

# TECHNICAL BULLETIN

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1532 I/O CONSOLE ADJUSTMENT PROCEDURES

The following adjustment procedures should be used in conjunction with the listed references.

REFERENCES

1. Model 2500 Digitronics Reader Manual, Technical Manual for Perforated Tape Reader
2. Bulletin 281B, Volume I, Technical Manual for Teletypewriter (Theory of Operation)
3. Bulletin 281B, Volume II, Technical Manual for Teletypewriter (Adjustments)
4. PX 3618-0-2, Technical Manual for 1532 I/O Console (Theory of Operation)
5. Bulletin 215B, Technical Manual for High Speed Punch

READER ADJUSTMENTS

1. Capstan Alignment.
  - a) Check horizontal and vertical alignment of the capstan with a small machinist's square.
  - b) If the shaft is not in perfect alignment, place small shims under the motor mounting screws. The bottom edge of the capstan must be on the same level or slightly above the read head assembly. This adjustment should be checked whenever the motor assembly is removed for drive belt replacement.
2. Pinch Roller Alignment.
  - a) Visually check horizontal alignment of the pinch roller.
  - b) If adjustment is necessary, loosen the four screws on the pinch roller spring. (See figure 6-3 in the Digitronics manual.)
  - c) Check the vertical alignment or parallelism between the pinch roller and capstan by placing a feeler gauge between the rollers. The gap spacing should be equal at both ends or tape will tend to skew.
  - d) If adjustment is necessary, loosen the two screws that hold the roller mount block to the bracket solenoid mounting and move roller mount block until pinch roller is parallel.
3. Return Spring Adjustment.
  - a) Enable the reader by grounding test point G10 in the reader logics.

- b) Using a spring scale, pull the pinch roller away from the capstan until solenoid deactivates. This force should be 2-1/2 pounds minimum.
- c) If adjustment is necessary, turn locknut no. 4 as shown on figure 6-3 in the Digitronics manual until solenoid deactivates.
- d) Turn locknut counterclockwise until solenoid reactivates and give an additional half turn.
- e) If the force is less than 2-1/2 pounds minimum, check gap spacing and readjust return spring.

4. Pinch Roller-Capstan Gap Adjustment.

- a) Check the gap spacing between the pinch roller and the capstan. The gap should be 0.008 inch with the pinch roller deactivated.
- b) If adjustment is necessary, loosen the two allen screws that hold the solenoid assembly to the front panel.
- c) Adjust for an 0.008 inch gap.

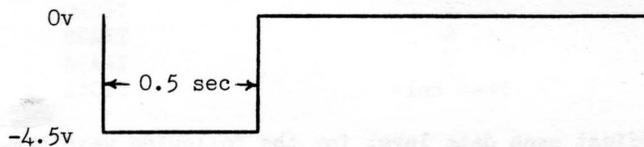
5. Brake Assembly Alignment.

- a) Read a tape off-line, stopping tape periodically. The feedhole should be centered over the photodiode with tape stopped.
- b) Reform the brake spring if the brake armature does not rest squarely and evenly upon the poles of the coil assembly.
- c) If the tape feedhole is stopping slightly past the photocell, the brake spring tension should be increased.

6. Reader Checks.

- a) Depress READ indicator.
  - 1) READ indicator should light.
  - 2) Reader motor should begin running (power switch on, reader must be on).
  - 3) Light source on reader should be on.
- b) Set tape levels switch to 8.
- c) Pull tape width guide out as far as possible and put it in the down position.
  - 1) All eight indicators of the input register should light and stay lighted.
- d) Clear READ.
  - 1) READ indicator should clear.
  - 2) Reader motor should stop.
  - 3) All eight bits of the input data register should clear.

