◆"DATASPEED*" 40 DISPLAY MONITOR (40MN101 and 40MN201)

TESTING AND TROUBLESHOOTING◆

CONTENTS PAGE

1. GENERAL

1.01 This section provides testing and troubleshooting information for the DATASPEED 40 display monitor.

1.02 ◆This section is reissued to include a fuse design change in the power distribution assembly and new cable routing in the monitor.◆ Marginal arrows are used to indicate changes and additions.

1.03 The DATASPEED 40 display monitor shall be tested on a full edit DATASPEED 40 KD Set or equivalent.

1.04 The operational checks given in Part 2 are to be performed in the order specified.

1.05 If the unit under test fails an operational check in Part 2, perform the adjustment in Section 582-213-700 or go to Troubleshooting, Part 3, as indicated in the column headed Analysis.

1.06 To use the troubleshooting information in Part 3, always start with Step 1 and follow the indicated procedure to isolate and correct the trouble.

1.07 Where more than one component is specified for replacement, they shall be substituted one at a time in the order specified. The original component shall be replaced if the trouble is not corrected before making the next indicated substitution.

1.08 Refer to Section 582-213-701 for disassembly and reassembly procedures for the DATASPEED 40 display monitor.

Warning: Turn OFF all ac power and signal sources when installing the display monitor on the KD set or when removing it. Similarly, turn OFF all power and signal sources when removing or replacing components.

Danger: Wear approved safety glasses when the housing of the display monitor is removed, as the display tube is fragile in the neck area and is subject to implosion if broken. Be careful not to strike the glass of the tube with tools or components when working in its vicinity. See Section 010-110-002.

Note: The level of troubleshooting and parts replacement provided in this section is the recommended limit as a field practice. More extensive troubleshooting or disassembly should be restricted to repair locations (Reference Wiring Diagram Package WDP0400).

*Registered Trademark of AT&TCo.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. TESTING

♦TABLE A♦

OPERATIONAL CHECKS

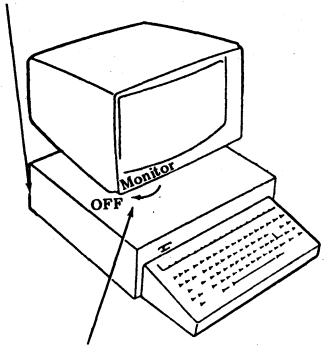
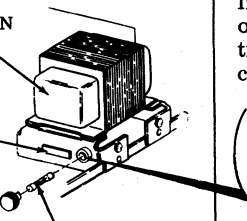
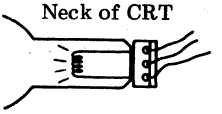
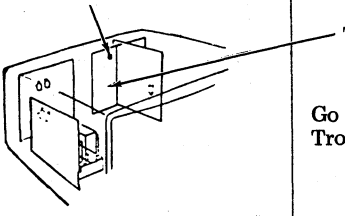
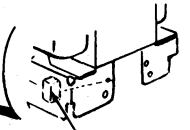
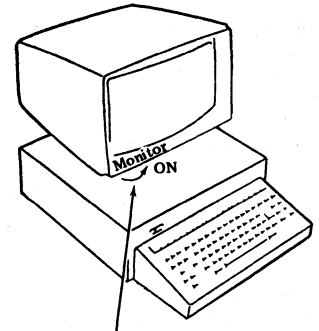
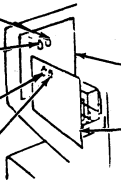
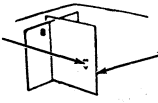
STEP NO.	PROCEDURE	CORRECT RESPONSE	ANALYSIS
1	Apply ac power to KD. Turn ac switch on.  Monitor ac power switch off.	POWER DISTRIBUTION ASSEMBLY a. Red pilot lamp lighted.  341686 FUSE (1.5 AMP SL-BL) (Late Design) Neck of CRT  b. Filaments lighted. c. Red drive lamp lighted. 	Insure P5 in front of power distribution assembly is connected.  341578 FUSE (1.4 AMP SL-BL) (Early Design) CRT Go to Part 3, Troubleshooting. TP410656 Go to Part 3, Troubleshooting.
2	 Monitor ac power switch on.	c. Overvoltage lamp extinguished. b. Normal lamp lighted. a. Unreg 65 V lamp lighted. Unreg 130 V lamp lighted.  d. High voltage lamp lighted.  *Note:* If all lamps remain extinguished.	Go to Part 3, Troubleshooting. TP410853 TP410852 Go to Part 3, Troubleshooting. TP410854 Go to Part 3, Troubleshooting. Check red pilot lamp (Step 1).

