

**LINE CONTROL UNIT (LCU)**  
**TEST AND TROUBLESHOOTING PROCEDURES**  
**COMM-STOR\* II COMMUNICATIONS STORAGE UNIT**

**1. GENERAL**

- 1.01** This section provides test and troubleshooting procedures for the line control unit (LCU) of the COMM-STOR II communications storage unit manufactured by Sykes Datatronics, Incorporated. The model is an 8220AC dual-drive unit, hereafter referred to as the LCU.
- 1.02** Whenever this section is reissued, the reason(s) for reissue will be listed in this paragraph.
- 1.03** Information covering LCU test and troubleshooting procedures is contained in the attached reprint of Section SYKS 578-400-503, Issue 1, prepared by Sykes Datatronics, Incorporated.
- 1.04** Diagnostic tests are presented as stand-alone procedures and require a User Diagnostic Kit, No. 1030A5307.
- 1.05** An operational checkout should be performed after installation or on trouble calls.

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## Comm-Stor II LINE CONTROL UNIT TEST AND TROUBLESHOOTING PROCEDURES

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## **1. GENERAL**

**1.01** This section provides testing and troubleshooting procedures for the Comm-Stor® II Line Control Unit, hereafter referred to as the Comm-Stor II LCU, model 8220AC (dual drive unit). Diagnostic tests are presented as stand-alone procedures and require User Diagnostic Kit #1030A5307.

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

**1.03** 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 LCU (refer to Section 578-400-203).

**1.04** 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 the network controller.

**1.05** 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.

**1.06** 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.

**1.07** 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.

**1.08** As a further aid to troubleshooting, refer to the wiring diagrams for the Comm-Stor II LCU in Section 578-400-400. For help in identifying

components, refer to Section 578-400-700, Disassembly/Reassembly and Parts.

## **DANGER AND WARNINGS**

### **1.09**

***Danger:*** Turn off all 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:

- ***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 using a felt marker - do not use a ball point pen or pencil.***
- ***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.***

1.10 Throughout this procedure opening and closing the drive door performs a continue process type of function.

## 2. PRELIMINARY CHECK

2.01 Before turning on any equipment, check that the Comm-Stor II LCU 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 LCU, peripheral devices such as the Console Terminal, data set, and printer should be checked, depending on the area of difficulty.

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

changed if required. The parameters should then be rechecked after the LCU has been off for several hours.

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 number 1030A5307) consists of a special Diagnostic diskette and a 3-port EIA conductor plug (Fig. 1). The test procedure is automatically loaded off the diskette into the unit's memory when the test is performed.

