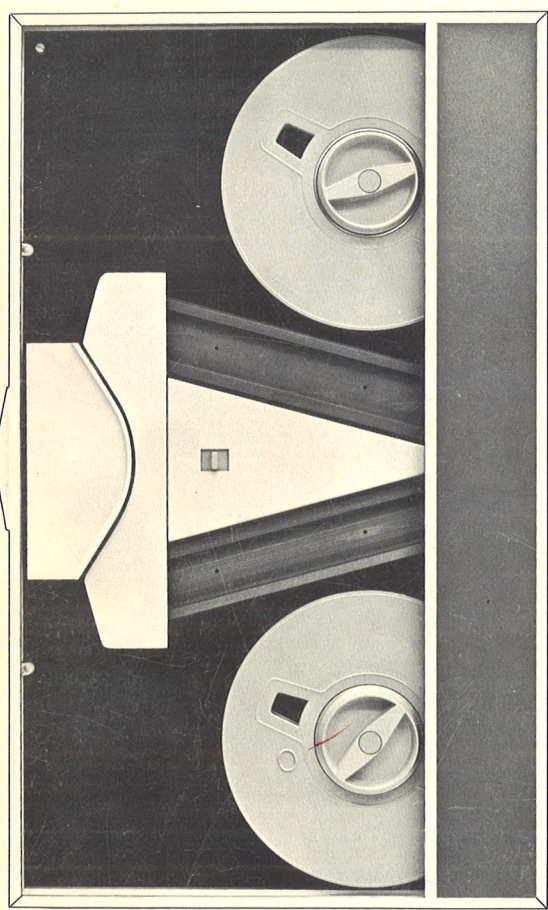


# OPERATING AND SERVICE MANUAL



## DIGITAL MAGNETIC TAPE TRANSPORT MODEL 7975A

HEWLETT  PACKARD

TEMPORARY CHANGE PAGE

DATE OF CHANGE:

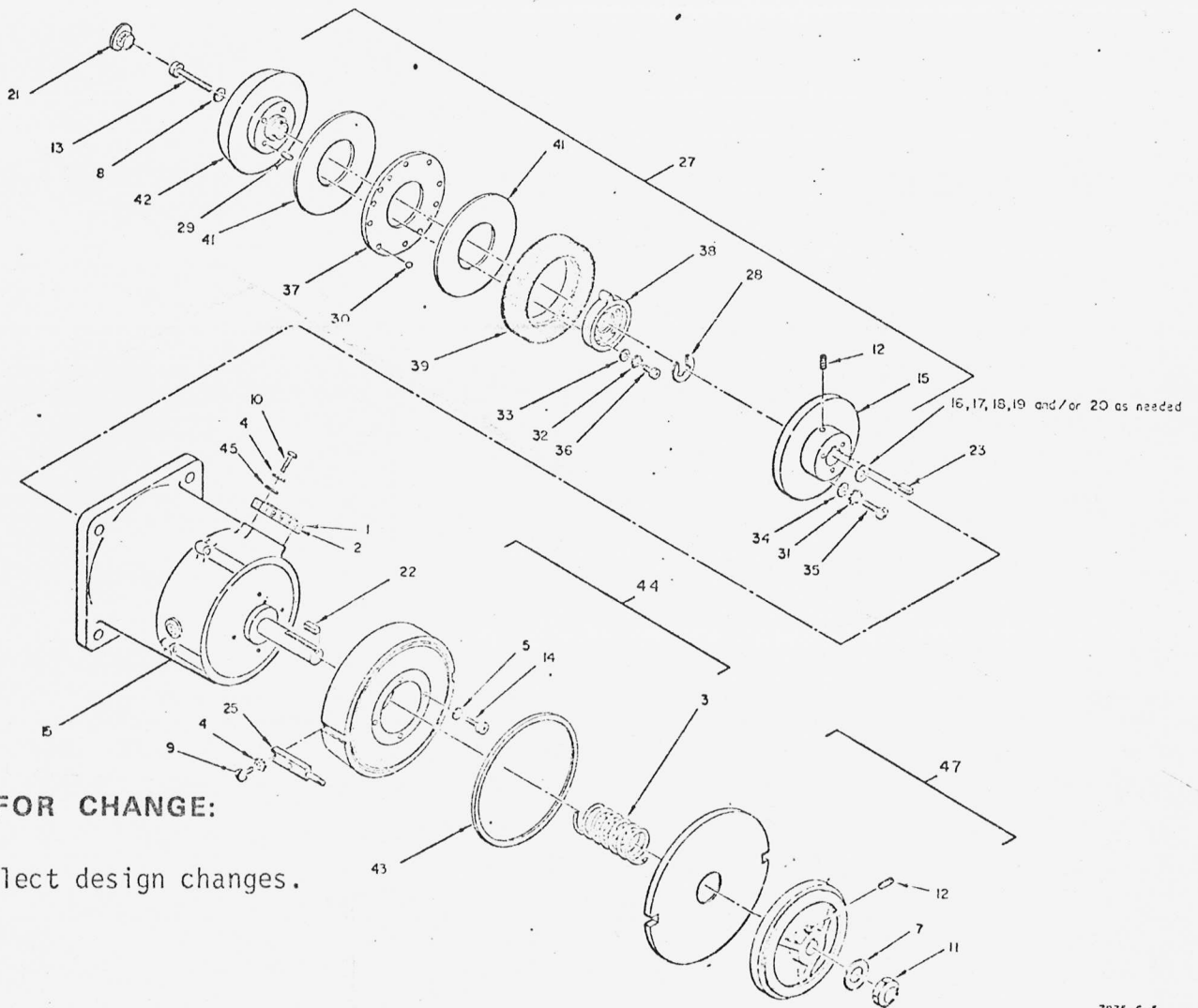
16 Dec 1969

TITLE: 7975A Tape Transport

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 9-5 as follows:



REASON FOR CHANGE:

To reflect design changes.

Figure 9-4. File Reel Motor, Parts Location  
(See Table 9-3.)

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

TEMPORARY CHANGE PAGE

DATE OF CHANGE:

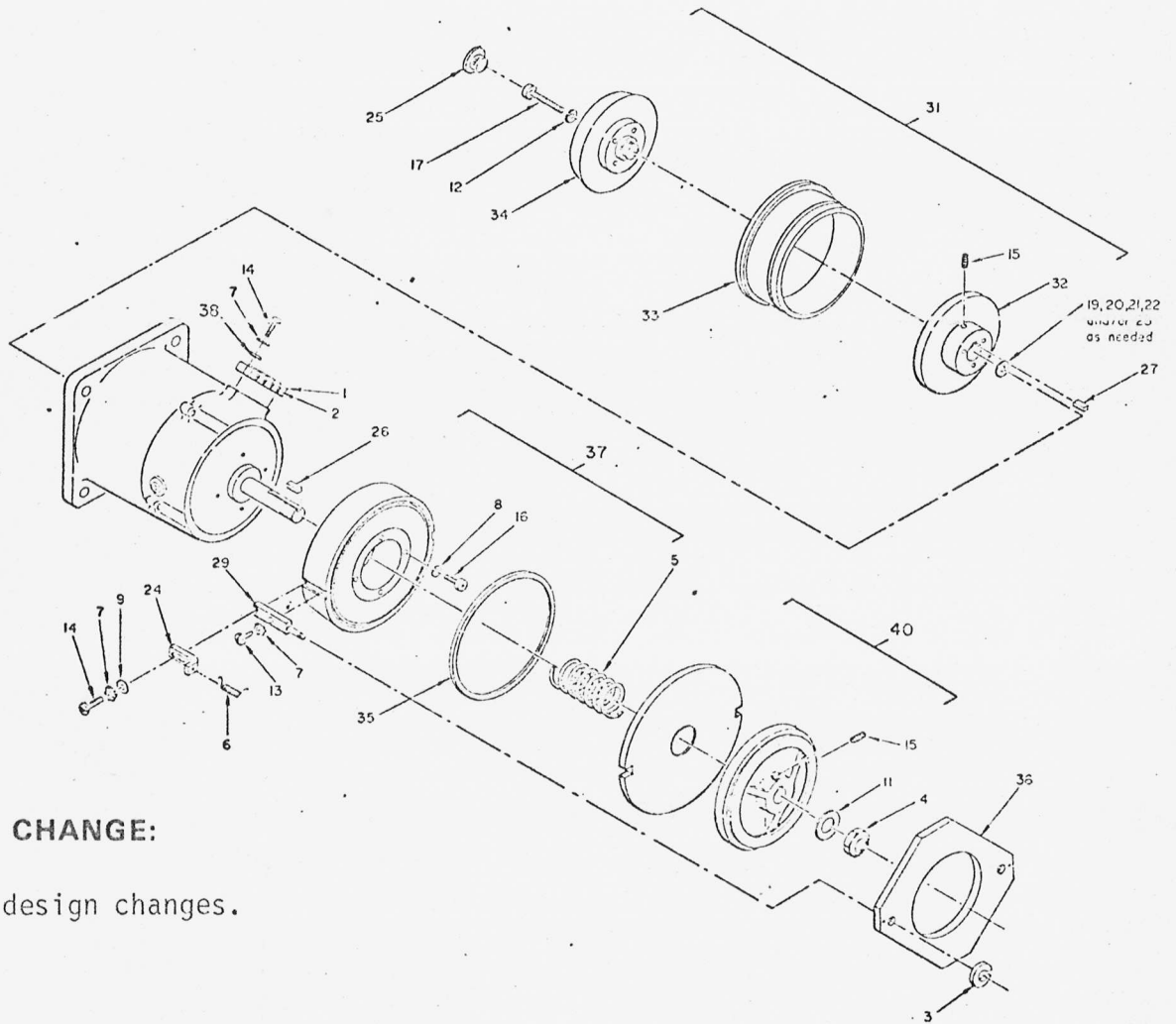
16 Dec 1969

TITLE: 7975A Tape Transport

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 9-6 as follows:



REASON FOR CHANGE:

To reflect design changes.

Figure 9-5. Takeup Reel Motor, Parts Location  
(See Table 9-4.)

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

TEMPORARY CHANGE PAGE

DATE OF CHANGE:

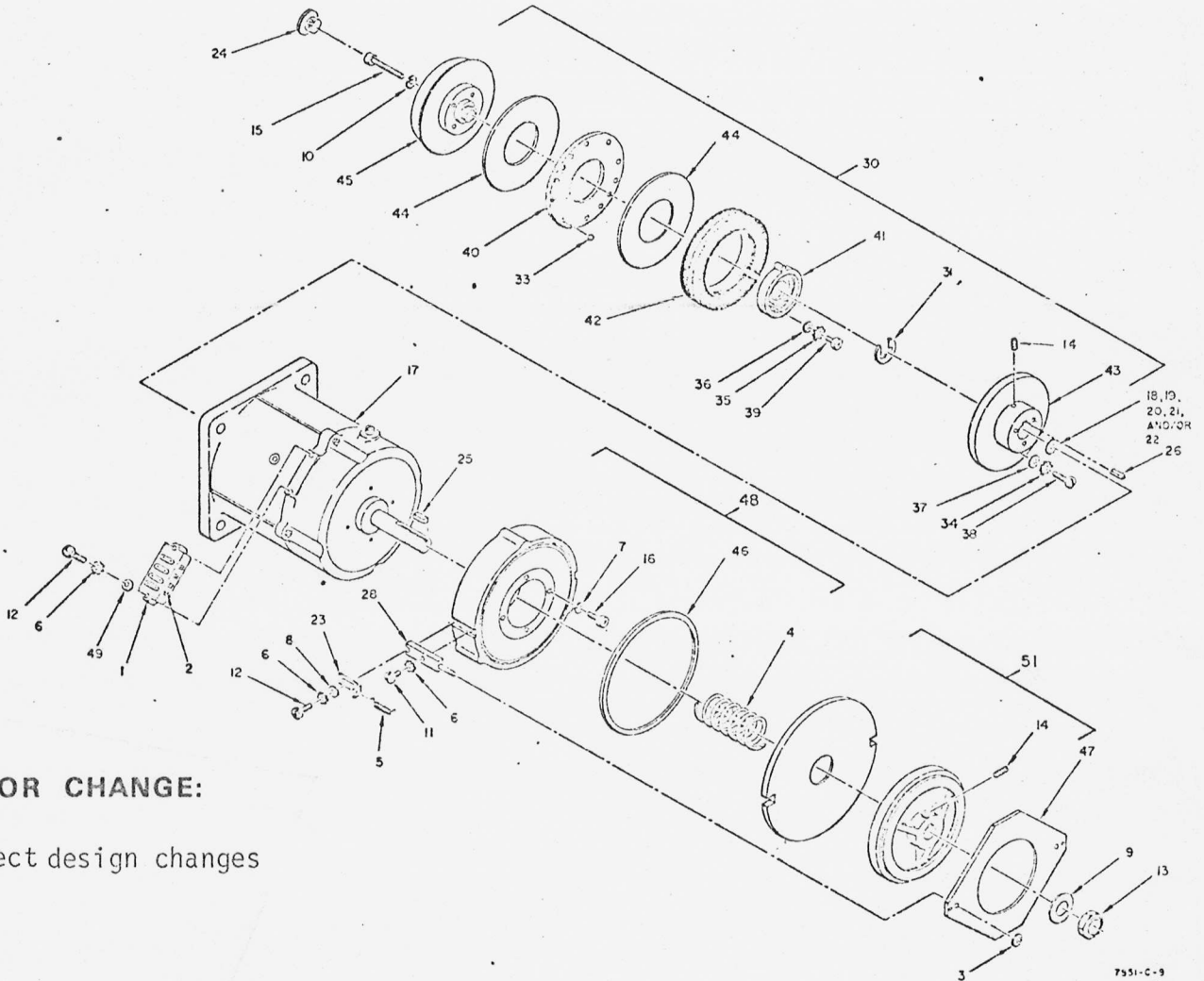
16 Dec 1969

TITLE: 7975A Tape Transport

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 9-15 as follows:



REASON FOR CHANGE:

To reflect design changes

Figure 9-17. File Reel Motor, Fast Forward, Parts Location  
(See Table 9-21.)

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

**TEMPORARY CHANGE PAGE**

**DATE OF CHANGE:**

16 Dec 1969

**TITLE:** 7975A Tape Transport

**DOCUMENT NO:** 07975-90470

**ISSUE/DATE:** August 1969

This temporary change page replaces information on page 9-20 as follows:

Effect the following parts list change to table 9-3:

TYPE OF CHANGE	REF DESIG	HP PART NUMBER	DESCRIPTION	QTY
DELETE	24	07975-20150	Brake Plate	1
DELETE	25	07975-20220	Pin, Brake	2
DELETE	26	07975-60050	Brake Rotor Assembly	1
DELETE	43	07975-40030	Spacer, Brake Plate	1
DELETE	44	07975-80010	Brake Coil Housing Assembly	1
ADD	47	5060-5459	Brakeplate/Rotor Assembly	1
ADD	44	5060-5460	Brake Coil Housing Assembly	1
ADD	43	07975-40030	. Spacer, Brake Plate	1
ADD	25	07975-20220	. Pin, Brake	2

**REASON FOR CHANGE:**

To reflect design changes

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

## TEMPORARY CHANGE PAGE

DATE OF CHANGE:

16 Dec 1969

TITLE: 7975A Tape Transport.

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 9-21 as follows:

Effect the following parts list change to table 9-4:

TYPE OF CHANGE	REF DESIG	HP PART NUMBER	DESCRIPTION	QTY
DELETE	28	07975-20150	Brake Plate	1
DELETE	29	07975-20220	Pin, Brake	2
DELETE	30	07975-60051	Brake Rotor Assembly	1
DELETE	35	07975-40030	Spacer, Brake Plate	1
DELETE	37	07975-80010	Brake Coil Housing Assembly	1
ADD	40	5060-5459	Brakeplate/Rotor Assembly	1
ADD	37	5060-5460	Brake Coil Housing Assembly	1
ADD	35	07975-40030	. Spacer, Brake Plate	1
ADD	29	07975-20220	. Pin, Brake	2

## REASON FOR CHANGE:

To reflect design changes.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

## TEMPORARY CHANGE PAGE

DATE OF CHANGE:

24 Feb 1970

TITLE: 7975A Tape Transport

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 9-26, 27 as follows:

Below the heat sink listed for Q6 and Q10, add the following:

<u>HP PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QTY</u>
8500-0059	. Compound: Silicone	A/R

Also, delete reference to the turret lugs listed after the resistors; these lugs are part of the blank PC board, 02020-80020.

## REASON FOR CHANGE:

Improvement to replacement parts information.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

## TEMPORARY CHANGE PAGE

DATE OF CHANGE:

16 Dec 1969

TITLE: 7975A Tape Transport

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 9-41 as follows:

Effect the following parts list changes to table 9-21:

TYPE OF CHANGE	REF DESIG	HP PART NUMBER	DESCRIPTION	QTY
DELETE	27	07975-20150	Brake Plate	1
DELETE	28	07975-20220	Pin, Brake	2
DELETE	29	07975-60051	Brake Rotor Assembly	1
DELETE	46	07975-40030	Spacer, Brake Plate	1
DELETE	48	07975-80010	Brake Coil Housing Assembly	1
ADD	51	5060-5459	Brakeplate/Rotor Assembly	1
ADD	48	5060-5460	Brake Coil Housing Assembly	1
ADD	46	07975-40030	. Spacer, Brake Plate	1
ADD	28	07975-20220	. Pin, Brake	2

## REASON FOR CHANGE:

To reflect design changes.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.



TEMPORARY CHANGE PAGE

DATE OF CHANGE:

24 FEB 1970

TITLE: 7975A Tape Transport

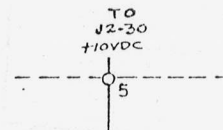
DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

This temporary change page replaces information on page 10-15/10-16 as follows:

There are two changes on figure 10-4.

First, indicate pin 5 as follows:



Second, change the value of RI6 to read 3.3K.

REASON FOR CHANGE:

Correction to error in manual.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

## TEMPORARY CHANGE PAGE

DATE OF CHANGE:

15 June 1970

**TITLE:** Model 7975A Tape Transport  
Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** August 1969

This temporary change page replaces information on page 4-1 as follows:

Change sentence in paragraph 4-8

**FROM:** "Contacts 15 and 16 of K1 close,  
forming a holding circuit for K1  
through VS7; normally closed  
contacts 6, 5, 8, and 9 of K4;  
VS8; and diode CR21."

**TO:** "Contacts 15 and 16 of K1 close,  
forming a holding circuit for K2.  
The holding circuit for K1 is  
through VS7, normally closed contacts  
5 and 6, and 8 and 9 of K4, VS8, CR21,  
and VS6."

**REASON FOR CHANGE:** Correction to error in manual.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

## TEMPORARY CHANGE PAGE

DATE OF CHANGE:

15 June 1970

TITLE: Model 7975A Tape Transport  
Operating and Service Manual

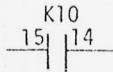
DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969

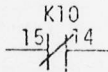
This temporary change page replaces information on page 4-4 as follows:

Change relay logic in Figure 4-4 for K10 contacts 15 and 14

FROM:



TO:



REASON FOR CHANGE: Correction to error in manual.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

## TEMPORARY CHANGE PAGE

DATE OF CHANGE:  
8 July 1970

TITLE: Digital Magnetic Tape Transport  
Model 7975A

DOCUMENT NO: 07975-90470

ISSUE/DATE: August 1969 (Original)

This temporary change page replaces information on page 6-6 as follows:

Between Paragraphs (6) and (7) of the Azimuth Adjustment, use the following:

CAUTION
---------

In steps (7) through (11), avoid excessive tightening of azimuth adjusting screws, as breaking of the screw heads will result.

Place this temporary change page immediately <sup>opposite</sup>~~preceding~~ affected page. Replace when official changed pages are issued.

TEMPORARY CHANGE PAGE

DATE OF CHANGE:  
9 July 1970

TITLE: Digital Magnetic Tape Transport  
Model 7975A  
DOCUMENT NO: 07975-90470  
ISSUE/DATE: August 1969 (Original)

This temporary change page replaces information on page 6-6 as follows:

Change Figure 6-8:

FROM:

TO:

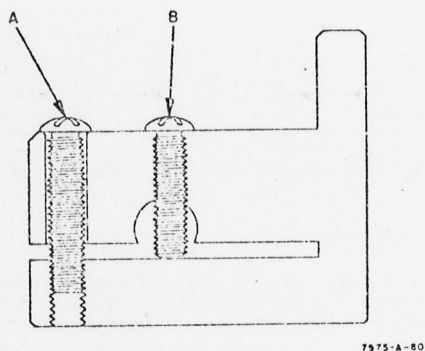


Figure 6-8. Azimuth Adjusting Block

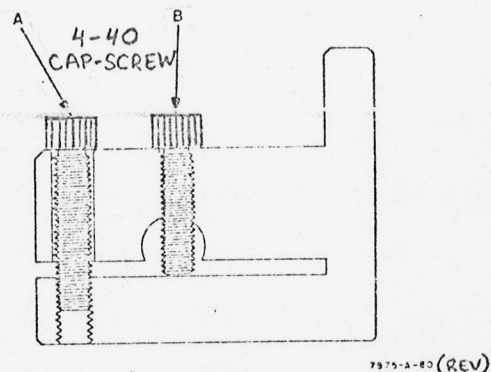


Figure 6-3. Azimuth Adjusting Block

Place this temporary change page immediately ~~preceding~~ <sup>opposite</sup> affected page. Replace when official changed pages are issued.

TEMPORARY CHANGE PAGE

DATE OF CHANGE:  
13 July 1970

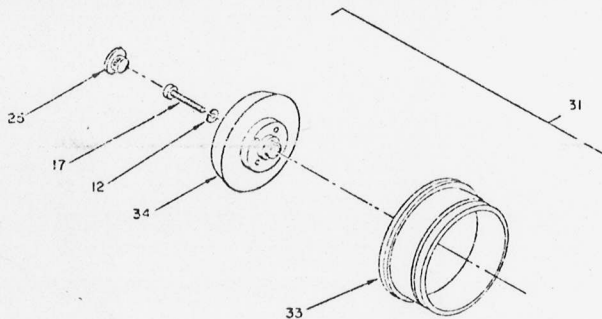
TITLE: 7975A Tape Transport  
Operating and Service Manual

DOCUMENT NO: 07975-90470

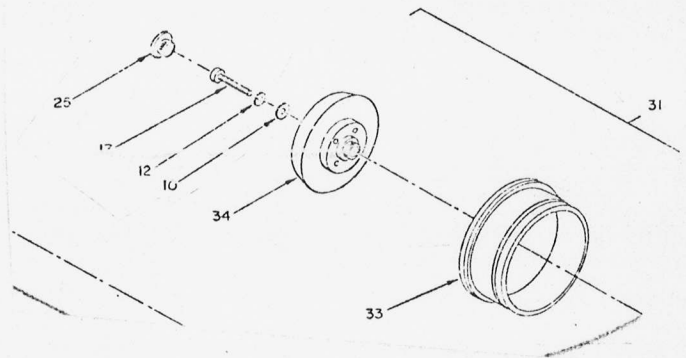
ISSUE/DATE: August 1969 (Original)

This temporary change page replaces information on page 9 - 6 as follows:

FROM:



TO:



~~REASON FOR CHANGE~~

Place this temporary change page immediately ~~preceding~~ <sup>opposite</sup> affected page. Replace when official changed pages are issued.

TEMPORARY CHANGE PAGE

DATE OF CHANGE:

15 June 1970

**TITLE:** Model 7975A Tape Transport  
Operating and Service Manual

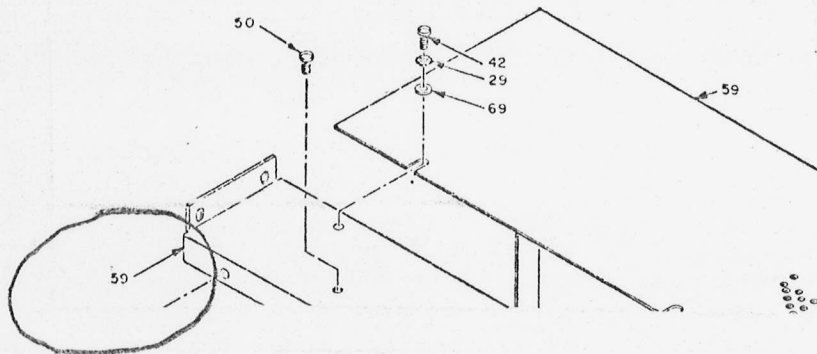
**DOCUMENT NO:** 07975-90470

**ISSUE/DATE:** Original, August 1969

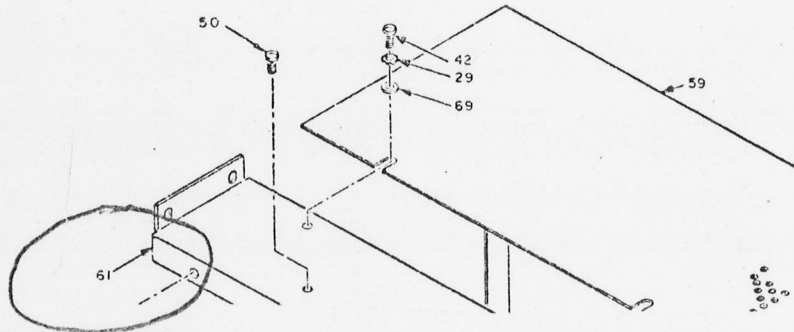
This temporary change page replaces information on page 9-9 as follows:

Change One item 59 (of two called out) in Figure 9-9

FROM:



TO:



**REASON FOR CHANGE:** Correction to Manual error.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.

TEMPORARY CHANGE PAGE

DATE OF CHANGE:

15 June 1970

TITLE: Model 7975A Tape Transport  
Operating and Service Manual

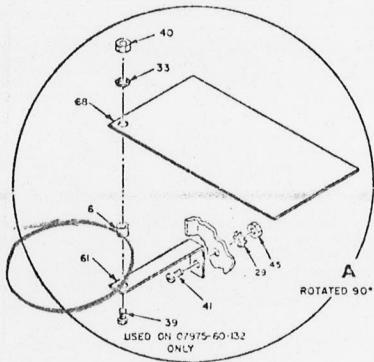
DOCUMENT NO: 07975-90470

ISSUE/DATE: Original, August 1969

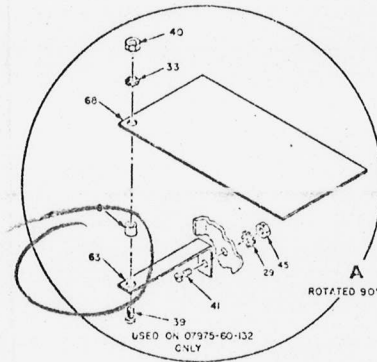
This temporary change page replaces information on page 9-10 as follows:

Change item 61 in Figure 9-10, detail A

FROM:



TO:



REASON FOR CHANGE: Correction to manual error.

Place this temporary change page immediately preceding affected page. Replace when official changed pages are issued.



# TEMPORARY CHANGE PAGE

**Product**

**MODEL:** 7975A Digital Magnetic Tape Transport  
~~XXXXXXXXXXXXXXXXXXXX~~ **SERIES:** 850

**Date of Change:**

4 August 1970

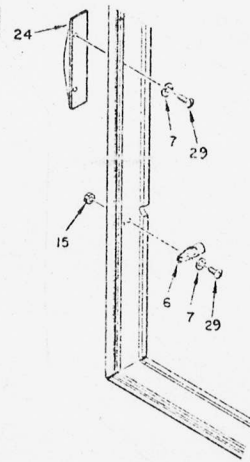
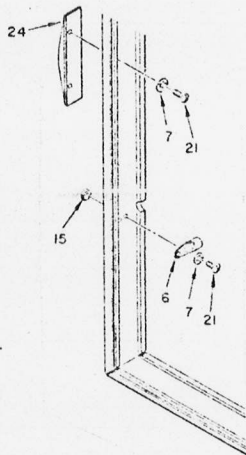
**Literature**

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/August 1969

This temporary change page replaces information on page 9-11 as follows:

FROM:

TO:



Place this temporary change page immediately preceding affected page.

TEMPORARY CHANGE PAGE

Product

MODEL: 7975A Digital Magnetic Tape Transport  
~~XXXXXXXXXXXXXXXXXXXX~~ SERIES: 850

Date of Change:

4 August 1970

Literature

TITLE: Operating and Service Manual  
 DOCUMENT NO: 07975-90470  
 ISSUE/DATE: Original/August 1969

This temporary change page replaces information on page 9-30 as follows:

TYPE OF CHANGE	REF DESIG	HP PART NUMBER	DESCRIPTION	QTY
ADD	29	2200-0141	Screw, PH POZI 4-40 x .312	2

Place this temporary change page immediately preceding affected page.

## TEMPORARY CHANGE PAGE

### Product

Date of Change:

**MODEL:** 7975A Magnetic Tape Transport  
~~SERIAL PREFIX~~ **SERIES:** 1034A

20 August 1970

### Literature

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/August 1969

This temporary change page replaces information on page 5-2 as follows:

5-10b. Program forward command (P1-13) alternately on for 8-ms and off for 10-ms. Verify that forward start characteristic displayed on oscilloscope resembles trace in Figure 5-3 and that start time is  $3.2 \pm .1$  ms.

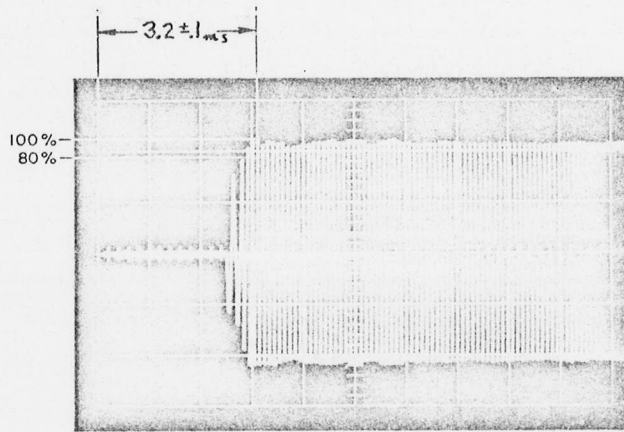


Figure 5-3. Start Time Characteristics (lms/cm)

Place this temporary change page immediately preceding affected page.

## TEMPORARY CHANGE PAGE

### Product

**MODEL:** 7975A Magnetic Tape Transport  
~~XXXXXXXXXXXX~~ **SERIES:** 1034A

### Date of Change:

20 August 1970

### Literature

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/August 1969

This temporary change page replaces information on page 6-5 as follows:

The first sentence in paragraph 6-20 should read:

6-20. Actuator assemblies are nominally positioned so  $.007 \pm .002$ -inch clearance exists between the pinchroller and the capstan when the actuator is deenergized. A locking-nut is added to the back-gap adjustment screw.

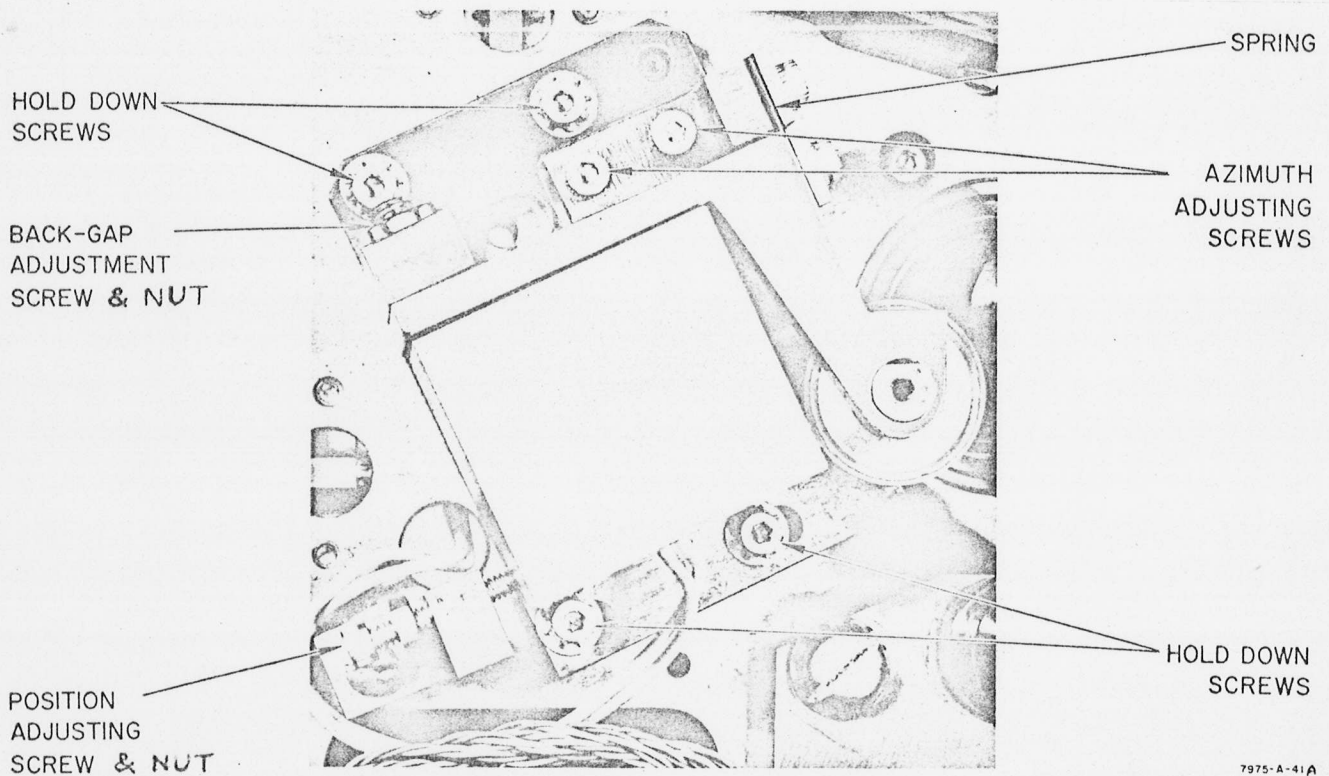


Figure 6-7. Actuator Adjustment Points

7975-A-41A

Place this temporary change page immediately preceding affected page.

## TEMPORARY CHANGE PAGE

### Product

Date of Change:  
20 August 1970

**MODEL:** 7975A Magnetic Tape Transport  
~~XXXXXXXXXXXX~~ **SERIES:** 1034A

### Literature

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/August 1969

This temporary change page replaces information on page 6-6 as follows:

#### 6-20-e. Back-Gap Adjustment

- (1) Remove tape from machine.
- (2) Loosen the locking nut on the back-gap adjustment screw.
- (3) Adjust the back-gap adjustment screw for a 0.007 +0.007 +0.002-inch gap between the pinchroller and the capstan (Figure 6-9).
- (4) Tighten locking nut sufficient for holding adjustment on back-gap screw.

Place this temporary change page immediately preceding affected page.

# TEMPORARY CHANGE PAGE

**Product**

**Date of Change:**

**MODEL:** 7975A Magnetic Tape Transport  
~~SERIAL PREFIX~~ **SERIES:** 1034A

20 August 1970

**Literature**

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/August 1969

This temporary change page replaces information on page 9-8 as follows:

FROM:

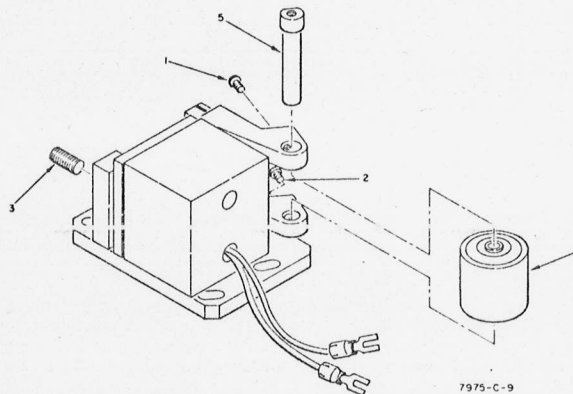


Figure 9-8. Actuator, Parts Location  
(See Table 9-7.)

TO:

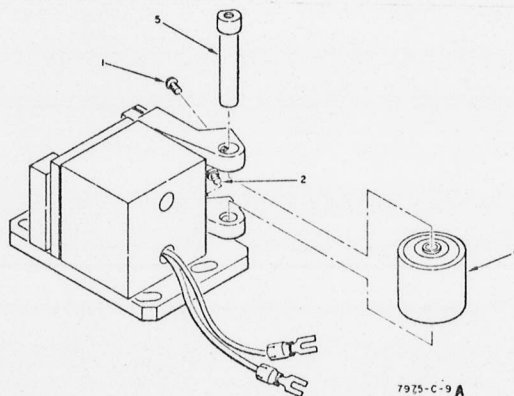


Figure 9-8. Actuator, Parts Location  
(See Table 9-7.)

Place this temporary change page immediately preceding affected page.

**TEMPORARY CHANGE PAGE**

**Product**

**Date of Change:**

**MODEL:** 7975A Magnetic Tape Transport  
~~SERIAL PREFIX~~ **SERIES:** 1034A

20 August 1970

**Literature**

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/August 1969

This temporary change page replaces information on page 9-18 as follows:

TYPE OF CHANGE	REF DESIG	HP PART NUMBER	DESCRIPTION	QTY
FROM	112	07975-60120	Actuator Assembly (See Table 9-7)	1
TO	112	07975-60330	Actuator Assembly (See Table 9-7)	1
FROM	113	07975-60121	Actuator Assembly (See Table 9-7)	1
TO	113	07975-60331	Actuator Assembly (See Table 9-7)	1

Place this temporary change page immediately preceding affected page.

**TEMPORARY CHANGE PAGE**

**Product**

**Date of Change:**

**MODEL:** 7975A Magnetic Tape Transport  
~~SERIAL PREFIX~~ **SERIES:** 1034A

20 Aug 70

**Literature**

**TITLE:** Operating and Service Manual  
**DOCUMENT NO:** 07975-90470  
**ISSUE/DATE:** Original/Aug 69

This temporary change page replaces information on page 9-23 as follows:

TYPE OF CHANGE	REF DESIG	HP PART NUMBER	DESCRIPTION	QTY
FROM TO		07975-60120 07975-60330	Actuator (Reverse) Actuator (Reverse)	1 1
FROM TO		07975-60121 07975-60331	Actuator (Forward) Actuator (Forward)	1 1
DELETE	3	3030-0259	Screw, Set 10-32 x 3/8	1

Place this temporary change page immediately preceding affected page.





# OPERATING AND SERVICE MANUAL

## DIGITAL MAGNETIC TAPE TRANSPORT

**Model 7975A**

Copyright 1969  
HEWLETT-PACKARD COMPANY  
690 E. MIDDLEFIELD ROAD, MOUNTAIN VIEW, CALIFORNIA 94040, U.S.A.  
PRINTED IN U.S.A.

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Series Number 850

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## SECTION I GENERAL INFORMATION

### 1-1. INTRODUCTION

1-2. This manual contains operating and service instructions for the Digital Magnetic Tape Transport, Hewlett-Packard Model 7975A. (See figure 1-1.)

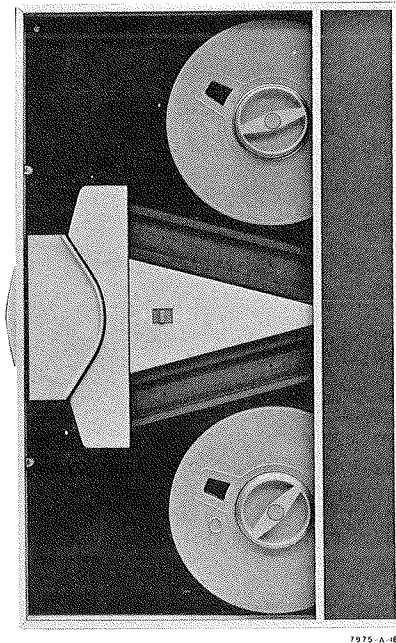


Figure 1-1. Digital Magnetic Tape Transport  
Hewlett-Packard Model 7975A

1-3. Although the transport is especially intended for the Hewlett-Packard Series 2020 Digital Magnetic Tape Units, it may be used in any system that requires a general purpose digital tape transport.

### 1-4. INSTRUMENTS COVERED

1-5. The Hewlett-Packard Digital Magnetic Tape Transports have a three-digit series number, located on the back of the transport. This manual applies directly to instruments with series numbers indicated in the list of effective pages on the back of the title page. If you do not find the instrument series number so listed, consult your nearest Hewlett-Packard Sales and Service Office for assistance.

### 1-6. MANDATORY OPTIONS

1-7. All transports must have a speed range option installed (options 015 through 019 or option 029). Refer to your SYSTEM CONFIGURATION LIST at the front of the manual for the specific option number and exact speed of your transport.

### 1-8. ACCESSORIES

1-9. Transports are delivered ready for operation. Tape and other transport accessories are listed in table 1-1. Accessories and equipment options available for use with Hewlett-Packard 2020 systems are listed in the general information manual.

Table 1-1. Transport Accessories

HP MODEL OR PART NO.	DESCRIPTION
9162-0023	Magnetic Tape, 10.5-inch reel (2400 ft.) certified at 556 bpi
9162-0025	Magnetic Tape, 10.5-inch reel (2400 ft.) certified at 800 bpi
9162-0026	Magnetic Tape, 8-inch reel (1200 ft.) certified at 800 bpi
8500-0810	HP Head Cleaner (Head and Tape Guide Cleaner)
13128A	Preventive Maintenance Kit, 2000 hours
13129A	Preventive Maintenance Kit, 4000 hours
5080-4525	HP Transport Test Tape, 7-track
5080-4526	HP Transport Test Tape, 9-track
9162-0027	IBM Alignment Tape, full width

### 1-10. SPECIFICATIONS

1-11. Table 1-2 lists the specifications for the Model 7975A Digital Magnetic Tape Transport.

Table 1-2. Specifications\*

<p><b>TAPE SPEED:</b></p> <p><b>Single-Speed Transports:</b></p> <p>From 7.5** to 45 ips.</p> <p><b>Dual-Speed Transports:</b></p> <p>Any two speeds between 45 ips and 1 ips that do not exceed a 10:1 ratio.</p> <p><b>REEL BRAKES:</b></p> <p>Disk type electromechanical. Brakes apply if tape breaks or power fails.</p> <p><b>REELS:</b></p> <p>Maximum diameter is 10.5 inches, with IBM type hub.</p> <p><b>POWER REQUIREMENTS:</b></p> <p>105 to 126 VAC (117 VAC nominal), 60 Hz single phase (50-Hz operation, optional).</p> <p>Standby . . . . . 450 watts</p> <p>Peak Operating . . . . . 750 watts, average</p> <p>Maximum Surge . . . . . 970 watts</p> <p><b>TAPE MOTION COMMANDS:</b></p> <p>No sequence of commands or combination of simultaneous commands will cause tape damage. Five milliseconds must be allowed between commands to maintain start-stop specifications. The following commands are necessary for the operation of the transport:</p> <p>Forward Command . . . . . -8 (<math>\pm 3</math>) VDC</p> <p>Reverse Command . . . . . -8 (<math>\pm 3</math>) VDC</p> <p>Rewind Command . . . . . -8 (<math>\pm 3</math>) VDC</p> <p>Stop Command . . . . . Removal of previously applied drive command</p> <p>Additional commands required for transports with fast forward (option 079) or with DC capstan servo system (option 001) are:</p> <p>Fast Forward . . . . . -8 (<math>\pm 3</math>) VDC</p> <p>Low Speed . . . . . 0 (<math>\pm 0.5</math>) VDC</p> <p>High Speed . . . . . -8 (<math>\pm 3</math>) VDC</p> <p><b>TEMPERATURE:</b></p> <p>+32° to +100° F ambient, operating.***</p>	<p><b>HUMIDITY:</b></p> <p>20% to 95% relative humidity, operating.***</p> <p><b>ALTITUDE:</b></p> <p>To 10,000 feet above sea level.</p> <p><b>SPEED DEVIATION:</b></p> <p>Average long-term speed deviation is <math>\pm 1\%</math>. Speed deviation from average is <math>\pm 1\%</math> or less when measured over tape lengths as short as 1.5 inches, and less than <math>\pm 1.5\%</math> when measured over tape lengths as short as 0.135 inch.</p> <p><b>START TIME:</b></p> <p>Less than 5 ms (forward or reverse) to within <math>\pm 5\%</math> of normal speed, after receipt of start command.</p> <p><b>START DISTANCE:</b></p> <p>0.108 (<math>\pm 0.032</math>) inch during 5-ms start period at 45 ips. At other tape speeds, tape travel = <math>0.0024 (\pm 0.0007) V</math>, where V = tape speed in ips.</p> <p><b>STOP TIME:</b></p> <p>Less than 1.5 ms after forward or reverse drive command is removed.</p> <p><b>STOP DISTANCE:</b></p> <p>0.045 (<math>\pm 0.010</math>) inch during the 1.5-ms stop period at 45 ips. At other tape speeds, tape travel = <math>0.001 (\pm 0.00022) V</math>, where V = tape speed in ips.</p> <p><b>REWIND TIME:</b></p> <p>Less than 3 minutes for a full 2400-foot reel.</p> <p><b>DIMENSIONS:</b></p> <p><b>7975A Transport:</b></p> <p>Size: 31-3/8 inches high, 19 inches wide, 13-7/8 inches deep (79,7 x 48,3 x 35,3 cm).</p> <p>Weight: 130 pounds (59 kg).</p> <p><b>OPTIONAL ITEMS:</b></p> <p><b>13350A Cabinet:</b></p> <p>Size: 66-1/4 inches high, 24 inches wide, 26 inches deep (168,3 x 61,0 x 66,1 cm).</p> <p>Weight: 186 pounds (84,5 kg).</p> <p><b>13351A Dolly:</b></p> <p>Size: 4-1/2 inches high, 24 inches wide, 36 inches deep (11,4 x 61,0 x 91,5 cm).</p> <p>Weight: 24 pounds (10,9 kg).</p>
--	--

\*Specifications apply to units operating from a precise 60-Hz or 50-Hz AC power line. All specifications except speed deviation will be met with a  $\pm 2$ -Hz line frequency variation.

\*\*Lower speeds on special order.

\*\*\*Magnetic tape manufacturer's recommendations for operating environment should be followed. Digital magnetic tape standards are +60° to +90° F ambient operating temperature at 20% to 80% relative humidity.



## SECTION II INSTALLATION

### 2-1. INCOMING INSPECTION

#### 2-2. Mechanical Check

2-3. If damage to the shipping carton is evident, ask that the carrier's agent be present when the instrument is unpacked. Visually inspect the instrument for mechanical damage. If damage is evident, refer to paragraph 2-6 for recommended claim procedure.

#### 2-4. Performance Checks

2-5. Proper performance should be verified as soon as possible after receiving the transport. Performance checks suitable for incoming inspection are given in section V. These checks verify that the transport is operating within specifications listed in section I, table 1-2.

#### 2-6. Claims for Damages

2-7. If mechanical damage is evident or if the transport does not meet operating specifications

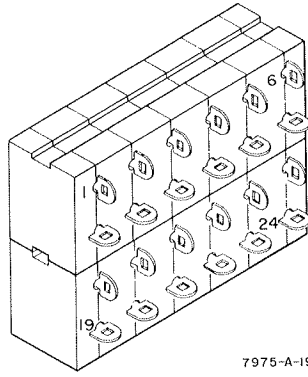
when received, immediately notify the carrier and the nearest Hewlett-Packard Sales and Service Office. (Refer to list at the rear of this manual.) The sales and service office will arrange for repair or replacement of the faulty instrument without waiting for settlement of any claim against the carrier.

### 2-8. TRANSPORT MOUNTING

2-9. Refer to section II of the series 2020 general information manual for transport mounting data.

### 2-10. TRANSPORT CONNECTOR

2-11. All power, control, and status lines for the transport terminate in P1 on the transport control cable. P1 connects to J1 on the Hewlett-Packard operator control panel. If the Hewlett-Packard operator control panel is not used, external connections to P1 must be made through a mating connector. Figure 2-1 shows the part number and wiring for the mating connector.



