
instruction

maintenance

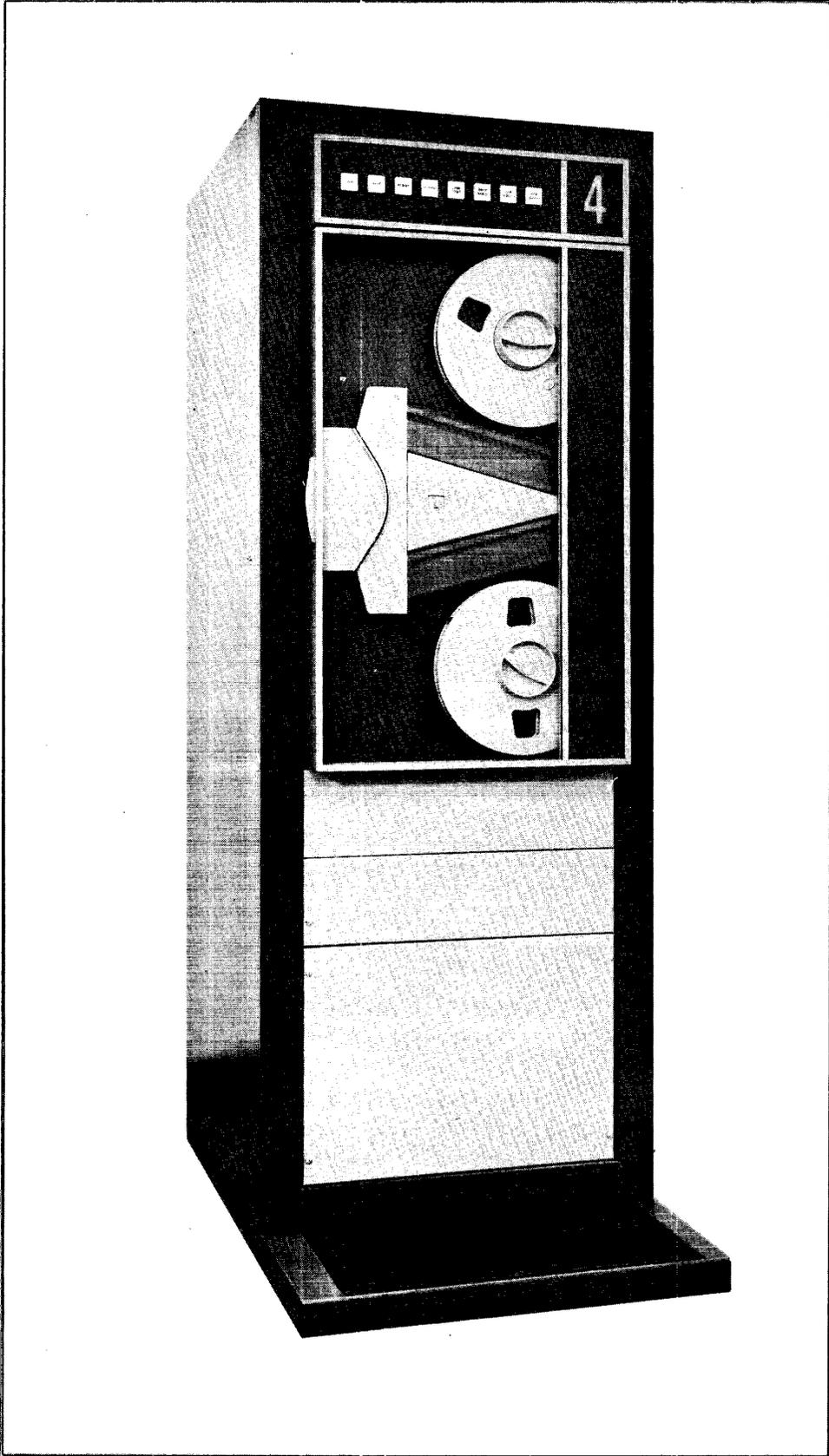
& spare parts manual

**for D 2020 SERIES
TAPE SYSTEMS**

D A T A M E C

345 Middlefield Road, Mountain View, California (415) 968-7291





FORWARD

TAPE TRANSPORT _____
SERIAL NOS. _____

A. USE OF THE MANUAL.

THIS MANUAL HAS BEEN TAILORED TO REFLECT THE EXACT CONFIGURATION OF THE EQUIPMENT IT ACCOMPANIES. THE SERIAL NUMBERS LISTED ABOVE IDENTIFY THE SYSTEMS TO WHICH THIS MANUAL APPLIES.

FORWARD:

CONTAINS THESE INSTRUCTIONS, A LIST OF PAGES, TABLE OF CONTENTS AND ANY ERRATA OR ADDENDA WHICH MAY BE REQUIRED.

SECTION I, DESCRIPTION AND SPECIFICATIONS:

PAGES 1-1 THROUGH 1-10 ARE INCLUDED WITH ALL MANUALS. PAGES 1-11 AND 1-12 PERTAIN TO THE DATA SWITCHER AND PAGES 1-13 AND 1-14 PERTAIN TO THE CONTROL SWITCHER; THEY ARE INCLUDED ONLY WITH MACHINES SO EQUIPPED.

SECTION II, INSTALLATION:

PAGES 2-1 THROUGH 2-18 ARE INCLUDED WITH ALL MANUALS. PAGES 2-19 AND FOLLOWING PERTAIN TO MULTI-UNIT INSTALLATIONS, I.E., UNITS WHICH CONTAIN A DATA SWITCHER. THESE PAGES ARE INCLUDED ONLY WITH SUCH SYSTEMS.

SECTION III, OPERATION:

INCLUDED WITH ALL MANUALS.

SECTION IV, SYSTEM CHECKOUT:

INCLUDED WITH ALL MANUALS.

SECTION V, DESCRIPTION AND THEORY OF OPERATION:

PAGES 5-1 THROUGH 5-22.1 PERTAIN TO THE TAPE TRANSPORT AND TO TRANSPORT ACCESSORIES, SUCH AS THE PHOTOSENSE. THESE PAGES ARE INCLUDED WITH ALL MACHINES.

IF THE SYSTEM INCLUDES DATA ELECTRONICS, THE MANUAL WILL ALSO CONTAIN PAGES 5-23 THROUGH 5-42. THERE ARE THREE AVAILABLE VERSIONS OF THIS GROUP OF PAGES, COVERING SINGLE-DENSITY, DUAL-DENSITY OR TRIPLE-DENSITY ELECTRONICS. THE VERSION FURNISHED WILL CONFORM TO THE ELECTRONICS IN THE SYSTEM.

IF THE SYSTEM INCLUDES A DATA SWITCHER, THE MANUAL WILL CONTINUE WITH PAGES 5-43 THROUGH 5-54.

IF THE SYSTEM CONTAINS A CONTROL SWITCHER, THE MANUAL WILL ALSO INCLUDE PAGES 5-55 THROUGH 5-62.

SECTION VI, MAINTENANCE:

PAGES 6-1 THROUGH 6-32 ARE INCLUDED WITH ALL MANUALS. PAGES 6-32.1 AND 6-32.2 PERTAIN TO THE D-2020 MAINTENANCE UNIT AND ARE INCLUDED ONLY WITH MACHINES SO EQUIPPED. PAGES 6-33 AND 6-34 ARE SUPPLIED ONLY WITH SYSTEMS WHICH INCLUDE A DATA SWITCHER.

SECTION VII, SCHEMATIC DIAGRAMS:

THOSE SCHEMATICS ARE SUPPLIED WHICH APPLY TO THE SPECIFIC EQUIPMENT SHIPPED.

SECTION VIII, SPARE PARTS:

INCLUDED WITH ALL MANUALS.

SECTION IX, PARTS LISTS:

THOSE PARTS LISTS ARE SUPPLIED WHICH APPLY TO THE SPECIFIC EQUIPMENT SHIPPED. PARTS LISTS ARE NOT PAGE NUMBERED BUT ARE IN NUMERICAL SEQUENCE BY CATALOG NUMBER.

B. LIST OF PAGES.

FOR YOUR CONVENIENCE IN CONFIRMING THAT YOU HAVE THE CORRECT PAGES AND ISSUES, THESE LISTS SHOW, FOR SECTIONS I THROUGH VI, ALL PAGES IN THE MANUAL. IN SOME CASES OPTIONS ARE SHOWN, NOT ALL OF WHICH MAY BE INCLUDED IN THIS SPECIFIC MANUAL. SUCH OPTIONS ARE DEFINED IN THE SECTION DESCRIPTIONS, ABOVE.

C. GENERAL.

WITH THIS GUIDE, YOU SHOULD BE ABLE TO MAKE MAXIMUM USE OF YOUR MANUAL. EVERY EFFORT HAS BEEN MADE TO PREPARE A MANUAL WHICH WILL BE A USEFUL TOOL IN THE INSTALLATION, USE AND SERVICING OF YOUR DATAMEC EQUIPMENT. IF YOU HAVE ANY SUGGESTIONS BY WHICH WE MIGHT FURTHER IMPROVE THE MANUAL, PLEASE CONVEY THEM TO YOUR DATAMEC REPRESENTATIVE AND WE WILL BE HAPPY TO CONSIDER THEM.



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*PART OF MANUAL SUPPLIED WITH UNITS WHICH INCLUDE THE EQUIPMENT MENTIONED.



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*PART OF MANUAL SUPPLIED WITH UNITS WHICH INCLUDE THE EQUIPMENT MENTIONED.

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*PAGES SUPPLIED ONLY FOR SYSTEMS WHICH INCLUDE A DATA SWITCHER.

**PAGES SUPPLIED ONLY FOR SYSTEMS WHICH INCLUDE A CONTROL SWITCHER.

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2-16	B
2-17	A
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*2-19	Mu-A
*2-20	MU-B
*2-21	MU-B
*2-22	MU-B
*2-22.1	MU-A
*2-22.2	MU-A
*2-23	MU-B
*2-24	MU-A
*2-25	MU-A
*2-26	(BLANK)

*PAGES SUPPLIED ONLY FOR MULTI-UNIT SYSTEMS, I.E., SYSTEMS WHICH CONTAIN MORE THAN ONE TRANSPORT, A DATA SWITCHER AND PERHAPS A CONTROL SWITCHER.

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<u>PAGE</u>	<u>ISSUE</u>	<u>PAGE</u>	<u>ISSUE</u>	<u>PAGE</u>	<u>ISSUE</u>	<u>PAGE</u>	<u>ISSUE</u>	<u>PAGE</u>	<u>ISSUE</u>	<u>PAGE</u>	<u>ISSUE</u>
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5-15	B1	5-37	SD-B	5-37	DD-B	5-37	TD-A				
5-16	B	5-38	SD-B	5-38	DD-B	5-38	TD-A				
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6-8.3	A	*6-32.1	A
6-8.4	A	*6-32.2	A
6-8.5	A		
6-8.6	(BLANK)	**6-33	DS-A
6-9	A	**6-34	DS-A
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6-20.1	A		
6-20.2	(BLANK)		
6-21	B		
6-22	A		
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*PAGES SUPPLIED ONLY FOR SYSTEMS WHICH INCLUDE A MAINTENANCE UNIT.

**PAGES SUPPLIED ONLY FOR SYSTEMS WHICH INCLUDE A DATA SWITCHER.

NOTICE

SCHEMATICS AND PARTS LISTS FOR
CATALOG ITEMS: 10600-DUAL DENSITY READ CARD,
10603-DUAL DENSITY READ CONTROL CARD AND
10606-DUAL DENSITY WRITE CARD HAVE NOT BEEN
INCLUDED IN THIS MANUAL. THIS INFORMATION
WILL BE SHIPPED AT A LATER DATE.

FOR DODGE TRACTOR SYSTEMS

THE SUBJECT SYSTEMS DIFFER FROM THE STANDARD SYSTEMS COVERED BY THIS INSTRUCTION MANUAL, AS OUTLINED BELOW:

TRUCK TRANSPORTS, CAT. NO'S. 10000 OR 10800

ON SCHEMATIC, SECTION VII, FIGURE 7-1:

ADD DIODE, IN1692, BETWEEN PINS 1 AND 3 OF TB1. ANODE TO PIN 3.

ADD DIODE, IN1692, BETWEEN PINS 1 AND 4 OF RELAYS K5, K7 AND K9. ANODES TO PINS 4.

DELETE THE SECTION OF RELAY K7 WITH PINS 11 AND 12. CONNECT LEAD DIRECTLY FROM TB1, PIN 3, TO RELAY K9 COIL, PIN 4.

ADD A 2200 RESISTOR AND A 0.22 μ f, 400 VOLT CAPACITOR IN SERIES BETWEEN PINS 15 AND 16 OF RELAY K5.

ADD A 2200 RESISTOR AND A 0.22 μ f, 400 VOLT CAPACITOR IN SERIES BETWEEN TS3, TERMINAL 10, AND TS2, TERMINAL 6.

ADD A 2200 RESISTOR AND A 0.22 μ f, 400 VOLT CAPACITOR IN SERIES BETWEEN THE SWINGER AND THE NORMALLY OPEN CONTACT OF SWITCH S1A, BRAKES.

IN PARTS LIST, SECTION IX, ADD THE FOLLOWING COMPONENTS:

<u>DATAMEC PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
00001-033	RESISTOR, FIXED COMP 2200 1/2W 5%	3
00019-001	DIODE, IN1692	4
00076-009	CAPACITOR, PAPER, 0.22 μ f, 400 VDC	3

NOTE: THE PHYSICAL LOCATIONS OF THESE COMPONENTS CORRESPOND TO THE LOCATIONS ON THE SCHEMATIC DIAGRAM.

OPERATOR CONTROL PANELS, CAT. NO'S. 10390-C.-1 OR 10391-C.-1

ON SCHEMATIC, SECTION VII, FIGURE 7-2:

ADD DIODE, IN1692, BETWEEN PINS 1 AND 4 OF RELAY K4. ANODE TO PIN 1.

IN PARTS LIST, SECTION IX, ADD THE FOLLOWING:

00019-001	DIODE, IN1692	1
-----------	---------------	---

OPERATOR CONTROL PANELS, CAT. NO'S. 10510-0,-1

ON SCHEMATIC, SECTION VII, FIG. 7-2:

CHANGE RESISTOR R29 TO: 330Ω

DELETE RESISTOR R28

CHANGE CAPACITOR C2 TO: 0.1μf

ADD CONNECTION BETWEEN TERMINAL BOARD LUGS (NUMBERED CIRCLES) NO'S. 6 AND 49

IN PARTS LIST, SECTION VII, CHANGE AS FOLLOWS:

ITEM 46.6 ADD REF. NO. R29, CHANGE QTY TO: 2

ITEM 46.7 DELETE REF. NO. R29, CHANGE QTY TO: 4

ITEM 46.10 DELETE ENTIRE ITEM.

ITEM 46.29 DELETE ENTIRE ITEM.

ITEM 46.37 ADD REF. NO. C2, CHANGE QTY TO: 4

PHOTOSENSE, CAT. NO. 10270

ON SCHEMATIC, SECTION VII, FIG. 7-3:

DELETE RESISTORS R16 AND R33. REPLACE WITH THROUGH CONNECTION.

IN PARTS LIST, SECTION IX:

DELETE ITEM 1.3.16

DUAL DENSITY READ, CAT. NO'S. 10239 OR 10240

ON SCHEMATIC, SECTION VII, FIG. 7-8:

CHANGE RESISTOR R66 TO: 39Ω

NOTE: ON 10239, EFF. S/N 221 AND ON 10240, EFF. S/N 473, CHANGE RESISTOR R77.

IN PARTS LIST, SECTION IX, CHANGE AS FOLLOWS:

ITEM 23 DELETE REF. NO. R66, CHANGE QTY TO: 12

NOTE: ON LATER UNITS AS INDICATED ABOVE, CHANGE ITEM 35, DELETE REF. NO. R77.

ADD ITEM 19 00038-015 . RESISTOR, FIXED COMP 39Ω 1/4W 5% R66 QTY: 1

NOTE: ON LATER UNITS ADD ITEM 31, REF. NO. R77

NOTE: CHANGE R66 CALLOUT ON ILLUSTRATION TO ITEM 19.
ON LATER UNITS CHANGE R66.

LOW RESISTY READ, CAT. NO. 10310

ON SCHEMATIC, SECTION VII, FIGURE 7-8:

CHANGE RESISTOR R50 TO: 390

IN PARTS LIST, SECTION IX, CHANGE AS FOLLOWS:

ITEM 21 DELETE REF. NO. R50. CHANGE QTY TO: 9

ADD ITEM 32 00038-015 . RESISTOR, FIXED COMP 390 1/4W 5% QTY 1

NOTE: CHANGE R50 CALLOUT ON ILLUSTRATION TO ITEM 32.

CONTROL SWITCHER, CAT. NO. 10500

ON SCHEMATIC, SECTION VII, FIGURE 7-16:

CHANGE RESISTORS R146, R150 AND R162 AS APPLICABLE TO: 4700

DELETE CONNECTIONS BETWEEN J2, PINS 4, 5, 6 AND 7 AND THE ETCHED BOARD TERMINALS (NUMBERED CIRCLES) 1, 2, 3, & 4.

IN PARTS LIST, SECTION IX, CHANGE AS FOLLOWS:

DELETE REF. NO'S R146, R150 AND R162 FROM PRESENT ITEMS, AS APPLICABLE AND ADD TO THE ITEMS SPECIFYING PART NO. 00001-041 FOR THE -0 AND -1 VERSIONS. ADJUST QUANTITIES ACCORDINGLY.

NOTE: CERTAIN UNITS MAY HAVE ONE OR MORE OF THE 3 RESISTORS AS PART NO. 00001-041, 4700. CONSEQUENTLY, THE ABOVE CHANGES WILL HAVE TO BE MADE ON AN "AS APPLICABLE" BASIS.

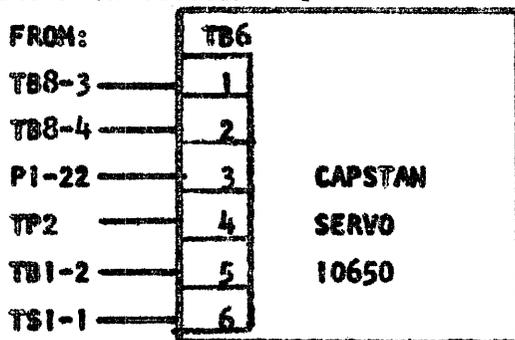
ERRATA

TAPE TRANSPORT, CAT. NO'S. 10000-0 THRU -9 AND 10800-0 THRU -9.

SECTION VII, FIG. 7-1, SCHEMATIC DIAGRAM:

CHANGE TITLE BLOCK TO INDICATE VERSIONS -0 THRU -9.

ADD NOTE: WHEN CAPSTAN SERVO (CAT. NO. 10650) IS USED, CONNECTIONS TO THE TAPE TRANSPORT ARE MADE AS SHOWN IN SECTION "A."



SECTION "A"

SECTION IX, PARTS LIST:

CHANGE TITLE, ALL PAGES, TO INDICATE VERSIONS -0 THRU -9.

ON ILLUSTRATION, REAR OF OVERALL TRANSPORT BREAKDOWN, VERSION TABLE, ADD -9 VERSION, WITH NOTATION ACROSS ALL COLUMNS: SPECIAL, SEE PARTS LIST FOR CAPSTAN SERVO, CAT. NO. 10650.

ON ILLUSTRATION BREAKDOWN OF ITEMS 32, 33, 34 AND 35, ADD NOTATION: "-0 THRU -8 VERSIONS ONLY."

IN LIST, ADD NOTATION, "-0 THRU -8 VERSIONS ONLY." AT ITEMS 105 AND 106.

ERRATA

CAT. NO. 10650, CAPSTAN SERVO DRIVE ASSEMBLY.
SECTION IX, PARTS LIST.

EXPLODED VIEW: DIFFERS SLIGHTLY FROM EQUIPMENT.

BREAKDOWN OF ITEM 5.4:
VIEW DIFFERS SLIGHTLY FROM EQUIPMENT.

TABLE: DELETE COLUMNS FOR R18 AND FOR R20, 21; "BELT BREAK SAFETY."

REF. NO./ITEM NO. CROSS INDEX: DELETE R11, R14, R15, R20, R21, C5 AND Q6.
CHANGE R18 TO ITEM 27.

IN LIST:

ITEM 5.4.1, DELETE ENTIRE ITEM.

ITEM 5.4.8, CHANGE QTY TO 1. DELETE REF. NO. R15.

ITEM 5.4.15, DELETE ENTIRE ITEM.

ITEM 5.4.17, DELETE REF. NO. R14.

ITEM 5.4.27, CHANGE QTY TO *1. ADD REF. NO. R18.

ITEM 5.4.33, CHANGE QTY TO 2. DELETE REF. NO. Q6.

ITEM 5.4.44, DELETE ENTIRE ITEM.

ITEM 5.4.47, CHANGE QTY TO 17. (TWO EACH USED UNDER ALL DIODES, 1 EACH UNDER ALL TRANSISTORS).

ADD ITEM 5.4.50/00050-009/...TERMINAL STRIP, 6 CONTACT, TB6/1

ITEM 5.4.62, CHANGE PART NO. TO 00071-003, DESCRIPTION TO BOURNS 3067P-1-203.

ITEM 5.4.63, CHANGE PART NO. TO 00071-004, DESCRIPTION TO BOURNS 3068P-1-503.

ADD THE FOLLOWING:

ITEM 11/10657-0/.PLATE, ADAPTOR (NOT ILLUSTRATED)/QTY 1

ITEM 14, CHANGE QTY TO: 8.

ITEM 15/00005-002/.WASHER, EXT TOOTH LOCK, #6. (NOT ILLUSTRATED)/QTY 4

ITEM 20/00025-007/.NUT, HEX, 10-32 (NOT ILLUSTRATED)/QTY 4

ITEM 24/00021-056/.SCREW, BINDING HD, 6-32 x 1-1/2 (NOT ILLUSTRATED)/QTY 4

ITEM 25/00021-086/.SCREW, BINDING HD, 10-32 x 1/4 (NOT ILLUSTRATED)/QTY 4

ITEM 27/00045-008/.SPACER, PLAIN TUBULAR, 1/2 LG (NOT ILLUSTRATED)/QTY 4

ITEM 29/00123-001/.BRAKE, WARNER RF160, 90V COIL (NOT ILLUSTRATED)/QTY 1

(111) REISSUED 9-9-64

ERRATA

SALES ORDER 20362

CAT. NO. 10000-9M TAPE TRANSPORT, SECTION IX, PARTS LIST.

THE STANDARD PARTS LIST IS APPLICABLE WITH THE FOLLOWING EXCEPTIONS:

DELETE ITEM 61.

ADD ITEM 157/ 17-20362/.CATCH, COVER DOOR/QTY: 1

CAT. NO. 10650-1, CAPSTAN SERVO, SECTION IX, PARTS LIST.

THE STANDARD PARTS LIST IS APPLICABLE WITH THE FOLLOWING EXCEPTION:

IN THE NOTE AT THE BEGINNING OF THE LIST PROPER, THE PART NUMBER FOR THE MOUNTING PLATE SHOULD BE: 11-20362-10001-XM.

SECTION 1
DESCRIPTION

A. GENERAL

Datamec D2020 tape units are designed for use in data processing and handling systems to write or read information on magnetic tapes. The D2020 falls into the category generally referred to as "digital" or "data processing system" tape units. They are distinguished from their counterparts, analog tape recorders, primarily by their ability to start and stop tape motion rapidly and by the fact that they store information as discrete characters rather than as continuously varying analog signals.

Generally, the tape unit is controlled by the data handling system in which it is operated.

The Datamec D2020 product line consists of a number of components that may be combined into a variety of configurations to perform specific tasks. Components that make up the D2020 tape unit fall into three general categories:

- (1) Those concerned with physically transporting the tape over the heads;
- (2) Those concerned with causing a record to be written on or read from the tape; and
- (3) Those concerned with control of either or both of the preceding functions.

The principal component of all D2020 Tape Units is the tape transport. A file or reel of tape is affixed to the transport. The transport, under external control, causes the tape to be driven in a forward or reverse direction. The transport also provides a high-speed rewind.

The writing and reading of data is accomplished by magnetic heads over which the tape is driven. Head assemblies that attach to the transport are available in write only, read only, and write and read configurations.

Accessories with which the transport may be equipped include Photosense, for detecting the presence of reflective marker tabs on the tape; File Protect, which prevents inadvertent writing on a reel of tape; and a Transport Cover Door.

Electronic functions associated with writing and reading on the tape are performed by the Data Electronics. The Data Electronics package contains its own power supply and is designed to accept a variety of plug-in units forming systems to read and write records at densities of 200, 556, or 800 bpi. In some systems, a single set of data electronics may be shared by several tape transports. This is accomplished by the Electronic Data Switcher, useable at all densities. In addition, for multi-transport systems, a Control Switcher is available which will switch control signals from one transport to another. This eliminates the need for multiple control lines from the data handling system. When a Control Switcher is used, a special Data Switcher is required. D2020 Tape Units as well as other equipment may be housed in the Datamec Rack Cabinet. In addition to the Rack Cabinet, a Dolly and Blank Filler Panels are available.

Routine maintenance and testing of the Tape Transport is facilitated by using the suitcase-housed D2020 Maintenance Unit.

Manual control functions may be performed by using the D2020 Operator

SERIES

Control Panel. This unit, in addition to providing pushbutton control over the transport, performs certain logic functions associated with detection of the beginning and end of a file. When a Control Switcher is used, a special Operator Control Panel is required.

B. SYSTEM SPECIFICATIONS**NOTE**

THESE PERFORMANCE CHARACTERISTICS WILL BE MET WHEN USING A RECOGNIZED BRAND OF COMPUTER TAPE SUCH AS IBM 351527, AMPEX 832, MEMOREX 22, MMM 498 OR 499.

1. Interchannel Time Displacement Error. Interchannel Time Displacement Error is defined as the time position of one reproduce pulse with respect to the reproduced pulse from any other track, both pulses being recorded concurrently in time.

a. Static ICTDE. Will not exceed the values in table 4-I, System Checkout Section.

b. Dynamic ICTDE. Will not exceed the values in table 4-I, System Checkout Section.

c. Total ICTDE. The total error is the time interval between the reproduced pulse from any channel and the reproduced pulse from any other channel, both pulses having been recorded concurrently, measuring to the far side of the jitter of the pulse from the second channel. It will not exceed the values in table 4-I, System Checkout Section.

2. System Reliability. System reliability includes both data reliability, in terms of drop-outs, or false injected signals due to tape or data electronics defects, and equipment reliability in terms of mean time to failure and preventive maintenance requirements.

a. Tape Life. All figures quoted here pertaining to tape life are for recordings made at a density of 200 bits per inch on 1.5 mil mylar base hard oxide tape, recorded at twice tape saturation.

b. Write Errors. Write errors, detected in a read-after-write mode, with the data electronics threshold set at 40% will not exceed 30 per reel of tape.

c. Read Errors - Long Passes. Not more than one permanent error per 150 reels of tape, with the data electronics detection threshold set at 20%, reading tapes that have no read-after-write errors. A permanent error is one that cannot be cleared after 5 re-reads or by cleaning the read head surface.

d. Read Errors - Short Passes. Not more than one permanent error per 10,000 passes of a ten foot length of tape will occur, with the data electronics set for a 20% threshold when reading a section of tape that has no initial errors as detected in a read-after-write check.

3. Machine Reliability

a. Mean Time to Failure. The mean time to failure shall be in excess of 400 hours, when measured on a group of eight or more machines operating over a period in excess of 1,000 hours average per machine. Operating time is defined as the total time during which power has been applied to the machine.

b. Preventive Maintenance. Average preventive maintenance per machine will not exceed 15 minutes per eight hour shift when such maintenance is accomplished by trained competent service personnel.

4. Environment

a. General. This equipment is designed for operation at sites where it is not subject to shock or vibration, nor to wide temperature ranges.

b. Power. The equipment will meet all specifications when operated on line voltages between 105 and 126v ac, at line frequencies between 58 and 62 cps, or, for 50 cycle units,



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line frequencies between 48 and 52 cps.

NOTE

THE SPEED VARIATION SPECIFICATIONS APPLY ONLY UNDER CONDITIONS OF PRECISE 60 CPS OR 50 CPS LINE FREQUENCY.

c. Temperature. The equipment will operate in ambient temperatures between 55°F and 110°F.

d. Humidity. The equipment will operate at any relative humidity between 20% and 95% RH.

e. Altitude. The equipment will operate at any altitude between sea level and 10,000 feet.

C. TAPE TRANSPORT

1. Description. The D2020 Tape Transport provides a means of moving 1/2 inch-wide magnetic tape on standard 10-1/2 inch diameter reels, bi-directionally, across a magnetic head, at a constant tape speed.

Tape speed acceleration or deceleration is achieved by the movement of a solenoid-actuated pinch-roller which clutches the tape to

one of the two counter-rotating capstans. Tape storage loops are maintained within the vacuum chambers by a step-function reel servo utilizing vacuum switch loop length sensors to control the reel motors.

All tape motion, including the function of high speed rewind, can be remotely controlled. A sensing post is provided for stopping tape motion at a predetermined location.

The components of the Tape Transport are mounted on a rigid aluminum frame attached to the mounting rack by a hinge, enabling the frame to swing out for access to rear components. The primary components mounted on the frame include two reel motor and brake assemblies, two capstans, two pinchroller/actuators, a vacuum unit, a capstan motor, a transport control chassis, eight vacuum switches, a head cover, and two cover plates. A transport cover door, which pivots from the rack hinge block, is also available as an optional accessory.

Tape Transports are available with a standard modification which provides a DC Capstan Servo System. This Servo System replaces the normal Capstan Drive components and provides two selectable speeds at any ratio between 1 and 45 ips.



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2. Specifications**NOTE**

THE FOLLOWING PERFORMANCE CHARACTERISTICS WILL BE MET WHEN USING A RECOGNIZED BRAND OF COMPUTER TAPE SUCH AS IBM 351527, AMPEX 832, MEMOREX 22, MMM 498 OR 499.

Tape Motion. The following specifications apply to units operating at 45 inches per second from a precise 60 CPS (or 50 CPS) line. Variation will occur in both values and tolerances for other tape speeds.

a. Start Characteristics. The tape speed will be within $\pm 10\%$ of normal speed within 5 milliseconds after initiation of a forward or reverse command. Tape travel during that start time period will be 0.080 ± 0.035 , -0.025 inch. The amplitude of the reproduced signals will not vary from the normal amplitude by more than $\pm 20\%$ after 5 millisecond start period.

b. Run Characteristics. Within 35 milliseconds after the initiation of a forward or reverse command, the tape speed will be within $\pm 2\%$ of specified speed, averaged over time intervals as short as 33 milliseconds. When measured over time intervals as

short as 3.0 milliseconds, the average speed will be within $\pm 3\%$ of specified speed.

c. Stop Characteristics. All tape motion will cease within 1.5 milliseconds after a stop command is initiated. No spurious signals will be generated after this time. Tape motion will be 0.045, ± 0.015 inch after the initiation of a stop command.

d. Rewind Time. A full 2,400 foot reel of tape will be rewound within three minutes after the initiation of a rewind command.

e. Actuator Limitations. The tape drive actuation system will accept any sequence of commands separated by at least 5 milliseconds for start and stop commands. It will automatically discriminate against commands that could cause simultaneous drive in both directions.

f. Two-speed Tape Transports. Transports equipped with a DC Capstan Servo System, providing two selectable speeds, are unaffected by power line frequency variations. Two speed ranges are provided, 1



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to 30 ips and 3 to 45 ips. Any two speeds within these ranges are selected by logic level command to the system. The time required for changing speeds depends on the ratio between the two speeds. At the maximum ratio (30:1) approximately 3 seconds are required for acceleration from the low to the high speed. Deceleration from the high to low speed requires approximately 2 seconds.

3. Command Requirements.

Forward or Reverse Drive Command:

-10v dc

Stop Command:

Removal of previously applied drive command

Rewind Command:

-10v dc

Additional Commands required for two-speed Transports with DC Capstan Servo System:

Low Speed: 0v dc

High Speed: -10v dc

4. Reel Servo Restrictions.

No combination of tape motion commands over the entire range of permissible line variations and environment conditions, will cause a malfunction in the tape supply or takeup system due to servo limitations.

5. Power Requirements.

The Tape Transport requires 117 vac power. Current requirements are:

Standby: 4-1/2 amperes.

Run: 6-3/4 amperes average 8 amperes peak.

D. HEAD ASSEMBLIES

1. General. Standard heads are 1/2" 7 track, with track widths and track-to-track spacings conforming to IBM tape format specifications. The heads have a smooth all metal surface in contact with the tape. The heads and the vacuum cleaning tape guides are mounted on a base which fits onto the transport. The same head is used for both 200 and 556 bpi tape formats. The head for 800 bpi format may also be used for 556 and 200 bpi formats.



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- a. Track Width:
 - i. Read Only Assembly:
0.030 ± 0.001
 - ii. Write Only Head Assembly:
0.048 ± 0.001
 - iii. Write-Read Head Assembly:

Write track, 0.048 ;
read track 0.030 . The
spacing from the Write
to read gaps is 0.300
± 0.005 . The tape
transport start and stop

distances and tolerances
combined with this write-
to-read head gap spacing
permits read-after-write
checking with inter-
record gaps as short as
0.450 .
 - iv. Write-Read Head Assembly
with Erase Head (for 800
bpi):

Write and Read trackwidths
and gap spacing same as
(iii). The erase head gap,
placed ahead of the write
gap, erases the full width
of the tape (.500).



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b. Track Location. The track locations are referenced to the top edge of the tape. The center line of the first track is 0.040 ± 0.0025 inch from the top edge of the tape. Succeeding tracks are centered at 0.070 inch increments, with the tolerance for each track with reference to the top edge of the tape held to ± 0.0025 inch. The Write Only Head has a track width of 0.048 inch. The Read Only Head has a track width of 0.030 inch.

E. FILE PROTECT

The File Protect unit senses the presence or absence of a Write Enable Ring on a reel of tape. Sensing is accomplished by means of a pin which protrudes through the main frame of the Tape Transport adjacent to the supply reel turntable. Presence of a ring depresses the pin and causes it to be retracted by a solenoid during operation. This action also closes a relay, which completes a circuit in the Data Electronics and provides external indication of status. Thus, with a Write Enable Ring installed on a reel, the file is unprotected and the Write function is enabled. Protection of the file is accomplished by removing the ring.

F. PHOTOSENSE

1. Description. The Datamec Photosense is used to detect the presence of reflective tabs which are applied to the back side of the tape. It is a two-channel device capable of detecting tabs placed adjacent to the outer or inner edge of the tape.

The Photosense consists of a dual head assembly with attached cable and a dual amplifier assembly. The head is mounted to the transport main frame adjacent to the reverse capstan. The amplifier is mounted on the rear of the transport main

frame between the capstan and takeup motors. The Photosense amplifier derives its power from the transport power supply. Two outputs are provided. One indicates the presence of a tab adjacent to the outer edge of the tape and is usually referred to as the "Load Point" tab; the second indicates the presence of the inner or "End of File" tab. These outputs are available for use with external equipment through the transport connector.

2. Specifications.

Output: Both channels,
+9v dc 100 ohm
source

Maximum
Recommended
Load Current: 25 milliamps

Power Required: +10v dc, 6.3v ac

Head to Tape
Spacing: 1/8th inch
minimum
3/16th inch
maximum

Photosense Head
to Read Head
Distance on
Datamec Transport: 2 inches

G. OPERATOR CONTROL PANEL

1. General. The Datamec Operator Control Panel provides means for manually performing all control functions necessary in the normal operation of a tape unit. In addition, it provides visual indication of tape unit status and performs certain logic functions with respect to the beginning and end of tape.

The Operator Control Panel is customarily mounted directly above the tape transport and is styled and



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proportioned to match the Transport Cover Door. The front panel contains indicating pushbutton switches, illuminated indicators, and provision for a back-lighted numeral. The LOCAL and AUTO pushbuttons are used to transfer control of the tape unit between the Operator Control Panel and the data processing system. When in Local status, the LOAD POINT pushbutton will cause tape to be driven forward until a "Load Point" tab is detected by the Photosense. When the transport is equipped with File Protect, the WRITE ENABLED indicator will be illuminated when the transport is operating with a reel on which a Write Enable Ring has been installed

The Dual Density Operator Control Panel also has a pair of pushbuttons for selecting high or low density operation.

The Triple Density Operator Control Panel has a translucent backlit switch wheel for selecting "200-", "556-" or "800-Density" operation.

Access to switches and lamps is provided by a hinged front panel

Primary power for the complete tape unit is brought in through the Operator Control Panel. Other receptacles on the rear of the chassis provide connection to the Tape Transport, data electronics, and the data processing system. Power for operation of the Operator Control Panel is provided by the tape transport power supplies. All control signals and status indications between the transport and the data processing system are channeled through the Operator Control Panel.

2. Specifications

Size (HW): 5 1/4 inches
 19 inches

Front Extension
from Mounting
Rail: 2 7/8 inches

Depth Behind
Mounting Rail: 6 3/4 inches
 (9 1/2 inches
 total required
 to clear mat-
 ing connectors)

Weight: 8 lbs. uncrated

Power Require-
ments: -24v dc, 200
 milliamps max-
 imum. +10v dc
 20 milliamps
 maximum. 6.3v
 ac, 2 amps
 maximum

Status Indica-
tion Provided at
J2 (Control)
Receptacle: Auto, Local,
 Photosense
 signals, Main-
 tained Tape End
 Warning, Rewind,
 Write Enabled,
 unit numbers 1
 through 4;
 High or Low on
 Dual Density
 model; 200,
 556 or 800 on
 Triple Density
 model.

Note: For input command requirements see Sec. 1-C3.

H. RACK CABINET

1. General. A 24 x 26 x 66-1/4 inch enclosed rack cabinet with a louvered rear access door and removable wiring access panel, is available for installation of the D2020 Tape Transport and its allied components. The heavy 2 x 2 inch structural angle



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rails that form the rack's mounting surface permit swinging out of the transport for inspection and maintenance. The mounting surface has standard Western Electric spacing #10-32 tapped holes and accomodates 19 inch wide panels over a 61-1/4 inch panel surface.

2. Specifications

Size (HWD) 66-1/4 x 24 x 26 inches.

Weight: 125 lbs.

I. DOLLY

1. General. A heavy duty Dolly is available for mounting the D2020 Rack Cabinet.

2. Specifications (see Fig. 2-1 for mounting details).

Size (HWD): 4 1/2 x 24 x 36

Weight: 40 lbs.

Undercarriage

Clearance: 2 inches

Rack base to

floor: 4 1/2 inches

Special Features: 10 inch front extension of Dolly platform, 3 inch diameter, 7/8 inch wide rubber wheel, ball bearing casters.

J. FILLER PANELS

1. General. Formed steel filler/cover panels in most standard heights are available for mounting in the D2020 Rack Cabinet.

K. MAINTENANCE UNIT

The D2020 Maintenance Unit is a packaged test unit designed to provide operating signals and test circuits for testing the various modes of operation of a D2020 Transport. The unit is assembled in a carrying case with all inter-connecting cables.

The Maintenance Unit has two functions. The first is to test the Transport without an Operator Control Panel when tape is loaded on the machine. In this mode of operation the Maintenance Unit connector P1 is connected to P1 of the transport control chassis. When this connection has been made and tape is loaded on the machine, the Maintenance Unit provides the following functions:

- (1) Forward, Reverse and Rewind commands.
- (2) Simultaneous inputs to the actuator drive circuits for the purpose of checking the actuator interlock.
- (3) Monitoring of vacuum during normal and rewind operation.
- (4) Tests the servo under worst case conditions.
- (5) Checks leader sense post connections.
- (6) Checks the write enable and rewind status lines.
- (7) Checks Photosense outputs.
- (8) Checks the interlock between the actuator drive circuitry and the rewind circuitry.

The second operation condition is without Operator Control Panel and without tape. In this mode of operation P1 of the Maintenance Unit is



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connected to P1 of the transport control chassis and P2 of the Maintenance Unit is connected to dummy plug receptacle J5 of the transport control chassis. Under these conditions, the Maintenance Unit provides all of the features listed above except the servo test. In addition to the above tests, the Maintenance Unit will also provide a test of the reel motor SCR circuitry.

The D2020 Maintenance Unit is furnished with a complete set of operating instructions. It is housed in a carrying case approximately 18 x 12 x 4-3/4 inches. The weight is approximately 10 lbs.

L. DATA ELECTRONICS

1. Type of Data Recording.

D2020 Tape Units use NRZ recording (compatible with all IBM 727 and 729 series Tape Units at 200, 556 or 800 bits per inch recording densities). In the Write mode, current flows through the heads continuously in one direction or the other, magnetizing the tape to saturation. A bit (logic "one") is recorded on the tape by reversing the direction of the head current. In the Read mode the points of flux reversal induce current pulses in the read head; the presence or absence of a pulse indicates a logical "one" or "zero," respectively.

2. Low Density, Dual Density and Triple Density Data Electronics.

The D2020 Low Density, Dual Density and Triple Density Electronics present identical input, output, and control lines to the data processing system. Triple Density systems operate at 36.0, 25.0 or 9.0 Kc rates for a tape speed of 45 ips. Dual Density systems operate at 25.0 or 9.0 Kc rate, and Low Density systems operate at a 9.0 Kc rate. Internally, the Triple Density and Dual Density Electronics have three functional capabilities not provided in the Low Density Electronics.

(a) The seven Write Cards have individual, manually adjusted delay circuits for write static skew compensation.

(b) The seven Read Cards have high-pass amplifiers (differentiators) ahead of the detectors. Detection takes place on the pulse peaks, reducing pulse time displacement due to tape signal amplitude variations.

(c) The seven Read Cards also have individual, manually adjusted delay circuits for read static skew compensation.

3. Data Inputs and Outputs.

The D2020 Data Electronics provide seven data channel inputs, plus one optional clock input, and seven data channel outputs, plus one optional clock output.

For systems using NRZ level-change logic, the D2020 Data Electronics are available to accept seven channel NRZ data as the Tape Unit input, and to provide seven channel NRZ, detected and clocked data as the Tape Unit output.

The D2020 Data Electronics can also be furnished to accept seven channels of sustained level logic and a clock pulse (such as is used in IBM systems) and provide level and clock output. Systems are also available wherein write inputs accept NRZ, and the read outputs provide clocked level or the converse.

All data control inputs accept any level between 3 and 15v into 2.2 K ohms. All data and control outputs are 10v with a source impedance of 470 ohms. Inputs and outputs are available for either positive or negative logic.



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4. Power Supply. The Data Electronics Power Supply provides regulated $\pm 10v$ to the read and/or write electronics. The regulator circuit is designed to limit current at 2 amperes. In the event of a short circuit or other overload, the regulator circuit will turn off and must be manually reset. Two lights on each Regulator Card indicate that power is present.

5. Physical Description. The Data Electronics package accomodates seven channels of read and seven channels of write amplifier cards. Space is also provided for read and write regulator cards and read and write control cards. The package mounts in a standard 19" rack, occupies 5-1/4" of rack space, and is 15" deep.

The Data Electronics package is designed to operate from single phase 105-126v, 48-62 cycle power. AC power is supplied from a receptacle on the D2020 Operator Control Panel. The package weighs approximately 35 lbs., including power supply.

6. Low Density Write and Write Control. The Low Density Write Card is designed to accept information at a maximum transfer rate of 9 kc. Input impedance is approximately 2.2K; the input signal must be between 3 and 15v. Either positive or negative polarity signals of an NRZ or clocked level nature are acceptable. Test points are available for monitoring input, intermediate, and output signals.

The Write Control Card is designed to provide logic signals for up to seven Low Density Write Cards. Input signals to the Write Control Card can be of either polarity with a level between 3 and 15v. Input impedance is 2.2K. The write permit line controls the power to the head

driving circuits. The write reset resets all of the Write Cards to the same output state. The write clock pulse in the clocked level system controls the time when signals are recorded on the tape. The internal strobe pulse is generated from the trailing edge of the clock signal to compensate for any random input variations. In the NRZ mode of operation, tape signals are written in the same manner as the input signal to the individual write channels.

7. Dual Density Write and Write Control. The Dual Density Write card is identical in all respects to the Low Density Write card except that it will handle transfer rates of up to 25 Kc (556 bpi at 45 ips). Each Write Card also has a manually adjustable delay circuit for write static skew compensation.

The Dual Density Write Control Card is identical to the Low Density Control Card.

8. Triple Density Write and Write Control. The Triple Density Write card is functionally identical to the Dual Density Write Card. It accomodates transfer rates of up to 36 Kc (800 bpi at 45 ips) and provides a manually adjustable head current balance circuit for adjustment of written pulse symmetry.

The Triple Density Write Control card is functionally identical to the Low/Dual Density Write Control card.

9. Low Density Read and Read Control. The Low Density Read Card accepts the signals from the tape head and amplifies and transfers these signals into either NRZ or clocked level format. Two registers (input and output) are provided for buffer storage of signals. The output is either plus or minus 10 volts at 470 Ohms impedance; optionally, the output may also be clamped to any level from 0 to 10 volts. The Read



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card reshapes the information from the tape head by means of a level-sensing circuit.

The Read Control card senses the states of the input registers of all Read cards, and determines by means of a gate the time at which information-transfer from input to output registers occurs. Transfer is accomplished by a Strobe pulse, coincident with which an output Clock pulse (plus or minus 10 volts at 470 Ohms impedance) is generated. The Read Control card also contains provisions for clamping all input and output registers in the reset state, in response to an external Reset command; Strobe and Clock pulses are inhibited during Read Reset.

10. Dual Density Read and Read Control. The Dual Density Read Card is similar to the Low Density Card. The Dual Density Read Card, however, uses peak detection for both high and low density. Further, an adjustable skew compensation circuit is included.

The Dual Density Read Control Card is similar to the Low Density Read Control Card, except that it has two adjustable gate delays, selected by the density control line.

11. Triple Density Read and Read Control. The Triple Density Read Card is similar to the Dual Density Read card, with higher gain preamplifier-detector, and faster registers and gates to provide a transfer rate capability greater than 36 Kc.

The Triple Density Read Control card is functionally the same as the

Dual Density Read Control card, except that three adjustable gate delays are provided, selectable by the density control line.

12. Power Supply. The main portion of the Power Supply, composed of two transformers, four capacitors and silicon diode bridge rectifiers, is located on the rear of the Card Cage. It supplies filtered dc to the Regulator Cards.

13. Regulator Card. The Regulator Card is the same size as the Data Electronics Cards and contains components necessary to regulate the dc from the main Power Supply. Each Regulator Card contains two 10v, 2 ampere Regulators, one of which is plus and the other minus. Above 2 amperes, the power supply automatically limits and shuts off. A manual reset switch is provided to reset the power supply. Two lights indicate operation of the Regulator.

14. Data Electronics Card Cage. The Data Electronics Card Cage is the main support frame for the Data Electronics. It mounts in a standard 19" rack and has a total overall height of 5-1/4 inches. The depth, including the main Power Supply is 15 inches. The Card Cage contains the main connector board into which the Data Electronic Cards and Regulator Cards plug, and the necessary input and output connectors for signals and control.

15. Power Requirements. The Data Electronics draw 1/2 ampere at 117 vac.



SECTION II
INSTALLATION

A. INSTALLATION OF CABINET MOUNTED
D2020 TAPE UNIT.

1. Selection of Location. The D2020 is designed for operation at sites that are not subject to shock, vibration, or wide ranges of ambient temperatures. The unit should be

located so as to provide access to both front and rear of the cabinet. Mounting dimensions and clearances are shown in Fig. 2-1.

Ventilation is provided by louvers at the top and bottom of the rear door. No forced air cooling is

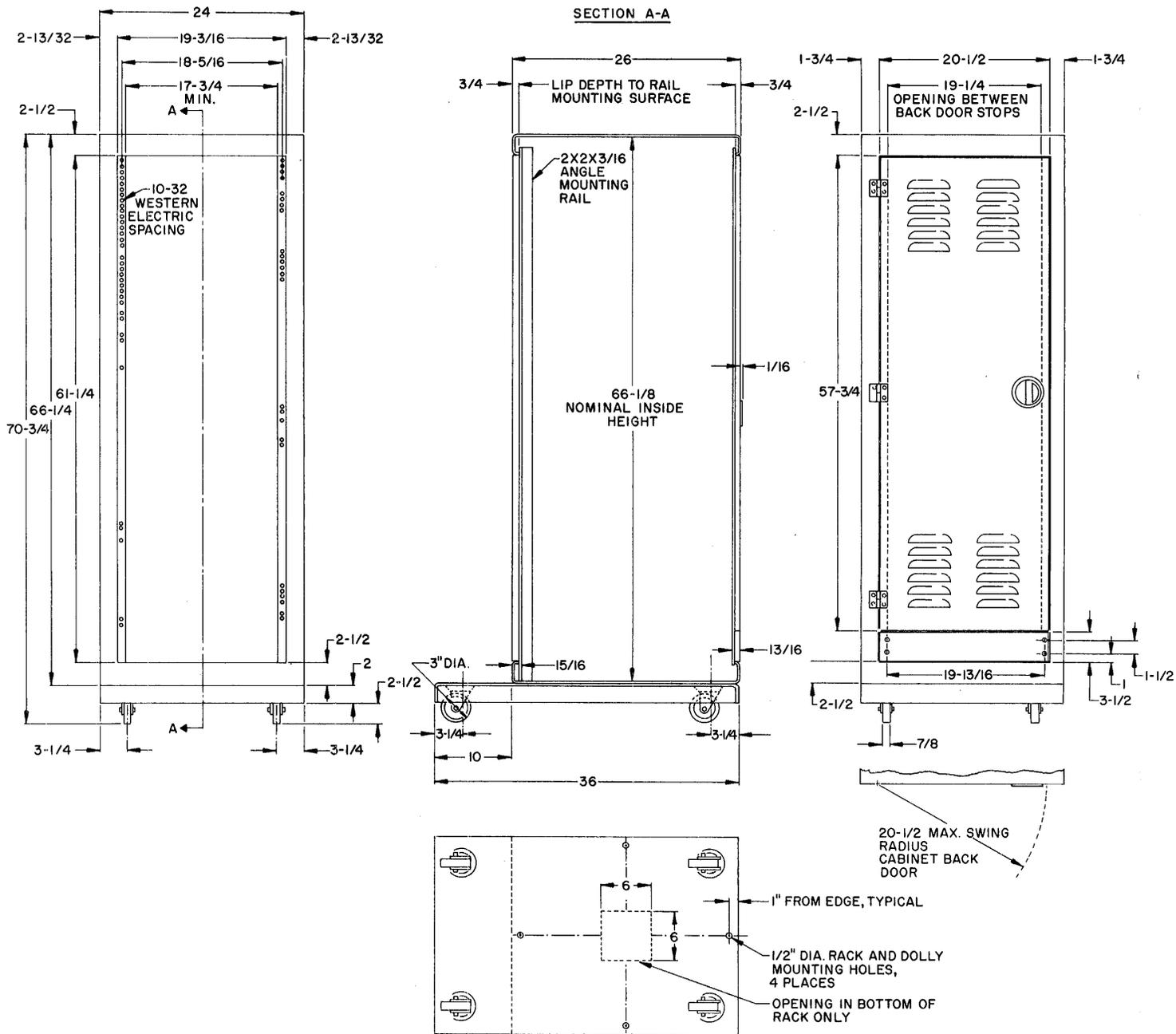


Figure 2-1
Rack and Dolly Dimensions

required in installations where the ambient temperature outside the cabinet does not exceed 90°F and no heat generating equipment (other than the Datamec Tape Unit) is housed in the cabinet. For installations that do not conform to the above requirements, consult the factory. In general, the in-cabinet air temperature should be maintained between +55°F and +110°F. The D2020 is designed to operate at relative humidities in the range between 20% and 95%, although a range of 40% to 60% is recommended. Operation at any altitude from sea level to 10,000 feet is permissible. Insofar as possible, the location should be free of excessive dirt and dust, corrosive fumes or vapors, and strong magnetic fields.

In permanent installations (where the Rack Dolly is not used), it is recommended that the cabinet be bolted to the floor to eliminate any danger of the cabinet tipping over when the transport is swung out.

2. Wiring. Wiring to and from the D2020 may be brought in through the wiring access panel below the rear door, or through the access hole in the bottom of the cabinet. The wiring access panel may be removed from the cabinet and punched to accommodate fittings or grommets suitable to the particular installation.

Primary power is supplied to the tape unit through receptacle J4 at the rear of the Operator Control Panel chassis. A ten foot power cable is supplied with the equipment. However, any standard 3 pin "U" ground connector which will fit in the 1 1/4" diameter recessed housing may be used.

CAUTION

BE SURE THAT THE HOT AND NEUTRAL SIDES OF THE POWER LINE ARE CONNECTED TO THE PROPER PINS OF J4 AS SHOWN IN FIG. 2-2.

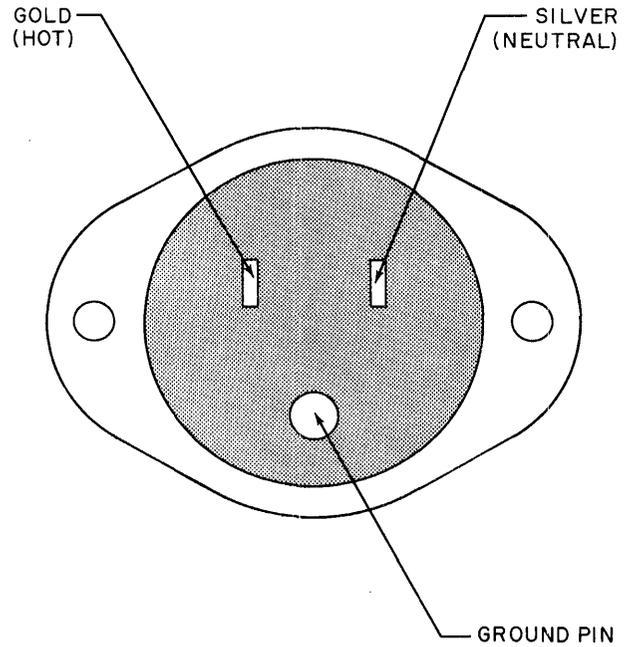


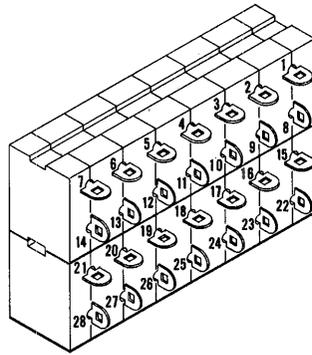
Figure 2-2
Power Line Connections

Control connections are made at J2 on the rear of the Operator Control Panel. The mating connector is supplied and should be wired according to Fig. 2-3. Input and output data signals are connected through receptacles J6 and J7 on the rear of the data electronics Power Supply, and mating connector wiring as shown in Fig. 2-4 and 2-5.

NOTE

CONNECTOR WIRING CHARTS IN THIS MANUAL ALWAYS SHOW THE SOLDER LUG VIEW OF THE MATING CONNECTOR FOR A PARTICULAR UNIT, NOT THE CONNECTOR ON THE UNIT ITSELF. FOR EXAMPLE FIG. 2-3 SHOWS THE CONNECTOR THAT MUST BE WIRED UP TO CONNECT TO J2 ON THE OPERATOR CONTROL PANEL. SINCE THERE ARE NO PIN NUMBERS ON THE CONNECTOR BODY, IT IS IMPORTANT TO BE SURE THAT THE CONNECTOR IS ORIENTED AND WIRED AS SHOWN ON THE CHART.

Fig. 2-6 shows the system cabling and the relative location of the various connectors.

INSTALLATION


CONTROL CONNECTOR - ELCO RF22824
Connects to J2 on Operator Control Panel

PIN NO	FUNCTION	APPROX. MAXIMUM CURRENT & VOLTAGE		*AWG
1	COMMON	1 amp		18
2	"AUTO" STATUS	Note 1		22
3	"AUTO-LOCAL" STATUS COMMON	Note 1		22
4	"LOCAL" STATUS	Note 1		22
5	UNIT NUMERAL LIGHT	0.8 amp	6.3 V.A.C.	18
6	"END OF TAPE" STATUS	Note 1		22
7	"LOAD POINT" PHOTONSENSE	25ma	10v	22
8	"END OF TAPE" PHOTONSENSE	25ma	10v	22
9	"REWIND" STATUS	Note 1		22
10	"REWIND" STATUS	Note 1		22
11	"WRITE ENABLED" STATUS	Note 1		22
12	"WRITE ENABLED" STATUS	Note 1		22
13	FORWARD	10ma	10v	22
14	REVERSE	10ma	10v	22
15	REWIND	5ma	10v	22
16	"END OF TAPE" STATUS	Note 1		22
17	NUMERAL LIGHT COMMON	1 amp		18
18	GROUND			22
19	UNLOAD	5ma	10v	22
20	UNIT NUMBER COMMON	Note 1		22
21	UNIT NUMBER 1	Note 1		22
22	UNIT NUMBER 2	Note 1		22
23	UNIT NUMBER 3	Note 1		22
24	UNIT NUMBER 4	Note 1		22
25	"LOW (200) DENSITY" STATUS	Note 1		22
26	"DENSITY" STATUS COMMON	Note 1		22
**	27	"HIGH (556) DENSITY" STATUS	Note 1	22
***	28	"800 DENSITY" STATUS	NOTE 1	22

Note 1: Status line current and voltage are determined by their usage on connected equipment. 1 Amp, 115 Vac Max.

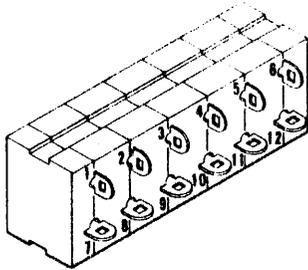
*Recommended wire gauge for runs of 25 feet or less.

** This connection on Dual Density and Triple Density Models only.

*** This connection on Triple Density Models only.

FIGURE 2-3
CONTROL CONNECTIONS FOR
OPERATOR CONTROL PANEL

INSTALLATION

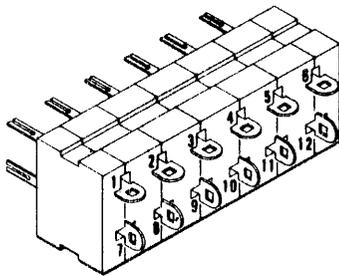


**FIGURE 2-4
INPUT CONNECTIONS**

**DATA ELECTRONICS WRITE INPUT - ELCO RF11224
CONNECTS TO J6 ON DATA ELECTRONICS**

PIN NO	FUNCTION	APPROX. MAXIMUM CURRENT & VOLTAGE		*AWG
1	TRACK 1 WRITE	10ma	15v	22
2	TRACK 2 WRITE	10ma	15v	22
3	TRACK 3 WRITE	10ma	15v	22
4	TRACK 4 WRITE	10ma	15v	22
5	TRACK 5 WRITE	10ma	15v	22
6	TRACK 6 WRITE	10ma	15v	22
7	TRACK 7 WRITE	10ma	15v	22
8	WRITE RESET	10ma	15v	22
9	WRITE CLOCK	10ma	15v	22
10	WRITE PERMIT	10ma	15v	22
11	NC			
12	COMMON	100ma	-	18

*Recommended wire gauge for runs of 25 feet or less.



**FIGURE 2-5
OUTPUT CONNECTIONS**

**DATA ELECTRONICS READ OUTPUT - ELCO RM11224
CONNECTS TO J7 ON DATA ELECTRONICS**

PIN NO	FUNCTION	APPROX. MAXIMUM CURRENT & VOLTAGE		*AWG
1	TRACK 1 READ	10ma	10v	22
2	TRACK 2 READ	10ma	10v	22
3	TRACK 3 READ	10ma	10v	22
4	TRACK 4 READ	10ma	10v	22
5	TRACK 5 READ	10ma	10v	22
6	TRACK 6 READ	10ma	10v	22
7	TRACK 7 READ	10ma	10v	22
8	READ RESET	10ma	10v	22
9	READ CLOCK	10ma	10v	22
10	NC			
11	NC			
12	COMMON	100ma	-	18

*Recommended wire gauge for runs of 25 feet or less.

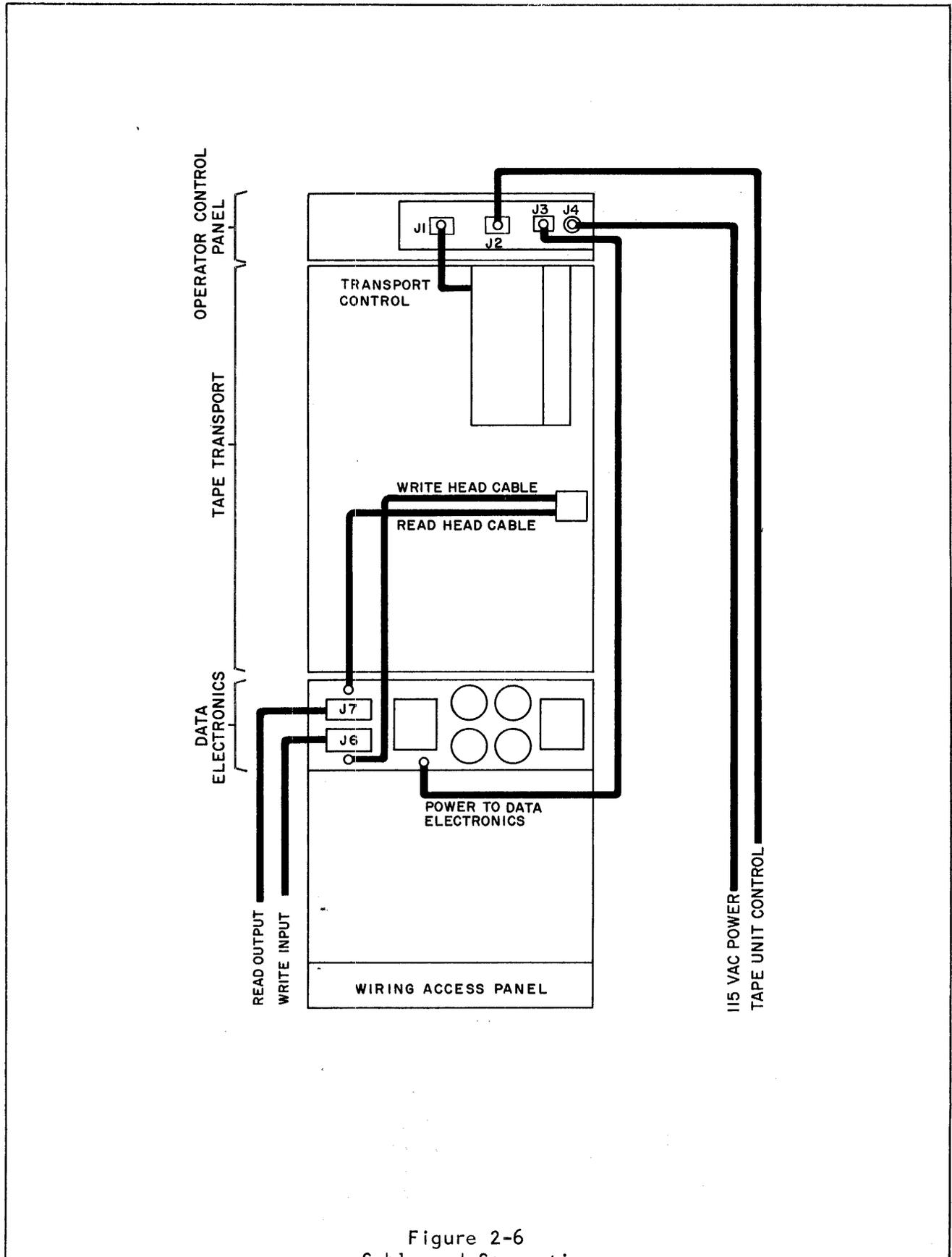


Figure 2-6
Cable and Connection
Location Diagram

B. CUSTOM INSTALLATION

1. Selection of Location. See part A-1 of this section regarding suitable location and environment.

2. Tape Transport

a. Mounting Considerations.

The D2020 Tape Transport should be mounted in a ruggedly constructed rack if the unit is to be pivoted out from the mounting rail for maintenance. The mounting rails of the rack and auxiliary bracing of the side panels should be sufficiently strong to resist the heavy bending moment produced by the transport when it is swung out. The direction of the moment load on the right hand mounting rail, which contains the tape transport hinge block, changes as the transport is swung out. The rail should, therefore, be rugged enough to resist this moment through an angular change of at least 90°.

Most industrial racks are not designed to take this hinge moment loading without additional bracing. In such cases the transport may be secured permanently to the rack rails and access provided through the side or rear of the enclosure.

b. Mounting the Tape Transport to the Rack.

Step 1: Remove the hardware bag from the packing crate and identify the following:

1. Upper rack mounting block with 3° tapered base. Datamec part number 10217-1.
2. Lower rack mounting block without tapered base. Datamec part number 10217-0.
3. Two threaded hinge pivot pins 1/4 dia. x 1-3/4 lg. Datamec part number 10211-0.
4. Plastic shim washers 1/4 ID x 1/2 OD in assorted thicknesses.

5. Four 10-32 x 7/8 cap head screws.

6. Two 10-32 x 3/4 cap head screws.

7. Six 10 spring lock washers.

Step 2: Secure the rack mounting blocks to the rail with proper spacing as indicated in Fig. 2-7, using 10-32 x 7/8 cap head screws and lock washers. The tapered rack mounting block should be mounted to the upper right hand mounting rail and oriented with the groove out. It is important to keep in mind that the centerline referred to in Fig. 2-7 is located midway between the 1/2" spaced holes on the rack rails. Clearance should be allowed above the Transport if a control panel is to be mounted in this position.

Step 3: Center a 1/16 thick plastic washer over the pivot hole on the top edge of the lower rack mounting block.

CAUTION

THE TAPE TRANSPORT WEIGHS APPROXIMATELY 130 LBS. IT IS SUGGESTED THAT AT LEAST TWO MEN LIFT AND POSITION THE TRANSPORT WHILE A THIRD MAN SECURES THE MOUNTING HARDWARE.

Step 4: Remove the transport from the packing crate and position it so the 1/4 hole in the transport hinge block is over the plastic washer. Hold the transport vertically and insert a pivot pin (threaded end first) from the under side of the lower rack mounting block until the threads pass through the plastic washer and engage the tapped hole in the transport hinge block.



INSTALLATION

Partially secure the pin by screwing it several turns into the transport block.

Step 5: With the transport supported vertically, insert sufficient plastic washers between the upper rack block and the transport hinge block to fill the gap. Insert a second pivot pin and turn it until it engages and bottoms in the tapped hole.

Step 6: Check the left hand edge of the Transport to see that the two mounting holes align with the rail holes. If necessary, loosen the hinge blocks and move the entire assembly to gain alignment. The transport should pivot smoothly without binding and return to proper alignment with the left rail holes. Re-adjust if necessary.

Step 7: Fasten the left side of the Transport to the rack using two 10-32 x 3/4 cap head screws and lock washers.

WARNING

IF THE RACK IS NOT SECURED TO THE FLOOR, OR IS MOUNTED ON A DOLLY, THE DISTANCE THE TRANSPORT CAN SWING OUT WITHOUT TIPPING OVER THE RACK SHOULD BE CHECKED. IF NECESSARY TRAVEL SHOULD BE RESTRICTED BY USE OF A CHAIN OR OTHER DEVICE.

3. Operator Control Panel. The Operator Control Panel is designed to be mounted directly above the D2020 Tape Transport. However, it may be mounted anywhere in a standard 19" rack, if sufficient cable length to the Transport is provided. Since the front of the Operator Control Panel swings up, it is important to provide the necessary clearance directly above. The required clearances are shown in Fig. 2-7.

To mount the Operator Control Panel in the rack, position the unit in the location desired and swing up the front cover to gain access to the rack mounting screw holes. Align the panel holes with the rack holes and secure in place with the four 10-32 x 3/4 machine screws provided.

4. Data Electronics

a. General. The Data Electronics package consists of a Card Cage and Power Supply which are normally joined at the factory and shipped as a single unit. Circuit cards may be shipped installed in the card cage. In addition, a kit of hardware is provided for use in mounting the package and installing the head cables on the Transport. Mating connectors for data input and output receptacles are also provided.

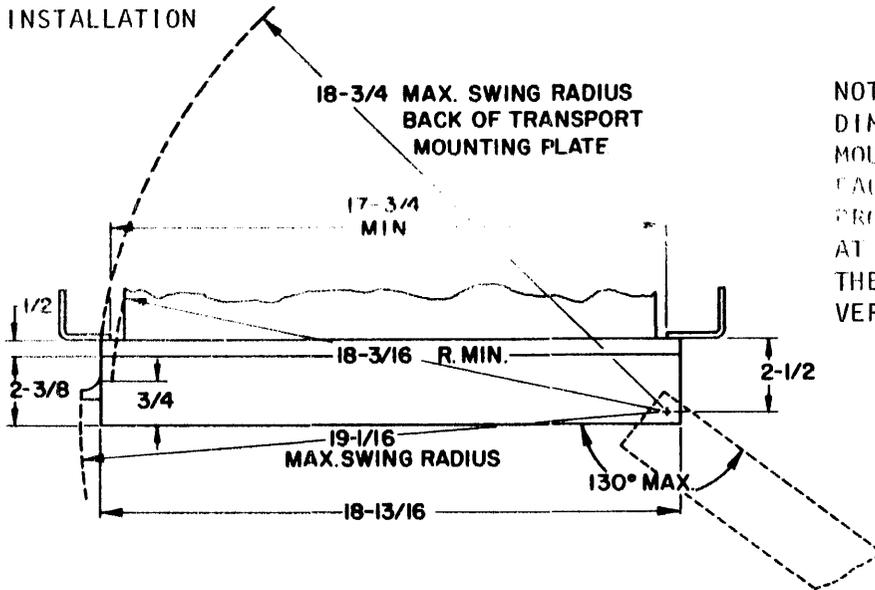
The Data Electronics package is usually installed directly below the Tape Transport. However, it may be installed at any location so long as the head cables which are permanently attached to the chassis will reach to the Tape Transport. The standard location and mounting dimensions are shown in Fig. 2-7.

While it is not absolutely necessary, it is recommended that all of the circuit cards be removed from the card cage during installation. Record read and write card serial numbers as they are removed so they may be returned to the same position (see Fig. 2-9).

b. Installation Procedure

Step 1: Position the Data Electronics in the rack so that the four slots on each mounting flange line up with holes in the rack rails.

INSTALLATION



NOTE: TRANSPORT HEIGHT DIMENSION SHOWN IS ACTUAL. MOUNTING HOLES FOR THE FACE HINGE ARE LOCATED TO PROVIDE CLEARANCE OF 1/32" AT THE TOP AND 3/32" AT THE BOTTOM WITHIN A 31-1/2" VERTICAL SPACE.

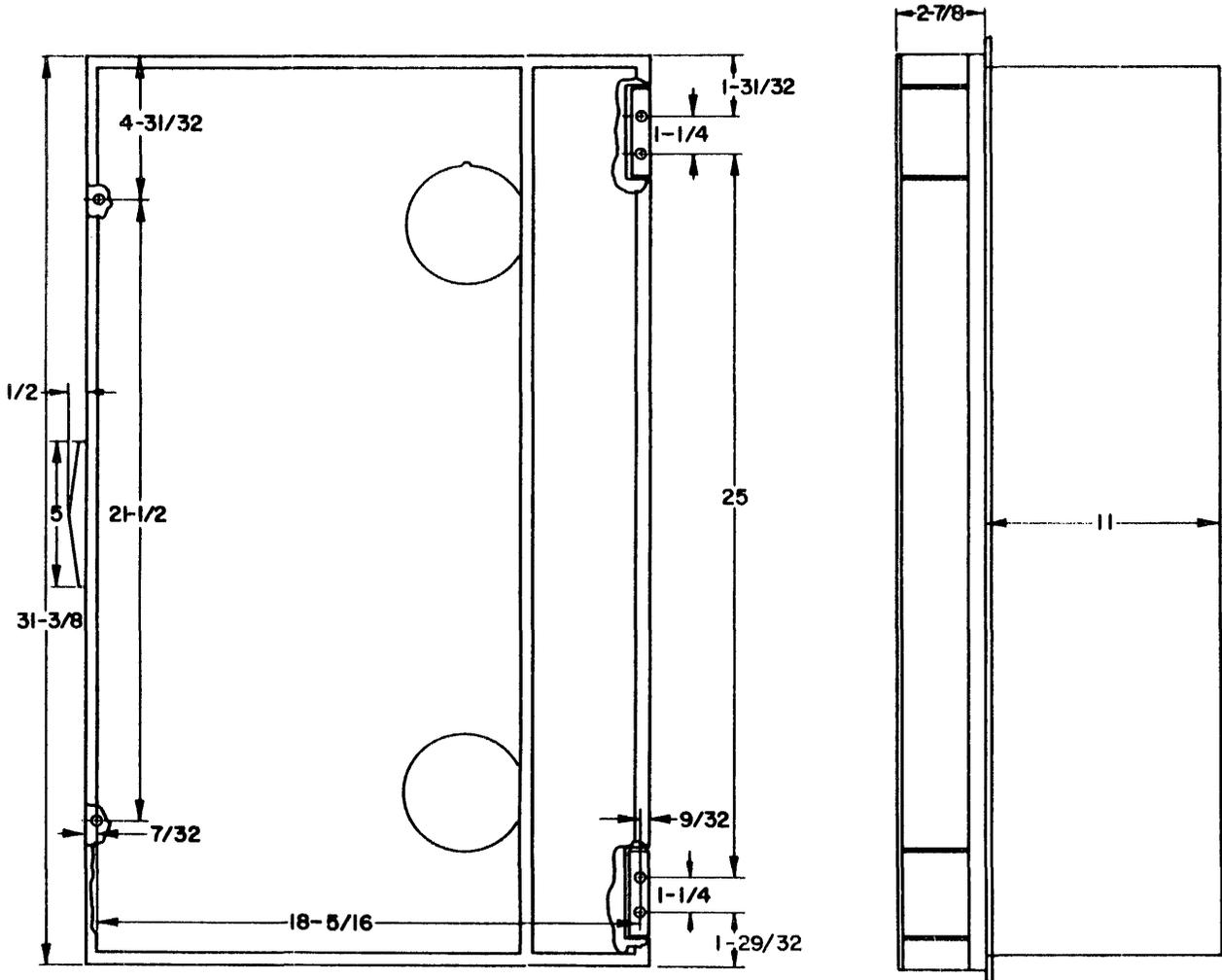


Figure 2-7
Mounting Dimensions (Sheet 1)

INSTALLATION

NOTE: VERTICAL DIMENSIONS OF UNITS SHOWN ARE NOMINAL AND ALLOW 1/64" CLEARANCE TOP AND BOTTOM.

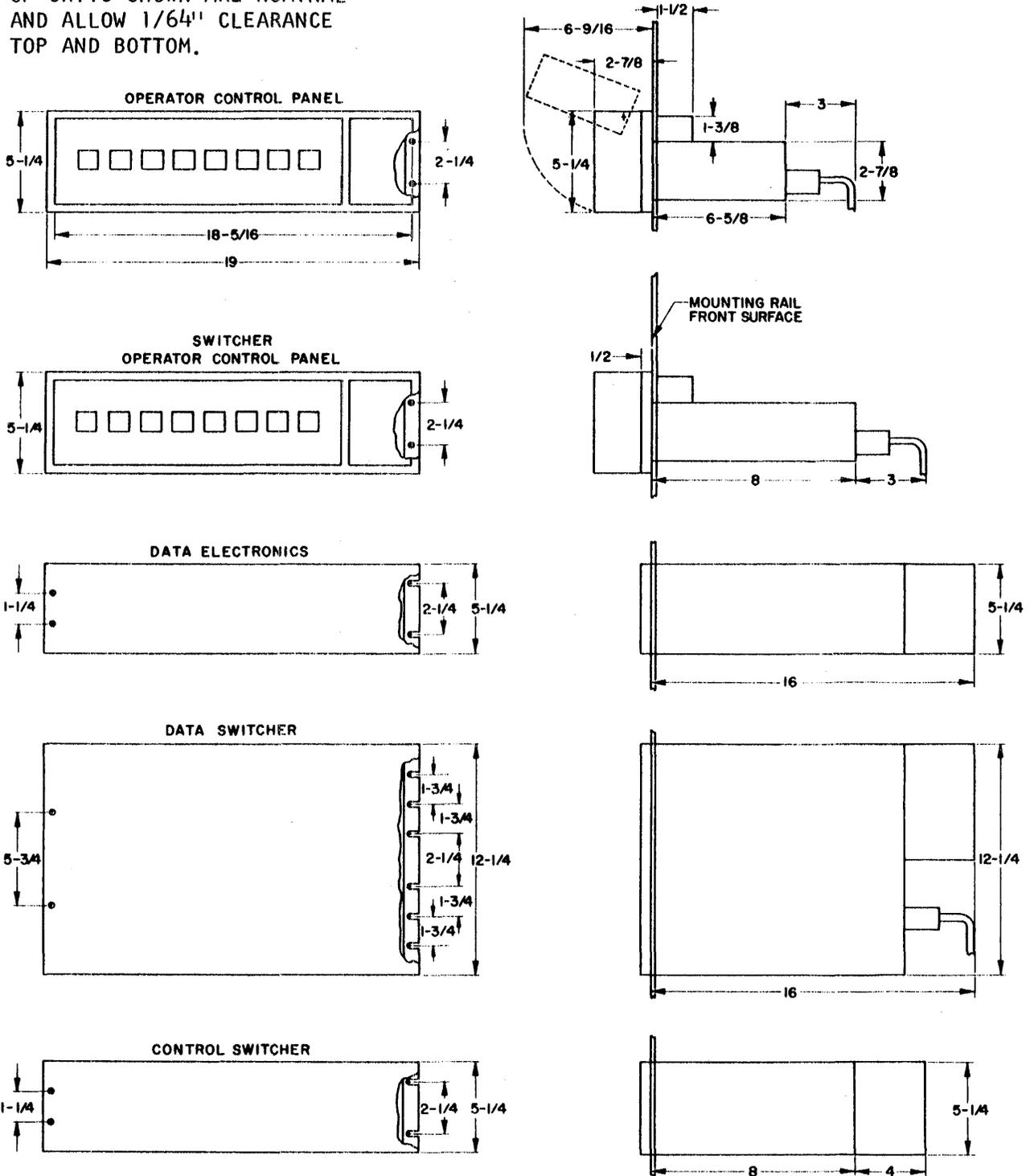


Figure 2-7
Mounting Dimensions (Sheet 2)



INSTALLATION

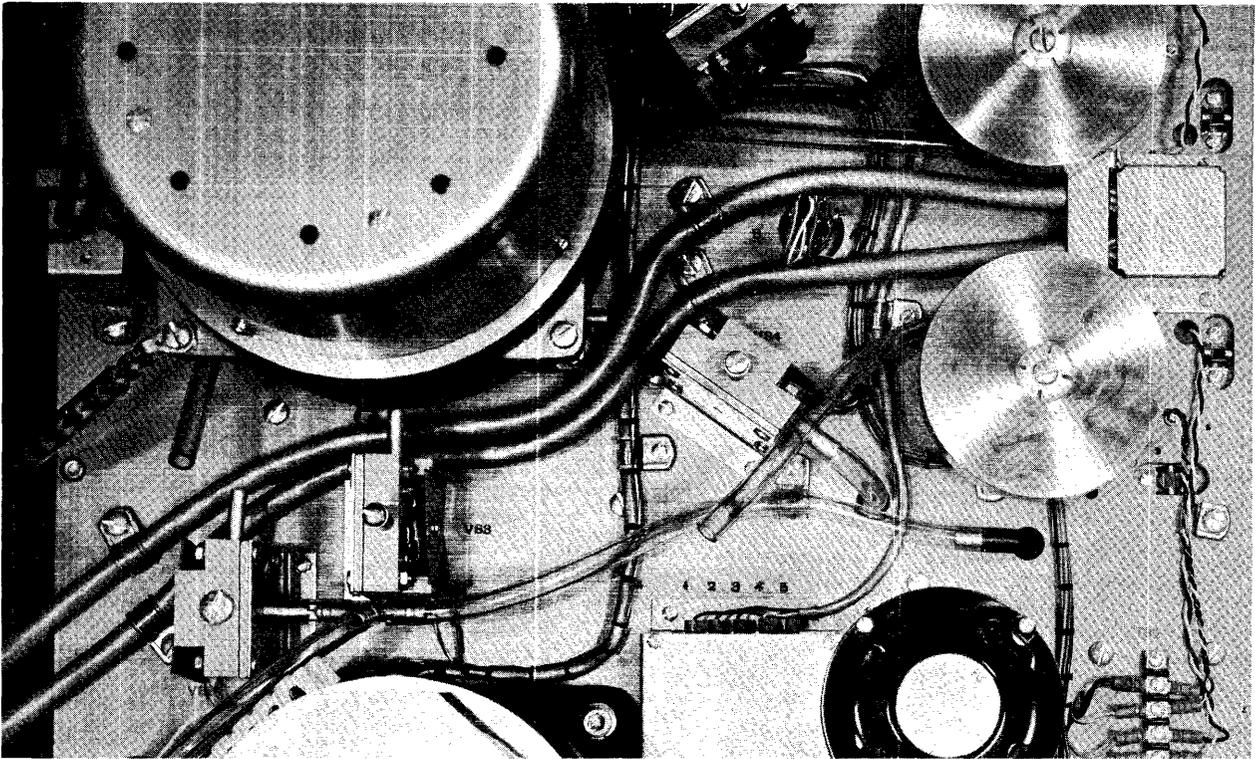


Figure 2-8
Head Cable Installation

Step 2: Fasten the unit to the rack using four 10-32 x 1/2 screws, lock washers, and flat washers. Be sure to use the outer holes, as shown in Fig. 2-7 (inner holes are used for mounting the cover).

Step 3: Referring to Fig. 2-8, prepare the Tape Transport for head cable installation as follows:

1. Remove the capstan belt.
2. Disconnect the lower tape guide vacuum line from the vacuum unit.
3. Disconnect the vacuum line from switch VS-3.
4. Disconnect the vacuum line that is connected to the body fitting of switch VS-8.

Step 4: Grasp the head connector box at the end of the head cables and straighten out any twists or kinks in the cables.

Step 5: Position the cables and box on the rear of the transport approximately as shown.

NOTE

FIG. 2-8 SHOWS A WRITE-READ INSTALLATION. IN WRITE ONLY OR READ ONLY SYSTEMS, THERE WILL BE ONLY ONE HEAD CABLE.

Step 6: Fasten the box to the transport with four 4-40 x 1/4 screws and lock washers.

Step 7: In this step the cable clamps near the center of the transport will be installed. They are

INSTALLATION

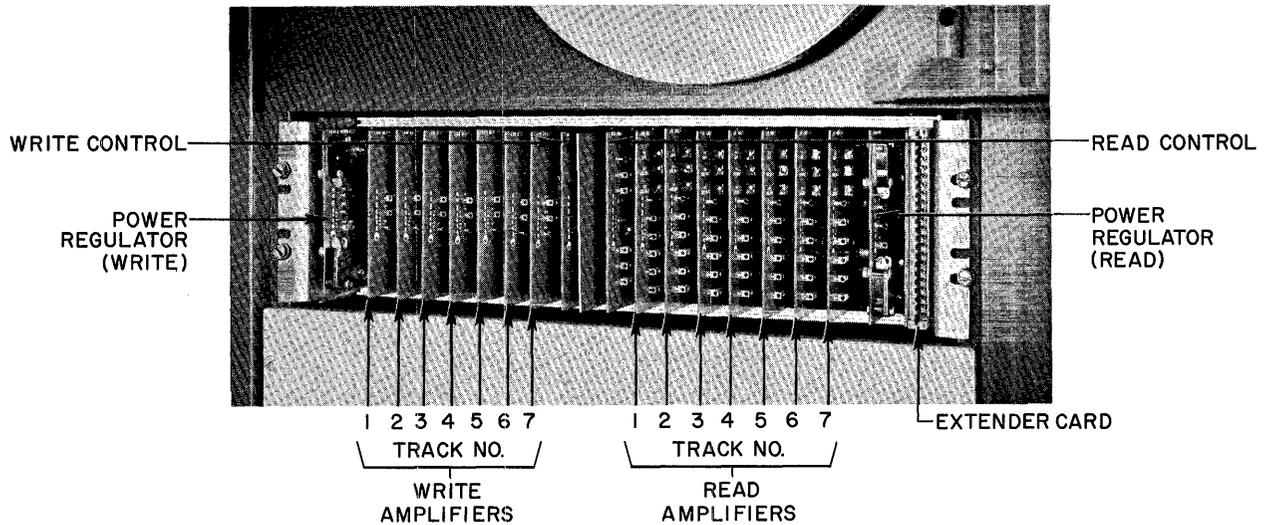


Figure 2-9
Data Electronics Card
Location

mounted with existing screws which hold a switch mounting block on the other side. Therefore it is important that only one screw be removed at a time. Remove the lower screw first and install a cable clamp and clamp retaining "D" washer on the lower cable. Position as shown and secure with the screw. Repeat for the upper cable clamp.