- e) Adjust read delay 19F00 as follows: <sup>11B.</sup> R1 Right.
- 1) Connect oscilloscope to TPG6.  
Adjust as looking from the front for a delay of 0.5 seconds.  
(Externally trigger on TPC2)



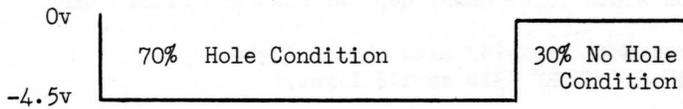
- f) Put tape width guide down; depress READ and START READ.
  - 1) Input data register bits should light.
  - 2) READ and START READ should light.
- g) Put tape width guide to the UP position.
  - 1) START READ should clear.
  - 2) Input data register bits should remain set.
- h) Clear READ

7. Reader Data Level Adjustments.

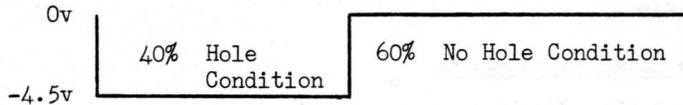
- a) Preparations for adjustments.
  - 1) Reader power to ON.
  - 2) Tape levels switch to 6-7 if using 7 level tape or to 8 if using 8 level tape.
  - 3) ON-LINE/OFF-LINE switch to OFF-LINE.
  - 4) Make a tape loop with all levels punched.
  - 5) Position the tape loop in the reader and put the tape width guide down.
- b) Obtain motion as follows:
  - 1) Depress READ.
  - 2) Ground TPG11.
- c) Tape should be read at normal operating speed.
- d) The data levels should be adjusted for a 70 percent hole condition and a 30 percent no-hole condition. The feed hole should be adjusted for a 40 percent hole condition and a 60 percent no-hole condition. The adjustment pots are located on the reader itself and are in sequential order from the operator, starting with level 0 and ending with the feed hole. The levels and test points are as follows:

LEVEL	TEST POINT
0	TPE19
1	TPF12
2	TPF16
3	TPF20
4	TPG16
5	TPG20
6	TPA28
7	TPA30
Feed hole	TPC14

Adjust each data level for the following waveform.



Adjust feed hole for the following waveform.



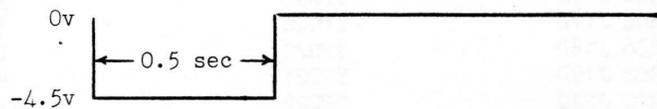
NOTE: Digitronics perforated tape reader manual will answer any questions regarding reader operation.

#### PUNCH ADJUSTMENTS

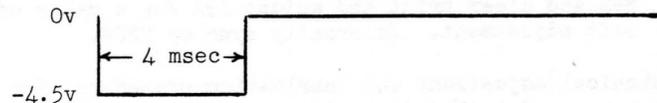
##### 1. Punch Checks.

- a) Load a roll of tape on the punch and manually feed it through the tape guide path. Rotate the punch flywheel manually to ensure that there is no binding.
- b) Depress PUNCH indicator. The indicator should light and the punch should begin running. If the punch doesn't run, check the power switch on the punch itself.
- c) Depress the manual tape feed arm on the punch and feed tape through the punch block. Only the feed holes should be punched.
- d) The feed holes punched must be clean cut and the holes must be 10 per inch as measured with a tape guide. (Teletype technical manual, high speed tape punch set, Bulletin 215B will answer any questions regarding punch operation or adjustments.)
- e) When manually feeding tape, check the tape wheel brake for proper operation.

- f) Check the tape remaining gauge for proper operation.
- g) Depress punch CLEAR switch and note that the indicator clears and the punch stops running.
- h) Adjust 52D02 delay as follows:
  - 1) Connect oscilloscope to test point TPA2.
  - 2) Set and clear the punch indicator and adjust J10A (right adjustment as viewed from the front) for a delay of 0.5 second. (It may be necessary to trigger externally on TPA5.)



- i) Adjust tape feed delay 51E00 as follows:
  - 1) Connect oscilloscope to TPF2.
  - 2) Hold tape feed indicator depressed and adjust J12B for a delay of 4 milliseconds.



NOTE: If tape doesn't feed when tape feed button is depressed, check the air gap between punch timing wheel and the magnetic pick up. Adjust gap at the point of least clearance for a gap of 0.005 inch.