7975-A-19

(Solder Lug View)

TRANSPORT MATING CONNECTOR Hewlett-Packard Part  
No. 1251-1427 connects to P1 on Transport Control Cable

PIN NO.	FUNCTION	APPROX. CURRENT	NOMINAL VOLTAGE	**WIRE SIZE
1	COMMON	4 A	--	18
2	117 VAC NEUTRAL	7.5 A	117 VAC	18
3	117 VAC HOT	7.5 A	117 VAC	18
4	-28 VDC OUT	250 mA	-28 VDC	22
5	+10 VDC	25 mA	+10 VDC	22
6	6 VAC	2.5 A	6 VAC	18
7	LOAD POINT PHOTOSENSE	25 mA	+10 VDC	22
8	END OF TAPE PHOTOSENSE	25 mA	+10 VDC	22
9	REWIND STATUS	*	*	22
10	REWIND STATUS	*	*	22
11	WRITE ENABLED STATUS	*	*	22
12	WRITE ENABLED STATUS	*	*	22
13	FORWARD	10 mA	-10 VDC	22
14	REVERSE	10 mA	-10 VDC	22
15	REWIND	10 mA	-10 VDC	22
16	END OF TAPE RESET	200 mA	-24 VDC	22
17	REWIND LIGHT	250 mA	6 VAC	22
18	WRITE ENABLED LIGHT	250 mA	6 VAC	22
19	WRITE ENABLED CONTACT			
20	(Write Power Supply)	200 mA	117 VAC	22
21	FAST FORWARD (Option 079)***	10 mA	-10 VDC	22
22	SPEED SELECT (Option 001)***	10 mA	-10 VDC	22
23				
24	GROUND	--	--	18

\*Status line current and voltage are determined by their usage on connected equipment.  
1 Amp, 115 VAC Max.  
\*\*Recommended AWG for runs of 25 feet or less.  
\*\*\*No connection unless option installed.

Figure 2-1. Control and Status Connections

## SECTION III OPERATION

### 3-1. INTRODUCTION

3-2. Since the Model 7975A Digital Magnetic Tape Transport normally functions as part of a complete recording system, the operator need only install and remove the file reel as needed, and restart the tape transport after changing tapes or correcting a power failure.

### 3-3. OPERATING CONTROLS

3-4. The tape transport (figure 3-1) has only a single operating control, the transport switch marked START/BRAKES. However, there is a TRANSPORT POWER switch on the rear of the transport control unit. The TRANSPORT POWER switch is normally turned off only for maintenance purposes.

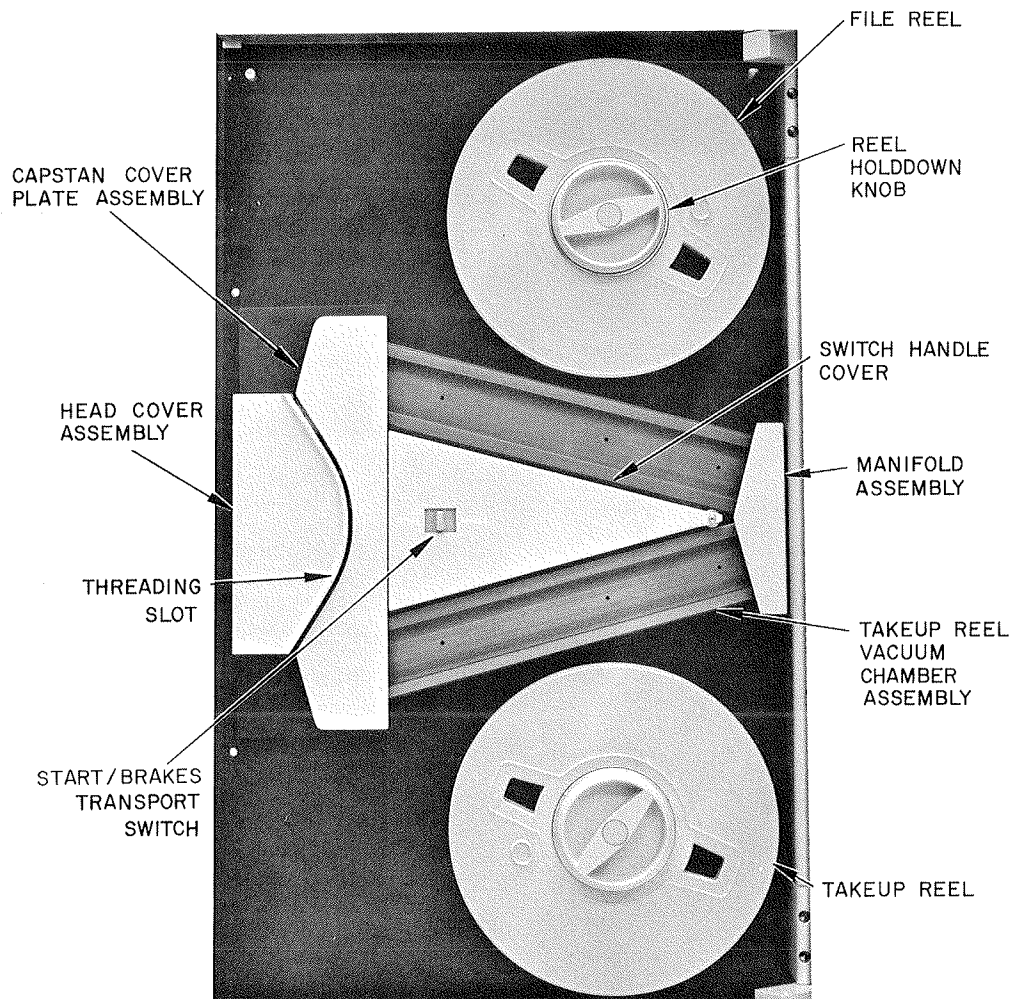
### 3-5. INSTALLING PHOTOSENSE TABS

3-6. Photosense tabs (IBM part no. 352407, or equivalent) have a pressure-sensitive adhesive on their backs and attach to the non-oxide (shiny) side of the tape as shown in figure 3-2. The load-point tab is placed along the edge of the tape nearest the operator; the end-of-tape tab is placed along the edge of the tape nearest the transport.

### 3-7. INSTALLING THE FILE REEL

3-8. To install the file reel, proceed with the following steps:

- a. Verify that 117 VAC power is applied to tape transport.



7975-A-20

Figure 3-1. Tape Transport Front Component Locations

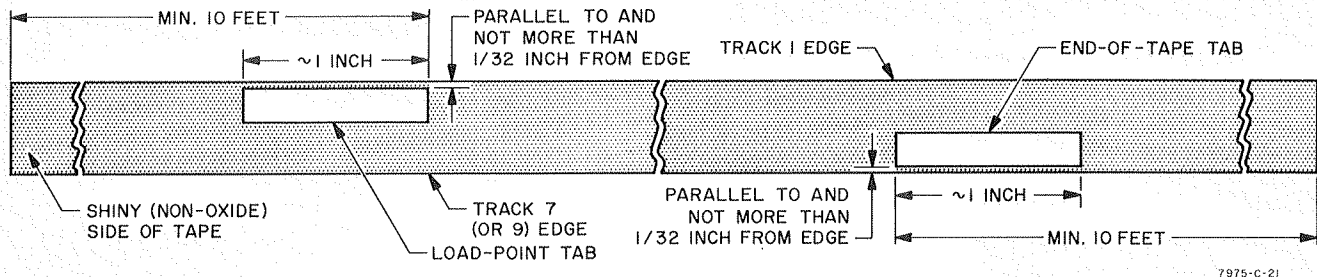


Figure 3-2. Location of Photosense Tabs

b. If tape transport is to operate in the write mode, verify that a plastic write enable ring is in groove on file reel (figure 3-3).

c. Rotate holddown knob of file reel counterclockwise as far as possible.

d. Place file reel over holddown knob and make sure reel seats firmly against turntable. The side of the reel with a groove for the write enable ring must face the tape transport.

e. Holding reel firmly against turntable with one hand, turn holddown knob clockwise to tighten. (See figure 3-4.) Tighten holddown knob until it is snug or until it reaches the end-of-travel stop (approximately 3/4 turn).

f. Hold transport switch in BRAKES position while pulling approximately 3 feet of tape from file reel.

g. Release transport switch.

### 3-9. THREADING THE TAPE

3-10. Thread tape on the transport as follows:

a. Hold end of tape between thumb and forefinger of right hand. Hold tape between thumb and forefinger of left hand, with about 15 inches of tape between the two hands. (See figure 3-5.)

b. Place tape over raised portion of the head cover, above threading slot (figure 3-6). Pull tape taut and position right hand near end of lower chamber, leaving several inches of tape between left hand and head cover.

c. Move taut section of tape downward and toward tape transport, causing tape to pass into threading slot. Pull remaining slack tape through threading slot, bringing it around vacuum chamber guides.

d. Place the end of the tape over top of takeup (lower) reel hub. (See figure 3-1.) Hold transport switch in BRAKES position while winding about six turns of tape clockwise on the takeup reel. After taking up slack between the two reels, release transport switch.

e. Verify that tape is properly aligned with vacuum chamber entrances.

f. Hold transport switch in START position. The capstan and vacuum motors will start and tape will feed into the vacuum chambers. When reel motors stop, release transport switch.

### 3-11. REMOVING FILE

3-12. Remove the file reel from the tape transport as follows:

a. With tape rewound onto the file reel (figure 3-1), hold transport switch in BRAKES position while manually winding end of tape and leader onto file reel.

b. Turn file reel holddown knob counterclockwise to release reel; then remove file reel from tape transport.

### 3-13. RESTARTING AFTER POWER FAILURE

3-14. If primary power to the tape transport fails, restart the unit as follows:

a. Verify that power is restored.

b. Hold transport switch in BRAKES position while winding slack tape onto either reel.

c. Momentarily position transport switch to START.

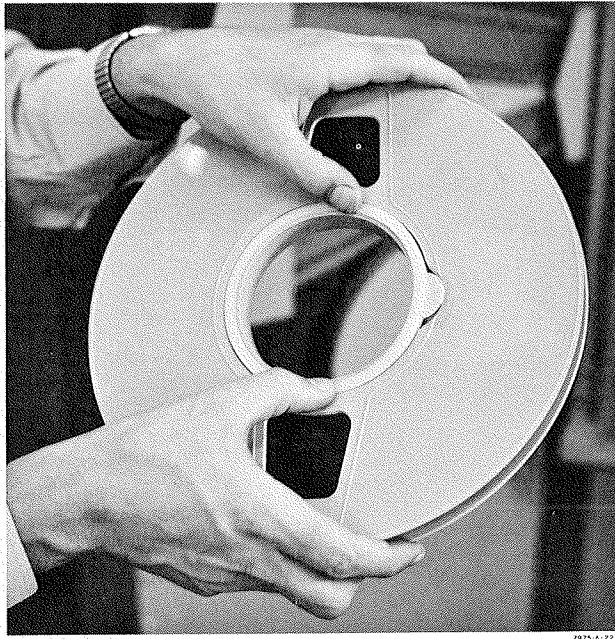


Figure 3-3. Installing the Write Enable Ring

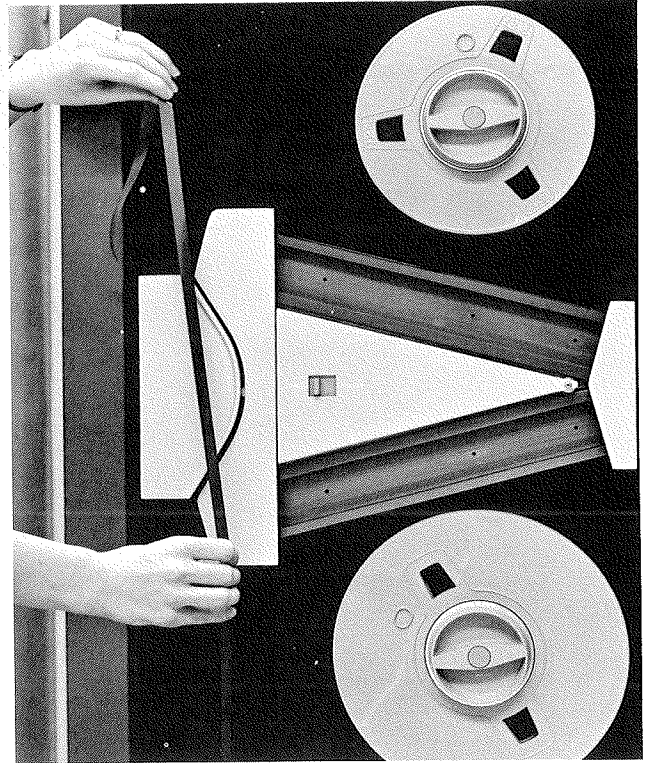


Figure 3-5. Threading Tape (step a)

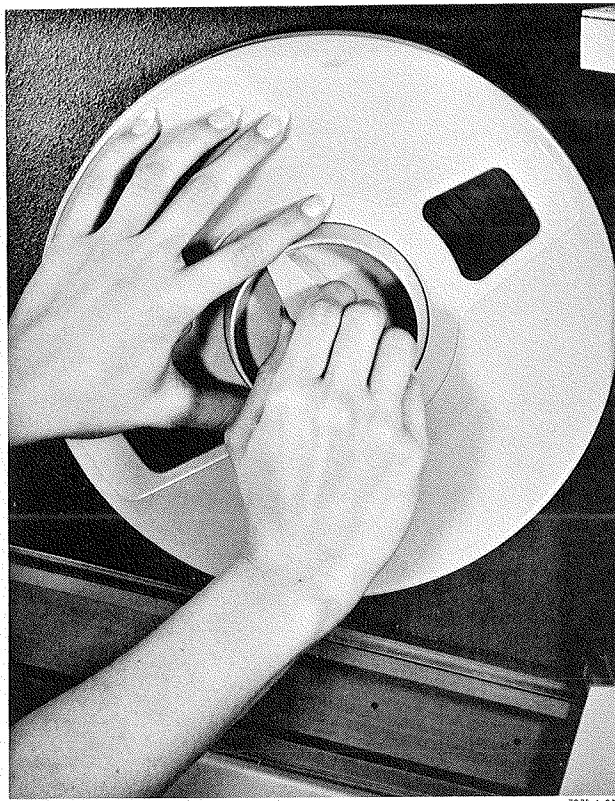


Figure 3-4. Installing the File Reel

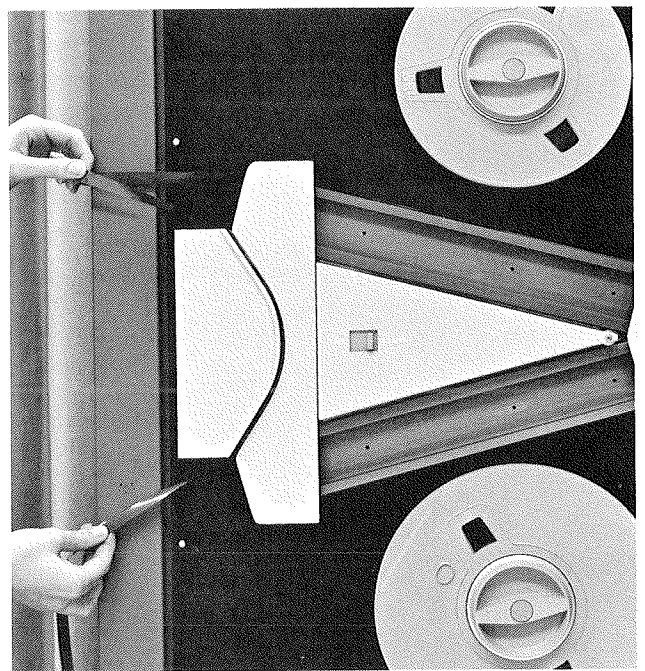


Figure 3-6. Threading Tape (step b)



## SECTION IV

### THEORY OF OPERATION

#### 4-1. INTRODUCTION

4-2. This section briefly describes the functional operation of the tape transport components. The analysis is supported by simplified circuit diagrams. If more detailed circuit information is needed for troubleshooting or maintenance, see the wiring and schematic diagrams in section X.

4-3. After tape has been threaded into the tape transport (figure 4-1), pressing the transport switch to the START position starts the vacuum and capstan motors and enables the tape drive control circuits. The vacuum chambers draw in tape, forming a loop in each chamber between the vacuum switch sensing holes, as shown in figure 4-1. The reel motors, responding to signals from vacuum switches, turn the reels to supply the required lengths of tape. When tape loops have formed, the reel motors stop, but the tape transport remains enabled so that it can respond to forward, reverse, or rewind commands.

4-4. A forward command applied to the transport control assembly causes the forward actuator to clamp the tape between the rotating capstan and the pinchroller. This pulls the tape toward the lower vacuum chamber. The takeup reel pulls tape from the tape loop to prevent the loop from becoming too large. As the forward capstan draws the tape from the upper vacuum chamber, the file reel supplies tape to the chamber to maintain the tape loop in the chamber. The motions of the file reel and the takeup reel are controlled by the actions of vacuum switches that sense the positions of the tape loops in the vacuum chambers. Removing the forward signal from the transport control assembly stops the forward motion of the tape.

4-5. When the transport control assembly receives a reverse command, the upper (reverse) actuator operates, and the pinchroller presses the tape against the reverse capstan. The reverse capstan pulls the tape from the lower vacuum chamber loop and feeds it into the upper vacuum chamber. The takeup reel feeds tape to maintain the lower tape loop and the file reel takes tape from the upper loop to compensate for the tape being fed into the upper vacuum chamber. Removing the reverse input signal from the transport control assembly stops reverse tape motion.

4-6. Applying a rewind input signal to the transport control assembly causes the reel motors to jog the tape loops out of the vacuum chambers; then the file reel motor rewinds the tape at high speed. The actuators do not energize during rewind. Removing the rewind signal from the tape transport stops the file reel motor and restores the tape transport to the initial enabled condition.

#### 4-7. VACUUM SYSTEM AND CAPSTANS

4-8. With tape threaded into the tape transport and looped around the takeup reel, the vacuum and capstan motors will continue running once they are started. Positioning the transport switch (figure 3-1) to START, energizes vacuum relay K2. (See figure 4-2.) Contacts 7 and 9 of K2 apply 117 VAC to the capstan motor and to the vacuum motor. As soon as vacuum builds up, switch VS6 closes, energizing relay K1. Contacts 15 and 16 of K1 close, forming a holding circuit for K1 through VS7; normally closed contacts 6, 5, 8, and 9 of K4; VS8; and diode CR21. Switch S1 may now be released from its START position without de-energizing K1 and K2. The vacuum and capstan motors continue running until an operator positions the transport switch to BRAKES.

4-9. Positioning switch S1 to BRAKES opens the S1C contacts, releasing relay K2 and removing alternating-current power from the capstan and vacuum motors. When the vacuum drops, VS6, VS7, and VS8 open, de-energizing K1 and disabling the transport until S1 is again positioned to START.

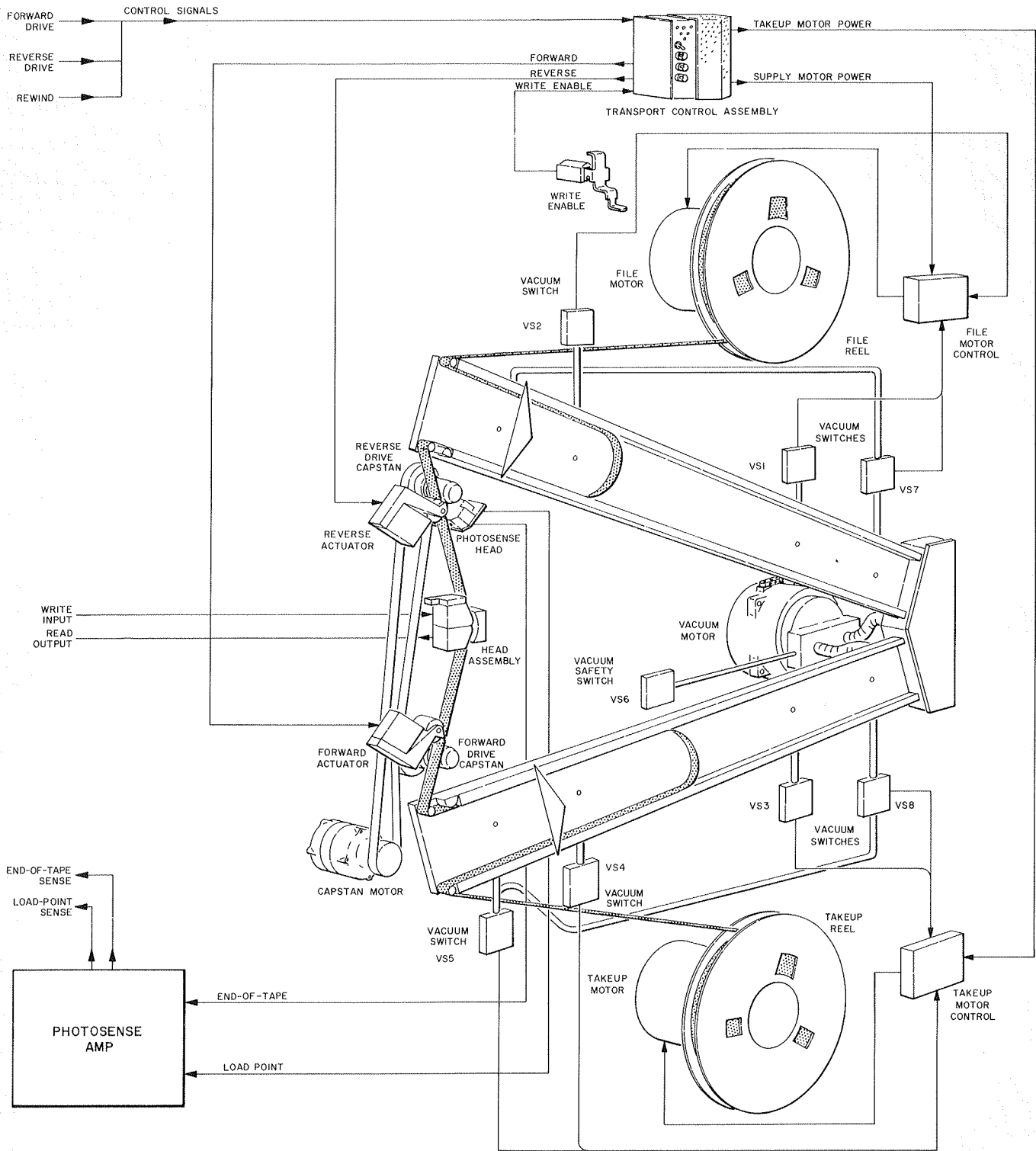
#### 4-10. ACTUATOR CONTROL CIRCUITS

4-11. The forward and reverse actuators control forward and reverse tape motion at capstan speeds. The actuators are driven by identical circuits that are interlocked to prevent the two actuators from operating at the same time.

4-12. When the vacuum system of the tape transport is operating normally, and is not rewinding, K10 will be energized. A negative 10-volt signal applied at pin 13 of connector P1 (figure 4-3) is then sent by the Schmitt trigger composed of transistors Q4 and Q5 to the base of transistor Q7, turning on Q7 and energizing the forward actuator. The actuator pinchroller presses the tape against the forward capstan, pulling the tape across the tape head. Interlock transistor Q6 supplies the collector voltage for Q9 and blocks the action of the reverse actuator while a forward command is present. Interlock transistor Q10 supplies collector voltage for Q5 if a reverse command is not present at pin 14 of P1. The presence of a reverse command operates the reverse actuator and cuts off the collector supply for Q5, preventing the forward actuator from energizing. If the tape transport receives forward and reverse commands simultaneously, the actuator circuits respond to only one of the commands and reject the other.

#### 4-13. REEL MOTOR CONTROL CIRCUITS

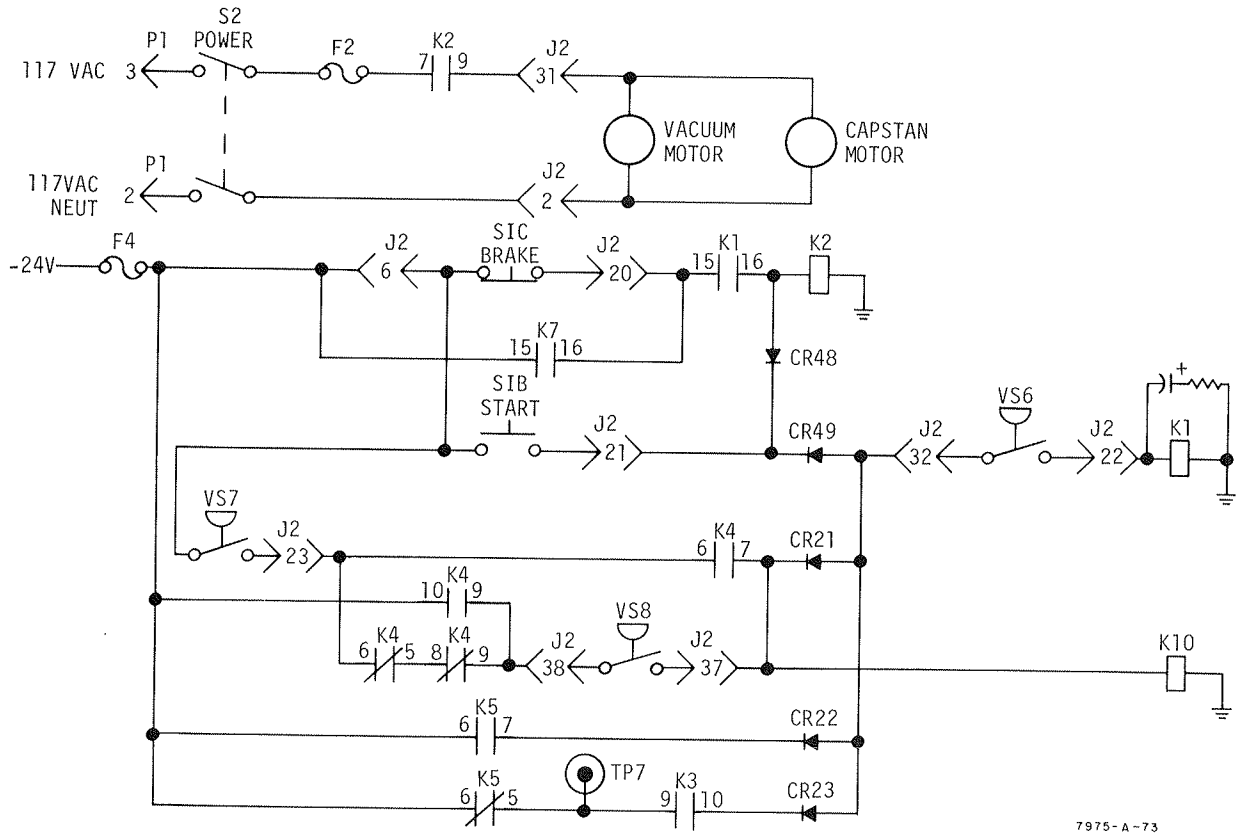
4-14. The reel motor control circuits (figure 4-4) connect to the reel motor power supply through contacts 12 and 13 of disable relay K1 and contacts



7975-C-27

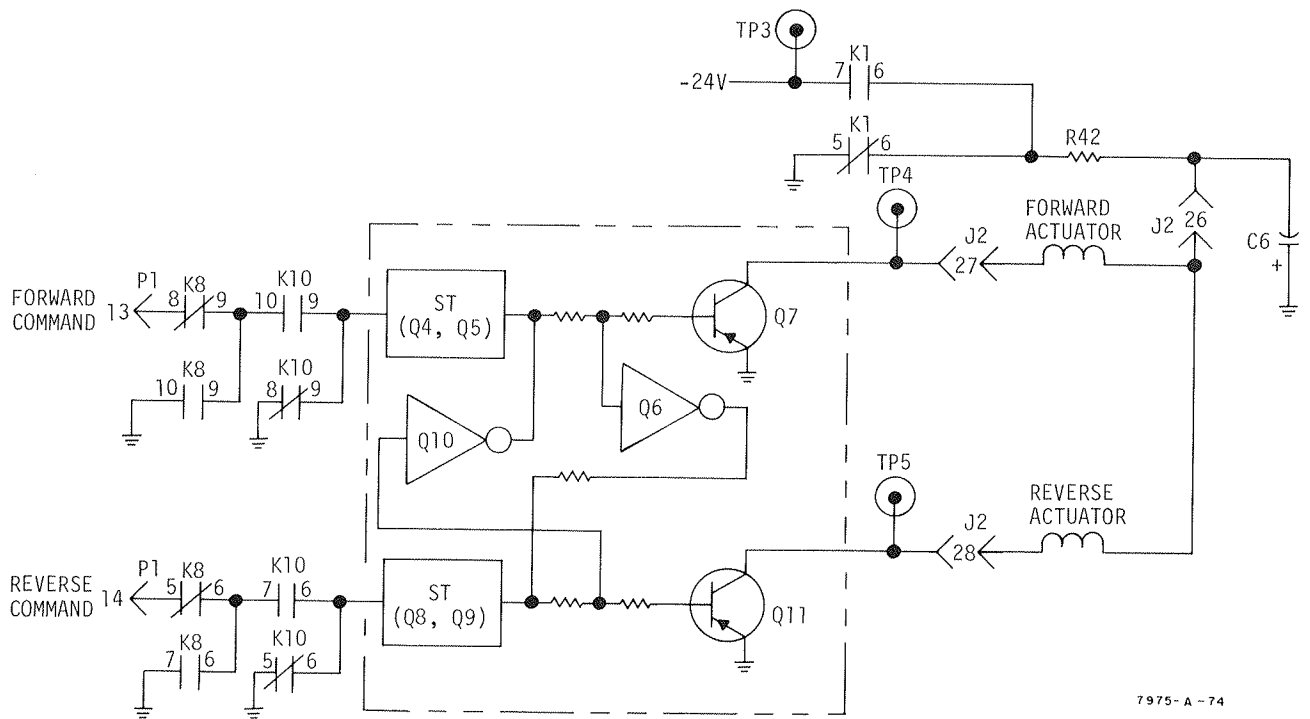
Figure 4-1. Tape Transport Functional Diagram





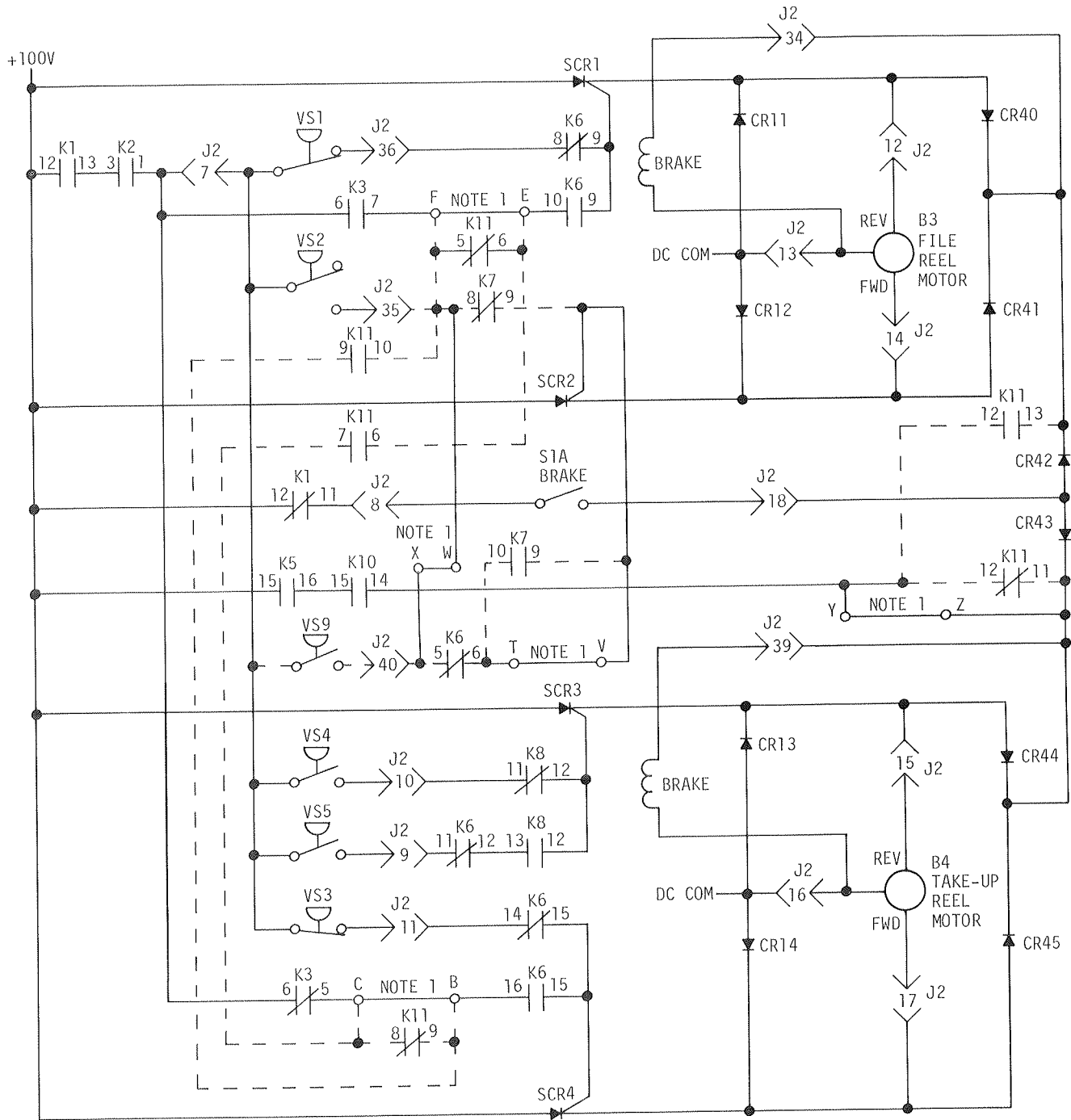
7975-A-73

Figure 4-2. Vacuum and Capstan Motor Control Circuit



7975-A-74

Figure 4-3. Forward and Reverse Actuator Circuits



NOTES:

1. OPTION 079 (FAST FWD) DELETES LINES FROM B TO C, E TO F, T TO V, W TO X, AND Y TO Z.
2. OPTION 079 (FAST FWD) ADDS CIRCUITS SHOWN BY DASHED LINES.

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Figure 4-4. Reel Motor Control Circuits

1 and 3 of vacuum relay K2. After an operator has threaded tape in the transport and positioned the transport switch to START, vacuum switches VS1, VS2, VS3, and VS4 remain open. If a forward command energizes the actuator to pull tape from the upper vacuum chamber, the shortening of the tape loop closes VS2. The gate of SCR2 connects to the positive input through VS2 and contacts 5 and 6 of relay K6 (open only during rewind), causing the file reel to turn forward to feed more tape into the upper vacuum chamber. The forward motion of the tape into the lower vacuum chamber lengthens the tape loop; this allows VS3 to close and triggers SCR4 with a positive voltage. The resulting forward motion of the takeup reel pulls tape from the lower vacuum chamber, shortening the tape loops. When the loop passes VS3 it opens and allows SCR4 to shut off.

4-15. When the reverse capstan pulls tape from the lower vacuum chamber and feeds it into the upper vacuum chamber, vacuum switches VS1 and VS4 close, causing the reels to turn in the reverse direction to compensate for changes in the lengths of the tape loops. Diodes CR11, CR12, CR13, and CR14 clamp out voltage spikes, preventing transient triggering of the silicon-controlled rectifiers.

**4-16. BRAKE CIRCUITS**

4-17. Spring pressure automatically applies the brakes when the reel motors do not receive drive power. When SCR2 (figure 4-4) triggers to turn the file reel forward, diode CR41 conducts current for the file reel motor brake solenoid, energizing the solenoid which releases the brake. Similarly, triggering SCR1 for reverse file reel rotation applies forward bias to diode CR40 and releases the file reel brake. The takeup reel motor brake functions similarly, releasing when forward bias

is applied to diode CR44 or diode CR45. During tape threading, holding the transport switch to the BRAKES position applies forward bias to diodes CR42 and CR43, energizing both brake solenoids so the reels can be rotated manually.

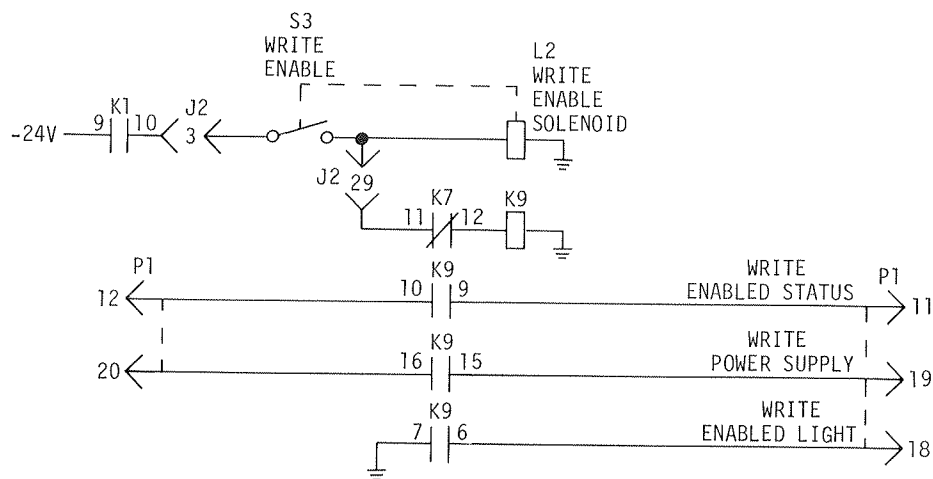
**4-18. WRITE ENABLE CIRCUITS (FILE PROTECT)**

4-19. Installing a file reel equipped with a write enable ring on the tape transport overrides the built-in file protection of a standard 2020 series tape recorder unit. Installing a reel with a write enable ring presses switch S3 (figure 4-5) closed, energizing write enable solenoid L2. (See figures 4-6 and 4-7.) The actuator of L2 holds S3 closed, relieving pressure on the write enable ring by the switch actuator. (See figure 4-8.) Closing S3 also energizes relay K9 (figure 4-5), except during rewinding when contacts 11 and 12 of K7 remain open. Energizing K9 closes the write power supply circuit, the write enabled status circuit, and the write enable light circuit to the operator control panel in a standard series 2020 unit.

**4-20. TAPE REWINDING CIRCUITS**

4-21. The tape transport responds to a rewind command by decreasing the amount of vacuum, jogging the tape loops out of the vacuum chambers, then rewinding the tape from the takeup reel to the file reel at high speed.

4-22. The rewind command connects from pin 15 of connector P1 (figure 4-9) to the base of Q3, turning on Q3 and completing the ground return circuit for the coil of relay K4. The closure of K4 contacts 15 and 16 energizes relays K5 and K6; closing contacts 12 and 13 of K4 energizes relays K7 and K8.



7975-A-76

Figure 4-5. Write Enable Circuit

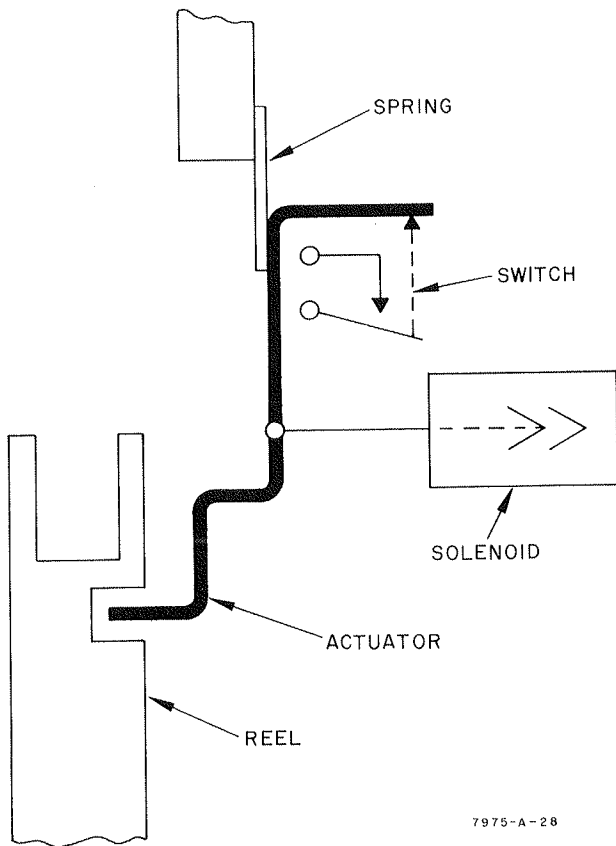


Figure 4-6. Write Enable Ring Not Installed

7975-A-28

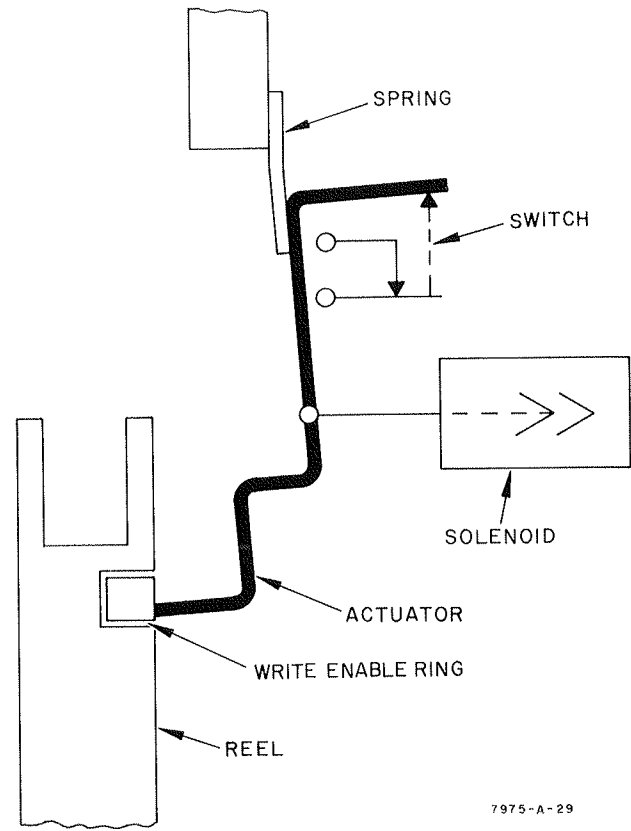


Figure 4-7. Write Enable Ring Installed,  
Transport Not Started

7975-A-29

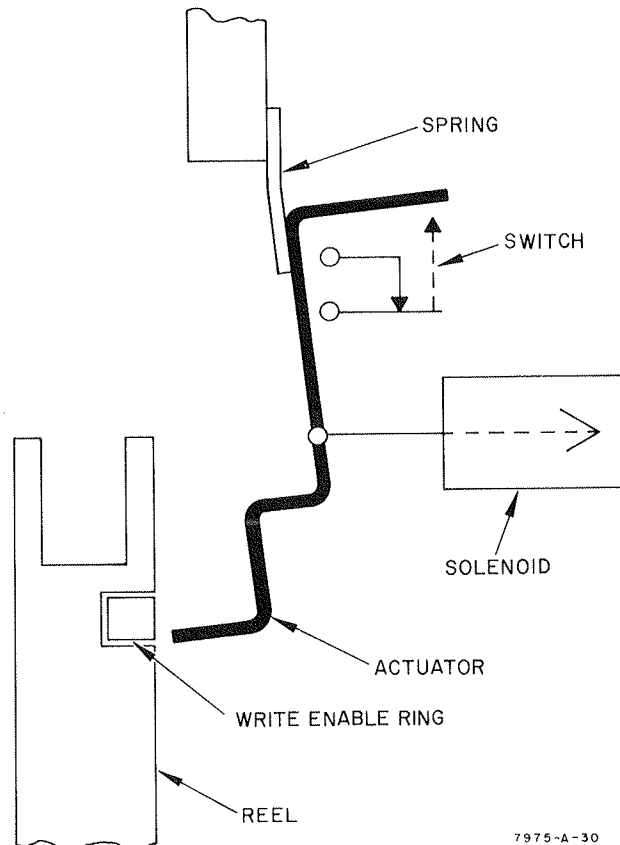
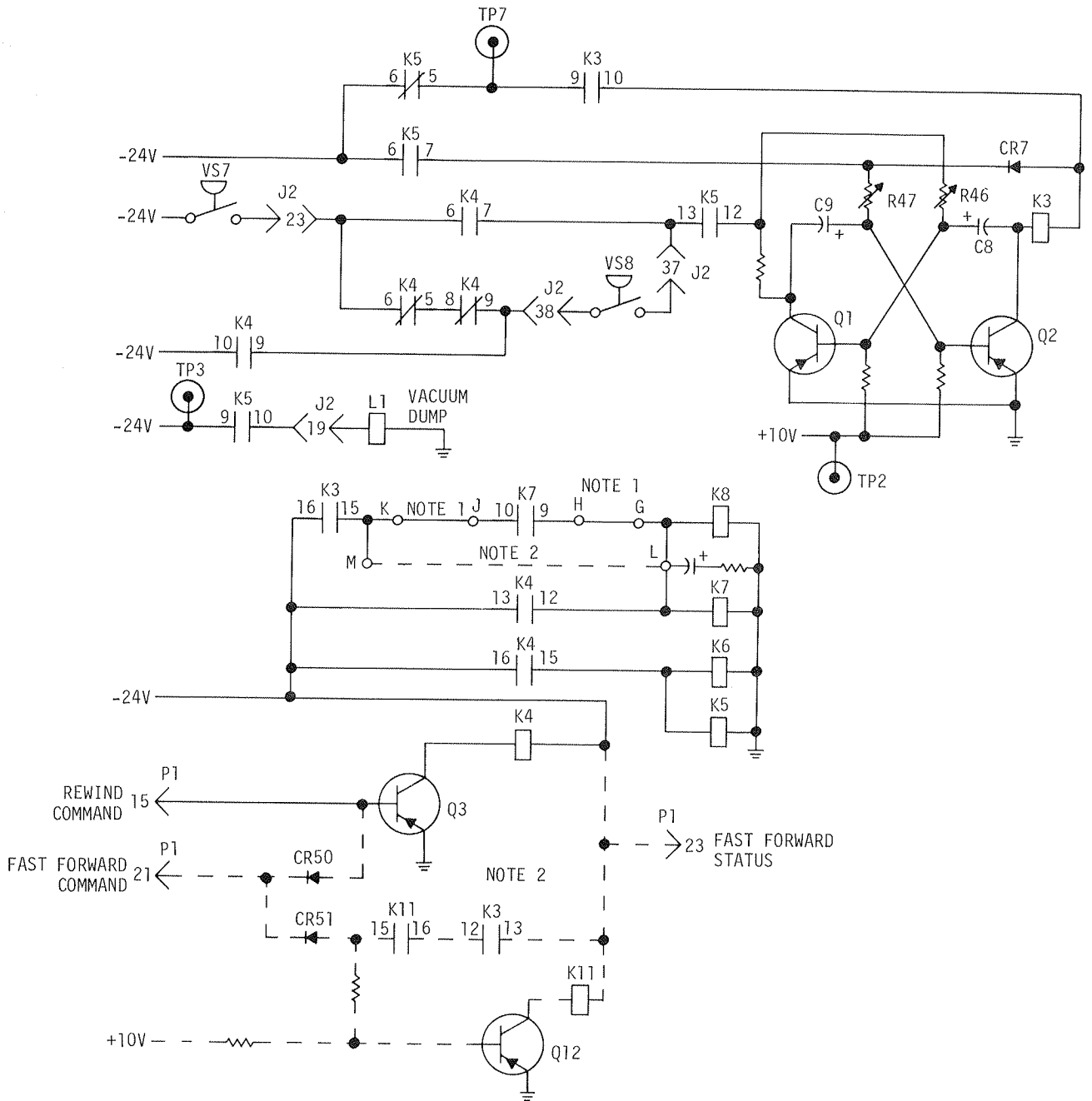


Figure 4-8. Write Enable Ring Installed, Solenoid Energized

7975-A-30



NOTES:

1. OPTION 079 (FAST FWD) DELETES LINES FROM G TO H AND J TO K.
2. OPTION 079 (FAST FWD) ADDS CIRCUITS SHOWN BY DASHED LINES.

