

CENTRAL UNIT
MAINTENANCE OPERATION PROCEDURES
ENGINEERING AND ADMINISTRATIVE DATA ACQUISITION SYSTEM
NETWORK MANAGEMENT (EADAS/NM)

CONTENTS	PAGE
1. GENERAL	1
2. OPERATING PROCEDURES	1
A. Handling Magnetic Tape—Precautions	1
B. DEC* TU16 Magtape	2
C. LA36 DECwriter II	4
D. RP04 Disk Pack	8
E. CR11 Card Reader	9
F. DATASPEED® 40 Operator Consoles	11
G. System Start-up	14
H. System Backup	15
I. Creating Backup Tapes	15
J. Generic Loading Procedures	18
K. Updating Generic Programs	19

1.02 This section is reissued to reflect changes due to generic 1NM2 of the system.

1.03 Before any of the procedures in this section are performed, a release of the EADAS/NM CU equipment should be obtained from the traffic department.

1.04 Refer to Section 252-116-302 for trouble sectionalizing procedures associated with EADAS/NM CU equipment.

1.05 Refer to Section 201-653-504 for testing and replacing a telemetry-to-computer translator (TCT).

1.06 **Lettered Steps:** A letter a, b, c, etc. added to a step number in Part 2 of this section indicates a procedure which may or may not be required depending on local conditions. The condition under which a lettered step, or a series of lettered steps, should be made is given in the PROCEDURE column, and all steps governed by the same condition are designated by the same letter within a procedure. Where a condition does not apply, all steps designated by that letter should be omitted.

2. OPERATING PROCEDURES

2.01 The following describes magnetic tape precautions.

A. Handling Magnetic Tape—Precautions

- Always handle a tape reel by the hub hole. Squeezing the reel flanges can cause damage to the tape edges when winding or unwinding tape.

* Registered Trade Mark of Digital Equipment Corporation

1. GENERAL

1.01 This section provides operating procedures required for maintenance purposes for the EADAS/NM Central Unit (CU) peripheral equipment. It also describes start-up and back-up procedures.

NOTICE

Not for use or disclosure outside the Bell System except under written agreement

SECTION 252-116-301

- Never touch the portion of tape between the BOT and EOT markers. Oils from fingers attract dust and dirt. Do not allow the end of the tape to drag on the floor.
- Never use a contaminated reel of tape. This spreads dirt to clean tape reels and can affect tape transport operation.
- Always store tape reels inside their containers. Keep empty containers closed so that dirt cannot get inside.
- Inspect tapes, reels, and containers for dust and dirt. Replace take-up reels that are old or damaged.
- Do not smoke near the transport or tape storage area. Tobacco smoke and ash are specially damaging to tape.
- Do not place the DEC magtape near a line printer or other device that produces paper dust.
- Clean the tape path frequently (see appropriate DEC TU-16 magtape documentation).
- Do not jerk the reel when winding tape by hand. This can distort or compress the tape on the reel and damage the tape.

B. DEC TU16 Magtape

2.02 The DEC TU16 magtape unit is shown in Figure 1. Controls and indicators are shown in Figure 2 and listed in Table A. Associated with each control or indicator is a description of its function. All controls and indicators are located in a control box (Fig. 2) mounted to the left of the file reel.

2.03 The following describes applying power, loading and unloading magnetic tape, and restart procedures.

STEP	PROCEDURE
Applying Power	
1a	If the 861 power controller REMOTE ON/OFF/LOCAL ON switch is in the REMOTE ON position, the power is controlled by the processor POWER key. This method is used in normal operation.
2b	If the processor POWER key is not activated, the power may be turned on locally by setting the 861 power controller REMOTE ON/OFF/LOCAL ON switch to the LOCAL ON position. This method may be used during maintenance.
Loading Magnetic Tape	
3	Operate OFF-LINE/ON LINE switch to OFF-LINE.
4	Apply power to the transport (Step 1a or 2b).
5	Operate LOAD/BR REL switch to BR REL position to tighten the hubs on the reels for removing or fastening.
6c	If data is to be written on the tape, place a write enable ring in the tape reel groove.
7d	If data on the tape is <i>not</i> to be erased or written over, ensure that there is no ring in the groove.

STEP	PROCEDURE
8	Mount the file reel onto the lower hub (Fig. 3), with the groove facing toward the back (away from the operator).
9	Ensure that the reel is firmly seated against the flange of the hub and that the reel hub is securely tightened by hand. To tighten the reel hub, turn it clockwise.
10	Mount the take-up reel onto the upper hub, with the groove facing toward the back.
11	Repeat Step 9.
12	Operate the LOAD/BR REL switch to the BR REL position.
13	Manually unwind tape from the file reel and thread the tape by the tape guides and head assembly as shown in Figure 3.
14	Wind about four turns of tape onto the take-up reel.
15	Operate the LOAD/BR REL switch to the LOAD position to draw the tape into the vacuum columns.
16	Operate the FWD/REW/REV switch to the FWD position.
17	Operate the START/STOP switch to the STOP position and then to the START position to advance the tape to the load point. When the BOT marker is sensed, tape motion stops, the FWD indicator extinguishes, and the LD PT indicator lights. <i>Note:</i> If tape motion continues for more that 10 seconds, there is either no BOT marker on the tape or too much leader has been wound on the take-up reel covering the BOT marker.
18e	If there is too much leader on the take-up reel covering the BOT marker, operate the START/STOP switch to the STOP position.
19e	Operate the FWD/REW/REV switch to the REV position.
20e	Operate the START/STOP switch to the START position. The tape should move to the BOT marker (load point) and stop.
21	Operate OFF-LINE/ON LINE key to ON-LINE.
Unloading Magnetic Tape	
22f	If the tape is at the BOT marker, operate the OFF-LINE/ON-LINE switch to OFF-LINE.
23f	Operate the LOAD/BR REL switch to the BR REL position to release the brakes.
24f	Gently hand wind the file reel (lower reel) in a counterclockwise direction until all of the tape is wound on the reel.

STEP	PROCEDURE
25f	Operate the LOAD/BR REL switch to the LOAD position.
26f	Turn the hub on the lower reel counterclockwise to loosen the file reel.
27f	Remove the file reel from the hub assembly and operate LOAD/BR REL switch to BR REL position.
28g	If the tape is not at the BOT marker, operate the ON-LINE/OFF-LINE switch to the OFF-LINE position.
29g	Operate the START/STOP switch to the STOP position.
30g	Operate the FWD/REW/REV switch to the REW position.
31g	Operate the START/STOP switch to the START position. The tape should rewind until the BOT marker is reached.
32g	Perform Steps 22f thru 27f.

Restart After Power Failure

Note: In the event of a power failure, the TU16 automatically shuts down and tape motion stops without physical damage to the tape. However, if the TU16 was on-line and was either reading or writing at the time of the power failure, return to Applying Power, Step 1a.

C. LA36 DECwriter II

2.04 The controls used for operation of the LA36 DECwriter II, Figure 5, (with the exception of the keyboard) are listed in Table B.

2.05 The following procedures describe the method for loading paper and changing the ribbon

in the LA36 DECwriter II. When initially loading paper in the LA36 DECwriter II or when adjustments need to be made (paper positioning, impression adjustment, horizontal positioning, and fine vertical positioning) perform the loading paper procedure. When simply reloading paper and no adjustments are required, perform the reloading paper procedure.

STEP	PROCEDURE
Loading Paper	
Paper Positioning	
1	Operate POWER switch to OFF.
2	Open DECwriter cover.

STEP

PROCEDURE

- 3 Place the tractor-feed paper on the floor between the legs of the DECwriter.
Note: The term tractor-feed refers to the holes on either side of the paper.
- 4 Ensure that the leading edge of the forms is directly below the parallel to the feed slot.
- 5 Open the left tractor cover (Fig. 6) so that the tractor pins are exposed.
- 6 Move the carriage adjustment lever (Fig. 6) to the highest number.
- 7 Feed the paper through the load channel under the terminal and align the left paper margin holes over the left tractor pins.
- 8 Close the left tractor cover.
- 9 Loosen the tractor adjustment knob (Fig. 6) on the right tractor about 1/2 turn.
- 10 Open the right tractor cover (Fig. 6) and slide the tractor to a position where the holes on the right paper margin align directly over the tractor pins.
- 11 Close the tractor cover.
Caution: *Ensure that the paper does not pull against the tractor pins or bow in the middle.*
- 12 Tighten the tractor adjustment knob.

Impression Adjustment

Note: The carriage adjustment lever (Fig. 6) is normally set forward (to number 1) for single thickness paper. The following procedure (Steps 13 and 14) is applicable only for multipart forms.

- 13 Set the carriage adjustment lever to the number corresponding to the number of parts in the form.
- 14 Turn the paper advance knob (Fig. 6) counterclockwise while moving the carriage adjustment lever forward one notch at a time until the paper smudges. Move the lever back one notch at a time until the paper no longer smudges.

Note: If the impression is unsatisfactory due to a worn ribbon, perform the changing ribbon procedure. An indication of a worn ribbon is that the first copy in a multipart copy is poor but the remaining copies are good.

