

“DATASPEED*” 4540 STATION ARRANGEMENTS

TESTING AND TROUBLESHOOTING

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1. GENERAL

1.01 This section includes all testing and trouble analysis of the DATASPEED 4540 Station (hereafter referred to as 4540-Type).

1.02 This section is reissued to include the 45FG110/AC/01 program circuit card.

1.03 Troubles isolated to the telephone lines or associated systems are not analyzed in this section.

1.04 The correction of troubles in this section is based on replacement of defective major subassemblies (eg, monitor, display base, keyboard, printer, controller, power supply,

controller circuit cards, etc). Field level repair of the monitor, printer, 40-style keyboard and 45-style keyboard is given in Sections 582-213-500, 582-210-500, 582-211-500, and 582-311-500 respectively. Repair of defective controller power supply, controller circuit cards, and display base should only be done at an authorized Service Center.

Note: When ordering replaceable parts or components, unless otherwise specified, prefix each part number with the letters “TP” (ie, TP410311).

1.05 The following Caution applies whenever it becomes necessary to replace a 45FG110-type program circuit card in the controller:

Caution: If the program circuit card is any 45FG110-type other than 45FG110/AA, simply depress the PF 1 key after replacement. If the program card is a 45FG110/AA, and all of the keyboards in the station are typewriter-style (ie, 40K104, 40K203 or 45K301), re-option the Station for line code not originally intended. (eg, If originally intended line code is EBCDIC, then option (See OPTIONS in 582-300-200, Installation) station for ASCII line code and depress S/R. Then option station back to EBCDIC line code and depress S/R again). This action will cause the SCC to down-load all KDs, with the proper applications program, thus assuring correct operation at all KDs.

If 40K105 Type Internal Numeric Cluster style Keyboards are part of the station, then perform the following after replacing the 45FG110/AA program circuit card.

- (a) Perform a controller self-test per Chart 1.
- (b) When the “End-of-Test” pattern appears, depress the test switch and hold it down for approximately 30 seconds (every 5 seconds, controller RUN indicator blinks). This will cause a default message to appear on the first KD (device 0).
- (c) Depress at first KD (device 0); CONTROL (or NUMERIC) and T together.

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SECTION 582-300-500

- (d) When the cursor appears and the LOCAL indicator lights, depress CONTROL (or NUMERIC) and T together again. This will cause the option format to appear on the display.
- (e) Fill out the option format with the correct options. (See Station Configuration Worksheet — part of W-4C800.)
- (f) Depress S/R or ENTER.

1.06 A keyboard should be connected to a KD display base which has power off. If a keyboard is inadvertently connected to a KD display base which has power on, the display base RUN indicator (See Fig. 6) may turn off. If the RUN indicator is off, turn the KD display base off and wait approximately 30 seconds; then re-apply power. If the display base RUN indicator remains off, refer to display analysis, Chart 8.

1.07 The following warnings are to be used as safety measures for the apparatus and the craftsperson:

Danger: Safety glasses must be worn whenever monitor cover is removed or whenever monitor is replaced.

Danger/Warning: Turn off the ac power before removing or replacing any component. Failure to do so may result in damage to the components.

Warning 1: To avoid possible internal damage to circuit cards, wear a 346392 static discharge strap connected to a ground to allow static discharge before handling circuit cards for removal or replacement. Avoid touching circuit lands or components as much as possible.



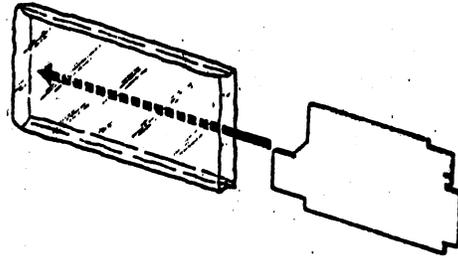
Attach static ground strap tightly to wrist.



Attach clip end of static discharge strap to frame ground

Warning 2: Place listed card in a static bag immediately after removal from unit. Do not place any printer paper in the bag with the card. Keep the card in the static bag at all times. Never handle the card outside the bag without wearing a properly grounded 346392 static ground strap.

<u>Cards List</u>	<u>Static Bag</u>
Printer Logic Card — 404620 (Black)	
Controller — All Cards — RM160083 (Pink)	



1.08 Reference BSP Sections

Description and Operation	
Installation	582-300-150
Wiring Diagrams	582-300-200
Disassembly/Reassembly and Parts	582-300-400
Routine Maintenance	582-300-700
HTO, 4540 Typewriter Style Keyboard	582-300-750
HTO, 4540 Internal Numeric Cluster Style Keyboard	999-300-140
HTO, 4540 Printer	999-300-141
HTO, 40 Printer	999-200-142
HTO, 40 Forms Access Printer	999-301-121
	999-305-121

1.09 Abbreviations used in this section are defined in Section 582-300-150.

2. TESTING

A. Controller Self-Test

2.01 Chart 1 procedures should be performed on the Station Cluster Controller (SCC). This test requires either the use of the Controller test pattern label attached to the inside of the controller door, or Figures 2, 3 or 4, as applies.

Caution: Controller Self-Test should not be performed when station is on-line with computer. If test is to be performed and station is on-line, call the computer operations personnel and request that the station be taken off line. When test is complete, and troubles, if any, have been corrected, inform the computer operations personnel that station can be brought back up on-line.

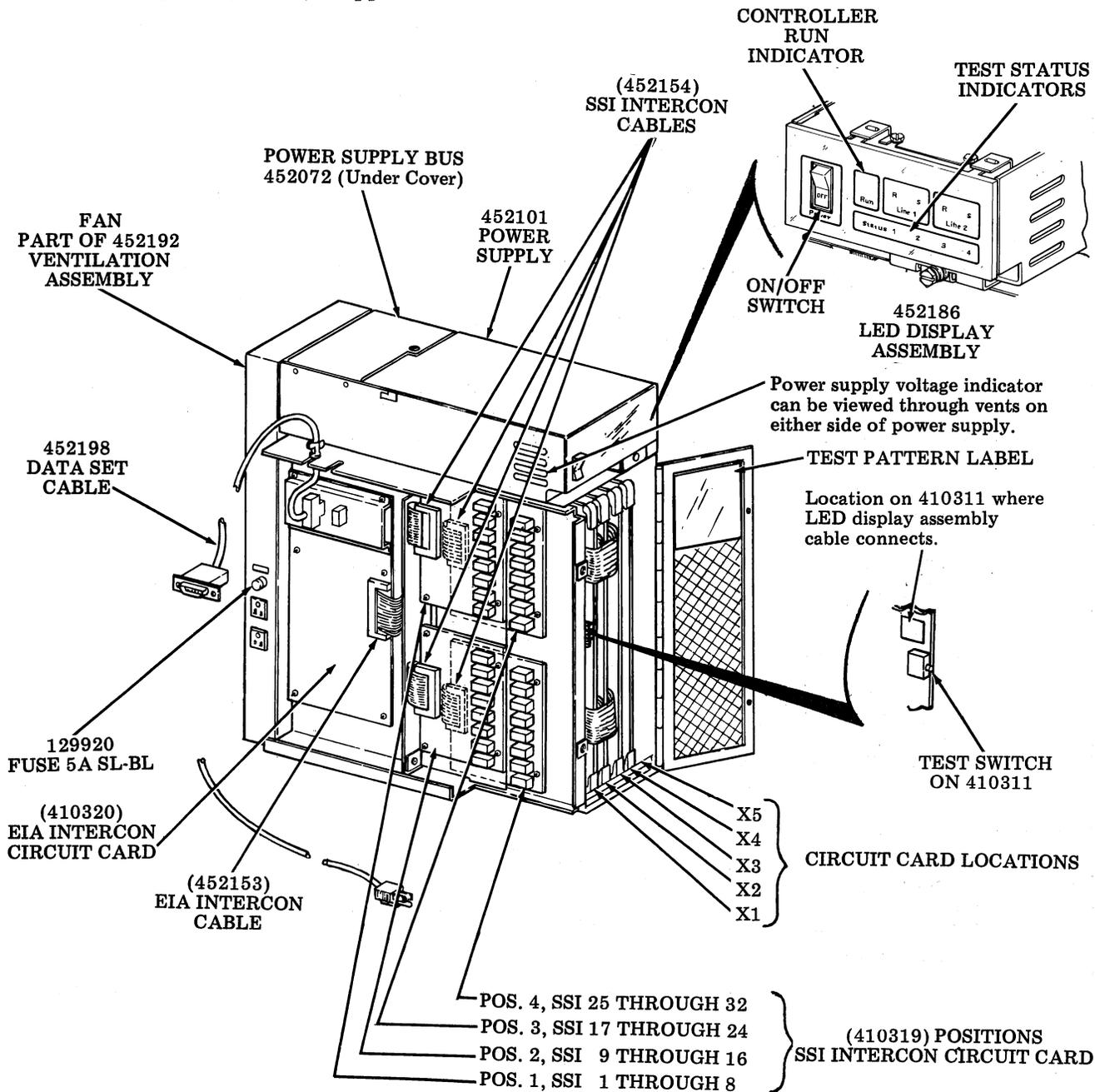


Fig. 1—Station Cluster Controller (SCC)
(Shown With Left Side Cover Removed)

CHART 1

CONTROLLER SELF-TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1	Connect controller ac cable to power source. Turn on controller ac switch.	POWER SUPPLY VOLTAGE indicator is steady on. Indicator can be viewed by observing through power supply vent, as shown in Fig. 1. Fan at rear of controller must be moving air.	Perform Power Supply Analysis, per Chart 7.
2	Observe controller RUN indicator and TEST STATUS indicators (See Fig. 1).	RUN indicator is steady on. TEST STATUS indicators are off.	Perform Controller Analysis, Chart 6.
3	Depress TEST switch (Fig. 1) for two seconds; then release.	All TEST STATUS indicators at front of controller blinking. <i>Note:</i> RUN indicator may blink during self-test.	Perform Controller Analysis, Chart 6.
4	Using the test pattern label attached to the inside of the controller door (or Fig. 2, 3 or 4, as applies) perform the following: For each "Continue Test Pattern" shown, depress the TEST switch for two seconds (or until TEST STATUS indicators displayed, turn off); then release.	Observe TEST STATUS indicators. Each pattern as shown under the "Continue Test Pattern" column appears and remains until TEST switch is again depressed. <i>Note 1:</i> A delay in the appearance of the first "Continue Test Pattern" is normal. <i>Note 2:</i> Printer motor may turn on and off during self-test.	Perform Controller Analysis, Chart 6.
5	When "End-of-Test" pattern appears, again depress TEST switch for two seconds; then release.	TEST STATUS indicators will turn off. RUN indicator will be steady on. Controller self-test is complete.	

SELF TEST LED PATTERN FOR 45C340/AAA/999											
FUNCTION TEST	STATUS LED PATTERNS								REPLACE		
	CONTINUE TEST PATTERN				FAIL TEST PATTERN				CARD	SLOT	
	1	2	3	4	1	2	3	4			
BUS TEST	●	●	●	●	●	●	●	●	●	REFER TO CONTROLLER ANALYSIS CHART 6	
IXL/RWM	○	●	○	○	●	○	○	●	410311	X1	
	○	○	○	○	●	○	○	○	410311	X1	
I/O PORTS					○	●	○	●	410314	X2	
SSI 1 - SSI 16	○	○	●	○	●	●	○	○	410314	X2	
					○	●	●	○	410314	X2	
					●	○	●	○	410314	X2	
I/O PORTS SSI 17 - SSI 32	●	●	○	○	○	●	●	○	410314	X2	
					●	●	●	○	410314	X2	
					○	○	○	●	410314	X2	
ROM OR ADD'TNL RWM	●	○	○	●	○	○	●	●	45FG110	X3	
					○	●	○	●	45FG110	X3	
					●	●	○	●	45FG110	X3	
FD CNTRLR 1	●	○	●	○					410311	X1	
FD DRIVE SET A	TEST BYPASSED										
FD CNTRLR 2	○	●	●	○					410311	X1	
FD DRIVE SET B	TEST BYPASSED										
FUTURE FUNCTION 1	●	●	●	○					410311	X1	
FUTURE FUNCTION 2	○	○	○	○					410311	X1	
END OF TEST	●	○	○	○					410311	X1	

SEE 1.05 CAUTION

LEGEND:

- LED Lighted
- LED Off
- ◐ LED Blinking
- ◑ LED Blinking out of phase with ●

Fig. 2—Test Status Indicator Patterns For SCC Handling Up to 8 Devices

SELF TEST LED PATTERN FOR 45C340 /AAB/999										
FUNCTION TEST	STATUS LED PATTERNS								REPLACE	
	CONTINUE TEST PATTERN				FAIL TEST PATTERN				CARD	SLOT
	1	2	3	4	1	2	3	4		
BUS TEST	●	●	●	●	●	●	●	●	REFER TO CONTROLLER ANALYSIS CHART 6	
IXL / RWM	○	●	○	○	●	○	○	●	410311	X1
					●	○	○	○	410311	X1
I/O PORTS					○	●	○	●	410313	X2
SSI 1 - SSI 16	●	○	●	○	●	●	○	○	410313	X2
					○	●	○	○	410313	X2
					○	○	●	○	410313	X2
I/O PORTS SSI 17 - SSI 32	●	●	○	●	○	●	●	○	410313	X2
					●	●	●	○	410313	X2
					○	○	○	●	410313	X2
ROM OR ADD'TNL RWM	●	○	○	●	○	○	●	●	45FG110	X3
					○	●	○	●	45FG110	X3
					●	●	○	●	45FG110	X3
FD CNTRLR 1	●	○	●	●					410811	X1
FD DRIVE SET A	TEST BYPASSED									
FD CNTRLR 2	○	●	●	●					410811	X1
FD DRIVE SET B	TEST BYPASSED									
FUTURE FUNCTION 1	●	●	●	●					410811	X1
FUTURE FUNCTION 2	○	○	○	○					410811	X1
END OF TEST	●	●	●	●					410811	X1

SEE 1.05 CAUTION

LEGEND:

- LED Lighted
- LED Off
- ◐ LED Blinking
- ◑ LED Blinking out of phase with ◐

Fig. 3—Test Status Indicator Patterns For SCC Handling Up to 16 Devices

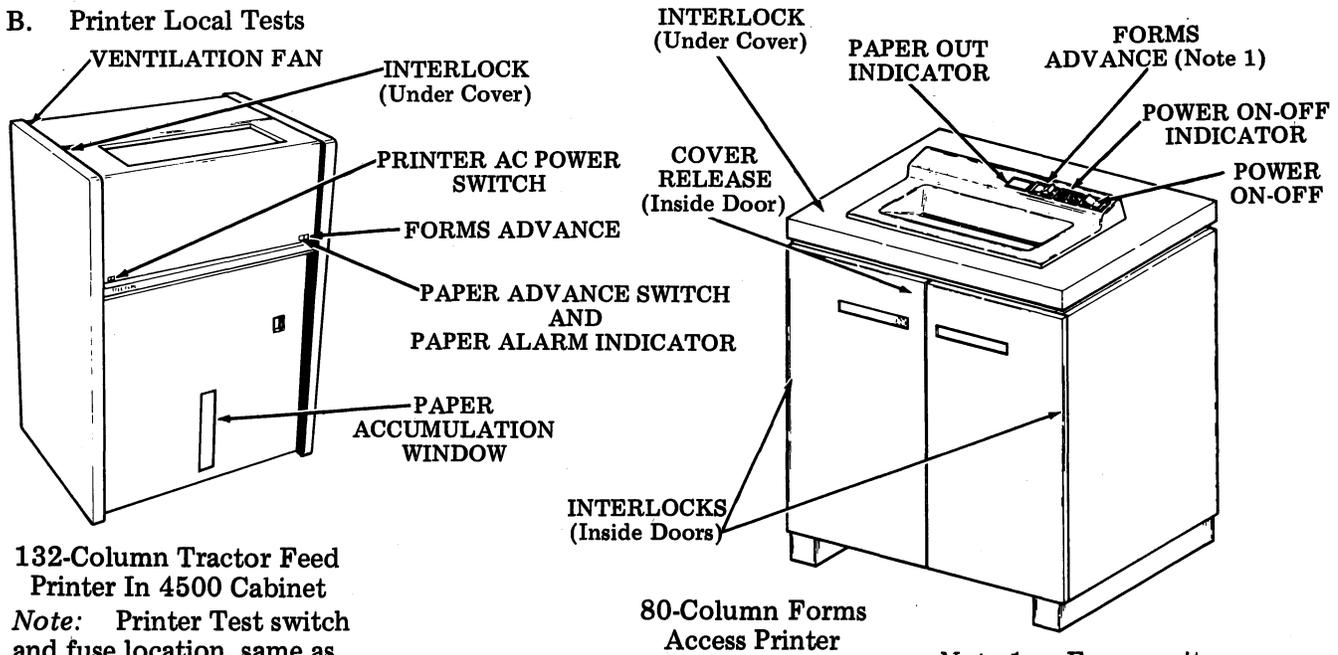
SELF TEST LED PATTERN FOR 45C340/AAD/999											
FUNCTION TEST	STATUS LED PATTERNS				REPLACE						
	CONTINUE TEST PATTERN		FAIL TEST PATTERN		CARD	SLOT					
	1	2	3	4			1	2	3	4	
BUS TEST	●	●	●	●	●	●	●	●	●	REFER TO CONTROLLER ANALYSIS CHART 6	
IXL/RWM	○	●	○	○	●	○	○	●	410311	X1	
					●	○	○	○	410311	X1	
I/O PORTS					○	●	○	●	410313	X2	
SSI 1- SSI 16	●	○	●	○	●	●	○	○	410313	X2	
					●	●	●	●	410313	X2	
					○	○	●	○	410313	X2	
I/O PORTS					○	●	●	○	410313	X3	
SSI 17- SSI 32	○	○	○	●	●	●	○	○	410313	X3	
					●	●	○	●	410313	X3	
ROM OR ADD'TNL RWM	●	○	○	●	○	○	●	●	45FG110	X4	} SEE 1.05 CAUTION
					○	●	○	●	45FG110	X4	
					●	●	○	●	45FG110	X4	
FD CNTRLR 1	●	○	●	○					410311	X1	
FD DRIVE SET A	TEST BYPASSED										
FD CNTRLR 2	○	●	●	○					410311	X1	
FD DRIVE SET B	TEST BYPASSED										
FUTURE FUNCTION 1	●	●	●	○					410311	X1	
FUTURE FUNCTION 2	○	○	○	○					410311	X1	
END OF TEST	●	●	●	○					410311	X1	

LEGEND:

- LED Lighted
- LED Off
- ◐ LED Blinking
- ◑ LED Blinking out of phase with ●

Fig. 4—Test Status Indicator Patterns For SCC Handling Up to 32 Devices

B. Printer Local Tests

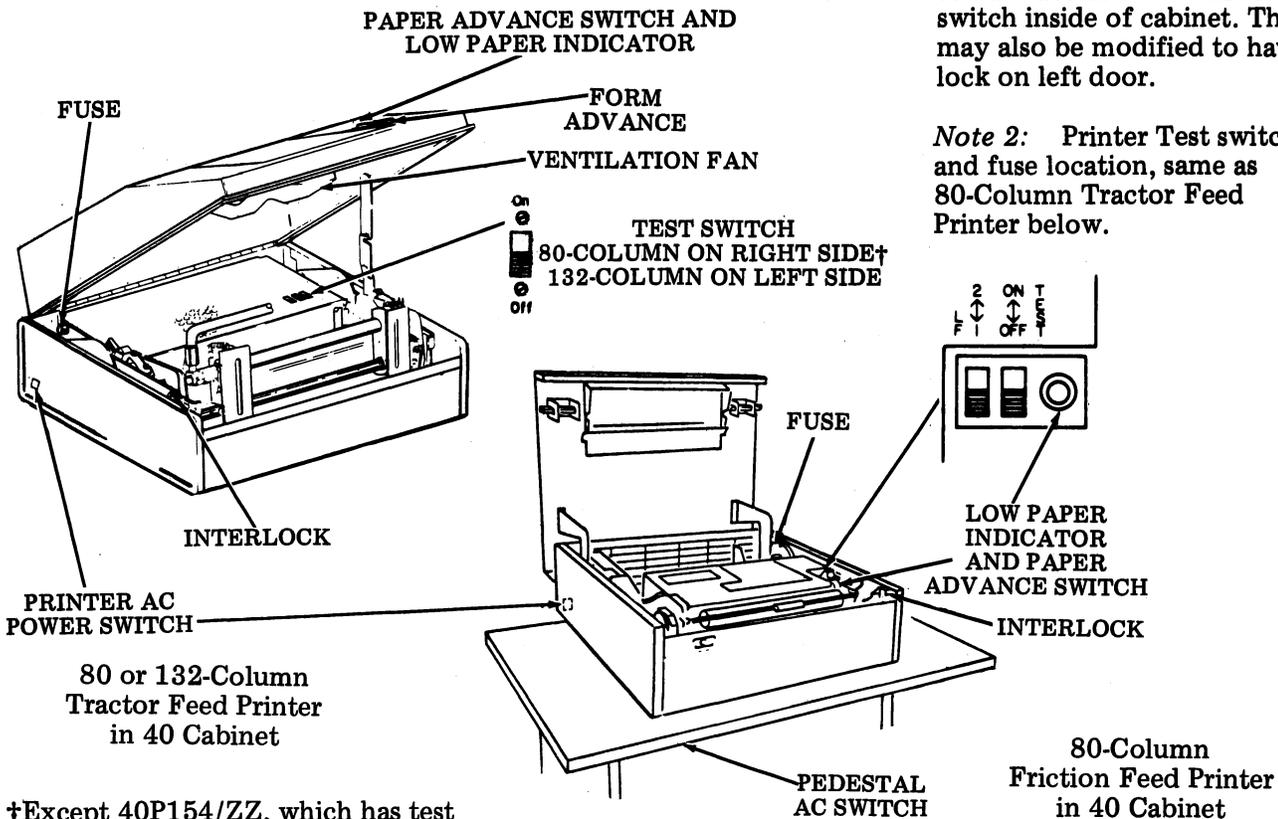


132-Column Tractor Feed Printer In 4500 Cabinet
 Note: Printer Test switch and fuse location, same as 132-Column Tractor Feed Printer below.