Step 8: Dress the cables around the bottom of the vacuum unit, keeping them parallel as shown. Secure them near the edge of the Transport with two cable clamps. Use 10-32 x 3/8 screws, lock washers and "D" washers. Two tapped holes are provided in the Transport for mounting these cable clamps.

Step 9: Replace the belt and vacuum lines removed in Step 3.

Step 10: Connect the plugs from the head assembly to the receptacles in the head cable box. If necessary, loosen the connector box mounting screws and adjust its position so the

receptacles are in alignment with the head plugs when they are inserted through the opening in the transport.

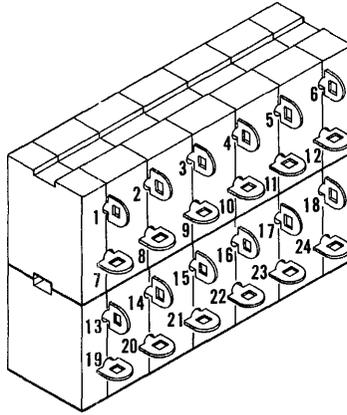
Step 11: Reinsert the circuit cards if they were removed prior to installation. The proper location is shown in Fig. 2-9.

Step 12: Install the cover plate over the front of the Data Electronics using 10-32 x 3/4 screws and flat washers.

5. Interconnection of Units.

Fig. 2-6, which shows the system cabling for a complete D2020 Tape Unit, may be used as a guide in custom or non-standard installation. When the D2020 Operator Control Panel is not used, refer to Fig. 2-10 for transport mating connector wiring and Fig. 2-11 for data electronics mating connector wiring. Mating connector wiring for J3 on the Operator Control Panel is shown in Fig. 2-12. Fig. 2-13 and 2-14 shows head connector wiring.

INSTALLATION



TRANSPORT MATING CONNECTOR - ELCO RF22420-5
CONNECTS TO P1 ON TRANSPORT CONTROL CABLE

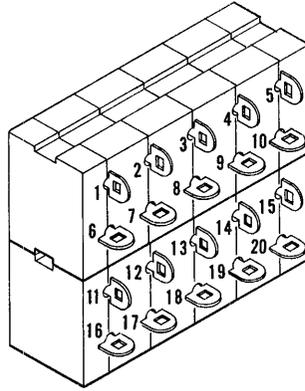
PIN NO	FUNCTION	APPROX. MAXIMUM CURRENT & VOLTAGE	*AWG
1	COMMON	1 amp	18
2	117 VAC NEUTRAL	7.5 amp 117 V.A.C.	18
3	117 VAC "HOT"	7.5 amp 117 V.A.C.	18
4	-28 VDC "OUT"	0.25 amp 28v	22
5	+10 VDC	25 ma. 10v	22
6	6 VAC	2.5 amp 6 V.A.C.	18
7	"LOAD POINT" PHOTOSENSE	25ma 10v	22
8	"END OF TAPE" PHOTOSENSE	25ma 10v	22
9	"REWIND" STATUS	Note 1	22
10	"REWIND" STATUS	Note 1	22
11	"WRITE ENABLED" STATUS	Note 1	22
12	"WRITE ENABLED" STATUS	Note 1	22
13	FORWARD	10ma -10v	22
14	REVERSE	10ma -10v	22
15	REWIND	10ma -10v	22
16	"END OF TAPE" RESET	0.25ma 6v	22
17	"REWIND" LIGHT	0.25ma 6v	22
18	"WRITE ENABLED" LIGHT	0.25ma 6v	22
19 20	"WRITE ENABLED" CONTACT	0.2 amp 110 V.A.C.	22
21	LEADER SENSE	30ma 28v	22
22	NC		
23	NC		
24	GROUND		22

Note 1: Status line current and voltage are determined by their usage on connected equipment. 1 Amp, 115 Vac Max.

*Recommended wire gauge for runs of 25 feet or less.

FIGURE 2-10
TRANSPORT MATING
CONNECTOR WIRING

INSTALLATION



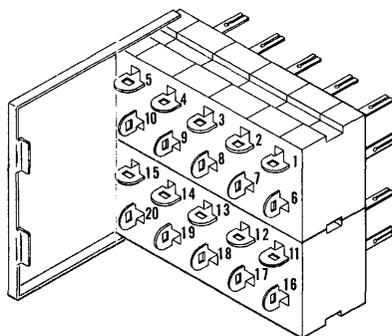
DATA ELECTRONICS MATING CONNECTOR
Connects to P3 on Data Electronics Cable

PIN NO	FUNCTION	APPROX. MAXIMUM CURRENT & VOLTAGE	*AWG
1	GROUND	1 amp	18
2	117 V.A.C. NEUTRAL	1A 117 V.A.C.	22
3	117 V.A.C. HOT	1A 117 V.A.C.	22
4	"WRITE ENABLED" CONTACT	.2A 117 V.A.C.	22
5			
6	"LOW (200) DENSITY" CONTROL	10 ma 10 V.D.C.	22
7	"DENSITY" COMMON	10 ma 10 V.D.C.	22
** 8	"HIGH (556) DENSITY" CONTROL	10 ma 10 V.D.C.	22
9	NC		
*** 10	"800 DENSITY" CONTROL	10 ma 10 V.D.C.	22
11	DATA ELECTRONICS COMMON	10ma	22
12	READ REVERSE	10ma 10 V.D.C.	22
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	NC		
19	NC		
20	NC		

- * Recommended wire gauge for runs of 25 feet or less.
- ** Dual Density and Triple Density Models only.
- *** Triple Density Models Only.

FIGURE 2-11
DATA ELECTRONICS MATING
CONNECTOR WIRING

INSTALLATION



DATA ELECTRONICS CONNECTOR ELCO RM22024
Connects to J3 on Operator Control Panel

PIN NO	FUNCTION	APPROX. MAXIMUM CURRENT & VOLTAGE	*AWG
1	GROUND	1 amp	18
2	117 V.A.C. NEUTRAL	1A 117 V.A.C.	22
3	117 V.A.C. HOT	1A 117 V.A.C.	22
4	"WRITE ENABLE" RETURN	.2A 117 V.A.C.	22
5	"WRITE ENABLE" CONTROL	NOTE 1.	
6	"LOW (200) DENSITY" CONTROL	10 ma 10 V.D.C.	22
7	"DENSITY" COMMON	10 ma 10 V.D.C.	22
** 8	"HIGH (556) DENSITY" CONTROL	10 ma 10 V.D.C.	22
9	NC		
*** 10	"800 DENSITY" CONTROL	10 ma. 10 V.D.C.	22
11	DATA ELECTRONICS COMMON	10ma	22
12	READ REVERSE	10ma 10 V.D.C.	22
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	NC		
19	NC		
20	NC		

* Recommended wire gauge for runs of 25 feet or less.
 ** Dual Density and Triple Density Models only.
 *** Triple Density Models only.

NOTE 1: 100 ma. 10 V.D.C., Switcher Models.

FIGURE 2-12
OPERATOR CONTROL PANEL
MATING CONNECTOR WIRING

INSTALLATION

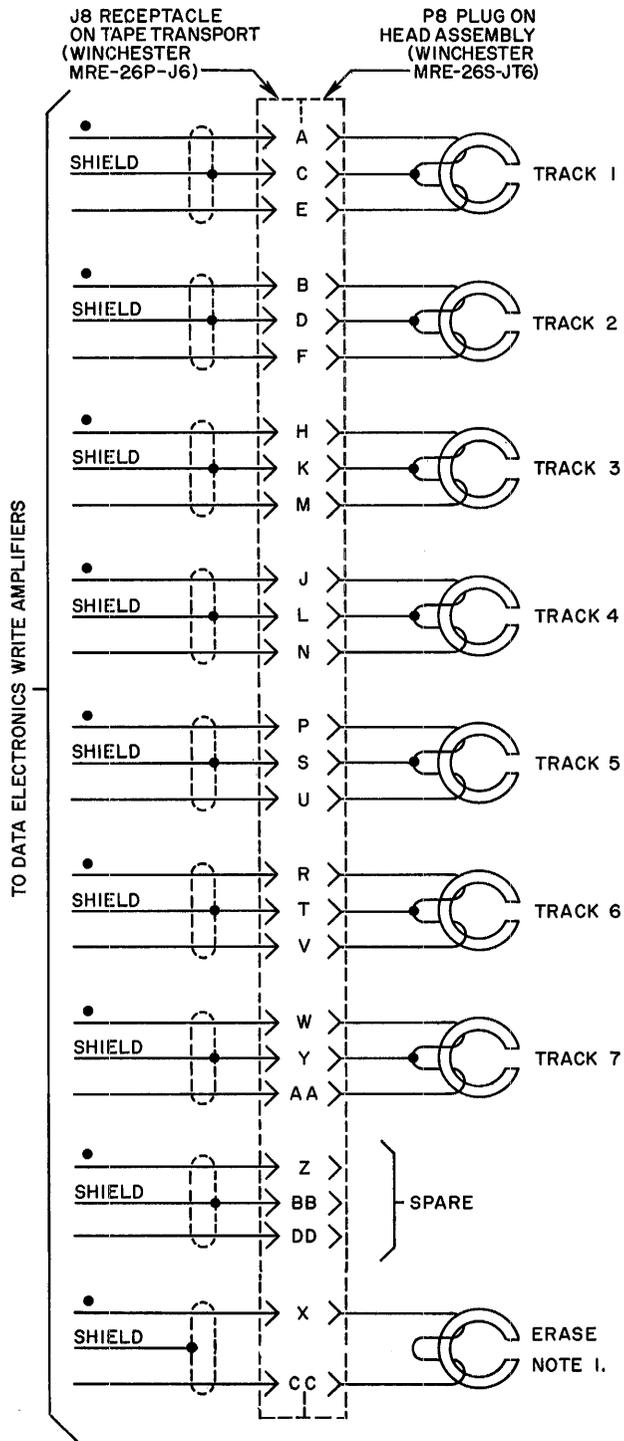


FIGURE 2-13
HEAD CONNECTOR WIRING (WRITE)

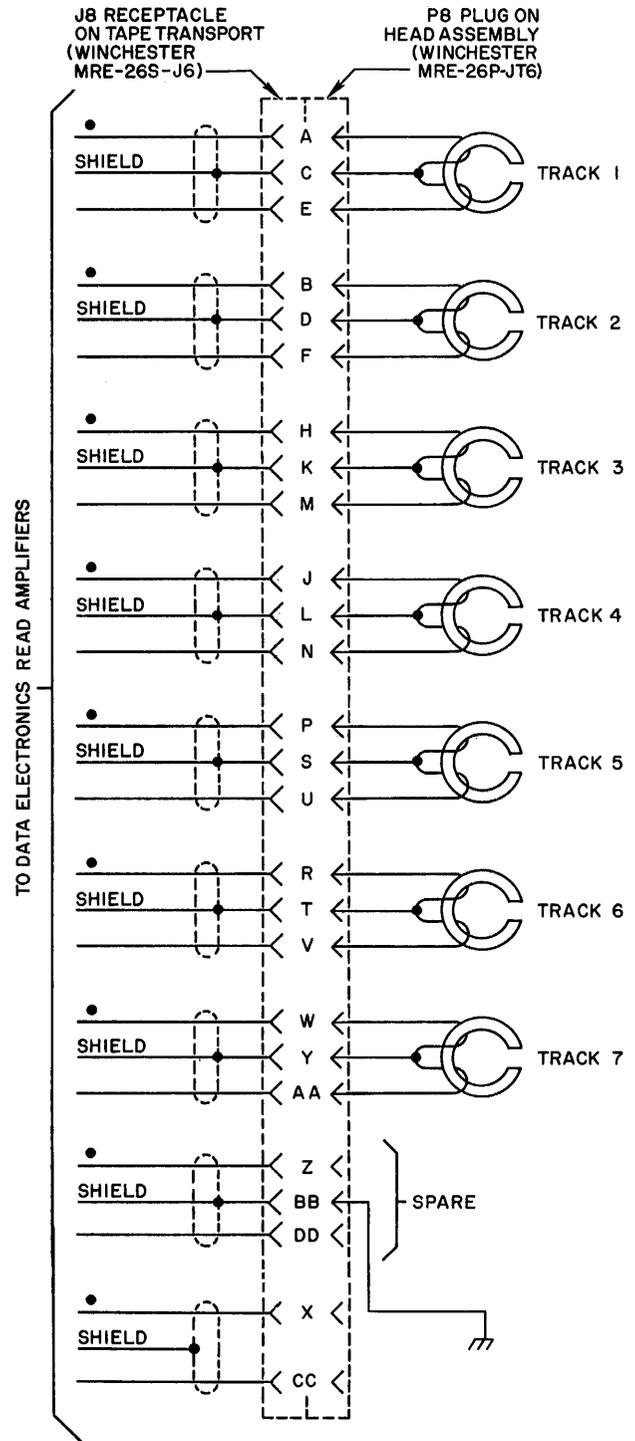


FIGURE 2-14
HEAD CONNECTOR WIRING (READ)

NOTE 1: TRIPLE DENSITY MODELS ONLY; SINGLE & DUAL DENSITY JUMPER INSTALLED BETWEEN X & CC.



INSTALLATION

C. INSTALLING COVER DOOR

The Tape Transport Cover Door is available for mounting on the D2020 Tape Transport Unit as an optional accessory. The following instructions apply to installation or removal of the door. All necessary hardware is provided.

Referring to Fig. 2-15, the door assembly is held to the hinge block by two hinge pivot pins and two plastic shim washers.

Step 1: Place the door on the upper hinge block with a 1/16 plastic shim between the door and the block.

Step 2: Insert the smooth end of the hinge pin through the threaded end of the door hinge block until the threaded portion mates with the threads of the block.

Step 3: Turn the pin until the smooth portion protrudes below the hinge block, thus engaging the center hole of the washer. Continue turning the pin until the smooth portion of the pin engages the mating hole in the hinge block.

Step 4: Select a plastic washer from those provided to fill the gap between the lower hinge block and the door, and insert this washer into the gap.

Step 5: Install the second hinge

pivot pin, following the procedure of Steps 2 and 3.

Step 6: Loosen the 4-40 screws that hold the plastic catches on the left side of the cover door and adjust for a mating fit with the transport.

Step 7: Mount the stop bracket assembly inside the upper right hand corner of the Transport, using four 4-40 x 1/4 screws and lock washers.

Step 8: Insert the threaded end of the 3/16 diameter rod from the front of the Transport to engage the hole in the plastic post of the stop assembly. Thread the 10-32 elastic stop nut on the rod until the back of the nut is flush with the end of the rod. The front portion of the rod is flattened and has a hole with a plastic bushing which is mounted to the upper cover door mounting block as shown in Fig. 2-15. Attach this bushing and rod to the cover door with the 4-40 x 5/8 screw, lock washer, and flat washer as shown. With the Transport closed and secured to the left edge of the rack, swing the cover door open until the right hand edge just contacts the undercut in the hinge block. Advance the elastic stop nut by rotating clockwise until it contacts the plastic stopping post in the stop bracket assembly. Give the nut two full additional turns to insure clearance between the cover door edge and the hinge mounting block.

INSTALLATION

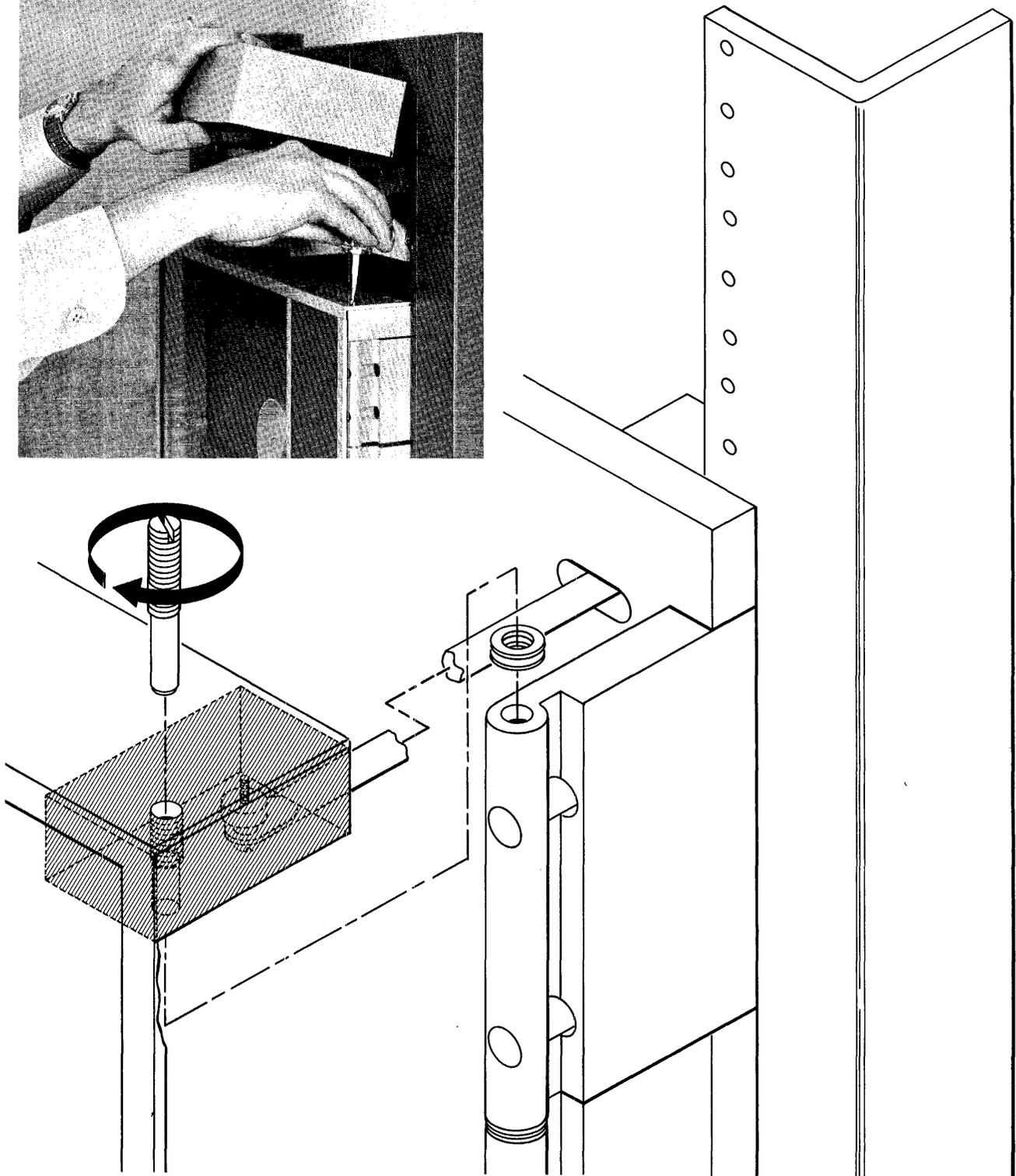
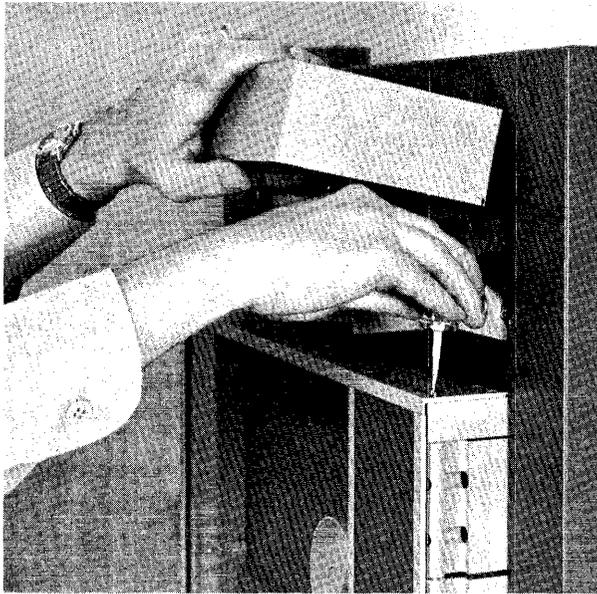


Figure 2-15.
Cover Door Installation

OPERATION

SECTION III

A. GENERAL

Since the Datamec D2020 tape unit is primarily intended to be operated automatically under the control of a data processing system, manual operations are limited to changing files and transferring control to the data processing system. The operating instructions that follow are based on

the use of a complete Datamec tape unit incorporating Dual Density Operator Control Panel, File Protect and Photosense. Some of the instructions will, therefore, not apply to systems that are not equipped with all options.

B. OPERATING CONTROLS

Operating controls of the Datamec D2020 tape unit are shown in Fig. 3-1.

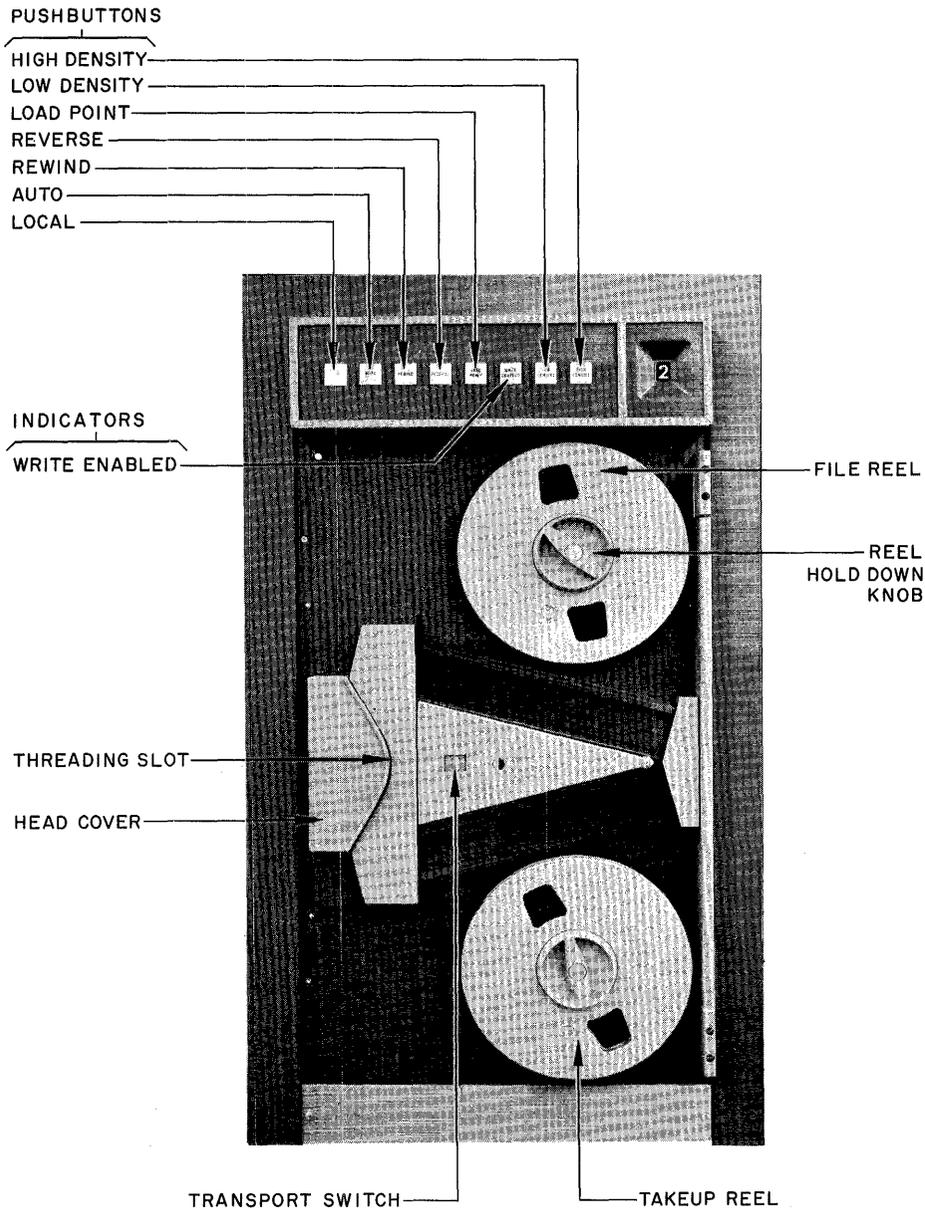


Figure 3-1
Operating Controls

OPERATION

C. APPLICATION OF POWER

The Datamec Operator Control Panel does not contain a power switch. Power to the tape unit is intended to be controlled as part of the system in which the tape unit is to function. It is assumed here that power to the tape unit is turned on at the same time the system is turned on.

When power is first applied, the vacuum and capstan motors may start for a fraction of a second, then turn off. This is normal. With power applied, the LOCAL light on the Operator Control Panel will be illuminated. The transport will be in the Disabled mode, with vacuum and capstan motors stopped.

D. INSTALLING THE FILE AND THREADING TAPE

Step 1:

If the Write mode is to be used, insert the plastic Write Enable Ring

in the groove on the back of the file reel (Fig. 3-2). If the Write mode is NOT to be used, check to be sure that the Write Enable Ring is NOT present.

Step 2:

Rotate the reel holddown knob of the upper reel in a counter-clockwise direction as far as it will go, thus relaxing the rubber grip ring.

Step 3:

Place the file reel over the holddown knob and make sure it is seated firmly against the turntable. The Write Enable Ring groove around the hub should be nearest the tape unit, facing away from the operator.

Step 4:

Holding the reel firmly against the turntable with one hand, tighten the holddown knob in a clockwise direction with the other hand (see Fig. 3-3). Tighten the holddown knob



Figure 3-2
Installing the
Write Enable Ring



Figure 3-3
Installing the
File Reel



OPERATION

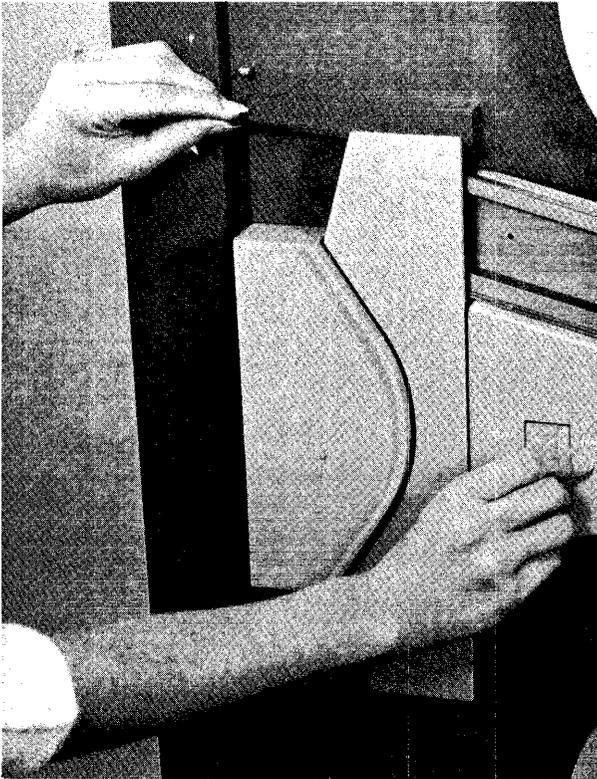


Figure 3-4
Pulling the Tape
from File Reel

until it is snug or until it reaches the end-of-travel stop (approximately 3/4 turn).

Step 5:

Operate the Transport Switch to the BRAKES position (right of center) and pull approximately three feet of leader or tape from the file reel (Fig. 3-4). Release the Transport Switch, permitting it to return to its center position.

NOTE

THE TAPE SHOULD UNWIND FROM THE BOTTOM OF THE FILE REEL. IF THIS IS NOT THE CASE, CHECK TO ENSURE THAT THE REEL HAS BEEN INSTALLED ON THE TURNTABLE WITH THE WRITE ENABLE GROOVE TOWARD THE TAPE UNIT. IF THE GROOVE IS TOWARD THE TAPE UNIT AND TAPE UNWINDS FROM THE TOP



Figure 3-5
Threading the Tape
(Step 6)

OF THE REEL, THE FILE HAS BEEN IMPROPERLY WOUND AND CANNOT BE USED ON THE TAPE UNIT. THE OXIDE (NON-SHINY) SIDE OF THE TAPE SHOULD BE WOUND TOWARD THE HUB OF THE FILE REEL. IF THE FILE IS WOUND OXIDE SIDE OUT, IT CANNOT BE USED ON THE TAPE UNIT.

Step 6:

Grasp the end of the tape between the thumb and forefinger of the right hand. Grasp the tape in a similar manner with the left hand with about fifteen inches of tape between the two hands, as shown in Fig. 3-5.

Step 7:

Place the tape over the raised portion of the head cover, above the threading slot. Pull the tape taut

OPERATION

and position the right hand near the end of the lower chamber; thus leaving several inches of tape between the left hand and the head cover, as shown in Fig. 3-6.

Step 8:

Move the taut section of tape downward and toward the tape unit. This will cause the tape to pass into the threading slot and engage with the driving components. Pull the remaining slack tape through the threading slot, wrapping it around the chamber guides.

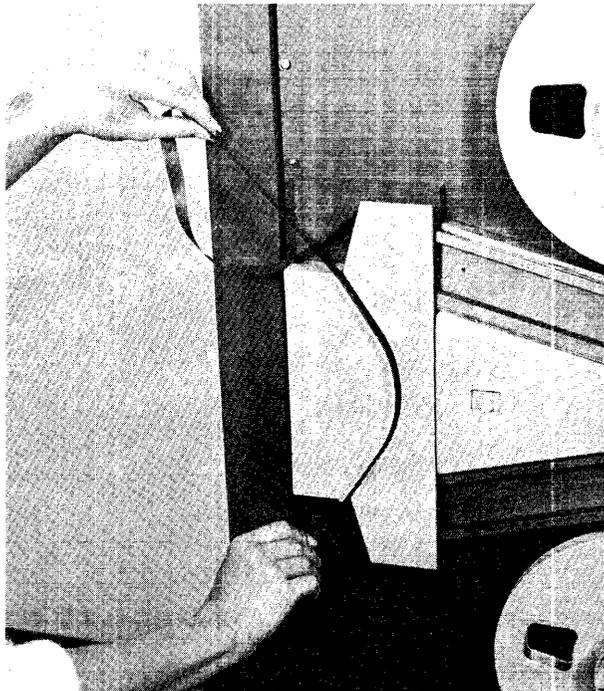


Figure 3-6
Threading the Tape
(Step 7)

Step 9:

Place the end of the tape or leader over the top of the takeup (lower) reel hub. Operate the Transport Switch to the BRAKES position and wind about six turns of tape in a clockwise direction on the takeup reel. When there is no slack

in the threaded tape path between the two reels, release the Transport Switch.

Step 10:

Check to see that the tape is properly lined up with the chamber entrances. If the tape is cocked over the glass, shift the tape so as to line up correctly.

Step 11:

Operate the Transport Switch to the START position (left of center). The capstan and vacuum motors will start and the reel motors will feed tape into the chamber. When the reel motors have stopped, release the Transport Switch.

Step 12:

Close the Transport door. The tape unit is now threaded and ready for operation.

E. MANUAL OPERATION

1. Load Point Search. When the tape unit has been threaded in accordance with the instructions above, it is in the Local status and ready for the file to be advanced to the load point marker.

Step 1:

Momentarily depress the LOAD POINT pushbutton on the Operator Control Panel. The tape will be driven forward until the load point tab is detected by the Photosense, at which point it will stop. The LOAD POINT pushbutton will be illuminated during the tab search.

2. Selecting Automatic Status. To transfer control of the tape unit to the data processing system, momentarily depress the AUTO pushbutton on the Operator Control Panel. The



OPERATION

LOCAL pushbutton light will be extinguished and the AUTO pushbutton light illuminated. The tape unit is now in the Automatic status and can be controlled only from the data processing system.

3. Selecting Local Status. To return the tape unit to Local status at any time, momentarily depress the LOCAL pushbutton on the Operator Control Panel. The AUTO pushbutton light will be extinguished and the LOCAL pushbutton light will be illuminated. Any tape motion will stop, and control of the tape unit will be removed from the data processing system.

4. Rewind. To rewind the tape from the takeup reel to the file reel by operator command, the tape unit must be in the Local status.

Step 2:

Momentarily depress the REWIND pushbutton on the Operator Control Panel. The REWIND button will be illuminated. Tape will first be removed from the chambers by a "jogging" action of the upper reel motor. When the tape loops have cleared both chambers, tape will be rewound on the upper reel. The rewind action will continue until the LOAD POINT tab is detected by the photosense head. At this point, rewind action will stop and tape loops will be automatically loaded into the chambers. The tape will then automatically reposition to the LOAD POINT tab. If there is no LOAD POINT tab, the Transport will rewind completely, stopping when vacuum is lost at the end of the tape.

Step 3:

To stop tape motion at any time during the Rewind mode, momentarily depress the LOCAL pushbutton.

5. File Removal

Step 1:

To remove a file from the tape unit, rewind the tape to LOAD POINT as previously described.

Step 2:

Depress and hold the REVERSE button to wind the tape off the takeup reel. When the tape is stripped from the takeup reel, the end will snap into the lower chamber and the tape unit will switch to the Disabled mode.

Step 3:

When the Transport has come to a stop, operate the Transport Switch to the BRAKES position and wind the tape onto the file reel.

Step 4:

Turn the holddown knob counterclockwise to release the reel, and remove the file from the tape unit.

F. AUTOMATIC OPERATION

In the Automatic status, the tape unit is completely under the control of the data processing system.

If the file mounted on the tape unit has been equipped with a Write Enable Ring, the Write Electronics will be enabled at all times (except in Rewind mode). This condition will be indicated by illumination of the WRITE ENABLED light on the Operator Control Panel.

When the tape is driven past the end-of-file tab on the file, a signal is supplied to the data processing system. This signal will remain until such time as the tape unit is placed in the Rewind mode, from either the Local or Automatic status.



OPERATION

Tape motion is not stopped by passage of the end-of-file tab.

While in the Automatic status, the tape may be rewound by a command from the data processing system. When this command has been issued, the tape unit rewinds the file back to the LOAD POINT tab, then switches to a load point search. The data processing system cannot stop Rewind once it has been initiated; the operation can be stopped only by pressing the LOCAL pushbutton on the Operator Control Panel to remove control of the tape unit from the data processing system.

G. ABNORMAL CONDITIONS

1. Long or Short Loop. Anything that causes an abnormally short or long loop in either vacuum chamber will stop the tape unit and place it in the Disabled mode. If the abnormal loop condition clears itself within approximately one second, the tape unit will restart automatically. If the condition fails to clear, the capstan and vacuum motors will stop and must be restarted after the condition has been cleared by operating the Transport Switch to the START position.

CAUTION

WHENEVER THE TAPE UNIT HAS BEEN SWITCHED TO THE DISABLED MODE FOR ANY REASON, ALWAYS OPERATE THE TRANSPORT SWITCH TO THE BRAKES POSITION AND WIND ANY TAPE SLACK ONTO ONE OF THE REELS. THE TAPE UNIT CAN THEN BE SAFELY RESTARTED BY OPERATING THE TRANSPORT SWITCH TO THE START POSITION.

In either event, the tape unit will have switched from Automatic to Local status, and control must be returned to the data processing system by depressing the AUTO pushbutton.

2. Power Failure. Power failure produces an effect similar to a long or short loop in that the machine immediately enters the Disabled mode. Momentary power failures (less than approximately one second) may not require that the tape unit be restarted whereas longer failures will require that the Transport Switch be operated to the START position in order to restart the tape unit. In either event, the AUTO pushbutton must be pressed to return the tape unit to Automatic status.

3. Emergency Stop. The LOCAL pushbutton on the Operator Control Panel serves as an emergency stop button. Any tape motion, whether initiated under Automatic or Local status, can be stopped by momentarily depressing the LOCAL pushbutton.

H. INSTALLING PHOTOSENSE TABS

Photosense tabs are supplied with a pressure sensitive adhesive and should be attached to the non-oxide side of the tape as shown in Fig. 3-7. The load point tab is placed along the edge of the tape nearest the operator; the end-of-file tab is placed along the edge of the tape nearest the Transport.

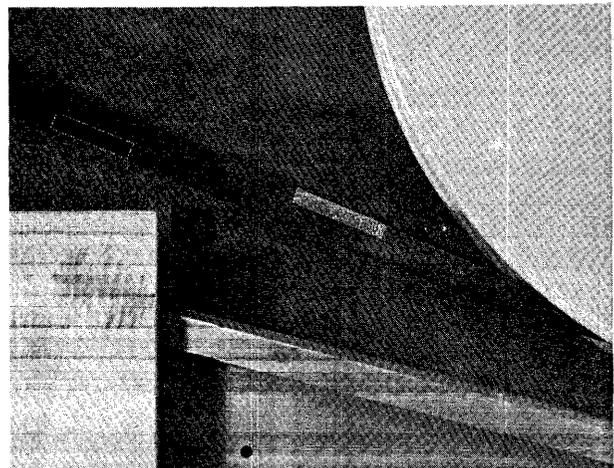


Figure 3-7
Location of Tabs. "Load Point" Shown, "End of Tape" in Outline

OPERATION

1. CHANGING TAPE UNIT DESIGNATION

Tape unit address designations may be changed by lifting the hinged Operator Control Panel and operating the switch revealed at the right hand side to the desired designation (see Fig. 3-8).

The illuminated number is changed by pressing the number from the front of the panel until it can be slipped to the left and out of the retainer. The new number is installed by reversing this process (Fig. 3-9). Always be sure to change the number at the same time that the address designation switch is changed.

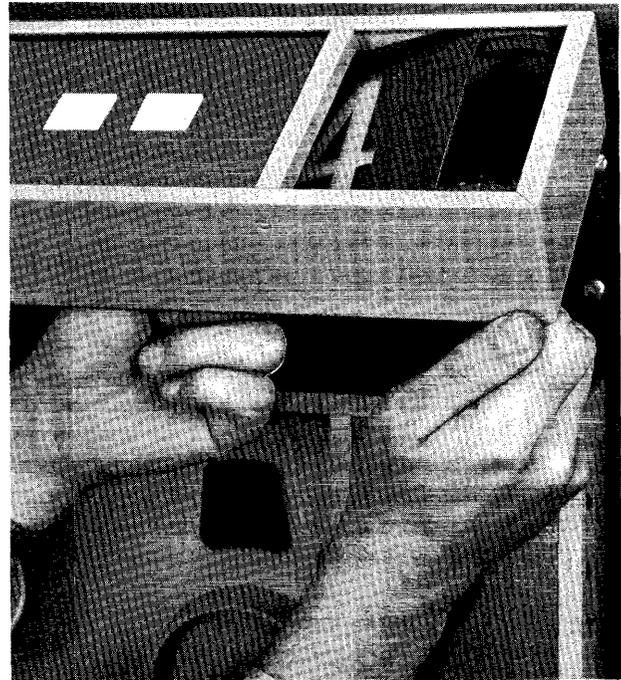


Figure 3-9
Removing or Installing
Illuminated Number

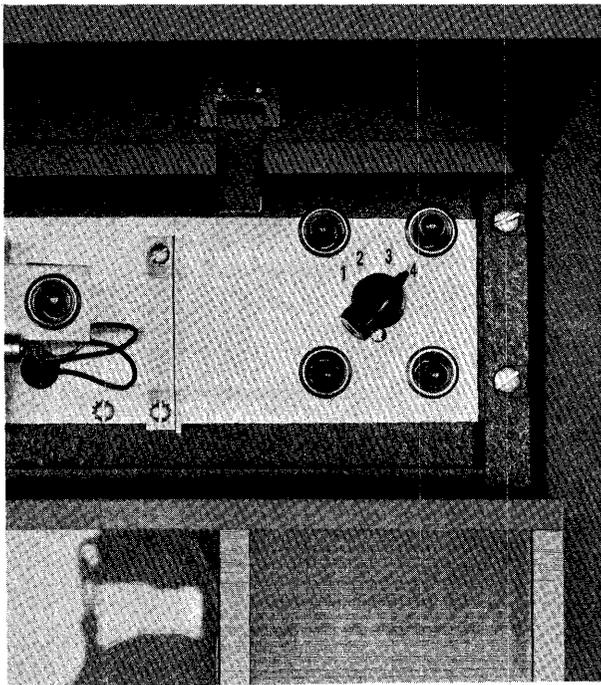


Figure 3-8
Tape Unit Address
Designator Switch

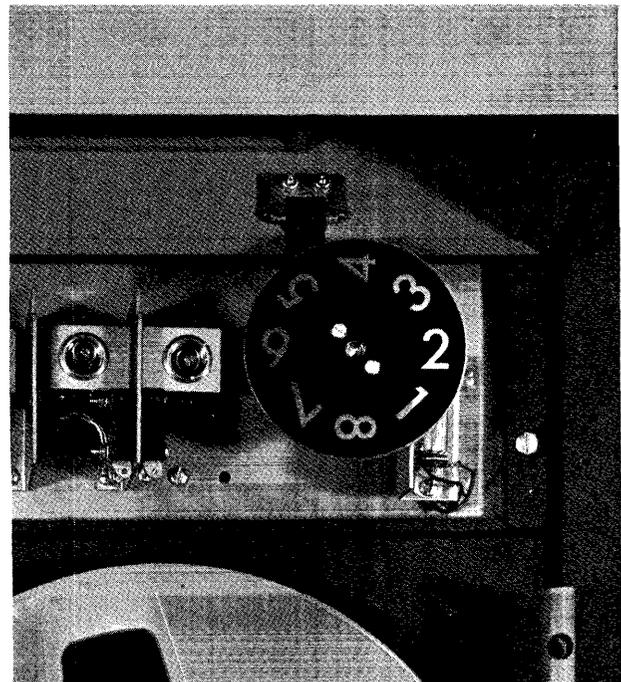


Figure 3-10
Operator Control Panel
With Number Wheel

On operator control panels equipped with an address designator number wheel (Fig. 3-10), it is merely necessary to raise the cover



OPERATION

and rotate the wheel until the desired number is in position to be visible through the opening in the panel. This also switches the corresponding number indication to the data processing system.

J. CHANGING PACKING DENSITY.

1. Dual Density Units. Dual-density systems (identified by the presence of HIGH DENSITY and LOW DENSITY pushbuttons on the Operator Control Panel) are switched from one packing density to the other by pressing the appropriate pushbutton on the Operator Control Panel. The condition presently in effect is indicated by illumination of the appropriate pushbutton. It is only necessary to select density at the time of change; the selected condition remains until changed by an operator.

2. Triple Density Units. Triple-density systems are equipped with a rotary switch operated by a back-

lighted Density Select Wheel. To change packing density it is merely necessary to raise the cover and rotate the wheel as shown in Fig. 3-11, until the desired density designation is in position to be visible through the opening in the cover.

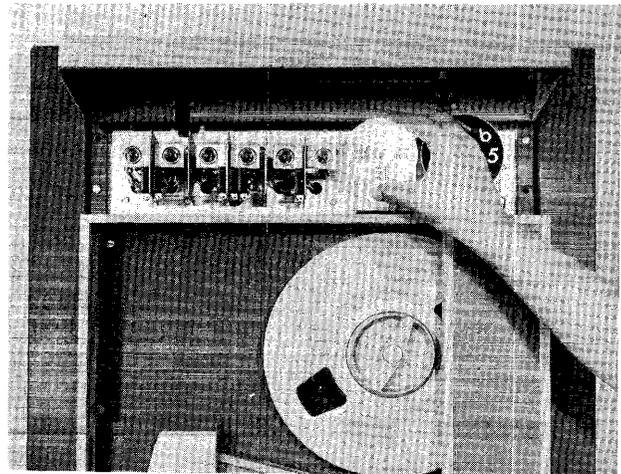


Figure 3-11
Triple Density Operator
Control Panel



SECTION IV

SYSTEM CHECKOUT

A. GENERAL

Information contained in this section will enable the user to check the tape unit for compliance with the manufacturer's specifications. The checks outlined in this section parallel those made at the Datamec factory prior to shipment.

In general, performance of system checks is not required upon receipt of the tape unit, unless it is suspected that the unit has been damaged in shipment. The tests outlined in this section should be performed whenever tape driving elements have been removed for repair or replacement.

The procedures outlined in this section are based on the complete Datamec D2020 system, including Operator Control Panel, File Protect and Photosense. In addition, it is assumed that a program source capable of providing the -10vdc Forward Drive and Reverse Drive commands is available. In the case of the start and stop distance check this program source must be capable of supplying commands as short as 5 milliseconds.

If Datamec heads and data electronics are not included in this system, it is assumed that an appropriate set of heads and data electronics are available. For the purposes of system checkout, read amplifiers must be capable of producing a 2 v peak to peak signal into 1000 ohms.

Checkout procedures for any special features supplied with the Datamec D2020 tape unit will be found in an appendix at the rear of this Instruction Manual.

CAUTION

READ SECTION III - OPERATION - BEFORE UNDERTAKING THE SYSTEM CHECKOUT PROCEDURE.

B. TAPE HANDLING CHECKS

1. Checking Tape Speed. Tape speed is checked by reading a tape previously written with a 10 kc signal at 45 IPS. Accuracy of the tape speed test is dependent upon the accuracy of the recorded frequency and the speed at which the signal was recorded.

NOTE

IN ORDER TO MEET TAPE SPEED SPECIFICATIONS, THE POWER LINE FREQUENCY MUST BE PRECISELY 60 CPS, OR A CORRECTION FACTOR MUST BE APPLIED TO THE MEASURED SPEED.

In addition to the test tape described above, the following equipment is required to check tape speed.

Counter, Hewlett-Packard 523B or equivalent.

Step 1:

Connect the test equipment as shown in Fig. 4-1.

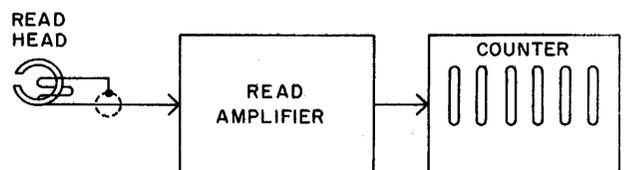


Figure 4-1
Test Equipment Set-Up
For Checking Tape Speed

Step 2:

Adjust the counter to operate over a gate time of 10 seconds.

SYSTEM CHECKOUT

Step 3:

Supply a Forward Drive command. As the tape unit reads the test tape, the counter indicates the number of pulses passing the read head. At the end of the ten second gate period, the totalized count should be $100,000 \pm 2000$ pulses.

Step 4:

Supply a Reverse Drive command, and count the number of pulses passing the read head. At the end of the ten second gate period, the totalized count should be $100,000 \pm 2000$ pulses.

Step 5:

If the tape unit fails to meet specifications, refer to the Maintenance Section of this Instruction Manual for corrective action.

For Tape Transports modified to use a 10650 DC Capstan Servo System, tape speed adjustment is accomplished in the same manner as that described above. The only difference is in interpretation of the readout from the counter. If the output from the tape being used to check speed is 10KC at 45 ips, a correction factor must be applied if the playback speed is anything other than 45 ips. For example: if the tape speed is 15 ips, then the playback frequency will be 3.333KC and the counter should show 33333 ± 666 counts. Of course, since a speed adjustment is provided, the tape speed can be set to any desired value within the limits shown on the schematic. If an attempt is made to set speeds beyond the ranges given, the "Overspeed" safety circuits will take over and cause erratic action of the servo.

2. Checking Start-Stop Time. The purpose of the start time check is to determine if the tape is accelerated

to the specified speed within a specified time; similarly, the stop speed check determines whether the tape is decelerated from the specified speed to a halt within a specified time.

In addition to the test tape used in the tape speed check, the following equipment is required to check start-stop time:

Oscilloscope, Tektronix 531A or equivalent.

Step 1:

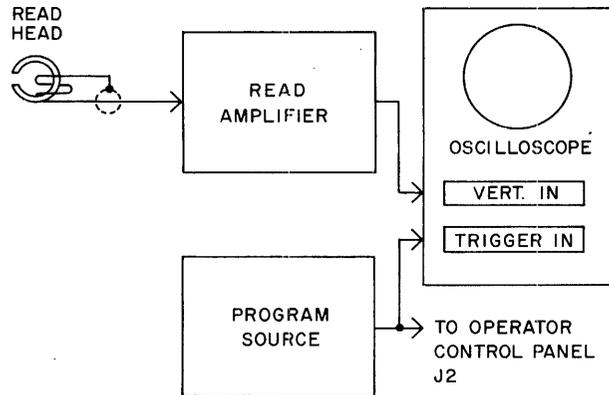
Connect the equipment as shown in Fig. 4-2.

Step 2:

Adjust the oscilloscope to trigger on an externally generated negative pulse. Horizontal sweep time should be adjusted to 1 msec/cm.

Step 3:

Program the tape unit at a convenient rate. The oscilloscope displays the forward start characteristic, which should resemble Fig. 4-3.



**Figure 4-2
Test Equipment Set-Up
For Checking Start-Stop Time**

SYSTEM CHECKOUT

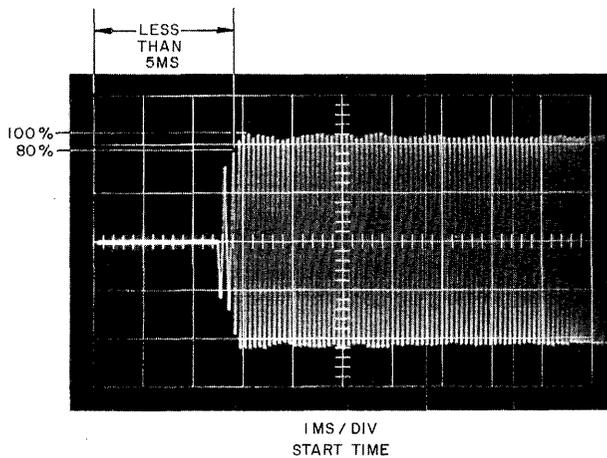


Figure 4-3
Start Time

Start time, as determined from the oscilloscope display, should be less than 5 msec.

Step 4:

Switch the oscilloscope trigger input to the Reverse Drive command input. The oscilloscope displays the reverse start time characteristic which should be less than 5 msec.

Step 5:

Adjust the oscilloscope to 0.5 msec /cm and to trigger on a positive pulse. The oscilloscope displays the

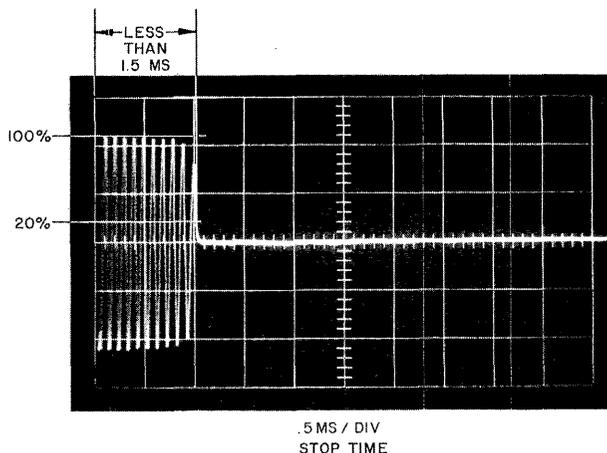


Figure 4-4
Stop Time

reverse stop characteristic, which should resemble Fig. 4-4. Stop time, as determined from the oscilloscope display, should be less than 1.5 msec.

Step 6:

Switch the oscilloscope trigger input to the Forward Drive command input. The oscilloscope displays the forward stop characteristic, which should be less than 1.5 msec.

Step 7:

If the tape unit fails to meet specifications, refer to the Maintenance Section of this Instruction Manual for corrective action.

3. Checking Start-Stop Distance.

The start-stop distance checks determine the amount of tape passing over the read head during the start and stop time. Therefore, start and stop times should be within specifications before the start and stop distance checks are undertaken.

In addition to the test tape used in preceding tests, the following equipment is required to check start-stop distance:

Counter, Hewlett-Packard 523B or equivalent.

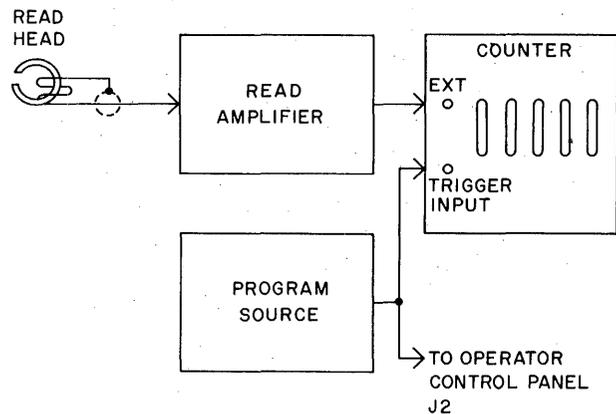


Figure 4-5
Test Equipment For Checking
Start-Stop Distance



SYSTEM CHECKOUT

Step 1:

Connect the test equipment as shown in Fig. 4-5.

Step 2:

Adjust the counter to trigger and count on the negative Forward Drive command.

Step 3:

Adjust the program source to provide a 5 msec. Forward Drive command. The counter reads the number of pulses passing the read head during the 5 msec start time. The count multiplied by 0.0045 equals the start distance in inches, which should be 0.105 ± 0.045 , -0.030 inch, at 45 ips.

Step 4:

Adjust the program source to produce a 5 msec Off command with any convenient Forward Drive command. Adjust the counter to trigger and count on the positive Off command. The counter reads the number of pulses passing the read head. Multiplying the count by 0.0045 produces a stop distance in inches, which should be 0.045 ± 0.015 inch.

Step 5:

Adjust the program source for a 5 msec Reverse Drive command and any convenient Off time. Adjust the counter to trigger and count on the negative Reverse Drive command and read the reverse start distance characteristic. Reverse start distance should be 0.105 ± 0.045 , -0.030 inch.

Step 6:

Adjust the counter to trigger and count on the positive Off com-

mand. Adjust the program source for a 5 msec Off command and any convenient Reverse Drive command. Reverse stop distance should be 0.045 ± 0.015 inch.

Step 7:

If the tape unit fails to meet specifications, refer to the Maintenance Section of this Instruction Manual for corrective action.

C. INTERCHANNEL TIME DISPLACEMENT ERROR

Interchannel Time Displacement Error (ICTDE) is defined as the time relationship of one reproduced pulse with respect to a simultaneously recorded pulse in any other track. Two classes of ICTDE may be defined: Static ICTDE may be generated by write and read head gap scatter, head azimuth errors and tape guiding errors; Dynamic ICTDE is generated by dynamic tape skew.

Equipment required to check Interchannel Time Displacement Error includes:

Oscilloscope, Tektronix 535A or Equivalent; with Type CA dual-trace preamplifier.

Step 1:

Place an unwritten file on the tape unit.

Step 2:

Connect the test equipment as shown in Fig. 4-6.

Step 3:

Apply a Forward Drive command to the tape unit and write a series of pulses (ones) in all tracks. The

SYSTEM CHECKOUT

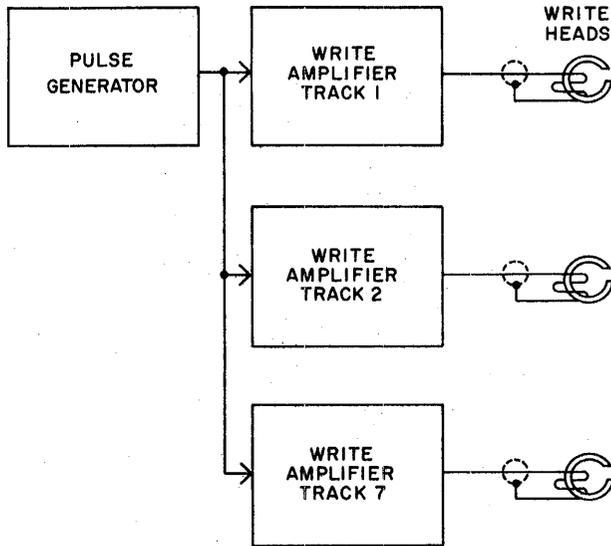


Figure 4-6
Test Set-Up for
Checking ICTDE
(Step 2)

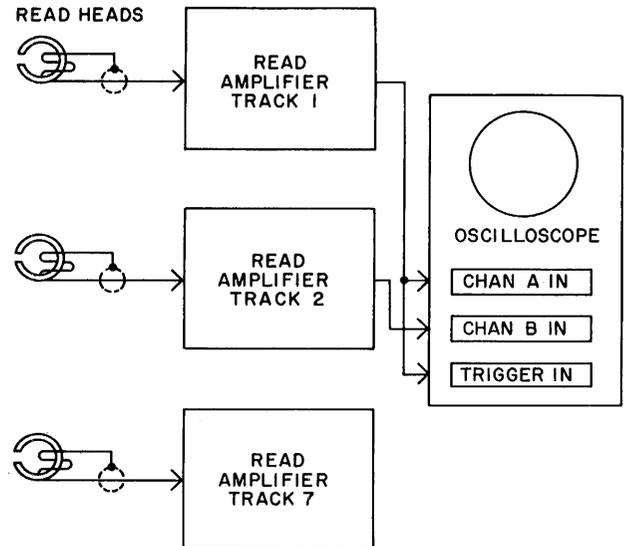


Figure 4-6a
Test Set-Up For
Checking ICTDE
(Steps 5 through 7)

preferred packing density is that at which the tape unit will normally be employed. Record for several minutes.

Step 4:

Rewind the tape to the beginning of the section written in Step 3 and remove the write permit signal.

Step 5:

Apply a Forward Drive command to the tape unit. Connect the test lead for Channel A of the oscilloscope to TP 1 of track 1 and the test lead for Channel B of the oscilloscope to TP 1 of track 2 (Fig. 4-6a). Adjust the oscilloscope to trigger on the zero axis crossing of the signal on the Channel A input. The oscilloscope display should resemble Fig. 4-7, which represents the ICTDE between tracks 1 and 2. If the zero crossing of the signal from track 2 is occurring prior to the zero crossing of the signal from track 1, interchange the oscilloscope inputs to trigger on the track 2 signal.

Step 6:

Examine the ICTDE between all tracks to determine the worst case. It will ordinarily be between tracks 1 and 7. In no case should this exceed the limits given in Table 4-I.

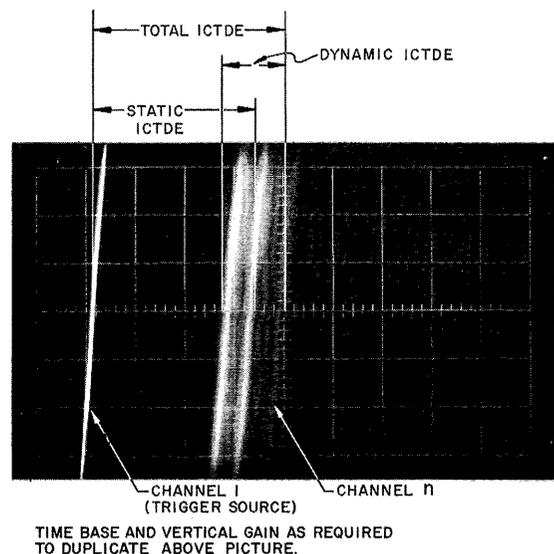


Figure 4-7
Interchannel Time
Displacement Error

SYSTEM CHECKOUT

TAPE SPEED	TOTAL ICTDE	STATIC ICTDE	DYNAMIC ICTDE
45 ips	±14 Microseconds	10 Microseconds	±4 Microseconds
30 ips	±21 Microseconds	15 Microseconds	±6 Microseconds
15 ips	±42 Microseconds	30 Microseconds	±12 Microseconds
10 ips	±63 Microseconds	45 Microseconds	±18 Microseconds
5 ips	±126 Microseconds	90 Microseconds	±36 Microseconds

TABLE 4-I
D. AUTOMATIC CONTROL CIRCUITRY
1. Rewind and Photosense
Step 1:

Load the tape unit with a file equipped with photosense tabs and beginning-of-tape conductive leader.

Step 2:

Place the tape unit in Automatic status and apply a Forward Drive command. Allow the tape to run past the end-of-file photosense tab. The END OF FILE warning light on the Operator Control Panel should come on as the tab passes under the photosense head.

Step 3:

Stop the tape by removing the Forward Drive command. The END OF FILE warning light should stay on.

Step 4:

Apply a Rewind command. As the tape starts to rewind, the END OF FILE light should go off. The tape should continue to rewind until it reaches

the load point photosense tab, at which point it should stop and begin a search for the load point photosense tab. The LOAD POINT pushbutton on the Operator Control Panel should be illuminated during the load point search.

Step 5:

If the tape unit fails to perform these functions, refer to the Maintenance Section of this Instruction Manual for corrective action.

2. File Protect
Step 1:

Load the tape unit with a file on which a Write Enable Ring has been installed. When the Transport Switch is operated to the START position, the WRITE ENABLE indicator on the Operator Control Panel should be illuminated.

Step 2:

Remove the Write Enable Ring from the file and repeat Step 1. When the Transport Switch is operated to the START position, the WRITE ENABLE indicator on the Operator Control Panel should not be on.



SECTION V
DESCRIPTION AND THEORY OF OPERATION

A. TAPE TRANSPORT (Fig. 5-1)

a. General. All operational subassemblies and components of the D2020 Transport are mounted on a

1. Description

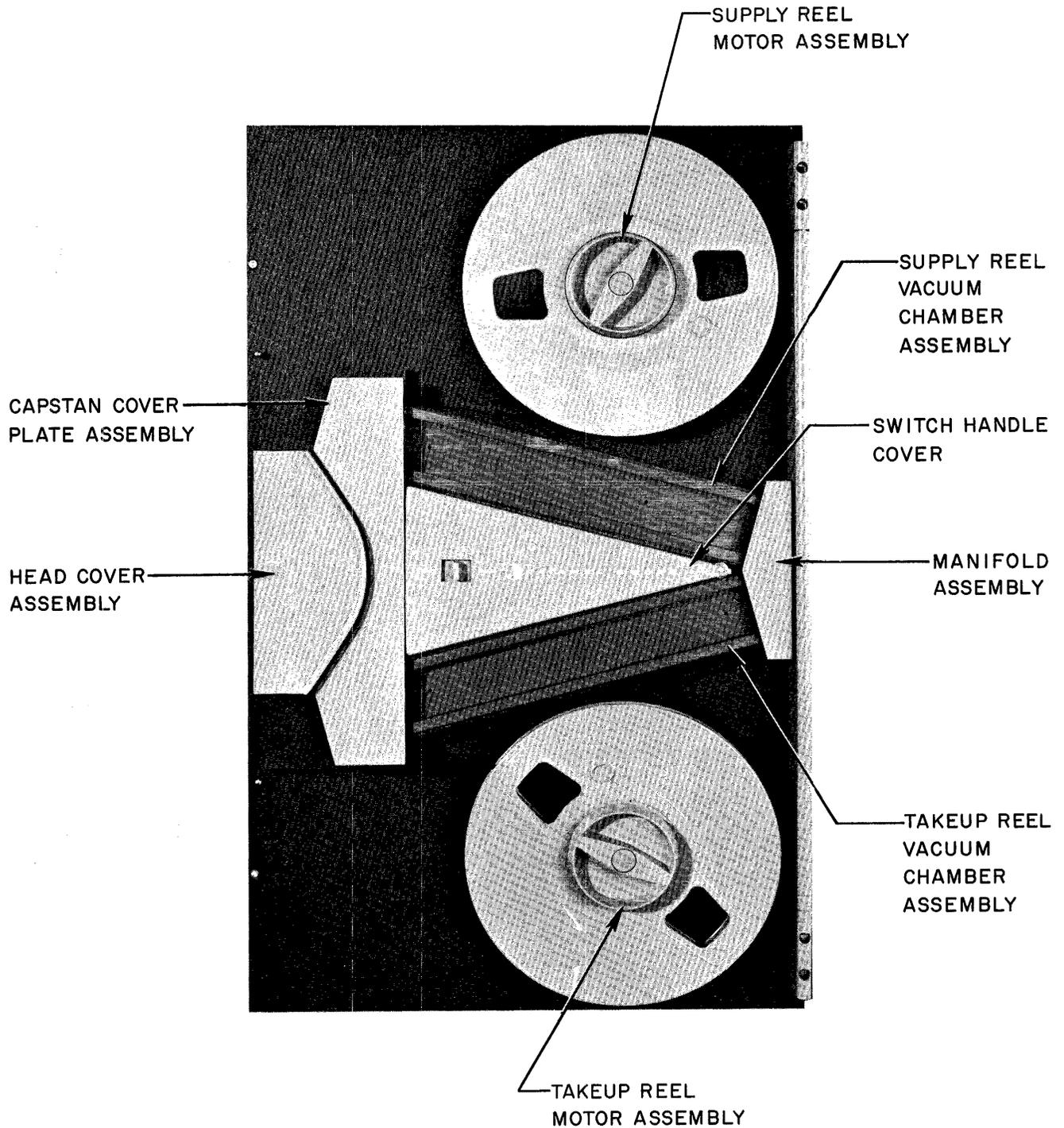


Figure 5-1A
D2020 Tape Transport
(Front View)

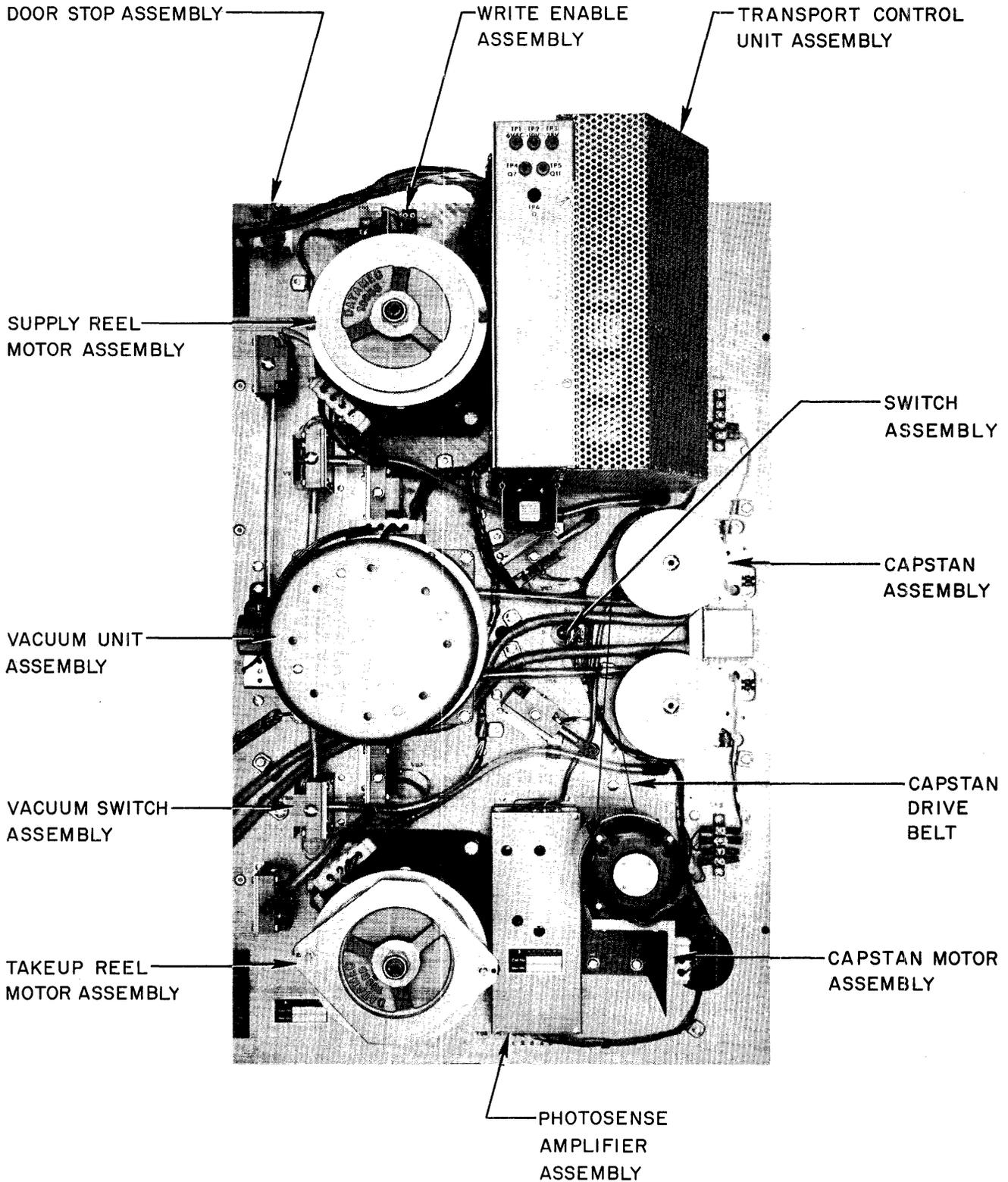


Figure 5-1B
D2020 Tape Transport
(Rear View)

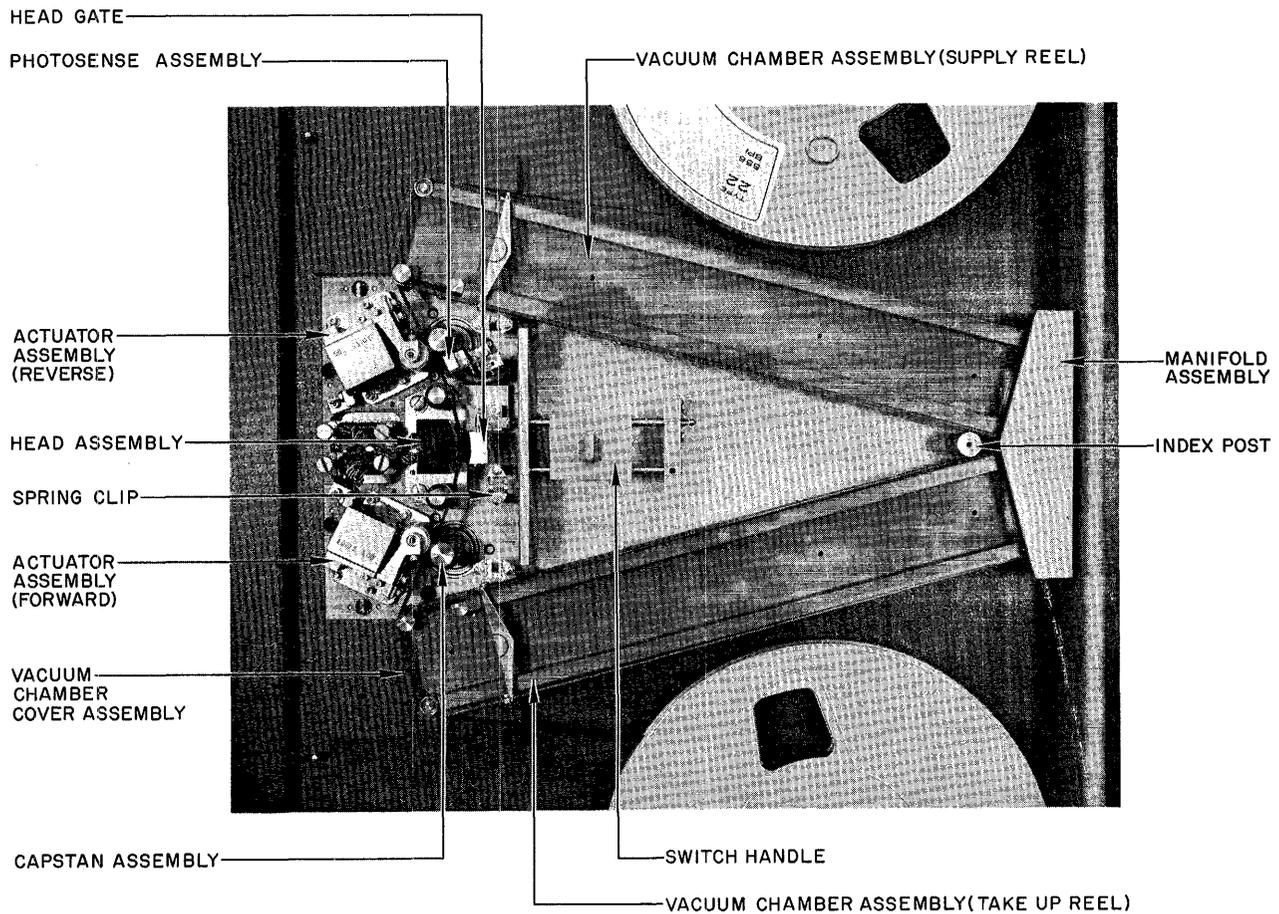


Figure 5-1C
 D2020 Tape Transport
 (Front view with protective
 covers removed)

rigid aluminum plate. Among these subassemblies are: reel motors, vacuum chambers, actuators, vacuum switches, capstan motor, transport control unit, vacuum unit and miscellaneous components that cover or complete the appearance of the equipment.

b. Main Frame. The transport mounting plate is fabricated from 1/2"-thick aluminum tool plate. Holes drilled and tapped from both sides of the plate mount the various subassembly components. A portion of the front surface is left unpainted to provide a precision mounting surface for the heads and tape guiding components.

c. Reel Motor Assemblies.

i. General. Two types of reel motor assemblies are used on the

D2020: (a) supply reel motor and (b) takeup reel motor. Each holds a 10-1/2" reel at the proper height and supplies tape upon command of the transport control unit.

ii. Supply Reel Motor Assembly.

The supply reel motor assembly consists of a holddown knob, a motor, and a supply reel brake. It is illustrated in Fig. 5-2. The turntable is located axially on the motor shaft such that its height is 33/64" from the front surface of the mounting plate.

The removable-reel holddown knob grips the smooth inside surface of a tape reel by expanding a rubber grip ring radially when the operating knob is axially advanced, compressing the ring.

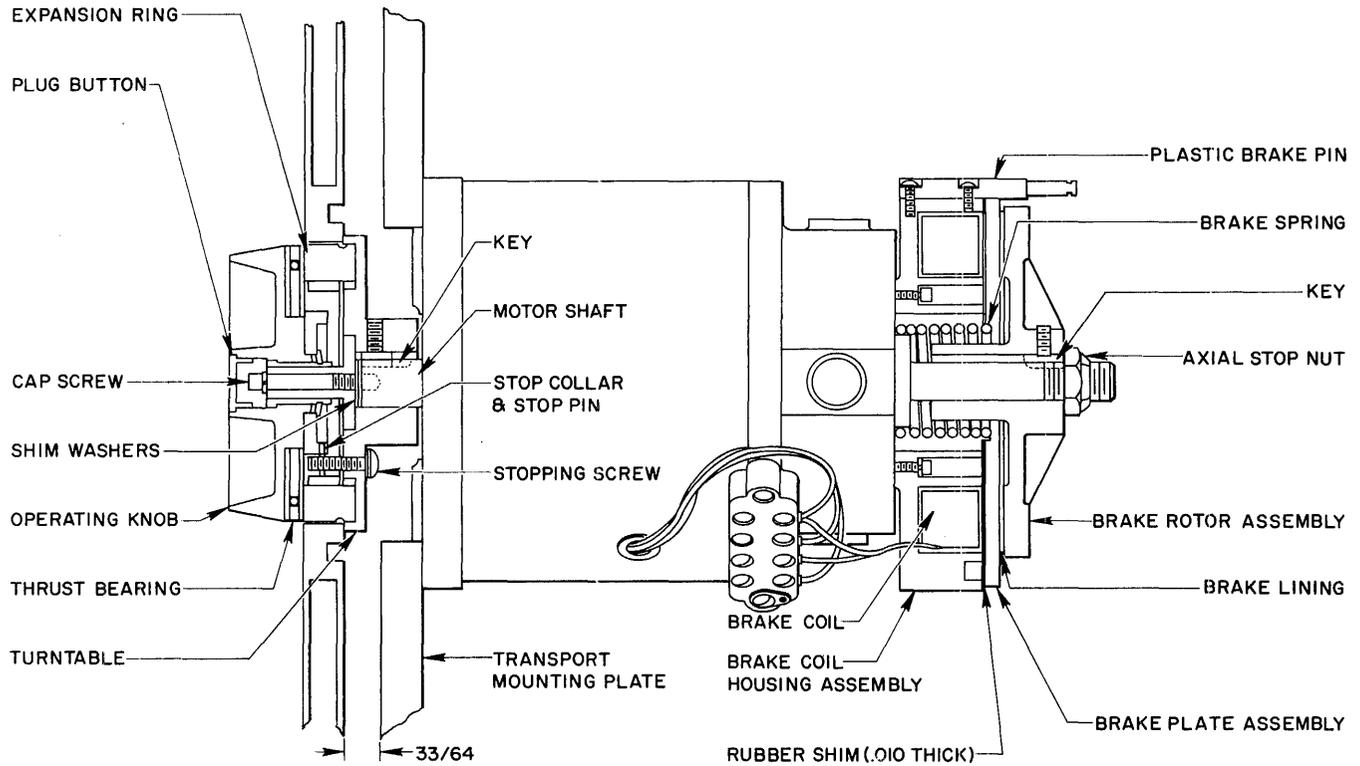


Figure 5-2
Supply Reel Motor Assembly

A brake assembly is mounted to the rear shaft and frame of the supply reel motor. The motor brake serves two functions:

- (1) It holds the reel turntable fixed when changing tape reels; and
- (2) It decelerates the reel when the motor is de-energized.

The brake consists of four principal operational parts: a brake coil, a keyed brake plate, a brake rotor, and an operating spring.

The brake coil is connected in series with the motor armature winding and the motor field winding. Consequently, the brake coil produces a magnetic field when the motor is energized. The magnetic field attracts the keyed brake plate, overcoming the spring. The brake rotor is released, allowing the motor to rotate. When the motor is de-energized, the axial spring forces the

keyed brake plate against the brake lining of the brake rotor and decelerates the motor.

Compensation for brake lining wear can be obtained by re-adjusting the position of the rotor assembly with the stop nut.

iii. Takeup Reel Motor Assembly. Operational features of this component are similar to those of the supply reel motor assembly. Two main differences are:

- (1) A modified holddown knob is used to mount the takeup reel semi-permanently.
- (2) A drag brake, which contacts the back surface of the brake rotor, provides tape tension during the high-speed rewind mode.

Fig. 5-3 is a cross-sectional view of the takeup reel motor assem-

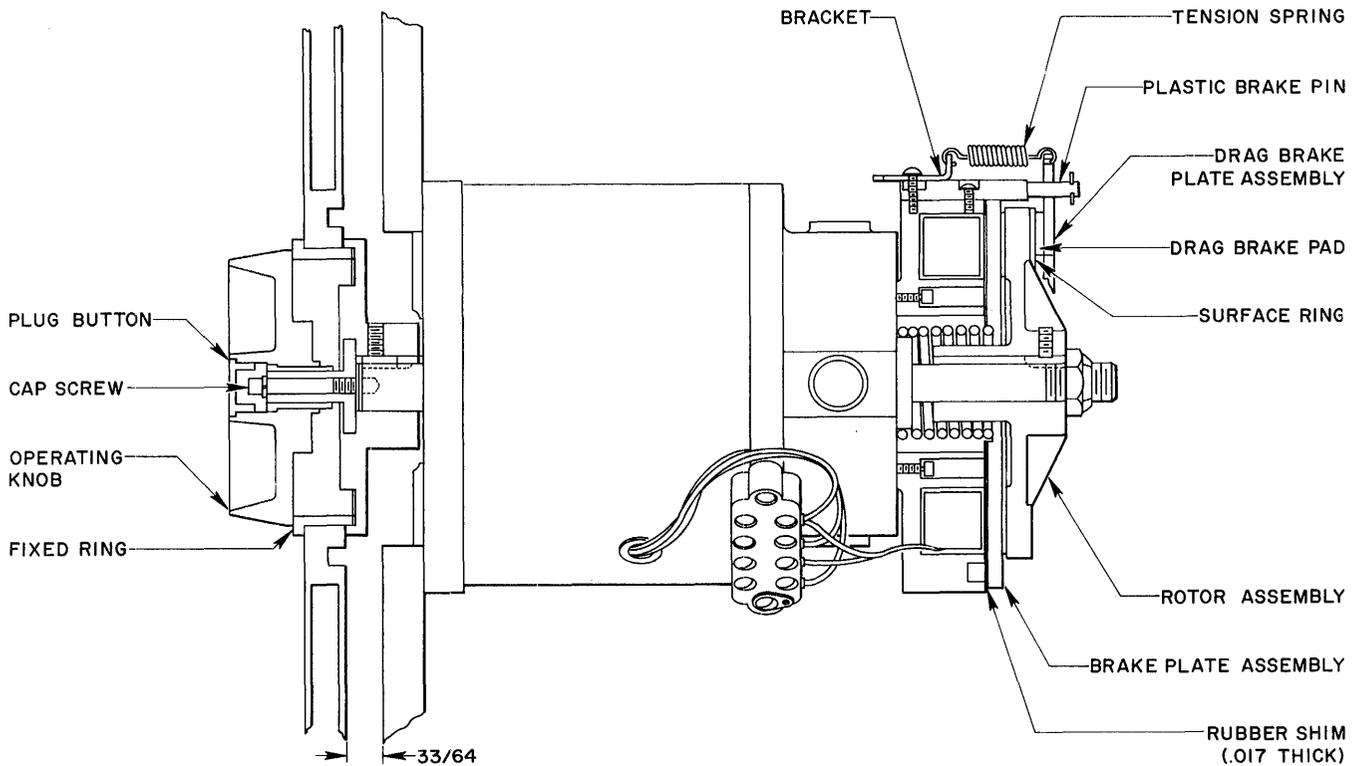


Figure 5-3
Take-up Reel Motor Assembly

bly. A takeup reel is mounted by means of a squeeze action between the collar of the fixed ring and the turntable. The squeeze action is provided by advancing the operating knob axially along its lead screw. The assembly is then secured to the motor shaft.

The drag brake is mounted behind the motor brake. A spring-loaded plate applies pressure to a special plastic surface ring on the back of the rotor. Drag brake friction is adjusted by means of two movable brackets and two tension springs that maintain force on the drag brake plate. It is normally set to provide a drag of 12 to 15 inch-ounces.

d. Vacuum System

i. General Description. The vacuum system consists of the following main subassemblies:

- (1) The vacuum unit;

- (2) Tape storage vacuum chambers;
- (3) The manifold; and
- (4) Tape loop sensing vacuum switches.

The vacuum unit mounts on the back of the D2020 transport plate, providing a source of differential pressure for the vacuum chambers and the vacuum tape guides. The vacuum chambers are connected to the vacuum unit through an end manifold, mounted on the front surface of the transport mounting plate.