Horizontal Positioning Adjustment

Note: The horizontal positioning adjustment enables the paper to be shifted left or right (1/2 inch maximum). Shifting the paper provides a simple means of aligning the type within the appropriate columns on the paper.

STEP

PROCEDURE

- 15 Loosen both tractor adjustment knobs (Fig. 6) about 1/2 turn.
- 16 Move the tractors the desired amount (1/2 inch maximum) to have the characters type in the appropriate columns.
- 17 Tighten the tractor adjustment knobs.

Note: Ensure that the paper does not pull against the tractor pins or that the paper does not bow in the middle.

Fine Vertical Positioning

- 18 For fine vertical positioning, press in and turn the paper advance knob (Fig. 6) to the desired position.
- 19 Close DECwriter cover.
- 20 Operate POWER switch to ON.

Reloading Paper

- 21 Operate POWER switch to OFF.
- 22 Open DECwriter cover.
- 23 Place the tractor-feed paper on the floor between the legs of the DECwriter.
Note: The term tractor-feed refers to the holes on either side of the paper.
- 24 Open both tractor covers (Fig. 6) so that the tractor pins are exposed.
- 25 Ensure that the leading edge of the forms is directly below and parallel to the feed slot.
- 26 Feed the paper through the load channel under the terminal and align the paper holes over the tractor pins.
- 27 Close the tractor covers.
- 28a If any adjustments need to be made, refer to the procedure on loading paper.

- 29 Close the DECwriter cover.

- 30 Operate POWER switch to ON.

Changing Ribbon

Note: The ribbon should last from 8 to 12 hours of actual printing at 30 characters per second. After 12 hours or when the print density becomes too light, the ribbon can be replaced or turned over and the lower half of the ribbon can be used. After rethreading

STEP	PROCEDURE
	the same ribbon, another 4 hours (approximately) of printing time is possible before the ink is completely used. At this time, the ribbon must be replaced.
31	Wait until reel is completely emptied and ready to reverse.
32	Operate POWER switch to OFF.
33	Open DECwriter cover.
34	Record the setting of the carriage adjust lever (Fig. 6).
35	Move the carriage adjust lever to the highest number.
36b	If the ribbon is to be replaced, remove the ribbon spools and ribbon. Save one spool to be used with the new ribbon.
37b	Connect the hook on the end of the ribbon to the empty spool.
38b	Wind 10 turns of ribbon on the empty spool. Ensure that direction reversing rivet on the ribbon is wound on the empty spool.
	Caution: If the direction reversing rivet is not wound on the empty spool beyond the direction sensing guide, the ribbon will not reverse.
39c	If the lower half of the ribbon is to be used, remove both spools and unthread the ribbon.
40c	Ensure that the direction reversing rivet on the ribbon is wound on the take up spool.
	Caution: If the direction reversing rivet is not wound on the take up spool beyond the direction sensing guide, the ribbon will not reverse.
41	Place the full spool on the left spindle (Fig. 7) and turn clockwise until it drops into position.
42	Guide the ribbon and idler spool A (Fig. 7) through direction sensing guide B, and around the outside of idler spool C through E.
43	Guide the ribbon around the front of head F and idler spools G through I.
44	Guide the ribbon through direction sensing guide J and around idler spool K.
45	Place the spool on the right spindle and turn clockwise until it drops into position.
46	Take up the slack in the ribbon by turning the free moving spool.
47	Return the carriage adjust lever to its original setting.
48	Close the DECwriter cover.

STEP	PROCEDURE
49	Operate POWER switch to ON.
D. RP04 Disk Pack	2.07 The following procedures describe the disk pack installation, disk pack removal, and drive start up for the RP04 disk pack.
2.06 Controls, switches, and indicators for operation of the RP04 disk pack (Fig. 8) are shown in Figure 9 and listed in Table C.	

STEP	PROCEDURE
	Disk Pack Installation
1	Verify that a disk pack is not installed and that the spindle is stopped.
2	Operate and release operator cover latch (Fig. 8). The operator cover will spring open.
3	Push operator cover straight back to fully expose drive spindle area (Fig. 10).
	Note: A solenoid operated latch locks the operator cover closed until spindle rotation has stopped.
	Caution: To avoid damage to the shroud, heads, disk pack, etc, do not allow disk pack to strike these areas during installation.
4	Remove disk pack bottom cover by squeezing bottom cover release mechanism.
5	Place disk pack on spindle.
6	Rotate disk pack top cover handle (Fig. 11) in a clockwise direction until it comes to a complete stop. Continue to rotate, even though cover may disengage, to ensure that full stop point is reached and pack-on switch is closed.
7	Remove disk pack cover.
8	Close and latch operator cover.
9	Reassemble disk pack top and bottom covers and store in a designated area.
	Disk Pack Removal
10	Operate the drive START/STOP switch (Fig. 9) to STOP.
11	Wait for disk pack to come to a complete stop (approximately 15 seconds) before opening operator cover.

STEP	PROCEDURE
12	Operate and release operator cover latch. The operator cover will spring open.
13	Push operator cover straight back to fully expose the disk pack. <i>Note:</i> A solenoid operated latch locks the operator cover closed until disk pack rotation has stopped. <i>Caution: Do not touch disk pack with hands.</i> <i>Caution: To avoid damage to the shroud, heads, disk pack, etc, do not allow disk pack to strike these areas during disk pack removal.</i>
14	Very carefully position disk pack cover over top of disk pack.
15	Turn cover in a counterclockwise direction for two full turns so that cover becomes securely fastened to disk pack.
16	Remove disk pack by its top cover handle.
17	Immediately attach bottom cover to create a positive dust seal, and store in a designated area.
18a	If another disk pack is not to be installed at this time, close and latch operator cover.
	Drive Start-Up
19	Visually check to determine that a disk pack is installed in the drive, disk pack top cover is removed, and operator cover is closed and latched. Drive is now ready to be turned on. <i>Note:</i> If the operator is responsible for recording usage meter time before the drive is started, it should be done now.
20	Operate drive START/STOP switch to START.
21	Observe that READY indicator lights approximately 15 seconds after drive starts.
22	Drive is now ready to receive commands and to seek and transfer data.

E. CR11 Card Reader

2.08 A description of controls and indicators which provide the operator with types and functions of each switch and indicator on the card reader is given in Tables D and E.

2.09 The following describes loading cards, unloading cards, correcting error conditions, off-line operation, and on-line operation procedures.

STEP	PROCEDURE
Loading Cards	
1	Pull the hopper follower back with one hand and begin loading card decks into the hopper. Ensure that the first card to be read is placed at the front with the "9" edge down and column "1" to the left. <i>Caution: Do not pack the input hopper so full that the air from the blower cannot riffle the cards properly. If the cards are packed too tightly, proper operation of the vacuum picker is impaired.</i>
2	Continue placing cards into the input hopper until it is loosely filled. <i>Caution: When maintaining tension on the card deck, use just enough pressure to maintain the riffle action to prevent card damage and jamming the reader.</i>
3	Cards may continue to be loaded while the reader is operating, provided that tension is maintained on the front portion of the deck as cards are added to the rear. Additional cards should not be loaded, however, until the hopper is approximately 1/2 to 1/3 full.
4	Normally, all cards are moved through the reader into the stacker. However, if it is necessary to remove cards from the input hopper, pull back the follower and remove the card deck.
Unloading Cards	
5	To unload cards from the output stacker, pull the stacker follower back with one hand and remove the card deck. The stacker may be unloaded while the cards are being read.
Correcting Error Conditions	
6	The four error alarm indicators on the front control panel of the card reader normally indicate a condition that can be corrected by operator intervention. The alarms, their causes, and the required operator interventions are shown in Table F.
Off-Line Operation	
<i>Note:</i> Off-line operation of the card reader is used primarily for setting up and checking reader operation prior to switching to on-line use, for correcting error conditions, and for maintenance tests. When placed off-line, the reader can be operated locally from the control panels. The following procedure is used to energize the reader and check off-line operation prior to switching to on-line operation.	
7	Ensure that the ac power cord is plugged in and that the circuit breaker on the rear panel of the card reader is in the ON position.
8	Set MODE switch to LOCAL position.
9	Set SHUTDOWN switch to AUTO position.

STEP	PROCEDURE
10	Depress POWER switch to energize reader. Note that POWER indicator lights but blower does not come on.
11	Depress LAMP TEST switch and observe that all front panel indicators lighted.
12	Load card deck into input hopper.
13	Depress RESET switch and observe that associated green indicator lighted. After approximately 3 seconds, cards should start being picked and moved through the read station into the input stacker.
14	When the input hopper is empty, observe that the HOPPER CHECK indicator lighted, the green RESET indicator extinguished, and the red STOP indicator lighted.
15	The card reader may now be operated locally or switched to on-line operation.
On-Line Operation	
Note: When card reader is placed on-line, the system is controlled by programmed commands from the central unit.	
16	Ensure that the card reader is operational by performing Steps 1 through 9.
17	Ensure that the output stacker is empty. Load the input hopper with the cards to be read.
18	Set the MODE switch to REMOTE.
19	Depress the RESET switch and observe that the associated green indicator lighted. The system is now on-line.
20a	If the system goes off-line because of an error alarm, it can be placed back on-line by correcting the error and then depressing the RESET switch.
21b	If at any time it is desirable to go off-line, depress the STOP switch.

