MODEL 2500
PERFORATED TAPE READER
OPERATION AND MAINTENANCE MANUAL

SERIAL NO. _____

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SECTION I

INTRODUCTION

1.1 GENERAL

The Digitronics Model 2500 (Figure 1-1) is a solid state, photoelectric, perforated tape reader that converts information on 5, 6, 7, or 8 level tape into dc signal levels. The Model 2500 is unidirectional and reads 5 to 8 level tapes interchangeably at slew speeds up to 300 characters per second.

This section outlines the applications of the equipment, specifications, options, and system requirements. In addition, this section provides a physical description of the unit.

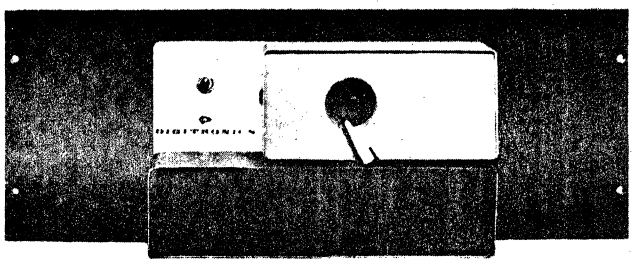
1.2 APPLICATIONS

The Model 2500 Tape Reader may be used in the assembly of digital computers, numerically controlled machine tools, ground support equipment, and other instrumentation systems.

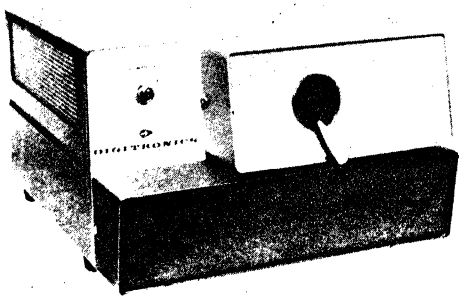
1.3 SPECIFICATIONS

1.3.1 Tape Read Features

Tape Read	Unidirectional
Tape Channel Capacity . . .	Available with a three-position tape guide which enables reading 11/16" to 1"(5-, 6/7-, and 8-level) tapes interchangeably by adjusting for tape width used, or a fixed guide for either 5-, 6/7-, 8-level, or teletypesetter.
Tape Channel Capacity . . . . (Cont'd)	
Type of Tape	Paper, paper-mylar laminated, or mylar, .004 to .005 inches in thickness. Tapes with up to 40% transmissivity are acceptable. With a slight adjustment to the pinch roller assembly, tapes from .0025 to .008 inches in thickness may be used.
Read (slew) Speed	The standard read speeds are 100, 200, or 300 characters per second (with tape perforated at 10 characters per inch). Other speeds available as options.
Stop Time	Approximately 1.0 milliseconds. Capable of stopping on character at all available speeds (see Paragraph 4.4.2).



(a) With Rack Adapter



(b) With Case Mount

Figure 1-1 Model 2500

Pinch Roller Operate Time . . . . Approximately 3 milliseconds.

Start Time . . . . . To determine start time (time to first character), add pinch roller operate time to time it takes to read one character at slew speed, then multiply by the appropriate friction factor from Table 1-1.

Table 1-1 Coefficient Of Friction For Perforated Tape

TYPE OF TAPE	FRICTION FACTOR*
Dry Paper	1.1 - 1.3
Oiled Paper	1.3 - 1.5
Mylar (aluminized or solid)	1.5 - 4.0
Paper Mylar Laminated	1.1 - 1.3

*These factors are approximate since the coefficient of friction varies from sample to sample.

1.3.2 Drive Motor

Type . . . . . Synchronous Induction

Excitation . . . . . 115 volts, 60 Hertz, single phase ac.

Speed . . . . . 3600 rpm

Duty Cycle . . . . . Continuous

1.3.3 Power Requirements and Environmental Limits

Line Voltage . . . . . 115 $\pm$ 10 volts, 50/60 Hz, single phase ac.

. . . . . 220 $\pm$ 10 volts, 50 Hz, single phase ac.

Power . . . . . 125 watts.

Operating Temperature . . . . 0° to 55° C.

1.4 OUTPUT SIGNALS

Built in photodiode output transistor amplifiers permit driving external circuits directly at the following levels:

Hole Condition: Pos. Logic — $+10.0 \pm 0.7$ volts @ 5 ma. maximum with a 2K ohm external load.

Hole Condition: Neg. Logic — -10.0 ± 0.7 volts @ 5 ma. maximum with a 2K ohm external load.

No-Hole Condition: — 0 ± 0.5 volts. The maximum allowable current flow through the reader output transistor, from the external circuitry, is 8 ma.

The reader can be operated with the data channel amplifiers ungated, or gated by the sprocket output.

1.5 TAPE RUN/STOP CONTROL

The tape reader has a single-line input for RUN/STOP control signals. It can be operated using both external RUN and STOP signals, or using external RUN signals with the reader self-initiating STOP signals.

1.5.1 External RUN and STOP Control

With this method of control, external dc signal levels are used for RUN and STOP control of the tape.

The tape will run (slew) for the duration of a RUN signal level, applied to the reader RUN/STOP input, and will stop upon the application of a STOP signal level. The specifications for the RUN and STOP signals are as follows:

RUN (Pos. Logic) — $+6.0 \begin{smallmatrix} -1.0 \\ +10.0 \end{smallmatrix}$ volts @2.5 ma.

RUN (Neg. Logic — $-6.0 \begin{smallmatrix} +1.0 \\ -10.0 \end{smallmatrix}$ volts @ 2.5 ma.

STOP: — 0 ± 0.5 volts @ 0.5 ma.

1.5.2 Self-initiated Stop

With the reader wired for self-initiated stop (see Section II, Paragraph 2.4.1), it can be made to slew

tape with a dc level RUN input, or step tape with a pulsed RUN input.

a. Slewing Tape With a DC Level RUN Input:

   Applying a 6 volt RUN signal level to the reader RUN/STOP input will cause the reader to slew tape for the duration of the RUN signal level. The reader will stop the tape on the first character after the RUN signal level is removed by self-initiating a STOP signal upon sensing the sprocket hole of that character.

b. Stepping Tape With a Pulsed RUN Input:
   The reader can be made to step the tape along one character at a time by applying 6 volt RUN pulses with a minimum duration of 5 microseconds to the reader RUN/STOP input. Each pulse will cause the tape to run, and upon sensing the sprocket hole of the next character the reader will self-initiate a STOP signal, and stop on that character. The duration of the RUN pulses must not exceed the time it takes the reader to step the tape to the next character. There are two basic methods of controlling the stepping of tape, which are described in Pharagraph 1.6.

1.6 METHODS OF CONTROLLING STEPPING OF TAPE

There are two basic methods of controlling the stepping of tape, which are arbitrarily called "open loop" operation and "closed loop" operation.

1.6.1 Open Loop Operation (See Figure 1-2)

In open loop operation the reader is wired for self-initiated stop and a train of RUN pulses is applied to the reader RUN/STOP input from an external source which may, in character, resemble a signal generator. The duration of the RUN pulses must be a minimum of 5 microseconds, but must not exceed the time it takes the reader to step the tape to the next character. The RUN pulses must also be sufficiently spaced so as to permit the reader time to step the tape to the next character and stop before the next RUN pulse is applied. This operation is called open loop because there is no tie-back from the reader to the equipment which is generating the RUN pulses. With this type of operation the maximum stepping rate is 60 characters per second.

1.6.2 Closed Loop Operation (See Figure 1-2)

One example of closed loop operation is where the reader is wired for self-initiated stop, and an initial RUN pulse is applied by the equipment utilizing the reader. The reader will then start the tape, and upon sensing the sprocket hole of the next character will self-initiate a STOP signal and stop on that character. The external equipment, at the same time, uses the sprocket to indicate that data is coming in and proceeds to process

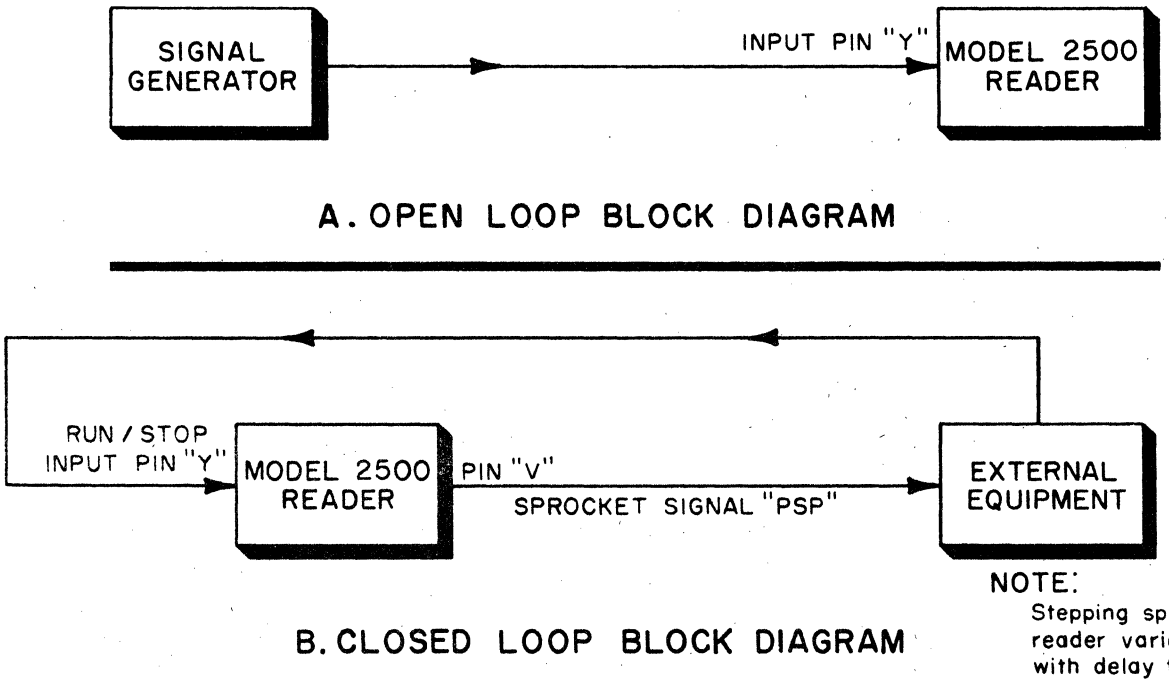


Figure 1-2 Methods of Controlling Stepping of Tape

the data. The external equipment then generates another RUN pulse some time later, depending on how long it takes to process this data.

Another example of closed loop operation is where the reader is not wired for self-initiated stop, and the external equipment applies RUN pulses to the reader in the same manner as in the first example. Using the sprocket output (signal PSP) for synchronization the external equipment also applies STOP signals to the reader. In this manner the external equipment controls both the starting and stopping of tape.

In closed loop operation the reader is capable of stepping tape at any rate up to the slew speed. This is possible because due to the synchronization between the reader and the external equipment, the stepping rate can be increased beyond the point where the pinch roller and brake are ever fully deenergized and energized respectively, and the tape will in fact be slewing. For instance if there is no delay involved for the external equipment to process the data received from the reader, then it can generate another RUN pulse at the same time that the data is received. With a RUN signal present at the same time that the self-initiated STOP signal is generated, the tape will not be stopped (see Section IV, Paragraph 4.4.2b).

1.7 READER SOLENOID VOLTAGE

The -15 Volts (+ 15 volt with optional positive logic) for the reader pinch rollers and brake solenoids is applied to pin 2 of the Input/Output connector, and pin AA is wired to the solenoids. This permits applying the 15 volts through the tape handler so that the tape handler can be used to interrupt the 15 volts to the reader solenoids during tape rewind, thereby deenergizing the solenoids.

If the Model 2500 is used with a tape handler which requires 15 volts for operating the tape handler relays (such as Digitronics Models 4566ALCR, B4566ALCR, P4566ALCR and PB4566ALCR) the 15 volts at pin Z of the Input/Output connector is available with a maximum current of 600 milliamperes.

