

“DATASPEED®” PRINTER

RECEIVE-ONLY STATION

CHECKOUT AND TROUBLESHOOTING

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1. GENERAL

1.01 This section provides operational checks and troubleshooting procedures for the DATASPEED Printer (Receive-Only). It is being reissued to add a checkout procedure, incorporate current troubleshooting information, and to accommodate the latest engineering changes in the electronic circuitry and mechanical components. Since this is a general revision, marginal arrows ordinarily used to indicate additions and changes are omitted. This section was formerly designated 592-820-300, but this number is now cancelled. Since this issue of Section 578-500-300 is a revision of Section 592-820-300, Issue 2, it is designated Issue 3.

2. OPERATIONAL CHECKS

2.01 The following operational checks should be performed after a station is completely assembled and properly programmed. All checks should be performed upon initial installation or whenever a system trouble condition or routine maintenance requires an operational checkout. Refer to Part 4 of this section for analysis and correction of any trouble which appears during checkout.

LOCAL CHECKS

2.02 Remove the cover assembly from the base and front panel assembly at the top of the printer cabinet, and insert the TP330131 jumper in the cover interlock socket at the front left of the cover base.

2.03 Load the transport with a roll of standard KS1920 teletypewriter paper. Do not use KS8621 paper or any other paper which is not identical in characteristics to KS1920.

2.04 With the power cord plugged into the ac line, open the front door of the cabinet and place the ON/OFF switch in the ON position. The ventilating fans should turn on. Close the front door. The READY lamp should light approximately 15-45 seconds after the door is closed.

2.05 Depress the PAPER ADVANCE pushbutton. The PAPER ADVANCE and PRINTER ON lamps should light, and the printer should feed paper.

Note: Observe proper braking action of the paper puller and paper winder motors during paper advance.

2.06 Place the paper release lever at the top right of the transport in the OPEN position and make a pencil mark on the line feed disc (top left of transport). Hold the line feed drive belt to keep it from moving and press the PAPER ADVANCE button for a few seconds. The red paper jam lamp (top left rear of paper transport) should light after the line feed disc has rotated from 1-1/2 to 1-3/4 turns, and the line feed disc should stop rotating at the same time. Depress the lens cap of the paper jam lamp to extinguish the lamp and reset the circuit. Close the paper release lever.

2.07 If the requirement in 2.06 is not met, remove the knurled cover and adjust the potentiometer on the right side of the transport frame (clockwise decreases rotation, counterclockwise increases rotation). Press the PAPER ADVANCE button several times before rechecking this requirement.

2.08 Lift the paper roll on the paper unwinder assembly to verify that the PAPER ALARM lamp lights when the paper supply is low.

2.09 Open the front door of the cabinet and turn off the ac ON/OFF switch. Remove the paper from the transport, and remove the jumper from the interlock

connector on the left side of the base. Place the cover assembly on the top of the printer, making sure it is properly seated on the base and front panel. Load the printer with paper.

2.10 Turn on the ac ON/OFF switch. The ventilating fans should turn on and the copylight in the cover assembly should light.

2.11 Close the front door of the cabinet. The READY lamp should light approximately 15-45 seconds after the front door is closed, provided there is no paper jam and the door and lid interlock circuit is complete. (The interlock circuit must be complete if the PRINTER ON lamp lights when the PRINTER ON button is depressed while waiting for the READY lamp to light.)

2.12 When the READY lamp is on and the paper supply is not low, the station should be ready for an on-line check.

2.13 If a sender is part of the station (for example, if the DATASPEED printer is directly interfaced with a DATASPEED sender and receiver), a local receiving test can be performed. For a type 2 DATASPEED installation (serial operation) the rotary switch on the switch panel of the printer must be set to the LOCAL position, and the rotary switch on the sender cabinet must be set to the SEND position. For a type 5 DATASPEED installation (parallel operation) the rotary switch on the switch panel of the printer must be set to the MONITOR OFF LINE position. A test tape on the sender can then be used to check the operation of the printer.

2.14 A test tape used to check the operation of the DATASPEED printer should include both printing and nonprinting functions. For example, there should be a program to test the line feed function in the printer. A burst of at least 30 consecutive line feed codes is desirable for this test. The tape should include all letters of the alphabet plus symbols. Full lines of 80 characters should be included to check uniformity of character formation across the line. Also, lines of more than 80 characters without a line feed or carriage return code should be a part of the test in order to check the automatic carriage return and line feed feature after the 80th character. With this function the 81st character will be missing and the 82nd character, which will appear as the 1st character of the next line, may be distorted. If the printer has been strapped to provide options such as carriage return and line feed on line feed, these options should be checked in the test.

2.15 Example printouts of these test messages are shown in Figure 1 for ASCII (United States of America Standard Code for Information Interchange) and Figure 2 for Baudot. Test tapes to produce these messages are available; TP325897 for ASCII and TP325899 for Baudot.

ON-LINE CHECKS

2.16 If the printer has a data set for dial-up or private line operation, a remote sender must be called to arrange for the test. In a dial-up system, the printer station should be placed in the talk mode, and the remote station dialed. When the remote station answers the call, a test should be requested. The two operators should agree on the nature and duration of the test, with provisions to go back to the talk mode at a specific time. Information on baud rate and type of code – ASCII, communications Baudot, etc – should be specified. The operator at the remote sending station must then go into the data mode, and the printer station must be placed in the data mode before the 2025 Hz recognition tone ends.

2.17 The procedure is similar for a private line installation. However, the original call must be placed over the regular phone lines to arrange for the test.

2.18 If the printer station is equipped with special modifications (discrete calling generator, etc), these functions must be tested by a sender similarly equipped. To check the operation of a discrete calling generator (TP325200, mounted on DAIF module frame), depress the TRANS START button on the printer function strip after the PRINTER ON light has turned on. This should enable the remote sender, if it is identically coded, and transmission should begin from remote sender to printer within 5 seconds after the TRANS START button is depressed. For generator coding information, see Section 578-500-200 (formerly Section 592-820-200).

2.19 In systems where the DATASPEED printer is directly interfaced with type 2 or type 5 DATASPEED equipment, the various functions of the DATASPEED installation can be checked after the printer operation has been verified. Normal operation for each setting of the selector switch on the printer switch panel, for each type of DATASPEED installation, is described in Tables A through F.

2.20 If the results of the local and on-line checks are satisfactory, the station is ready for operation. If the results are unsatisfactory, refer to the appropriate steps in the troubleshooting chart.

TABLE A

TYPE 2 SEND ONLY "DATASPEED" INSTALLATION

SWITCH POSITION	FUNCTION	OPERATION
1	OFF	Printer inactive. Sender operates as conventional type 2 send only station.
2	MONITOR SEND	Printer provides page copy of data transmitted on line by sender.
3	LOCAL	Sender transmits data to printer without going on line.

TABLE B

TYPE 2 RECEIVE ONLY "DATASPEED" INSTALLATION

SWITCH POSITION	FUNCTION	OPERATION
1	TAPE	Printer inactive. Receiver operates as conventional type 2 receive only station
2	PAGE	Station provides printed copy only.
3	BOTH	Receiver provides tape and printer provides page copy of received data.

TABLE C

TYPE 2 SEND/RECEIVE "DATASPEED" INSTALLATION

SWITCH POSITION	FUNCTION	OPERATION
1	REC. TAPE	Printer inactive. Sender and receiver operate as conventional type 2 send/receive station.

TABLE C

TYPE 2 SEND/RECEIVE "DATASPEED" INSTALLATION (Continued)

SWITCH POSITION	FUNCTION	OPERATION
2	REC. TAPE REC. PAGE	Printer inactive in send mode. In receive mode, printer provides page copy and receiver provides tape.
3	REC. PAGE	Printer inactive in send mode. In receive mode, printer provides page copy but receiver does not provide tape.
4	LOCAL	With rotary switch in sender set to SEND, sender transmits data to receiver and printer without going on-line.
5	MON. SEND REC. TAPE	Printer provides page copy of transmitted data in send mode. Printer inactive in receive mode, and receiver operates as conventional type 2 receive station.
6	MON. SEND REC. TAPE REC. PAGE	Printer provides page copy of data transmitted by sender and received by receiver, and receiver provides tape of received data.
7	MON. SEND REC. PAGE	Printer provides page copy of data transmitted by sender and received by receiver, but receiver does not provide tape of received data.

TABLE D

TYPE 5 SEND ONLY "DATASPEED" INSTALLATION

SWITCH POSITION	FUNCTION	OPERATION
1	MON. OFF LINE	Sender transmits data to printer without going on-line.

TABLE D

TYPE 5 SEND ONLY "DATASPEED" INSTALLATION (Continued)

SWITCH POSITION	FUNCTION	OPERATION
2	SEND TAPE	Printer inactive. Sender operates as a type 5 send only station.
3, 4	MONITOR SENDER	Printer provides page copy of data transmitted on-line by sender.

TABLE E

TYPE 5 RECEIVE ONLY "DATASPEED" INSTALLATION

SWITCH POSITION	FUNCTION	OPERATION
2	REC. TAPE	Printer inactive. Receiver operates as a type 5 receive only station.
3	REC. PAGE	Station provides printed copy only.
4	REC. BOTH	Receiver provides tape and printer provides printed copy of received data.

TABLE F

TYPE 5 SEND/RECEIVE "DATASPEED" INSTALLATION

SWITCH POSITION	FUNCTION	OPERATION
1	MONITOR OFF LINE	Sender transmits data to printer without going on-line.
2	REC. TAPE SEND TAPE	Printer inactive. Sender and receiver operate as conventional type 5 send/receive station.
3	REC. PAGE MON. SEND	Printer provides page copy of data transmitted by sender and received by receiver, but receiver does not provide tape of received data.

TABLE F

TYPE 5 SEND/RECEIVE "DATASPEED" INSTALLATION (Continued)

SWITCH POSITION	FUNCTION	OPERATION
4	REC. TAPE PAGE MON. SEND	Printer provides page copy of data transmitted by sender and received by receiver, and receiver provides tape of received data.
5	REC. PAGE SEND TAPE	Printer inactive in send mode. In receive mode, printer provides page copy but receiver does not provide tape.
6	REC. TAPE PAGE SEND TAPE	Printer inactive in send mode. In receive mode, printer provides page copy and receiver provides tape of received copy.
7	MON. SEND REC. TAPE	Printer provides page copy of transmitted data in send mode. Printer inactive in receive mode, and receiver operates as conventional type 5 receive station.