F. DATASPEED 40 Operator Consoles

2.10 There are two basic types of DATASPEED 40 operator consoles.

- KDP—Operator console with Keyboard Display and Printer (KDP) (Fig. 12) for use on send/receive data terminals

- ROP—Operator console with Receive Only Printer (ROP) (Fig. 13) for use on receive only data terminals

2.11 The following describes the paper and ribbon replacement procedures.

STEP	PROCEDURE
Paper Replacement	
1	At the left rear of the printer cabinet, operate the ON switch (Fig. 14) to the down position. This removes primary ac power.
2	Tilt the monitor back until it reaches its stop position.
3	Move left and right cover release levers inward (Fig. 12) and raise cover. Raising the cover turns off the power.
4	(KDP operator console only) Lift left and right keyboard release levers (Fig. 15) and pull keyboard forward.
5	Pull pressure roller release lever up and to the front (Fig. 15).
6	Remove empty paper roll from printer enclosure.
7	Remove center tube from empty paper roll and insert it into full paper roll.
8	Crease paper sharply as shown in Figure 16.
9	Insert paper roll into printer enclosure as shown in Figure 17. Do not bend or kink point of paper.
10	Back up roll until the point of the paper drops behind the lip of the paper access chute (Fig. 17).
11	Rotate paper roll as shown in Figure 18 to feed paper through printer. <i>Note:</i> It may be necessary to push and pull paper roll slightly.
12	Guide point of paper into gap between platen and pressure roller (Fig. 15).
13a	If the point of the paper does not appear in the gap between the platen and the pressure roller: (a) Raise the printer by depressing both left and right printer release levers simultaneously and pull forward (Fig. 15). Printer will rise slightly.
Caution: Care should be taken when printer release mechanism is operated. Attendant's hands should not be in immediate area of printer.	
(b) Lift printer until release mechanism "clicks" into its 45° position stop.	
(c) Open paper access chute by grasping knobs (Fig. 19) and snapping chute down while printer is in a raised position.	
(d) Guide point of paper over roller and into the gap between the platen and the pressure roller (Fig. 20).	

STEP	PROCEDURE
	(e) Close the paper access chute.
	(f) Lower the printer by pressing down on extended portions of both printer release levers (Fig. 15). Printer will drop slightly.
	(g) Push down on printer until release mechanism "clicks" into its down position.
14	Pull creased portion of paper through gap, center paper, and return pressure roller release lever to engaged position.
15	(KPD operator console only) Depress and hold left and right keyboard release levers (Fig. 21) and push keyboard backward until keyboard stops. The left and right keyboard release levers should drop into their locked position. This locks the keyboard in place.
16	With paper extending out, thread paper through the window, and close the printer cover.
17	At left rear of the printer cabinet, operate the power ON switch to the up position.
18	Tilt the monitor forward until it reaches its stop position.
	Ribbon Replacement
19	At the left rear of the printer cabinet, operate the ON switch (Fig. 14) to the down position. This removes primary ac power.
20	Tilt the monitor back until it reaches its stop position.
21	Move left and right cover release levers inward (Fig. 12) and raise cover. Raising the cover turns off the power.
22	(KDP operator console only) Lift left and right keyboard release levers (Fig. 15) and pull keyboard forward.
23	Raise the printer by depressing both printer release levers simultaneously and pull forward (Fig. 15). Printer will rise slightly.
	Caution: Care should be taken when printer release mechanism is operated. Attendant's hands should not be in immediate area of printer.
24	Lift printer until release mechanism "clicks" into its 45° position stop.
25	Remove and discard used ribbon and both spools. The spools (Fig. 22) rest on nylon drive pins. Pull to remove.
26	Rotate spindles by hand to determine which one is fixed and which one turns freely.
27	Place new full ribbon spool on free turning spindle.

STEP	PROCEDURE
28	<p>Thread ribbon as shown in Figure 22. Be sure that:</p> <ul style="list-style-type: none"> (a) Spools are on spindles so that the retaining pin and drive pin of each spindle fits into the small holes on the spool (b) Ribbon feeds into and from bottom of spool (c) Eyelets are wound on spool and pass through the reversing arms (d) Ribbon is centered on all rollers and is not caught on type pallets.
29	Rotate free spindle by hand to take up all slack of the ribbon.
30	Lower the printer by pressing down on extended portions of both printer release levers (Fig. 15). Printer will drop slightly.
31	Push down on printer until release mechanism "clicks" into its down position.
32	(KPD operator console only) Depress and hold left and right keyboard release levers (Fig. 21) and push keyboard backward until keyboard stops. The left and right keyboard release levers should drop into their locked position. This locks the keyboard in place.
33	With paper extending out, thread paper through the window and close the printer cover.
34	At left rear of the printer cabinet, operate the power ON switch to the up position.
35	Tilt the monitor forward until it reaches its stop position.

G. System Start-Up

2.12 The following describes the system start-up procedure. This procedure loads the operating system from the RP04 disk.

STEP	PROCEDURE
1	At CU switch register (Fig. 23), operate the HALT switch down.
2	Set the processor switch register to 17765000 (001 111 111 110 101 000 000 000). Operate LOAD ADRS switch.
3	Set the processor switch register to 70 (000 000 000 000 000 000 111 000).
4	Operate HALT switch up. Depress START switch and wait until the DECwriter prints HPBOOT before proceeding to Step 5.

STEP	PROCEDURE
5	Type in UNIX and then depress line feed key. The DECwriter will respond with initialization statements. Then, it will print FUNCTION .
6	Respond by typing SYSCHK . This makes a UNIX file system consistency check.
7	◆If the following message or a similar one is printed, then repeat G: ***Boot UNIX (NO SYNC)***
8	If after three trials SYSCHK still prints the above message, reload the generic tape in accordance with J. <i>Note:</i> Continuous failure of the SYSCHK program may indicate RP04 disk problems. In this case, the disk diagnostics should be run.◆

H. System Backup	should be backed up to ensure that the changes are not lost.
2.13 The EADAS/NM system should be backed up at least once per week. Also, whenever the reference data base is changed, the system	2.14 The following describes the procedures for creating backup tapes and reloading the system from backup tapes.

STEP	PROCEDURE
I. Creating Backup Tapes	
1	Mount a 2400-foot backup tape (with a write enable ring) in accordance with Steps 1 through 20e, Procedure B.
2	At DECwriter, in response to FUNCTION , type BOOTLOAD and operate the LINE FEED key. This command causes a boot program to be written on the tape. After the boot load program is completed, FUNCTION will be printed.
3	At DECwriter, type STOP and operate the LINE FEED key. The system will respond by printing FUNCTION :
4	At the processor, depress the HALT switch. Be sure the key is in the POWER position.
5	Enter octal 17765000 (001 111 111 110 101 000 000 000) in switch register switches.
6	Momentarily depress LOAD ADRS switch.
7	Enter octal 60 (000 000 000 000 000 000 110 000) in switch register switches.
8	Operate HALT/ENABLE switch to ENABLE.

STEP	PROCEDURE
9	Depress START switch.
10	After a short boot routine has been read, the DECwriter will print MTBOOT .
11	At the DECwriter, type SACOPY and then operate the LINE FEED key.
12	The DECwriter will print FROM :
13	If a 1600 BPI backup tape is to be made, go to Step 25.
14	At DECwriter, type HP1 and operate the LINE FEED key. The system responds by printing TO :
15	At DECwriter, type HTO and operate the LINE FEED key. The system responds by printing NBLKS NNNN and the tape will be written. At the end of the tape, it will rewind and the system will print NEXT COPY and FROM :
16	Dismount the 2400-ft backup tape.
17	Mount the second backup tape (with a write enable ring).
18	At the DECwriter, type HP2 and <LINE FEED> .
19	The DECwriter will print TO :
20	At DECwriter, type HTO and <LINE FEED> . The tape will be written.
21	At the end of the dump, the DECwriter will print NEXT COPY FROM .
22	At processor control, operate the HALT ENABLE switch to the HALT position.
23	Restart the system in accordance with Procedure J.
24	If a 1600 BPI tape is to be made, perform Steps 25 through 28.
25	At DECwriter, type HP3 and operate LINE FEED key.
26	The DECwriter will print TO :
27	At DECwriter, type HT8 and <LINE FEED> . The tape will be written and the DECwriter will print NEXT COPY FROM .
28	For a 1600 BPI tape backup, only one tape is needed. When the tape has been written, restart the system in accordance with Procedure J.

Note: If a fault condition exists, a list of bad sectors will be printed. If errors do occur, try again with the same tape or a different tape. If an error condition persists, a problem is in the CU and proper maintenance procedures shall be followed.

