

43 RO TELEPRINTER

TESTING

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1. GENERAL

- 1.01 This section provides testing information for the 43 RO Teleprinter.
- 1.02 This section is reissued to include testing of teleprinters equipped with an integrated Terminal Auxiliary Unit (TAU1) or an answer-back modification kit.
- 1.03 An installation checkout should be performed after installation to make sure the station is operable.
- 1.04 On trouble calls, an installation checkout should be performed after trouble correction to make sure the station is operable and a trouble verification test should be performed under the direction of the Test Center to isolate specific troubles not covered in the installation test. After correction of a trouble, the test may be confined to the specific area that was failing.
- 1.05 Following routine maintenance calls at a location, an installation checkout should be performed.
- 1.06 The checkout routines are presented in table form with test conditions arranged in a specific sequence. A response is given to verify the test condition has passed.

1.07 Always perform the tests in the order given. The test steps are based on satisfactory results of all previous steps.

1.08 If the indicated response is not obtained in any step of a test procedure, repeat the step to make sure that the procedure has been performed properly. If the results are still unsatisfactory, refer to the RO Teleprinter Troubleshooting Section 574-500-301.

1.09 Teleprinters without access to the switched network must be associated with locally developed external testing arrangements and procedures to perform actual On-Line Tests. If test station is remote, a copy of RO Teleprinter On-Line Tests should be available at the test station.

*Note:* The local tests specified in this section simulate most On-Line Tests for these teleprinters.

1.10 On-Line Tests can be performed with Test Centers equipped with a 43 Teleprinter or equivalent using Section 668-130-500.

1.11 Before an On-Line Test can be performed, the remote testing station or Test Center must be provided with advance details about the teleprinter under test, such as, telephone number, type of terminal (friction or sprocket) option exceptions present, speed, etc.

PRELIMINARY CHECK

- 1.12 Before proceeding with the checkout procedure, check the following:
  - (a) Is the station connected to a properly grounded and polarized ac service?
  - (b) Are all cable connectors fully seated?
  - (c) Are printer paper and ribbon properly installed?
  - (d) Are any option exceptions present? Refer to the Engineering Options, Section 574-500-210 and reverse side of directory card.

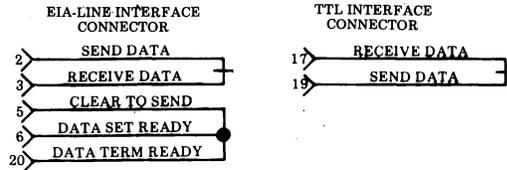
## SECTION 574-500-501

Procedures in Off-Line and On-Line Tests are based on standard factory furnished options being present. If option exceptions are present, the test response will be as shown in Engineering Options Section 574-500-210.

### 2. TEST EQUIPMENT

2.01 For teleprinters without access to the switched network, Off-Line Test Procedures are provided to simulate On-Line Tests where external communication test devices are not available. To perform these tests, the connector terminals, shown as follows, should be strapped before proceeding with the tests. The remaining terminals should be connected or measured as specified during the test steps.

*Note:* Contact Teletype Corporation Custom Product Division for availability of a 43 Teleprinter Interface Test Box, CP10.002.001-1, which provides both arrangements shown as follows:



2.02 A 43 KSR Operator Console, 43K101/CAA or CAB can be substituted in RO Teleprinters to perform tests off-line when external communication test devices (Test Centers) are not available for on-line operation.

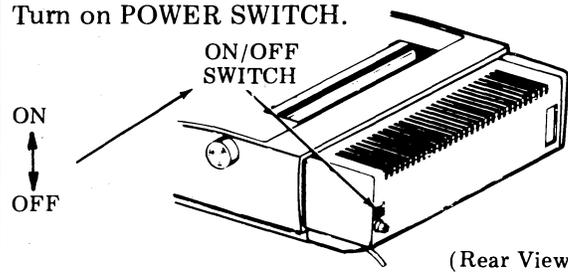
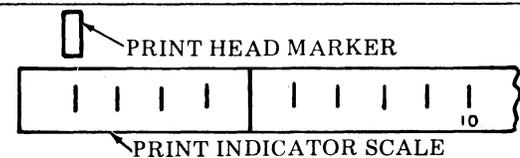
2.03 A volt-ohmmeter or equivalent means to measure  $\pm 12$  volts and  $\pm 5$  volts and perform continuity checks is required.