- j) Master clear console and depress tape feed.
  - 1) While holding tape feed depressed, set bits 0-6 (0-7 with 8 level tape) in the output register. Tape should now be fed with all levels punched.
  - 2) Release tape feed.
    - a. Tape feed indicator and all output register indicators clear.
    - b. Punch should cease running.

#### KEYBOARD AND PRINTER ADJUSTMENTS

##### 1. Adjustment of Printer Delay Cards.

- a) Install tape loop in the reader. Set ON-LINE/OFF-LINE switch to OFF-LINE.

- b) Set tape width guide to the down position.
- c) Set READ, START READ, PRINT and put the READ/READ-ONE switch to READ.
- d) Connect scope to TPC22 and adjust J25C (76H02) for a 4 milli-second delay.
- e) Adjust serializer delays at the following test points for the specified delay.

DELAY	TEST POINT	TIME
71H02 J16D	TPG18	9.09 ms
71H04 J17D	TPG28	9.09 ms
71H06 J18D	TPD20	9.09 ms
71H08 J19D	TPD21	9.09 ms
71H10 J22D	TPD22	9.09 ms
71H12 J23D	TPE12	9.09 ms
71H14 J24D	TPE13	9.09 ms
71H16 J25D	TPD14	9.09 ms
71H18 J26D	TPD15	9.09 ms
71H18 J27D	TPD16	18.18 ms

- f) Adjust 52D01 as follows:
  - 1) Connect scope at TPD3.
  - 2) Set and clear print and adjust J9A for a delay of 0.5 seconds left adjustment. Externally sync on TPD2.
- 2. The mechanical adjustment and lubrication procedures for the keyboard and printer are detailed in Bulletin 281B, Volumes I and II, Technical Manual for Teletypewriter.
- 3. Time Delay Adjustments.

**NOTE:** Time delay adjustments should be made as accurately as possible. Use the fastest possible sweep time to display each delay time.

- a) Delay adjustment of 52E04.
  - 1) Connect oscilloscope to TPE8.
  - 2) Ground TPG11.
  - 3) Jumper TPE6 to TPE19.
  - 4) Adjust J10A for 2 usec delay. (left adjustment as looking from the front).
- b) Delay adjustment of 27F01, 18D01, 52F03. *Ground G11*
  - 1) Connect oscilloscope to TPC13.
  - 2) Jumper TPE19 to TPA19.
  - 3) Adjust J11B for a 2 microsecond delay. (left adjustment)
  - 4) Connect scope to TPB4.
  - 5) Jumper TPE19 to TPA1.
  - 6) Remove card in J4A.
  - 7) Adjust J9A for a 2 microsecond delay. (right adjustment)

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- 8) Replace card in J4A.
- 9) Jumper TPE19 to TPB20 and ground TPG10. + 611
- 10) Connect scope to TPG31, externally sync on TPG23.
- 11) Adjust J30A for a 4.4 millisecond delay.

c) Delay adjustment of 30F01.

- 1) Remove all jumpers and grounds.
- 2) Set PRINT indicator and READ and START READ.
- 3) Set READ/READ-ONE to READ.
- 4) Connect scope to TPA17.
- 5) Adjust J11B for a 2 millisecond delay.

d) Delay adjustment of 22D00.

- 1) Master clear console and set ON-LINE/OFF-LINE switch to ON-LINE.
- 2) Connect scope to TPA9.
- 3) Repeatedly ground TPA3 with a jumper and at the same time adjust J11A for a 70 millisecond delay.

1532 Punch Motor Delays

At the present time there is the possibility of there being three versions of the punch motor delay circuitry in 1532 I/O Consoles in the field. This delay is to provide time for the punch motor to attain full speed before punching data. Adding to the confusion is that the possibility also exists that there are two versions of this circuitry shown in the technical manual. Depending on FCO status and on the serial number of the 1532, neither of these versions may reflect the actual circuitry in the 1532.

S/N's 1-64 were built with the original delay circuitry shown in Figure 1. S/N's 65-160 were built with the circuitry shown in Figure 2. This was the result of EIR B-93901 and FCO MPL-390. Those S/N's below 65 which had **MPL-390** installed also have the circuitry shown in Figure 2. S/N's 161 and above were built with the circuitry shown in Figure 3. This was the result of EIR E-1034 and is a part of FCO MPL-552B. Also included in MPL-552B is a new P.C. Card type for the 70 millisecc EFR delay.