STEP	PROCEDURE
	Reloading From Backup Tapes
29	Mount a 2400-foot backup tape (without a write enable ring) in accordance with Steps 1 through 20e Procedure B.
30	Operate HALT/ENABLE switch to HALT.
31	Enter octal 17765000 (001 111 111 110 101 000 000 000) in switch register switches.
32	Depress LOAD ADRS switch.
33	Enter octal 60 (000 000 000 000 000 000 110 000) in switch register switches.
34	Operate HALT/ENABLE switch to ENABLE and depress START switch.
35	After a short boot routine has been read, the DECwriter will print MTBOOT .
36	At the DECwriter, type SACOPY and <LINE FEED> .
37	The DECwriter will print FROM:
38	If a 1600 BPI backup tape is to be used, go to Step 51.
39	At the DECwriter, type HTO and <LINE FEED> . The system will respond by printing TO:
40	At the DECwriter, type HP1 and <LINE FEED> .
41	The system responds by printing NBLKS NNNN and the tape will be written. At the end of the tape, it will rewind and the system will print NEXT COPY and FROM:
42	Dismount the 2400-foot backup (dump) tape.
43	Mount the second backup tape (without a write enable ring).
44	At the DECwriter, type HTO <LINE FEED> .
45	The DECwriter will print TO:
46	At the DECwriter, type HP2 and <LINE FEED> . The tape will be written.
47	At the end of the dump, the DECwriter will print NEXT COPY .
48	At processor control, operate the HALT/ENABLE switch to HALT position.
49	Restart the system in accordance with Procedure J.
50	If a 1600 BPI tape is to be made, perform the following steps:
51	At DECwriter, type HT8 and <LINE FEED> .

STEP	PROCEDURE
52	The DECwriter will print TO:
53	At DECwriter, type HT3 and <LINE FEED> . The tape will be written and the DECwriter will print NEXT FROM.
54	For a 1600 BPI tape, only one tape is needed. When the tape has been written, operate the HALT/ENABLE switch to the HALT position and restart the system in accordance with Procedure J.

J. Generic Loading Procedures

2.15 The EADAS/NM generic program is supplied on one magnetic tape which contains the boot program, the operating system, and the

application programs. This tape must be loaded into the EADAS/NM computer (PDP11-70) after the EADAS/NM processor, peripheral equipment, and all necessary hardware interfaces are installed. The procedure for loading the system is as follows:

STEP	PROCEDURE
1	Mount the magnetic tape (without a write enable ring) on the TU16 tape drive in accordance with Steps 1 through 20e, Procedure B.
2	Ensure the tape is positioned to the load point.
3	Ensure that the RP04 disk drive is up to normal running speed. (The READY indicator must be illuminated and the WRITE PROTECT switch is in the OFF position).
4	Operate the HALT/ENABLE switch to the HALT position.
5	Enter octal 17765000 (001 111 111 110 101 000 000 000) in switch register switches.
6	Depress LOAD ADRS switch.
7	Enter octal 60 (000 000 000 000 000 000 110 000) in switch register switches.
8	Operate the HALT/ENABLE switch to ENABLE .
9	Operate the START switch.
10	The DECwriter will print MTBOOT.
11	At the DECwriter, type SACOPY and operate the LINE FEED key.
12	The DECwriter will print FROM:
13	At the DECwriter, type HT0 and operate the LINE FEED key.

STEP	PROCEDURE
14	The DECwriter will print TO:
15	At the DECwriter, type HPO and operate the LINE FEED key.
16	The DECwriter will print 8360 BLKS. A file on the tape will be read and the tape will return to the load point.
17	When completed, the program will respond with NO BAD SECTORS NEXT COPY FROM.
18	At the processor, depress the HALT switch.
19	Enter octal 17765000 (001 111 111 110 101 000 000 000) in switch register switches.
20	Depress the LOAD ADRS switch.
21	Enter octal 70 (000 000 000 000 000 000 111 000) in switch register switches.
22	Operate the START switch and wait until the DECwriter prints HPBOOT before proceeding to Step 23.
23	Type UNIX and operate the LINE FEED key.
24	The DECwriter will respond with initialization statements and then print FUNCTION:
25	At the DECwriter, type GENLOAD and operate the LINE FEED key. This operation will result in the loading of the application programs.
26	After 15 or 20 minutes, the DECwriter will type FUNCTION.
27	Halt and start up the system in accordance with G.
28	After verification of the new load via SYSCHK , any of the system commands may be typed.

K. Updating Generic Programs

2.16 This procedure describes the loading procedure of EADAS/NM generic programs into the EADAS/NM central unit when preservation of the data base is required. This procedure is necessary if the system backup tape generated by the system backup procedure (Procedure H) is inadvertently destroyed and reloading from the originally supplied

generic is required. Also, newly supplied generic programs may be loaded by following this procedure.

Note: Make a system backup tape, if possible, in accordance with Procedure H.

2.17 The present temporary file data base will be outputted to magnetic tape via the following procedures:

STEP	PROCEDURE
1a	<p>If exception system is running— After obtaining permission from office personnel— At EADAS/NM DECwriter— Type: stop <return></p> <p>Response: ex 999 system termination Response: complete Response: function =</p>
2	Mount a blank 600 foot magnetic tape with the write ring in place on the tape drive per mounting instructions of Procedure B.
3	<p>In response to the function message on the DECwriter— Type: dumpdata <return></p> <p>Response: eadas/nm network data save utility Response: ensure that tape is mounted and write enabled</p> <p>Response: listing? (y or n)</p>
4	<p>Type: y <return></p> <p>◆The system will write the tape while the DECwriter outputs a listing of files. Save the list for future reference.◆</p>
5	Dismount the tape in accordance with Procedure B, label and ◆save for reloading.◆

2.18 Mount the new generic program tape on the tape drive and load the generic into the system in accordance with Procedure J.

2.19 The data base will be reloaded into the "temporary file" via the following procedures.

STEP	PROCEDURE
1	Mount the dump data tape of 2.17(5) in accordance with Procedure B.
2	<p>In response to the function message— Type: loaddata <return></p> <p>Response: eadas/nm network data load utility ensure that tape previously created with dump data is mounted.</p> <p>Response: enter h for help Response: files to be loaded:</p>
3	Type: * <return>

STEP	PROCEDURE
4	<p>Response: remove existing files (y or n)?</p> <p>Type: y <return></p>
5	<p>Response: are you sure (y or n)?</p> <p>Type y <return></p>
6	<p>Response: listing?</p> <p>Type: y <return></p> <p>The system will read data base file from tape. At completion, FUNCTION will be printed at DECwriter.</p>
2.20	<p>The system device table of the new generic program must now be updated to include the equipped TCTs and ETS channels according to the following procedures.</p>

STEP	PROCEDURE
1	<p>Count the number of TCTs (0-7) equipped in the J3B022C-1 cabinet which are connected to the processor (there may be one spare TCT).</p>
2	<p>At DECwriter— In response to the function message— Type: tct <return></p> <p>Response: tct number?</p>
3	<p>Type: 0 <return></p> <p>Response: add or delete?</p>
4	<p>Type: a <return></p> <p>Response: function?</p>
5	<p>Repeat Steps 2 through 4 for each of the TCTs counted in Step 1.</p>
6	<p>Count the number of 108 data sets (0-15) equipped in the J3B022B-1 cabinet.</p>
7	<p>At DECwriter— In response to the function message— Type: ets <return></p>

SECTION 252-116-301

STEP	PROCEDURE
8	Response: ets number? Type: 0 <return>
9	Response: add or delete? Type: a <return>
10	Response: function? Repeat Steps 7 through 9 for each of the 108 data sets counted in Step 6.

2.21 Generate a new system backup tape per the instructions of Procedure I.

TABLE A

TU 16 MAGTAPE CONTROLS AND INDICATORS

	CONTROL OR INDICATOR	FUNCTION	
CONTROLS	LOAD/BR REL LOAD Position Center Position BR REL Position	Enables vacuum motor, which draws tape into the buffer columns. Disables vacuum motor; brakes are full on. Releases brakes.	
	ON-LINE/OFF-LINE ON-LINE Position OFF-LINE Position	Selects computer controlled operation. Selects manual controlled operation.	
	FWD/REW/REV FWD Position REW Position REV Position	Selects, but does not initiate, forward tape motion when transport is off-line. Selects, but does not initiate, tape rewind when transport is off-line. Selects, but does not initiate, reverse tape motion when transport is off-line.	
	START/STOP START Position STOP Position	Initiates tape motion selected by FWD/REW/REV switch when transport is off-line. Clears any motion commands when transport is off-line.	
	UNIT SELECT (plug activated)	Selects the tape transport unit by number (0-7); this number is used in the program to address the tape transport.	
	INDICATORS	PWR	Indicates power has been applied to the transport.
		LOAD	Indicates the vacuum is on and the tape is loaded into the buffer columns.
RDY		Indicates that the tape transport is ready (vacuum on and settle-down delay complete); no tape motion.	

TABLE A (Cont.)

TU 16 MAGTAPE CONTROLS AND INDICATORS

CONTROL OR INDICATOR		FUNCTION
INDICATORS	LD PT	Indicates that the tape is at load point (beginning of tape - BOT).
	END PT	Indicates that the tape is at end point (end of tape - EOT).
	FILE PROT	Indicates that write operations are inhibited because the write enable ring is not mounted on the file reel.
	OFF-LINE	Indicates local operation by the control box.
	SEL	Indicates the tape transport is selected by the controller (program).
	WRT	Indicates that a write operation has been initiated.
	FWD	Indicates that a forward command has been issued.
	REV	Indicates that a reverse command has been issued.
	REW	Indicates that a rewind command has been issued.