80-Column Forms Access Printer

Note 1: For security reasons, some cabinets may be modified to have access to Forms Access switch inside of cabinet. They may also be modified to have lock on left door.

Note 2: Printer Test switch and fuse location, same as 80-Column Tractor Feed Printer below.



80 or 132-Column Tractor Feed Printer in 40 Cabinet

80-Column Friction Feed Printer in 40 Cabinet

†Except 40P154/ZZ, which has test switch on left side.

Fig. 5—Printers

CHART 2
 PRINTER LOCAL TEST PROCEDURES

Note 1: If a printer is not part of the station, proceed to Chart 3.

Note 2: See Fig. 5 for all printer switches.

Note 3: Chart 2 must be performed for all printers before proceeding to Chart 3.

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1	Preliminary requirements of printer: (a) Ribbon and paper loaded. (b) TEST switch (at top right or left) switched OFF. (c) Cabinet cover (and coors, if applicable) closed and acpower switched ON.	Fan in tractor feed printer cabinet must be moving air. Printer motor is off. PAPER indicator off. <i>Note:</i> If tractor feed printer is 40P204-type or has paper jam modification kit (402920), PAPER indicator may be on. If so, see instructions in printer How to Operate Manual 999-300-142 to reset alarm.	Perform Printer Analysis, Chart 11
2	Raise printer cabinet cover (For Forms Access Printer; open lower doors, depress cover release button to release cover; then close doors.)	None	
3	Raise cover interlock switch to maintenance position.	None	

CHART 2 (Contd)

PRINTER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS	
4	Push TEST switch to ON; allow printer to print several lines, then push TEST switch OFF.	Printer turns on and prints font identification symbol (see chart) repeatedly in all columns until switch is turned off. <i>Note 1:</i> On printer which has a 410071, 410072 or 410076 circuit card, the font identification symbol will not be printed in the columns margined per Option 17.	Perform Printer Analysis, Chart 11.	
Type Carrier Font ID Symbol				
132-Column 80-Column				
Carrier Type	ASCII	EBCDIC	ASCII	EBCDIC
Monocase Standard	≡A≡ ≡J≡	≡A≡ ≡2≡	≡A≡ ≡A≡	≡A≡ ≡Q≡
Up-Low Standard	≡A≡ ≡G≡	≡A≡ ≡M≡	≡A≡ ≡B≡	≡A≡ ≡N≡
Monocase OCR-B	≡B≡ ≡E≡	≡B≡ ≡K≡	≡B≡ ≡D≡	≡B≡ ≡M≡
Up-Low OCR-B	≡B≡ ≡C≡	≡B≡ ≡J≡	≡B≡ ≡B≡	≡B≡ ≡N≡
Monocase Line Drawing (requires 45FG110/AB/03 Feature Group Card)	—	—	≡A≡ ≡Q≡	—
		<i>Note 2:</i> If LF switch on top of printer is set for 1, printing will occur on each line. If LF switch is set for 2, a blank line will occur between printed lines.		

CHART 2 (Contd)

PRINTER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
5	<p>FRICITION FEED PRINTER:</p> <p>Lift paper roll to simulate a paper alarm.</p> <p>Lower paper roll, guide paper through window, and close cabinet cover.</p> <p>TRACTOR FEED PRINTER:</p> <p>Tear off next form below printer (see Note) at perforations, then depress PAPER button on cabinet cover or front (as applies) until last form passes through printer.</p> <p>On Forms Access Printer, depress FORM switch since there is no PAPER button.</p> <p><i>Note:</i> If printer being tested is Forms Access Printer and includes a 406374 Pre-Sensor modification kit, tear paper below the sensor mechanism.</p> <p>Reload forms and close cabinet cover.</p>	<p>PAPER indicator lights.</p> <p>PAPER indicator goes out.</p> <p><u>80-Column Printer With 410640 Circuit Card</u> — PAPER indicator lights and printer motor turns off.</p> <p><u>80-Column Printer With 410076 or 410071 Circuit Cards and Any 132-Column Printer</u> — If Option 48a is selected, PAPER indicator lights and printer motor turns off when last form is partly through printer. If Option 48b is selected, PAPER indicator does not light and printer motor does not turn off until form is completely out of printer (<u>Forms Access Printer With 406374 Modification Kit</u> — last form is above paper sensor mechanism) and end of form contact is sensed.</p> <p>PAPER indicator goes out.</p>	<p>Perform Printer Analysis, Chart 11.</p>
6	<p>Momentarily depress PAPER button (red) on printer cabinet.</p> <p>Step 6 does not apply to Forms Access Printer.</p>	<p>Paper feeds out while button is depressed.</p>	<p>Perform Printer Analysis, Chart 11.</p>

CHART 2 (Contd)

PRINTER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
7	<p>TRACTOR FEED PRINTER ONLY:</p> <p>Depress and release FORMS ADVANCE button (black) on printer cabinet.</p>	<p>Forms Switch On (Option 39a): Paper feeds out until first line of next form is reached (provided the forms are registered — refer to How to Operate Manual if necessary), then stops.</p> <p><i>Note:</i> See chart on top of printer to determine if form-out length is correct for setting of lever and color of belt. Make certain that form length is what customer needs.</p> <p>Forms Switch Off (Option 39b): Paper feeds out as long as button is depressed.</p>	<p>Perform Printer Analysis, Chart 11.</p>
8	<p>If local Test of Chart 2 is successfully completed at all printers, continue to Chart 3.</p>		

C. KD/Controller Local Test

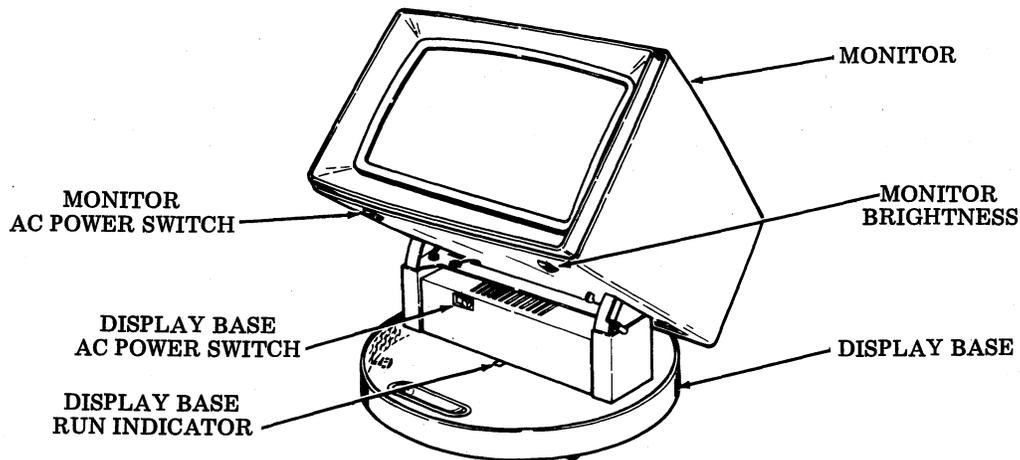


Fig. 6—Display Base and Monitor

2.02 Chart 3 procedures should be performed on each KD device in the station. After successful completion of the chart for all KDs, proceed to Chart 4, Data Set Analog Loopback Self-Test Procedures.

Note 1: If test of Chart 3 is performed during customer operations of the other KD devices (if present), SEND operation will be momentarily interrupted during the loopback portion (Step 6) of the test.

Note 2: More than one KD can perform this test when the SCC is on-line, without affecting the send or receive capabilities of other devices on the SCC.

Note 3: If a KD that has requested the test (Step 4) is selected, the test will be cancelled and the device will prepare to accept data.

Caution: When the SCC is on-line, and a KD is attempting to perform the loopback portion (Step 6) of the test, the SCC will ignore the line (from LCU) for 500 ms. During this time, poll or select sequences may be missed. If two or more KDs are attempting to perform the loopback portion of the test simultaneously, the SCC will ignore the line for 500 ms for each KD attempting the test. This may cause the SCC to miss several poll or select sequences and, therefore, fail to respond to the LCU, thus causing the LCU to stop polling the SCC. For this reason, it is suggested that an interval of at least ten seconds be provided between performing the loopback portion of the test at each KD being tested.

Danger/Warning — See 1.07.

CHART 3

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1	<p>From power off mode, turn on ac power to display base.</p> <p><i>Note:</i> If power is already on before Step 1, turn power off, wait 20 seconds, then turn power on.</p>	<p>Display base RUN indicator (see Fig. 6) begins blinking then stays "ON" steady.</p> <p>LOCAL indicator is lit. Display is clear of data and cursor is at HOME location.</p> <p><i>Note:</i> If the SCC includes a 45FG110-type circuit card other than 45FG110/AA and the KD is equipped with a security lock, the keylock must be in the ON position when ac power is applied in order for the LOCAL indicator to turn ON and the cursor to appear in the HOME location of the display.</p>	<ul style="list-style-type: none"> • Check that ac power is on at SCC. • If KD is connected to any port from 2 through 32 (device 1 through 31) of the SCC, check at first KD that KD under test is optioned correctly. (See Section 582-300-200). • Check that monitor power switch is turned on. • Perform Display Analysis, Chart 8.
2	<p>Turn Monitor Brightness switch fully on.</p>	<p>As gauged by eye, raster should be visible, (but not bright) and raster edge should be approximately equal distance from top and bottom of display.</p> <p>Turn Monitor Brightness switch down to point where raster can barely be seen.</p>	<p>If monitor adjustments are needed, refer to Section 582-213-700.</p>

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
3	Depress a few keytops on the keyboard.	Each keytop causes proper character to be displayed each time keytop is depressed. See Fig. 8 for keyboard arrangements. Refer to How to Operate Manual for unique keytop functions.	<ul style="list-style-type: none"> • Make sure security lock is turned on. See Step 3a. • If KD being tested is connected to port 1 (device 0), perform the Controller Self-Test, Chart 1. When the "End-of-Test" pattern appears, depress the controller test for at least 30 seconds. When the TEST switch is released, a default message will appear on the display. Follow the directions of the default message. When the option listing appears on the display, re-option the SCC per Section 582-300-200. • If KD being tested is connected to any port from 2 through 32 (device 1 through 31), check at first KD to see that KD under test is optioned correctly. (See Section 582-300-200). • Perform the Keyboard Analysis, Chart 10.

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
3a	<p>This step applies only to 45K301-type keyboards with security lock modification kit; otherwise go to Step 3b.</p> <p>Turn lock off and depress a few keytops; then turn lock back to on position.</p> <p><i>Caution 1: Do not depress keys while turning keylock on or off.</i></p> <p><i>Caution 2: Do not attempt to use 40/4-type security lock.</i></p>	<p>Keyboard should be inoperative when security lock is in off position.</p> <p><i>Note: If SCC includes a 45FG110-type circuit card other than 45FG110/AA and data is present on the display when the keylock is turned back on, all data on the display will disappear.</i></p>	<p>Perform the Keyboard Analysis, Chart 10.</p>
3b	<p>This step applies only to keyboards equipped with a Magnetic Stripe Reader (MSR), otherwise go to Step 4.</p> <p>Depress ERASE INPUT and UNDERLINE keys together with additional force.</p> <p>Insert 406303 test card into reader smoothly.</p> <p>Remove Test Card.</p> <p>End test by depressing ERASE INPUT and PERIOD keys together with additional force.</p>	<p>TST indicator lights and remains on.</p> <p>CAPS LOCK indicator flashes repeatedly.</p> <p>CAPS LOCK indicator stops flashing. LOCAL indicator lights. TST indicator goes out.</p>	<p>Perform the Keyboard Analysis, Chart 10.</p> <p>Perform the Keyboard Analysis, Chart 10.</p> <p>Perform the Keyboard Analysis, Chart 10.</p>

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
4	Depress the CLEAR key, then depress LOCAL (or RESET) key if not lit. Request a Local Test by depressing the L/TST key while CONTROL (or ALPHA) key is held down. (See Notes 2 and 3)	The "LOCAL TEST MODE" message shown below is displayed on the monitor. Display does not clear automatically in 20 seconds as it did with 40/4-type equipment. As gauged by eye: All characters are sharply defined and are the same height throughout display.	<ul style="list-style-type: none"> • If no message appears or S/R indicator is flashing. <ul style="list-style-type: none"> (a) Check to see that KD is optioned correctly. (See Section 582-300-200) (b) Check SSI cabling to SCC per SSI cable analysis in this section. • If monitor adjustments are needed, refer to Section 582-213-700.

All 45FG110-types:

LOCAL TEST MODE

TEST MSG:

THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 0123456789 TIMES.

TO TEST LOOPBACK, PRESS S/R OR ENTER
TO RESET PRESS CLEAR
SEE MANUAL FOR DETAILS

THE QUICK BROWN FOX... message appears on 1 line, the message may be changed by typing from the keyboard.

If the word "BAD" appears in this area, replace the display base.

45FG110/AA or 45FG110/AB type only:

()

Depending on the line code chosen, the word ASCII or EBCDIC will appear in this area.

— DEVICE ADDRESS
 — STATION SELECT ADDRESS
 — STATION POLL ADDRESS (See Note 1)

If the wrong line code appears, check Option 408.

If addresses are not per customer order and Fig. 7, refer to Section 582-300-200 to check options.

45FG110/AC/01 only:

SCC No. — — —

DEV No. — — —

CODE EBCDIC

If addresses are not per customer order, refer to Section 582-300-200 to check options.

Note 1: 45FG110/AA or 45FG110/AB type only: Three address characters will be present within the parentheses. If a character is not displayed; it is assumed that the character is SPACE.

Note 2: If Step 4 is tried twice in succession, an "Operation Error, Aborted" message will appear. Repeat Step 4 again to resume testing.

Note 3: If the CLEAR key is depressed with the above message on the display screen, the keyboard will become locked. To unlock the keyboard, depress the CLEAR key again.

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
5	<p>If KD device number is lower than a printer device number (see configuration worksheet) and the printer is optioned for "PRINT LOCAL". (Option 415b) depress "PRINT LOCAL" key.</p> <p>If KD has a blocking keytop over the "PRINT LOCAL" key (to prevent operator from depressing "PRINT LOCAL") or if KD has no PRINT LOCAL printer or printers are not part of the station configuration, proceed to Step 6.</p>	<p>At KD, LOCAL indicator extinguishes and PRINT LOCAL and S/R indicators light and then go off (printer buffer received the message). LOCAL indicator then lights.</p> <p>Printer(s) can be checked for correct copy after all KDs in station have been installed and tested per Chart 3 and after End-to-End Installation Test of Chart 5 is performed. If End-to-End Installation Test cannot or will not be performed, all "PRINT LOCAL" printers should be checked out per Step 14 of this chart.</p>	<ul style="list-style-type: none"> • If PRINT LOCAL indicator begins flashing: <ul style="list-style-type: none"> (a) Check that printer cabinet lid is closed. (b) Check that printer has paper. (c) Check that paper jam (if so equipped) is reset. (Refer to HTO if required.) (d) Check that printer ac power is on. (e) Check that printer is Print Local to the KD. (f) Perform printer SSI cable analysis. (g) Replace printer. (h) Replace printer cabinet.

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
5 (Contd)			<ul style="list-style-type: none"> • If PRINT LOCAL indicator is on, and S/R indicator begins flashing, depress LOCAL (or RESET) key and retry Step 5 once. <p>If condition occurs again:</p> <ul style="list-style-type: none"> (a) Make certain that screws and nuts that secure power bus to power supply and SCC back panel are tightened. (b) Perform printer SSI cable analysis. (c) If printer is device 0 through 15, replace 410313 or 410314 circuit card in X2 location of SCC. <p>If printer is device 16 through 31, replace 410313 circuit card in X3 location of SCC.</p>

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
6	<p>Depress S/R (or ENTER) key.</p> <p><i>Note:</i> If any send function key other than S/R, ENTER or CLEAR is depressed, an "INVALID BID KEY" message will appear on the display, and Local Test will be cancelled. Perform Steps 4 and 6 again. (Do not repeat Step 5.)</p> <div data-bbox="358 867 1040 961" style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 10px auto; width: fit-content;"> <p>THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 0123456789 TIMES.</p> </div> <p><i>Note 1:</i> If any characters in the QUICK BROWN FOX message were changed before depressing S/R (or ENTER) key, those characters will appear in the above message. Up to 2-1/2 lines can be entered.</p> <p><i>Note 2:</i> If SCC is on line with LCU, and is sending and receiving large amounts of long text blocks, a "LOOPBACK CANNOT BE PERFORMED" message will appear on the display. Perform Steps 4 and 6 (to try again).</p>	<p>The following message will appear on the monitor. If optioned for single alarm, alarm will sound once and LOCAL indicator should light. If optioned for continuous alarm, alarm will sound repeatedly until LOCAL (or RESET) key is manually depressed.</p> <p>Appears on one line. (See Note 1)</p>	<ul style="list-style-type: none"> • If S/R indicator is flashing, replace 410311 circuit card in SCC. • If "LOOPBACK DATA CONTAINED ERRORS" message is received, go to Step 10. • If "DEVICE FAILED TO SEND DATA" message is received, perform Display Analysis, Chart 8. • If "INVALID DATA FROM DEVICE" message is received, go to Step 11. • If, after 5 seconds, a "NO DATA RECEIVED" message is received, go to Step 12. • See Note 2.

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
7	Depress CLEAR key, Depress LOCAL (or RESET) key if LOCAL indicator does not light.	Display is cleared. LOCAL indicator lights.	
8	Step 8 applies only to 40K104 or 40K203 type keyboard with a blocking keytop over CAPS LOCK position; otherwise go directly to Step 9. (a) Depress ERASE INPUT and QUOTES keys together with additional force. (b) Depress A (do not depress SHIFT). (c) Depress ERASE INPUT and P keys together with additional force. (d) Depress LOCAL key if LOCAL indicator does not light.	TST indicator lights and remains lit. S/R key lights. TST indicator light goes out. LOCAL indicator lights.	<ul style="list-style-type: none"> Remove blocking keytop, check that plunger is in lower position. If not, place in lower position; then repeat Step 8b. Replace keyboard. See 1.06.
9	Omit this step and go directly to Step 14 if End-to-End Installa- tion Test, Chart 5 cannot or will not be performed. Depress PA1 key. <i>Note:</i> This step preconditions the KD for the End-to- End Installation Test of Chart 5.	LOCAL indicator ex- tinguishes. Internal Numeric Cluster Keyboard: INPUT INHIBIT indicator lights. Go to Step 13.	Perform Keyboard Analysis, Chart 10.