The vacuum in the chambers can be adjusted to give proper tape tension. This adjustment is provided by leakage at the vacuum unit (i.e., decrease in leakage and therefore, an increase in vacuum, produces a greater tape tension in the tape storage chamber). The magnitude of the vacuum in the chambers is further reduced by a solenoid-operated butter-

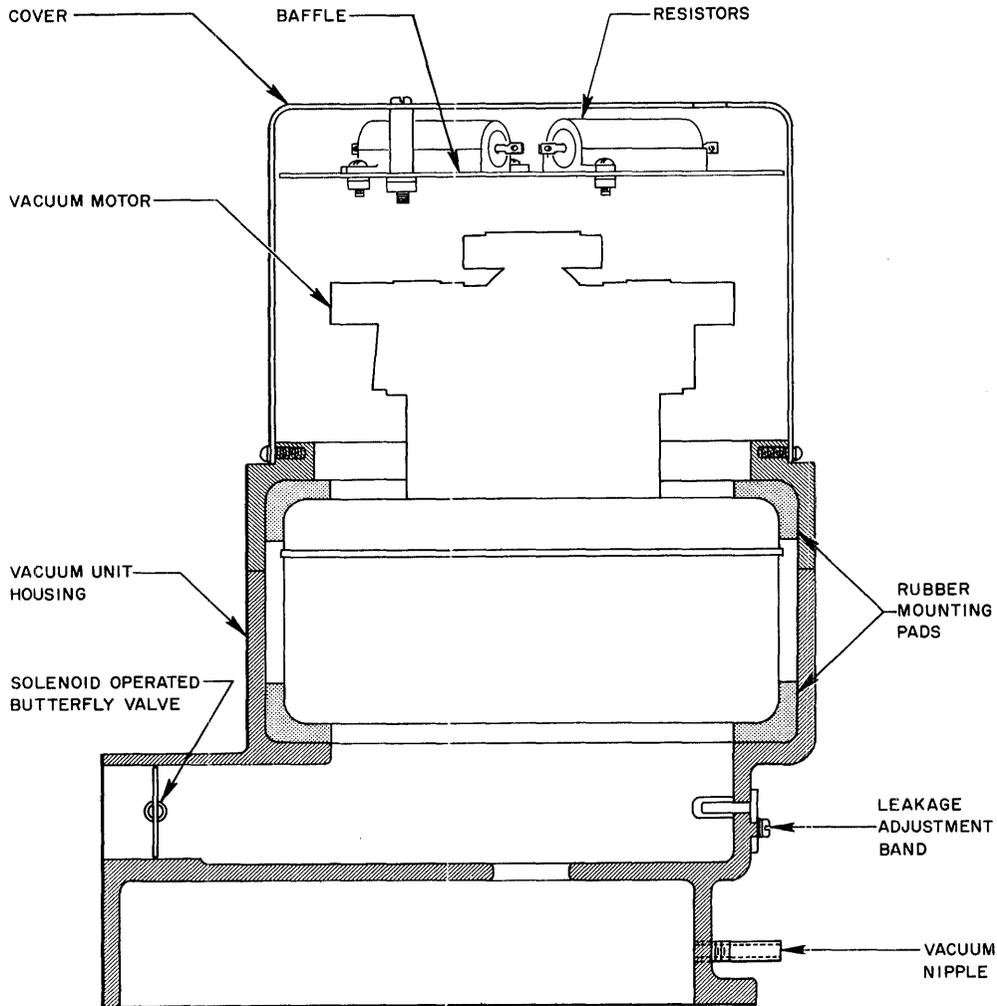


Figure 5-4
Vacuum Unit

fly valve, which is actuated during the rewind mode to allow the tape to be withdrawn.

The position of the tape loop in a vacuum chamber is monitored by four holes in the back of the chamber.

These holes are connected through plastic tubing to vacuum switches. The vacuum switch contacts are actuated by a diaphragm that senses a differential pressure.

The tape loop position provides two pressure states: a low pressure (or vacuum) state and a high (or atmospheric) pressure state. The vacuum switches operate under the

vacuum state and provide a signal to the transport control unit which in turn directs the reel motors to supply or remove tape from the appropriate storage chamber. A vacuum switch connected to holes at either end of the chamber senses an extreme loop position and stops tape motion.

ii. Vacuum Unit. Fig. 5-4 is a cross-sectional view of the vacuum unit. The vacuum motor is contained between two castings by two rubber mounting pads, which act as a shock mounting to reduce noise and vibration from the motor. The main casting, or vacuum unit housing, also provides a mounting surface for the solenoid operated butterfly valve.

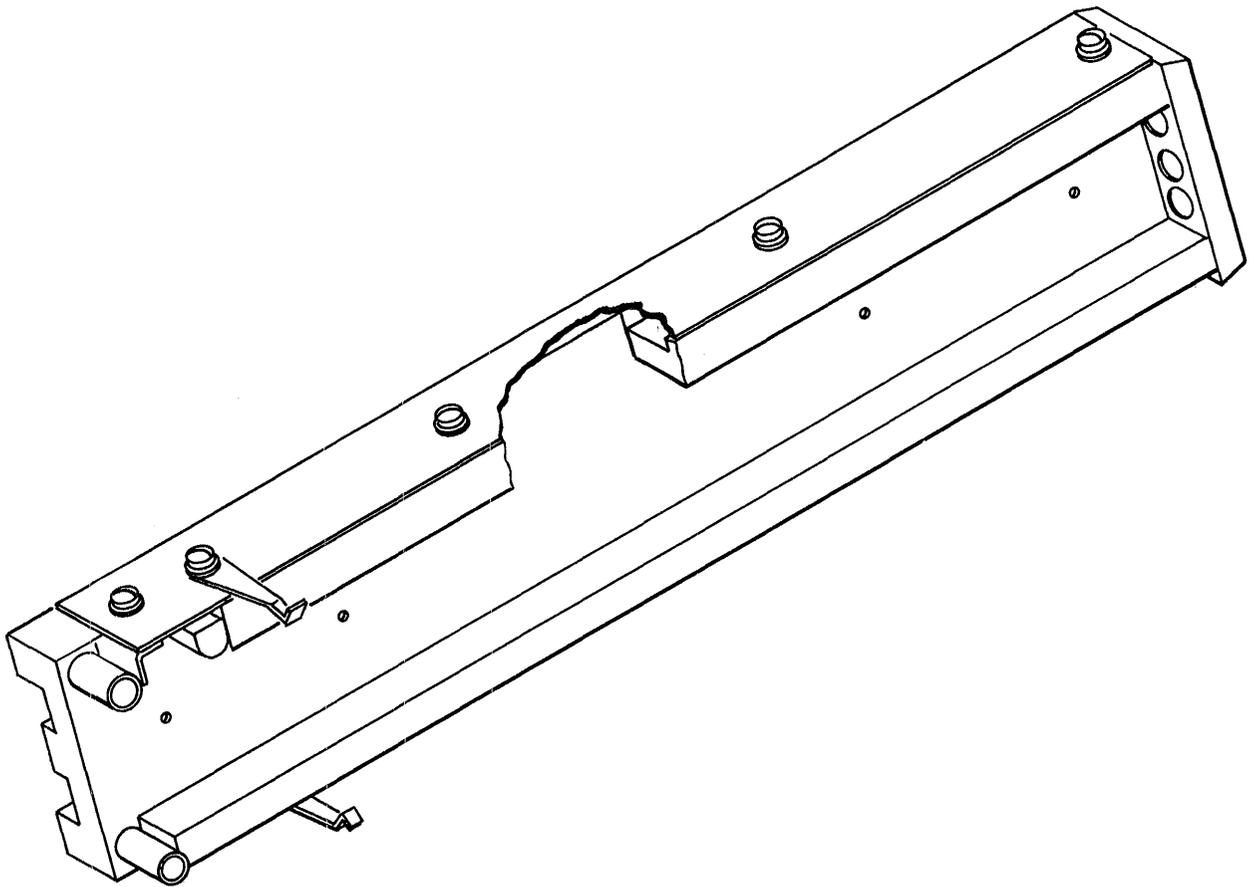


Figure 5-5
Vacuum Chamber (Take-up Reel)

The valve is rotated by a solenoid; a return spring is used to keep this valve normally closed. The amount of leakage provided by the open butterfly valve can be adjusted by moving the energized solenoid.

Brake release resistors R12, R13, R43 and R44 are mounted on the baffle plate in the vacuum unit cover for cooling purposes. Connections are brought out to a receptacle mounted on the cover.

Electrical connections to the vacuum motor and solenoid are made

through a terminal block located on the side of the main casting.

iii. Vacuum Chamber. Two vacuum chambers are used on the D2020 Transport to produce tape tension and store a tape loop. An additional "secondary" tape loop is provided at the front edge of each chamber to reduce tape velocity transients caused by variable length tape loops within the chamber. The takeup reel vacuum chamber is illustrated in Fig. 5-5.

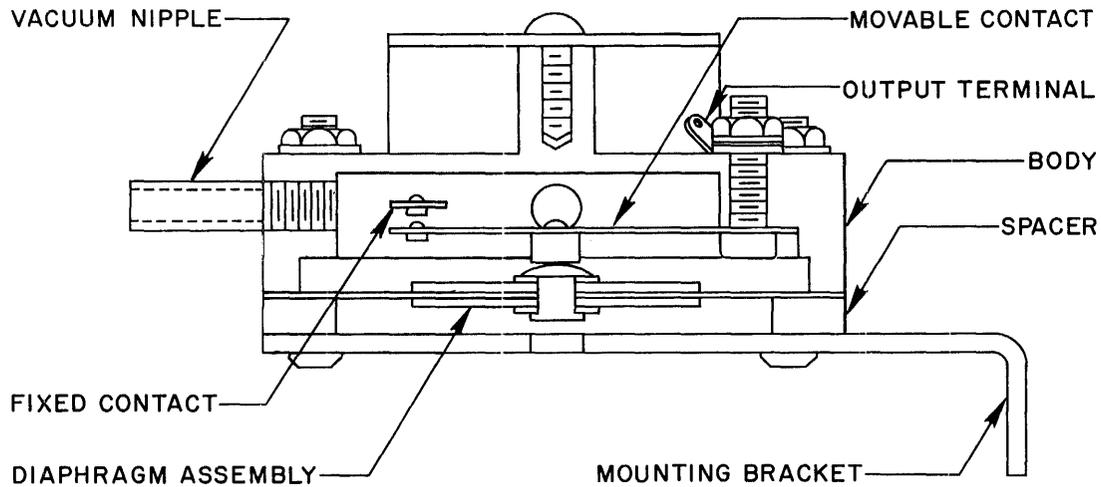


Figure 5-6
Vacuum Switch

The two chambers are mirror images of each other

The glass cover plate is mounted to the top of the chamber by two spring clips located on the sides of the chamber walls. These clips hold the front end of the cover plate securely to the chamber. The rear end of the cover plate is secured by a rubber lip that protrudes from the top edge of the vacuum manifold.

A side plate with a rubber gasket glued to its front edge seals the open side of the secondary vacuum chamber channel located in the side of the main storage chamber wall.

iv. Manifold. The manifold connects the two vacuum chambers to the vacuum unit. The manifold consists of an aluminum casting with a hollow center section and a rubber gasket mounted to its contact surface. The rubber gasket provides a seal between the vacuum chamber end plates and the manifold. This gasket also contains lips to retain the back end of the chamber cover plates.

v. Vacuum Switches. Vacuum switches are used to detect the position of a loop within a tape storage chamber. They are connected to the vacuum sense holes in the bottom of the chamber by a flexible plastic tubing. Pressure lower than atmospheric will cause movement of a diaphragm which actuates an electrical contact and applies the appropriate signal to the reel servo motors.

Fig. 5-6 is a cross-sectional view of a typical normally open vacuum switch. It consists of eight principal parts: a body, a diaphragm assembly, a movable contact, a fixed contact, a spacer, a mounting bracket, a nipple, and output terminals.

e. Capstan Motor and Capstans.

i. General. Two counter-rotating capstan assemblies are mounted on the D2020 Tape Transport mounting plate. These capstans are driven by a single capstan motor through an appropriate pulley-flywheel

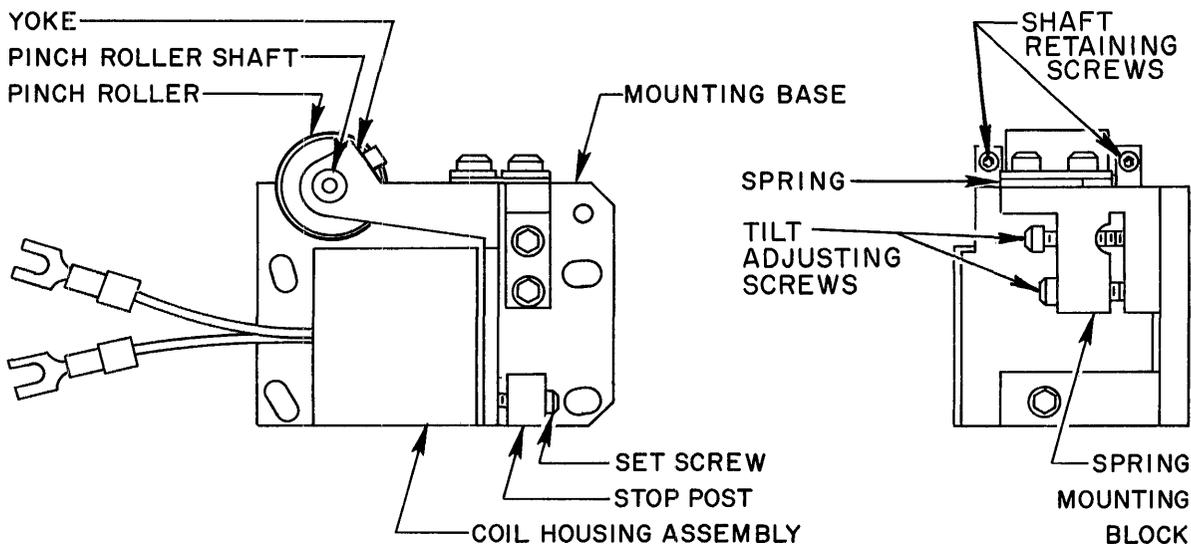


Figure 5-7
Actuator Assembly

belt arrangement. The capstans rotate at 1145 rpm to provide a 45 ips tape velocity.

ii. Capstan Motor Assembly. The capstan motor assembly consists of an 1800 rpm synchronous motor on an aluminum mounting bracket. The cast bracket also has a surface for mounting the motor capacitor and a terminal block. A crowned motor pulley is attached to the motor shaft.

iii. Capstan Assembly. The capstan assembly consists of a bearing housing, a capstan shaft, two sealed bearings, and a flywheel pulley. Two of these assemblies are mounted on the back of the transport plate. Double sealed bearings are used to prevent oxide and other contaminants from reaching the inside of the bearing.

f. Actuators. Two actuator assemblies are mounted on the front surface of the D2020 mounting plate. Each actuator (with its associated capstan) produces one direction of tape movement. The tape is driven as a result of being forced against the rotating surface of the capstan by the pinch roller.

The actuator consists of a mounting base, a coil housing, a spring, a spring mounting block, a yoke, a stop post, a pinch roller and pinch roller shaft.

Fig. 5-7 illustrates a typical actuator assembly. The yoke is free to pivot against the restoring force of a cantilevered spring. Yoke rotation is produced when the solenoid is energized, thus attracting the flat portion of the yoke.

The pinchroller assembly consists of a rubber covered aluminum shell, two miniature flange bearings, and a fixed mounting shaft. The outer race of the bearing rotates about the fixed shaft, thus allowing the pinchroller to rotate when in contact with the capstan.

The de-energized position of the yoke is adjusted such that a pre-load exists in the pivot spring. This adjustment is obtained by advancing the screw in the stop post until it contacts the back surface of the yoke.

The spring mounting block is slotted and can be adjusted by two screws to provide varying degrees of tilt to the yoke. This adjustment

may be required to establish a parallel gap between the pinch roller and the capstan.

The entire actuator assembly pivots about a pin in the main frame. This permits adjustment so that the pinchroller contacts the capstan when the actuator is at the proper degree of closure.

g. Transport Control Unit. The transport control unit is mounted to the back of the transport plate, adjacent to the supply reel assembly. It contains most of the electrical components associated with the transport control circuitry.

Electrical connection between the transport control assembly and the Operator Control Panel is made through a connector cord that is captive to the control chassis. An input connector for the Datamec Maintenance Unit is located on the side of the chassis. Six test point jacks are located on the back of the chassis.

h. Miscellaneous Components. A removable head cover and cover plate are used to aid in threading the tape. A raised lip on the head cover provides a surface to guide the tape down between the capstans and pinch rollers. Both covers are held to the tape transport by means of friction catches.

A sliding switch handle is located on the front of the D2020 Transport. It is accessible through a square opening in its cover panel. The switch handle is mounted on two parallel rods; the bottom of the handle engages the operating lever of a toggle switch (mounted on the transport plate). The switch handle is normally centered such that moving the handle in either direction from the neutral position completes a circuit through one section of the switch.

When the handle is moved to the right, the brakes are released on both

reel motors allowing rotation of the reels to facilitate tape threading. Moving the switch handle to the left places the transport in operation after it has been threaded.

A hinge block is mounted to the front surface of the D2020 Transport at the extreme right edge. This block is used to engage other hinge blocks which are mounted to the rack rails. The two assemblies are fastened together by two pivot rods and two plastic shim washers, which provide axial clearance between the two hinge blocks. The other sides of the two rack mounted blocks are used as the inside portion of the cover door hinge. A threaded pin is passed through the two end mounting blocks on the cover door to engage the pivot hole in the two rack mounted hinge blocks. Plastic shim washers are also used between these mating surfaces to establish clearance.

A Cover Door Assembly is available as an optional feature for the D2020 Tape Transport. The cover door frame is constructed from an extruded aluminum section and employs a rubber gasket to retain a plexiglass pane which permits observation of the tape transport. The extent of the door swing is limited by a stop assembly.

2. Operation (See Transport Schematic, Fig. 7-1)

a. Threading and Starting. When 117v ac power is applied to the transport through contacts 2 and 3 of P-1 power is applied to the primary of low voltage power transformer T-1, causing -24v dc, +10v dc, and 6v ac to be generated. The -24v dc is applied to relay K-2 through the S1B contact (normally closed) and K-1 relay contacts 14-15 (normally closed). Energizing relay K-2 opens contact 7-8 in the capstan and vacuum motor lines. It also causes the transfer of relay K-2 contact 4-5 to the open position. Power is applied to the servo power supply CR-15 through



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CR18. The transport is now ready to be threaded. A full reel of tape is placed on the upper reel holddown and the holddown knob is tightened. Placing the transport switch in the BRAKES position closes the normally open contact S1A, which is connected to the dc power. Power is applied to the two reel motor brakes, energizing the brakes and allowing the reel motors to be turned by hand.

After the threading operation has been completed and tape is looped around the lower reel, the Transport Switch is placed in the START position. This de-energizes relay K2, which allows the vacuum motor to run and build up a vacuum. When vacuum has been built up to a sufficient level, vacuum switch VS6 closes, which energizes relay K1. Relay K1 contact 12-13 applies power to the vacuum switches VS1 through VS4 in the SCR gate circuit. This in turn causes the reel servos to operate, turning the reels so as to drive tape into the chambers. The Transport Switch may now be released and relay K1 will be held in through vacuum switches VS7 and VS8 (in series).

The disabled relay K1 is delayed by the action of C7. This capacitor prevents the instantaneous drop-out of relay K1 during relay switching transients or other short duration interruptions. Relay K1 contact also applies -24v dc power to the Operator Control Panel and the balance of the transport control circuitry.

b. Reel Servo. The reel motor drive system is composed of five basic parts: the bridge rectifier composed of CR15 to CR18, the power switching circuit composed of silicon controlled rectifiers SCR1 through SCR4, the vacuum switch circuit composed of VS1 through VS5, the upper and lower reel motors and the upper and lower reel brakes. The brake coils are energized with the reel motors through diodes CR40, CR41, CR44 and CR45 (the brakes are sole-

noid disengaged, spring engaged). Each reel motor is a 110v, split winding, series motor. When power is applied to one winding, current flows through this winding and through the armature. The motor is then free to turn in the direction determined by the energized winding.

Power enters the transport control chassis at pins 2 and 3 of P1. Fuse F3 protects the reel motor power circuit against short circuits or other faults. The full wave silicon rectifier bridge converts the ac power to dc power (unfiltered), which is applied to the anodes of SCR1 through SCR4.

When the transport is threaded and turned on, vacuum switches VS1 through VS4 are open. Disabled relay K1 will be energized, closing a circuit through contacts 12 and 13; vacuum motor and standby relay K2 will be de-energized.

Assuming that VS1 contact is closed, voltage is applied to the gate of SCR1 through resistor R4. SCR1 will fire, applying power to the reverse winding of the upper reel motor. The upper reel motor will then rotate in such a direction as to move tape back across the vacuum sensing hole, causing the vacuum switch to re-open. When the vacuum switch re-opens, SCR1 will be turned off and the servo action ceases. In a similar manner, VS2, VS4 and VS3 control SCR2, SCR3 and SCR4 which in turn control the upper and lower reel motors. Relays K6 and K8 in the gate circuit and vacuum switch VS5 are a portion of the rewind circuitry (explained in part c below).

Diodes CR11, CR12, CR13 and CR14 are damper diodes to absorb the voltage spikes generated by the collapsing flux in the motor windings. These voltage spikes, if undamped, could cause false triggering of the silicon controlled rectifiers. Diodes CR46 and CR47 produce a fixed, forward voltage-drop which provides a slight



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delay in re-application of power to the SCR's after each half cycle of the rectified line voltage. This ensures that the SCR's have sufficient time to turn off between each half cycle.

c. Rewind. Rewind on the Datamec D2020 is accomplished by first slowly stepping the tape out of the vacuum chambers, then rewinding it at high speed.

The rewind operation is initiated by applying a -10v signal to pin 15 of the transport control unit plug P1. This -10v signal turns on transistor Q3, which energizes relay K4. Relay K4, in turn, energizes relays K5, K6, K7 and K8 and transfers the loop alarm switches VS7 and VS8 from a series to a parallel connection. Relay K5 connects -24v to the Q1 side of the rewind jog circuit; applies power to the right hand side of the rewind jog circuit through diode CR7 and applies power to the vacuum dump solenoid, which reduces the vacuum supply to the vacuum chambers. Relay K6 transfers the reel servo control circuits from normal vacuum switch control to control by relay K3. Relay K5 applies power to the lower reel motor brake to enable the lower reel to turn freely. Relay K7 signals the Operator Control Panel that the machine is in the Rewind mode and de-energizes Write Enable relay K9. Relay K8 completes the Rewind light circuit, grounds the actuator drive lines, and transfers the gate drive of SCR3 from VS4 to K6 and VS5.

When power is applied to both sides of the rewind jog circuit, the multivibrator begins its flip-flopping action, causing K3 to be alternately energized and de-energized. The on and off times for relay K3 are controlled by R46 and R47, respectively. When K3 relay is energized, gate power is applied to SCR1, which causes the upper reel motor to turn in a reverse direction, drawing tape out of the chamber. The jogging action

continues until tape has been drawn out of both chambers and the contacts of vacuum switches VS7 and VS8 have opened.

At this time, power is removed from the Q1 side of the rewind jog circuit, causing Q2 to be turned on and remain on. Relay K3 is then energized and remains on, which applies power continuously to the gate of SCR1. This, in turn, causes the upper reel motor to continue in a reverse direction rewinding the tape at high speed.

The Rewind mode is terminated by removing the command from pin 15 of the transport control unit connector P1. When the command is removed, relay K4 is immediately de-energized, which in turn de-energizes relays K5 and K6. Relay K3 is held energized by the charge remaining on capacitor C10, which is connected to the base of Q2. Power to hold K3 is received through the combination of K5, (normally closed), and K3 (held closed). At the end of the time delay K3 is de-energized and, in turn, relays K7 and K8 are de-energized. During the short delay period caused by the holding of K3, K7 and K8, upper reel servo control is returned to vacuum switches VS1 and VS2. Relay K8 delays the application of control to the lower reel motor until this time delay period is over. During the time delay, the lower reel motor is under control of vacuum switch VS5, which is in the same relative position as the lower chamber short loop alarm hole. Application of power to the lower reel motor through normal vacuum switch contacts is deferred to permit full recovery of the lower reel motor system.

After the rewind cycle is complete, all portions of the control circuitry return to normal, ready-to-operate condition. That is, tape is back in position in the chambers, the actuator circuit is unlocked and ready to operate, and the vacuum is at a normal level.



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d. Actuator Control. The forward and reverse actuators are driven from identical circuits and the only connection between the forward and reverse is the interlock (to be explained later in this section).

When a -5v to -10v command is applied at Terminal 2 of the printed circuit board, transistor Q4 is turned on and Q5 is turned off. The collector of Q5 rises to approximately -13v and applies a signal to the base of Q6, which is normally held off by the application of +10v to diodes CR31 and CR32 through R30. This biasing technique applies +0.7v to the emitter of Q6, +1.4v to the base of Q7 and +0.9v to the base of Q6. When Q5 is turned off the -13v at its collector is applied to the base of Q6 through R27 overcoming the positive bias and causing Q6 to be turned on. Current flows through Q6 via CR31 and the base emitter junction of Q7. The magnitude of the current flow is such as to turn Q7 on and cause it to become saturated. Resistor R29 limits the current available to turn on Q7. When Q7 is turned on, one end of the forward actuator coil is clamped to ground with -24v applied to the other end. When the charge on capacitor C6 has been drained off, (approximately 0.5 milliseconds) the voltage at the upper end of the actuator coil drops to approximately 5v, due to the limiting action of R42. The actuator, now energized, has caused the pinchroller to press against the capstan, which in turn drives the tape.

When the negative command is removed from pin 2 all circuit conditions revert to the off state. Transistors Q4 and Q5 comprise a Schmitt trigger, which gives a snap action to the circuit operation, and precludes any difficulty from slowly rising command signals. The differential on the Schmitt trigger is such as to give positive action when commands are applied and removed.

Zener diodes CR35 and CR36 connected from the collector of Q7 and Q11 to ground, prevent high voltage spikes from appearing at the collector of Q7 or Q11 that could lead to breakdown. However, the inductive "kick" of the actuator coil is not suppressed sufficiently by these diodes to delay the release of the actuator assembly.

The collector of Q5, the second transistor in the Schmitt trigger, is connected to resistor R25, which gets its negative voltage from the collector of Q10. In this manner, if the reverse actuator has been previously energized, it will be impossible to obtain enough voltage drive to cause the forward actuator to turn on. This precludes the possibility of having a forward and reverse actuator energized at the same time. In a like manner, the collector of Q9 obtains its voltage from the collector of Q6. In the event of simultaneously applied commands to the forward and reverse actuator drive lines, the circuit will select only one of these two commands, energizing only one of the actuators.

R-C combination, R42 and C6, provides a high voltage surge to the actuator coil when the output transistor is first turned on. This high voltage surge causes the actuator to operate at a fast rate and yet be current-limited over a long period of time. The re-charge time of C6 is 1 millisecond.

If commands are applied and removed at a rate faster than 5 milliseconds on or 5 milliseconds off, the mechanical inertia of the actuator assembly will become a prominent factor in the response time of the system since it takes a definite amount of time for the actuator to move from one position to the other. It is necessary to provide the 5 millisecond restriction to insure that the actuator will always start from its full OFF or ON position.

Also, at program rates exceeding 5 millisecond duration, the heating factor of the current pulse being delivered to the actuator could damage the output transistor.

e. Miscellaneous Power and Interlock Circuits. The 117v power is applied to pins 2 and 3 of the transport control unit connector P-1, which in turn supplies power to the primary of transformer T-1. The secondary of transformer T-1 supplies 6v ac for the various light circuits and 41v ac center tapped for the -24v dc supply. A portion of the -24v is used in the Operator Control Panel for relays and transistors. The +10v dc supply is primarily a bias supply, which is used to provide hold off voltage for the transistor circuits. The -24v supply is also subdivided into two branches, one branch supplying the above mentioned items, the other branch supplying the actuator drive circuit.

An interlock exists between the rewind function and the actuator drive function. If, for instance, the machine is in a normal driving mode (that is, one actuator energized) the anode end of CR-33 or CR-34 is clamped to ground, in turn causing the junction of R-19 and R-20 in the rewind relay circuit to be clamped to ground. A Rewind command initiated under these conditions is ignored, due to the clamping action. This prevents the machine from going into a rewind operation during a normal drive operation. Conversely, once the machine is in Rewind, relay K-8 grounds the input to the actuator drive circuits.

During a rewind operation, relay K-7 causes the Write Enable relay to be de-energized if it was previously energized. This prevents writing on the tape during a rewind operation even though the reel has a Write Enable Ring installed. However, the File Protect actuator is still energized, in position, to prevent wear on the Write Enable Ring.

f. Accessory Connections: Photosense and File Protect. Provision is made in the transport control assembly to provide power and switching to the File Protect solenoid which retracts the File Protect actuator when a Write Enable Ring is in place on the reel.

Power is also supplied for the Photosense package. The Photosense package uses a +10v dc and 6v ac.

B. HEAD ASSEMBLY

The head assembly includes a write head stack, a read head stack, two tape guide/cleaners, a head gate and a base plate. The base plate serves as the primary structure to which all of the other components are mounted.

The write head stack has seven tracks, arranged to write seven parallel tracks on the tape. Each individual track consists of a magnetic circuit with a center-tapped winding and with a gap in the magnetic circuit at the center of tape contact with the magnetic circuit. A current from one end of the winding to the center tap causes a magnetic field in the circuit. Fringing of the flux at the gap causes the flux to penetrate and thereby magnetize the iron oxide on the tape. When the current is switched from one end of the winding to the other, flux of opposite polarity is generated, thereby causing a reversal in the polarity of magnetization at the point on the tape which was opposite the gap at the moment of switching. Each point of reversal of tape magnetization is considered a "one" in the coding scheme used in IBM compatible magnetic tapes.

The seven gaps of the write head stack are arranged to be very closely perpendicular to the edge of the tape. Variation from this perpendicularity is called "gap" scatter, and is generally limited to a maximum of a band 0.00015 inches wide.



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The read stack is almost identical with the write stack, the primary differences being that the width of the individual read tracks are narrower than the write tracks, that there are more turns of wire on the windings, and that the gap in the magnetic circuit is smaller. As magnetized tape passes over a read track, flux from any point of change in tape magnetization will thread through the magnetic structure of that track, thereby inducing a voltage in the winding. The voltage produced in the winding will be proportional to the time rate of change of flux, and therefore the output voltage from the winding will be proportional to the tape speed.

The two head stacks are arranged so that the tape passes first over the write gaps and then over the read gaps, with a 0.300 inch spacing between them. It is therefore possible to read what has been written almost concurrently with the writing, so that a tape may be checked for accuracy during the writing process.

On 800 BPI Write/Read Head Assemblies, a full-width Erase head is also provided, over which the tape passes before reaching the write gaps. This ensures consistent high-density writing regardless of the previous magnetic history of the tape.

The face of the head, where it contacts the tape, is made of metal. Experience has shown that a metallic face is far less likely to pick up magnetic oxide (thereby lifting the tape away from the head) than is a plastic face. Experience also shows that a "cut-back" head, wherein the spaces between the tracks are relieved, results in rapid tape wear.

The leads from the windings of the heads are terminated in a pair of connectors which mate with the connectors going to the data electronics.

The two tape guide/cleaners are located on each side of the head stacks. The undersurface of the cap on each of these guides is located precisely, and serves to guide the tape so that exact location of the tracks on the tape is obtained. This location must be closely held to ensure read and write compatibility with IBM equipment. The tape is held against this reference surface by a spring-loaded washer at the bottom of the guide.

The guide is slotted, and the interior is connected to the vacuum system with plastic tubing. The slot is arranged so that the tape passes over it, with space for air to sweep over the face of the tape into the slot. This action cleans away any loose particles of oxide or dust from the surface of the tape, lessening the incidence of drop-outs and reducing requirements for periodic cleaning of the tape transport.

A hinged head gate is attached to the front extension of the base plate. This gate serves to reduce the write-to-read crosstalk. It is coupled to the transport switch slide rod so that it is opened whenever the switch is operated to the "BRAKES" position. It will remain open until the switch is operated to the "START" position, at which time it closes. This insures that the gate will not be in the way when tape is being threaded.

For special applications, special head assemblies are available. They incorporate only the read function or only the write function. In such instances, the function not required is simply omitted from the head assembly, and a dummy stack inserted in its place. Other modifications, such as differing number and width tracks or differing gap to gap spacing, may also be provided where specific systems requirements dictate it.

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C. OPERATOR CONTROL PANEL

1. Description. The Operator Control Panel serves as a means of manual control over the tape transport and as a control center or junction point between the Tape Transport, the Data Electronics, the data processing system, and the primary power line. The unit is designed for rack mounting and occupies 5-1/4" of rack space. The front panel is set in a frame that extends 2-7/8" in front of the rack mounting surface, exactly matching the Transport Cover Door.

The frame and front panel are top hinged to provide access to the switches and lamps beneath, as shown in Fig. 5-8. The plastic pushbuttons are captive to the front panel, while the switch and lamp assemblies are mounted to the main structure. This arrangement exposes the lamps for changing when the front panel is lifted. The lamp sockets are threaded to accept colored plastic lenses; the equipment is supplied with a red lens on the WRITE ENABLED lamp and an amber lens on the LOCAL lamp. A slotted hole on the mounting bracket for each switch permits adjustment for proper travel when the pushbutton is depressed. The WRITE ENABLED pushbutton is only an indicator and is positioned by a metal bushing rather than a switch.

The extreme right hand side of the unit is filled by a removable

panel. In single unit installations, this may be a solid panel painted to match the rest of the unit. In multiple installations, a panel with a translucent number may be inserted to designate the particular number assigned to the tape unit. Behind this numeral are four lamps and a rotary switch. The ground side of the lamp circuit and all switch connections are connected to the data processing system. Thus, when a particular number panel is inserted, the switch can be set to indicate the number that has been assigned. Since the lamp circuit is also remotely controlled, the number can be illuminated whenever the tape unit is selected to perform an operation. The removable number panel is held in place by two spring clips, and can be removed by pressing inward and sliding to the left.

On control panels equipped with a number wheel, the number panel is replaced by a bezel with a rectangular opening near the center. A plastic wheel with translucent numerals is mounted on the shaft of the Unit Select switch in such a manner that one of the numerals is visible through the bezel opening. A single lamp provides back lighting for the numeral selected. The address of the tape unit is changed by the opening of the front panel and rotating the number wheel to the desirable position.

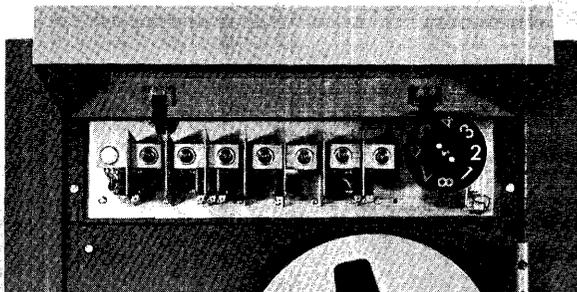


Figure 5-8
Operator Control Panel

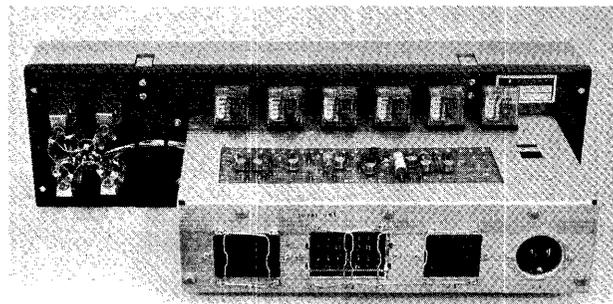


Figure 5-9
Operator Control Panel
(Rear View)

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A chassis on the rear of the Operator Control Panel contain six relays and an etched circuit board (Fig. 5-9). Input and output connectors are located along the rear skirt of this chassis.

2. Operation
a. Auto-Local Selection.

Referring to the schematic diagram of the Operator Control Panel, fig. 7-2, it can be seen that Automatic and Local status is controlled by relays K-1 and K-2. A -24 volt supply from the tape transport is brought in through pin 4 of J-1 to normally closed Local switch S-1. This voltage then arrives at normally open Auto switch S-2, which is paralleled by a normally open contact of K-1. One end of the K-1 and K-2 coils are returned to ground through transistor Q-2. Q-2, which is in the Unload circuit, is normally turned on so that the K-1 and K-2 coils are returned to ground. The function of the Unload circuit will be explained later in the text. Depressing S-2 energizes the coils of relays K-1 and K-2. The K-1 contact around S-2 closes, holding these relays energized after the release of S-2. Closure of these relays transfers a number of circuits from Local to Auto status, as will be seen from subsequent examination of the circuit. Relays K-1 and K-2 remain closed until the Local switch S-1 is depressed, an Unload command is received, or until power from the transport is interrupted. It should be noted that the -24 volt power to most other circuits passes through the normally closed contact of S-1, permitting this switch to be used to interrupt any function at any time.

b. Rewind. The transport is made to rewind by applying -10 volts to pin 15 of J-1. This in turn is accomplished by closing K-3, which connects pin 15 to the junction of

R-1 and R-2. Relay K-3 is closed by turning on transistor Q-3. This transistor is normally held off by positive bias applied to its base through R-10. When in Local status, rewind can be initiated by depressing REWIND pushbutton S-3, thus completing the circuit to the -24 volt line and supplying turn-on current to Q-3 through R-8 and a normally closed K-1 contact. Relay K-3 closes and locks by means of one of its contacts connected through R-11 and R-17 to -24 volts.

Rewind is stopped automatically by the passage of a load point photosense tab across the photosense head. In High Speed rewind, the duration of the photosense signal is not sufficiently long to allow K-3 to drop out. Therefore, a time delay circuit, Q-4 and Q-5, is provided to extend the effective duration of this signal. The photosense signal, +9 volts, appears at pin 7 of J1. This is applied to the base of Q-4 through CR-6 and R-13. Q-4 is normally turned on by current supplied through R-12. The positive photosense signal overcomes this turn-on bias and turns Q-4 off. When Q-4 is turned off, C-1 charges to -24 volts through R-14 and CR-5. C-1 becomes fully charged in approximately 3 milliseconds. After the photosense tab has passed, which takes approximately 5 milliseconds, Q-4 turns on leaving C-1 charged to -24 volts. CR-5 prevents C-1 from discharging back through Q-4. The negative charge on C-1 supplies base current to Q-5 through R-15 and overcomes the positive turn-off bias applied through R-16. When Q-5 turns on, its collector is effectively clamped to ground thus shortening out the turn-on current supplied to Q-3 through R-11 and the K-3 holding contact. This turns off Q-3 and allows relay K-3 to open. Q-5 remains on until C-1 discharges to the point where it can no longer supply sufficient turn-on current. This time



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period is approximately 50 milliseconds, which allows more than enough time for K3 to drop out. Relay K3 will also be dropped out if the LOCAL button is depressed.

When in Automatic status, the base of circuit Q3 is transferred by K1 to R9, which connects to pin 15 of J2 through CR4. A potential of -10 volts applied to this pin will cause Rewind relay K3 to lock closed. It can be seen that once K3 is closed, the data processing system loses control and has no way of stopping rewind. Rewind in this case can be stopped by the passage of a load point photosense tab or by manually transferring control back to Local status.

c. Unload. When a -10 volt signal is applied to pin 19 of J2 and the tape unit is in Automatic status, rewind is initiated in the same manner as when the signal is applied to pin 15. However, when K3 closes, this -10 volt signal is also applied to the base of Q1 through R3. This causes Q1 to turn on which, in turn, causes Q2 to turn off. Turning off Q2 opens the grounded end of the Auto-Local relays and simultaneously transfers the tape unit back to Local status. Thus, the Unload command places the tape unit in rewind and transfers it to Local status.

d. Load Point. Closure of the load point relay K5 transfers the Forward Drive line, pin 13 on J1, from the normal Forward input line to the load point circuit. The voltage for the load point drive command is derived from the -24 volt supply through resistor R82 which is also connected to the collector of Q25. When load point relay K5 is energized, the collector of Q6 is at ground potential and a positive bias is applied through R81 to turn Q25 off. With Q25 off, the load point drive signal is present at Q25 collector. When a photosense

signal turns off Q6, Q25 is simultaneously turned on by current through K5 coil and R80. This immediately shorts out the load point drive signal and tape motion is stopped without having to wait for K5 to open. This eliminates the possibility of over running the tab when a very short rewind cycle has stopped the tape near the trailing end of the tab.

When in Local status, depressing Load Point switch S5 supplies turn-on current from the -24 volt line to the base of Q6 through a K1 contact and R18. This causes K5 to close and holding-current to the base of Q6 is supplied through a K5 contact and R18. Tape is driven forward until a load point photosense tab comes under the photosense head. At this point a +9 volt signal appears at pin 7 of J1 and is applied to the base of Q6 through a K4 contact, CR8 and R19. This turns off Q6, stops forward drive, and allows K5 to open.

A K4 contact in series with the load point drive line prevents application of the drive command until the transport has recovered from rewind. Another K4 contact in series with the photosense signal to Q6 prevents a slow passage of the photosense tab during rewind from prematurely dropping out K5.

A load point search is automatically initiated whenever the tape unit has been in rewind and has been automatically stopped by passage of a load point photosense tab. The load point relay is made to close by shorting across Q6 with a K4 and a K3 contact. The K3 contact closes as soon as a rewind command is given. K4, the end of tape reset relay, is energized at all times, except when the Tape Transport is actually in rewind. This is accomplished by connecting one end of the K4 coil to -24 volts and the other end to pin 16 of J1, which is grounded by a normally closed con-



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tact on the Tape Transport rewind relay. This contact opens only when the transport has actually gone into the rewind mode. Thus the K4 contact at the collector of Q6 is actually open at all times except when the transport is rewinding. This prevents K5 from closing until after K3 has closed and the transport has actually started to rewind. If the load point relay were allowed to close as soon as a rewind command is given, the transport would go into forward drive before it could go into rewind, which would automatically lock out the rewind command supplied by K3. In review, the sequence of events is as follows:

- (1) A rewind command is given.
- (2) K3 closes.
- (3) The transport goes into rewind.
- (4) K4 is de-energized and K5 is energized.

When rewind is terminated by the photosense tab, the short across Q6 is removed by the opening of the K3 and K4 contacts, but K5 remains closed by virtue of its own holding contact. Thus, the transport will be driven forward until a load point photosense tab is encountered and turns off Q6. If rewind is stopped at any time by depressing the LOCAL button, K5 will not remain energized because its power is supplied through Local switch S1.

e. Reverse. In order to remove a file from the Tape Transport, all of the tape must be wound off of the take up reel. This is accomplished by depressing the REVERSE pushbutton S4, which in turn connects the voltage divider R1 and R2 to pin 14 of J1 through a normally closed K1 contact. The K1 contact locks out the REVERSE pushbutton when the unit is in Automatic status. As long as S4 is held closed, the transport will drive the tape in reverse so it may be stripped off the take up reel.

f. End-of-Tape Warning. The purpose of the end of tape circuit is to store the information that an end-of-tape tab has passed under the photosense head. This is indicated by closure of K6 contacts connected to pins 6 and 16 of J2. One end of the K6 coil is connected directly to -24 volts. The other end is connected through Q8 and a K4 contact to ground. As previously noted K4 is always closed except when the transport is in rewind. Q7 is normally turned on by current supplied to the base through R23. With the collector of Q7 clamped to ground, Q8 is turned off by positive bias applied to its base through R26. Thus K6 will be de-energized. When an end-of-tape tab passes the photosense head a +9 volt signal will momentarily appear at pin 8 of J1. This causes Q7 to turn off, Q8 to turn on and K6 to close. Relay K6 is locked in by the contact across Q8 and can be opened by only one of the following events:

- (1) The transport is placed in rewind which de-energizes K4 and causes the K4 contact at the emitter of Q8 to open.
- (2) Power from the Tape Transport is turned off.

g. Density Selection. The dual density control panel provides facilities for selecting High or Low Density operation of the tape unit. Two push-buttons are provided, one for HIGH DENSITY and the other for LOW DENSITY. K7, the density switching relay, is a two coil mechanical latching relay. This relay has two stable states, corresponding to high or low density. It can be transferred from one state to the other by momentarily energizing the opposite coil and will remain in the last selected position even though power to the machine is turned off. Switch S6 energizes the Low coil and switch S7 energizes the High coil. Switches S6 and S7 are connect-



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ed to the -24 volt supply through a normally closed K1 contact. This means that a density setting can be changed only when the tape unit is in Local status. One set of K7 contacts switches the data electronics through pins 6, 7, and 8 of J3. Another set of contacts serves to indicate density status to the data processing system through pins 25, 26, and 27 of J2. A third set of contacts switches the indicator lights behind the High or Low Density pushbuttons.

The triple density control panel has a back-lit wheel, visible through an opening in the front panel, for selecting 200 Density, 556 Density or 800 Density. Density may be changed by opening the front panel and rotating the wheel until the desired density is in position behind the front panel opening. One set of contacts on the associated rotary switch S6, provides a density status indication to the data processing system through pins 25, 26, 27 and 28 of J2; other contacts switch the data electronics through pins 6, 7, 8 and 10 of J3.

h. Indicator Lights. One side of all indicator lights is tied to pin 6 of J1, which is the hot side of the 6.3 volt ac supply in the Tape Transport. Grounding the other side of any lamp will cause it to light. The Auto and Local lights are controlled by a K2 contact. The REWIND light is grounded through pin 17 of J1 by a contact on the transport rewind relay. Thus, the rewind light does not come on until the transport has actually started to rewind. The LOAD POINT light is controlled by a K5 contact and a K3 contact. Since the load point relay K5 is closed whenever the transport is rewinding, the K3 contact prevents the LOAD POINT light from coming on until the rewind cycle has been completed. The WRITE ENABLED light is grounded through pin 18 of J1 by a contact on the Write Enable relay in the Tape Trans-

port. The numeral lights may be connected to ground through pins 5 and 17 of J2. A separate ground connection for these lamps is brought out through pin 17 so that the system ground line will not have to carry the large ac current. Control panels using the large interchangeable number panel have four lamps in parallel, I9, I10, I11 and I12. On panels with the number wheel only one lamp, I9, is used. On dual density panels the high and low density lights are controlled by a contact on K7.

i. Primary Power. Primary power is brought in through receptacle J4. The neutral side of the line is connected to the Tape Transport through pin 2 of J1 and to the data electronics through pin 2 of J3. The hot side of the line is connected to the transport through pin 3 of J1 and to the data electronics through pin 3 of J3.

j. Status Indications. A number of tape unit status indications are provided by the Operator Control Panel to the data processing system. Auto-Local status is provided by a set of K2 relay contacts connected to pins 2, 3, and 4 of J2. Rewind Status indication is provided by closure of a set of relay contacts in the Tape Transport which are connected to pins 9 and 10 of J2. A set of K5 relay contacts across these pins maintains the rewind indication until the tape has been repositioned to the load point. A set of K6 contacts provides end-of-tape indication at pins 6 and 16 of J2. The unit number assigned to the tape unit is indicated to the data processing system by connections brought out from unit select switch S8. A common line is brought out to pin 20 of J2. Depending upon the setting of this switch, the common line will be connected to one of four other lines brought out to pins 21, 22, 23 and 24. Write enabled status is indicated to the data processing system by closure of

DESCRIPTION AND THEORY OF OPERATION

the set relay contacts in the Tape Transport. These are brought out to pins 11 and 12 on J2. Density status is indicated by K7 relay contacts (or S6 Density switch contacts) connected to pins 25, 26 and 27 (and 28) on J2. Write Enabled and density setting status is also provided to the data electronics through J3. Pin 12 of J3 is connected to the reverse drive line so that whenever the transport is driving in reverse a -10 volt signal will appear at this pin. On single density Operator Control Panels pins 6 and 7 on J3 are jumpered together so that low density status will always be indicated to the data electronics.

D. FILE PROTECT

The File Protect Unit mounts to the rear of the transport main frame directly above the supply reel motor. Its function is to detect the presence of a Write Enable Ring on a file reel.

The File Protect Assembly, shown in Fig. 5-10, consists of a base plate to which is mounted a spring loaded actuator, a solenoid, a switch and a terminal strip.

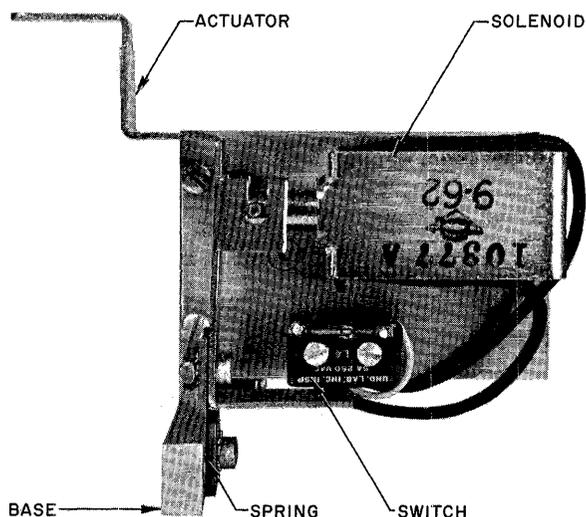


Figure 5-10
File Protect Assembly

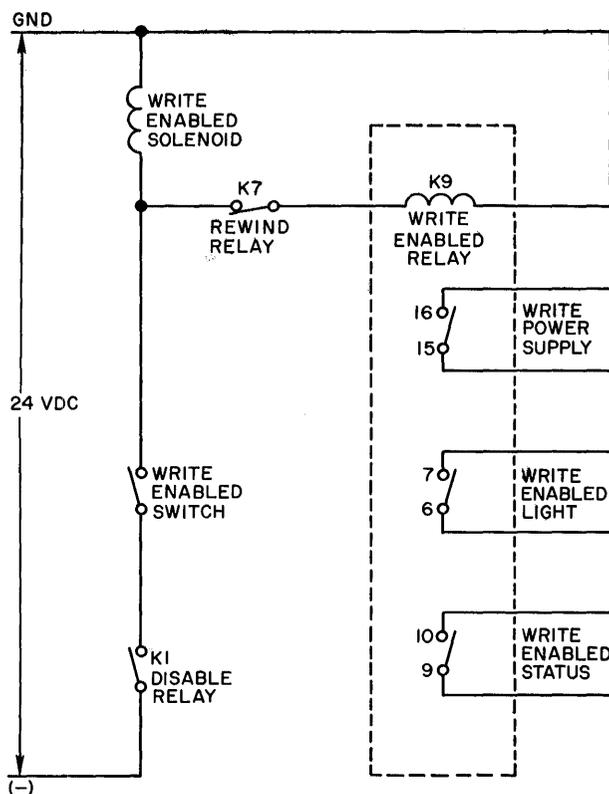


Figure 5-11
File Protect Schematic

Operation of the File Protect may be understood by referring to Fig. 5-11 and 5-12. When a reel with a Write Enable Ring is placed on the machine, the ring depresses the actuator far enough to close the switch. After the tape has been threaded and the transport started, disable relay K1 closes, completing the 24v dc circuit to the solenoid. The solenoid retracts the actuator so that it is no longer in contact with the Write Enable Ring. At the same time that the solenoid is energized, write enable relay K9 is also energized through a normally closed contact on rewind relay K7. Closure of K9 completes three circuits: A write enabling circuit in the Data Electronics; the Write Enable light on the Operator Control Panel; and the write enable status circuit which indicates to the data

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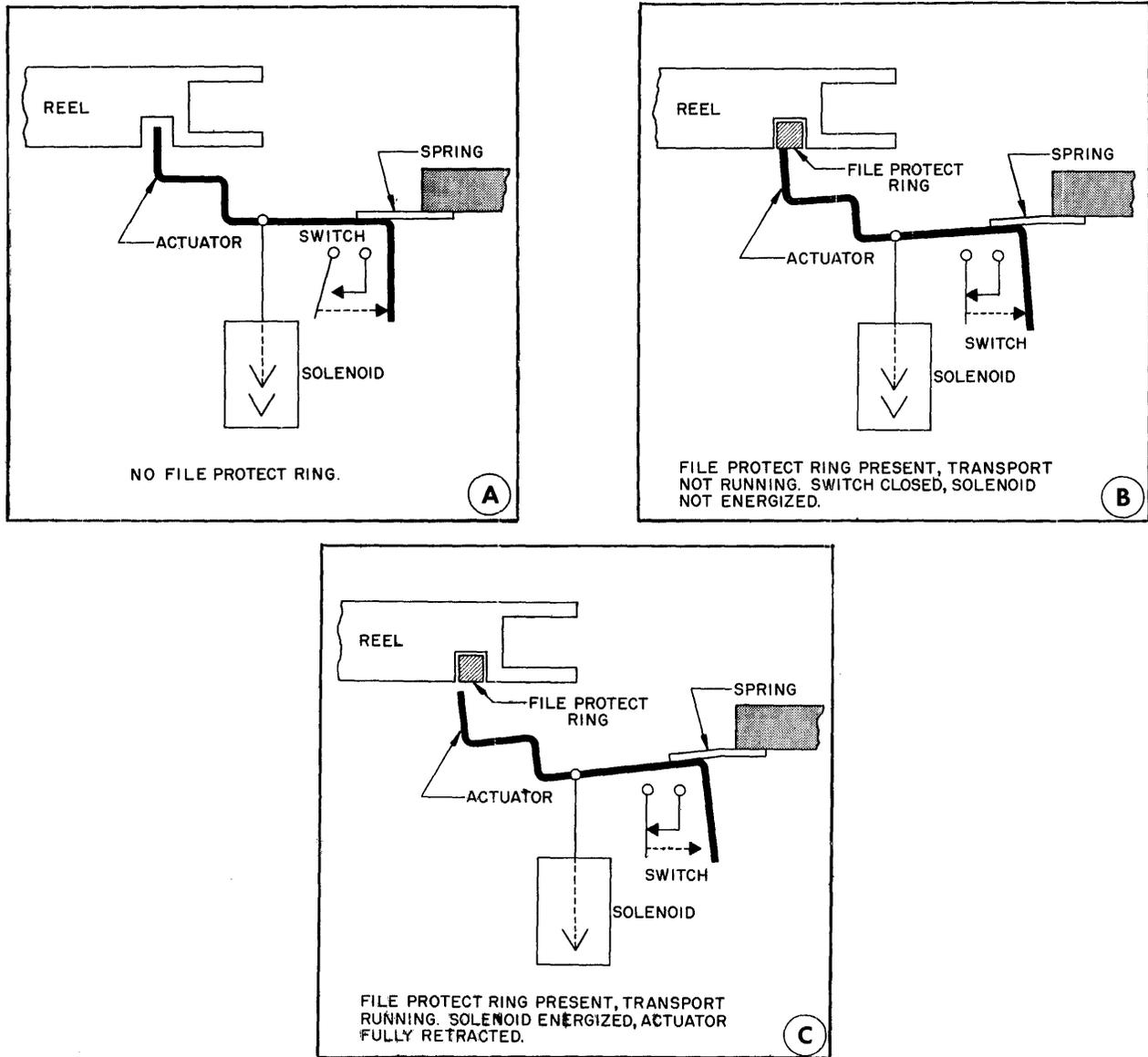


Figure 5-12
File Protect Operation

processing system that a Write Enable Ring is present.

Once the file protect has been activated, the actuator will remain in the retracted position until power is turned off or until K1 relay contact is opened. This would normally occur when all the tape is wound back

onto the file reel for removal. When the tape transport is placed in Re-wind, the normally closed contact on K7 opens and write enable relay K9 is de-energized. This disables the write amplifiers during rewind, but leaves the solenoid energized so that the actuator will not drag on the Write Enable Ring during rewind.

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E. PHOTONSENSE

The Photosense is used to detect the presence of reflective tabs placed on the back side of the tape to designate the beginning and end of a file. The Photosense consists of a head assembly and an amplifier assembly.

The head assembly and its relationship to the tape and tabs is shown diagrammatically in Fig. 5-13. A single light is located along the center line of the tape. Directly above and below the light are the photodiode sensing elements. These cells have a built-in lens and are positioned at such an angle that light from the bulb will be reflected from the tab directly into the lens. A mask over the bulb prevents unnecessary radiant energy from striking the tape and thus reduces the heating effect of the lamp. The photocell leads are brought out to a terminal board at the rear of the head. The lamp is held in place by a removable leaf spring which also serves as the center contact. Contact with the bulb base is made through the body of the head assembly. A cable connect-

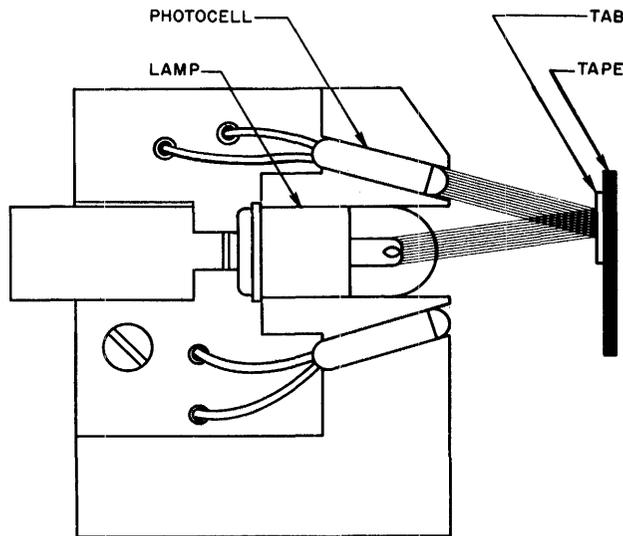


Figure 5-13
Photosense Head

ing the lamp and photocells to the amplifier is permanently attached to the head.

The amplifier assembly is shown in place on the transport (with the cover removed) in Fig. 5-14. All components are mounted on a single etched circuit board, which is in turn mounted to a chassis frame. The amplifier has two identical channels, one associated with each of the photocells.

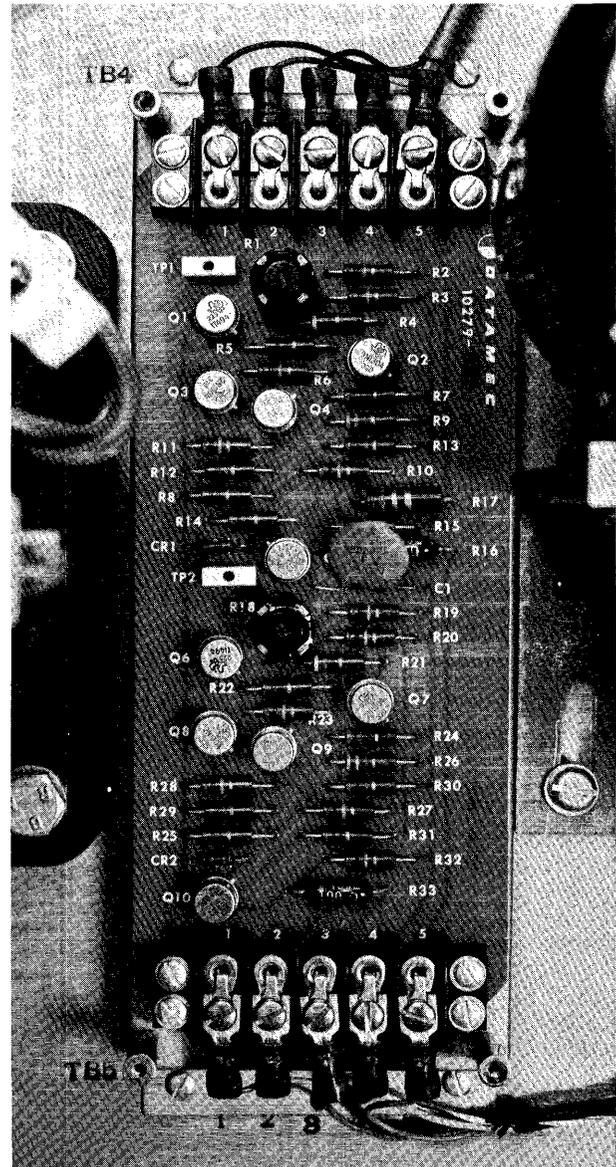


Figure 5-14
Photosense Amplifier



DESCRIPTION AND THEORY OF OPERATION

Referring to the schematic (Fig. 7-3) operation is as follows:

Resistors R1 and R2 and the photocell form a voltage divider between +10v and ground. The base of Q1 is connected to the junction of the resistors and the photocell. The photocell acts as a light sensitive current source; increasing light causing an increase in current. Thus the voltage developed across the resistors and appearing at the base of Q1 will be a function of the light entering the photocell. To accommodate variations in lamps and photocells, an adjustment, R1, is provided. When properly adjusted, the Q1 base voltage will be +5 volts or more on-tab, and +1 volt or less off-tab. Q1 is connected as an emitter follower and serves to transform the input voltage from a high to a low impedance. In view of the high resistance of the sensing circuit, a low leakage silicon transistor is used in this stage.

The output of Q1, which closely follows the input voltage, is directly coupled to Q2 through R4. Q2 and Q3 form a conventional Schmitt trigger circuit. The trigger level is approximately +3v. When the input voltage is below the trigger level, as is the case in the off-tab condition, Q2 will be off and Q3 will be on. When the input voltage rises above the trigger level, the circuit will flip to the other state, Q2 turning on and Q3 turning off. Q4 serves as an invert-

er and driver for output transistor Q5. Voltage divider R12-R13 maintains the emitter of Q4 at approximately +4 volts. When Q3 is on, its collector is at approximately +3 volts which holds Q4 off and results in the base of Q5 being effectively returned to the +10v line through R14 and R11. Q5 is therefore off, and silicon diode CR1 in the emitter circuit ensures that it will not be partially turned on by leakage current through R14 and R11. With Q5 turned off, the output terminal is at zero potential with a resistance to ground of 10,000 ohms.

In the on-tab condition, Q3 turns off, Q4 turns on and Q5 receives base current through R13, Q4 and R14. With Q5 on, the output is connected to +10v through R16, Q5 and CR1. The drop across CR1 and Q5 is approximately 1 volt which leaves an open circuit output voltage of 9v. Resistor R16 serves as a current limiter to prevent destruction of Q5 if the output is inadvertently shorted to ground.

Power for the Photosense is taken from the transport power supply. The amplifier operates on +10v dc and the lamp in the photosense head is supplied by the 6.3v ac supply. A dropping resistor is used in series with the lamp to reduce its voltage to 5-1/2v, thereby extending its life.



SECTION VI
MAINTENANCE

A. GENERAL

Two elements of maintenance will be covered in this section, preventive maintenance and corrective maintenance. A thorough program of preventive maintenance will help to eliminate the need for corrective maintenance as the equipment will be maintained in an "almost new" condition. Close adherence to the preventive maintenance section will enable the user to keep his equipment in excellent condition for its operational life.

Provision must always be made for corrective maintenance as there is always a possibility of faulty or damaged components which result in unscheduled system down time. The corrective maintenance section will enable the user to quickly diagnose and localize any malfunction and return the equipment to normal condition in a minimum period of time.

Extensive factory testing has determined the life expectancy of the various assemblies and components of the equipment. As a result, a

TABLE I
D2020 PREVENTIVE MAINTENANCE SCHEDULE

INTERVAL (HOURS)	CLEAN	CHECK	REPLACE
16	TAPE PATH	TAPE TRACKING PINCHROLLER BEARINGS ROTARY GUIDE BEARINGS PILOT LAMPS PHOTOSENSE LAMP	
160	RACK CABINET TAPE CLEANERS	PINCHROLLER GAPS PINCHROLLER WEAR PHOTOSENSE OUTPUT VOLTAGE	
1000		DATA ELECTRONICS ADJUSTMENT	VACUUM MOTOR BRUSHES PHOTOSENSE LAMP
2000		REEL BRAKE GAP DRAG BRAKE TENSION REWIND JOG SETTING	PINCHROLLERS PINCHROLLER BEARINGS VACUUM MOTOR CAPSTAN DRIVE BELT
4000		CAPSTAN BEARINGS	ROTARY GUIDE BEARINGS OPERATOR CONTROL LAMPS
16000			CAPSTAN MOTOR CAPSTAN BEARINGS UPPER ACTUATOR ASSY. LOWER ACTUATOR ASSY. HEAD ASSY. VACUUM CHAMBER FIXED GUIDE VACUUM CHAMBER SENSE POST VACUUM CHAMBER COVERS SUPPLY REEL MOTOR ASSY. TAKE-UP REEL MOTOR ASSY.

Figure 6-1
Maintenance Schedule

good forecast may be made of their life under factory test conditions. Actual usage conditions, however, may vary widely and significantly alter life expectancies. The time periods specified in Fig. 6-1 are conservative and assume fairly heavy usage. In a particular application it may be found that longer periods between maintenance operations are possible if average usage is light, or conversely, when the equipment is subjected to very heavy usage, it would be desirable to shorten the time period between maintenance operations.

B. PREVENTIVE MAINTENANCE OPERATIONS

1. Cleaning Tape Path and Checking Primary Tape Transport Elements.

Any loose oxide, dust, or other contaminants should be cleaned from the tape unit after every 16 hours of operating time. Items to be cleaned include the vacuum chambers, vacuum chamber guides, vacuum chamber glass covers, capstans, pinchrollers, heads, and tape guides. Cleaning is best accomplished with a lint-free cloth or disposable wipers such as Kimberly Clark "Kimwipes" and a mild solvent such as denatured alcohol.

WARNING

DO NOT USE M.E.K. OR OTHER STRONG SOLVENTS AS THEY WILL DAMAGE THE RUBBER PINCHROLLERS AND PAINTED SURFACES. DO NOT USE EXCESSIVE SOLVENT, AS IT MAY FLOW INTO AND CONTAMINATE THE BEARINGS.

While the alcohol will clean the vacuum chamber glass adequately, a regular glass cleaner such as "Windex" will do a faster and better job. Cleaning should be accomplished in the following manner:

Step 1: Remove the tape from the transport, remove the head cover, cover plate, and the two glass vacuum chamber covers.

Step 2: Moisten a wiper sparingly with denatured alcohol and scrub the interior metal surfaces of the upper chamber, fixed guide and rotary guide.

CAUTION

DO NOT SCRUB THE "SCOTCHLITE" COVERING ON THE INNER CHAMBER WALL. THIS SURFACE USUALLY DOES NOT REQUIRE CLEANING OTHER THAN BRUSHING OR BLOWING AWAY LOOSE DUST, AND SCRUBBING MAY DAMAGE THE ADHESIVE BACKING.

Step 3: Take a new wiper, moistened with denatured alcohol, and clean the front surface of the head and the tape guides.

Step 4: Clean the upper (reverse) capstan and pinchroller by scrubbing while rotating them by hand. Check for binding or looseness in the bearings, and if present, refer to the corrective maintenance section for the repair procedure. Next, clean and check the lower (forward) capstan and pinchroller.

Step 5: Take a new wiper, moistened with denatured alcohol, and clean the lower vacuum chamber. Check the condition of the bearings in the rotary guide.

Step 6: Clean the glass vacuum chamber covers with a wiper moistened with Windex and replace. If dirty, clean the cover door window with Windex or soap and water. Waxing the plexiglass with a good grade of paste wax will improve appearance by filling in minor scratches.

CAUTION

USE ONLY "WINDEX" OR SOAP AND WATER ON THE PLEXIGLASS COVER DOOR. POLISHING THE PLEXIGLASS WITH A DRY CLOTH WILL CREATE A DUST-ATTRACTING STATIC CHARGE.

Step 7: Replace the vacuum chamber covers, and load a file tape on the Tape Transport.

Step 8: Cycle the tape forward and reverse for about one second intervals. Observe that it is leaving the driving capstan without twist or curl and that it is not riding hard against the top or bottom of the entrance to either chamber. If the tape is not tracking satisfactorily refer to the Checking and Adjusting Actuators information in the corrective maintenance section.

Step 9: Place the transport in Forward drive and observe that the tape is reeling onto the take-up (lower) reel without scraping the reel flanges. Place the transport in reverse drive and observe that the tape is reeling onto the supply reel without scraping the reel flanges. If it is scraping, refer to the Checking and Adjusting Turntable Height information in the corrective maintenance section.

Step 10: Check that all pilot lamps in the Operator Control Panel will light to indicate the various modes of operation. Replace any lamps found to be defective.

2. Cleaning Rack Cabinet.

Clean all dust and dirt from the interior surfaces and bottom of the Rack Cabinet, using a vacuum cleaner with a brush attachment. Clean dust and dirt from the top of the Rack Cabinet and Operator Control Panel.

3. Cleaning Tape Cleaners.

Remove the head cover and cover plate. Carefully remove the tops of the two tape cleaners and the ceramic tape followers by unscrewing the tops counter-clockwise. Using a cotton-tipped swab, such as a "Q-tip," moistened with alcohol, clean the interior of the tape cleaners and the tape followers. During re-assembly, care must be taken that the rounded edges of the ceramic tape followers are adjacent to the tape. If they are installed incorrectly,

the tape will guide against the sharp edges and mylar and oxide particles, shaved from the tape, will tend to deposit in the head area.

4. Checking Pinchroller Gaps.

Step 1: With the tape threaded normally, insert a 0.0002 brass shim between the actuator clapper and the actuator coil housing on the lower (forward) actuator as shown in Fig. 6-13. Energize the actuator and check to see that the shim will come out with only a slight resistance. If this is not the case, adjust the actuator assembly position as described in the corrective main-

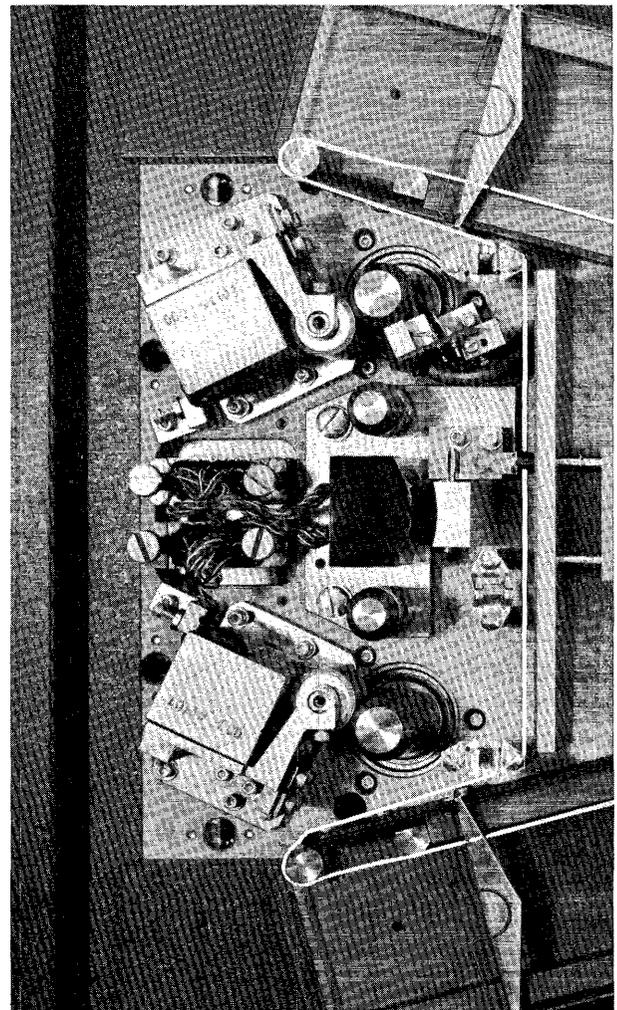


Figure 6-2
Tape Threaded Around
Support Post



MAINTENANCE

tenance section. With the actuator de-energized and tape removed from between the pinchroller and capstan, measure the gap between the pinchroller and capstan with a feeler gauge or shim as shown in Fig. 6-14. This gap should be .004 inch. If not, adjust as described in the corrective maintenance section. Check the gaps on the upper (reverse) actuator in the same manner.

Step 2: Remove the capstan drive belt in order to disable capstan rotation. Thread the tape around the cover support posts as shown in Fig. 6-2. Place the Tape Transport in Forward Drive mode and sight along the normal tape path past the point where the forward (lower) pinchroller contacts the capstan. If any light can be seen coming past the contact point, the pinchroller is excessively worn, and should be replaced as described in the corrective maintenance section. Repeat for the other pinchroller.

5. Checking Photosense Head Output Voltage. Advance the tape to the "END OF TAPE" reflective marker and stop with the marker opposite the photosense head. Measure the dc voltage between TP2 on the photosense amplifier and transport ground using a dc vacuum tube volt meter or calibrated oscilloscope. The voltage should be +5v or greater. Move the tape so the marker is not opposite the photosense head. The voltage should be +1v or less. Rewind the tape until the "LOAD POINT" marker is opposite the photosense head and repeat the voltage measurements using TP1. If any of the above measurements fail to fall within the prescribed limits, follow the adjustment procedure in the corrective maintenance section.

6. Checking Reel Brake Gap. If the reel brakes are noisy, the gap may need adjusting.

Note:

(1) In the procedure below the brake should always be engaged whenever the allen set screw is tightened.

(2) Terminology:

Brake Engaged: No brake coil current.

Brake release button relaxed.

Reel locked.

Brake Released: Current in brake coil.

Brake release button to far right.

Reel free to turn.

No braking action.

Loosen the set screw on the supply reel brake rotor and tighten the axial stop nut on the rear shaft (see Fig. 5-2). Tighten the set screw and test to see if the reel turns freely when the brake release button is operated. (Be sure that the reel is checked over a full 360° of rotation). Continue tightening and testing until the brake starts to drag. At this point engage the brake, loosen the set screw, back off the stop nut approximately 30° and re-tighten the set screw. Re-check to be sure the brake does not drag. If the reel now turns freely when the BRAKE RELEASE button is operated, it is properly adjusted. Repeat for the takeup reel. This adjustment should be made with the drag brake springs removed.

7. Checking Drag Brake Tension. Before any adjustment is made to the drag brake, the vacuum system should be checked as outlined in part 17, this section.

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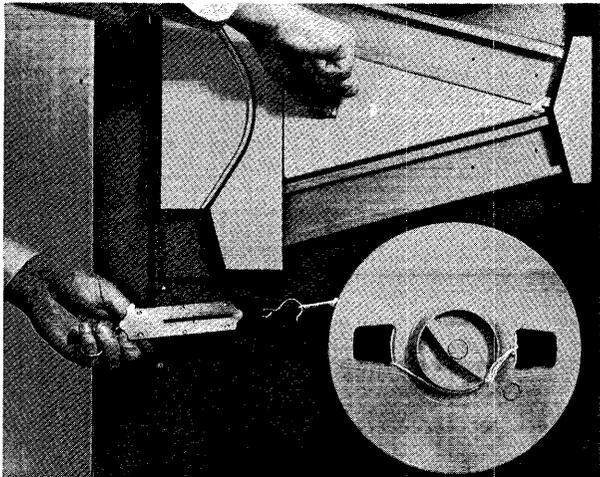


Figure 6-3
Measuring Drag
Brake Torque

(a) Measure the braking torque caused by the drag brake on the take-up reel as shown in Fig. 6-3. It should be 10 to 15 inch ounces (4 to 6 ounces as measured on the spring scale). If incorrect, adjust the tension on the drag brake plate by moving the spring retaining brackets equally on both sides of the brake housing as shown in Fig. 6-4.

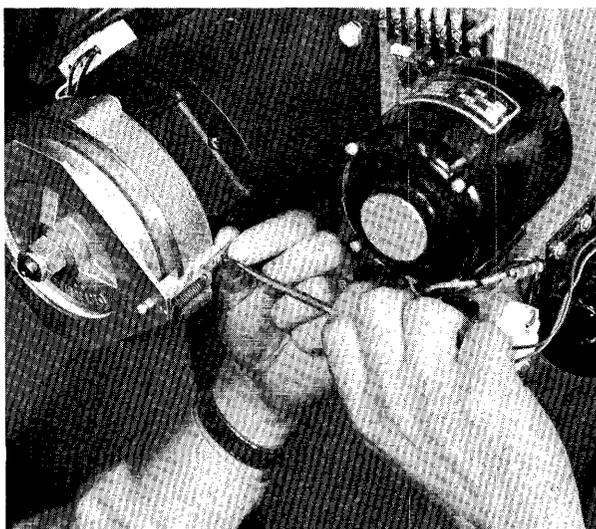


Figure 6-4
Adjusting the Drag Brake

(b) An alternate method may be used to adjust the drag brake when no spring scale is available. This method assures proper drag brake tension after making two separate checks and (if necessary) adjustments.

Step 1: Increase line voltage to 126 volts.

Step 2: Press the rewind button. Note action of the tape loop in the lower chamber. The tape loop should not move until it is pulled from the chamber by the rewind jog action of the upper servo. Should the lower reel turn counter-clockwise and feed tape into the lower chamber before the upper reel jog action starts to pull tape out, the drag brake tension is too loose.

Step 3: If drag brake tension is too loose, adjust by moving the spring retaining brackets equally on both sides of the brake housing, just enough to arrest the feeding action of the lower reel.

Step 4: Drop the line voltage to 105 volts. Check to see if the unit will now require a 2400 ft. reel of tape in less than 3 minutes. If so, drag brake tension is properly set. If not, tension established in Step 3 is too tight and should be re-adjusted.

8. Checking Rewind Jog Time.

Load the machine and advance the tape past "Load Point." Place the machine in the Rewind mode and measure the jog time in accordance with the procedure of Adjusting Rewind Jog Time in the corrective maintenance section.

9. Checking Capstan Bearings.

Remove the capstan belt and rotate each of the capstans slowly, feeling for any roughness. Attempt to move them axially, feeling for any endplay.

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If either capstan has rough spots or endplay, replace the bearings in accordance with the instructions in the corrective maintenance section.

10. Checking Adjustment of Low Density Data Electronics.

Required Equipment:

Tektronix Type 531A oscilloscope (or equivalent).

Tektronix Type CA preamplifier (or equivalent).

Tektronix P6000, 10X Attenuator Probe

Step 1: Verify that the adjustments of all potentiometers are in accordance with the following instructions. The following adjustments should be checked on the Low Density Read Cards:

(a) TP1 (preamplifier output) set to 8v peak-to-peak in a read-after-write mode by means of the GAIN potentiometer R13 (Fig. 6-5).

(b) TP2 (signal rectifier output) the read threshold should be set for a detection level of 40% in Write mode by means of LEVEL ADJUST 2,

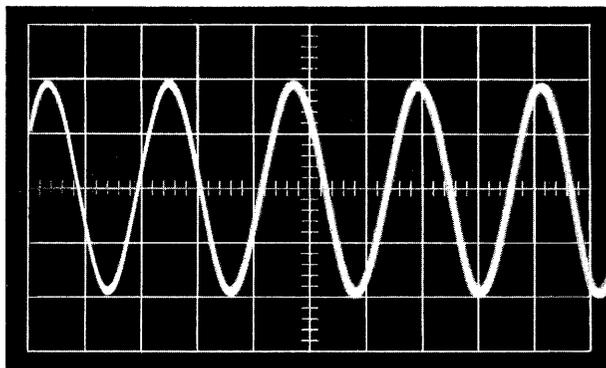


Figure 6-5
Preamp Output, Set to 8v.
Peak to Peak

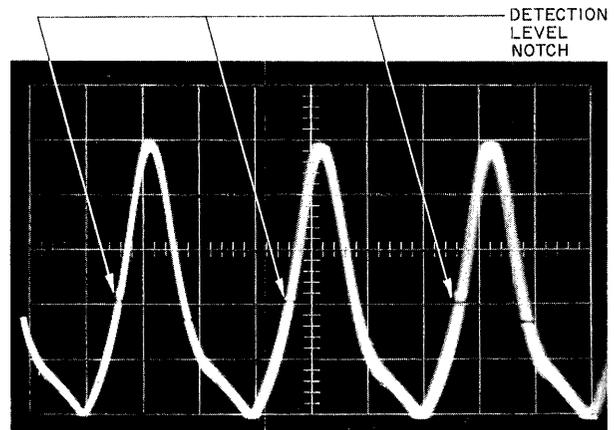


Figure 6-6
Signal Rectifier
Output Showing Detection
Level at 40%

potentiometer R53. The detection level is indicated by the position of the slight notches in the observed wave form as shown in Fig. 6-6

NOTE

THE PRECEEDING ADJUSTMENT WILL AFFECT THE READ DETECTION LEVEL. IT IS IMPORTANT THAT THE ADJUSTMENTS BE MADE IN THE ORDER GIVEN.

Repeat this adjustment while in the Read mode, adjusting LEVEL ADJUST 1, potentiometer R26, for a detection level of 20%.

Step 2: The following adjustment should be checked on the Low Density Read Control Card:

TP3 (DELAY) set for a gate time of one half the bit period (83 microseconds for 200 bits per inch at a tape speed of 30 inches per second), by means of LOW DENSITY DELAY potentiometer R13. The delay period is from the start of the sawtooth to the tip, as shown in Fig. 6-7.

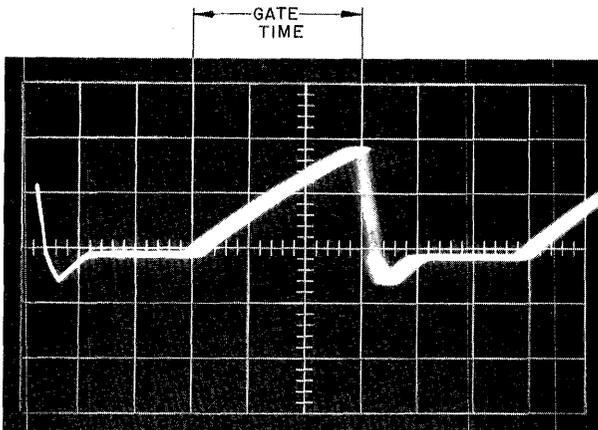


Figure 6-7
Read Control Delay Set
to One Half Bit Period

There are no adjustments in the write section or power supply.

11. Checking and Adjustment of Dual Density Data Electronics.

Required equipment:

Tektronix Type 531A oscilloscope (or equivalent)

Tektronix Type CA preamplifier (or equivalent)

Tektronix P6000, 10X Attenuator Probe (2 Required)

IBM Standard Alignment Tape No. 461096 (Datamec part no. 00112-002)

The following sequence of adjustments should be checked on the Dual Density Read Cards:

(a) Preamplifier Gain. Connect the scope probe to TP1 (preamplifier output), set to 8v peak-to-peak by means of GAIN potentiometer R13.

(b) Read amplifier delays.

Step 1: Thread the Tape Transport with the standard alignment tape. In order to protect the standard tape against accidental erasure, be sure it is NOT equipped with a Write

Enable Ring and that the write amplifiers do not have a Write Permit signal. Remove the Write Power Regulator Card (located in the extreme left hand position of the card cage) from the card cage. Insert the probe from oscilloscope input A into TP4 of the read card for Track No. 4, with the polarity switch for input A of the oscilloscope set to "normal" and the sensitivity set to 0.5 volts per division.

Step 2: Insert the probe from oscilloscope input B into TP4 of the read card for Track 1. Set the oscilloscope "mode selector" to "added algebraically." Set the sensitivity of oscilloscope input B to 0.5 volts per division and the polarity switch of input B to "inverted". Set the oscilloscope for internal ac trigger. Put the tape unit in Forward Drive and observe the oscilloscope.

A pattern similar to Fig. 6-8, 6-9 or 6-10 will be observed. If the trailing pulse is negative, the B input to the oscilloscope (Track 1) is leading, and must be further delayed by rotating the DELAY potentiometer R40 on Track 1 clockwise. If the trailing pulse is positive, the B input to the oscilloscope (Track 1) is

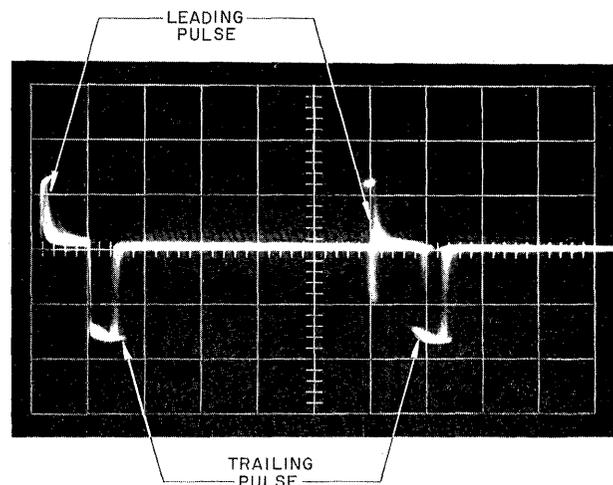


Figure 6-8
Delay Adjustment Showing
Trailing Pulse Negative

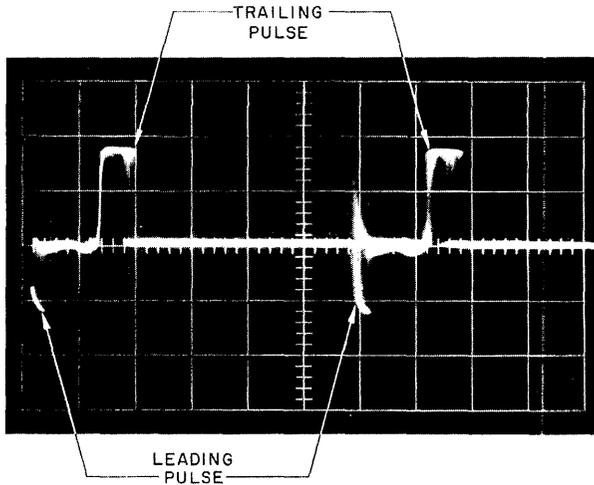


Figure 6-9
Delay Adjustment Showing
Trailing Pulse Positive

lagging and the delay must be reduced by rotating the DELAY potentiometer R40 on Track 1 counter-clockwise.

Adjust the DELAY potentiometer R40 to minimize the trailing pulse. Due to tape skew, the pulse cannot be completely eliminated but an adjustment can be found that produces equal length positive and negative pulses as shown in Fig. 6-10.