TABLE B

LA36 DECWRITER II CONTROLS

CONTROL	FUNCTION
<p>POWER ON/OFF</p> <p>ON Position</p> <p>OFF Position</p>	<p>Allows normal unit operation.</p> <p>Removes power. The POWER switch should be in the OFF position when changing ribbon, changing paper, or adjusting the print head.</p>
<p>LINE/LOCAL</p> <p>LINE Position</p> <p>LOCAL Position</p>	<p>Enables the LA36 to transmit and receive.</p> <p>The LA36 receive/transmit lines are disabled. Only local operation can be performed when in the LOCAL position.</p>
<p>BAUD RATE 110, 150, 300</p> <p>110 Position</p> <p>150 Position</p> <p>300 Position</p>	<p>Selects the rate at which characters are transmitted and received over the communications line.</p> <p>10 characters per second.</p> <p>15 characters per second.</p> <p>30 characters per second.</p>
<p>Numeric Keypad</p>	<p>The numeric keypad enables numbers to be entered in an adding machine fashion. Each key in the numeric keypad generates the same ASCII character as the corresponding key in the main keyboard.</p>

TABLE C (Cont.)

RP04 DISK PACK CONTROLS AND INDICATORS

CONTROL OR INDICATOR	FUNCTION
DISABLE Switch/Indicator	Operation of the DISABLE switch with the drive not selected will cause the RP04 to go off-line immediately. If the drive is selected when the DISABLE switch is operated, the drive will go off-line when the drive is negated. The DISABLE indicator is lighted when the DISABLE switch is operated. The drive may be returned to the on-line mode by restoring the DISABLE switch. When the DISABLE switch is operated, a disable switch status is asserted on the drive/DCL (MDLI) interface.
READY Indicator	The READY indicator is lighted when the power-on sequence is completed and when the drive is ready to accept commands. The READY indicator is extinguished if the START/STOP switch is dropped, or the drive is placed in the standby mode.
UNSAFE Indicator	The UNSAFE indicator is lighted when an unsafe condition exists within the drive. An unsafe condition prevents the drive from performing a read or write command. The unsafe conditions can be reset by stopping and starting the drive or by the device initialize signal. The unsafe status will be set again if the condition still exists after the power on/reset or device initialize pulse is issued.
Drive Number Display	The drive number LED display converts the binary logical address of the drive (DCL display 1, 2, and 4) into a numeric display from 0 to 7. The drive numeric address does not perform any other function in the drive.

TABLE D

CARD READER FRONT PANEL CONTROLS AND INDICATORS

CONTROL OR INDICATOR		FUNCTION
CONTROLS	POWER	<p>Controls application of all power to the card reader.</p> <p>When indicator is extinguished, operation of the switch applies power to card reader and causes associated indicator to light.</p> <p>When indicator is illuminated, operation of the switch removes all power from card reader and causes indicator to extinguish.</p>
	STOP	<p>When operated, the STOP (red) indicator immediately illuminates and drops the READY line, thereby extinguishing the RESET indicator. Card reader operation then stops as soon as the card currently in the read station has been read.</p> <p>This switch has no effect on the system power; it only stops the current operation.</p>
	RESET	<p>When operated and released, clears all error flip-flops and initializes card reader logic. Associated RESET (green) indicator illuminates to indicate that the READY signal is applied to the controller.</p> <p>The RESET indicator extinguishes whenever the STOP switch is operated or whenever an error indicator illuminates (READ CHECK, PICK CHECK, STACK CHECK, or HOPPER CHECK).</p>
INDICATORS	READ CHECK	<p>When illuminated, this white indicator indicates that the card just read may be torn on the leading or trailing edge, or that the card may have punches in column position 0 or 81.</p> <p>Because READ CHECK indicates an error condition, whenever this indicator is illuminated, it causes the card reader to stop operation and extinguishes the RESET indicator.</p>
	PICK CHECK	<p>When illuminated, this white indicator indicates that the card reader failed to move a card into the read station after it received a READ COMMAND from the controller.</p> <p>Stops card reader operation and extinguishes RESET indicator</p>
	STACK CHECK	<p>When illuminated, this white indicator indicates that the previous card was not properly seated in the output stacker and therefore may be badly mutilated.</p> <p>Stops card reader operation and extinguishes RESET indicator.</p>
	HOPPER CHECK	<p>When illuminated, this white indicator indicates that either the input hopper is empty or that the output stacker is full.</p> <p>In either case, the operator must manually correct the condition before card reader operation can continue.</p>

TABLE E
CARD READER REAR PANEL CONTROLS

CONTROL	FUNCTION
LAMP TEST	When operated, illuminates all indicators on the front control panel to determine if any of the indicator lamps are faulty.
SHUTDOWN MAN/AUTO MAN Position AUTO Position	Controls automatic operation of the input hopper blower. When operated, blower operates continuously whether or not cards are in the input hopper. When operated, causes the blower to shut down automatically whenever the input hopper is emptied. The blower automatically restarts when cards are loaded into the hopper and the RESET switch is operated. The blower activates approximately three seconds after the RESET switch is operated.
MODE LOCAL/REMOTE LOCAL Position REMOTE Position	Permits selection of either on-line or off-line operation. When operated, removes the READ COMMAND input from the controller to allow the operator to run the card reader off-line by using the RESET and STOP switches on the front control panel. When operated, enables the READ COMMAND input from the controller to allow normal on-line operation under program control once RESET switch is operated.

TABLE F

ERROR ALARM CAUSES AND REMEDIES

ERROR INDICATOR	POSSIBLE CAUSE	CORRECTIVE ACTION
READ CHECK	Card edges torn Punch in column 0 or 81	Remove faulty card and restart reader. If READ CHECK occurs for every card, it indicates a malfunction in the reader read logic.
PICK CHECK	Damage to leading edge Torn webs Cards stapled together	Remove faulty card and restart reader. If there is no evidence of card damage, check for excessive warpage of card deck and/or a build-up of ink glaze on the picker face.
STACK CHECK	Jam in card track Badly mutilated card	Correct jam or remove mutilated card and restart reader.
HOPPER CHECK	Input hopper empty Output stacker full	Load input hopper. Unload output stacker.