7975-A-77

Figure 4-9. Jog Relay and Rewind Control Circuits

4-23. Opening contacts 11 and 12 of K7 (figure 4-5) de-energizes relay K9, disabling the write enable circuits. Closing contacts 15 and 16 of K7 (figure 4-2) bypasses S1C, preventing loss of vacuum during rewinding by the operation of the BRAKES switch. Relay K8 (figure 4-3) disables the forward and reverse actuators by transferring contacts 6 and 9 from the reverse and forward inputs to ground.

4-24. Closing contacts 9 and 10 of K5 (figure 4-9) operates vacuum dump solenoid L1, actuating the vacuum dump valve that reduces the vacuum in the vacuum chambers. This action reduces the hold-back tension on the tape, allowing the dragbrake to govern the amount of tension.

4-25. The action of relay K4 switches the connection of loop alarm switches VS7 and VS8 from series to parallel. Contacts 12 and 13 of K5 connect -24 volts to the collector and base circuits of Q1, turning on this transistor. Contacts 6 and 7 of K5 connect -24 volts to the base circuit of transistor Q2 and through diode CR7 to the coil of jog relay K3 in the collector circuit of Q2. In this configuration, Q1 and Q2 function as a multivibrator, alternately energizing and de-energizing K3 about 10 times per second. The contacts of relay K6 transfer control of the reel motors from the vacuum switches to contacts of relay K3. (See figure 4-4.) Contacts 6 and 7 of K3 apply positive voltage pulses through contacts 10 and 9 of K6 to the gate of SCR1, causing reverse jogging of the file reel motor. Alternate opening and closing of contacts 6 and 5 produce forward jogging of the takeup reel motor. The combined actions of the reel motors pull the tape loops from the vacuum chambers, clearing the sensing ports of vacuum switches VS7 and VS8 (figure 4-9) and opening both switches. Opening both VS7 and VS8 removes power from Q1 but leaves Q2 conducting; so K3 remains energized with no jogging action.

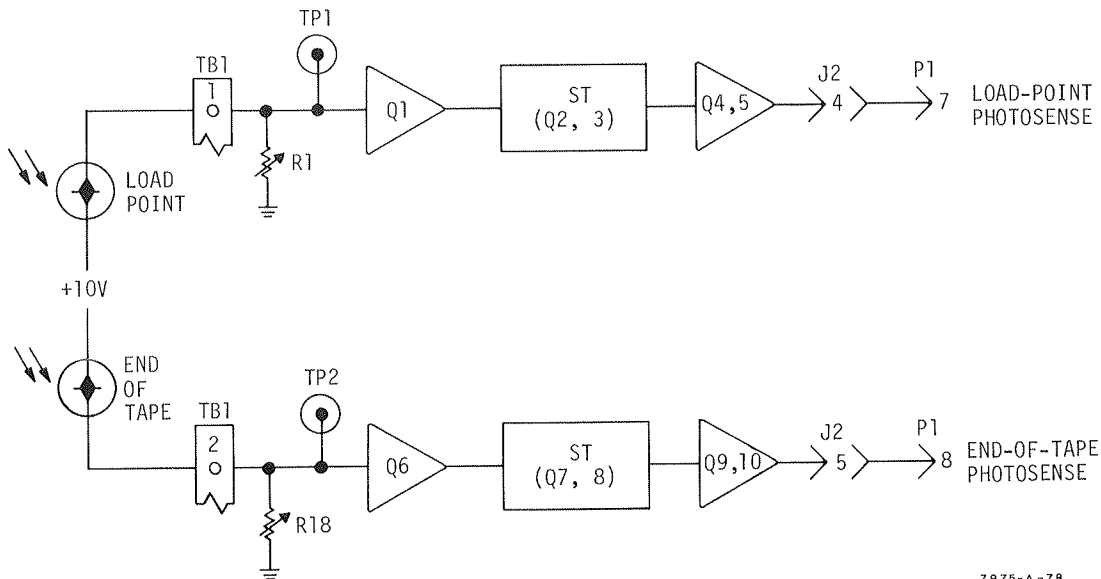
4-26. Normally closed contacts 6 and 5 of K3 (figure 4-4) stay open when K3 remains energized, removing the trigger voltage from SCR4 and turning off power to the takeup reel motor. The takeup motor brake solenoid continues receiving current through contacts 15 and 16 of K5 and contacts 15 and 14 of K10, holding the main brake released. A dragbrake built into the takeup reel motor assembly retards free rotation of the takeup reel during rewinding. After the jogging action of K3 stops, contacts 6 and 7 remain closed, causing the file reel motor to run in reverse at high speed.

4-27. When the rewind command turns off, relays K4, K5, and K6 (figure 4-9) de-energize immediately; however K7 and K8 remain energized by current through contacts 15 and 16 of K3 and contacts 10 and 9 of K7. After the release of K5, relay K3 remains energized until the charge on capacitor C9 reduces to a level that cuts off Q2. After K3 de-energizes, K7 and K8 de-energize. During the delay time, vacuum switch VS5 (figure 4-4) controls the takeup reel motor by applying trigger voltage to SCR3 through contacts 11 and 12 of K6 and contacts 13 and 12 of K8. This action allows time for tape loops to form in both vacuum chambers before restoring full control of the takeup reel motor to vacuum switches VS3 and VS4.

**4-28. PHOTSENSE CIRCUITS**

4-29. The photosense head and photosense amplifier detect reflective tabs installed on the tape. The photosense head consists of a lamp, a load point photocell, and an end-of-tape photocell. These components are accurately positioned on a mounting plate.

4-30. The load point photocell (figure 4-10) functions as a resistance that changes in response to the amount of light striking it. The more light striking the photocell, the lower the resistance of the



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Figure 4-10. Photosense Circuit

cell and the greater the current it will pass. Thus, the voltage applied to the input of Q1 depends on the amount of light entering the photocell. Resistor R1 provides an adjustment to compensate for variations in the lamp and in the photocell. Properly adjusting R1 provides a turn-on voltage at the input of Q1 when a load point tab on the tape reflects light into the photocell. When no tab reflects light, the voltage at the base of Q1 drops and Q1 is turned off. The Schmitt trigger composed of Q2 and Q3 sharpens the on and off characteristics of the circuit. The amplifier-driver composed of transistors Q4 and Q5 sends the photosense signal out through pin 7 of connector P1.

4-31. The end-of-tape circuit provides an end-of-tape signal output at pin 8 of P1 and functions the same as the load point circuit.

**4-32. POWER SUPPLIES**

4-33. The power supply circuits are shown in figure 4-11. Primary AC power enters the tape transport through TRANSPORT POWER switch S2, normally left turned on at all times.

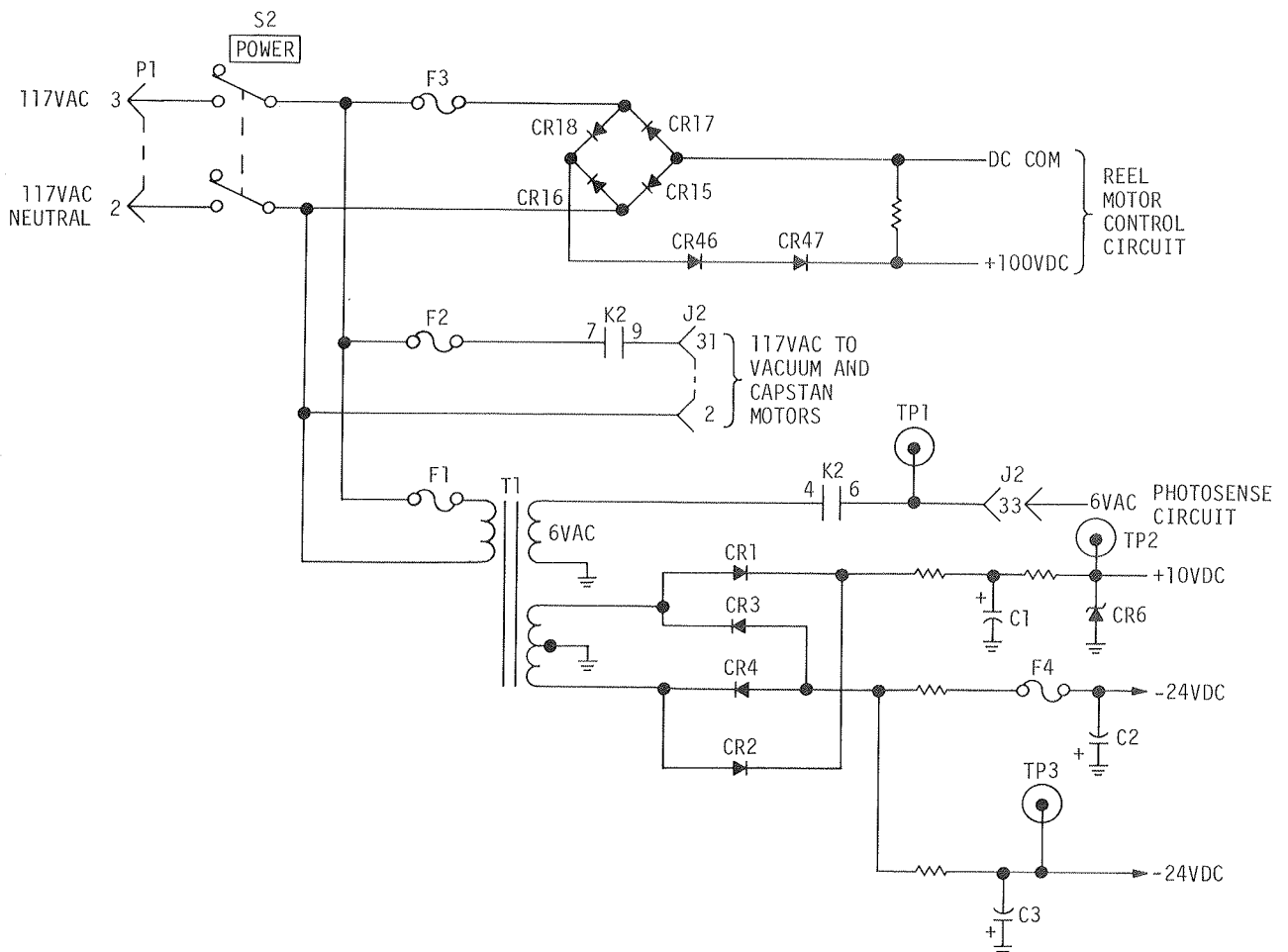
4-34. Alternating-current power for the vacuum motor and capstan motor connects through fuse F2 and contacts 7 and 9 of vacuum relay K2.

4-35. Fuse F1 protects transformer T1 that supplies 6 VAC power through contacts 4 and 6 of K2 to the photosense circuits. Diodes CR1 and CR2 supply full-wave rectified power at +10 volts. Diodes CR3 and CR4 supply full-wave rectified power at -24 volts. Bridge circuit CR15 through CR18 provides pulsating +100 VDC to the reel motor control circuits.

**4-36. DC CAPSTAN SERVO DRIVE ASSEMBLY (OPTION 001 ONLY)**

4-37. Dual-speed tape transports (option 001) are equipped with a capstan servo drive assembly in place of the standard AC capstan drive motor. The servo drive consists of a capstan motor, tachometer, and control circuits on a circuit board.

4-38. The series-wound universal motor (figure 10-9) drives the capstans by a belt as in the standard model and is coupled to the tachometer by a second belt. During normal operation, relay K2 energizes, releasing the motor brake and connecting the motor to the positive output of the bridge rectifier. Contacts 9 and 10 of K2 apply a reference voltage derived from diode CR8 to the base of transistor Q1. Transistor Q1 compares this reference to the output of the tachometer. Unijunction transistor Q5 receives the amplified difference



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Figure 4-11. Power Supply Circuits

signal and triggers SCR1 for a part of each rectified half-cycle. The average current through SCR1 controls the capstan motor speed and depends on the point at which Q3 gates on SCR1. This gating point can be adjusted by setting R22 or R23. Relay K1 selects high- or low-speed capstan drive, being energized by the presence of a negative speed select signal at terminal 3 of TB6. If no signal appears at terminal 3 of TB6, K1 contacts remain as shown, connecting R17 and R23 to the base of Q1 for low-speed operation.

4-39. Transistor Q5 in conjunction with relay K2 protects against motor runaway if a circuit failure should cause SCR1 to be turned on continuously. During normal operation, Q5 is turned on, energizing K2. Overspeeding of the motor increases the output of the tachometer, applying a negative voltage to the base of Q5 and de-energizing K2. Opening the contacts of K2 in series with the capstan motor turns off the motor and applies the brake until motor speed falls below the value set by K1 and resistor R18 or resistor R19. Relay K2 also de-energizes during the transition from high-speed to low-speed operation, until the motor speed decreases to the value set by R18.

4-40. Alternating-current power connects from pins 2 and 31 of connector P2 to the full-wave bridge rectifier composed of CR1, CR2, CR3, and CR4. The output of the bridge rectifier supplies DC power for operating the capstan servo.

#### **4-41. FAST FORWARD (OPTION 079) CIRCUITS**

4-42. Tape transports supplied with fast forward (option 079) are provided with an additional circuit board containing a relay and two diodes. The addition of these components and changes in the circuits of the reel motors provide the capability for transferring tape from the file reel to the takeup reel at the same speed as in rewinding.

4-43. The tape transport responds to a fast forward command by decreasing the vacuum, jogging the tape loops out of the vacuum chambers, then pulling the tape from the file reel to the takeup reel at high speed.

4-44. The fast forward command connects from pin 21 of connector P1 (figure 4-9) through diode CR50 to the base of Q3, turning on Q3 and completing the ground return circuit for the coil of relay

K4, as when rewinding. The closure of K4 contacts 15 and 16 energizes relays K5 and K6. Closing contacts 12 and 13 of K4 energizes relays K7 and K8.

4-45. Opening contacts 11 and 12 of K7 (figure 4-5) de-energizes relay K9, disabling the write enable circuits. Closing contacts 15 and 16 of K7 (figure 4-2) bypasses S1C, preventing de-energizing relay K2. Relay K8 (figure 4-3) disables the forward and reverse actuators as in rewinding. (Refer to paragraph 4-23.)

4-46. The vacuum dump and jog relay circuits operate as in rewinding. (Refer to paragraph 4-24.)

4-47. Contacts 6 and 7 of K3 apply positive voltage pulses through contacts 10 and 9 of K11 and contacts 16 and 15 to the gate of SCR4, jogging the takeup reel motor forward. Alternately opening and closing contacts 6 and 5 of K3 applies positive pulses through contacts 7 and 6 of K11 and contacts 10 and 9 of K6, jogging the file reel motor in reverse. The combined actions of the reel motors pull the tape loops from the vacuum chambers, clearing the sensing ports of vacuum switches VS7 and VS8 (figure 4-9) and opening both switches. Simultaneously opening VS7 and VS8 leaves K3 energized with no jogging action, as described in paragraph 4-25.

4-48. Normally closed contacts 6 and 5 of K3 (figure 4-4) stay open when K3 remains energized, removing the trigger voltage from SCR1 and turning off power to the file reel motor. The file reel motor brake solenoid continues to receive current through contacts 15 and 16 of K5, contacts 15 and 14 of K10, and contacts 12 and 13 of K11, to hold the main brake released. A dragbrake built into the file reel motor assembly retards free rotation of the file reel during fast forward operation. After the jogging action stops, contacts 6 and 7 of K3 remain closed, causing the takeup reel motor to run forward at high speed.

4-49. When the fast forward command turns off, relays K4, K5, K6, and K11 (figure 4-9) de-energize immediately; however, K7 and K8 remain energized until K3 de-energizes. (Refer to paragraph 4-27.) During the delay time, vacuum switch VS9 (figure 4-4) controls the file reel motor by applying trigger voltage to SCR2 through contacts 5 and 6 of K6. This action allows time for forming tape loops in both vacuum chambers before vacuum switches VS1 and VS2 regain full control of the file reel motor.



## SECTION V PERFORMANCE TEST PROCEDURES

### 5-1. INTRODUCTION

5-2. The performance tests in this section check a tape transport for compliance with the specifications listed in table 1-1. Make these tests only upon receiving the equipment or if tape drive elements have been removed for repair or replacement.

5-3. The procedures assume the use of the transport with a complete tape unit, including an operator control panel. In addition, a program source capable of providing the -8 VDC forward drive and reverse drive commands must be available. For the start- and stop-distance test, the program source must be capable of supplying command pulses as short as 8 milliseconds.

5-4. If data electronics equipment is not included in the system, appropriate data electronics must be available. A list of recommended test equipment required for the performance tests is given in table 5-1. Procedures for any special features supplied with the tape unit will be found on the SPECIAL INSTRUMENT sheet in the front of this manual.

### CAUTION

Read Section III, Operation, before proceeding with the test.

Table 5-1. Recommended Test Equipment For Performance Tests

EQUIPMENT	MFG MODEL NO.*	QTY
Memory Oscilloscope	HP 141A	1
Sweep Generator	HP 1421A	1
Dual Trace Amplifier	HP 1402A	1
Electronic Counter	HP 5211A	1
Test Tape (7-track)	HP 5080-4525	1
Test Tape (9-track)	HP 5080-4526	1

\*Equivalent equipment may be used.

### 5-5. TAPE HANDLING TESTS

#### 5-6. Tape Speed Tests

5-7. Tape speed is checked by reading a tape previously written with a 10 kHz signal at a specified speed. Because the accuracy of the tape speed check depends on the accuracy of the recorded frequency and the speed at which the tape was recorded, a Hewlett-Packard test tape (part number 5080-4525 or 5080-4526), or equivalent, must be

used. (Refer to table 5-2.) Power line frequency must be exactly 60 Hz (50 Hz for option 002 transports), or a correction factor must be applied to the measured speed.

Table 5-2. Test Tape Track Assignments

TRACKS		ASSIGNMENT		
7-TRACK (5080-4525)	9-TRACK (5080-4526)	BIT SPACING (±0.1%)	FREQ (kHz)	SPEED (ips)
2	3	0.0015"	10	30
3	4	1.5"		
4	5	0.0022"	10	45
5	6	0.135"		
6	7	0.00375"	10	75

5-8. To check tape speed, proceed as follows:

a. Install transport test tape (without write enable ring) on tape unit. Connect test equipment as shown in figure 5-1. Set counter gate time to 1 second.

b. Apply a forward command to tape unit.

c. Verify that, at the end of the 1-second gate period, the total pulse count is as indicated in table 5-3. Example: For a 7-track, 30-ips, system, check channel 2. Total pulse count will be 10,000 (±100).

d. Supply a reverse command and repeat step c.

e. If tape speed is not as specified, refer to section VIII of this instruction manual for corrective procedures.

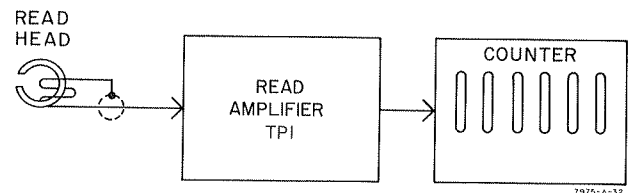


Figure 5-1. Tape Speed Test Setup

Table 5-3. Tape Speeds

TAPE UNIT SPEED (ips)	TRACKS		TOTAL PULSE COUNT ( $\pm 1\%$ )
	7-TRACK (5080-4525)	9-TRACK (5080-4526)	
75	6	7	10,000
45	4	5	10,000
30	2	3	10,000
15	2	3	5,000
7.5	6	7	1,000
4.5	4	5	1,000
3.0	2	3	1,000

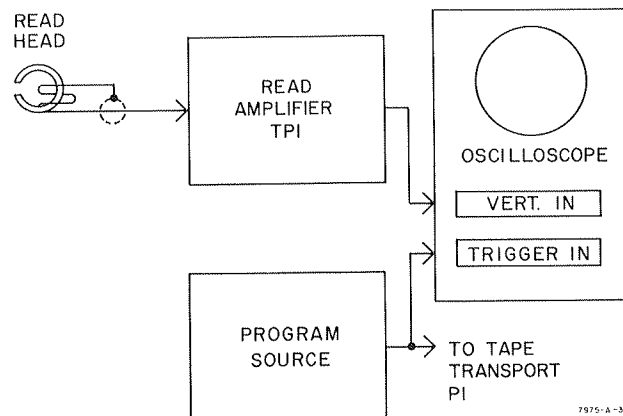


Figure 5-2. Start-Stop Time and Distance Test Setup

**5-9. Start-Stop Time Test**

5-10. Tape start and stop times are checked by reading a tape previously written with a 10 kHz signal at a specified tape speed, and by observing an oscilloscope trace of a read channel preamplifier. To perform the start-stop time checks, proceed as follows:

a. Connect test equipment as shown in figure 5-2. Adjust oscilloscope to trigger on the externally generated leading edge of the drive command. Adjust horizontal sweep time to 1 ms/cm.

b. Program forward command (P1-13) alternately on for 8-ms and off for 10-ms. Verify that forward start characteristic displayed on oscilloscope resembles trace in figure 5-3 and that start time is less than 5 ms.

c. Switch program source output to reverse command input (P1-14). Verify that reverse start time displayed on oscilloscope is less than 5 ms.

d. To determine stop time, adjust oscilloscope to trigger on the trailing edge of the drive command and set horizontal sweep to 0.5 ms/cm. Verify that reverse stop time display resembles trace shown in figure 5-4 and that stop time is less than 1.5 ms.

e. Switch program source output back to forward drive (P1-13). Verify that forward stop time is less than 1.5 ms.

f. If start and stop times are not as specified, refer to section VIII of this instruction manual for corrective procedures.

**5-11. Start-Stop Distance Test**

5-12. Tape start and stop distances are checked by counting the bits read from a prerecorded tape during the start and stop times, then multiplying by the known bit-to-bit distance.

a. To determine start distance, install HP Transport Test Tape. Use the correct track (refer to table 5-2) for 10 kHz at 75 ips (0.00375-inch bit spacing).

b. Program a start-stop drive command alternately on for 8 ms and off for 10 ms. Supply this input to P1-13.

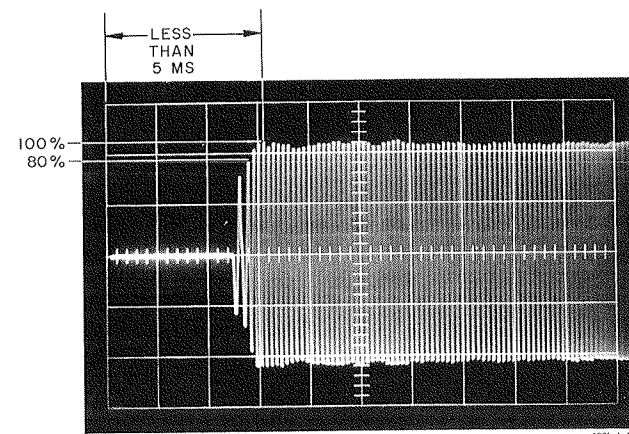


Figure 5-3. Start Time Characteristics (1ms/cm)

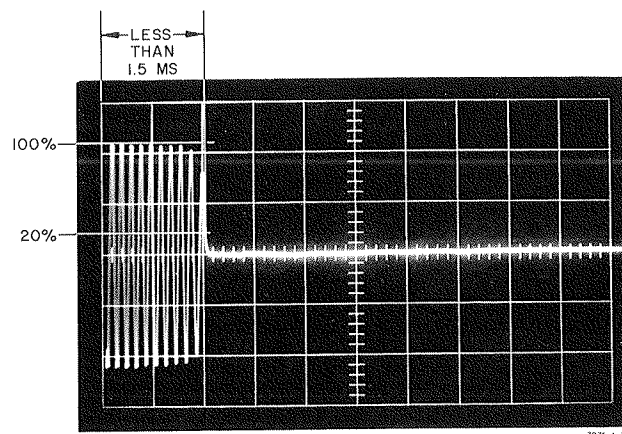


Figure 5-4. Stop Characteristics (0.5 ms/cm)

c. Connect test equipment as shown in figure 5-2. Adjust oscilloscope to trigger on the externally generated leading edge of the drive command from the program sources. Adjust horizontal sweep time to 0.5 ms/cm.

d. Store one start cycle on the memory oscilloscope.

e. Count total bits presented. (One sine wave = 2 bits). Start distance = total bits x 0.00375 inch. Refer to table 1-2 for correct specifications.

f. Move program source output to reverse drive input P1-14 and repeat steps d and e, above.

g. To determine reverse stop distance, adjust oscilloscope to trigger on the trailing edge of the drive command signal from the program source.

h. Store one stop cycle (figure 5-4) on the memory oscilloscope.

i. Count total bits presented. (One sine wave = 2 bits). Stop distance = total bits x 0.00375 inch. Refer to table 1-2 for correct specifications.

j. Move program source output back to forward drive input P1-13 and repeat steps h and i, above.

k. If start and stop distances are not as specified, refer to section VIII of this manual for corrective procedures.

### 5-13. CONTROL AND STATUS CIRCUITRY TESTS

#### 5-14. Rewind and Photosense Circuits

5-15. To check the rewind and photosense circuits, proceed as follows:

a. Load the tape transport with reel of tape equipped with load-point and end-of-tape reflective marker tabs.

b. Apply a forward drive command.

c. Stop tape by removing forward drive command when end-of-tape status is sensed at P1-8.

d. Apply a rewind command. Verify that the tape continues rewinding until the load-point reflective marker tab passes the photosense head; and that it then stops and returns to the load-point reflective marker.

e. If tape transport fails to function correctly, refer to section VIII of this instruction manual for corrective procedures.

#### 5-16. Write Enable (File Protect) Circuits

5-17. To check the write enable (file protect) circuits, proceed as follows:

a. Load tape transport with tape reel having a write enable ring installed.

b. After positioning the transport switch to START, verify that P1-19 is shorted to P1-20 by contacts of K9. This contact closure provides write power to Hewlett-Packard 13320A Data Electronics Card Cage. Verify that P1-18 is grounded by K9 (the red WRITE ENABLE indicator light on Hewlett-Packard operator control panels will be on).

c. Remove write enable ring from file reel, then repeat step a, above.

d. When transport switch is positioned to START, verify that K9 does not energize.



## SECTION VI ADJUSTMENTS

### 6-1. INTRODUCTION

6-2. This section contains adjustment procedures for the tape transport. Adjustments should be made only when indicated by maintenance procedures (section VII), or as indicated by failure of performance tests (section V).

### 6-3. TEST EQUIPMENT

6-4. Test equipment required to make the adjustments described in this section is listed in table 6-1. Equivalent test equipment may be used if the equipment listed is not available.

### 6-5. OPERATIONAL ADJUSTMENTS

6-6. The following procedures are used to adjust transport operation upon installation of equipment and as indicated by periodic checks of the equipment. Performance test procedures are given in section V. Component locations are shown in figures 3-1 and 6-1.

6-7. All the adjustments in this section assume a line voltage of 117 VAC and line frequency of 60 Hz (50 Hz for option 002 transports). By performing the adjustments at a line voltage of 117 VAC 60 Hz, satisfactory operation of the unit will be ensured throughout input power range specified in table 1-2. Performing the adjustments at any other line voltage might optimize the performance of the tape transport for that voltage but not throughout the specified input power range.

6-8. Because of the interaction of some of the following adjustments, these adjustments must be made in the sequence shown below.

- a. Running Vacuum
- b. Pucker Pocket
- c. Head Assembly Position
- d. Actuators

Table 6-1. Recommended Test Equipment For Adjustments

EQUIPMENT	MANUFACTURER AND MODEL NUMBER	QTY
Oscilloscope	HP 140A*	1
Sweep Generator	HP 1421A*	1
Dual Trace Amplifier	HP 1402A*	1
Electronic Counter	HP 5211A*	1
Test Tape (7-track)	HP 5080-4525	1
Test Tape (9-track)	HP 5080-4526	1
0.002-Inch Nonmagnetic Shim	HP 5020-4915	1
Actuator Azimuth Gauge	HP 5020-4949	1
0.005-Inch Feeler Gauge	Standard Commercial Product	1
Vacuum Gauge (0 to 30 inches of water)	HP 0101-0027*	1
Spring Scale (0 to 8 ounces)	Standard Commercial Product	1
Ohmmeter	Simpson 260*	1
T-Fitting	HP 0100-0177	1
Plastic Tubing (1/4-inch ID)	HP 0890-0784 (18-inch lengths)	2
Sealing Compound	Standard Commercial Product	A/R
*Equivalent tools and materials may be used.		

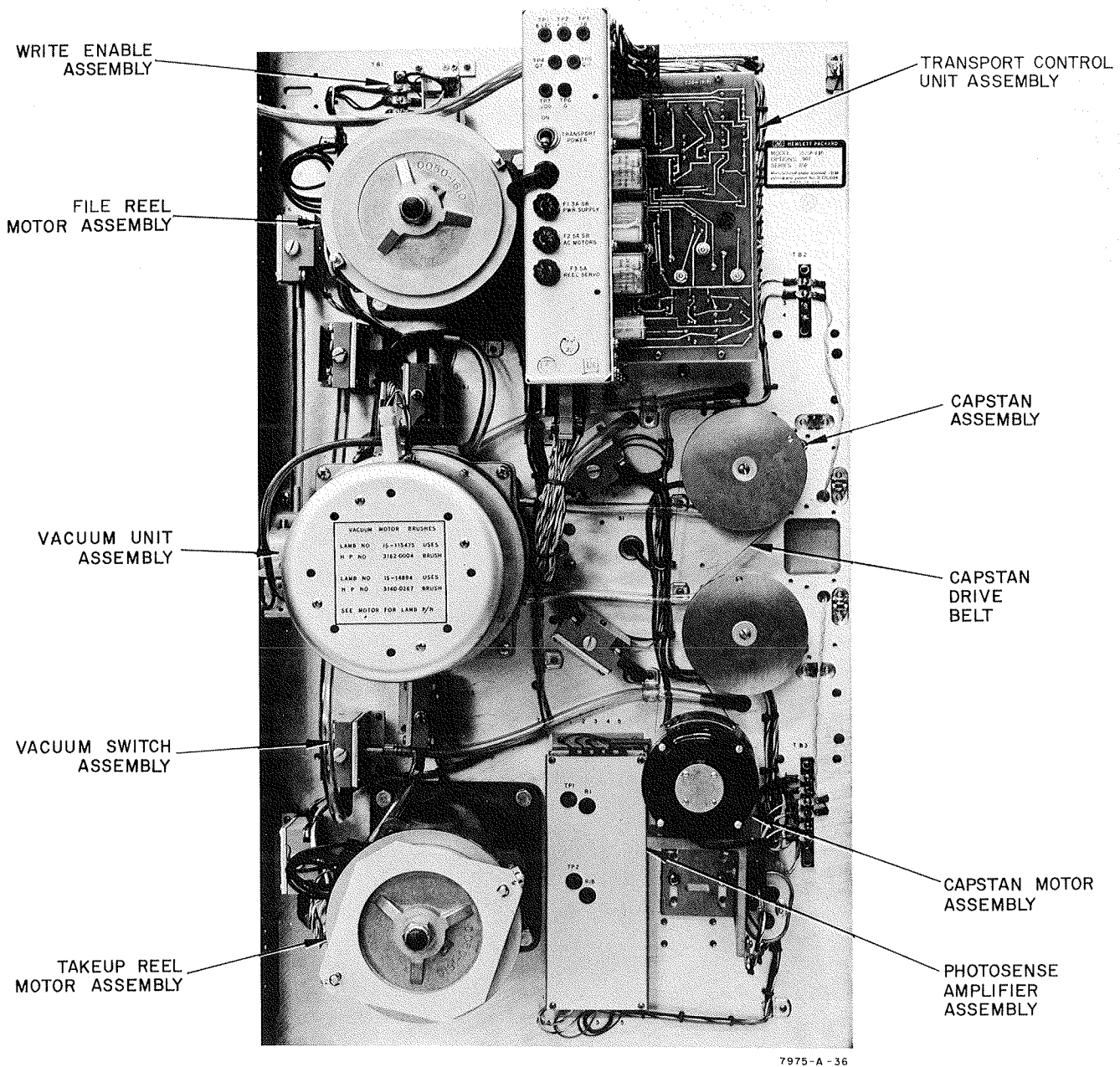


Figure 6-1. Tape Transport Rear Component Locations

### 6-9. Vacuum System

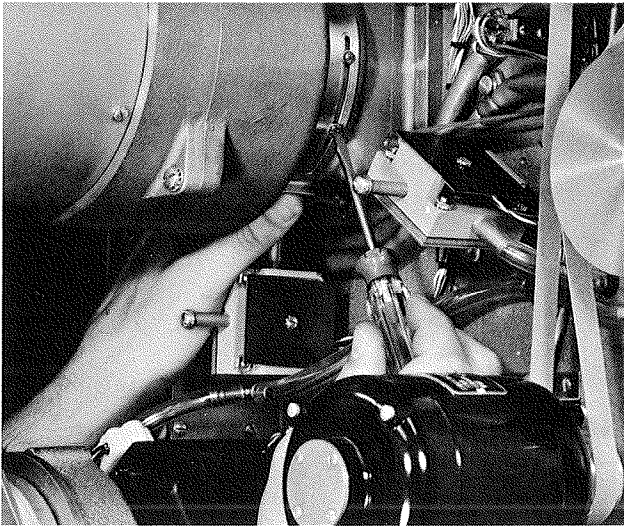
6-10. Running vacuum and rewind vacuum adjustments are provided. If the measurements made in the preventive maintenance inspection indicate that the vacuum is not within the allowable tolerance, proceed with the following adjustments.

6-11. RUNNING VACUUM. Adjust the running vacuum as follows:

a. With tape transport turned off, disconnect a tape cleaner hose from its fitting on the vacuum

motor housing. Tuck the loose hose under a vacuum switch to prevent it from being cut by the capstan belt. Connect vacuum gauge hose over the fitting, then load and thread a reel of tape and turn on the transport.

b. Loosen two vacuum adjust band mounting screws and slide band as shown in figure 6-2 until vacuum is 15 ( $\pm 1$ ) inches of water. Enlarging the slot reduces vacuum, while reducing the slot increases vacuum.



7975-A-37

Figure 6-2. Adjusting the Running Vacuum

c. After correcting vacuum reading, tighten band screws while observing vacuum gauge. Tightening band screws may change the vacuum slightly. If it does, loosen screws and make compensating adjustments until vacuum remains correct after screws are tightened.

6-12. **REWIND VACUUM.** To adjust the rewind vacuum, the tape should be threaded and the transport started in a normal manner, then proceed as follows:

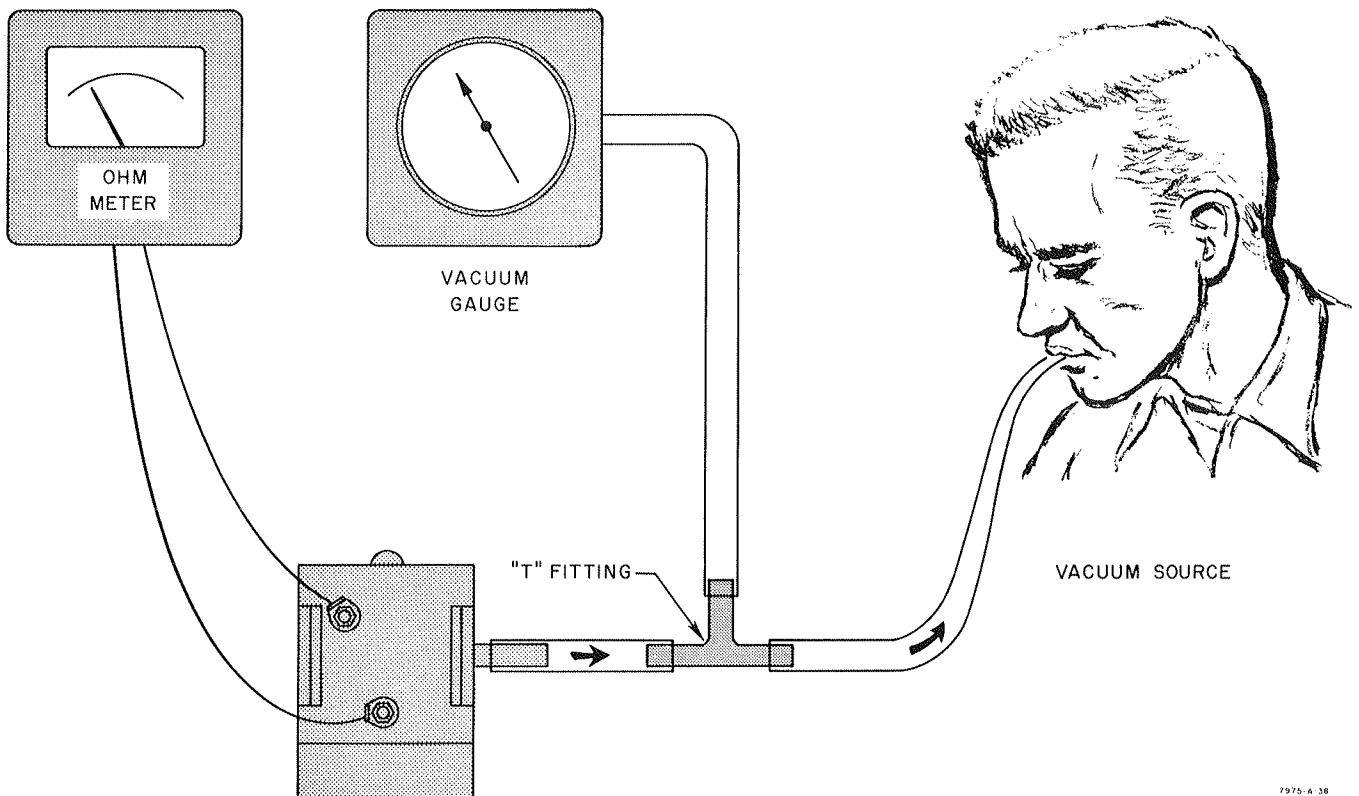
a. Have an assistant hold the file reel firmly while placing the transport in rewind. The upper motor will start jogging, but the reel must be held so it cannot move while takeup reel pulls tape loops from both chambers.

b. While assistant holds file reel so it cannot move, make sure the vacuum dump solenoid is energized and pulled all the way down, then loosen the two screws holding solenoid. Slide solenoid body in or out as needed until meter indicates a vacuum of 10 inches of water.

c. After the vacuum is correct, tighten screws locking solenoid in place.

d. Release upper reel, allowing machine to start rewinding. Verify that solenoid releases and vacuum returns to its normal running value when the machine stops rewinding. If solenoid does not release, check to see that solenoid is not cocked, causing the plunger to run into dump valve shaft. If necessary, adjust solenoid position so valve operates freely while maintaining correct rewind vacuum.

6-13. **VACUUM SWITCHES.** A vacuum switch may be adjusted by applying a known vacuum to it while testing for continuity using an ohmmeter. This procedure is shown in figure 6-3.



7975-A-38

Figure 6-3. Testing Vacuum Switches

Section VI  
Paragraphs 6-14 to 6-18

6-14. If a T-fitting is not available, the one used for a hose connection between VS5 and VS8 on the tape transport may be removed and used for the adjustment. To adjust a vacuum switch, proceed as follows:

- a. Turn off TRANSPORT POWER switch and disconnect P2 on transport control chassis to remove other circuit elements which may parallel the open switch contacts.
- b. Remove phenolic cover from back (terminal) side of vacuum switch.
- c. Remove vacuum hose from switch fitting. (This is most easily accomplished by prying end of hose away from switch body using a wide screwdriver blade as shown in figure 6-4.)
- d. Connect an ohmmeter across the vacuum switch terminals. Switches VS1 and VS3 are normally closed. All other switches are normally open.
- e. Connect hose and vacuum gauge as shown in figure 6-3 and apply vacuum to switch by sucking on end of hose. Back fittings attached to the switch mounting brackets of VS7 and VS8, are to be left open and exposed to the atmosphere during adjustment. Always connect test vacuum to fitting protruding from plastic switch body. The switch should make or break at a vacuum of 4 to 6 inches of water. Slowly increase applied vacuum while observing vacuum gauge and ohmmeter to determine operating point of switch. Since vacuum switches are not snap action, the connection may be intermittent at the vacuum where the switch just opens or closes. Adjustment is normal if definite opening or closure occurs before the vacuum reaches 6 inches or drops below 4 inches.
- f. If vacuum switch does not operate within correct range, break away plastic seal on adjustment setscrew and adjust setscrew so switch operates at a vacuum of 5 inches of water.

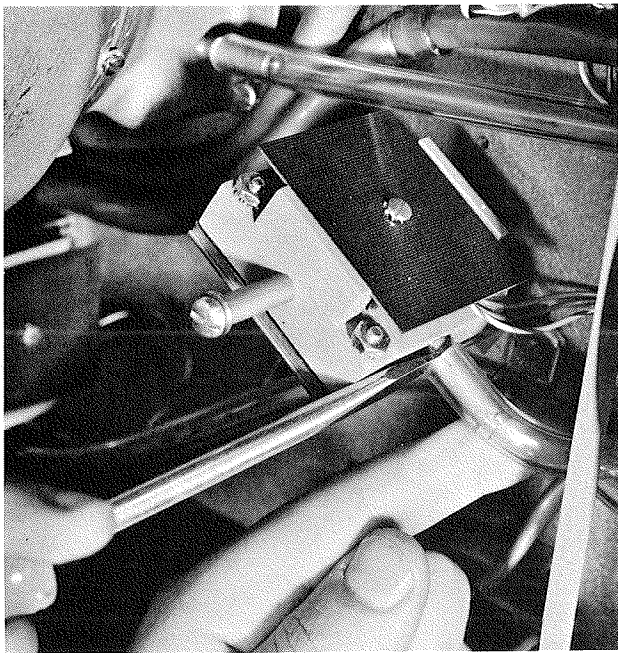


Figure 6-4. Removing Vacuum Hose

g. After completing adjustment, reseal adjusting screw with sealing compound.

### 6-15. Pucker Pocket

6-16. With tape recorder in standby operation, tape should curve approximately halfway into the pucker pocket. (See figure 6-5.) If the tape curvature is too great, adjust the vacuum in the pocket as follows:

- a. Check and adjust running vacuum (paragraph 6-11).
- b. While applying a start-stop command to tape transport, observe deflection of tape in pucker pocket.
- c. If deflection is too great, use a razor blade to notch foam rubber pad near fixed guide in small increments until tape deflection decreases to one-half of the pucker pocket depth but leaves at least 0.1-inch clearance between tape and foam rubber pad.

### 6-17. Head Assembly Position

6-18. Head assembly position adjustments are necessary only after replacing the head. Adjust position of head assembly as follows:

- a. Loosen the two 10-32 mounting screws until head assembly remains in position after adjusting, but still may be moved. Load tape on machine, and start transport.
- b. Position head assembly so tape is approximately 0.001 inch from capstan and clears both pinchrollers and capstans.
- c. Tighten head mounting screws securely.

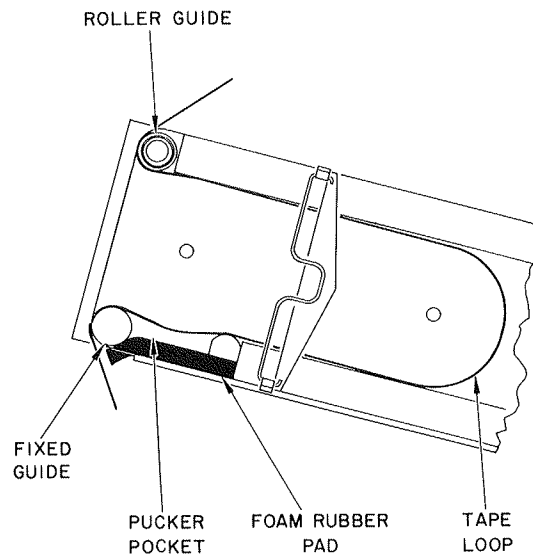


Figure 6-5. Vacuum Chamber Pucker Pocket



**6-19. Actuators**

6-20. Actuator assemblies are normally positioned so 0.005-inch clearance exists between the pinchroller and the capstan when the actuator is de-energized. In the energized position while pulling tape, the pinchroller engages the capstan so the clapper clears the coil housing by 0.002 inch. The azimuth adjustment should be made so that the pinchroller does not steer the tape from its normal path between the headguides and the vacuum chamber guides. The procedure for adjusting actuator clearances is as follows:

**CAUTION**

Do not loosen the screws holding the azimuth adjusting block and the coil to the baseplate. This action would destroy the initial factory adjustments of the actuator assembly, which determine the amount of spring preload and total clapper travel.

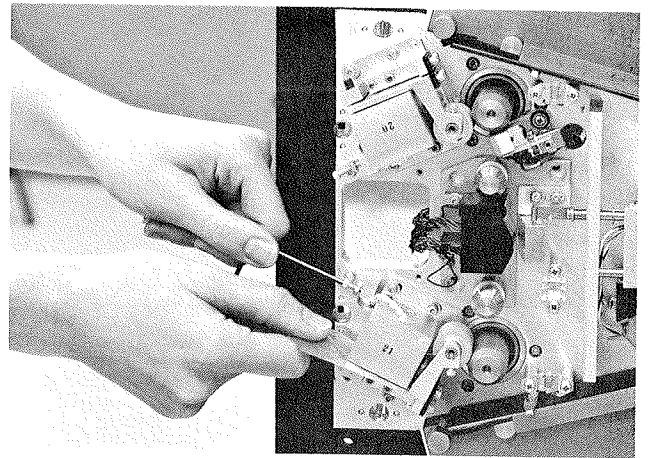
a. Check and adjust running vacuum (paragraph 6-11), pucker pocket (paragraph 6-15), and the head position (paragraph 6-17).

b. Pinchroller Bearing Preload

- (1) Insert a 4-40 screw into top of pinchroller shaft to provide a handle.
- (2) Loosen the two 4-40 screws holding the pinchroller shaft.
- (3) Push in (down) on the shaft until pinchroller no longer moves in and out on the shaft but will still turn freely.