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

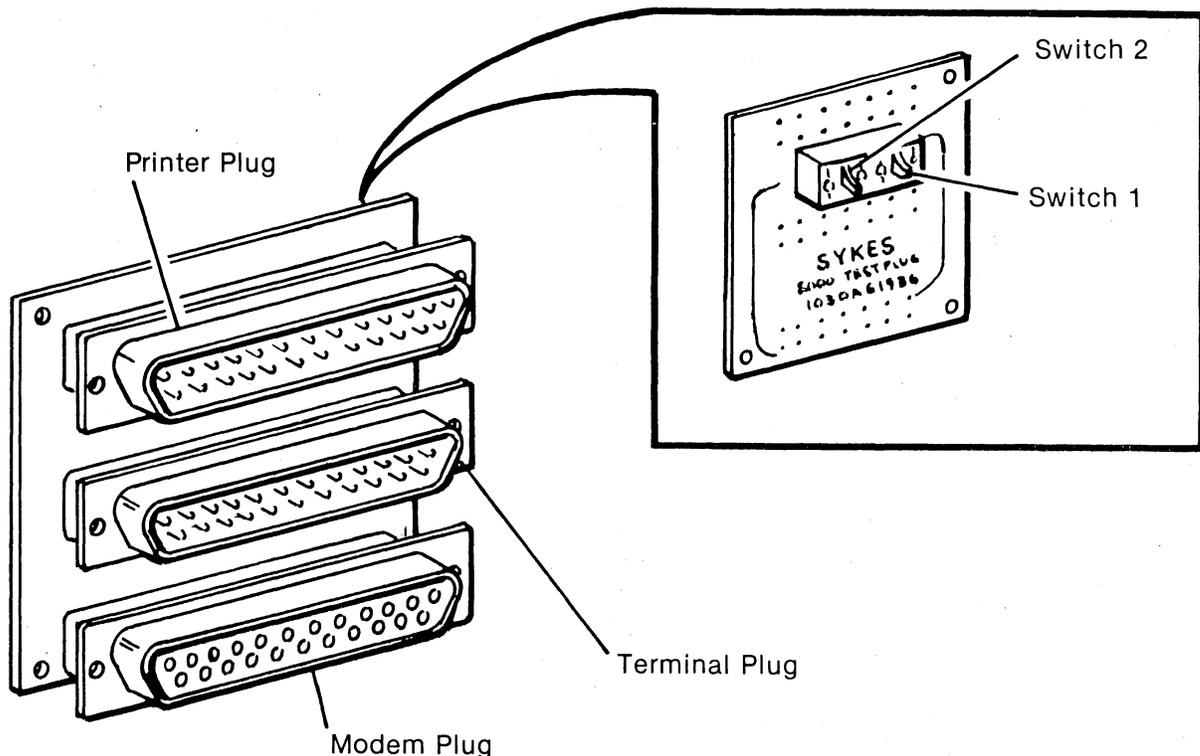


Fig. 1—Diagnostic Test Plug

**USER DIAGNOSTIC TESTS**

Test A - LED/Switch Test

Test B - Hardware Features Check

Test C - Internal Tests: Memory/Disk/  
 Time/Bit Rate

Test D - Terminal and Modem Port Tests

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/Disk Verify Test\*

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

**4. BASIC TROUBLESHOOTING PROCEDURE**

**4.01** To simplify isolating the problem area of the Comm-Stor II LCU, begin all troubleshooting procedures 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.

**4.05** If the equipment passes all tests and the trouble cannot be identified, notify your super-

visor who may then obtain Data Technical (DATEC) Support per BSP 010-521-100.

**5. USER DIAGNOSTIC PROCEDURE**

**5.01** If a Comm-Stor II LCU 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:

- the binary switch is set to EXIT and the modem switch is set to 0,
- 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.

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

**TABLE A**

**TEST SELECTIONS**

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

## DIAGNOSTICS TESTS

### Test A - LED/Switch Test

#### 5.05

- (a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskette from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.

*Note:* Do not remove the Diagnostic diskette until instructed.

- (h) Set the modem switch to 1.
- (i) Set the binary switch to EXIT. Set the terminal switch to 0. Set the printer switch to 0.
- (j) Depress the RESTART button.
- (k) 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 (2 seconds); then all will go off.

*Requirement 4:* Each LED is lit independently and sequentially (1 second each) in a "walking" pattern. If the walking LED test is not performed within one minute, a hardware failure has prevented execution.

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

- (l) 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 (not lit).

*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 in Table B. (Each bit rate setting 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.

- (m) Refer to Table C for failure interpretation.
- (n) Remove the Diagnostic diskette from the drive.

### Test B - Hardware Features Check

#### 5.06

- (a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the

**TABLE B**  
**LED DISPLAY (TEST A)**

BINARY 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 baud 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.

operational parameters to factory standard values.

- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.
- (h) Set the modem switch to 7. Set the printer switch to 0. Set the terminal switch to 0. Set the binary switch to EXIT.
- (i) Depress the RESTART button.

**Requirement:** The LED test (Test A) is *automatically* performed.

- (j) Open and close the drive 1 door.

**Requirement 1:** All LEDs will blink in unison.

**Requirement 2:** The hardware features check 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 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)	(OFF)	(ON)

This would indicate that no forms and editor options have been 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, if a unit contains 14K of RAM memory, the first pattern will be:



The second pattern will be:



- (k) Remove the Diagnostic diskette from the drive.

#### Test C - Internal Tests: Memory/Disk/Timer/Bit Rate

##### 5.07

- (a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND" prompt is issued.