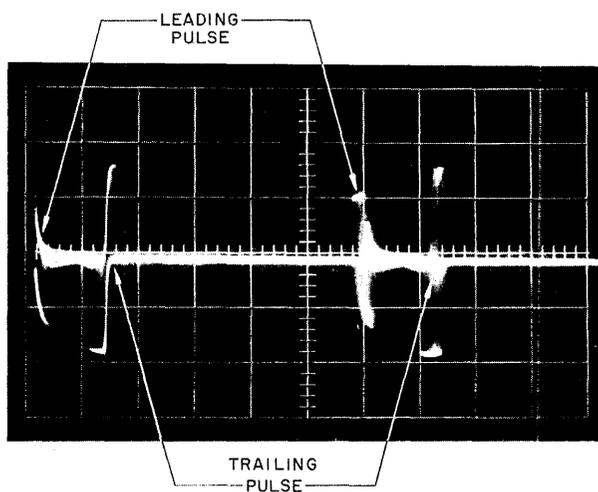


Figure 6-10
Proper Delay Adjustment
Showing
Equal Positive and Negative
Trailing Pulse

Step 3: Repeat this adjustment for Tracks 2, 3, 5, 6 and 7, keeping oscilloscope input A connected to TP4 of Track 4 at all times. If any Track does not have sufficient delay range, the DELAY potentiometer R40 of Track 4 will have to be adjusted to eliminate or minimize the second pulse. In this event, all Tracks previously set will have to be re-adjusted.

(c) Read control delay.

Turn the oscilloscope mode selector to "A only" and put the probe from the oscilloscope A input into TP3, DELAY on the Read Control Card. Adjust the HIGH DENSITY DELAY potentiometer R12 for a delay of 30 microseconds (for 556 bits per inch at a tape speed of 30 inches per second). The delay is from the start of the sawtooth to the tip as shown in Fig. 6-7. Switch the Read Command from HIGH DENSITY to LOW DENSITY. Set the LOW DENSITY DELAY potentiometer for 83 microseconds (for 200 bits per inch at a tape speed of 30 inches per second).

(d) Write delays

Step 1: Remove the alignment tape from the Tape Transport and put a "scratch" tape on the transport with a Write Enable Ring installed. Replace the Write Power Regulator Card and set the unit to write "all ones" on all tracks.

Step 2: Put the probe from the oscilloscope A input into TP4 of the read amplifier of Track 4. Put the probe from the oscilloscope B input into TP4 of the read amplifier of Track 1. Observe the oscilloscope pattern which will be similar to that observed in setting the delays on the read amplifiers. Adjust the DELAY potentiometer R13 on each write amplifier, in turn, to eliminate the second pulse, just as was done in adjusting the read amplifier delays.

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12. Checking and Adjustment of Triple Density Data Electronics.

Required equipment: same as for Dual Density Data Electronics (paragraph 11).

The adjustment procedure is similar to that already described for Dual Density Data Electronics, the principal difference being in the steps involved in adjustment of Write head current balance.

Step 1: Thread the Tape Transport with the standard alignment tape, taking the usual precautions against writing on the alignment tape (remove the Write Power Regulator). Pull tape forward.

(a) At a scope sensitivity of 2 volts per division (including probe attenuation) and with the scope in-

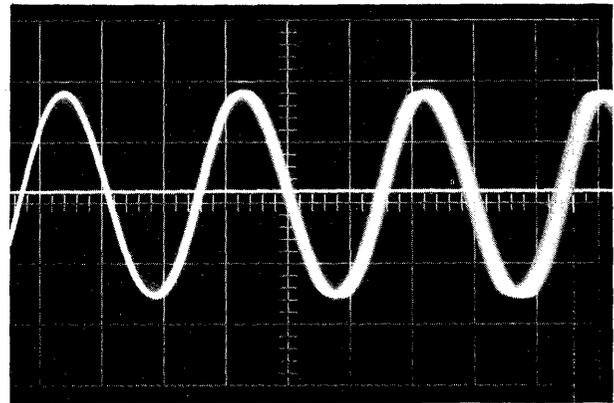


FIGURE 6-10.1
TP1, TRIPLE DENSITY READ
HORIZONTAL: 20μs/cm
VERTICAL: 2v/cm

ternally triggered, adjust Read Gain for each channel, in turn, to obtain approximately 6 volts peak-to-peak signal at TP1. Check remaining test points of each Read card for proper

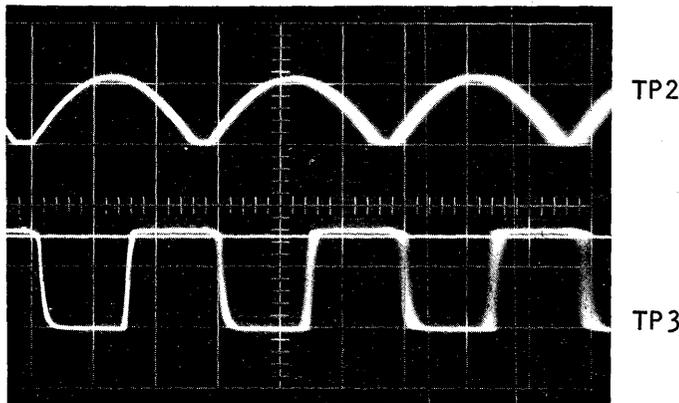


FIGURE 6-10.2
TP2, TP3, TRIPLE DENSITY READ
HORIZONTAL: 20μs/cm
VERTICAL: 5v/cm

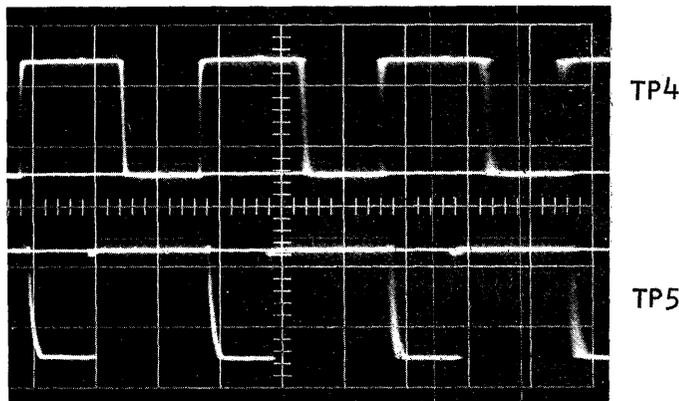
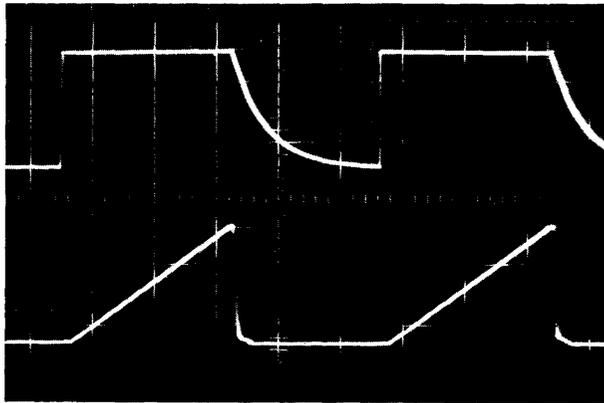


FIGURE 6-10.3
TP4, TP5, TRIPLE DENSITY READ
HORIZONTAL: 20μs/cm
VERTICAL: 5v/cm

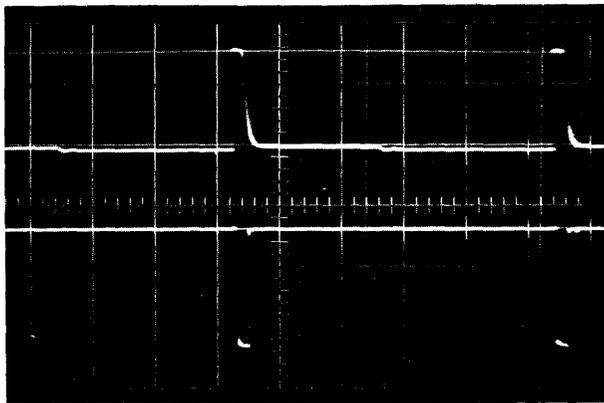
MAINTENANCE



TP3

TP4

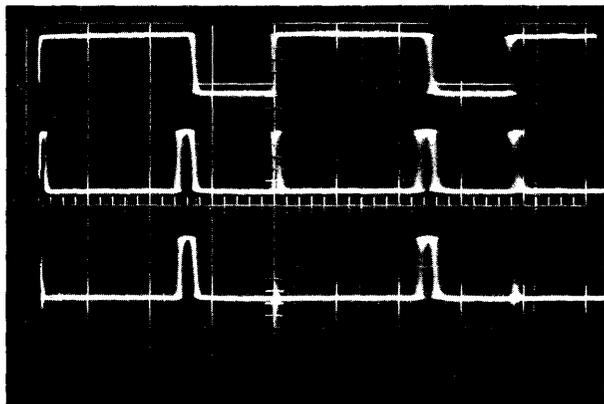
FIGURE 6-10.4
TRIPLE DENSITY READ
CONTROL WITH 18KC READ
SIGNAL (EQUIVALENT TO
800 bpi at 45 ips)
HORIZONTAL: 5 μ s/cm
VERTICAL: 5v/cm



TP5

TP6

FIGURE 6-10.5
TRIPLE DENSITY READ
CONTROL WITH 18KC READ
SIGNAL (EQUIVALENT TO
800 bpi at 45 ips)
HORIZONTAL: 5 μ s/cm
VERTICAL: 5v/cm



TP4, READ 4

INCORRECT

CORRECT

TP4, READ 4
MINUS TP4,
READ 1

FIGURE 6-10.6
TRIPLE DENSITY
ALIGNMENT WAVEFORMS
HORIZONTAL: NONE
VERTICAL: 10v/cm

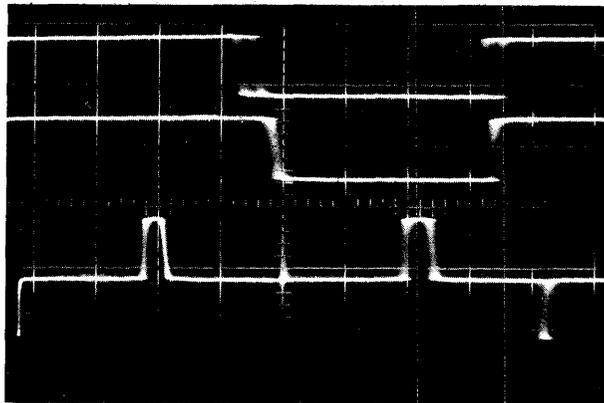
signals, as shown in Figures 6-10.1 through 6-10.3 for 800 bpi at 45 ips.

(b) Check Read Control test points for proper signals. Figures 6-10.4 and 6-10.5 show waveforms at TP3 through TP6 for Read system operation from a simulated 800 bpi 45 ips Read signal; actual signals will show blurring due to dynamic skew,

and signal durations will depend on tape speed and bit density. Character gate times should be set for 200, 556 and 800 bpi densities by adjusting the corresponding Read Control pots to obtain linear sweep times, as in Figure 6-10.4, upper trace, equal to one-half the character periods for the Tape Transport speed and the selected density.



MAINTENANCE



INCORRECT
WRITE BALANCE

CORRECT
WRITE BALANCE

TP4, READ 4

TP4, READ 4 MINUS TP4,
READ 1. (INCORRECT BALANCE,
WRITE 1)

FIGURE 6-10.7
TRIPLE DENSITY
ALIGNMENT WAVEFORMS
HORIZONTAL: NONE
VERTICAL: 10v/cm

(c) Set both scope amplifier channels for overall sensitivity of 10 volts per division and observe TP4 of Read card number 4 with scope channel A. Adjust sweep speed and triggering to obtain a presentation similar to that shown in Figure 6-10.6, upper trace; for convenience in setting Read skew delays, trigger at negative level, negative slope a.c. from TP5 of Read 4, and adjust horizontal position of presentation so that the trailing edge of the delay period (positive-going transition in Figure 6-10.6) takes place at a particular scope graticule line. If necessary, adjust Read 4 Forward-delay pot to obtain a delay period midway between the maximum and minimum available delays.

(d) Set scope mode selector to "Added Algebraically" and channel B polarity to "Inverted," and insert B probe in TP4 of Read 1. Observe the resulting pulse at the previously noted location of the Read 4 delay trailing edge; the pulse may be positive (as in Figure 6-10.6, center trace), negative or both with respect to the main baseline. Adjust Forward

skew delay pot of Read 1 to obtain symmetrical trailing edge pulse, as in Figure 6-10.6, lower trace. In case this is not possible simultaneously for both trailing edge pulses displayed, balance the two trailing edge pulses around the main baseline.

(e) Repeat (d) for the remaining Read channels (except number 4). If the correct setting for any channel lies beyond its range of adjustment, return to (c) above, set a higher or lower initial delay adjustment as necessary, and repeat all subsequent adjustments on other channels.

Step 2: Pull alignment tape in reverse and repeat (c) through (e) of step 1 using Reverse skew delay pots. Recheck both forward and reverse adjustments and unload alignment tape from the Tape Transport.

Step 3: Load the Tape Transport with a "scratch" tape having a write enable ring installed. Reinstall Write Power Regulator if removed for steps 1 and 2, pull tape forward and write "all ones" on all tracks at 800 bpi.



MAINTENANCE

(a) Check TPI through TP5 of Write 4 for proper signals using internal scope sync, then observe TP3. Set Write 4 Delay adjust pot to obtain a delay period (negative-going to positive-going portion of waveform) midway between the maximum and minimum available delays.

(b) Repeat (a) for remaining Write channels in turn.

(c) Trigger scope (a.c., negative level, negative slope) from TP5 of Read 4, and observe TP4 of Read 4 with scope channel A. Adjust scope sweep time "Variable" pot to obtain a display similar to that shown in Figure 6-10.7, upper trace, where two distinct delay period leading-edges may be seen. If scope sweep time adjustment does not cause presentation to "pop" back and forth between a single leading edge (as in Figure 6-10.7, center trace) and two leading edges, unbalance the Write head current for track 4 by setting Write 4 Balance adjust pot either maximum or minimum.

(d) When a "two-leading edge" presentation has been obtained in (c), and before proceeding with Write Balance and Delay adjustments, readjust scope sweep to obtain again a presentation similar to that of Figure 6-10.6, upper trace, meeting the following conditions:

(i) Two delay period trailing edges observable.

(ii) Delay period leading edges and trailing edges Not twinned as in (c). This scope sweep setting will be used later and should be carefully noted.

(e) Return to the scope presentation of (c) above, and adjust Write 4 Balance pot to merge the two leading edges, as in Figure 6-10.7, center trace.

(f) Using the scope sweep setting noted in (d) above, adjust scope horizontal position to bring one of the trailing edges under a graticule line for easy identification. Insert scope B-channel probe (inverted polarity) in TP4 of Read 1 to obtain presentation resembling that obtained with the alignment tape. Adjust Write 1 Delay pot to minimize pulses at trailing edge positions; display may then appear as in Figure 6-10.7, lower trace. Adjust Write 1 Balance pot to equalize the residual pulses at the two trailing edges. Repeat Delay and Balance adjustments to obtain best possible symmetry of both trailing edges around the main baseline, as in Figure 6-10.6, lower trace.

(g) Repeat (f) for the remaining Write channels, in turn (except number 4). If the correct Delay for any channel lies beyond its range of adjustment, return to (a) above and set a higher or lower initial delay as necessary, then repeat the Delay adjustment procedure from (f); readjustment of the Balance pots may be deferred until (h).

(h) Recheck all write Balance and Write Delay adjustments made in (f) above. Minor interaction between these adjustments may be expected.

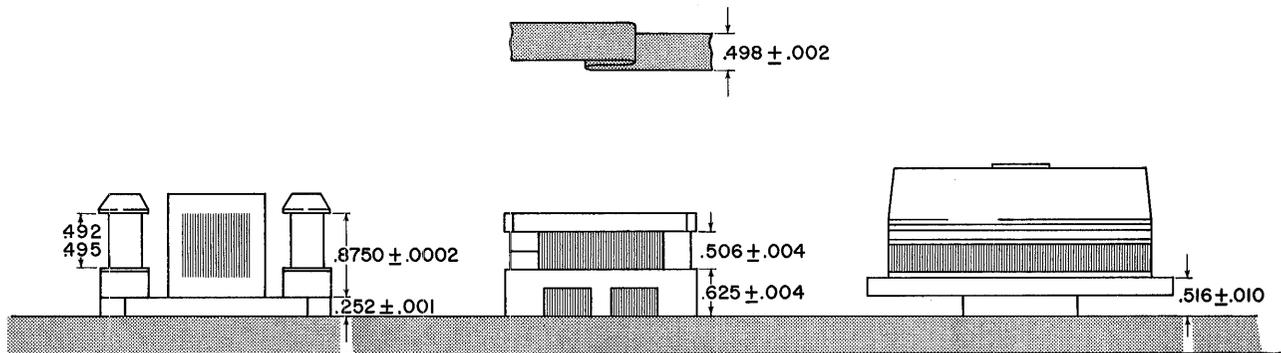


Figure 6-11
Critical Tape Path Dimensions

C. TAPE TRANSPORT CORRECTIVE
MAINTENANCE

1. Checking and Adjusting Actuators. The actuator is assembled at the factory using precision jigs and methods and should require no adjustment other than establishing the operating position and the back gap.

The normal setting of the actuator assembly relative to the capstan is such, that in the de-energized position, a gap of approximately 0.004" exists between the pinchroller and the capstan. In the energized position, the pinchroller engages the capstan in such a manner that the clapper is separated from the coil housing by 0.002". The procedure for adjusting these settings is as follows: (see Fig. 6-12).

Step 1: Release holddown screws so that the actuator assembly is capable of being moved, but will maintain a position after adjustment. Loosen the support post adjusting screws until they no longer cause distortion of the support post.

Step 2: Insert a 0.002 brass shim between the coil housing and the clapper. (Fig. 6-13).

Step 3: Energize the actuator coil.

Step 4: With tape installed on the machine and the capstans rotating, turn the position adjusting screw until the pinchroller engages the tape and capstan. Further turning of this adjustment screw will allow the 0.002" shim to be removed. At this point, tighten the four holddown screws to clamp the actuator assembly firmly against the transport frame.

Step 5: Check that a 0.002" +.0005, -.0000, gap still exists between the clapper and the coil housing.

Step 6: De-energize the actuator coil, stop the machine and remove tape from between pinchroller and capstan.

Step 7: Establish a 0.004" gap between the pinchroller and capstan by adjusting the back stop screw (Fig. 6-14). Restart the machine and check for proper tape drive.

If poor tracking still exists (as evidenced by tape skew across the heads or by curl as the tape leaves the pinchroller-capstan contact point), additional minor corrections may be made by adjustment of the actuator spring-mounting block. The two screws in the top of the block provide adjustment of the vertical spring-mounting surface. Clockwise rotation of the screw

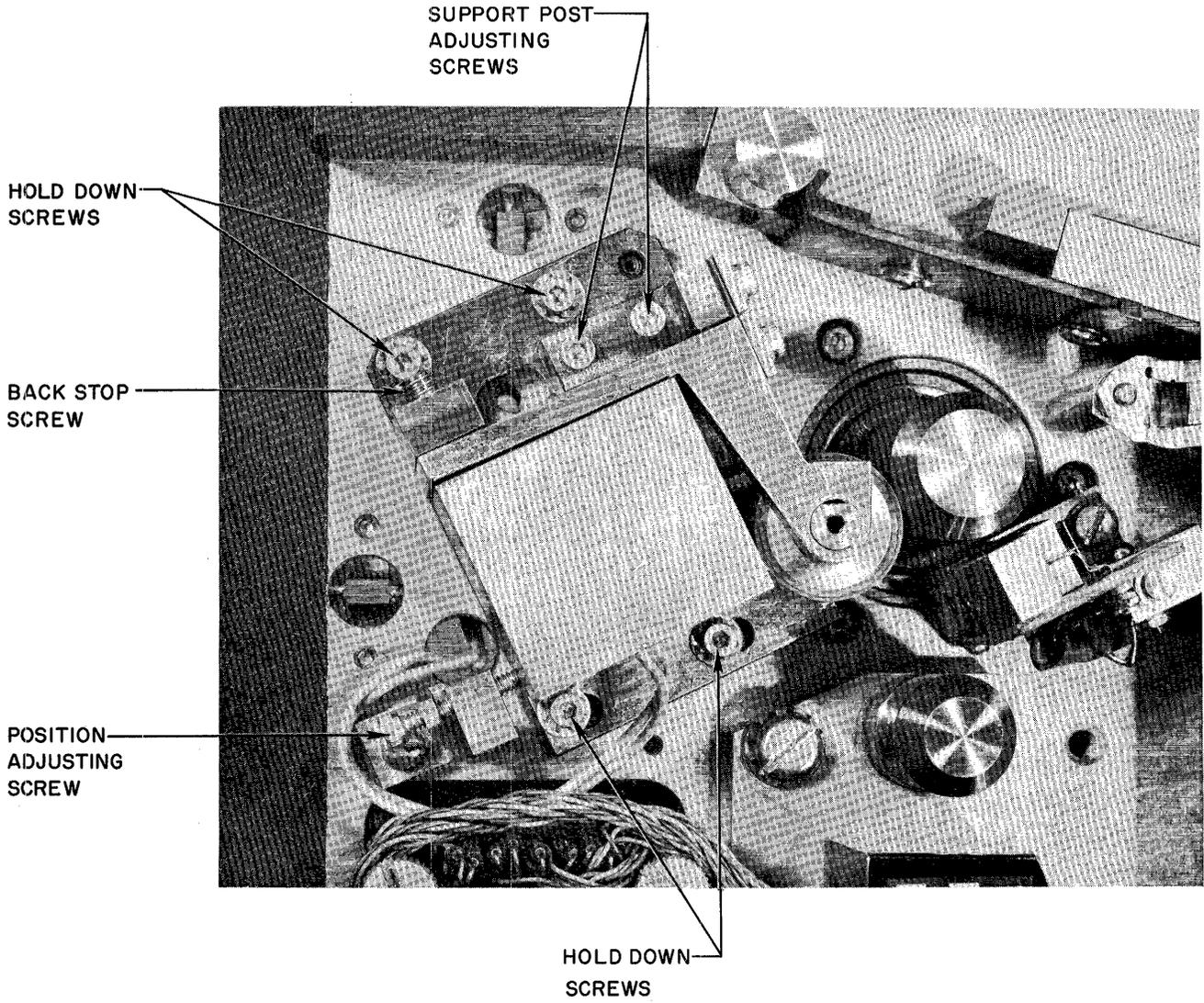


Figure 6-12
Actuator Adjustment Points

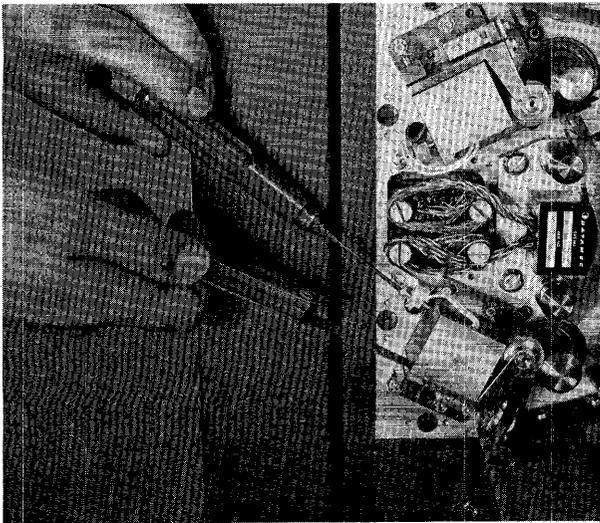


Figure 6-13
Energized Actuator Adjustment

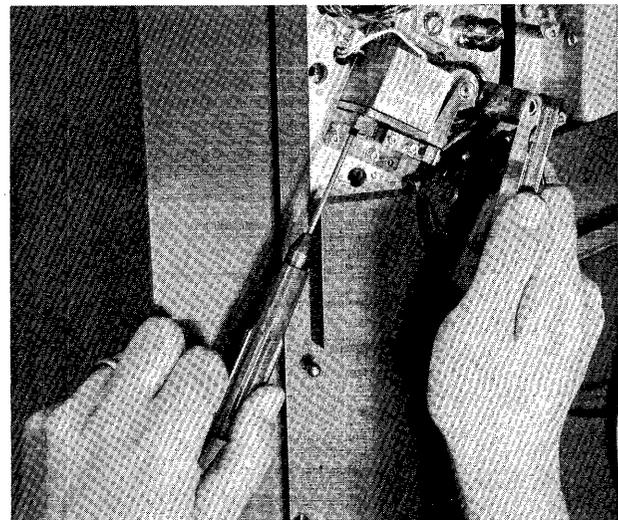


Figure 6-14
De-energized Actuator Adjustment

SERIES

nearest the spring tends to spread the slot, tilting the upper portion of the spring-mounting surface (and, consequently, the top of the pinchroller), toward the capstan. Clockwise rotation of the other screw compresses the slot, tilting the top of the pinchroller away from the capstan. Tighten these screws alternately until the desired setting is reached with one of them. Then tighten the other to a point which causes locking action.

If poor tracking still exists, the entire tape guiding path should be checked for tape height, guide post perpendicularity, and capstan perpendicularity.

After the above adjustments have been made, the actuator assembly can be checked for speed of operation by performing the stop and start tests as outlined in Sec. IV. If the start time is longer than specified, the normal open gap may be too wide. Small corrections may be made in this area by using the back stop screw adjustment, but under no circumstances should the pinchroller/capstan open gap be less than 0.004". If the stop time is longer than specified, the 0.002" gap between the clapper and the coil housing should be checked. If this gap is too small (or non-existent) the "stop time" will be lengthened due to the residual holding action of the coil housing clapper magnetic circuit. Tape slippage may also be due to the lack of gap between the clapper and the coil housing.

CAUTION

UNDER NO CIRCUMSTANCES SHOULD THE SCREWS HOLDING THE SUPPORT POST AND THE COIL TO THE BASEPLATE BE LOOSENED. THIS WOULD DESTROY THE INITIAL FACTORY ADJUSTMENTS ON THE ACTUATOR ASSEMBLY. THESE ADJUSTMENTS DETERMINE THE AMOUNT OF PRE-LOAD AND TOTAL CLAPPER TRAVEL.

2. Replacing Pinchrollers. The pinchroller assembly uses sealed ball



Figure 6-15
Loosening Pinchroller
Shaft Screws

bearings which should last almost indefinitely. In the event a pinchroller bearing does become worn to the point where it freezes or becomes very rough, it can be removed by releasing the two 4-40 socket head screws that clamp the pinchroller shaft into the pinchroller yoke. (Fig. 6-15). By inserting a 4-40

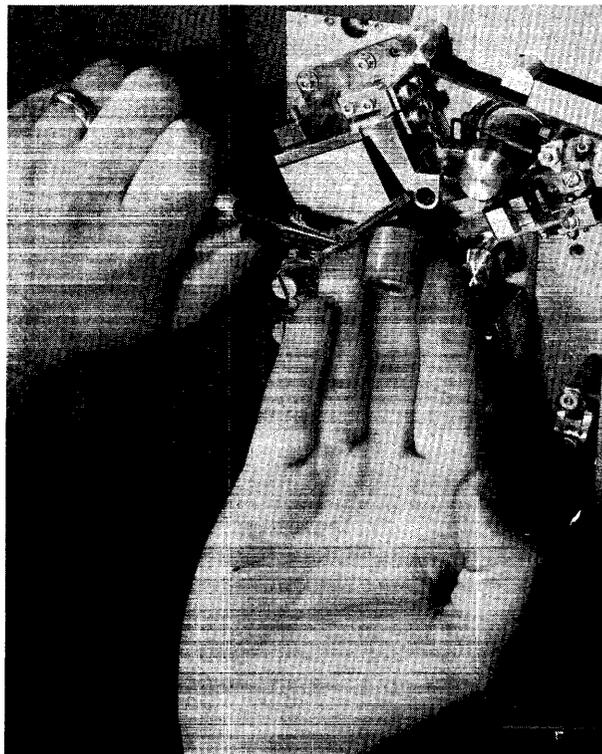


Figure 6-16
Removing Pinchroller
From Yoke

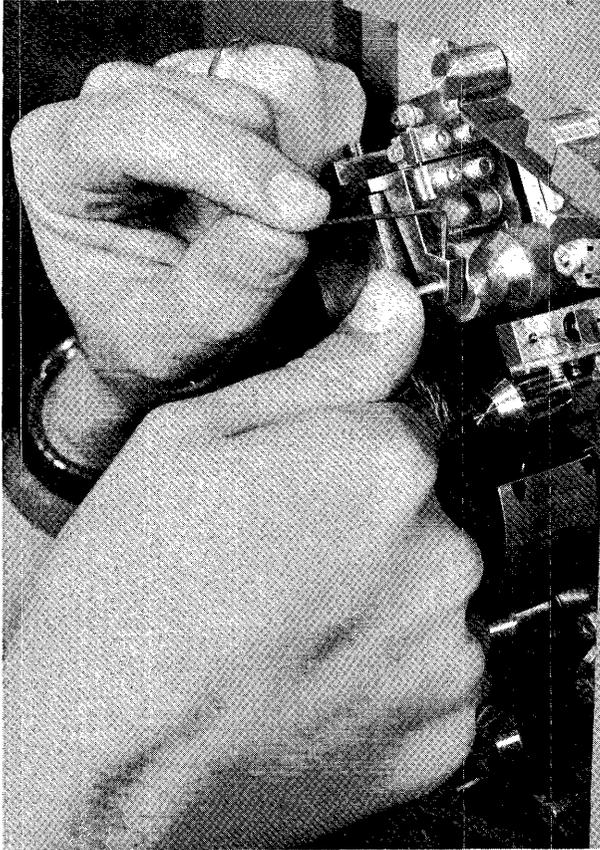


Figure 6-17
Applying Preload to
Pinchroller Bearings

screw (one of the four holddown screws may be used) in the hole in the end of the pinchroller shaft, it is possible to pull the shaft out of the yoke. The pinchroller may then be removed from the yoke. (Fig. 6-16). The bearings can be removed by inserting a suitable tool in the bearing hole and pressing the old bearings out. The new bearings should slip into the hub with finger pressure. If they do not, or if they are quite loose, the pinchroller body should be replaced.

To install the pinchroller, place the hub and bearing assembly in the yoke in the proper position. Push the pinchroller shaft through the yoke into the bearing and into the other side of the yoke. When tightening the shaft screws apply enough pressure on the pinchroller

shaft in an inward direction to preload the bearings to the point where there is no endplay and yet the bearings are free to turn (Fig. 6-17). After replacing the pinchroller assembly, it may be necessary to readjust the actuator assembly for proper operation.

3. Replacing an Actuator.

Step 1: Turn off power.

Step 2: Disconnect the two actuator leads from the terminal strip on the back of the Transport.

Step 3: Remove the four holddown screws and remove the actuator assembly from the transport frame.

Step 4: To reinstall the actuator, reverse the above procedure and adjust as outlined in part 1 above.

4. Vacuum Chamber Maintenance.

Periodic cleaning of the vacuum chamber is required. The frequency of such maintenance depends upon the extent of the Tape Transport operation and the type of magnetic tape used. This procedure is outlined in the preventive maintenance section. Additional long term maintenance may be required in replacement of the roller guides and fixed guide posts.

Roller guide replacement is indicated if the guides become frozen or seem excessively gritty when rotated with the finger. The fixed guide post requires replacement if excessively worn.

Either guide can be removed by loosening the 4-40 set screw that contacts the center post (Fig. 6-18). These set screws are located on the side walls of the vacuum chamber. It is recommended that the standard hex key used to loosen this set screw be ground down on the short leg of the wrench to a maximum of 1/4" length,

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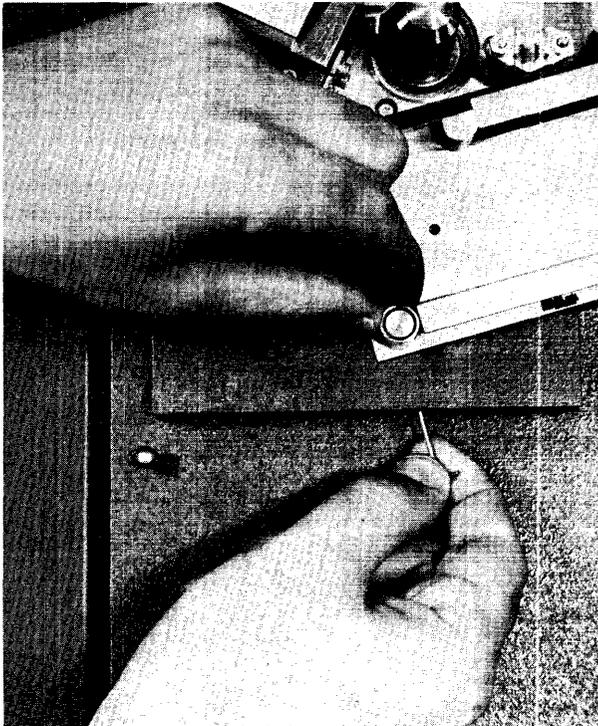


Figure 6-18
Removing Roller Guide

since clearances on the machine between adjoining parts and the set screw wrench are very close.

In the replacement of the roller guide post, sufficient axial pressure must be applied in an inward direction to pre-load the bearing to the point where there is no end play and yet the bearings are free to turn. This axial pressure should also properly position the roller guide between the glass cover and the base of the vacuum chamber. The roller guide should be checked to see that it rotates freely without either end surface scraping after installation.

The fixed guide should be mounted so that the top surface just touches the inside of the glass cover.

The abrasive action of the edge of the tape may cause wear both in the chamber wall and the glass cover plate. The replacement of the tape chamber is as follows:

Step 1: Remove the vacuum unit to allow access to one of the six chamber mounting screws.

Step 2: Remove the end manifold and the chamber.

Step 3: In replacing a chamber, reverse the procedure and use the 9/32 inch diameter locating hole in combination with the shaft extension of either the fixed guide post or the tape sensing post to locate the forward edge of the chamber. Manipulate the manifold until intimate contact is obtained between the back end of the two chambers and the manifold gasket.

5. Removing and Installing the Head Assembly.

CAUTION

THE HEAD ASSEMBLY IS ASSEMBLED AT THE FACTORY USING PRECISION FIXTURES AND SHOULD NOT BE DISTURBED UNNECESSARILY. BE PARTICULARLY CAREFUL NOT TO MOVE THE HEAD LEADS AND CONNECTORS EXCESSIVELY.

The head assembly should be replaced when there is evidence of ex-



cessive wear on the face of the head, combined with poor resolution of the pulses due to increased pulse width. The head assembly should also be replaced when the head or guides have been damaged.

Step 2: Operate the transport switch to the "BRAKES" position and disconnect the coupling spring from the head gate pin.

Step 3: Remove the two #10-32 screws holding the head base to the transport.

CAUTION

BE CAREFUL AT THIS POINT TO MAINTAIN A FIRM GRIP ON THE HEAD ASSEMBLY SO THAT IT WILL NOT BE DROPPED.

Step 3: Remove the rubber vacuum fittings from the vacuum cleaner posts which allows the head assembly to be removed.

Step 4: To install the head assembly slip the two vacuum fittings over the vacuum cleaner posts while holding the head assembly in its approximate mounting position. Place the assembly against the transport main frame making certain that no burrs, chips or other foreign particals are between the base and the transport. Insert the two #10-32 mounting screws and associated hardware and tighten until the head assembly will stay in position after adjustment, but is still capable of being moved. Connect the head connectors to the appropriate transport receptacles, load tape on the machine, and place the transport in operation.

Step 5: By pivoting the head assembly first about one mounting screw and then the other, position the tape so that it touches neither the pinch-roller nor the capstan. This can be most easily accomplished by driving the tape in the forward direction and adjusting the upper end of the head assembly so that the tape does

not cause the reverse pinchroller to turn. In a similar manner, drive the tape in the reverse direction and adjust the lower portion of the head assembly so that the tape does not cause the forward pinchroller to turn.

Step 6: Tighten the two mounting screws securely.

6. Checking and Adjusting Turntable Height. The tape reel turntables on the supply and take-up motor assemblies may be adjusted to the proper height to insure proper tape tracking into the vacuum chambers.

Step 1: Remove the reel from the supply reel assembly and check the turntable height by measuring its distance to the tape transport frame. This distance should be $0.516'' \pm 0.010''$. (See Fig. 6-11).

Step 2: Remove the take-up reel by first removing the plug button in the top of the operating knob handle, and then removing the cap head screw from the motor shaft. The operating knob is then unscrewed in a counter-clockwise direction until it can be removed from its mating assembly. The reel and its retaining ring are now removed. The turntable height may now be checked.

Step 3: If the height is not within tolerance, it should be adjusted by adding or removing shim washers.

Step 4: Loosen the #10-32 set screw in the side of the turntable collar. When the set screw has been removed the turntable can be lifted off and the proper shim inserted or removed from the $5/8''$ diameter hole. Care should be taken in replacing the turntable to insure the proper alignment between the keyway and key embedded in the motor shaft.

Step 5: When the assembly has been replaced, the turntable height should be rechecked with the turntable tightened against the shims. When the turntable height is correct, reassem-

ble the reel and holddown components.

Step 6: Check the adjustment by operating the Tape Transport in both directions. Observe the tape pack upon the reels. It should not scrape either flange during normal operation, but may pack closer to one flange than the other. This is a normal condition.

7. Replacing and Adjusting the Supply Reel Holddown Knob. It is necessary to readjust the supply reel holddown knob if this assembly fails to contact the smooth surface of the reel with sufficient force to prevent it from slipping. The holddown knob must be removed from the motor shaft to be adjusted properly. Refer to Fig. 5-2 to identify holddown knob parts.

Step 1: Remove the supply reel.

Step 2: Remove the plug button from the top of the operating knob.

Step 3: Remove the cap head screw and spring lock washer from the motor shaft.

Step 4: Loosen the #10-32 set screw in the side of the reel turntable.

Step 5: Remove the holddown assembly by pulling it off axially from the motor shaft. Retain the shim washers.

Step 6: Remove the #10-32 screw in the bottom of the turntable to allow free rotation of the operating knob.

Step 7: Unscrew the operating knob from its mating shaft.

Step 8: Remove the two #4-40 screws holding the stop adjustment collar.

Step 9: Reinstall the #10-32 screw and lock washer in the bottom of the turntable. Advance the screw until it compresses the lock washer.

Step 10: Reassemble the operating knob, rotating it clockwise until the thrust bearing engages the elastic

rubber ring. Make sure all axial clearance has been removed from the bearing by rotating the knob another 10°.

Step 11: Remove the #10-32 screw from the bottom of the turntable and carefully remove the operating knob so that the position of the stop collar is not disturbed.

Step 12: Fasten the stop collar securely to the operating knob with two #4-40 screws and lock washers through the slot in the collar that will uncover at least two tapped holes in the operating knob. This procedure produces the proper location of the stop collar pin, for its initial position.

Step 13: Reassemble the operating knob to its mating shaft. Rotate the assembly until contact is made with the elastic ring. Rotate the assembly an additional 90°, compressing the elastic ring.

Step 14: Reinsert the #10-32 screw from the bottom of the reel turntable until its head fully compresses the lock washer.

Step 15: Rotate the operating knob in a counter-clockwise direction. The knob rotation should be limited by the stop pin. At this point, check to see if any clearance is present between the thrust bearing and the elastic ring. If clearance exists, the turntable is improperly adjusted and the procedure must be repeated.

Step 16: Check the action of the holddown knob by installing a reel of tape and rotating the operating knob to check reel engagement before reinstalling the assembly to the supply reel motor shaft. This is best accomplished by securing the turntable in a vise, and rotating the knob firmly until the reel engagement stop is reached. The reel should not slip if the proper adjustment has been made.



Step 17: Install the holddown assembly on the supply reel motor shaft and check the turntable height as previously described. Readjust if necessary.

8. Replacing the Take-up Reel.

Removing and installing the take-up reel has been described previously. After installing a new reel check to see that proper tape clearance is provided between the reel flanges and the edge of the tape. If the flanges drag on both sides, too much compression has been applied to the reel. Remove the plug and loosen the assembly as required.

9. Checking the Capstan Drive System and Adjusting Belt Tension.

Improper or erratic tape speed may result from a variety of causes. If the actuators are properly adjusted and the tape is not slipping on the capstan, then the drive system should be investigated.

Capstan and capstan motor speeds can be checked by using a strobe light. For 45 ips machines, the capstans should operate at 1145 rpm and the motor speed should be 1800 rpm synchronous with the power line.

If the motor is not running at synchronous speed, remove the belt and check it again. If it is still out of sync., the motor or its capacitor may be defective and should be replaced. If the motor pulls into sync. when the belt is removed, check both capstans to see if there is excessive drag which could be caused by defective bearings or the flywheel rubbing on a foreign object. Examine the under side of the capstan flywheels to see if they are dragging on the head cable box or vacuum lines. If both capstans turn freely, replace the belt and check to see if its dragging against anything.

If the motor speed is correct but the capstans are running slow or erratically, check the belt tension and adjust if necessary. Also check to see if the belt has become worn or oily.

Belt tension is adjusted by vertical movement of the capstan motor assembly. Loosen the four screws which hold the casting to the transport and move the motor downward to increase tension. Belt tension is proper when a force of 8 ounces applied perpendicular to the belt produces a deflection of approximately 1/8 inch. A method of making this measurement is shown in Fig. 6-20. This illustration also shows the proper belt threading path.

10. Replacing Capstan Motor.

To replace the complete capstan motor assembly, disconnect the two power leads at the terminal block and then remove the screws which attach the mounting bracket to the transport. Install the new assembly and adjust the belt tension to the proper value before tightening the screws. Connect the power leads to the terminal block.

If only the motor or capacitor is to be replaced, proceed as follows:

Step 1: Remove the motor assembly from the transport as described above.

Step 2: Disconnect the leads from the terminal block and separate the wires so the faulty component can be removed. Note the connections and lead placement so they can be duplicated when the new component is installed.

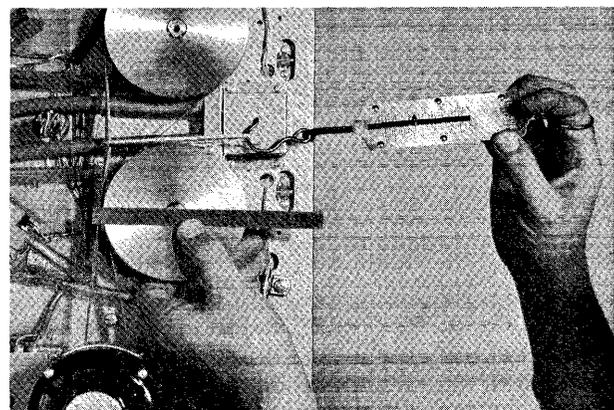


Figure 6-20
Measuring Capstan Belt Tension

Step 3: Remove the faulty component. If it is the motor, remove the pulley and install it on the shaft of the new motor.

Step 4: Install the new component on the mounting bracket. If a new motor was installed, adjust its position so the front surface of the pulley is 1-1/8 inch from, and parallel to, the front surface of the mounting bracket.

Step 5: Reconnect the wiring (see Fig. 6-21) and install the assembly on the transport.

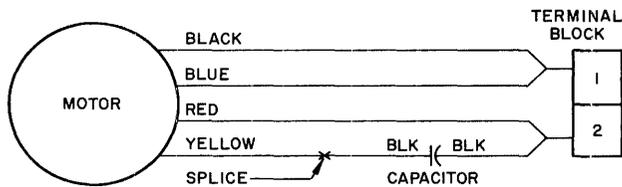


Figure 6-21
Capstan Motor Wiring

11. Replacing Capstan Bearings.

Step 1: Remove the belt and then the capstan assembly which is attached with three socket head screws accessible from the front of the transport.

Step 2: Remove the flywheel from the capstan shaft.

NOTE

UNLESS PROPER EQUIPMENT IS AVAILABLE AND THE OPERATOR IS FAMILIAR WITH PRECISION BALL BEARING INSTALLATION, IT IS RECOMMENDED THAT THE ENTIRE ASSEMBLY OF CAPSTAN, BEARINGS AND HOUSING BE REPLACED AS A UNIT. IF ONLY THE BEARINGS ARE TO BE REPLACED, PROCEED AS FOLLOWS:

Step 3: Remove the capstan shaft from the old bearings and remove the bearings from the housing.

CAUTION

CARE SHOULD BE TAKEN TO AVOID UNDUE AXIAL STRESSES WHEN INSTALLING THE NEW BEARINGS AS THIS MAY RESULT IN PERMANENT DAMAGE.

Step 4: Install the forward bearing on the capstan shaft by pressing on the inner race until it seats against the capstan shoulder.

Step 5: Install this partial assembly into the front of the housing by pressing on the outer race until it seats against the retaining ring.

Step 6: Support the capstan shaft and install the rear bearing on the shaft by pressing on the inner race until the outer race contacts the housing. STOP at this point.

Step 7: Support both the shaft and housing and simultaneously press on both the inner and outer races until the bearing seats on the retaining ring in the housing.

Step 8: Place the flywheel on the shaft and align the set screw with the flat. Do not tighten the set screw. Install the spring washer and #10-32 machine screw in the center of the flywheel. Tighten the screw against the washer to apply sufficient preload to remove any endplay. Maximum allowable preload is 2 lbs. Do not overtighten.

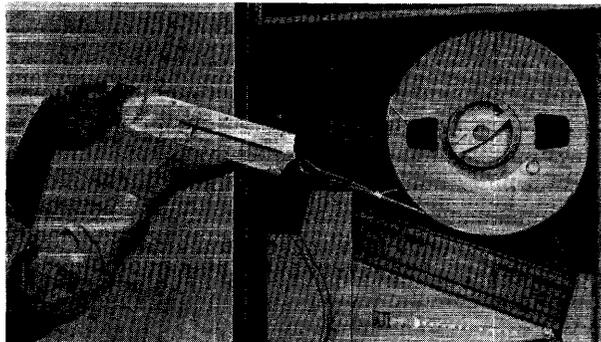


Figure 6-22
Measuring Brake Torque



Step 9: Tighten the set screw and rotate the capstan to check for smooth operation.

Step 10: Replace the capstan assembly on the Tape Transport.

12. Checking Brake Torque.

Using a full reel of tape, tie a string to the flange and wrap a full turn of the string around the outside of the tape pack as shown in Fig. 6-22. Attach a spring scale to the string and pull until the reel begins to move. Continue pulling slowly and read the scale as the reel is rotating. The brake torque should be at least 500 inch ounces which would be indicated by 100 ounces at a 5 inch radius.

13. Repairing and Replacing Reel Motor Brakes. If the brake lining disc on the brake rotor has become contaminated with grease or some other substance that reduces the braking torque, the rotor must be removed for replacement of the lining or for cleaning of the brake plate. This is accomplished by removing the set screw which bears against the key. The 1/2"-20 stop nut is then removed so the rotor can be removed axially from the motor shaft. The plate and thrust spring are then removed and cleaned. The brake lining should be inspected. If it appears to be excessively gummy or worn below 1/32" in thickness, it should be replaced (the entire rotor assembly may be replaced in lieu of gluing a new pad to the metal casting). Reverse the procedure for re-assembly, using suitable clamps to hold the plate to the coil housing (against the force of the thrust spring) while the rotor is remounted to the motor shaft. Re-adjust the gap as described previously.

14. Replacing Reel Motor Assembly. To remove the reel motor assembly, remove the reel and disconnect the wires to the terminal block and remove the four 5/16"-18 screws that mount the assembly to the back of the Tape Transport. The holddown knob

assembly will clear the hole in the Tape Transport frame and should not be removed from the motor shaft. After installing a new assembly, the turntable height should be checked and adjusted. Reconnect the wires to the terminal block.

15. Checking Vacuum Switches.

If a faulty vacuum switch is suspected, it may be tested by applying a known vacuum while testing for continuity with an ohm meter. The method of doing this is illustrated in Fig. 6-23.

In order to check the vacuum it is necessary to have a vacuum gauge with a full scale range of 25 to 50 inches of water, such as found on the D2020 Maintenance Unit. It will also be necessary to have two lengths of quarter-inch inside diameter rubber or plastic tubing and a quarter-inch "T" fitting. If such a fitting is not available, the one used for hose connection between VS5 and VS8 on the Tape Transport may be removed and used for the test.

Step 1: Remove power from the transport and remove the dummy plug from J5 on the transport control chassis.

Step 2: Remove the phenolic cover from the back (contact) side of the vacuum switch.

Step 3: Remove the vacuum hose from the switch fitting. This is most easily accomplished by prying the end of the hose away from the switch body, with a wide screw driver blade as shown in Fig. 6-24. Pulling on the hose tends to stretch it and make it grip the fitting more tightly.

Step 4: Connect an ohm meter across the vacuum switch terminals. Use a low resistance scale as there may be other circuit elements which will register some resistance across the open switch contacts. Switches VS1 and VS3 are normally closed while all of the other switches are normally open. VS1 and VS3 also have a diode

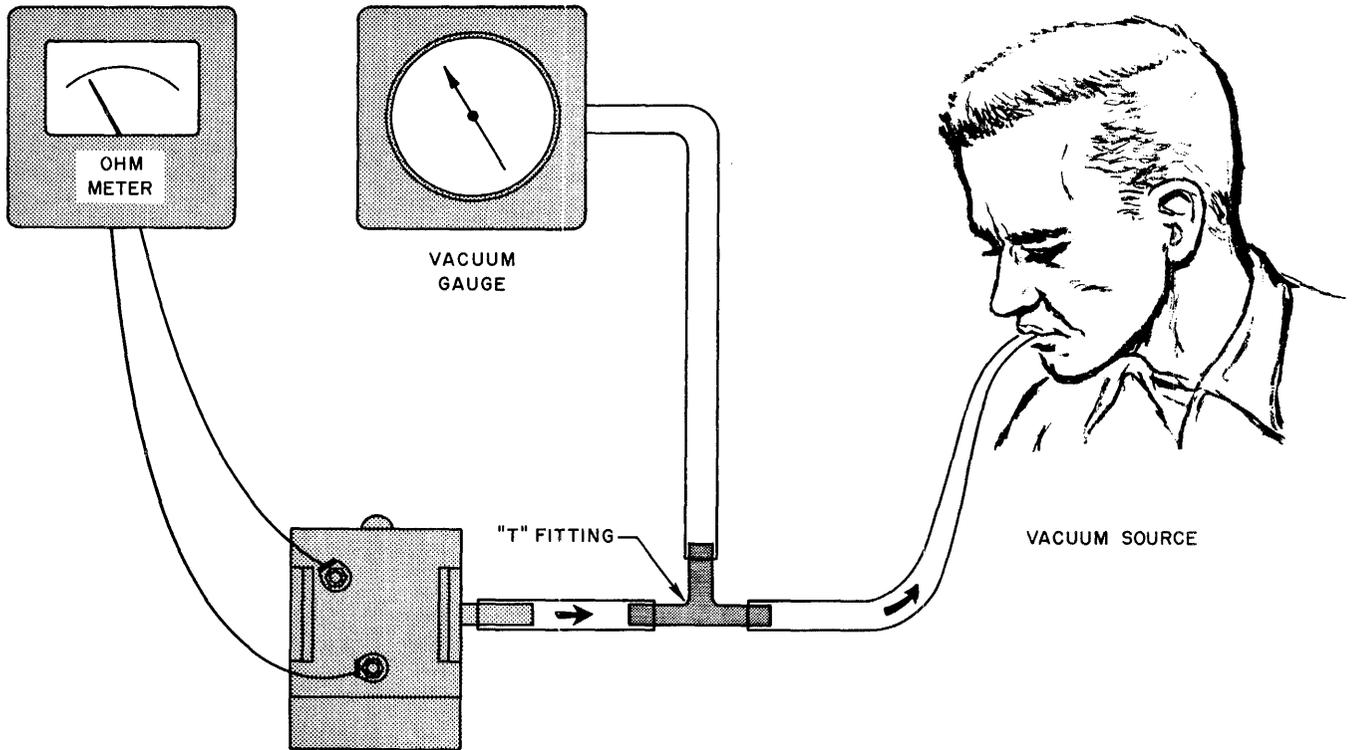


Figure 6-23
Testing Vacuum Switches

mounted on the back of the switch body. Continuity on these switches should be checked between terminals C and NC.

Step 5: Connect the hose and vacuum

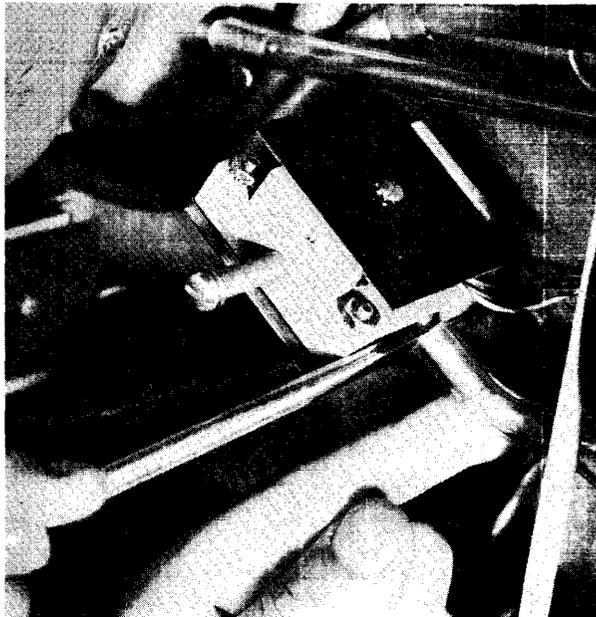


Figure 6-24
Removing Vacuum Hose

gauge as shown in Fig. 6-23 and apply a vacuum to the switch by sucking on the end of the hose. Vacuum switches VS7 and VS8 have back fittings attached to the switch mounting bracket. When testing, leave this fitting open and exposed to the atmosphere. Always connect the test vacuum to the fitting that protrudes from the plastic switch body. The switch should change state, that is, make or break on a vacuum of 3 to 8 inches of water. Slowly increase the applied vacuum and watch the vacuum gauge and ohm meter to determine the point at which the switch operates. Since the vacuum switches are not snap action, the connection may be intermittent at the point where the switch just opens or closes. This is normal as long as a definite opening or closure has occurred by the time the vacuum reaches 8 inches or drops below 3 inches.

Step 6: To check for excessive leakage, apply a vacuum of 25 to 30 inches of water and double the hose tightly back on itself to prevent air from entering. Remove the applied vacuum



and observe the vacuum gauge. It should fall rather slowly, requiring 2 or 3 seconds to reach zero. If it drops abruptly, the switch may have a leak. Check all screws and fittings to be sure that they are tight.

If a vacuum switch is found to be defective without obvious and easily repairable cause, such as a loose screw or fitting, it should be replaced.

16. Replacing Vacuum Switches.

When replacing a vacuum switch always be sure that the switch has the same part number as the one that is being replaced. The part number will be found on the mounting bracket under the switch body. Each of the eight switches used on the transport differs in some way from the other, and has its own part number. Fig. 6-25 cross indexes the part numbers to schematic reference numbers.

To replace a switch, remove the hose and wire connections and remove the two mounting screws that attach the assembly to the transport. Install the new switch using the old mounting hardware and replace the hose and wire connections. Since the solder lugs from the old switch will remain with the transport wiring, the lugs on the new switch may be removed and discarded. After installa-

SCHEMATIC REF. NO.	DATAMEC PART NO.
VS1	10125-1
VS2	10125-4
VS3	10125-5
VS4	10125-0
VS5	10125-6
VS6	10125-7
VS7	10125-3
VS8	10125-2

Figure 6-25
Vacuum Switch Part
Number Table

tion is complete, install the phenolic cover on the back of the switch.

17. Vacuum System Measurement.

Vacuum measurement requires a vacuum gauge with a full scale reading of 25 to 50 inches of water, such as is found in the Datamec Maintenance Unit. The gauge should be equipped with a length of 1/4" ID plastic or rubber hose.

Step 1: With the Tape Transport turned off, remove one of the tape cleaner guide hoses from the fitting on the vacuum unit housing. Install the vacuum gauge hose over this fitting.

Step 2: Load and thread a reel of tape on the transport in the normal manner and start the transport.

Step 3: With tape loops in the chambers, the vacuum motor running and the tape standing still, read the vacuum on the vacuum gauge. It should be 20 ±2 inches of water with line voltage at 117v.

Step 4: Drive the tape forward until there is at least 1/2" of tape pack on the lower reel.

Step 5: Depress the REWIND button and observe the vacuum gauge. With the line voltage at 117v, the vacuum should drop to between 10 and 12 inches during the time that the tape is being jogged out of the chambers, and should not fall to not less than 9 inches once the steady rewind action has started.

18. Adjusting the Running Vacuum.

Two vacuum adjustments are provided. These are the running vacuum and the rewind vacuum. Normally, the vacuum does not require adjustment unless a vacuum motor or vacuum unit has been removed or replaced. However, if the measurements made in the section above indicate that the vacuum is not within the prescribed tolerance, the following adjustment procedure should be followed.

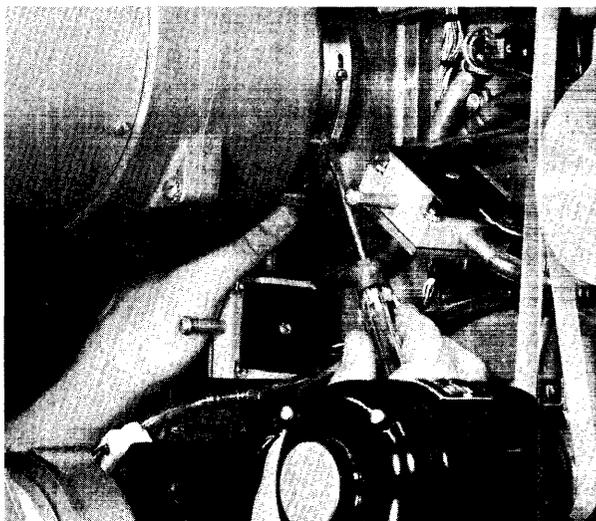


Figure 6-26
Adjusting the Running Vacuum

NOTE

IF BOTH RUNNING AND REWIND
VACUUM NEED ADJUSTMENT,
ALWAYS ADJUST THE RUNNING
VACUUM FIRST.

Step 1: With the transport running and the vacuum gauge attached, loosen the two vacuum adjust band mounting screws and slide the band as shown in Fig. 6-26 until the proper vacuum is obtained. Sliding the band to enlarge the slot will reduce the vacuum, while closing off more of the slot will increase the vacuum.

Step 2: When the proper vacuum reading is obtained, tighten the band screws and observe the vacuum gauge. Tightening the band screws may cause the vacuum to change slightly. If this occurs, loosen the screws and make a compensating adjustment until the proper value is obtained when the screws are tightened.

19. Adjusting the Rewind Vacuum.
The rewind vacuum must be adjusted with the transport in the Rewind mode but preferably while the tape is not actually moving. Therefore, it is desirable to obtain the assistance of a second person when adjusting

the rewind vacuum. The tape should be threaded and the transport started in a normal manner.

Step 1: Have one person hold the upper reel firmly and place the Transport in Rewind. The upper motor will start jogging but it should be held so it cannot move.

Step 2: Rotate the lower reel slowly in a clockwise direction until all of the tape has been removed from both chambers. At this point jogging action will stop and the upper reel should still be held so it cannot move.

Step 3: Loosen the two solenoid mounting screws and slide the solenoid body in or out as necessary to obtain a vacuum reading of 10 inches of water. Check to insure that the solenoid is energized and that its plunger is bottomed before attempting this adjustment.

Step 4: When the proper vacuum reading is obtained, tighten the screws locking the solenoid in place.

Step 5: Release the upper reel allowing the machine to start rewinding, then depress the LOCAL pushbutton to stop Rewind. The solenoid should release and the vacuum should return to its normal running value. If it does not, check to see that the solenoid body has not been cocked so that the plunger runs into the dump valve shaft. If necessary adjust the solenoid position so that the valve operates freely while maintaining proper rewind vacuum.

20. Checking for Vacuum Leaks.
If it is not possible to obtain proper vacuum settings, the system should be checked for leaks. Since the D2020 vacuum system is a low-pressure, high-volume system, the various connections need not be absolutely air tight. The existence of any significant leak will usually be obvious upon inspection. The following are the most likely causes of leaks:



MAINTENANCE

- (1) Rewind dump valve not closing properly.
- (2) Vacuum chamber cover glass improperly seated.
- (3) Misalignment of vacuum manifold with respect to vacuum chamber ends.
- (4) Vacuum hose removed from a vacuum fitting.

21. Removing and Replacing Vacuum Unit. Most service operations on the vacuum unit and motor can be performed most easily if the unit is first removed from the Tape Transport. To remove the vacuum unit, proceed as follows:

Step 1: Turn off the power to the Tape Transport.

Step 2: Remove the three vacuum hoses from their fittings on the vacuum housing.

Step 3: Remove the four harness wires from the connector on the upper side of the vacuum housing. Note color coding of wires to terminals. Remove the resistor lead plug

from the receptacle on the side of the vacuum unit cover.

Step 4: Remove the four screws that mount the vacuum unit to the transport main frame. Remove the two lower screws first, and then support the unit so that it will not fall while the remaining two screws are removed. The unit is now free and may be removed from the Transport.

Step 5: To install the vacuum unit on the transport, reverse the above procedure. Employ care that the mating surface of the vacuum unit and transport frame are clean and free of foreign material and that no wires or hoses are trapped under the vacuum unit when it is installed on the transport.

To obtain access to the brake release resistors remove the plug from the receptacle on the side of the vacuum unit cover and remove the cover from the vacuum unit. Loosen the nuts that hold the baffle plate inside the cover. Place the cover upside down on a flat surface so the screws will not fall out and remove the nuts. The baffle may now be lifted up exposing the resistors.



MAINTENANCE

22. Vacuum Motor Servicing. The vacuum motor brushes have an average life of 1200 to 1500 hours. Therefore, to prevent unscheduled down time, they should be replaced on a regular basis. It is generally most convenient to keep a spare motor with new brushes so that the entire motor can be replaced on schedule with minimum down time.

Although it is possible to replace the motor with the vacuum unit mounted in the transport, it is generally easier to remove the vacuum unit before attempting to replace the motor.

Step 1: Remove the vacuum unit from the transport.

Step 2: Remove the vacuum motor leads from the terminal strip.

Step 3: Remove the four cover retaining screws and remove the cover while holding the motor leads and grommet so that they slide out of the slot at the lower edge of the cover as shown in Fig. 6-27.

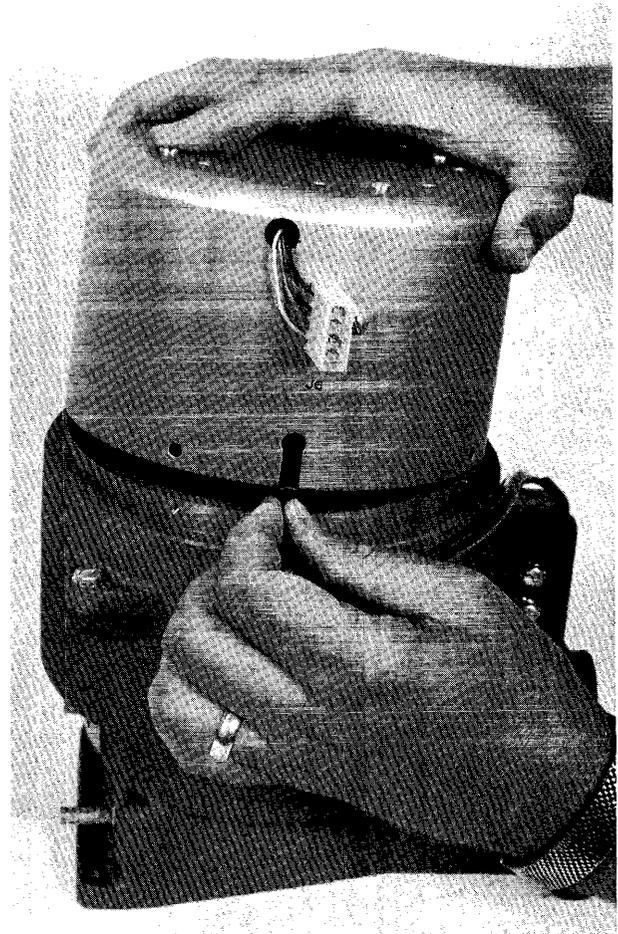


Figure 6-27
Removing Vacuum Unit Cover

Step 4: Remove the four retainer screws and lift off the retainer and rubber mounting pad. Recessed notches are provided on the inside of the retainer so that it will pass over the motor brush holders.

Step 5: Note the approximate position of the brush holders with respect to the vacuum unit housing. Now lift straight up on the motor and pull it out of the housing.

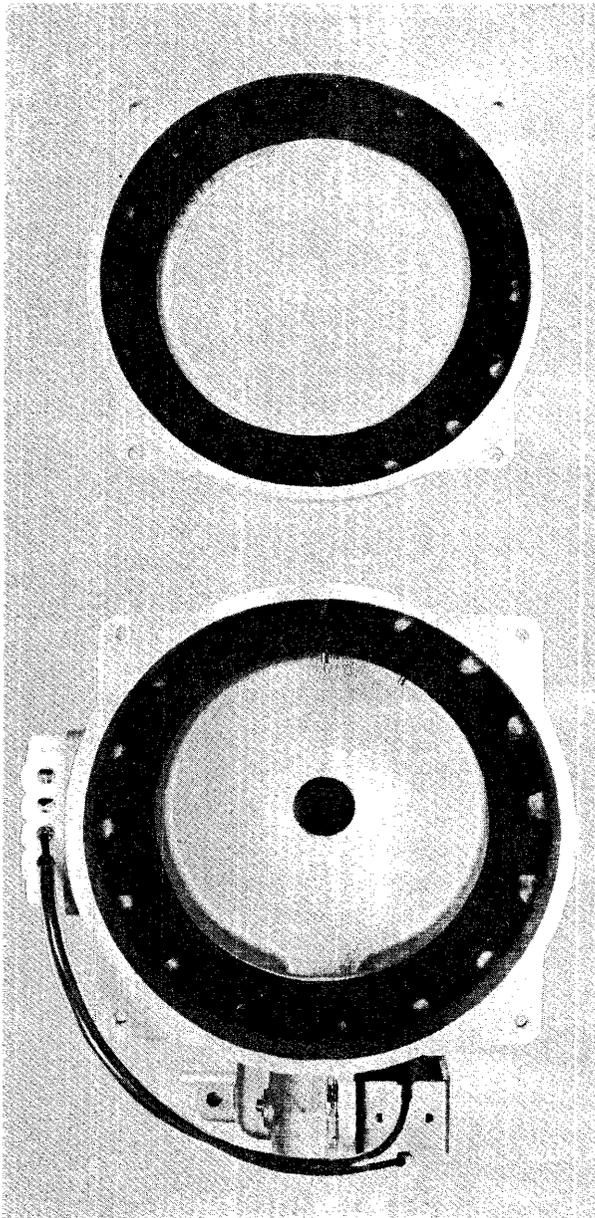


Figure 6-28
Mounting Pad Position
Prior to Installing Motor

Step 6: Place the retainer upside down on a flat surface and position the rubber mounting pad so that it is centered in the retainer as shown in Fig. 6-28. Check to be certain that the other mounting pad is still centered in the main housing. If necessary, adjust its position so that it is centered as shown.

Step 7: Hold the replacement vacuum motor over the housing and position it so that the brush holders and leads are in approximately the same position as on the replaced motor.

Step 8: Lower the motor carefully into the housing so that it seats in the center of the rubber pad. Press down on the motor and manipulate it slightly to make certain that the motor is surrounded by rubber, and does not touch the metal housing.

Step 9: Invert the retainer and rubber pad and hold it over the vacuum motor. Position it so that its recesses are aligned with the brush holders. Pass the motor leads through the center of the retainer, being careful not to disturb the position of the rubber pad.

Step 10: Lower the retainer down over the motor, rocking it slightly from one side to the other so that it passes over the brush holders. Center the retainer over the motor and align the mounting ears with those on the housing. Push straight down, seating the retainer and rubber pad on top of the motor. Check to see that the pad is still centered so that the motor does not touch the retainer or housing. Install the four retainer screws and tighten, compressing the rubber pads and seating the retainer firmly against the housing.

Step 11: Dress the motor leads around the top of the retainer and slide the grommet over the leads, placing it over the terminal block in the proper position to slide into the cover slot.



Step 12: Position the cover over the assembly and slide the grommet into the slot. Push the cover into position on top of the retainer and install the four mounting screws.

Step 13: Connect the motor leads to the terminal block.

Step 14: Replace the vacuum unit on the Tape Transport.

23. Replacing Vacuum Motor Brushes.

Step 1: Remove the vacuum unit from the transport and remove the cover as described previously.

Step 2: Remove the brush holder retainer clip by taking out the two screws as shown in Fig. 6-29.

Step 3: Carefully remove the brush holder assembly from its seat in the

end bell casting and rotate it 90° so that the bottom of the brush holder is facing you and the motor winding lead is facing down as it emerges from the connector clip. Be careful not to put undue strain on the motor winding lead.

Step 4: Support the brush holder assembly with one hand and insert a sharp screw driver between the bent-over tab of the connector clip and the end of the plastic brush holder. With a twisting motion, carefully pry the connector clip out of the brush holder as shown in Fig. 6-30. Be careful not to strain or break the wire where it is attached to the connector clip.

Step 5: Remove the second brush holder in a similar manner.

Step 6: Holding a new brush assembly compress the brush all the way into the holder. Grasp one of the connector tabs on the motor with a pair of long nose pliers as shown in Fig. 6-31, and rest the pliers against one of the fins on the end bell in such a manner that the connector tab points outward and the motor winding lead is not subjected to strain or bending.

Step 7: Push the new brush assembly against the connector clip so that the clip slides into position at the

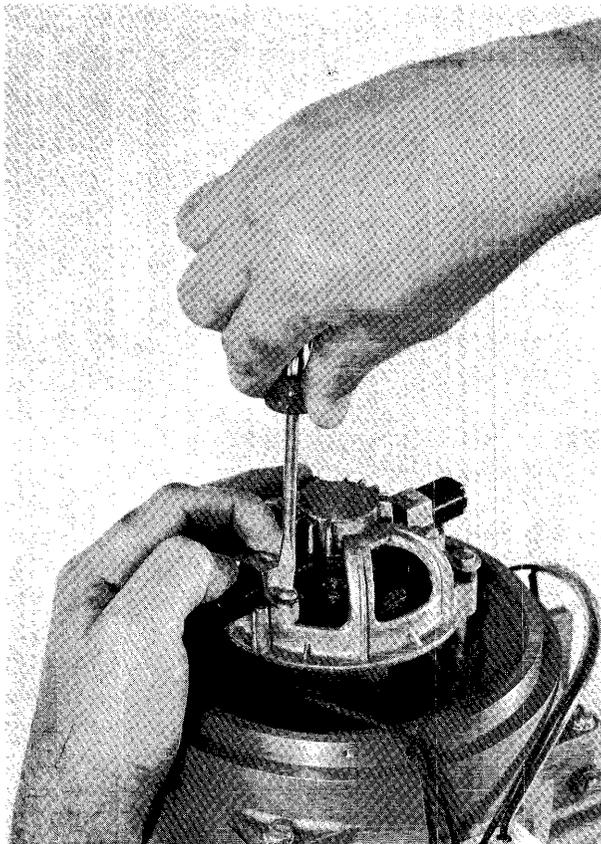


Figure 6-29
Removing Brush Holder
Retaining Clip

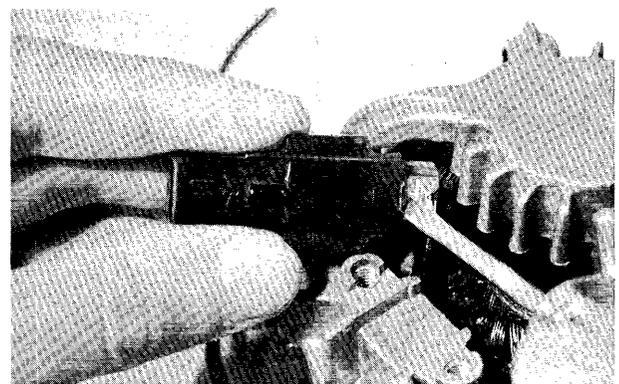


Figure 6-30
Removing Connecting Clip
From Brushholder



Figure 6-31
Inserting Connector Clip
In Brushholder

bottom of the brush holder. If necessary rock the brush holder slightly to force the tab into position. Do not rock the tab as this will cause bending of the motor lead. Be certain that the connector clip is inserted into the bottom of the brush holder. Observe the replaced brush holder and note that there is an indexing tab on the bottom surface.

Step 8: Carefully rotate the brush holder into position in its seat on the end bell. Indexing tabs on the bottom and side of the brush holder will establish its location.

Step 9: Reinstall the brush holder retaining clip with the two mounting screws.

Step 10: Install the second brush holder in a similar manner.

Step 11: To achieve maximum motor life, it is desirable to provide a run-in period for new brushes at reduced voltage. Some replacement brushes will seat better and more quickly than others. In general, a run-in period of from four to six 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 VARIAC. DO NOT OPERATE THE ENTIRE TAPE TRANSPORT AT REDUCED VOLTAGE FOR THE RUN-IN PERIOD.

Step 13: Reassemble and reinstall the vacuum unit on the Tape Transport.

24. Servicing the Transport Control Chassis. Access to the bottom of the control chassis is obtained by removing the screws holding the bottom plate to the main chassis. When this plate is removed, it is possible to inspect the relay socket connections and the various resistors, diodes and capacitors in the low-voltage circuits.

The servo sub-chassis and the actuator printed circuit board are on top of the main chassis and can be reached by removing the perforated cover. General trouble-shooting can be done without removing these two items from the main chassis. In the event component replacement is necessary, it may be advantageous to remove the servo sub-chassis or the actuator circuit board.

WARNING

BE CERTAIN THAT POWER HAS BEEN REMOVED FROM THE MACHINE BEFORE ATTEMPTING TO REMOVE THE SUB-CHASSIS OR CIRCUIT BOARD.

To remove the servo sub-chassis, remove the two screws holding the sub-chassis to the main chassis.

The servo sub-chassis can now be swung out and away from the main chassis for access to the components.

To remove the actuator circuit board, remove the four screws hold-

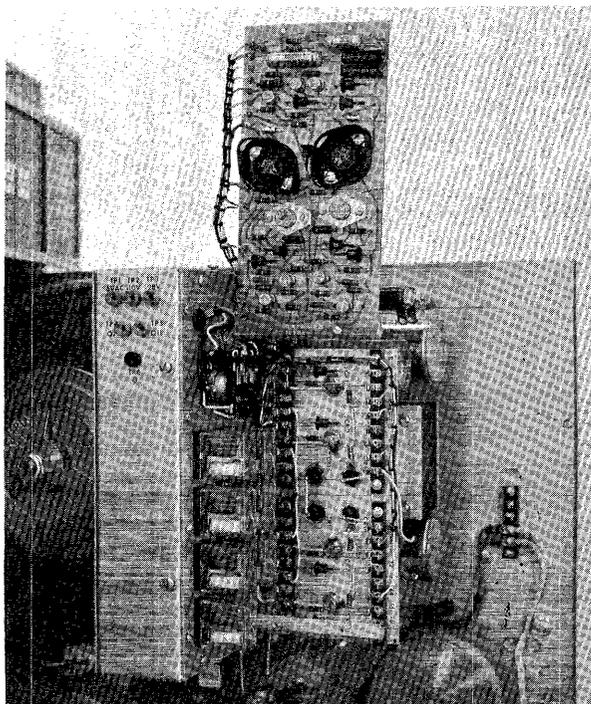


Figure 6-32
Servicing Actuator
Circuit Board

ing the actuator board to the support posts. The board can now be swung away from the main chassis as shown in Fig. 6-32.

Fig. 7-1 is the schematic of the Tape Transport.

25. Trouble-Shooting Primary Power Circuits. There are three main branches of the primary 117 volt circuit. The first branch is composed of the capstan motor and vacuum motor. Fuse F2 (5 amp) protects this branch of the circuit. The second leg is the primary of transformer T1, which supplies the low-voltage power supply and the light circuits; Fuse F1 (3 amp slow-blow) protects this branch. The third branch is the reel motor power circuit, protected by Fuse F3 (3 amp).

Normal trouble-shooting procedures should resolve any difficulties encountered in these circuits.

26. Trouble-Shooting Low Voltage Power Supply. The low voltage

power supply generates -28vdc and +10vdc. The -28vdc is obtained from a center-tapped full wave rectifier composed of CR3 and CR4. Current limiting resistors R3 and R41 protect the diodes during the turn-on surge. The R41-C3 leg of the low voltage circuit provides power to the vacuum dump solenoid and the actuator circuitry. The R3-C2 leg of the 28v circuit supplies power to the balance of the machine.

The +10vdc is generated from the same winding used for the 28v supply. A center-tapped full wave rectifier is employed; the output is filtered and regulated by means of C1 and 10v Zener diode CR6. The +10v supply is used primarily for providing hold-off voltages for the transistor circuits, and as the main power source for the photosense circuitry. Again, normal trouble-shooting procedures should clear up any difficulties arising in these circuits.

27. Trouble-Shooting Reel Servo Circuits. The reel servo circuits can be most easily checked by using the Maintenance Unit. By using the motor test switch on the Maintenance Unit, it can be established whether or not the SCR circuits are functioning properly. If the test indicates that the SCR circuits are functioning properly and trouble is still experienced with the transport, check the vacuum switch circuits VS1 through VS4. Also check that the contacts on relays K6 and K8 are operating properly. If tests with the Maintenance Unit indicate that the SCR circuits are not functioning properly an oscilloscope may be used to ascertain whether or not operating voltages are present.

WARNING

THE OSCILLOSCOPE MUST BE OPERATED FROM AN ISOLATED POWER SOURCE, THAT IS, IT MUST NOT BE GROUNDED.

The SCR board can be reached by removing the perforated cover from

the transport control unit. Caution must be exercised since voltages in excess of 150v peak exist in the SCR motor circuit. Connect the scope ground to terminal B1. Check at the anode connections of SCR1 through SCR4 for the presence of 150 to 170v full wave dc. This voltage should also appear at terminal B4. Place the Maintenance Unit motor select switch in the UPPER REVERSE position and place the motor test switch in the ON position. Connect the scope to terminal B3 and ascertain that a voltage of approximately 150v exists at this point. If the voltage does exist here, place the scope probe on terminal A2 and ascertain whether wave form exists as shown in Fig. 6-33. If an improper indication is seen at this test point, the SCR should be replaced. If replacing the SCR does not cure the problem, check R4 for continuity and value (470 Ω). Check CR11 for continuity and proper diode action and check the motor and brake circuits for continuity. The upper reel forward and the lower reel forward and reverse circuits can be checked in a similar manner.

28. Testing Reel Servo for Worst Case. In order to test the reel servo for worst case condition, it is necessary to use the Datamec Maintenance Unit. It contains a relay circuit and vacuum switches that automatically generate a worst case program for the servo. Instructions

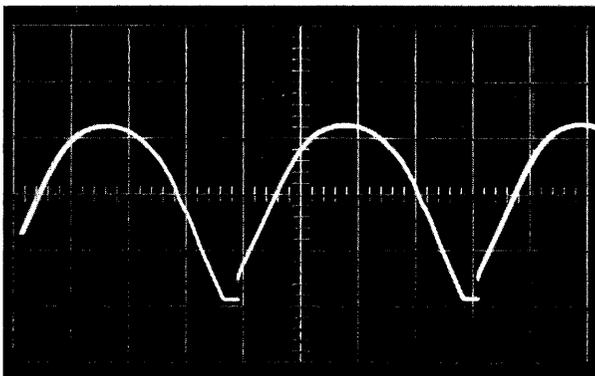


Figure 6-33
Motor Voltage Wave For
M1, Terminal A2

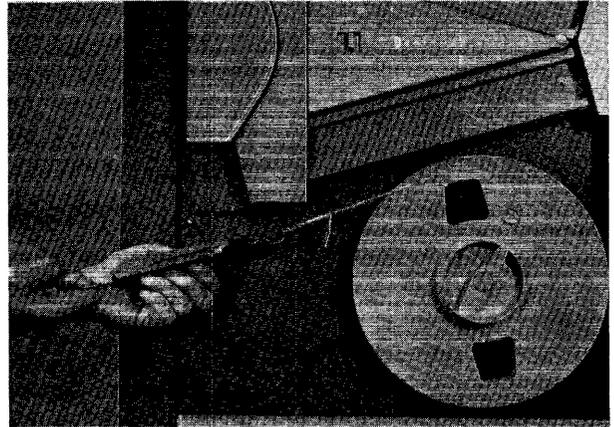


Figure 6-34
Checking Reel Motor Torque

for connecting the Maintenance Unit to the Tape Transport are included with the Maintenance Unit. Failure to pass the worst case test generally indicates faulty brake adjustment or brake malfunction.

29. Checking Reel Motor Torque. With the Maintenance Unit connected as above, it is possible to check the reel motor torque output. Use a piece of suitable strong cord to form a loop of twine around the reel at the outer extremity (Fig. 6-34). Attach a suitable spring scale, energize the motor in the proper direction, and allow the scale to move very slowly in the direction the motor is trying to run. Read the scale and multiply by the radius of the string attachment point. This will give the torque which should be approximately 170 inch ounces. If this torque output is not realized, check the reel motor SCR circuits and the line voltage which should be 117v rms for this test. If all circuit operations are correct and the motor is still low in torque, it should be replaced.

30. Checking Long and Short Loop Safety Shut-offs. With the machine loaded with tape and in a standby condition, that is, capstan and vacuum motors running and tape in the chambers, grasp the upper reel firmly and turn so as to withdraw tape from the chamber. When the loop sens-



ing hole is passed, the motor will be energized and caution should be exercised that the motor does not twist the reel out of one's hand. Continue withdrawing tape from the chamber until the short loop sensing hole is uncovered. At this point, the capstan and vacuum motors should turn off. In a like manner, the lower reel can be turned until the lower chamber short loop hole is uncovered. In a similar manner, test the long loop sensing holes in each chamber. If the loop safety shut-offs do not operate properly, check the vacuum switch for proper operation by connecting a voltmeter from ground to the normally open contact of VS7 (the upper chamber safety switch) and repeat the above test. The voltmeter should indicate -28v. If the voltage does not disappear when the vacuum switch hole is uncovered, the vacuum switch is defective and should be replaced. Vacuum switch VS8 can be checked in a similar manner.

31. Trouble-Shooting Rewind Circuits. The following discussion is based on the premise that the machine is operating properly in all other modes.

If upon the application of a -10v command to pin 15 of transport control unit connector P1, the machine fails to go into Rewind, the following corrective action should be taken. Check relay K4 to see that it is being energized when the signal is applied. If it is not, either the relay or transistor Q3 or associated circuitry is defective and should be checked further. If relay K4 is being energized but the machine still will not rewind, check relays K5, K6, K7 and K8 for proper action.

If, when the Rewind command is applied, the tape is pulled from the chambers without any jogging action, relay K3 is not being pulsed by the rewind jog circuit, hold the upper reel firmly and apply a Rewind Command. Measure the voltage at terminal 11 of the printed circuit board. This voltage should be -28v. If it is

absent, check relay contacts 12 and 13 on K5. If the voltage is not present at both sides of this relay contact, then check vacuum switches VS7 and VS8, and the circuit of relay K4.

If during the jogging action tape is pulled from the take-up reel into the lower chamber, the drag brake is too loose or vacuum is too high. If it is suspected that the vacuum is too high, check the vacuum dump solenoid and butterfly valve on the vacuum assembly. The vacuum during Rewind should drop to approximately 10 inches of water. If the drag brake is not providing sufficient hold back tension, it should be adjusted.

If the jogging action continues, even after tape is completely removed from the chambers, vacuum switches VS7 and VS8 are probably malfunctioning and should be checked.

If the Rewind action is sluggish or jerky, a dragging reel motor brake or a drag brake that is too tight is indicated.

During a Rewind operation the lower reel motor brake is energized through an external source. In order to provide hold back tension, a small low torque drag brake is provided. The drag brake is normally adjusted to provide 10 to 15 inch ounces of hold back tension. Checking and adjusting the drag brake tension has been covered previously.