2.04 Steps 1 through 7 apply to all teleprinters. Steps 8 through 29 apply to all teleprinters unless otherwise indicated.

3. TESTING PROCEDURES

OFF-LINE TESTS (Installation and Trouble Call Checkout)

TABLE A  
OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Power On/Off	1.	Turn on POWER SWITCH. 	Print head returns to the left-hand margin.  Paper feeds to next line.  TERM READY (AUTO ANSW) turns on.
	2.		Print head marker points to first mark on indicator scale.
Printer Option 431.a. 432.a.	3.	Hold PRINTER TEST key depressed until approximately eight lines are printed.	ALARM turns on. Characters printed as in Fig. 1. (Refer to Option 431 or 432.b. and c. for any exceptions.)  Bell rings at end of each line. (Right-Hand Margin and Test Message.)

Note 1: First line may start with any character for sprocket or friction feed printers.

```

lmnopqrstuvwxyz{}"
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"

```

Sprocket Feed — Approximately 13 Characters per inch

See Note 1.

Note 2: The lower case "o" does not print on 80 character line.

```

tuvwxyz{}"
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
pqrstuvwxyz{|}~"
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
pqrstuvwxyz{|}~"
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
pqrstuvwxyz{|}~"
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
pqrstuvwxyz{|}~"

```

Friction Feed — 10 Characters per inch

Fig. 1

TABLE A (Cont)  
OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Printer (Cont)	4.	Release PRINTER TEST key.	ALARM turns off. Character printing stops. Print head returns to left-hand margin. Paper feeds to next line.
Cover Interlock	5.	Raise cover	ALARM turns on. TERM READY turns off.
	6.	Close cover	ALARM remains on.
	7.	Depress RESET key.	ALARM turns off. TERM READY turns on.

Steps 8 through 29 may be omitted if On-Line Tests are performed instead.

*Note:* Not all tests performed in Steps 8 through 29 are checked in on-line tests.

SIMULATED ON-LINE TESTS (LOOPBACK)

Loopback	8.	Turn off POWER switch and connect the test arrangement shown on Page 2 to the interface connector.	
	8.a.	W/TDU — Remove the paper holder and bustle cover. Unplug the logic card cable connector on top of the TDU and plug into test arrangement. Measure continuity between pins 6 and 9 on TTL Interface Connector.  TTL INTERFACE — Connect Terminal Ready pin 5 to Data Ready pin 15. Turn on teleprinter POWER switch.	Meter should read 0 ohms (Issue 2A Logic Card).  Print head returns to left-hand margin. Paper feeds to next line. DATA turns on.
	8.b.	W/TAU OR TAU1 — LINE INTERFACE: Connect Carrier Detect pin 8 to Data Term Ready pin 20. Turn on teleprinter POWER switch.	Print head returns to left-hand margin. Paper feeds to next line. DATA turns on. +12 V will be present on pin 4 of Line Interface Connector (Issue 2A Logic Card, sets w/TAU or sets w/TAU1).
	8.c.	TTL INTERFACE — Measure continuity between pins 6 and 9 on TTL Interface Connector.  Connect Terminal Ready pin 5 to Data Ready Pin 15. Turn on teleprinter POWER switch.	Meter should read 0 ohms (Issue 2A Logic Card).  Print head returns to left-hand margin. Paper feeds to next line. DATA turns on.