**TABLE D**  
**HARDWARE FEATURES TABLE‡**

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)			
○	○	○	○	--	2--	--	--	--
○	○	○	●	32K	2K	1 DRIVE NO STAND - BY	4 *--	NO PRINTER PORT NO EXTENDED USER COMMAND TABLE
○	○	●	○	36K	4K	2 DRIVES NO STAND - BY	--	PRINTER PORT NO EXTENDED USER COMMAND TABLE
○	○	●	●	1 40K	8K	1 DRIVE STAND - BY	--	NO PRINTER PORT EXTENDED USER COMMAND TABLE
○	●	○	○	†44K	12K	2 DRIVES 3 STAND - BY	--	5 PRINTER PORT AND EXTENDED USER COMMAND TABLE
○	●	○	●	†48K	14K	1 DRIVE NO STAND - BY	--	--
○	●	●	○	†52K	16K	2 DRIVES NO STAND - BY	--	--
○	●	●	●	†56K	20K	1 DRIVE STAND - BY	--	--
●	○	○	○	†60K	24K	2 DRIVES STAND - BY	--	--
●	○	○	●	N/A	28K	--	--	--

‡Hardware features besides those installed on the LCU are included here to identify improper hardware.

ON ● OFF ○

1-5 Standard LCU equipment.

†Reserved for future expansion.

- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.
- (h) Remove all cables from the rear of the Comm-Stor II LCU.
- (i) Set the modem switch to 2. Set the printer switch to 0. Set the terminal switch to 0. Set the binary switch to EXIT.
- (j) Depress the RESTART button.
- (k) The Diagnostic will immediately perform the LED test.
- (l) 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 LCU.

*Note:* Upon completion of the 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.

- (m) Open and close the drive 2 door.

*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.

- (n) 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.
- (o) Remove the Diagnostic diskette from the drive.

#### Test D - Terminal and Modem Ports Tests

##### 5.08

- (a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.

**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. If failure persists, replace the 24K RAM board.

**TABLE F**  
**CONFIGURATION MEMORY FAULTS**

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/TIMER/BIT RATE FAULTS**

LIGHT	INTERPRETATION	REMEDY
READY	The main memory is faulty. Random and unpredictable operating faults may occur.	Replace the ROM board.
BUSY	A timer fault has occurred.	Replace the diskette controller board.
CARRIER	A bit rate generator is faulty.	Replace the communications ports board. If problem persists, replace the printer extended memory 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 diskette 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) Mount the diagnostic test plug on the rear panel. Set switch 1 up (EIA) and switch 2 down (TERM).
- (i) 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.
- (j) Depress the RESTART switch.

**Requirement:** The LED Test (Test A) is automatically performed.

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

- (m) 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 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.

**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

(n) 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.

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

**Test E - Printer Port Test (if External port is used)**

**5.09**

(a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.

(b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.

(c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.

(d) Enter P[CR] and a colon prompt displays.

- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.
- (h) Mount the diagnostic test plug on the rear panel and set switches 1 and 2 both up (EIA and PRINTER).
- (i) 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.
- (j) Depress the RESTART button.

**Requirement:** The LED test (Test A) is *automatically* performed.

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

- (m) 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 group of 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.

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: <ol style="list-style-type: none"> <li>1. The terminal port may not respond to a break (i.e., long space) from the terminal.</li> <li>2. The terminal port cannot send a break to the terminal.</li> <li>3. A terminal parity error indication may be falsely given.</li> </ol>	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. <ol style="list-style-type: none"> <li>1. The modem port may not respond to a break (i.e., long space) from the data set.</li> <li>2. The modem port cannot send a break to the data set.</li> <li>3. A modem parity error indication may be falsely given.</li> </ol>	Replace the communications ports board.
STATUS	Under certain conditions, transmission from the modem to the terminal may be faulty.	Replace the communications ports board.

**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.

**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.

- (n) 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.
- (o) 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 LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays,
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt displays.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.

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

- (i) Set the modem port switch to 6.

- (j) Depress the RESTART button.

**Requirement:** The LED test (Test A) is automatically performed.

- (k) 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.

- (l) 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 (m).

**Requirement 2:** If a series of LEDs are lit, refer to Table K for the first group of 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.