Fig. 1—TU16 Magtape Unit

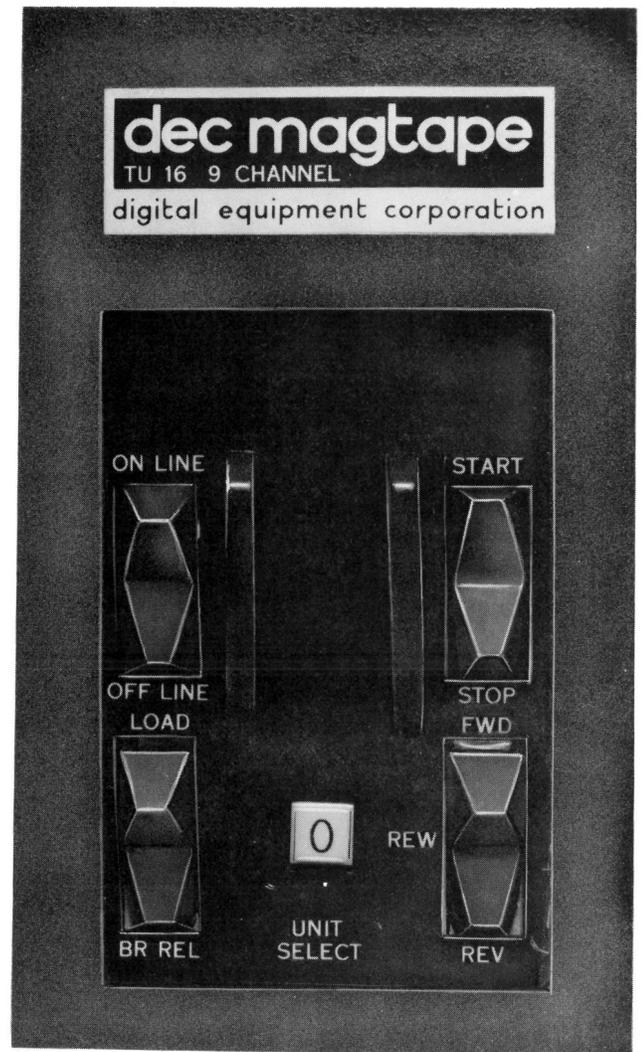


Fig. 2—TU16 Magtape Operator Controls and Indicators

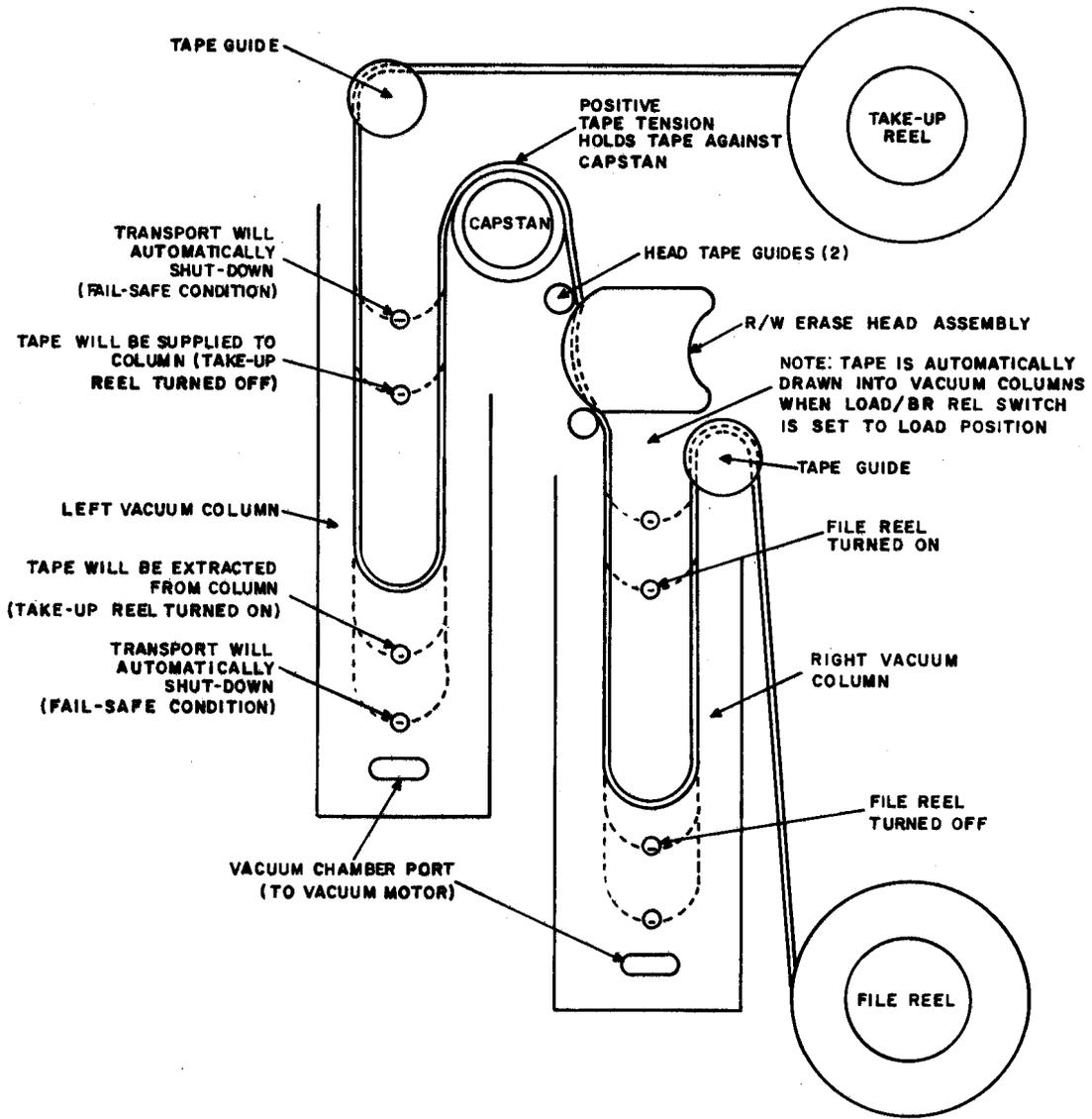


Fig. 3—DEC Magtape Threading

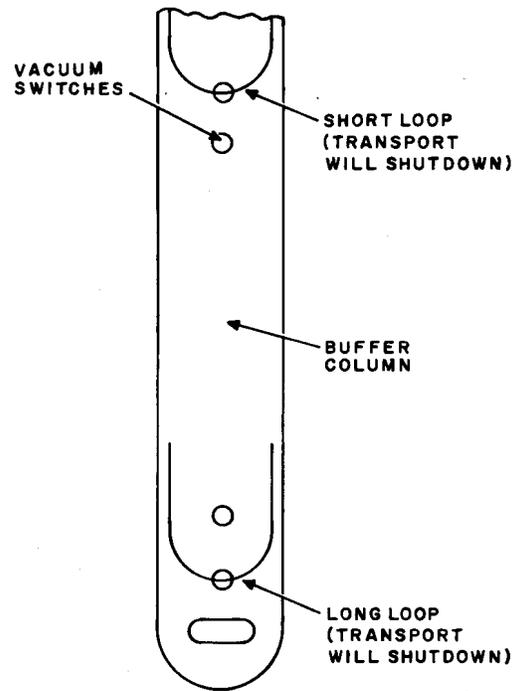


Fig. 4—TU16 Magtape Fail-Safe Limits



Fig. 5—LA36 DECwriter II

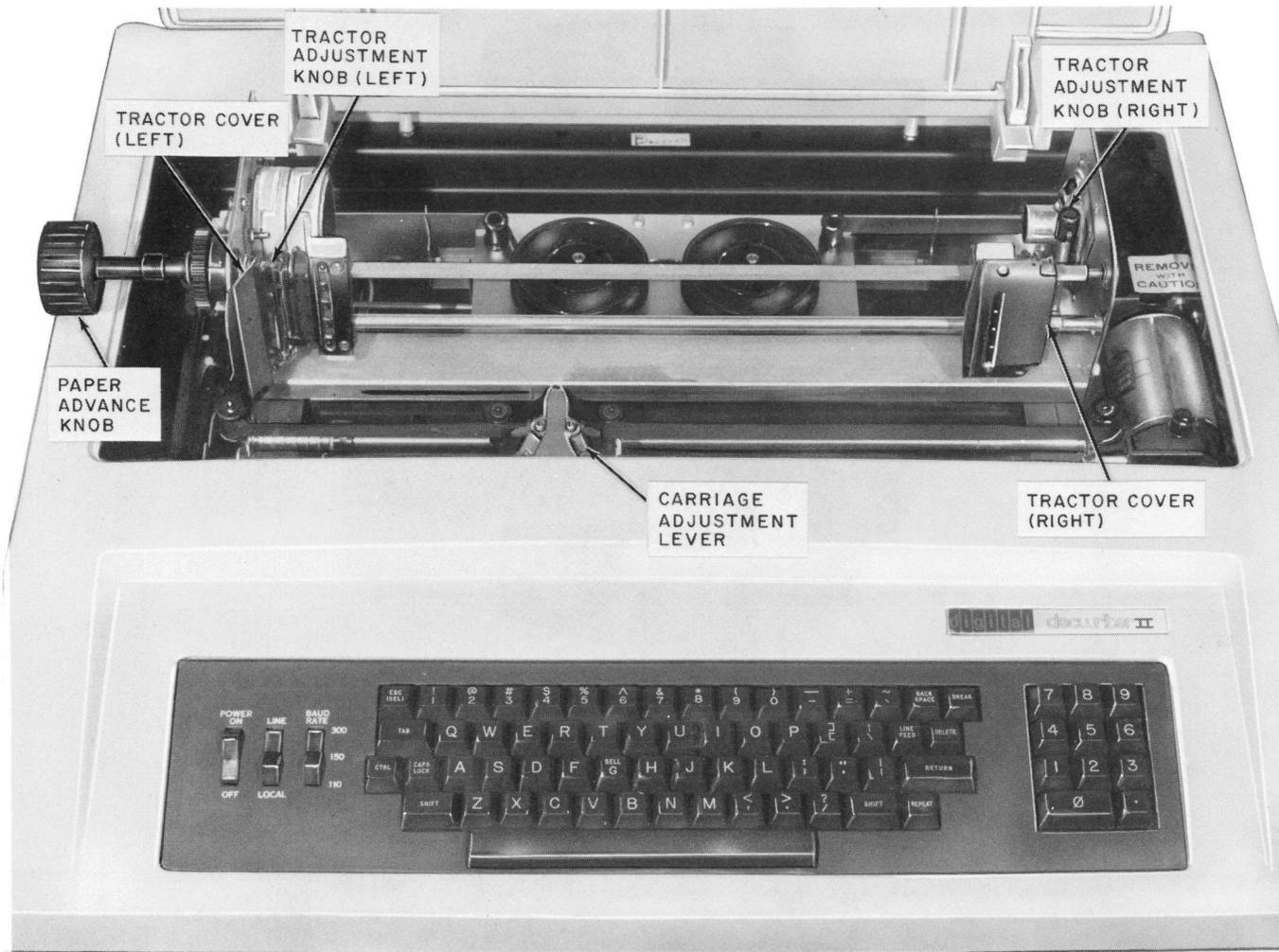


Fig. 6—LA36 DECwriter II

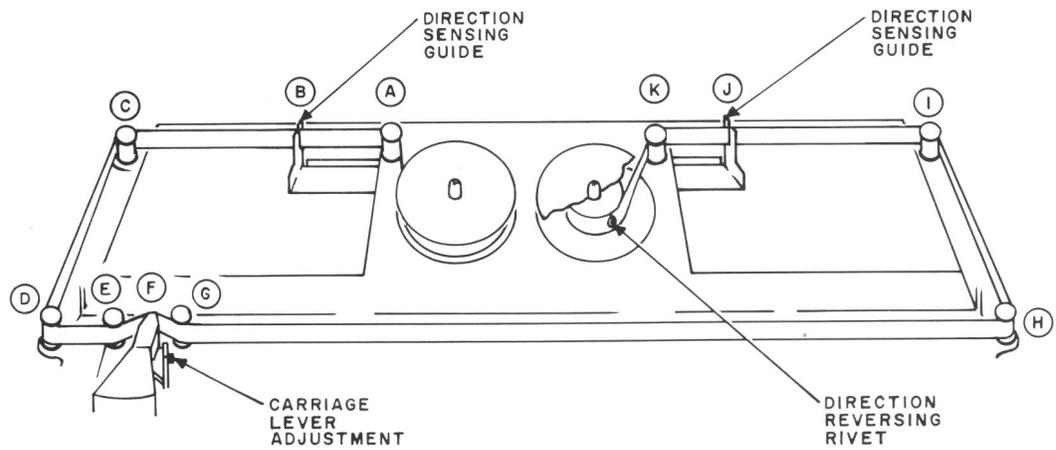


Fig. 7—LA36 DECwriter II Ribbon Threading Diagram