TABLE A

OPERATIONAL CHECKS (Continued)

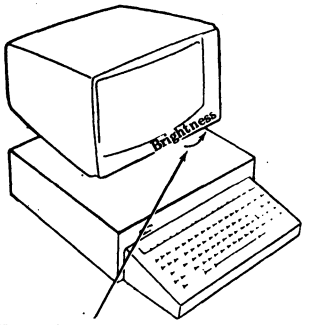
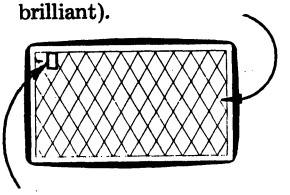
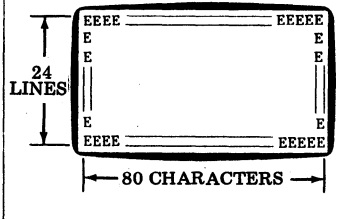
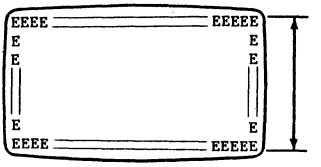
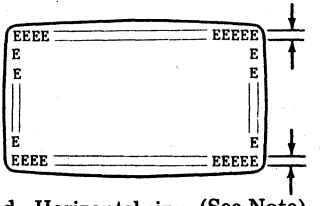
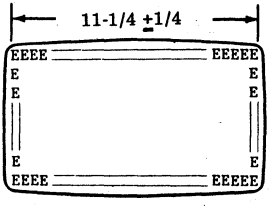
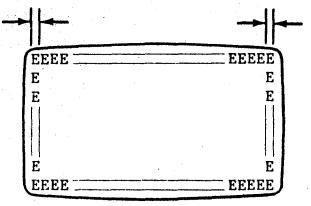
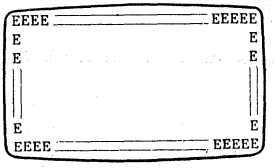
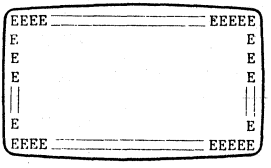
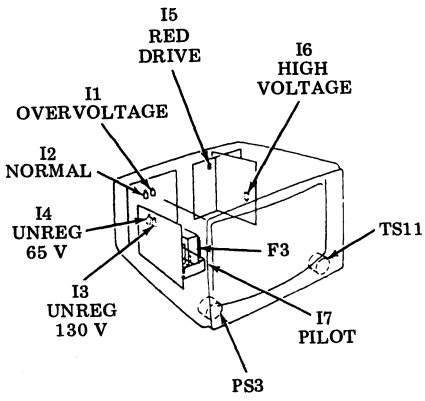
STEP NO.	PROCEDURE	CORRECT RESPONSE	ANALYSIS
3	 OPERATOR BRIGHTNESS TO MAXIMUM INTENSITY	a. Raster clearly visible (not brilliant).  b. Cursor and segment marker present. (See Note in Step 4.)	Master Brightness Adjustment Go to Part 3, Troubleshooting.
4	Generate the following test pattern on the screen.  *Note: Allow a 3-minute warm-up before checking or refining master brightness, vertical size, or horizontal size adjustments.*	a. Characters well defined. b. Vertical size 5-1/4 ± 1/8 inch. (See Note)  c. Equal character height.  d. Horizontal size. (See Note) 	Focus Adjustment Vertical Size Adjustment Vertical Linearity Adjustment Horizontal Size Adjustment