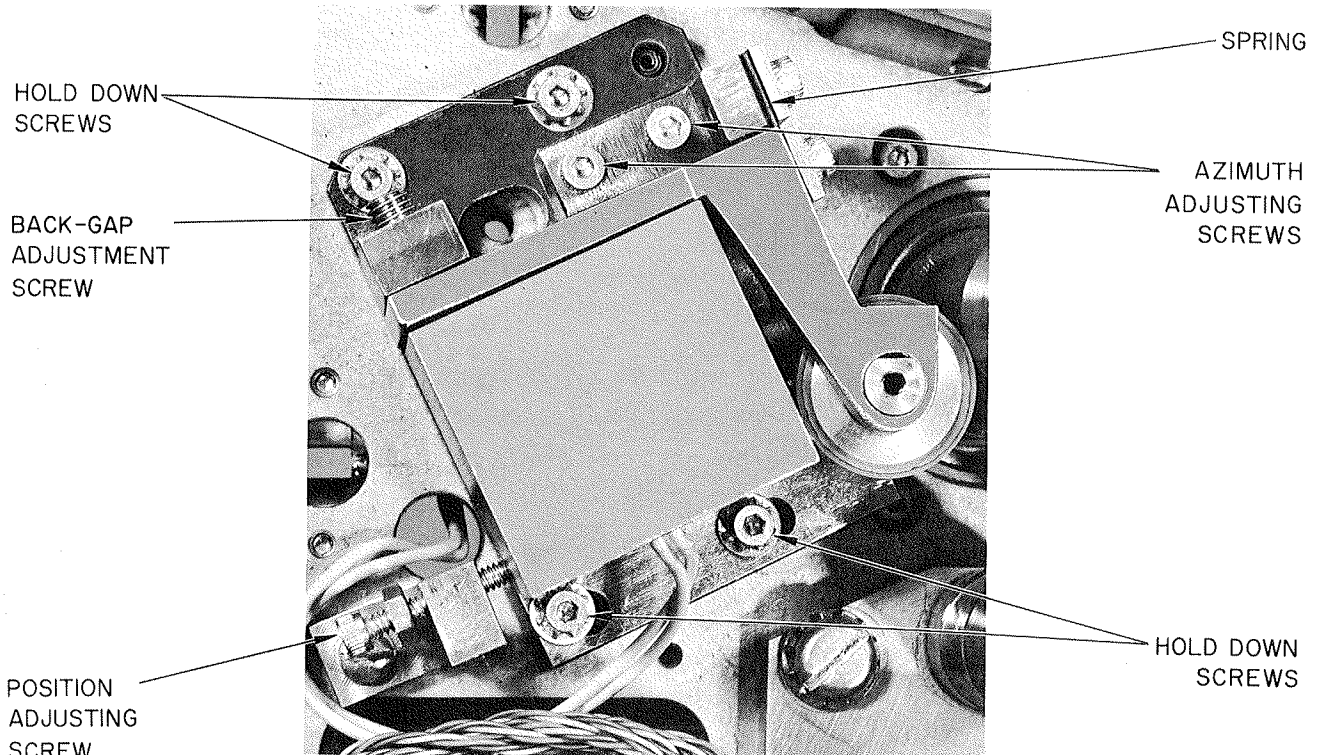
c. Position Adjustment

- (1) Install an undamaged tape, and start transport. Insert 0.002-inch nonmagnetic shim between coil housing and clapper (figure 6-6). Energize actuator coil by placing transport in forward (or reverse) drive. One should feel a slight drag while pulling the shim, indicating a 0.002-inch gap. If gap is correct, proceed with d, and then with e, below. If gap is not correct, continue with next step.
- (2) Loosen the four holddown screws (see figure 6-7) until the actuator may be moved but maintains its new position after movement.



7975-A-40

Figure 6-6. Energized Actuator Adjustment



7975-A-41

Figure 6-7. Actuator Adjustment Points

- (3) Insert a 0.002-inch nonmagnetic shim between coil housing and clapper. Energize actuator by placing unit in forward (or reverse) drive. Back off position adjustment screw and push actuator away from capstan so shim is tight between housing and clapper. Then tighten adjustment screw until shim can be removed. (Refer to (1), above.) Then tighten four holddown screws to clamp actuator assembly firmly against transport plate.
- (4) Verify that 0.002 ( $\pm 0.001$ )-inch clearance remains between clapper and coil housing. Repeat (2) and (3), above until setting is correct.

d. Azimuth Adjustment

- (1) Remove cap from head guide nearest the driving capstan. Take care not to drop ceramic washer and rubber O-ring.
- (2) Place transport in forward (reverse) drive.
- (3) While holding down the spring-loaded lower ceramic washer, observe the relative position of the outer edge of the tape and the upper surface of the head guide. The tape should track approximately 0.005 inch above the guide.
- (4) To determine if actuator is in need of azimuth adjustment, use Azimuth Adjustment Gauge, Hewlett-Packard part number 5020-4949. Place gauge on guide body with the 0.010-inch step nearest the tape path and slowly approach the tape edge with the tip of the gauge. The tape must not be touched by the tip. This assures that the tape is not tracking more than 0.010 inch above the guide surface.
- (5) Visually observe the tape to see that there is some tape visible above the guide. If the amount of tape is very small, a corner of the gauge with no step may be used. When this is brought into the tape path, the tape must be deflected, indicating that the tape was definitely tracking above the guide.
- (6) The 0.005-inch step in the gauge may be used to measure the 0.005-inch nominal distance when re-adjustment of the azimuth is made. If re-adjustment is required, proceed with steps (7) through (11).
- (7) Loosen both azimuth adjusting screws and check tape position to determine if tape should be moved up or down. Referring to figure 6-8, screw A will move the tape down towards the transport; screw B will bring the tape out towards the operator.
- (8) While holding spring-loaded washer down, adjust screws A and/or B as

required to position tape at the nominal 0.005-inch tracking position above the guide. Lock the adjustment with the opposing adjustment screw. There may be some interaction between the adjusting and locking screws.

- (9) Replace head cap, O-ring, and washer. Make sure smooth, beveled side of washer is toward tape edge. Tightening the caps forces tape down into the spring-loaded guide below, maintaining correct reference to the fixed guide.
- (10) Repeat step c(4), above.
- (11) While pulling tape verify that tape leaves driving capstan straight and flat without twisting or curling.

e. Back-Gap Adjustment

- (1) Remove tape from machine.
- (2) Adjust back-gap adjustment screw (figure 6-9) to obtain 0.005 ( $\pm 0.001$ )-inch gap between the pinchroller and the capstan.

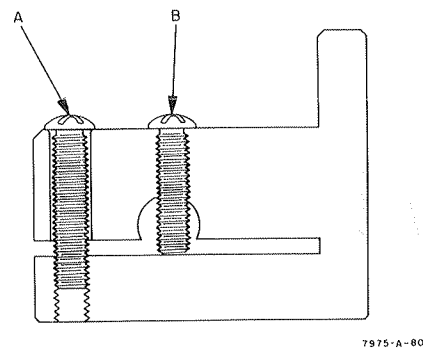


Figure 6-8. Azimuth Adjusting Block

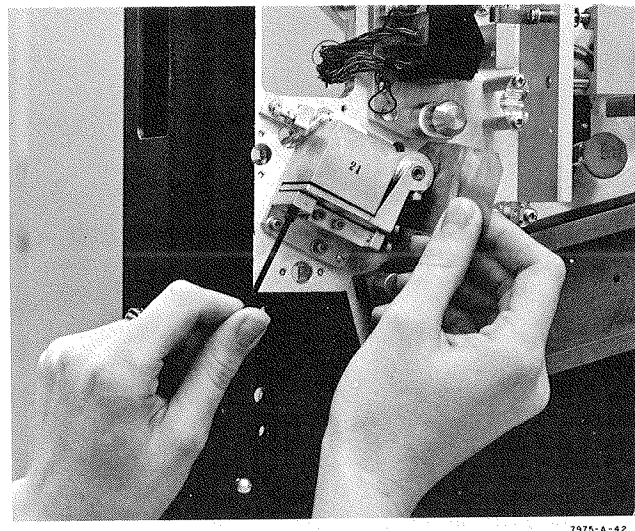


Figure 6-9. De-energized Actuator Adjustment

6-21. After making the above adjustment, check the actuator assembly for speed of operation by performing the stop and start test outlined in section V. If the start time is longer than specified, small corrections may be made by using the back-gap adjustment screw, but under no circumstances may the gap between pinchroller and capstan be less than 0.004 inch when the actuator is de-energized. If the stoptime is longer than specified, the 0.002-inch gap between the clapper and the coil housing should be checked. If this gap is too small, the stop time will increase due to the residual magnetism of the coil housing and clapper. Insufficient clearance between the clapper and the coil housing may also cause tape slippage.

## 6-22. Photosense

6-23. The photosense amplifier must be adjusted whenever the lamp or a photodiode is changed. Adjust as follows:

a. Load transport with a reel of tape having new IBM photosense tabs (IBM part number 352407) in normal positions.

b. Start transport and check position of photosense head. Front of photosense head should parallel tape. If necessary, loosen mounting screw and adjust head to make front of head parallel to tape. Verify that photosense mask (figure 6-10) is correctly positioned, making openings equal.

c. Connect oscilloscope vertical input between photosense amplifier TP1 (figure 6-1) and ground.

d. Position tape so that a reflective tab on outer edge of tape (load point tab) lies under the photosense head.

e. On the photosense amplifier circuit card, adjust R1 to obtain 3.0 ( $\pm 0.1$ )-volt indication on oscilloscope.

f. Move tape so no reflective tab lies under photosense head. Verify that oscilloscope indicates 0.5 volts or less.

g. Move oscilloscope lead from photosense amplifier TP1 to TP2; then repeat d through f for tab on inner edge of tape (end-of-tape tab), adjusting R18 on amplifier circuit board.

## 6-24. Reel Motor Brakes

6-25. MAIN BRAKES. Noisy reel brakes may require adjustment as follows:

### WARNING

Do not stand behind reel motor while backing off axial stopnut and do not remove axial stopnut completely, as spring tension can shoot the brakeplate and rotor violently to the rear.

a. Main brake adjustments require that the transport be at operating temperature. Warm up brakes by pulling tape for at least 30 minutes.

b. While holding transport switch to BRAKES, rotate the rotor 360°. If rotor turns freely, loosen the rotor setscrew. (See figure 6-11.)

-90470  
Original

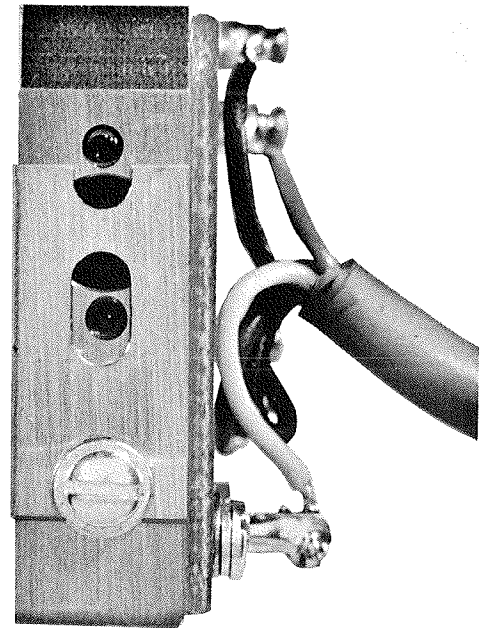
c. Tighten axial stopnut.

### NOTE

The brake must be engaged while tightening the setscrew (START/BRAKES switch released).

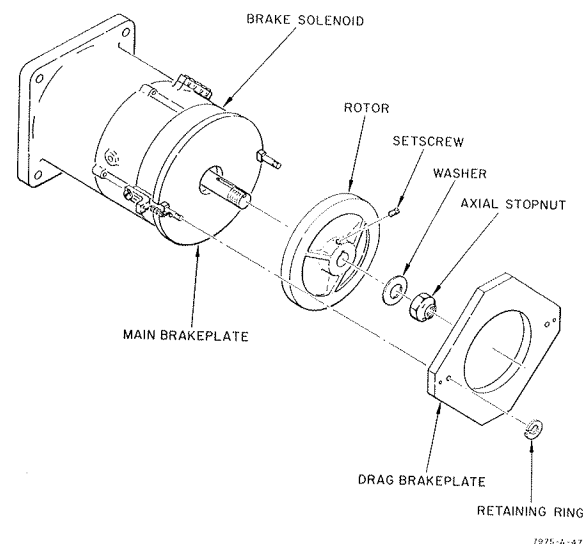
d. Release transport (START/BRAKES) switch and tighten rotor setscrew. Check for drag. Repeat steps b and c until rotor is dragging.

e. Loosen the setscrew, back off the stopnut approximately 30°, and tighten the setscrew.



7975-A-44

Figure 6-10. Photosense Mask Position



7975-A-47

Figure 6-11. Brake Adjustment Parts

6-26. DRAGBRAKE. Adjustment of the dragbrake requires a spring scale capable of measuring 6 ounces. Adjust the dragbrake as follows:

- a. Tie a string to the lower reel and wrap it around the reel once or twice.
- b. While holding transport switch to BRAKES, use spring scale to measure dragbrake torque. (See figure 6-12.) Torque should measure 4 to 6 ounces.
- c. Adjust tension on dragbrake plate by moving spring retaining brackets (figure 6-11) equally on both sides of brake housing. Recheck dragbrake torque.

### 6-27. Rewind Jog Time

6-28. Rewind jog time is set at the factory and seldom requires readjusting. If components in the rewind jog circuit have been changed, readjusting the on-time and off-time of the jog circuit will be necessary. To do this, connect an oscilloscope vertical input to TP7 on the transport control assembly. Connect the other oscilloscope lead to ground. Disconnect P6 (on vacuum motor). Put transport in rewind mode, then adjust R46 and R47 so pulse duration at TP7 is 50 milliseconds ON and 50 milliseconds OFF.

### 6-29. Capstan Drive Belt Tension

6-30. Incorrectly adjusted capstan drive belt tension may cause the capstans to run slowly or erratically. Adjustment of the capstan drive belt requires the use of a spring scale that can measure at least 8 ounces tension. To adjust the capstan drive belt, proceed as follows:

- a. At rear of tape transport, position TRANSPORT POWER switch to off (down).
- b. Loosen four screws holding capstan drive motor assembly to transport.
- c. Move drive motor toward or away from the capstan flywheels (figure 6-13), as needed, to adjust belt tension so that applying a force of 8 ounces perpendicular to the belt deflects the belt approximately 1/8 inch.

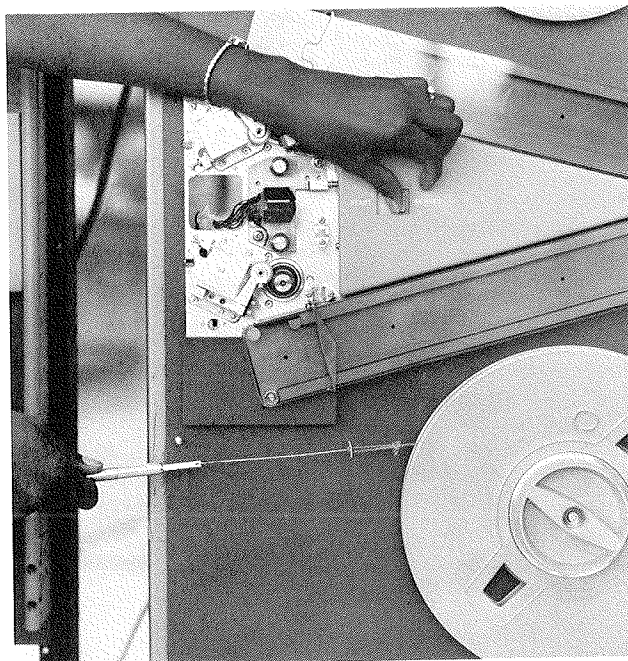
### 6-31. Turntable Height

6-32. If the turntable requires aligning, proceed as follows:

- a. Remove holddown knob in accordance with procedure given in paragraph 7-70.
- b. Add or remove reel motor shims as needed for proper tape tracking.
- c. Replace holddown knob, taking care to ensure alignment of keyway with key fitted into motor shaft.
- d. Check adjustment by operating tape transport forward and in reverse and verify that tape does not scrape on reel flange.

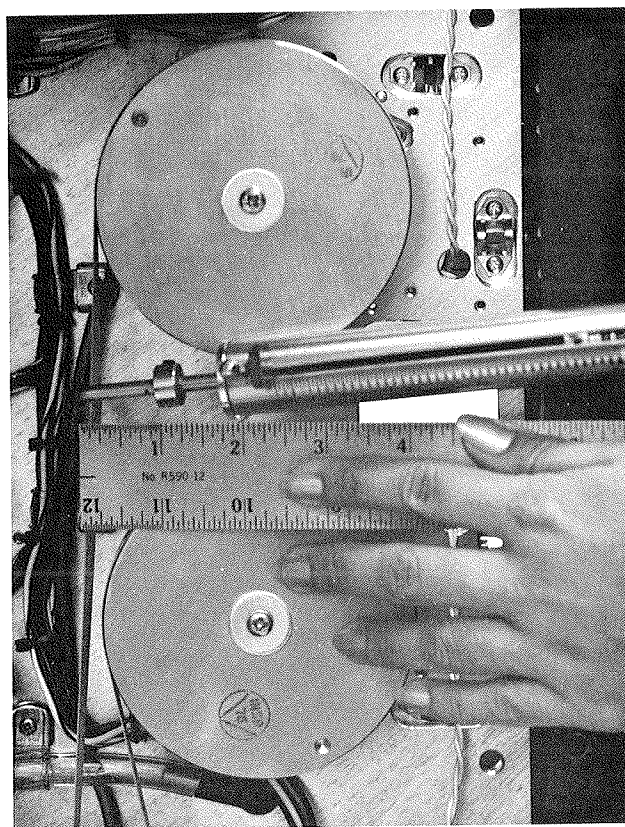
### 6-33. Holddown Knob

6-34. The holddown knob needs adjustment when it must be tightened to its limit to hold the reel



7975-A-43

Figure 6-12. Measuring Dragbrake Torque



7975-A-45

Figure 6-13. Measuring Capstan Belt Tension

securely. To adjust the holddown knob proceed as follows:

a. Remove plug button from center of holddown knob by pressing one end of a piece of adhesive tape on plug button then pulling outward on tape.

b. Loosen setscrew (figure 6-14) and remove hex head capscrew and washer. Pull holddown knob assembly from motor shaft, taking care not to lose reel motor shims.

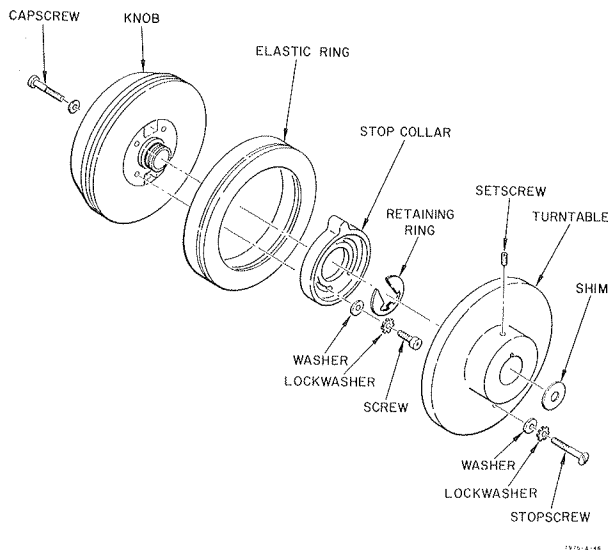


Figure 6-14. Holddown Knob Adjustment Parts

c. Unscrew stopscrew about 1/2 inch from turntable. Unscrew knob from turntable.

d. Remove two screws and washers holding stop collar to knob.

e. Screw knob on turntable until thrust bearing touches elastic ring. Fit tape reel on knob assembly, then continue tightening knob and turntable together until reel fits assembly snugly, but can be removed easily. Use pencil to mark plastic knob at position of stopscrew.

f. Remove the knob from turntable. Position stop on collar just to left of mark on knob; then use screws and washers to fasten stop collar to knob, taking care that stop collar does not move.

g. Screw knob to turntable. Place reel on knob and tighten knob until it starts gripping reel. Tighten stopscrew, then turn knob counterclockwise to limit and remove reel.

h. Install holddown knob assembly on transport, reversing procedure in steps a and b. Install same shims removed in step b.

### 6-35. Capstan Servo

6-36. The capstan servo is used in place of the capstan motor on option 001 machines. Set up test equipment and run tape speed test as described in paragraphs 5-6 through 5-8. Adjust R22 on the capstan servo assembly for correct high speed and R23 for correct low speed.



## SECTION VII MAINTENANCE

### 7-1. INTRODUCTION

7-2. Maintenance information includes preventive maintenance, repair, and replacement procedures. Maintenance procedures must be done at regularly scheduled intervals. Repair and replacement is accomplished when indicated by inspection or troubleshooting procedures. It is recommended that an operation and maintenance log be kept as an operational history of maintenance performed, repetitive problems, symptoms, and corrective action.

The log can be used as a troubleshooting guide to solve problems unique to your specific system or transport.

### 7-3. PREVENTIVE MAINTENANCE

7-4. Lubrication is not required. Failure to clean the transport at regular intervals can cause severe tape and transport problems. Table 7-1 provides an inspection and maintenance schedule; table 7-2 lists recommended maintenance tools and materials.

Table 7-1. Preventive Maintenance Schedule

INTERVAL (HOURS)	CLEAN	INSPECT	REPLACE
8	Tape Path		
40	Tape Path Tape Cleaners	Tape Tracking Pinchroller Bearings Rotary Guide Bearings Photosense Lamp	
160	Repeat 40-Hour cleaning	Repeat 40-Hour Inspection Photosense Output Voltage Actuator Adjustments	
1000	Repeat 40-Hour cleaning	Repeat 160-Hour Inspection Vacuum Setting Pucker Pocket	Vacuum Motor Brushes Photosense Lamp
2000	Repeat 40-Hour cleaning	Repeat 1000-Hour Inspection Reel Brake Gap Dragbrake Tension Rewind Jog Time	Photosense Lamp Pinchrollers and Bearings Vacuum Motor Capstan Drive Belt
4000	Repeat 40-Hour cleaning	Repeat 2000-Hour Inspection Capstan Bearings	Photosense Lamp Pinchrollers and Bearings Vacuum Motor Capstan Drive Belt Rotary Guide Bearings

Table 7-2. Maintenance Test Equipment, Tools and Materials

NAME	MANUFACTURER AND MODEL NUMBER*	QTY
<b>TEST EQUIPMENT</b>		
Oscilloscope	HP 140A	1
Sweep Generator	HP 1421A	1
Dual Track Amplifier	HP 1402A	1
Electronic Counter	HP 5211A	1
Test Tape (7-track)	HP 5080-4525	1
Test Tape (9-track)	HP 5080-4526	1
IBM Alignment Tape	IBM 432640 (HP 9162-0027)	1
0.002-Inch Nonmagnetic Shim	HP 5020-4915	1
Azimuth Adjusting Gauge	HP 5020-4949	1
0.005-Inch Feeler Gauge	Standard Commercial Product	1
Vacuum Gauge (0 to 30 inches of water)	HP 0101-0027	1
Spring Scale (0 to 8 ounces)	Standard Commercial Product	1
Ohmmeter	Simpson 260	1
T-Fitting	HP 0100-0177	1
Plastic Tubing (1/4-Inch ID)	HP 0890-0784 (18-inch lengths)	2
<b>TOOLS</b>		
POZIDRIV Screwdriver	Stanley #2951	1
POZIDRIV Screwdriver	Stanley #2952	1
Allen Wrenches	1/16", 5/64", 3/32", and 5/32"	1
Screwdriver	1/8" x 4" Xcelite R-184	1
Screwdriver	1/4" x 4" Xcelite R-144	1
Screwdriver	1/4" x 1" Xcelite S-141	1
Long Nose Pliers	Xcelite 71CG	1
Wire Cutters	Xcelite 74CG	1
Adjustable Wrench, 6-Inch	Utica 91	1
Wire Strippers	K Miller 101-S	1
Soldering Iron	Ungar Handle type 776, Ungar 37-1/2 watt element type 1235, or Ungar pencil tip type 332	1 1 1
Seizers, 5-Inch	Xcelite 33H	1
Screw-Holding Screwdriver	Kedman 1836	1
Flashlight	Ray-O-Vac Z Zip	1
Steel Rule, 6-Inch	General 300	1
Inspection Mirror	Walsco 554	1
Suction Device	Edsyn DS-007 (Soldapullt)	1
<b>MATERIALS</b>		
HP Head Cleaning Fluid	HP 8500-0810	A/R
Cotton-Tipped Applicators (non-sterile)	HP 8520-0023 or Standard Commercial Product	A/R
Soft lint-free cloth or disposable wipers	Standard Commercial Product	A/R
Glass Cleaner	Standard Commercial Product	A/R
Magne-See Solution	Reeves Soundcraft, Division of Reeves Industries, Inc., Danbury, Connecticut (HP 8500-0790)	A/R
Sealing Compound	Loctite Quick Set Adhesive 404 or Standard Commercial Product	A/R
Cement	Dupont Duco Cement CS-500-0264	A/R
Flux Core Solder	Standard Commercial Product	A/R
Flux Remover	Divco Rosin, or Lonco Formula #49 Flux Remover	A/R

\*Equivalent tools and materials may be used.



**7-5. Tape Path Cleaning**

7-6. Clean the vacuum chambers, vacuum chamber guides, vacuum chamber glass covers, capstans, pinchrollers, heads, and tape guides as follows:

**CAUTION**

Do not use M.E.K. or other strong solvents on "Scotchlite" inside the vacuum chambers. Do not scrub the glass-beaded tape on the inner chamber wall. This surface usually requires only brushing or blowing away loose dust, and scrubbing may damage the adhesive backing.

a. Remove tape from transport, remove head cover, coverplate, and glass vacuum chamber covers.

b. Moisten a wiper sparingly with cleaning fluid and scrub interior metal surfaces of the upper chamber, fixed guide and rotary guide.

c. Use a new wiper dampened with cleaning fluid to clean the front surface of the head and the tape guides.

d. Clean the capstans by scrubbing while rotating them by hand. Check for binding or looseness in the bearings and, if necessary, refer to paragraph 7-58 for capstan replacement procedure.

e. Clean pinchrollers with a soft, lint-free cloth dampened in cleaning fluid. Keep cleaning fluid out of bearings.

f. Moisten a new wiper with cleaning fluid, and use to clean the lower vacuum chamber. Check the condition of the rotary bearings.

g. Clean glass vacuum chamber covers using a wiper moistened with glass cleaner. Clean cover door window using glass cleaner or soap and water. Waxing plexiglass with a good grade of paste wax improves appearance by filling in minor scratches.

**NOTE**

Avoid polishing plexiglass with a dry cloth as this will create a dust-attracting static charge.

**7-7. Tape Cleaner Cleaning**

7-8. Clean the head cleaner by first removing the head cover and coverplate. Then carefully remove the two tape cleaner caps and the ceramic tape followers by unscrewing the caps counterclockwise. Using cotton-tipped applicators moistened with cleaning fluid, clean the interior of the tape cleaners and the tape followers. During reassembly, take care that the beveled edges of the ceramic tape followers are toward the tape. Incorrectly installed, tape followers will guide the tape against the sharp edges, causing damage to the edge tracks.

**7-9. Tape Tracking Inspection**

7-10. Poor tape tracking causes tape to pack onto the reels improperly or to damage the edge of the tape. Inspect for improper tracking as follows:

a. Remove head and capstan covers and load a new tape on tape transport.

b. Alternately move tape forward and in reverse for about one-second periods. Observe that tape leaves driving capstan straight and flat without twisting or curling. If tape does not track satisfactorily, refer to actuator adjustment information in paragraph 6-19.

c. Place transport in forward drive mode and observe that tape winds onto the takeup (lower) reel without scraping reel flanges. Place transport in reverse drive mode and observe that tape winds onto file reel without scraping reel flanges. If tape scrapes, refer to turntable height adjusting information in paragraph 6-31.

d. Inspect the tape pack for deformation and cinching of the tape. Tape should be wound flat and even on the reel.

**7-11. Pinchroller Bearing Inspection**

7-12. Turn the pinchroller by hand, checking for rough spots. Try moving pinchroller in and out on its shaft, checking to be sure no end play exists.

**7-13. Rotary Guide Inspection**

7-14. Remove the vacuum chamber glass. Turn the rotary guide, checking for rough bearings. Try moving the guide in and out to check for end play.

**7-15. Actuator Inspection**

7-16. If the actuator adjustment inspection reveals a discrepancy in any one of the following checks, a complete adjustment must be performed as described in paragraph 6-19. Inspect as follows:

a. With the actuator de-energized and no tape threaded, check the pinchroller-to-capstan clearance with a feeler gauge. The clearance must be 0.005 ( $\pm 0.001$ ) inch.

b. Thread a good tape on the machine and place the transport in forward (or reverse) drive. Visually inspect the tape tracking. The tape should leave the capstan straight and flat without twist or curl.

c. Insert a 0.002-inch nonmagnetic shim (Hewlett-Packard part number 5020-4915) between the clapper and coil housing of the forward (or reverse) actuator, as shown in figure 6-6.

d. Energize the actuator and verify that the shim comes out with only slight resistance. The clearance is 0.002 ( $\pm 0.001$ ) inch.

e. Remove the cap from the head assembly tape guide nearest the actuator and place the transport in forward drive.

f. While holding the spring-loaded bottom ceramic washer down, use the actuator azimuth gauge (Hewlett-Packard part number 5020-4949) to verify that the tape is riding above the guide but does not touch the 0.010-inch side of the gauge.

g. Repeat steps a through f for the reverse actuator.

### **7-17. Photosense Output Voltage Inspection**

7-18. Using a new reflective tab (IBM part number 352407) on the tape, advance the tape to the end-of-tape tab, stopping with the tab opposite the photosense head. Using an oscilloscope, measure the DC voltage between TP2 on the photosense amplifier and transport ground. The oscilloscope should indicate 3 ( $\pm 0.3$ ) volts. Move the tape so the marker is not opposite the photosense head. The indication should drop to 0.5 volt or less. Rewind the tape until the load point marker lies opposite the photosense head, then repeat the voltage measurements using TP1. If any of the measurements fail to fall within the specified limits, adjust as described in paragraph 6-22.

### **7-19. Vacuum Setting Inspection**

7-20. Vacuum measurement requires a vacuum gauge having a full scale reading of 30 inches of water. The gauge should be equipped with a length of 1/4-inch ID plastic or rubber hose.

a. Turn off tape transport, disconnect a tape cleaner guide hose from fitting on vacuum motor housing, then install vacuum gauge hose over this fitting.

b. Load and thread a reel of tape on transport, then start transport.

c. With tape loops in the chambers, vacuum motor running, and tape standing still, the vacuum gauge should indicate 15 ( $\pm 1$ ) inches of water.

d. Drive tape forward until at least 1/2 inch of tape packs on lower reel.

e. Start rewind and observe vacuum gauge. The vacuum should drop to 10 ( $\pm 1$ ) inches while tape is jogging out of chambers, but should not fall to less than 8 inches after steady rewind action starts.

f. If adjustment is needed, refer to paragraphs 6-9 through 6-12.

### **7-21. Pucker Pocket Inspection**

7-22. While applying start and stop commands to the transport, observe the tape deflection into the pucker pocket. Maximum deflection should be 0.10 to 0.15 inch from the foam rubber pad. If adjustment is required, refer to paragraph 6-15.

### **7-23. Reel Brake Inspection**

7-24. Check brake adjustment as outlined in paragraph 6-24.

### **7-25. Dragbrake Inspection**

7-26. Check the brake tension as outlined in paragraph 6-26.

### **7-27. Rewind Jog Time Inspection**

7-28. Load the machine and advance the tape past the load point. Place the transport in the REWIND mode, then measure the jog time in accordance with the procedure in paragraph 6-27.

### **7-29. Capstan Bearing Inspection**

7-30. Remove the capstan belt and rotate each of the capstans slowly, feeling for any roughness. Try moving them axially, feeling for end play. Replace a capstan having rough spots or end play.

### **7-31. Scheduled Replacement Parts**

7-32. Factory testing has determined the life expectancies of the various components and assemblies of the tape transport. Actual conditions of use, however, may vary widely and significantly alter life expectancies. The maintenance intervals specified in table 7-1 assume average use. In a specific application longer intervals between maintenance operations are possible if average use is light. When the equipment is subjected to very heavy use, the interval between maintenance operations should shorten.

7-33. Capstan and reel motors, actuators, and capstan assemblies should be replaced or factory reconditioned only as indicated by failures. Consult your local Hewlett-Packard Sales and Service Office for additional information.

## **7-34. REPAIR AND REPLACEMENT**

7-35. Generally, repair of transport mechanisms includes replacement of parts and assemblies. Repair of printed-circuit assemblies should be done as instructed in the following paragraphs. Equipment required for repair and replacement is listed in table 7-2.

### **7-36. Printed-Circuit Assemblies**

7-37. The printed-circuit assemblies consist of metal conductors bonded to both sides of insulating material (board) having metal conductors extended through the component mounting holes by a plated-through process. Soldering can be done on either side of the board, whichever is most convenient. Following are recommendations and cautions pertinent to etched-circuit repair work.

a. Avoid unnecessary component substitution and resulting damage to the circuit board and adjacent components.

b. Do not use a high-wattage soldering iron on etched circuit boards (refer to table 7-2). Excessive heat may lift a conductor or damage the board.

c. Use a suction device (table 7-2) or wooden toothpick for removing solder from component mounting holes. Do not use a sharp metal object such as an awl or twist drill for this purpose. Sharp objects may damage the plated-through conductor.

d. After soldering, remove excess flux from the soldered areas.

e. When removing a multiple-connection component, such as a transistor, held tightly in a socket, loosen it gradually using gentle side-to-side or

rotary motion to avoid damage to plated-through conductors.

f. A broken or burned section of conductor can be repaired by bridging damaged section with a length of tinned copper wire. Allow adequate overlap and remove any varnish from etched conductor before soldering wire into place.

### 7-38. Access To Printed-Circuit Boards

7-39. Access to the bottom of the relay circuit board is obtained by removing the bottom plate (next to the reel motor) of the transport control assembly. Servo and actuator printed-circuit boards can be reached by removing the main chassis perforated cover. General troubleshooting can be done without removing these boards from the main chassis. If component replacement is necessary, moving the servo and/or the actuator circuit board may be desirable.

#### CAUTION

Be sure to remove power from the machine before attempting removal of circuit boards.

7-40. To remove circuit boards, take out four screws holding the support posts to the transport control unit chassis. Then swing the boards away as shown in figure 7-1.

### 7-41. Photosense

7-42. PHOTONSENSE LAMP. To remove and replace lamp, loosen contact retaining screw (figure 7-2) and remove contact. Install new lamp and

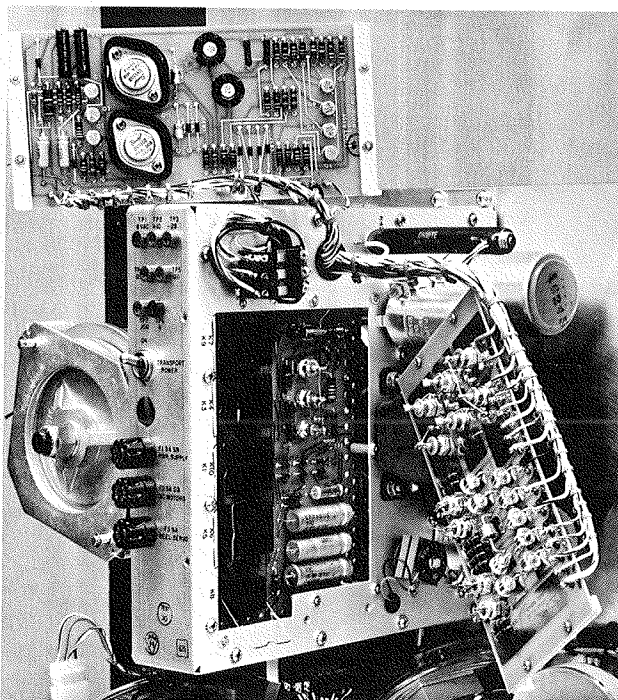


Figure 7-1. Servicing Printed Circuit Boards  
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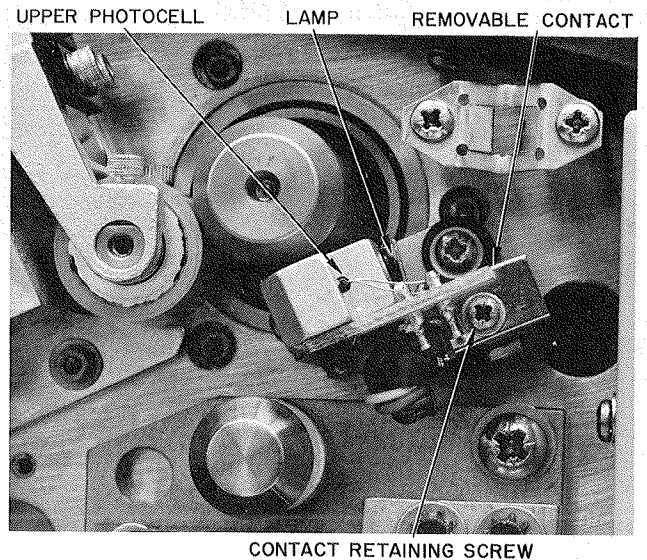


Figure 7-2. Photosense Parts

replace contact. The lamp is a CM8-428, with a precision-mounted filament. In emergency, a standard 328 lamp may be used if filament is centered in bulb. Adjust photosense output in accordance with paragraph 6-22.

#### CAUTION

Do not apply cement to the front of the head or to the photocell lens.

7-43. PHOTOCCELL. The upper photocell (figure 7-2) may be changed without removing the photosense head from the transport. To replace the lower cell, the head must be removed. Using a small iron, unsolder the photocell leads and pull it from the terminals. Install new photocell and position lens flush with front of photosense head. The cell must be secured at the back with a small amount of cement. Solder new photocell leads to terminals. The photocell is not polarized; either lead may go to either terminal. Adjust photosense circuits in accordance with paragraph 6-22.

7-44. PHOTONSENSE HEAD AND AMPLIFIER. Use standard disassembly procedures to remove photosense amplifier or photosense head. If necessary, refer to parts location drawings in section IX.

### 7-45. Pinchrollers

7-46. Remove pinchrollers by releasing two 4-40 socket head screws holding the pinchroller shaft. (See figure 7-3.) Insert a 4-40 screw into hole in end of shaft, then use screw to pull shaft from yoke. Take off pinchroller as shown in figure 7-4.

7-47. To install new pinchroller and bearing assembly, place pinchroller in yoke and install shaft. Replace shaft retaining screws. When tightening shaft screws push down on screw used as a puller (figure 7-5). Apply enough pressure to preload bearings so there is no end play but pinchroller turns freely. After replacing pinchroller, check actuator adjustments. (Refer to paragraphs 6-19 through 6-21).

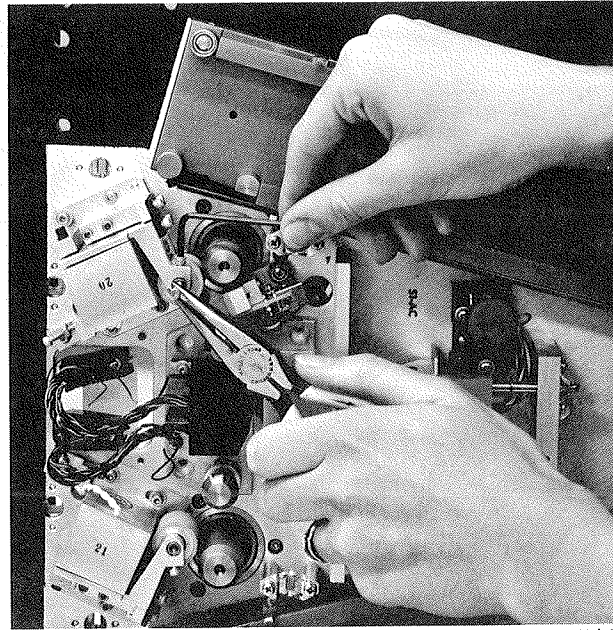


Figure 7-3. Loosening Pinchroller Shaft Screws

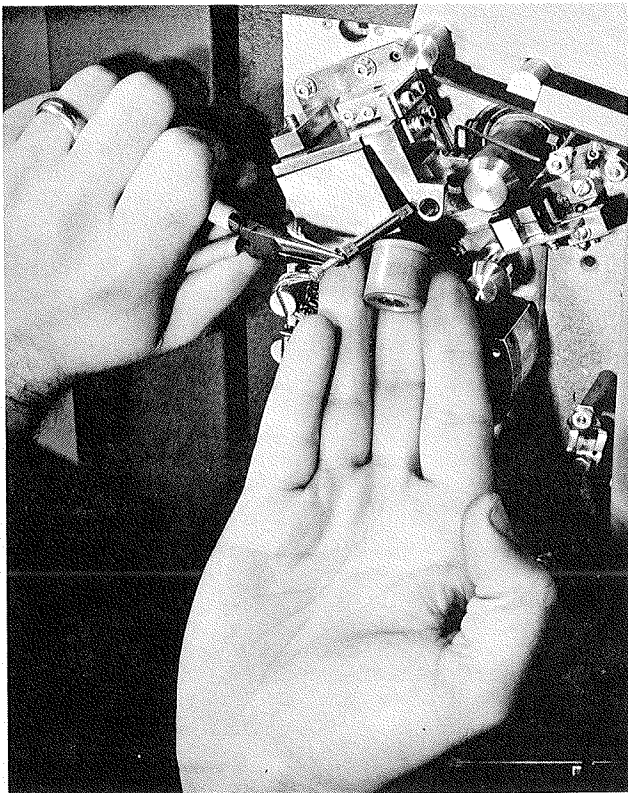


Figure 7-4. Removing Pinchroller From Yoke

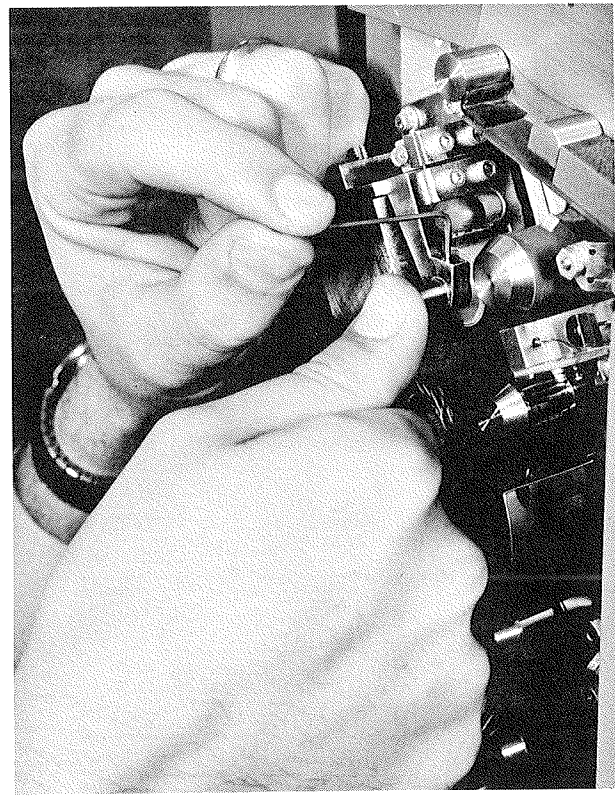


Figure 7-5. Applying Preload To Pinchroller Bearings

**7-48. Actuators**

7-49. To replace actuator assemblies, turn off TRANSPORT POWER switch and disconnect the two actuator wires from terminal strip on the back of the transport. Remove four holddown screws (figure 6-7) and take actuator assembly from transport frame. To reinstall actuator, reverse procedure and adjust in accordance with paragraphs 6-19 through 6-21.

**7-50. Vacuum Motor**

7-51. To replace vacuum motor, use the following procedure:

- a. Turn off TRANSPORT POWER switch.
- b. Disconnect P6 and motor wires on TB8 pins 3 and 4.
- c. Remove four cover screws and remove cover while holding motor leads and grommet so they slide from slot as shown in figure 7-6.
- d. Remove four vacuum motor retainer screws and lift off retainer and rubber mounting pad.



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Figure 7-6. Removing Vacuum Unit Cover

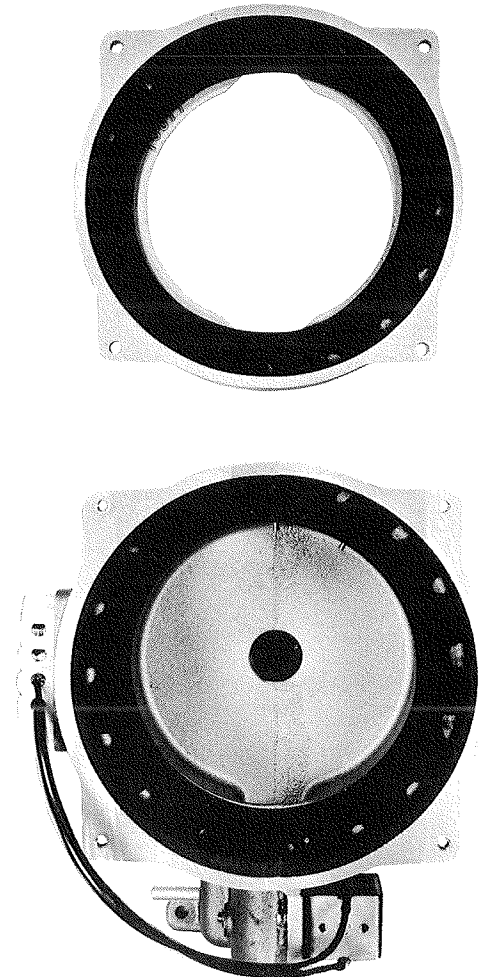
e. Note approximate position of brush holders with respect to vacuum unit housing. Lift up on motor and pull it from housing.

f. Place retainer upside down on a flat surface and position rubber mounting pad so that it centers in retainer as shown in figure 7-7. Make certain other mounting pad centers in main housing.

g. Hold replacement vacuum motor over housing and position so brush holders and leads are positioned approximately as the old motor.

h. Lower motor into center of rubber pad. Press down on motor and turn slightly to make certain motor is surrounded by rubber, and does not touch metal housing.

i. Lower retainer down over motor, rocking slightly from side to side so it passes over brush holders. Center retainer over motor and align mounting ears with those on housing. Push straight down, seating retainer and rubber pad on top of motor. Check to see that pad remains centered so motor does not touch retainer or housing. Install four retainer screws and tighten, compressing rubber pads and seating retainer firmly against housing.



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Figure 7-7. Vacuum Motor Mounting Pads

j. Dress motor leads around top of retainer and slide grommet over leads, placing it over terminal block in position to slide into cover slot.

k. Replace cover and wires removed in steps b and c. Either motor wire may go to either pin on terminal block.

### 7-52. Vacuum Motor Brushes

7-53. To replace vacuum motor brushes, use the following procedure:

a. Remove vacuum motor cover and wires as described in paragraph 7-51.

b. Remove brush holder clip as shown in figure 7-8.

c. Pry connecting clip from brush holder, being careful not to strain or break wire (figure 7-9).

d. Holding a new brush assembly, press brush into holder as far as it will go. Grasp one of the connector tabs on motor with a pair of long nose pliers and rest pliers against one of the fins on end bell so the connector tab points outward and motor winding lead is not strained or bent.

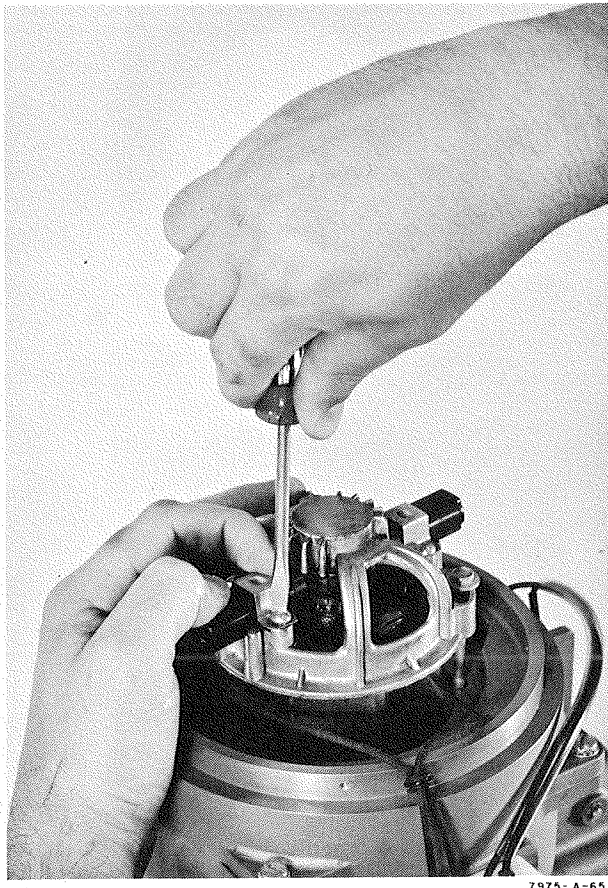


Figure 7-8. Removing Brush Holder

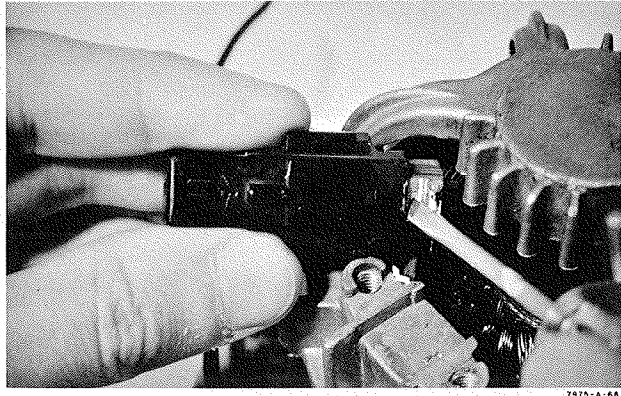


Figure 7-9. Removing Brush Connecting Clip

e. Push new brush assembly against connector clip so clip slides into position at bottom of brush holder. If necessary, rock brush holder slightly to force tab into position. Do not rock tab as this will bend motor lead.

f. Carefully place brush holder into position on end bell. Indexing tabs on bottom and side of brush holder will establish its location.

g. Install brush holder retaining clip using two mounting screws.

h. Install second brush holder similarly.

i. To achieve maximum motor life, provide a run-in period at reduced voltage for new brushes. Some replacement brushes will seat better and more quickly than others. In general, a run-in period of from 4 to 6 hours at 80 to 90 volts is recommended.