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
10	<p>The following message is displayed when Step 6 is performed.</p> <p>All 45FG110-types:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p align="center">**LOOPBACK DATA CONTAINED ERRORS**</p> <p align="center">LOCAL TEST MODE</p> <p>TEST MSG:</p> <p>THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 0123456789 TIMES.</p> <p>RE-TEST LOOPBACK, PRESS S/R OR ENTER TO RESET PRESS CLEAR SEE MANUAL FOR DETAILS</p> </div> <p>45FG110/AA or 45FG110/AB type only:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>(_ _) <input type="text"/></p> </div> <p>45FG110/AC/01 only:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>SCC No. _ _</p> <p>DEV No. _ _</p> <p>CODE EBCDIC</p> </div>	(Does not apply, see "Test Fails")	<p>If test fails the second time:</p> <ul style="list-style-type: none"> • Replace 410311 circuit card in SCC. • When 208A data set is mounted on shelf in controller cabinet, the ventilation fan modification kit (451340) must be present and moving air through the data set. (See Section 582-300-200.) • Perform Display Analysis, Chart 8.
11	<p>"INVALID DATA FROM DEVICE" message is displayed when Step 6 is performed.</p> <p><i>Note:</i> If "ERASE INPUT" key was depressed before S/R or ENTER, message is valid and Steps 4 and 6 should be tried again.</p>	(Does not apply, see "Test Fails")	<ul style="list-style-type: none"> • If ERASE INPUT was not depressed before S/R or ENTER: <ul style="list-style-type: none"> (a) Check SSI cabling to SCC per SSI Cable Analysis of this section. (b) Perform Display Analysis, Chart 8.

CHART 3 (Contd)

KD/CONTROLLER LOCAL TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
12	<p>“NO DATA RECEIVED” message is displayed after five seconds when Step 6 is performed.</p>	(Does not apply, see “Test Fails”)	<ul style="list-style-type: none"> • Replace 410311 circuit card in SCC. • Perform display analysis, Chart 8.
13	<p>If Chart 3 has been successfully completed for all KDs and End-to-End Installation Test of Chart 5:</p> <ul style="list-style-type: none"> • Will be performed; proceed directly to Chart 4. Do not perform the “CORRECT RESPONSE” portion of this step. • Cannot or will not be performed; then check all “PRINT LOCAL” printers (if any) that should have received data per Step 5 of this chart by referring to the “CORRECT RESPONSE” portion of this step. 	<ol style="list-style-type: none"> 1. “LOCAL TEST MODE” message of Step 4 printed for all associated KDs. This can be verified by checking the device address (see Step 4) at bottom of each message. 2. Print out will terminate at line 24 (no data) for each message. Space may or may not be present between line 24 and the next message depending on the following printer options: <ul style="list-style-type: none"> Friction Feed: <ul style="list-style-type: none"> 18a — none 18b or 18c — 16 line feed-out Tractor Feed: <ul style="list-style-type: none"> (18a) and (39a or 39b) — none (18b or 18c) and (39a) — form-feed (18b or 18c) and (39b) — 16 line feed-out <p><i>Note:</i> The printer motor turns off approximately 20 seconds after receiving data. Early version printers (those with 410640 or 410729 circuit cards) turn off motor after approximately 6 seconds. Printer cabinet ventilation fan, if present, remains on.</p> 3. The printer motor should not be running. <p>Proceed to Chart 4.</p>	<ul style="list-style-type: none"> • Perform printer analysis, Chart 11.

SECTION 582-300-500

Stn or Dvce No.	S P A	S S A	D A
00	SP	-	SP
01	A	/	A
02	B	S	B
03	C	T	C
04	D	U	D
05	E	V	E
06	F	W	F
07	G	X	G
08	H	Y	H
09	I	Z	I
10	⌈⌋	!	⌈⌋
11	.	,	.
12	<	%	<
13	(-	(
14	+	>	+
15	!	?	!

Stn or Dvce No.	S P A	S S A	D A
16	&	0	&
17	J	1	J
18	K	2	K
19	L	3	L
20	M	4	M
21	N	5	N
22	O	6	O
23	P	7	P
24	Q	8	Q
25	R	9	R
26	⌈⌋ !	:	⌈⌋ !
27	\$	#	\$
28	*	@	*
29)	')
30	;	=	;
31	^ ⌈⌋	"	^ ⌈⌋

Fig. 7—ASCII or EBCDIC Station and Device Identification

Note 1: Fig. 7 is used with Step 4 of Chart 3. Fig. 7 indicates all station and device identification for ASCII or EBCDIC coded stations.

Note 2: Where two characters appear, character on left is ASCII; character on right is EBCDIC.

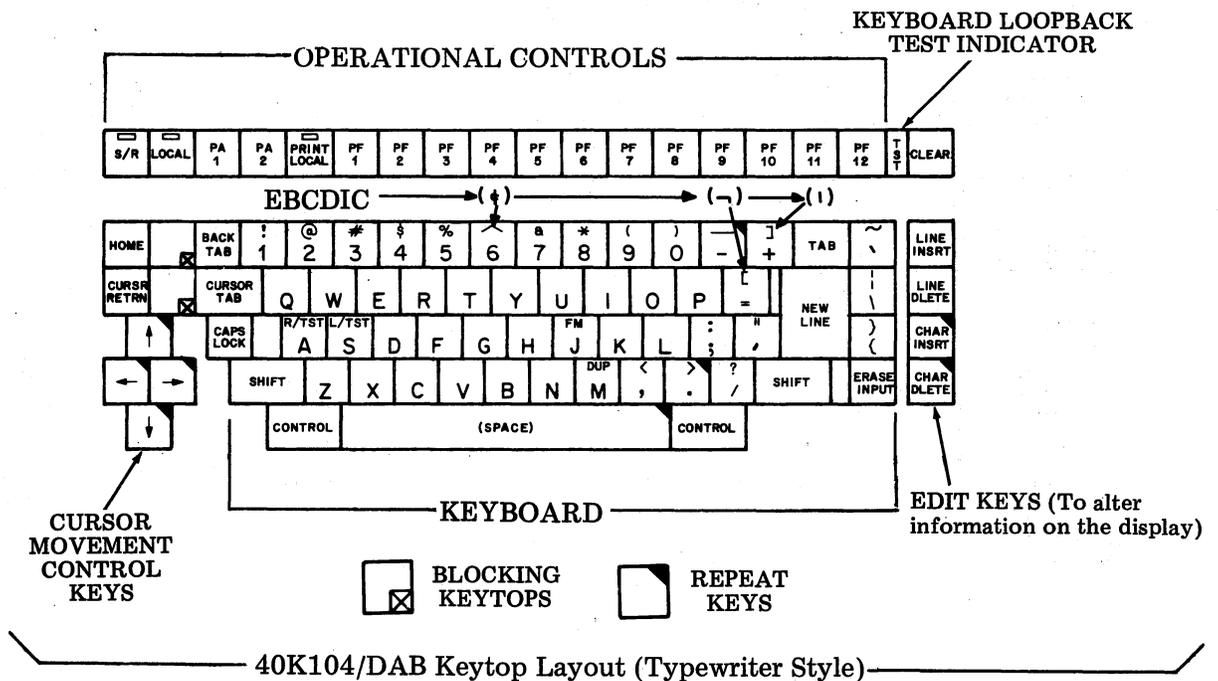
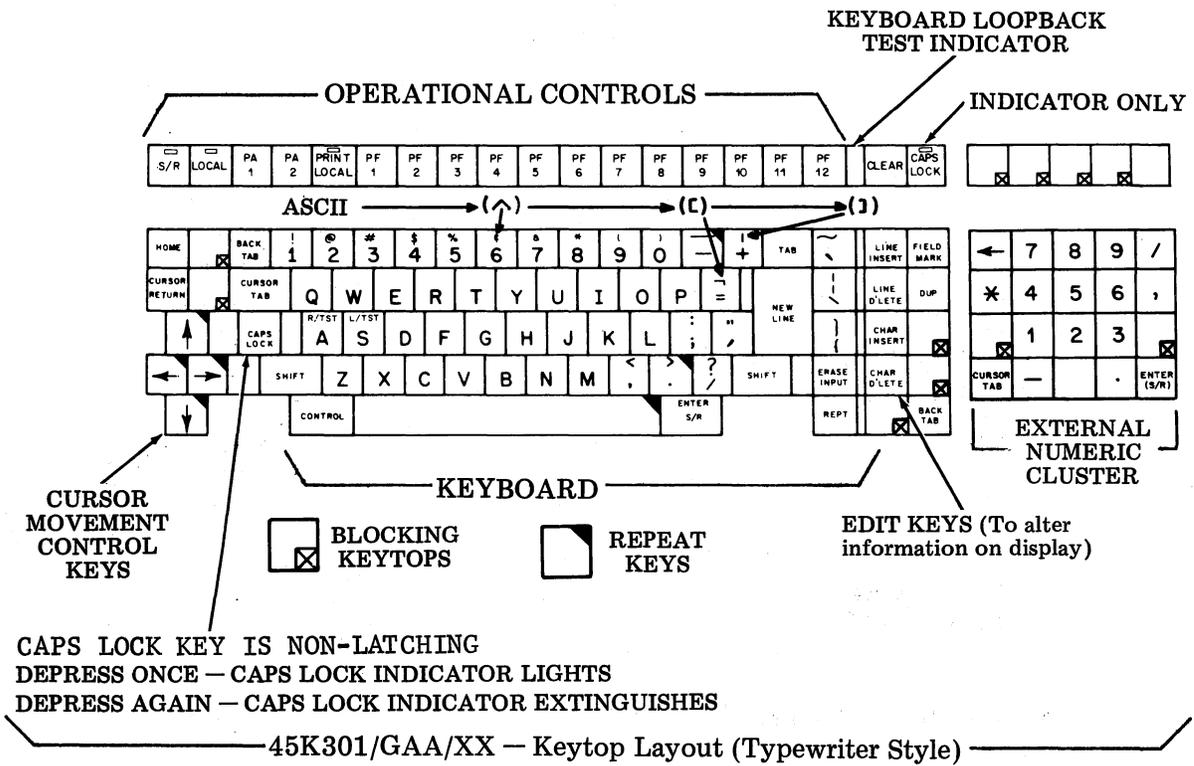
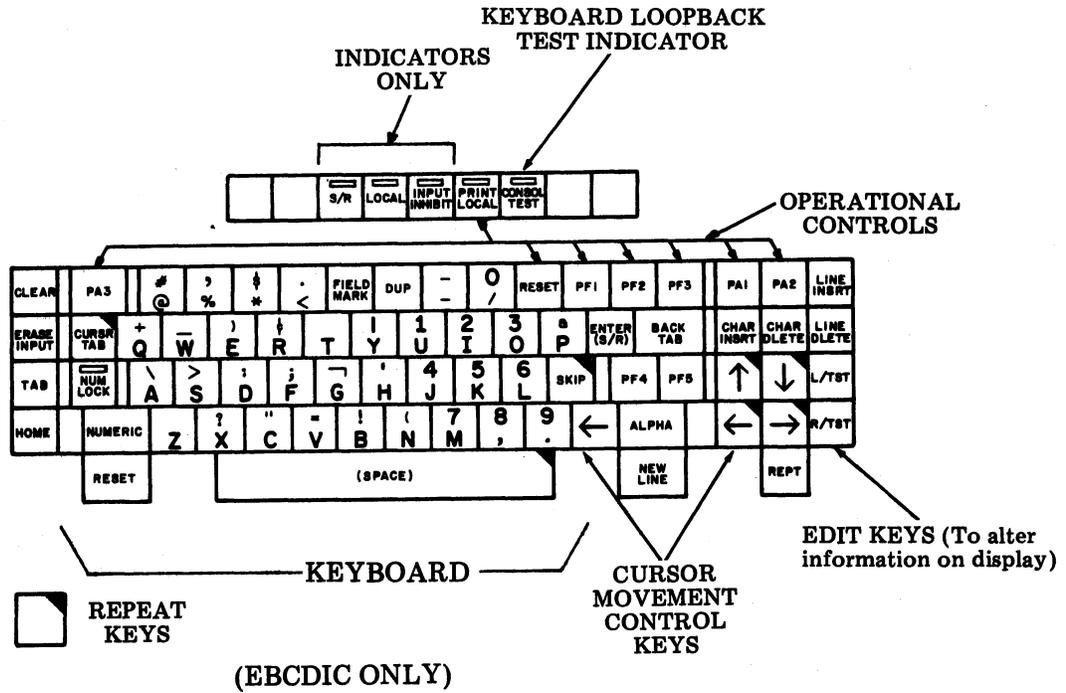
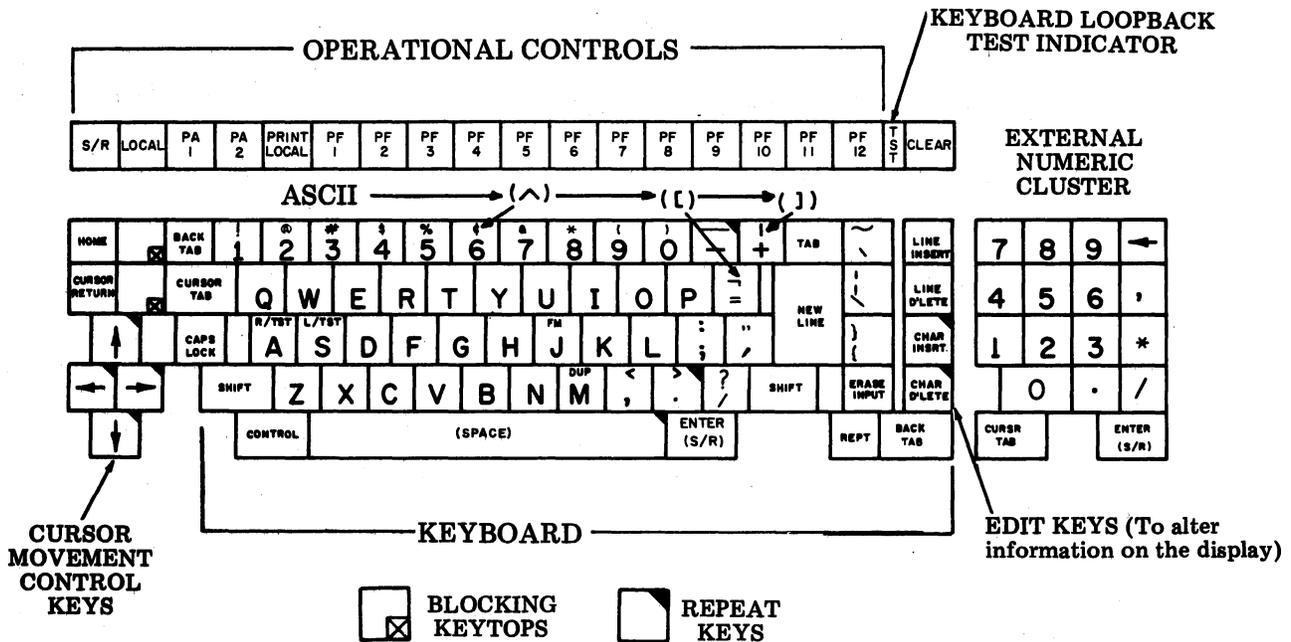


Fig. 8—Keyboard Keytop Layouts



40K105/CAA Keytop Layout (Internal Numeric Cluster Style)



40K203/GAB Keytop Layout (Typewriter Style)

Fig. 8—Keyboard Keytop Layouts (Cont)

D. Data Set Analog Loopback Self-Test

2.03 Chart 4 includes Data Set Analog Loop Self-Test Procedures for Western Electric type Data Sets 201C, 208A, and 209A, 500A-type Data Service Units and 48230 Local Area Data Sets (LADS). Initial operating conditions are given in Step 4. If station includes a modem other than mentioned above, refer to operating manual that comes with that modem for testing and/or initial operating conditions.

Note: References for 2024, 2048 or 2096: Sections 592-040-120 (description) 592-040-220 (installation), 592-040-520 (test), 999-100-210 (2024 or 2048 HTO), and 999-100-211 (2096 HTO).

CHART 4
DATA SET ANALOG LOOPBACK SELF-TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
<p><i>Note:</i> If station has a Data Set 208A or 209A, go directly to Step 2. If station has a 48230 LADS, go directly to Step 3. If 500A-type Data Service Unit (DSU) is used, go directly to Step 4.</p>			
<p>1</p>	<p>Data Set 201C-L1 and 201C-L1D:</p> <p>Apply ac power to data set.</p> <p>Perform Analog Loopback Self-Test as follows:</p> <ul style="list-style-type: none"> • Depress AL button • Depress ST button. • Observe MC indicator for 30 seconds. • Depress RO button. 	<p>AL button latches. TM lights and MR goes OFF.</p> <p><i>Note:</i> MR stays on if 201C-L1D is used.</p> <p>ST button latches All indicators except MC should be ON.</p> <p>MC indicator should not blink on.</p> <p>RO button latches RS, and CS indicators should be OFF; MC indicator should be ON.</p> <p>If data set has continuous carrier (Option XB), CO indicator should be ON.</p> <p>If data set has switched carrier (Option XA), CO indicator should be OFF.</p>	<ul style="list-style-type: none"> • If MC indicator is ON or blinks, the data set has failed the self-test. • If test fails, replace data set.
<p>(Step 1 continued on following page)</p>			

CHART 4 (Contd)

DATA SET ANALOG LOOPBACK SELF-TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1 (Contd)	<ul style="list-style-type: none"> • Release RO, ST, and AL buttons. 	<p>TM indicator should turn off. This completes the data set self-test.</p> <p>All buttons should be released.</p> <p>Go to Step 4.</p>	
2	<p>Data Set 208A and 209A:</p> <p>Apply ac power to data set. Perform Analog Loopback Self-Test as follows:</p> <ul style="list-style-type: none"> • Depress LP non-locking button. • Depress AL button. • Depress ST button. • Observe ER indicator for 30 seconds. • Depress AL and ST buttons. 	<p>All indicators on the data set should be lighted.</p> <p>ON, RS, CS, TM (209A only) and CO indicators should be lighted. MR and ER indicators should be OFF.</p> <p>ER indicator should not blink ON.</p> <p>The data set is returned to normal operating condition. This completes the data set self-test.</p> <p>All buttons should be released.</p> <p>Go to Step 4.</p>	<ul style="list-style-type: none"> • If ON indicator is off, check that ac voltage to data set is between 105 to 130 volts. <p><i>Note:</i> The ON indicator will go off if the output voltage of the power supply becomes excessive. The power cord must be unplugged and plugged in again after correcting the overvoltage to make the indicator light again.</p> <ul style="list-style-type: none"> • If ER indicator is ON or blinks, this indicates that the data set has failed the Analog Loopback Self-Test. • If test fails, replace data set.