3. TOOLS AND TEST EQUIPMENT

3.01 Tools required to service the printer are included in the TP330048 Tool Kit supplied with the printer. This kit contains the following items:

- TP310425 Gauge (0.280")
- TP310426 Gauge (0.320")
- TP331041 Gauge (0.589")
- TP108805 Lubriplate
- TP330131 Jumper Cable Assembly
- TP336152 Magnet Assembly (Used for KSR Set Only)
- TP310394 Nozzle Wiper
- TP334500 Ink Aspirator
- TP334510 Electrode Cleaner
- TP334503 Filter
- TP325896 Tool Roll
- TP145867 Grease
- TP334508 Hand Cleaner

3.02 The ink aspirator (TP334500) is used to clear clogged nozzles and electrodes in the recorder. It may be used with the high voltage on or off, but should only be used after the recorder has been fully warmed up and in the printing mode for about five minutes. To use the aspirator, proceed as follows:

- (1) Remove the cover from the recorder.

CAUTION: BE CAREFUL NOT TO COME IN CONTACT WITH THE HIGH VOLTAGE ELEMENTS OF THE PLATEN AND RECORDER, INCLUDING THE CONDUCTIVE STRIP ON THE FRONT EDGE OF THE RECORDER COVER.

- (2) Clean the end of the aspirator with a clean tissue or shop towel.
- (3) Squeeze the bulb, place the slot in the tube over the nozzle to be cleaned, and release the bulb (Figure 3). Do not remove the tube from the nozzle until the bulb is fully released.
- (4) Repeat as required to clear the nozzle.

CAUTION: USE WITH CARE TO AVOID DAMAGE TO THE NOZZLES OR ELECTRODES.

3.03 The aspirator may also be used to clear valving or deflection electrodes blocked by a film of ink. After wiping the tip with a clean tissue or shop towel, squeeze the bulb, place the tip over the electrode to be cleaned (but not the mask) and release the bulb (Figure 3).

3.04 The aspirator contains a felt filter which becomes saturated after extensive use. To replace the filter, remove the tube from the check valve. Replace the old filter with a new one (TP334503) and reposition the tube over the correct check valve (Figure 3).

3.05 The nozzle wiper (TP310394) may be used to start a clogged nozzle by carefully wiping the end of the nozzle as shown in Figure 3. The wiper may also be used to clear a valving or deflection electrode blocked with a film of ink. The film is wiped from the electrode as shown in Figure 3. Always clean the wiper before using.

3.06 The electrode cleaner is a liquid spray used to clear lint and residue from the electrodes (Figure 3). This cleaner may be used with the high voltage on or off. Directions are on the can. If a nozzle fails to start after using, repeat the application or clean the nozzle further with the ink aspirator or nozzle wiper.

3.07 Test equipment required for troubleshooting the DATASPEED printer consists of a DATS1 simulator and KS14510 volt-ohm-milliammeter or equivalent. The meter above can be used to measure low voltages throughout the printer circuit, and when used in conjunction with the DATS1 simulator, can also be used to measure the high voltages. References to the meter scales used for voltage measurements, and the reading obtained, are based on the KS14510 meter. If another meter is used, appropriate scales should be selected. The measured values will vary accordingly, but should be within reasonable limits of those indicated.

3.08 The DATS1 serves as a signal source for the DATASPEED printer, and also works in conjunction with the meter to provide both high and low voltage measurements throughout the printer circuits. To connect the DATS1 to the printer, proceed as follows:

- (1) Open the front door of the printer cabinet, and place the ON/OFF switch in the OFF position.
- (2) Release the thumbscrews securing the DAG and DAIF modules and slide the modules forward.
- (3) Remove the DAIF/AA1 connector from the right rear of the DAIF module.
- (4) Connect the DATS/A1 connector of the simulator cable to the DAIF/AA1 cable connector (not to the module).
- (5) Connect the meter to the METER terminals of the DATS1. If a volt-ohm-milliammeter is used, set the meter for voltage measurements.
- (6) Set the DATS1 switches as follows:

REC. MSG. ---- OFF
 CHAR. AVAIL. ---- OFF
 OUTPUT ---- L. V.
 POLARITY ---- NORM.

(The settings of the CODE LEVEL switches are not critical.)

- (7) Place the cabinet interlock switch in the bypass position and set the ac ON/OFF switch to ON. The fans and copylight should turn on and the READY lamp should light in 15-45 seconds.
- (8) Check the voltages at the four test jacks across the bottom of the DATS1 panel, using the red, low voltage probe of the DATS1 (polarity may be reversed for the -12 v measurement by switching the POLARITY switch to INV.). The meter must be set to an appropriate voltage range for each measurement. The +48 v

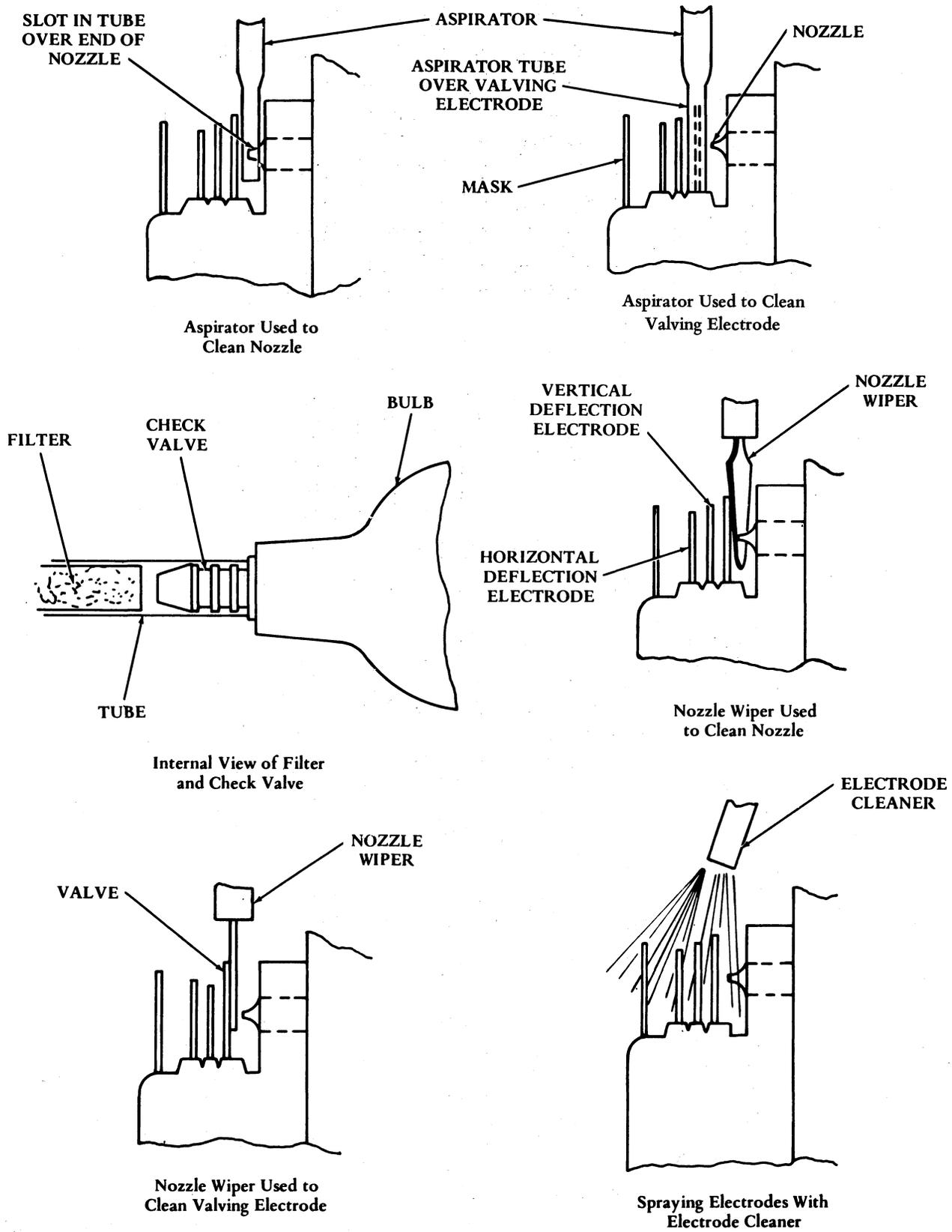


Figure 3 - Aspirator, Nozzle Wiper, and Electrode Cleaner as Used in Troubleshooting the Recorder Elements

reading will not be present for up to 45 seconds, when the READY lamp turns on.

CAUTION: DO NOT ATTEMPT ANY FURTHER TESTS WITH THE DATS1 IF THE PROPER VOLTAGES (+48 V, +18 V, +6 V, -12 V) ARE NOT PRESENT. REPLACE DAPS POWER SUPPLY MODULE. NEVER ATTEMPT TO USE THE DATS1 SIMULATOR PROBES UNLESS THE UNIT IS PROPERLY CONNECTED AND THE POWER IS ON.

3.09 With the switch settings described in 3.08, the DATS1 and voltmeter can be used for low voltage measurements in the printer. For high voltage measurements, all switch settings remain the same except for the OUTPUT switch, which is set to the H. V. position. This switches in the 1000:1 voltage divider in the DATS1 circuit, and all voltages at the METER terminal are 1/1000 of the voltages measured with the black, high voltage probe. Therefore, readings on the meter scale must be multiplied by 1000 to determine the actual voltage.

3.10 Low voltage pulses can be measured by placing the OUTPUT switch in the PULSE position and using the red, low voltage probe for the measurement. The meter will give an indication of either +6 v or 0 v when no pulse is present, and will switch to the opposite value when a single pulse is applied. For a series of pulses, the meter will average the changes, giving a reading of about +3 v.

3.11 To use the DATS1 as a signal source, proceed as follows:

- (1) Select a printing character by means of the CODE LEVEL switches. (See Figure 4 for ASCII and Baudot Codes.)
- (2) Place the REC. MSG. switch in the ON position. The PRINTER ON lamp and motors should turn on and the HIGH VOLTAGE POWER ON lamp on the DAPS power supply should light. The printer may line feed once.
- (3) Place the CHAR. AVAIL. switch in the ON position. The printer should print continuous lines of the selected character.
- (4) Place the CHAR. AVAIL. switch in the MAN position. Depress and release the MAN. STEP button. The printer should print the selected character once for each operation.

3.12 If the printer fails to turn on or print selected characters when operated from the DATS1, refer to the troubleshooting chart for analysis and correction of the trouble. If the printer operates satisfactorily from the DATS1, yet fails to function normally when operated on-line, the trouble is in the data set or interface area. The data set can be checked by calling a sending station or test center and requesting a remote data set test. Interface troubles are covered in the troubleshooting chart.