32. Adjusting Rewind Jog Time. Rewind jog time is set at the factory and generally requires no re-adjustment unless components have been changed. If components in the Rewind jog circuit are changed, it may be necessary to re-adjust the ON and OFF times of the jog circuit. To do this, connect an oscilloscope to terminal 12 of the printed circuit board. The other side of the scope should be connected to ground. Place the machine in Rewind and adjust R46 so that terminal 12 is at 0 volts for

60 milliseconds. Adjust R47 so that the total cycle time is 500 milliseconds. These adjustments should be made at a line voltage of 117 volts.

33. Checking Actuator Drive and Trouble-Shooting Actuator Circuit.

With power on, and tape loaded and threaded, apply a command to energize the forward or reverse actuator. Test point TP4 located on the back of the transport control unit displays the saturation voltage of forward actuator transistor Q7. Test point TP5 displays the saturation voltage of reverse actuator transistor Q11. With neither actuator energized the voltage at TP4 and TP5 should be approximately 28v. With the forward actuator energized the voltage of TP4 should be approximately 0.4v. The voltage at TP5 should be approximately -5 to -6v. Conversely, with the reverse actuator energized, TP5

should be 0.4v and TP4 should be -5 to -6v. If these conditions are not met, the actuator drive circuit should be tested using normal trouble-shooting procedures and the typical operating voltage chart shown in Fig. 6-35.

The actuator circuit components are located on an etched circuit board on top of the control chassis. Be certain that +10v hold-off bias is present at terminal 5 of the circuit board. Be certain also, that the actuator coils are not open or shorted to ground. Normal dc resistance of the coil is approximately 3.7Ω.

D. FILE PROTECT CORRECTIVE MAINTENANCE

1. Checking File Protect Operation. File Protect malfunction is evidenced by one of the following:

- (1) Write enable circuits are not closed when the tape unit is operated with a reel equipped with a Write Enable Ring.
- (2) The write enable circuits are closed even though no Write Enable Ring is present.

The first step in isolating the difficulty is to determine whether the trouble lies in the File Protect Unit itself or in the write enable relay K9 on the transport control unit. To do this, place the tape unit in operation so that the malfunction is present. Then check to see if the File Protect Unit is energized, that is, whether or not the actuator pin has been retracted by the solenoid. If the write enable circuits are closed, the actuator should be retracted. If they are open, the actuator should be in its normal position. If the conditions of the relay and the File Protect Unit do not correspond, the fault probably lies in the relay or its associated wiring. If the status of the relay and File Protect Unit do correspond to each other but not to the presence or absence of a Write Enable Ring, then the trouble probab-

TYPICAL CIRCUIT VOLTAGES

TRANSISTOR		EMITTER	BASE	COLLECTOR
Q1	Note 1	0	+7	-
Q2	Note 1	0	-.5	.2
Q3	On	0	-.3	-.6
	Off	0	+10	-26
Q4/Q8	On	-2.8	-3	-2.8
	Off	-2.5	-	-22
Q5/Q9	On	-2.8	-1	-13.5
	Off	-2.5	-2.8	-2.6
Q6/Q10	On	-1.2	-14	-1.35
	Off	+7	+8	-24
Q7/Q11	On	0	-.45	-.25
	Off	0	+1.4	-28

NOTE 1: VOLTAGES AT Q1 AND Q2 READ WHILE IN REWIND WITH LOOP ALARM SWITCHES OPEN TO PREVENT JOGGING ACTION.

NOTE 2: VOLTAGES OF Q4 TO Q7 AND Q8 TO Q11 ARE SIMILAR FOR THE SAME OPERATING CONDITION, i.e. ON OR OFF. "ON" AND "OFF" REFER TO THE ULTIMATE OUTPUT i.e. ACTUATOR "ON OR "OFF".

Figure 6-35
Actuator Circuit Voltage Chart

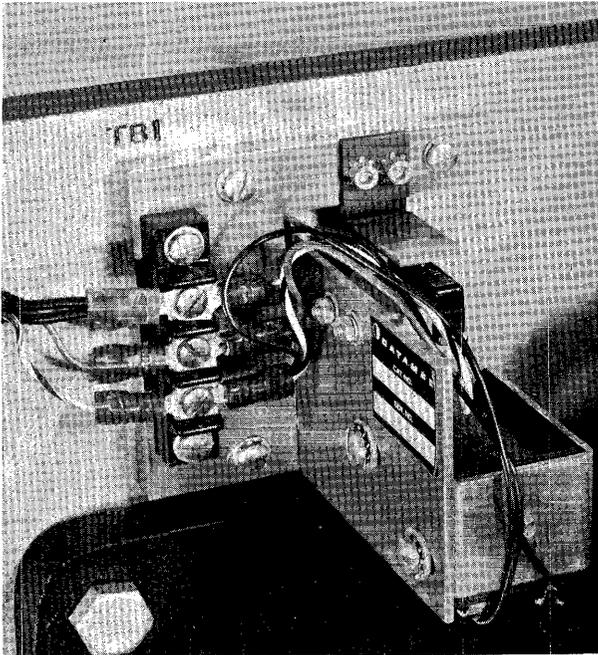


Figure 6-36
File Protect

ly lies in the File Protect Unit itself.

2. Adjusting the File Protect.

There are two adjustments on the File Protect; switch position and actuator travel (see Fig. 6-36).

To adjust the switch, loosen the two screws that mount it to the upright plate. The holes in the plate are slotted, allowing the switch to move. Pull the switch away from the actuator so that the actuator bottoms against the recessed cutout in the transport main frame. Now move the switch in against the actuator until it snaps. Then tighten the switch mounting screws to lock it in position. When the switch is properly adjusted, it will trip during the first 1/16" of travel of the actuator tip. There must be sufficient travel so that the switch always retrips when the actuator returns to its rest position. In the rest position, the actuator should always bottom against the transport frame and never against the switch.

Actuator travel is determined by the position of the solenoid body

on the upright mounting plate. Loosen the two solenoid mounting screws and slide the body up or down so that with the plunger all the way in, the tip of the actuator is retracted 1/4" from its rest position. After positioning the solenoid for correct travel, see that it is lined up straight with the edge of its mounting plate and then tighten the screws to lock it in place.

3. Replacing and Repairing the File Protect. If the entire File Protect Unit is to be replaced, it is first necessary to remove the supply reel motor assembly. The File Protect Unit may then be removed by removing the harness wires connected to its terminal block and the three screws that attach it to the Tape Transport. If the file protect actuator is to be replaced, the entire unit must first be removed from the Tape Transport. However, replacement of the switch, solenoid or actuator spring may be accomplished with the unit in place.

To install a File Protect on the transport, proceed as follows:

Step 1: Mount the File Protect Unit on the rear of the transport as shown in Fig. 6-36. Do not tighten the screws.

Step 2: Position the assembly so that the edge of the base plate is straight up and down and the end of the actuator is at the center of the half circle when viewed from the front as shown in Fig. 6-37. When the assembly is properly aligned, tighten the three mounting screws.



Figure 6-37
Actuator Tip

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

Step 4: Replace the reel motor assembly.

Step 5: Perform the adjustments described previously.

E. PHOTONSENSE

1. Photosense Adjustment.

Step 1: Thread the machine with a reel of tape which has photosense tabs on the back in the normal positions (see Fig. 3-8).

Step 2: Start the transport and observe the photosense head with respect to the tape passing in front of it. The front of the head should be parallel to the tape. If necessary, loosen the head mounting screw and adjust the position of the head to achieve this condition.

Step 3: Connect a dc vacuum tube volt meter between TP1 and ground. Position the tape so that there is no tab reflecting light into the photosense head. Adjust R2 to give a reading as high as possible without exceeding +1 volt. In many cases the maximum voltage attainable will be less than one volt, which is perfectly acceptable. Move the tape until a reflective tab on the outer edge of the tape is under the photosense head. Check the volt meter reading, which should be greater than +5 v. If it is not, rotate the photosense light bulb, which will change the position of the filament with respect to the photocell. Recheck the off tab setting to be sure it is +1v or less.

Step 4: Connect the meter between TP2 and ground and repeat the adjustment procedure of Step 3, using the

tab at the inner edge of the tape and adjusting R14. Do not make further adjustments of the light bulb position without re-checking the other channel.

2. General Trouble Shooting.

If one or both channels of the photosense fail to operate when a reflective tab is present under the photosense head, the trouble should first be traced to either the head, the amplifier, or the power supply. Check the photocell voltage at TP1 and TP2 for the values specified in the adjustment procedure. If the input voltage behaves as specified but the output does not follow correspondingly, the trouble is in the photosense amplifier.

If the head voltage does not change as specified, with the presence and removal of the reflective tab, the difficulty is probably in the photosense head. If there is no voltage present at the input to either channel, with or without a reflective tab, it is possible that the trouble is in the +10v power supply. Check for the presence of +10v at pin 1 of TS2. Once the cause of the trouble has been isolated, the following general procedure should be followed.

3. Head Trouble Shooting. If the trouble appears to be with the photosense head, check to be certain that the lamp is lit. Next, check to see that the adjustments are correct. If it is impossible to obtain the specified adjustment, check to see that the mask on the front of the head is correctly positioned.

The web through the center of the mask should be centered over the lamp hole, leaving equal portions exposed adjacent to each photocell (see Fig. 6-38). If necessary, adjust the mask by loosening its mounting screw near the bottom of the front surface of the head.

A more likely cause of photosense head difficulty is the lamp bulb, which tends to blacken with age, resulting in a decrease in the

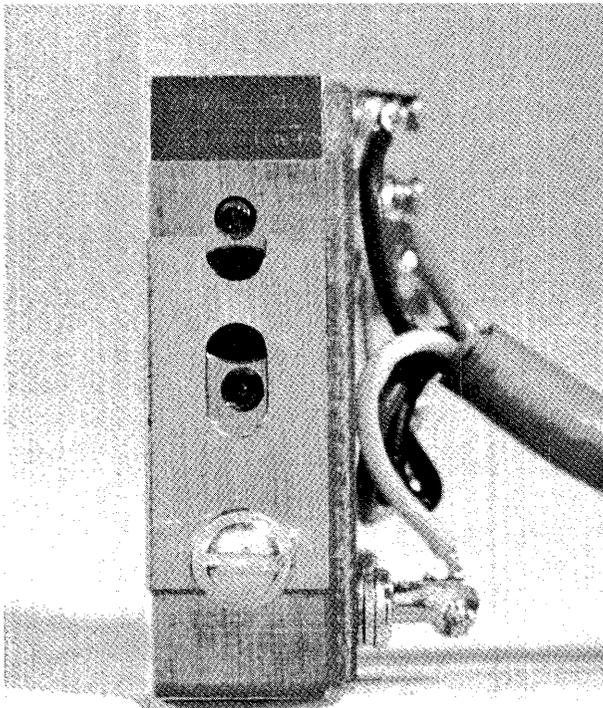


Figure 6-38
Photosense Mask Position

light output. As a general rule, it is recommended that these lamps be replaced after every 1000 hours of operation. To remove and replace the bulb, loosen the contact screw and slide the contact back until it can be removed (see Fig. 6-39). Replace the lamp and re-install the contact. The photosense head uses a special version of the type 328 lamp with a precision mounted filament (Datamec Part No. 00048-001). In an emergency a regular 328 lamp may be used, but many of these standard lamps have the filament so far off center that they will not work properly.

If changing the lamp does not correct the difficulty, a defective photocell should be suspected. This is particularly true if one channel is working properly and the other is not. Before changing the photocell interchange the head leads on terminals 1 and 2 of TS1 at the photosense amplifier. This will connect the photocells to the opposite amplifier channels. If the diffi-

culty is thus traced to one photocell, it is probable that the photocell is at fault. Should the difficulty remain with the amplifier channel, it is probable that the input transistor is at fault.

If the upper photocell is to be changed, this can be done with the photosense head mounted on the transport in its normal position. If the lower cell is to be changed, the head should be removed. Using a small soldering iron, remove the photocell leads from the terminals and then pull back on the leads to remove the cell. The cell will usually come free without difficulty, although it has been secured to the head with a small amount of cement. Install a new photocell from the rear and position it so the front of its lens is approximately flush with the front of the photosense head. It may be secured at the rear with a small amount of "Duco" cement.

CAUTION

DO NOT APPLY CEMENT TO THE FRONT OF THE HEAD NEAR THE PHOTOCELL LENS.

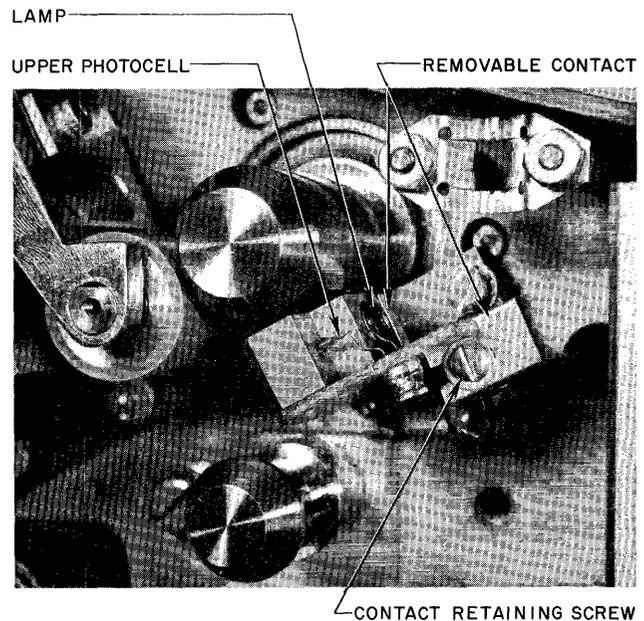


Figure 6-39
Photosense Head

Connect and solder the new photocell leads to the appropriate terminals. The photocell is not polarized so either lead may be connected to either terminal. After installing a new photocell, perform the adjustment procedure.

4. Amplifier Trouble Shooting. To isolate a difficulty in the photo-sense amplifier, use standard electronic trouble shooting techniques after referring to the theory of operation in Section V. Unless the defective component is a transistor, it should be possible to replace the component without removing the photo-sense amplifier from the Tape Transport. It is suggested that components be replaced by cutting out the old component and using the remaining lead as a terminal to which the new component is attached.

F. OPERATOR CONTROL PANEL CORRECTIVE MAINTENANCE.

1. Trouble-Shooting. The Operator Control Panel circuitry is relatively simple, consisting mainly of transistor operated relay circuits. For aid in trouble-shooting, consult the detailed circuit description in Section V.

2. Changing Lamps. Access to the lamps is gained by opening the hinged front cover on the Operator Control Panel. The lamps are Type 44, 6.3v bayonet-base bulbs. Two of the lamp sockets are equipped with a colored lens which screws into the lamp holder assembly. To change one of these bulbs, first unscrew the plastic lens, then remove and replace the bulb.

3. Front Panel Adjustment. Slotted holes in the front panel hinge provide for in and out adjustment of the front panel. Normally this adjustment is made at the factory to provide proper clearance between the hinged panel and the main structure and no adjustment in the field should be required. However, some times warping will occur if the panel

has been mounted in a rack on which the mounting rails are not flat.

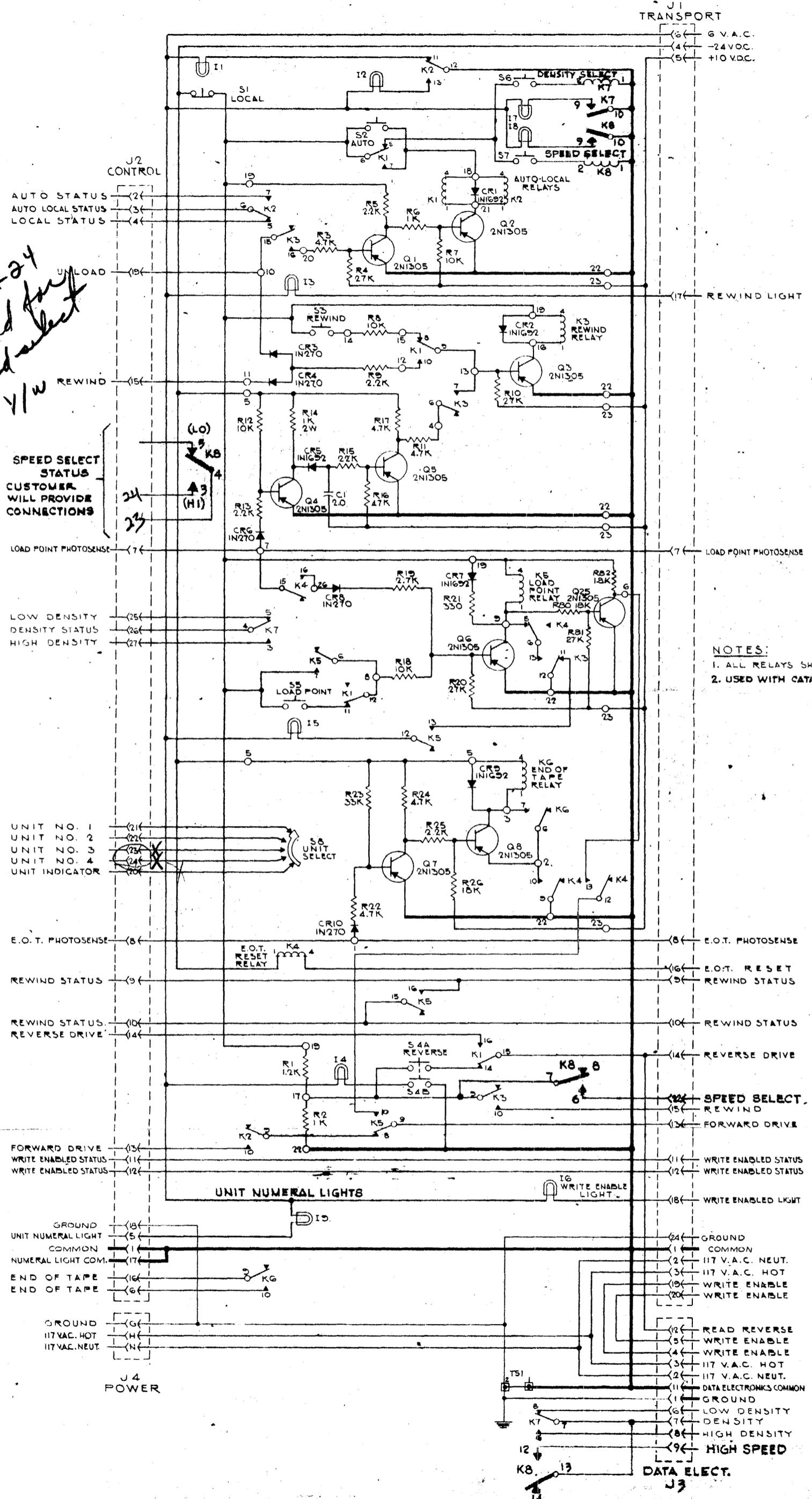
This condition is evidenced by binding of the rubber gasket around the back edge of the hinged cover when it is opened and closed. If adjustment is required, loosen the four screws and nuts which attach the front cover to the hinge leaf and adjust the position of the cover until it no longer binds. Then re-tighten the screws and nuts.

4. Pushbutton Switch Adjustment.

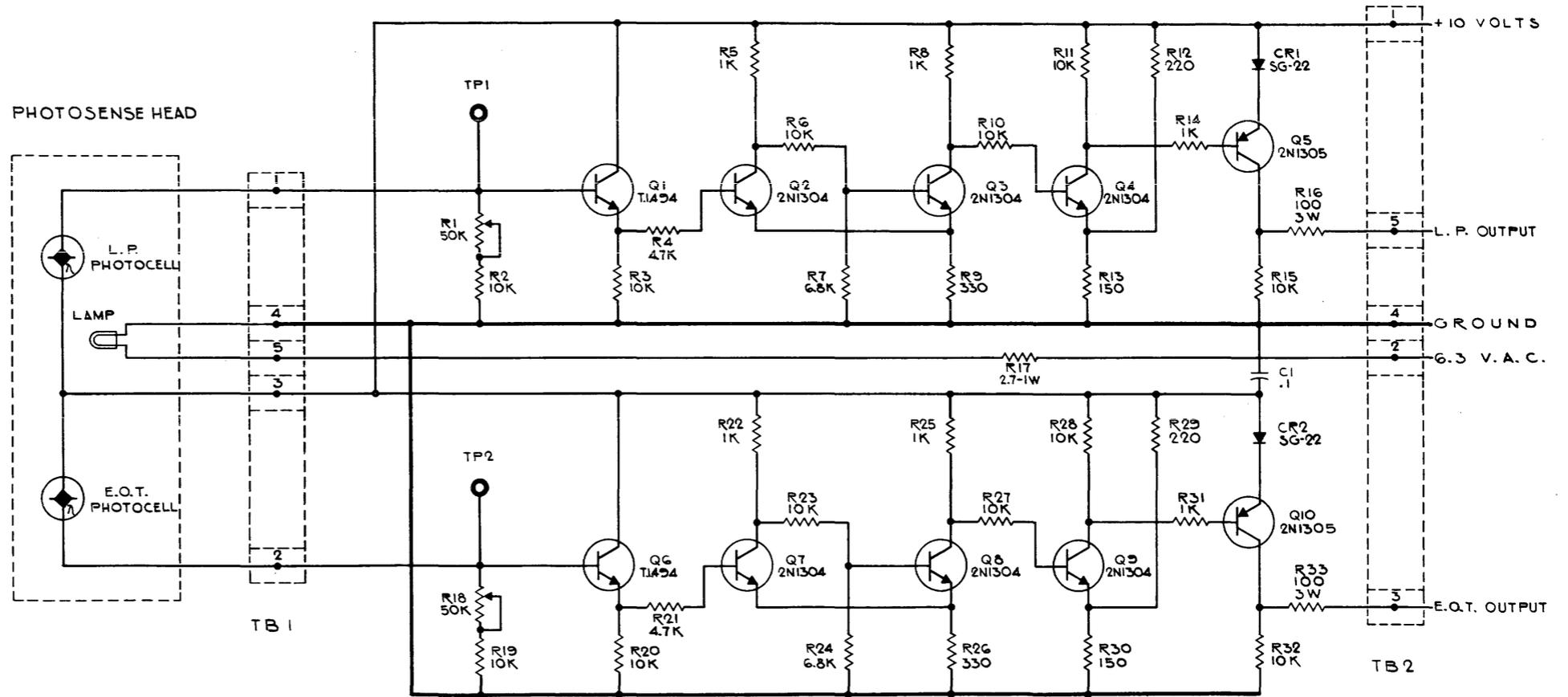
The Operator Control Panel pushbuttons are attached to the front cover assembly, while the switches which they actuate are attached to brackets on the fixed portion of the panel. A slotted hole in the switch mounting bracket allows the actuator end of the switch to be moved in and out so as to mate properly with the pushbutton. The switch should be positioned so that it trips and resets freely when actuated by its pushbutton with the front panel closed. If the switch will not reset when the pushbutton is released, it should be moved inward. If there is excessive rattle or play between the pushbutton and the switch plunger, the switch should be adjusted outward.

5. Replacing Electrical Components. To trouble-shoot or repair the electrical parts of the Operator Control Panel, it is recommended that the panel be removed from the cabinet. If a component on the circuit board (other than a transistor) is to be replaced, the old component should be clipped and the remainder of the old lead used as a terminal for the new component. K1 through K6 are plug-in type relays. To remove one of these relays, disengage the wire spring retainer from the top of the relay housing and unplug the relay. If it is necessary to repair any wiring on the underside of the chassis, it is recommended that the rear chassis plate be removed and folded out of the way to allow access to wiring on the underside of the chassis.

*Pin 23-24
rewind for
speed select
Blw 1/w*



NOTES:
 1. ALL RELAYS SHOWN DEENERGIZED.
 2. USED WITH CATALOG NO. 1-20362-10391-1M.



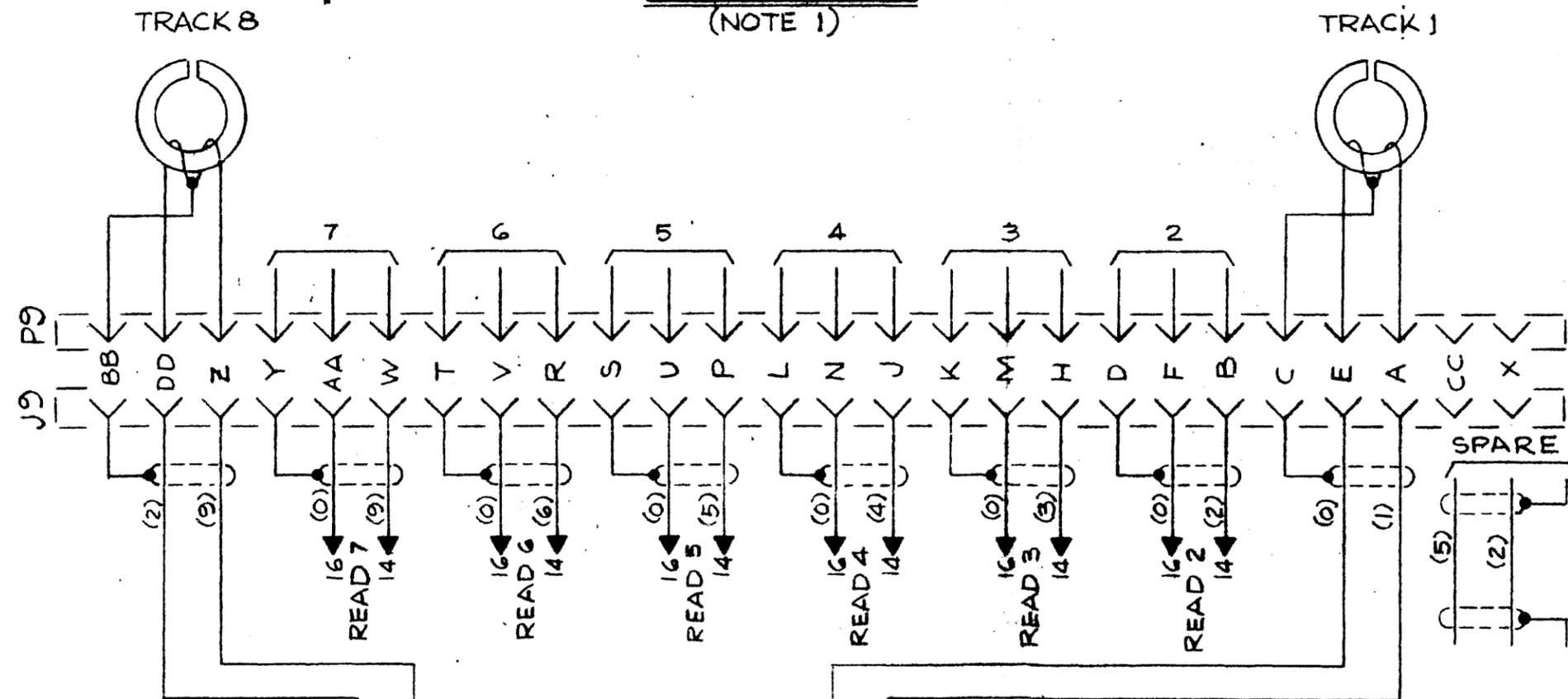
NOTES:

1. ALL RESISTORS ARE 1/2 WATT, 5% UNLESS OTHERWISE SPECIFIED.
2. CATALOG NO. 10270.

REVISIONS

REVISION NO.	DESCRIPTION OR CHANGE NO.	CHECKED	AUTH.	DATE
A	RELEASED	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Date]</i>
B	ADDED 905 WIRE READ 30 TO WRITE 22 TO TB2. SCH N° WBS -000, ECN 316-64	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Date]</i>

READ HEAD
(NOTE 1)



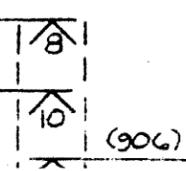
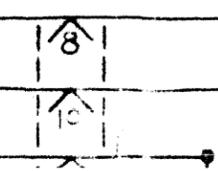
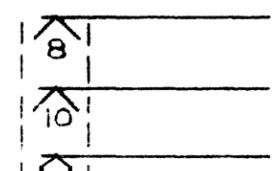
TB2
(POWER SUPPLY)

(908)	8	RE
(0)	7	CC
(906)	6	6
(905)	5	+
	4	
(903)	3	20
(902)	2	+
(901)	1	55

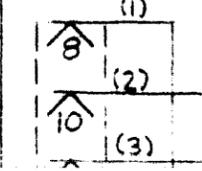
READ 8

READ 1

READ CONTROL



NOTE 4
READ
PARITY



S/O 20362

DRAWN	KCD	4-8-64	A 10587 D
CHECKED	W.P.	4-17-64	
ENGINEER	R.K.H.	4-17-64	
TOLERANCE UNLESS OTHERWISE SPECIFIED:			
BREAK SHARP EDGES AND DEBURR.	FRACTIONS ±	—	
	DECIMALS ±	—	
DO NOT SCALE.	ANGLES ±	—	

THE INFORMATION ON THIS DRAWING
MAY NOT BE DISSEMINATED WITHOUT
AUTHORIZATION OF DATAMEC COR-
PORATION.

**SCHEMATIC -
CARD CAGE ASSEMBLY
8CH WRITE/READ**

SCALE: _____

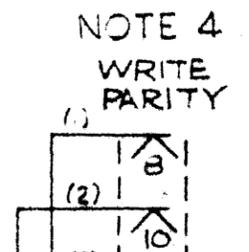
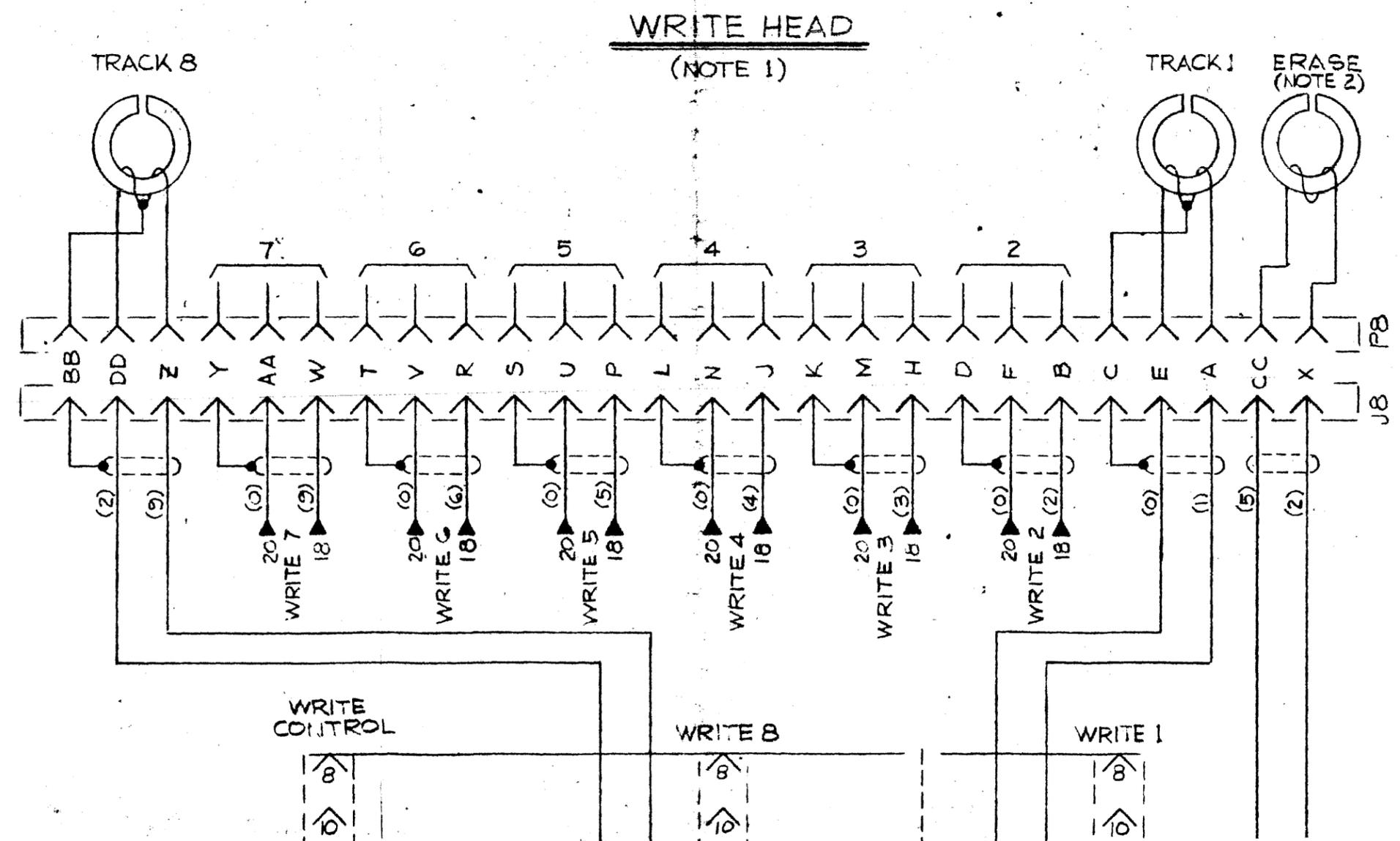
SCHEM. NO.: 10587

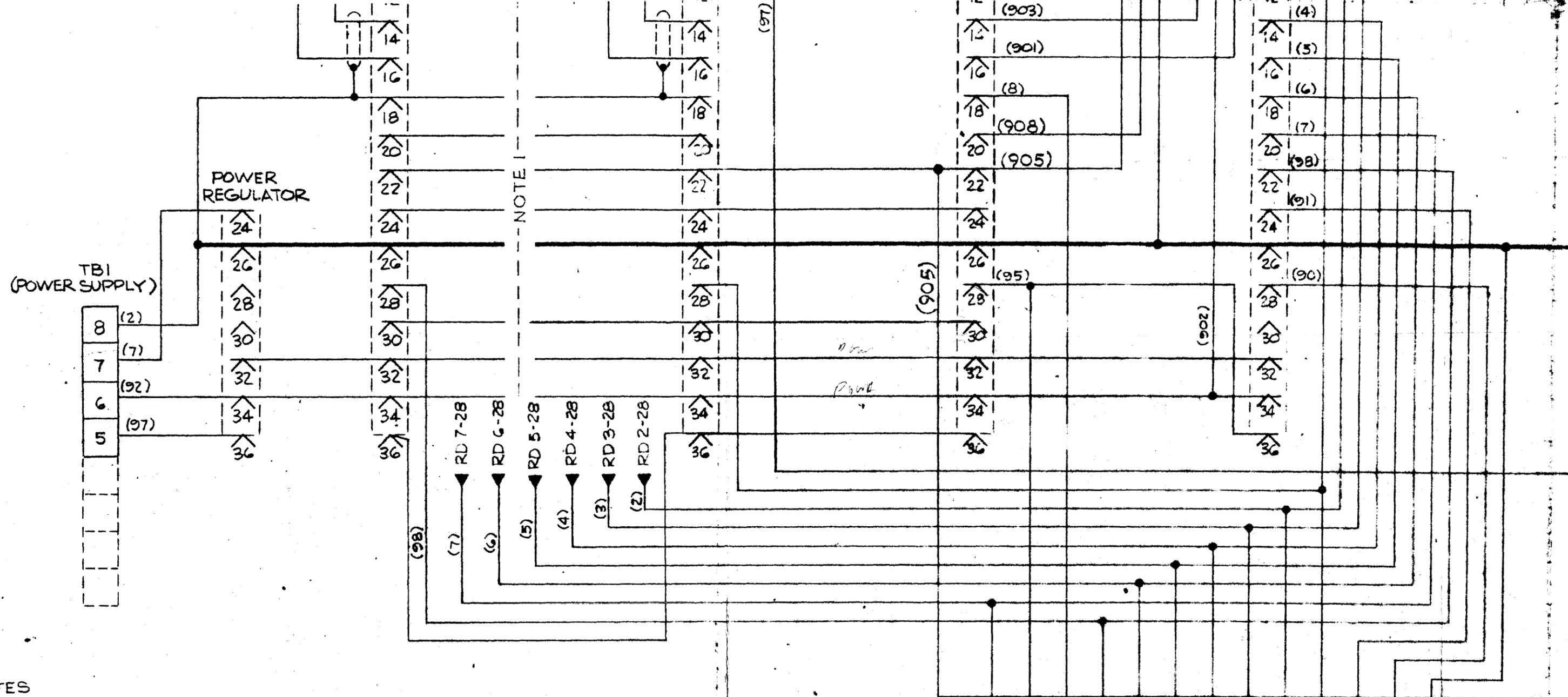
D	10587	A
DRAWING NO. ISSUE		
SHEET	1	OF 1
 DATAMEC CORPORATION 345 MIDDLEFIELD ROAD MOUNTAIN VIEW, CALIFORNIA		

VERSION											BILL OF MATERIAL	
-9	-8	-7	-6	-5	-4	-3	-2	-1	-0	ITEM	DATAMEC PART NO.	DESCRIPTION

REVERSE
COMMON
800 DENSITY
HIGH SPEED

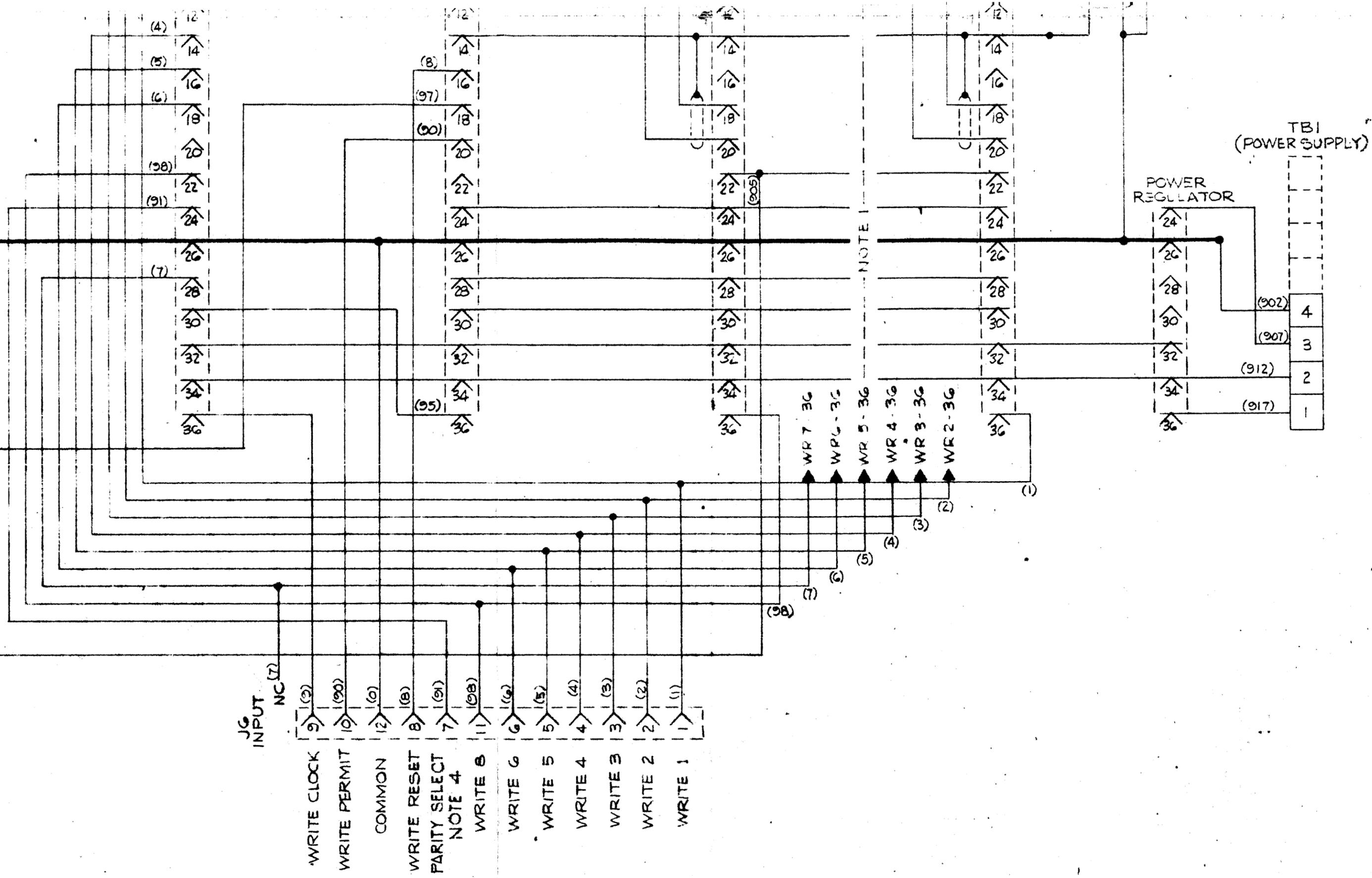
200 DENSITY
+ 10V.
556 DENSITY





NOTES

1. WRITE AND READ HEAD CORES AND CARD CONNECTIONS ARE NOT SHOWN FOR TRACKS 2 THRU 7. CONNECTIONS FOR TRACKS 1 AND 8 ARE TYPICAL. 7 TRACK HEAD ASSEMBLIES DO NOT HAVE TRACK 8 CORES.
2. CONNECTOR PINS "X" AND "CC" OF P8 ARE JUMPED ON HEAD ASSEMBLIES WITHOUT AN ERASE HEAD.
3. CATALOG UNIT 10590-0
4. WHEN USED WITHOUT PARITY CHECK, SPECIAL JUMPER CARDS MUST BE USED IN THE READ PARITY AND WRITE PARITY CARDS. PIN 7 ON CONNECTORS J6 AND J7 WILL THEN BE USED FOR "WRITE 7" AND "READ 7" RESPECTIVELY.



J6 INPUT

NC (7)

9 (9) WRITE CLOCK

10 (90) WRITE PERMIT

12 (9) COMMON

8 (8) WRITE RESET

7 (9) PARITY SELECT NOTE 4

11 (98) WRITE 6

6 (6) WRITE 6

5 (5) WRITE 5

4 (4) WRITE 4

3 (3) WRITE 3

2 (2) WRITE 2

1 (1) WRITE 1

WR 7 - 36

WR 6 - 36

WR 5 - 36

WR 4 - 36

WR 3 - 36

WR 2 - 36

NOTE

TBI (POWER SUPPLY)

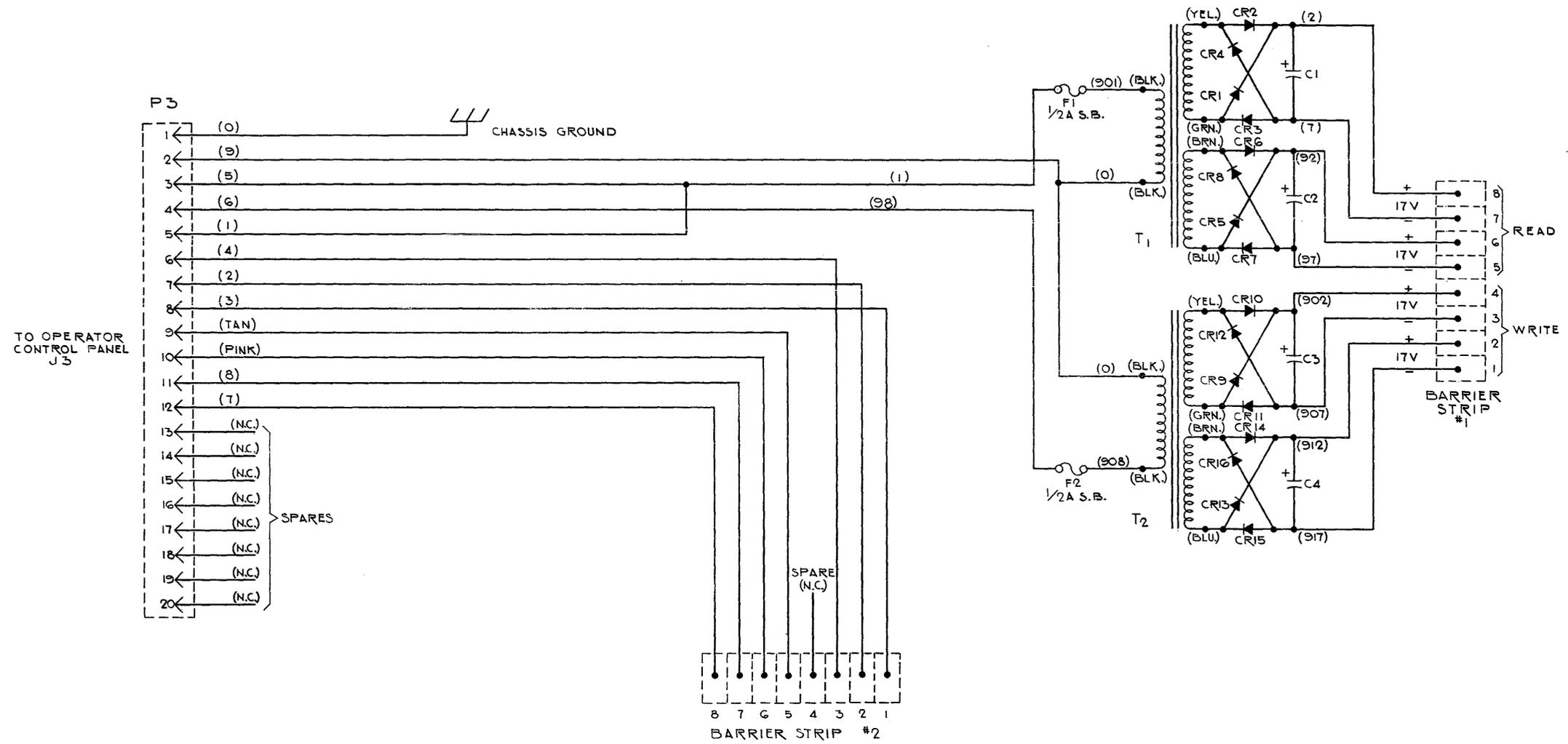
POWER REGULATOR

(902) 4

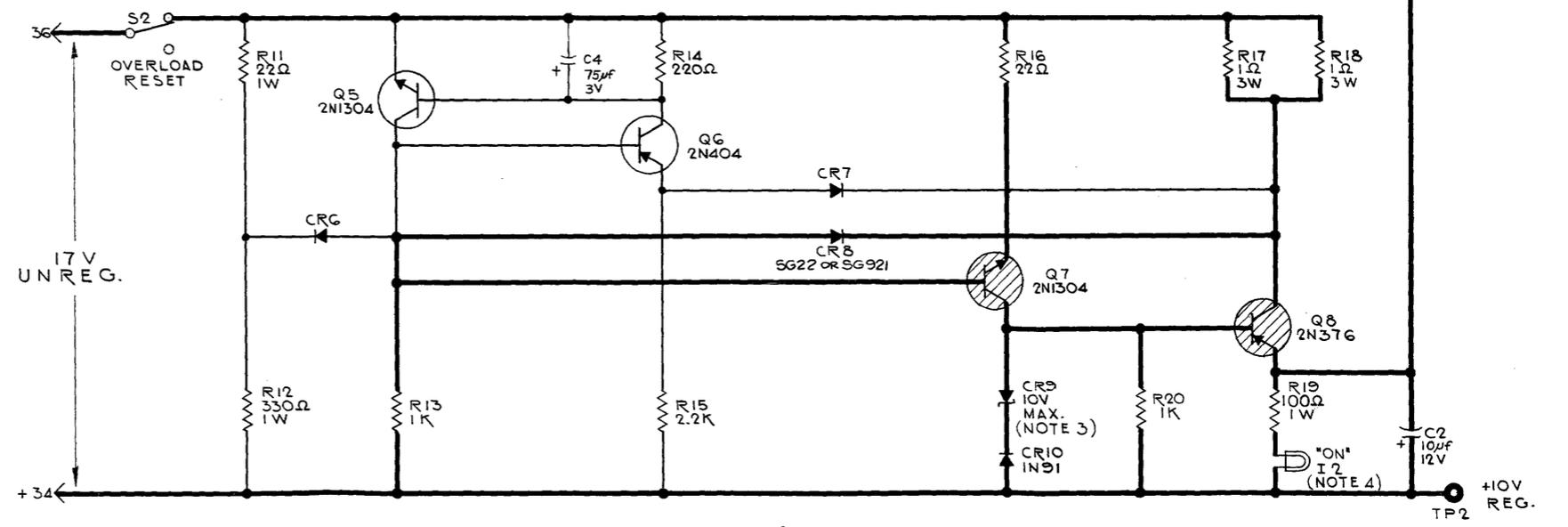
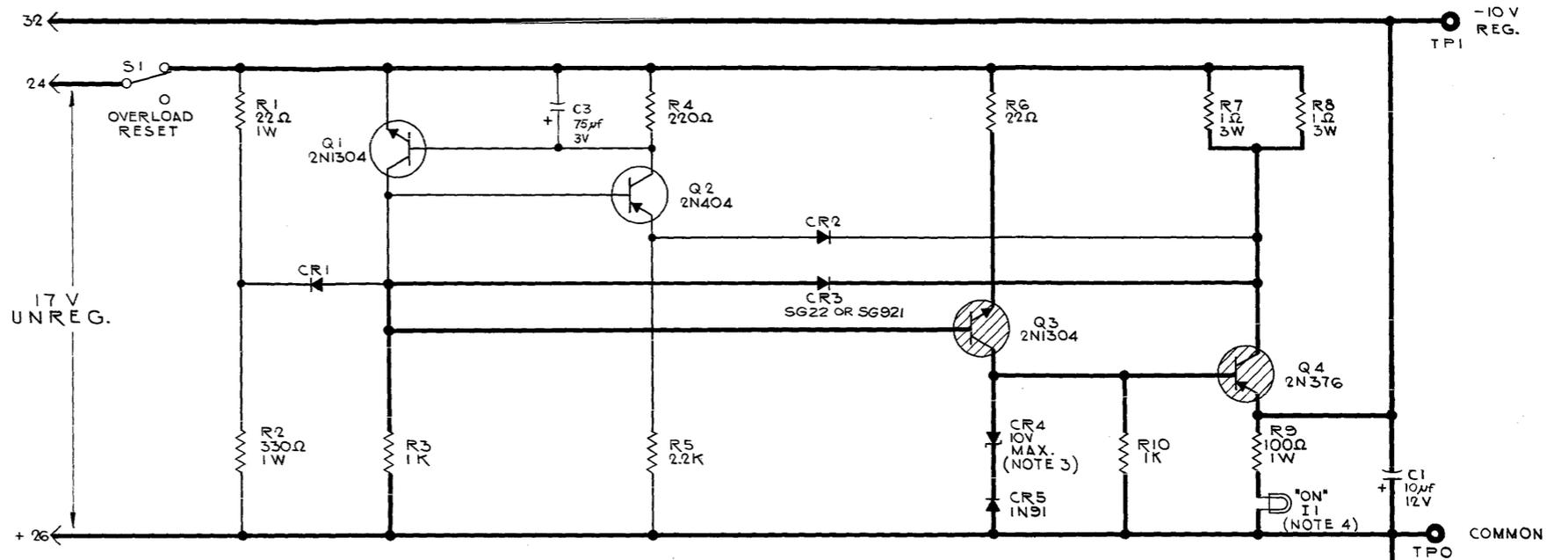
(907) 3

(912) 2

(917) 1



NOTES:
 1. CR1 THRU CR15 ARE RCA4010B.
 2. C1 THRU C4 ARE 5400µF, 20V.



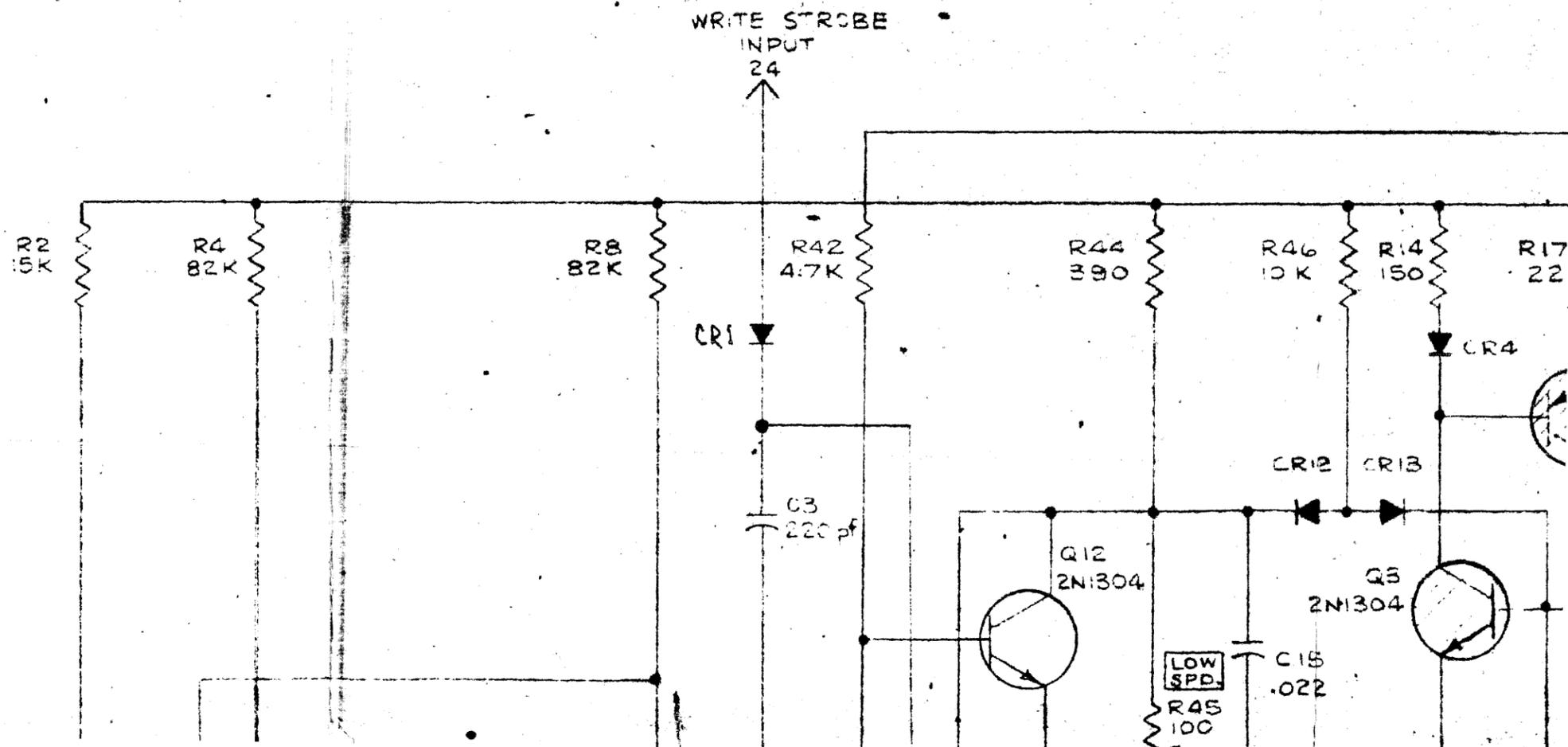
- NOTES:
1.  NORMAL "ON" STATE.
 2. ALL DIODES ARE IN270, OR EQUIV. UNLESS OTHERWISE SPECIFIED.
 3. CR4, AND CR9 TRANSITRON 1015 $9.8V \pm 5\%$ OR EQUIV.
 4. INDICATORS I1, AND I2 GE344, OR EQUIV.
 5. CATALOG NO. 10340.

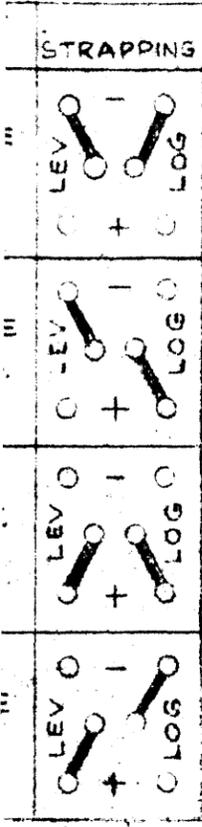
Power Regulator
 Circuit Card Assembly
 Catalog No. 10340-0
 7-6

REVISIONS

ISSUE	DESCRIPTION OR CHANGE NO.	CHECKED	AUTH.	DATE
A	RELEASED	<i>[Signature]</i>		
00A	INCLUDES TEC 470-64			

TYPE OF LOGIC	ST
NEGATIVE TRUE	LEV
NEGATIVE FALSE	LEV
POSITIVE TRUE	LEV
POSITIVE FALSE	LEV





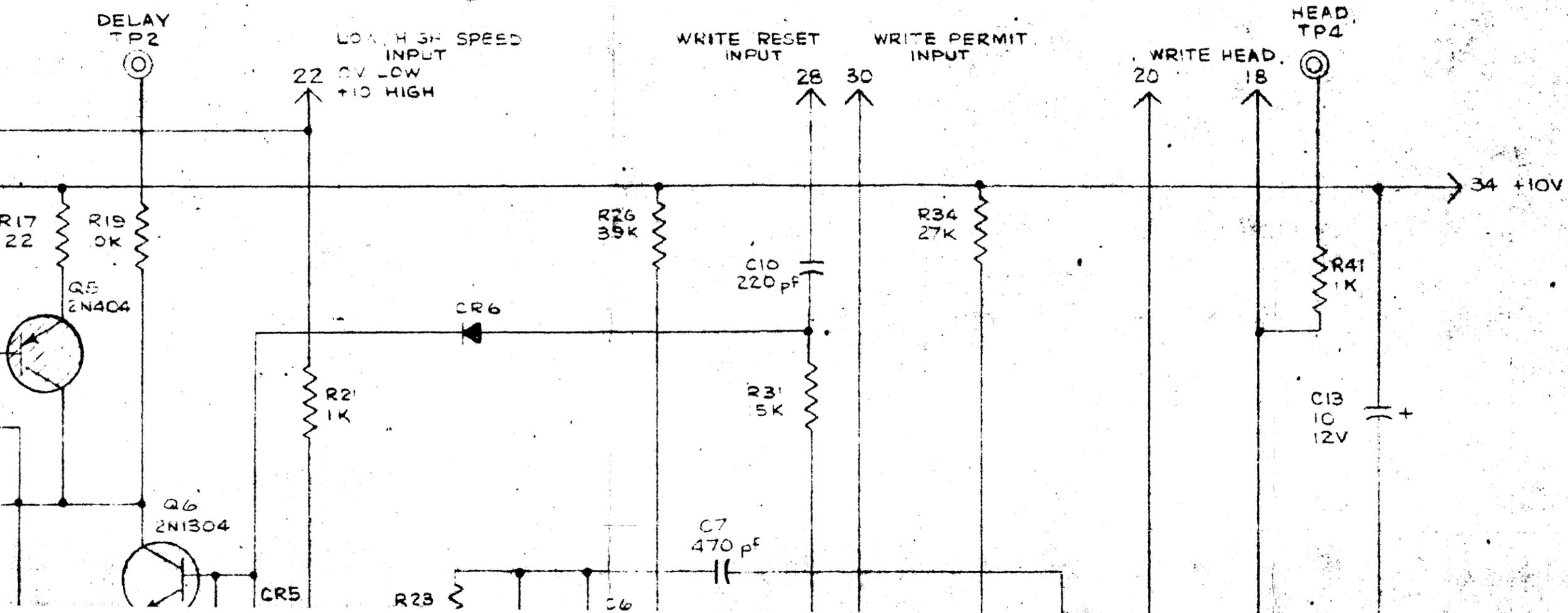
DRAWN	<i>E. P. ...</i>	9.25.64	4
CHECKED	<i>...</i>	7.2.64	
ENGINEER	<i>...</i>	7.2.64	
TOLERANCE UNLESS OTHERWISE SPECIFIED:			
BREAK SHARP EDGES AND DEBURR.	FRACTIONS	+ -	
	DECIMALS	+ -	
DO NOT SCALE	ANGLES	+ -	

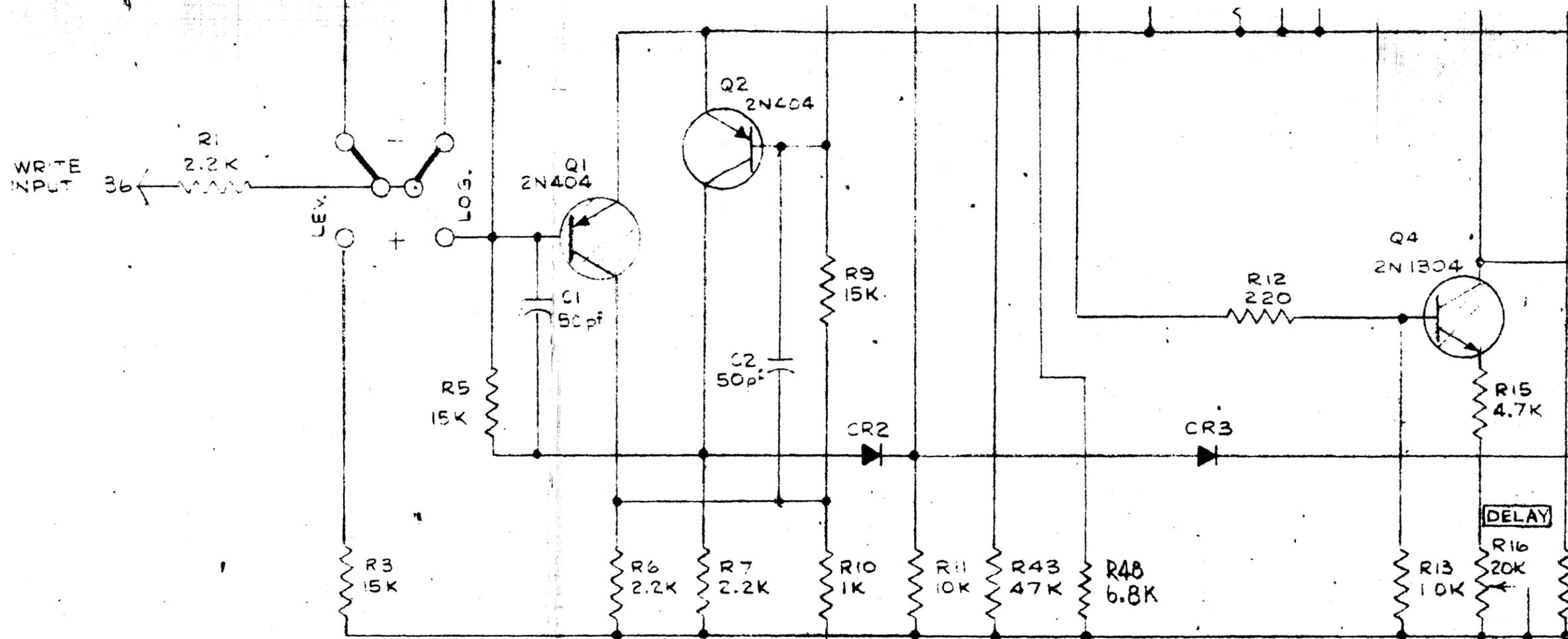
THE INFORMATION ON THIS DRAWING
MAY NOT BE DISSEMINATED WITHOUT
AUTHORIZATION OF DATAMEC COR-
PORATION.

FIG 7-7
SCHEMATIC -
DUAL SPEED WRITE

D 10608	A
DRAWING NO.	ISSUE
SHEET	OF
DATAMEC CORPORATION 345 MIDDLEFIELD ROAD MOUNTAIN VIEW, CALIFORNIA	

VERSION											BILL OF MATERIAL	
-9	-8	-7	-6	-5	-4	-3	-2	-1	-0	ITEM	DATAMEC PART NO.	DESCRIPTION





SCHMITT TRIGGER

NOTES:

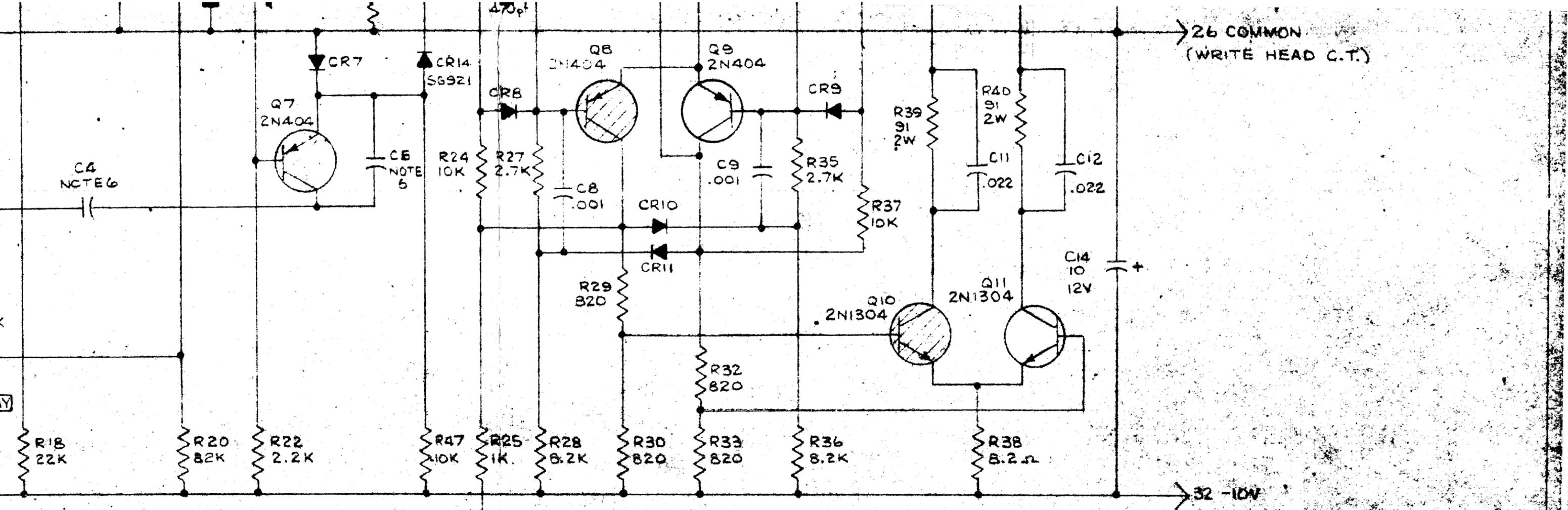
1. SHADED TRANSISTORS ARE IN NORMAL "ON" STATE
2. ALL RESISTOR VALUES ARE OHMS, CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. ALL RESISTORS ARE $\frac{1}{2}$ WATT 5% UNLESS OTHERWISE SPECIFIED.
4. ALL DIODES ARE TYPE IN270 UNLESS OTHERWISE SPECIFIED
5. THIS SCHEMATIC IS FOR CATALOG UNIT 10606-C
6. C4 AND C5 DEPEND ON LOW TAPE SPEED V_L , AND HIGH TAPE SPEED V_H AS FOLLOWS:
CHOOSE C5 THE NEAREST EIA 10% VALUE TO

$$C_H = \frac{.045}{V_H - 0.8V_L} \text{ MICROFARADS}$$

WHERE V_H AND V_L ARE IN INCHES PER SECOND, CHOOSE C4 THE NEAREST EIA 10% SERIES VALUE TO

$$C_L = 1.25 \frac{V_H - 0.8V_L}{V_L} C_5$$

C4 AND C5 BOTH $\pm 10\%$ UNITS.



TAPE SPEED SWITCH

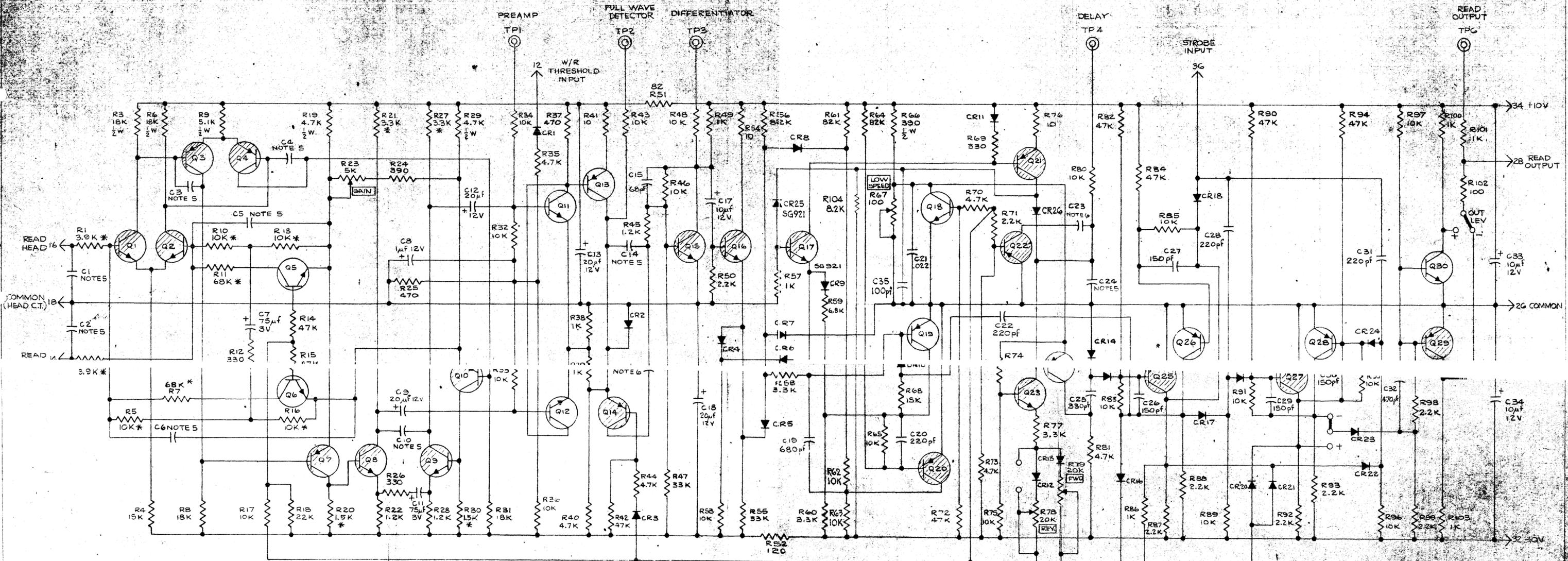
WRITE TOGGLE

WRITE DRIVER

COMPONENT	LAST USED	OMITTED
RESISTOR	R47	
CAPACITOR	C15	
DIODE	CR14	CR1
TRANSISTOR	Q12	

REVISIONS	DESCRIPTION OF CHANGE	CHECKED	AUTH.	DATE
1	GENERAL REV. PER ECN 457-69 SCN WAS-001			11/1/66
2	SPECIAL INCLUDES J.E.C. 463-66			

DRAWN KCD 10.1.64	CHECKED JPH 10.8.64	ENGINEER PETRENG 10.8.64	THE INFORMATION ON THIS DRAWING MAY NOT BE DISSEMINATED WITHOUT AUTHORIZATION OF DATACOR CORP. POSITION:	FIG. 7-8 SCHEMATIC - DUAL SPEED READ ISSUE 02A	D 10602 DRAWING NO	C ISSUE			
TOLERANCE UNLESS OTHERWISE SPECIFIED: BREAK SHARP EDGES FRACTIONS ± AND DENOM. DECIMALS ± DO NOT SCALE. ANGLES ±			SCALE: D	PART NO.	BILL OF MATERIAL				
VERSION		ITEM DATACOR PART NO. DESCRIPTION							
-9	-8	-7	-6	-5	-4	-3	-2	-1	0



- NOTES:
- ALL RESISTORS 1/2W, ALL RESISTANCE VALUES IN OHMS, ALL CAPACITANCE VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED. * DESIGNATES ±1% PRECISION RESISTORS.
 - SHADED TRANSISTORS ARE IN NORMAL "ON" STATE, LOW SPEED CONDITIONS SHOWN.
 - UNLESS OTHERWISE SPECIFIED: ALL DIODES IN270, NPN TRANSISTORS 2N1304, PNP TRANSISTORS 2N404

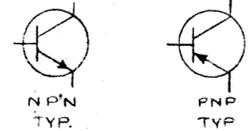
- VALUES OF NOTED COMPONENTS DEPEND ON HIGH TAPE SPEED V_H : SEE TABLE I ALL VALUES ±10%.
- CHOOSE C_{16} THE NEAREST EIA 10% SERIES VALUE TO $\frac{V_H - V_L}{V_L} \times C_{14}$.
WHERE V_L = LOW TAPE SPEED.
CHOOSE C_{23} THE NEAREST EIA 10% SERIES VALUE TO $1.25 \frac{V_H - 0.9V_L}{V_L} \times C_{24}$

TABLE I

HIGH TAPE SPEED INCHES PER SEC	C1, C2	C3, C4	C5, C6	C10	C14, C24
V_H (GENERAL)	-	$\frac{.015}{V_H}$	$\frac{.003}{V_H}$	$\frac{.021}{V_H}$	$\frac{.045}{V_H}$
45	.023	330 pF	68 pF	470 pF	.001
30		470 pF	100 pF	680 pF	.0015

TYPE OF LOGIC	LOGIC STRAPPING	OUT LEV STRAPPING
NEGATIVE TRUE		
NEGATIVE FALSE		
POSITIVE TRUE		
POSITIVE FALSE		

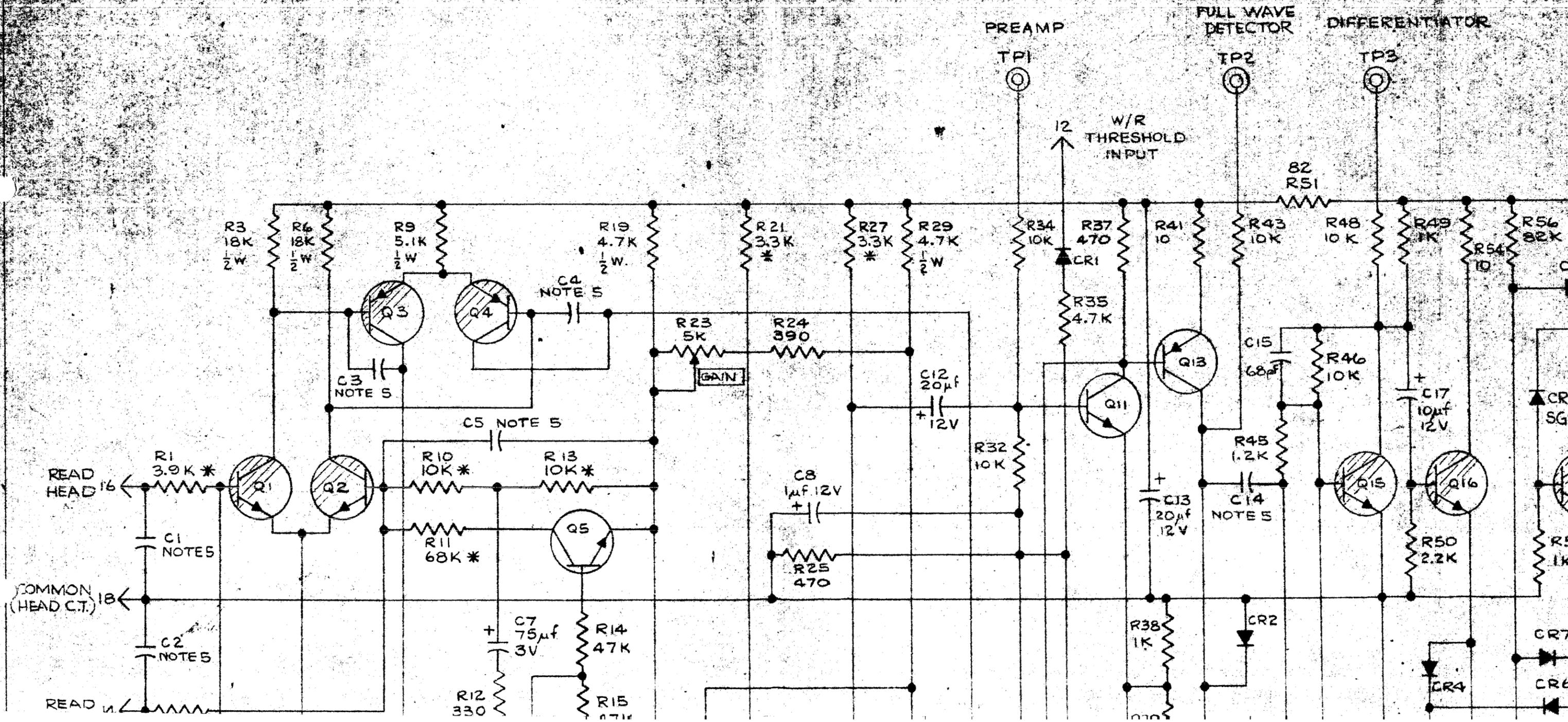
COMPONENT	LAST USED	OMITTED
RESISTOR	R103	
CAPACITOR	C34	
DIODE	CR24	
TRANSISTOR	Q30	



4 CATALOG NUMBER 10600

REVISIONS

ISSUE	DESCRIPTION OR CHANGE NO.	CHECKED	AUTH.	DATE
1	GENERAL REV. PER ECN 457-64 SCH N WAS-001	DN	MA	10/18/64
SPECIAL INCLUDES T.E.C. 463-64				



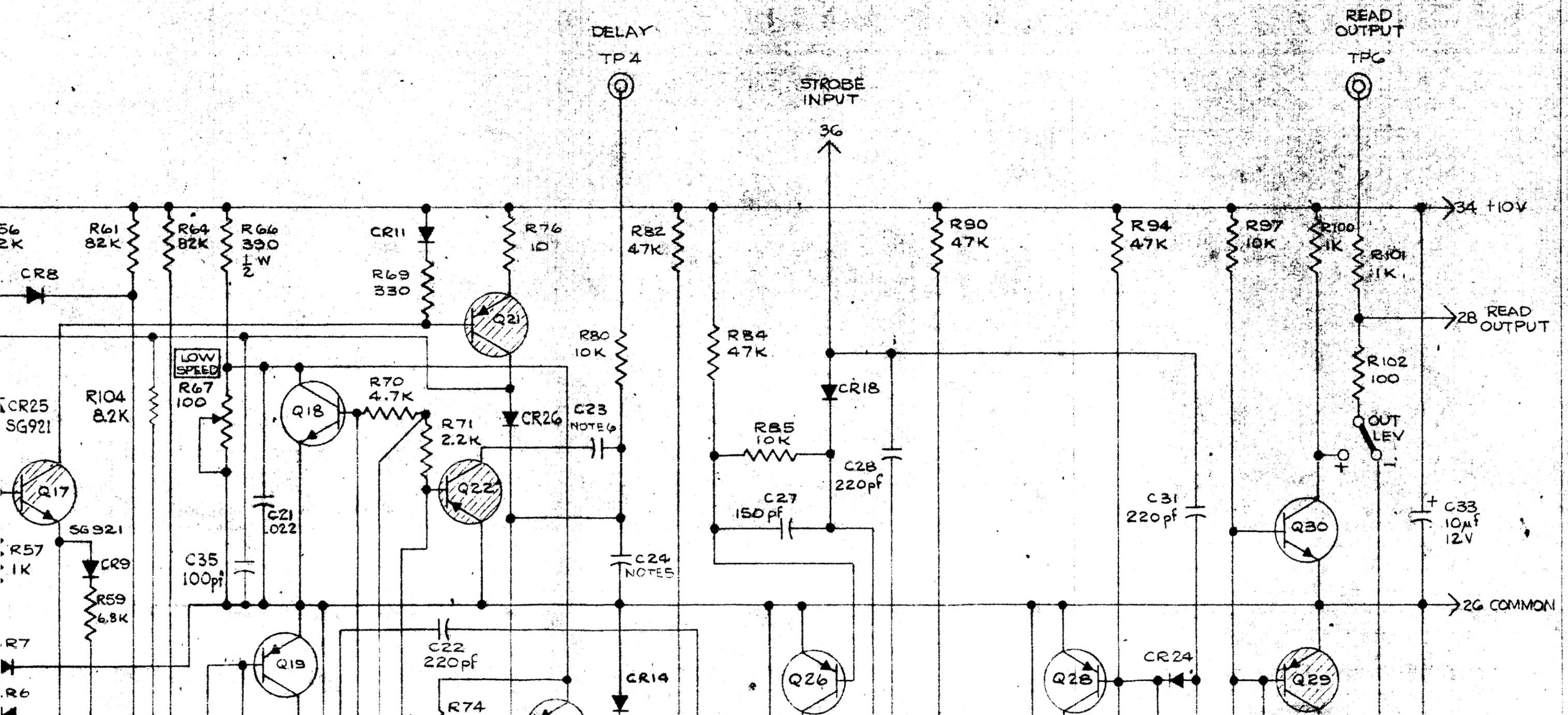
DRAWN	KCD	10.1.64	20601
CHECKED	PKT	10.8.64	
ENGINEER	PETTENGILL	10.8.64	
TOLERANCE UNLESS OTHERWISE SPECIFIED:			
BREAK SHARP EDGES AND DEBURR.	FRACTIONS ±		
	DECIMALS ±		
DO NOT SCALE.	ANGLES ±		

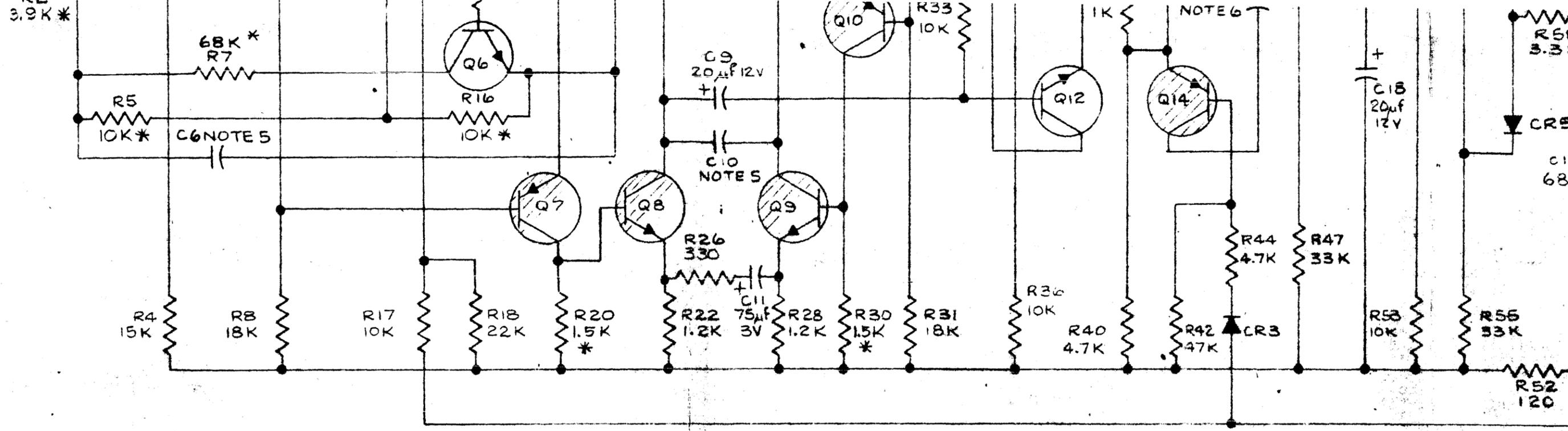
THE INFORMATION ON THIS DRAWING
MAY NOT BE DISSEMINATED WITHOUT
AUTHORIZATION OF DATAMEC COR-
PORATION.