CHART 4 (Contd)

DATA SET ANALOG LOOPBACK SELF-TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
3	<p>Data Set — 48230 Local Area Data Set — (LADS)</p> <p>Apply ac power to data set. Perform Analog Loopback Self-Test as follows:</p> <p>Depress the Data Clamp (DC) and Local Loopback (LL) buttons (behind front panel).</p> <p>Observe the Signal Detect indicator for 30 seconds.</p> <p>Depress the DC and LL buttons again to release.</p>	<p>Power On indicator should be ON.</p> <p>The test and Signal Detect indicators should turn ON.</p> <p><i>Note:</i> Signal Detect may already be on.</p> <p>Signal Detect indicator should not turn off or blink.</p> <p>The data set is returned to normal operating condition. This completes self-test.</p> <p>Go to Step 4.</p>	<p>If test fails, replace data set.</p>
4	<p>201C, 208A, 209A, 500A, and 48230 LADS;</p> <p>With SCC ac power switch on, check for correct data set indicator lights. (Initial operating conditions)</p>	<p>Data Set 201C: ON Lighted TR Lighted</p> <p>MR Lighted RS Off } See Note 1 CS Off } CO Off } See Note 2 MC Lighted } TM Off }</p> <hr/> <p>Data Set 208A or 209A: ON Lighted MR Lighted RS Off } See Note 1 CS Off } CO Off } See Note 2 ER Lighted } TM Off (209A Only)</p> <p>(Step 4 continued on following page)</p>	<ul style="list-style-type: none"> • Replace data set. • Replace 410311 circuit card in SCC. • Replace data set cable. <hr/> <ul style="list-style-type: none"> • Check that data set buttons are released <hr/> <ul style="list-style-type: none"> • Replace data set. • Replace data set. <hr/> <ul style="list-style-type: none"> • Check that data set buttons are released.

CHART 4 (Contd)

DATA SET ANALOG LOOPBACK SELF-TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
4 (Contd)		500A-DSU: PWR On NS On — Note 3 LL Off RT Off 48230 LADS: Power On On Signal Detect Off — Note 3 Remote Loopback Off Test Off	<ul style="list-style-type: none"> • Replace data set. • Replace 500A-DSU • Check that data DSU test switch is in center position. • Replace data set • Check that data set buttons are released.

Note 1: If station is part of point-to-point installation, and the data set is optioned for continuous carrier, the RS and CS indicators should be on continuously.

Note 2: When the distant end (CPE) is providing carrier on condition, CO should be ON (MC OFF for Data Set 201C, ER OFF for Data Set 208A or 209A).

Note 3: When the distant end (CPE) is providing carrier on condition, NS will be OFF for 500A-DSU or Signal Detect will be ON for 48230 LADS.

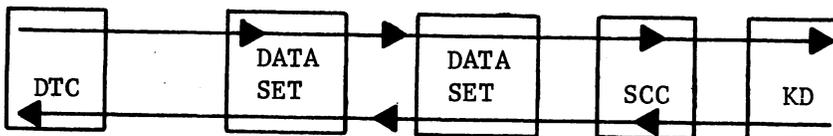
E. End-To-End Installation Test

2.04 The test of Chart 5 must be requested from a local area Data Test Center (DTC). Hereafter, the DTC is called the Test Center. Access to the Test Center is usually by way of a Servicing Test Center (STC). A four-wire DDD backup connection may be required at the STC or installation site. This connection is beyond the scope of this section (refer to Section 598-082-201, if required).

2.05 In situations where access to a Test Center is not provided for in the customer's system, the End-to-End Installation Test can be omitted if correct in-service operation testing with the customer's equipment can be verified by the craftsperson and accepted by the customer. If trouble does occur in an in-service operation test, refer to on-line operation analysis, Chart 12, or request a Data Test Center to perform line monitoring.

Note: If automatic test facilities such as ADTS (Automatic Data Test System) are available, the craftsperson should utilize that arrangement. Contact your local supervisor for information regarding availability, access and password.

End-to-End Installation Test — Performed with Assistance of Data Test Center



Important: Before beginning the test of Chart 5, Step 9 from the KD/Controller Local Test (Chart 3) must be performed on all KDs in the station. (PA1 key depressed). All power switches must be on, printers must have paper installed ("Paper" indicators must be OFF), and printer cabinet lids must be closed.

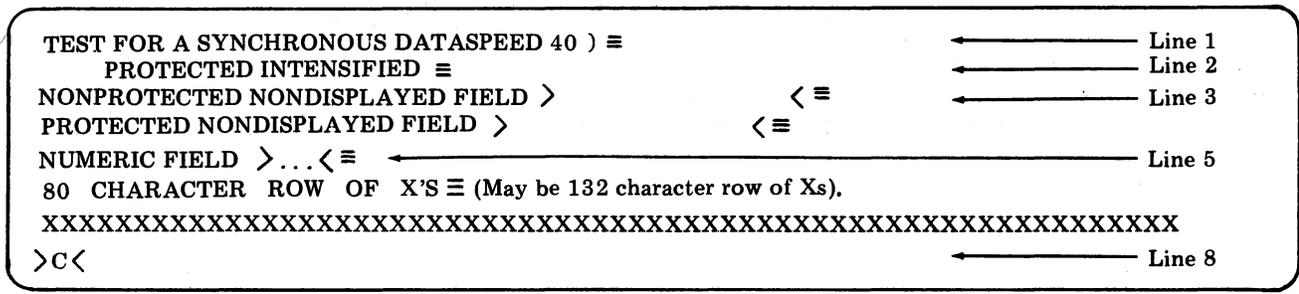
CHART 5

END-TO-END INSTALLATION TEST PROCEDURES

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1	<p>Go to location of station data set. Contact DATASPEED Test Center and request End-to-End Installation Test.</p> <p>Establish line connections per DTC instructions, then observe Carrier On indicator indicating line established to DTC.</p>	<p>“Carrier on” indicator lit when line is established.</p> <p>201C: MC Goes off. CO Lights.</p> <p>208A or 209: ER Goes off. CO Lights.</p> <p><i>Note:</i> If modem other than above is used, refer to operating manual included with that modem.</p>	<p>Inform DTC of problem.</p>
2	For DTC only	When DTC advises, go to Step 3.	
3	<p>If talk line to the DTC is not available after test is requested, verify that the test has started by observing the RTS/CTS LEDs (if provided) on the front of the data set.</p> <p>Go to SCC and observe the Line 1 “R” and “S” indicators.</p> <p><i>Note:</i> “R” indicator is for received data. “S” indicator is for sent data.</p>	<p>RTS/CTS lights on the front of the data set should flash ON; then OFF during testing.</p> <p><i>Note:</i> If RTS/CTS are on constantly, data set has continuous carrier option.</p> <p>Indicators flash indicating data is being received and response is being sent. STATUS 1 indicator will also turn on each time SCC is polled and will turn off when SCC responds.</p> <p>See Note 1.</p>	<ul style="list-style-type: none"> • Inform DTC of problem. • Co-ordinate with DTC and perform “ON-LINE OPERATIONS” Analysis of Chart 12.
4	The DTC will perform remainder of test and will inform of test acceptance or trouble. Proceed to devices and check for correct test results per Fig. 9 and 10.	<p>Call DTC back, if required.</p> <p>See Note 2.</p>	<p>If test results per Fig. 9 and/or 10 indicate a failure, notify DTC of problem.</p>

Note 1: Applicable only when using other than a 45FG110/AA-type circuit card in SCC: STATUS 3 indicator will flash each time a retransmission (because of error in first transmission) occurs between the SCC and any KD device. If it is noticed that the STATUS 3 indicator blinks 2 or more times within 15 minutes, the DTC should be advised of the problem and the SSI Cable Analysis of this section should be performed.

Note 2: If you are not in “talk” communication with the Test Center during the test of Chart 5, be sure to “call back” Test Center for verification of correct operation. After verification of correct operation using the Chart 5 test procedure (including Test Center approval), depress LOCAL (or RESET) then CLEAR keys on all KDs to normalize station. Verify correct operation in customer system before leaving site.



Note 1: When test is run on ADTS, the first line is changed to “ADTS SYNCHRONOUS DATASPEED 40 TEST”.

Note 2: When sent from PACER — 103, LB1/2 Data Line Monitor/Simulator, “END OF TEST” appears on Line 24.

Note 3: When sent to printer from PACER, test message may not appear in format shown above.

Note 4: Report an S/R indicator flashing continuously (abort condition) to DTC as failure.

Fig. 9—SYNC 40 or 4540 Test Message

Checkout of Received KD Message

2.06 Check correctness of display and station options per Fig. 9 as follows:

- Option 402a — Continuous Alarm (the keyboard bell repeatedly sounds if volume is turned up) until LOCAL (or RESET) key is depressed.
- or
- Option 402b — Single Alarm (the keyboard bell sounds once if volume is turned up) and LOCAL indicator lights.

Line 1 is copied as shown (Fig. 9).
 Line 2, the word PROTECTED begins in the fifth character position and is followed by the word INTENSIFIED (which is brighter than normal for Option 403a or 403c; or blinks for Option 403b).
 Lines 3 through 8 are as shown in Fig. 9; the cursor must be positioned over “C” on line 8.

- Option 406a — Alpha characters can be typed over periods in the numeric field — Line 5. (or 407a or 407b) (bell sounds for 406 only). (407 only; Hold down ALPHA key to enter Alpha characters).
- or
- Option 406b — Bell sounds when alpha character is typed over numeric field; only numeric characters can be entered into field — line 5.
- Option 407a — Upper portion characters of any depressed keys are typed over periods in the numeric field — Line 5.
- or
- Option 407b — Upper portion characters of numeric cluster keys only (ie 0-9, DUP, 1, and minus) are typed over periods in the numeric field — Line 5.

If any failures are observed when checking the above, report failure to Test Center.

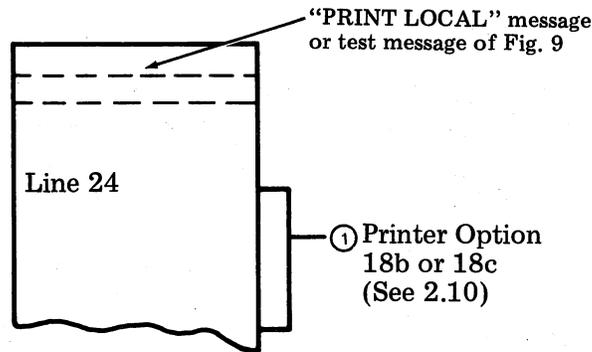


Fig. 10—Printed Test Message

Checkout of Received Printer Message

2.07 If printers that have been optioned for “PRINT LOCAL” capability (Option 415b) are part of station, check that they have received the “Local Test Mode” message of Chart 3, Step 4, from each associated KD. This can be verified by checking the device address (see Chart 3, Step 4) at bottom of each message.

Note: Message (s) of 2.07 present only if Chart 3, Step 5 has been performed.

2.08 Check each printer for correctness of printed test message per Fig. 9 (See Note 3, of Fig. 9).

2.09 The printout of both; the “PRINT LOCAL” message(s) and the test message, will terminate at Line 24, regardless of whether or not any characters have been printed in Line 24.

2.10 Check Option 18 of the printer circuit card as follows:

Option 18a (No automatic Feed out) — No feed out occurs after Line 24.

or

Options 18b or 18c (16-line feed-out on RM loss or 16-line feed out on RM loss or ETX) — This option is illustrated as ① in Fig. 10. After Line 24 of each message, a 16-line feed out will occur on a friction feed printer or a tractor feed printer with Option 39b (Forms Switch OFF) installed. If Option 39a (Forms Switch ON) is installed, a tractor feed printer will form feed after Line 24 of each message is reached. Refer to the Form Selector Lever Setting and the belt and form length chart on the printer to determine if the formout length is correct for the lever setting and belt color.

2.11 Check that printer motors have timed out and are not running. Note of Step 14 of Chart 3 applies.

If any failures are observed when performing the printer test, report failure to Test Center.

End-to-End Installation Test is complete.

SECTION 582-300-500

3. TROUBLESHOOTING

3.01 The troubleshooting analysis charts of this section have been arranged in such a manner as to lead from one analysis chart to another analysis or testing chart if the following table is followed.

TROUBLE REPORTED		PERFORM
One KD		Chart 8 — Display Analysis
All KDs	Off-Line	Chart 6 — Controller Analysis
	On-Line	Chart 12 — On-Line Operations Analysis
One Printer		Chart 11 — Printer Analysis
Station		Chart 12 — On-Line Operations Analysis
All Printers	Off-Line	Chart 6 — Controller Analysis
	On-Line	Chart 12 — On-Line Operations Analysis

3.02 When more than one directive is given under an Analysis Chart “Response Directive”, perform in the order given, one directive at a time and retry the analysis chart from Step 1 unless otherwise directed.

3.03 Caution — See 1.05 if 45FG110-type circuit card is replaced.

3.04 Danger/Warning — See 1.07.

A. Controller Analysis

3.05 If any question of Chart 6 (except questions 1 and 3) are answered “NO”, first check that all controller ribbon cables are properly seated into circuit cards. Also check that power supply bus bar connections are tightened at both the power supply terminal strip and the back panel connector. If cables are found to be seated and bus bar screws and nuts are found to be tight; then follow the “NO” Response Directive for the question that failed.

3.06 If a circuit card is indicated to be defective per controller analysis of Chart 6, perform the following before replacing the circuit card:

- (a) Turn off power.
- (b) Remove card and check for bent connector pins.
- (c) If circuit card contains sockets, make sure all I.C. packs are firmly seated.
- (d) Reinstall circuit card and make sure card is firmly seated in connector.
- (e) Turn on power.
- (f) Perform the self-test again.

CHART 6
CONTROLLER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>1. Power up controller from a power off mode.</p> <p>Is fan at rear of controller moving air?</p>	Go to 2.	Replace 452192 ventilation fan assembly
<p>2. Is Power Supply Voltage indicator steady on? (See Fig. 1 on Page 3)</p>	Go to 3.	Perform Power Supply Analysis, Chart 7.
<p>3. Is RUN indicator at front of controller steady on when controller is <u>not</u> in test mode?</p>	Go to 4.	<p>Perform steps below one at a time until problem is corrected.</p> <p>(a) Make sure that all circuit cards are present and fully seated.</p> <p>(b) Replace 410311 circuit card.</p> <p>(c) Perform Power Supply Analysis (Chart 7) beginning at Step 2.</p> <p>(d) Replace 45186 LED display assembly.</p> <p>(e) Replace 45FG110-type circuit card.</p> <p>Caution: See 1.05</p>
<p>4. Are all STATUS indicators at front of controller off?</p> <p style="text-align: right;">(4. continued on following page)</p>	Go to 5.	<p>Make sure that all circuit cards are fully seated.</p> <p>Disconnect SSI cable from port 2 at SSC and retry Chart 6 from question 1.</p> <ul style="list-style-type: none"> • If controller now passes test, check SSI cable disconnected from port 2 per SSI cable analysis of this section. • If after disconnecting SSI cable from port 2 trouble still remains: <ul style="list-style-type: none"> (a) Replace 410313 or 410314 circuit card in location X2.

CHART 6 (Contd)
CONTROLLER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
4. (Contd)		(b) Replace 410319 SSI Intercon card at location 1. (c) Replace 452154 cable between 410313 or 410314 circuit card in location X2 and 410319 card in location 1. (See Fig. 1.)
5. Depress controller self-test switch for two seconds; then release. Are all STATUS indicators blinking?	SCC has entered the self-test mode. Go to 8.	<ul style="list-style-type: none"> • Check connection of LED display assembly to 410311 circuit card, see Fig. 1. • Replace 410311 circuit card. Go to 6.
6. Repeat Question 5.	Go to 8.	Replace 452186 LED display assembly. Go to 7.
7. Repeat Question 5.	Go to 8.	Remove cards to right of 410311 one at a time. As each card is removed, repeat Question 5. Last card removed allowing a "YES" response to Question 5 must be replaced. If all cards to the right of 410311 have been removed, replace back panel. Go to 5. <i>Caution: See 1.05 if 45FG110-type circuit card is replaced.</i>

CHART 6 (Contd)
CONTROLLER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>8. For each "Continue Pattern" shown on label attached to inside of controller door or Fig. 2, 3 or 4 (as applies), depress for two seconds or until STATUS indicators displayed, turn off; then release the controller test switch.</p> <p>Does each "Continue Test Pattern" appear and remain until test switch is again depressed?</p> <p><i>Note:</i> Printer motor may turn on; then off during controller analysis.</p>	<p>Go to 9.</p>	<ul style="list-style-type: none"> • Replace circuit card indicated by "Fail Test Pattern" of Fig. 2, 3 or 4 as applies. <p><i>Caution: See 1.05 if 45FG110-type circuit card is replaced.</i></p> <p>Repeat Chart 6 beginning with Question 5.</p> <ul style="list-style-type: none"> • If pattern other than "Continue" or "Fail Test" appears: <ul style="list-style-type: none"> (a) Replace 452186 LED display. (b) Replace 410311 circuit card. <p>Repeat Chart 6 beginning with Question 5.</p> <ul style="list-style-type: none"> • If "Continue Test Patterns" advance automatically (ie, without depressing test switch) disconnect SSI cable at ports 1 and 2 and retry Chart 6 from Question 5. <ul style="list-style-type: none"> (1) If test now passes, check SSI cable disconnected from ports 1 and 2 per SSI cable analysis of this section. (2) If test still fails: <ul style="list-style-type: none"> (a) Replace 410313 or 410314 circuit card at location X2. (b) Replace 410319 circuit card at location 1. (c) Replace 452154 cable between 410313 or 410314 circuit card in location X2 and 410319 card in location 1. (See Fig. 1)

CHART 6 (Contd)

CONTROLLER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
9. When "END OF TEST" pattern is reached, press controller test switch for two seconds; then release to exit the test mode.	Controller Test Status indicators will turn off. Controller RUN indicator will be steady on. If on-line trouble is suspected, perform Chart 12.	<ul style="list-style-type: none"> • Replace 410311 circuit card.

B. Power Supply Analysis

CHART 7

POWER SUPPLY ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. With the controller plugged in and power on, is Power Supply Voltage indicator steady on? (See Fig. 1)	Go to 2.	(Indicator is off or blinking) Go to 3.
2. Are all voltages correct at the output terminal block? Check voltage using voltmeter having 20,000 ohms/volt sensitivity.	Power Supply OK	<ul style="list-style-type: none"> • Check that ac power to controller is 115 V ac \pm 10% (103 to 127 V ac). • Turn off power, Remove bus bar connections from back panel to power supply terminal block and insulate the bus bar from the terminal block. Turn on power. Go to 10.

(2. continued on following page)

Danger/Warning — See 1.07.