TABLE A (Cont)  
OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Setup	9.	Turn off POWER switch. Remove RO Operator Console and install KSR Operator Console. Remove cover and manually depress Interlock switch on KSR operator console (between ALARM and PRINTER TEST keys) during test procedure.	
	9.a.	W/TDU — Remove test arrangement and reconnect TTL connector from logic card to TDU.  Replace bustle cover and paper holder.	
Analog Loop  Option 439.a. 441.a. 442.a. 443.a.	10.	Turn on POWER switch.	TERM READY (AUTO ANSW) turns on.
	10.a.	W/TDU — Place DUPLEX key in UP position (HALF-DUPLEX). Wait 6 seconds then depress ESC key.  Hold SHIFT key depressed and depress  key.	ALARM flashes. DATA turns on. Answer-Back message is printed (sets w/answer-back). (Refer to options 439.b., 441.b., 442.b., and 443.b. for any exceptions.)
	10.b.	W/TTL INTERFACE ONLY	+5 V will be present on pin 7. -12 V will be present on pin 11. +12 V will be present on pin 13. GND will be present on pin 9.
Data Loopback	11.	Place CPS key in UP position (30 CPS).  Depress and release PARITY key to UP position (PARITY ON). Place DUPLEX key in UP position (HALF-DUPLEX). Place CAPS LOCK key in DOWN position. Type the following: ANALOG Depress SPACE BAR.	-12 V will be present on pin 23 of Line Interface Connector (sets w/TAU). AANNAALLOOG is printed.

TABLE A (Cont)  
OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
EOT Option 433.a.	12.	Place DUPLEX key in DOWN position (FULL DUPLEX). Type the following: TEST  Watch TERM READY (AUTO ANSW) key, then hold CTRL key depressed and depress  key.	TEST is printed.  DATA and TERM READY (AUTO ANSW) flash as EOT key is depressed. (Refer to Option 433.b. for any exceptions.)
	13.	Depress INTRPT key.	INTRPT turns on momentarily. Signal bell rings.
	14.	Hold CTRL key depressed and depress RETURN key.	Print head does not return.
CPS Option 435.a.  Option 436.a.	15.	Depress RETURN and then LINE FEED key.  Depress REPT and K keys.  Hold down until two lines of Ks are printed (check time to print line).	Continuous Ks will be printed across entire new line.  Bell rings at end of line and automatic return and line feed will be performed.  One printed line plus return will occur in approximately: 4 seconds (sprocket feed) 2.5 seconds (friction feed) (Refer to Option 435.b. or 436.b. for any exceptions.)
		Measure continuity between pins 4 and 17 on connector of RO opcon that was removed.	Meter should read an open circuit. (Refer to Option 436.b. for any exceptions.)
Option 437.a.	16.	Enable Option 434.b.  Depress the following keys: PARITY TEST	Printer will print: ■ ■ R I T ■ T E ■ T (Refer to Option 437.b. for any exceptions.)
		Measure continuity between pins 4 and 20 on connector of RO opcon that was removed.  Enable Option 434.a.	Meter should read an open circuit.  (Refer to Option 437.b. for any exceptions.)

TABLE A (Cont)  
OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Low-Paper (Friction Feed) Paper-Out (Sprocket Feed)	17.	Remove the paper — Paper-out (sprocket feed). Lift paper roll from paper support — (friction feed).	Signal bell rings (sprocket feed only).  ALARM remains on, ie, stops flashing (sets w/TDU).  ALARM turns on (sets w/o TDU).
	18.	Watch DATA key and depress LINE FEED key eight times.	<u>Sprocket Feed</u> DATA turns off. LOCAL (LOCAL-TALK) turns on as 8th LINE FEED is received.  <u>Friction Feed</u> DATA remains on. LOCAL (LOCAL-TALK) remains off.
	19.	Watch and depress TERM READY (AUTO ANSW) key.	<u>Sprocket Feed</u> DATA remains off. LOCAL (LOCAL-TALK) remains on.  <u>Friction Feed</u> TERM READY (AUTO ANSW) flashes as key is depressed. LOCAL (LOCAL-TALK) turns on.
	20.	Replace the paper. Depress RESET button on paper roll support (friction feed only).	ALARM flashes (sets w/TDU). ALARM turns off (sets w/o TDU).
	21.	Depress DATA key .	DATA turns on. LOCAL (LOCAL-TALK) turns off.
Answer-Back on ENQ Option 440.a. Option 443.a.	22.	W/ANSWER-BACK AND TAU, TAU1 OR TTL — Hold SHIFT key depressed and depress  key.	ALARM flashes.