FIG. 7-8
SCHEMATIC -
DUAL SPEED READ
ISSUE 02A

D	10602	C
DRAWING NO.		ISSUE
SHEET		OF
 DATAMEC CORPORATION 345 MIDDLEFIELD ROAD MOUNTAIN VIEW, CALIFORNIA		

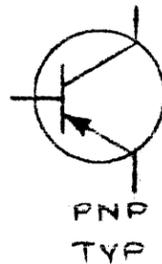
VERSION											BILL OF MATERIAL	
-9	-8	-7	-6	-5	-4	-3	-2	-1	-0	ITEM	DATAMEC PART NO.	DESCRIPTION





NOTES:

1. ALL RESISTORS $\frac{1}{4}$ W, ALL RESISTANCE VALUES IN OHMS, ALL CAPACITANCE VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED. * DESIGNATES $\pm 1\%$ PRECISION RESISTORS.
2. SHADED TRANSISTORS ARE IN NORMAL "ON" STATE, LOW SPEED CONDITIONS SHOWN.
3. UNLESS OTHERWISE SPECIFIED: ALL DIODES IN270, NPN TRANSISTORS 2N1304, PNP TRANSISTORS 2N404

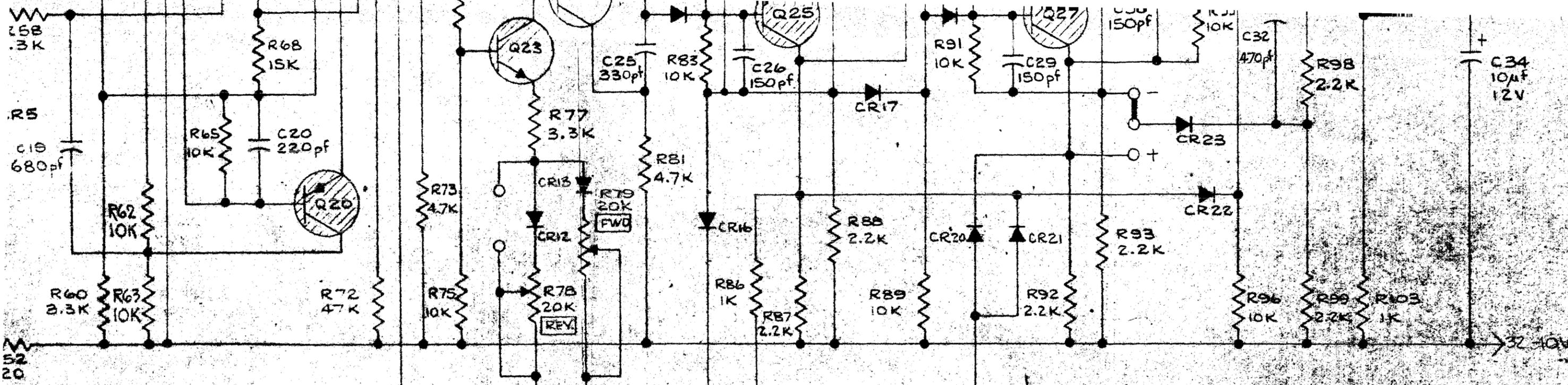


4 CATALOG NUMBER 10600

5. VALUES OF NOTED COMPONENTS DEPEND ON HIGH TAPE SPEED V_H : SEE TABLE I ALL VALUES $\pm 10\%$.
6. CHOOSE $C16$ THE NEAREST EIA 10% SERIES VALUE TO $\frac{V_H - V_L}{V_L} \times C14$,
WHERE $V_L =$ LOW TAPE SPEED.
CHOOSE $C23$ THE NEAREST EIA 10% SERIES VALUE TO $1.25 \frac{V_H - 0.8V_L}{V_L} \times C24$

TABLE I

HIGH TAPE SPEED INCHES PER SEC	C1, C2	C3, C4	C5, C6
V_H (GENERAL)	—	$\frac{.015}{V_H}$	—
45	.0033	330 pf	—
30	—	470 pf	—



4	C5, C6	C10	C14, C24
	.005 VH	.021 VH	.045 VH
pf	68pf	470pf	.001
pf	100pf	680pf	.0015

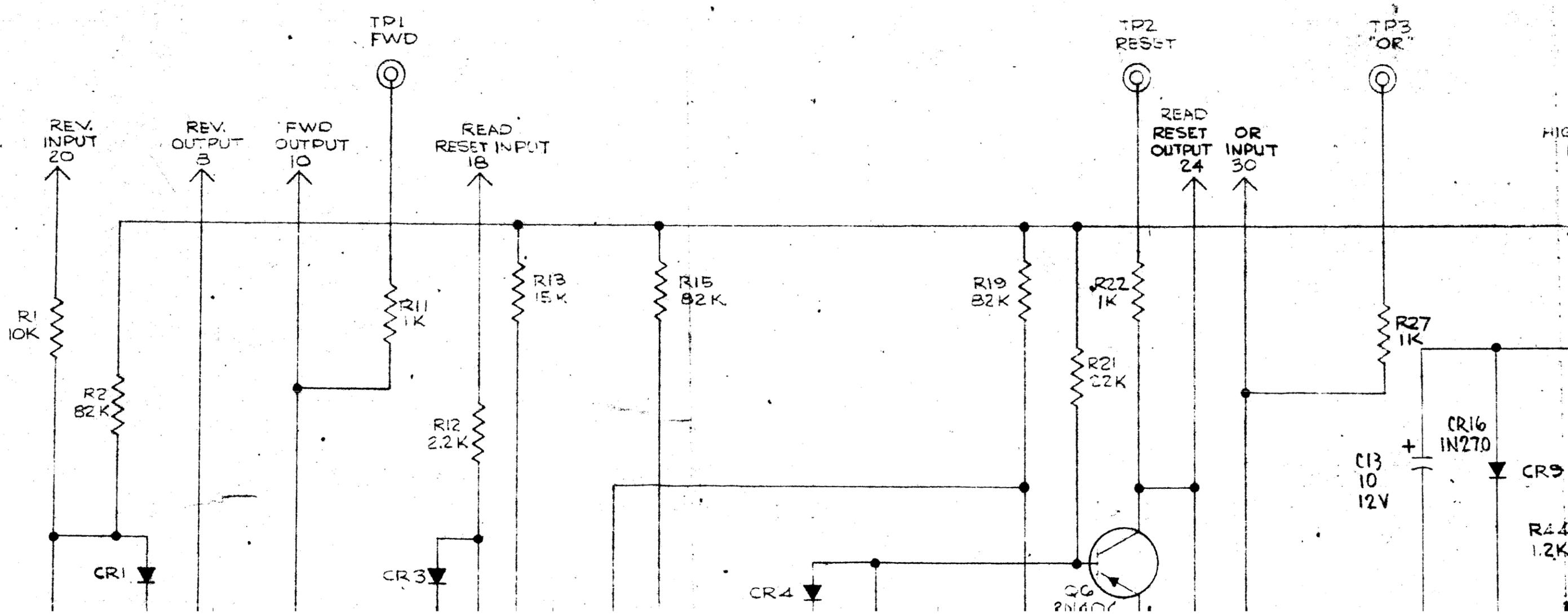
22 DUAL SPEED INPUT
 QV. LOW +10V. HIGH
 8 REV. INPUT
 10 FWD INPUT
 30 "OR" OUTPUT
 TP5 INPUT REGISTER
 24 RESET INPUT

TYPE OF LOGIC	LOGIC STRAPPING	OUT LEV STRAPPING
NEGATIVE TRUE		
NEGATIVE FALSE		
POSITIVE TRUE		
POSITIVE FALSE		

COMPONENT	LAST USED	OMITTED
RESISTOR	R103	
CAPACITOR	C34	
DIODE	CR24	
TRANSISTOR	Q30	

REVISIONS

ISSUE	DESCRIPTION OR CHANGE NO.	CHECKED	AUTH.	DATE
C	REVISED & REDRAWN PER ECN 466-64, SCH NO WAS-0012	<i>[Signature]</i>	<i>[Signature]</i>	11/1/64
02A	INCLUDES TEC 466-64			



DRAWN: [Signature]
 CHECKED: [Signature]
 ENGINEER: [Signature]
 TOLERANCE UNLESS OTHERWISE SPECIFIED:
 BREAK SHARP EDGES FRACTIONS +
 AND DEBURR. DECIMALS +
 DO NOT SCALE ANGLES +

THE INFORMATION ON THIS DRAWING
 MAY NOT BE DISSEMINATED WITHOUT
 AUTHORIZATION OF DATAMEC COR-
 PORATION

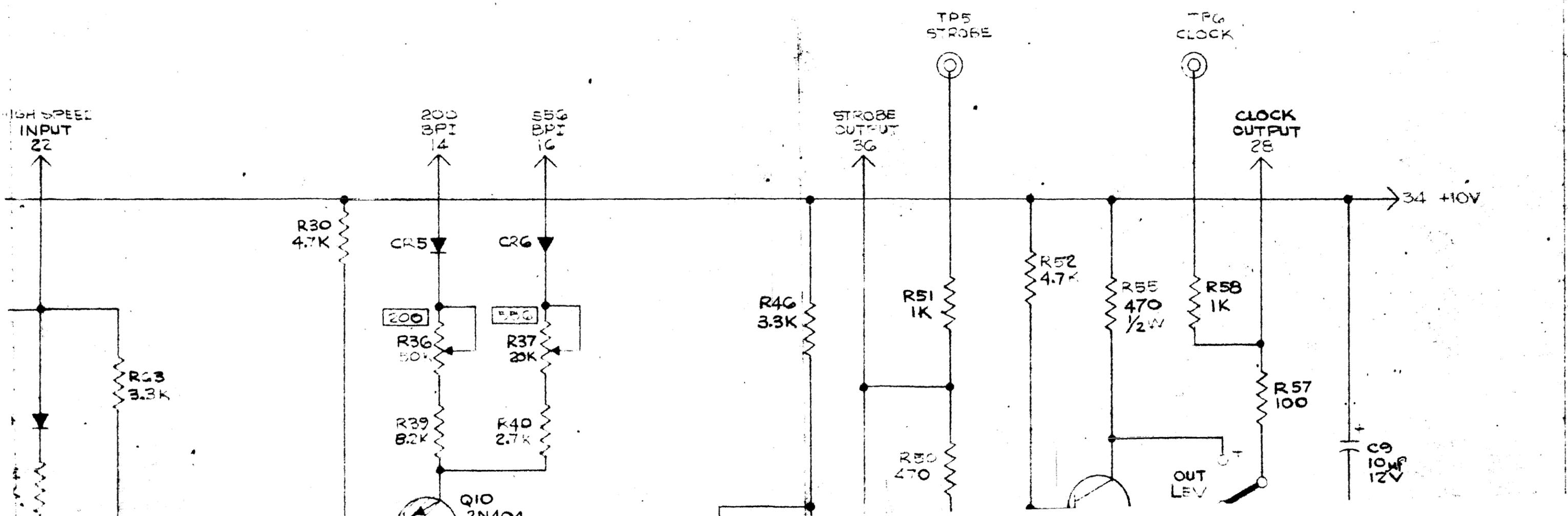
FIG 7-9
 SCHEMATIC -
 3000 SPEED READ
 CONTROL

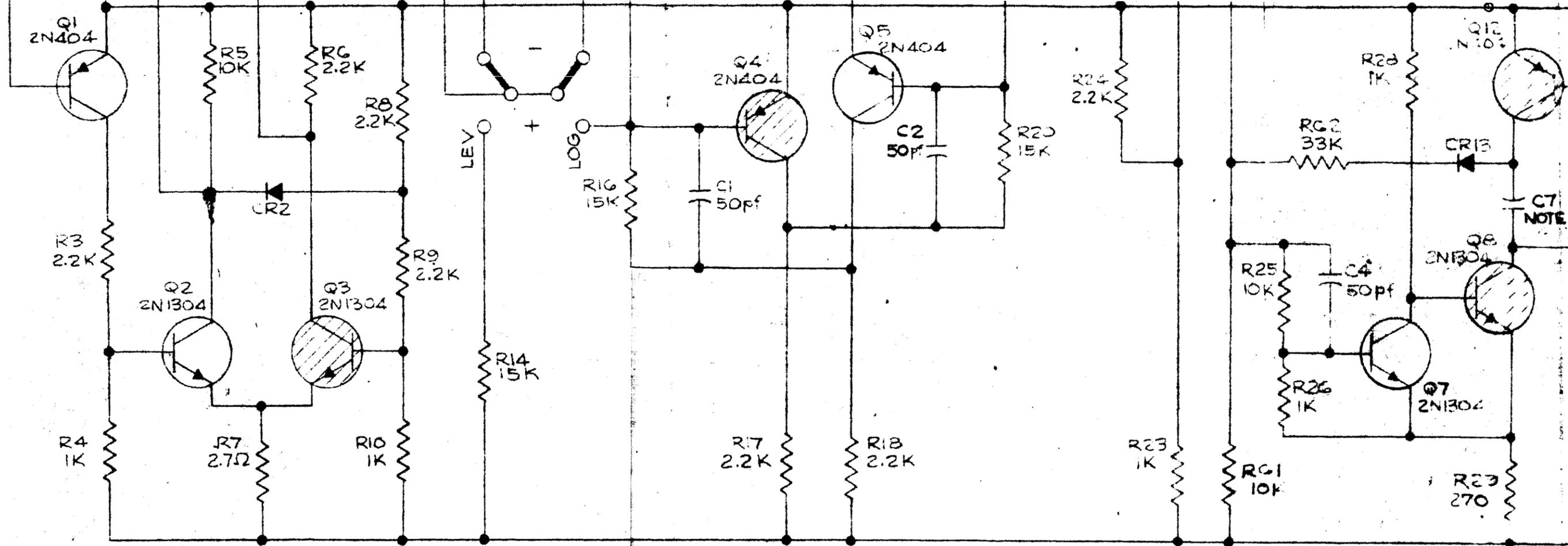
D 10605
 DRAWING NO
 SHEET 1 OF 1
 CORPORATION
 345 MIDDLEFIELD ROAD
 MOUNTAIN VIEW CALIFORNIA

VERSION

BILL OF MATERIAL

VERSION	ITEM	DATAMEC PART NO.	DESCRIPTION
-9			
-8			
-7			
-6			
-5			
-4			
-3			
-2			
-1			
-0			





NOTES:

1. ALL RESISTORS $\frac{1}{4}$ W, ALL RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL DIODES ARE TYPE IN270 UNLESS OTHERWISE SPECIFIED.
3. SHADED TRANSISTORS ARE IN NORMAL "ON" STATE.
4. C6 AND C7 DEPEND ON LOW TAPE SPEED V_L , AND HIGH TAPE SPEED V_H AS FOLLOWS:
CHOOSE C6 THE NEAREST EIA 10% SERIES VALUE TO

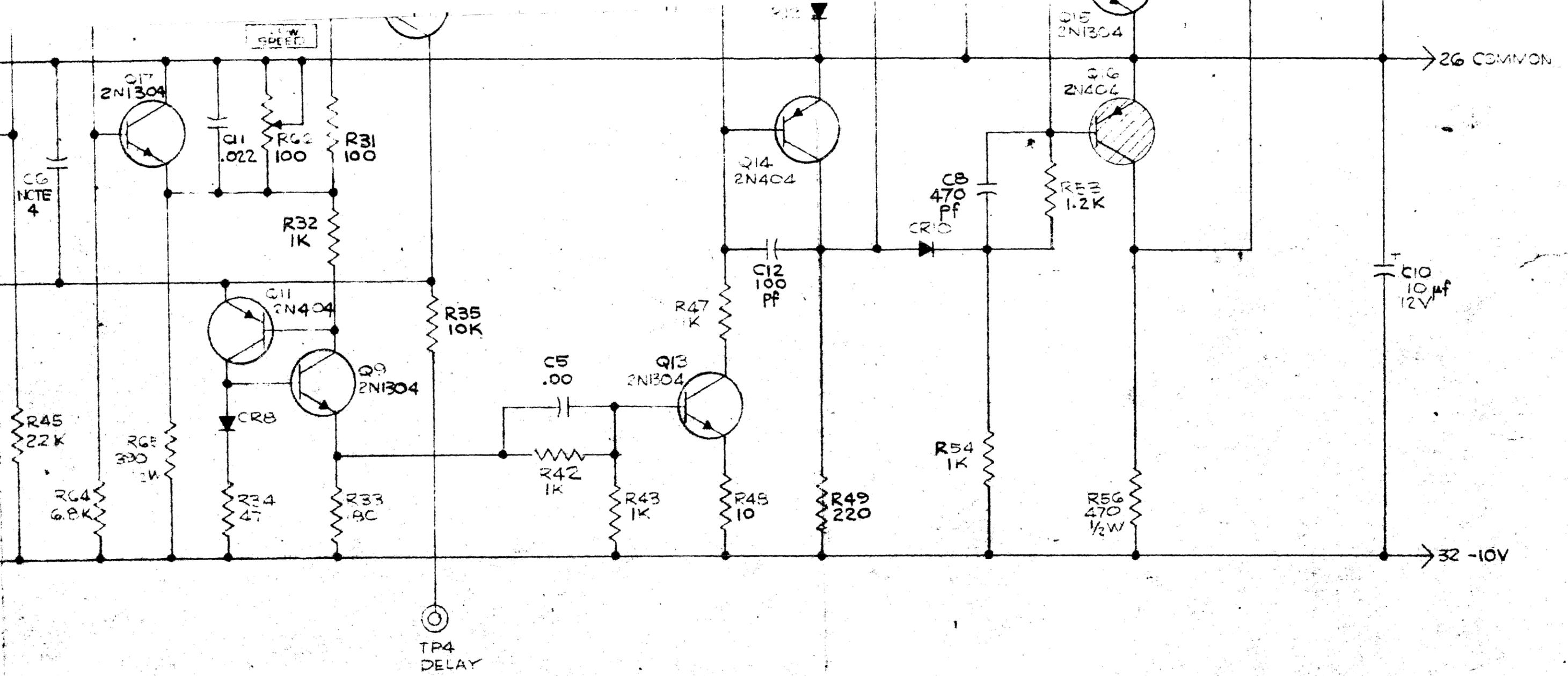
$$C_H = \frac{.135}{V_H} \text{ MICROFARADS}$$

CHOOSE C7 THE NEAREST EIA 10% SERIES VALUE TO

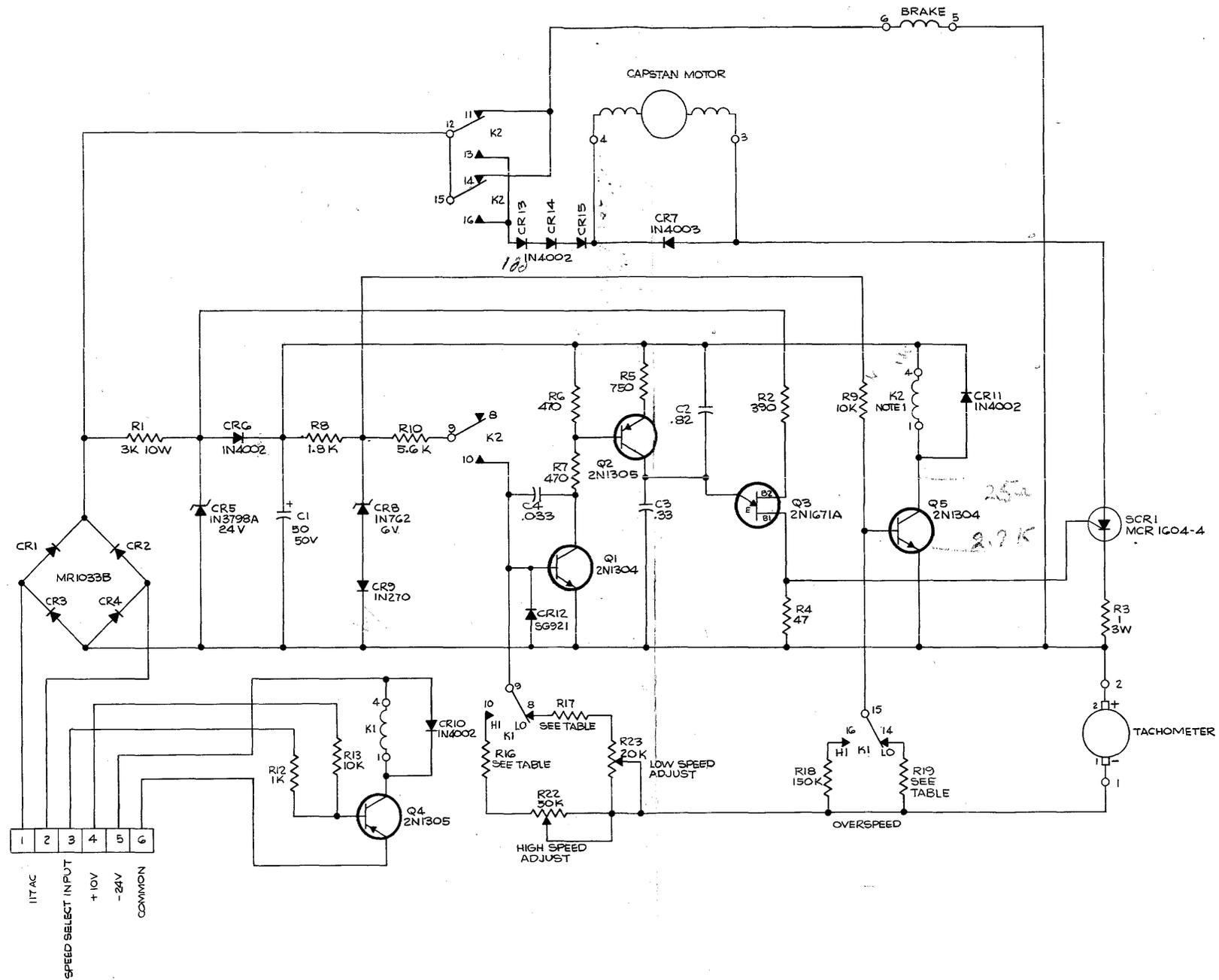
$$C_L = 1.25 \frac{V_H - 0.8V_L}{V_L} C_6$$

C6 AND C7 BOTH $\pm 10\%$ UNITS; V_H AND V_L ARE IN INCHES PER SECOND.

5. THE CIRCUIT BOARD HAS PROVISIONS FOR CR7, R38, R41, NOT USED IN THIS ASSEMBLY.



COMPONENT	LAST USED	OMITTED
RESISTOR	R66	R38, R1, R59, C8
CAPACITOR	C12	C8
DIODE	CR13	CR7, 11
TRANSISTOR	Q17	



- 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. CATALOG NO 10650-X

SELECTION TABLE FOR RESISTOR VALUES FOR VARIOUS SPEEDS

TAPE SPEED (IPS)		RESISTOR VALUES IN KILOHMS				
A RANGE	B RANGE	SPEED SELECT		OVERSPEED SAFETY		
SEE NOTE	SEE NOTE	HIGH RIG	LOW RIT	RIS		
.85 - 2.1	1.5 - 4.2	1	1	15		
1.9 - 3.25	3.8 - 6.5	1	1	22		
2.75 - 4.7	5.5 - 9.4	1	1	27		
4.15 - 6.05	8.3 - 12.1	1	1	33		
4.7 - 7.2	9.4 - 14.4	1	1	39		
7.0 - 10.2	14.0 - 20.4	1	15	47		
8.5 - 12.1	17.0 - 24.2	1	15	56		
10.2 - 14.6	20.4 - 29.2	1	15	68		
12.8 - 17.8	25.6 - 35.6	27	27	82		
15.4 - 21.7	30.8 - 43.4	27	27	100		
18.6 - 26.0	37.2 - 45	27	47	120		
23.0 - 30.0		27	47	150		

NOTE: USE "A" COLUMN WHEN HIGHEST TAPE SPEED IS AT OR BELOW 30 IPS
 USE "B" COLUMN WHEN HIGHEST TAPE SPEED IS ABOVE 30 IPS

EXAMPLE:

FOR SPEEDS OF 3 AND 30 IPS

- "A" COLUMN WOULD BE USED
- SPEED RANGE OF 2.75 - 4.7 (LOW SPEED) AND 23.0 - 30.0 (HIGH SPEED) APPLIES
- SELECT LOW RANGE RESISTORS RIT=1K, RIS=27K
- SELECT HIGH RANGE RESISTOR RIG=27K



SPARE PARTS LIST

DESCRIPTION OF LISTS

- A. MINIMAL SPARE PARTS FOR OPERATION OF D2020. INCLUDES REPLACEMENTS FOR SHORT LIFE ITEMS (LESS THAN 2000 HOURS) AND FUSES.
- B. NORMAL SPARES COMPLEMENT, INCLUDING PREVENTIVE MAINTENANCE ITEMS FOR 4000 HOURS OF OPERATION AND LOW-COST COMPONENTS WHICH ARE NOT ORDINARILY AVAILABLE "OFF THE SHELF." THIS LIST INCLUDES ALL ITEMS IN THE "A" LIST.
- C. UNIT REPLACEMENT SPARES, EXCLUDING HIGH COST UNITS (SEE LIST "E").
- D. SPARE COMPONENTS FOR ORGANIZATIONS WHICH PLAN TO DO DETAILED MAINTENANCE AND ASSEMBLY REBUILDING.
- E. UNIT REPLACEMENT SPARES WHICH HAVE HIGH UNIT COST OR WHICH ARE NOT REQUIRED UNTIL 16000 HOURS OF OPERATION.

NOTE: WHEN ORDERING PARTS, PLEASE SUPPLY THE SERIAL NUMBER OF THE TAPE TRANSPORT IN THE SYSTEM OR THE SERIAL NUMBERS OF THE INDIVIDUAL CATALOG ITEMS.

LIST A

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10000 TAPE TRANSPORT			
-0 THRU -8	00004-001*	MOTOR, VACUUM, LAMB IS-14894	1/TRANSPORT
-0 THRU -8	00010-004*	BEARING, PINCHROLLER, MPB55632FCZZELG-20	4/TRANSPORT
-0 THRU -8	00057-007	FUSE, 3AG, 3 AMP, QUICK BLOW, BUSS AGC3A	1 BOX/SYSTEM
-0 THRU -8	00057-016	FUSE, 3AG, 3 AMP, SLO-BLO, BUSS MDX3A	1 BOX/SYSTEM
-0 THRU -8	00057-018	FUSE, 3AG, 4 AMP, SLO-BLO, BUSS MDX4A	1 BOX/SYSTEM
-0 THRU -8	00060-004	LUG, SOLDERLESS, SLEEVE	2/TRANSPORT
-0 THRU -8	00096-001*	BELT, CAPSTAN DRIVE, 1/2" x 30"	1/TRANSPORT
-0 THRU -8	00109-005*	BRUSH, VACUUM MOTOR, LAMB	2/TRANSPORT
-0 THRU -8	10091-0	COVER, VACUUM CHAMBER	1/SYSTEM
-0 THRU -8	10136-0*	PINCHROLLER	2/TRANSPORT
CAT. NO. 10270-0 PHOTONSENSE			
-0	00048-001*	LAMP, CHICAGO MINIATURE CM8-428	1/TRANSPORT
CAT. NO. 10330 DATA ELECTRONICS POWER SUPPLY			
-0 THRU -2	00057-011	FUSE, 3AG, 1/2 AMP, SLO-BLO, BUSS MDL 1/2A	1 BOX/SYSTEM
CAT. NO. 10460 CARD CAGE, DATA SWITCHER			
-0 THRU -3	00057-011	FUSE, 3AG, 1/2 AMP, SLO-BLO, BUSS MDL 1/2A	1 BOX/SYSTEM
CAT. NO. 10493 OPERATOR CONTROL PANEL			
ALL	00057-019	FUSE, 3AG, 10 AMP, SLO-BLO, BUSS MDL10A	1 BOX/SYSTEM
CAT. NO. 10500 CONTROL SWITCHER			
-0,-1	00057-011	FUSE, 3AG, 1/2 AMP, SLO-BLO, BUSS MDL 1/2A	1 BOX/SYSTEM

* PREVENTIVE MAINTENANCE ITEM

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SPARE PARTS LIST



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02020

LIST A

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DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10800 TAPE TRANSPORT			
-0 THRU -8	00004-001*	MOTOR, VACUUM, LAMB IS-14894	1/TRANSPORT
-0 THRU -8	00010-004*	BEARING, PINCHROLLER, MPB55632FCZZELG-20	4/TRANSPORT
-0 THRU -8	00057-007	FUSE, 3AG, 3 AMP, QUICK BLOW, BUSS AGC3A	1 BOX/SYSTEM
-0 THRU -8	00057-016	FUSE, 3AG, 3 AMP, SLO-BLO, BUSS MDX3A	1 BOX/SYSTEM
-0 THRU -8	00057-018	FUSE, 3AG, 4 AMP, SLO-BLO, BUSS MDX4A	1 BOX/SYSTEM
-0 THRU -8	00060-004	LUG, SOLDERLESS, SLEEVE	2/TRANSPORT
-0 THRU -8	00096-001*	BELT, CAPSTAN DRIVE, 1/2" x 30"	1/TRANSPORT
-0 THRU -8	00109-005*	BRUSH, VACUUM MOTOR, LAMB	2/TRANSPORT
-0 THRU -8	10091-0	COVER, VACUUM CHAMBER	1/SYSTEM
-0 THRU -8	10136-0*	PINCHROLLER	2/TRANSPORT

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SPARE PARTS LIST



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D 2020
SERIES

* PREVENTIVE MAINTENACE ITEM

LIST B

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10000 TAPE TRANSPORT			
ALL	00004-001*	MOTOR, VACUUM, LAMB IS-14894	2/TRANSPORT
ALL	00008-001	SILICON CONTROLLED RECTIFIER, TRANSITRON TCR-23	2/SYSTEM
ALL	00010-004*	BEARING, PINCHROLLER & ROTARY GUIDE	12/TRANSPORT
ALL	00012-002	TRANSISTOR, MOTOROLA 2N1545	1/SYSTEM
ALL	00019-003	DIODE, SILICON, GEIN3569	1/SYSTEM
ALL	00019-005	DIODE, SILICON, RCA 40108	1/SYSTEM
ALL	00019-011	DIODE, SILICON, IN1221	1/SYSTEM
ALL	00019-012	DIODE, SILICON, RCA 40111	4/SYSTEM
ALL	00020-001	DIODE, ZENER, IN1593	1/SYSTEM
ALL	00033-004	CAPACITOR, 100 μ f, 50V, SPRAGUE 41D D31317	1/SYSTEM
ALL	00034-001	CAPACITOR, 1200 μ f, 40VDC, SPRAGUE 32D3121T	1/SYSTEM
ALL	00034-002	CAPACITOR, 4300 μ f, 40VDC, SPRAGUE 32D3127T	1/SYSTEM
ALL	00055-001	RELAY, 24VDC, 4PDT, ALLIED T154CC-CC24VDC	1/SYSTEM
ALL	00055-002	RELAY, 24VDC, 3PDT, POTTER & BRUMFIELD KA14D	1/SYSTEM
ALL	00057-007	FUSE, 3AG, 3 AMP, QUICK BLO, BUSS AGC3A	1 BOX/SYSTEM
ALL	00057-016	FUSE, 3AG, 3 AMP, SLO-BLO, BUSS MDX3A	1 BOX/SYSTEM
ALL	00057-018	FUSE, 3AG, 5 AMP, SLO-BLO, BUSS MDX5A	1 BOX/SYSTEM
ALL	00060-004	LUG, SOLDERLESS, SLEEVE	4/TRANSPORT
ALL	00071-001	RESISTOR, VARIABLE, 10K Ω , BOURNS 3067P-1-103	1/SYSTEM
ALL	00076-002	CAPACITOR, MOTOR, 2.5 μ f, BODINE N-1896	1/SYSTEM
ALL	00096-001*	BELT, CAPSTAN DRIVE, 1/2" x 30"	2/TRANSPORT
ALL	00109-005*	BRUSH, VACUUM MOTOR, LAMB	4/TRANSPORT
ALL	10068-0	SPRING, DRAG BRAKE	1/SYSTEM
ALL	10078-0	SOLENOID, VACUUM	1/SYSTEM
ALL	10091-0	COVER, VACUUM CHAMBER	1/SYSTEM
ALL	10136-0*	PINCHROLLER	4/TRANSPORT
ALL	10141-0	SHAFT, PINCHROLLER	1/SYSTEM
CAT. NO. 10175 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, 6-8 VOLT, GE44	4/SYSTEM
ALL	00074-001	SWITCH, SNAP, ELECTROSNAP F1-3	2/SYSTEM

* PREVENTIVE MAINTENANCE ITEM

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SPARE PARTS LIST

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LIST B

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10235 DUAL DENSITY WRITE CARD			
ALL	00071-003	RESISTOR, VARIABLE, 20K Ω , BOURNS 3068P-1-503	1/SYSTEM
CAT. NO. 10239 DUAL DENSITY READ, SWITCHER			
-7 ONLY	00033-015	CAPACITOR, 125 μ f, 3VDC, GENERAL INSTRUMENTS BL-1611	1/SYSTEM
-2 ONLY	00033-019	CAPACITOR, 600 μ f, 3VDC, GENERAL INSTRUMENTS BL-2210	1/SYSTEM
-1 ONLY	00033-020	CAPACITOR, 1200 μ f, 3VDC, GENERAL INSTRUMENTS BL-2311	1/SYSTEM
-0 ONLY	00033-021	CAPACITOR, 1500 μ f, 3VDC, GENERAL INSTRUMENTS BL-2410	1/SYSTEM
ALL	00071-001	RESISTOR, VARIABLE, 10K Ω , BOURNS 3067P-1-103	1/SYSTEM
-1 ONLY	00076-003	CAPACITOR, .027 μ f, 100VAC, ELECTRON M1-273	1/SYSTEM
-2 ONLY	00076-004	CAPACITOR, .056 μ f, 100VAC, ELECTRON M1-563	1/SYSTEM
-1 ONLY	00076-005	CAPACITOR, .082 μ f, 100VAC, ELECTRON M1-823	1/SYSTEM
-0 ONLY	00076-006	CAPACITOR, .12 μ f, 100VAC, ELECTRON M1-124	1/SYSTEM
ALL	10483-0	TRANSISTOR, SELECTED 2N1121	2/SYSTEM
CAT. NO. 10240 DUAL DENSITY READ CARD			
-7 ONLY	00033-015	CAPACITOR, 125 μ f, 3VDC, GENERAL INSTRUMENTS BL-1611	1/SYSTEM
-2 ONLY	00033-019	CAPACITOR, 600 μ f, 3VDC, GENERAL INSTRUMENTS BL-2210	1/SYSTEM
-1 ONLY	00033-020	CAPACITOR, 1200 μ f, 3VDC, GENERAL INSTRUMENTS BL-2311	1/SYSTEM
-0 ONLY	00033-021	CAPACITOR, 1500 μ f, 3VDC, GENERAL INSTRUMENTS BL-2410	1/SYSTEM
ALL	00071-003	RESISTOR, VARIABLE, 20K Ω , BOURNS 3067P-1-203	1/SYSTEM
-1 ONLY	00076-003	CAPACITOR, .027 μ f, 100V, ELECTRON M1-273	1/SYSTEM
-2 ONLY	00076-004	CAPACITOR, .056 μ f, 100V, ELECTRON M1-563	1/SYSTEM
-1 ONLY	00076-005	CAPACITOR, .082 μ f, 100V, ELECTRON M1-823	1/SYSTEM
-0 ONLY	00076-006	CAPACITOR, 0.12 μ f, 100V, ELECTRON M1-124	1/SYSTEM
CAT. NO. 10255 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E.#44	4/SYSTEM
ALL	00055-003	RELAY, LATCHING, POTTER & BRUMFIELD KA4D-24VDC	1/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM

SPARE PARTS LIST

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LIST B

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10270 PHOTONSENSE			
ALL	00009-001	PHOTODIODE, TI H-38	1/SYSTEM
ALL	00048-001*	LAMP, INCANDESCENT, 6V, CHICAGO MIN CM8-428	4/TRANSPORT
ALL	00071-002	RESISTOR, VARIABLE, 50K Ω , ALLEN BRADLEY FW	1/SYSTEM
CAT. NO. 10305 READ CONTROL CARD			
ALL	00071-003	RESISTOR, VARIABLE, 20K Ω , BOURNS, 3067P-1-203	1/SYSTEM
-5 THRU -9 ONLY	00071-004	RESISTOR, VARIABLE, 50K Ω , BOURNS, 3068P-1-503	1/SYSTEM
CAT. NO. 10310 LOW DENSITY READ CARD			
-7 ONLY	00033-015	CAPACITOR, 125 μ f, 3VDC, GENERAL INSTRUMENTS, BL-1611	1/SYSTEM
-2 ONLY	00033-019	CAPACITOR, 600 μ f, 3VDC, GENERAL INSTRUMENTS, BL-2210	1/SYSTEM
-1 ONLY	00033-020	CAPACITOR, 1200 μ f, 3VDC, GENERAL INSTRUMENTS, BL-2311	1/SYSTEM
-0 ONLY	00033-021	CAPACITOR, 1500 μ f, 3VDC, GENERAL INSTRUMENTS, BL-2410	1/SYSTEM
CAT. NO. 10330 POWER SUPPLY, DATA ELECTRONICS			
ALL	00034-003	CAPACITOR, 5400 μ f, 20V, SPRAGUE 32D3081T	1/SYSTEM
CAT. NO. 10340 POWER REGULATOR, DATA ELECTRONICS			
ALL	00020-006	DIODE, ZENER, 9.8V, TRANSITRON EVR10B	1/SYSTEM
ALL	00048-004	LAMP, INCANDESCENT, 10V, G.E. #344	1/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM
CAT. NO. 10370 FILE PROTECT			
ALL	00074-002	SWITCH, SNAP, SPDT, MISCROSWITCH, 11SM1	1/SYSTEM
ALL	10377-0	SOLENOID	1/SYSTEM
CAT. NO. 10390 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E. #44	4/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	4/SYSTEM

* PREVENTIVE MAINTENANCE ITEM

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SPARE PARTS LIST



ATA

SERIES



LIST B

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10391 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E. #44	4/SYSTEM
ALL	00055-003	RELAY, LATCHING, POTTER & BRUMFIELD KA140-24VDC	1/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM
CAT. NO. 10396 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E. #44	4/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM
CAT. NO. 10436 READ CARD, TRIPLE DENSITY			
-7 ONLY	00033-015	CAPACITOR, 125 μ f, 3VDC, GENERAL INSTRUMENTS BL-1611	1/SYSTEM
-2 ONLY	00033-019	CAPACITOR, 600 μ f, 3VDC, GENERAL INSTRUMENTS BL-2210	1/SYSTEM
-1 ONLY	00033-020	CAPACITOR, 1200 μ f, 3VDC, GENERAL INSTRUMENTS BL-2311	1/SYSTEM
-0 ONLY	00033-021	CAPACITOR, 1500 μ f, 3VDC, GENERAL INSTRUMENTS BL-2410	1/SYSTEM
ALL	00071-003	RESISTOR, VARIABLE, 20K Ω , BOURNS, 3067P-1-203	1/SYSTEM
ALL	00071-006	RESISTOR, VARIABLE, 5K Ω , BOURNS, 3067P-1-502	1/SYSTEM
CAT. NO. 10438 WRITE CARD, TRIPLE DENSITY			
ALL	00071-005	RESISTOR, VARIABLE, 100K Ω , BOURNS, 3067P-1-101	1/SYSTEM
CAT. NO. 10442 READ CONTROL CARD, TRIPLE DENSITY			
ALL	00071-004	RESISTOR, VARIABLE, 50K Ω , BOURNS, 3068P-1-503	1/SYSTEM
CAT. NO. 10460 CARD CAGE, DATA SWITCHER			
ALL	00034-003	CAPACITOR, 5400 μ f, 20V, SPRAGUE 32D3081T	1/SYSTEM
ALL	00057-011	FUSE, 1/2A, 3AG, SLO-BLO, BUSS MDL 1/2A	1 BOX/SYSTEM
CAT. NO. 10474 WRITE SELECT CARD			
ALL	00071-003	RESISTOR, VARIABLE, 20K Ω , BOURNS, 3067P-1-203	1/SYSTEM

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SPARE PART LIST



DATA M E G

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D 2020

LIST B

SPARE PART LIST



DATA M E G

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D 2020

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10476 READ CLAMP CARD			
ALL	00071-003	RESISTOR, VARIABLE, 20K Ω , BOURNS, 3067P-1-203	1/SYSTEM
ALL	10483-1	TRANSISTOR, SELECTED, 2N1121	2/SYSTEM
ALL	10483-2	TRANSISTOR, SELECTED, 2N1121	2/SYSTEM
ALL	10483-3	TRANSISTOR, SELECTED, 2N1121	2/SYSTEM
CAT. NO. 10493 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E.#44	4/SYSTEM
ALL	00055-004	RELAY, COMAR TYPE W, 3 FORM C, 24VDC	1/SYSTEM
ALL	00055-005	RELAY, COMAR TYPE W, 2 FORM C, 115VAC	1/SYSTEM
ALL	00057-019	FUSE, 10A, 3AG, SLO-BLO, BUSS MDL10A	1 BOX/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM
CAT. NO. 10495 READ CARD, TRIPLE DENSITY, SWITCHER			
-7 ONLY	00033-015	CAPACITOR, 125 μ f, 3VDC, GENERAL INSTRUMENTS BL-1611	1/SYSTEM
-2 ONLY	00033-019	CAPACITOR, 600 μ f, 3VDC, GENERAL INSTRUMENTS BL-2210	1/SYSTEM
-1 ONLY	00033-020	CAPACITOR, 1200 μ f, 3VDC, GENERAL INSTRUMENTS BL-2310	1/SYSTEM
-0 ONLY	00033-021	CAPACITOR, 1500 μ f, 3VDC, GENERAL INSTRUMENTS BL-2410	1/SYSTEM
ALL	00071-006	RESISTOR, VARIABLE, 5K Ω , BOURNS, 3067P-1-502	1/SYSTEM
CAT. NO. 10497 WRITE CARD, TRIPLE DENSITY, SWITCHER			
ALL	00071-005	RESISTOR, VARIABLE, 100K Ω , BOURNS, 3067P-1-101	1/SYSTEM
CAT. NO. 10500 CONTROL SWITCHER			
ALL	00034-003	CAPACITOR, 5400 μ f, 20V, SPRAGUE, 32D3081T	1/SYSTEM
ALL	00057-011	FUSE, 3AG, 1/2A, SLO-BLO, BUSS, MDL 1/2A	1/SYSTEM
CAT. NO. 10510 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E.#44	4/SYSTEM
ALL	00055-003	RELAY, LATCHING, POTTER & BRUMFIELD, KA14D-24VDC	1/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM

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LIST B

SPARE PART LIST

DATA M E G

SERIES

D 2020

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10554 OPERATOR CONTROL PANEL			
ALL	00048-002	LAMP, INCANDESCENT, 6V, G.E.#44	4/SYSTEM
ALL	00055-004	RELAY, COMAR TYPE W, 3 FORM C, 24VDC	1/SYSTEM
ALL	00074-001	SWITCH, SNAP, SPDT, ELECTROSNAP F1-3	1/SYSTEM
CAT. NO. 10800 TAPE TRANSPORT, 800 BPI			
ALL	00004-001*	MOTOR, VACUUM, LAMB 1S-14894	2/TRANSPORT
ALL	00008-001	SILICON CONTROLLED RECTIFIER, TRANSITRON TCR-23	2/SYSTEM
ALL	00010-004*	BEARING, PINCHROLLER & ROTARY GUIDE	12/TRANSPORT
ALL	00012-002	TRANSISTOR, MOTOROLA 2N1545	1/SYSTEM
ALL	00019-003	DIODE, SILICON, GEIN3569	1/SYSTEM
ALL	00019-005	DIODE, SILICON, RCA 40108	1/SYSTEM
ALL	00019-011	DIODE, SILICON, IN1221	1/SYSTEM
ALL	00019-012	DIODE, SILICON, RCA 40111	4/SYSTEM
ALL	00020-001	DIODE, ZENER, IN1593	1/SYSTEM
ALL	00033-004	CAPACITOR, 100 μ f, 50V, SPRAGUE 41D D31317	1/SYSTEM
ALL	00034-001	CAPACITOR, 1200 μ f, 40VDC, SPRAGUE 32D3121T	1/SYSTEM
ALL	00034-002	CAPACITOR, 4300 μ f, 40VDC, SPRAGUE 32D3127T	1/SYSTEM
ALL	00055-001	RELAY, 24VDC, 4PDT, ALLIED T154CC-CC24VDC	1/SYSTEM
ALL	00055-002	RELAY, 24VDC, 3PDT, POTTER & BRUMFIELD KA14D	1/SYSTEM
ALL	00057-007	FUSE, 3AG, 3 AMP, QUICK BLO, BUSS AGC3A	1 BOX/SYSTEM
ALL	00057-016	FUSE, 3AG, 3 AMP, SLO-BLO, BUSS MDX3A	1 BOX/SYSTEM
ALL	00057-018	FUSE, 3AG, 5 AMP, SLO-BLO, BUSS MDX5A	1 BOX/SYSTEM
ALL	00060-004	LUG, SOLDERLESS, SLEEVE	4/TRANSPORT
ALL	00071-001	RESISTOR, VARIABLE, 10K Ω , BOURNS 3067P-1-103	1/SYSTEM
ALL	00076-002	CAPACITOR, MOTOR, 2.5 μ f, BODINE N-1896	1/SYSTEM
ALL	00096-001*	BELT, CAPSTAN DRIVE, 1/2" x 30"	2/TRANSPORT
ALL	00109-005*	BRUSH, VACUUM MOTOR, LAMB	4/TRANSPORT
ALL	10068-0	SPRING, DRAG BRAKE	1/SYSTEM
ALL	10078-0	SOLENOID, VACUUM	1/SYSTEM
ALL	10091-0	COVER, VACUUM CHAMBER	1/SYSTEM
ALL	10136-0*	PINCHROLLER	4/TRANSPORT
ALL	10141-0	SHAFT, PINCHROLLER	1/SYSTEM

* PREVENTIVE MAINTENANCE ITEM

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LIST C

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10000 TAPE TRANSPORT			
ALL	10043-0	ROTARY GUIDE ASSEMBLY	1/SYSTEM
ALL	10051-0	REEL MOTOR	1/SYSTEM
ALL	10059-1	BRAKE COIL ASSEMBLY	1/SYSTEM
ALL	10063-0	BRAKE ROTOR, SUPPLY	1/SYSTEM
ALL	10063-1	BRAKE ROTOR, TAKEUP	1/SYSTEM
ALL	10072-0	SHIM, TURNTABLE, .017 THICK	6/SYSTEM
ALL	10072-1	SHIM, TURNTABLE, .032 THICK	6/SYSTEM
ALL	10072-2	SHIM, TURNTABLE, .064 THICK	6/SYSTEM
ALL	10073-0	DRAG BRAKE PLATE ASSEMBLY	1/SYSTEM
-0, -1, -2, -6 ONLY	10101-0	MOTOR, CAPSTAN, BODINE B7338	1/SYSTEM
-3, -4, -5, -7, -8 ONLY	10107-0	MOTOR, CAPSTAN, BODINE B7306	1/SYSTEM
-0, -1, -2, -3, -6, -7 ONLY	10115-0	CAPSTAN ASSEMBLY	1/SYSTEM
-4, -5, -8 ONLY	10115-1	CAPSTAN ASSEMBLY	1/SYSTEM
-0 THRU -8	10156-0	TRANSFORMER, 117VAC to 41 VAC CT@3A	1/SYSTEM
ALL	10220-0	HOLDDOWN KNOB ASSEMBLY, SUPPLY	1/SYSTEM
ALL	10220-1	HOLDDOWN KNOB ASSEMBLY, TAKEUP	1/SYSTEM
CAT. NO. 10234 DUAL DENSITY WRITE CARD, SWITCHER			
-0/9	10234-0/9	DUAL DENSITY WRITE CARD, SWITCHER	1/SYSTEM
CAT. NO. 10235 DUAL DENSITY WRITE CARD			
-0/9	10235-0/9	DUAL DENSITY WRITE CARD	1/SYSTEM
CAT. NO. 10239 DUAL DENSITY READ CARD, SWITCHER			
-0/9	10239-0/9	DUAL DENSITY READ CARD, SWITCHER	1/SYSTEM
CAT. NO. 10240 DUAL DENSITY READ CARD			
-0/9	10240-0/9	DUAL DENSITY READ CARD	1/SYSTEM

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SPARE PART LIST



DATA M E G

SERIES

LIST C

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10244 RUNNING TIME METER			
-0	00119-001	METER, RUNNING TIME, HAYDEN ED71	1/SYSTEM
CAT. NO. 10265 RACK FAN ASSEMBLY			
-0	00004-004	FAN ASSEMBLY, ROTRON GOLD SEAL MUFFIN	1/SYSTEM
CAT. NO. 10270 PHOTOSENSE			
-0	10274-0	AMPLIFIER ASSEMBLY	1/SYSTEM
-0	10275-0	SENSING HEAD ASSEMBLY	1/SYSTEM
CAT. NO. 10300 WRITE CONTROL CARD			
-0	10300-0	WRITE CONTROL CARD	1/SYSTEM
CAT. NO. 10305 READ CONTROL CARD			
-0/9	10305-0/9	READ CONTROL CARD	1/SYSTEM
CAT. NO. 10310 LOW DENSITY READ CARD			
-0/9	10310-0/9	LOW DENSITY READ CARD	1/SYSTEM
CAT. NO. 10315 LOW DENSITY WRITE CARD			
-0	10315-0	LOW DENSITY WRITE CARD	1/SYSTEM
CAT. NO. 10320 EXTENDER CARD, DATA ELECTRONICS			
-0	10320-0	EXTENDER CARD	1/SYSTEM
CAT. NO. 10330 POWER SUPPLY, DATA ELECTRONICS			
-0 THRU -2	00099-001	TRANSFORMER, 117VAC to 12.6V @ 7A, MERIT P-2963	1/SYSTEM
CAT. NO. 10340 POWER REGULATOR			
-0	10340-0	POWER REGULATOR	1/SYSTEM

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SPARE PART LIST

DATA M E G

SERIES
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LIST C

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10370 FILE PROTECT			
-0	10370-0	FILE PROTECT ASSEMBLY	1/SYSTEM
CAT. NO. 10436 TRIPLE DENSITY READ CARD			
-0/9	10436-0/9	TRIPLE DENSITY READ CARD	1/SYSTEM
CAT. NO. 10438 TRIPLE DENSITY WRITE CARD			
-0/9	10438-0/9	TRIPLE DENSITY WRITE CARD	1/SYSTEM
CAT. NO. 10442 TRIPLE DENSITY READ CONTROL CARD			
-0/3	10442-0/3	TRIPLE DENSITY READ CONTROL CARD	1/SYSTEM
CAT. NO. 10444 TRIPLE DENSITY WRITE CONTROL CARD			
-0	10444-0	TRIPLE DENSITY WRITE CONTROL CARD	1/SYSTEM
CAT. NO. 10460 CARD CAGE, DATA SWITCHER			
-0 THRU -3	00099-001	TRANSFORMER, 117VAC to 12.6VAC @ 7A, MERIT P-2963	1/SYSTEM
CAT. NO. 10472 SWITCHER CONTROL CARD			
-0	10472-0	SWITCHER CONTROL CARD	1/SYSTEM
CAT. NO. 10474 SWITCHER WRITE SELECT CARD			
-0	10474-0	SWITCHER WRITE SELECT CARD	1/SYSTEM
CAT. NO. 10476 SWITCHER READ CLAMP CARD			
-0	10476-0	SWITCHER READ CLAMP CARD	1/SYSTEM
CAT. NO. 10478 SWITCHER READ SELECT CARD			
-0	10478-0	SWITCHER READ SELECT CARD	1/SYSTEM

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SPARE PART LIST



DATA M E G

SERIES

LIST C

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10480 SWITCHER EXTENDER CARD			
-0	10480-0	SWITCHER EXTENDER CARD	1/SYSTEM
CAT. NO. 10495 TRIPLE DENSITY READ CARD, SWITCHER			
-0/9	10495-0/9	TRIPLE DENSITY READ CARD, SWITCHER	1/SYSTEM
CAT. NO. 10497 TRIPLE DENSITY WRITE CARD, SWITCHER			
-0/9	10497-0/9	TRIPLE DENSITY WRITE CARD, SWITCHER	1/SYSTEM
CAT. NO. 10800 TAPE TRANSPORT, 800 BPI			
ALL	10043-0	ROTARY GUIDE ASSEMBLY	1/SYSTEM
ALL	10051-0	REEL MOTOR	1/SYSTEM
ALL	10059-1	BRAKE COIL ASSEMBLY	1/SYSTEM
ALL	10063-0	BRAKE ROTOR, SUPPLY	1/SYSTEM
ALL	10063-1	BRAKE ROTOR, TAKEUP	1/SYSTEM
ALL	10072-0	SHIM, TURNTABLE, .017 THICK	6/SYSTEM
ALL	10072-1	SHIM, TURNTABLE, .032 THICK	6/SYSTEM
ALL	10072-2	SHIM, TURNTABLE, .064 THICK	6/SYSTEM
ALL	10073-0	DRAG BRAKE PLATE ASSEMBLY	1/SYSTEM
-0,-1,-2,-6 ONLY	10101-0	CAPSTAN MOTOR, BODINE B7338	1/SYSTEM
-3,-4,-5,-7,-8 ONLY	10107-0	CAPSTAN MOTOR, BODINE B7306	1/SYSTEM
-0 THRU -8	10156-0	TRANSFORMER, 117VAC to 41VAC CT@3A	1/SYSTEM
ALL	10220-0	HOLDDOWN KNOB ASSEMBLY, SUPPLY	1/SYSTEM
ALL	10220-1	HOLDDOWN KNOB ASSEMBLY, TAKEUP	1/SYSTEM
-0,-1,-2,-3,-6,-7 ONLY	10599-0	CAPSTAN ASSEMBLY	1/SYSTEM
-4,-5,-8 ONLY	10599-1	CAPSTAN ASSEMBLY	1/SYSTEM

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SPARE PART LIST

DATAMEG

02020
SERIES

LIST D

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10000 TAPE TRANSPORT			
ALL	00010-001	BEARING, CAPSTAN, NEW DEPARTURE 87013	2/SYSTEM
ALL	00092-001	TUBING, VACUUM, 1/4" ID, TYGON S22-1	6 FEET/SYSTEM
ALL	00114-001	SCOTCHLITE TAPE, 3M TYPE C	26 INCHES/SYSTEM
ALL	10006-0	ELBOW, RUBBER	2/SYSTEM
ALL	10056-0	LINING, REEL BRAKE	2/SYSTEM
ALL	10060-0	SHIM, RUBBER, REEL BRAKE	2/SYSTEM
ALL	10062-0	SURFACE RING, DRAG BRAKE	1/SYSTEM
ALL	10064-0	PAD, DRAG BRAKE	1/SYSTEM
ALL	10085-0	PAD, VACUUM MOTOR MOUNTING	2/SYSTEM
ALL	10093-0	PAD, RUBBER, SURFACE RING MOUNTING	1/SYSTEM
ALL	10121-0	DIAPHRAGM ASSEMBLY, VACUUM SWITCH	2/SYSTEM
ALL	10127-0	CONTACT, FIXED, VACUUM SWITCH	4/SYSTEM
ALL	10128-0	CONTACT, MOVABLE, VACUUM SWITCH	4/SYSTEM
ALL	10151-0	PAWL, TRANSPORT LATCHING	1/SYSTEM
CAT. NO. 10175 OPERATOR CONTROL PANEL			
ALL	00080-001	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
CAT. NO. 10200 TRANSPORT COVER DOOR			
ALL	00091-003	FASTENER, DOOR CATCH, NYLON BALL	2/SYSTEM
CAT. NO. 10255 OPERATOR CONTROL PANEL			
ALL	00080-001	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
CAT. NO. 10390 OPERATOR CONTROL PANEL			
ALL	00080-001	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
ALL	10516-0	SWITCH, ROTARY, 3P8T, OAK TYPE F	1/SYSTEM
CAT. NO. 10391 OPERATOR CONTROL PANEL			
ALL	00080-001	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
ALL	10516-1	SWITCH, ROTARY, 1P8T, OAK TYPE F	1/SYSTEM

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SPARE PART LIST




LIST D

SPARE PART LIST



DATA M E G

D 2020
SERIES

DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10396 OPERATOR CONTROL PANEL			
ALL	00080-001	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
ALL	00080-003	SWITCH, ROTARY, 1P3T, OAK, 238631-F2	1/SYSTEM
ALL	10516-1	SWITCH, ROTARY, 1P8T, OAK TYPE F	1/SYSTEM
CAT. NO. 10510 OPERATOR CONTROL PANEL			
ALL	00080-003	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
ALL	10516-0	SWITCH, ROTARY, 3P8T, OAK TYPE F	1/SYSTEM
CAT. NO. 10554 OPERATOR CONTROL PANEL			
ALL	00080-001	SWITCH, ROTARY, 1P4T, OAK, 228095-F1	1/SYSTEM
CAT. NO. 10800 TAPE TRANSPORT, 800 BPI			
ALL	00010-006	BEARINGS, CAPSTAN, DUPLEX PAIR, NEW DEPARTURE Z993L01-DTX-5C	1 PAIR/SYSTEM
ALL	00092-001	TUBING, VACUUM, 1/4" ID, TYGON S22-1	6 FEET/SYSTEM
ALL	00114-001	SCOTCHLITE TAPE, 3M TYPE C	26 INCHES/SYSTEM
ALL	10006-0	ELBOW, RUBBER	2/SYSTEM
ALL	10056-0	LINING, REEL BRAKE	2/SYSTEM
ALL	10060-0	SHIM, RUBBER, REEL BRAKE	2/SYSTEM
ALL	10062-0	SURFACE RING, DRAG BRAKE	1/SYSTEM
ALL	10064-0	PAD, DRAG BRAKE	1/SYSTEM
ALL	10085-0	PAD, VACUUM MOTOR MOUNTING	2/SYSTEM
ALL	10093-0	PAD, RUBBER, SURFACE RING MOUNTING	1/SYSTEM
ALL	10121-0	DIAPHRAGM ASSEMBLY, VACUUM SWITCH	2/SYSTEM
ALL	10127-0	CONTACT, FIXED, VACUUM SWITCH	4/SYSTEM
ALL	10128-0	CONTACT, MOVABLE, VACUUM SWITCH	4/SYSTEM
ALL	10151-0	PAWL, TRANSPORT LATCHING	1/SYSTEM

-01

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LIST E

SPARE PART LIST



DATA M E G

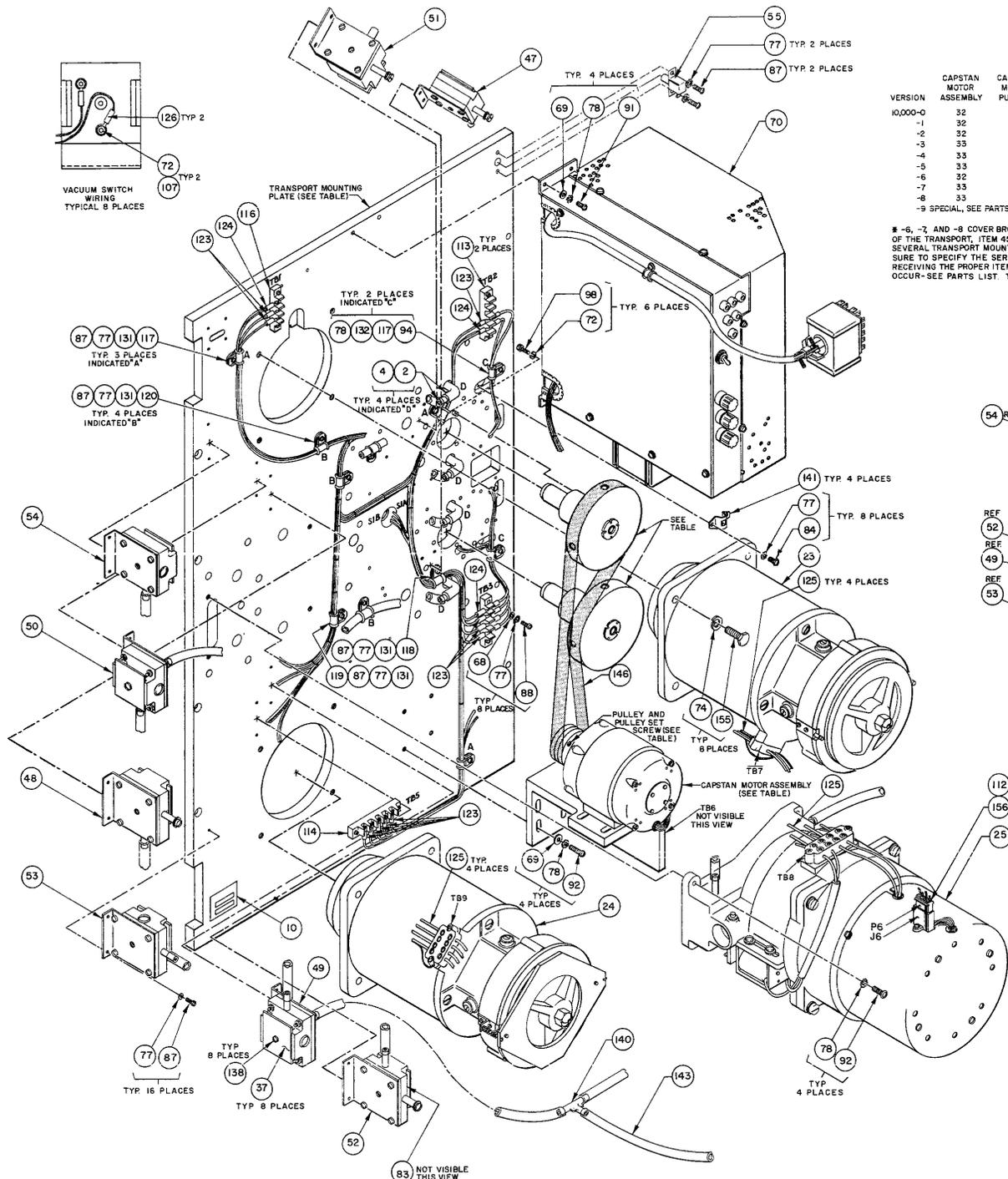
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DASH VERSIONS	PART NUMBER(S)	DESCRIPTION	QUANTITY
CAT. NO. 10000 TAPE TRANSPORT			
ALL	10037-0	GUIDE, FIXED	2/SYSTEM
ALL	10049-1	SUPPLY REEL ASSEMBLY	1/SYSTEM
ALL	10050-1	TAKEUP REEL ASSEMBLY	1/SYSTEM
ALL	10135-0	ACTUATOR, REVERSE	1/SYSTEM
ALL	10135-1	ACTUATOR, FORWARD	1/SYSTEM
CAT. NO. 10400 HEAD ASSEMBLY, WRITE/READ, TRIPLE DENSITY			
-0/9	10400-0/9	HEAD ASSEMBLY, WRITE/READ, TRIPLE DENSITY	1/SYSTEM
CAT. NO. 10402 HEAD ASSEMBLY, READ ONLY, TRIPLE DENSITY			
-0/9	10402-0/9	HEAD ASSEMBLY, READ ONLY, TRIPLE DENSITY	1/SYSTEM
CAT. NO. 10420 HEAD ASSEMBLY, WRITE/READ, DUAL DENSITY			
-0/9	10420-0/9	HEAD ASSEMBLY, WRITE/READ, DUAL DENSITY	1/SYSTEM
CAT. NO. 10430 HEAD ASSEMBLY, WRITE ONLY, 200 BPI			
-0/9	10430-0/9	HEAD ASSEMBLY, WRITE ONLY, 200 BPI	1/SYSTEM
CAT. NO. 10440 HEAD ASSEMBLY, READ ONLY, DUAL DENSITY			
-0/9	10440-0/9	HEAD ASSEMBLY, READ ONLY, DUAL DENSITY	1/SYSTEM
CAT. NO. 10800 TAPE TRANSPORT, 800 BPI			
ALL	10037-0	GUIDE, FIXED	2/SYSTEM
ALL	10049-1	SUPPLY REEL ASSEMBLY	1/SYSTEM
ALL	10050-1	TAKEUP REEL ASSEMBLY	1/SYSTEM
ALL	10135-0	ACTUATOR, REVERSE	1/SYSTEM
ALL	10135-1	ACTUATOR, FORWARD	1/SYSTEM

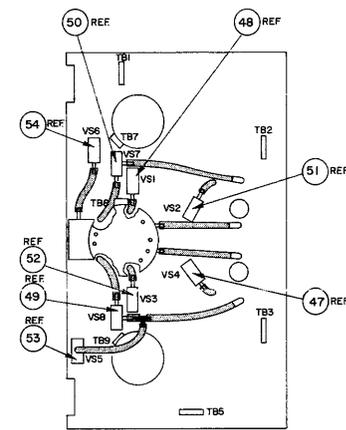
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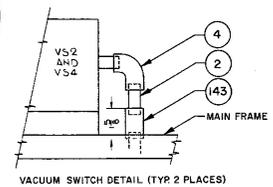


VERSION	CAPSTAN MOTOR ASSEMBLY	CAPSTAN MOTOR PULLEY	PULLEY SET SCREW	CAPSTAN ASSEMBLY	TRANSPORT MOUNTING PLATE
10,000-0	32	39	106	34	148
-1	32	30	106	34	149
-2	32	41	105	34	150
-3	33	41	105	34	150
-4	33	42	106	35	151
-5	33	43	106	35	152
-6	32	45*	105	34	148, 149 OR 150*
-7	33	45*	105	34	150
-8	33	45*	105	35	151, 152 OR 153*
-9	SPECIAL, SEE PARTS LIST COVERING CAT. 10650 DC CAPSTAN SERVO.				

* -6, -7, AND -8 COVER BROAD SPEED RANGES. DEPENDING ON THE SPECIFIC SPEED OF THE TRANSPORT, ITEM 45 (CAPSTAN MOTOR PULLEY) WILL VARY AND ONE OF SEVERAL TRANSPORT MOUNTING PLATES MAY BE USED. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS. FOR 50 CPS A-C OPERATION, OTHER VARIATIONS MAY OCCUR-SEE PARTS LIST. THE -9 VERSION IS USED FOR MULTI-SPEED MODIFICATION.



TUBING CHART	
ROUTING	INCHES
VS6 TO VAC. UNIT	7
VS7 TO L.L. HOLE	5
VS2 TO SENSE HOLE	3-1/4
VS4 TO SENSE HOLE	3-1/4
VS7 (BACK) TO S.L. ELBOW	11-1/4
VS1 TO SENSE HOLE	3-1/2
VS3 TO SENSE HOLE	3-1/2
VS8 (BACK) TO TEE	1-1/4
TEE TO LOWER S.L. ELBOW	9-3/4
VS5 TO TEE	7
VS8 TO L.L. HOLE	5
UPPER GUIDE ELBOW TO VACUUM UNIT	6-1/2
LOWER GUIDE ELBOW TO VACUUM UNIT	6-1/2



TAPE TRANSPORT, REAR VIEW

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

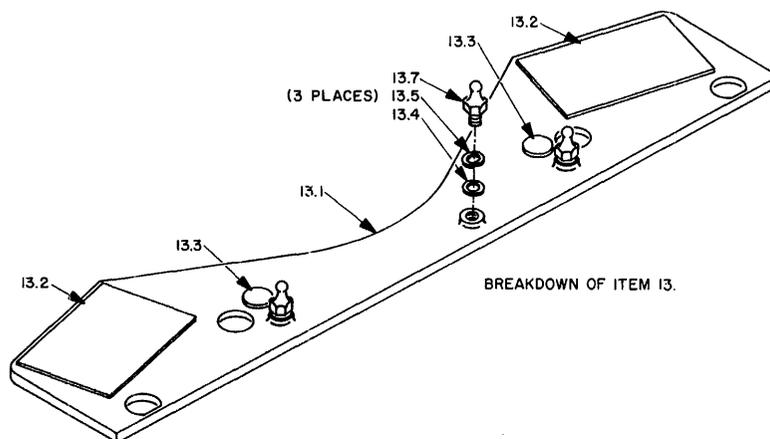
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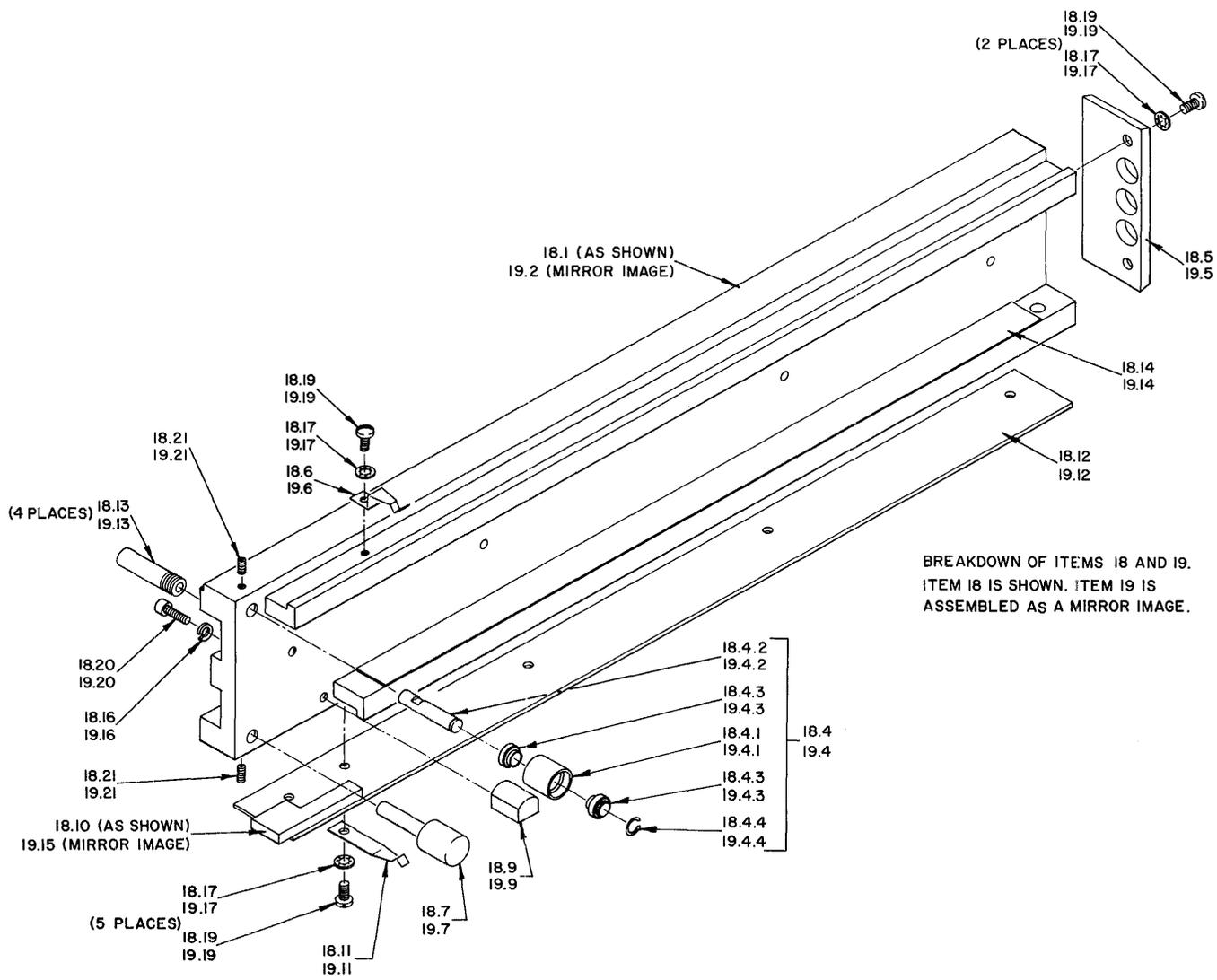


ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10000-0 thru -8	TAPE TRANSPORT						
2	10003-0	.STANDOFF, SPRING CLIP						12
3	00046-014	.SPACER, THREADED						1
4	10006-0	.ELBOW, VACUUM LINE						6
5	10007-0	.WASHER, SPECIAL, PLASTIC, .062						A/R
6	10007-1	.WASHER, SPECIAL, PLASTIC, .025						A/R
7	10007-2	.WASHER, SPECIAL, PLASTIC, .0125						A/R
8	10010-0	.MANIFOLD, TAPE TRANSPORT						1
9	10011-0	.GASKET, VACUUM MANIFOLD						1
10	10008-0	.NAMEPLATE						1
13	10015-0	.CAPSTAN, COVER PLATE ASSEMBLY						1
13.1	10020-0	. .PLATE, COVER						1
13.2	10044-0	. .PAD, SQUARE, COVER PLATE						2
13.3	10048-0	. .PAD, ROUND, COVER PLATE						2
13.4	00002-006	. .WASHER, PLAIN #6						3
13.5	00003-003	. .WASHER, HELICAL SPRING LOCK #6						3
13.7	00091-002	. .FASTENER, PLUG, TINNERMAN P116-499-5-495						3
14	10017-0	.PLUG, BUTTON, REEL HOLDDOWN KNOB (SEE NOTE)						2
		NOTE: ITEM 14, ABOVE, IS FOR USE IN MACHINES WITH STANDARD TAPE REEL HOLDDOWN KNOBS. FOR MACHINES WHICH USE NARTB TAPE REEL HOLDDOWN KNOBS, SUBSTITUTE PART NO. 10017-1, PLUG BUTTON. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.						
15	10021-0	.POST, INDEX						1
16	10023-0	.COVER, SWITCH HANDLE						1
17	10024-0	.COVER, HEAD						1
18	10025-0	.VACUUM CHAMBER ASSEMBLY						1
18.1	10027-0	. .BASE, VACUUM CHAMBER						1
18.4	10043-0	. .ROLLER GUIDE ASSEMBLY						1

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT



BREAKDOWN OF ITEM 13.



BREAKDOWN OF ITEMS 18 AND 19.
ITEM 18 IS SHOWN. ITEM 19 IS
ASSEMBLED AS A MIRROR IMAGE.