- (m) 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.

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

**Test G - Configuration Memory Test**

**5.11**

- (a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.
- (h) Set the modem switch to 8.
- (i) Depress the RESTART button.

**Requirement:** The LED test (Test A) is automatically performed.

- (j) 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 LCU OFF. Wait about 1 minute.

- (k) Turn the Comm-Stor II LCU 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 the BUSY LED comes on and stays on, no faults exist. Turn the Comm-Stor II LCU OFF. Wait about 1 minute.

- (m) Turn the Comm-Stor II LCU ON.

**Requirement:** The LED test is again automatically performed.

- (n) 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:** 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.

**TABLE Q**

**CONFIGURATION MEMORY FAULTS**

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

**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 LCU ON and depress any character on the Console Terminal.

- (b) When the "COMMAND?" prompt displays, enter 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the User Diagnostic diskette into drive 1; close the drive door.
- (h) Set the modem switch to 9.
- (i) Depress the RESTART button.

**Requirement:** The LED test is automatically performed.

- (j) Open and close the drive 1 door.

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

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

**Requirement 3:** If no errors occur, the READY 2 and BUSY 2 LEDs will blink on and off. Another diskette may be inserted into drive 2 and tested.

**Note:** 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, insert the Diagnostic diskette into drive 1 and proceed from step (i).

**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 C in Table E or F.

- (a) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values.
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.
- (h) Connect a terminal to the Comm-Stor II LCU's terminal port and set the terminal bit rate switch for the appropriate bit rate.
- (i) Depress the RESTART button. Wait approximately 15 seconds. The following message is displayed at the terminal:

\*\*\*USER DIAGNOSTIC, VER. A\*\*\*

ENTER A COMMAND FOLLOWED BY A  
RETURN  
#

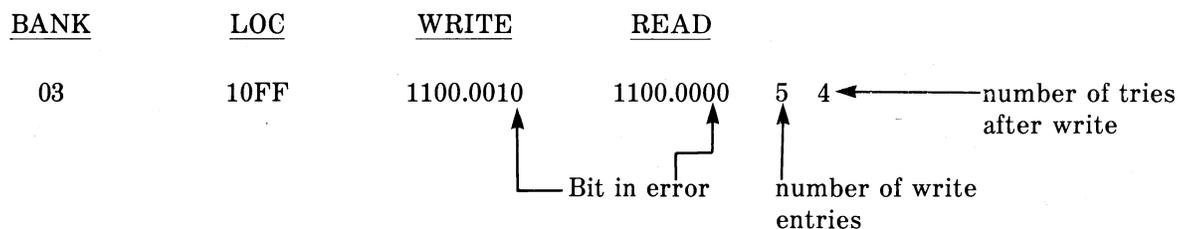
- (j) After the number sign prompt (#) appears, type the letter "M" on the terminal followed

**TABLE R**  
**USER DIAGNOSTIC MEMORY TEST**

ADDRESS RANGE	FUNCTION	CIRCUIT BOARD	IC LOCATION BIT POSITIONS							
			7	6	5	4	3	2	1	0
0020-03FF	RAM	MP-RAM	D3	D1	C3	C1	B3	B1	A3	A1
0400-07FF	RAM	MP-RAM	D4	D2	C4	C2	B4	B2	A4	A2
0800-08FF	Configuration Memory (CMOS)	MP-RAM	E2	E2	E2	E2	F3	F3	F3	F3
0900-09FF	Extended User Command Table (CMOS)	MP/RAM	A5	A5	A5	A5	B5	B5	B5	B5
1000-1FFF	RAM	16K RAM Memory	A1	B1	C1	D1	E1	F1	H1	J1
2000-2FFF	RAM	16K RAM Memory	A2	B2	C2	D2	E2	F2	H2	J2
3000-3FFF	RAM	16K RAM Memory	A3	B3	C3	D3	E3	F3	H3	J3
4000-4FFF	RAM	16K RAM Memory	A4	B4	C4	D4	E4	F4	H4	J4
5000-5FFF	RAM	24K RAM Memory	F1	H1	J1	K1	L1	M1	N1	P1
6000-6FFF	RAM	24K RAM Memory	F2	H2	J2	K2	L2	M2	N2	P2
7000-7FFF	RAM	24K RAM Memory	F3	H3	J3	K3	L3	M3	N3	P3
8000-8FFF	RAM	24K RAM Memory	F4	H4	J4	K4	L4	M4	N4	P4
9000-9FFF	RAM	24K RAM Memory	F5	H5	J5	K5	L5	M5	N5	P5
A000-AFFF	RAM	24K RAM Memory	F6	H6	J6	K6	L6	M6	N6	P6