CHART 7 (Contd)
POWER SUPPLY ANALYSIS

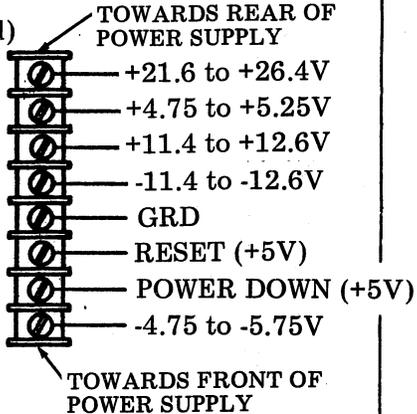
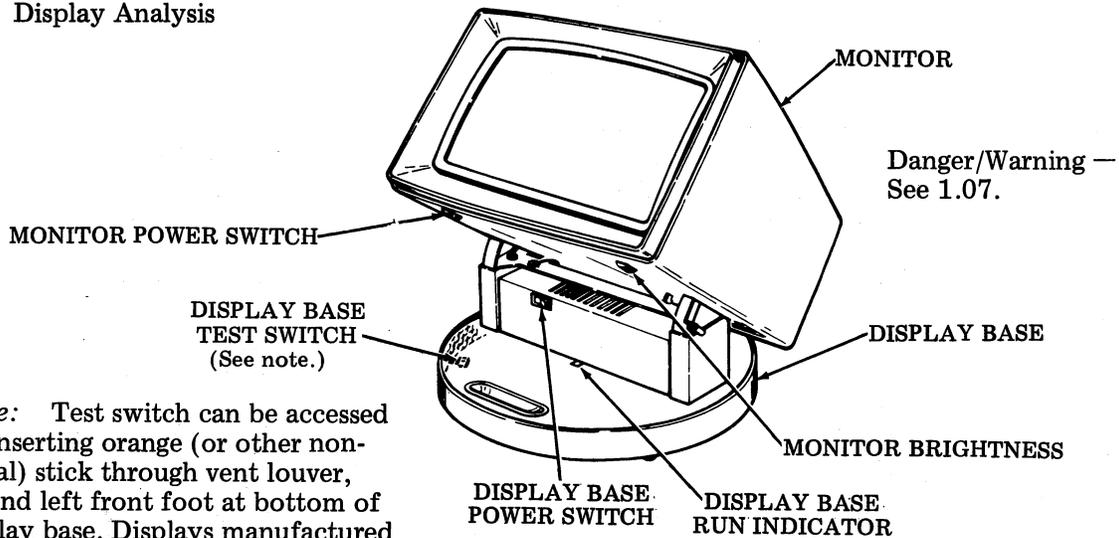
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>2 (Contd)</p>  <p>Note: Terminal block can be accessed by removing bus bar cover at rear of power supply.</p>		
<p>3. Is ventilation fan assembly moving air?</p>	<p>Turn off power. Remove bus bar connections from back panel to power supply terminal block, and insulate the bus bar from the terminal block. Turn on power. Go to 6.</p>	<p>Go to 4.</p>
<p>4. Does fuse on ventilating fan assembly at rear of controller check good?</p>	<p>Check ac power outlet and ventilation fan assembly per Section 582-300-400. Correct problem. Go to 1.</p>	<p>Replace fuse (see Fig. 1). Go to 5.</p>
<p>5. Did fuse blow again?</p>	<ul style="list-style-type: none"> • Replace power supply. • Replace ventilating fan assembly. 	<p>Go to 1.</p>
<p>6. Is Power Supply Voltage indicator steady on?</p>	<p>Go to 10.</p>	<p>Go to 7.</p>
<p>7. Is Power Supply Voltage indicator blinking?</p>	<p>(Indicator blinks) Replace power supply.</p>	<p>(Indicator is out) Go to 8.</p>

CHART 7 (Contd)
POWER SUPPLY ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>8. Is ac power connector at rear of power supply connected?</p> <p><i>Note:</i> Power supply bus bar cover must be removed to check power connection.</p>	Go to 9.	Connect ac connector. Go to 1.
<p>9. Is there 115 V ac at power supply connector? (On ventilation fan assembly side)</p>	Replace power supply.	Check ac power outlet and ventilation fan assembly wiring per Section 582-300-400. Correct problem. Go to 1.
<p>10. Are all voltages correct at the output terminal block?</p> <p><i>Note:</i> See Question 2 for values.</p>	Turn off power. Reconnect bus bar. Remove one (any) circuit card from controller. Turn power on. Go to 11.	Replace power supply.
<p>11. Are all voltages at the output terminal block now correct?</p>	Turn off power. Replace SCC circuit card that was removed. Power supply OK.	<p>Continue removing SCC circuit cards (see Cautions below) until voltages are correct at output terminal block. Circuit card removed prior to voltages being corrected at output terminal block should be replaced.</p> <p><i>Caution 1:</i> See 1.05 if 45FG110-type circuit card is replaced.</p> <p><i>Caution 2:</i> The ac power must be OFF, before moving or replacing a circuit card.</p> <p><i>Note:</i> If all circuit cards have been removed, but voltages are still incorrect, replace back panel or bus bar assembly.</p>

C. Display Analysis



Note: Test switch can be accessed by inserting orange (or other non-metal) stick through vent louver, behind left front foot at bottom of display base. Displays manufactured after February 1980 have a black plastic assembly (452721) which extends the test switch so that the middle of the assembly can be easily operated by an orange stick or screwdriver etc.

Fig. 11—Display (Display Base and Monitor)

CHART 8

DISPLAY ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>1. With power switches on display base and monitor turned on, and brightness control turned up (raster should be barely visible), is display base RUN indicator steady ON or BLINKING?</p> <p>(Step 1 does not require connection between SCC and display base.)</p>	<p>Go to 2.</p>	<p>Turn display base power switch OFF. Wait 30 seconds, then repeat analysis question 1. If RUN indicator remains OFF, replace display base. If RUN indicator begins to blink and then within one minute turns off, proceed to Step 2.</p>

CHART 8 (Contd)
DISPLAY ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>2. Depress for one second and release the display base test switch (see Fig. 11). Within one minute, does the pattern of Fig. 12 appear on the display and is the display base RUN indicator steady ON? Check that display pattern meets requirements of 3.07.</p> <p><i>Note:</i> As test switch is depressed and released, a spurious pattern may briefly appear on monitor.</p> <p>When cursor reaches the end of the display of Fig. 12, does pattern of Fig. 13 appear on the display?</p> <p>Check that display pattern meets requirements of 3.08.</p>	<p>Go to 3.</p>	<ul style="list-style-type: none"> • If display base RUN indicator does not turn steady ON for at least one minute, replace display base. • If no patterns appear, and display base RUN indicator remains steady ON for at least one minute, perform Monitor Analysis of Chart 9. • If patterns appear, but do not match those shown in Fig. 12 and 13, replace the display base.
<p>3. With ac power on at SCC, SSI cable connected at both SCC and KD ends, and KD correctly optioned (see Section 582-300-200); when display pattern of Fig. 13 disappears from the screen, does the display base RUN indicator begin to blink and then within one minute, stay ON steady?</p>	<p>Go to 4.</p>	<ul style="list-style-type: none"> • If KD is connected to port 1 (Device 0), perform the following: <ul style="list-style-type: none"> (a) Check SSI cable. (b) Replace associated 410313 or 410314 SSI circuit card in SCC (see Fig. 1). Device 0 to 15 = X2 location. Device 16 to 31 = X3 location.

(3. continued on following page)

CHART 8 (Contd)

DISPLAY ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>3 (Contd) <i>Note:</i> If the option listing cannot be obtained at the first KD (device 0), perform the Controller Self-Test, Chart 1. When the "End-of-Test" pattern appears, depress the controller test switch for approximately 30 seconds. When the test switch is released, a default message will appear on the display. Follow the directions of the default message. When the option listing appears on the display, reoption the SCC per Section 582-300-200.</p> <p>(See note following Chart 8)</p>		<p>(c) Replace associated 410319 SSI intercon card in SCC (see Fig. 1). Device 0 to 7 = Location 1 Device 8 to 15 = Location 2 Device 16 to 23 = Location 3 Device 24 to 31 = Location 4</p> <p>(d) Replace associated 452154 SSI intercon cable in SCC.</p> <p>(e) Replace 452015 display base cable.</p> <ul style="list-style-type: none"> • If KD is connected to any port from 2 through 32 (Device 1 through 31), disconnect KD (Device 0) SSI cable from port 1 of SCC and connect KD being analyzed to port 1. <p>(a) If display base RUN indicator now remains ON steady, perform (b), (c), and (d) above for original device number.</p> <p>(b) If display base RUN indicator still BLINKS:</p> <ol style="list-style-type: none"> (1) Check SSI cable. (2) Replace 452015 display base cable.
<p>4. Does display screen appear blank (no characters) but with cursor in HOME position and LOCAL indicator of keyboard lit?</p>	<p>Display base OK. Perform KD/Controller Local Test, (Chart 3) beginning at Step 2.</p>	<ul style="list-style-type: none"> • Replace display base. • Replace 452015 display base cable.

Note: If station is or has been on-line with LCU and Status and Sense other than "Device End" is pending; trying to download KD twice, by first turning KD ac power off, then on, causing KD to download the first time; then power off and on again, will result in KD failing to download on second attempt. If the KD fails to download on the second attempt, turn the ac power to the SCC off, then on, and retry downloading the KD.

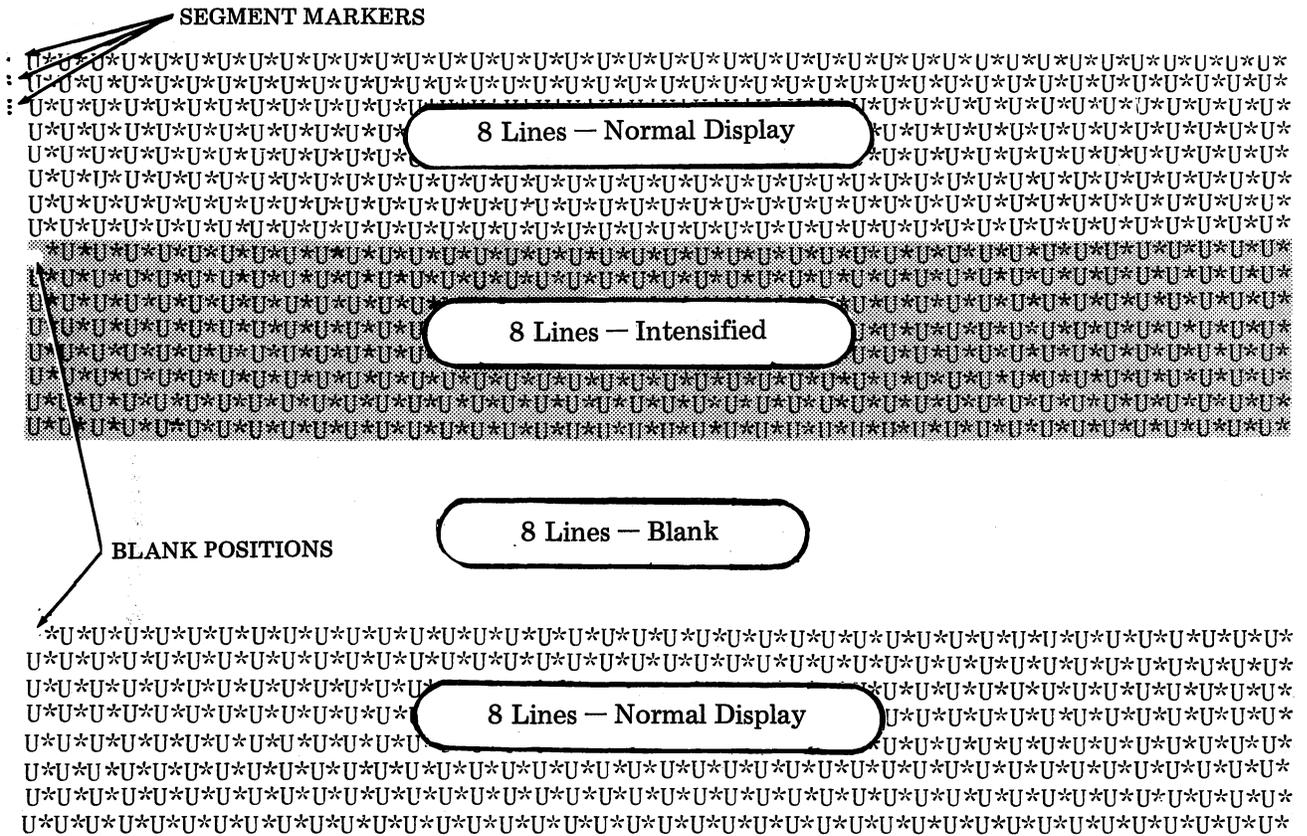
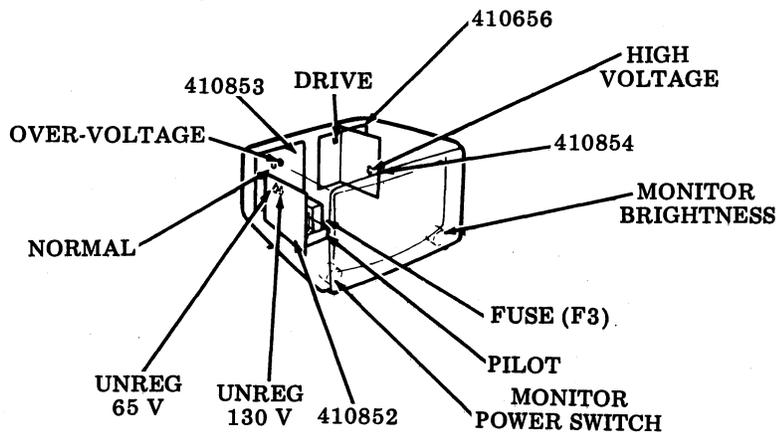


Fig. 13—32 Line, 80-Column Display Test Pattern

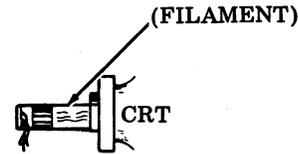
3.08 Compare the display and Fig. 13 for the following:

- a. 32 lines — 80 columns.
- b. Correctness of characters.
- c. Segment markers (as shown).
- d. Field characteristics as described for each eight lines.
- e. Cursor scanning and pausing at end of each line.
- f. Blank positions at beginning of second and fourth group of eight lines.

D. Monitor Analysis



Danger: Safety glasses must be worn whenever monitor cover is removed or whenever monitor is replaced.



Danger/Warning —
See 1.07.

Fig. 14—Monitor

CHART 9

MONITOR ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE
1. With display base power on, is Drive indicator lit?	Go to 2.	<ul style="list-style-type: none"> • Replace 410656 circuit card. • Replace display base.
2. With monitor power on, is Pilot indicator lit?	Go to 3.	Check fuse F3 <u>Old Style</u> — 1.4ASL-BL Plug-In type — 341578 <u>New Style</u> — 1.5ASL-BL Glass type — 341686
3. Are UNREG 65 V and 130 V indicators lit?	Go to 4.	Replace 410852 circuit card.
4. Is Normal indicator lit?	Go to 5.	Replace 410853 circuit card.
5. Is Over-Voltage indicator lit?	Replace 410853 circuit card.	Go to 6.
6. Is High-Voltage indicator lit?	Go to 7.	<ul style="list-style-type: none"> • Replace 410854 circuit card. • Replace 410656 circuit card.
7. Is CRT filament lit?	Monitor OK.	Replace monitor.

E. Keyboard Analysis

Danger/Warning — See 1.07.

Note: Start with Question 1 if KD has typewriter-style keyboard. (40K104, 40K203 and 40K301) Start with Question 8 if KD has internal numeric cluster-style keyboard. (40K105) See Fig. 8 if required, for identification.

CHART 10
KEYBOARD ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE																																					
Typewriter Style Keyboard Analysis (Steps 1 — 6)																																							
<p>1. Depress ERASE INPUT and QUOTES (ERASE INPUT and UNDERLINE on 45K301 keyboard) keys together with additional force. Does TST indicator remain lit when keys are released?</p>	<p>Keyboard is in loopback mode. For 45K301-type keyboard only: alarm sounds repeatedly; then stops.</p> <p>Go to 2.</p> <p><i>Note: For 40K104, or 40K203 only: If lamps flash or the alarm sounds, clear by depressing ERASE INPUT and P keys; then repeat Question 1.</i></p>	<ul style="list-style-type: none"> • Replace keyboard. See 1.06. • Replace display base. • Check wiring between display base and keyboard (See Section 582-300-400). 																																					
<p>2. Do the following for 40K104 or 40K203 only:</p> <table border="1" data-bbox="203 1270 673 1648"> <thead> <tr> <th colspan="2" data-bbox="203 1270 406 1354">Depress Keys</th> <th colspan="2" data-bbox="406 1270 673 1312">Indicator</th> </tr> <tr> <th colspan="2"></th> <th data-bbox="406 1312 511 1354">Key</th> <th data-bbox="511 1312 673 1354">Condition</th> </tr> </thead> <tbody> <tr> <td data-bbox="203 1354 300 1396">SHIFT</td> <td data-bbox="300 1354 406 1396">A</td> <td data-bbox="406 1354 511 1396" rowspan="2">S/R</td> <td data-bbox="511 1354 673 1396">ON</td> </tr> <tr> <td data-bbox="203 1396 300 1438">CTRL</td> <td data-bbox="300 1396 406 1438">A</td> <td data-bbox="511 1396 673 1438">OFF</td> </tr> <tr> <td data-bbox="203 1438 300 1480">SHIFT</td> <td data-bbox="300 1438 406 1480">C</td> <td data-bbox="406 1438 511 1480" rowspan="2">LOCAL</td> <td data-bbox="511 1438 673 1480">ON</td> </tr> <tr> <td data-bbox="203 1480 300 1522">CTRL</td> <td data-bbox="300 1480 406 1522">C</td> <td data-bbox="511 1480 673 1522">OFF</td> </tr> <tr> <td data-bbox="203 1522 300 1564">SHIFT</td> <td data-bbox="300 1522 406 1564">F</td> <td data-bbox="406 1522 511 1564">PRINT</td> <td data-bbox="511 1522 673 1564">ON</td> </tr> <tr> <td data-bbox="203 1564 300 1606">CTRL</td> <td data-bbox="300 1564 406 1606">\</td> <td data-bbox="406 1564 511 1606">LOCAL</td> <td data-bbox="511 1564 673 1606">OFF</td> </tr> <tr> <td data-bbox="203 1606 300 1648"></td> <td data-bbox="300 1606 406 1648">→</td> <td data-bbox="406 1606 511 1648" rowspan="2">LOCAL</td> <td data-bbox="511 1606 673 1648">FLASH</td> </tr> <tr> <td data-bbox="203 1648 300 1690">CTRL</td> <td data-bbox="300 1648 406 1690">C</td> <td data-bbox="511 1648 673 1690">OFF</td> </tr> </tbody> </table> <p><i>Note:</i> Keyboard must be in "CAPS LOCK" mode when performing above tests.</p> <p>(Continued on following page)</p>	Depress Keys		Indicator				Key	Condition	SHIFT	A	S/R	ON	CTRL	A	OFF	SHIFT	C	LOCAL	ON	CTRL	C	OFF	SHIFT	F	PRINT	ON	CTRL	\	LOCAL	OFF		→	LOCAL	FLASH	CTRL	C	OFF		
Depress Keys		Indicator																																					
		Key	Condition																																				
SHIFT	A	S/R	ON																																				
CTRL	A		OFF																																				
SHIFT	C	LOCAL	ON																																				
CTRL	C		OFF																																				
SHIFT	F	PRINT	ON																																				
CTRL	\	LOCAL	OFF																																				
	→	LOCAL	FLASH																																				
CTRL	C		OFF																																				

CHART 10 (Contd)
KEYBOARD ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE																							
<p>2. (Contd)</p> <p>Do the following for 45K301 only: (See Note 1)</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 15%;">Indicator</th> <th style="width: 15%;">Depress & Release to Flash</th> <th style="width: 15%;">Depress & Hold to Turn On</th> <th style="width: 15%;">Release to Turn Off</th> </tr> </thead> <tbody> <tr> <td>S/R</td> <td>-(Minus) See Note 2</td> <td>REPT</td> <td>REPT</td> </tr> <tr> <td>LOCAL</td> <td>.(Period) See Notes 3&4</td> <td>↓ (Cursor Down) See Note 4</td> <td>↓ (Cursor Down)</td> </tr> <tr> <td>PRINT LOCAL</td> <td>H</td> <td>LINE INSERT</td> <td>LINE INSERT</td> </tr> <tr> <td>CAPS LOCK</td> <td>PF8</td> <td>PA2</td> <td>PA2</td> </tr> </tbody> </table> <p><i>Note 1:</i> Keytops must be depressed in the order given for each indicator. (ig CAPS LOCK): depress “PF8” to flash; then depress and hold “PA2” to turn on steady; then release “PA2” to turn off.</p> <p><i>Note 2:</i> Minus in external numeric cluster area.</p> <p><i>Note 3:</i> Period in keyboard area.</p> <p><i>Note 4:</i> Depress key with additional force.</p>	Indicator	Depress & Release to Flash	Depress & Hold to Turn On	Release to Turn Off	S/R	-(Minus) See Note 2	REPT	REPT	LOCAL	.(Period) See Notes 3&4	↓ (Cursor Down) See Note 4	↓ (Cursor Down)	PRINT LOCAL	H	LINE INSERT	LINE INSERT	CAPS LOCK	PF8	PA2	PA2	<table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 30%;">Do all indicators operate as described above?</td> <td style="width: 30%;">Depress ERASE INPUT and P (ERASE INPUT and PERIOD on 45K301 keyboard) keys together with additional force to terminate test. TST indicator light goes out. Go to 3.</td> <td style="width: 40%;">Replace keyboard. See 1.06</td> </tr> </table>	Do all indicators operate as described above?	Depress ERASE INPUT and P (ERASE INPUT and PERIOD on 45K301 keyboard) keys together with additional force to terminate test. TST indicator light goes out. Go to 3.	Replace keyboard. See 1.06	<p>3. Is 40K203, 45K301 or late design 40K104 keyboard present?</p> <p>45K301 present, go to 5.</p> <p>40K203 or late design 40K104 present. Go to 4.</p> <p style="text-align: center;">(3. continued on the following page.)</p>
Indicator	Depress & Release to Flash	Depress & Hold to Turn On	Release to Turn Off																						
S/R	-(Minus) See Note 2	REPT	REPT																						
LOCAL	.(Period) See Notes 3&4	↓ (Cursor Down) See Note 4	↓ (Cursor Down)																						
PRINT LOCAL	H	LINE INSERT	LINE INSERT																						
CAPS LOCK	PF8	PA2	PA2																						
Do all indicators operate as described above?	Depress ERASE INPUT and P (ERASE INPUT and PERIOD on 45K301 keyboard) keys together with additional force to terminate test. TST indicator light goes out. Go to 3.	Replace keyboard. See 1.06																							
		<p>Interface/bell card present, go to 5.</p>																							

CHART 10 (Contd)
KEYBOARD ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>3 <i>Note 1:</i> Late design (Contd) 40K104 keyboards have a single card. Early design 40K104 keyboards (interface/bell card present) will not cause alarm to ring when ERASE INPUT key is depressed.</p> <p><i>Note 2:</i> To check the vintage of a 40K104 keyboard, it is sufficient to remove keyboard from table (or base) and look through the slot at the rear for the small second card. (interface/bell card).</p>		
<p>4. Fully depress ERASE INPUT key. Does the alarm sound repeatedly as long as the key is depressed?</p> <p><i>Note:</i> The alarm loudness control may require adjustment to hear the tone.</p>	Go to 5.	Replace keyboard. See 1.06.
<p>5. Does the keyboard generate proper characters or perform proper functions when keys are depressed? (FM displays as FM, DUP displays as DU, CHAR and LINE DELETE and INSERT operates properly, TAB, CURSOR TAB and BACK TAB operate correctly (on unformatted display, cursor returns HOME)). See Fig. 8 for keyboard arrangements.</p>	Go to 6. (If keyboard has no security lock, go to 7.)	<ul style="list-style-type: none"> • Replace keyboard. See 1.06. • Perform Controller Analysis of Chart 6.