### NOTE

For run-in purposes, connect the vacuum motor, only, to a separate power source such as a variable transformer. Do not operate the entire tape transport at reduced voltage for the run-in period.

### 7-54. Rotary Guide Bearings

7-55. The guide can be removed by loosening the 4-40 setscrew that contacts the center post (figure 7-10). The setscrew is on the side wall of the vacuum chamber. Sufficient axial pressure must be applied in an inward direction to preload the bearing so there is no end play and yet the bearings are free to turn. After installation, check the rotary guide to ensure that it rotates freely and does not scrape either end.

### 7-56. Capstan Drive Belt

7-57. To replace the capstan drive belt, loosen the four mounting screws on the capstan drive motor bracket. Adjust the tension of the new belt in accordance with paragraph 6-29.

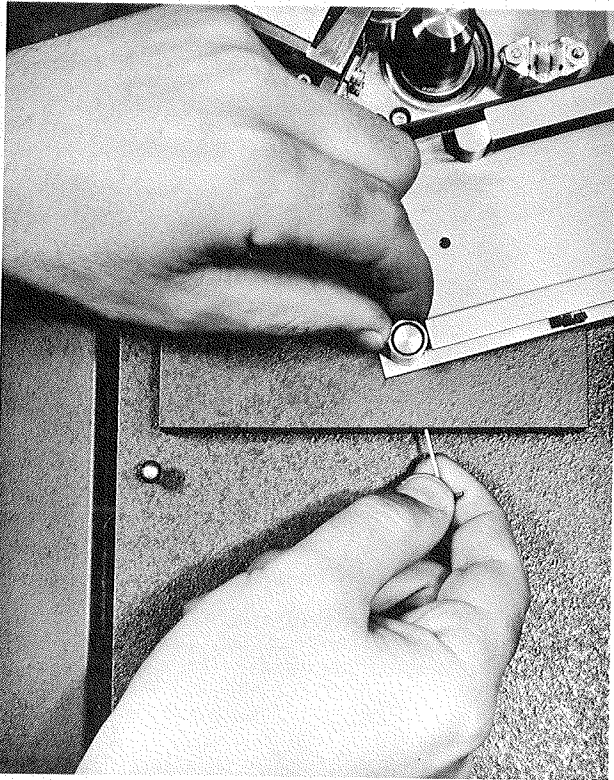


Figure 7-10. Removing Rotary Guide

**7-58. Capstan**

7-59. To replace a capstan, remove the belt and then the capstan assembly that is attached with three socket head screws, which are accessible from the front of the transport.

**7-60. Capstan Motor**

7-61. To replace the capstan motor assembly, turn off TRANSPORT POWER switch, disconnect the power leads at the terminal block, and remove the screws that attach the mounting bracket to the transport. Install the new assembly and adjust the belt tension (paragraph 6-29) before tightening the screws. Connect the power leads to the terminal block. If only the motor is to be replaced, proceed as follows:

- a. Remove motor assembly from transport as described above.
- b. Disconnect leads from terminal block and separate wires. Note connections and lead placement so they can be duplicated when new motor is installed.
- c. Remove motor.
- d. Remove pulley and install it on shaft of new motor.
- e. Install new motor on mounting bracket, leaving screws only finger tight.
- f. Connect wiring (figure 7-11) and install assembly on transport. Do not tighten screws.

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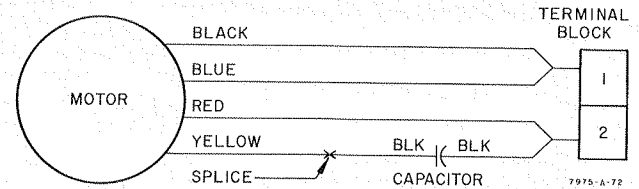


Figure 7-11. Capstan Motor Wiring

g. Adjust the motor position on the mounting bracket so that the belt will be in the center of the pulley, then tighten the screws.

h. Adjust belt tension (paragraph 6-29) and tighten the mounting screws.

**7-62. Reel Motors**

7-63. To remove the reel motor assembly, remove the reel, turn off TRANSPORT POWER switch, and disconnect wires to the terminal block. Remove the four 5/16-18 screws that hold the assembly to the back of the tape transport. The holddown knob assembly will clear the hole in the tape transport frame. After installing a new assembly, reconnect the wires to the terminal block. Check the turntable height and adjust if needed. (Refer to paragraph 6-31.)

**WARNING**

Be sure that transport switch is held to BRAKES position (brakes disengaged) when removing axial stop nut, because strong spring loading of the rotor and brakeplate could cause an injury.

**7-64. Brakes**

7-65. MAIN BRAKES. Replace the rotor by removing the setscrew that bears against the motor shaft key (figure 6-11); then, while holding transport switch to BRAKES, remove the rotor and the brakeplate from the motor shaft. Reverse the procedure to reassembly, using clamps to hold the brakeplate to the coil housing (against the force of the thrust spring) while reassembling the rotor to the motor shaft. Readjust the brake as described in paragraph 6-24.

7-66. DRAGBRAKE. To replace dragbrake, remove the two retainers and pull springs out of the dragbrake assembly. Install new dragbrake and adjust as described in paragraph 6-26.

**7-67. Takeup Reel**

7-68. To remove the takeup reel, first remove the plug button in the top of the operating knob handle by using a length of adhesive tape, then remove the capscrew from the motor shaft. Unscrew the operating knob by turning counterclockwise until it can be separated from its mating assembly.

**7-69. Holddown Knob**

7-70. The holddown knob may be replaced as follows:

- a. Remove plug button from top of operating knob. (Use a length of adhesive tape.)

- b. Loosen 10-32 setscrew in side of reel turntable.
- c. Remove capscrew and spring lockwasher from motor shaft.
- d. Remove holddown assembly by pulling it from motor shaft. Retain shim washers.
- e. Install new holddown knob and adjust turntable height. (Refer to paragraph 6-31.)

### 7-71. Vacuum Switches

7-72. To replace a vacuum switch, disconnect the hose and wires, then remove the two mounting screws that attach the assembly to the transport. Install the new switch using the old mounting hardware, then reconnect the hose and wires.

### 7-73. Vacuum Chambers

7-74. The abrasive action of the edge of the tape may wear the chamber wall and the glass coverplate. Replacing the vacuum chamber is done as follows:

- a. Remove vacuum motor unit to allow access to one of the four chamber-mounting screws.
- b. Remove end manifold and chamber.
- c. To replace a chamber, reverse procedure using 9/32-inch diameter locating hole in combination with shaft extension of fixed guide post to locate forward edge of chamber.

### 7-75. Write Enable (File Protect)

7-76. If the entire write enable unit is to be replaced, turn off the TRANSPORT POWER switch and remove the file reel motor assembly. The write enable unit may then be removed by disconnecting the wires to its terminal block and the three screws that attach the unit to the tape transport. To install a write enable unit on the transport, proceed as follows:

- a. Mount write enable unit on rear of transport as shown in figure 7-12. Do not tighten screws.

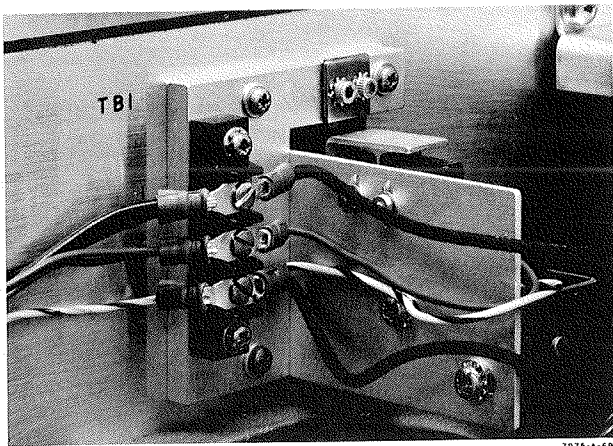


Figure 7-12. Write Enable Assembly

b. Position assembly so edge of baseplate is straight up and down and tip of actuator is at center of half circle when viewed from front, as shown in figure 7-13. After assembly is properly aligned, tighten three mounting screws.

c. Connect harness wires to terminal block with black wire going to terminal 1, red wire to terminal 2, and striped wire to terminal 3.

d. Replace reel motor assembly.

e. Energize solenoid and verify that tip does not bind on the transport frame.

### 7-77. Head Assembly

7-78. The head assembly should be replaced when there is evidence of excessive wear on the face of the head. The head assembly should also be replaced when the head or guides have been damaged. Replacement procedures are as follows:

#### CAUTION

The head assembly is assembled at the factory using precision fixtures and should not be disturbed unnecessarily. Be particularly careful; avoid moving the head leads and connectors excessively.

- a. Disconnect connectors.
- b. Set transport switch to BRAKES position and disconnect coupling spring from head gate pin.
- c. Remove rubber vacuum fittings from vacuum cleaner posts.

#### CAUTION

Take care to maintain a firm grip on the head assembly to avoid dropping it.

d. Remove two 10-32 screws holding head base to transport.

e. Slip two vacuum fittings over the vacuum cleaner posts while holding new head assembly in its approximate mounting position. Place assembly against transport mainframe, making certain

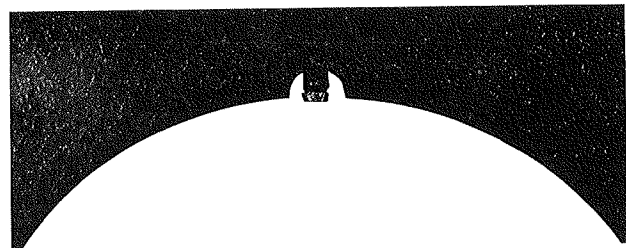


Figure 7-13. Write Enable Actuator Tip



no burrs, chips, or other foreign particles are between base and transport. Insert two 10-32 mounting screws and associated hardware, then tighten so head assembly will stay in position after adjustment, but still can be moved. Connect head connectors to appropriate transport receptacles.

g. Refer to paragraph 6-17 to adjust head position. After head assembly has been replaced, data electronics must be readjusted to correct gain and skew. Refer to the System Maintenance Manual.

### **7-79. Cover Door Assembly**

7-80. To remove cover door, first open door and disconnect the door stop, then take out hex-head setscrew that holds hinge pins. Use narrow-blade screwdriver to unscrew lower hinge pin, then swing lower end of door outward to clear fixed part of hinge while lifting door to remove it from transport frame. When reassembling door to frame, use thick washer on upper hinge pin and thinner washer on lower hinge pin.



## SECTION VIII TROUBLE ISOLATION

### 8-1. INTRODUCTION

8-2. Most often, the cause of mechanical trouble in the tape transport becomes obvious upon close visual observation of the transport when it functions in its various modes of operation. Less obvious sources of trouble can be located by checking performance (section V) or carrying out inspection procedures provided in section VII. Before starting detailed trouble analysis, make sure recording tape, even if new, is free of defects.

### 8-3. TROUBLE ANALYSIS

8-4. Systematic troubleshooting will be facilitated by carefully observing the motion of the tape through

the head assembly area and the action of the vacuum chambers and reel motors, and noting whether trouble occurs during all modes of operation or in only one mode, and if the trouble starts during some specific phase of operation; for example, the jogging period at the start of rewinding. The procedures listed in table 8-1 are recommended, assuming the tape transport is used with standard 2020 series components, including data electronics and operator control panel.

8-5. Failure of electrical circuits can be traced to specific parts by standard troubleshooting methods while referring to the theory of operation in section IV and the schematic diagrams in section X.

Table 8-1. Trouble Analysis

TROUBLE	PROBABLE CAUSE	REMEDY
<b>REEL MOTORS</b>		
Tape loop in vacuum chamber too short or too long during drive.	Faulty reel motor control circuit.	Troubleshoot reel motor control circuits (paragraphs 4-13 through 4-17).
	Bad brake clearance.	Adjust brake clearances (paragraph 6-24).
	+100-volt power supply defective.	Troubleshoot +100-volt power supply (paragraph 4-32).
	File reel dragbrake too tight (fast forward option only).	Adjust dragbrake (paragraph 6-26).
<b>BRAKES</b>		
Reel brakes do not disengage when transport switch is held at BRAKES.	TRANSPORT POWER switch S2 set to OFF position.	Set TRANSPORT POWER switch to ON.
	Defective +100-volt power supply.	Check +100-volt reel motor power supply (paragraph 4-32).
	Fault in brake circuit.	Check brake circuit (paragraphs 4-13 through 4-17).
Squeaking	Brake pins worn.	Replace brake pins.
	Brake surface glazed.	Replace brakeplate and/or rotor assembly. Refer to paragraph 7-64 for disassembly procedure.
	Brake surface warped.	Replace brakeplate and rotor (paragraph 7-64).
Sticking	Brake rotor cork defective.	Replace rotor (paragraph 7-64).
	Low line voltage.	Increase line voltage.
	Brake surface contaminated.	Replace rotor (paragraph 7-64).

Table 8-1. Trouble Analysis (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
BRAKES (Continued)		
Low brake torque (slipping).	Brake surface glazed.	Replace brakeplate and/or rotor assembly. Refer to paragraph 7-64 for disassembly procedure.
Noisy	Too much clearance.	Adjust brakes (paragraph 6-24).
CAPSTAN AND VACUUM MOTORS		
Capstans do not turn, but vacuum motor operates.	Belt slipping or broken.	Adjust or replace belt (paragraphs 6-29 and 7-56).
	Defective capstan motor.	Replace motor (paragraph 7-60).
	Defective capstan servo (option 001 transports only).	Troubleshoot servo (paragraph 4-36).
Desired capstan speed cannot be selected (dual-speed transports only).	Speed-change relay does not function.	Replace K1 or Q4 in capstan servo (paragraph 4-36).
Capstan and vacuum motors do not start when transport switch	TRANSPORT POWER switch S2 set to OFF position.	Set TRANSPORT POWER switch to ON.
	Fault in vacuum and capstan control circuits.	Check vacuum and capstan control circuits (paragraph 4-7).
Capstan and vacuum motors start, but stop.	Faulty vacuum system.	Check vacuum system circuits (paragraph 4-7). Adjust vacuum (paragraph 6-9).
	Vacuum switch failure.	Check vacuum switches VS6, VS7, and VS8.
ACTUATORS		
Forward or reverse actuator does not energize.	Faulty actuator circuit.	Troubleshoot actuator circuit (paragraph 4-10).
Actuator energizes but tape does not move.	Actuator out of adjustment.	Adjust actuator (paragraph 6-19).
	Worn pinchroller.	Replace pinchroller (paragraph 7-45).
REWIND		
Tape does not rewind.	Faulty rewind control circuits.	Troubleshoot rewind circuits (paragraph 4-20).
	Vacuum too low.	Adjust vacuum (paragraph 6-9).
Rewind too slow or erratic.	Brakes dragging.	Adjust main brakes and drag-brake (paragraph 6-24).
	High temperature.	Correct the ambient environmental conditions. Refer to table 1-2.
	Low line voltage.	Increase line voltage.
START/STOP TIME AND DISTANCE		
Starting distance out of specification.	Slipping capstan drive belt.	Adjust capstan drive belt (paragraph 6-29).
	Actuator out of adjustment.	Adjust actuator (paragraph 6-19).
	Worn pinchroller.	Replace pinchroller (paragraph 7-45).

Table 8-1. Trouble Analysis (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
START/STOP TIME AND DISTANCE (Continued)		
Stopping distance out of specification.	Actuator out of adjustment.	Adjust actuator (paragraph 6-19).
	Pucker pocket vacuum out of adjustment.	Adjust pucker pocket vacuum (paragraph 6-15).
TAPE SPEED		
Tape slipping.	Dirty tape path.	Clean the tape unit (paragraph 6-9).
	Temperature too high, humidity too low.	Correct the ambient environmental conditions. Refer to table 1-2.
	Actuator maladjusted.	Adjust actuator (paragraph 6-19).
	Capstan worn.	Replace capstan (paragraph 7-58).
	Head gate touching tape.	Refer to Head Assembly Manual Supplement.
	Capstan servo (option 001 only) out of adjustment.	Adjust capstan servo speed (paragraph 6-35).
TAPE DAMAGE		
Tape stretched.	Rewinding jog time unbalanced.	Adjust rewind jog (paragraph 6-27.)
	Brake failure.	Check performance of reel brakes and dragbrake.
Tape edge damaged.	Improper tape tracking.	Inspect tape tracking (paragraph 7-9).
	Chipped vacuum chamber glass.	Replace glass.
	Actuator azimuth incorrect.	Adjust actuator (paragraph 6-19).
Excessive dynamic skew of the tape.	Defective tape.	Replace tape.
	Capstan or pinchroller eccentric.	Replace defective component.
	Pinchroller or capstan bearings defective.	Replace defective component.
	Actuator maladjusted.	Correct the actuator adjustments (paragraph 6-19).
Tape wraps around capstan.	Pucker pocket too deep.	Adjust pucker pocket (paragraph 6-15).
	Dirty tape unit.	Clean unit (paragraph 7-5).
	LP sticker applied so that it projects past tape edge.	Replace LP sticker (paragraph 3-5).
Tape wraps around tape reel.	Vacuum adjustment and/or vacuum switch adjustment.	Adjust as necessary (paragraph 6-9).
	Noise on input power line.	Eliminate power line noise.
	SCR failure.	Replace SCR suspected to be defective. (Refer to paragraph 4-13.)

Table 8-1. Trouble Analysis (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
STATUS SIGNALS		
End-of-tape and load-point sensors both fail to function.	Defective photosense head lamp.	Replace lamp (paragraph 7-42).
	Defective +10-volt power supply.	Troubleshoot +10-volt power supply (paragraph 4-32).
	Faulty 6 VAC supply.	Troubleshoot 6 VAC supply (paragraph 4-32).
End-of-tape sensor fails to function, or gives false indications.	Faulty end-of-tape circuit.	Troubleshoot end-of-tape circuit (paragraph 4-28). Adjust photosense R18 (paragraph 6-22).
Load-point sensor fails to function, or gives false indications.	Faulty load-point circuit.	Troubleshoot load-point circuit (paragraph 4-28). Adjust photosense R1 (paragraph 6-22).
Write enable circuit does not function.	No write enable ring installed on file reel.	Install write enable ring.
	Faulty switch S3 or relay K9.	Troubleshoot write enable circuit (paragraph 4-18).
ELECTRICAL NOISE		
Electrical noise.	Vacuum motor brushes or commutator worn.	Replace brushes (paragraph 7-52) or motor assembly (paragraph 7-50).
	Capstan servo motor brushes or commutator worn (option 001 only).	Replace brushes or motor assembly (paragraph 7-60).

## SECTION IX

### PARTS LIST

#### 9-1. INTRODUCTION

9-2. This section of the manual contains a complete replacement parts list. Since the printed circuit cards have the reference designators marked on them, they are not illustrated.

9-3. An entry in the USED ON OPTIONS column indicates that part is used only on the option listed. If the USED ON OPTIONS column has no entry for an item, that part is used for all versions.

9-4. Abbreviations used in the DESCRIPTION column are largely self-explanatory. Most abbreviations used in this manual are from MIL-STD-12B. In the list below are those abbreviations not covered by the referenced MIL Standard.

#### 9-5. ORDERING INFORMATION

9-6. To obtain replacement parts, address order or inquiry to your nearest Hewlett-Packard Field Office. When ordering a painted part, always include the paint configuration code number located on the system configuration list.

#### ABBREVIATIONS

A/R = as required

Assy = assembly

BH = binding head

D = D-shaped

Hz = hertz

$\mu$ f = microfarads ( $10^{-6}$ )

MF = metal film

MY = Mylar

P = peak

PC = printed circuit

PF = picofarads ( $10^{-12}$ )

PIV = peak inverse voltage

PWV = peak working voltage

SB = slow blow

WIV = working inverse voltage

WV = working voltage

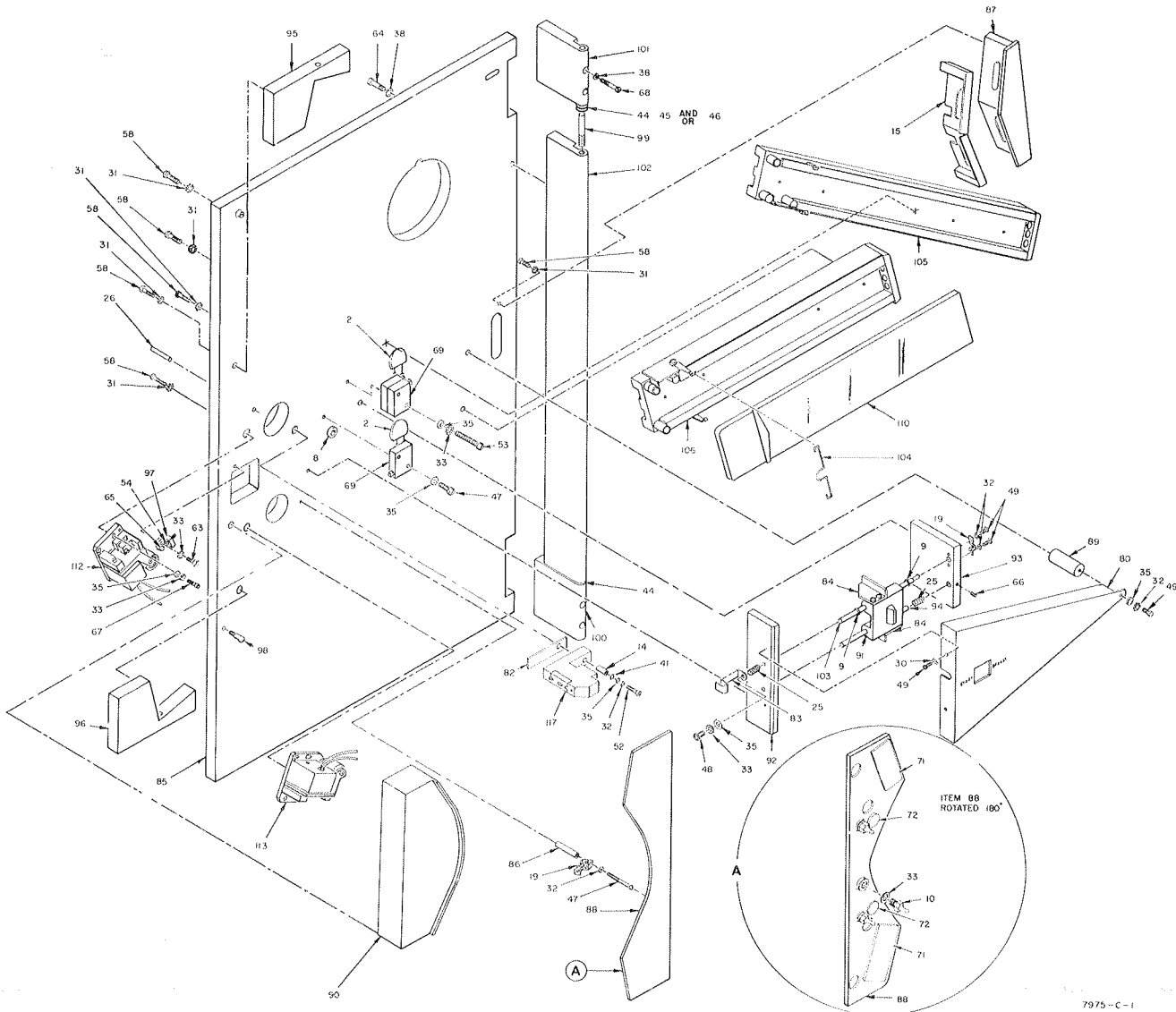


Figure 9-1. Tape Transport, Parts Location, Front View  
(See Table 9-1.)

7975-C-1



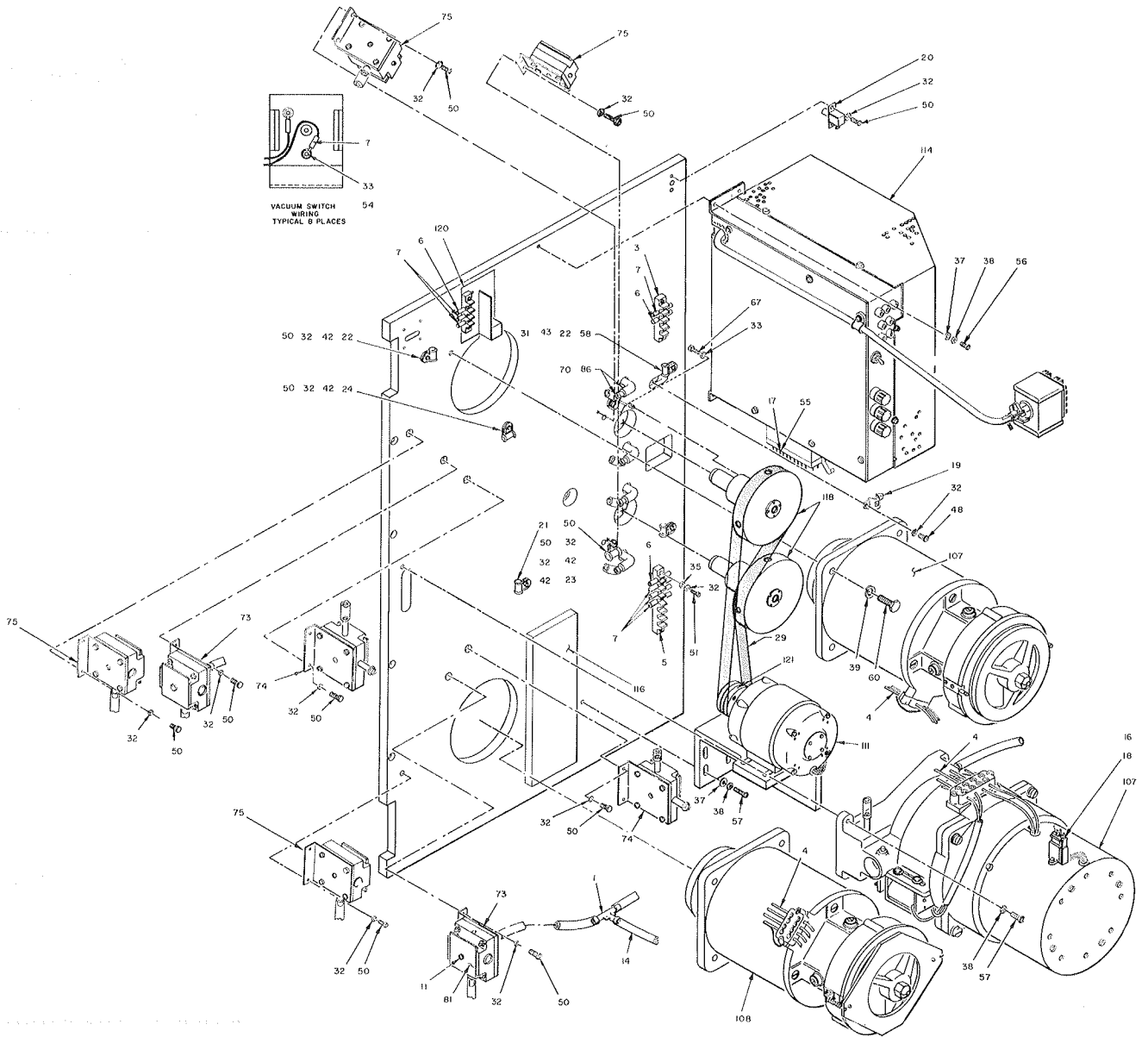
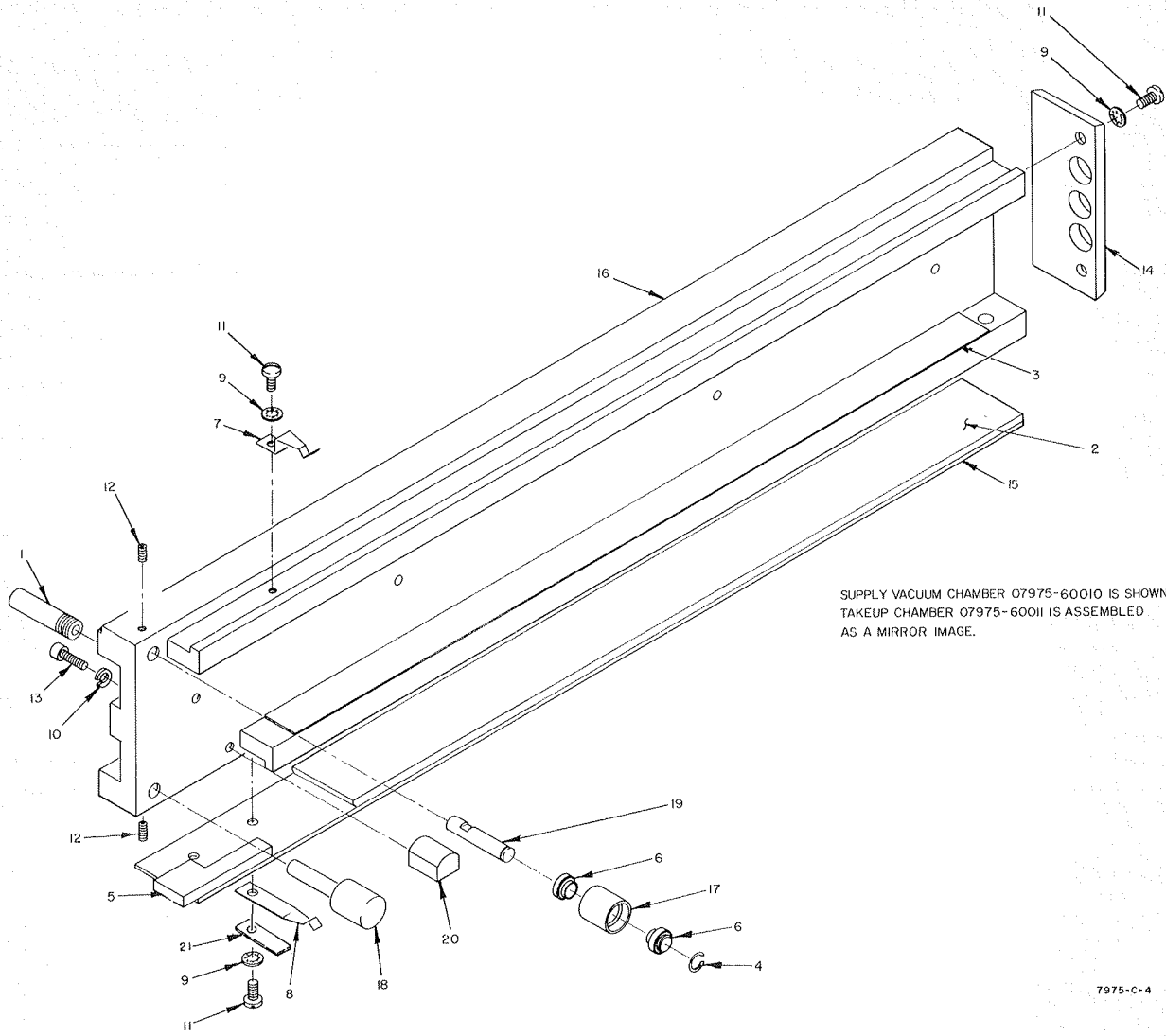


Figure 9-2. Tape Transport, Parts Location, Rear View  
(See Table 9-1.)



7975-C-4

Figure 9-3. Vacuum Chamber, Parts Location  
(See Table 9-2.)

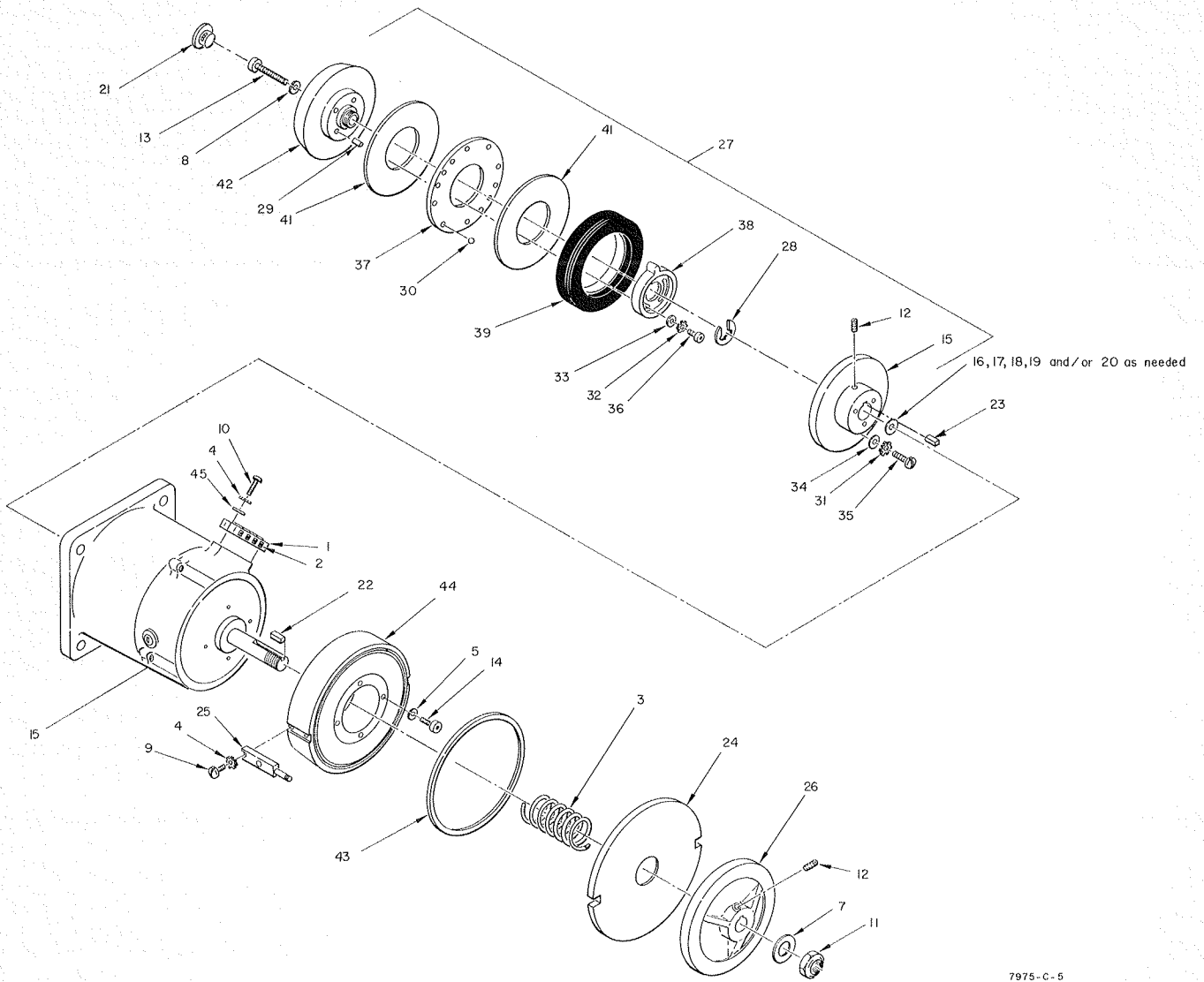
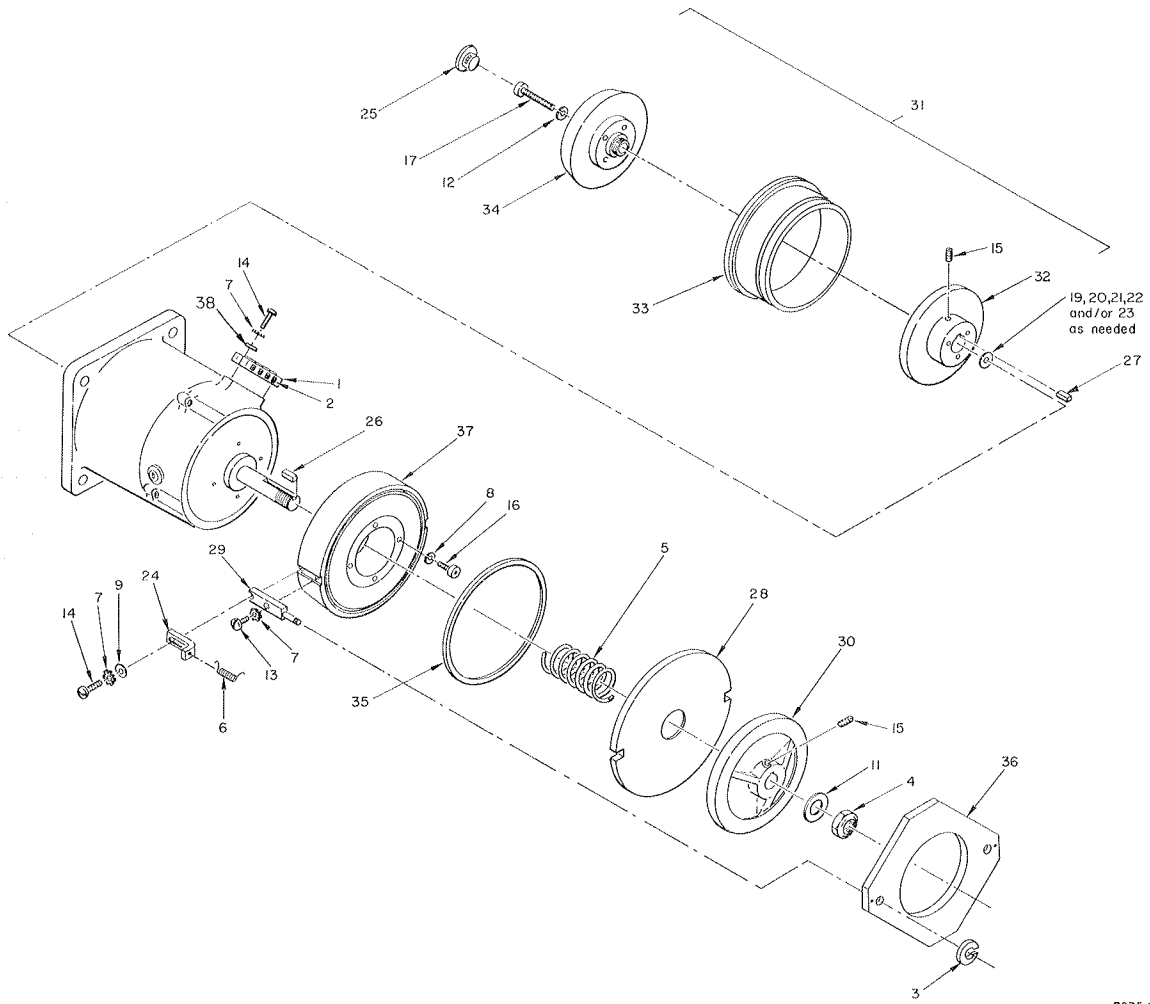


Figure 9-4. File Reel Motor, Parts Location  
(See Table 9-3.)

7975-C-5



7975-C-6

Figure 9-5. Takeup Reel Motor, Parts Location  
(See Table 9-4.)

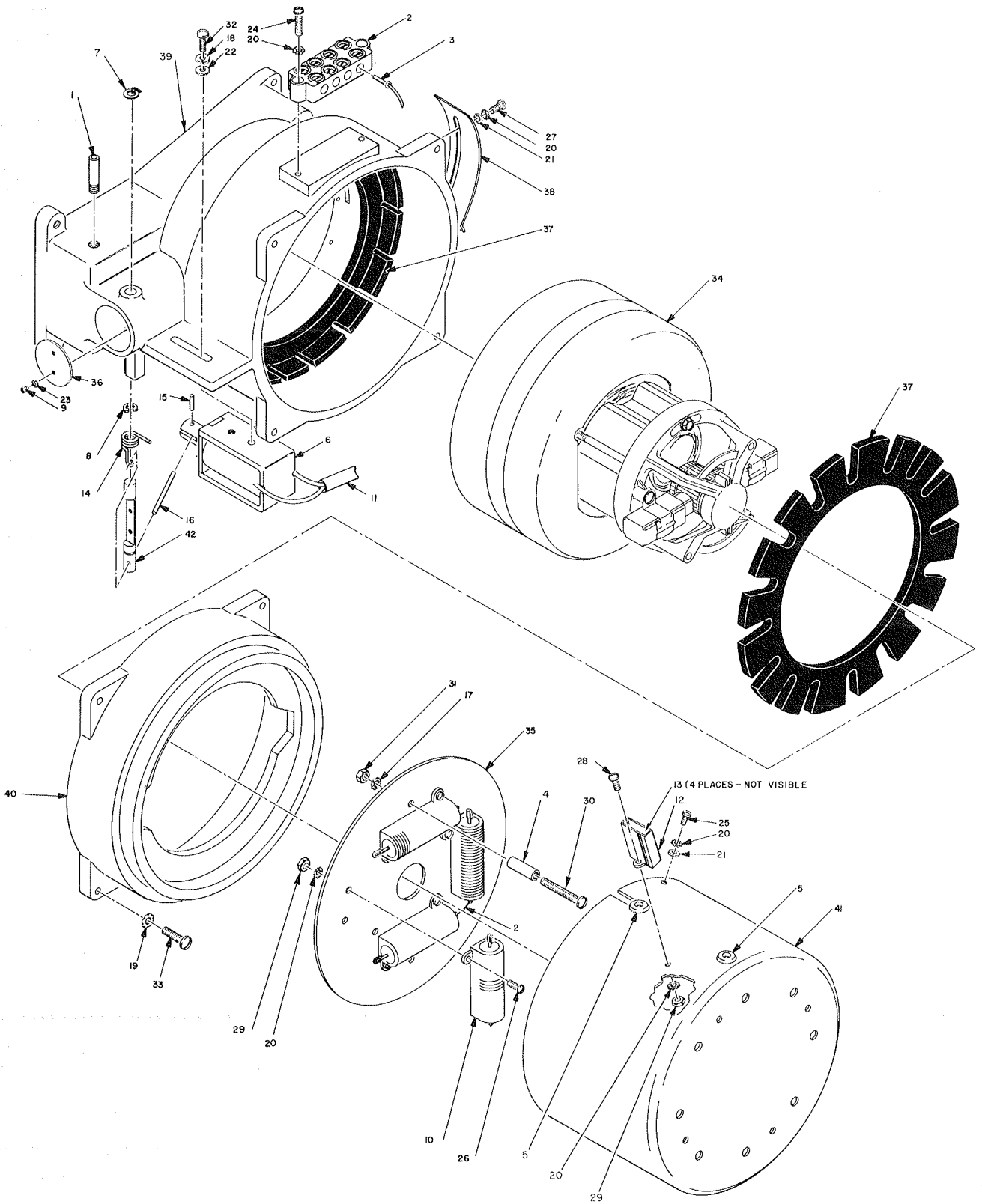
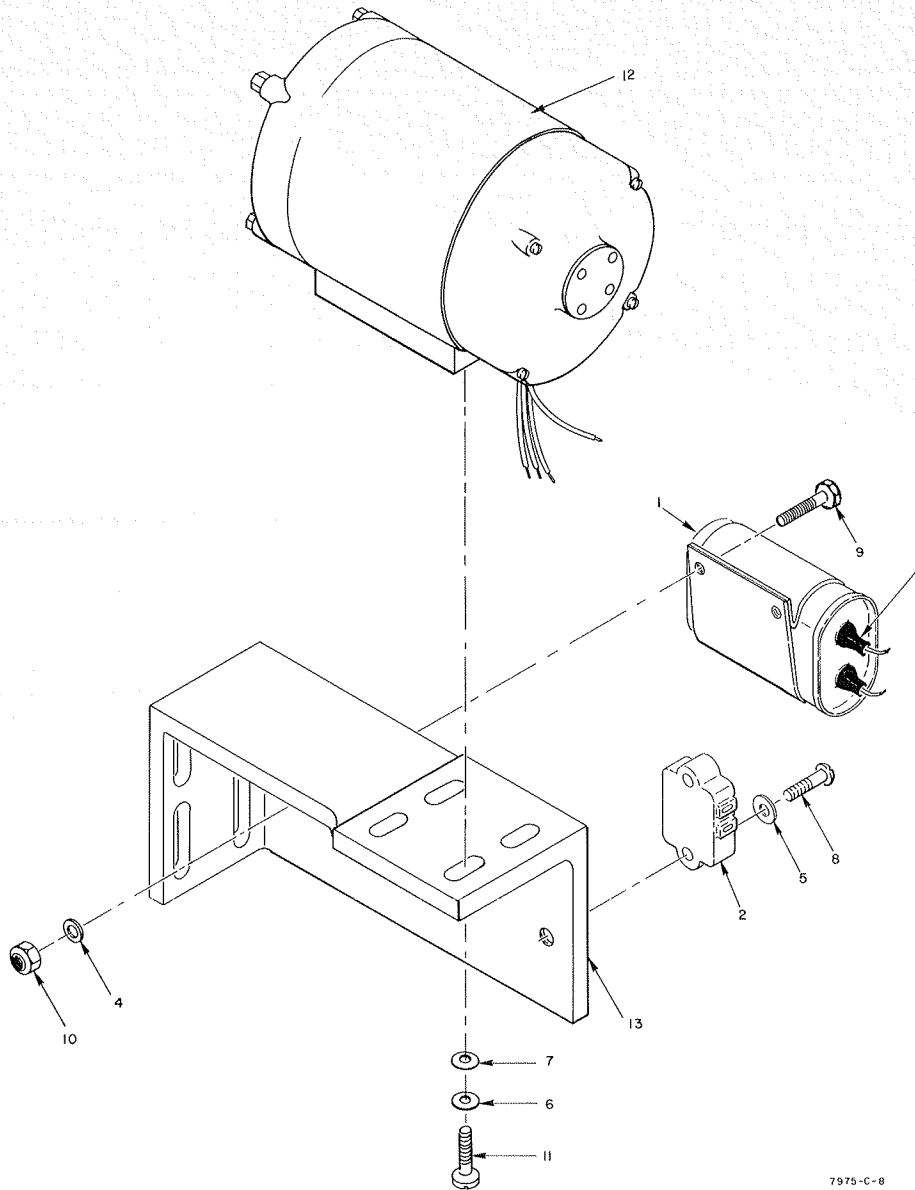
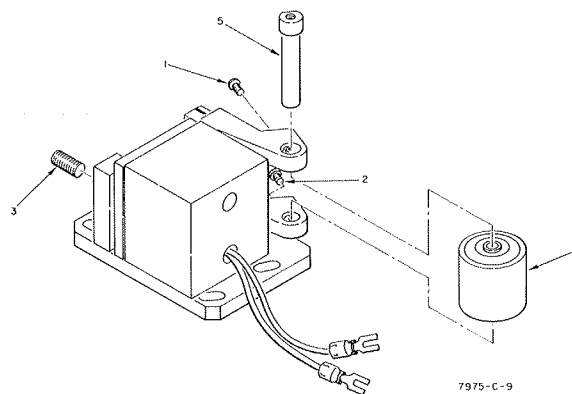


Figure 9-6. Vacuum Unit, Parts Location  
(See Table 9-5.)