1. If an error occurs in a RAM test, the location of the error (Hexadecimal Address) and the Write/Read patterns can be used to locate the defective RAM IC. Write/Read patterns are arranged 76543210 on the failure printout.

Example:



Bit error is bit 1.

The defective IC can be pinpointed to H1 on the 16K RAM memory board using the above chart.

2. A RAM failure which is not solved by replacing the RAM IC requires troubleshooting the address decoding circuitry on the board in question.

by a carriage return. After a slight delay, the letter M will be echoed back to the terminal and the following statement will be displayed:

### STANDARD RAM

Now type "Y".

(k) The system will print the following message at the terminal:

### EXP RAM

Type "Y". 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 0 indicates the logic level of each data bit written into RAM

READ = a 1 or 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 LCU 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 LCU will respond with the following message:

### PRESS RETURN KEY

Strike any key 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 (up to 6 tries), 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.

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

At the completion of this test it will loop to the beginning.

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

### Test V - Drive/Disk Verify Test

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

5.15 The main 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) Turn the Comm-Stor II LCU ON and depress any character on the Console Terminal.
- (b) When the "COMMAND?" prompt displays, enter a 3[CR] at the Console Terminal. A period prompt displays.
- (c) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the operational parameters to factory standard values.
- (d) Enter P[CR] and a colon prompt displays.
- (e) Enter R[CR] and the system responds with "--SURE?". Enter Y[CR]. This entry sets the protocol parameters to factory standard values..
- (f) Enter Q[CR] and the "COMMAND?" prompt is issued.
- (g) Remove any diskettes from the drives. Insert the Diagnostic diskette into drive 1; close the drive door.
- (h) Connect a terminal to the terminal port of the Comm-Stor II LCU and set the terminal bit rate switch for the appropriate bit rate.
- (i) Depress the RESTART button. Wait approximately 15 seconds. The following message is displayed at the terminal:

\*\*\*USER DIAGNOSTIC, VER. A\*\*\*

ENTER A COMMAND FOLLOWED BY A RETURN.  
#

- (j) 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 back to the terminal and the following statement will be displayed:

INSERT IN

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

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

- (l) 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.

- (m) 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 LCU 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.

- (n) The test will begin automatically after a carriage return has been typed following the ID REVS number.