Fig. 8—RP04 Disk Pack

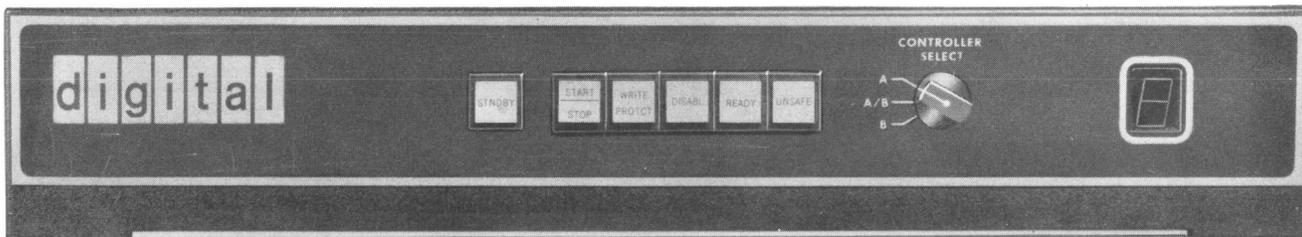


Fig. 9—RP04 Disk Pack Controls and Indicators



Fig. 10—RP04 Disk Pack



Fig. 11—RPO4 Disk Pack



Fig. 12—DATASPEED 40 KDP Operator Console



Fig. 13—DATASPEED 40 ROP Operator Console

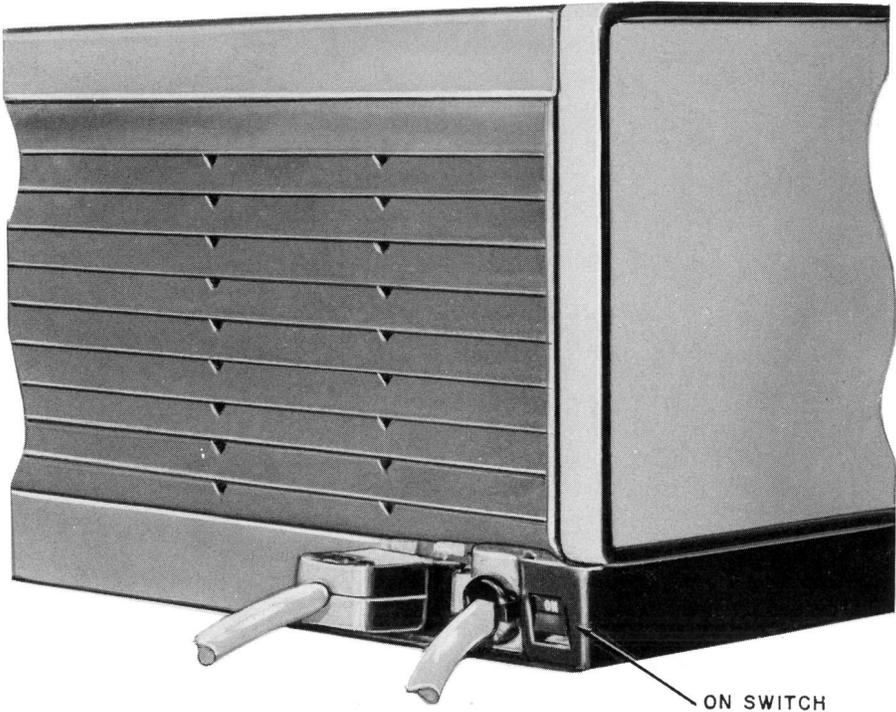


Fig. 14—DATASPEED 40 Power Switch

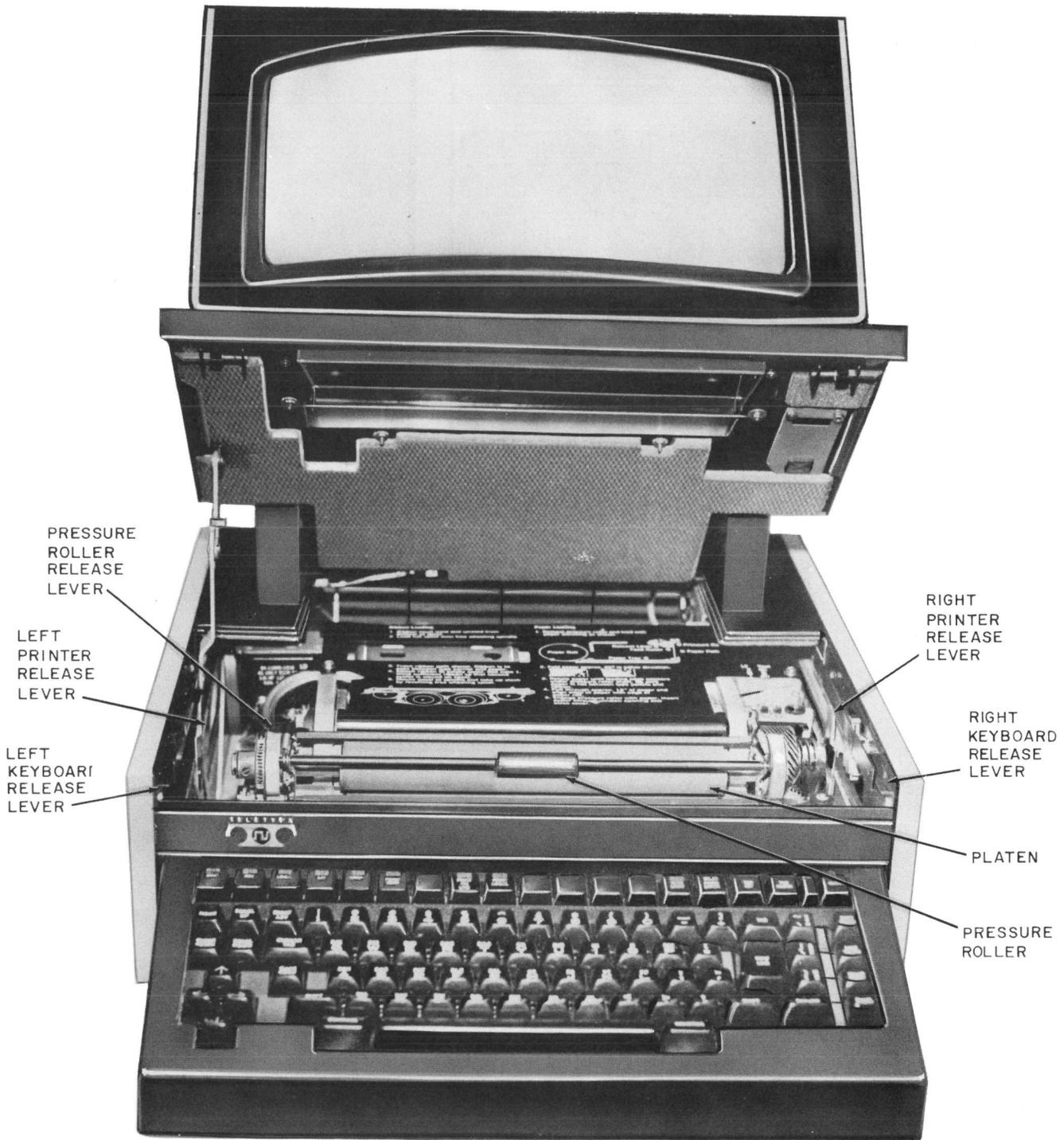


Fig. 15—DATASPEED 40 Operator Console

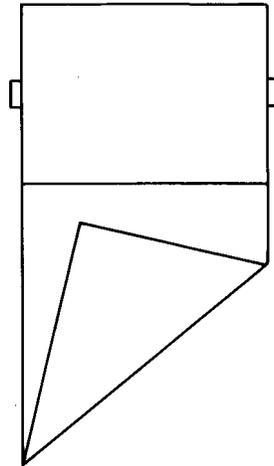