3.13 A complete set of wiring diagrams (WDP 0194) is supplied for each printer installation. These diagrams show actual and schematic connections of all circuits and electrical components in the printer.

4. TROUBLESHOOTING PROCEDURE

4.01 Preliminary tests should be used to locate the source of trouble either in the logic and printer area or the data set and interface area. They can also eliminate minor troubles caused by burned out fuses or lamps, or poor electrical connections. Visually inspect cables, connectors, and components. Make sure all plug-in connectors are firmly seated, and where latching connectors are involved, that the latches are locked.

4.02 The troubleshooting chart provides step-by-step procedures to isolate troubles to a particular component or circuit card. For troubles other than data set or interface troubles, troubleshooting can be facilitated in many cases by use of the DATS1 simulator in conjunction with a meter.

4.03 The troubleshooting chart is arranged according to the sequence in which troubles would occur in a normal checkout procedure. To simplify troubleshooting, troubles should be identified in this manner. That is, if the station is not printing and the READY light is not on, the trouble would be identified as "READY light not on" rather than "No printing." The numbers of related groups of troubles on the troubleshooting chart are as follows:

- Trouble Nos. 1-12 Local troubles only – no connection to sender
- Trouble Nos. 13-16 On-line turn-on troubles
- Trouble Nos. 17-21 No printing
- Trouble No. 22 No line feed when on-line
- Trouble Nos. 23-41 Defective printing
- Trouble No. 42 Automatic carriage return/line feed failure

ASCII CODE

Bits				b7	b6	b5	Column											
b4	b3	b2	b1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
Row				0	1	2	3	4	5	6	7							
0	0	0	0	0	NUL	DLE	SP	0	"	P								
0	0	0	1	1	SOH	DC1	!	1	A	Q								
0	0	1	0	2	STX	DC2	"	2	B	R								
0	0	1	1	3	ETX	DC3	#	3	C	S								
0	1	0	0	4	EOT	DC4	\$	4	D	T								
0	1	0	1	5	ENO	NAK	%	5	E	U								
0	1	1	0	6	ACK	SYN	&	6	F	V								
0	1	1	1	7	BEL	ETB	'	7	G	W								
1	0	0	0	8	BS	CAN	(	8	H	X							
1	0	0	1	9	HT	EM	)	9	I	Y							
1	0	1	0	10	LF	SUB	*	:	J	Z								
1	0	1	1	11	VT	ESC	+	;	K	|								
1	1	0	0	12	FF	FS	.	<	L	\								
1	1	0	1	13	CR	GS	-	=	M	|								
1	1	1	0	14	SO	RS	.	>	N	^								
1	1	1	1	15	SI	US	/	?	O	SP	DEL							

Divided Boxes: ASCII designations shown to left of diagonal line; functions performed by DATASPEED Printer shown to right of diagonal line.

Shaded Boxes: Upon receiving these code characters the DATASPEED Printer will be in a nonprint, nonspacing mode.

COMMUNICATIONS BAUDOT CODE

Figures	- ? : \$ 3 ! & # 8 ' () . , 9 0 1 4 5 7 ; 2 / 6 "																										Letters	Figures	Space	Carr. Ret.	Line Feed	Blank	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z							
Information Levels	1	1	1	0	1	1	1	0	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	1	1	1	1	1	1	0	0	0	
	2	1	0	1	0	0	0	1	0	1	1	1	1	0	0	0	1	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	0
	3	0	0	1	0	0	1	0	1	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0	0
	4	0	1	1	1	0	1	1	0	0	1	1	0	1	1	1	0	0	1	0	0	0	1	0	1	0	0	1	1	0	1	0	0
	5	0	1	0	0	0	0	1	1	0	0	0	1	1	0	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0	0	0

Figure 4 - ASCII and Communications Baudot Code Tables as Used in DATASPEED Printer

4.04 Figure 5 shows the location of fuses, connectors, switches, etc, designated in the chart, and Table G lists the circuit card locations. Figures 6 through 17 show the test points and connector pins at the front and rear of the DAG and DAD modules. Signals should be checked at these points only, as described in the troubleshooting chart.

CAUTION: USE EXTREME CARE WHEN REMOVING AND REPLACING CONNECTORS, AND IN CONNECTING METER PROBES FOR MEASUREMENTS AT VARIOUS TERMINALS, TO AVOID SHORTING TERMINALS. TURN ALL POWER OFF TO REMOVE OR REPLACE CIRCUIT CARDS.

4.05 Because it is difficult to locate and correct failures in industrial microcircuits on location, it is intended that defective circuit cards will be replaced by the serviceman and will be repaired at a central location.

Note: The DAPS power supply, DAR recorder, and the core plane assembly (memory) should be replaced with complete units and returned to the manufacturer or an authorized service center for repair.

4.06 When trouble analysis indicates a defective circuit card, its connectors and associated interconnecting cables should be examined for defects prior to card replacement.

4.07 Components of a redesigned version (designated 2101AB) of the receive-only printer can be used as replacements in 2101AA DATASPEED Printer (RO) sets in some cases, if 2101AA components are not immediately available. The interchangeability of these redesigned components is summarized in Table K.

TABLE G
CIRCUIT CARD LOCATIONS

MODULE	CARD NUMBER	DESCRIPTION	CONNECTOR LOCATION
DAIF 1 (Serial)	322130	Shift Register Card	ZAU
	322132	Data Set Control Card	ZAN
	322180	1050 Baud R/D Card	ZAS
	322181	1200 Baud R/D Card	ZAS
	322182	890 Baud R/D Card	ZAS
	322183	840 Baud R/D Card	ZAS
	322184	600 Baud R/D Card	ZAS
DAIF 2 (Parallel)	322134	Station Control Card	ZAN
DAG	322150	Output Logic Card	DAG/D1, 2, 3, & 4
	322151	Input Logic Card	DAG/A1, 2, 3, & 4
	322152	ASCII Control Card	On 322151 card
	322153	Baudot Control Card	On 322151 card
	303929	Output Board	DAG/C1 & C2
	303927	ASCII Program Board	DAG/B1
	303928	Baudot Program Board Character Sheets	DAG/B1 Between program board & output board
DAD	322145	Spacing Drive Card	DAD/D3 & D4
	322146	Tracing Drive Card	DAD/C1, 2 & /A2
	300469	Tubes	On 322146

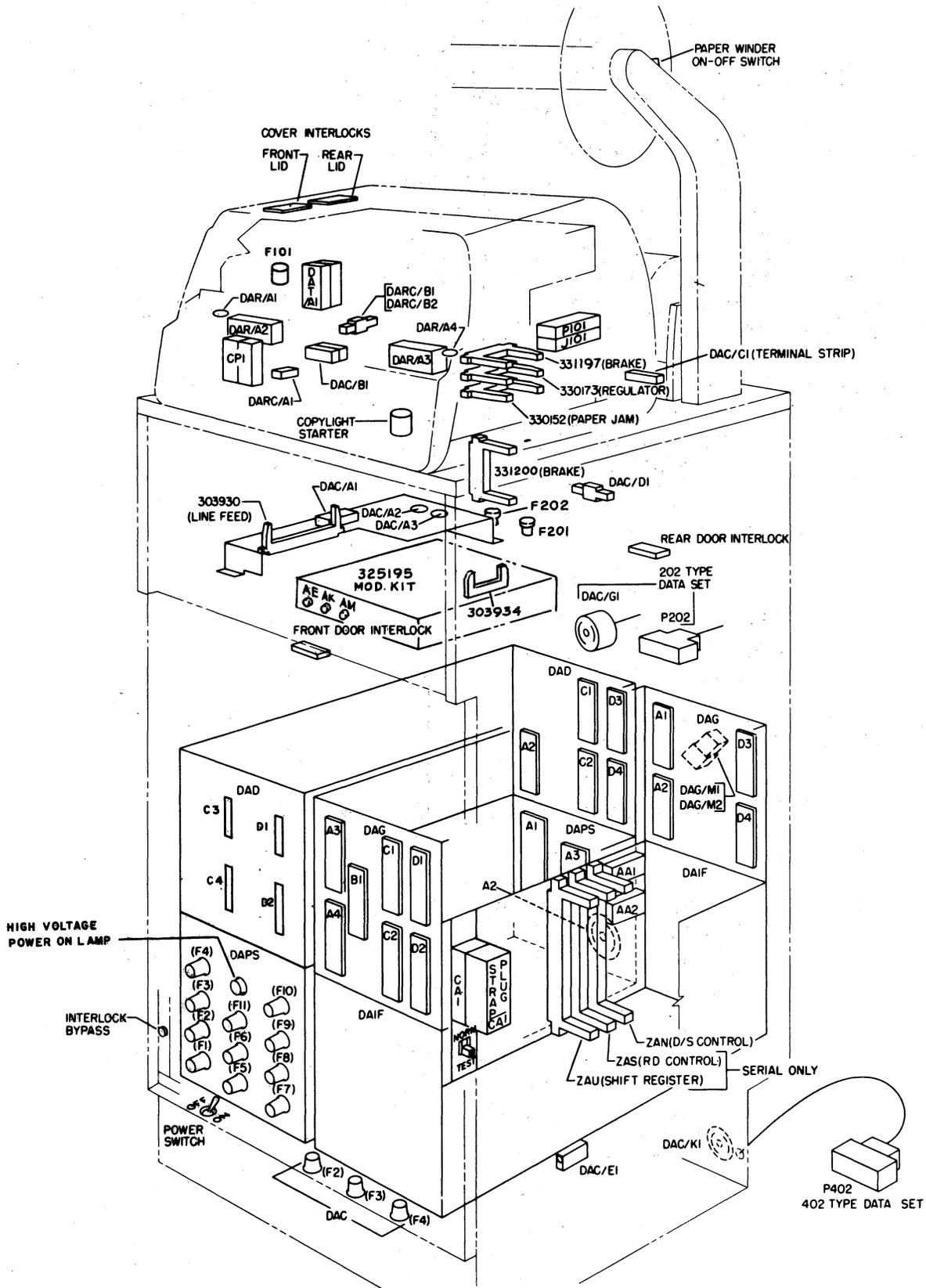


Figure 5 - Positioning of Connectors on DATASPEED Printer (Receive-Only)