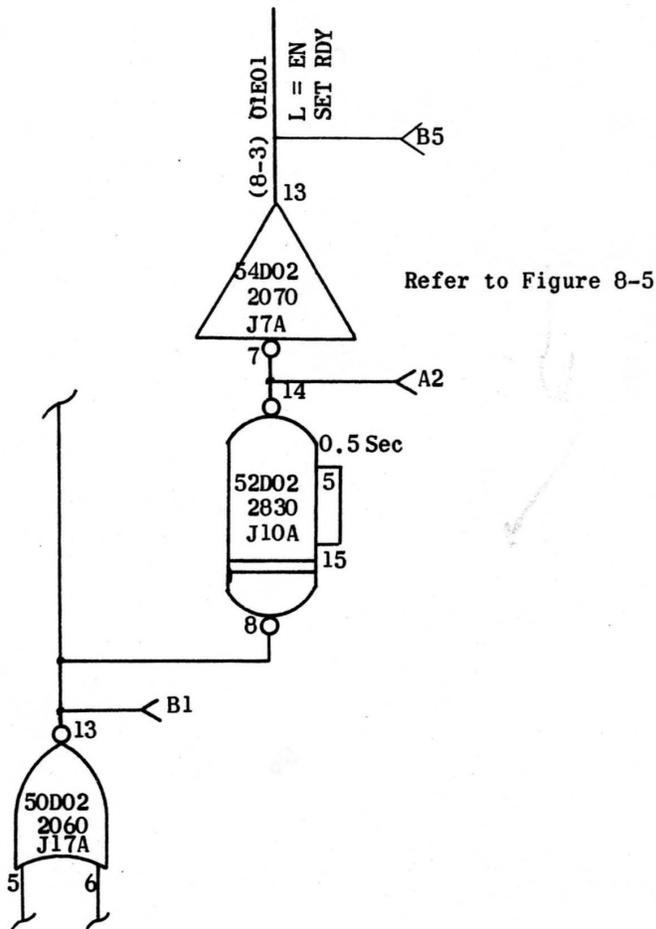


FIGURE 1

1532 Punch Motor Delays

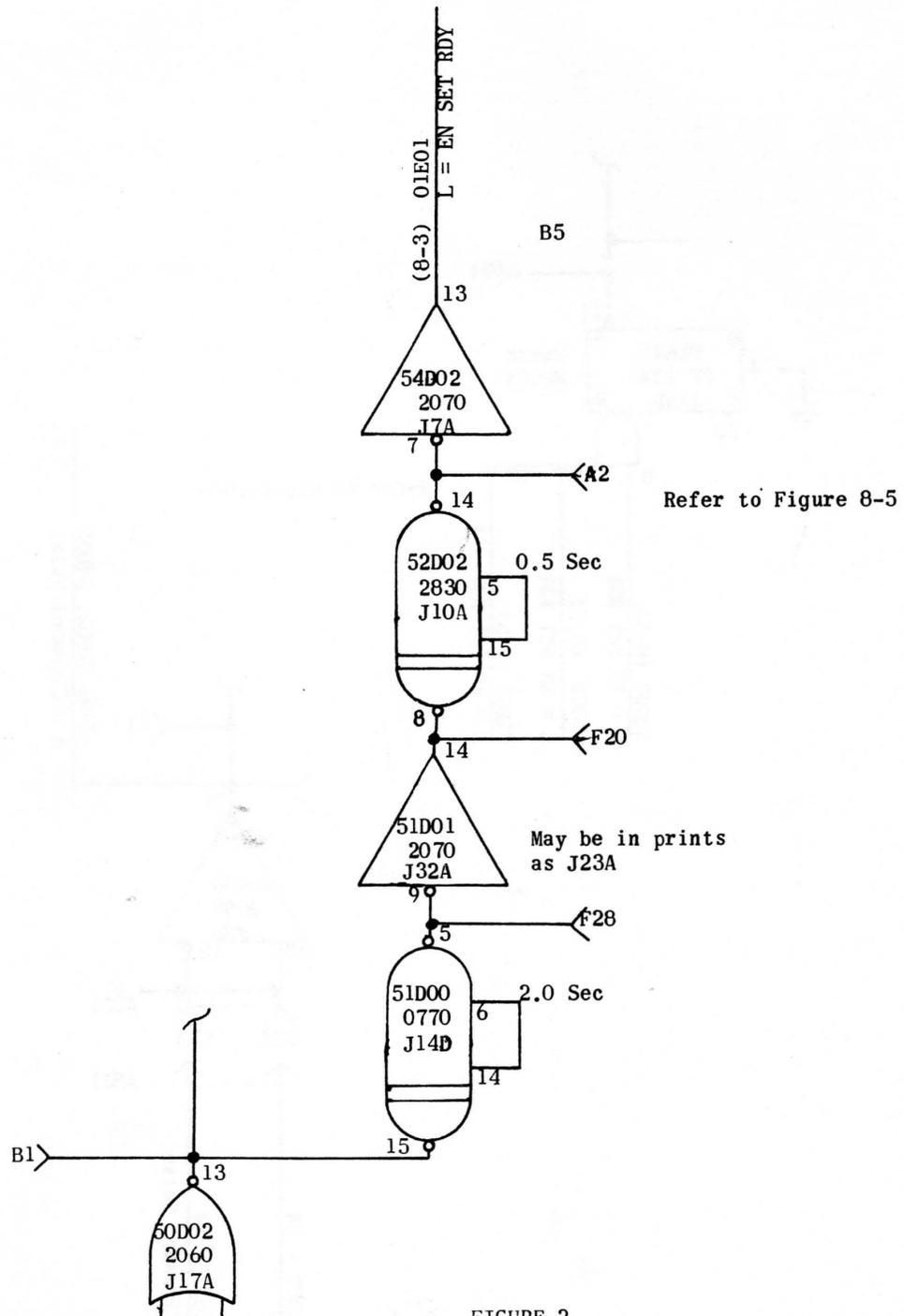


FIGURE 2

1532 Punch Motor Delays

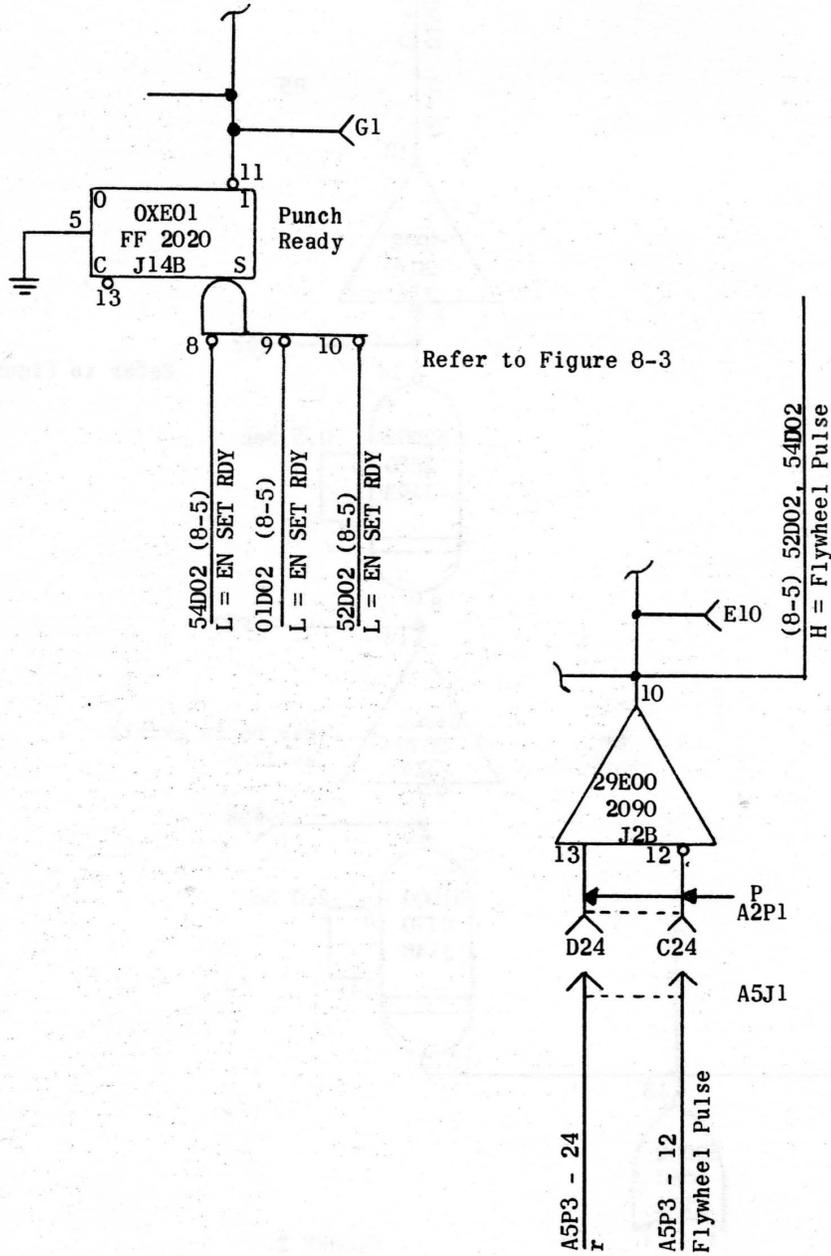


FIGURE 3A

1532 Pulse Motor Delays

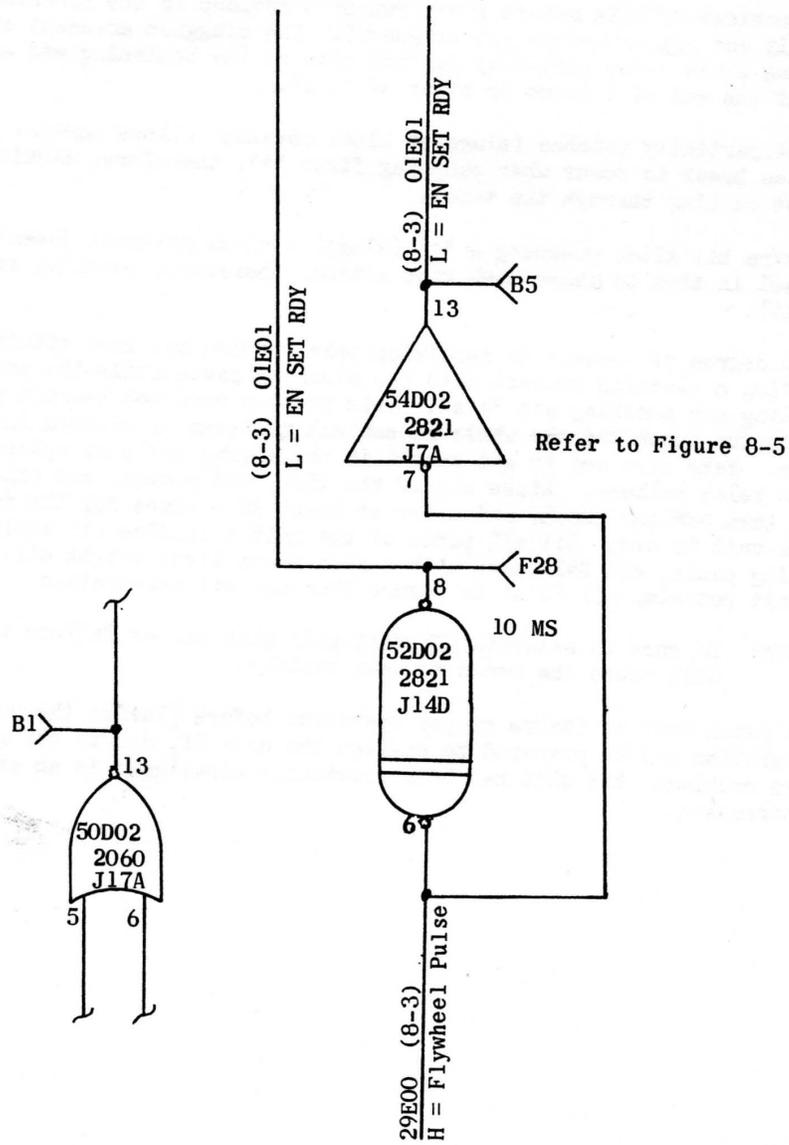


FIGURE 3B

1532 I/O CONSOLE, TTY BRPE-11 PUNCH CLEANING PROCEDURE

This procedure will resolve most of the intermittent bit problems which occur during punch operation without extensive disassembly or realignment.

Most problems of this nature stem from dirt buildup in the Blocking Pawl Assembly and not in mechanical alignment. The sluggish movement of the blocking pawls cause partially punched bits at the beginning and extra bits at the end of a frame or block of "1's".

1. Bit partially punched (sluggish block movement allows partial pawl knee break to occur when punching first "1", therefore, marking but not cutting through the tape).
2. Extra bit after punching a "1" (sluggish block movement doesn't catch pawl in time to cause pawl knee action, therefore, punching an extra bit).