CHART 10 (Contd)
KEYBOARD ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE
<p>6. If keyboard has security lock modification kit, does keyboard become inoperative when lock is in OFF position?</p> <p><i>Note:</i> 40/4-type security lock modification kits cannot be used in 4540 stations.</p>	<p>Go to 7.</p> <p>Also see note under “CORRECT RESPONSE” of Chart 3, Step 3a.</p>	<p>Replace keyboard security lock modification kit.</p>
<p>7. If keyboard is equipped with a Magnetic Stripe Reader (MSR), can it pass the test of Chart 3, Step 3b? If keyboard does not have MSR, keyboard is OK.</p>	<p>Keyboard is OK.</p>	<ul style="list-style-type: none"> • Replace 406302 Magnetic Stripe Reader (MSR) assembly. • Replace 45K301/GAA/02 keyboard. • Replace 406303 test card.
INTERNAL NUMERIC CLUSTER STYLE KEYBOARD ANALYSIS (Steps 8-11)		
<p>8. Depress CONSOL TEST and LINE INSERT** keys together. Does CONSOL TEST indicator remain lit when keys are released?</p> <p>** Fully depress LINE INSERT key.</p>	<p>Keyboard is in loopback mode.</p> <p>Go to 9.</p> <p><i>Note:</i> If indicators flash or the alarm sounds more than once or continuously, clear by depressing CONSOL TEST and RESET keys, then repeat Question 8. (Use RESET key adjacent to PF1 key.)</p>	<ul style="list-style-type: none"> • Replace keyboard. See 1.06. • Replace display base. • Check wiring between display base and keyboard. (See Section 582-300-400).

CHART 10 (Contd)
KEYBOARD ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE		"NO" RESPONSE DIRECTIVE
9. Do the following in the order given:			
Depress key(s)	Indicator		Notes
A	S/R	On	
C	LOCAL	On	If entered loopback mode from LOCAL, LOCAL indicator is already on.
M	INPUT INHIBIT	On	
F	PRINT LOCAL	On	
I	NUM LOCK	On	
R/TST	S/R	Flashing On & Off	Depress only R/TST key.
(Cursor right) →	LOCAL	Flashing On & Off	
LINE DELETE	INPUT INHIBIT	Flashing On & Off	
L/TST	PRINT LOCAL	Flashing On & Off	Depress only L/TST key.
NUM LOCK	NUM LOCK	Flashing On & Off	
ALPHA & A	S/R	On (no flash)	
ALPHA & C	LOCAL	On (no flash)	
ALPHA & M	INPUT INHIBIT	On (no flash)	
ALPHA & F	PRINT LOCAL	On (no flash)	

(9. continued on the following page.)

CHART 10 (Contd)
KEYBOARD ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE
9. (Contd)		
	Indicator	
Depress key(s)	Key	Condition
ALPHA & I	NUM LOCK	On (no flash)
NUM & R/TST	S/R	Off
ERASE INPUT	INPUT INHIBIT	Off
TAB	NUM LOCK	Off
R/TST	S/R	Flashing On & Off
ALPHA & R/TST	S/R	Off
CONSOL TEST	(See note to the right)	Keyboard attention bell sounds repeatedly as long as key is depressed.
Do all indicators and bell operate as described in Question 9?	Depress CONSOL TEST and RESET (adjacent to PF1) keys to terminate test. Go to 10.	Replace keyboard. See 1.06.
10. Does the following occur? (a) CONSOL TEST indicator goes out. (b) PRINT LOCAL indicator goes out. (c) LOCAL indicator stays on.	All three conditions are met. Go to 11.	Replace keyboard. See 1.06.

CHART 10 (Contd)
KEYBOARD ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE
<p>11. Does the keyboard generate proper characters and perform proper functions when keys are depressed? (FM displays as FM, DUP displays as DU, CHAR and LINE DELETE and INSERT operate properly, TAB, CURSOR TAB and BACK TAB operate correctly (on unformatted display, cursor returns HOME)). See Fig. 8 for Keyboard arrangement.</p>	Keyboard is OK.	<ul style="list-style-type: none"> • Replace keyboard. See 1.06. • Perform Controller Analysis of Chart 6.

F. Printer Analysis

Danger/Warning — See 1.07.

CHART 11
PRINTER ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE
<p>1. With power turned on, paper loaded, cabinet cover closed, and no data being sent to printer, is printer motor off but fan in tractor feed printer cabinet moving air?</p>	Go to 2.	<ul style="list-style-type: none"> • Replace printer circuit card if motor is on. • If tractor feed printer fan is not moving air: <ul style="list-style-type: none"> (a) Check for power at ac outlet. (b) Check cabinet wiring per Section 582-312-400, (4500 Cabinet) or Section 582-212-400, (40 Cabinet).

CHART 11 (Contd)
 PRINTER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>2. For 40P204 printer or printer with paper jam alarm only: Is PAPER indicator OFF? If printer does include paper jam alarm mechanism, proceed directly to 3.</p>	<p>Go to 3.</p>	<ul style="list-style-type: none"> • Reset paper jam alarm per printer How To Operate. If alarm can be reset, go to 3. • Refer to Section 582-210-500.
<p>3. Does paper feed out as PAPER (red) button on printer cabinet is depressed?</p> <p><i>Note:</i> This step does not apply to Forms Access printer (no PAPER button). Go to 4.</p>	<p>Go to 4.</p>	<ul style="list-style-type: none"> • Check cabinet wiring per Section 582-312-400, (4500 cabinet) or Section 582-212-400, (40 cabinet). • Replace printer circuit card. <p><i>Note:</i> If printer has 410640 or 410729 circuit card, check out SSI cable per SSI cable analysis of this section. (SSI signal from SCC is required)</p>
<p>4. Tractor feed printer with FORMS switch on only: (Option 39a) When FORMS ADVANCE (black) switch is depressed and released, will paper feed out until first line of next form is reached?</p> <p><i>Note:</i> See chart on top of printer to determine if form out length is correct for setting of lever and color of belt.</p>	<p>For 40P204 printer or printer with paper jam alarm, go to 5.</p> <p>Otherwise go directly to 6.</p>	<ul style="list-style-type: none"> • Refer to Section 582-210-500. <i>Note:</i> Continuous feedout will occur if form selector lever is not fully seated in slots 1, 2, 3, or 4. • Check cabinet wiring per Section 582-312-400, (4500 cabinet) or Section 582-212-400, (40 cabinet). • Replace printer circuit card. <p><i>Note:</i> If printer has 410640 or 410729 circuit card, check out SSI cable per SSI cable analysis of this section. (SSI signal from SCC is required)</p>

CHART 11 (Contd)
 PRINTER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>5. For 40P204 printer or printer with paper jam alarm modification kit only: Did PAPER indicator turn on?</p>	<p>Refer to Section 582-210-500.</p>	<p>Go to 6.</p>
<p>6. With cover raised and interlock switch in maintenance (up) position and printer TEST switch on, does printer print font ID symbol (see chart on following page) in all columns until TEST switch is turned off? (See Fig. 5 if required)</p> <p><i>Note 1:</i> Printers which have a 410071, 410072 or 410076 circuit card will not print outside columns optioned per Option 17.</p> <p><i>Note 2:</i> If LF switch on top of printer is set for 1, printing will occur on each line. If LF switch is set for 2, a blank line will occur between printed lines.</p>	<p>Go to 7.</p>	<ul style="list-style-type: none"> • Replace printer circuit card. • Refer to Section 582-210-500. <p><i>Note:</i> Interlock switch may be defective in maintenance position. Check by closing cover.</p>

(6. continued on the following page.)

CHART 11 (Contd)
 PRINTER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE		"NO" RESPONSE DIRECTIVE																																							
<p>6. (Contd)</p> <table border="1" data-bbox="126 436 932 1104"> <thead> <tr> <th rowspan="3">Carrier Type</th> <th colspan="4">Type Carrier Font ID Symbol</th> </tr> <tr> <th colspan="2">132-Column</th> <th colspan="2">80-Column</th> </tr> <tr> <th>ASCII</th> <th>EBCDIC</th> <th>ASCII</th> <th>EBCDIC</th> </tr> </thead> <tbody> <tr> <td>Monocase Standard</td> <td>≡A≡ ≡J≡</td> <td>≡A≡ ≡2≡</td> <td>≡A≡ ≡A≡</td> <td>≡A≡ ≡Q≡</td> </tr> <tr> <td>Up-Low Standard</td> <td>≡A≡ ≡Q≡</td> <td>≡A≡ ≡M≡</td> <td>≡A≡ ≡8≡</td> <td>≡A≡ ≡N≡</td> </tr> <tr> <td>Monocase OCR-B</td> <td>≡8≡ ≡E≡</td> <td>≡8≡ ≡K≡</td> <td>≡8≡ ≡D≡</td> <td>≡8≡ ≡M≡</td> </tr> <tr> <td>Up-Low OCR-B</td> <td>≡8≡ ≡C≡</td> <td>≡8≡ ≡J≡</td> <td>≡8≡ ≡8≡</td> <td>≡8≡ ≡N≡</td> </tr> <tr> <td>Monocase Line Drawing (requires 45FG110/AB/03 Feature Group Card)</td> <td>—</td> <td>—</td> <td>≡A≡ ≡Q≡</td> <td>—</td> </tr> </tbody> </table>	Carrier Type	Type Carrier Font ID Symbol				132-Column		80-Column		ASCII	EBCDIC	ASCII	EBCDIC	Monocase Standard	≡A≡ ≡J≡	≡A≡ ≡2≡	≡A≡ ≡A≡	≡A≡ ≡Q≡	Up-Low Standard	≡A≡ ≡Q≡	≡A≡ ≡M≡	≡A≡ ≡8≡	≡A≡ ≡N≡	Monocase OCR-B	≡8≡ ≡E≡	≡8≡ ≡K≡	≡8≡ ≡D≡	≡8≡ ≡M≡	Up-Low OCR-B	≡8≡ ≡C≡	≡8≡ ≡J≡	≡8≡ ≡8≡	≡8≡ ≡N≡	Monocase Line Drawing (requires 45FG110/AB/03 Feature Group Card)	—	—	≡A≡ ≡Q≡	—				
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Monocase Line Drawing (requires 45FG110/AB/03 Feature Group Card)	—	—	≡A≡ ≡Q≡	—																																						
<p>7. Friction Feed Printer Only:</p> <p>Does PAPER indicator light; then turn off when paper roll is lifted and then lowered back in place?</p> <p>Tractor Feed Printer Only:</p> <p>Does PAPER indicator light and motor turn off when paper is torn below printer and FORMS button is depressed until paper passes through printer?</p>	<p>If Printer is not optioned (see Note 1) for Print Local capability, go to 8.</p> <p>If Printer is optioned (see Note 1) for Print Local (415b) capability, go to 9.</p> <p><i>Note 1:</i> A printer is optioned (or not optioned) for PRINT LOCAL capability from first KD (see Section 582-300-200).</p> <p><i>Note 2:</i> If Printer is tractor feed, re-load paper.</p>		<ul style="list-style-type: none"> • Replace printer circuit card. • Refer to Section 582-210-500. 																																							

CHART 11 (Contd)

PRINTER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
<p>8. For printer that is <u>not</u> optioned for "PRINT LOCAL" capability, is trouble experienced when printer copies on-line?</p>	<ul style="list-style-type: none"> • Perform Controller Analysis, Chart 6. • Replace associated 410313 or 410314 SSI circuit card in SCC. (See Fig. 1) Device 0-15 = X2 Location Device 16-31 = X3 Location • Replace associated 410319 intercon card in SCC (See Fig. 1) Device 0 to 7 = Location 1 Device 8 to 15 = Location 2 Device 16 to 23 = Location 3 Device 24 to 31 = Location 4 • Check SSI cable per SSI cable analysis of this section. • Replace SSI assembly in printer cabinet. • If wrong or errored characters are being printed, check to be certain that printer contains correct carrier. Also check printer options. 	<p><i>Note 1:</i> A feed out or form feed may occur after the last printed line depending on the following printer options: 18a and (39a or 39b) — None (18b or 18c) and 39a — form feed (18b or 18c) and 39b — 16 line feed out</p> <p><i>Note 2:</i> After printer is finished copying, the printer motor will remain on for approximately 20 seconds before turning off. Early version printer cards (410640 or 410729) will allow motor to remain on for approximately six seconds before turning off.</p> <p>Printer OK.</p>
<p>9. Depress CLEAR; then LOCAL (or RESET) keys and type some text (upper and lower case if possible) on associated KD (See Station Configuration Worksheet); then depress PRINT LOCAL key. Does printer copy from KD as follows:</p>	<p><i>Note 1:</i> A feed out or form feed may occur after line 24 (whether or not data is present in line 24) depending on the following printer options:</p> <p>18a and (39a or 39b) — None (18b or 18c) and 39a — form feed (18b or 18c) and 39b — 16-line feed out</p> <p>(9. continued on following page)</p>	<p>If S/R indicator is flashing and PRINT LOCAL indicator is on, depress LOCAL key and retry Analysis, Question 9. If same failure occurs the second time, perform Chart 6 (Controller Analysis); then a, b, c and d on the following page.</p>

CHART 11 (Contd)
 PRINTER ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE																								
<p>9 <u>Up-Low Printer</u> (Contd) All display characters are copied as displayed.</p> <p><u>Monocase Printer</u> All display characters print as capitals. If the following characters are entered at the KD, the printer will substitute characters as follows:</p> <table border="1" data-bbox="151 877 529 999"> <thead> <tr> <th>TYPE OF MONOCASE CARRIER</th> <th colspan="5">CHAR. ENTERED</th> </tr> </thead> <tbody> <tr> <td>ASCII</td> <td>~</td> <td>\</td> <td> </td> <td>{</td> <td>}</td> </tr> <tr> <td>EBCDIC</td> <td>^</td> <td>@</td> <td>\</td> <td>[</td> <td>]</td> </tr> <tr> <td></td> <td>c</td> <td>@</td> <td>\</td> <td>-</td> <td> </td> </tr> </tbody> </table> <p><i>Note:</i> In Question 9, depressing CLEAR clears any formatted display. In operation with a formatted display, it is normal for print local to be inhibited when a protected alphanumeric attribute is in the home position provided Option 414a is installed for the KD.</p>	TYPE OF MONOCASE CARRIER	CHAR. ENTERED					ASCII	~	\		{	}	EBCDIC	^	@	\	[]		c	@	\	-		<p><i>Note 2:</i> After printer is finished copying, the printer motor will remain on for approximately 20 seconds before turning off. Early version printer cards (410640 or 410729) will allow motor to remain on for approximately six seconds before turning off.</p> <p>Printer OK.</p>	<p>If KD S/R indicator is off while PRINT LOCAL indicator is flashing and printer power is on, printer lid is closed, printer paper indicator is off, and printer is "PRINT LOCAL" to KD:</p> <p>(a) Replace associated (to printer) 410313 or 410314 SSI circuit card in SCC. (See Fig. 1) Device 0-15 = X2 Location Device 16-31 = X3 Location</p> <p>(b) Replace associated (to printer) 410319 Intercon card in SCC. (See Fig. 1) Device 0-7 = Location 1 Device 8-15 = Location 2 Device 16-23 = Location 3 Device 24-31 = Location 4</p> <p>(c) Check SSI cabling to printer per SSI Cable Analysis of this section.</p> <p>(d) Replace SSI assembly in printer cabinet.</p> <p>If wrong or errored characters are being printed, check to be certain that printer contains correct carrier. Also check printer options.</p>
TYPE OF MONOCASE CARRIER	CHAR. ENTERED																									
ASCII	~	\		{	}																					
EBCDIC	^	@	\	[]																					
	c	@	\	-																						

G. On-Line Operations Analysis

Danger/Warning — See 1.07.

3.09 Before beginning Chart 12, verify that data is being transmitted from the LCU (or DTC) location.

3.10 If a “NO” response is given for any analysis question of Chart 12, first perform the Controller Analysis of Chart 6, then follow associated “NO” Response Directive.

Warning: When a 208A-type data set is installed in cabinet on shelf above controller, the required ventilation for assembly must be moving air (power applied) to avoid damage to data set.

Caution: If it is noticed that the Status 3 indicator of the SCC blinks 2 or more times, within 15 minutes, perform the SSI cable analysis of this section.

CHART 12

ON-LINE OPERATIONS ANALYSIS

ANALYSIS QUESTION	“YES” RESPONSE DIRECTIVE	“NO” RESPONSE DIRECTIVE (See 3.10)
1. Is CO indicator of data set “ON”?	Go to 2.	<ul style="list-style-type: none"> • Perform Data Set Analog Loopback Self-Test of Chart 4. • Request that LCU data set and channel facilities be checked out. <p><i>Note: The LCU (or Test Center) end can perform the Far-End Digital Loopback test. See 3.11.</i></p>
2. Does “R” indicator of LINE 1 at SCC appear to be blinking? (3.09 applies.)	Go to 3.	<ul style="list-style-type: none"> • Perform Near-End Analog Loopback test. See 3.12. • Check data set cable (pin 3). • Replace 410311 circuit card in SCC. • Replace 452186 LED display assembly.
3. Does Status indicator # 1 of SCC turn on when station is being polled and then turn off when response is sent.	Go to 4.	<ul style="list-style-type: none"> • Perform Near-End Analog Loopback test. See 3.12. • Replace 410311 circuit card in SCC.

(3. continued on following page)

CHART 12 (Contd)

ON-LINE OPERATIONS ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE (See 3.10)
3 (Contd)		<ul style="list-style-type: none"> • Replace 452186 LED display assembly. • Perform line monitoring or request assistance through normal escalation procedures.
<p>4. Does RS indicator of data set turn on when Status LED indicator # 1 turns on?</p> <p><i>Note:</i> RS indicator may already be on if data set is optioned for continuous RTS and carrier.</p>	Go to 5.	<ul style="list-style-type: none"> • Perform Near-End Analog Loopback Test. See 3.12. • Check data set cable (pin 4). • Replace 410311 circuit card in SCC.
5. Is CS indicator of data set lit when RS indicator is lit?	Go to 6.	<ul style="list-style-type: none"> • Check data set. • Check data set cable (pin 5).
6. Does "S" indicator of Line 1 at SCC turn on then off when station is polled.	Go to 7.	<ul style="list-style-type: none"> • Perform Near-End Analog Loopback Test. See 3.12. • Replace 410311 circuit card in SCC. • Replace 452186 LED display assembly.
7. Did LCU (or Test Center) receive data sent from station?	Go to 8.	<ul style="list-style-type: none"> • Perform Far-End Digital Loopback Test. See 3.13. • Replace 410311 circuit card in SCC. • Perform line monitoring or request assistance through normal escalation procedures.