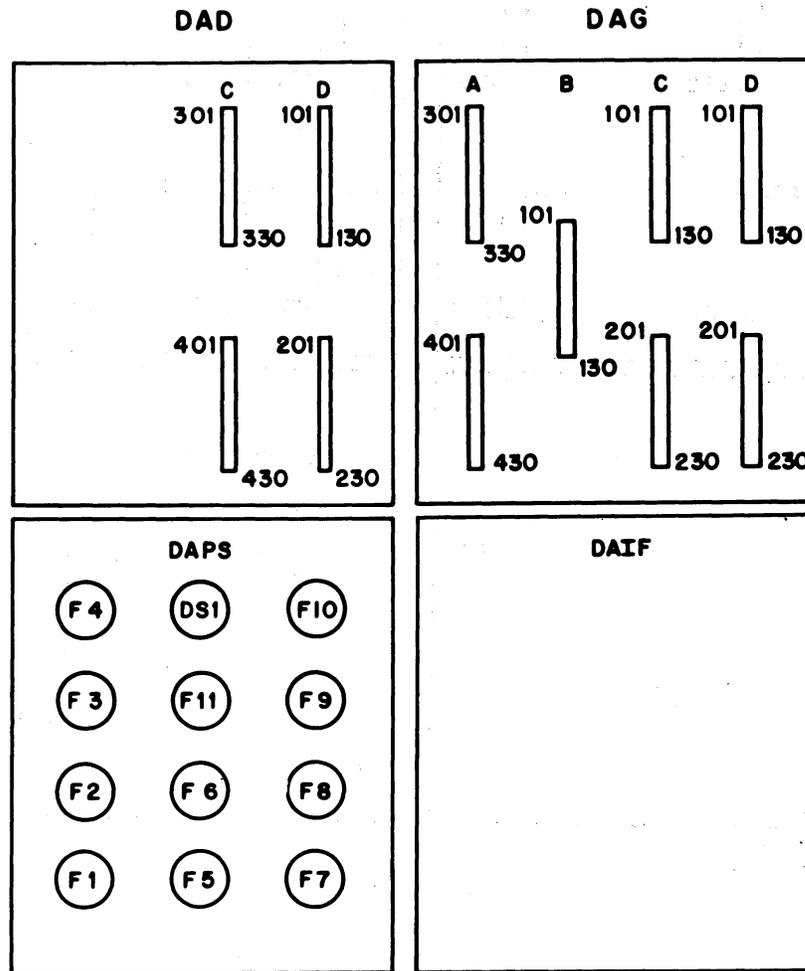


Figure 6 - Front Connectors for Modules

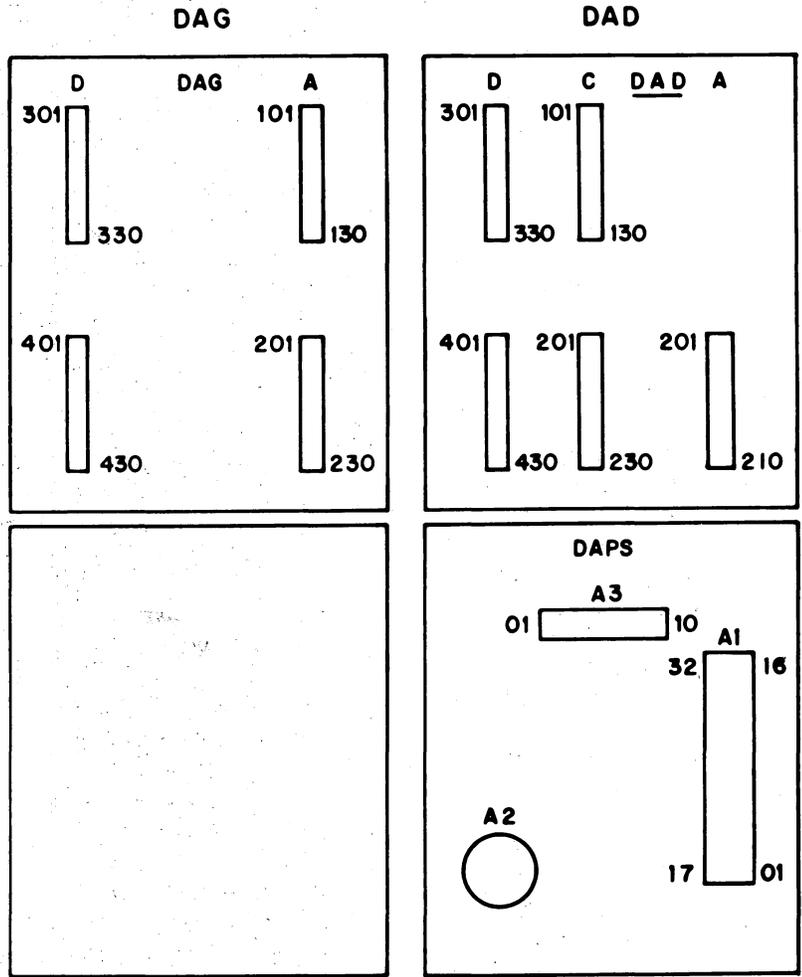


Figure 7 - Rear Connectors for Modules

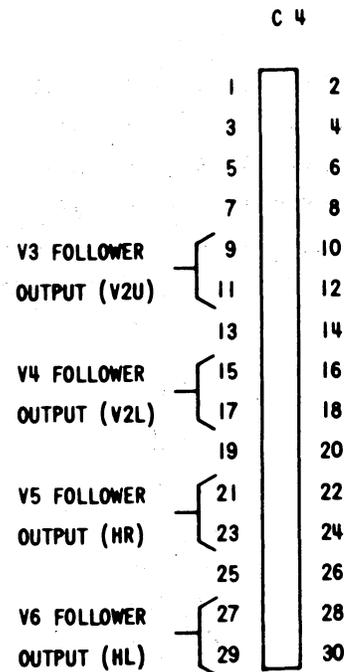
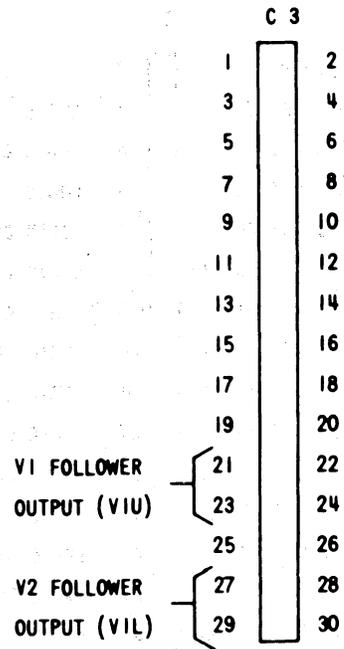


Figure 8 - Printer Drive Test Points - Front of DAD Module

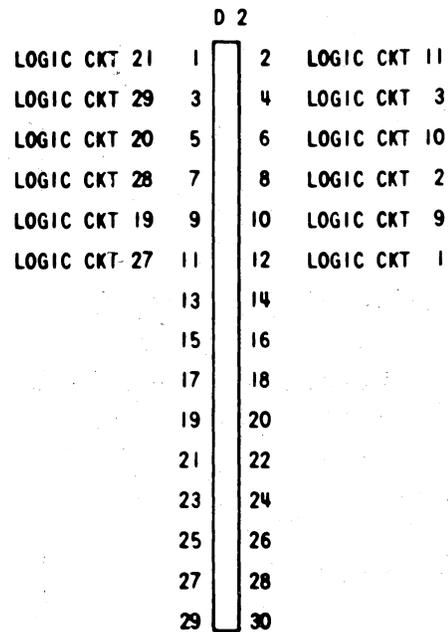
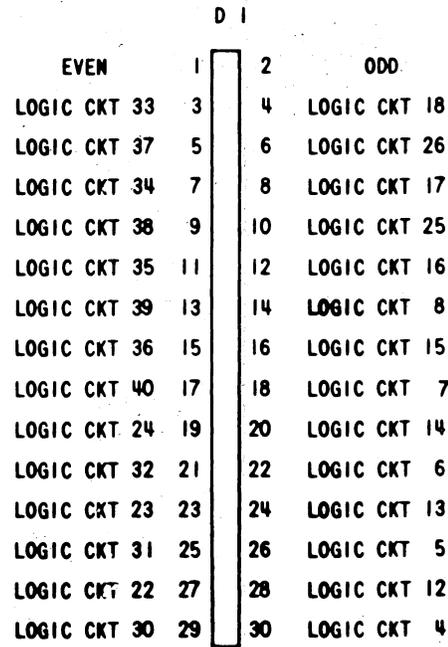


Figure 9 - Spacing Drive Test Points – Front of DAD Module

A3

(DAG/D123)	C. R.	1	2
(DAG/D125)	L. F.	3	4
(DAG/D127)	PAPER ADV.	5	6
(DAG/D129)	MEM. CLR. \overline{MC}	7	8
(DAG/D108)	OSCILLATOR	9	10
(DAG/D121)	HORIZ. TAB	11	12
(DAG/D104)	PRINT INH.	13	14
(DAG/D115)	REED INH.	15	16
(DAG/D112)	BIT $\overline{5M}$	17	18
(DAG/D113)	BIT 5	19	20
(DAG/D103)	START OF CYCLE	21	22
(DAG/D110)	PRINT INTERVAL	23	24
		25	26
		27	28
		29	30

A4

		1	2	Y1-1	(DAG/B129)
		3	4	Y1-2	(DAG/B127)
		5	6	Y2-1	(DAG/B125)
		7	8	Y2-2	(DAG/B123)
(DAG/B121)	Y3-1	9	10	X16	(DAG/B101)
(DAG/B119)	Y3-2	11	12	X15	(DAG/B102)
(DAG/B117)	Y4-1	13	14	X13	(DAG/B106)
(DAG/B115)	Y4-2	15	16	X14	(DAG/B104)
(DAG/B118)	X7	17	18	X2	(DAG/B128)
(DAG/B120)	X6	19	20	X1	(DAG/B130)
(DAG/B112)	X9	21	22	X3	(DAG/B126)
(DAG/B114)	X10	23	24	X4	(DAG/B124)
(DAG/B110)	X11	25	26	X8	(DAG/B116)
(DAG/B108)	X12	27	28	X5	(DAG/B122)
		29	30		

Figure 10 - Input Logic Connector Pins - Front of DAG Module

B1

(DAG/A410)	X16	1	2	X15	(DAG/A412)
		3	4	X14	(DAG/A416)
		5	6	X13	(DAG/A414)
		7	8	X12	(DAG/A427)
		9	10	X11	(DAG/A425)
		11	12	X10	(DAG/A421)
		13	14	X9	(DAG/A423)
(DAG/A415)	Y4-2	15	16	X8	(DAG/A426)
(DAG/A413)	Y4-1	17	18	X7	(DAG/A417)
(DAG/A411)	Y3-2	19	20	X6	(DAG/A419)
(DAG/A409)	Y3-1	21	22	X5	(DAG/A428)
(DAG/A408)	Y2-2	23	24	X4	(DAG/A424)
(DAG/A406)	Y2-1	25	26	X3	(DAG/A422)
(DAG/A404)	Y1-2	27	28	X2	(DAG/A418)
(DAG/A402)	Y1-1	29	30	X1	(DAG/A420)