The following table will be displayed:

```

TRK  SEC  TRK  = track number
                SEC  = sector number
RUN 1                RUN 1 = 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. Strike the space bar on the terminal to stop the test and return the procedure to the TRK message. Strike the character "I" to return to the INSERT IN message.

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

#### 6. CHECKLIST #1 - DIAGNOSTIC DOES NOT RUN

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

**TABLE S**  
**CHECKLIST #1**

SYMPTOM	REMEDY
<p><b>Unit is completely dead.</b> Cooling fan is not spinning, drive motor is not spinning, no illumination of power switch, no front panel illumination.</p>	<ul style="list-style-type: none"> <li>(a) Reset the circuit breaker by pushing the power switch/circuit breaker button located on the back panel.</li> <li>(b) Check the power outlet for 115 VAC.</li> <li>(c) Remove the top cover. Check the power harness connectors to make sure they are mated together properly and there are no loose wires.</li> <li>(d) Check the AC power connections at the power supply (red and gray wires).</li> <li>(e) With the unit <i>unplugged</i>, check the continuity of the power switch/circuit breaker, and the harnessing.</li> </ul>
<p><b>No power indication.</b> No illumination of power switch. No illumination of LEDs when system turned ON or restarted.</p>	<ul style="list-style-type: none"> <li>(a) With a digital voltmeter, check DC power supply voltages at base card edge connectors. (Allowable tolerances are also indicated.) <ul style="list-style-type: none"> <li>+ 5.0 VDC @ pins 5,6 5.1 to 5.2</li> <li>+ 24.0 VDC @ pins 7,8 + 23.0 to + 25.0</li> <li>+ 12.0 VDC @ pins 99,100 + 11.0 to + 13.0</li> <li>-12.0 VDC @ pins 97,98 -11.0 to -13.0</li> <li>Ground @ pins 1,2,66</li> </ul> </li> </ul>

TABLE S (Cont)

CHECKLIST #1

SYMPTOM	REMEDY
	<p>If one or more of the DC voltages are not present at the base card edge connector, refer to Section 578-400-750, <i>Routine Maintenance Procedures</i> for power supply adjustment procedure.</p> <p>(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 power supply. Swap/verify the circuit boards one at a time.</p>
<p><i>LEDs do not illuminate when the unit is restarted.</i> No head load solenoid activity when the unit is restarted with a diskette inserted.</p>	<p>(a) Check DC voltages (refer to section B, above) at base card edge connector.</p> <p>(b) Check battery voltage for 3.5 VDC MINIMUM.</p> <p>(c) Check battery connections.</p> <p>(d) Check front panel LED harness connection at the communications ports board.</p> <p>(e) If all the DC voltages appear to be normal, follow the sequences below:</p> <ol style="list-style-type: none"> <li>(1) Turn the unit OFF; remove the diskette controller board, and turn the unit ON. If LEDs come on, the problem is in the diskette controller board or diskette drive assembly. Swap/verify these assemblies one at a time.</li> <li>(2) Turn the unit OFF; remove the printer option board if installed, and turn the unit ON. If the LEDs come on, the problem is in the printer option board.</li> <li>(3) Turn the unit OFF; swap/verify the MP-RAM board.</li> <li>(4) Turn the unit OFF; swap/verify the ROM board.</li> <li>(5) Turn the unit OFF; swap/verify the base card.</li> </ol>

**TABLE S (Cont)**

**CHECKLIST #1**

SYMPTOM	REMEDY
<i>LEDs light for one second and go off, but User Diagnostic does not load from the diskette.</i>	(a) Check the User Diagnostic diskette on another unit. (b) Check for drive motor rotation. (c) Swap/verify the drive ribbon wire cables. (d) Swap 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**

without failure. Table T lists potential trouble symptoms and recommended remedies. Observe the symptoms and proceed with the indicated remedy.

7.01 This part applies to Comm-Stor II LCUs which have passed the User Diagnostic tests

**TABLE T**

**CHECKLIST #2**

SYMPTOM	REMEDY
<i>System will not respond to certain keyboard commands.</i>	(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 the ROM board.
<i>Unit does not respond with "carriage return", "line feed", or "asterisk" when re-started.</i>	(a) The terminal bit rate switch is not set the same as the terminal. (b) The parity of the terminal and the Comm-Stor II LCU are not set the same.

TABLE T (Cont)

CHECKLIST #2

SYMPTOM	REMEDY
	<ul style="list-style-type: none"> <li>(c) Unit was not refreshed after the MP-RAM board removal/replacement.</li> <li>(d) Check configuration parameters as described in section A, above.</li> </ul>