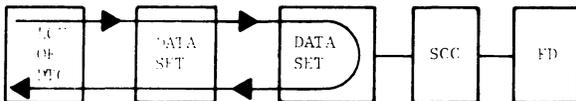
CHART 12 (Contd)

ON-LINE OPERATIONS ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE (See 3.10)
8. Are data transmissions received or sent by station OK?	"On-Line Operation" OK.	<ul style="list-style-type: none"> • Replace 45FG110-type circuit card in SCC. Caution: See 1.05. • Replace 410311 circuit card in SCC. • Perform line monitoring or request assistance through normal escalation procedures.

The following three tests should be performed when directed to do so in Chart 12.

3.11 Far-End Digital Loopback Test to 4540 Data set from LCU or Test Center:



Caution: This test should not be performed if the customer data channel is on the same circuit with other stations which are actively sending or receiving data. If this test is performed on an active circuit, data transmissions on that circuit will be scrambled and possibly halt the data system operation. BEFORE TESTING, REQUEST PERMISSION FROM CUSTOMER AND DATA TRANSMISSION CENTER FOR TIME AND COOPERATION TO TEST.

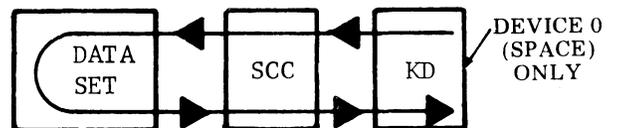
Data Sets 201, 208 or 209-type only: Depress the data set DL key (locking) when directed by the attendant at the far end. When the test is complete, the attendant at the far end will tell you to release the DL key to the released position.

500-type only: When directed by far-end attendant, place DSU into RT (See Section 595-200-200). When test is complete, slide test switch back to center position.

48230 LADS only: When directed by far-end attendant, depress the DC BUSBACK button. When test is complete, release DC BUSBACK button by depressing it again.

Note: If modem other than mentioned above is used, refer to operating manual included with that modem.

3.12 Near-End Analog Loopback Test:

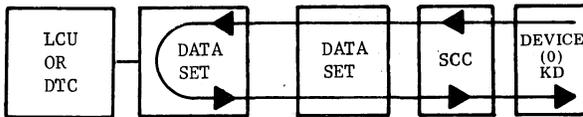


This test provides a local test method to check station and data set operation. Perform Steps 1 and 2 of Chart 13.

Note 1: This test can only be performed from KD connected to Port 1.

Note 2: This test does not require that Data Set Ready (DSR) from data set be on.

3.13 Far-End Digital Loopback Test to Test Center or LCU Data Set:



Caution: Caution of 3.11 applies.

If permission is given, perform Steps 1 and 3 of Chart 13.

Note 1: This test can only be performed from KD connected to port 1.

Note 2: This test does not require that Data Set Ready (DSR) from Data Set be on.

CHART 13

NEAR-END ANALOG AND FAR-END DIGITAL LOOPBACK TESTS

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1	<p>Depress the CLEAR key, then depress LOCAL (or RESET) key if not lit. Request a Local Test by depressing the L/TST key while CONTROL (or ALPHA) key is held down.</p> <p>(See Notes 1 and 2 on the next page.)</p>	<p>The "LOCAL TEST MODE" message shown below is displayed on the monitor. Display does not clear automatically in 20 seconds as it did with 40/4-type equipment.</p> <p>To perform analog loopback test: Go to 2.</p> <p>To perform far-end digital loopback test: Go to 3.</p>	<ul style="list-style-type: none"> •If no message appears or S/R indicator is flashing: <ul style="list-style-type: none"> (a) Check to see that KD is optioned correctly. (See Section 582-300-200). (b) Check SSI cabling to SCC per SSI cable analysis in this section. •If monitor adjustments are needed, refer to Section 582-213-700.
All 45FG110-types:			
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">LOCAL TEST MODE</p> <p>TEST MSG:</p> <p>THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 0123456789 TIMES.</p> <p>TO TEST LOOPBACK, PRESS S/R OR ENTER TO RESET PRESS CLEAR SEE MANUAL FOR DETAILS </p> </div>			<p>THE QUICK BROWN FOX message appears on one line.</p> <p>If the word "BAD" appears in this area, replace the display base.</p>
45FG110/AA or 45FG110/AB type only:			
<div style="border: 1px solid black; padding: 5px;"> <p>(_ _ _) </p> </div>			<p>If the wrong line code appears, check Option 408.</p>
45FG110/AC/01 only:			
<div style="border: 1px solid black; padding: 5px;"> <p>SCC No. _ _ _</p> <p>DEV No. _ _ _</p> <p>CODE EBCDIC</p> </div>			

CHART 13 (Contd)

NEAR-END ANALOG AND FAR-END DIGITAL LOOPBACK TESTS

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
1 (Contd)			
	<p><i>Note 1:</i> If Step 2 is tried twice in succession, an "Operation Error, Aborted" message will appear. Repeat Step 4 again to resume testing.</p> <p><i>Note 2:</i> If the CLEAR key is depressed with the above message on the display screen, the keyboard will become locked. To unlock the keyboard, depress the CLEAR key again.</p>		
2	<p>Near-end analog loopback Test from KD connected to SSI port # 1 only: (Device 0 (space))</p> <p><i>Caution: If station is on-line with LCU, obtain permission from customer before performing this test.</i></p> <p>Depress AL on 201, 208 or 209-type data set or slide test switch on 500A-type DSU to LL position or depress Local Loopback button on 48230 LADS.</p> <p>Depress CONTROL (or ALPHA) and R/TST together.</p>	<p>The message shown below is displayed.</p> <p>The TEST STATUS indicator #4 on SCC also turns on; then off.</p> <p>If optioned for single alarm, alarm will sound once and LOCAL indicator should light. If optioned for continuous alarm, alarm will sound repeatedly until LOCAL (or RESET) key is manually depressed.</p> <p>When test is complete, release AL button on 201, 208 or 209-type data set, or slide test switch on 500A-type DSU to center position, or release local loopback button on 48230 LADS.</p> <p><i>Note:</i> If modem other than mentioned above is used, refer to operating manual included with that modem.</p> <p>The station passes the Analog Loopback Test. Return to Chart 12 Question 2, 3, 4 or 6 (as applies).</p>	<ul style="list-style-type: none"> • If S/R indicator is flashing, replace 410311 circuit card in SCC. • If "LOOPBACK DATA CONTAINED ERRORS" message is received, go to Step 4. • If "DEVICE FAILED TO SEND DATA" message is received, perform Display Analysis, Chart 8. • If "INVALID DATA FROM DEVICE" message is received, go to Step 5. • If, after 5 seconds, a "NO DATA RECEIVED" message is received, go to Step 6. • If "NO CTS FROM DATA SET" is received, go to Step 7. • See Note 2 below.
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 0123456789 TIMES.</p> </div>		<p>Appears on one line. (See Note 1 below.)</p>
	<p><i>Note 1:</i> If any characters in the QUICK BROWN FOX message were changed before depressing S/R (or ENTER) key, those characters will appear in the above message. Up to 2-1/2 lines can be entered.</p>		
	<p><i>Note 2:</i> If SCC is on line with LCU, and is sending and receiving large amounts of long text blocks, a "LOOPBACK CANNOT BE PERFORMED" message will appear on the display. Perform Steps 1 and 2 (to try again).</p>		

CHART 13 (Contd)

NEAR-END ANALOG AND FAR-END DIGITAL LOOPBACK TESTS

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
3	<p>Far-end Digital Loopback Test from KD connected to SSI port #1 only (device 0 (space)), to LCU data set or DATA TEST CENTER:</p> <p><i>Caution: Permission must first be obtained before performing this test if station is on-line with customer's equipment.</i></p> <p>Instruct far-end attendant to depress DL on 201, 208 or 209-type data set or slide test switch on 500-type DSU to RT position or depress DC BUSBACK button on 48230 LADS.</p> <p>Depress CONTROL (or ALPHA) and R/TST together.</p>	<p>The message shown in Step 2 is displayed.</p> <p>When test is complete, have far-end attendant release DL button on 201, 208 or 209-type data set or slide test switch on 500A-type DSU to center position, or release DC BUSBACK button on 48230 LADS.</p> <p><i>Note: If modem other than mentioned above is used, refer to operating manual included with that modem.</i></p> <p>The station passes the Digital Loopback Test. Return to Chart 12, Question 7.</p>	<p>(Refer to "No" response column of Step 2.)</p>

CHART 13 (Contd)

NEAR-END ANALOG AND FAR-END DIGITAL LOOPBACK TESTS

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
4	<p>The following message is displayed when Step 2 or 3 is performed:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p align="center">**LOOPBACK DATA CONTAINED ERRORS**</p> <p align="center">LOCAL TEST MODE</p> <p>TEST MSG:</p> <p>THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 0123456789 TIMES.</p> <p>RE-TEST LOOPBACK, PRESS S/R OR ENTER TO RESET PRESS CLEAR SEE MANUAL FOR DETAILS</p> </div> <p>45FG110/AA or 45FG110/AB type only:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>(_ _ _) <input type="text"/></p> </div> <p>45FG110/AC/01 only:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>SCC _ _ _ DEV _ _ _ CODE EBCDIC</p> </div>	<p>(Does not apply, see "Test Fails")</p> <p>Correct response is given in Step 2 or 3.</p>	<p>If test fails the second time:</p> <ul style="list-style-type: none"> • Check data set or data set cable if message occurred during Analog Loopback Test (Step 2). When 208A data set is mounted on shelf in controller cabinet, the ventilation fan modification kit (451340) must be present and moving air through the data set. (See Section 582-300-200). • Check far-end data set or check facilities between data sets if message occurred during Far-End Digital Loopback Test (Step 3). • Perform Display Analysis, Chart 8.
5	<p>"INVALID DATA FROM DEVICE" message is displayed when Step 2 or 3 is performed.</p> <p><i>Note:</i> If "ERASE INPUT" key was depressed before S/R or ENTER, message is valid and Steps 1 and 2 (or 1 and 3) should be tried again.</p>	<p>(Does not apply, see "Test Fails")</p>	<ul style="list-style-type: none"> • If ERASE INPUT was not depressed before S/R or ENTER: <ul style="list-style-type: none"> (a) Check SSI cabling to SCC per SSI Cable Analysis of this section. (b) Perform Display Analysis, Chart 8.

CHART 13 (Contd)

NEAR-END ANALOG AND FAR-END DIGITAL LOOPBACK TESTS

STEP	PROCEDURE	CORRECT RESPONSE	TEST FAILS
6	<p>“NO DATA RECEIVED” message is displayed after five seconds when Step 2 or 3 is performed.</p>	(Does not apply, see “Test Fails”)	<p>If message occurred during Step 2 or 3:</p> <ul style="list-style-type: none"> • Make sure data set has power on and is conditioned as directed in Step 2 or 3. • Replace data set. • Replace data set cable. • Replace 410320 circuit card in SCC. • Replace 410311 circuit card in SCC.
7	<p>“NO CTS FROM DATA SET” message is displayed when Step 2 or 3 is performed.</p> <p><i>Note:</i> If test is part of Analog or Digital Loopback Test and no data set is present, message is valid.</p>	(Does not apply, see “Test Fails”)	<ul style="list-style-type: none"> • Make sure data set ac power is on. • Replace data set. • Replace data set cable. • Replace data set extension cable (if used). • Replace 410311 circuit card in SCC.

H. SSI Cable Analysis

3.14 When it is suspected that cabling between the controller (SCC) and device may be a cause of trouble or when the controller is equipped with a 45FG110/AB circuit card, it is noticed that the Status 3 indicator of the SCC, blinks 2 or more times within 15 minutes, the following troubleshooting procedures should be used:

- (a) First try to isolate the cable causing the trouble by disconnecting device cables in groups until the trouble is no longer experienced. Then start reconnecting cables from last disconnected group until trouble reappears. Cable last connected, causing the trouble to reappear, is at fault.
- (b) If cable exhibits outer jacket damage, (shield or wire insulators visible while flexing) cable should be replaced and the cause of the damage corrected.
- (c) Visually inspect the seating of terminals in the connectors at both ends of the cable. Check crimping of terminals to wires; the lower crimp point must tightly grip the conductor and the upper crimp point must tightly grip the conductor insulation. Shielded cables have mylar tape wrapped around the conductor bundle under the shield. When the outer shield is removed in preparation for affixing terminals and connectors, the mylar tape must extend approximately 1/4-inch beyond the point of shield removal in order to prevent frayed shield ends from piercing conductor insulation.

Note 1: Intermittent operational failures may occur between a device and the controller when there is a significant difference in ground potential at the device and the controller ac outlets, and the SSI cable drains are connected at both ends. If the above situation should occur, it is recommended that the device end SSI cable drain terminal be removed from the connector with a 402840 extractor and taped back. If failures still

occur, then reinsert terminal at device end and remove and tape back drain terminal at the SCC end.

Note 2: The next issue will include suggestions for alternate hardware to make required jumpers.

3.15 Short SSI cable lengths (up to 50 feet) or data set cables can be checked for shorts and continuity per the following methods:

- (a) Unplug the cable under test at both the controller and device ends.
- (b) See warning below. Using a standard continuity tester (lamp or buzzer type or ohmmeter):
 - (1) Measure that shorts do not exist between conductors.
 - (2) Measure each conductor for continuity. (Refer to Section 582-300-400 for wiring.) If cable is still suspected, replace cable. Do not perform test of 3.17 — 3.27.

Warning: If foreign voltages are present, they may damage an ohmmeter. Before using an ohmmeter, check that no voltage is present. If voltage is present, correct fault and do not attempt a shorts or continuity test until fault is corrected.

3.16 For long SSI cable runs, the following methods may be employed:

- (a) Unplug the cable under test from both the controller and the remote device.
- (b) See warning above. Using an ohmmeter (VOM) on the RX10 or RX100 range, measure that shorts do not exist between conductors or between a conductor and shield.
- (c) When it is determined that the cable is free from internal shorts, perform SSI Cable Testing beginning at 3.17.

I. SSI Cable Testing

3.17 When checking SSI cable, the cable should be tested per the following cable tests. The cables which pass these tests will operate with an error rate of less than one error in 10^8 bits, or one bit error in 15 minutes, under normal conditions.

3.18 The following test equipment and materials are required for testing cable:

- 1 — Simpson 260 Volt-Ohm-Meter (VOM) (or equivalent)
- 2 — 6 inch jumper cables with insulated alligator clips
- 2 — 135 ohm \pm 10 percent, 1/4 watt resistors

1 — WILCOM T194B Transmission and Noise Test Set

OR

1 — HP3550B Communication Test Set and 1-6F (J94006F) Voiceband Noise Set with 50KHZ network.

3.19 There are two types of cable tests, dc tests and ac tests. The dc tests consist of measuring foreign voltages, insulation resistances, and loop resistances. The ac tests consist of measuring crosstalk, loop loss, background circuit noise, and impulse noise. Tables "A" through "G" can be copied to provide separate records for different cables.

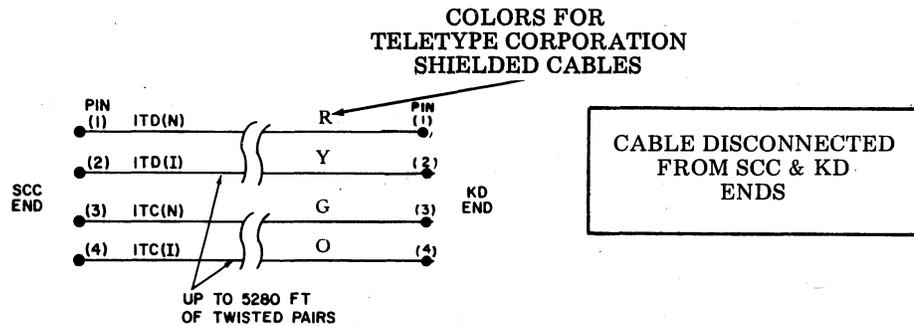


Fig. 15—DC Tests on Cable Pairs Between SCC and KD

FOR CONSISTANCY, MAKE MEASUREMENTS AT THE SCC END.

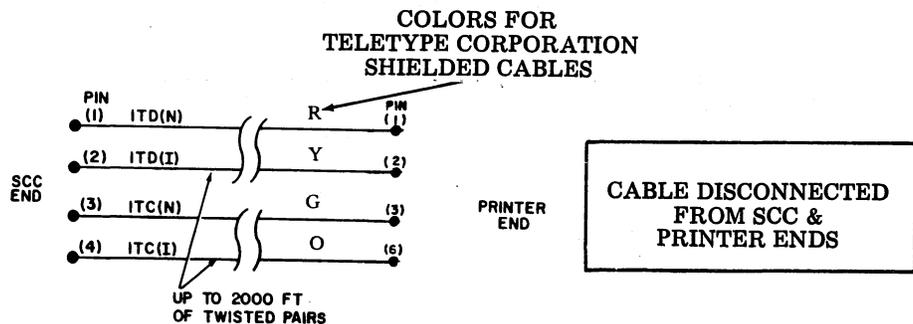


Fig. 16—DC Tests on Cable Pairs Between SCC and KD

DC Tests

3.20 The Loop Resistance tests require a Simpson 260 VOM and a jumper. See Fig. 15 or 16 (as applies) for test arrangement.

(a) If the cable length is known, use the formula "Loop resistance equals 2 times cable length times 0.025 ohms per foot". Then make measurement per Table A. If measured resistance is approximately equal

to resistance determined by above formula, the cable passed the test.

Example: If cable is 2000 feet long, the approximate resistance should be 2 times 2000 (cable length) times 0.025 (ohms per foot) = 100 ohms.

(b) If the cable length is not known, make measurement per Table A. If measured resistance is less than 300 ohms for a KD cable or less than 140 ohms for a printer cable, the cable passed the test.

Table A — Loop Resistance Tests	
Cable being tested:	SCC _____ TO DEVICE _____
Measure the resistances between the following leads with the conditions given:	
1. Short ITD (N) and ITD (I) with a jumper at the device end of cable. Measure the resistance across ITD pair at the SCC end.	Measured Resistances 1. _____ ohms
2. Remove jumper from ITD pair and place jumper across ITC pair at the device end of cable. Measure the resistance at the SCC end.	2. _____ ohms
3. Remove jumper from ITC pair and place jumper across ITC (I) and shield at the device end of the cable. Measure that resistance is less than 300 ohms for a KD cable or less than 140 ohms for a printer cable.	3. _____ ohms
The cable: Passed <input type="checkbox"/> Failed <input type="checkbox"/>	

3.21 The foreign voltage tests require a Simpson 260 VOM or equivalent. See Fig. 15 or 16 (as applies). Perform the tests in Table B.

The cable passes foreign voltage tests if all measured voltages are less than 0.1 volt dc.

Table B — Foreign Voltage Tests		
Cable being tested:	SCC _____	TO DEVICE _____
Measure the voltage between the following leads:		Measured Voltages
1. ITD(N) to ITD(I)		_____ VDC
2. ITC(N) to ITC(I)		_____ VDC
3. ITC(N) to ground		_____ VDC
4. ITC(I) to ground		_____ VDC
5. ITD(N) to ground		_____ VDC
6. ITD(I) to ground		_____ VDC
7. Shield to ground		_____ VDC
This cable:	passed <input type="checkbox"/>	failed <input type="checkbox"/>

3.22 The Insulation Resistance Tests require a Simpson 260 VOM or equivalent. See Fig. 15 or 16 (as applies) for test arrangement. Perform the tests in Table C.