Fig. 16—Paper Crease for DATASPEED 40

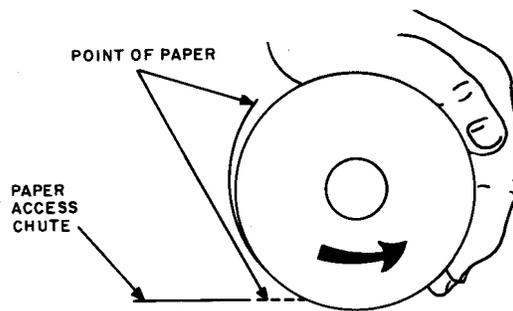


Fig. 17—Paper Insertion for DATASPEED 40

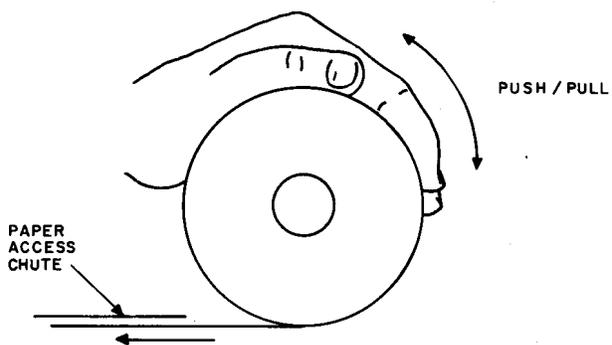


Fig. 18—Paper Rotation for DATASPEED 40



Fig. 19—DATASPEED 40 Operator Console



Fig. 20—DATASPEED 40 Operator Console

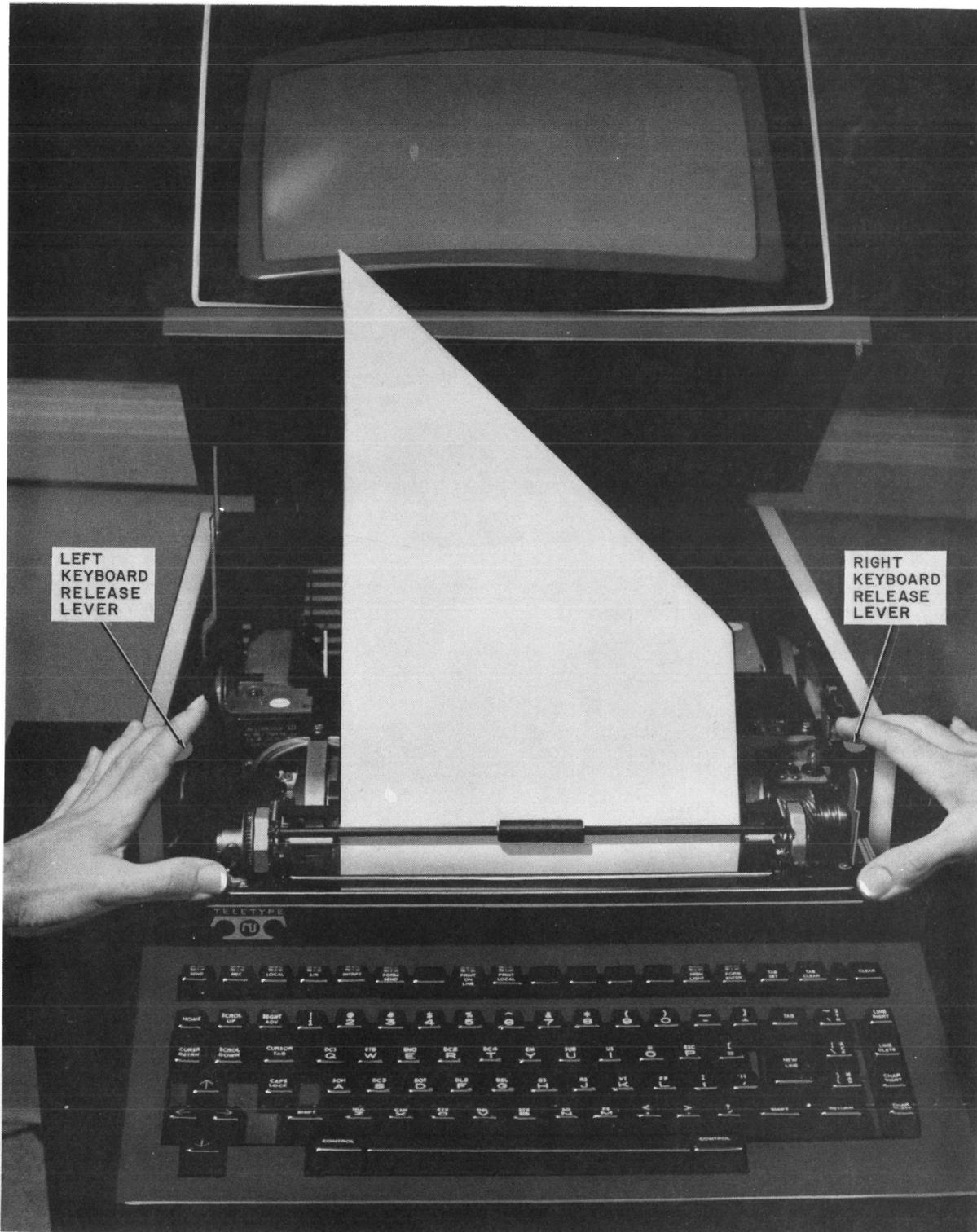


Fig. 21—DATASPEED 40 Operator Console

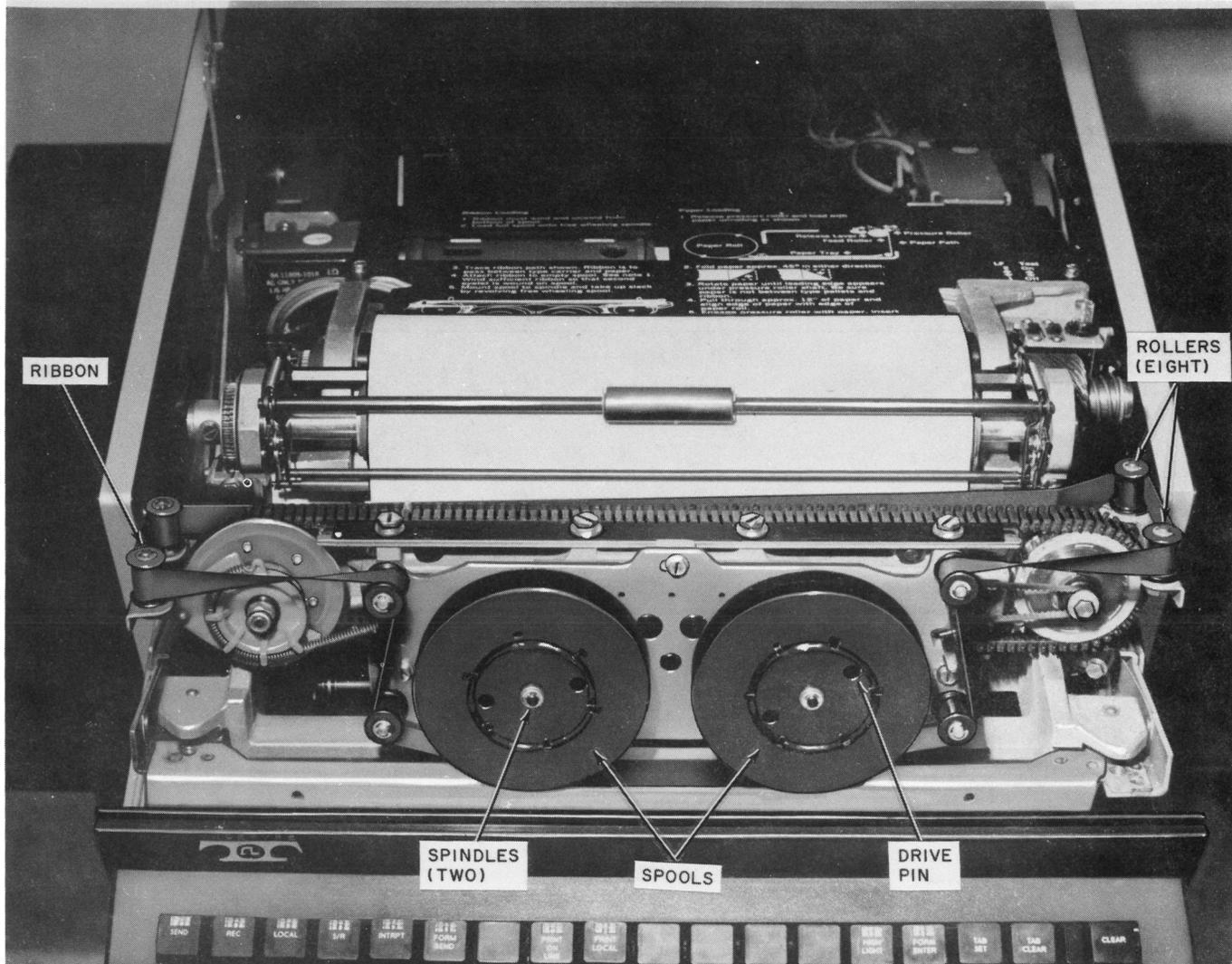


Fig. 22—DATASPEED 40 Operator Console



Fig. 23—Central Unit Switch Register