1.8 PHYSICAL DESCRIPTION

The Model 2500 stock unit is available with a rack mount adapter for mounting in a standard 19" rack, or a desk top case mount.

1.8.1 Stock Unit

a. Dimensions:

Width	10"
Height	6"
Thickness of Front Panel	1/8"
Depth Behind Front Panel	10 5/8"

b. Weight . . . . . Approximately 15 lbs.

1.8.2 Rack Mount Adapter Option

The rack mount adapter is designed to fit a standard 19" RETMA equipment rack.

a. Dimensions:

Width	19"
Height	6.968"
Thickness of Adapter	3/8"
Depth of Unit Behind Adapter	10 1/4"

b. Weight of Adapter. . . . . 5 lbs.

1.8.3 Case Mount Option

a. Dimensions:

Width	10"
Height	6 7/16"
Depth of Case Behind Front Panel	10"

b. Weight of Case . . . . 3 lbs.

1.9 ACCESSORIES SUPPLIED

The reader is supplied with a mating connector for the Input/Output connector. The mating connector is a U.S. Components P/N UPCC-F2HSL-23 (Digitronics P/N TPES02302).

1.10 COMPATIBLE TAPE HANDLERS

The Model 2500 is compatible with the Digitronics Tape Handlers listed in Table 1-2.

Table 1-2 Compatible Tape Handlers

TAPE HANDLER MODEL	TAPE SERVO SPEED	REWIND	REEL SIZE AND CAPACITY
6010	Up to 150 characters per second	Unidirectional 30 inches/second	4 inch outside diameter, 175 feet of 4.5 mil tape
6011	Up to 300 characters per second	Unidirectional 40 inches/second	4 inch outside diameter, 175 feet of 4.5 mil tape
4566ALCR P4566ALCR	Up to 400 characters per second	Unidirectional 100 inches/second	8 inch outside diameter, 600 feet of 4.5 mil tape
B4566ALCR PB4566ALCR	Up to 400 characters per second	Bidirectional 100 inches/second	8 inch outside diameter, 600 feet of 4.5 mil tape
6070 with 10 1/2" reels*	Up to 500 characters per second	Bidirectional 150 inches/second	10 1/2" outside diameter, 1200 feet of 4.5 mil tape
6040A with 8" reels	Up to 700 characters per second	Bidirectional 180 inches/second	8 inch outside diameter, 600 feet of 4.5 mil tape
6040B with 10 1/2" reels	Up to 600 characters per second	Bidirectional 180 inches/second	10 1/2 inch outside diameter, 1200 feet of 4.5 mil tape

* When ordering Model 6070 Tape Handler for use with Model 2500 Reader, customer must specify that Tape Handler is to be used with Model 2500.

SECTION II

INSTALLATION

2.1 GENERAL

This section describes the procedures required for the proper mechanical and electrical installation of the unit. Initial installation checks are also given in this section.

2.2 UNPACKING

The unit is shipped in a reinforced packing case designed to provide maximum protection during handling and transportation. This case is reusable and should be retained if reshipment is anticipated. Care should be exercised in unpacking to insure no damage occurs in the process. All parts of the equipment should be checked against the shipping list to insure a complete shipment and a visual inspection of all parts should be performed to verify that they sustained no damage in transit. Should this inspection result in the discovery of an incomplete shipment or damage, the carrier and Digitronics Corporation should be notified immediately.

2.3 MECHANICAL INSTALLATION

The unit can be mounted in a 19" RETMA equipment rack using the rack mount adapter, or desk mounted using the case mount option.

2.3.1 Rack Mounting (See Figure 2-1)

The rack mount adapter is designed to fit a standard 19" RETMA equipment rack, using four (4) number 10 mounting screws.

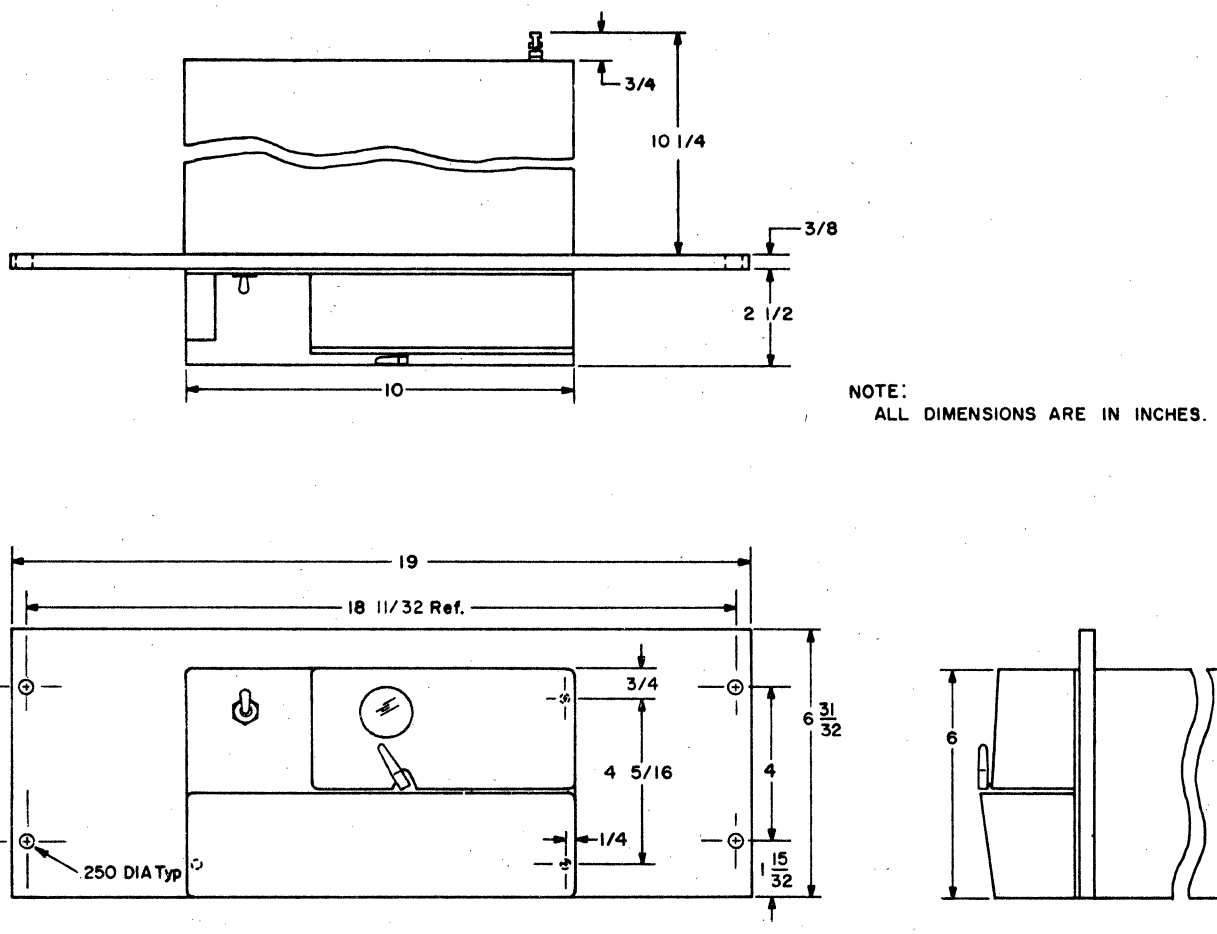


Figure 2-1. Model 2500 Outline Drawing

Table 2-1 Input/Output Mating Connector (P2) Wiring

PIN #	SIGNAL	DESCRIPTION
A	PD-1	Data Channel Output
B	PD-2	Data Channel Output
C	PD-3	Data Channel Output
D	PD-4	Data Channel Output
E	PD-5	Data Channel Output
F	PD-6	Data Channel Output
H	PD-7	Data Channel Output
J	PD-8	Data Channel Output
K	OV	Reader dc ground. Must be wired to ground in external equipment.
L	-	Not Used
M	-	Not Used
N	-	Not Used
P	-	Not Used
R	-15V (+15V, Pos. Unit)	Available for external monitoring.
S	G1	For operation with data amplifiers gated by sprocket output, these two pins must be shorted together by a jumper wire or external switch.
T	G2	
U	+15V Neg.Unit | -15V Pos.Unit	Available for external monitoring.
V	PSP	Sprocket Channel Output
W	SA1	For operation with self-initiated stop, these two pins must be shorted together by a jumper or external switch.
X		
Y	RUN/STOP	Tape RUN/STOP Control Input.
Z	-15S Neg.Unit | +15S Pos. Unit	These two pins can be wired to tape handler for use as described in Section 1, Paragraph 1.7. If not wired to tape handler, these pins must be shorted together at the connector.
AA	-15L Neg.Unit | +15L Pos. Unit	

2.3.2 Desk Mounting

The stock unit with the case mount option requires no mechanical installation for desk mounting.

2.4 ELECTRICAL INSTALLATION

The electrical installation of the reader consists of wiring the Input/Output mating connector, and applying ac power to the unit.

2.4.1 Mating Connector Wiring

a. Wire the Input/Output mating connector P2 to the external equipment, and also wire together the appropriate pins for the options selected, (see Table 2-1).

b. Connect the Input/Output mating connector P2 to the Input/Output connector J2 located on the rear of the reader chassis.

2.4.2 AC Power

Connect 115 $\{^{+}_{-}$ 10 volts, 60 Hertz, single phase ac line power to the reader, via the reader ac line cord.

2.5 INITIAL INSTALLATION CHECK

The procedures which follow provide an effective means of checking the power supply voltages, data and sprocket channel amplifiers, and motion control circuitry. These checkout procedures should be performed immediately following the installation of the equipment.

2.5.1 Power Supply Voltage

The reader +15 volt and -15 volt power supply should be checked for proper output. These voltage measurements can be taken across pin U and pin K (OV) of the Input/Output connector J2 for the +15 volt supply, and across pins R and K for the -15 volt supply. The reverse is true with the positive logic option. Voltage across pin U and pin K (OV) is -15 volts and +15 volts across pins R and K (see Table 2-1).
The tolerance for these voltages are as follows:

+15.0 $\{^{+}_{-}$ 1.0 volts -15.0 $\{^{+}_{-}$ 1.0 volts

2.5.2 Sprocket and Data Channel Outputs

Check the sprocket and data channel outputs as described in Section V, Paragraph 5.6 and 5.7.

2.5.3 Motion Control Circuitry

To check for the proper operation of the motion control circuitry, perform the operating procedures in Section III, and observe that the reader starts and stops the tape properly. If the reader is wired for self-initiated stop (pin W and X of the Input/Output connector P2 shorted together), the reader will stop the tape on character as described in Section I, Paragraph 1.5.2.

SECTION III

OPERATING PROCEDURES

3.1 GENERAL

This section describes the operating controls, and the operating procedures for the equipment. It is assumed that the equipment has been properly installed and that the initial installation check has been performed as described in Section II.

3.2 OPERATING CONTROLS

The operating controls (see Figure 3-1) and their functions are described in Table 3-1.

3.3 OPERATING PROCEDURES

The operating procedures consist of applying ac power, loading tape, and controlling tape reading.

3.3.1 Loading Tape

a. Move the POWER ON switch to the POWER ON position.

b. Move the READY/LOAD switch to the LOAD position (see Figure 3-1).

Table 3-1 Operating Controls

CONTROL	REF. DES.	FUNCTION
POWER ON	S1	This switch applies ac power to the reader.
READY/LOAD	S2	This switch is used to deenergize the reader pinch roller and brake solenoids to permit loading or changing of tape without removing ac power from the reader. Control handle also moves in and out providing tape guide adjustment for different tape widths (on units with adjustable tape guide).