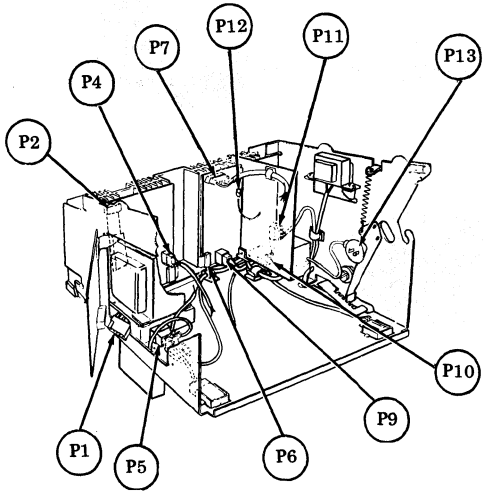
TABLE A

OPERATIONAL CHECKS (Continued)

STEP NO.	PROCEDURE	CORRECT RESPONSE	ANALYSIS
4 (cont)		e. Equal character width.  	Horizontal Linearity Adjustment
		f. Lines across display appear parallel to horizontal plane.  	Yoke Orientation
		g. Test pattern centered.  	Display Centering
5	Generate one line of highlighted U characters.	U's shall alternate full to half intensity at approximately one second interval as gauged by eye.	Go to Part 3, Troubleshooting.

3. TROUBLESHOOTING





Warning: Display monitor units with serial no. below 10,000 require TP403594 modification kit for compatibility with 40PSU101 power supply units with serial no. 10,000 or higher.

TABLE B

TROUBLESHOOTING PROCEDURES

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. With power ON is the red DRIVE lamp I5 ON? (Typical failure is a dark screen — no display.)	Go to 2.	Check that connector P9 is plugged into TP410656 circuit card. Replace TP410656 circuit card. Check continuity of TP341582 video cable assembly: P9, terminals 8, 9, 10, 12, 14, and 15 to J15, terminals 8, 9, 10, 12, 14, and 15 respectively.

♦TABLE B♦

TROUBLESHOOTING PROCEDURES (Continued)

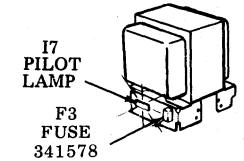
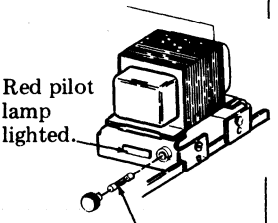
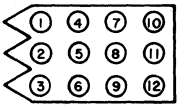
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
2. Is the PILOT lamp I7 ON?   	Go to 4.	Check fuse F3 for continuity. Replace if open circuit. If fuse F3 is good, check for 115 V ac on connector P5, terminals 10 to 12.  WIRE SIDE OF P5 CONNECTOR If no 115 V ac, check continuity or replace TP341581 ac cable assembly. If 115 V ac is present, replace TP341721 power distribution assembly. Go to 3.
3. Does fuse F3 continue to fail when replaced?	Replace TP410852 circuit card assembly. Replace TP410853 circuit card assembly. Replace transistor Q1 (TP341569) on heat sink. Replace transistor Q2 (TP318822) on heat sink. Replace TP410656 circuit card assembly. Replace transistor Q4 on heat sink.	Go to 4.

TABLE B

TROUBLESHOOTING PROCEDURES (Continued)