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
18.4.1	10029-0	.	.	.	ROLLER, GUIDE			1
18.4.2	10030-0	.	.	.	SHAFT, GUIDE			1
18.4.3	00010-004	.	.	.	BEARING, BALL (MPB S5632FCZZELG-20)			2
18.4.4	00063-015	.	.	.	RING, RETAINING, EXT. CRESCENT			1
18.5	10031-0	.	.	.	END PLATE, VACUUM CHAMBER			1
18.6	10032-0	.	.	.	CLIP, OUTSIDE COVER			1
18.7	10037-0	.	.	.	GUIDE, FIXED			1
18.9	10039-0	.	.	.	POST, BUFFER POCKET			1
18.10	10045-0	.	.	.	GASKET, SIDE PLATE			1
18.11	10046-0	.	.	.	CLIP, INSIDE COVER			1
18.12	10047-0	.	.	.	PLATE, SIDE, VACUUM CHAMBER			1
18.13	10133-0	.	.	.	NIPPLE, THREADED			4
18.14	00114-001	.	.	.	TAPE, SCOTCHLITE, 1/2 WIDE, MMM TYPE 2, #234C			A/R
18.16	00003-002	.	.	.	WASHER, HELICAL SPRING LOCK #4			1
18.17	00006-002	.	.	.	WASHER, INTERNAL TOOTH LOCK #4			8
18.19	00021-018	.	.	.	SCREW, BINDING HD., SLOT DRIVE, 4-40 x 1/4			8
18.20	00023-006	.	.	.	SCREW, HEX SOCKET, HD. CAP, 4-40 x 3/8			1
18.21	00024-004	.	.	.	SCREW, HEX SOCKET SET, CUP PT., 4-40 x 1/8			2
19	10025-1	.	.	.	VACUUM CHAMBER ASSEMBLY			1
19.2	10027-1	.	.	.	BASE, VACUUM CHAMBER			1
19.4	10043-0	.	.	.	ROLLER GUIDE ASSEMBLY			1
19.4.1	10029-0	.	.	.	ROLLER GUIDE			1
19.4.2	10030-0	.	.	.	SHAFT, GUIDE			1
19.4.3	00010-004	.	.	.	BEARING, BALL (MPB S5632FCZZELG-20)			2
19.4.4	00063-015	.	.	.	RING, RETAINING, EXT. CRESCENT			1
19.5	10031-0	.	.	.	END PLATE, VACUUM CHAMBER			1
19.6	10032-0	.	.	.	CLIP, OUTSIDE COVER			1
19.7	10037-0	.	.	.	GUIDE, FIXED			1

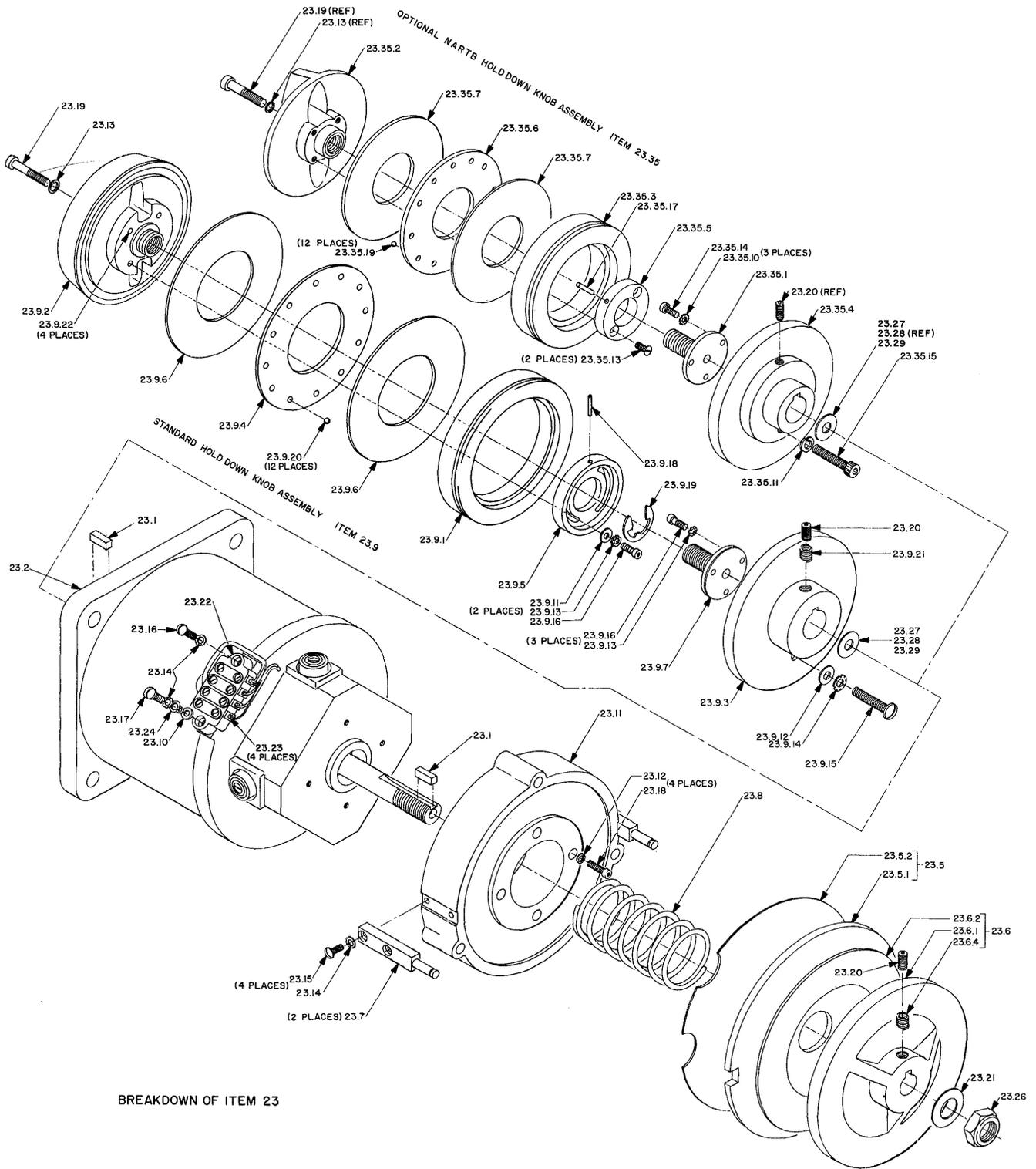


ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
19.9	10039-0	. .POST, BUFFER POCKET						1
19.11	10046-0	. .CLIP, INSIDE COVER						1
19.12	10047-0	. .PLATE, SIDE, VACUUM CHAMBER						1
19.13	10133-0	. .NIPPLE, THREADED						4
19.14	00114-001	. .TAPE, SCOTCHLITE 1/2 WIDE, MMM TYPE 2, #234C						A/R
19.15	10045-1	. .GASKET, SIDE PLATE						1
19.16	00003-002	. .WASHER, HELICAL SPRING LOCK #4						1
19.17	00006-002	. .WASHER, INTERNAL TOOTH LOCK #4						8
19.19	00021-018	. .SCREW, BINDING HD., SLOT DRIVE, 4-40 x 1/4						8
19.20	00023-006	. .SCREW, HEX SOCKET HD. CAP, 4-40 x 3/8						1
19.21	00024-004	. .SCREW, HEX SOCKET SET, CUP PT., 4-40 x 1/8						2
22	10070-0	.HANDLE, SWITCH, TAPE TRANSPORT ASSEMBLY						1
		NOTE: ITEM 23, SUPPLY REEL MOTOR ASSEMBLY, INCLUDES THE STANDARD TAPE REEL HOLDDOWN KNOB ASSEMBLY. FOR MACHINES WHICH USE NARTB TAPE REEL HOLDDOWN KNOBS, ITEM 23 AND SOME OF ITS COMPONENT PARTS WILL CHANGE. SUCH CHANGES ARE INDICATED BELOW, WHERE THEY OCCUR. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.						
23	10049-1	.SUPPLY REEL MOTOR ASSEMBLY FOR STANDARD HOLDDOWN KNOB:						1
	10049-2	.SUPPLY REEL MOTOR ASSEMBLY FOR NARTB HOLDDOWN KNOB:						1
23.1	10018-0	. .KEY						2
23.2	10051-0	. .MOTOR						1
23.5	10061-0	. .BRAKE PLATE ASSEMBLY						1
23.5.1	10054-0	. . .PLATE, BRAKE						1
23.5.2	10060-0	. . .RUBBER SHIM, .010 THICK						1
23.6	10063-0	. .BRAKE ROTOR ASSEMBLY						1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
23.6.1	10055-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.6.2	10056-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.6.4	00085-005	. . .	. . .	. . .	. . .	. . .	. . .	1
23.7	10066-0	. . .	. . .	. . .	. . .	. . .	. . .	2
23.8	10407-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9	10220-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.1	10221-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.2	10222-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.3	10223-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.4	10224-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.5	10225-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.6	10226-0	. . .	. . .	. . .	. . .	. . .	. . .	2
23.9.7	10227-0	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.11	00002-004	. . .	. . .	. . .	. . .	. . .	. . .	2
23.9.12	00002-009	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.13	00005-001	. . .	. . .	. . .	. . .	. . .	. . .	5
23.9.14	00005-004	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.15	00021-090	. . .	. . .	. . .	. . .	. . .	. . .	1
23.9.16	00023-006	. . .	. . .	. . .	. . .	. . .	. . .	5

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT



BREAKDOWN OF ITEM 23



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
23.9.18	00031-042	. . .PIN, SPIROL, 3/32 DIA. x 1/2 FOR STANDARD HOLDDOWN KNOB ONLY:	1
23.9.19	00063-012	. . .RING, RETAINING, 5/8 DIA. SHAFT FOR STANDARD HOLDDOWN KNOB ONLY:	1
23.9.20	00077-001	. . .BALL, 1/8 DIA. FOR STANDARD HOLDDOWN KNOB ONLY:	12
23.9.21	00085-004	. . .HELICOIL INSERT, 1191-3CN x 3/8 LG., 10-32 FOR STANDARD HOLDDOWN KNOB ONLY:	1
23.9.22	00085-007	. . .INSERT, TAP-LOC TYPE 112 40-12, 4-40 THREAD FOR STANDARD HOLDDOWN KNOB ONLY	4
23.10	00002-004	. .WASHER, PLAIN #4	1
23.11	10059-1	. .BRAKE, COIL HOUSING ASSEMBLY	1
23.12	00003-002	. .WASHER, HELICAL SPRING LOCK #4	4
23.13	00003-005	. .WASHER, HELICAL SPRING LOCK #10	1
23.14	00005-001	. .WASHER, EXTERNAL TOOTH #4	6
23.15	00021-019	. .SCREW, BND. HD., SLOT STEEL CAD., 4-40 x 5/16	4
23.16	00021-022	. .SCREW, BND. HD., SLOT STEEL CAD., 4-40 x 1/2	1
23.17	00021-026	. .SCREW, BND. HD., SLOT STEEL CAD., 4-40 x 3/4	1
23.18	00023-007	. .SCREW, HEX SOCKET HD. CAP, STEEL CAD., 4-40 x 1/2	4
23.19	00023-033	. .SCREW, HEX SOCKET HD. CAP, STEEL CAD., 10-32 x 1-1/2	1
23.20	00024-029	. .SCREW, HEX SOCKET SET, CUP PT., 10-32 x 3/8	2
23.21	00002-030	. .WASHER, PLAIN, .5156 ID x .875 OD x 1/16 THK	1
23.22	00050-002	. .TERMINAL STRIP, SCREW TYPE, CAMBLOCK CB-15-4 TB7	1
23.23	00060-004	. .LUG, SOLDERLESS, CAMBLOCK 'WIREGUARD'	4
23.24	00061-002	. .LUG, SOLDER #4	1
23.26	00089-001	. .NUT, SELF LOCKING, HEX 1/2-20 THIN	1
23.27	10072-0	. .SHIM, #10, TURNTABLE, .010 THK	A/R
23.28	10072-1	. .SHIM, #10, TURNTABLE, .032 THK	A/R
23.29	10072-2	. .SHIM, #10, TURNTABLE, .062 THK	A/R



CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

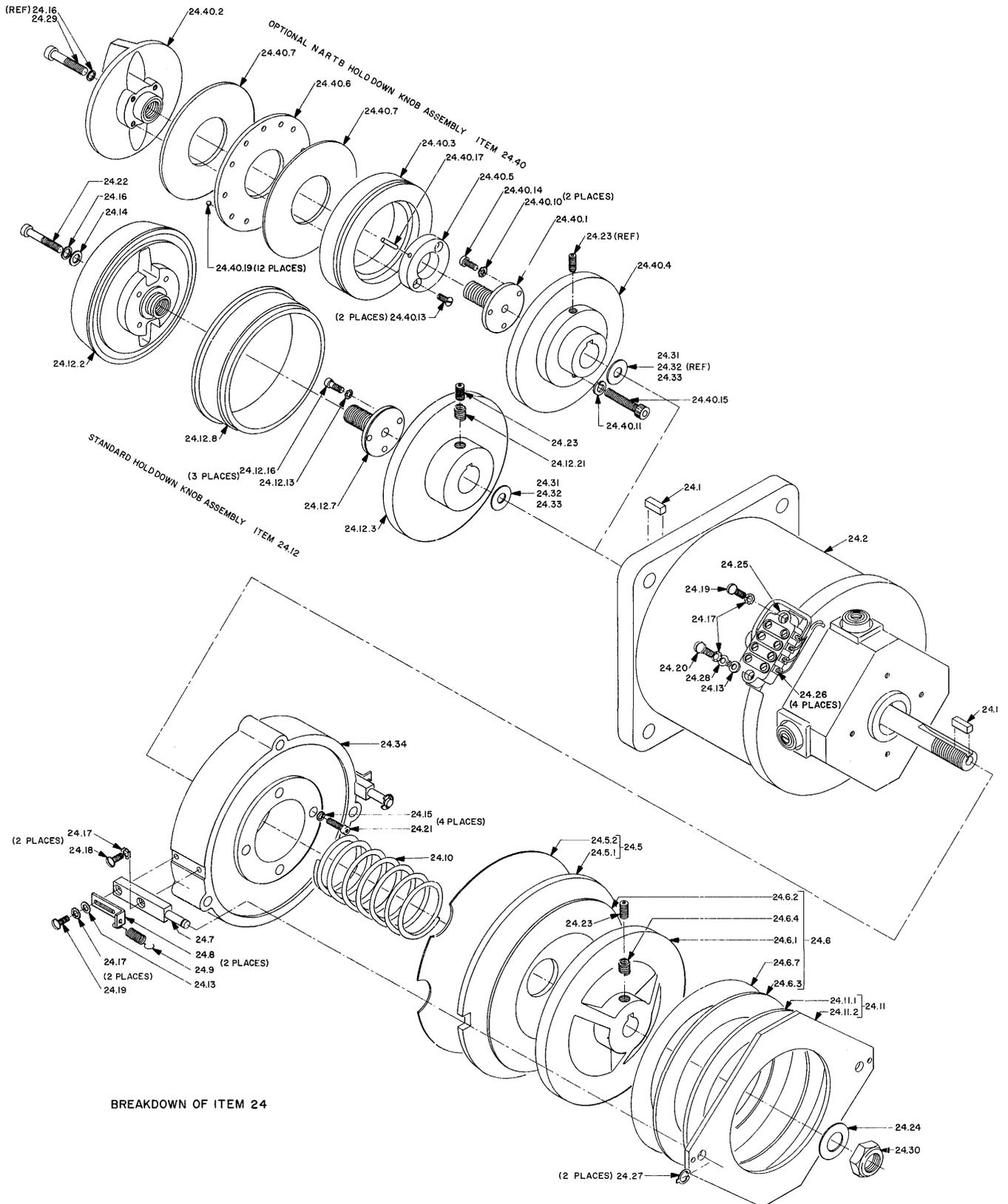
ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
		1 2 3 4 5 6	
23.35	10560-0	. .TAPE REEL HOLDDOWN KNOB ASSEMBLY FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.1	10227-0	. . .SHAFT, THREADED FOR NARTB HOLDDOWN KNOB ONLY	1
23.35.2	10561-0	. . .KNOB, OPERATING FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.3	10562-0	. . .RING, EXPANSION, FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.4	10563-0	. . .TURNTABLE, FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.5	10564-0	. . .COLLAR, FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.6	10565-0	. . .SPACER, BALL, FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.7	10566-0	. . .PLATE, THRUST, FOR NARTB HOLDDOWN KNOB ONLY:	2
23.35.10	00003-002	. . .WASHER, HELICAL SPRING, LOCK #4 FOR NARTB HOLDDOWN KNOB ONLY:	3
23.35.11	00003-005	. . .WASHER, HELICAL SPRING LOCK #10 FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.13	00022-020	. . .SCREW, FLAT HD., 4-40 x 3/8, STEEL CAD. FOR NARTB HOLDDOWN KNOB ONLY:	2
23.35.14	00023-006	. . .SCREW, CAP HD., 4-40 x 3/8, STEEL CAD. FOR NARTB HOLDDOWN KNOB ONLY:	3
23.35.15	00023-031	. . .SCREW, CAP HD., 10-32 x 1, STEEL CAD. FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.17	00031-078	. . .PIN, SPIROL, 1/8 DIA x 1/2 LG., 302 STAINLESS FOR NARTB HOLDDOWN KNOB ONLY:	1
23.35.19	00077-001	. . .BALL, 1/8 DIA., 440 STAINLESS FOR NARTB HOLDDOWN KNOB ONLY:	12



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
		NOTE: ITEM 24, TAKEUP REEL MOTOR ASSEMBLY INCLUDES THE STANDARD TAPE REEL HOLDDOWN KNOB ASSEMBLY. FOR MACHINES WHICH USE NARTB TAPE REEL HOLDDOWN KNOBS, ITEM 24 AND SOME OF ITS COMPONENT PARTS WILL CHANGE. SUCH CHANGES ARE INDICATED BELOW, WHERE THEY OCCUR. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.						
24	10050-1	.TAKEUP REEL MOTOR ASSEMBLY FOR STANDARD HOLDDOWN KNOB:						1
	10050-2	.TAKEUP REEL MOTOR ASSEMBLY FOR NARTB HOLDDOWN KNOB:						1
24.1	10018-0	. .KEY						2
24.2	10051-0	. .MOTOR						1
24.5	10061-0	. .BRAKE PLATE ASSEMBLY						1
24.5.1	10054-0	. . .PLATE, BRAKE						1
24.5.2	10060-0	. . .RUBBER SHIM, .010 THK						1
24.6	10063-1	. .BRAKE ROTOR ASSEMBLY						1
24.6.1	10055-0	. . .ROTOR, BRAKE						1
24.6.2	10056-0	. . .LINING, BRAKE						1
24.6.3	10062-0	. . .SURFACE RING, ROTOR						1
24.6.4	00085-005	. . .HELICOIL INSERT, 10-32, 1191 3CN x .285						1
24.6.7	10093-0	. . .PAD, SURFACE RING MOUNTING						1
24.7	10066-0	. .PIN, BRAKE						2
24.8	10067-0	. .BRACKET, DRAG BRAKE						2
24.9	10068-0	. .SPRING, TENSION DRAG BRAKE						2
24.10	10407-0	. .SPRING, BRAKE						1
24.11	10073-0	. .DRAG BRAKE PLATE ASSEMBLY						1
24.11.1	10064-0	. . .PAD, DRAG BRAKE						1
24.11.2	10065-0	. . .PLATE, DRAG BRAKE						1



CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT



BREAKDOWN OF ITEM 24



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
		1 2 3 4 5 6	
24.12	10220-1	. TAPE REEL HOLDDOWN KNOB ASSEMBLY FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.12.2	10222-0	. . KNOB, OPERATING FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.12.3	10223-0	. . TURNTABLE FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.12.7	10227-0	. . SHAFT, THREADED FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.12.8	10228-0	. . RING, FIXED FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.12.13	00005-001	. . WASHER, EXT. TOOTH LOCK #4 FOR STANDARD HOLDDOWN KNOB ONLY:	3
24.12.16	00023-006	. . SCREW, HEX SOCKET HEAD, 4-40 x 3/8 FOR STANDARD HOLDDOWN KNOB ONLY:	3
24.12.21	00085-004	. . HELICOIL INSERT, 1191-3CN x 3/8 LG., 10-32 STAINLESS FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.13	00002-004	. WASHER, PLAIN #4	3
24.14	00002-026	. WASHER, PLAIN #10 FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.15	00003-002	. WASHER, HELICAL SPRING LOCK #4	4
24.16	00003-005	. WASHER, HELICAL SPRING LOCK #10	1
24.17	00005-001	. WASHER, EXTERNAL TOOTH LOCK #4	6
24.18	00021-019	. SCREW, BND. HD., SLOT DRIVE, 4-40 x 5/16	2
24.19	00021-022	. SCREW, BND. HD., SLOT DRIVE, 4-40 x 1/2	3
24.20	00021-026	. SCREW, BND. HD., SLOT DRIVE, 4-40 x 3/4	1
24.21	00023-007	. SCREW, HEX SOCKET HD. CAP, 4-40 x 1/2	4
24.22	00023-034	. SCREW, HEX SOCKET HD. CAP, 10-32 x 1-3/4 FOR STANDARD HOLDDOWN KNOB ONLY:	1
24.23	00024-029	. SCREW, HEX SOCKET SET, CUP PT., 10-32 x 3/8	2

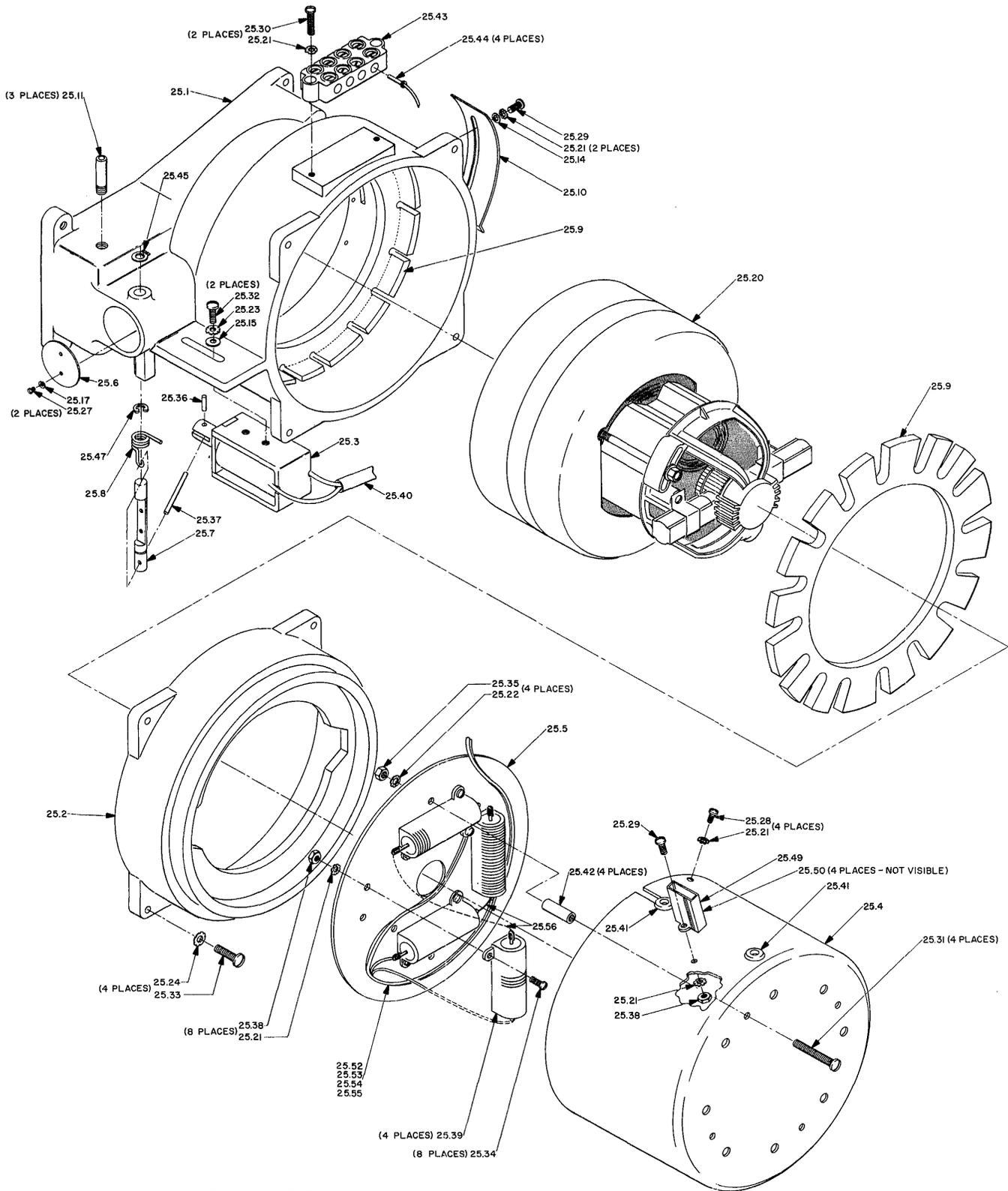


ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
		1 2 3 4 5 6	
24.24	00002-030	. .WASHER, PLAIN, .5156 ID x .875 OD x 1/16 THK	1
24.25	00050-002	. .TERMINAL STRIP, SCREW TYPE, CAMBLOCK CB-15-4, TB9	1
24.26	00060-004	. .LUG, SOLDERLESS, CAMBLOCK "WIREGUARD"	4
24.27	00063-005	. .RING, RETAINING, 3/16 SHAFT DIA.	2
24.28	00061-002	. .LUG, SOLDER #4	1
24.29	00023-033	. .SCREW, HEX SOCKET HD. CAP, 10-32 x1-1/2 FOR NARTB HOLDDOWN KNOB ONLY:	1
24.30	00089-001	. .NUT, SELF LOCKING, HEX 1/2 - 20 THIN	1
24.31	10072-0	. .SHIM, #10, TURNTABLE, .010 THK	A/R
24.32	10072-1	. .SHIM, #10, TURNTABLE, .032 THK	A/R
24.33	10072-2	. .SHIM, #10, TURNTABLE, .062 THK	A/R
24.34	10059-1	. .BRAKE COIL HOUSING ASSEMBLY	1
24.40	10560-0	. .TAPE REEL HOLDDOWN KNOB ASSEMBLY FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.1	10227-0	. . .SHAFT, THREADED FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.2	10561-0	. . .KNOB OPERATING FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.3	10562-0	. . .RING, EXPANSION FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.4	10563-0	. . .TURNTABLE FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.5	10564-0	. . .COLLAR FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.6	10565-0	. . .SPACER, BALL FOR NARTB HOLDDOWN KNOB ONLY:	1
24.40.7	10566-0	. . .PLATE, THRUST FOR NARTB HOLDDOWN KNOB ONLY:	2
24.40.10	00003-002	. . .WASHER, HELICAL SPRING, LOCK #4 FOR NARTB HOLDDOWN KNOB ONLY:	3
24.40.11	00003-005	. . .WASHER, HELICAL SPRING LOCK #10 FOR NARTB HOLDDOWN KNOB ONLY:	1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
24.40.13	00022-020	. . .	. . .	. . .	. . .	. . .	. . .	2
24.40.14	00023-006	. . .	. . .	. . .	. . .	. . .	. . .	3
24.40.15	00023-031	. . .	. . .	. . .	. . .	. . .	. . .	1
24.40.17	00031-078	. . .	. . .	. . .	. . .	. . .	. . .	1
24.40.19	00077-001	. . .	. . .	. . .	. . .	. . .	. . .	12
25	10075-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.1	10076-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.2	10077-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.3	10078-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.4	10079-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.5	10080-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.6	10081-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.7	10083-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.8	10084-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.9	10085-0	. . .	. . .	. . .	. . .	. . .	. . .	2
25.10	10086-0	. . .	. . .	. . .	. . .	. . .	. . .	1
25.11	10133-0	. . .	. . .	. . .	. . .	. . .	. . .	3
25.14	00002-004	. . .	. . .	. . .	. . .	. . .	. . .	2
25.15	00002-008	. . .	. . .	. . .	. . .	. . .	. . .	A/R
25.17	00003-016	. . .	. . .	. . .	. . .	. . .	. . .	2
25.20	00004-001	. . .	. . .	. . .	. . .	. . .	. . .	1
25.21	00005-001	. . .	. . .	. . .	. . .	. . .	. . .	17
25.22	00005-002	. . .	. . .	. . .	. . .	. . .	. . .	4

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

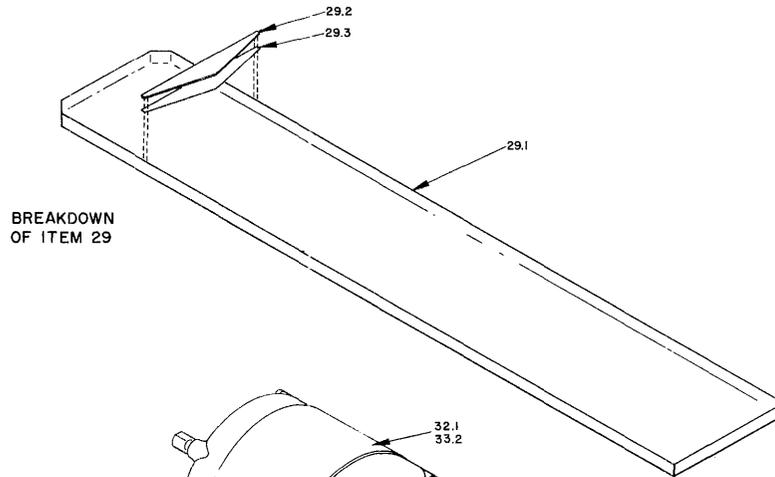


BREAKDOWN OF ITEM 25

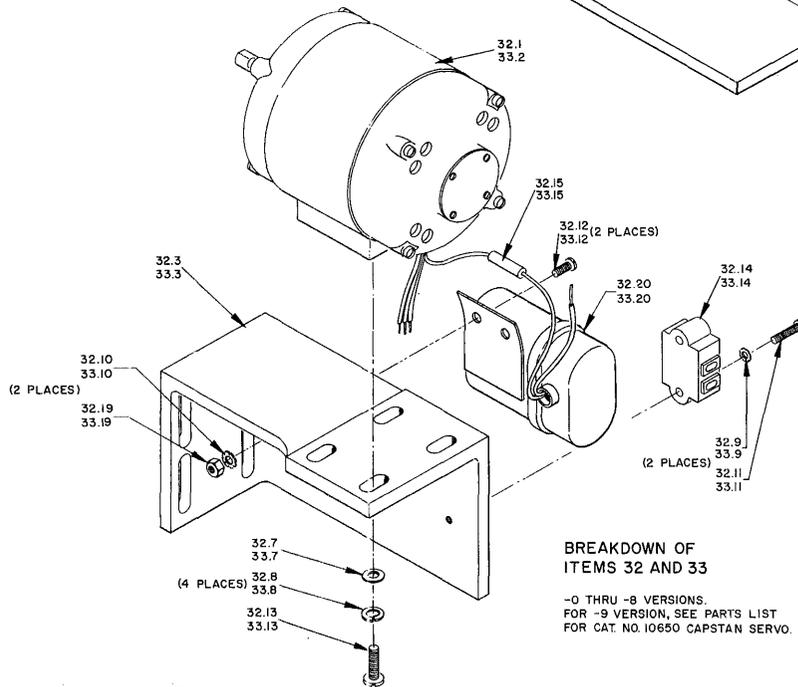


ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
		1 2 3 4 5 6	
25.23	00005-003	. .WASHER, EXT. TOOTH LOCK #8	2
25.24	00005-004	. .WASHER, EXT. TOOTH LOCK #10	4
25.27	00021-002	. .SCREW, BINDER HEAD, 2-56 x 3/16	2
25.28	00021-018	. .SCREW, BINDER HEAD, 4-40 x 1/4	4
25.29	00021-022	. .SCREW, BINDER HEAD, 4-40 x 1/2	3
25.30	00021-026	. .SCREW, BINDER HEAD, 4-40 x 3/4	2
25.31	00021-053	. .SCREW, BINDER HEAD, 6-32 x 1-1/8	4
25.32	00021-064	. .SCREW, BINDER HEAD, 8-32 x 7/16	2
25.33	00021-090	. .SCREW, BINDER HEAD, 10-32 x 3/4	4
25.34	00021-019	. .SCREW, BINDER HEAD, 4-40 x 5/16	8
25.35	00025-005	. .NUT, HEX, 6-32 UNC	4
25.36	00031-041	. .PIN, SPIROL, 3/32 D x 7/16 LG	1
25.37	00031-052	. .PIN, SPIROL, 3/32 D x 1-1/4 LG	1
25.38	00025-004	. .NUT, HEX 4-40 UNC	9
25.39	00054-005	. .RESISTOR, FIXED WW 50Ω, DALOHM RH50, R12,13,43,50	4
25.40	00032-010	. .TUBING, INSUL. PVC. SIZE NO. 4, 208 ID	A/R
25.41	00036-002	. .GROMMET, RUBBER, 3/16 ID - 5/16 MTG. HOLE	2
25.42	00045-009	. .SPACER, 1/4 D x 3/4	4
25.43	00050-002	. .TERMINAL STRIP, SCREW TYPE, 4 CONTACT TB8	1
25.44	00060-004	. .LUG, SOLDERLESS, SLEEVE FOR CAMBLOCK STRIP	4
25.45	00063-013	. .RING, RETAINING, EXTERNAL	1
25.47	00063-014	. .RING, RETAINING, EXTERNAL, CRESCENT	1
25.49	00040-012	. .CONNECTOR, 4 PIN FEMALE RECEPT., AMP 480135-1 J6	1
25.50	00109-008	. .CONTACT, AMP 42859-2	4
25.52	00100-003	. .WIRE, HOOKUP, #22 TEFLON INS. BROWN	A/R
25.53	00100-004	. .WIRE, HOOKUP, #22 TEFLON INS. RED	A/R
25.54	00100-005	. .WIRE, HOOKUP, #22 TEFLON INS. ORANGE	A/R
25.55	00100-006	. .WIRE, HOOKUP, #22 TEFLON INS. YELLOW	A/R
25.56	00100-001	. .WIRE, BARE, #22 TINNED	A/R

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

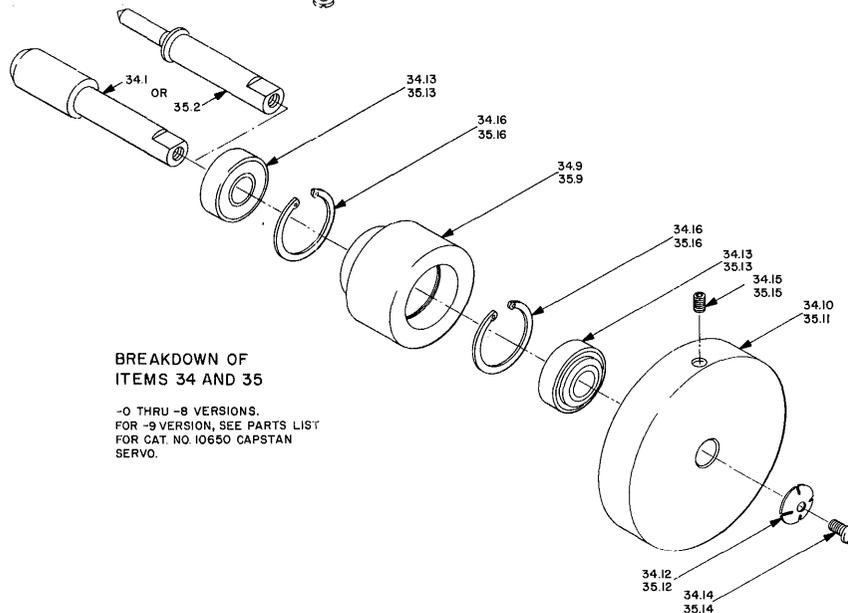


BREAKDOWN OF ITEM 29



BREAKDOWN OF ITEMS 32 AND 33

-0 THRU -8 VERSIONS.
FOR -9 VERSION, SEE PARTS LIST
FOR CAT. NO. 10650 CAPSTAN SERVO.



BREAKDOWN OF ITEMS 34 AND 35

-0 THRU -8 VERSIONS.
FOR -9 VERSION, SEE PARTS LIST
FOR CAT. NO. 10650 CAPSTAN SERVO.



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
26	10087-0	. BRACKET, MOUNTING SWITCH HANDLE COVER						1
27	10088-0	. BLOCK, BACK MOUNTING SWITCH HANDLE ROD						1
28	10089-0	. ROD, SLIDER						1
29	10091-0	. COVER ASSEMBLY, VACUUM CHAMBER						2
29.1	10028-0	. . COVER						1
29.2	10033-0	. . RETAINER						1
29.3	00114-002	. . TAPE, DOUBLE COATED FOAM						A/R
30	10095-0	. PLATE, TAPE POSITION						1
31	10095-1	. PLATE, TAPE POSITION						1
32	10106-0	. CAPSTAN MOTOR ASSEMBLY (1800 RPM) -0,-1,-2,-6:						1
32.1	10101-0	. . MOTOR, BODINE B7338 OR EQUIV. - (1800 RPM) -0,-1,-2,-6:						1
32.3	10108-1	. . BRACKET, CAPSTAN MOTOR, UNIVERSAL -0,-1,-2,-6:						1
32.7	00002-011	. . WASHER, FLAT #10 -0,-1,-2,-6:						4
32.8	00003-020	. . WASHER, HELICAL SPRING LOCK #10 -0,-1,-2,-6:						4
32.9	00005-001	. . WASHER, EXT. TOOTH LOCK #4 -0,-1,-2,-6:						2
32.10	00005-003	. . WASHER, EXT. TOOTH LOCK #8 -0,-1,-2,-6:						2
32.11	00021-024	. . SCREW, BINDING HD, 4-40 x 5/8 -0,-1,-2,-6:						2
32.12	00021-067	. . SCREW, BINDING HD, 8-32 x 5/8 -0,-1,-2,-6:						2
32.13	00021-089	. . SCREW, BINDING HD, 10-32 x 5/8 -0,-1,-2,-6:						4
32.14	00050-001	. . TERMINAL STRIP, CAMBLOCK CB15-2 -0,-1,-2,-6: TB6						1
32.19	00025-006	. . NUT, HEX, 8-32 -0,-1,-2,-6:						2
32.20	00076-002	. . CAPACITOR, PAPER 2.5µf 330VAC -0,-1,-2,-6: C11						1
33	10106-1	. CAPSTAN MOTOR ASSEMBLY (900 RPM) -3,-4,-5,-7,-8:						1
33.2	10107-0	. . MOTOR, BODINE B7306, (900 RPM) -3,-4,-5,-7,-8:						1
33.3	10108-0	. . BRACKET, CAPSTAN MOTOR, UNIVERSAL -3,-4,-5,-7,-8:						1

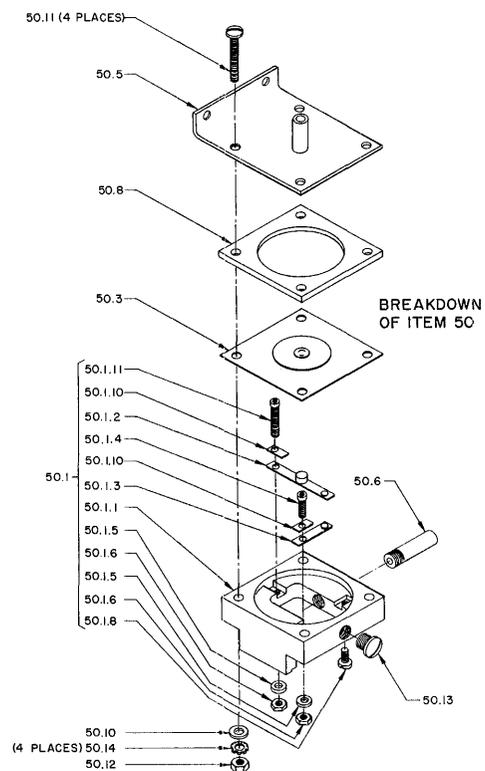
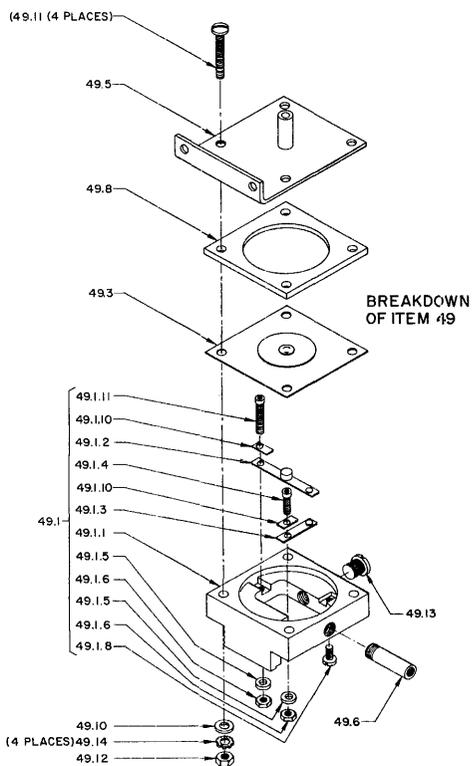
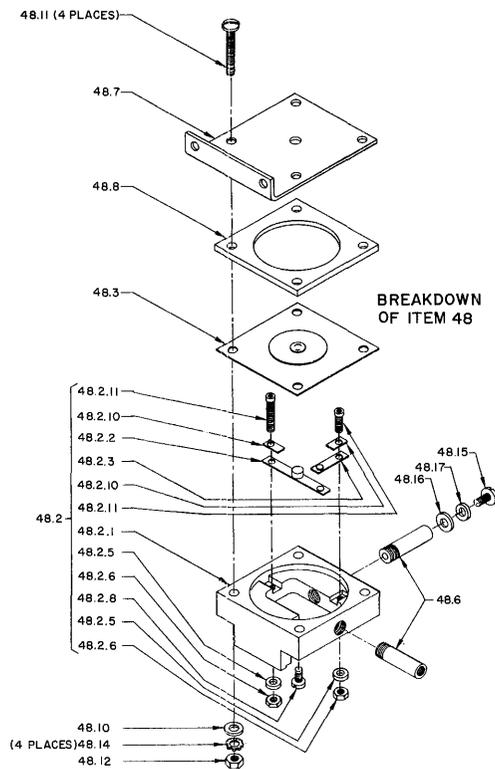
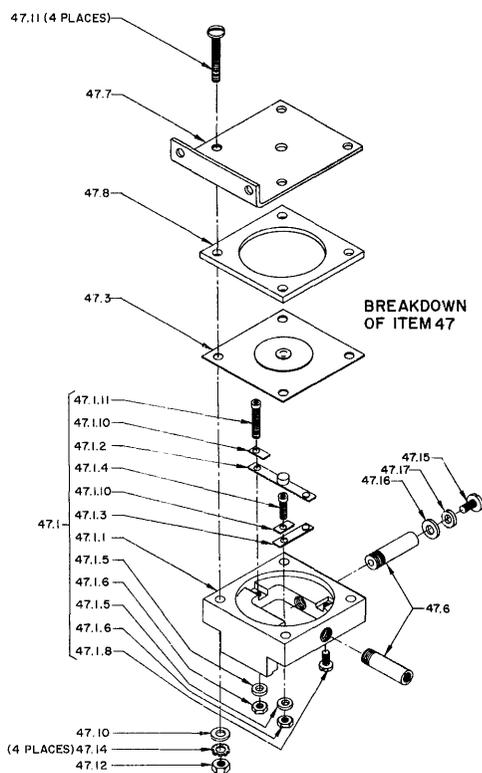
CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.	
		1	2	3	4	5	6		
33.7	00002-011	. .	WASHER, FLAT #10					-3,-4,-5,-7,-8:	4
33.8	00003-020	. .	WASHER, HELICAL SPRING LOCK #10					-3,-4,-5,-7,-8:	4
33.9	00005-001	. .	WASHER, EXT. TOOTH LOCK #4					-3,-4,-5,-7,-8:	2
33.10	00005-003	. .	WASHER, EXT. TOOTH LOCK #8					-3,-4,-5,-7,-8:	2
33.11	00021-024	. .	SCREW, BINDING HD, 4-40 x 5/8					-3,-4,-5,-7,-8:	2
33.12	00021-067	. .	SCREW, BINDING HD, 8-32 x 5/8					-3,-4,-5,-7,-8:	2
33.13	00021-089	. .	SCREW, BINDING HD, 10-32 x 5/8					-3,-4,-5,-7,-8:	4
33.14	00050-001	. .	TERMINAL STRIP, CAMBLOCK CB15-2					-3,-4,-5,-7,-8: TB6	1
33.19	00025-006	. .	NUT, HEX, 8-32					-3,-4,-5,-7,-8:	2
33.20	00076-002	. .	CAPACITOR, PAPER 2.5 μ f, 330VAC					-3,-4,-5,-7,-8: C11	1
34	10115-0	. .	CAPSTAN ASSEMBLY					-0,-1,-2,-3,-6,-7:	2
34.1	10116-0	. .	CAPSTAN					-0,-1,-2,-3,-6,-7:	1
34.9	10117-0	. .	HOUSING					-0,-1,-2,-3,-6,-7:	1
34.10	10118-0	. .	FLYWHEEL					-0,-1,-2,-3,-6,-7:	1
34.12	00007-026	. .	WASHER, SPRING LOCK					-0,-1,-2,-3,-6,-7:	1
34.13	00010-001	. .	BEARING, BALL, NEW DEPARTURE 87013					-0,-1,-2,-3,-6,-7:	2
34.14	00021-087	. .	SCREW, BND, HD, 10-32 x 3/8					-0,-1,-2,-3,-6,-7:	1
34.15	00024-032	. .	SCREW, SET, CUP PT. NYLOK 10-32 x 3/8					-0,-1,-2,-3,-6,-7:	2
34.16	00062-001	. .	RING, RETAINING, TRUARC 5000-125-MD					-0,-1,-2,-3,-6,-7:	2
35	10115-1	. .	CAPSTAN ASSEMBLY (LOW SPEED)					-4,-5,-8:	2
35.2	10116-1	. .	CAPSTAN					-4,-5,-8:	1
35.9	10117-0	. .	HOUSING					-4,-5,-8:	1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.	
		1	2	3	4	5	6		
35.11	10118-1	.	.FLYWHEEL					-4,-5,-8:	1
35.12	00007-026	.	.WASHER, SPRING LOCK					-4,-5,-8:	1
35.13	00010-001	.	.BEARING, BALL, NEW DEPARTURE 87013					-4,-5,-8:	2
35.14	00021-087	.	.SCREW, BINDING HD, 10-32 x 3/8					-4,-5,-8:	1
35.15	00024-032	.	.SCREW, SET, CUP PT, NYLOK 10-32 x 3/8					-4,-5,-8:	1
35.16	00062-001	.	.RING, RETAINING, TRUARC 5000-125-MD					-4,-5,-8:	2
37	10124-0	.	.COVER, VACUUM SWITCH						8
39	10104-0	.	.PULLEY (45 IPS)	(SEE NOTE)				-0:	1
40	10104-1	.	.PULLEY (30 IPS)	(SEE NOTE)				-1:	1
41	10104-2	.	.PULLEY (15 & 7.5 IPS)	(SEE NOTE)				-2,-3:	1
42	10104-4	.	.PULLEY (3.75 IPS)	(SEE NOTE)				-4:	1
43	10104-5	.	.PULLEY (3 IPS)	(SEE NOTE)				-5:	1
NOTE: FOR 50 CPS A-C OPERATION, -0,-1,-2,-3,-4,-5 VERSIONS USE SPECIAL PULLEY (ITEM 45). WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.									
45	10109-X	.	.PULLEY, SPECIAL	(SEE NOTE)				-6,-7,-8:	1
NOTE: -6, -7 & -8 VERSIONS COVER BROAD SPEED RANGES. DEPENDING UPON THE SPECIFIC SPEED OF THE TAPE TRANSPORT, THE PHYSICAL CHARACTERISTICS OF ITEM 45 MAY VARY. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.									
47	10125-0	.	.VACUUM SWITCH ASSEMBLY					VS4	1
47.1	10123-0	.	.BODY, ASSEMBLY (N/O)						1
47.1.1	10126-0	.	. . .BODY						1
47.1.2	10128-0	.	. . .CONTACT, MOVABLE						1
47.1.3	10127-0	.	. . .CONTACT, FIXED						1
47.1.4	00023-007	.	. . .SCREW, CAP 4-40 x 1/2						1

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT





ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
47.1.5	00002-004	.	.	.	WASHER, FLAT #4			2
47.1.6	00025-004	.	.	.	NUT, HEX 4-40			2
47.1.8	00021-018	.	.	.	SCREW, BINDER HD, 4-40 x 1/4			1
47.1.10	10149-0	.	.	.	RETAINER, VACUUM SWITCH CONTACT			2
47.1.11	00023-008	.	.	.	SCREW, CAP, 4-40 x 5/8			1
47.3	10121-0	.	.	.	DIAPHRAGM ASSEMBLY			1
47.6	10133-0	.	.	.	NIPPLE, THD			2
47.7	10130-0	.	.	.	BRACKET			1
47.8	10129-0	.	.	.	SPACER			1
47.10	00002-006	.	.	.	WASHER, PLAIN #6			4
47.11	00021-050	.	.	.	SCREW, BINDER HD, 6-32 x 7/8			4
47.12	00025-005	.	.	.	NUT, HEX, 6-32			4
47.14	00005-002	.	.	.	WASHER, EXT. TOOTH LOCK #6			4
47.15	00021-061	.	.	.	SCREW, BINDER HD, 8-32 x 1/4			1
47.16	00002-008	.	.	.	WASHER, FLAT #8			1
47.17	00003-019	.	.	.	WASHER, LOCK, SPLIT RING, #8			1
48	10125-1	.	.	.	VACUUM SWITCH ASSEMBLY		VS1	1
48.2	10123-1	.	.	.	BODY, ASSEMBLY (N/C)			1
48.2.1	10126-0	.	.	.	BODY			1
48.2.2	10128-0	.	.	.	CONTACT, MOVABLE			1
48.2.3	10127-0	.	.	.	CONTACT, FIXED			1
48.2.5	00002-004	.	.	.	WASHER, FLAT #4			2
48.2.6	00025-004	.	.	.	NUT, HEX, 4-40			2
48.2.8	00021-018	.	.	.	SCREW, BINDER HD, 4-40 x 1/4			1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY. NEXT ASSY.
48.2.10	10149-0	. . .RETAINER, VACUUM SWITCH CONTACT	2
48.2.11	00023-008	. . .SCREW, CAP, 4-40 x 5/8	2
48.3	10121-0	. .DIAPHRAGM ASSEMBLY	1
48.6	10133-0	. .NIPPLE, THD	2
48.7	10130-0	. .BRACKET	1
48.8	10129-0	. .SPACER	1
48.10	00002-006	. .WASHER, PLAIN #6	4
48.11	00021-050	. .SCREW, BINDER HD, 6-32 x 7/8	4
48.12	00025-005	. .NUT, HEX, 6-32	4
48.14	00005-002	. .WASHER, EXT. TOOTH LOCK #6	4
48.15	00021-061	. .SCREW, BINDER HD, 8-32 x 1/4	1
48.16	00002-008	. .WASHER, FLAT #8	1
48.17	00003-019	. .WASHER, LOCK, SPLIT RING, #8	1
49	10125-2	.VACUUM SWITCH ASSEMBLY	1
49.1	10123-0	. .BODY, ASSEMBLY (N/O)	1
49.1.1	10126-0	. . .BODY	1
49.1.2	10128-0	. . .CONTACT, MOVABLE	1
49.1.3	10127-0	. . .CONTACT, FIXED	1
49.1.4	00023-007	. . .SCREW, CAP, 4-40 x 1/2	1
49.1.5	00002-004	. . .WASHER, FLAT #4	2
49.1.6	00025-004	. . .NUT, HEX, 4-40	2
49.1.8	00021-018	. . .SCREW, BINDER HD, 4-40 x 1/4	1
49.1.10	10149-0	. . .RETAINER, VACUUM SWITCH CONTACT	2
49.1.11	00023-008	. . .SCREW, CAP, 4-40 x 5/8	1
49.3	10121-0	. .DIAPHRAGM ASSEMBLY	1

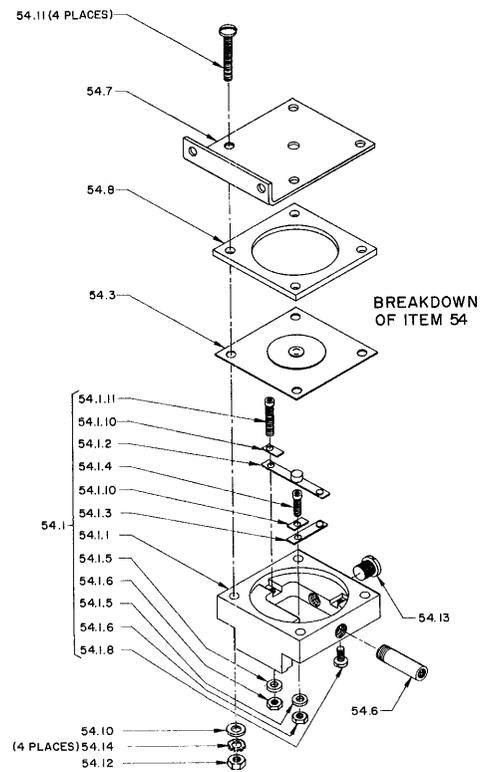
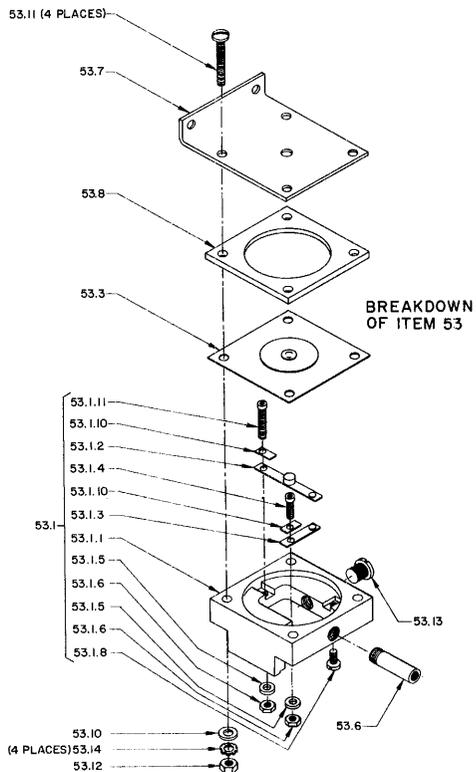
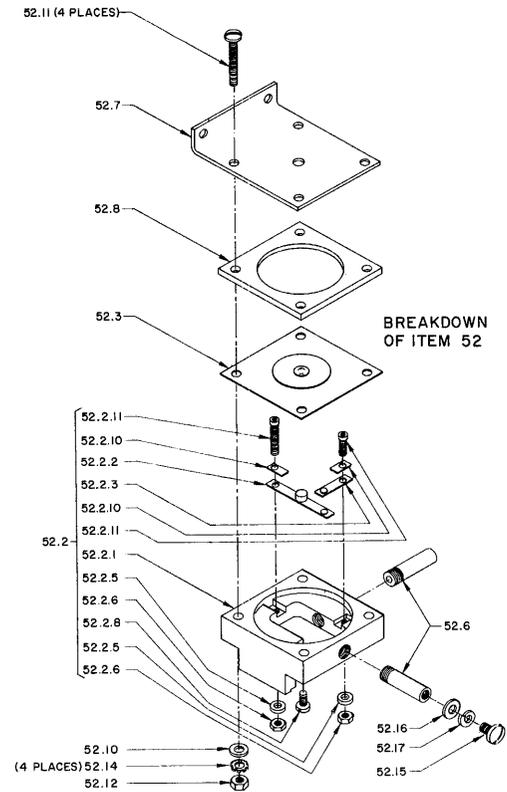
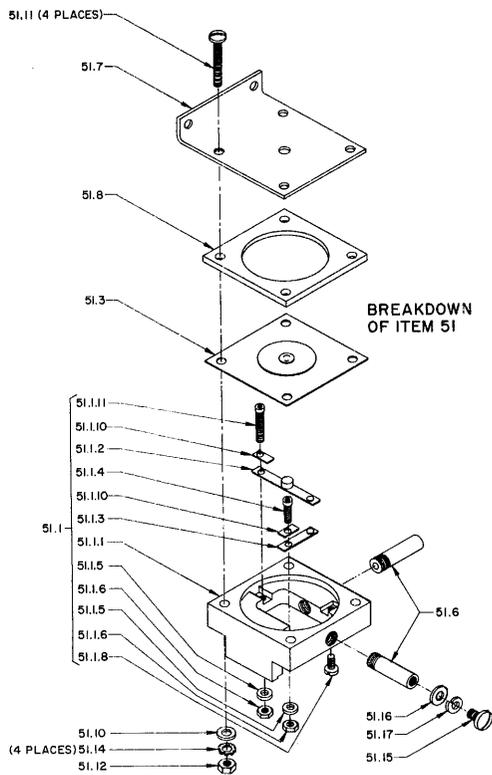
VS8



CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
49.5	10122-0	.	.	BRACKET ASSEMBLY				1
49.6	10133-0	.	.	NIPPLE, THD				1
49.8	10129-0	.	.	SPACER				1
49.10	00002-006	.	.	WASHER, PLAIN #6				4
49.11	00021-050	.	.	SCREW, BINDER HD, 6-32 x 7/8				4
49.12	00025-005	.	.	NUT, HEX, 6-32				4
49.13	00021-134	.	.	SCREW, BINDER HD, 1/4-28 x 1/4				1
49.14	00005-002	.	.	WASHER, EXT. TOOTH LOCK #6				4
50	10125-3	.	.	VACUUM SWITCH ASSEMBLY			VS7	1
50.1	10123-0	.	.	BODY, ASSEMBLY (N/O)				1
50.1.1	10126-0	.	.	BODY				1
50.1.2	10128-0	.	.	CONTACT, MOVABLE				1
50.1.3	10127-0	.	.	CONTACT, FIXED				1
50.1.4	00023-007	.	.	SCREW, CAP, 4-40 x 1/2				1
50.1.5	00002-004	.	.	WASHER, FLAT #4				2
50.1.6	00025-004	.	.	NUT, HEX, 4-40				2
50.1.8	00021-018	.	.	SCREW, BINDER HD, 4-40 x 1/4				1
50.1.10	10149-0	.	.	RETAINER, VACUUM SWITCH CONTACT				2
50.1.11	00023-008	.	.	SCREW, CAP, 4-40 x 5/8				1
50.3	10121-0	.	.	DIAPHRAGM ASSEMBLY				1
50.5	10122-0	.	.	BRACKET ASSEMBLY				1
50.6	10133-0	.	.	NIPPLE, THD				1
50.8	10129-0	.	.	SPACER				1
50.10	00002-006	.	.	WASHER, PLAIN #6				4

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT



CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
50.11	00021-050	.	.	SCREW, BINDER HD, 6-32 x 7/8				4
50.12	00025-005	.	.	NUT, HEX, 6-32				4
50.13	00021-134	.	.	SCREW, BINDER HD, 1/4-28 x 1/4				1
50.14	00005-002	.	.	WASHER, EXT. TOOTH LOCK #6				4
51	10125-4	.	.	VACUUM SWITCH ASSEMBLY			VS2	1
51.1	10123-0	.	.	BODY, ASSEMBLY (N/O)				1
51.1.1	10126-0	.	.	BODY				1
51.1.2	10128-0	.	.	CONTACT, MOVABLE				1
51.1.3	10127-0	.	.	CONTACT, FIXED				1
51.1.4	00023-007	.	.	SCREW, CAP, 4-40 x 1/2				1
51.1.5	00002-004	.	.	WASHER, FLAT #4				2
51.1.6	00025-004	.	.	NUT, HEX, 4-40				2
51.1.8	00021-018	.	.	SCREW, BINDER HD, 4-40 x 1/4				1
51.1.10	10149-0	.	.	RETAINER, VACUUM SWITCH CONTACT				2
51.1.11	00023-008	.	.	SCREW, CAP, 4-40 x 5/8				1
51.3	10121-0	.	.	DIAPHRAGM ASSEMBLY				1
51.6	10133-0	.	.	NIPPLE, THD				2
51.7	10130-0	.	.	BRACKET				1
51.8	10129-0	.	.	SPACER				1
51.10	00002-006	.	.	WASHER, PLAIN #6				4
51.11	00021-050	.	.	SCREW, BINDER HD, 6-32 x 7/8				4
51.12	00025-005	.	.	NUT, HEX, 6-32				4
51.14	00005-002	.	.	WASHER, EXT. TOOTH LOCK #6				4
51.15	00021-061	.	.	SCREW, BINDER HD, 8-32 x 1/4				1
51.16	00002-008	.	.	WASHER, FLAT #8				1
51.17	00003-019	.	.	WASHER, LOCK, SPLIT RING #8				1

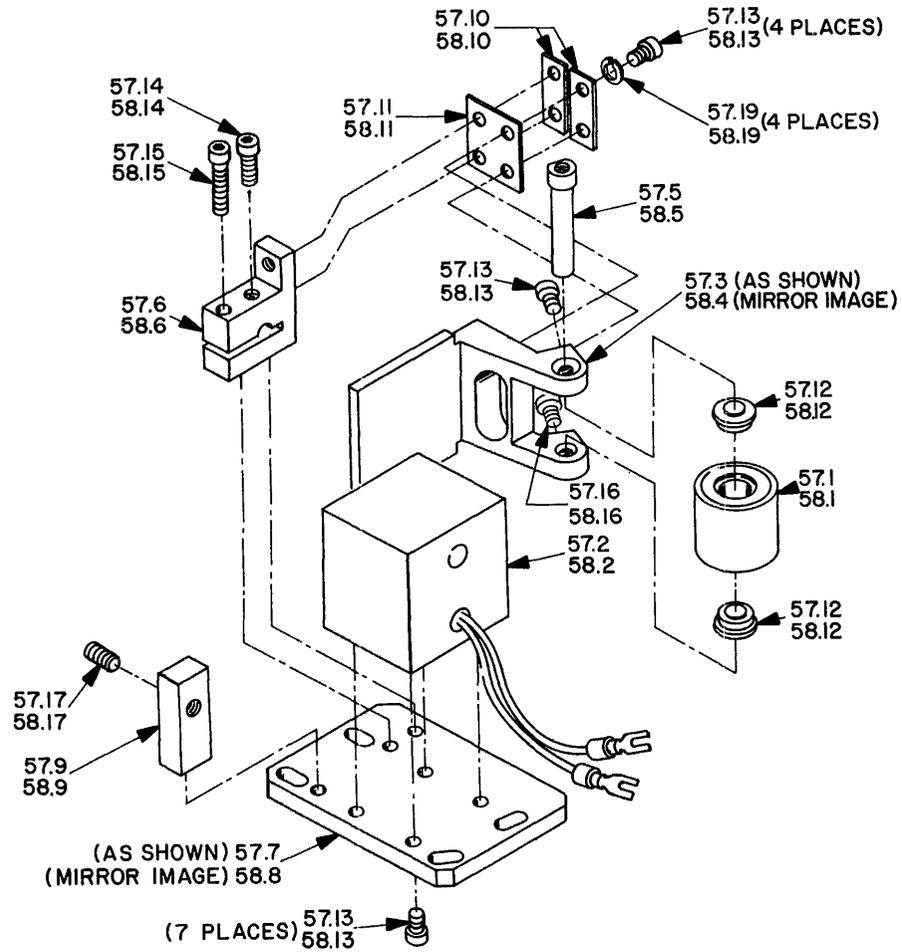


ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.	
		1	2	3	4	5	6		
52	10125-5	.VACUUM SWITCH ASSEMBLY						VS3	1
52.2	10123-1	. .BODY, ASSEMBLY (N/C)							1
52.2.1	10126-0	. . .BODY							1
52.2.2	10128-0	. . .CONTACT, MOVABLE							1
52.2.3	10127-0	. . .CONTACT, FIXED							1
52.2.5	00002-004	. . .WASHER, FLAT #4							2
52.2.6	00025-004	. . .NUT, HEX, 4-40							2
52.2.8	00021-018	. . .SCREW, BINDER HD, 4-40 x 1/4							1
52.2.10	10149-0	. . .RETAINER, VACUUM SWITCH CONTACT							2
52.2.11	00023-008	. . .SCREW, CAP, 4-40 x 5/8							2
52.3	10121-0	. .DIAPHRAGM ASSEMBLY							1
52.6	10133-0	. .NIPPLE, THD							2
52.7	10130-0	. .BRACKET							1
52.8	10129-0	. .SPACER							1
52.10	00002-006	. .WASHER, PLAIN #6							4
52.11	00021-050	. .SCREW, BINDER HD, 6-32 x 7/8							4
52.12	00025-005	. .NUT, HEX, 6-32							4
52.14	00005-002	. .WASHER, EXT. TOOTH LOCK #6							4
52.15	00021-061	. .SCREW, BINDER HD, 8-32 x 1/4							1
52.16	00002-008	. .WASHER, FLAT #8							1
52.17	00003-019	. .WASHER, LOCK, SPLIT RING, #8							1
53	10125-6	.VACUUM SWITCH ASSEMBLY						VS5	1
53.1	10123-0	. .BODY, ASSEMBLY (N/O)							1
53.1.1	10126-0	. . .BODY							1
53.1.2	10128-0	. . .CONTACT, MOVABLE							1
53.1.3	10127-0	. . .CONTACT, FIXED							1
53.1.4	00023-007	. . .SCREW, CAP, 4-40 x 1/2							1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
53.1.5	00002-004	.	.	.	WASHER, FLAT #4			2
53.1.6	00025-004	.	.	.	NUT, HEX, 4-40			2
53.1.8	00021-018	.	.	.	SCREW, BINDER HD, 4-40 x 1/4			1
53.1.10	10149-0	.	.	.	RETAINER, VACUUM SWITCH CONTACT			2
53.1.11	00023-008	.	.	.	SCREW, CAP, 4-40 x 5/8			1
53.3	10121-0	.	.	.	DIAPHRAGM ASSEMBLY			1
53.6	10133-0	.	.	.	NIPPLE, THD			1
53.7	10130-0	.	.	.	BRACKET			1
53.8	10129-0	.	.	.	SPACER			1
53.10	00002-006	.	.	.	WASHER, PLAIN #6			4
53.11	00021-050	.	.	.	SCREW, BINDER HD, 6-32 x 7/8			4
53.12	00025-005	.	.	.	NUT, HEX, 6-32			4
53.13	00021-134	.	.	.	SCREW, BINDER HD, 1/4-28 x 1/4			1
53.14	00005-002	.	.	.	WASHER, EXT. TOOTH LOCK #6			4
54	10125-7	.	.	.	VACUUM SWITCH ASSEMBLY		VS6	1
54.1	10123-0	.	.	.	BODY ASSEMBLY (N/O)			1
54.1.1	10126-0	.	.	.	BODY			1
54.1.2	10128-0	.	.	.	CONTACT, MOVABLE			1
54.1.3	10127-0	.	.	.	CONTACT, FIXED			1
54.1.4	00023-007	.	.	.	SCREW, CAP, 4-40 x 1/2			1
54.1.5	00002-004	.	.	.	WASHER, FLAT #4			2
54.1.6	00025-004	.	.	.	NUT, HEX, 4-40			2
54.1.8	00021-018	.	.	.	SCREW, BINDER HD, 4-40 x 1/4			1
54.1.10	10149-0	.	.	.	RETAINER, VACUUM SWITCH CONTACT			2
54.1.11	00023-008	.	.	.	SCREW, CAP, 4-40 x 5/8			1

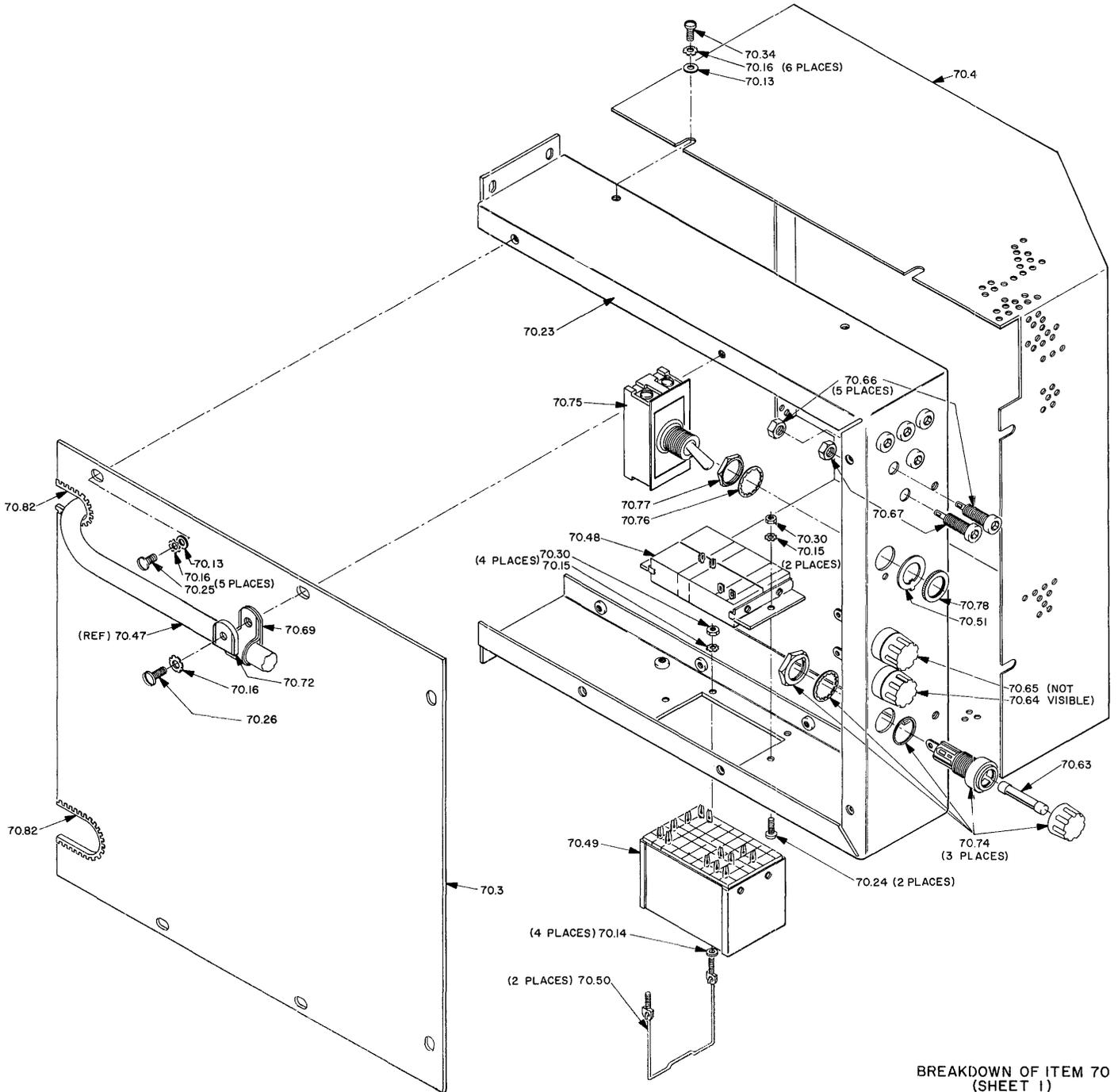
CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT



BREAKDOWN OF ITEMS 57 AND 58.
ITEM 57 IS SHOWN. ITEM 58 IS
ASSEMBLED AS A MIRROR IMAGE.

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
54.3	10121-0	.	.	DIAPHRAGM ASSEMBLY				1
54.6	10133-0	.	.	NIPPLE, THD				1
54.7	10130-0	.	.	BRACKET				1
54.8	10129-0	.	.	SPACER				1
54.10	00002-006	.	.	WASHER, PLAIN #6				4
54.11	00021-050	.	.	SCREW, BINDER HD, 6-32 x 7/8				4
54.12	00025-005	.	.	NUT, HEX, 6-32				4
54.13	00021-134	.	.	SCREW, BINDER HD, 1/4-28 x 1/4				1
54.14	00005-002	.	.	WASHER, EXT. TOOTH LOCK #6				4
55	10151-0	.	.	FASTENER, ADJ. PAWL				1
56	10148-0	.	.	BLOCK, ACTUATOR, ADJUSTING				2
57	10135-0	.	.	ACTUATOR ASSEMBLY				1
57.1	10136-0	.	.	PINCH ROLLER				1
57.2	10137-0	.	.	HOUSING ASSEMBLY, COIL				1
57.3	10140-0	.	.	YOKE				1
57.5	10141-0	.	.	SHAFT, PINCH ROLLER				1
57.6	10142-0	.	.	BLOCK, SPRING MTG.				1
57.7	10143-0	.	.	BASE, MOUNTING				1
57.9	10144-0	.	.	POST, STOP				1
57.10	10145-0	.	.	PLATE, SPRING				2
57.11	10146-0	.	.	SPRING				1
57.12	00010-004	.	.	BEARING, BALL, SEALED (MPB S5632FCZZELG-20)				2
57.13	00023-005	.	.	SCREW, SOC. HD. CAP, 4-40 x 1/4				12
57.14	00023-007	.	.	SCREW, SOC. HD. CAP, 4-40 x 1/2				1
57.15	00023-008	.	.	SCREW, SOC. HD. CAP, 4-40 x 5/8				1
57.16	00023-067	.	.	SCREW, SOC. HD. CAP, 4-40 x 5/16				1
57.17	00024-033	.	.	SCREW, HEX SOCKET SET, 10-32 x 3/8, SPECIAL				1
57.19	00003-002	.	.	WASHER, HELICAL SPRING LOCK, #4				4

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

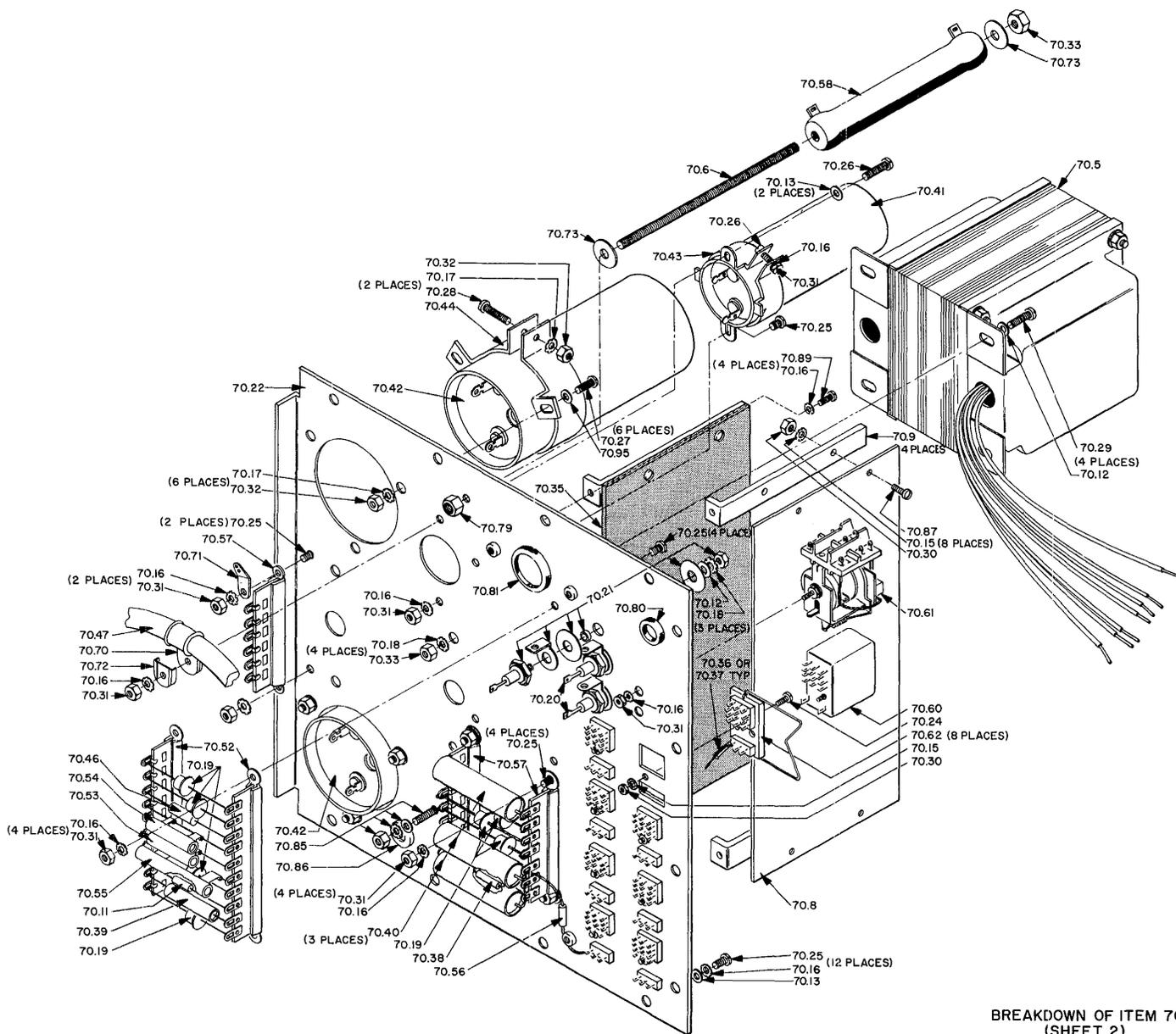


BREAKDOWN OF ITEM 70
(SHEET 1)



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
58	10135-1	.ACTUATOR ASSEMBLY	1
58.1	10136-0	. .PINCHROLLER	1
58.2	10137-0	. .HOUSING ASSEMBLY, COIL	1
58.4	10140-1	. .YOKE	1
58.5	10141-0	. .SHAFT, PINCHROLLER	1
58.6	10142-0	. .BLOCK, SPRING MTG.	1
58.8	10143-1	. .BASE, MOUNTING	1
58.9	10144-0	. .POST, STOP	1
58.10	10145-0	. .PLATE, SPRING	2
58.11	10146-0	. .SPRING	1
58.12	00010-004	. .BEARING, BALL, SEALED (MPB S5632FCZZELG-20)	2
58.13	00023-005	. .SCREW, SOC. HD. CAP, 4-40 x 1/4	12
58.14	00023-007	. .SCREW, SOC. HD. CAP, 4-40 x 1/2	1
58.15	00023-008	. .SCREW, SOC. HD. CAP, 4-40 x 5/8	1
58.16	00023-067	. . SCREW, SOC. HD. CAP, 4-40 x 5/16	1
58.17	00024-033	. . SCREW, HEX SOCKET SET, 10-32 x 3/8 SPECIAL	1
58.19	00003-002	. . WASHER, HELICAL SPRING LOCK, #4	4
60	10348-0	.RETAINER	2
61	10210-0	.CATCH BALL, TRANSPORT	2
62	10211-0	.HINGE PIVOT, TRANSPORT	2
63	10217-0	.HINGE BLOCK, RACK (LOWER)	1
64	10218-0	.HINGE BLOCK, TRANSPORT	1
65	10323-0	.CLIP, HEAD GATE	1
66	10324-0	.SPRING, HEAD GATE ROD	1
67	10326-0	.ROD, HEAD GATE OPERATING	1
68	00002-004	.WASHER, PLAIN #4	21
69	00002-009	.WASHER, PLAIN #10	8
70	10150-1	.TRANSPORT CONTROL ASSEMBLY	1
70.3	10154-0	. .COVER, BOTTOM	1
70.4	10155-0	. .COVER, TOP	1
70.5	10156-0	. .TRANSFORMER	1

T1



BREAKDOWN OF ITEM 70
(SHEET 2)

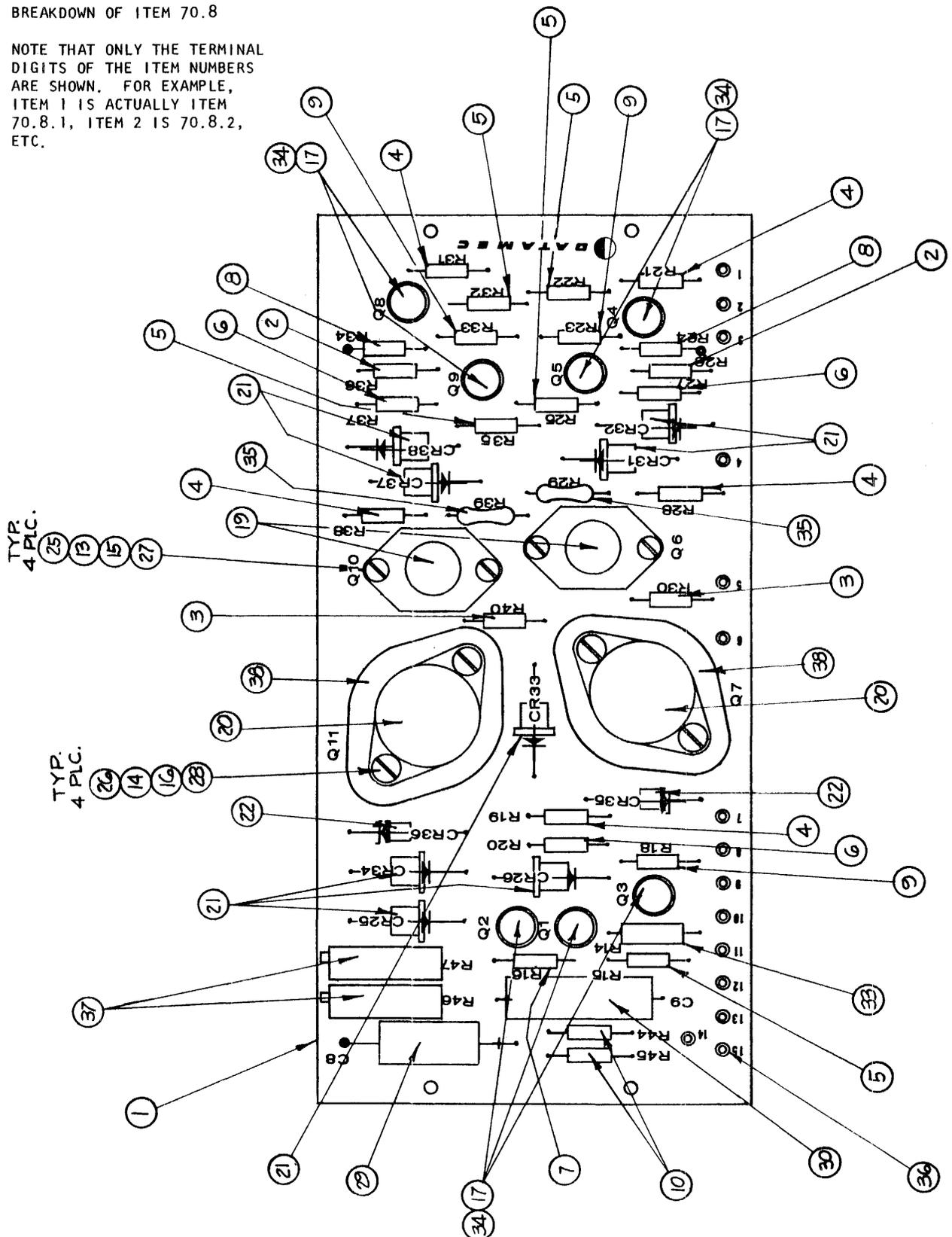


ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
70.6	10158-0	.	.	ROD, THREADED, 10-32 x 4-1/2				1
70.8	10160-0	.	.	CIRCUIT BOARD ASSEMBLY				1
70.8.1	10161-0	.	.	CIRCUIT BOARD				1
70.8.2	00001-037	.	.	RESISTOR, FIXED COMP. 330, 1/2W 5%		R26, 36		2
70.8.3	00001-047	.	.	RESISTOR, FIXED COMP. 820, 1/2W 5%		R30, 40		2
70.8.4	00001-049	.	.	RESISTOR, FIXED COMP. 1K, 1/2W, 5%		R19, 21, 28, 31, 38		5
70.8.5	00001-061	.	.	RESISTOR, FIXED COMP. 3.3K, 1/2W, 5%		R15, 22, 25 32, 35		5
70.8.6	00001-067	.	.	RESISTOR, FIXED COMP. 5.6K, 1/2W, 5%		R20, 27, 37		3
70.8.7	00001-073	.	.	RESISTOR, FIXED COMP. 10K, 1/2W, 5%		R16		1
70.8.8	00001-077	.	.	RESISTOR, FIXED COMP. 15K, 1/2W, 5%		R24, 34		2
70.8.9	00001-079	.	.	RESISTOR, FIXED COMP. 18K, 1/2W, 5%		R18, 23, 33		3
70.8.10	00001-085	.	.	RESISTOR, FIXED COMP. 33K, 1/2W, 5%		R44, 45		2
70.8.13	00002-004	.	.	WASHER, PLAIN #4				4
70.8.14	00002-006	.	.	WASHER, PLAIN #6				4
70.8.15	00005-001	.	.	WASHER, EXT. TOOTH LOCK #4				4
70.8.16	00005-002	.	.	WASHER, EXT. TOOTH LOCK #6				4
70.8.17	00011-001	.	.	TRANSISTOR, 2N1305		Q1, 2, 3, 4, 5, 8, 9		7
70.8.19	00012-001	.	.	TRANSISTOR, 2N1183		Q6, 10		2
70.8.20	00012-002	.	.	TRANSISTOR, 2N1545		Q7, 11		2
70.8.21	00019-001	.	.	DIODE, IN1692, 100 PIV, 600 MA		CR25, 26, 31, 32, 33, 34, 37, 38		8
70.8.22	00020-002	.	.	DIODE, ZENER, IN1788, 51V, 1W, 10%		CR35, 36		2
70.8.25	00021-019	.	.	SCREW, BINDER HD, 4-40 x 5/16				4
70.8.26	00021-042	.	.	SCREW, BINDER HD, 6-32 x 3/8				4
70.8.27	00025-004	.	.	NUT, HEX, 4-40				4
70.8.28	00025-005	.	.	NUT, HEX, 6-32				4
70.8.29	00033-002	.	.	CAPACITOR, ELECTROLYTIC TUBULAR, 10µf, 50V C8				1

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT

BREAKDOWN OF ITEM 70.8

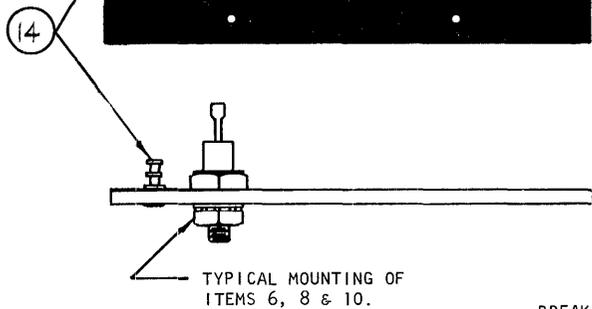
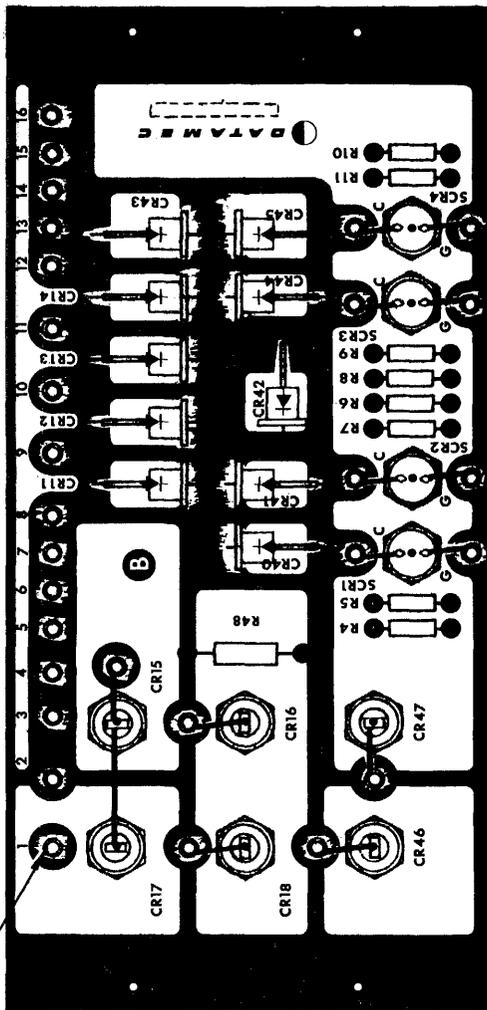
NOTE THAT ONLY THE TERMINAL DIGITS OF THE ITEM NUMBERS ARE SHOWN. FOR EXAMPLE, ITEM 1 IS ACTUALLY ITEM 70.8.1, ITEM 2 IS 70.8.2, ETC.





ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
70.8.30	00033-003	.	.	.	CAPACITOR, ELECTROLYTIC TUBULAR, 20 μ F, 50V	C9	1	
70.8.33	00037-047	.	.	.	RESISTOR, FIXED COMP. 820, 1W, 5%	R14	1	
70.8.34	00047-001	.	.	.	SPACER, SPECIAL, TRANSISTOR		2	
70.8.35	00051-002	.	.	.	RESISTOR, FIXED, W.W., 470, 3W	R29, 39	2	
70.8.36	00070-001	.	.	.	LUG, TURRET, 3/32 DIA. x 9/32 HIGH		15	
70.8.37	00071-001	.	.	.	RESISTOR, VARIABLE, 10K	R46, 47	2	
70.8.38	00072-002	.	.	.	HEAT SINK, POWER TRANSISTOR		2	
70.9	10309-0	.	.	.	BRACKET, CIRCUIT BOARD MOUNTING		4	
70.11	00001-057	.	.	.	RESISTOR, 1/2W, 2.2K, 5%	R49	1	
70.12	00002-009	.	.	.	WASHER, PLAIN, #10		7	
70.13	00002-006	.	.	.	WASHER, PLAIN, #6		25	
70.14	00002-004	.	.	.	WASHER, PLAIN #4		4	
70.15	00005-001	.	.	.	WASHER, EXT. TOOTH #4		22	
70.16	00005-002	.	.	.	WASHER, EXT. TOOTH #6		42	
70.17	00005-003	.	.	.	WASHER, EXT. TOOTH #8		8	
70.18	00005-004	.	.	.	WASHER, EXT. TOOTH #10		7	
70.19	00019-001	.	.	.	DIODE, IN1692	CR1, 2, 5, 7, 21, 22, 23	7	
70.20	00019-003	.	.	.	DIODE, IN3569	CR3, 4	2	
70.21	00020-001	.	.	.	DIODE, ZENER, IN1593	CR6	1	
70.22	10408-0	.	.	.	PLATE, CHASSIS		1	
70.23	10409-0	.	.	.	FRAME, CHASSIS		1	
70.24	00021-019	.	.	.	SCREW, BINDER HEAD 4-40 x 5/16		10	
70.25	00021-040	.	.	.	SCREW, BINDER HEAD 6-32 x 1/4		28	
70.26	00021-046	.	.	.	SCREW, BINDER HEAD 6-32 x 5/8		2	
70.27	00021-063	.	.	.	SCREW, BINDER HEAD 8-32 x 3/8		6	
70.28	00021-067	.	.	.	SCREW, BINDER HEAD 8-32 x 5/8		2	
70.29	00021-088	.	.	.	SCREW, BINDER HEAD 10-32 x 1/2		4	
70.30	00025-004	.	.	.	NUT, HEX, 4-40		22	
70.31	00025-005	.	.	.	NUT, HEX, 6-32		16	
70.32	00025-006	.	.	.	NUT, HEX, 8-32		8	

CAT. NO. 10000-0 THRU -9, TAPE TRANSPORT



SCHEM REF. NUMBER	REF. NO./ITEM NO. CROSS INDEX									
	-0									
R4	4									
R5	3									
R6	4									
R7	3									
R8	4									
R9	3									
R10	4									
R11	3									
R4B	12									
CR11	9									
CR12	9									
CR13	9									
CR14	9									
CR15	10									
CR16	10									
CR17	10									
CR18	10									
CR40	9									
CR41	9									
CR42	9									
CR43	9									
CR44	9									
CR45	9									
CR46	8									
CR47	8									
SCR1	6									
SCR2	6									
SCR3	6									
SCR4	6									

BREAKDOWN OF ITEM 70.35

NOTE THAT ONLY THE TERMINAL
DIGITS OF THE ITEM NUMBERS
ARE SHOWN. FOR EXAMPLE,
ITEM 1 IS ACTUALLY 70.35.1,
ITEM 3 IS 70.35.3, ETC.