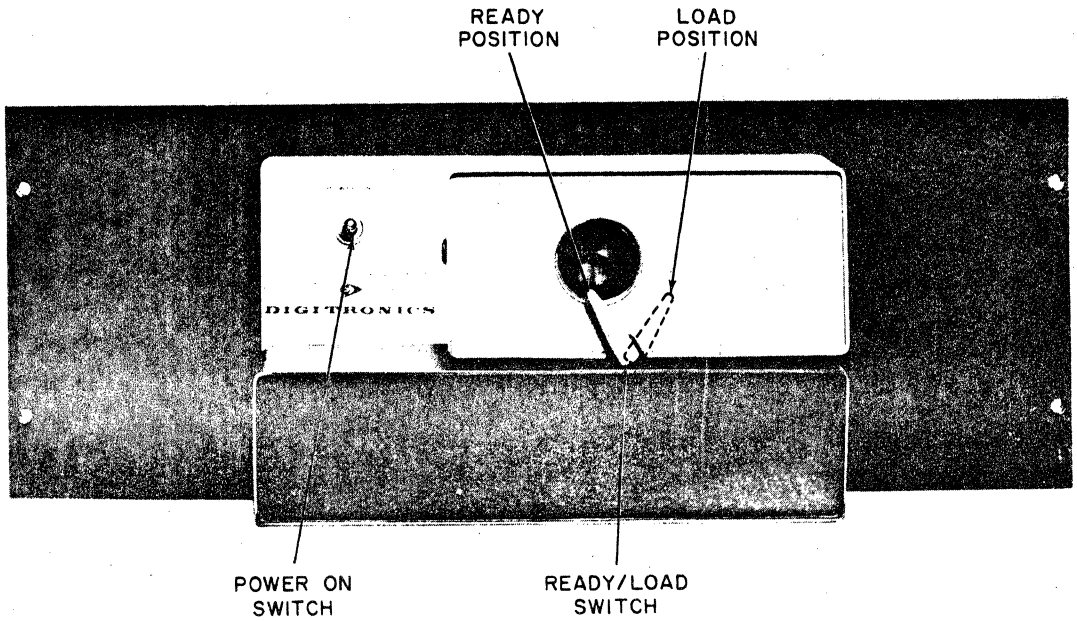


Figure 3-1. Operating Controls

Note

The variable tape guide is adjusted with inward/outward movement of the READY/LOAD switch control handle.

c. If the unit has the three position variable tape guide, position the tape guide to accommodate the width of the tape to be used as follows:

TAPE WIDTH	TAPE GUIDE POSITION
11/16 inches (5 level)	Innermost
7/8 inches (6 and 7 level)	Middle
1 inch (8 level)	Outermost

d. Thread tape through reader with channel 1 nearest panel. (See Figure 3-2.)

e. Move the READY/LOAD switch to the READY position.

The reader is now ready for tape read operation.

3.3.2 Tape Read

Tape reading (RUN/STOP) is controlled by the external equipment. The tape RUN/STOP signal requirements are described in Section I, Paragraph 1.5.

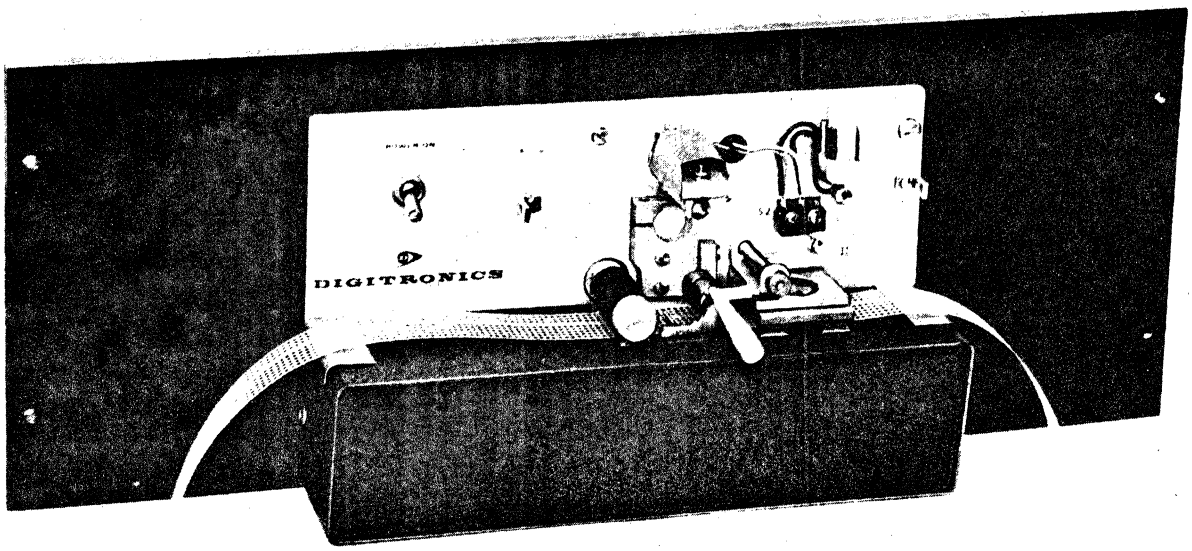


Figure 3-2. Tape Path (shown with upper cover removed)

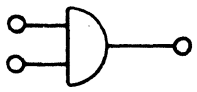
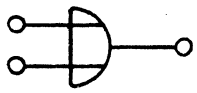
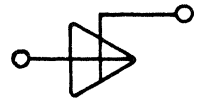
SECTION IV

THEORY OF OPERATION

4.1 GENERAL

This section provides a general description of the reader subassemblies and circuits (Paragraph 4.3), and a detailed circuit analysis (Paragraph 4.4). The reader schematic and logic diagrams (Section VII, Figures 7-1 or 7-2) should be used in conjunction with this section.

Table 4-1 Description of Logic Symbols

SYMBOL	DESCRIPTION
	Gate or "AND" Gate
	Buffer or "OR" Gate
	Non-Inverting Amplifier
	Inverting Amplifier (Inverter)

4.2 LOGIC SYMBOL TERMINOLOGY

Table 4-1 presents a description of the logic sysmbols used in this manual.

4.3 GENERAL DESCRIPTION OF SUBASSEMBLIES AND CIRCUITS

The reader consists of a power supply, tape drive system, and a tape read system (see Block Diagram; Figure 4-1) which are described in the following paragraphs.

The circuit descriptions contained and described in this section relate to the negative logic unit. These descriptions are also applicable to the positive logic units. A mental note should be made when applicable to reverse the polarity of numerical values when dealing with a positive unit.

4.3.1 Power Supply

The power supply operates on 115 $\pm$ 10.0 volts, 50 or 60 Hz, or 220-230 volts, 50 or 60 Hz, single phase ac line power and supplies the +15 and -15 volt requirements of the tape drive and tape read systems, and the +8.6 volts for the exciter lamp.

4.3.2 Tape Drive System

The tape drive system consists of a drive motor system, pinch roller solenoid assembly, brake assembly; and a control circuit, pinch roller circuit, and brake circuit which are located on the Motion Control Printed Circuit Board (MPC Board).

a. Drive Motor System

The drive motor consists of an ac drive motor, pulley assembly, and capstan. The drive motor via the pulley assembly rotates the capstan continuously in a clockwise direction as long as ac power is on. The drive motor and pulley assembly determine the tape slew speed and can be obtained in any speed increment up to 300 characters per second. The capstan will be maintained within 5% of rated speed.

b. Pinch Roller Solenoid Assembly

The pinch roller solenoid assembly is mounted on the front panel with the pinch roller positioned directly below the capstan. When the pinch roller solenoid is energized, the pinch roller is driven upward by the solenoid, squeezing the tape between the pinch roller and the constantly rotating capstan causing the tape to be pulled across the read head from right to left.

c. Brake Assembly

The brake assembly is located on the front panel so that the tape passes between the armature and the coil assembly. When the brake is energized, the armature is pulled against the poles of the coil assembly thereby causing the tape to be stopped.

d. Control Circuit

Tape RUN/STOP signals are applied as inputs to the control circuit, and the control circuit in turn applies inputs to the pinch roller and brake circuits, controlling the starting and stopping of tape.

e. Pinch Roller Circuit

The pinch roller circuit is essentially a non-inverting amplifier, the output of which is used to energize or deenergize the pinch roller solenoid, and is controlled by inputs from the control circuit.

f. Brake Circuit

The brake circuit is essentially a non-inverting amplifier, the output of which is used to energize or deenergize the brake solenoid, and is controlled by inputs from the control circuit.

4.3.3 Tape Read System

The tape read system consists of an exciter lamp, photodiode head assembly, and data and sprocket channel circuits. The data and sprocket channel circuits are located on the Logic Amplifier Printed Circuit Board (LAC Board).

a. Exciter Lamp

The exciter lamp is mounted on the front panel above the photodiode head assembly, with a two inch clearance from the center line of the lamp to the tops of the photodiodes. A 12 volt, 10 watt lamp is used with an operating voltage of $+8.6 \{ \pm 0.3$ volts. Derating the 12 volt exciter lamp to 8.6 volts provides ample light intensity and ensures extended life and reliability of the lamp.

b. Photodiode Head Assembly

The photodiode head assembly is mounted on the front panel and is comprised of a photodiode head with nine LS431 type diodes mounted in it; eight data photodiodes and one sprocket photodiode. The photodiodes are positioned on 0.10 inch centers to detect the passage of data and sprocket holes in the tape.

A hole condition in a given channel of tape permits the passage of light and causes photodiode conduction, resulting in an increased photodiode output current. The photodiodes are biased so that during a no-hole condition, the data photodiode outputs will be at a positive level and the sprocket photodiode output at a negative level; and during a hole condition, the data photodiode outputs will be at a negative level and the sprocket photodiode output at a positive level. These outputs are applied to the data and sprocket channel circuits.

c. Data Channel Circuits

There are eight identical data channel circuits, each consisting of an emitter follower, and a two stage amplifier. The data channel circuits provide outputs (PD-1 to PD-8) of $-10.0 \{ \pm 0.7$ volts at 5 milliamperes with a 2K ohm external load (-15.0 volts, no load) for a hole condition, and $0 \{ \pm 0.5$ volts for a no-hole condition. These outputs can be gated by the sprocket internally by shorting G1 and G2 together (pins S and T of the Input/Output connector), or externally using the sprocket output (signal PSP) which is available at pin V of the Input/Output connector.

d. Sprocket Channel Circuit

The sprocket channel circuit consists of an emitter follower, inverter amplifier, Schmitt trigger circuit, and a second inverter amplifier. The Schmitt trigger circuit reshapes the sprocket waveform, permitting use of the sprocket to gate the data outputs. The sprocket channel output (signal PSP) is $-10.0 \{ \pm 0.7$ volts at 5 milliamperes with a 2K ohm external load (-15.0 volts, no load) during a hole condition, and $0 \{ \pm 0.5$ volts during a no-hole condition.

4.4 CIRCUIT ANALYSIS

The following paragraphs provide a detailed description of the power supply, tape drive system, and tape read system.

4.4.1 Power Supply

The power supply operates on 115 ± 10 volts, 50 or 60 Hz, or 220 volts, 50 Hz, single phase ac and will draw 125 watts of power. The power supply provides +15 and -15 volts for the tape drive and tape read systems, and +8.6 volts for the exciter lamp.