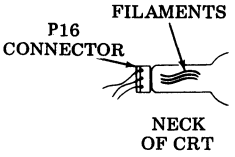
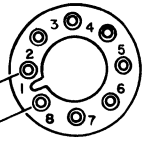
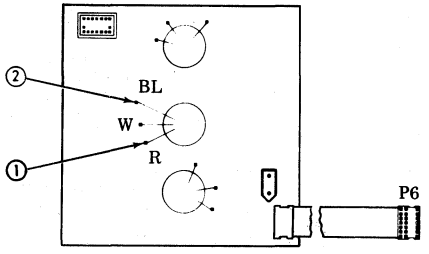
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
4. Are the CRT filaments glowing? (Failure is no display — dark screen.)  	Go to 5.	With display monitor control switch PS3 OFF (CW) and connector P16 disconnected from CRT neck, check for 5.4 V ac ±10% at P16, terminals 1 to 8.  P16 If 5.4 V ac is present, replace CRT. If no 5.4 V ac, check as follows: (a) Turn all power OFF. (b) Disconnect P5. (c) Check continuity of P5, terminal 1 to P16, terminal 8. (d) Check continuity of P5, terminal 4 to P16, terminal 1. If no continuity, replace TP341699 cable assembly. If continuity checks good, replace TP341721 power distribution assembly.

TABLE B

TROUBLESHOOTING PROCEDURES (Continued)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
5. Are 65 V and 130 V unregulated lamps (I4 and I3) ON?	Go to 6.	Remove the TP410852 circuit card from the display monitor and check for 135 V ac ±10% on connector P1, terminals 4 to 5. If 135 V ac is present, replace TP410852 circuit card (with a new card). If no 135 V ac, replace TP341721 power distribution assembly.
6. Is the NORMAL lamp I2 ON?	Go to 7.	Check for 190 V dc ±10% from test point ① on TP410853 circuit card (red lead) to frame ground (chassis). If no 190 V dc, check that connector P2 is plugged into the TP410853 circuit card. If P2 is connected, replace TP410852 circuit card. If 190 V dc is present, check for 130 V dc ±10% from test point ② on TP410853 circuit card (blue lead) to frame ground (chassis). If no 130 V dc, replace TP410853 circuit card. If 130 V dc is present, replace transistor Q2 (TP318822) on heat sink.



TP410853 CIRCUIT CARD ASSEMBLY

TABLE B

TROUBLESHOOTING PROCEDURES (Continued)

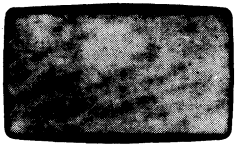
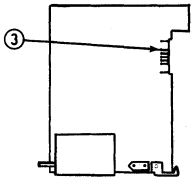
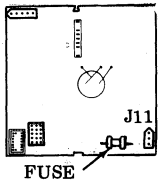
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
7. Is OVER VOLTAGE lamp I1 OFF? (Typical trouble symptom — display expanded horizontally.) 	Go to 8.	Replace TP410853 circuit card assembly in the display monitor. Replace transistor Q2 (TP318822) on heat sink.
8. Is HIGH VOLTAGE lamp I6 ON? (Typical failure is a dark screen — no display.)	Go to 9.  TP410854 CIRCUIT CARD ASSEMBLY  FUSE (See green and orange marking at opposite ends.) TP410656 CIRCUIT CARD ASSEMBLY	Check for 130 V dc ±10% from test point ③ on TP410854 circuit card (terminal 3 of card edge connector P8) to frame ground (chassis). If 130 V dc is present, first replace transistor Q4 (TP341570), then replace TP410854 circuit card. If I6 is still OFF, replace TP410656 circuit card. If no 130 V dc, check continuity of the fuse on TP410656 circuit card (bottom of card to the left of connector P11). If the fuse is open, replace it with an 18-gauge wire strap. *Note:* Later design cards will have a wire strap or circuit land.

TABLE B

TROUBLESHOOTING PROCEDURES (Continued)