7975-C-8

Figure 9-7. Capstan Motor, Parts Location  
(See Table 9-6.)



7975-C-9

Figure 9-8. Actuator, Parts Location  
(See Table 9-7.)

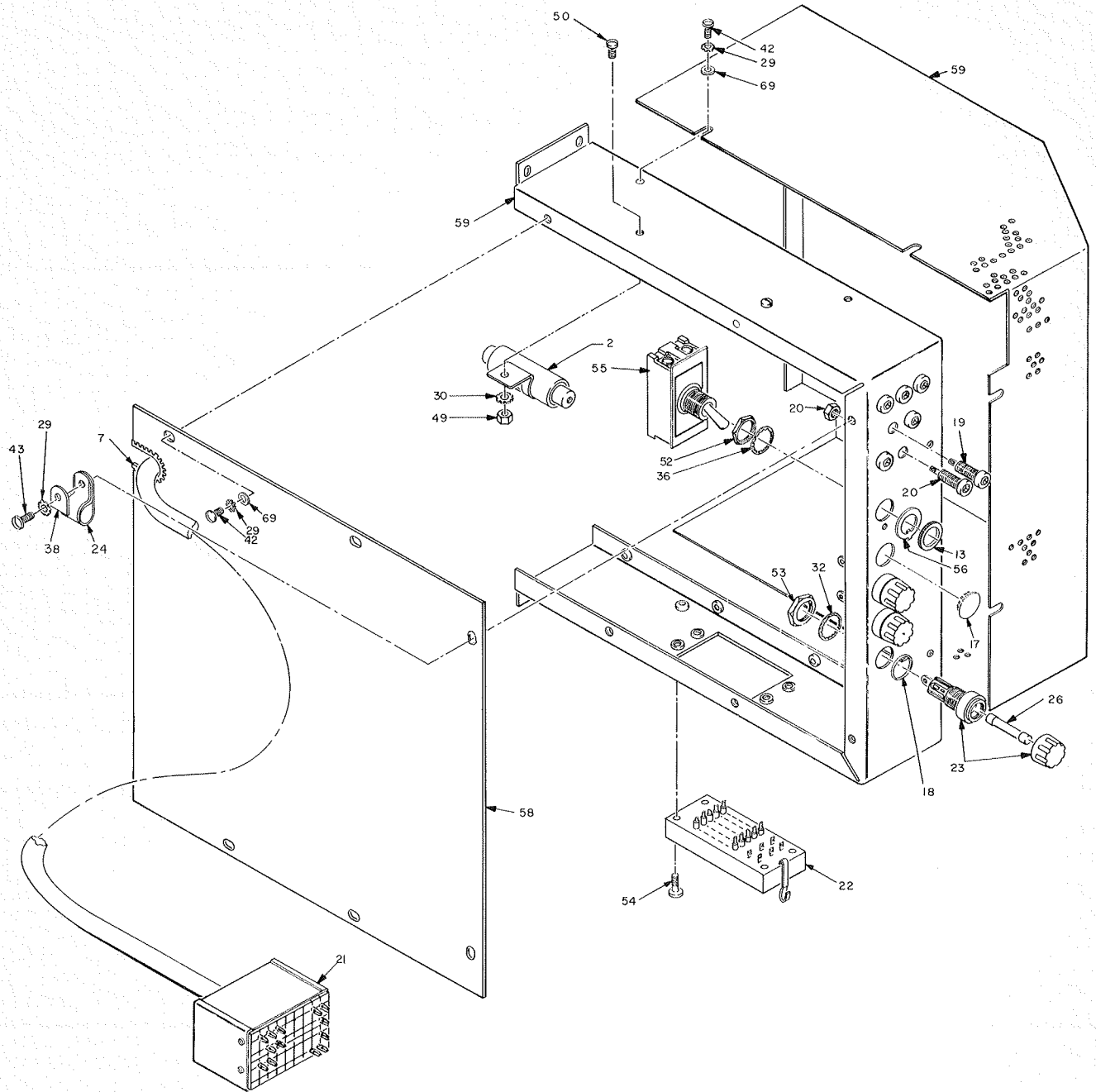


Figure 9-9. Transport Control Unit, Parts Location, View A  
(See Table 9-8.)

7975-C-10

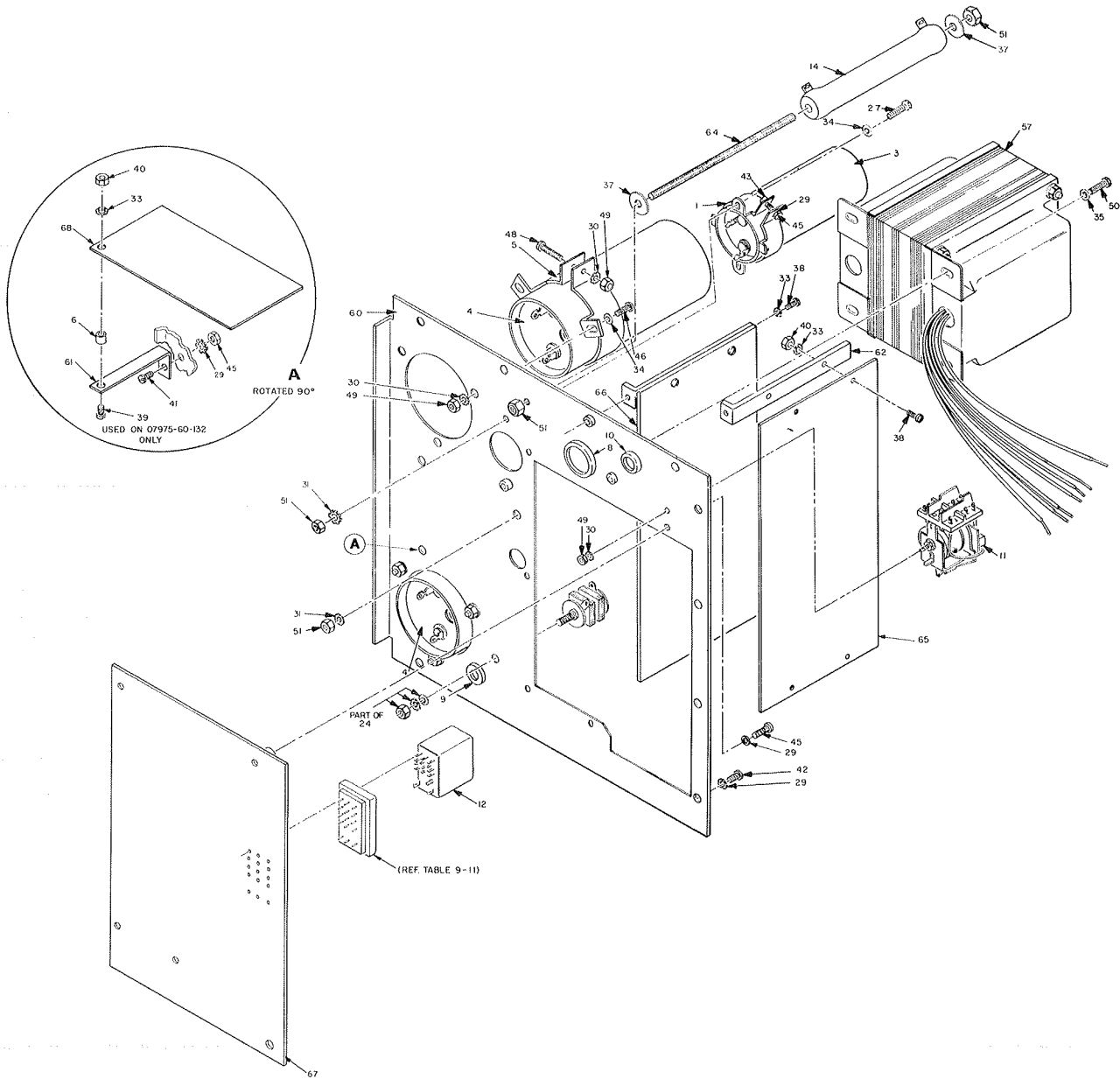


Figure 9-10. Transport Control Unit, Parts Location, View B  
(See Table 9-8.)

7975-C-11



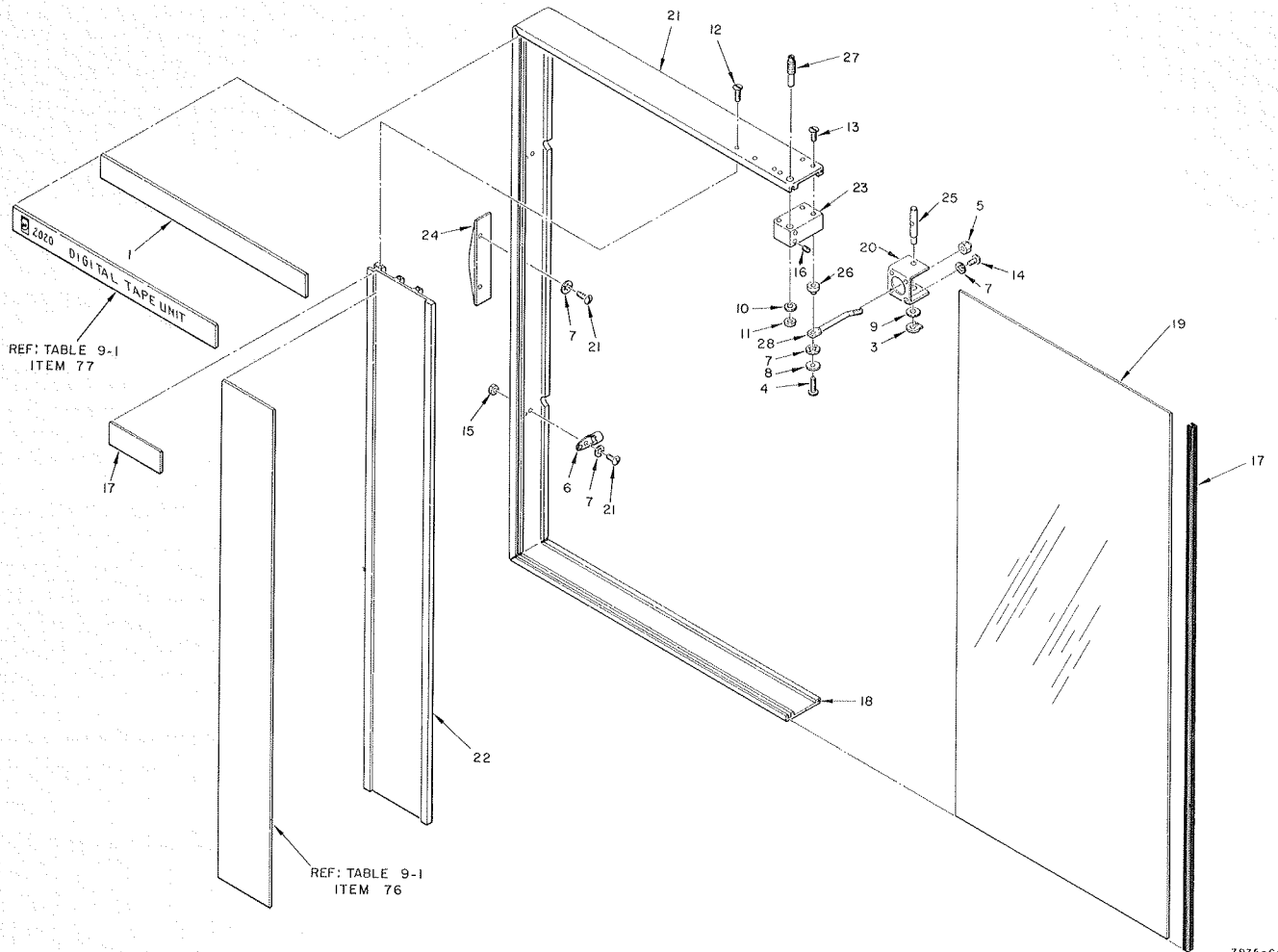
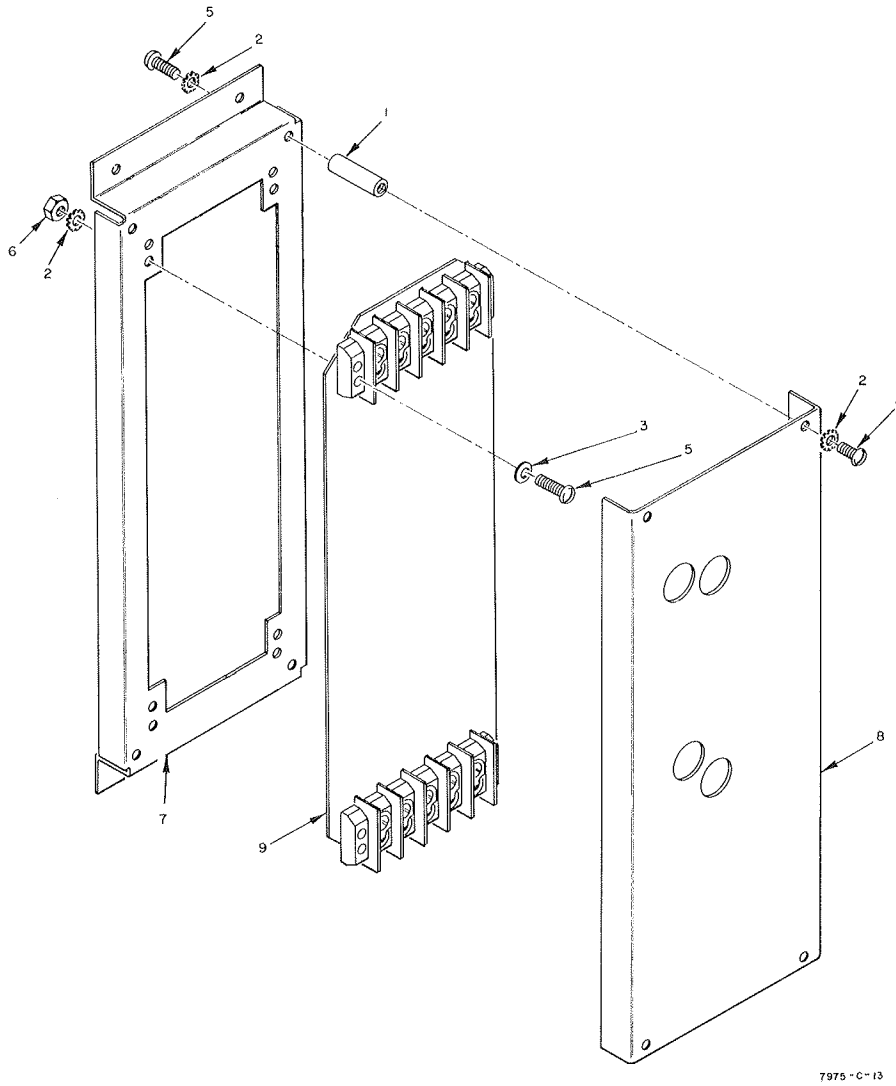
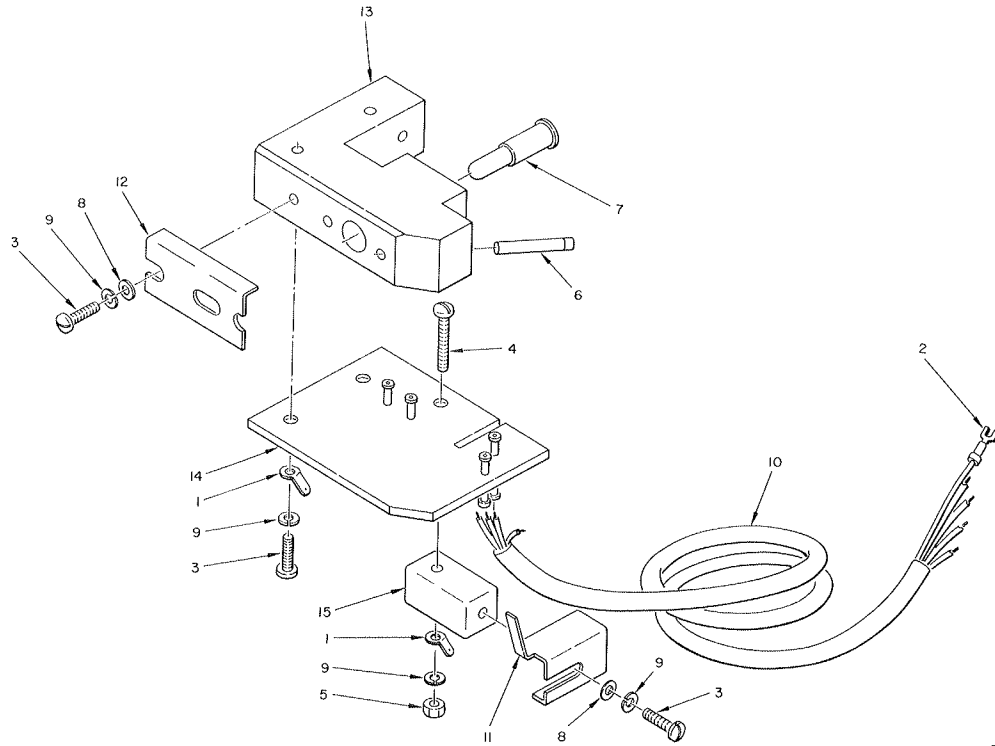


Figure 9-11. Cover Door, Parts Location  
(See Table 9-12.)



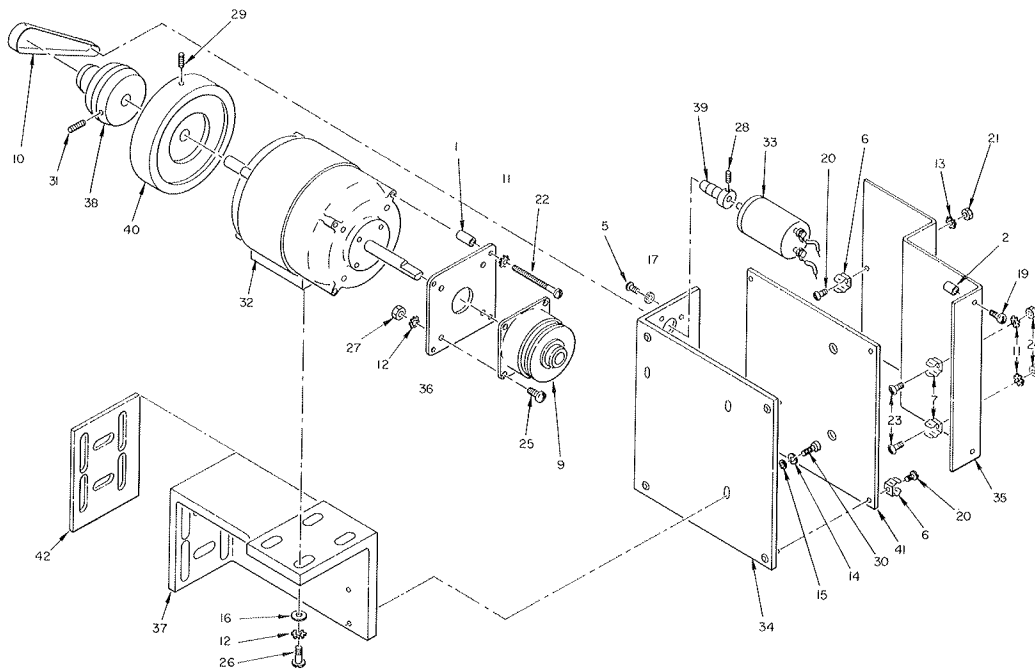
7975-C-13

Figure 9-12. Photosense Amplifier, Parts Location  
(See Table 9-13.)



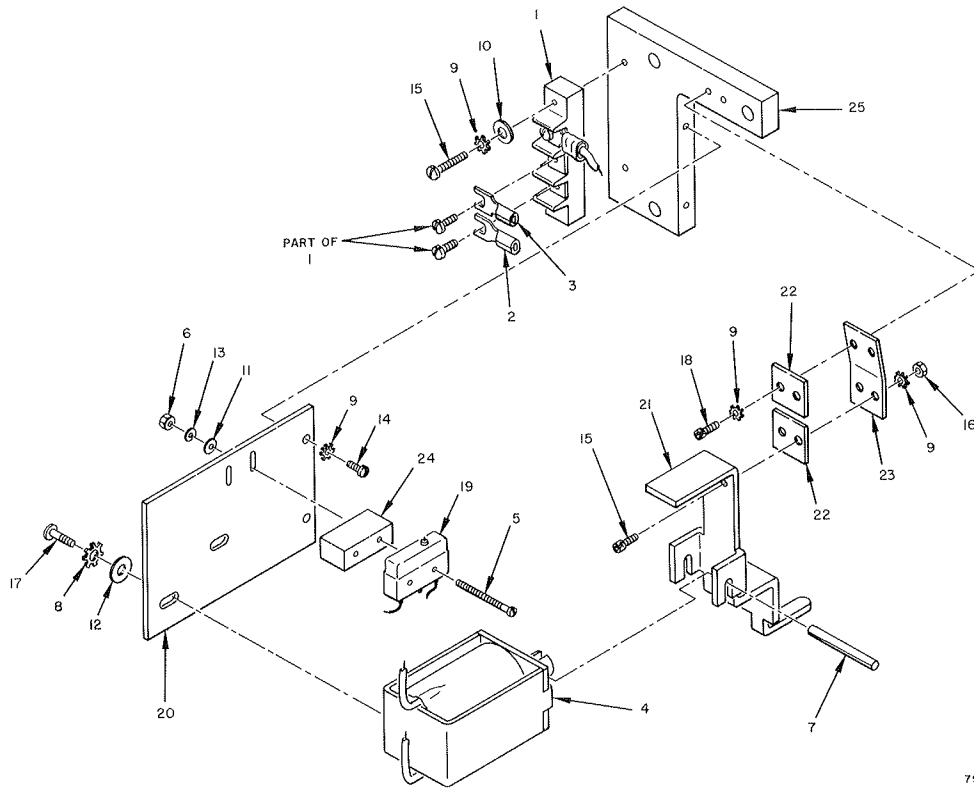
7975-C-14

Figure 9-13. Photosense Head, Parts Location  
(See Table 9-15.)



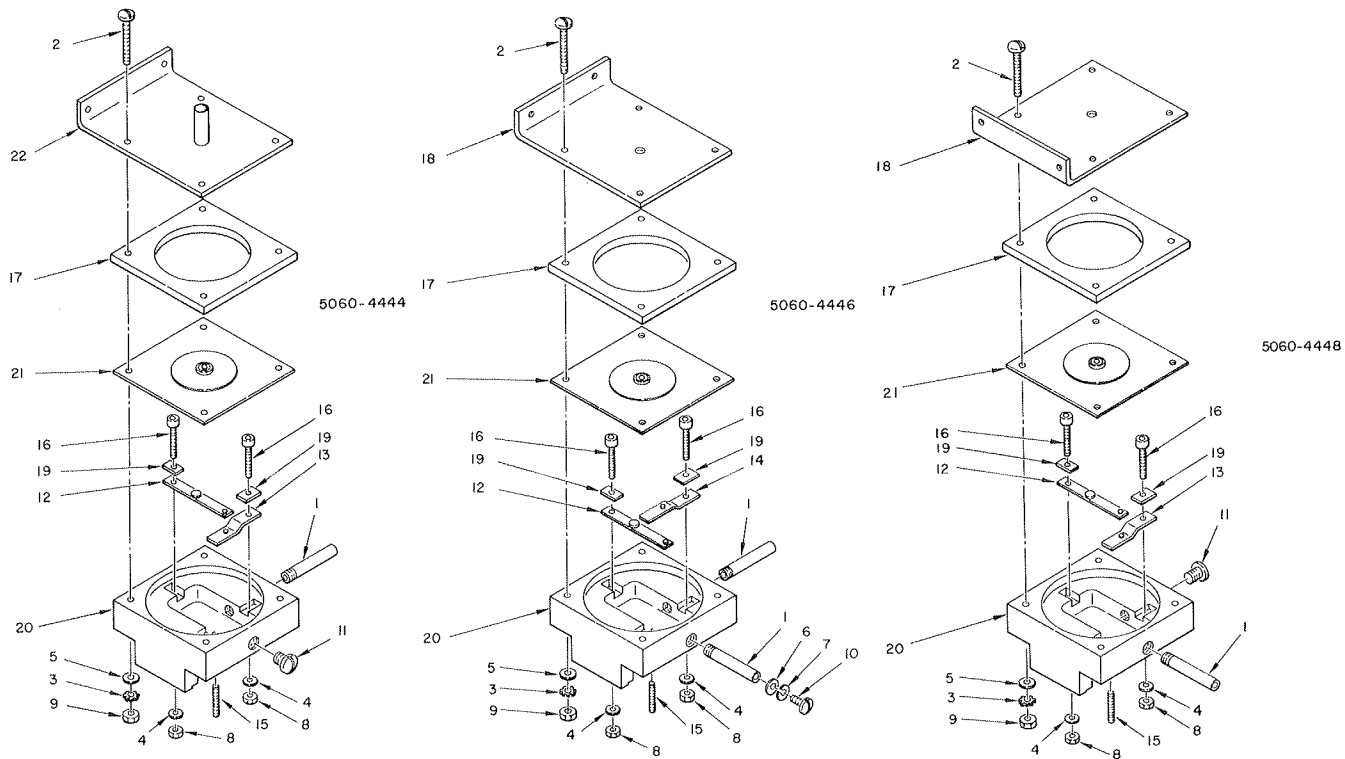
7975-C-15

Figure 9-14. Capstan Servo, Parts Location  
(See Table 9-16.)



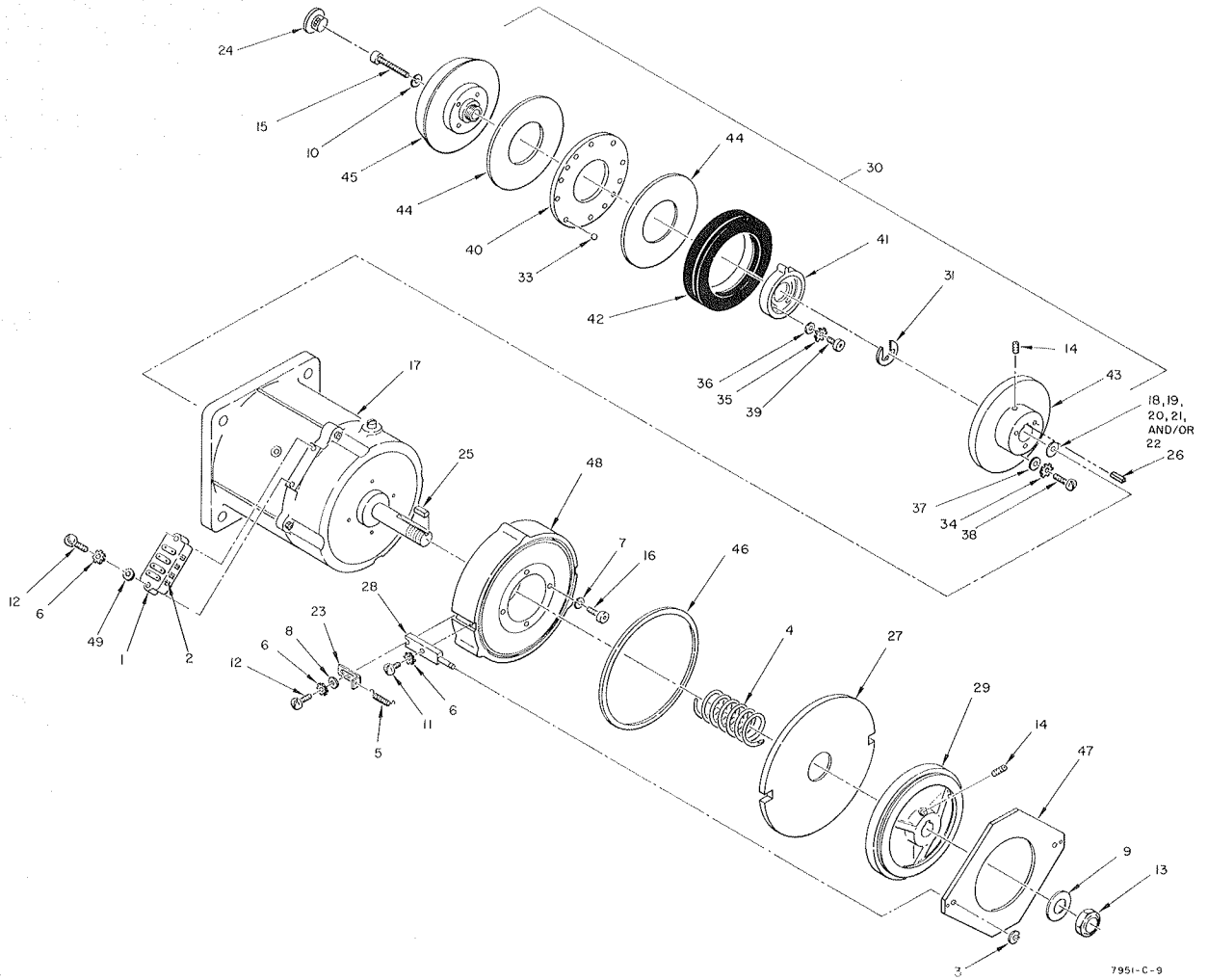
7975-C-16

Figure 9-15. Write Enable, Parts Location  
 (See Table 9-18.)



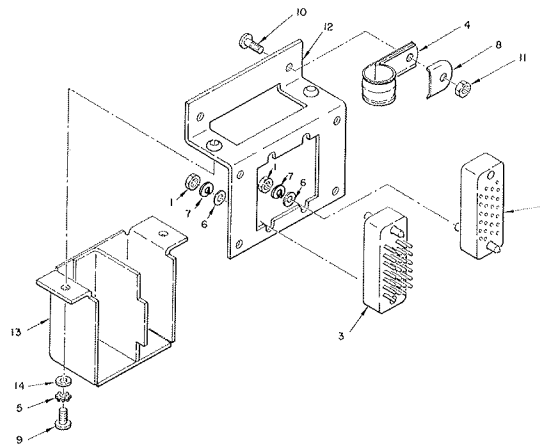
7975-C-17

Figure 9-16. Vacuum Switches, Parts Location  
 (See Table 9-19.)



7951-C-9

Figure 9-17. File Reel Motor, Fast Forward, Parts Location  
 (See Table 9-21.)



7954-C-1

Figure 9-18. Head Connector Kit, Parts Location  
 (See Table 9-22.)

Table 9-1. Tape Transport Parts List  
(See Figures 9-1 and 9-2.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	7975A	Tape Transport		
1	0100-0177	Fitting "T" 1/4	A/R	
2	0160-0269	Capacitor, Cer Disc 0.1 $\mu$ f 500 VDC	2	
3	0360-1180	Terminal Strip, 4 Terminals, TB2	1	
4	0360-1192	Lug, Solder	9	
5	0360-1495	Terminal Strip, 7 Terminals, TB3	1	
6	0362-0102	Lug, Solder #16	A/R	
7	0362-0103	Lug, Solderless #22	A/R	
8	0400-0056	Bushing	1	
9	0510-0045	Ring, Truarc	2	
10	0510-0979	Stud-Ball	7	
11	0624-0061	Screw, BH 4-40 x 1/4 (Self-Tap)	8	
12	0890-0017	Tubing, Plastic (Not Illustrated)	A/R	
13	0890-0779	Tubing, Teflon #10	A/R	
14	0890-0784	Tubing, Plastic 1/4 ID x 3/8 OD	A/R	
15	0905-0332	Gasket, Vacuum Manifold	1	
16	1251-1468	Connector, Male 4 Pin, P6	1	
17	1251-1474	Connector, 50 Pin, P2	1	
18	1251-1478	Contact	4	
19	1390-0064	Catch, Spring	8	
20	1390-0076	Fastener, Panel	1	
21	1400-0187	Cable Clamp 5/16	1	
22	1400-0291	Cable Clamp 3/16	4	
23	1400-0293	Cable Clamp 3/8	3	
24	1400-0294	Cable Clamp 1/2	3	
25	1460-1005	Spring, Head Gate Rod	2	
26	1480-0205	Pin, Groove 1/8 x 3/4	2	
27	1490-0738	Reel, Magnetic Tape (Not Illustrated)	1	
28	1500-0038	Chain (Not Illustrated)	18"	
29	1500-0072	Belt 1/2 x 30	1	
30	2190-0004	Washer, #4 Int	A/R	
31	2190-0012	Washer, Ext #10	A/R	
32	2190-0071	Washer, Ext #4	A/R	
33	2190-0078	Washer, Split Lock #4	A/R	
34		(Deleted)		
35	2190-0416	Washer, Plain #4	A/R	
36		(Deleted)		
37	2190-0420	Washer, Plain #10	A/R	
38	2190-0430	Washer, Split Lock #10	A/R	
39	2190-0432	Washer, Split Lock 5/16	A/R	
40		(Deleted)		
41	2190-0450	Washer, Fiber #6	1	
42	2190-0451	Washer, #4 "D"	10	
43	2190-0453	Washer, #10 "D"	2	
44	2190-0885	Washer, Special Plastic .062	A/R	

Table 9-1. Tape Transport Parts List (Continued)  
(See Figures 9-1 and 9-2.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
45	2190-0886	Washer, Special Plastic .025	A/R	
46	2190-0887	Washer, Special Plastic .0125	A/R	
47	2200-0125	Screw, 4-40 x 1-1/2	A/R	
48	2200-0137	Screw, Machine 4-40 x 3/16	A/R	
49	2200-0139	Screw, Machine 4-40 x 1/4	A/R	
50	2200-0143	Screw, Machine 4-40 x 3/8	A/R	
51	2200-0147	Screw, Machine 4-40 x 1/2	A/R	
52	2200-0151	Screw, Machine 4-40 x 3/4	A/R	
53	2200-0155	Screw, Machine 4-40 x 1	A/R	
54	2260-0005	Nut 4-40	A/R	
55	2200-0121	Screw, 4-40 x 1-1/8	A/R	
56	2680-0099	Screw, 10-32 x 3/8	4	
57	2680-0105	Screw, 10-32 x 5/8	8	
58	2680-0107	Screw, 10-32 x 3/4	13	
59	2680-0108	Screw, 10-32 x 7/8	3	
60	2940-0056	Screw, Hex 5/16-18 x 7/8	8	
61		(Deleted)		
62		(Deleted)		
63	3030-0026	Screw, Socket 4-40 x 3/8	2	
64	3030-0039	Screw, Socket 10-32 x 5/8	4	
65	3030-0070	Screw, Socket 4-40 x 5/8	2	
66	3030-0197	Screw, Socket 4-40 x 1/4	1	
67	3030-0209	Screw, Socket 4-40 x 1/2	14	
68	3030-0215	Screw, Socket 10-32 x 7/8	4	
69	3101-0960	Switch, S1A, S1B, S1C	3	
70	4320-0204	Elbow, Vacuum Line	A/R	
71	4320-0206	Pad, Square Cover Plate	2	
72	4320-0207	Pad, Round Cover Plate	2	
73	5060-5444	Vacuum Switch Assembly, (See Table 9-19)	2	
74	5060-5446	Vacuum Switch Assembly, (See Table 9-19)	2	
75	5060-5448	Vacuum Switch Assembly, (See Table 9-19)	4	
76	02020-00010	Strip, Filler (Illustrated on Figure 9-12)	1	
77	02020-00020	Panel, Identification (Illustrated on Figure 9-12)	1	
78	02020-00050	Panel, Filler	1	
79	07951-00020	Insulator	1	
80	07975-00010	Cover, Switch Handle	1	
81	07975-00140	Cover, Vacuum Switch	A/R	
82	07975-00280	Insulator, Photosense Head	1	
83	07975-00290	Clip, Head Gate	1	
84	07975-00370	Bracket, Switch	2	
85	07975-20010	Plate, Mounting	1	
86	07975-20020	Standoff	A/R	
87	07975-20030	Manifold, Tape Transport	1	
88	07975-20040	Capstan Cover Plate	1	
89	07975-20050	Post, Index	1	

Table 9-1. Tape Transport Parts List (Continued)  
(See Figures 9-1 and 9-2.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
90	07975-20060	Cover, Head	1	
91	07975-20120	Handle, Switch	1	
92	07975-20280	Bracket, Switch	1	
93	07975-20290	Block, Back Mtg. Sw. Handle Rod	1	
94	07975-20300	Rod, Slider	1	
95	07975-20320	Plate, Tape Position	1	
96	07975-20321	Plate, Tape Position	1	
97	07975-20420	Block, Actuator Adjusting	2	
98	07975-20520	Catch Ball	2	
99	07975-20530	Hinge Pivot	2	
100	07975-20540	Hinge Block, Rack (Lower)	1	
101	07975-20541	Hinge Block, Rack (Upper)	1	
102	07975-20551	Hinge Block	1	
103	07975-20590	Rod, Head Gate Operating	1	
104	07975-20600	Retainer	2	
105	07075-60010	Vacuum Chamber Assembly (See Table 9-2)	1	
106	07975-60011	Vacuum Chamber Assembly (See Table 9-2)	1	
107	07975-60040	File Reel Motor Assembly (See Table 9-3)	1	
	07951-60030	File Reel Motor Assembly (See Table 9-21)	1	079
108	07975-60070	Takeup Reel Motor Assembly (See Table 9-4)	1	
109	07975-60090	Vacuum Unit Assembly (See Table 9-5)	1	
110	07975-60100	Cover Assembly, Vacuum Chamber	2	
111	07975-60110	Capstan Motor Assy, 1800 RPM/60 Hz (See Table 9-6)	1	016 thru 019
	07975-60111	Capstan Motor Assy, 1500 RPM/50 Hz (See Table 9-6)	1	002 and 016 thru 019
	07975-60112	Capstan Motor Assy, 900 RPM/60 Hz (See Table 9-6)	1	015
	07975-60113	Capstan Motor Assy, 750 RPM/50 Hz (See Table 9-6)	1	002 and 015
112	07975-60120	Actuator Assembly (See Table 9-7)	1	
113	07975-60121	Actuator Assembly (See Table 9-7)	1	
114	07975-60131	Transport Control Assembly (See Table 9-8)	1	
	07975-60132	Transport Control Assembly (See Table 9-8)	1	079
115	07975-60170	Cover Door Assembly (See Table 9-12)	1	
116	07975-60180	Photosense Amplifier Assembly (See Table 9-13)	1	
117	07975-60200	Photosense Head Assembly (See Table 9-15)	1	
118	07975-60210	Capstan Assembly, Single Speed	2	
	07975-60211	Capstan Assembly, Dual Speed	2	001
119	*	Capstan Servo Assembly (See Table 9-16)	1	001
120	07975-60270	Write Enable Assembly (See Table 9-18)	1	all except 037
121	07975-20330	Capstan Motor Pulley, 60 Hz	1	019
	07975-20331	Capstan Motor Pulley, 50 Hz	1	002 and 019
	07975-20332	Capstan Motor Pulley, 60 Hz	1	018
	07975-20333	Capstan Motor Pulley, 60 Hz	1	015, 016
	07975-20334	Capstan Motor Pulley, 50 Hz	1	002 and 018
	07975-20335	Capstan Motor Pulley, 60 Hz	1	017
	*	Capstan Motor Pulley, Dual Speed (See Table 9-16)	1	001
*Part Numbers listed on Table 9-16				



Table 9-2. Vacuum Chamber Assemblies Parts List  
(See Figure 9-3.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60010	Vacuum Chamber Assembly (File)	1	
	07975-60011	Vacuum Chamber Assembly (Takeup)	1	
1	0100-0252	Nipple, Threaded	4	
2	0460-0374	Tape, Double Coated Foam	A/R	
3	0460-0375	Tape, Glass-beaded 1/2" Wide	A/R	
4	0510-0021	Ring, Retaining	1	
5	0905-0333	Gasket, Side Plate	1	-60011
	0905-0334	Gasket, Side Plate	1	-60010
6	0410-0749	Bearing, Ball	2	
7	1530-1276	Clip, Outside Cover	1	
8	1530-1277	Clip, Inside Cover	1	
9	2190-0004	Washer, Internal Tooth Lock #4	A/R	
10	2190-0078	Washer, Helical Spring Lock #4	1	
11	2200-0139	Screw, 4-40 x 1/4	A/R	
	2200-01430	Screw, 4-40 x 3/8	1	-60010
12	3030-0007	Screw, Hex Socket Set, 4-40 x 1/8	A/R	
13	3030-0026	Screw Hex, Socket Head Cap 4-40 x 1/8	1	
14	02020-40010	End Plate, Vacuum Chamber	1	
15	07975-00020	Plate, Side, Vacuum Chamber	1	
16	07975-20070	Base, Vacuum Chamber	1	-60010
	07975-20071	Base, Vacuum Chamber	1	-60011
17	07975-20100	Roller, Guide	1	
18	07975-20080	Guide, Fixed	1	
19	07975-20110	Shaft, Guide	1	
20	07975-20090	Post, Buffer Pocket	1	
21	07975-00420	Plate, Stiffener	1	-60010

Table 9-3. File Reel Motor Assembly Parts List  
(See Figure 9-4.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60040	File Reel Motor Assembly	1	
1	0360-1182	Terminal Strip, Camblock	1	
2	0360-1192	Lug, Camblock "Wireguard"	4	
3	1460-0998	Spring, Brake	1	
4	2190-0071	Washer, Ext. Tooth #4	6	
5	2190-0078	Washer, Helical Spring Lock #4	4	
6	2190-0416	Washer, Plain #4	1	
7	2190-0425	Washer, Plain .5156 x .875 x 1/16	1	
8	2190-0430	Washer, Helical Spring Lock #10	1	
9	2200-0141	Screw, Slot 4-40 x 5/16	4	
10	2200-0149	Screw, Slot 4-40 x 5/8	2	
11	2950-0123	Nut, Self Locking, Cap Hex 1/2 Unf-35	1	
12	3030-0010	Screw, Set 10-32 x 3/8	2	
13	3030-0043	Screw, Hex 10-32 x 1-1/2	1	
14	3030-0209	Screw, Hex 4-40 x 1/2	4	
15	3140-0411	Motor	1	
16	07975-00040	Shim .010	A/R	
17	07975-00041	Shim .032	A/R	
18	07975-00042	Shim .062	A/R	
19	07975-00043	Shim .005	A/R	
20	07975-00044	Shim .002	A/R	
21	07975-20130	Plug Button, Reel Holddown Knob	1	
22	07975-20140	Key	1	
23	07975-20141	Key	1	
24	07975-20150	Brake Plate	1	
25	07975-20220	Pin, Brake	2	
26	07975-60050	Brake Rotor Assembly	1	
27	07975-60060	Tape Reel Holddown Knob Assembly	1	
28	0510-0957	● Ring, Retaining 5/8 D Shaft	1	
29	0590-0346	● Insert, 4-40	4	
30	1410-0750	● Ball 1/8 Dia.	12	
31	2190-0012	● Washer, Ext. Tooth Lock #10	1	
32	2190-0071	● Washer, Ext. Tooth Lock #4	2	
33	2190-0416	● Washer, Plain #4	2	
34	2190-0420	● Washer, Plain #10	1	
35	2680-0107	● Screw, 10-32 x 3/4	1	
36	3030-0026	● Screw, Hex Socket 4-40 x 3/8	2	
37	5040-4302	● Retainer, Ball	1	
38	5040-4303	● Collar, Stop	1	
39	07975-20180	● Ring, Expansion	1	
40	07975-20190	● Turntable	1	
41	07975-20200	● Plate, Ball Thrust Bearing	2	
42	07975-40010	● Knob, Operating	1	
43	07975-40030	Spacer, Brake Plate	1	
44	07975-80010	Brake Coil Housing Assembly	1	
45	3050-0235	Washer, Plain #4	2	

Table 9-4. Takeup Reel Motor Assembly Parts List  
(See Figure 9-5.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60070	Takeup Reel Motor Assembly	1	
1	0360-1182	Terminal Strip, Camblock	1	
2	0360-1192	Lug, Camblock "Wireguard"	4	
3	0510-0045	Ring, Retaining 3/16 Shaft	2	
4	2950-0123	Nut, Self Locking, Cap Hex 1/2-20 Unf-3B	1	
5	1460-0998	Spring, Brake	1	
6	1460-0999	Spring, Tension, Drag Brake	2	
7	2190-0071	Washer, Ext. #4	6	
8	2190-0078	Washer, Split Lock #4	4	
9	2190-0416	Washer, Plain #4	3	
10	2190-0423	Washer, Plain #10	1	
11	2190-0425	Washer, .5156 x .875 x 1/16	1	
12	2190-0430	Washer, Split Lock #10	1	
13	2200-0141	Screw, Slot 4-40 x 5/16	2	
14	2200-0149	Screw, Slot 4-40 x 5/8	4	
15	3030-0010	Screw, Set 10-32 x 3/8	2	
16	3030-0209	Screw, Hex Socket Head 4-40 x 1/2	4	
17	3030-0216	Screw, Hex Socket Head 10-32 x 1-3/4	1	
18	3140-0411	Motor	1	
19	07975-00040	Shim .010	A/R	
20	07975-00041	Shim .032	A/R	
21	07975-00042	Shim .062	A/R	
22	07975-00043	Shim .005	A/R	
23	07975-00044	Shim .002	A/R	
24	07975-00060	Bracket, Drag Brake	2	
25	07975-20130	Plug Button, Reel Holddown Knob	1	
26	07975-20140	Key	1	
27	07975-20141	Key	1	
28	07975-20150	Brake, Plate	1	
29	07975-20220	Pin, Brake	2	
30	07975-60051	Brake Rotor Assembly	1	
31	07975-60061	Tape Reel Holddown Knob Assembly	1	
32	07975-20190	● Turntable	1	
33	07975-20230	● Ring, Fixed	1	
34	07975-40010	● Knob, Operating	1	
35	07975-40030	Spacer, Brake Plate	1	
36	07975-60080	Drag Brake Plate Assembly	1	
37	07975-80010	Brake Coil Housing Assembly	1	
38	3050-0235	Washer, Plain #4	2	

Table 9-5. Vacuum Unit Assembly Parts List  
(See Figure 9-6.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60090	Vacuum Unit Assembly	1	
1	0100-0252	Nipple	3	
2	0360-1182	Terminal Strip	1	
3	0360-1192	Lug, Solderless	4	
4	0380-0181	Spacer 1/4 x 3/4	4	
5	0400-0089	Grommet, Rubber 3/16 x 5/16	2	
6	0491-0042	Solenoid	1	
7	0510-0054	Ring, Retaining	1	
8	0510-0091	Ring, Retaining	1	
9	0520-0127	Screw, 2-56 x 3/16	2	
10	0811-1844	Resistor Fxd, WW 50Ω 50W	4	
11	0890-0006	Tubing, Insulated	A/R	
12	1251-1456	Connector, 4 Pin Female	1	
13	1251-1478	Contact	4	
14	1460-0997	Spring	1	
15	1480-0211	Pin, Spirol 3/32 x 7/16	1	
16	1480-0216	Pin, Spirol 3/32 x 1-1/4	1	
17	2190-0008	Washer, Ext. #6	4	
18	2190-0484	Washer, Split Lock #8	2	
19	2190-0012	Washer, Ext. #10	4	
20	2190-0071	Washer, Ext. #4	17	
21	2190-0416	Washer, Plain #4	6	
22	2190-0419	Washer, Plain #8	2	
23	2190-0428	Washer, Split Lock #2	2	
24	2200-0151	Screw, 4-40 x 3/4	2	
25	2200-0139	Screw, 4-40 x 1/4	4	
26	2200-0141	Screw, 4-40 x 5/16	8	
27	2200-0143	Screw, 4-40 x 3/8	2	
28	2200-0147	Screw, 4-40 x 1/2	1	
29	2260-0005	Nut 4-40	9	
30	2360-0131	Screw, 6-32 x 1-1/8	4	
31	2420-0019	Nut, 6-32	4	
32	2510-0105	Screw, 8-32 x 7/16	2	
33	2680-0107	Screw, 10-32 x 3/4	4	
34	3162-0003	Motor, Vacuum	1	
35	07975-00090	Baffle	1	
36	07975-00100	Vane	1	
37	07975-00110	Pad, Rubber	2	
38	07975-00120	Band	1	
39	07975-20240	Housing	1	
40	07975-20250	Retainer	1	
41	07975-20260	Cover	1	
42	07975-20270	Shaft	1	