TABLE A (Cont)  
OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Answer-Back on ENQ Option 440.a. Option 443.a. (Cont)	22.a.	Place DUPLEX key in DOWN position (FULL DUPLEX). Hold CTRL key depressed and depress  key.	Answer-Back message does not print.
	22.b.	Place DUPLEX key in UP position (HALF-DUPLEX). Hold CTRL key depressed and depress  key.	Answer-Back message is printed. (Refer to Options 440.b. and 443.b. for any exceptions.)
	22.c.	W/ANSWER-BACK AND TAU, TAU1, OR TTL — Depress ESC and then  key.	ALARM turns off.
Answer-Back Option 439.a. 442.a.	23.a.	W/ANSWER-BACK AND TAU OR TAU1 — LINE INTERFACE: Remove strap from Send Data pin 2 to Rec Data pin 3. (Perform the following procedures within 6 seconds.) Disconnect wire from Carrier Detect pin 8 and momentarily connect to Ring Indicator pin 22; then reconnect to pin 8. Reconnect strap from pin 2 to pin 3.	Answer-Back message is printed. (Refer to Options 439.b. and 442.b. for any exceptions.)
	23.b.	W/ANSWER-BACK AND TTL INTERFACE — Remove strap from Send Data pin 19 to Rec Data pin 17. (Perform the following procedures within 6 seconds.) Disconnect wire from Term Ready pin 5 and connect to +5 V pin 7. Connect strap between +12 V pin 3 and Ring Indicator pin 12. Immediately disconnect wire from pin 7 and reconnect to pin 5. Disconnect strap from pin 3 to pin 12. Reconnect strap from pin 19 to pin 17.	Answer-Back message is printed. (Refer to Options 439.a. and 442.a. for any exceptions.)
Answer-Back Option 441.b.	24.a.	W/ANSWER-BACK AND TAU OR TAU1 — Momentarily disconnect wire from Carrier Detect pin 8, then reconnect to pin 8.	Answer-Back message is not printed. (Refer to Option 441.a. for any exceptions.)
	24.b.	W/ANSWER-BACK AND TTL INTERFACE — Momentarily disconnect wire from Term Ready pin 5, then reconnect to pin 5.	Answer-Back message is not printed. (Refer to Option 441.a. for any exceptions.)

TABLE A (Cont)

## OFF-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Current Loop	25.	W/TAU1 — LINE INTERFACE: Connect Data Term Ready pin 20 to Rec Data pin 3. Remove strap from Send Data pin 2 to Rec Data pin 3.	INTRPT turns on. Signal bell rings.
		Disconnect strap between pin 20 and pin 3. Reconnect strap from pin 2 to pin 3. Depress INTRPT key.	INTRPT turns off.
Loopback Clear	26.a.	W/TDU — Depress ESC and then  key.	ALARM and DATA turn off. TERM READY (AUTO ANSW) turns on.
	26.b.	W/TAU OR TAU1 LINE INTERFACE — Disconnect strap between Data Term Ready pin 20 and Carrier Detect pin 8.	DATA turns off. TERM READY (AUTO ANSW) turns on.
	26.c.	W/TTL INTERFACE — Disconnect strap between Data Ready pin 15 and Terminal Ready pin 5.	
Low-Paper (Friction Feed) Paper-Out (Sprocket Feed)	27.	Sprocket Feed — Remove paper.	TERM READY (AUTO ANSW) turns off. LOCAL (LOCAL-TALK) and ALARM turn on. Signal bell rings (sprocket feed only).
		Friction Feed — Lift paper roll from paper roll support.	
	28.	Depress TERM READY (AUTO ANSW) key.	TERM READY (AUTO ANSW) remains off. LOCAL (LOCAL-TALK) and ALARM remain on.
	29.	Replace the paper. Depress RESET button on paper roll support (friction feed only).	ALARM turns off.