Figure 11 - Program Board Connector Pins – Front of DAG Module

		C1			
(DAG/D201)	DC COM	1	2	Z16	(DAG/D215)
(DAG/D229)	H4	3	4	Z14	(DAG/D228)
(DAG/D227)	H2	5	6	Z12	(DAG/D224)
(DAG/D225)	H1	7	8	Z10	(DAG/D220)
(DAG/D223)	V8	9	10	Z8	(DAG/D216)
(DAG/D221)	V4	11	12	Z6	(DAG/D212)
(DAG/D219)	V2	13	14	Z4	(DAG/D208)
(DAG/D217)	V1	15	16	Z2	(DAG/D204)
		17	18		
		19	20		
		21	22		
		23	24		
		25	26		
		27	28		
		29	30		

		C2			
		1	2		
		2	4		
		5	6		
		7	8		
		9	10		
		11	12		
		13	14		
(DAG/D217)	V1	15	16	Z1	(DAG/D202)
(DAG/D219)	V2	17	18	Z3	(DAG/D206)
(DAG/D221)	V4	19	20	Z5	(DAG/D210)
(DAG/D223)	V8	21	22	Z7	(DAG/D214)
(DAG/D225)	H1	23	24	Z9	(DAG/D218)
(DAG/D227)	H2	25	26	Z11	(DAG/D222)
(DAG/D229)	H4	27	28	Z13	(DAG/D226)
(DAG/D201)	DC COM	29	30	Z15	(DAG/D230)

Figure 12 - Output Board Connector Pins – Front of DAG Module

		D1			
(DAG/A321) START OF CYCLE		1	2		
		3	4	PRINT INHIBIT	(DAG/A313)
		5	6		
		7	8	OSCILLATOR	(DAG/A309)
		9	10	PRINT INTERVAL	(DAG/A323)
		11	12	BIT $\overline{5M}$	(DAG/A317)
(DAG/A319) BIT 5		13	14		
(DAG/A315) REED INH		15	16		
		17	18		
		19	20		
(DAG/A311) HORIZ. TAB		21	22		
(DAG/A301) C.R.		23	24		
(DAG/A303) L.F.		25	26		
(DAG/A305) PAPER ADV.		27	28		
(DAG/A307) MEM. CLR. \overline{MC}		29	30		

		D2			
(DAG/C101-C209) DC COM		1	2	Z1	(DAG/C216)
		3	4	Z2	(DAG/C116)
		5	6	Z3	(DAG/C218)
		7	8	Z4	(DAG/C114)
		9	10	Z5	(DAG/C220)
		11	12	Z6	(DAG/C112)
		13	14	Z7	(DAG/C222)
(DAG/C102) Z16		15	16	Z8	(DAG/C110)
(DAG/C114-C215) V1		17	18	Z9	(DAG/C224)
(DAG/C113-C217) V2		19	20	Z10	(DAG/C108)
(DAG/C111-C219) V4		21	22	Z11	(DAG/C226)
(DAG/C109-C221) V8		23	24	Z12	(DAG/C106)
(DAG/C107-C223) H1		25	26	Z13	(DAG/C228)
(DAG/C105-C225) H2		27	28	Z14	(DAG/C104)
(DAG/C103-C227) H4		29	30	Z15	(DAG/C230)

Figure 13 - Output Logic Connector Pins – Front of DAG Module

D 3

1	2	
3	4	+6V DC
5	6	DC COM
7	8	
9	10	
11	12	MONOSTABLE SUPPLY (DAG/A118)
13	14	
15	16	
17	18	
19	20	
21	22	
23	24	+48V DC
25	26	
27	28	+6V DC
29	30	DC COM

D 4

(DAG/D417) HORIZ. TAB	1	2	
(CPI/18-DAD/C228) PAPER ADV.	3	4	
(DAD/D304) COLUMN SELECT "E"	5	6	COLUMN SELECT $\bar{9}$ (DAD/D307-DAG/D422)
(DAD/D315) COLUMN SELECT "D"	7	8	COLUMN SELECT 9 (DAD/D306)
(DAD/D303) COLUMN SELECT "C"	9	10	COLUMN SELECT $\bar{8}$ (DAD/D309)
(DAD/D305) COLUMN SELECT "B"	11	12	COLUMN SELECT 8 (DAD/D308)
(DAD/D313) COLUMN SELECT "A"	13	14	COLUMN SELECT $\bar{7}$ (DAD/D311)
	15	16	COLUMN SELECT 7 (DAD/D310)
(DAG/D401) HORIZ. TAB	17	18	BIT 6 (L/R) (DAD/C223)
(DAD/D301) HORIZ. TAB ODD	19	20	LINE FEED (DAG/A116-DAD/C230)
(DAD/D302) HORIZ. TAB EVEN	21	22	PAPER ADV. CLOCK $\bar{9}$ (DAG/D406)
(DAD/C222) JET DOWN	23	24	VERT 8 (DAD/C215)
(DAD/C221) VERT 1	25	26	HORIZ. 1 (DAD/C229)
(DAD/C219) VERT 2	27	28	HORIZ. 2 (DAD/C227)
(DAD/C217) VERT 4	29	30	HORIZ. 4 (DAD/C225)

Figure 14 - Output Logic Connector Pins - Rear of DAG Module

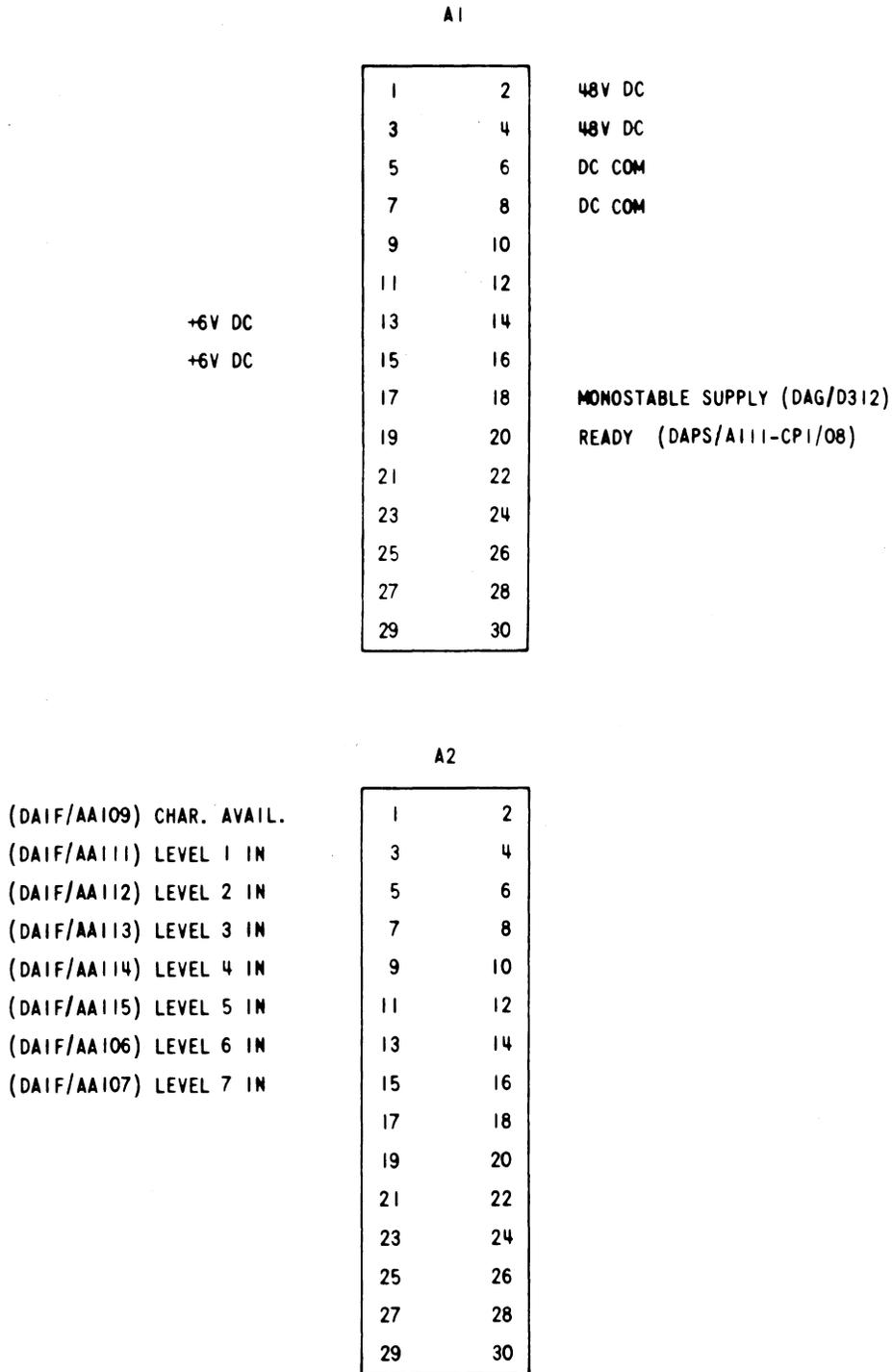


Figure 15 - Input Logic Connector Pins – Rear of DAG Module

D3

(DAG/D419)	ODD	1	2	EVEN (DAG/D421)
(DAG/D409)	COLUMN SELECT "C"	3	4	COLUMN SELECT "E" (DAG/D405)
(DAG/D411)	COLUMN SELECT "B"	5	6	COLUMN SELECT 9 (DAG/D408)
(DAG/D406)	COLUMN SELECT $\overline{9}$	7	8	COLUMN SELECT 8 (DAG/D412)
(DAG/D410)	COLUMN SELECT $\overline{8}$	9	10	COLUMN SELECT 7 (DAG/D416)
(DAG/D414)	COLUMN SELECT $\overline{7}$	11	12	+6V DC
(DAG/D413)	COLUMN SELECT "A"	13	14	
(DAG/D407)	COLUMN SELECT "D"	15	16	DC COM
	DC COM	17	18	550V DC
		19	20	VALVE 33 (DAR/A341)
(DAR/A318)	VALVE 26	21	22	VALVE 37 (DAR/A337)
(DAR/A327)	VALVE 17	23	24	VALVE 34 (DAR/A340)
(DAR/A319)	VALVE 25	25	26	VALVE 38 (DAR/A336)
(DAR/A328)	VALVE 16	27	28	VALVE 35 (DAR/A339)
		29	30	VALVE 39 (DAR/A335)