Table 9-6. Capstan Drive Assembly Parts List  
(See Figure 9-7.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS	
1	07975-60110	Capstan Drive Assembly, 11.1 to 45.0 ips, 60 Hz	1		
	07975-60111	Capstan Drive Assembly, 11.1 to 45.0 ips, 50 Hz	1		
	07975-60112	Capstan Drive Assembly, 7.5 to 11.0 ips, 60 Hz	1		
	07975-60113	Capstan Drive Assembly, 7.5 to 11.0 ips, 50 Hz	1		
	0160-2522	Capacitor, 3.75 $\mu$ f	1	-60111	
			1	-60113	
	0160-2523	Capacitor, 2.5 $\mu$ f	1	-60110	
			1	-60112	
	2	0360-1183	Terminal Strip	1	
	3	0890-0273	Tubing, Shrink	A/R	
	4	2190-0484	Washer, Split Lock #8	2	
	5	2190-0071	Washer, Ext. #4	2	
	6	2190-0483	Washer, Split Lock #10	4	
7	2190-0420	Washer, Flat #10	4		
8	2200-0149	Screw, 4-40 x 5/8	2		
9	2510-0109	Screw, 8-32 x 5/8	2		
10	2580-0005	Nut 8-32	2		
11	2680-0105	Screw, 10-32 x 5/8	4		
12	3140-0281	Motor (1800 RPM/60 Hz; 1500 RPM/50 Hz)	1	-60110	
			1	-60111	
	3140-0282	Motor (900 RPM/60 Hz; 750 RPM/50 Hz)	1	-60112	
		1	-60113		
13	07975-20340	Bracket, Capstan Motor	1		

Table 9-7. Actuator Assemblies Parts List  
(See Figure 9-8.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
1	07975-60120	Actuator (Reverse)	1	
	07975-60121	Actuator (Forward)	1	
	3030-0208	Screw, Cap 4-40 x 1/4	1	
	3030-0235	Screw, Cap 4-40 x 5/16	1	
	3030-0259	Screw, Set 10-32 x 3/8	1	
4	02020-60011	Pinchroller and Bearing Assembly	1	
5	07975-20380	Shaft	1	

Table 9-8. Transport Control Assembly Parts List  
(See Figures 9-9 and 9-10.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60131	Transport Control Assembly	1	
	07975-60132	Transport Control Assembly, Fast Forward	1	079
1	0160-2149	Clamp, Capacitor	1	
2	0160-2525	Capacitor, Fixed, 0.1 $\mu$ f 600 V	2	
3	0180-1963	Capacitor, Fixed, 1200 $\mu$ f 40 V	1	
4	0180-1964	Capacitor, Fixed, 4300 $\mu$ f 40 V	2	
5	0180-1969	Clamp, Capacitor	2	
6	2190-0772	Washer, Fiber	4	-60132
7	0400-0018	Grommet	A/R	
8	0400-0070	Bushing, Plastic 11/16	1	
9	0400-0085	Bushing, Plastic 1/4	1	
10	0400-0096	Bushing, Plastic 5/8	1	
11	0490-0128	Relay, 24 V 3 PDT, K2	1	
12	0490-0347	Relay, 24 V 4 PDT, K1, K3 thru K10	9	
13	0590-0370	Nut, Knurled 15/32-32	1	
14	0811-1940	Resistor, 10 ohm 50 W	1	
15		(Deleted)		
16		(Deleted)		
17	6960-0010	Plug, Button	1	
18	0900-0016	Washer, "O" Ring	3	
19	1251-1397	Jack, Test, Red	6	
20	1251-1398	Jack, Test, Black	1	
21	1251-1424	Connector, P1	1	
22	1251-1462	Connector, Female Recept., J2	1	
23	1400-0084	Fuseholder	3	
24	1400-0194	Clamp, Cable 7/16	1	
25	1885-0001	Suppressor	1	
26	2110-0010	Fuse, 5A (Not Illustrated)	1	
27	2110-0029	Fuse, 3A (Not Illustrated)	1	
28	2110-0030	Fuse, 5A (Not Illustrated)	1	
29	2190-0008	Washer, Ext. Lock #6	A/R	
30	2190-0010	Washer, Ext. Lock #8	6	
31	2190-0012	Washer, Ext. Lock #10	7	
32	2190-0037	Washer, Int. Lock 1/2	3	
33	2190-0071	Washer, Ext. Lock #4	A/R	
34	2190-0419	Washer, Plain #8	8	
35	2190-0420	Washer, Plain #10	4	
36	2190-0444	Washer, Int. Lock 15/32	1	
37	2190-0447	Washer, Special	2	
38	2190-0452	Washer, "D" #6	1	
39	2230-0011	Screw 4-40 x 5/8	4	-60132
40	2260-0005	Nut, Hex 4-40	4	-60132
41	2360-0193	Screw 6-32 x 1/4	2	-60132
42	2360-0195	Screw 6-32 x 5/16	26	
43	2360-0203	Screw 6-32 x 5/8	1	
44	2360-0207	Screw 6-32 x 7/8	7	

Table 9-8. Transport Control Assembly Parts List (Continued)  
(See Figures 9-9 and 9-10.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
45	2420-0019	Nut, Hex 6-32	A/R	
46	2510-0101	Screw 8-32 x 5/16	6	
47	2510-0103	Screw 8-32 x 3/8	2	
48	2510-0109	Screw 8-32 x 5/8	2	
49	2580-0005	Nut, Hex 8-32	A/R	
50	2680-0099	Screw 10-32 x 3/8	6	
51	2740-0007	Nut, Hex 10-32	7	
52	2950-0035	Nut 15/32-32	1	
53	2950-0038	Nut 1/2-32	3	
54	3030-0026	Screw, Hex Socket Head 4-40 x 3/8	4	
55	3101-0946	Toggle Switch	1	
56	3130-0082	Retainer	1	
57	9100-2511	Transformer	1	
58	07975-00171	Bottom Cover	1	
59	07975-00181	Top Cover	1	
60	07975-00191	Plate, Chassis	1	
61	07975-00201	Frame, Chassis	1	
62	07975-00210	Bracket, Circuit Board Mounting	4	
63	07975-00400	Bracket, Circuit Board Mounting	2	-60132
64	07975-20430	Rod, Threaded	1	
65	07975-60140	Actuator & Rewind Circuit Board (See Table 9-9)	1	
66	07075-60150	Reel Servo Circuit Board (See Table 9-10)	1	
67	07975-60161	Transport Control Circuit Board (See Table 9-11)	1	-60131
	07975-60162	Transport Control Circuit Board (See Table 9-11)	1	-60132
68	07975-60290	Fast Forward Circuit Board (See Table 9-20)	1	-60132
69	2190-0418	Washer, Plain #6	A/R	

Table 9-9. Actuator and Rewind Circuit Board Assembly Parts List

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60140	Actuator and Rewind Circuit Board Assembly	1	
	02020-80020	Board: Blank PC	1	
C8	0180-2129	Capacitor: Fxd Elect 10 $\mu$ f 10% 50 VDCW	1	
C9	0180-2129	Capacitor: Fxd Elect 10 $\mu$ f 10% 50 VDCW	1	
C15	0160-0153	Capacitor: Fxd MY 1000 PF 10% 200 VDCW	1	
CR25	1901-0045	Diode: Silicon 100 PIV	1	
CR26	1901-0045	Diode: Silicon 100 PIV	1	
CR31	1901-0045	Diode: Silicon 100 PIV	1	
CR32	1901-0045	Diode: Silicon 100 PIV	1	
CR33	1901-0045	Diode: Silicon 100 PIV	1	
CR34	1901-0045	Diode: Silicon 100 PIV	1	
CR35	1902-1213	Diode Breakdown: 51V 5%	1	
CR36	1902-1213	Diode Breakdown: 51V 5%	1	
CR37	1901-0045	Diode: Silicon 100 PIV	1	
CR38	1901-0045	Diode: Silicon 100 PIV	1	
Q1	1850-0404	Transistor: Germanium PNP	1	
Q2	1850-0404	Transistor: Germanium PNP	1	
Q3	1850-0404	Transistor: Germanium PNP	1	
Q4	1850-0404	Transistor: Germanium PNP	1	
Q5	1850-0404	Transistor: Germanium PNP	1	
Q6	1850-0017	Transistor: 2N525	1	
	1205-0011	● Heat Sink	1	
Q7	1850-0403	Transistor: 2N1558	1	
	1205-0071	● Heat Sink	1	
	2190-0008	● Washer: Split Lock #6	2	
	2190-0418	● Washer: Flat #6	2	
	2360-0199	● Screw: 6-32 x 7/16	2	
	2420-0019	● Nut: Hex 6-32	2	
Q8	1850-0404	Transistor: Germanium PNP	1	
Q9	1850-0404	Transistor: Germanium PNP	1	
Q10	1850-0017	Transistor: 2N525	1	
	1205-0011	● Heat Sink	1	
Q11	1850-0403	Transistor: 2N1558	1	
	1205-0071	● Heat Sink	1	
	2190-0008	● Washer: Split Lock #6	1	
	2190-0418	● Washer: Flat #6	1	
	2360-0199	● Screw: 6-32 x 7/16	1	
	2420-0019	● Nut: 6-32 x 0.312	1	



Table 9-9. Actuator and Rewind Circuit Board Assembly Parts List (Continued)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
R14	0689-8215	Resistor: Fxd Comp 820 ohm 5% 1W	1	
R15	0686-3325	Resistor: Fxd Comp 3300 ohm 5% 1/2W	1	
R16	0686-3325	Resistor: Fxd Comp 3300 ohm 5% 1/2W	1	
R18	0686-1835	Resistor: Fxd Comp 18K ohm 5% 1/2W	1	
R19	0686-1025	Resistor: Fxd Comp 1000 ohm 5% 1/2W	1	
R20	0686-5625	Resistor: Fxd Comp 5600 ohm 5% 1/2W	1	
R21	0686-1025	Resistor: Fxd Comp 1000 ohm 5% 1/2W	1	
R22	0686-3325	Resistor: Fxd Comp 3300 ohm 5% 1/2W	1	
R23	0686-1835	Resistor: Fxd Comp 18K ohm 5% 1/2W	1	
R24	0686-1535	Resistor: Fxd Comp 15K ohm 5% 1/2W	1	
R25	0686-3325	Resistor: Fxd Comp 3300 ohm 5% 1/2W	1	
R26	0686-3315	Resistor: Fxd Comp 330 ohm 5% 1/2W	1	
R27	0686-5625	Resistor: Fxd Comp 5600 ohm 5% 1/2W	1	
R28	0686-1025	Resistor: Fxd Comp 1000 ohm 5% 1/2W	1	
R29	0811-1555	Resistor: Fxd WW 470 ohm 5% 3W	1	
R30	0686-8215	Resistor: Fxd Comp 820 ohm 5% 1/2W	1	
R31	0686-1025	Resistor: Fxd Comp 1000 ohm 5% 1/2W	1	
R32	0686-3325	Resistor: Fxd Comp 3300 ohm 5% 1/2W	1	
R33	0686-1835	Resistor: Fxd Comp 18K ohm 5% 1/2W	1	
R34	0686-1535	Resistor: Fxd Comp 15K ohm 5% 1/2W	1	
R35	0686-3325	Resistor: Fxd Comp 3300 ohm 5% 1/2W	1	
R36	0686-3315	Resistor: Fxd Comp 330 ohm 5% 1/2W	1	
R37	0686-5625	Resistor: Fxd Comp 5600 ohm 5% 1/2W	1	
R38	0686-1025	Resistor: Fxd Comp 1000 ohm 5% 1/2W	1	
R39	0811-1555	Resistor: Fxd WW 470 ohm 5% 3W	1	
R40	0686-8215	Resistor: Fxd Comp 820 ohm 5% 1/2W	1	
R44	0686-3335	Resistor: Fxd Comp 33K ohm 5% 1/2W	1	
R45	0686-3335	Resistor: Fxd Comp 33K ohm 5% 1/2W	1	
R46	2100-0778	Resistor: Var WW 10K ohm 10% 1/2W	1	
R47	2100-0778	Resistor: Var WW 10K ohm 10% 1/2W	1	
R53	0686-1835	Resistor: Fxd Comp 18K ohm 5% 1/2W	1	
R54	0686-1835	Resistor: Fxd Comp 18K ohm 5% 1/2W	1	
	0360-1165	Lug: Turret	15	
		NOTE: This assembly is used with other assemblies of the transport control unit. Reference number sequence will continue on those assemblies.		

Table 9-10. Reel Servo Circuit Board Assembly Parts List

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60150	Reel Servo Circuit Board Assembly	1	
	02020-80130	Board: Blank PC	1	
CR11	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR12	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR13	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR14	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR15	1901-0498	Diode: Silicon 300 PIV 12A	1	
CR16	1901-0498	Diode: Silicon 300 PIV 12A	1	
CR17	1901-0498	Diode: Silicon 300 PIV 12A	1	
CR18	1901-0498	Diode: Silicon 300 PIV 12A	1	
CR40	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR41	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR42	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR43	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR44	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR45	1901-0411	Diode: Silicon 300 PIV 3A	1	
CR46	1901-0495	Diode: Silicon 50 PIV 12A	1	
CR47	1901-0495	Diode: Silicon 50 PIV 12A	1	
R4	0686-4715	Resistor: Fxd Comp 470 ohm 5% 1/2W	1	
R5	0686-4705	Resistor: Fxd Comp 47 ohm 5% 1/2W	1	
R6	0686-4715	Resistor: Fxd Comp 470 ohm 5% 1/2W	1	
R7	0686-4705	Resistor: Fxd Comp 47 ohm 5% 1/2W	1	
R8	0686-4715	Resistor: Fxd Comp 470 ohm 5% 1/2W	1	
R9	0686-4705	Resistor: Fxd Comp 47 ohm 5% 1/2W	1	
R10	0686-4715	Resistor: Fxd Comp 470 ohm 5% 1/2W	1	
R11	0686-4705	Resistor: Fxd Comp 47 ohm 5% 1/2W	1	
R48	0689-4735	Resistor: Fxd Comp 47K ohm 5% 1W	1	
SCR1	1884-0024	Thyristor: 7.4A 200 PIV	1	
SCR2	1884-0024	Thyristor: 7.4A 200 PIV	1	
SCR3	1884-0024	Thyristor: 7.4A 200 PIV	1	
SCR4	1884-0024	Thyristor: 7.4A 200 PIV	1	
	0360-1165	Lug, Turret	29	
		NOTE: This assembly is used with other assemblies of the transport control unit. Reference number sequence will continue on those assemblies.		

Table 9-11. Transport Control Circuit Board Assembly Parts List

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60161	Transport Control Circuit Board Assembly	1	
	07975-60162	Transport Control Circuit Board Assembly, Fast Forward	1	079
	07975-80020	Board: Blank PC	1	
C6	0180-1913	Capacitor: Fxd 100 $\mu$ f 50V	1	
C7	0180-1913	Capacitor: Fxd 100 $\mu$ f 50V	1	
C10	0180-0049	Capacitor: Fxd 20 $\mu$ f 150V	1	
C12	0180-1913	Capacitor: Fxd 100 $\mu$ f 50V	1	
CR1	1901-0191	Diode	1	
CR2	1901-0191	Diode	1	
CR3	1901-0496	Diode	1	
	2190-0011	● Washer, Int Tooth Lock #10	1	
	2740-0007	● Nut, Hex 10-32	1	
CR4	1901-0496	Diode	1	
	2190-0011	● Washer, Int Tooth Lock #10	1	
	2740-0007	● Nut, Hex 10-32	1	
CR5	1901-0191	Diode	1	
CR6	1902-1203	Diode, Zener	1	
	2190-0011	● Washer, Int Tooth Lock #10	1	
	2740-0007	● Nut, Hex 10-32	1	
CR7	1901-0191	Diode	1	
CR21	1901-0191	Diode	1	
CR22	1901-0191	Diode	1	
CR23	1901-0191	Diode	1	
CR48	1901-0191	Diode	1	
CR49	1901-0191	Diode	1	
F4	2110-0015	Fuse, 2.5A, SB	1	
	0361-0010	● Rivet	2	
	2110-0257	● Fuse Clip, 0.250	2	
	2190-0007	● Washer, Internal Tooth Lock #4	2	
K1	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K3	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K4	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K5	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K6	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K7	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K8	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K9	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
K10	0490-0347	Relay, 24V, 4 PDT (Ref: Table 9-8, Item 11)	1	
	0490-0468	● Socket, Relay	9	
R1	0689-1505	Resistor: Fxd Comp 15 ohm 1W 5%	1	
R2	0812-0097	Resistor: Fxd WW 75 ohm 5W	1	
R3	0812-0066	Resistor: Fxd WW 0.33 ohm 2W	1	
R41	0812-0019	Resistor: Fxd WW 0.33 ohm 3W	1	
R49	0686-2215	Resistor: Fxd Comp 220 ohm 1/2W 5%	1	
R51	0686-2205	Resistor: Fxd Comp 22 ohm 1/2W 5%	1	
R52	0686-2215	Resistor: Fxd Comp 220 ohm 1/2W 5%	1	

Table 9-11. Transport Control Circuit Board Assembly Parts List (Continued)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	0360-1047	Turret Lug	69	
	0360-1165	Turret Lug	6	
	0380-0772	Spacer	7	
		NOTE: This assembly is used with other assemblies of the transport control unit. Reference number sequence will continue on those assemblies.		

Table 9-12. Cover Door Assembly Parts List  
(See Figure 9-11.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60170	Cover Door Assembly	1	
1	0460-0374	Tape, 3M 4032	A/R	
2	0460-0873	Tape, Vinyl 1/16" Thk x 1" (Not Illustrated)	1-1/2"	
3	0510-0083	Ring, Retaining 1/4	1	
4	0520-0129	Screw, 4-40 x 5/8	1	
5	0590-0364	Nut, Self Locking, 10-32	1	
6	1390-0074	Fastener, Catch	2	
7	2190-0004	Washer, Int. #4	11	
8	2190-0416	Washer, Flat #4	1	
9	2190-0421	Washer, Flat 17/16	1	
10	2190-0885	Washer, .062	2	
11	2190-0886	Washer, .025	2	
12	2200-0170	Screw, FH 4-40 x 5/8	6	
13	2200-0167	Screw, FH 4-40 x 3/8	10	
14	2200-0139	Screw, 4-40 x 1/4	6	
15	2260-0005	Nut 4-40	4	
16	3030-0329	Screw, Set 4-40 x 1/8	2	
17	4320-0038	Extrusion, Rubber	A/R	
18	4320-0046	Extrusion, Rubber	A/R	
19	07975-00220	Pane, Cover Door	1	
20	07975-00230	Bracket, Door Stop	1	
21	07975-20440	Frame, Cover Door	1	
22	07975-20451	Panel, Cover Door	1	
23	07975-20460	Block, Cover Door	2	
24	07975-20470	Handle, Cover Door	1	
25	07975-20480	Shaft, Pivot	1	
26	07975-20490	Standoff, Door Stop	1	
27	07975-20500	Hinge, Pivot, Door	2	
28	07975-20510	Rod, Door Stop	1	

Table 9-13. Photosense Amplifier Assembly Parts List  
(See Figure 9-12.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60180	Photosense Amplifier Assembly	1	
1	0380-0380	Spacer, Threaded 4-40 1/4 x 3/4	4	
2	2190-0071	Washer, Ext. #4	12	
3	2190-0416	Washer, Flat #4	4	
4	2200-0139	Screw, 4-40 x 1/4	4	
5	2200-0147	Screw, 4-40 x 1/2	8	
6	2260-0005	Nut, 4-40	4	
7	07975-00240	Chassis	1	
8	07975-00250	Cover, Photosense	1	
9	07975-60190	Etched Board Assembly (See Table 9-14)	1	

Table 9-14. Photosense Circuit Board Assembly Parts List

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60190	Photosense Circuit Board Assembly	1	
	02020-80120	Board; Blank PC	1	
C1	0160-0168	Capacitor: Fxd MY 0.1 $\mu$ f 200 VDCW	1	
CR1	1901-0040	Diode: Silicon 30 MA 30 WV	1	
CR2	1901-0040	Diode: Silicon 30 MA 30 WV	1	
Q1	1854-0258	Transistor: Silicon NPN, MM2001-2	1	
Q2	1851-0017	Transistor: 2N1304	1	
Q3	1851-0017	Transistor: 2N1304	1	
Q4	1851-0017	Transistor: 2N1304	1	
Q5	1850-0404	Transistor: 2N1305	1	
Q6	1854-0258	Transistor: Silicon NPN, MM2001-2	1	
Q7	1851-0017	Transistor: 2N1304	1	
Q8	1851-0017	Transistor: 2N1304	1	
Q9	1851-0017	Transistor: 2N1304	1	
Q10	1850-0404	Transistor: 2N1305	1	
R1	2100-0723	Resistor: Var WW 100K ohm 1/4W	1	
R2	0686-2225	Resistor: Fxd Comp 2200 ohm 5% 1/2W	1	
R3		(Deleted)		
R4	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R5	0686-4725	Resistor: Fxd Comp 4700 ohm 5% 1/2W	1	
R6	0686-4725	Resistor: Fxd Comp 4700 ohm 5% 1/2W	1	
R7	0686-1525	Resistor: Fxd Comp 1500 ohm 5% 1/2W	1	
R8	0686-4725	Resistor: Fxd Comp 4700 ohm 5% 1/2W	1	
R9	0686-3315	Resistor: Fxd Comp 330 ohm 5% 1/2W	1	
R10	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R11	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	

Table 9-14. Photosense Circuit Board Assembly Parts List (Continued)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
R12	0686-2215	Resistor: Fxd Comp 220 ohm 5% 1/2W	1	
R13	0686-8205	Resistor: Fxd Comp 82 ohm 5% 1/2W	1	
R14	0686-1025	Resistor: Fxd Comp 1K ohm 5% 1/2W	1	
R15	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R16	0813-0050	Resistor: Fxd WW 100 ohm 3W	1	
R17	0689-0915	Resistor: Fxd Comp 9.1 ohm 5% 1W	1	
R18	2100-0723	Resistor: Var WW 100K ohm 1/4W	1	
R19	0686-2225	Resistor: Fxd Comp 2200 ohm 5% 1/2W	1	
R20		(Deleted)		
R21	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R22	0686-4725	Resistor: Fxd Comp 4700 ohm 5% 1/2W	1	
R23	0686-4725	Resistor: Fxd Comp 4700 ohm 5% 1/2W	1	
R24	0686-1525	Resistor: Fxd Comp 1500 ohm 5% 1/2W	1	
R25	0686-4725	Resistor: Fxd Comp 4700 ohm 5% 1/2W	1	
R26	0686-3315	Resistor: Fxd Comp 330 ohm 5% 1/2W	1	
R27	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R28	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R29	0686-2215	Resistor: Fxd Comp 220 ohm 5% 1/2W	1	
R30	0686-8205	Resistor: Fxd Comp 82 ohm 5% 1/2W	1	
R31	0686-1025	Resistor: Fxd Comp 1K ohm 5% 1/2W	1	
R32	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R33	0813-0050	Resistor: Fxd WW 100 ohm 3W	1	
TB1	0360-0097	Terminal Strip	1	
TB2	0360-0097	Terminal Strip	1	
TP1	1251-1395	Connector: Tip Jack White	1	
TP2	1251-1395	Connector: Tip Jack White	1	

Table 9-15. Photosense Head Assembly Parts List  
(See Figure 9-13.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60200	Photosense Head Assembly	1	
1	0360-1164	Lug, Solder #2	2	
2	0362-0103	Lug, Solder 1/4" Slotted Tongue	5	
3	0520-0128	Screw, 2-56 x 1/4	4	
4	0520-0131	Screw, 2-56 x 7/16	1	
5	0610-0013	Nut, 2-56	1	
6	1990-0029	Photo Diode	2	
7	2140-0203	Lamp	1	
8	2190-0417	Washer, Flat #2	2	
9	2190-0428	Washer, Split Lock #2	5	
10	8120-0836	Cable, 5 Cond.	15"	
11	07975-00260	Contact, Lamp	1	
12	07975-00270	Mask, Photosense Head	1	
13	07975-20560	Base, Head	1	
14	07975-20570	Board, Terminal	1	
15	07975-20580	Block, Contact Mounting	1	

Table 9-16. Capstan Servo Assembly Parts List  
(See Figure 9-14.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60230	Capstan Servo Assembly, High Speed 30.1 - 45.0 ips, Low Speed 30.1 - 45.0 ips	1	
	07975-60231	Capstan Servo Assembly, High Speed 30.1 - 45.0 ips, Low Speed 15.0 - 30.0 ips	1	
	07975-60232	Capstan Servo Assembly, High Speed 30.1 - 45.0 ips, Low Speed 2.0 - 14.9 ips	1	
	07975-60280	Capstan Servo Assembly, High Speed 15.0 - 30.0 ips, Low Speed 15.0 - 30.0 ips	1	
	07975-60281	Capstan Servo Assembly, High Speed 15.0 - 30.0 ips, Low Speed 7.5 - 14.9 ips	1	
	07975-60282	Capstan Servo Assembly, High Speed 15.0 - 30.0 ips, Low Speed 1.0 - 7.49 ips	1	
	07975-60283	Capstan Servo Assembly, High Speed 7.5 - 14.9 ips, Low Speed 7.5 - 14.9 ips	1	
	07975-60284	Capstan Servo Assembly, High Speed 7.5 - 14.9 ips, Low Speed 1.0 - 7.49 ips	1	
	07975-60285	Capstan Servo Assembly, High Speed 1.0 - 7.49 ips, Low Speed 1.0 - 7.49 ips	1	
1	0380-0360	Spacer 1/2	4	
2	0380-0381	Spacer Threaded 4-40 x 3/8	2	
3	0490-0163	Relay, Current Sensitive, K2	1	
4	0490-0347	Relay, K1	1	
5	0520-0128	Screw, 2-56 x 1/4	3	
6	1400-0068	Fastener, Clip	2	
7	1400-0076	Clip	3	
8	1400-0293	Cable Clamp	1	
9	1500-0071	Brake 90V	1	
10	1500-0073	Belt, 1/2 x 8	1	
11	2190-0008	Washer, Ext #6	A/R	
12	2190-0012	Washer, Ext #10	A/R	
13	2190-0071	Washer, Ext #4	1	
14	2190-0078	Washer, Splitlock #4	A/R	
15	2190-0416	Washer, Flat #4	A/R	
16	2190-0420	Washer, Flat #10	A/R	
17	2190-0427	Washer, Splitlock #2	3	
18	2190-0453	Washer, "D" #10	1	
19	2200-0137	Screw, 4-40 x 3/16	3	
20	2200-0139	Screw, 4-40 x 1/4	4	
21	2260-0005	Nut, Hex 4-40	1	
22	2360-0137	Screw, 6-32 x 1-3/4	A/R	
23	2360-0193	Screw, 6-32 x 1/4	2	
24	2420-0019	Nut, Hex 6-32	2	
25	2680-0099	Screw, 10-32 x 3/8	A/R	
26	2680-0105	Screw, 10-32 x 5/8	A/R	
27	2740-0007	Nut, Hex 10-32	A/R	
28	3030-0329	Screw, Set 4-40 x 1/8	1	



Table 9-16. Capstan Servo Assembly Parts List (Continued)  
(See Figure 9-14.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
29	3030-0010	Screw, Set 10-32 x 3/8	A/R	
30	3030-0026	Screw, Cap 4-40 x 3/8	A/R	
31	3030-0281	Screw, Set 10-32 x 1/8	A/R	
32	3140-0283	Motor, Universal	1	
33	3140-0288	Tachometer	1	
34	07975-00340	Bracket, Tachometer Mounting	1	
35	07975-00350	Cover, Servo	1	
36	07975-00360	Plate, Adapter	1	
37	07975-20340	Bracket, Capstan Motor	1	
38	07975-20680	Pulley, Capstan Drive	1	-60230, -60231, -60232
	07975-20681	Pulley, Capstan Drive	1	-60280, -60281, -60282, -60283, -60284, -60285
39	07975-20690	Pulley, Tachometer	1	
40	07975-20700	Flywheel, Capstan Motor	1	
41	07975-60220	Circuit Board Assembly, (See Table 9-17)	1	-60230, -60280
	07975-60221	Circuit Board Assembly, (See Table 9-17)	1	-60231, -60281
	07975-60222	Circuit Board Assembly, (See Table 9-17)	1	-60232, -60282
	07975-60223	Circuit Board Assembly, (See Table 9-17)	1	-60283
	07975-60224	Circuit Board Assembly, (See Table 9-17)	1	-60284
	07975-60225	Circuit Board Assembly, (See Table 9-17)	1	-60285
42	07975-00410	Shim, Bracket Mounting	1	

Table 9-17. Capstan Servo Circuit Board Assembly Parts List

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60220	Capstan Servo Circuit Board Assembly	1	
	07975-60221	Capstan Servo Circuit Board Assembly	1	
	07975-60222	Capstan Servo Circuit Board Assembly	1	
	07975-60223	Capstan Servo Circuit Board Assembly	1	
	07975-60224	Capstan Servo Circuit Board Assembly	1	
	07975-60225	Capstan Servo Circuit Board Assembly	1	
C1	0180-0141	Capacitor: Fxd 50 $\mu$ f 150 VDCW	1	
C2	0160-2559	Capacitor: Fxd MY 0.82 $\mu$ f 200 VDCW	1	
C3	0160-2558	Capacitor: Fxd MY 0.33 $\mu$ f 200 VDCW	1	
C4	0160-2557	Capacitor: Fxd MY 0.033 $\mu$ f 200 VDCW	1	
CR1	1901-0419	Diode	1	
CR2	1901-0419	Diode	1	
CR3	1901-0419	Diode	1	
CR4	1901-0419	Diode	1	
CR5	1902-0392	Diode: Breakdown, 1N3798A	1	
CR6	1901-0191	Diode: 1N4002	1	
CR7	1901-0158	Diode: 1N4003	1	
CR8	1902-3082	Diode: 1N762	1	
CR9	1901-0040	Diode	1	
CR10	1901-0191	Diode: 1N4002	1	
CR11	1901-0191	Diode: 1N4002	1	
CR12	1901-0040	Diode	1	
CR13	1901-0191	Diode: 1N4002	1	
CR14	1901-0191	Diode: 1N4002	1	
CR15	1901-0191	Diode: 1N4002	1	
K1		(See Table 9-16, Item 4)	1	
K2		(See Table 9-16, Item 3)	1	
	0490-0468	● Socket: Relay	2	
Q1	1854-0071	Transistor	1	
Q2	1850-0404	Transistor: 2N1305	1	
Q3	1855-0001	Transistor: 2N1671A	1	
Q4	1850-0404	Transistor: 2N1305	1	
Q5	1851-0017	Transistor: 2N1304	1	
R1	0811-1710	Resistor: Fxd WW 2.5K ohm 10W	1	
	1400-0076	● Fuse Clip	1	
	2200-0137	● Screw: 4-40 x 1/4	1	
	2260-0005	● Nut: Hex 4-40	1	
R2	0686-3915	Resistor: Fxd Comp 390 ohm 5% 1/2W	1	
R3	0811-1732	Resistor: Fxd WW 1 ohm 3W	1	
R4	0686-8205	Resistor: Fxd Comp 82 ohm 5% 1/2W	1	
R5	0686-1025	Resistor: Fxd Comp 1K ohm 5% 1/2W	1	
R6	0686-6825	Resistor: Fxd Comp 6800 ohm 5% 1/2W	1	
R7	0686-7515	Resistor: Fxd Comp 750 ohm 5% 1/2W	1	
R8	0686-1825	Resistor: Fxd Comp 1800 ohm 5% 1/2W	1	
R9	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R10	0686-5625	Resistor: Fxd Comp 5600 ohm 5% 1/2W	1	

Table 9-17. Capstan Servo Circuit Board Assembly Parts List (Continued)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
R11		(Deleted)		
R12	0686-1025	Resistor: Fxd Comp 1K ohm 5% 1/2W	1	
R13	0686-1035	Resistor: Fxd Comp 10K ohm 5% 1/2W	1	
R14		(Deleted)		
R15		(Deleted)		
R16	0686-1035	Resistor: Fxd Comp 1K ohm 5% 1/2W	1	
R17	0686-1035	Resistor: Fxd Comp 1K ohm 5% 1/2W	1	
R18	0686-1845	Resistor: Fxd Comp 180K ohm 5% 1/2W	1	
R19		(See Component Table on Schematic Diagram)		
R20		(Deleted)		
R21		(Deleted)		
R22	2100-0887	Resistor: Var WW 20K ohm	1	-60225
	2100-1516	Resistor: Var WW 50K ohm	1	-60223, -60224
	2100-1971	Resistor: Var WW 100K ohm	1	-60220, -60221, -60222
R23	2100-0887	Resistor: Var WW 20K ohm	1	-60222, -60224, -60225
	2100-1516	Resistor: Var WW 50K ohm	1	-60221, -60223
	2100-1971	Resistor: Var WW 100K ohm	1	-60220
SCR1	1884-0071	Thyristor	1	
TS1	0360-0126	Terminal Strip: 6 Contacts	1	
	0360-1165	Turret Lug	4	
	5080-4511	Board: Blank PC	1	

Table 9-18. Write Enable Assembly Parts List  
(See Figure 9-15.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60270	Write Enable Assembly	1	
1	0360-1181	Terminal Strip, 3 Contacts	1	
2	0362-0102	Lug, Solderless, Spade	1	
3	0362-0103	Lug, Solderless, Spade	2	
4	0491-0043	Solenoid	1	
5	0520-0139	Screw, 2-56 x 7/8	2	
6	0610-0013	Nut, Hex 2-56	2	
7	1480-0215	Pin, Spirol, 3/32 x 1	1	
8	2190-0006	Washer, Spring Lock #6	2	
9	2190-0003	Washer, Spring Lock #4	8	
10	2190-0416	Washer, #4 Flat	2	
11	2190-0417	Washer, #2 Flat	2	
12	2190-0418	Washer, #6 Flat	2	
13	2190-0428	Washer, #2 Split	2	
14	2200-0139	Screw, 4-40 x 1/4	2	
15	2200-0147	Screw, 4-40 x 1/2	2	
16	2260-0005	Nut, Hex 4-40	2	
17	2360-0193	Screw, 6-32 x 1/4	2	
18	3030-0208	Screw, Socket, 4-40 x 1/4	4	
19	3191-0136	Switch, Snap, SPDT	1	
20	07975-00300	Plate	1	
21	07975-00310	Actuator	1	
22	07975-00320	Retainer	2	
23	07975-00330	Spring	1	
24	07975-20610	Block	1	
25	07975-20620	Base	1	

Table 9-19. Vacuum Switch Assemblies Parts List  
(See Figure 9-16.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	5060-4444	Vacuum Switch Assembly, VS7, VS8	2	
	5060-4446	Vacuum Switch Assembly, VS1, VS3	2	
	5060-4448	Vacuum Switch Assembly, VS2, VS4, VS5, VS6	4	
1	0100-0252	Nipple	1	-4444
			2	-4446
			1	-4448
2	2360-0207	Screw 6-32 x 7/8	4	
3	2190-0008	Washer Ext. #6	4	
4	2190-0416	Washer, Flat #4	2	
5	2190-0418	Washer, Plain #6	4	
6	2190-0419	Washer, Flat #8	1	-4446
7	2190-0484	Washer, Split Lock #8	1	-4446
8	2260-0005	Nut 4-40	2	
9	2420-0019	Nut 6-32	4	
10	2510-0099	Screw 8-32 x 1/4	1	-4446
11	2940-0052	Screw 1/4-28 x 1/4	1	-4444
	2940-0052	Screw 1/4-28 x 1/4	1	-4444
			1	-4448
12	3101-1189	Contact, Movable	1	
13	5000-5317	Contact, Fixed - Normally Open	1	-4444
			1	-4448
14	3101-1191	Contact, Fixed - Normally Closed	1	-4446
15	3030-0288	Screw, Set 4-40 x 1/2	1	
16	3030-0070	Screw Cap 4-40 x 5/8	2	
17	5000-5304	Spacer	1	
18	5000-5305	Bracket	1	-4446
			1	-4448
19	5000-5308	Retainer, Vacuum Switch Contact	2	
20	5040-4305	Body	1	
21	5060-5402	Diaphragm Assy.	1	
22	5060-5404	Bracket Assy.	1	-4444

Table 9-20. Fast Forward Circuit Board Assembly Parts List

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07975-60290	Fast Forward Circuit Board Assembly	1	079
	07975-80030	Board: Blank PC	1	
CR50	1901-0045	Diode: Silicon 100 PIV	1	
CR51	1901-0045	Diode: Silicon 100 PIV	1	
CR52	1901-0045	Diode: Silicon 100 PIV	1	
K11	0490-0347	Relay: 24 VDC, 5 PDT	1	
	0490-0468	● Socket: Relay	1	
Q12	1850-0404	Transistor: 2N1305	1	
R55	0686-1535	Resistor: Fxd Comp 15K ohm 5% 1/2W	1	
R56	0686-2225	Resistor: Fxd Comp 2.2K ohm 5% 1/2W	1	
	0360-1047	Lug, Turret	14	
<p>NOTE: This assembly is used with other assemblies of the transport control unit. Reference number sequence will continue on those assemblies.</p>				

Table 9-21. File Reel Motor Assembly Fast Forward Parts List  
(See Figure 9-17.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	07951-60030	File Reel Motor Assembly, Fast Forward	1	
1	0360-1182	Terminal Strip, Camblock	1	
2	0360-1192	Lug, Camblock "Wireguard"	4	
3	0510-0045	Ring, Retaining 3/16 Shaft	2	
4	1460-0998	Spring, Brake	1	
5	1460-0999	Spring, Tension Drag Brake	2	
6	2190-0071	Washer, Ext. #4	6	
7	2190-0078	Washer, Split Lock #4	4	
8	2190-0416	Washer, Plain #4	2	
9	2190-0425	Washer, .5156 x .875 x 1/16	1	
10	2190-0430	Washer, Split Lock #10	1	
11	2200-0141	Screw, 4-40 x 5/16	2	
12	2200-0149	Screw, 4-40 x 5/8	4	
13	2950-0123	Nut, Self Locking Cap Hex 1/2-20 Unf-3B	1	
14	3030-0010	Screw, Set 10-32 x 3/8	2	
15	3030-0216	Screw, Hex Socket Head 10-32 x 1-3/4	1	
16	3030-0209	Screw, Hex Socket Head 4-40 x 1/2	4	
17	3140-0411	Motor	1	
18	07975-00040	Shim, .010	A/R	
19	07975-00041	Shim, .032	A/R	
20	07975-00042	Shim, .062	A/R	
21	07975-00043	Shim, .005	A/R	
22	07975-00044	Shim, .002	A/R	
23	07975-00060	Bracket, Drag Brake	2	
24	07975-20130	Plug Button, Reel Holddown Knob	1	
25	07975-20140	Key	1	
26	07975-20141	Key	1	
27	07975-20150	Brake, Plate	1	
28	07975-20220	Pin, Brake	2	
29	07975-60051	Brake Rotor Assembly	1	
30	07975-60060	Tape Reel Holddown Knob Assembly	1	
31	0510-0957	● Ring, Retaining 5/8 D Shaft	1	
32	0590-0346	● Insert, 4-40	4	
33	1410-0750	● Ball, 1/8 Dia.	12	
34	2190-0012	● Washer, Ext. Tooth Lock #10	1	
35	2190-0071	● Washer, Ext. Tooth Lock #4	2	
36	2190-0416	● Washer, Plain #4	2	
37	2190-0420	● Washer, Plain #10	1	
38	2680-0107	● Screw 10-32 x 3/4	1	
39	3030-0026	● Screw, Hex Socket 4-40 x 3/8	2	
40	5040-4302	● Retainer, Ball	1	
41	5040-4303	● Collar, Stop	1	
42	07975-20180	● Ring, Expansion	1	
43	07975-20190	● Turntable	1	
44	07975-20200	● Plate, Ball Thrust Bearing	2	
45	07975-40010	● Knob, Operating	1	

Table 9-21. File Reel Motor Assembly Fast Forward Parts List (Continued)  
(See Figure 9-17.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
46	07975-40030	Spacer, Brake Plate	1	
47	07975-60080	Drag Brake Plate Assembly	1	
48	07975-80010	Brake Coil Housing Assembly	1	
49	3050-0235	Washer, Plain #4	2	

Table 9-22. Optional Head Connector Kit Parts List  
(See Figure 9-18.)

REF DESIG	HP PART NUMBER	DESCRIPTION	QTY	USED ON OPTIONS
	5060-5452	Head Connector Kit	1	
1	0610-0013	Nut, Hex 2-56	4	
2	1251-1470	Connector, 32 Contact (Read)	1	
3	1251-1471	Connector, 32 Contact (Write)	1	
4	1400-0194	Clamp, Cable 7/16	2	
5	2190-0071	Washer, Ext. Lock #4	4	
6	2190-0417	Washer, Plain #2	4	
7	2190-0427	Washer, Split Lock #2	4	
8	2190-0451	Washer, "D"	2	
9	2200-0141	Screw, 4-40 x 5/16	2	
10	2200-0143	Screw, 4-40 x 3/8	2	
11	2260-0005	Nut, Hex 4-40	2	
12	13320-00040	Bracket, Head Connector	1	
13	13320-00060	Cover, Head Connector	1	
14	2190-0416	Washer, Plain #4	2	



## SECTION X DIAGRAMS

### 10-1. INTRODUCTION

10-2. This section contains the detailed schematic and wiring diagrams (figures 10-1 thru 10-9). Also included is information on Fast Forward Circuits (option 079) and the DC Capstan Servo Circuits (option 001). For functional schematics and theory of operation refer to section IV.

### 10-3. COMPONENT LOCATIONS

10-4. Table 10-1 lists the physical location and the detailed schematic diagram figure number for

all components. Since the component reference designators are marked on the circuit boards no location drawings are provided.

### 10-5. SCHEMATIC DIAGRAM NOTES

10-6. Conventional symbols and designations are used in the schematic diagrams. Most of the symbols used are from USA Standard Y32.2-1967. The notes on some schematic diagrams clarify the meaning of certain symbols used.