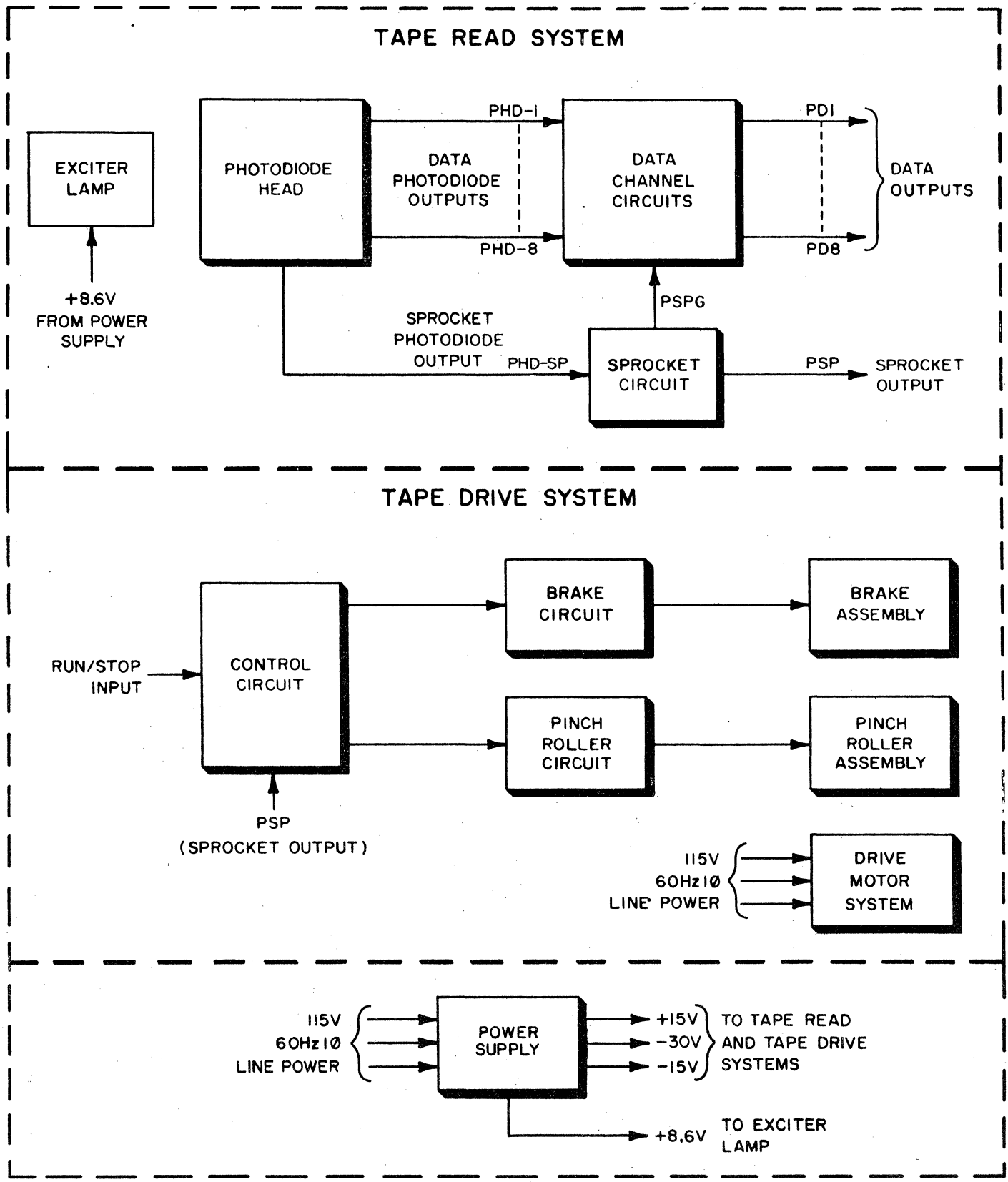


Figure 4-1. Reader Block Diagram

Ac power is applied via the line cord through the 1.5 ampere slo-blo fuse F1 and power switch S1 to the capstan drive motor M1; through terminal board TB1-1 to fan motor B1, and the primary of transformer T1. The secondary of transformer T1 applies 35 volts rms to the full wave diode rectifier bridge CR3. The outputs of rectifier bridge CR3 are +15 and -15 volts filtered by 10,000 microfarad, 25 vdc capacitors C2 and C3. These outputs are applied to the tape drive and tape read circuitry. +15 volts is also applied through a 5 ohm, 10 watt resistor R21 to adjustable power resistor R22 where it is reduced to 8.6 volts and applied to the exciter lamp.

-15 volts is also applied to the READY/LOAD switch S2, the output of which is called -15S and is applied to pin Z of the Input/Output connector J2. -15S is returned to the reader at pin AA of connector J2 and is called -15L. -15L is applied through a 25 ohm, 25 watt resistor (R1); and a 20 ohm, 25 watt resistor (R2) and becomes signals PR2R and B2R. Signals PR2R and B2R are applied to one side of the pinch roller solenoid and one side of the brake solenoid respectively. These two signal voltages are filtered by four, 47.0 microfarad, 20 vdc capacitors C4, 5, 6, and 7.

The purpose of the READY/LOAD switch and signals -15L and -15S available at connector J2 is to enable the pinch roller and brake solenoids to be deenergized without removing ac power from the unit; by the READY/LOAD switch for loading and unloading tape, or externally by the tape handler for rewinding of tape.

Transformer T1 also contains a filter winding which in conjunction with a 2.0 microfarad, 440 volt resonating capacitor C1 is used to suppress fluctuations in the ac line voltage.

CAUTION

In this unit the dc return is not tied to the chassis. Therefore; for dc waveform and voltage measurements, signal 0V (pin K of Input/Output connector J2) must be used for ground reference.

4.4.2 Tape Drive System

Electrically, the switching time from a stop condition to a run condition is approximately 2.0 microseconds; however, the mechanical switching time is much slower. From a complete stop, full energization of the pinch roller takes approximately 3.0 milliseconds. This time must be added to the time it takes to read one character at the slew speed, and then multiplied by the appropriate friction factor from Table 1-1 to determine the start time. When slewing tape at the maximum speed (300 characters per second), the time it takes the tape to come to a complete stop will be approximately 1.0 milliseconds. It is because of this mechanical switching time that the maximum stepping rate with open loop operation (Paragraph 1.6.1) is 60 characters per second.

The reader will stop in the stop character at all available speeds; however, at a speed of 300 characters per second it may or may not stop in the sprocket hole of the stop character. The design of the associated external logic circuitry should allow for the reader stopping anywhere from in the data and sprocket holes of the stop character to in the space preceding the following character, thereby ensuring maximum reliability. (See Figure 4-2).

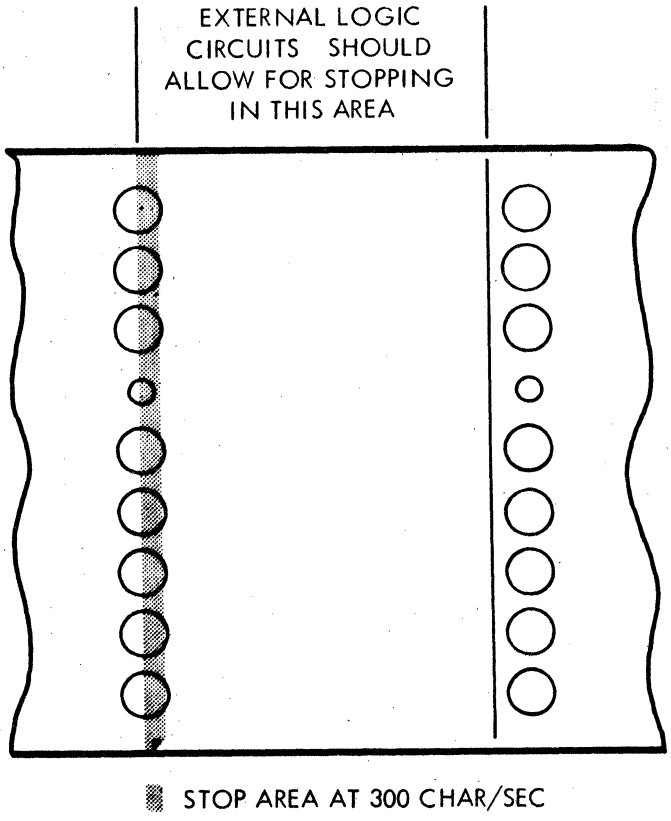


Figure 4-2 Reader Stop Distance

a. Control Circuit

When a -6 volt RUN signal is applied to the RUN/STOP input (pin Y of connector J2), it is applied through diode D2 of the input buffer to inverter T1. T1 inverts the -6 volt input to 0 volts and applies it to the pinch roller circuit where it energizes the pinch roller. The 0 volt output of T1 is also applied through diode D3 of a second buffer to inverter T2 where it is inverted to a negative level and applied to the brake circuit, deenergizing the brake. With the pinch roller energized and the brake deenergized, the tape will run and continue doing so until a STOP signal is applied to the RUN/STOP input.

When a 0 volt STOP signal is applied to the RUN/STOP input, it is passed through D2 of the input buffer to T1, where it is inverted to a negative level and applied to the pinch roller circuit deenergizing the pinch roller. The negative output of T1 is also applied through D3 of the second buffer to T2 where it is inverted to 0 volts and applied to the brake circuit, energizing the brake. With the pinch roller deenergized and the brake energized, the tape will be stopped.

The control circuit has -15 volts applied to a 10 microfarad, 25 volt capacitor (C8), which serves to prevent unwanted tape run until the capstan reaches normal operating speed after power is initially turned on. Due to the instantaneous current flow through capacitor C8 when power is initially turned on, the negative voltage is applied through diode D4 to inverter T2 which inverts it to 0 volts and applies it to the brake circuit, causing the brake to be energized. The brake will remain energized until the output of T2 returns to a negative level as a result of reduced current flow through C8 as the capacitor becomes charged.

b. Self-Initiated Stop

When the reader is wired for self-initiated stop (SA1 shorted to SA2), the output of inverter T2 in the control circuit is fed back (through pins W and X of connector J2) to the RUN/STOP input buffer, and the stopping of tape is controlled by the sprocket output (signal PSP) applied to capacitor C2 of the control circuit.

When slewing tape with a -6 volt dc RUN input, the output of inverter T2 will be at a negative level (as described in Paragraph 4.4.2a) and this negative level is fed back and applied to diode D1 of the input buffer. Upon removal of the RUN signal (return to 0 volts), tape will continue to run as a result of the negative output of T2 being fed back to D1 of the input buffer. However; when the reader senses the first sprocket hole after the RUN signal returns to 0 volts, signal PSP applied to C2 will go negative producing a negative spike which is applied through D5 to T2. This negative spike will drive the output of T2 to 0 volts, which is fed back to D1 of the input buffer. With 0 volts present at both inputs of the buffer, the tape will stop and remain stopped until another RUN signal is applied.

Due to PSP (which will be negative during sprocket hole time) being applied to C2, every sprocket hole sensed by the reader while tape is being slewed will produce a negative spike which in turn is applied through D5 to T2. Each negative spike will drive the output of T2 to 0 volts, and the 0 volts will be fed back to D1 of the input buffer. However; due to the presence of the -6 RUN signal at D2 of the input buffer, the output of T2 will be at 0 volts only during the time of the negative spike, which is not of sufficient duration to energize the brake.

When stepping the tape along one character at a time with a pulsed RUN input as described in Section I, Paragraph 1.5.2b, the circuit operation is the same except that in this case each sprocket hole will generate a STOP signal and stop the tape on each character. This is due to the fact that each RUN pulse will start the tape and return to 0 volts before the tape is stepped to the next character.

c. Pinch Roller and Brake Circuits

The pinch roller and brake circuits are identical; each having two inverting amplifiers, with the output of the second inverter being applied to one side of the solenoid (PR1C side of the pinch roller solenoid and the B1C side of the brake solenoid). The PR2C and B2C sides of the pinch roller and brake solenoids have an operating voltage applied to them as described in Paragraph 4.4.1.

The first inverter (T3 or T4) is a power driver which supplies increased current to the base of the second inverter (T5 or T6). The second inverter (T5 or T6) is a power amplifier whose output swings from -15 volts when it is off, to 0 volts when it is turned on, and is capable of handling the 1.5 ampere current surge requirements of the solenoid.

The pinch roller and brake are operated inversely by the control circuit; that is, when the pinch roller is energized the brake is deenergized and vice versa. When a RUN signal is applied to the RUN/STOP input, the control circuit applies a 0 volt input to the pinch roller circuit and a negative input to the brake circuit; and when a 0 volt STOP signal is applied to the RUN/STOP input, the control circuit applies a negative input to the pinch roller circuit and a 0 volt input to the brake circuit.

When a 0 volt input is applied to the pinch roller circuit (or brake circuit), the 0 volts is inverted to a negative level by T4 (or T3). The negative output of T4 (or T3) is inverted again to 0 volts by T6 (or T5) and applied to the solenoid. With 0 volts applied to PR1C (or B1C) side of the solenoid, the pinch roller (or brake) will be energized.