A high degree of success in resolving this problem has been attained by squirting a cleaning solvent into the blocking pawls while the punch is operating and punching all "1's". This portion does not require paper tape in the punch and the whole mechanical unit can be cleaned in this manner. Take care not to get caught in the moving parts or splash solvent on the relay pullers. Rinse all of the dirt, old grease, and oil out of the unit, turn off the punch, and allow at least 30 minutes for the felt pads in the unit to dry. Oil all parts of the unit including all moving joints, blocking pawls, and felt pads with a good grade light weight oil. Operate the unit punching all "1's" to insure thorough oil penetration.

**CAUTION:** Be sure to saturate all felt pads with oil as failure to do so will cause the punch to wear rapidly.

Run a punch test to insure proper operation before placing the unit back in operation and be prepared to realign the unit if, due to the above mentioned problems, the unit had been previously misaligned in an attempt to compensate.

1532 MISCELLANEOUS NOTES

TALOS ASSEMBLY BOARD REPLACEMENT

If the capacitor-coil assembly board, part number 7051182-00, is replaced on the teletypewriter of TALOS 1532's below S/N 165, it should be modified to the same shape as the one it is replacing. The board (located in the front left corner) will interfere with the teletypewriter door latch unless it is modified by filing off the corner of the board. The board has been moved to a new position, out of the way of the door latch, on TALOS 1532's S/N 165 and up.

1532 I/O Console Modification For Operation  
In Keyboard Interrupt Mode

1. As of 1973 SSN-688 and DDG NTDS systems and others for-  
seen may desire to use the 1532 I/O Console for Tele-  
typewriter Keyboard Interrupt generation in the mock-up  
or tactical environment or both.
2. To place the 1532 I/O Console constantly in keyboard  
interrupt mode without the necessity of holding keyboard  
interrupt indicator switch XDS22 constantly depressed  
it is suggested that pin 3 of indicator switch XDS22 be  
shorted to pin 5 to effect continuous keyboard interrupt  
mode.
3. This continuity may be selectively switched thru the  
usage of an externally attached on-off micro switch  
attached to the 1532 control panel front and wired to  
XDS22. Alternately, if not in conflict with paper tape  
reading requirements on site, paper tape LEVEL SWITCH  
52 may be wired at pin 10 and 1 or 2 or 3 as desired to  
obtain continuity when switch is in positions 5 or 6-7  
or 8 respectively.
4. Any such modifications to the 1532 I/O Console are  
unofficial and should be temporarily plugged only as  
necessary on site and removed if console is moved to  
any new usage.

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UNIVAC EQUIPMENT MANUALS

HARDWARE

<u>PRODUCT</u>	<u>NAME</u>	<u>S/N</u>	<u>PX NO.</u>
1532	I/O Console		3618-0-2
	Maintenance Study Guide		3949-0-1
	Maintenance Test 18-30 Bit		4236-0-2
	Digitronics Reader		3871-0-1