Table 10-1. Tape Transport Component Location

COMPONENT	PHYSICAL LOCATION	FIGURE NO.
B1	Transport Chassis	10-1
B1	Capstan Servo Assembly	10-9
B2	Transport Chassis	10-1
B2	Capstan Servo Assembly	10-9
B3	Transport Chassis	10-1
B4	Transport Chassis	10-1
C1	Transport Control Unit	10-2, 10-3
C1	Photosense Circuit Board	10-7
C1	Capstan Servo Assembly	10-9
C2	Transport Control Unit	10-2, 10-3
C2	Capstan Servo Assembly	10-9
C3	Transport Control Unit	10-2, 10-3
C3	Capstan Servo Assembly	10-9
C4	Transport Control Unit	10-2, 10-3
C4	Capstan Servo Assembly	10-9
C5	Transport Control Unit	10-2, 10-3
C6	Transport Control Circuit Board	10-6
C7	Transport Control Circuit Board	10-6
C8	Actuator Drive Circuit Board	10-4
C9	Actuator Drive Circuit Board	10-4
C10	Transport Control Circuit Board	10-6
C11	Transport Chassis	10-1
C12	Transport Control Circuit Board	10-6
C13	Transport Chassis	10-1
C14	Transport Chassis	10-1
C15	Actuator Drive Circuit Board	10-4

Table 10-1. Tape Transport Component Location (Continued)

COMPONENT	PHYSICAL LOCATION	FIGURE NO.
CR1	Transport Control Circuit Board	10-6
CR1	Photosense Circuit Board	10-7
CR1	Capstan Servo Assembly	10-9
CR2	Transport Control Circuit Board	10-6
CR2	Photosense Circuit Board	10-7
CR2	Capstan Servo Assembly	10-9
CR3	Transport Control Circuit Board	10-6
CR3	Capstan Servo Assembly	10-9
CR4	Transport Control Circuit Board	10-6
CR4	Capstan Servo Assembly	10-9
CR5	Transport Control Circuit Board	10-6
CR5	Capstan Servo Assembly	10-9
CR6	Transport Control Circuit Board	10-6
CR6	Capstan Servo Assembly	10-9
CR7	Transport Control Circuit Board	10-6
CR7	Capstan Servo Assembly	10-9
CR8	Capstan Servo Assembly	10-9
CR9	Capstan Servo Assembly	10-9
CR10	Capstan Servo Assembly	10-9
CR11	Reel Servo Circuit Board	10-5
CR11	Capstan Servo Assembly	10-9
CR12	Reel Servo Circuit Board	10-5
CR12	Capstan Servo Assembly	10-9
CR13	Reel Servo Circuit Board	10-5
CR13	Capstan Servo Assembly	10-9
CR14	Reel Servo Circuit Board	10-5
CR14	Capstan Servo Assembly	10-9
CR15	Reel Servo Circuit Board	10-5
CR15	Capstan Servo Assembly	10-9
CR16	Reel Servo Circuit Board	10-5
CR17	Reel Servo Circuit Board	10-5
CR18	Reel Servo Circuit Board	10-5
CR19	Omitted	
CR20	Omitted	
CR21	Transport Control Circuit Board	10-6
CR22	Transport Control Circuit Board	10-6
CR23	Transport Control Circuit Board	10-6
CR24	Omitted	
CR25	Actuator Drive Circuit Board	10-4
CR26	Actuator Drive Circuit Board	10-4
CR27	Omitted	
CR28	Omitted	
CR29	Omitted	
CR30	Omitted	
CR31	Actuator Drive Circuit Board	10-4
CR32	Actuator Drive Circuit Board	10-4
CR33	Actuator Drive Circuit Board	10-4

Table 10-1. Tape Transport Component Location (Continued)

COMPONENT	PHYSICAL LOCATION	FIGURE NO.
CR34	Actuator Drive Circuit Board	10-4
CR35	Actuator Drive Circuit Board	10-4
CR36	Actuator Drive Circuit Board	10-4
CR37	Actuator Drive Circuit Board	10-4
CR38	Actuator Drive Circuit Board	10-4
CR39	Omitted	
CR40	Reel Servo Circuit Board	10-5
CR41	Reel Servo Circuit Board	10-5
CR42	Reel Servo Circuit Board	10-5
CR43	Reel Servo Circuit Board	10-5
CR44	Reel Servo Circuit Board	10-5
CR45	Reel Servo Circuit Board	10-5
CR46	Reel Servo Circuit Board	10-5
CR47	Reel Servo Circuit Board	10-5
CR48	Transport Control Circuit Board	10-6
CR49	Transport Control Circuit Board	10-6
CR50	Fast Forward Circuit Board	10-8
CR51	Fast Forward Circuit Board	10-8
CR52	Fast Forward Circuit Board	10-8
CR53	Transport Control Unit	10-2, 10-3
F1	Transport Control Unit	10-2, 10-3
F2	Transport Control Unit	10-2, 10-3
F3	Transport Control Unit	10-2, 10-3
F4	Transport Control Circuit Board	10-6
K1	Transport Control Circuit Board	10-6
K1	Capstan Servo Assembly	10-9
K2	Transport Control Unit	10-2, 10-3
K2	Capstan Servo Assembly	10-9
K3	Transport Control Circuit Board	10-6
K4	Transport Control Circuit Board	10-6
K5	Transport Control Circuit Board	10-6
K6	Transport Control Circuit Board	10-6
K7	Transport Control Circuit Board	10-6
K8	Transport Control Circuit Board	10-6
K9	Transport Control Circuit Board	10-6
K10	Transport Control Circuit Board	10-6
K11	Fast Forward Circuit Board	10-8
L1	Transport Chassis	10-1
L2	Transport Chassis	10-1
Q1	Actuator Drive Circuit Board	10-4
Q1	Photosense Circuit Board	10-7
Q1	Capstan Servo Assembly	10-9
Q2	Actuator Drive Circuit Board	10-4
Q2	Photosense Circuit Board	10-7
Q2	Capstan Servo Assembly	10-9
Q3	Actuator Drive Circuit Board	10-4
Q3	Photosense Circuit Board	10-7

Table 10-1. Tape Transport Component Location (Continued)

COMPONENT	PHYSICAL LOCATION	FIGURE NO.
Q3	Capstan Servo Assembly	10-9
Q4	Actuator Drive Circuit Board	10-4
Q4	Photosense Circuit Board	10-7
Q4	Capstan Servo Assembly	10-9
Q5	Actuator Drive Circuit Board	10-4
Q5	Photosense Circuit Board	10-7
Q5	Capstan Servo Assembly	10-9
Q6	Actuator Drive Circuit Board	10-4
Q6	Photosense Circuit Board	10-7
Q7	Actuator Drive Circuit Board	10-4
Q7	Photosense Circuit Board	10-7
Q8	Actuator Drive Circuit Board	10-4
Q8	Photosense Circuit Board	10-7
Q9	Actuator Drive Circuit Board	10-4
Q9	Photosense Circuit Board	10-7
Q10	Actuator Drive Circuit Board	10-4
Q10	Photosense Circuit Board	10-7
Q11	Actuator Drive Circuit Board	10-4
Q12	Fast Forward Circuit Board	10-8
R1	Transport Control Circuit Board	10-6
R1	Photosense Circuit Board	10-7
R1	Capstan Servo Assembly	10-9
R2	Transport Control Circuit Board	10-6
R2	Photosense Circuit Board	10-7
R2	Capstan Servo Assembly	10-9
R3	Transport Control Circuit Board	10-6
R3	Capstan Servo Assembly	10-9
R4	Reel Servo Circuit Board	10-5
R4	Photosense Circuit Board	10-7
R4	Capstan Servo Assembly	10-9
R5	Reel Servo Circuit Board	10-5
R5	Photosense Circuit Board	10-7
R5	Capstan Servo Circuit Board	10-9
R6	Reel Servo Circuit Board	10-5
R6	Photosense Circuit Board	10-7
R6	Capstan Servo Assembly	10-9
R7	Reel Servo Circuit Board	10-5
R7	Photosense Circuit Board	10-7
R7	Capstan Servo Assembly	10-9
R8	Reel Servo Circuit Board	10-5
R8	Photosense Circuit Board	10-7
R8	Capstan Servo Assembly	10-9
R9	Reel Servo Circuit Board	10-5
R9	Photosense Circuit Board	10-7
R9	Capstan Servo Assembly	10-9
R10	Reel Servo Circuit Board	10-5
R10	Photosense Circuit Board	10-7

Table 10-1. Tape Transport Component Location (Continued)

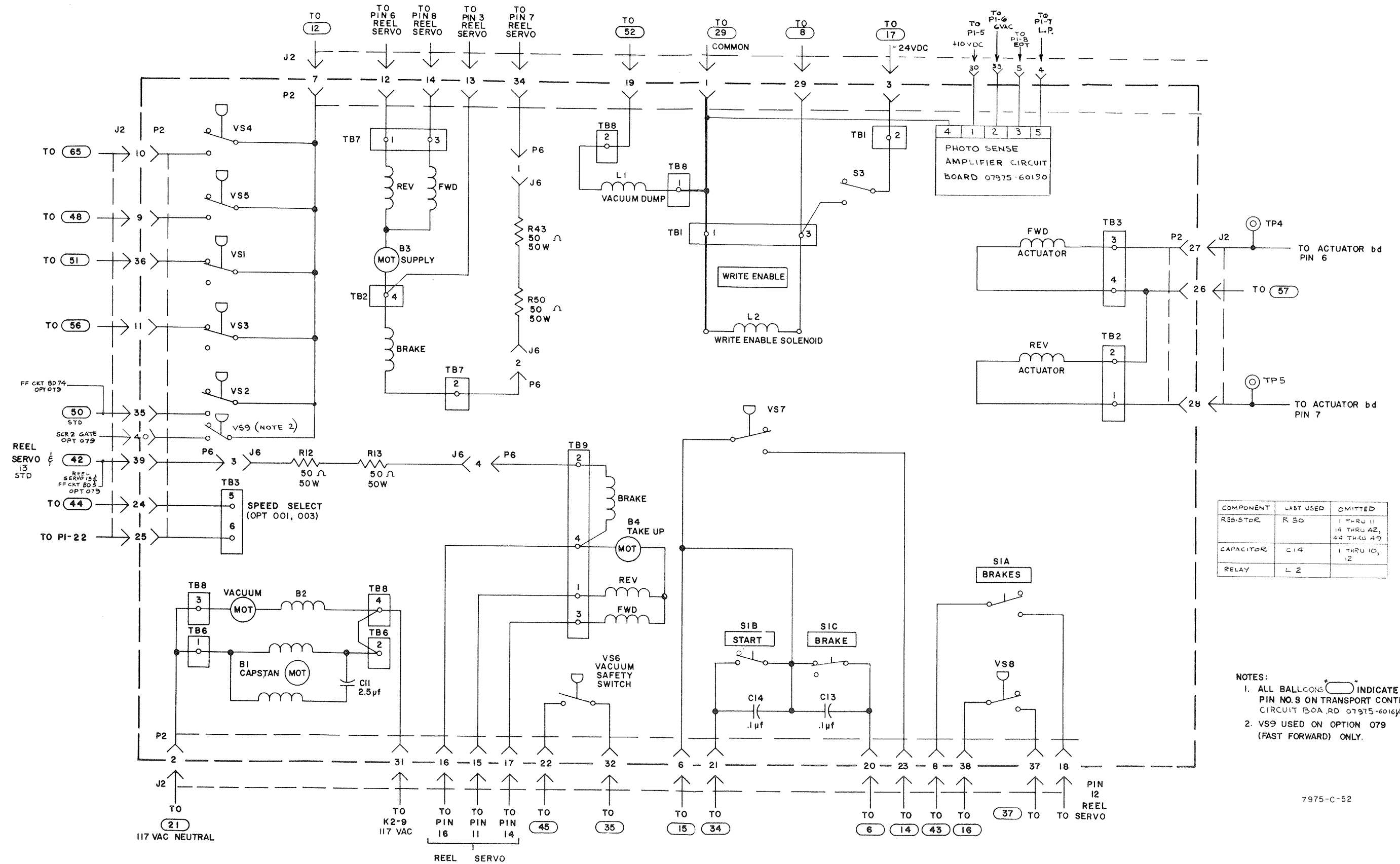
COMPONENT	PHYSICAL LOCATION	FIGURE NO.
R10	Capstan Servo Assembly	10-9
R11	Reel Servo Circuit Board	10-5
R11	Photosense Circuit Board	10-7
R11	Capstan Servo Assembly	10-9
R12	Transport Chassis	10-1
R12	Photosense Circuit Board	10-7
R12	Capstan Servo Assembly	10-9
R13	Transport Chassis	10-1
R13	Photosense Circuit Board	10-7
R13	Capstan Servo Assembly	10-9
R14	Actuator Drive Circuit Board	10-4
R14	Photosense Circuit Board	10-7
R14	Capstan Servo Assembly	10-9
R15	Actuator Drive Circuit Board	10-4
R15	Photosense Circuit Board	10-7
R15	Capstan Servo Assembly	10-9
R16	Actuator Drive Circuit Board	10-4
R16	Photosense Circuit Board	10-7
R16	Capstan Servo Assembly	10-9
R17	Photosense Circuit Board	10-7
R17	Capstan Servo Assembly	10-9
R18	Actuator Drive Circuit Board	10-4
R18	Photosense Circuit Board	10-7
R18	Capstan Servo Assembly	10-9
R19	Actuator Drive Circuit Board	10-4
R19	Photosense Circuit Board	10-7
R19	Capstan Servo Assembly	10-9
R20	Actuator Drive Circuit Board	10-4
R20	Capstan Servo Assembly	10-9
R21	Actuator Drive Circuit Board	10-4
R21	Photosense Circuit Board	10-7
R21	Capstan Servo Assembly	10-9
R22	Actuator Drive Circuit Board	10-4
R22	Photosense Circuit Board	10-7
R22	Capstan Servo Assembly	10-9
R23	Actuator Drive Circuit Board	10-4
R23	Photosense Circuit Board	10-7
R23	Capstan Servo Assembly	10-9
R24	Actuator Drive Circuit Board	10-4
R24	Photosense Circuit Board	10-7
R25	Actuator Drive Circuit Board	10-4
R25	Photosense Circuit Board	10-7
R26	Actuator Drive Circuit Board	10-4
R26	Photosense Circuit Board	10-7
R27	Actuator Drive Circuit Board	10-4
R27	Photosense Circuit Board	10-7
R28	Actuator Drive Circuit Board	10-4
R28	Photosense Circuit Board	10-7

Table 10-1. Tape Transport Component Location (Continued)

COMPONENT	PHYSICAL LOCATION	FIGURE NO.
R29	Actuator Drive Circuit Board	10-4
R29	Photosense Circuit Board	10-7
R30	Actuator Drive Circuit Board	10-4
R30	Photosense Circuit Board	10-7
R31	Actuator Drive Circuit Board	10-4
R31	Photosense Circuit Board	10-7
R32	Actuator Drive Circuit Board	10-4
R32	Photosense Circuit Board	10-7
R33	Actuator Drive Circuit Board	10-4
R34	Actuator Drive Circuit Board	10-4
R35	Actuator Drive Circuit Board	10-4
R36	Actuator Drive Circuit Board	10-4
R37	Actuator Drive Circuit Board	10-4
R38	Actuator Drive Circuit Board	10-4
R39	Actuator Drive Circuit Board	10-4
R40	Actuator Drive Circuit Board	10-4
R41	Transport Control Circuit Board	10-6
R42	Transport Control Unit	10-2, 10-3
R43	Transport Chassis	10-1
R44	Actuator Drive Circuit Board	10-4
R45	Actuator Drive Circuit Board	10-4
R46	Actuator Drive Circuit Board	10-4
R47	Actuator Drive Circuit Board	10-4
R48	Reel Servo Circuit Board	10-5
R49	Transport Control Circuit Board	10-6
R50	Transport Chassis	10-1
R51	Transport Control Circuit Board	10-6
R52	Transport Control Circuit Board	10-6
R53	Actuator Drive Circuit Board	10-4
R54	Actuator Drive Circuit Board	10-4
R55	Fast Forward Circuit Board	10-8
R56	Fast Forward Circuit Board	10-8
S1A	Transport Chassis	10-1
S1B	Transport Chassis	10-1
S1C	Transport Chassis	10-1
S2	Transport Control Unit	10-2, 10-3
S3	Transport Chassis	10-1
SCR1	Reel Servo Circuit Board	10-5
SCR1	Capstan Servo Assembly	10-9
SCR2	Reel Servo Circuit Board	10-5
SCR3	Reel Servo Circuit Board	10-5
SCR4	Reel Servo Circuit Board	10-5
T1	Transport Control Unit	10-2, 10-3
VS1	Transport Chassis	10-1
VS2	Transport Chassis	10-1
VS3	Transport Chassis	10-1
VS4	Transport Chassis	10-1

Table 10-1. Tape Transport Component Location (Continued)

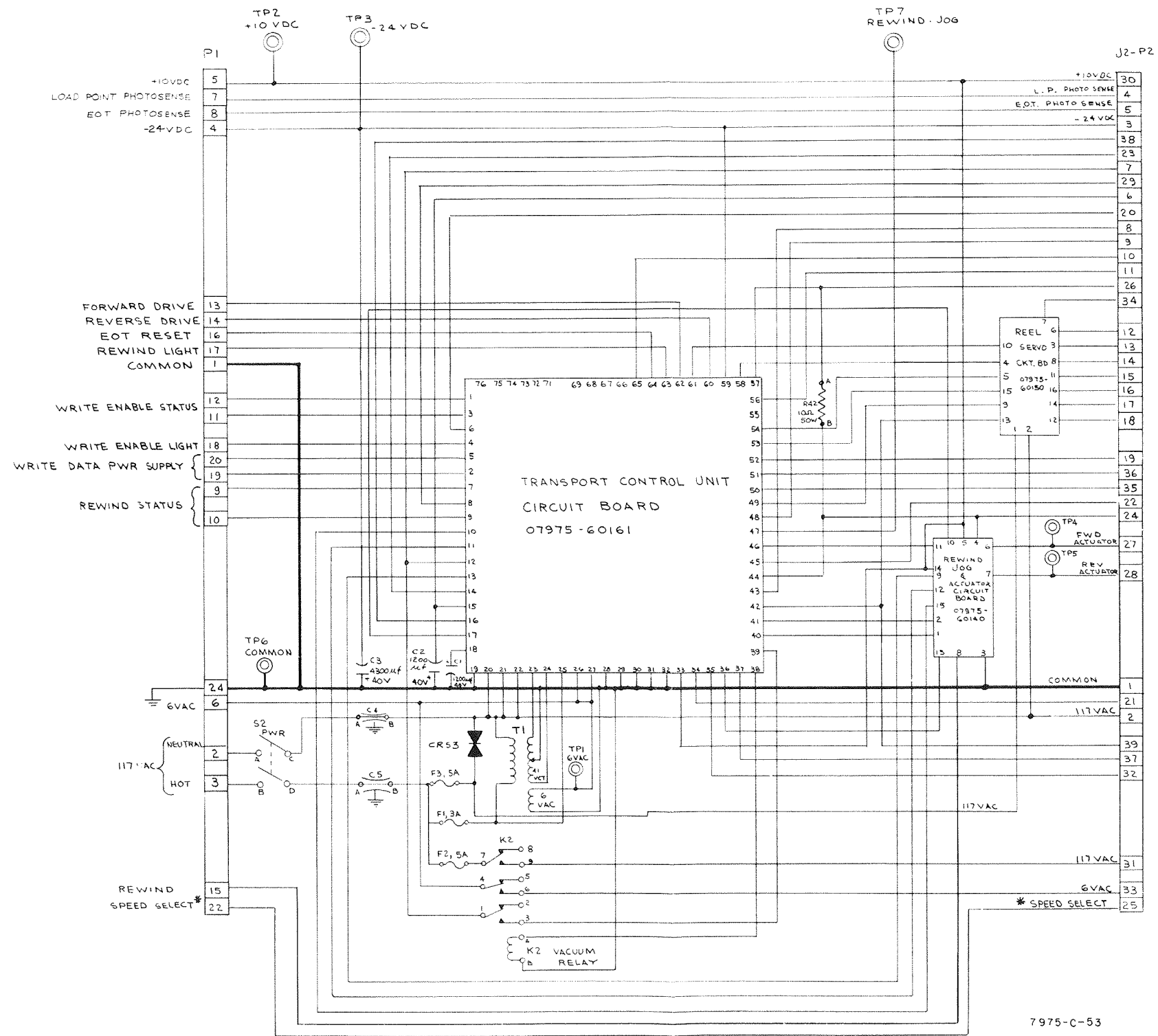
COMPONENT	PHYSICAL LOCATION	FIGURE NO.
VS5	Transport Chassis	10-1
VS6	Transport Chassis	10-1
VS7	Transport Chassis	10-1
VS8	Transport Chassis	10-1
VS9	Transport Chassis	10-1



7975-C-52

Figure 10-1. Tape Transport Chassis Wiring Diagram

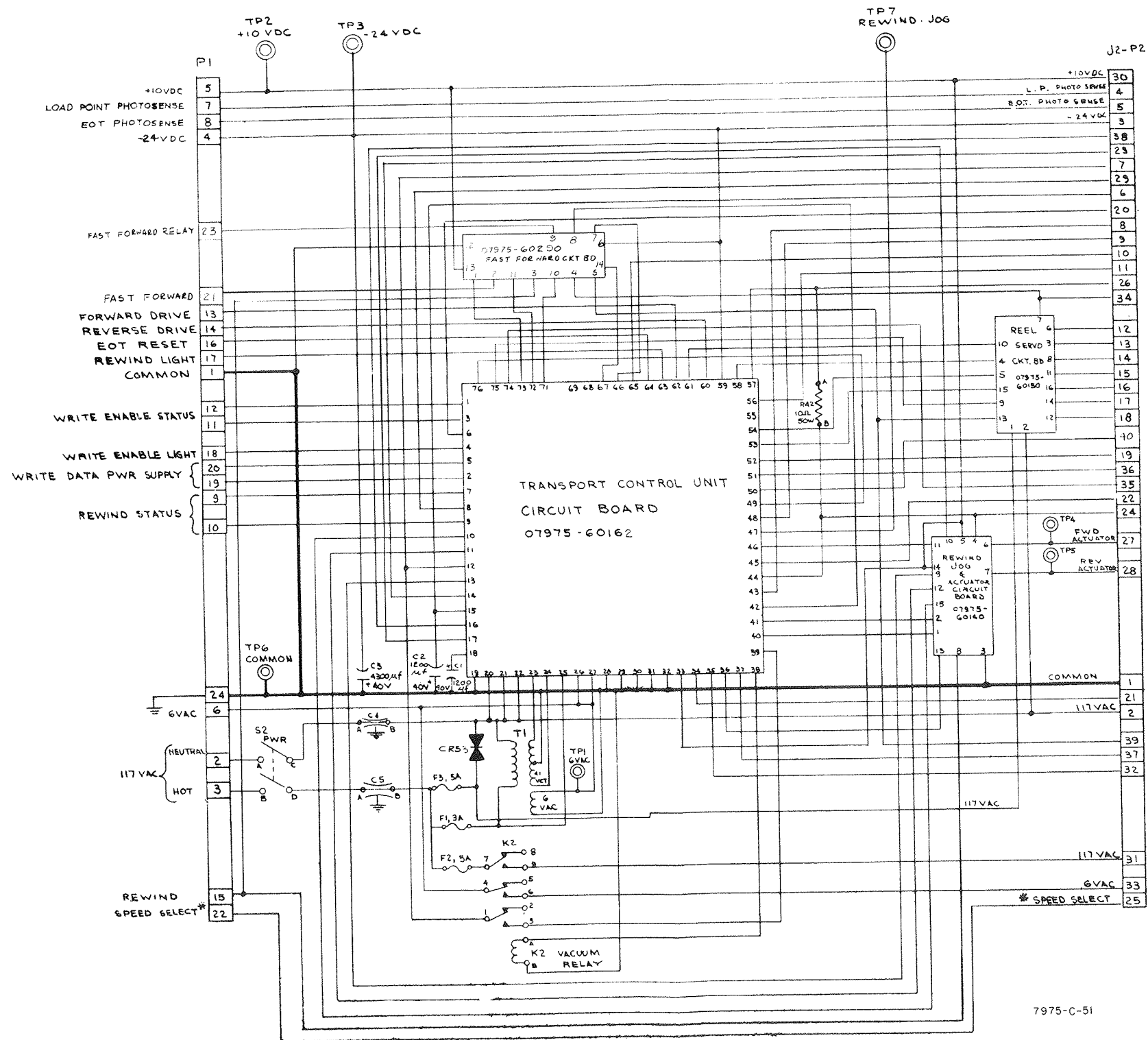




NOTE:  
 \*- USED FOR DUAL SPEED  
 (OPTION 001 OR 003) UNITS ONLY

7975-C-53

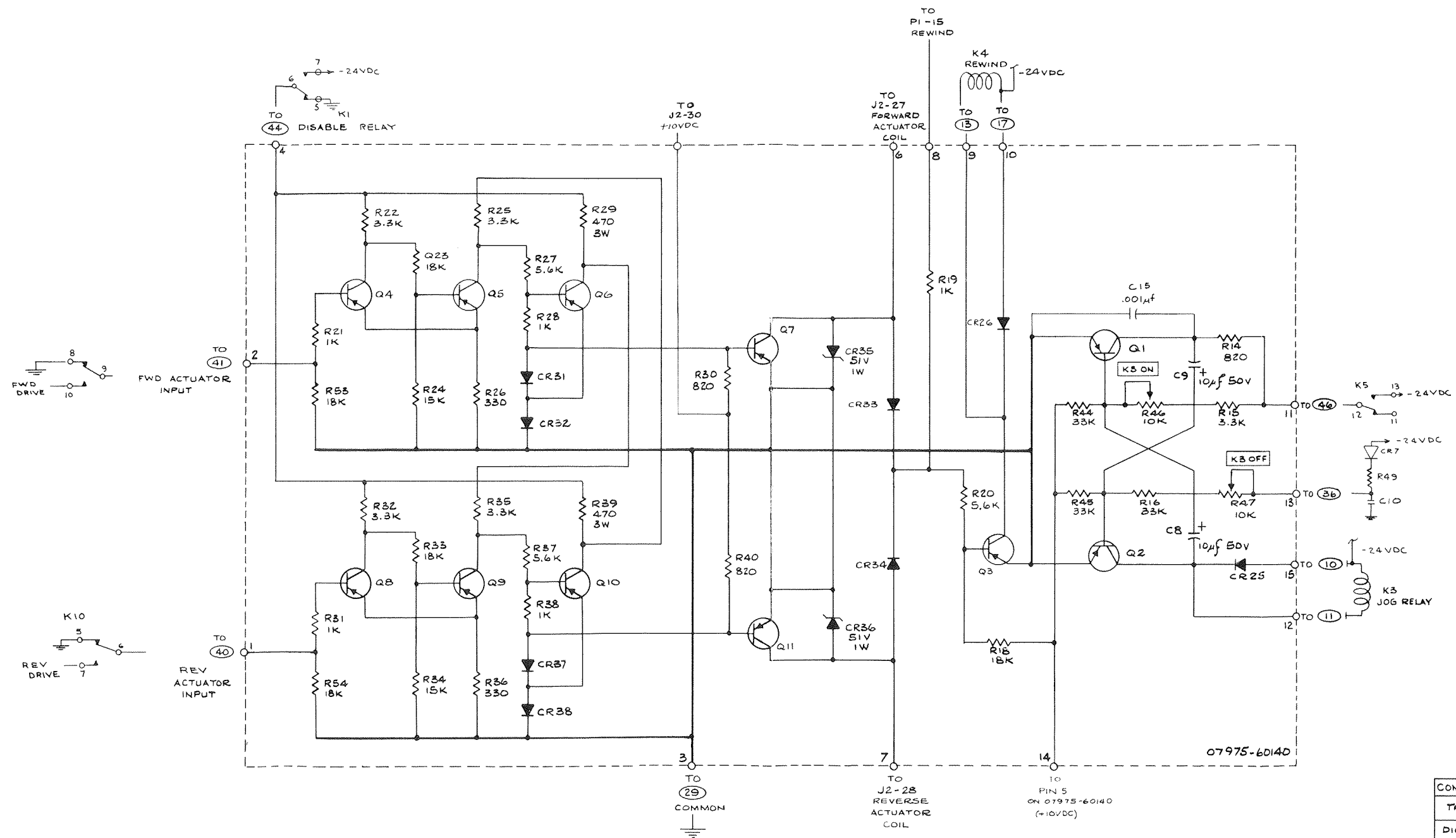
Figure 10-2. Transport Control Unit Schematic Diagram (Standard)



NOTE:  
\* USED FOR DUAL SPEED  
(OPTION 001 OR 003) UNITS ONLY

7975-C-51

Figure 10-3. Transport Control Unit Schematic Diagram (Option 079 Only)

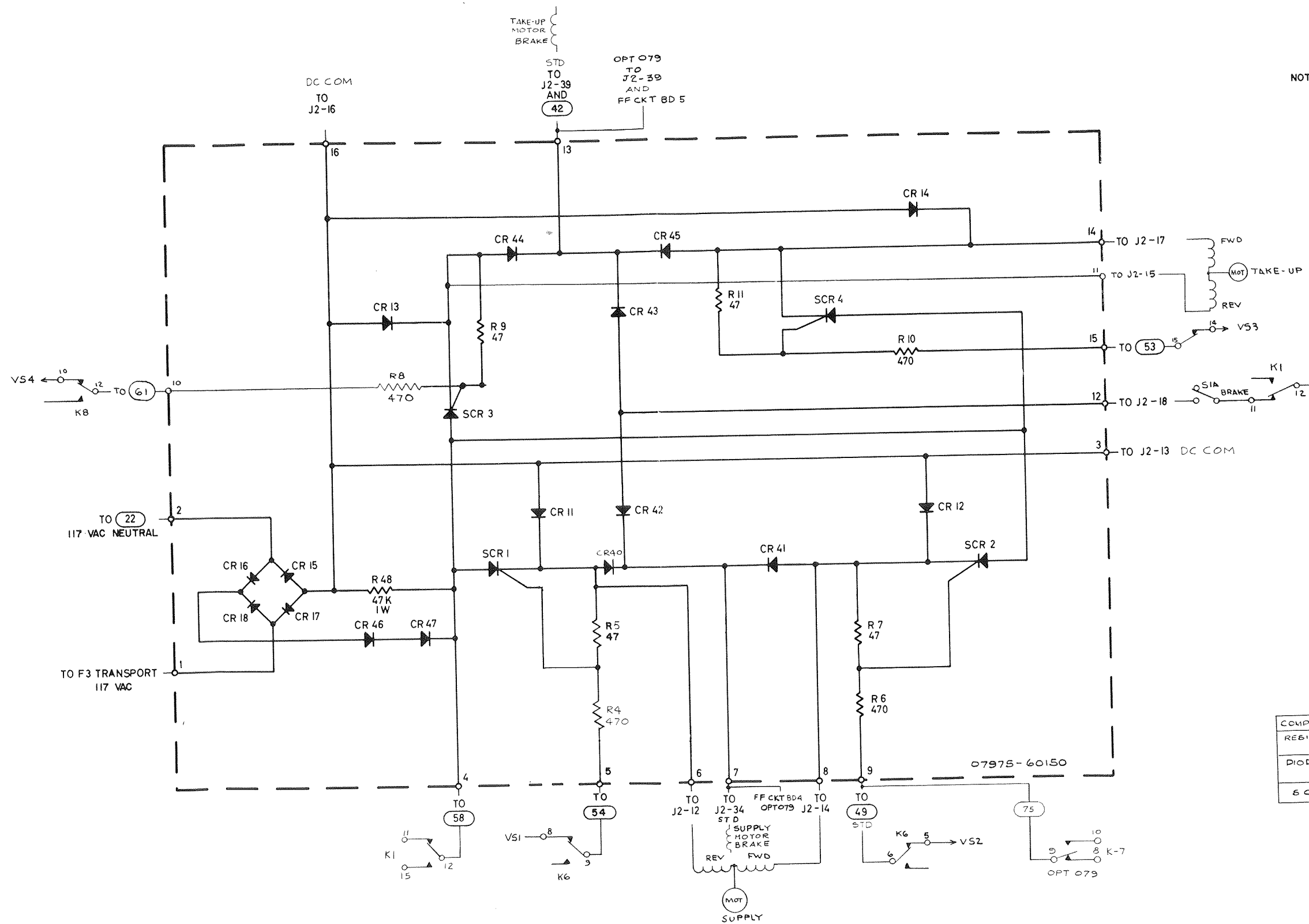


NOTES:  
1. ALL BALLOONS ○ INDICATE PIN NO'S ON TRANSPORT CONTROL CIRCUIT CARD 07975-60161/60162

COMPONENT	LAST USED	OMITTED
TRANSISTOR	Q 11	NONE
DIODE	CR 38	CR-1 THRU 24 CR-27 THRU 30
CAPACITOR	C 15	C-1 THRU 7 C-10 THRU 17
RESISTOR	R 54	R-1 THRU 13, 17, R-18 THRU 52

7975-C-55

Figure 10-4. Actuator and Rewind Jog Circuit Board Schematic Diagram



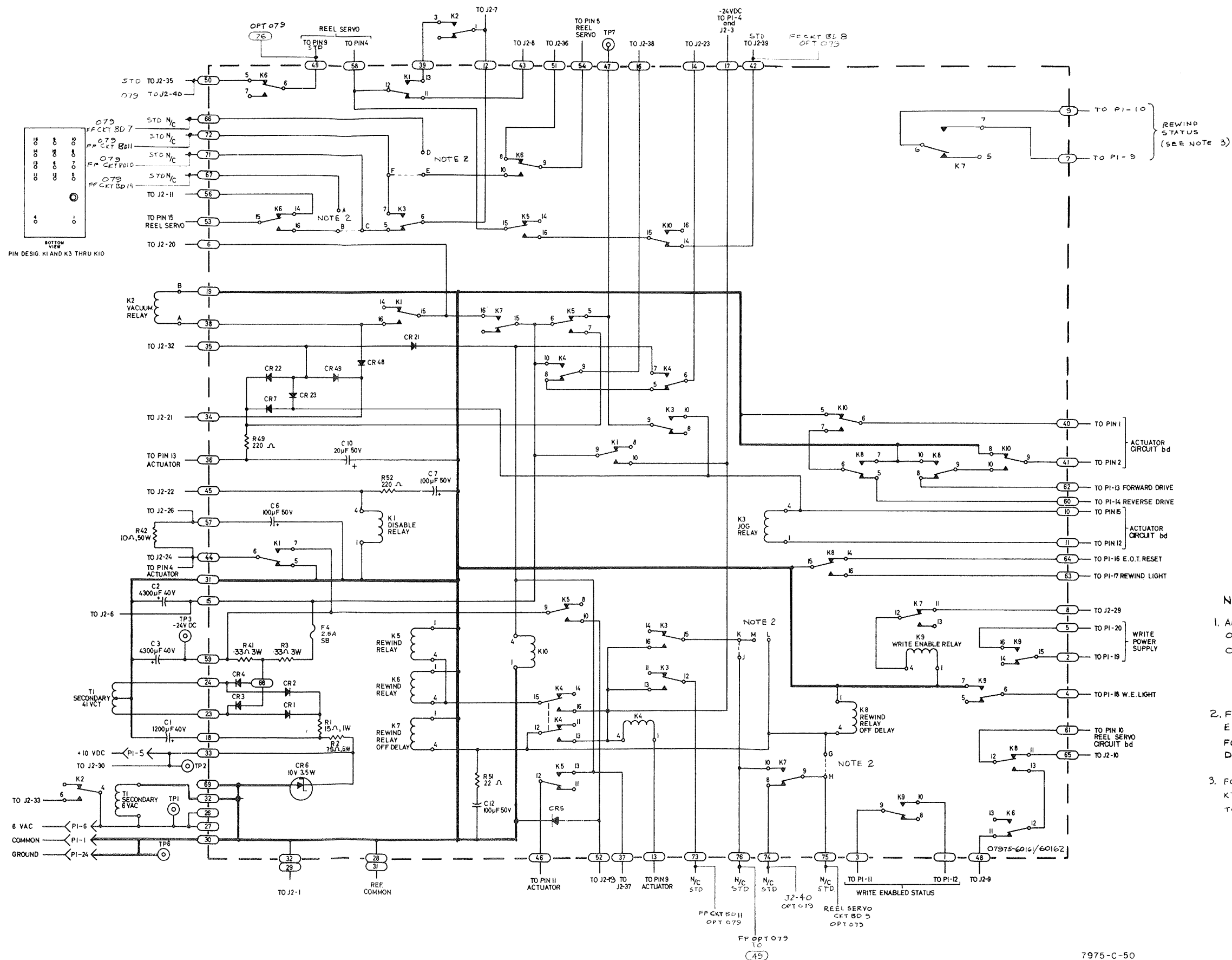
NOTES:  
1. ALL BALLOONS INDICATE PIN NO.S ON TRANSPORT CONTROL CIRCUIT BOARD 07975-60161/60162.

COMPONENT	LAST USED	OMITTED
RESISTOR	R48	R1 THRU 3 R12 THRU 47
DIODE	CR47	CR1 THRU 10 CR13 THRU 39
SCR	SCR4	NONE

7975-C-54

Figure 10-5. Reel Servo Circuit Board Schematic Diagram

10-17/10-18

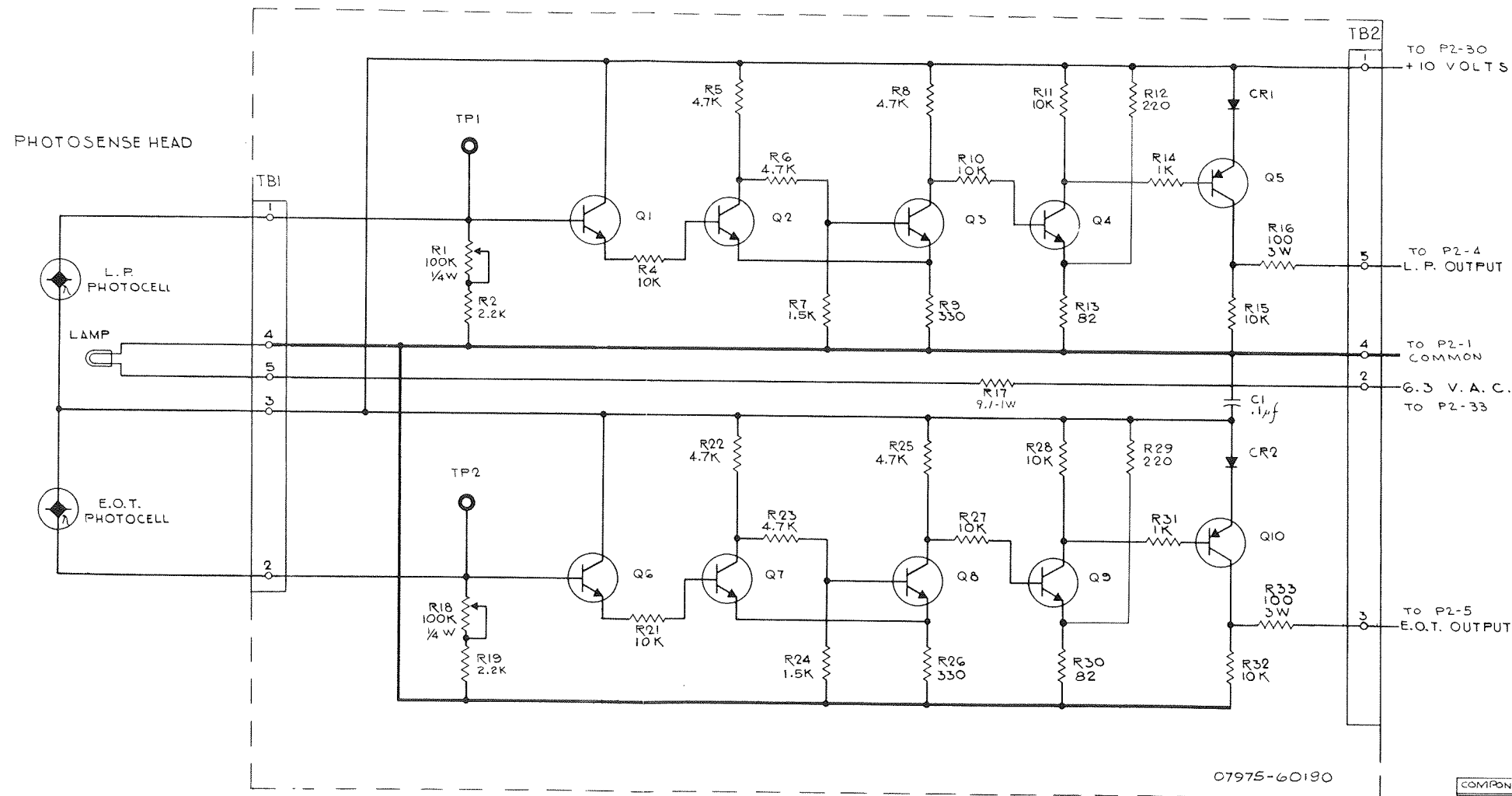


COMPONENT	LAST USED	OMITTED
DIODE	CR 49	CR 8 THRU 20 CR 24 THRU 47
CAPACITOR	C 12	C 8, 9, 11
RELAY	K 10	K 2
RESISTOR	R 51	R 4 THRU 40 R 42 THRU 48, 50

- NOTES:
- ALL BALLOONS INDICATE PIN NO'S ON TRANSPORT CONTROL CIRCUIT CARD 07975-60161/60162
  - FOR STANDARD VERSION (07975-60161) JUMPER B TO C, E TO F, G TO H AND J TO K. FOR OPTION 079 (07975-60162) JUMPER A TO B, D TO E AND L TO M.
  - FOR STANDARD (07975-60161) TERMINAL 7 IS CONNECTED TO K7 PIN 7. FOR 079 (07975-60162) TERMINAL 7 IS CONNECTED TO K7 PIN 6.

7975-C-50

Figure 10-6. Transport Control Circuit Board Schematic Diagram



NOTES:  
1. ALL RESISTORS ARE 1/2 WATT, 5% IN OHMS UNLESS OTHERWISE SPECIFIED.

COMPONENT	LAST USED	OMITTED
RESISTORS	R33	R3, R0
CAPACITORS	C1	
DIODES	CR2	
TRANSISTORS	Q10	

7975-C-56

Figure 10-7. Photosense Amplifier Schematic Diagram

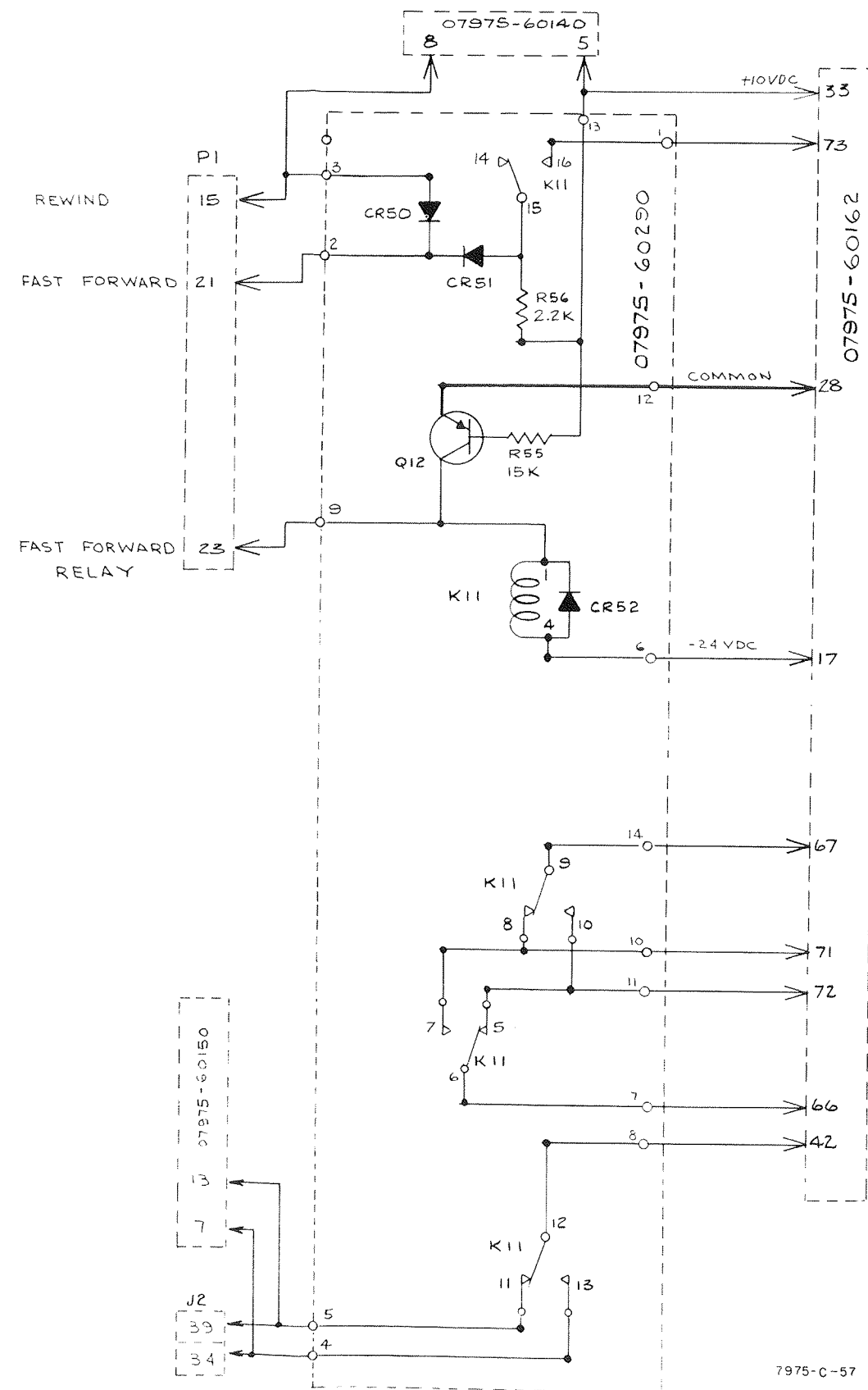
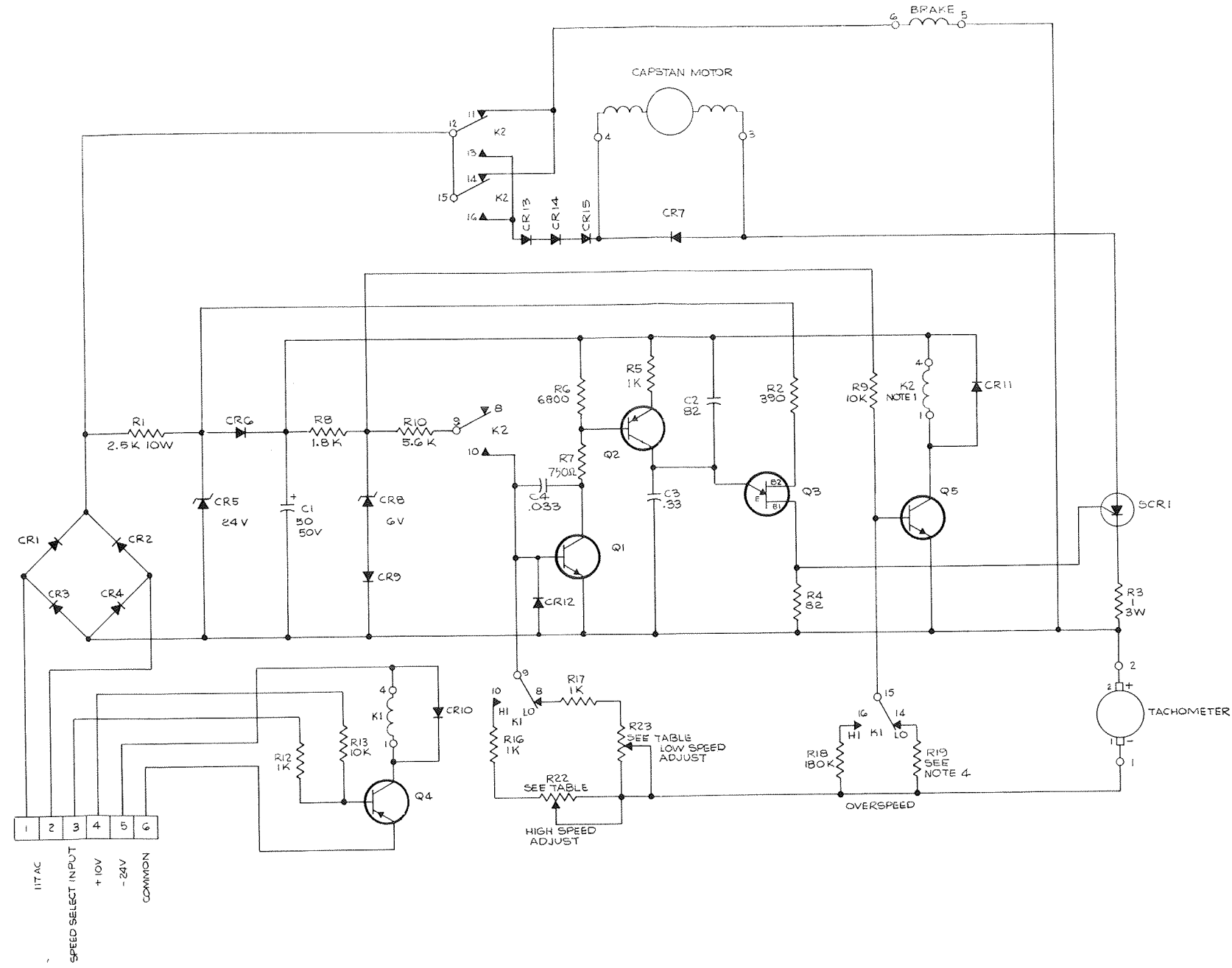


Figure 10-8. Fast Forward Circuit Board Schematic Diagram (Option 079 Only)

Typical values for R19 (see note 3)

LOW SPEED RANGE		R19
I	II	
.85 - 2.1	1.5 - 4.2	15 K
1.9 - 3.75	3.8 - 6.5	22 K
2.75 - 4.7	5.5 - 9.4	27 K
4.15 - 6.05	8.3 - 12.1	33 K
4.7 - 7.2	9.4 - 14.4	39 K
7.0 - 10.2	14.0 - 20.4	47 K
8.5 - 12.1	17.0 - 24.2	56 K
10.2 - 14.6	20.4 - 29.2	68 K
12.8 - 17.8	25.6 - 35.6	82 K
15.4 - 21.7	30.8 - 43.4	100 K
18.6 - 26.0	37.2 - 45.0	120 K
23.0 - 30.0		150 K



COMPONENT	LAST USED	OMITTED
RESISTOR	R23	R11, 14, 15, 20, 21
CAPACITOR	C4	
DIODE	CR15	
TRANSISTOR	Q5	
RELAY	K2	
SCR	SCR1	

NOTES

1. K2 IS A CURRENT SENSITIVE RELAY AND IS NOT INTERCHANGEABLE WITH K1
2. ALL RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
3. SELECT R19 FOR MINIMUM DOWN SPEED SHIFT TIME.


PART NUMBER TABLE

TRANSPORT	HIGH TAPE SPEED RANGE (IPS)	LOW TAPE SPEED RANGE (IPS)	R22 (V <sub>H</sub> )	R23 (V <sub>L</sub> )	PART NUMBER	R19
7975 A	30.1-45.0	30.1-45.0	100K	100K	07975-60230	USE TYPICAL VALUES FROM LOW SPEED RANGE COLUMN II
		15.0-30.0	100K	50K	07975-60231	
		2.0-14.9	100K	20K	07975-60232	
7975 A	15.0-30.0	15.0-30.0	100K	100K	07975-60280	USE TYPICAL
		7.5-14.9	100K	50K	07975-60281	
		1.0-7.49	100K	20K	07975-60282	
7975 A	7.5-14.9	7.5-14.9	50K	50K	07975-60283	VALUES FROM LOW SPEED RANGE COLUMN I
		1.0-7.49	50K	20K	07975-60284	
		1.0-7.49	20K	20K	07975-60285	



7975-C-58

Figure 10-9. DC Capstan Servo Schematic Diagram (Option 001 Only)



 Digital Tape Units-formerly DATAMEC Tape Units  
(Models 2020, 3024, 3029 & 3030)

MAINTENANCE LOG

This service note provides users of  Digital Tape Units with a method of logging performed maintenance for future reference. This log should prove helpful in analyzing tape unit performance, total use-time, and scheduling of routine preventive maintenance. This log should be kept in front of the maintenance manual for your  Digital Tape Unit. All manuals accompanying new machines will contain this log and additional copies can be ordered from the address below.

Model \_\_\_\_\_ Serial # \_\_\_\_\_

DATE	SCHED.	START TIME	STOP TIME	TOTAL TIME	DESCRIPTION	METER	ENGR NAME
	OR UNSCHED.						

(OVER)

7 June 1967-42





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690 E. Middlefield Road  
Mountain View  
California 94040

07975-90470

Printed in U.S.A.