When a negative input is applied to the pinch roller circuit (or brake circuit), the negative voltage is inverted to 0 volts by T4 (or T3). The 0 volt output of T4 (or T3) is inverted again to a negative level (-15 volts) by T6 (or T5) and applied to the solenoid. With -15 volts applied to the PR1C (or B1C) side of the solenoid, the pinch roller (or brake) will be deenergized.

The collectors of T5 and T6 are protected by clamping diodes CR1 and CR2 respectively, which prevent the collector voltage from exceeding -15 volts.

4.4.3 Tape Read System

a. Sprocket Channel Section

The positive side of the sprocket channel photodiode is biased by +4.0 volts which is derived from the voltage dividing network of resistors R18, 19, and 22. During a hole condition the photodiode output will go positive to +3.6 volts and negative to -6.0 volts during a no-hole condition.

As a hole passes over the sprocket photodiode, the positive output of the photodiode is applied to the base of emitter follower T1. T1 couples this positive signal to the base of inverting amplifier T2 turning it off, resulting in the collector going negative. This signal is applied to the Schmitt trigger circuit of T3 and T4. The negative going input at the base of T3 results in the collector going positive. This positive going voltage is coupled through capacitor C3 to the base of emitter follower T4. Conduction in T4 decreases with the collector current being drawn through emitter resistor R10 which is common to both T3 and T4. The decreased current through R10 results in a positive going change in the emitter potential of T3. This cumulative effect of an increasingly negative base potential and increasingly positive emitter potential accelerates the increase in the collector current of T3. The collector potential is thereby driven further positive, and is coupled through resistor R7 and R8 to the base of T4, with the result that conduction through T4 is further decreased. This positive feedback effect thus produces a rapid turn-on (saturation) of the first stage (T3), while driving the second stage (T4) into cut-off. The effect of the Schmitt trigger circuit on the input signal is to produce a rapid rise time on the leading edge and fall time on the trailing edge, thereby shaping the signal into a clean square wave.

The output of T4 is positive (+2 volts) during a hole condition, and negative (-6 volts) during a no-hole condition, and is applied to pin S (G1) of connector J2, and the base of inverter T5.

The output of T5 is -15.0 volts (no load) during a hole condition and 0.0 volts during a no-hole condition, and is applied to pin V (PSP) of J2.

b. Gating Circuit

As tape is being read, the data signals for each character occur before and are of longer duration than the sprocket signal due to the data holes being larger than the sprocket holes.

The gating circuit provides an output signal (PSPG) which is controlled by the sprocket signal and can be used to gate the data channel outputs, thus ensuring that all the data outputs occur at the same time for a given character.

When G1 is shorted to G2 (pins S and T of connector J2) the output of the Schmitt trigger circuit is applied to the base of transistor T6, the output of which is signal PSPG. When G1 is positive (during a hole condition) the collector of T6 will be -4 volts; and when G1 is negative (during a no-hole condition) the collector of T6 will be +4 volts. This output (signal PSPG) is applied to diode D5 of each data channel where it is gated with the output of emitter follower T1. When ungated (G1 not shorted to G2) signal PSPG remains at -4 volts.

c. Data Channel Section

The negative side of the data photodiodes are biased by a regulated -3.6 volts supplied by zener diode D4. During a hole condition, the output of a data photodiode will be at a negative level (-3 volts) and at a positive level during a no-hole condition.

As a hole passes over a photodiode, the negative output is applied to the base of emitter follower T1. The negative output of T1 is gated with signal PSPG, with the output of the gate being applied to the base of amplifier T2.

Because the data signals occur before the sprocket signal, when the data outputs are gated by the sprocket signal output the gate will be blocked by PSPG being +4.0 volts until the sprocket signal occurs. When the sprocket signal occurs, PSPG will go to -4.0 volts allowing the gate and applying a negative signal to the base of T2.

When the data outputs are not gated by the sprocket output, PSPG will always be -4.0 volts. In this case, as soon as the output of T1 goes negative the gate will be enabled and the negative signal will be applied to the base of T2.

When a negative signal is applied to the base of T2, the output of T2 will go positive and this is applied to the base of T3. This will turn T3 off and the collector will go to -15 volts (no load). The T3 outputs of the data channels (signals PD-1 to PD-8) are applied to pins A through J of connector J2. During a hole condition, T3 is capable of supplying -10 volts at 5 milliamperes into a 2K ohm external load.

During a no-hole condition the positive output of the photodiode is applied to T1. This is coupled by T1 to the base of T2 driving the collector of T2 negative. This negative signal is applied to the base of T3 turning it on and driving the collector to 0 volts. During a no-hole condition the maximum current through T3 from the external equipment must not exceed 8 milliamperes.

SECTION V

MAINTENANCE

5.1 GENERAL

This section describes the preventive maintenance, corrective maintenance, and adjustment procedures required to maintain the equipment in good operating condition. The Illustrated Parts Breakdown (Section VI) and Figure 5-1 (Component Locations) should be used in conjunction with this section.

5.2 PREVENTIVE MAINTENANCE

For trouble-free operation, certain vital points (listed in Table 5-1) should be inspected at periodic intervals, and the necessary adjustments or replacements be made when trouble is discovered. While this equipment has been designed for trouble-free operation, a certain amount of wear must be expected. If detected and corrected at an early stage, troubles from these sources can be minimized. The Component Replacement Schedule (Table 5-2) should be followed to assure maximum time between failures and to prolong trouble-free use.

5.2.1 Periodic Inspections

An over all inspection of the equipment is recommended as a precautionary measure immediately before being put into service. Such an inspection involves a complete examination of electrical wiring and mechanical details in addition to inspection of the output signals and the proper functioning of the operating controls. The Periodic Inspection Schedule (Table 5-1) was computed on the basis of a 40 hour work week, and should be used as a guide for equipment inspection after installation. When equipment usage exceeds these limits, adjust-

Table 5-1 Periodic Inspection

DAILY	
Read Head	Clean as required (see Paragraph 5.2.3)
Pinch Roller	
Capstan	
Brake	
MONTHLY	
Pinch Roller/Capstan Gap	Check adjustment - (see Paragraph 5.5.1d)
Pinch Roller	Check return spring locknut adjustment - (see Paragraph 5.5.1c)
"O" Ring Drive Belts	Check for wear and stretching
Brake	Check brake assembly adjustment - (see Paragraph 5.5.2)
SEMI-ANNUALLY	
All moving parts	Check for wear
Power Supply	Check power supply voltages - (see Section II, Paragraph 2.5.1)
Exciter Lamp	Check for proper voltage - (see Paragraph 5.6.1 steps d and e)
Data and Sprocket Channel Outputs	Check for proper amplifier adjustments - (see Paragraph 5.6 and 5.7)

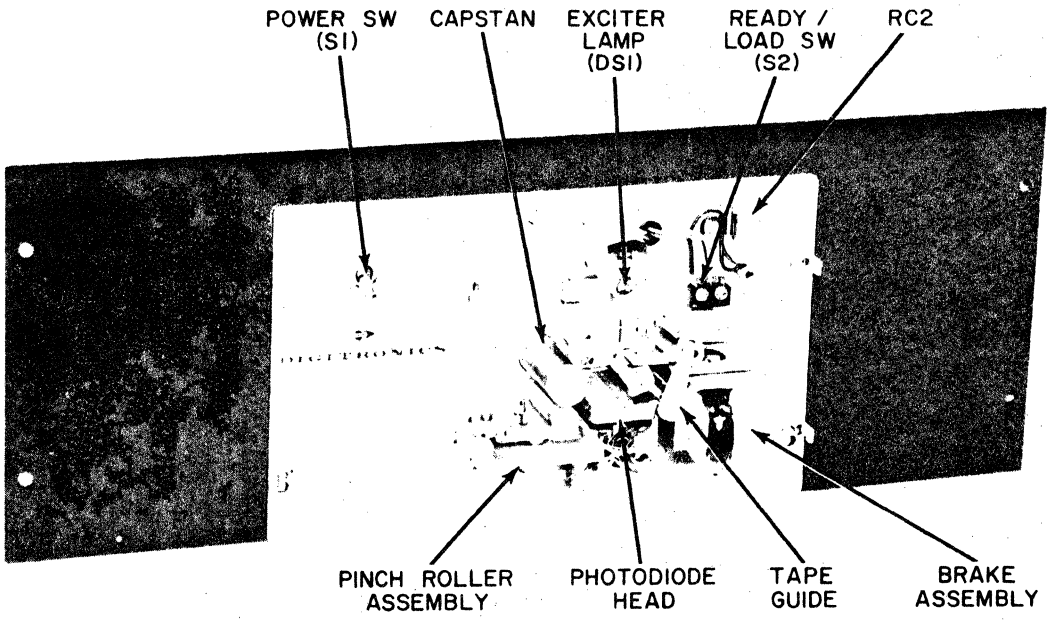


Figure 5-1a. Component Locations (front panel)

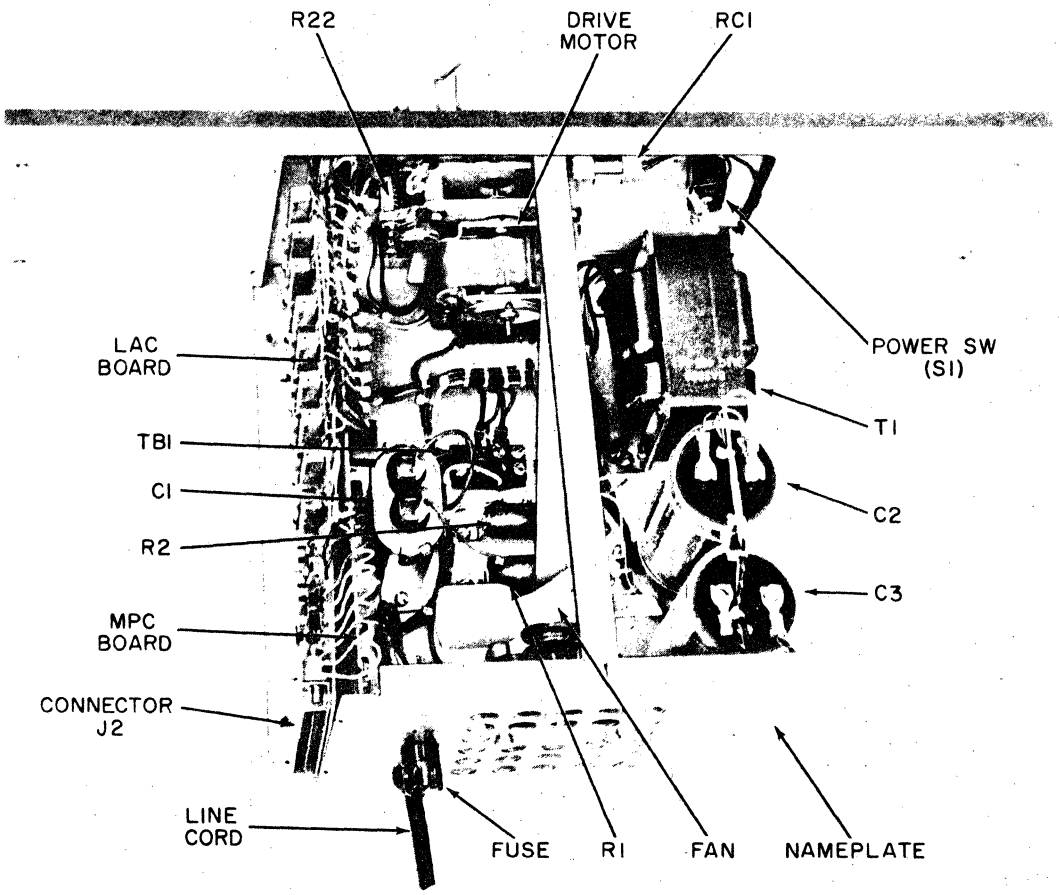


Figure 5-1b. Component Locations (chassis)

ments should be made to the schedule. If defects are evident during inspection; i.e., pinch roller worn or out of adjustment etc.; perform replacement and/or adjustment procedures immediately.