D4

(DAR/A306)	VALVE 8	1	2	VALVE 36 (DAR/A338)
(DAR/A329)	VALVE 15	3	4	VALVE 40 (DAR/A334)
(DAR/A307)	VALVE 7	5	6	VALVE 24 (DAR/A320)
(DAR/A330)	VALVE 14	7	8	VALVE 32 (DAR/A342)
(DAR/A308)	VALVE 6	9	10	VALVE 23 (DAR/A321)
(DAR/A301)	VALVE 13	11	12	VALVE 31 (DAR/A343)
(DAR/A309)	VALVE 5	13	14	VALVE 22 (DAR/A322)
(DAR/A302)	VALVE 12	15	16	VALVE 30 (DAR/A344)
(DAR/A310)	VALVE 4	17	18	VALVE 21 (DAR/A323)
(DAR/A303)	VALVE 11	19	20	VALVE 29 (DAR/A345)
(DAR/A311)	VALVE 3	21	22	VALVE 20 (DAR/A324)
(DAR/A304)	VALVE 10	23	24	VALVE 28 (DAR/A346)
(DAR/A312)	VALVE 2	25	26	VALVE 19 (DAR/A325)
(DAR/A305)	VALVE 9	27	28	VALVE 27 (DAR/A347)
(DAR/A313)	VALVE 1	29	30	VALVE 18 (DAR/A326)

Figure 16 - Spacing Drive Connector Pins – Rear of DAD Module

C1

DC COM	1	2
	3	4
	5	6
-12V DC	7	8
+30V DC	9	10
+120V DC	11	12
	13	14
+18V DC	15	16
(DAPS/A123) OVER VOLTAGE	17	18
-6V DC	19	20
+120V DC	21	22
+120V DC	23	24
6.3V AC	25	26
6.3V AC	27	28
+6V DC	29	30

C2

	1	2	SPARE (DAIF/AA137)
(CPI/15) READY LAMP	3	4	
(DAPS/A113) REC. MSG.	5	6	
(DAG/D414) VERT. CNTL. 1-2	7	8	
(DAIF/AA126) REC. MSG.	9	10	
	11	12	
(DAG/D416) VERT. CNTL. 1-2	13	14	OVER VOLTAGE RESET (CPI/16)
(DAG/D424) V8	15	16	
(DAG/D429) V4	17	18	
(DAG/D427) V2	19	20	
(DAG/D425) V1	21	22	JET DOWN (DAG/D423)
(DAG/D418) L/R	23	24	
(DAG/D430) H4	25	26	
(DAG/D428) H2	27	28	PAPER ADV. (CPI/18)
(DAG/D426) H1	29	30	LINE FEED (DAG/D420)

Figure 17 - Printer Drive Connector Pins – Rear of DAD Module

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
1	Copylight and/or fans do not turn on when power is turned on (cover closed).	<ul style="list-style-type: none"> a. If neither fans nor copylight turn on, check ac power to printer. Check fuse F4 in power supply and F2 at bottom front of cabinet. b. If copylight is on but fans are off, check fuse F4 at bottom front of cabinet. c. If all fuses are good, replace DAPS power supply module. d. If fans are on but copylight is off, trouble is either defective starter or burned out copylight.
2	READY lamp does not turn on 15 to 45 seconds after turning power on (doors and lids closed).	<ul style="list-style-type: none"> a. Depress READY button. If READY lamp lights and stays lit after releasing, a temporary overvoltage condition has been reset. b. If READY lamp does not light while button is depressed, either +48 v is not present or READY lamp is burned out. Check +48 v by depressing PAPER ALARM button. If PAPER ALARM lamp lights, but READY lamp does not, the READY lamp is burned out. If neither the PAPER ALARM lamp nor the READY lamp lights, check fuses F2 and F9 of power supply.
3	PRINTER ON lamp lights instead of READY lamp after 15-45 second time delay.	Replace fuse F8.
4	READY lamp lights when button is depressed, but does not remain lit when button is released.	<ul style="list-style-type: none"> a. Interlock may be open. Depress the PRINTER ON button. If the PRINTER ON lamp lights, interlocks are complete. If not, operate cabinet bypass switch, and/or bypass cover with TP330131 assembly and recheck. If PRINTER ON lamp lights, interlock switch in front door, rear door, or cover is open. Replace if necessary. b. Paper out or paper jam may have occurred. Check for a paper jam indication (red light on left side frame of transport). If paper is jammed or out, or if the pressure roller is in the open position, clear the condition and reset the circuit by depressing the red paper jam indicator button. If jam occurs repeatedly, see Trouble Nos. 9, 10, and 11. c. If no jam condition exists and jam indicator cannot be reset, check 1/4 amp fuse (F101) on left side frame of transport.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
4 (contd)		<p>d. Check for GND at DAD/C2-03 (rear of DAD module). If present when the READY button is depressed, yet the READY light goes out when button is released, replace the TP322146 tracing drive circuit card.</p> <p>e. If a circuit card is not available immediately, connect the DATS1 to the printer as explained in 3.08. Operate the REC. MSG. switch on the DATS1 and observe whether the HIGH VOLTAGE POWER ON light on the DAPS module of the printer turns on. If it does, the printer may be returned to service and will operate without the READY light turning on until a circuit card becomes available.</p>
5	Set fails to line feed when PAPER ADVANCE button is depressed.	<p>a. Depress PAPER ADVANCE button. If the line feed motor is not operating but the line feed escapement can be heard, refer to Trouble No. 6.</p> <p>b. If the line feed motor is operating but the line feed escapement operation cannot be heard with the PAPER ADVANCE button depressed, check fuse F10 in the power supply. If F10 is good, trouble is in the TP303930 line feed driver card.</p> <p>c. Check for presence of paper advance pulse at DAG/D4-03 and DAG/D1-20. If present at DAG/D4-03, but not at DAG/D1-20, TP322150 output logic card is defective.</p> <p>d. If the motor is running and the line feed escapement mechanism can be heard while depressing the PAPER ADVANCE button, check adjustments in the line feed area as described in Section 578-500-700 (formerly Section 592-820-700).</p>
6	Line feed motor does not run, or number of stored line feeds cannot be controlled by line feed torque potentiometer.	Defective TP330173 voltage regulator card on transport.
7	Paper winder and transport motors do not run.	Check fuse F3 in cabinet.
8	Paper winder motor does not brake immediately when slack paper is wound.	Check two 3/8 amp SL-BL fuses (F201, F202) at rear of cabinet. If good, the TP331200 dynamic brake card at the rear of the cabinet is defective.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
9	Paper jam – loop does not form when paper is installed and pulled tight or when power is turned on.	Check loop forming switch or brake card TP331197.
10	Paper jam – loop of insufficient size (should be approximately 20 line feeds) develops.	Check loop sensing switch on transport.
11	Paper jam – excessive paper being developed in paper loop.	Check <u>PAPER THROAT</u> adjustment in Section 578-500-700 (formerly Section 592-820-700). Check fuse on TP331197 dynamic brake card and 3/10 amp SL-BL (F102) on back of transport. If fuses are good, the card is defective.
12	Paper jam alarm is activated at wrong time or does not operate on jam or paper out condition.	Defective TP330152 paper jam card on transport.
13	DATA lamp does not come on when DATA button is depressed with carrier being received, or call is dropped immediately if data set is equipped for auto answer. (READY lamp on and printer equipped with 202C data set.)	<ul style="list-style-type: none"> a. If PAPER ALARM lamp is on, the low paper condition must be corrected before a call can be completed. b. If PAPER ALARM lamp is on, but a low paper condition does not exist, check <u>LOW PAPER SENSING ARM</u> adjustment as described in Section 578-500-701 (formerly Section 592-820-701). c. If PAPER ALARM lamp is not on, check pin 33 of TP322132 data set control card for data terminal ready signal. If approximately +6 v is present, trouble is in data set. If +6 v is not present, the data set control card is defective.
14	Station will not answer call in auto answer mode (option ZE on 202C and option E on 804A).	Trouble is in data set if station can be manually connected in data mode. Refer to Section 592-015-500 for information on tests for 202C data set, and 592-016-500 for information tests on 202D data set (used with 804A data auxiliary set).
15	PRINTER ON lamp does not light after READY lamp is on and data set is in data mode.	<ul style="list-style-type: none"> a. Depress PRINTER ON button. If lamp does not turn on while depressed, bulb is burned out.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
15 (contd)		<p>b. Set NORM./TEST switch on interface module to TEST position. If PRINTER ON lamp does not light, the TP322146 tracing drive card is defective if GND does not appear at receive message lead DAD/C2-5. If GND appears at DAD/C2-5, the trouble is in the power supply (KB2 relay circuit). If PRINTER ON lamp lights, return NORM./TEST switch to NORM. position.</p> <p>c. NORM./TEST switch in NORM. position. Repeat call and go into data mode. If pin 27 (sets with dial-up operation) or 25 (sets with private line operation) reads from +5.5 to +18.5 v, the TP322132 data set control card is defective. If not present, the data set is defective. Refer to Section 592-015-500 for data set tests.</p>
16	READY lamp goes out when DATA button on data set is depressed with carrier being received or when call is answered automatically.	<p>a. Check fuse F10 in power supply.</p> <p>b. Set NORM./TEST switch of interface module to TEST position. Depress READY lamp. If arcing in the DAR is observed, release the READY lamp immediately. Trouble is in the TP322146 tracing drive card or one of its tubes is defective. If no arcing occurs, replace DAPS power supply module.</p> <p style="text-align: center;">CAUTION: TURN OFF POWER WHEN REPLACING TUBES.</p>
17	No printing – PRINTER ON light on.	<p>a. If set has a DAIF1 interface, check pin B29 of the TP322130 shift register card for receive data pulses. If receive data is not present, see Trouble No. 18 or 19. If receive data is present, check the following for source of trouble. If set has a DAIF2 interface, check pin 2 of the TP322134 station control card for receive data pulses. If receive data is not present, see Trouble No. 20.</p> <p>b. Check for inverted receive data pulses at pin B31 of TP322130 shift register card. No pulses – defective TP322180-87 card.</p> <p>c. If stop pulses do not appear at pin B28 of TP322130 or inverted start pulses do not appear at pin B11 of TP322130 with clock pulses at pin B30, the shift register TP322130 is defective. If clock pulses are not present, the TP322180-87 R/D (Receiving Distributor) control card is defective.</p>