The cable passes the Insulation Resistance Tests if all measured resistances are greater than 300K ohms (300,000 ohms).

Table C — Insulation Resistance Tests		
Cable being tested:	SCC _____	TO DEVICE _____
Measure the Resistance between the following leads		Measured Resistance
1. ITD(N) to ITD(I)		_____ Kohms
2. ITD(N) to ITC(N)		_____ Kohms
3. ITD(N) to ITC(I)		_____ Kohms
4. ITD(I) to ITC(I)		_____ Kohms
5. ITD(I) to ITD(N)		_____ Kohms
6. ITC(N) to ITC(I)		_____ Kohms
7. Shield to ground		_____ Kohms
8. ITD(N) to ground		_____ Kohms
9. ITD(I) to ground		_____ Kohms
10. ITC(N) to ground		_____ Kohms
11. ITC(I) to ground		_____ Kohms
This cable:	passed <input type="checkbox"/>	failed <input type="checkbox"/>

Steps 8 — 11 require jumper to short shield to ground.

AC Tests

3.23 The Cross-Talk Tests require either a WILCOM T194B Transmission and Noise Test Set or a HP-3550B Communication Test Set and two 135 ohm resistors. Connect the test set and resistors as shown in Fig. 17. If a WILCOM Test Set is used, perform the initial set up of 3.24 first. Perform the tests in Table D.

The cable passes the Cross-Talk Tests if all measured values are lower than -48 dBm. (eg, -49 dBm is lower than -48 dBm.)

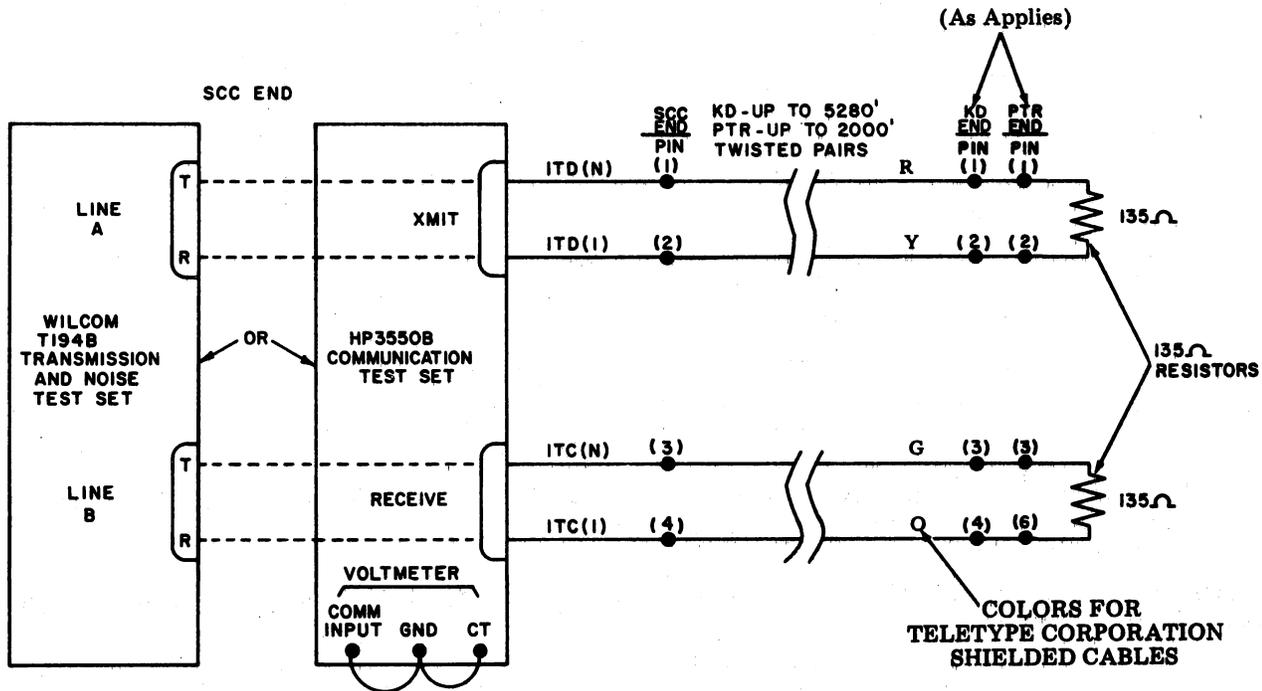


Fig. 17—Cross-Talk Measurements

3.24 WILCOM T194B Test Set — Initial Set Up

- Set FUNCTION switch to CAL OUTPUT position.
- Set SEND and RECEIVE IMPEDANCE switches to 135 position.
- Set BRDG/TERM switch to TERM position.
- Set SEND LEVEL and RECEIVE LEVEL switches to 0 dB. (use the red calibration scale to set the receive level).
- Set DISPLAY switch to SEND Hz position.
- Using FREQUENCY Hz switch, select the range of frequency.
(The three frequencies of TABLE D are 10 KHz, 50KHz and 100KHz)
- Select send frequency with the TUNING knob. The send frequency will appear in the digital display.
- Using send LEVEL VERNIER; adjust the output for a 0 dB reading on the meter scale.

Table D — Cross Talk Tests											
Cable being tested:	SCC _____ TO DEVICE _____										
1a. For WILCOM T194B Transmission and Noise Test Set Only: (Perform 3.24 first)	<ol style="list-style-type: none"> (1) Set FUNCTION switch to SEND A/REC B or SEND B/REC A to send signal on the desired pair of the SSI cable. (2) Set WEIGHTING switch to 30-300 KHz position. (3) Set both HOLD switches to OFF position. (4) Set NORMAL/DAMP switch to NORMAL position. (5) Set 1004 Hz NOTCH switch to OFF position. (6) Set desired send frequency with the FREQUENCY Hz switch and TUNING knob. Observe on digital display. (Check if "X 10" LED is lighted) (7) Adjust the RECEIVE LEVEL switches for a meter reading near 0 dB on the scale. (8) Read the dBm value by adding the readings (use outer (red) scale) of the RECEIVE LEVEL switches and the meter. (9) Repeat 3.24 a, f, h, then Table D Step 1a (1), (6), (7) and (8) for 50 KHZ and 100 KHZ. 										
1b. For HP-3550B Communications Test Set only:	<ol style="list-style-type: none"> (1) Connect the voltmeter common input (black) to the voltmeter ground terminal. (2) Connect the output and input center tap (CT) to the voltmeter ground terminal. (3) Input and output impedance to 135 ohms. (4) Set frequency to >5 KHz (greater than 5 KHz). (5) Set patch panel dB control to 0. (6) Set patch panel MEAS-CAL switch to CAL position, adjust the oscilloscope amplitude control to obtain a 0-dBm reading on the voltmeter. (7) Set the MEAS-CAL switch to MEAS position. 										
2. Measure the cross-talk between cable pairs at the following frequencies:	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;"></td> <td style="text-align: right; font-weight: bold;">Measured Cross-Talk</td> </tr> <tr> <td></td> <td style="text-align: right;">(Requirements: Lower than -48 dBm)</td> </tr> <tr> <td style="padding: 5px;">1. 10 KHz</td> <td style="padding: 5px; text-align: right;">1. _____ dBm</td> </tr> <tr> <td style="padding: 5px;">2. 50 KHz</td> <td style="padding: 5px; text-align: right;">2. _____ dBm</td> </tr> <tr> <td style="padding: 5px;">3. 100 KHz</td> <td style="padding: 5px; text-align: right;">3. _____ dBm</td> </tr> </table>		Measured Cross-Talk		(Requirements: Lower than -48 dBm)	1. 10 KHz	1. _____ dBm	2. 50 KHz	2. _____ dBm	3. 100 KHz	3. _____ dBm
	Measured Cross-Talk										
	(Requirements: Lower than -48 dBm)										
1. 10 KHz	1. _____ dBm										
2. 50 KHz	2. _____ dBm										
3. 100 KHz	3. _____ dBm										
The cable:	Passed <input type="checkbox"/> Failed <input type="checkbox"/>										

3.25 The Loop-Loss Tests require either a WILCOM T194B Transmission and Noise Test Set or a HP-3550B Communication Test Set and two jumpers. Connect the test set as shown in Fig. 18. Perform the tests in Table E.

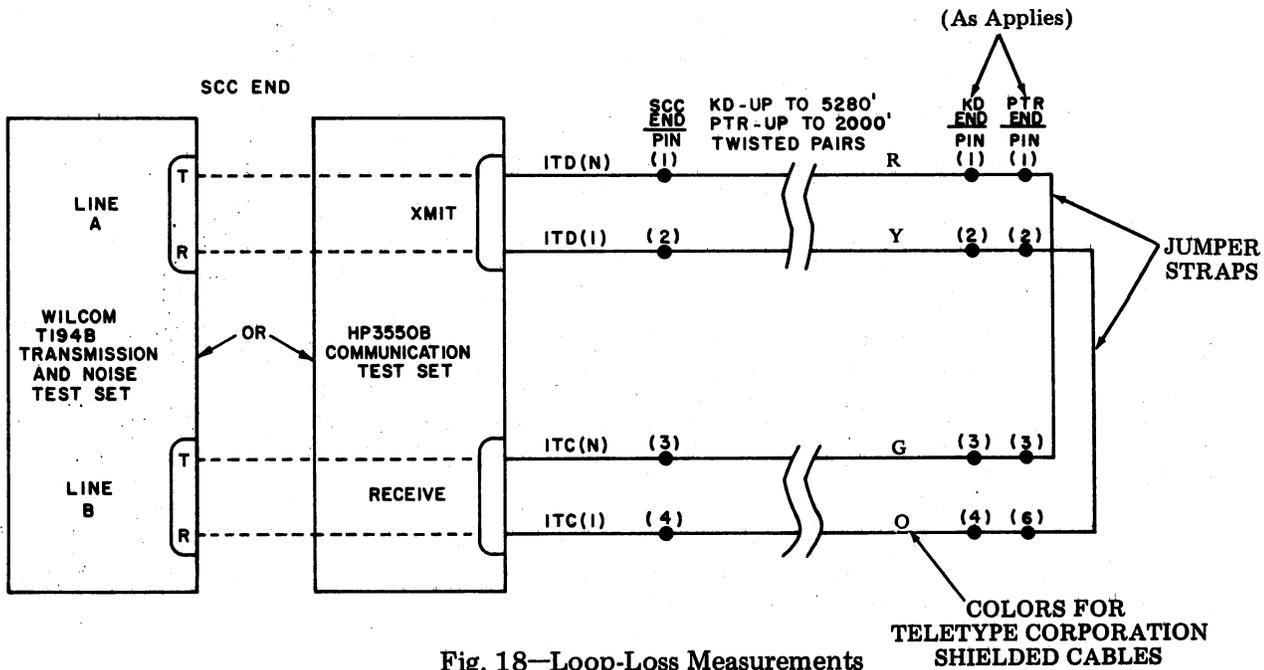


Fig. 18—Loop-Loss Measurements

Table E — Loop-Loss Tests			
Cable being tested:		SCC _____ TO DEVICE _____	
1. Set up the WILCOM T194B or HP-3550B as instructed in Table D.			
Note: For WILCOM Test Set only — perform steps (6), (7), and (8) of 1a, Table D for each frequency.			
2. Measure the Loop-loss at the following frequencies:	Measured Loop-Loss	Maximum Loop-Loss Allowed for KD	Maximum Loop-Loss Allowed for Printer
a. 28KHz	_____ dBm	24.5 dBm	7.5 dBm
b. 56KHz	_____ dBm	30.5 dBm	10.4 dBm
c. 84KHz	_____ dBm	34.5 dBm	12.5 dBm
The cable:		Passed <input type="checkbox"/>	Failed <input type="checkbox"/>

3.26 The Background Noise Tests require either a WILCOM Transmission and Noise Test Set or a 6F Voiceband Noise Measuring set and one or two 135 ohm resistors. Connect the test set as shown in "Test 1" of Fig. 19. Perform the tests in Table F. The cable passes the Background Noise Level Tests if the readings are lower than 45 dBm.

Note: Disconnect line B from test set when performing following test.

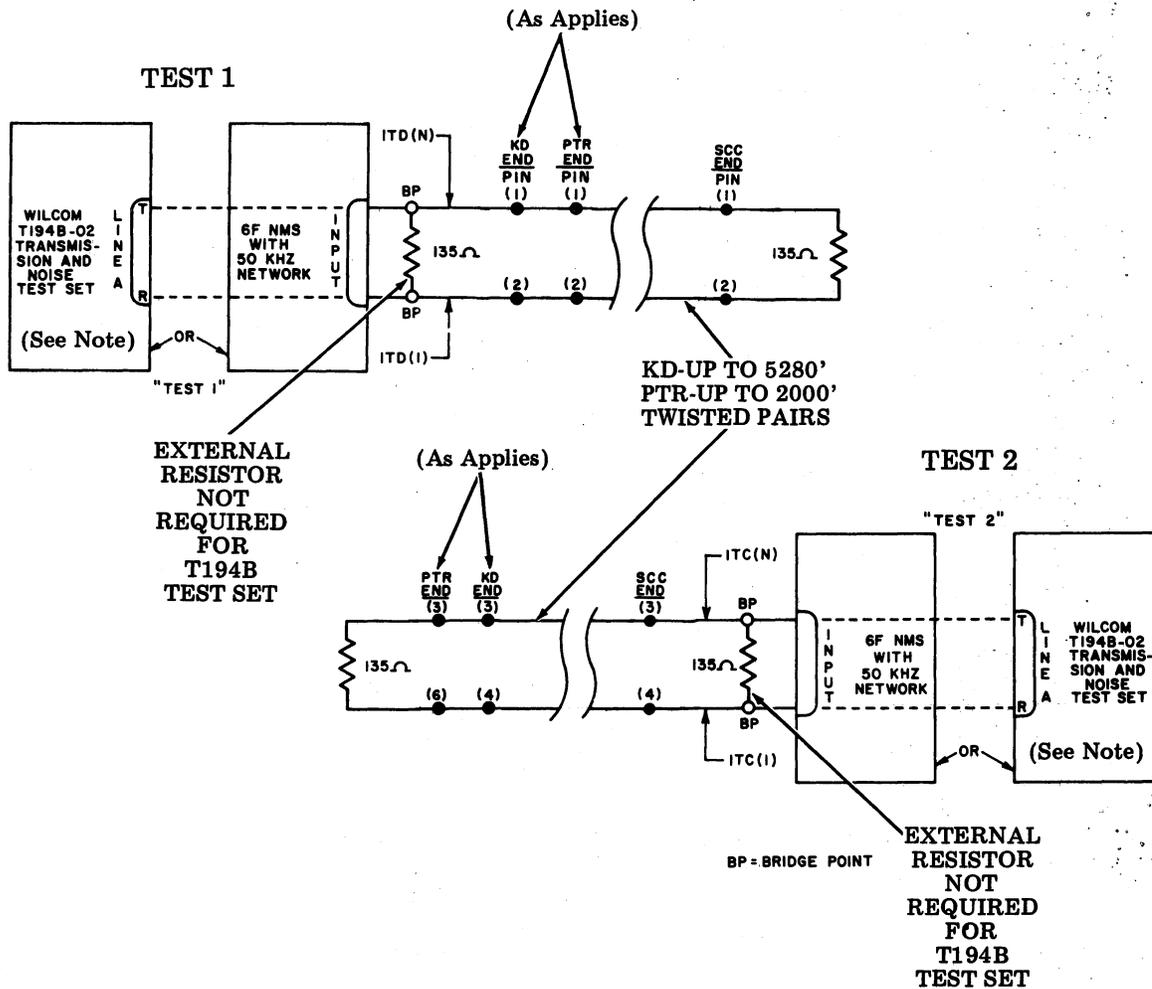


Fig. 19—Noise Measurements

Table F — Background Circuit Noise Tests

Cable being tested: SCC _____ TO DEVICE _____

1a. For WILCOM T194B Transmission and Noise Test Set ONLY:

- (1) Set FUNCTION switch to SEND B/REC A position (however, sending on B is not intended).
- (2) Set WEIGHTING switch to 50KHz position.
- (3) Set RECEIVE IMPEDANCE switch to 135 position.
- (4) Set BRDG/TERM switch to TERM position.
- (5) Set 1004 Hz notch switch to OUT position.
- (6) Set NORMAL/DAMP switch to NORMAL position.
(Exception: Under severely fluctuating noise condition, set to DAMP.)
- (7) Turn down send level (to avoid false reading) then adjust RECEIVE LEVEL switches for a meter reading near 0 dB on the scale. (Level may be so low that switch adjustments cannot permit an on-scale meter reading.)
- (8) Read the background noise level by adding the RECEIVE LEVEL Switch settings (using the inner (black) scale) and the meter reading.
- (9) Connect the test set as shown in "TEST 2" of Fig. 19. Again perform Steps 1a(7) and 1a(8).

1b. For 6F VOICE-BAND NOISE MEASURING SET ONLY:

Plug in the 50 KHz weighting network on 6F Voice band Noise Measuring Test Set and calibrate as follows:

- (1) Set the Counter Separation switch to the 2 dB position.
- (2) Set the Function switch to CAL-CTR-BAT and turn the power switch on.
- (3) Verify that the meter indicates in the BAT GOOD area.
Replace batteries that do not have good indication.
- (4) Adjust the Counter 1 CAL control until the associated counter just counts (the count will be erratic when properly adjusted).
- (5) Adjust the Counter 2, 3, and 4 controls by depressing the associated push button switch and adjusting the CAL control until the counter just counts as in Step 1b(4). During calibration, only one counter will operate at a time.
- (6) Set the FUNCTION switch to CAL-MTR and adjust the meter CAL control for a meter indication at the CAL marking.
- (7) Set the function switch to 600 ohm bridging. Adjust the dBrn dial to obtain a meter reading in the upper half of the meter scale.
- (8) The background noise level is the sum of the dBrn dial setting and the meter reading.
- (9) Connect the test set as shown in "Test 2" of Fig. 19. Again perform Steps 1b(7) and 1b(8).

"Test 1" Background noise level _____ dBrn
 "Test 2" Background noise level _____ dBrn

The cable: Passed Failed

3.27 The Impulse Noise Tests require either a WILCOM T194B Transmission and Noise Test or a 6F Voiceband Noise Measuring Set, and one or two 135 ohm resistors. Connect the test set as shown in "Test 1" of Fig. 19. Perform the tests in Table G. The cable passes the test if "Test 1" (or "Test 2") results in a count of 1 or less.

Table G — Impulse Noise Tests	
Cable being tested:	SCC _____ TO DEVICE _____
1a. For WILCOM T194B Transmission and Noise Test Set ONLY:	
<ul style="list-style-type: none"> (1) Set up test set as instructed in Steps 1a(1) through 1a(6) of Table F. (2) Set RECEIVE LEVEL switches using the inner (Black) scale to 65 dBrn. (3) Set DISPLAY switch to IMPULSE COUNT position. (4) Set IMPULSE COUNT TIME MINUTES to 30 position. (5) With COUNTING lamp lit, run the test for 30 minutes. (6) When COUNTING lamp turns off and COUNT COMPLETE lamp turns on, take a reading. (7) Set DISPLAY switch to SEND Hz position and back to IMPULSE COUNT position. (This resets a digital display to zero.) (8) Connect the test set as shown in "TEST 2" of Fig. 19. Run test as directed in Steps 5 and 6 of 1a. 	
1b. For 6F Voice Band Noise Measuring Set only:	
<ul style="list-style-type: none"> (1) Set up and calibrate the 6F Voice Band Noise Measuring Set as instructed in Step 1b of Table F. (2) Set the function switch to 600 ohm bridging. Adjust the impulse noise threshold to 65 dBrn by setting the dBrn dial to 35. Reset the counter to 00, (3) After resetting the counter, run the test for 30 minutes and take a reading. (4) Connect the test set as shown in "Test 2" of Fig. 19. Run test as directed in Steps 1, 2 and 3 of 1b. 	
"Test 1" count _____	"Test 2" count _____
The cable: Passed <input type="checkbox"/> Failed <input type="checkbox"/>	