5.2.2 Lubrication

Apply two or three drops of ANDEROL L456 lubricant (or until felt is saturated) to drive motor lubrication points (see Figure 5-2) every 200 hours or six (6) months, whichever comes first.

CAUTION

Care should be exercised not to spill oil on the drive belts as this can cause them to slip or deteriorate.

No other parts of the unit require lubrication. All bearings are permanently lubricated and double shielded to prevent the entry of dust.

5.2.3 Cleaning

When inspection reveals that components of the unit require cleaning; i.e., pinch roller, capstan etc., the Digitronics Cleaning Kit (MS-133) provides a convenient brush and solvent. Alternatively, a cotton swab or lint free brush may be used with a solvent such as N-AMYL Alcohol.

5.3 CORRECTIVE MAINTENANCE

When properly installed and preventive maintenance has been carried out, any irregularities that occur in the performance of the equipment will be attributed to the failure of some component part. Since the unit has been factory adjusted, the adjustment procedures should not be undertaken until after corrective maintenance has proven ineffective or has resulted in the replacement of parts.

When it becomes necessary to trouble shoot the equip-

Table 5-2 Component Replacement Schedule (See Paragraph 5.4)

ITEM	REPLACE AFTER	APPROXIMATE REPLACEMENT TIME
"O" Ring Drive Belts	1000 hrs. or 250 million start/stop operations	20 min.
Exciter Lamp Bulb	1500 hrs.	5 min.
Bearings, Capstan	2000 hrs. or 500 million start/stop operations	18 min.
Capstan	2000 hrs.	5 min.
Bearings, Pinch Roller	2000 hrs. or 500 million start/stop operations	15 min.
Pinch Roller Solenoid	3000 hrs. or 500 million start/stop operations	20 min.
Motor, Capstan Drive and Pulley Bearing (Pulley not used on 200 or 300 cps. models)	4000 hrs.	25 min.
Brake Assembly	5000 hrs.	12 min.
Load Switch	5000 hrs.	20 min.

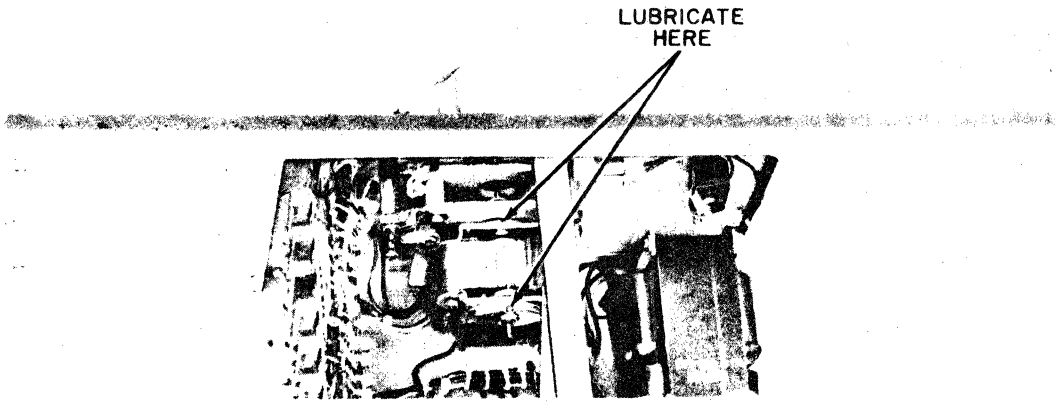


Figure 5-2. Drive Motor Lubrication Points

ment, the Reader Trouble Isolation Guide (Table 5-3) can be used as an aid in localizing the trouble. Point-to-point voltage and resistance measurements (see Table 5-4), or comparing input and output waveforms of the various stages (see Figure 5-3) may be necessary to locate defective circuit components.

The circuit waveforms illustrated in Figure 5-3 were made with a negative logic unit. This should be taken into consideration when checking a positive logic unit. The waveforms displayed will be inverted.

5.4 COMPONENT REMOVAL

The procedures outlined in this paragraph are included to aid service personnel in the removal and replacement of the pinch roller and brake solenoids, read head assembly, tape guide assembly, and "O" ring drive belts.

The remaining replaceable components of the Model 2500 require no subsequent adjustments, extraordinary precautions, or other special attention beyond normal good practice. Unless otherwise indicated, replacement procedures are the reverse of removal procedures.

5.4.1 Pinch Roller Solenoid

a. Remove lower cover.

b. Disconnect solenoid leads from PR1C and PR2C edgeboard connections on MPC board (see Figure 5-4) and separate leads from wire harness.

c. Remove pinch roller assembly from panel by removing two socket head screws and lockwashers on front of solenoid mounting bracket.

d. Remove Esna locknut, compression spring, and flatwasher from spring stud.

e. Remove two screws and lockwashers that hold roller bracket to pinch roller spring.

f. Remove two hex nuts and lockwashers that hold solenoid to mounting bracket.

g. Install and secure replacement solenoid and reassemble pinch roller assembly.

h. Remount assembly to panel, connect leads to edge board connections, and tie leads to wire harness.

i. Adjust pinch roller as outlined in Paragraph 5.5.1.

5.4.2 Brake Solenoid

a. Remove upper and lower covers.

b. Disconnect brake coil leads from B1C and B2C edgeboard connections on MPC board (see Figure 5-4) and separate leads from wire harness.

c. Remove two screws on top of brake assembly that hold limiter plate and armature spring to base plate.

d. Remove limiter plate and armature with spring from assembly.

e. Remove brake coil from base plate by removing two socket head mounting screws from front of coil.

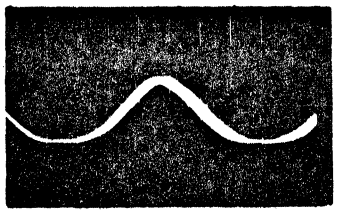
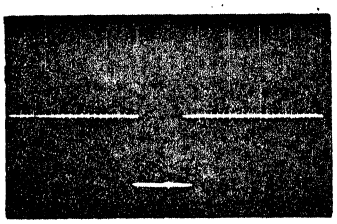
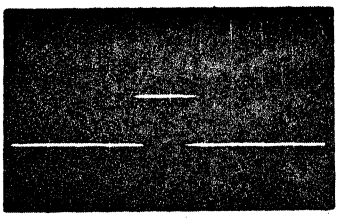
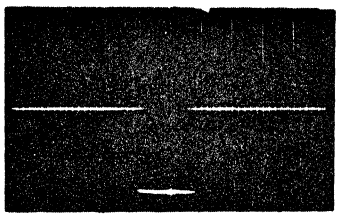
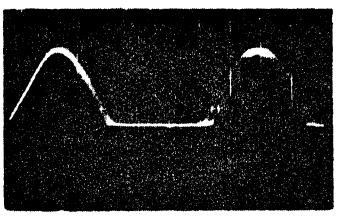
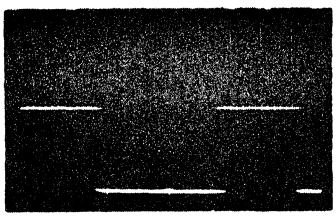
Waveform (Ref. to Fig. 7-1)	Oscilloscope Settings			Trigger	Oscilloscope Presentation
	Vert. (v/cm)	Horiz. (ms/cm)	Trigger Mode		
W1	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W2	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W3	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W4 (No Load)	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W5	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W6 (Ungated, No Load)	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	

Figure 5-3 Circuit Waveforms, Negative Logic
(Sheet 1 of 3)

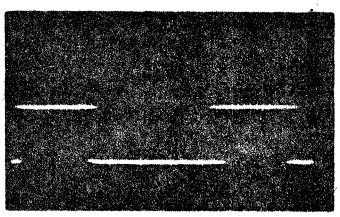
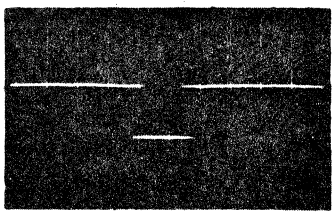
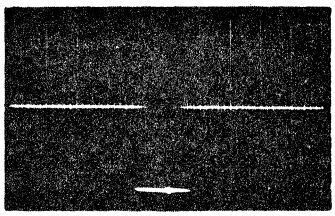
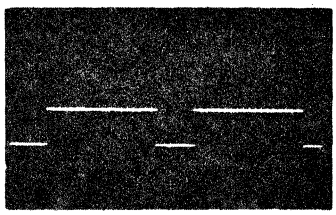
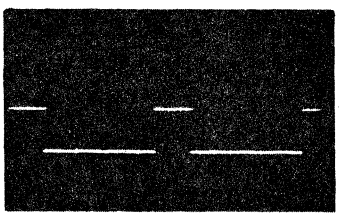
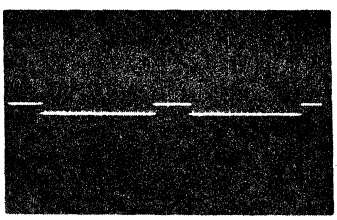
Waveform (Ref. to Fig. 7-)	Oscilloscope Settings			Trigger	Oscilloscope Presentation
	Vert. (v/cm)	Horiz. (ms/cm)	Trigger Mode		
W7 (Ungated, 2K ohm Load)	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W8	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W9 (Gated No Load)	5.0	0.5	Ext. (+)	CH-1 Photodiode Output	
W10	5.0	5.0	Ext. (-)	RUN Signal	
W11	5.0	5.0	Ext. (-)	RUN Signal	
W12	5.0	5.0	Ext. (-)	RUN Signal	

Figure 5-3 Circuit Waveforms, Negative Logic
(Sheet 2 of 3)

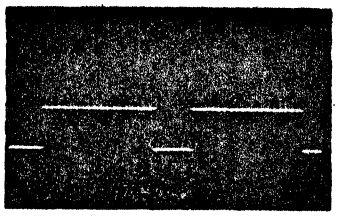
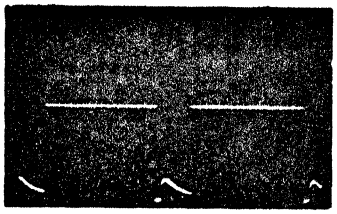
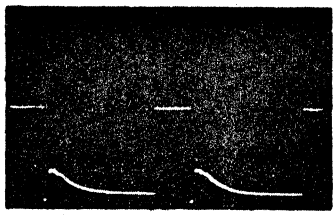
Waveform (Ref. to Fig. 7-1)	Oscilloscope Settings			Trigger	Oscilloscope Presentation
	Vert. (v/cm)	Horiz. (ms/cm)	Trigger Mode		
W13	5.0	5.0	Ext. (-)	RUN Signal	
W14	5.0	5.0	Ext. (-)	RUN Signal	
W15	5.0	5.0	Ext (-)	RUN Signal	

Figure 5-3 Circuit Waveforms, Negative Logic (Sheet 3 of 3)