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
17 (contd)		<p>d. If the stop, inverted start and clock pulses are all present but the character available pulses do not appear at pin B26 of TP322180-87 R/D control card, the R/D control card is defective.</p> <p>e. If all cards are good, see Trouble No. 21.</p>
18	No receive data – serial interface (printer equipped with 202C data set).	<p>a. Check pin 26 of TP322132 data set control card. If +5.5 to +18.5 v is present, a false ring indication is coming from the data set. Data set is defective. Refer to Section 592-015-500 for information on data set tests.</p> <p>b. Check pin 24 of TP322132 data set control card. If inverted receive data pulses are present, the TP322132 card is defective. If inverted receive data pulses are not present, the data set is defective or no data is being received. Refer to Section 592-015-500 for information on data set tests.</p>
19	No receive data – serial interface (printer equipped with 202D data set).	If inverted receive data pulses are not present at pin 24 of TP322132, the data set is defective or no data is being received. (Refer to Section 592-016-500 for data set tests.) If inverted receive data pulses are present, the TP322132 data set control card is defective.
20	No receive data – parallel interface.	All logic contained on one circuit card (TP332134) in DAIF2 module. Replace card and recheck.
21	No printing – DAIF operation correct and PRINTER ON light on.	<p>a. Check ink level and flow of ink from pump. If ink is not flowing, see Trouble No. 23. If pump leads (bottom of pump) are exposed, add ink. DO NOT OVERFILL – SCREWS ON TOP OF PUMP SHOULD NEVER BE COVERED.</p> <p>b. Connect DATS1 to DAIF/AA1 connector and generate repeat character A (ASCII) or E (Baudot) after sending a LETTERS shift. If the set prints, refer to Trouble No. 17. If the set does not print, proceed as follows:</p> <ol style="list-style-type: none"> 1. Check for loss of high voltage. Should be +10,000 v on platen (DATS1 will read approximately 6000 v), +5000 v on mask (DATS1 will read approximately 4000 v), and -1900 v on manifold (DATS1 will read approximately -1800 v).

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
21 (contd)		<ol style="list-style-type: none"> 2. If all of these voltages are missing, check for 167 v ac from DAPS power supply at DAT/A1-6 and 7. If 167 v is not present, check fuse F5 in DAPS power supply. If 167 v ac is present but high dc voltages are not the TP330190 high voltage power supply is defective. 3. If the platen or mask voltage is missing, but not both, the high voltage power supply is defective. 4. If the platen and mask voltages are present but the manifold voltage is not, turn off the high voltage and remove the TP331010 high voltage cover and regulator. Turn on the high voltage and check for -2500 v at the 2.5 kv terminal of the high voltage power supply (DATS1 will read approximately 2000 v). If not present, the high voltage supply is defective. If present, yet -1900 v is not available at manifold, the regulator assembly is defective. 5. Check for +550 v at DAD/D3-18. If not present, replace DAPS power supply. <p>c. If high voltage section is normal, proceed as follows:</p> <ol style="list-style-type: none"> 1. Check for SOC pulses at DAG/A3-21. No pulses – defective TP322151 input logic card. 2. Check for oscillator pulses at DAG/A3-9. No pulses – defective TP322150 output logic card. 3. Check for print interval pulses at DAG/A3-23. No pulses – defective TP322150 output logic card. 4. Check for print inhibit pulses at DAT/A3-13. This pin should be approximately +6 v. If 0 v or pulses occur – defective TP322152 control card. 5. Check for reed inhibit pulses at DAG/A3-15. No pulses – defective TP322151 input logic card. 6. Check for odd Y-driver pulses at DAG/A3-19. No pulses – defective TP322150 output logic card. 7. Check for X-driver pulses at DAG/A4-9. No pulses – defective TP322151 input logic card.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
21 (contd)		<p>8. Check for memory clear pulses at DAG/A3-7. No pulses – defective TP322151 input logic card.</p> <p>9. Check for vertical output (V2) pulses at DAG/D4-27. No pulses – defective TP322150 output logic card.</p> <p>10. Check jet down voltage at DAG/D4-23. If 0 v – defective TP322150 output logic card.</p> <p>11. Check for +120 v at DAD/C1-11, 21, and 23. If any or all are missing, replace DAPS power supply.</p> <p>If all of the above No Printing checks have been made, TP322146 tracing drive card is the probable cause of trouble.</p>
22	No line feed while receiving traffic but set will line feed from PAPER ADVANCE button.	Defective ASCII or Baudot control card in character generator. Replace TP322152 (ASCII) or TP322153 (Baudot) control card.
23	Light printed copy.	<p>a. Check for proper ink level and fill if necessary (see Trouble No. 21).</p> <p>b. If both ink heater (tank not warm to touch 15 minutes after main power is turned on) and ink pump are not operating (ink not flowing), check fuse F3 on power supply.</p> <p><u>Note:</u> If heater has not operated for at least 15 minutes, tank may not be warm to touch. Turn off power, remove cover, and touch manifold to see if it is warm.</p> <p>If F3 is good, turn power off, remove tank cover, and depress ink heater thermostat reset button (Figure 18). If tank does not heat up or stay warm, and pump still does not operate, check for 26 v ac at pins 32 and 33 of the DAR/A3 connector. If not present, trouble may be in transformer at ink heater and line feed bracket assembly.</p> <p>c. If 26 v ac is present at DAR/A3, yet tank does not heat and pump does not operate, replace DAR.</p>

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
23 (contd)		d. If either heater or pump is operating, but not both, replace DAR.
24	Printing trouble confined to a particular nozzle – adjacent odd and even characters, (i.e. 1 and 2, 7 and 8, etc).	<p>a. If both characters are missing, the jet may be clogged or the valving electrode may not be turning on (550 v not present). Clean according to instructions in Part 3. If cleaning does not clear the trouble, cause is probably defective TP322145 spacing drive card.</p> <p>b. If characters are partly formed or distorted, trouble may be dirty electrodes or defective recorder. If cleaning does not clear trouble, replace recorder.</p>
25	A number of characters partially or totally missing in any location on the page.	<p>If it can be determined that this group is controlled by the same X- or Y-driver, the TP322151 input logic card is defective or the wiring is bad on the DAG connectors.</p> <p>a. If three or four particular characters are totally missing regardless of their position on the line, an X-driver or connector is bad. Refer to Table H to determine which X-drivers affect which characters. Set up one of the missing characters on the DATS1 simulator and check for signal voltage at the points indicated in Table H. If voltage is not present at the indicated DAG/B1 connector, the X-driver is bad and the input logic card (TP322151) should be replaced. If the voltage is present at the DAG/B1 connector, but not at the corresponding DAG/A4 connector, the wiring or connectors between these points should be checked.</p> <p>b. If a group of 15 or 16 characters are partially missing, regardless of their position on the line, a Y-driver or connector is bad. Refer to Table I to determine which Y-drivers affect which characters. Set up one of the missing characters on the DATS1 simulator and check for signal voltage at the points indicated in Table I. If the voltage is not present at the indicated DAG/A4 connector, the Y-driver is bad and the input logic card (TP322151) should be replaced. If the voltage is present at the DAG/A4 connector, but not at the corresponding DAG/B1 connector, the wiring or connectors between these points should be checked.</p>
26	Every other character missing.	Trouble is in TP322146 tracing drive card. Replace and recheck.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
27	A character is malformed or missing regardless of location on page.	Trouble is likely to be on individual character sheet in the DAG module or open diode on program board. Replace appropriate core plane assembly (entire memory assembly – program board, output board, and character sheets): TP325740 ASCII TP325760 Baudot Communications TP325770 Baudot Weather
28	Character groups missing in uniformly spaced locations across a line of copy (except as indicated in Trouble No. 30).	Trouble is probably in TP322150 output logic card.
29	Defective printing – missing pair or pairs of characters.	Defective reed switch or driver circuit. With power off, ground pin A3-11 of the DAG front panel, taking care that no other pins are grounded. Turn the ac power on. When the READY lamp comes on, set the REC. MSG. switch on the DATS1 to ON, the CHAR. AVAIL. switch to MAN, and the OUTPUT switch to H.V. Depress the PAPER ADVANCE button and release. Using the MAN. STEP switch, step the printer to the suspected column, and with the high voltage probe, check for +550 v at the rear of the spacing drive circuit card TP322145. If +550 v is not observed, replace the circuit card. Take care that the +550 v is present at the suspected column and not during the printing of the two previous characters. If +550 v does appear, yet the characters are not printing, the problem could be a clogged jet or blocked electrodes which should be cleaned as described in Part 3.
30	Defective printing – every other pair of characters missing.	<ol style="list-style-type: none"> a. If +550 v is not appearing at the valve (DAR/A3) where the characters are missing, at the time they should be printing, the trouble is in the TP322150 output logic card. Check by connecting DATS1 simulator and using MAN. STEP pushbutton to step simulator to defective column position. Ground connector DAG/A3-11 and measure dc voltage at valve. b. If +550 v is appearing at the valves in question, the trouble is on the TP322146 tracing drive card. c. Try to correct the trouble by replacing high voltage tubes V3 or V4, if the trouble is confined to odd numbered nozzles. If the trouble is confined to even numbered nozzles, the cause could be V1 or V2. If tube replacement does not correct the trouble, the TP322146 tracing drive card is defective.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
31	Distorted printing – improper vertical alignment with underscoring.	Check fuse F7
32	Distorted printing – narrow characters.	<p>Defective horizontal amplifier tube or circuit. Remove the DAR/A2 connector from the recorder. Set the OUTPUT switch on the DATS1 to the H.V. position, the CHAR. AVAIL. switch to MAN, and the REC. MSG. switch to ON. Set the meter to the 12-volt dc range.</p> <ol style="list-style-type: none"> a. To check the right horizontal amplifier (V5), insert the high voltage probe into pin 8 of the DAR/A2 connector. Depress and release the PAPER ADVANCE key on the printer. The meter should read about 1350 v. Depress and release the MAN. STEP button of the DATS1 once. The meter reading should be about 2200 v. Set the REC. MSG. switch to OFF. b. To check the left horizontal amplifier (V6), insert the high voltage probe into pin 10 of the DAR/A2 connector, and turn the REC. MSG. switch ON. Depress and release the PAPER ADVANCE key on the printer. The voltmeter should read about 2850 v. Depress and release the MAN. STEP button of the DATS1 once. The meter should read about 2000 v. Set the REC. MSG. switch to OFF, remove the high voltage probe from the DAR/A2 connector, and reconnect the connector to the recorder. c. If the proper voltages are not observed in these tests, replace the appropriate horizontal amplifier tube and recheck the operation. If the proper voltages are still not present, yet the tubes are known to be good, replace the TP322146 printer drive circuit card and recheck the operation.
33	Distorted printing – every other pair of characters distorted or out of line vertically.	<ol style="list-style-type: none"> a. If character pairs associated with odd numbered valves are distorted, the cause could be high voltage tube V3 or V4. If character pairs associated with even numbered valves are distorted, V1 or V2 could be the cause. b. If the tubes are found to be good, the cause is the TP322146 tracing drive card.