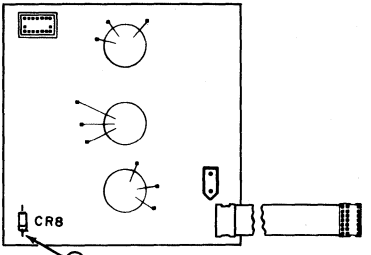
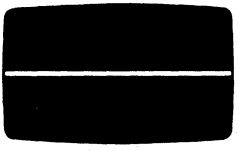
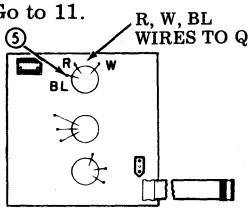
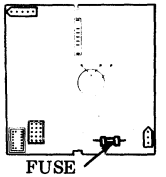
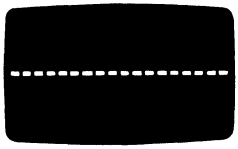
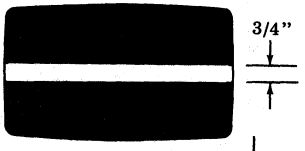
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
8. (Cont)  ④ Test point is the lowest component lead at lower left corner of card. TP410853 CIRCUIT CARD ASSEMBLY		Check that connector P6 is plugged into TP410656 circuit card. Check for 130 V dc ±10% at test point ④ on TP410853 circuit card to frame ground (chassis). If no 130 V dc, replace TP410853 circuit card. If 130 V dc is present, replace TP410853 circuit card and then TP410656 circuit card, if I6 is still OFF.
9. Is there still a display problem?	Go to 10.	Display monitor is OK.
10. Is there a bright horizontal line on the display monitor? 	Decrease brightness (rotate TS11 clockwise) until line is not bright. If the horizontal line now appears dashed, go to 11. Check three wires from heat sink transistor Q1 to TP410853 circuit card. Check for 65 V dc ±10% at test point ⑤ on TP410853 circuit card to frame ground (chassis). If 65 V dc is present, replace heat sink transistor Q1 (TP341569). Check for presence of fuse on TP410656 circuit card (bottom of card to the left of connector P11). If fuse is present, replace it with an 18-gauge wire strap.	Go to 11.  TP410853 CIRCUIT CARD ASSEMBLY  FUSE (See green and orange marking at opposite ends.) TP410656 CIRCUIT CARD ASSEMBLY

TABLE B

TROUBLESHOOTING PROCEDURES (Continued)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
10. (Cont)	If strap is present or no fuse, replace TP410853 circuit card.	
11. Is there a dashed horizontal line on the display monitor? 	Check that connector P4 is plugged into TP410853 circuit card. Replace heat sink transistor Q3 (TP341568). Replace TP410853 circuit card.	Go to 12.
12. Is there a raster (rectangular lighted background area visible when brightness is turned up — TS11 full CCW) but no cursor, segment marker, or characters?	Replace TP410656 circuit card. Check continuity of video cable (TP341582) dot information leads: P9, terminal 3 to J15, terminal 3 and P9, terminal 6 to J15, terminal 6.	Go to 13.
13. Is display rolling?	Replace TP410853 circuit card. Replace TP410656 circuit card. Replace TP410852 circuit card. Check continuity of video cable (TP341582) vertical sync leads: P9, terminal 11 to J15, terminal 11 and P9, terminal 13 to J15, terminal 13.	Go to 14.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
14. Can brightness be controlled by turning the operator brightness control TS11?	Go to 15.	Check that connector P11 is plugged into the TP410656 circuit card. Check continuity of TP341559 brightness control w/cable assembly: P11, terminals 1 to 3 and P11, terminals 1 to 2 where resistance reading should vary as TS11 is rotated. Replace TP410656 circuit card.
15. Is the display reduced to approximately 3/4 inch in height? 	Replace TP410853 circuit card.	Go to 16.
16. Is there a dim vertical line on the display monitor?	Check that connector P10 is plugged into the TP410854 circuit card. Replace TP410854 circuit card.	Go to 17.
17. Can characters be highlighted?	Display monitor is OK.	Replace TP410656 circuit card. Check continuity of video cable (TP341582) highlight leads: P9, terminal 1 to J15, terminal 1 and P9, terminal 2 to J15, terminal 2.

♦ *Note:* The 40MN101 display monitor (60 Hz) will exhibit significant distortion of the display or waviness if power source frequency deviates from 60 Hz by more than 0.1 percent for extended periods. This condition can be eliminated by use of the 40MN201 display monitor (50/60 Hz). ♦