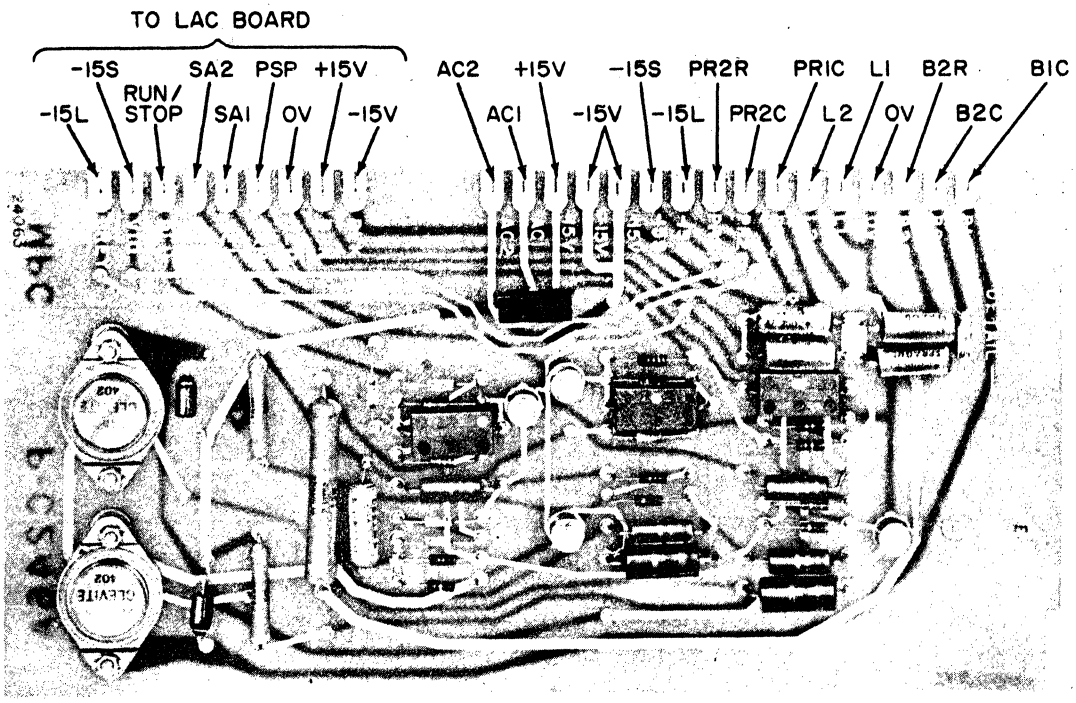


Figure 5-4. MPC Board Edgeboard Connections

Table 5-3 Reader Trouble Isolation Guide

SYMPTOM	PROBABLE CAUSE	REMEDY
RUN signal applied but pinch roller does not energize	Defective control or pinch roller circuit	Check circuits and repair as required
	Defective pinch roller coil	Replace coil
Pinch roller energizes but tape does not run	Pinch roller/capstan gap too wide	Adjust pinch roller assembly
Tape rises off read head when pinch roller is energized	Pinch roller assembly out of adjustment	Adjust pinch roller assembly
Tape skews	Pinch roller assembly out of adjustment	Adjust pinch roller assembly
	Brake assembly out of adjustment	Adjust brake assembly
	Adjustable tape guide in wrong tape width position	Move tape guide to correct tape width position
	Fixed or adjustable tape guide not adjusted properly	Adjust tape guide
Tape runs too slow	Pinch roller/capstan gap too wide	Adjust pinch roller/capstan gap
	"O" ring drive belt loose	Replace drive belt
	Defective drive motor	Replace drive motor
Capstan does not rotate	"O" ring drive belt off pulley	Replace drive belt on pulley
	"O" ring drive belt broken	Replace drive belt
	Defective motor	Replace motor
Brake does not energize	Control or brake circuit defective	Check circuits and repair as required
	Brake coil defective	Replace brake coil
Non-existent bit consistently being read	Defective photodiode	Check photodiode, and replace head assembly if necessary

Table 5-3 Reader Trouble Isolation Guide (Cont'd)

SYMPTOM	PROBABLE CAUSE	REMEDY
Non-existent bit consistently being read (cont'd)	Data channel amplifier out of adjustment	Check and readjust if required
	Defective data channel amplifier	Check amplifier and repair as required
One bit consistently not being read	Defective photodiode	Check photodiode and replace head assembly if required
	Data channel amplifier out of adjustment	Check and readjust amplifier if required
	Defective data channel amplifier	Check amplifier and repair as required
One bit intermittently not being read, or non-existent bit intermittently being read	Adjustable tape guide not in correct tape width position	Move guide to correct position
	Tape guide not adjusted properly	Adjust tape guide
	Tape improperly punched	Use new tape
	Incorrect exciter lamp voltage	Adjust R22 for proper voltage
	Photodiode dirty	Clean photodiodes
	Dc voltages not properly regulated	Check dc supply and repair as required
	Intermittent photodiode	Check photodiode and replace head assembly if necessary
	Intermittent data channel amplifier	Check amplifier and repair as required
	Data channel amplifier out of adjustment	Check amplifier and readjust if required

f. Mount replacement coil leaving mounting screws loose.

g. Connect brake coil leads to edgeboard connections, and tie leads to wire harness.

h. Adjust brake assembly as outlined in Paragraph 5.5.2.

5.4.3 Read Head Assembly

The following procedures are for the removal and replacement of the head assembly where one or more photodiodes has been determined to be faulty, or for any other cause requiring removal of the assembly as a unit.

WARNING

The warranty is void if the photodiodes are removed from the photodiode head assembly. When any repairs are necessary or replacement of photodiodes is required, the entire lens and head assembly must be returned to the factory.

a. Remove upper and lower covers.

b. Disconnect photodiode head lead edgeboard connections on LAC board (see Figure 5-5), and separate leads from wire harness.

c. Remove lens and head assembly from panel by removing two mounting screws and lockwashers on front of base plate.

d. Mount replacement lens and head assembly to panel.

e. Connect photodiode head leads to edgeboard connections following color code as shown in Figure 5-5, and dress and tie leads to wire harness.

f. Perform photodiode amplifier adjustment procedures (Paragraph 5.6).

5.4.4 Tape Guide Assembly

Removal of the tape guide assembly is accomplished by loosening the mounting screw on the right side of the

Table 5-4 Resistance Measurements (Reference Figure 7-1)

FROM	TO	RESISTANCE (IN OHMS)	REMARKS
TB1-1	TB1-2	5.0	Primary of Transformer (T1).
AC1	0V	0.4	Secondary of Transformer (T1). Measurements made from edgeboard connections on MPC board. (See Figure 5-4)
AC2	0V	0.4	Secondary of Transformer (T1). Measurements made from edgeboard connections on MPC board. (See Figure 5-4)
C1-1	C1-2	32.0	Filter Winding of Transformer (T1).
PR1C	PR2C	1.9	Pinch Roller Coil. Measurements made from edgeboard connections on MPC board. (See Figure 5-4)
B1C	B2C	1.3	Brake Coil. Measurements made from edgeboard connections on MPC board. (See Figure 5-4)

base plate, and sliding the tape guide assembly out of the base plate mounting hole.

Note

Whenever the guide assembly is removed from the base plate, and replaced, it must be adjusted. For proper adjustment, see Paragraph 5.5.3.

5.4.5 "O" Ring Drive Belts

a. Remove upper cover from reader.

b. Loosen capstan setscrew and slide capstan off pulley shaft.

c. Remove motor reducer assembly with motor from rear of front panel by removing three mounting screws from rear of reducer assembly.

d. Remove front plate from reducer assembly by separating from rear plate.

e. Remove appropriate pulley(s) necessary to gain access to "O" ring(s) requiring replacement.

f. Replace "O" ring(s) and reassemble reducer assembly.

g. Remount assembly to rear of front panel, tightening mounting screws securely.

h. Remount capstan to pulley shaft exercising care to center capstan rubber over pinch roller.

5.5 MECHANICAL ADJUSTMENT PROCEDURES

The adjustment procedures given in this section should be performed only after inspection or corrective maintenance has proven a component improperly adjusted, or resulted in the replacement of parts.

5.5.1 Pinch Roller Assembly

The pinch roller assembly has four adjustments; horizontal alignment, vertical alignment, return spring adjustment, and pinch roller/capstan gap adjustment. For proper operation it is important that the capstan and pinch roller be in perfect alignment to prevent skewing of tape during slewing or stepping operation.

a. Pinch Roller Horizontal Alignment

The pinch roller horizontal alignment must be made visually due to its location in the unit. The pinch roller should be visually aligned so that it is horizontally parallel to the capstan. This adjustment can be made by loosening the screws on the pinch roller spring and slightly rotating the roller bracket on the spring stud. It is also

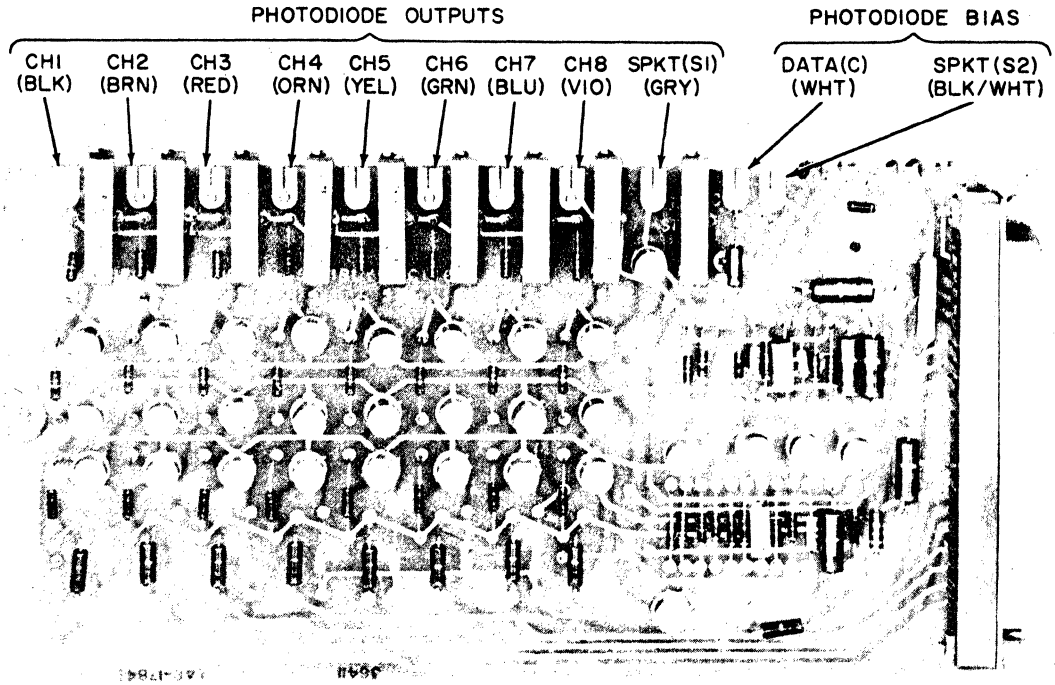


Figure 5-5 Photodiode Head Connections on LAC Board

important that the pinch roller engage the capstan bottom center point to prevent the tape from rising off the read head.

b. Pinch Roller Vertical Alignment

Vertical alignment or parallelism between the capstan and pinch roller can be accurately checked by inserting a feeler gauge between the rollers. The gap spacing must be equal at both ends of the rollers or tape skewing will occur during stepping operation. To adjust, loosen screws and move the roller mount block.

c. Return Spring Adjustment

1. Actuate pinch roller solenoid by applying a RUN signal level to RUN/STOP input.

2. Increase spring tension by tightening locknut until solenoid toggles to deactivated position.

3. Back off locknut until solenoid reactivates.

4. Back off locknut two additional full turns.

Note

This adjustment is intended for optimum performance. If a more rapid start response is desired, the locknut may be backed off an additional one or two turns, however; it must be taken into account that this will increase the stop time of the reader, and may prevent it from stopping the tape on character.

d. Pinch Roller-Capstan Gap Adjustment

Since the capstan rubber may be .001" to .002" out of round, the pinch roller-capstan gap adjustment is made by adjusting the pinch roller so that it JUST TOUCHES the high point of the rotating capstan. In this manner without using any gauges, the pinch roller will be approximately .001" to .002" from the low point of the capstan.

1. Apply ac power to reader so that capstan rotates.

2. Actuate pinch roller solenoid by applying a RUN signal level to RUN/STOP input.

3. Loosen solenoid assembly mounting screws and move assembly upward until pinch roller just touches high point of rotating capstan.

5.5.2 Brake Assembly

The brake assembly adjustment should be performed when the brake coil has been replaced. The following procedures assume that the limiter plate mounting screws and limiter plate have been removed.

a. Place brake armature (with spring mounted to it) on top of poles of brake coil assembly, with a .003 inch shim between poles of coil and armature.

b. With two (2) coil assembly mounting screws loose, adjust coil so that spring is flush and parallel to upper surface of base plate.

c. Tighten coil mounting screws exercising caution not to move coil.

d. Mount limiter plate to base plate.

5.5.3 Tape Guide Assembly

Whenever the tape guide assembly is replaced, it must be adjusted for the proper tape width. To adjust; loosen the mounting screw located on the right side of the base plate, and move the assembly in or out in the mounting hole to achieve the proper dimension as shown in Figure 5-6.