"DATASPEED" PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
34	All characters malformed.	<p>a. TP322150 output logic card is defective.</p> <p>b. Manifold cover TP330022 is loose on manifold, causing pressure fluctuations in nozzles. Carefully tighten screws on manifold cover.</p> <p>CAUTION: DO NOT OVERTIGHTEN – COVER MAY WARP AND CAUSE FURTHER MALFORMING OF CHARACTERS.</p>
35	All characters in one column malformed (usually at bottom of character).	TP322145 spacing drive card defective.
36	Every other character missing.	Trouble is in TP322146 tracing drive card.
37	All characters dark and distorted.	Trouble may be caused for a short period by overheating of the manifold which should result in operation of the thermal cutout, followed by light printing. See Trouble No. 23.
38	Overprinting.	<p>a. If overprinting occurs in one character pair location (associated with one jet), the trouble is probably in the TP322145 spacing drive card.</p> <p>b. If overprinting occurs in all locations across the page, and line feed is operating normally, the TP330308 high voltage regulator located in the cover assembly of the high voltage power supply may be at fault. Check the dc voltage at DAR/A4-1. If this voltage exceeds -1900 v by a significant amount, replace high voltage regulator.</p> <p>c. If overprinting occurs in every second column, the TP322146 tracing drive card is probably the cause.</p>
39	Errors in copy – wrong character printing.	If it can be determined that one level is always marking or spacing (see code charts of Figure 4), TP322151 input logic card is defective.

“DATASPEED” PRINTER (RECEIVE-ONLY) TROUBLESHOOTING CHART (Continued)

TROUBLE NO.	TROUBLE OBSERVED	ANALYSIS AND CORRECTION
40	Missing dots on a number of characters.	TP322150 output logic card or its connectors is probable cause. Set up the code letter B on the DATS1 simulator and observe the printed character for dot pattern. See Table J and Figure 19 to determine which dot numbers are missing and which Z-drivers affect these dots. If signal voltage is not present at the indicated DAG/D2 pins, the Z-driver is bad and the output logic card (TP322150) should be replaced. If the signal voltage is present at the DAG/D2 pin, but not at the corresponding DAG/C2 pin, the wiring or connectors should be checked.
41	Improper spacing – characters appear in pairs or overlay occurs.	See <u>PLATEN-MANIFOLD CLEARANCE</u> adjustment in Section 578-500-700 (formerly 592-820-700).
42	Set does not automatically line feed and/or carriage return after receipt of 81st character.	Trouble is in TP322150 output logic card.

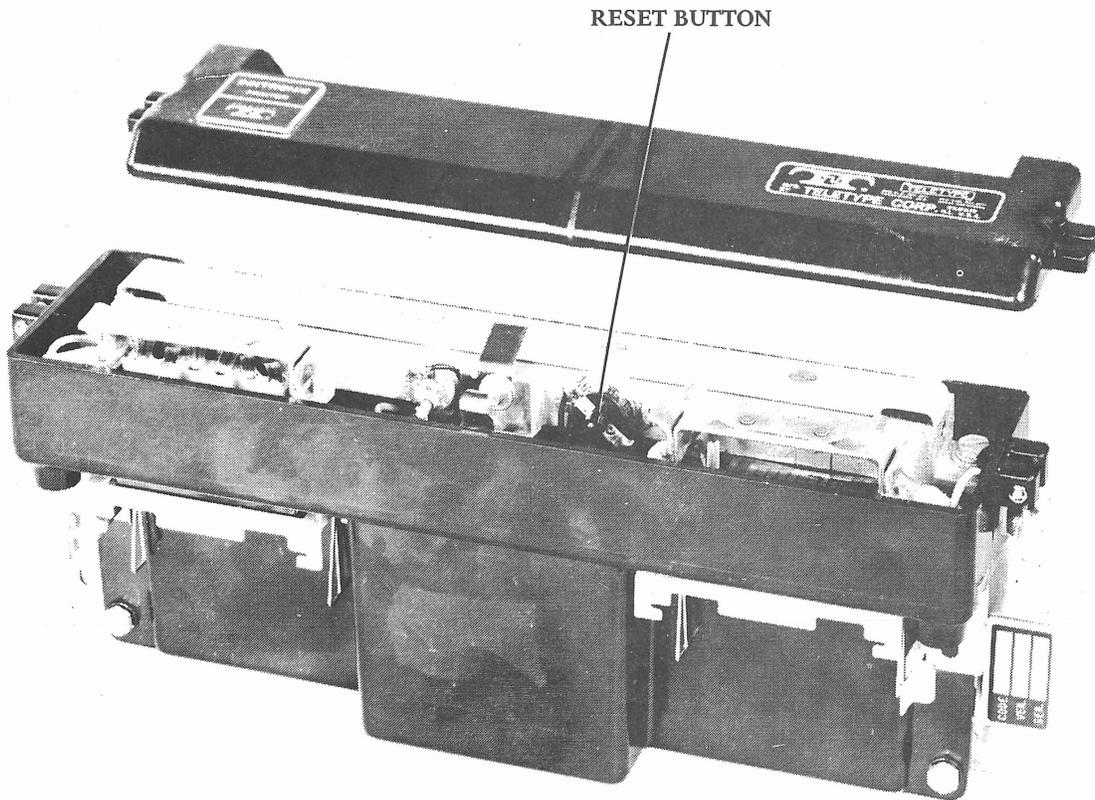


Figure 18 - Location of Ink Heater Thermostat Reset Button

TABLE H
MISSING CHARACTERS WHEN X-DRIVER IS BAD

DRIVER	CHARACTERS	CHECK DAG FOR NO SIGNAL ON	
		PIN NO.	PIN NO.
X1	@ 0 P	A 420	B130
X2	! A 1 Q	418	128
X3	" B 2 R	422	126
X4	# C 3 S	424	124
X5	\$ D 4 T	428	122
X6	% E 5 U	419	120
X7	& F 6 V	417	118
X8	' G 7 W	426	116
X9	(H 8 X	423	114
X10	) I 9 Y	421	112
X11	* J : Z	425	110
X12	+ K ; [	427	108
X13	, L < \	414	106
X14	- M =]	416	104
X15	. N > ^	412	102
X16	/ 0 ? -	410	101

TABLE I
MISSING HALF-CHARACTERS WHEN A Y-DRIVER IS BAD

DRIVER	CHARACTERS	MISSING HALF OF CHARACTER	CHECK DAG FOR NO SIGNAL ON	
			PIN NO.	PIN NO.
Y1-1	! " # \$ % & ' () * + , - . /	1st	A402	B129
Y1-2	! " # \$ % & ' () * + , - . /	2nd	404	127
Y2-1	0 1 2 3 4 5 6 7 8 9 : ; < = > ?	1st	406	125
Y2-2	0 1 2 3 4 5 6 7 8 9 : ; < = > ?	2nd	408	123
Y3-1	@ A B C D E F G H I J K L M N O	1st	409	121
Y3-2	@ A B C D E F G H I J K L M N O	2nd	411	119
Y4-1	P Q R S T U V W X Y Z [] ^ -	1st	413	117
Y4-2	P Q R S T U V W X Y Z [] ^ -	2nd	415	115

TABLE J

MISSING DOTS WHEN Z-DRIVER IS BAD

DRIVER	DOTS	CHECK DAG FOR NO SIGNAL ON	
		PIN NO.	PIN NO.
Z1	1 and 17	D202	C216
Z2	2 and 18	204	116
Z3	3 and 19	206	218
Z4	4 and 20	208	114
Z5	5 and 21	210	220
Z6	6 and 22	212	112
Z7	7 and 23	214	222
Z8	8 and 24	216	110
Z9	9 and 25	218	224
Z10	10 and 26	220	108
Z11	11 and 27	222	226
Z12	12 and 28	224	106
Z13	13 and 29	226	228
Z14	14 and 30	228	104
Z15	15 and 31	230	230
Z16	16 and 32	215	102

9	10	11	12	13			
	8				14		
	7				15		
	6				16		
	5	18	19	17	20		
	4					21	
	3					22	
	2					23	
	1					24	
30	29	28	27	26	25		

Figure 19 - Dot Sequence Used in Forming Letter B

TABLE K
INTERCHANGEABILITY OF REDESIGNED (2101AB)
COMPONENTS INTO 2101AA "DATASPEED" PRINTER

2101AA COMPONENT	2101AB COMPONENT	REMARKS
TP322146	TP322157	Interchangeable
TP322145	TP322145	Interchangeable
TP322150	TP322158	Cut strap J and add strap H on TP322158 when used with card TP303930; cut strap H and add strap J when used with card TP303950 (other strap closed)
TP322151 and TP322152 or TP322151 and TP322153	TP322156 and TP322154 or TP322156 and TP322155	Interchangeable but only in sets of 2
TP330152	TP330152	Interchangeable
TP303930	TP303950	Interchangeable only when card TP322158 is present
DAR2	DAR2	Interchangeable using mounting hardware supplied
DAPS5	DAPS8	Interchangeable only if TP322157 tracing drive card is used, and if control panel wiring is changed as indicated in Table L
DAT2	DAT3	Interchangeable using jumper cable supply

TABLE L
WIRING CHANGES REQUIRED ON CONTROL PANEL IF
DAPS5 POWER SUPPLY IS REPLACED BY DAPS8 POWER SUPPLY

WIRING TO BE CHANGED	ORIGINAL CONNECTION				REVISED CONNECTION			
	FROM		TO		FROM		TO	
	COMP.	TERM.	COMP.	TERM.	COMP.	TERM.	COMP.	TERM.
Resistor	B	1NO	LB	1L	B	2NO	LB	1L
Orange Wire	B	2NO	CP1	18	B	1NO	CP1	18
Black Wire	C	3C	D	1NO	C	3C	E	1C
Black Wire	D	1NO	E	1C	D	2NO	D	2NC
Slate Wire	D	2NO	CP1	4	D	1NO	CP1	4