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.	
		1	2	3	4	5	6		
70.33	00025-007	. .	NUT, HEX	10-32				5	
70.34	00021-042	. .	SCREW, BINDING HD,	6-32 x 3/8				6	
70.35	10303-0	. .	CIRCUIT BOARD ASSEMBLY,	REEL SERVO				1	
70.35.1	10304-0	. . .	CIRCUIT BOARD					1	
70.35.3	00001-017	. . .	RESISTOR, FIXED COMP	47Ω 5% 1/2W	R5,7,9,11			4	
70.35.4	00001-041	. . .	RESISTOR, FIXED COMP	470Ω 5% 1/2W	R4,6,8,10			4	
70.35.6	00008-003	. . .	RECTIFIER, SILICONE, GE	C12B	SCR1,2,3,4			4	
70.35.8	00019-005	. . .	DIODE, RCA	40108	CR46,47			2	
70.35.9	00019-011	. . .	DIODE, IN1221		CR11 THRU 14, 40 THRU 45			10	
70.35.10	00019-012	. . .	DIODE, RCA	40111	CR15 THRU 18			4	
70.35.12	00037-089	. . .	RESISTOR, FIXED COMP	47K 1W 5%	R48			1	
70.35.14	00070-007	. . .	LUG, TURRET					29	
70.36	00032-006	. .	TUBE, INSL, (SPAGHETTI)	#12				A/R	
70.37	00032-007	. .	TUBE, INSL, (SPAGHETTI)	#10				A/R	
70.38	00001-033	. .	RESISTOR, COMP	1/2W 220Ω	R52			1	
70.39	00033-002	. .	CAPACITOR, 10μf	50V	C10			1	
70.40	00033-004	. .	CAPACITOR, 100μf	50V	C6,7,12			3	
70.41	00034-001	. .	CAPACITOR, 1200μf	40V	C1			1	
70.42	00034-002	. .	CAPACITOR, 4300μf	40V	C2,3			2	
70.43	00035-001	. .	CLAMP, CAPACITOR, SPRAGUE	CMC-22				1	
70.44	00035-002	. .	CLAMP, CAPACITOR, SPRAGUE	CMC-32				2	
70.46	00037-005	. .	RESISTOR, 1W	15Ω 5%	R1			1	
70.47	10410-0	. .	HARNESS ASSEMBLY					1	
			NOTE: IN -9 TRANSPORTS, THIS HARNESS MAY BE MODIFIED. SEE PARTS LIST FOR 10650 DC CAPSTAN SERVO						
70.47.6	00043-002	. . .	CONNECTOR, ELCO	RM22424	P1			1	
70.48	00040-003	. .	CONNECTOR, FEMALE RECEPTACLE,	ELCO RF22820-5	J5			1	
70.49	00043-003	. .	CONNECTOR, MALE PLUG,	ELCO RM22824	P5			1	
70.50	00044-002	. .	RETAINER, ELCO	#1302				1	



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
70.51	00044-005	. .	RETAINER,	LOCK RING,	SWITCH			1
70.52	00049-002	. .	TERMINAL STRIP,	CINCH JONES 2010		TS2,3		2
70.53	00052-001	. .	RESISTOR,	5W 10Ω 5%		R3		1
70.54	00052-002	. .	RESISTOR,	5W 75Ω 5%		R2		1
70.55	00053-001	. .	RESISTOR,	10W 1Ω 5%		R41		1
70.56	00001-009	. .	RESISTOR,	1/2W 22Ω		R51		1
70.57	00049-007	. .	TERMINAL STRIP,	CINCH JONES 2007		TS1,4,5		3
70.58	00054-001	. .	RESISTOR,	50W 10Ω 5%		R42		1
70.60	00055-001	. .	RELAY,	24V 4PDT		K1,3,4,5,6,7,8,9		8
70.61	00055-002	. .	RELAY,	24V 3PDT		K2		1
70.62	00056-001	. .	SOCKET,	RELAY 16 CONTACT				8
70.63	00057-007	. .	FUSE 3A 3AG QUICK BLOW			F3		1
70.64	00057-018	. .	FUSE, 5A 3AG SLOBLOW			F2		1
70.65	00057-016	. .	FUSE, 3A 3AG SLOBLOW			F1		1
70.66	00058-015	. .	JACK, TEST, RED			TP1,2,3,4,5		5
70.67	00058-016	. .	JACK, TEST, BLACK			TP6		1
70.69	00059-005	. .	CLAMP, CABLE, 3/8					1
70.70	00059-009	. .	CLAMP, CABLE, 5/8					1
70.71	00061-003	. .	LUG, SOLDER #6					1
70.72	00065-002	. .	WASHER, SPECIAL, D SHAPED, #6					2
70.73	00065-005	. .	WASHER, SPECIAL CENTERING #10					2
70.74	00069-001	. .	FUSEHOLDER					3
70.75	00073-006	. .	SWITCH, TOGGLE			S2		1
70.76	00006-012	. .	WASHER, INT TOOTH LOCK 15/32					1
70.77	00025-012	. .	NUT, HEX 15/32-32					1
70.78	00110-002	. .	NUT, KNURLED RING, 15/32-32					1
70.79	00089-002	. .	NUT, SELF LOCKING, HEX, 10-32					1
70.80	00116-001	. .	BUSHING, PLASTIC, 3/8 ID					1
70.81	00116-004	. .	BUSHING, PLASTIC, 11/16 ID					1
70.82	00036-025	. .	GROMMET, NYLON STOCK, CATERPILLER, N.M.C.651-HA					A/R



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
70.85	00120-001	. .	SUPPRESSOR,	G.E.	THYRECTOR	6RS21SA6D6	1	
70.86	00116-005	. .	BUSHING,	PLASTIC,	1/4	ID	1	
70.87	00021-020	. .	SCREW,	BINDING	HD	4-40 x 3/8	4	
70.88	00021-022	. .	SCREW,	BINDING	HD	4-40 x 1/2	4	
70.89	00021-042	. .	SCREW,	BINDING	HD	6-32 x 3/8	4	
70.90	00021-050	. .	SCREW,	BINDING	HD	6-32 x 7/8	1	
70.91	00045-007	. .	SPACER,	PLAIN,	#6	ID x 3/8 OD x 1/4 LG	1	
70.95	00002-008	. .	WASHER,	PLAIN	#10		6	
71	10217-1	. .	HINGE	BLOCK,	RACK	(UPPER)	1	
72	00003-002	. .	WASHER,	HELICAL	SPRING	LOCK, #4	32	
73	00003-005	. .	WASHER,	HELICAL	SPRING	LOCK, #10	8	
74	00003-008	. .	WASHER,	HELICAL	SPRING	LOCK, 5/16	8	
77	00005-001	. .	WASHER,	EXTERNAL	TOOTH	LOCK, #4	53	
78	00005-004	. .	WASHER,	EXTERNAL	TOOTH	LOCK, 10	37	
81	00006-002	. .	WASHER,	INTERNAL	TOOTH,	#4	4	
82	00006-012	. .	WASHER,	INTERNAL	TOOTH,	15/32	1	
84	00021-017	. .	SCREW,	BINDING	HD,	4-40 x 3/16	9	
85	00021-018	. .	SCREW,	BINDING	HD,	4-40 x 1/4	5	
86	00021-019	. .	SCREW,	BINDING	HD,	4-40 x 5/16	4	
87	00021-020	. .	SCREW,	BINDING	HD,	4-40 x 3/8	27	
88	00021-022	. .	SCREW,	BINDING	HD,	4-40 x 1/2	8	
89	00021-026	. .	SCREW,	BINDING	HD,	4-40 x 3/4	2	
90	00021-038	. .	SCREW,	BINDING	HD,	4-40 x 1-1/2	6	
91	00021-087	. .	SCREW,	BINDING	HD,	10-32 x 3/8	4	
92	00021-089	. .	SCREW,	BINDING	HD,	10-32 x 5/8	8	



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
93	00021-090	.SCREW, BINDING HD, 10-32 x 3/4	18
94	00021-091	.SCREW, BINDING HD, 10-32 x 7/8	7
97	00023-008	.SCREW, HEX SOCKET, 4-40 x 5/8	2
98	00023-007	.SCREW, HEX SOCKET, 4-40 x 1/2	14
99	00023-006	.SCREW, HEX SOCKET, 4-40 x 3/8	2
100	00023-028	.SCREW, HEX SOCKET, 10-32 x 5/8	4
103	00023-030	.SCREW, HEX SOCKET, 10-32 x 7/8	4
104	00024-006	.SCREW, HEX SOCKET SET, 4-40 x 1/4	1
105	00024-005	.SCREW, HEX SOCKET SET, 4-40 x 3/16 -2,-3,-6,-7,-8:	1
106	00024-027	.SCREW, HEX SOCKET SET, 10-32 x 1/4 -0,-1,-4,-5: NOTE: -0,-1,-4, & -5 VERSIONS CONSTRUCTED FOR 50 CPS A-C OPERATION DO NOT USE ITEM 106. SUBSTITUTE ITEM 105.	1
107	00025-004	.NUT, HEX, 4-40	18
108	00025-006	.NUT, HEX, 8-32	1
110	00025-012	.NUT, HEX, 15/32-32	1
112	00043-008	.CONNECTOR, MALE PLUG, 4 PIN P6	1
113	00050-005	.TERMINAL STRIP, SCREW TYPE, 4 CONTACT TB2, 3	2
114	00050-006	.TERMINAL STRIP, SCREW TYPE, 5 CONTACT TB5	1
116	00050-004	.TERMINAL STRIP, SCREW TYPE, 3 CONTACT TB1	1
117	00059-002	.CLAMP, CABLE, PLASTIC, 3/16	5
118	00059-003	.CLAMP, CABLE, PLASTIC, 1/4	1
119	00059-004	.CLAMP, CABLE, PLASTIC, 5/16	1
120	00059-005	.CLAMP, CABLE, PLASTIC, 3/8	4

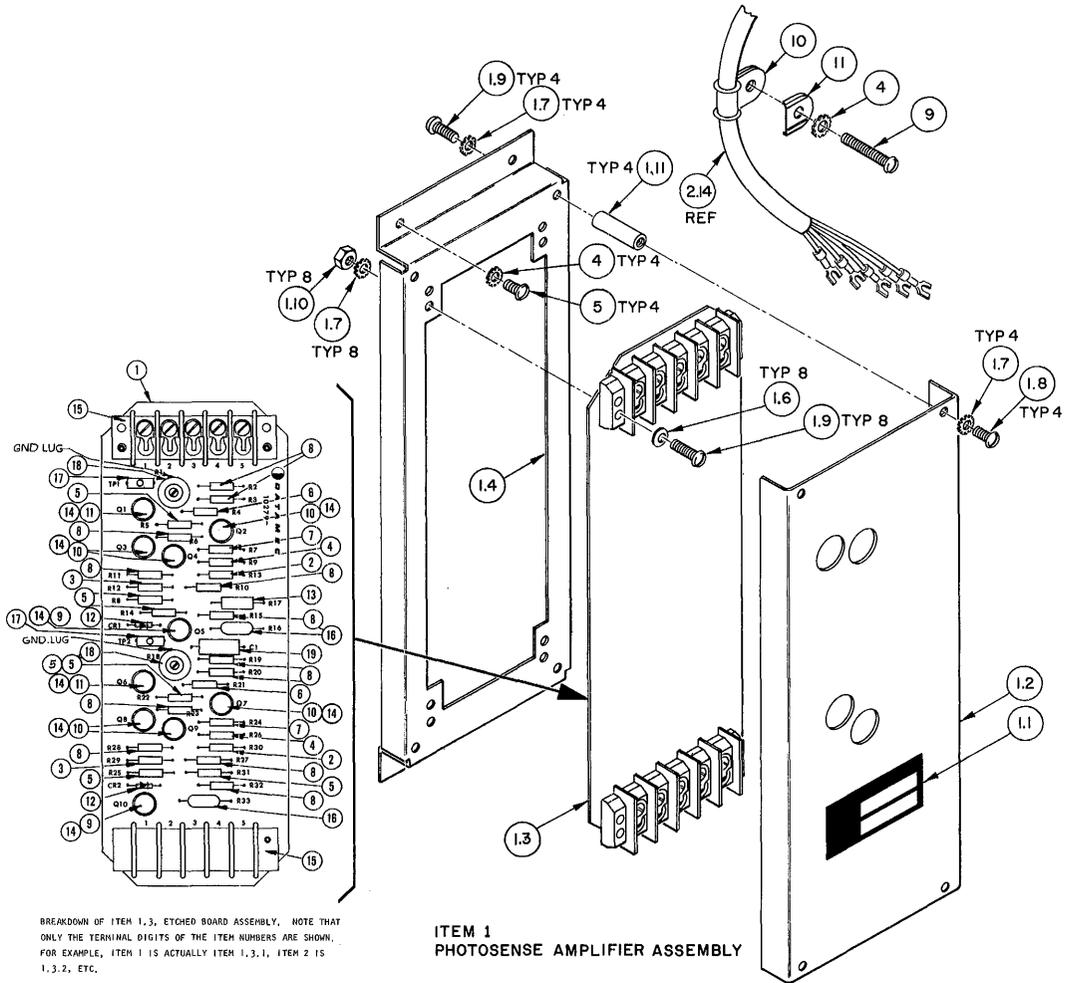


ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
		1 2 3 4 5 6	
123	00060-001	.LUG, SOLDERLESS, 22 GA	11
124	00060-002	.LUG, SOLDERLESS, 16 GA	3
125	00060-004	.LUG, SOLDERLESS, SLEEVE, WIRE	9
126	00060-006	.LUG, SOLDERLESS, INSULATED RING, 18-22	16
128	00063-005	.RING, EXT. E. RING, TRUARC 5133-18-MD	2
131	00065-001	.WASHER, SPECIAL, #4	9
132	00065-004	.WASHER, SPECIAL, #10	2
134	00073-001	.SWITCH, LEVER	1
136	00087-001	.PIN, GROOVED, 1/8 x 3/4	2
138	00088-001	.SCREW, BINDING HD, SELF TAPPING, 4-40 x 1/4	8
140	00090-001	.FITTING, "T", PNEUMATIC, 1/4	1
141	00091-001	.CATCH, SPRING	8
143	00092-001	.TUBING, PLASTIC, 1/4 ID x 3/8 OD	A/R
145	00093-001	.REEL, MAGNETIC TAPE, 1/2 WIDE x 10-1/2 DIA.	1
146	00096-001	.BELT, .010 TO .012, 1/2 x 30, ENDLESS WOVEN	1
148	10001-0	.PLATE, MOUNTING, TAPE TRANSPORT (37.9-45.0 IPS) (SEE NOTE) -0: (SEE NOTE) -6:	1 A/R
149	10001-1	.PLATE, MOUNTING, TAPE TRANSPORT (22.8-37.9 IPS) -1: (SEE NOTE) -6:	1 A/R

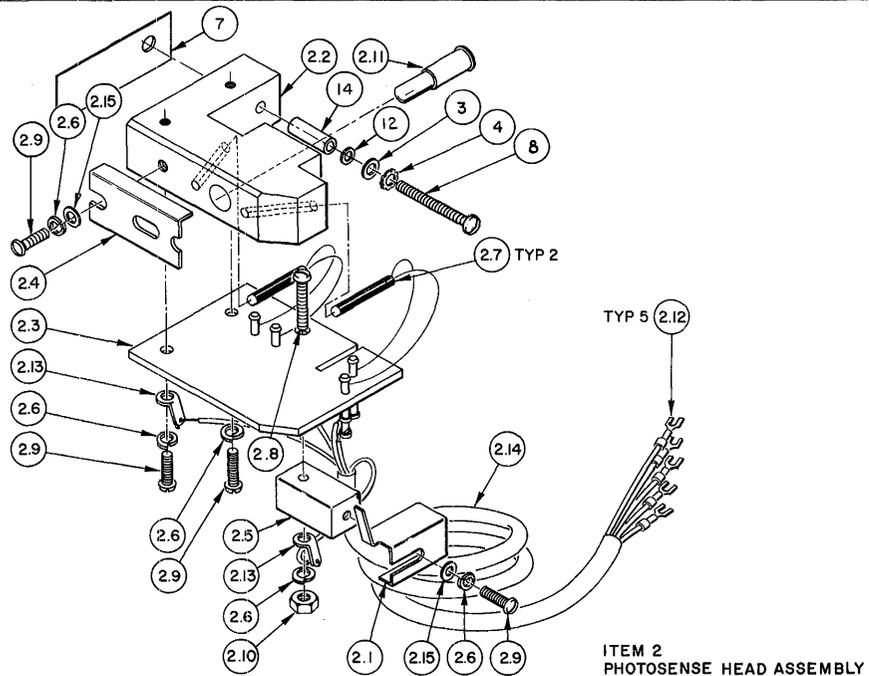
ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
150	10001-2	.PLATE, MOUNTING, TAPE TRANSPORT (3.94-22.8 IPS) (SEE NOTE) -2, -3, -7: (SEE NOTE) -6:						1 A/R
151	10001-3	.PLATE, MOUNTING, TAPE TRANSPORT (3.14-3.94 IPS) -4: (SEE NOTE) -8:						1 A/R
152	10001-4	.PLATE, MOUNTING, TAPE TRANSPORT (1.22-3.14 IPS) (SEE NOTE) -5: (SEE NOTE) -8:						1 A/R
153	10001-5	.PLATE, MOUNTING, TAPE TRANSPORT (1.000-1.222 IPS) (SEE NOTE) -8:						1 A/R
NOTE: -6 AND -8 VERSIONS COVER BROAD SPEED RANGES. DEPENDING UPON THE SPECIFIC SPEED OF THE TRANSPORT, ONE OF SEVERAL TRANSPORT MOUNTING PLATES MAY BE USED. FOR 50 CPS A-C OPERATION, -0 VERSION USES A MODIFIED ITEM 148; -5 VERSION USES ITEM 151; -7 VERSION USES ITEM 149; -6 AND -8 VERSIONS MAY USE ONE OF A NUMBER OF STANDARD OR MODIFIED MOUNTING PLATES. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBER OF YOUR EQUIPMENT TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.								
155	00107-002	.SCREW, SPECIAL, HEX HD, 5/16-18 x 7/8						8
156	00109-008	.CONTACT, AMP						4

ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY. PER ASSY.
	12-20362-10200-0M	COVER DOOR ASSEMBLY	
1	13-20362	. FRAME, COVER DOOR	1
2	10204-0	. PANEL, COVER DOOR	1
3	10205-0	. BLOCK, COVER DOOR	2
4	16-20362	. HANDLE, COVER DOOR	1
5	10207-0	. SHAFT, PIVOT	1
6	10208-0	. ROD, DOOR STOP	1
7	10209-0	. STANDOFF, DOOR STOP	1
8	10007-0	. WASHER, SPECIAL, PLASTIC, .062 THICK	2
9	10007-1	. WASHER, SPECIAL, PLASTIC, .025 THICK	2
10	10213-0	. PANE, COVER DOOR	1
11	10214-0	. BRACKET, DOOR STOP	1
12	10219-0	. HINGE, PIVOT, DOOR	2
13	10005-0	. NAMEPLATE	1
14	00002-004	. WASHER, PLAIN #4	1
15	00002-018	. WASHER, PLAIN 17/64 I.D.	1
16	00006-002	. WASHER, INTERNAL TOOTH LOCK #4	11
19	00021-018	. SCREW, BINDING HEAD, 4-40 x 1/4	6
20	00021-024	. SCREW, BINDING HEAD, 4-40 x 5/8	1
21	00022-020	. SCREW, FLAT HEAD, 4-40 x 3/8	10
22	00022-024	. SCREW, FLAT HEAD, 4-40 x 5/8	6
23	00024-002	. SCREW, HEX SOCKET SET 4-40 x 3/16	2
26	00025-004	. NUT, HEX 4-40	4
27	00039-001	. EXTRUSION, RUBBER, U SHAPE	A/R
28	00039-002	. EXTRUSION, RUBBER FIGURE 8 SHAPE	A/R
29	00063-006	. RING, RETAINING, 1/4 DIA. SHAFT, "E" TYPE	1
31	00089-002	. NUT, SELF-LOCKING, HEX, 10-32	1
32	14-20362	. LATCH, DOOR HANDLE	1
33	15-20362	. BLOCK, PIVOT	2
34	18-20362	. SPRING, DOOR HANDLE	1
35	NONE	. DOWEL PIN, 1/8 DIA X 1 LG	2

CAT. NO. 10270-0, PHOTOCENSE ASSEMBLY



BREAKDOWN OF ITEM 1.3, ETCHED BOARD ASSEMBLY. NOTE THAT ONLY THE TERMINAL DIGITS OF THE ITEM NUMBERS ARE SHOWN. FOR EXAMPLE, ITEM 1 IS ACTUALLY ITEM 1.3.1, ITEM 2 IS 1.3.2, ETC.





ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10270-0	PHOTONSENSE ASSEMBLY						
1	10274-0	. PHOTONSENSE AMPLIFIER ASSEMBLY						1
1.1	10005-0	. . NAMEPLATE						1
1.2	10273-0	. . COVER, PHOTONSENSE						1
1.3	10279-0	. . ETCHED BOARD ASSEMBLY						1
1.3.1	10280-0	. . . ETCHED BOARD, PHOTONSENSE						1
1.3.2	00001-029	. . . RESISTOR, FIXED COMP, 150Ω 1/2W 5% R13,30						2
1.3.3	00001-033	. . . RESISTOR, FIXED COMP, 220Ω 1/2W 5% R12,29						2
1.3.4	00001-037	. . . RESISTOR, FIXED COMP, 330Ω 1/2W 5% R9,26						2
1.3.5	00001-049	. . . RESISTOR, FIXED COMP, 1K 1/2W 5% R5,8,14 22,25,31						6
1.3.6	00001-065	. . . RESISTOR, FIXED COMP, 4.7K 1/2W 5% R4,21						2
1.3.7	00001-069	. . . RESISTOR, FIXED COMP, 6.8K 1/2W 5% R7,24						2
1.3.8	00001-073	. . . RESISTOR, FIXED COMP, 10K 1/2W 5% R2,3,6, 10,11,15, 19,20,23, 27,28,32						12
1.3.9	00011-001	. . . TRANSISTOR, PNP LOW PWR, 2N1305 Q5,10						2
1.3.10	00015-001	. . . TRANSISTOR, NPN LOW PWR, 2N1304 Q2,3,4,7 8,9						6
1.3.11	00017-001	. . . TRANSISTOR, NPN LOW PWR, SIL, T.I. 494 Q1,6						2
1.3.12	00019-009	. . . DIODE, SG921 CR1,2						2
1.3.13	00037-154	. . . RESISTOR, FIXED COMP, 2.7Ω 1W 5% R17						1
1.3.14	00047-001	. . . SPACER, SPECIAL TRANSISTOR						10
1.3.15	00050-003	. . . TERM. STRIP, SCREW TYPE, CINCH JONES 5-140-Y TB1,2						2
1.3.16	00051-001	. . . RESISTOR, FIXED WW, 100Ω 3W R16,33						2
1.3.17	00058-001	. . . JACK, TEST, WHITE TP1,2						2
1.3.18	00071-002	. . . RESISTOR, VARIABLE, 50K 1/4W 20% R1,18						2
1.3.19	00113-011	. . . CAPACITOR, TUB.FILM 0.1μf 200V C1						1
1.4	10272-0	. . CHASSIS						1
1.6	00002-004	. . WASHER, FLAT #4						8
1.7	00005-001	. . WASHER, EXT TOOTH LOCK #4						16
1.8	00021-018	. . SCREW, BINDING HEAD, 4-40 x 1/4						4
1.9	00021-022	. . SCREW, BINDING HEAD, 4-40 x 1/2						12



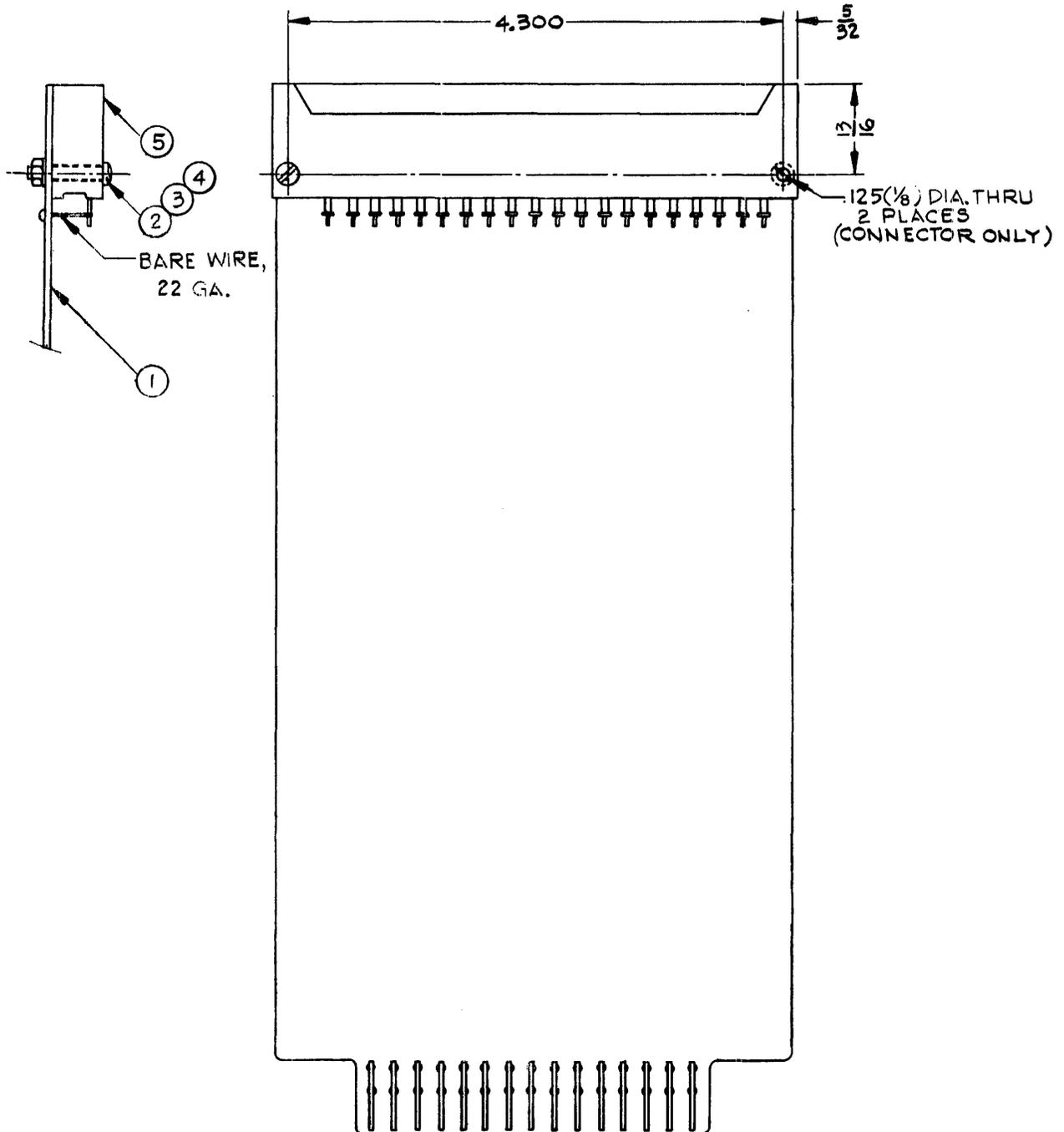
ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
1.10	00025-004	.	.	NUT, HEX, 4-40				8
1.11	00046-004	.	.	SPACER, THREADED, 4-40 x 3/4				4
2	10275-0	.		PHOTONSENSE HEAD ASSEMBLY				1
2.1	10282-0	.	.	CONTACT, LAMP				1
2.2	10277-0	.	.	BASE, HEAD				1
2.3	10278-0	.	.	BOARD, TERMINAL				1
2.4	10283-0	.	.	MASK, PHOTONSENSE HEAD				1
2.5	10284-0	.	.	BLOCK, CONTACT, MTG.				1
2.6	00003-016	.	.	WASHER, SPRING LOCK #2				5
2.7	00009-001	.	.	PHOTOELECTRIC DIODE, T1 H-38				2
2.8	00021-006	.	.	SCREW, BINDING HEAD, 2-56 x 7/16				1
2.9	00021-003	.	.	SCREW, BINDING HEAD, 2-56 x 1/4				4
2.10	00025-003	.	.	NUT, HEX, 2-56				1
2.11	00048-001	.	.	LAMP, INCANDESCENT 6V SINGLE CONT.				1
2.12	00060-001	.	.	LUG, SOLDERLESS, 1/4 SLOTTED TONGUE				5
2.13	00061-001	.	.	LUG, SOLDER, #2				2
2.14	00067-002	.	.	CABLE, 5 COND, BELDEN 8445				A/R
2.15	00002-002	.	.	WASHER, PLAIN #2				2
3	00002-004	.		WASHER, PLAIN #4				1
4	00005-001	.		WASHER, EXT TOOTH LOCK #4				6
5	00021-020	.		SCREW, BINDING HEAD, 4-40 x 3/8				4
7	10298-0	.		INSULATOR, PHOTONSENSE HEAD				1
8	00021-026	.		SCREW, BINDING HEAD, 4-40 x 3/4				1
9	00021-030	.		SCREW, BINDING HEAD, 4-40 x 1				1
10	00059-002	.		CLAMP, CABLE, PLASTIC, 3/16				1
11	00065-001	.		WASHER, SPECIAL, "D" CABLE CLAMP RETAINING #4				1
12	00065-008	.		WASHER, SPECIAL, FIBRE #6				1
14	00092-002	.		TUBING, #10 TEFLON				A/R



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10320-0	EXTENDER CARD						
1	10321-0	. CIRCUIT BOARD						1
2	00006-002	. WASHER, INT TOOTH LOCK #4						2
3	00021-024	. SCREW, BINDING HEAD, 4-40 x 5/8						2
4	00025-004	. NUT, HEX, 4-40						2
5	00040-007	. CONNECTOR, 21 PIN, ELCO						1



CAT. NO. 10320-0, EXTENDER CARD



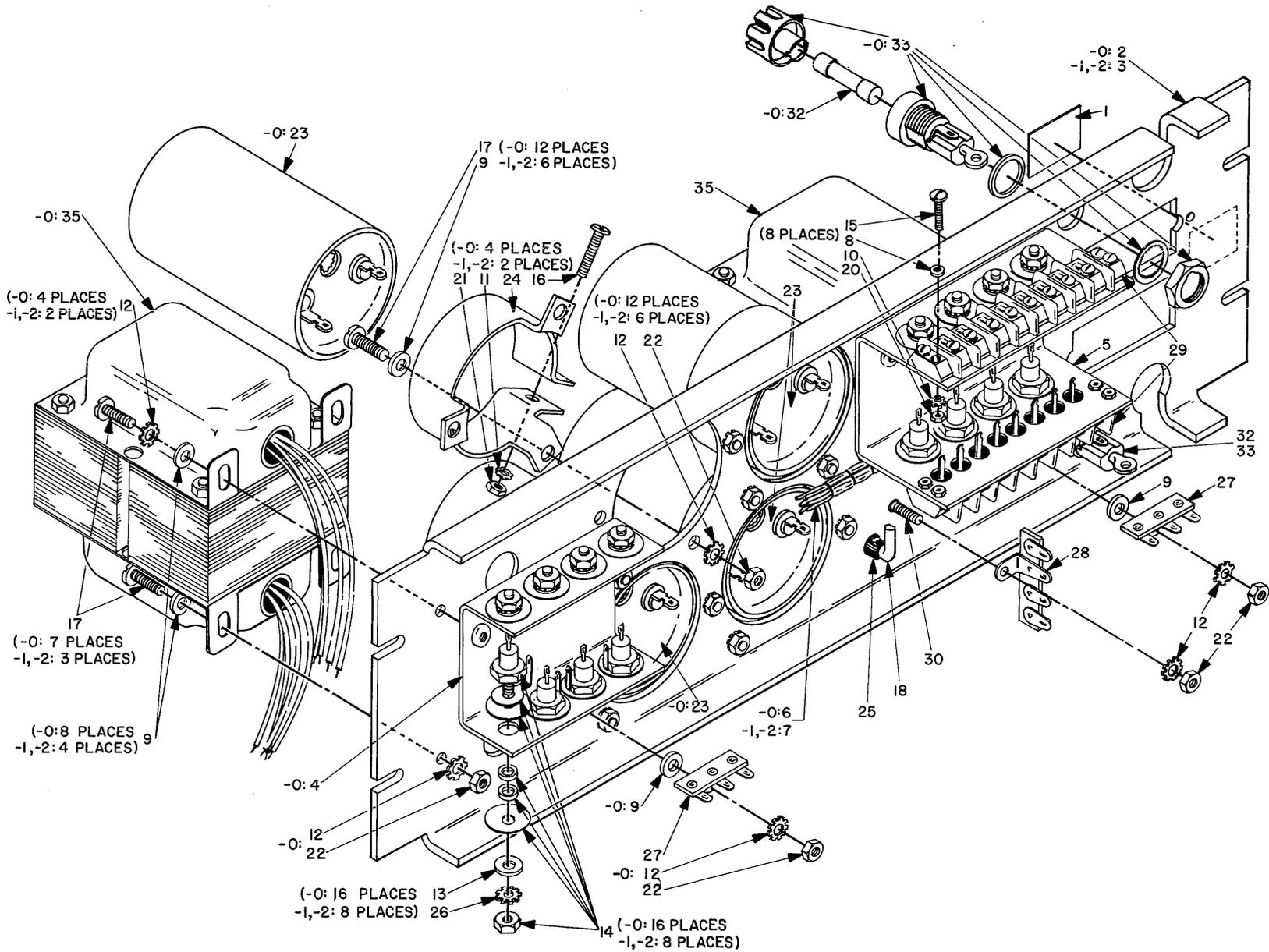
NOTES:
 1. Dimensions shown are for the location of holes in connector (Item 5) only.



ATA M E G

D 2020
S E R I E S

CAT. NO. 10330-0, -1, -2, POWER SUPPLY ASSEMBLY,
SIGNAL ELECTRONICS



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10330-0, -1, -2	POWER SUPPLY ASSEMBLY, SIGNAL ELECTRONICS						
1	10008-0	.NAMEPLATE						1
2	10331-0	.CHASSIS						1
						-0:		
3	10331-1	.CHASSIS						1
						-1, -2:		
4	10332-0	.BRACKET, DIODE MTG.						1
						-0:		
5	10333-0	.BRACKET, TERMINAL MTG.						1
6	10338-0	.HARNESS						1
						-0:		
7	10338-1	.HARNESS						1
						-1, -2:		
8	00002-004	.WASHER, PLAIN #4						8
9	00002-008	.WASHER, PLAIN #8						28*
						-0:	16*	
						-1, -2:		
10	00005-001	.WASHER, EXT TOOTH LOCK #4						8
11	00005-002	.WASHER, EXT TOOTH LOCK #6						4
						-0:	2	
						-1, -2:		
12	00005-003	.WASHER, EXT TOOTH LOCK #8						24*
						-0:	14*	
						-1, -2:		
13	00002-009	.WASHER, PLAIN #10						16
						-0:	8	
						-1, -2:		
14	00019-005	.DIODE (WITH HARDWARE) RCA 40108						16
						-0: CR1 THRU 16	8	
						-1, -2: CR1 THRU 8		
15	00021-022	.SCREW, BINDING HD, 4-40 x 1/2						8
16	00021-048	.SCREW, BINDING HD, 6-32 x 3/4						4
						-0:	2	
						-1, -2:		
17	00021-065	.SCREW, BINDING HD, 8-32 x 1/2						23*
						-0:	13*	
						-1, -2:		
18	10337-0	.CABLE ASSEMBLY, POWER						1
18.1	00043-005	.CONNECTOR, MALE PLUG, 20 CONTACT P3						1
18.2	00067-004	.CABLE, 12 CONDUCTOR						A/R
19	00032-010	.TUBING, INSULATING #4						A/R
20	00025-004	.NUT, HEX, 4-40						8
21	00025-005	.NUT, HEX, 6-32						4
						-0:	2	
						-1, -2:		
22	00025-006	.NUT, HEX, 8-32						16
						-0:	8	
						-1, -2:		



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.	
		1	2	3	4	5	6		
23	00034-003	.CAPACITOR, 5400 μ f, 20V						-0: C1 THRU 4 -1,-2: C1,2	4 2
24	00035-002	.CLAMP, CAPACITOR MTG						-0: -1,-2:	4 2
25	00116-003	.BUSHING, STRAIN RELIEF							1
26	00005-004	.WASHER, EXT TOOTH LOCK #10						-0: -1,-2:	16 8
27	00049-004	.TERMINAL STRIP, SOLDER TYPE 3 CONTACT						-0: TS1,3 -1,-2: TS1	2 1
28	00049-005	.TERMINAL STRIP, SOLDER TYPE 4 CONTACT						TS2	1
29	00050-007	.TERMINAL STRIP, SCREW TYPE, 8 CONTACT						TB1,2	2
30	00021-067	.SCREW, BINDING HD, 8-32 x 5/8							1
32	00057-011	.FUSE, 1/2A, "SLO-BLO"						-0: F1,2 -1,-2: F1	2 1
33	00069-001	.FUSEHOLDER, (WITH HARDWARE)						-0: -1,-2:	2 1
35	00099-001	.TRANSFORMER, FILAMENT						-0: T1,2 -1,-2: T1	2 1
*4 EACH OF ITEMS 9,12, AND 17, NOT SHOWN. USED FOR MOUNTING HARDWARE.									



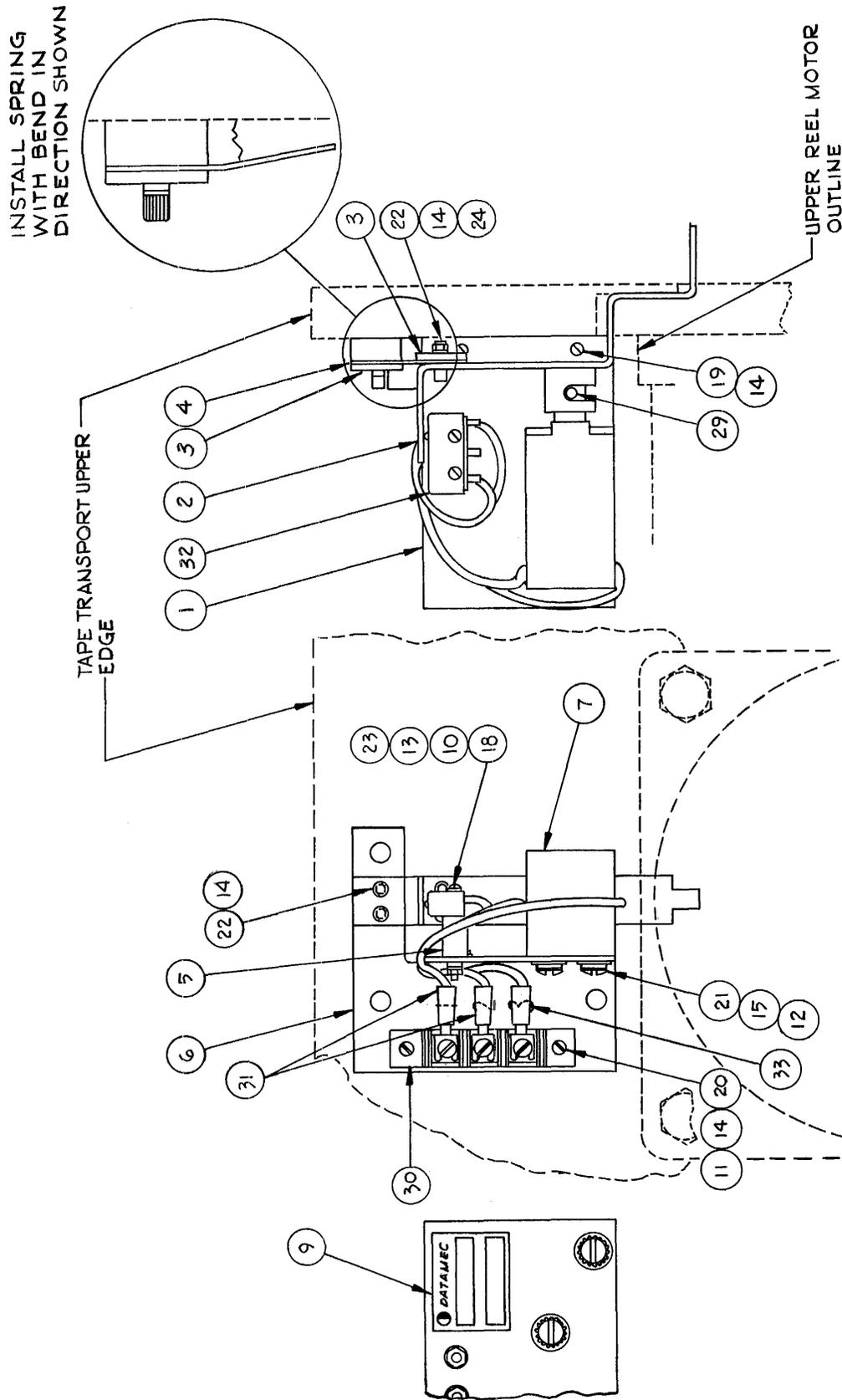
ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10340-0	POWER REGULATOR CARD						
1	10341-0	. CIRCUIT BOARD						1
2	10008-1	. TAG, SERIAL NO.						1
3	10352-0	. SPACER						1
4	00001-009	. RESISTOR, FIXED COMP. 22 Ω 1/2W 5% R6,16						2
5	00001-033	. RESISTOR, FIXED COMP. 220 Ω 1/2W 5% R4,14						2
6	00001-049	. RESISTOR, FIXED COMP. 1K 1/2W 5% R3,10,13,20						4
7	00001-057	. RESISTOR, FIXED COMP. 2.2K 1/2W 5% R5,15						2
8	00037-009	. RESISTOR, FIXED COMP. 22 Ω 1W 5% R1,11						2
9	00037-025	. RESISTOR, FIXED COMP. 100 Ω 1W 5% R9,19						2
10	00037-037	. RESISTOR, FIXED COMP. 330 Ω 1W 5% R2,12						2
11	00051-003	. RESISTOR, FIXED W/W 1 Ω 3W 5% R7,8,17,18						4
13	00002-004	. WASHER, PLAIN #4						4
14	00002-006	. WASHER, PLAIN #6						5
15	00005-001	. WASHER, EXT. TOOTH LOCK, #4						4
16	00005-002	. WASHER, EXT. TOOTH LOCK, #6						5
18	00011-002	. TRANSISTOR, 2N404 Q2,6						2
19	00012-003	. TRANSISTOR, 2N376A Q4,8						2
20	00015-001	. TRANSISTOR, 2N1304 Q1,3,5,7						4
22	00019-009	. DIODE, SG921 CR3,8						2
23	00019-007	. DIODE, IN91 CR5,10						2
24	00019-008	. DIODE, IN270 CR1,2,6,7						4
25	00020-006	. DIODE, ZENER, TRANSITRON 1015 CR4,9						2
27	00021-024	. SCREW, BINDER HEAD, 4-40 x 5/8						4
28	00021-044	. SCREW, BINDER HEAD, 6-32 x 1/2						4
29	00022-052	. SCREW, FLAT HEAD, 6-32 x 1						1
30	00025-004	. NUT, HEX, 4-40						4
31	00025-005	. NUT, HEX, 6-32						5
32	00033-008	. CAPACITOR, ELECTROLYTIC, 75μf 3V C3,4						2
33	00033-007	. CAPACITOR, ELECTROLYTIC, 10μf 12V C1,2						2
34	00047-001	. SPACER, SPECIAL TRANSISTOR						6
35	00048-004	. LAMP, INCANDESCENT, #344 I1,2						2
36	00047-003	. TRANSISTOR SPACER, MICA						2



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
37	00058-003	.	JACK,	TEST,	BLACK		TP0	1
38	00058-002	.	JACK,	TEST,	RED		TP2	1
39	00058-008	.	JACK,	TEST,	BROWN		TP1	1
40	10353-0	.	BUSHING,	INSULATING				4
41	10351-0	.	HEAT SINK,	POWER REGULATOR				1
42	00072-002	.	HEAT SINK,	BIRTCHER 3AL635-2R				2
44	00074-001	.	SWITCH,	F1-3; ELECTROSNAP			S1,2	2

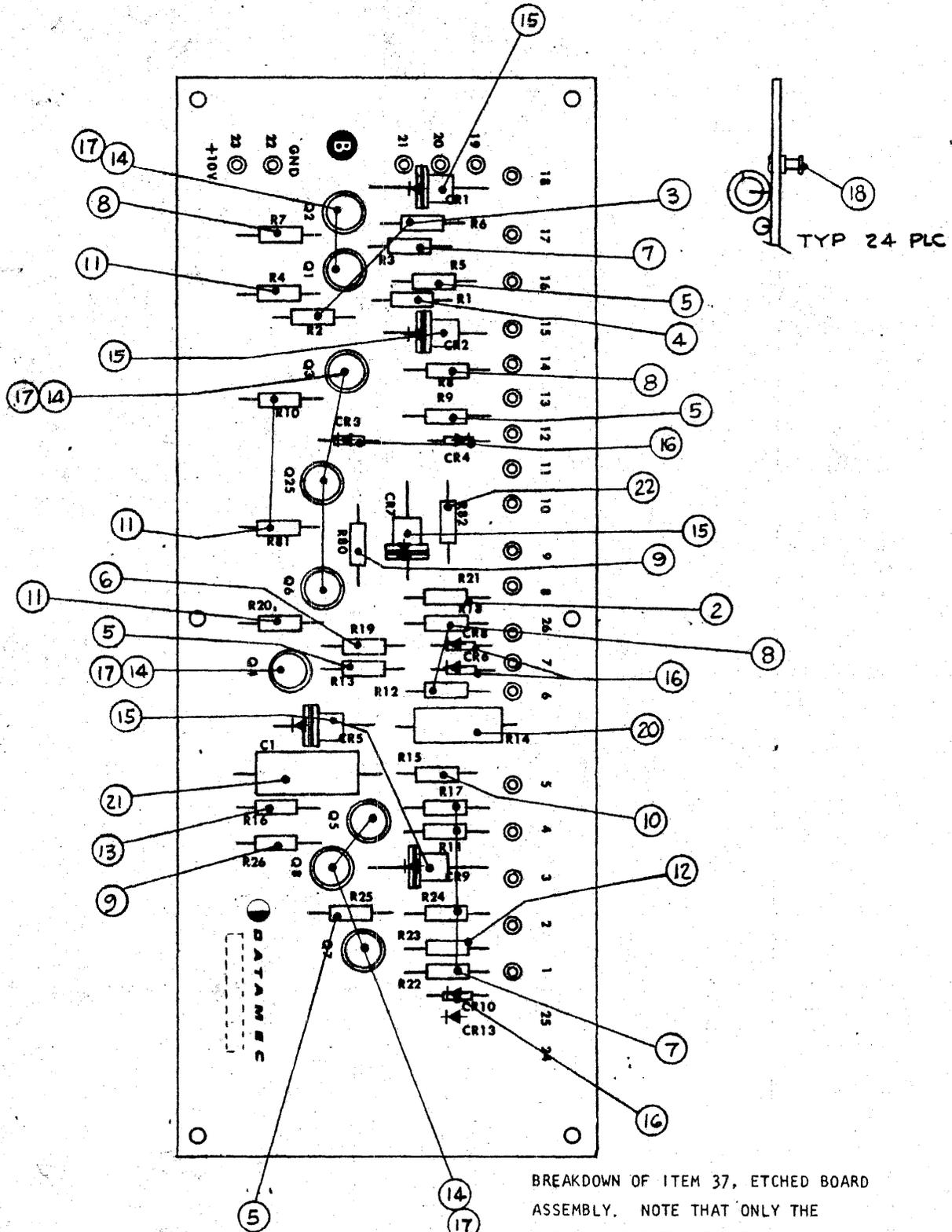


CAT. NO. 10370-0, FILE PROTECT ASSEMBLY





ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. PER ASSY.
		1	2	3	4	5	6	
	10370-0	FILE PROTECT ASSEMBLY						
1	10371-0	.						1
2	10372-0	.						1
3	10373-0	.						2
4	10374-0	.						1
5	10375-0	.						1
6	10376-0	.						1
7	10377-0	.						1
9	10008-0	.						1
10	00002-002	.						2
11	00002-004	.						5
12	00002-006	.						2
13	00003-016	.						2
14	00005-001	.						11
15	00005-002	.						2
18	00021-013	.						2
19	00021-018	.						2
20	00021-022	.						5
21	00021-039	.						2
22	00023-005	.						4
23	00025-003	.						2
24	00025-004	.						2
29	00031-050	.						1
30	00050-004	.						1
31	00060-001	.						2
32	00074-002	.						1
33	00060-002	.						1



BREAKDOWN OF ITEM 37, ETCHED BOARD ASSEMBLY. NOTE THAT ONLY THE TERMINAL DIGITS OF THE ITEM NUMBERS ARE SHOWN. FOR EXAMPLE, ITEM 1 IS ACTUALLY ITEM 37.1, ITEM 2 IS ITEM 37.2, ETC.



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10391-0,-1	OPERATOR CONTROL PANEL, DUAL DENSITY						
1	10005-0	. NAMEPLATE						1
2	3-20362-10177-1M	. FRONT PANEL ASSEMBLY						1
2.2	10191-0	. . HINGE, PUSHBUTTON						5
2.3	00064-001	. . RIVET, SOLID, CS HD, 3/32 DIA. X 1/2 (ALUMINUM)						5
2.4	2-20362-10174-0M	. . PANEL, FRONT						1
2.6	NONE	. . FASTENER, SOUTHCO 54-58-306-24						4
3	10181-0	. PLATE, CHASSIS						1
4	10182-0	. BRACKET, SWITCH -1:						6
5	10182-1	. BRACKET, SWITCH						1
8	10183-0	. BRACKET, LAMP						8
9	10184-0	. FRAME, BOTTOM						1
10	10185-0	. FRAME, TOP						1
13	10186-0	. RETAINER						2
14	10187-0	. STRIP, DIVIDER						1
15	10192-0	. LEAF, HINGE						2
16	10193-0	. BLOCK, HINGE						2
17	10197-0	. PUSHBUTTON, "LOCAL"						1
18	10197-1	. PUSHBUTTON, "AUTO"						1
19	10197-2	. PUSHBUTTON, "REWIND"						1
20	10197-3	. PUSHBUTTON, "LOAD POINT"						1
21	10197-4	. PUSHBUTTON, "WRITE ENABLED"						1
22	6-20362	. PUSHBUTTON, "HIGH SPEED"						1
23	10197-7	. PUSHBUTTON, "HIGH DENSITY"						1
24	10197-8	. PUSHBUTTON, "REVERSE"						1
26	10245-0	. PIN, HINGE						2
27	10246-0	. PIN, PUSHBUTTON						1
30	10249-0	. BLOCK, MOUNTING						1
31	10249-1	. BLOCK, MOUNTING						1



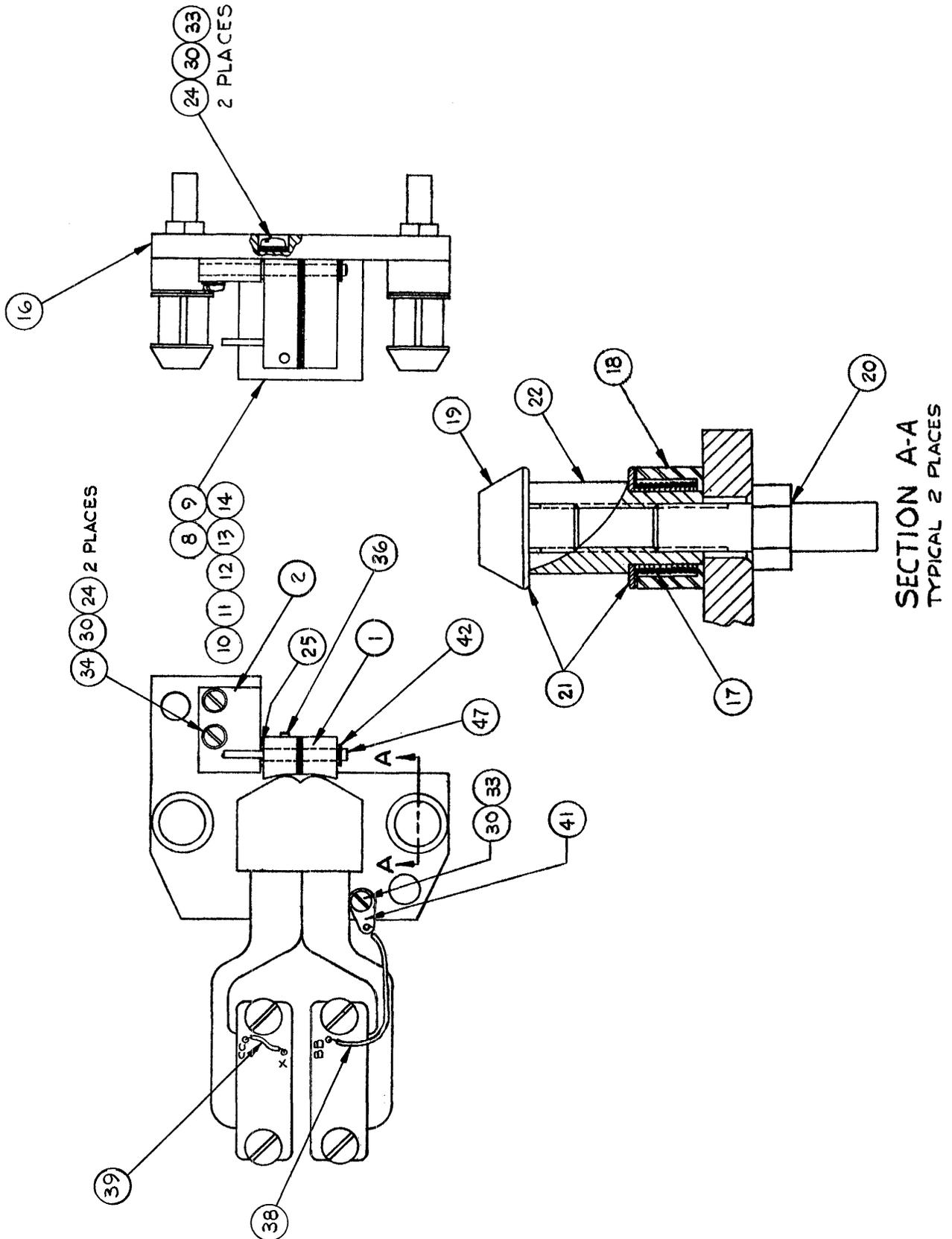
ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY.
			NEXT ASSY.
		1 2 3 4 5 6	
33	4-20362-10382-0M	. PANEL, REAR, O.C.P. NUMBER WHEEL, -1:	1
34	10383-0	. CHASSIS	1
36	8-20362-10384-0M	. HARNESS	1
37	10385-0	. ETCHED BOARD ASSEMBLY	1
37.1	10386-0	. . ETCHED BOARD, OPERATOR CONTROL PANEL	1
37.2	00001-037	. . RESISTOR, FIXED COMP., 330Ω 1/2W R21	1
37.3	00001-049	. . RESISTOR, FIXED COMP., 1K 1/2W R2,6	2
37.4	00001-051	. . RESISTOR, FIXED COMP., 1.2K 1/2W R1	1
37.5	00001-057	. . RESISTOR, FIXED COMP., 2.2K 1/2W R5,9,13,25	4
37.6	00001-059	. . RESISTOR, FIXED COMP., 2.7K 1/2W R19	1
37.7	00001-065	. . RESISTOR, FIXED COMP., 4.7K 1/2W R3,11,17,22,24	5
37.8	00001-073	. . RESISTOR, FIXED COMP., 10K 1/2W R7,8,12,18	4
37.9	00001-079	. . RESISTOR, FIXED COMP., 18K 1/2W R26,80	2
37.10	00001-081	. . RESISTOR, FIXED COMP., 22K 1/2W R15	1
37.11	00001-083	. . RESISTOR, FIXED COMP., 27K 1/2W R4,10,20,81	4
37.12	00001-085	. . RESISTOR, FIXED COMP., 33K 1/2W R23	1
37.13	00001-089	. . RESISTOR, FIXED COMP., 47K 1/2W R16	1
37.14	00011-001	. . TRANSISTOR, 2N1305, Q1 THRU 8,25	9
37.15	00019-001	. . DIODE, IN1692 CR1,2,5,7,9	5
37.16	00019-008	. . DIODE, IN270 CR3,4,6,8,10	5
37.17	00047-001	. . SPACER, TRANSISTOR	8
37.18	00070-001	. . LUG, TURRET, VECTOR T-19	24
37.20	00111-049	. . RESISTOR, FIXED COMP., 1K 2W R14	1
37.21	00113-013	. . CAPACITOR, TUBULAR FILM, 2.0μf 100V C1	1
37.22	00001-055	. . RESISTOR, FIXED COMP., 1.8K 1/2W R82	1
38	10387-0	. HUB, NUMBER WHEEL -1:	1
39	10388-0	. WHEEL, NUMBER WHITE -1:	1
40	10388-1	. WHEEL, NUMBER CLEAR -1:	1
41	10389-0	. DISC, NEGATIVE NUMERAL -1:	1
42	10392-0	. BRACKET, LAMP NUMBER WHEEL -1:	1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	1 2 3 4 5 6						QTY. NEXT ASSY.
43	10393-0	. BEZEL, OPERATOR CONTROL PANEL						-1:	1
44	10516-1	. SWITCH ROTARY, 8 POS., 45° OAK						-1:	1
46	00002-004	. WASHER, PLAIN #4							19
47	00002-006	. WASHER, PLAIN #6							7
48	00003-016	. WASHER, HELICAL SPRING LOCK #2							4
49	00005-001	. WASHER, EXTERNAL TOOTH LOCK #4							46
50	00005-002	. WASHER, EXTERNAL TOOTH LOCK #6						-1:	29
51	00006-011	. WASHER, INTERNAL TOOTH LOCK 11/16 ID						-1:	8
55	00021-002	. SCREW, BINDING HEAD, 2-56 x 3/16							4
56	00021-019	. SCREW, BINDING HEAD, 4-40 x 5/16							20
57	00021-020	. SCREW, BINDING HEAD, 4-40 x 3/8						-1:	10
58	00021-022	. SCREW, BINDING HEAD, 4-40 x 1/2							2
59	00021-024	. SCREW, BINDING HEAD, 4-40 x 5/8							2
60	00021-032	. SCREW, BINDING HEAD, 4-40 x 1-1/8							4
61	00021-038	. SCREW, BINDING HEAD, 4-40 x 1-1/2							2
62	00021-040	. SCREW, BINDING HEAD, 6-32 x 1/4						-1:	7
63	00021-042	. SCREW, BINDING HEAD, 6-32 x 3/8							20
64	00021-090	. SCREW, BINDING HEAD, 10-32 x 3/4							4
65	00022-020	. SCREW, FLAT HEAD, 4-40 x 3/8						-1:	12
66	00022-024	. SCREW, FLAT HEAD, 4-40 x 5/8							5
67	00024-006	. SCREW, HEX SOCKET SET, 4-40 x 1/4						-1:	1
68	00025-004	. NUT, HEX, 4-40							42
69	00025-005	. NUT, HEX, 6-32						-1:	8
72	00032-006	. TUBING, INSULATING SIZE NO. 12							A/R
73	00032-007	. TUBING, INSULATING SIZE NO. 10							A/R
74	00115-005	. BUSHING, PLASTIC, 1/4 ID						-1:	10



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
75	00039-001	. EXTRUSION, RUBBER, RUBBERCRAFT 789						A/R
76	00039-002	. EXTRUSION, RUBBER, RUBBERCRAFT 1909						A/R
80	00040-006	. CONNECTOR, FEMALE RECEPT., ELCO RF22020-5						1
81	00040-002	. CONNECTOR, FEMALE RECEPT., ELCO RF22420-5						1
82	00041-001	. CONNECTOR, MALE RECEPT., ELCO RM22826						1
83	00041-002	. CONNECTOR, MALE RECEPT., AMPHENOL 160-5						1
84	00042-002	. CONNECTOR, FEMALE PLUG, ELCO RF22824						1
85	00044-002	. RETAINER, ELCO 1302						2
86	00044-003	. RETAINER, ELCO 1302-RH						1
87	00044-004	. RETAINER, (FOR ALLIED CONTROL SOCKET 30055-2)						6
88	00045-017	. SPACER, PLAIN TUB., H. SMITH 2346						1
89	00048-002	. LAMP, INCANDESCENT, TYPE 44						9
92	00055-001	. RELAY, ALLIED CONTROL T154-4C-700 OHM K1 THRU 6						6
93	9-20362	. RELAY, COMAR 4 POLE K7,8						2
94	00056-001	. SOCKET, ALLIED CONTROL 30055-2						6
95	00059-005	. CLAMP, CABLE, PLASTIC, 3/8						2
96	00049-004	. TERMINAL STRIP, 3 LUG						1
97	00063-003	. RING, RETAINING EXT. TRUARC 5133-12-MD						4
98	00063-010	. RING, RETAINING EXT. TRUARC 5105-9-MD						2
99	00065-001	. WASHER, SPECIAL WECKESSER D6128						2
102	00074-001	. SWITCH, SNAP ACTION, ELECTROSNAP F1-3						8
103	00075-001	. LIGHT ASSEMBLY, DIALCO 810-B						8
104	00075-002	. LIGHT ASSEMBLY, RED, DIALCO 95-931						1
105	00075-003	. LIGHT ASSEMBLY, AMBER, DIALCO 95-933						1
106	00075-007	. LAMP, SOCKET ASSY., DIALCO NO. 708						1
109	00081-001	. CORD AND CABLE ASSEMBLY, ALPHA 636						1
110	7-20362	. SPACER, THREADED						4



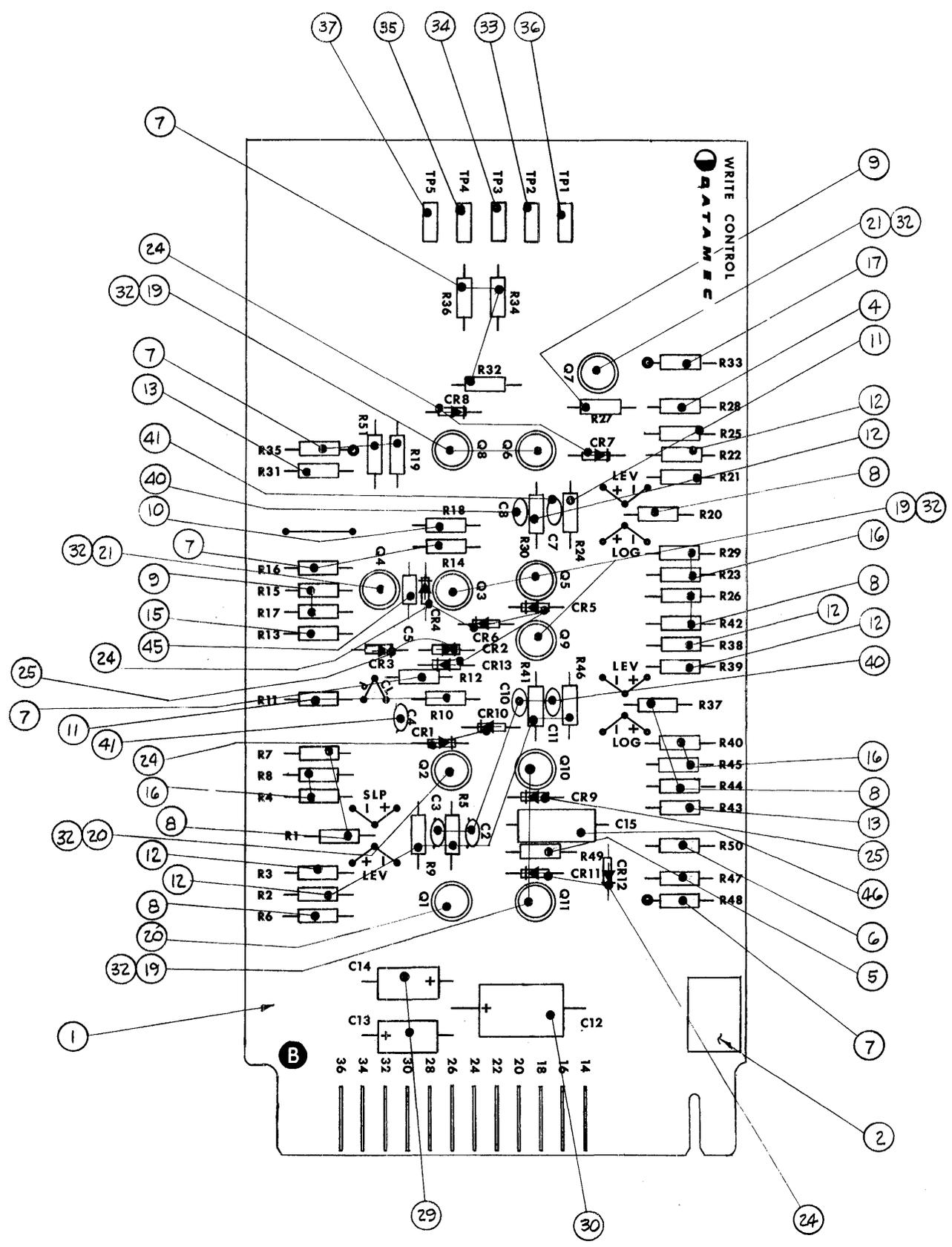


ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. PER ASSY.
		1	2	3	4	5	6	
	10420-3 THRU -9	HEAD ASSEMBLY, WRITE/READ, 556 BPI						
1	10322-0	. HEAD GATE						1
2	10325-0	. BLOCK, HEAD GATE PIVOT						1
8	10421-3	. MAGNETIC HEAD, 4.115 ips -3:						1
9	10421-4	. MAGNETIC HEAD, 6.18 ips -4:						1
10	10421-5	. MAGNETIC HEAD, 9.21 ips -5:						1
11	10421-6	. MAGNETIC HEAD, 13.85 ips -6:						1
12	10421-7	. MAGNETIC HEAD, 20.8 ips -7:						1
13	10421-8	. MAGNETIC, HEAD, 31.2 ips -8:						1
14	10421-9	. MAGNETIC HEAD, 47.4 ips -9:						1
16	10423-0	. BASE						1
17	10424-0	. SPRING, TAPE GUIDE						2
18	10425-0	. RETAINER, SPRING						2
19	10426-0	. CAP, TAPE GUIDE						2
20	10427-0	. FITTING, VACUUM, TAPE GUIDE						2
21	10428-0	. FOLLOWER, TAPE GUIDE						4
22	10429-0	. BODY, TAPE GUIDE						2
24	00002-004	. WASHER, PLAIN #4						4
25	00002-006	. WASHER, PLAIN #6						1
26	00002-009*	. WASHER, PLAIN #10						2
28	00003-005*	. WASHER, HELICAL SPRING LOCK #10						2
30	00005-001	. WASHER, EXTERNAL TOOTH LOCK #4						5
33	00021-018	. SCREW, BINDING HEAD, 4-40 x 1/4						3
34	00021-022	. SCREW, BINDING HEAD, 4-40 x 1/2						2
35	00021-090*	. SCREW, BINDING HEAD, 10-32 x 3/4						2
36	00024-050	. SCREW, SET, SLOT DRIVE, OVAL PT., NYLON 4-40 x 3/8						1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. PER ASSY.	
		1	2	3	4	5	6		
38	00027-001	.	WIRE,	22	GAUGE	HOOK	UP,	BLACK	A/R
39	00027-003	.	WIRE,	22	GAUGE	HOOK	UP,	RED	A/R
41	00061-002	.	LUG,	SOLDER	#4				1
42	00063-018	.	RING,	RETAINING	EXTERNAL	1/8			1
47	00087-002	.	PIN,	GROOVED,	1/8	x	1-1/2		1
<p>NOTE: Items indicated are mounting hardware and are not illustrated.</p>									

CAT. NO. 10444-0, TRIPLE DENSITY WRITE CONTROL CARD





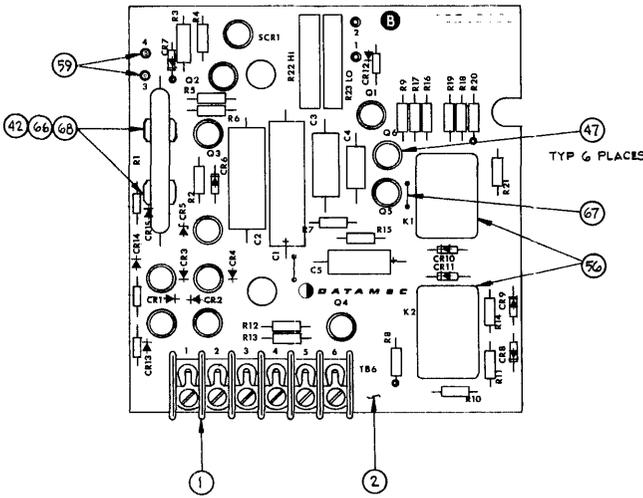
ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
	10444-0	TRIPLE DENSITY WRITE CONTROL CARD						
1	10445-0	.CIRCUIT BOARD						1
2	10008-1	.TAG, SERIAL NO.						1
4	00001-035	.RESISTOR, FIXED COMP 270Ω 1/2W 5%				R28		1
5	00001-041	.RESISTOR, FIXED COMP 470Ω 1/2W 5%				R47,49		2
6	00001-045	.RESISTOR, FIXED COMP 680Ω 1/2W 5%				R50		1
7	00001-049	.RESISTOR, FIXED COMP 1K 1/2W 5%				R12, 14, 16, 19, 32, 34, 35, 36, 48, 51		10
8	00001-057	.RESISTOR, FIXED COMP 2.2K 1/2W 5%				R1, 6, 7, 20, 26, 37, 42, 44		8
9	00001-059	.RESISTOR, FIXED COMP 2.7K 1/2W 5%				R15, 17, 27		3
10	00001-065	.RESISTOR, FIXED COMP 4.7K 1/2W 5%				R18		1
11	00001-073	.RESISTOR, FIXED COMP 10K 1/2W 5%				R10, 11, 24, 25		4
12	00001-077	.RESISTOR, FIXED COMP 15K 1/2W 5%				R2, 3, 5, 9, 21, 22, 30, 38, 39, 41, 46		11
13	00001-081	.RESISTOR, FIXED COMP 22K 1/2W 5%				R31, 43		2
15	00001-085	.RESISTOR, FIXED COMP 33K 1/2W 5%				R13		1
16	00001-095	.RESISTOR, FIXED COMP 82K 1/2W 5%				R4, 8, 23, 29, 40, 45		6
17	00001-155	.RESISTOR, FIXED COMP 2.7Ω 1/2W 5%				R33		1
19	00011-002	.TRANSISTOR, 2N404				Q3, 5, 6, 8, 9, 10, 11		7
20	00011-004	.TRANSISTOR, 2N1499A				Q1, 2		2
21	00015-001	.TRANSISTOR, 2N1304				Q4, 7		2
24	00019-008	.DIODE, 1N270				CR1, 4, 5, 6, 7, 8, 10, 11, 12, 13		10
25	00019-009	.DIODE, SG921				CR2, 3, 9		3
29	00033-007	.CAPACITOR, ELECT 10μf 12V				C13, 14		2
30	00033-008	.CAPACITOR, ELECT 75μf 3V				C12		1
32	00047-001	.SPACER, TRANSISTOR						11



ITEM NO.	DATAMEC PART NO.	DESCRIPTION	QTY. NEXT ASSY.
33	00058-002	.JACK, TEST, RED TP2	1
34	00058-006	.JACK, TEST, ORANGE TP3	1
35	00058-007	.JACK, TEST, YELLOW TP4	1
36	00058-008	.JACK, TEST, BROWN TP1	1
37	00058-009	.JACK, TEST, LT GREEN TP5	1
40	00101-001	.CAPACITOR, DISC, CERAMIC, 50pf C2,3,8,10,11	5
41	00101-002	.CAPACITOR, DISC, CERAMIC 220pf C4,7	2
45	00113-001	.CAPACITOR, TUB. FILM 470pf C5	1
46	00113-011	.CAPACITOR, TUB. FILM 0.1μf C15	1



CAT. NO. 10650-0,-1, CAPSTAN SERVO DRIVE (DUAL-SPEED TRANSPORT MODIFICATION)



TABLE

TAPE SPEED (IPS)		COMPONENT ITEM NOS.							
A RANGE	B RANGE	SPEED SELECT		OVERSPEED SAFETY		BELT BREAK SAFETY			
SEE NOTE	SEE NOTE	HIGH R16	LOW R17	HIGH R18	LOW R19	HIGH R20	LOW R21		
8.5 - 2.1	1.5 - 4.2	7	7	12	12	10	10		
1.9 - 3.25	3.8 - 6.5	7	7	16	16	12	12		
2.75 - 4.7	5.5 - 9.4	7	7	17	17	16	16		
4.15 - 6.05	8.3 - 12.1	7	7	18	18	18	18		
4.7 - 7.2	9.4 - 14.4	7	7	19	19	19	19		
7.0 - 10.2	14.0 - 20.4	7	12	20	20	21	21		
8.5 - 12.1	17.0 - 24.2	7	12	21	21	22	22		
10.2 - 14.6	20.4 - 29.2	7	12	22	22	24	24		
12.8 - 17.8	25.6 - 35.6	17	17	24	24	25	25		
15.4 - 21.7	30.8 - 43.4	17	17	25	25	26	26		
18.6 - 26.0	37.2 - 45	17	20	26	26	27	27		
23.0 - 30.0		17	20	27	27	28	28		

NOTE: USE "A" COLUMN WHEN HIGHEST TAPE SPEED IS AT OR BELOW 30 IPS. USE "B" COLUMN WHEN HIGHEST TAPE SPEED IS ABOVE 30 IPS.

EXAMPLE:

FOR SPEEDS OF 3 AND 30 IPS.

A. "A" COLUMN WOULD BE USED.

B. SPEED RANGE OF 2.75-4.7 (LOW SPEED) AND 23.0-30.0 (HIGH-SPEED) APPLIES.

C. SELECT LOW RANGE RESISTORS R17=7, R19=17, R21=16.

D. SELECT HIGH RANGE RESISTORS R16=17, R18=27, R20=28.

SCHEM. REF. NUMBER	REF. NO. / ITEM NO. CROSS INDEX									
	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9
R1	49									
R2	4									
R3	48									
R4	3									
R5	6									
R6	5									
R7	5									
R8	8									
R9	11									
R10	9									
R11	15									
R12	7									
R13	11									
R14	17									
R15	8									
R16	SEE TABLE									
R17										
R18										
R19										
R20										
R21	SEE TABLE									
R22	62									
R23	63									
C1	45									
C2	71									
C3	70									

SCHEM. REF. NUMBER	REF. NO. / ITEM NO. CROSS INDEX									
	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9
C4	69									
C5	44									
CR1	35									
CR2	35									
CR3	35									
CR4	35									
CR5	41									
CR6	36									
CR7	37									
CR8	40									
CR9	34									
CR10	36									
CR11	36									
CR12	38									
CR13,14,15	36									
Q1	33									
Q2	32									
Q3	73									
Q4	32									
Q5	33									
Q6	33									
SCR1	31									
K1	52									
K2	53									

(BREAKDOWN OF ITEM 5.4)

NOTE THAT ONLY THE TERMINAL DIGITS OF THE ITEM NUMBERS ARE SHOWN. FOR EXAMPLE, ITEM 1 IS ACTUALLY ITEM 5.4.1, ETC.



CAT. NO. 10650-0,-1, CAPSTAN SERVO DRIVE
(DUAL-SPEED TRANSPORT MODIFICATION)

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
		NOTE: THIS PARTS LIST IS INTENDED TO BE USED IN CONJUNCTION WITH THE TAPE TRANSPORTS PARTS LIST. IN ADDITION TO THE ITEMS SHOWN BELOW, TRANSPORTS MODIFIED FOR DUAL-SPEED SERVO DRIVE WILL USE PART NO. 10001-XM MODIFIED MOUNTING PLATES AND PART NO. 10410-OM MODIFIED HARNESS. WHEN ORDERING PARTS, BE SURE TO SPECIFY THE SERIAL NUMBERS OF THE CATALOG ITEMS INVOLVED, TO BE CERTAIN OF RECEIVING THE PROPER ITEMS.						
	10650-0,-1	CAPSTAN SERVO DRIVE ASSEMBLY						
1	10008-0	. TAG, SERIAL NUMBER						1
2	10108-0	. BRACKET, CAPSTAN MOTOR						1
3	10115-2	. CAPSTAN ASSEMBLY						2
		NOTE: THESE ARE REQUIRED FOR USE WITH CATALOG NO. 10000-9 TRANSPORTS. THEY ARE NOT PART OF THE CAPSTAN DRIVE ASSEMBLY PROPER, BUT MOUNT DIRECTLY ON THE TAPE TRANSPORT.						
3.1	10116-0	. . CAPSTAN						1
3.9	10117-0	. . HOUSING						1
3.11	10118-1	. . FLYWHEEL, CAPSTAN, LOW SPEED						1
3.12	00007-026	. . WASHER, SPRING						1
3.13	00010-001	. . BEARING, BALL, NEW DEPARTURE 87013						2
3.14	00021-087	. . SCREW, 10-32 x 3/8, BINDER HEAD						1
3.15	00024-032	. . SCREW, SET, 10-32 x 3/8 CUP PT, NYLOK						2
3.16	00062-001	. . RING, RETAINING, TRUARC 5000-125-MD						2
4	10599-2	. CAPSTAN ASSEMBLY						2
		NOTE: THESE ARE REQUIRED FOR USE WITH CAT. NO. 10800-9 TRANSPORTS. THEY ARE NOT PART OF THE CAPSTAN DRIVE ASSEMBLY PROPER, BUT MOUNT DIRECTLY ON THE TAPE TRANSPORT.						
4.1	10594-0	. . CAPSTAN, 800 BPI						1
4.4	10595-1	. . FLYWHEEL, CAPSTAN, 800 BPI						1
4.5	10596-0	. . HOUSING, CAPSTAN, 800 BPI						1



CAT. NO. 10650-0,-1, CAPSTAN SERVO DRIVE
(DUAL-SPEED TRANSPORT MODIFICATION)

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
4.6	10597-0	. .	PLATE, PRESSURE, CAPSTAN, BEARING, 800 BPI					1
4.7	10598-0	. .	SPACER SET, DUPLEX BEARING, CAPSTAN, 800 BPI					1
4.10	00002-029	. .	WASHER, PLAIN, 7/16 x 7/8 OD					1
4.12	0010-006	. .	BEARINGS, DUPLEX PAIR, N.D. Z993L01-DTX-5C					1
4.14	00022-020	. .	SCREW, FLAT HD, 4-40 x 3/8					3
4.16	00024-032	. .	SCREW, SET, 10-32 x 3/8					1
4.18	00062-003	. .	RING, RETAINING, TRUARC 5008-112-MD					1
4.20	00089-003	. .	NUT, ELASTIC STOP, 7/16-20 ESNA 52NE070					1
5	10651-0	. .	CAPSTAN SERVO TACHOMETER ASSEMBLY					1
5.1	10653-0	. .	PULLEY, TACHOMETER DRIVE					1
5.2	10654-0	. .	BRACKET, TACHOMETER MTG. ASSY.					1
5.3	10656-0	. .	COVER, SERVO ASSEMBLY					1
5.4	10661-0	. .	CIRCUIT BOARD ASSY, CAPSTAN SERVO					1
5.4.1	10659-0	. . .	TERMINAL STRIP, CINCH-JONES, 6-140-Y				TB6	1
5.4.2	10662-0	. . .	CIRCUIT BOARD, CAPSTAN SERVO					1
5.4.3	00001-017	. . .	RESISTOR, FIXED COMP 47Ω 1/2W 5%				R4	1
5.4.4	00001-039	. . .	RESISTOR, FIXED COMP 390Ω 1/2W 5%				R2	1
5.4.5	00001-041	. . .	RESISTOR, FIXED COMP 470Ω 1/2W 5%				R6,7	2
5.4.6	00001-046	. . .	RESISTOR, FIXED COMP 750Ω 1/2W 5%				R5	1
5.4.7	00001-049	. . .	RESISTOR, FIXED COMP 1K 1/2W 5%				R12	*1
5.4.8	00001-055	. . .	RESISTOR, FIXED COMP 1.8K 1/2W 5%				R8,15	2
5.4.9	00001-067	. . .	RESISTOR, FIXED COMP 5.6K 1/2W 5%				R10	1
5.4.10	00001-069	. . .	RESISTOR, FIXED COMP 6.8K 1/2W 5%					*
5.4.11	00001-073	. . .	RESISTOR, FIXED COMP 10K 1/2W 5%				R9,13	*2
5.4.12	00001-077	. . .	RESISTOR, FIXED COMP 15K 1/2W 5%					*



CAT. NO. 10650-0,-1, CAPSTAN SERVO DRIVE
(DUAL-SPEED TRANSPORT MODIFICATION)

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.	
		1	2	3	4	5	6		
5.4.15	00001-079	. . .	RESISTOR,	FIXED COMP	18K	1/2W	5%	R11	1
5.4.16	00001-081	. . .	RESISTOR,	FIXED COMP	22K	1/2W	5%		*
5.4.17	00001-083	. . .	RESISTOR,	FIXED COMP	27K	1/2W	5%	R14	*1
5.4.18	00001-085	. . .	RESISTOR,	FIXED COMP	33K	1/2W	5%		*
5.4.19	00001-087	. . .	RESISTOR,	FIXED COMP	39K	1/2W	5%		*
5.4.20	00001-089	. . .	RESISTOR,	FIXED COMP	47K	1/2W	5%		*
5.4.21	00001-091	. . .	RESISTOR,	FIXED COMP	56K	1/2W	5%		*
5.4.22	00001-093	. . .	RESISTOR,	FIXED COMP	68K	1/2W	5%		*
5.4.24	00001-095	. . .	RESISTOR,	FIXED COMP	82K	1/2W	5%		*
5.4.25	00001-097	. . .	RESISTOR,	FIXED COMP	100K	1/2W	5%		*
5.4.26	00001-099	. . .	RESISTOR,	FIXED COMP	120K	1/2W	5%		*
5.4.27	00001-101	. . .	RESISTOR,	FIXED COMP	150K	1/2W	5%		*
5.4.28	00001-103	. . .	RESISTOR,	FIXED COMP	180K	1/2W	5%		*
5.4.31	00008-004	. . .	RECTIFIER,	SILICON, CONTROLLED,	MOT. MCR			1604-4 SCR1	1
5.4.32	00011-001	. . .	TRANSISTOR,	PNP	2N1305			Q2,4	2
5.4.33	00015-001	. . .	TRANSISTOR,	NPN,	2N1304			Q1,5,6	3
5.4.34	00019-008	. . .	DIODE, RECTIFIER,		1N270			CR9	1
5.4.35	00019-013	. . .	DIODE, RECTIFIER,	300V, MOTOROLA,	MR1033B			CR1 THRU 4	4
5.4.36	00019-014	. . .	DIODE, RECTIFIER,	100V, MOTOROLA,	1N4002			CR6,10,11	3
5.4.37	00019-015	. . .	DIODE, RECTIFIER,	200V, MOTOROLA,	1N4003			CR7	1
5.4.40	00020-004	. . .	DIODE, ZENER,	6V,	1N762			CR8	1
5.4.41	00020-008	. . .	DIODE, ZENER,	24V, 1.5W, MOTOROLA,	1N3798A			CR5	1
5.4.42	00025-004	. . .	NUT, HEX,		4-40				2
5.4.44	00033-013	. . .	CAPACITOR, ELECTROLYTIC,	100µf	3V			C5	1



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
5.4.45	00033-014	.	.	.	CAPACITOR, ELECTROLYTIC, 50 μ f	50V	C1	1
5.4.47	00047-001	.	.	.	TRANSISTOR SPACER, MOLDED PLASTIC			6
5.4.48	00051-003	.	.	.	RESISTOR, FIXED WW 1 Ω	3W	R3	1
5.4.49	00053-002	.	.	.	RESISTOR, FIXED WW 3K 10W SPRAGUE 247-E		R1	1
5.4.52	00055-001	.	.	.	RELAY, ALLIED CONTROL, T154-4C-24VDC		K1	1
5.4.53	00055-006	.	.	.	RELAY, ALLIED CONTROL, TS154-4C-8.4MA (2.5K)		K2	1
5.4.56	00056-002	.	.	.	SOCKET, RELAY, ALLIED CONTROL, 30055-4			2
5.4.59	00070-001	.	.	.	LUG, TURRET, 3/32D x 9/32H, 1/16D BASE, VECTOR T19			2
5.4.62	00071-007	.	.	.	RESISTOR, VAR WW 50K BOURNS 200P-1-503		R22	1
5.4.63	00071-008	.	.	.	RESISTOR, VAR WW 20K BOURNS 200P-1-203		R23	1
5.4.66	00091-005	.	.	.	CLIP, LITTLEFUSE, 3AG EARLESS 101002			2
5.4.68	00107-006	.	.	.	SCREW, ROUND HD 4-40 x 1/4			2
5.4.69	00108-011	.	.	.	CAPACITOR, MET, MYLAR .033 μ f 200V ELECTRON DE2-333		C4	1
5.4.70	00108-012	.	.	.	CAPACITOR, MET, MYLAR .33 μ f 200V ELECTRON DE2-334		C3	1
5.4.71	00108-013	.	.	.	CAPACITOR, MET, MYLAR .82 μ f 200V ELECTRON DE2-824		C2	1
5.4.73	00121-001	.	.	.	TRANSISTOR, UNIUNCTION G.E. 2N1671A		Q3	1
		NOTE: * (SEE TABLE)						



ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
5.7	00003-001	.	.	WASHER, HELICAL SPRING LOCK #2				3
5.8	00005-001	.	.	WASHER, EXT TOOTH LOCK #4				1
5.11	00021-003	.	.	SCREW, BINDING HD 2-56 x 1/4				3
5.12	00021-018	.	.	SCREW, BINDING HD 4-40 x 1/4				4
5.14	00024-004	.	.	SCREW, HEX, SOC SET 4-40 x 1/8				1
5.15	00025-004	.	.	NUT, HEX, 4-40				1
5.16	00046-002	.	.	SPACER, THREADED, 4-40 x 3/8 LG x 1/4 OD				2
5.17	00091-005	.	.	FASTENER, CLIP				3
5.19	00107-006	.	.	SCREW, ROUND HD 4-40 x 3/16				3
5.21	00122-001	.	.	TACHOMETER, SERVO-TEK SA-757A-2				1
6	10652-0	.		PULLEY, CAPSTAN DRIVE (1-30 IPS) -0:				1
7	10652-1	.		PULLEY, CAPSTAN DRIVE (1.5-45 IPS) -1:				1
8	10655-0	.		FLYWHEEL, CAPSTAN MOTOR				1
9	00002-004	.		WASHER, PLAIN #4				3
10	00002-009	.		WASHER, PLAIN #10				4
12	00003-002	.		WASHER, HELICAL SPRING LOCK #4				3
13	00004-005	.		MOTOR, UNIVERSAL				1
14	00005-004	.		WASHER, EXT TOOTH LOCK #10				4
16	00021-089	.		SCREW, BINDING HEAD, 10-32 x 5/8				4
17	00023-006	.		SCREW, SOCKET HD, CAP 4-40 x 3/8				3
18	00024-025	.		SCREW, SET, 10-32 x 1/8 HEX SOC HD				1



D A T A M E C

D 2 0 2 0

CAT. NO. 10650-0,-1, CAPSTAN SERVO DRIVE
(DUAL-SPEED TRANSPORT MODIFICATION)

S E R I E S

ITEM NO.	DATAMEC PART NO.	DESCRIPTION						QTY. NEXT ASSY.
		1	2	3	4	5	6	
19	00024-029	.	S	C	R	E	W	1
23	00096-003	.	B	E	L	T	, 1/2 x 8 LG ENDLESS WOVEN DACRON, RUSSELL B690 1/2 x 8	1