<i>"Error-Diskette" Message</i>	<ul style="list-style-type: none"> <li>(a) Probable worn or damaged diskette. Check the unit with other diskettes.</li> <li>(b) Check diskette drive assembly head-to-track alignment.</li> <li>(c) Swap/verify the diskette controller board.</li> </ul>
<i>"Error-Bad Read" Message</i>	<ul style="list-style-type: none"> <li>(a) Probable worn or damaged diskette. Check the unit with other diskettes.</li> <li>(b) Check head-to-track alignment of the unit which wrote data on the diskette and the unit which is reading diskette.</li> <li>(c) Swap/verify the diskette controller board of the unit which wrote on diskette and the unit reading the diskette.</li> </ul>
<i>"Error-System" Message</i>	<ul style="list-style-type: none"> <li>(a) Caused by a diskette with a bad directory.</li> <li>(b) Swap/verify the ROM board.</li> <li>(c) Swap/verify the MP-RAM board.</li> <li>(d) Swap/verify the diskette controller board.</li> <li>(e) Swap/verify the communications ports board.</li> </ul>
<i>Erroneous data transfer between the Comm-Stor II LCU and terminal, data set or external port.</i>	<ul style="list-style-type: none"> <li>(a) Check for proper bit rate adjustment of the Comm-Stor II and peripheral device.</li> <li>(b) Check for proper parity adjustment of the Comm-Stor II LCU and the terminal.</li> <li>(c) Swap/verify the communications ports board for terminal or data set data transfer problems.</li> </ul>

TABLE T (Cont)

CHECKLIST #2

SYMPTOM	REMEDY
(Cont)	(d) Swap/verify the printer board for external port data transfer problems.  (e) Swap/verify the MP-RAM board if erroneous data transfer exists through <i>all</i> I/O ports.

8. COMMUNICATIONS CHECKOUT

8.01 The following on-line check should be performed immediately after installing the Comm-Stor II LCU and whenever send/receive prob-

lems are indicated. This procedure will determine whether the Comm-Stor II LCU can communicate with the Test Center through the modem port.

TABLE U

INSTALLATION TEST PROCEDURES

STEP	PROCEDURE		RESULT
	Comm-Stor II LCU	TEST CENTER	
1	Establish a connection to the Comm-Stor II LCU circuit.		
2	Refresh to factory standard configuration.		
3	Set configuration parameters for:  baud rate data set type answerbacks poll and address  Check anything that may be unique to the configuration.		

**TABLE U (Cont)**  
**INSTALLATION TEST PROCEDURES**

STEP	PROCEDURE		RESULT
	Comm-Stor II LCU	TEST CENTER	
4		Prepare equipment to respond to poll and address codes with answerbacks as listed in the Service Order.	
5	Restart.		NCS polling sequence will be observed on-line.
6	Polling resumes.	Respond to polling with no-traffic answerback.	
7	Polling continues.	Respond to polling with a message to NCS. Format:  S        S T        T : NCS X        X = = Test from STC  E O T	The Comm-Stor II LCU will pick up the message and then address NCS.
8	Send NCS address.	Return Ready Answerback.	
9	Send Acknowledgment message.		Acknowledgment message will display at STC.
10	Send NCS address.	Return Ready Answerback.	

**TABLE U (Cont)**  
**INSTALLATION TEST PROCEDURES**

STEP	PROCEDURE		RESULT
	Comm-Stor II LCU	TEST CENTER	
11	Send test message and trailer message.		Test message sent in step 7 will display.
12	Roll call begins.	Respond with Ready Answerback.	Receive-Interrupt character followed by address will display.
13	Send E O T		E O will display. T
14	Polling resumes.		Polling sequence will display.
15		Reconnect network.	
16	Refresh to customer parameters.	Monitor LCU drop.	The following will display:  <ul style="list-style-type: none"> <li>● service message</li> <li>● polling sequences</li> <li>● answerbacks and traffic from connected remote stations.</li> </ul>
17		Verify that installed remote stations are responding.	Remote stations that are not responding should be isolated and corrected.

**TABLE U (Cont)**  
**INSTALLATION TEST PROCEDURES**

STEP	PROCEDURE		RESULT
	Comm-Stor II LCU	TEST CENTER	
18	Depress any key on the Console terminal.		Polling will stop and the "COM-MAND?" prompt will display.
19	Type 10[CR] at the Console Terminal.		"STATION?" prompt will display.
20	Type ALL[CR].		The following will display:  <ul style="list-style-type: none"> <li>● all characters received and transmitted status report of all connected stations.</li> </ul>
21	Notify STC of any stations on the polling table that are not responding.	Verify the status of stations that are not responding and correct the trouble if required.	
22	When test is completed; type 1[CR] at the Console Terminal.	Remove monitor and restore circuit to normal.	
23	Polling resumes.		Polling sequences, answerbacks, and messages will be observed on-line.