This completes the OFF-LINE test of the 43 RO Teleprinter.

Remove the KSR Operator Console and replace the RO Operator Console.

Remove the Interface Test Arrangement (if present) and replace the bustle cover and paper holder.

Teleprinters with access to the switched network, proceed to the ON-LINE TESTS.

Teleprinters without access to the switched network, use local procedures and arrangements for ON-LINE testing.

## ON-LINE TESTS (Teleprinters With Access to the Switched Network — Installation Checkout)

TABLE B  
ON-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Auto- matic Answer  Option 439.a. 441.a. 442.a. 443.a.	1.	With power on, verify TERM READY is on.	Data Test Center will call station.  DATA turns on. TERM READY goes off. Answer-Back message is printed at station and Test Center (sets w/ answer-back). (Refer to Options 439.b., 441.b., 442.b. and 443.b. for any exceptions).
ENQ Option 440.a.	2.	Test Center will send CTRL E (ENQ)	Answer-Back message is printed at station and Test Center (sets w/ answer-back). (Refer to Option 440.b. for any exceptions.)
EOT Detect  Option 433.a. 436.a.	3.	Test Center will send the following test message ending with EOT:  43 RO TELEPRINTER ON LINE TEST	Test message will be printed. Station will disconnect: DATA goes off. TERM READY turns on. (Refer to Option 433.b. or 436.b. for any exceptions.)
Digital Loop	4.	Test Center will call station.	DATA turns on. TERM READY goes off. Answer-Back message is printed (sets w/ answer-back.)
	5.	Test Center will send the following message:  E <sub>sc</sub> < DIGITAL LOOP	ALARM flashes. DIGITAL LOOP will be printed.
	6.	Test Center will send: E <sub>sc</sub> =	ALARM turns off.

TABLE B (Cont)  
ON-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Paper-Out	7.	Remove the paper — paper-out (sprocket feed).  Lift and hold paper roll (friction feed).  Test Center will send eight LINE FEED characters.    Test Center will disconnect call.	Signal bell rings (sprocket feed only). ALARM turns on.  ALARM turns on.  <u>Sprocket Feed</u> DATA turns off as 8th line feed is received.  <u>Friction Feed</u> DATA remains on as 8th line feed is received.
	8.	Test Center will call station.	Station will not go to Data mode.  DATA remains off.
Auto- matic Carriage Return  Option 435.a.	9.	Replace the paper. Depress RESET key.  Test Center will call station and send the following message:  CR LF 4 Spaces E <sub>sc</sub> L (lower case) 5 Spaces E <sub>sc</sub> r (lower case) CR LF E <sub>sc</sub> < two full lines of repeat Ks E <sub>sc</sub> x (lower case) E <sub>sc</sub> =  <i>Note:</i> CR = Carriage Return LF = Line Feed  (Refer to Option 435.b. for any exceptions.)	ALARM turns off.   DATA turns on. TERM READY goes off. ALARM flashes.  Printer will print Ks between columns 5 and 10 and line feed automatically at right margin. Print head will move to column 1 at end of message. ALARM turns off.
Receive Parity Detect Option 437.a.	10.	Test Center will send the following message (8th Bit Marking): PARITY TEST	Printer will print: ■ ■ R I T ■ T E ■ T

TABLE B (Cont)

## ON-LINE TEST PROCEDURES

TEST	STEP	PROCEDURE	RESPONSE
Receive Parity Detect Option 437.a. (Cont)	11.	<p>Test Center will send TEST OK message if test was satisfactory and disconnect.</p> <p>Test Center will send TEST NOT OK message if test was unsatisfactory and disconnect call.</p> <p>Call Test Center and evaluate results.</p>	<p>Station will disconnect. DATA goes off. TERM READY turns on.</p>

This completes the On-Line Test of the 43 RO Teleprinter.