5.6 PHOTODIODE AMPLIFIER ADJUSTMENTS

There are two methods of adjusting the photodiode amplifiers; one employing the use of the neutral density filter, and the other by adjusting the duty cycle of the sprocket and data channel outputs. The neutral density filter method is the more accurate and preferred method of the two; however, the duty cycle method may be used as an alternate method. The adjustments must be made with the data amplifiers ungated by the sprocket signal. In gated units this can be done by disconnecting pins S and T (signals G1 and G2) of the Input/Output connector J2. The Output Signal Coincidence Check (Paragraph 5.7) should be performed immediately following the amplifier adjustments.

5.6.1 Neutral Density Filter Method

The neutral density filter (Digitronics Part Number AA4559) has a neutral density of 50%, which means that only 50% of the light available from the exciter lamp will be passed through the filter.

a. Remove upper cover.

b. Connect jumper lead across common (C) and normally open (NO) terminals of READY/LOAD switch S2.

c. Check that pins Z (-15S) and AA (-15L) of connector J2 are shorted together. If not, short them together.

d. Apply ac power, and allow at least 15 minutes for unit to stablize at ambient room temperature with exciter lamp on.

e. Check that lamp voltage is +8.6 $\pm$ 0.5 volts. If not, adjust resistor R22 for proper voltage.

f. With READY/LOAD switch in LOAD position, place neutral density filter on top of photodiode head so that filter covers all of the photodiodes.

g. Adjust oscilloscope or dc volt meter for a -15 volt signal (+15 volts if positive logic), connect ground lead to reader signal 0V (pin K of connector J2) and connect probe to sprocket output signal PSP (pin V of J2).

CAUTION

In this unit the dc return is not tied to the chassis. Therefore; for dc waveform and voltage measurements, signal 0V (pin K of connector J2) must be used for ground reference.

h. Adjust potentiometer R23 of sprocket channel circuit (see Figure 5-7) so that sprocket output is -15 volts (+15 volts if positive logic).

i. Slowly readjust R23 to point where sprocket output just goes to 0 volts. Care should be taken to seek this point as accurately as possible.

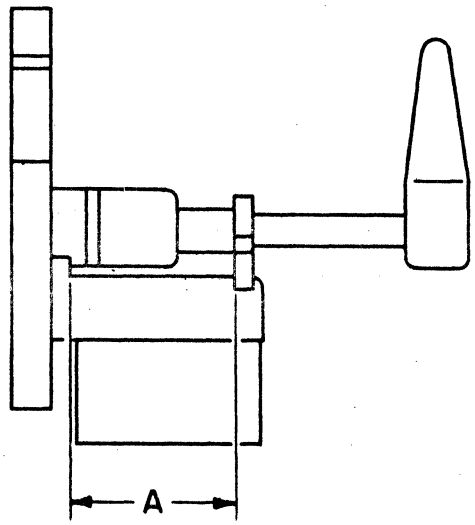
j. Repeat steps g, h, and i for each data channel output, signals PD-1 through PD-8 (pins A through J respectively of connector J2).

5.6.2 Duty Cycle Method

The duty cycle method of adjusting the amplifiers is done by monitoring the sprocket and data channel outputs with an oscilloscope while the reader is slewing a test tape that is fully punched, and adjusting the on-off ratio of the output signals. The neutral density filter method is preferred to this method because with this method the reader is adjusted to a test tape and the adjustments will vary from tape to tape, while with the neutral density filter method the reader is adjusted to a fixed standard.

a. Perform steps c, d, and e of Paragraph 5.6.1.

b. Adjust oscilloscope for a -15 volt signal (+15 volts if positive logic), connect ground lead to reader 0V (pin K of connector J2), and connect probe to sprocket output signal PSP (pin V of J2).



ADJUST FOR DIMENSION "A" AS FOLLOWS:

TYPE OF TAPE GUIDE	DIMENSION "A" IN INCHES
Adjustable Guide - all levels	1.0015 (with tape guide in outermost position)
Fixed Guide - 8 level	1.0015
Fixed Guide - 6/7 level and Teletypesetter	.8765
Fixed Guide - 5 level	.6885

Figure 5-6 Tape Guide Adjustment

CAUTION

In this unit the dc return is not tied to the chassis. Therefore; for dc waveform and voltage measurements, signal 0V (pin K of connector J2) must be used for ground reference.

c. Load test tape following procedures in Section III, Paragraph 3.3.1.

d. Apply a RUN signal level so that reader will slew test tape (see Section I, Paragraph 1.5.1).

e. Adjust oscilloscope for one full cycle of signal PSP equal to 10 divisions of oscilloscope scale.

f. Adjust potentiometer R23 of sprocket channel (see Figure 5-7) so that signal PSP is -15 volts (+15 if positive logic) for 40 % of cycle, and 0 volts for 60 % of cycle.

g. Connect oscilloscope probe to data channel 1 output signal PD-1 (pin A of J2).

h. Adjust oscilloscope for one full cycle of signal PD-1 equal to 10 divisions of oscilloscope scale.

i. Adjust potentiometer R23 of data channel 1 (see Figure 5-7) so that signal PD-1 is -15 volts (+15 volts if positive logic) for 70 % of cycle, and 0 volts for 30 % of cycle.

j. Repeat steps g, h, and i for the remaining data channel signals PD-2 through PD-8 (pins B through J respectively of connector J2).

5.7 OUTPUT SIGNAL COINCIDENCE CHECK

This check verifies that the relative coincidence between the sprocket channel and data channel outputs is within the specified tolerances. It should be performed immediately following any amplifier adjustments (Paragraph 5.6). This check must be performed with the data channels ungated by the sprocket signal. If unit is gated, disconnect pins S and T of connector J2. The check is performed using a dual trace oscilloscope and comparing all of the data channel outputs with the sprocket channel output while the reader is slewing a fully punched test tape.

a. Connect the oscilloscope channel B probe to the sprocket output (signal PSP).

b. Use the channel 1 data output (signal PD-1) as an external trigger for the oscilloscope, and also

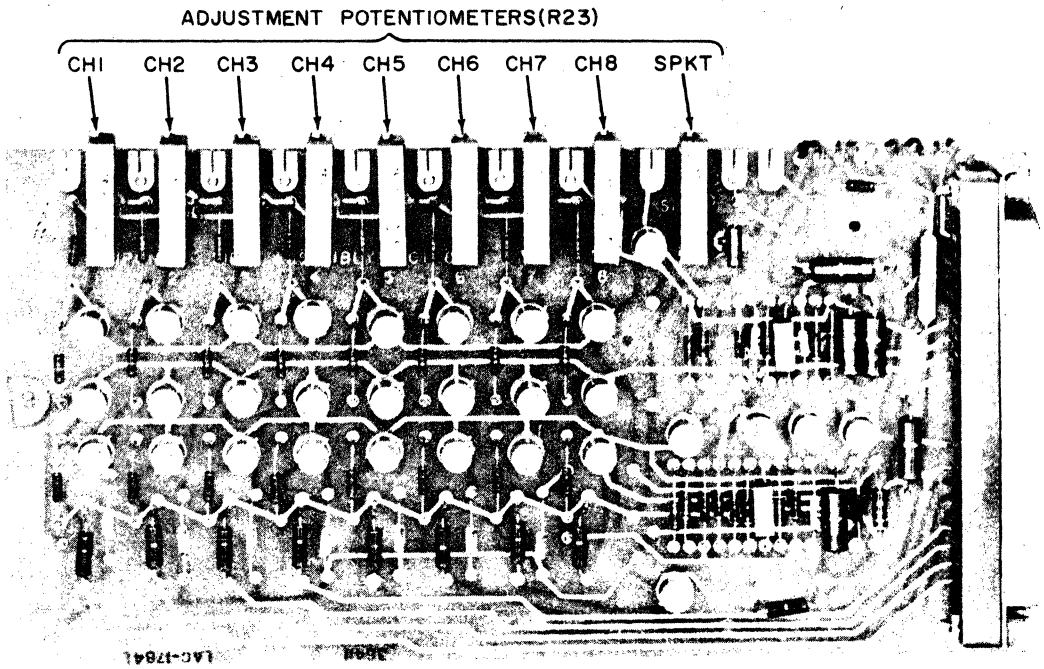


Figure 5-7 Amplifier Adjustment Locations

connect the oscilloscope channel A probe to the same output signal.

c. Observe the sprocket and data channel waveforms and compare the relative coincidence between the two. See Figure 5-8 for the proper relationship and the allowable variations to it.

d. Repeat steps b and c for the remaining data channels.

Various factors such as badly punched tape, cumulative tolerances, or tape skewing may add together to cause variations in the relative coincidence between the sprocket and data channel outputs. These variations are acceptable within the tolerances specified in Figure 5-8. If the relative coincidence can not be brought within the specified tolerances by readjusting the sprocket and data channel amplifiers, the head assembly should be returned to the factory.

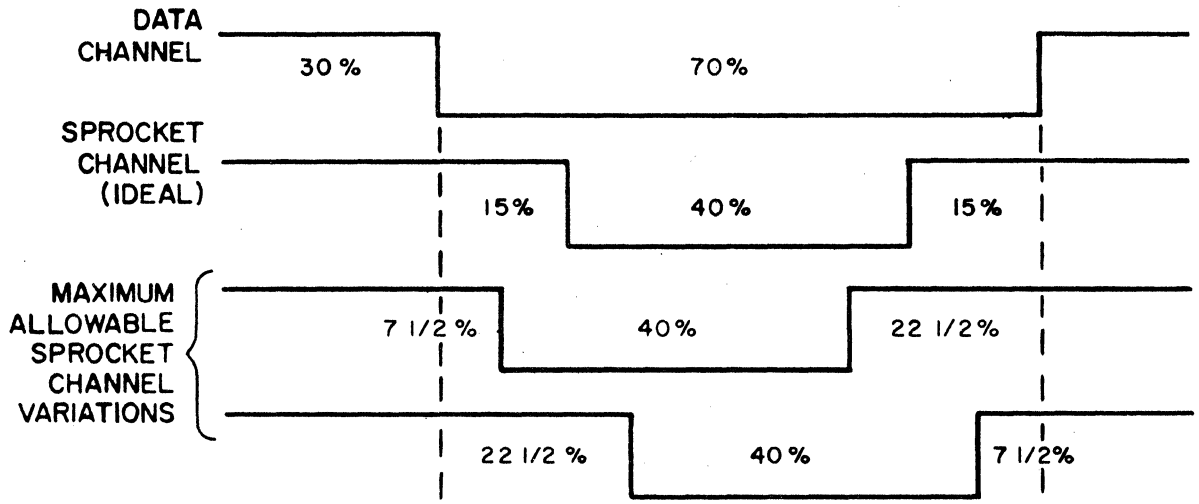


Figure 5-8 Relative Coincidence of Sprocket and Data Channel Outputs

SECTION VI

ILLUSTRATED PARTS BREAKDOWN

6.1 GENERAL

This section lists and illustrates the component parts of the Model 2500 Tape Reader. A system of indention is used throughout the parts list to show the relationship between the detailed parts and the subassemblies, and between the subassemblies and the main assemblies. The parts list is presented in a tabular form containing the information given in the following paragraphs.

6.2 FIGURE AND INDEX NUMBER

The figure and index number column provides a cross reference between each list and its associated illustration. The figure number to which the parts list is keyed is followed by a dash and appears at the beginning of the listing and at the first line of continuing pages. The index numbers are preceded by a dash and correspond to those numbers on the associated illustration.

6.3 PART NUMBER

The part number column provides the Digitronics part number for each part.

6.4 DESCRIPTION

The description column lists the name and the descriptive information for each part and component listed. All components are listed in order of disassembly with the exception of the attaching parts. They are preceded by the legend "ATTACHING PARTS". The symbol "---*---" denotes end of the attaching parts.

6.5 UNITS PER ASSEMBLY

The units per assembly column indicates the quantity of the part required for the assembly or subassembly in which that part appears. "NP" indicates that the part is nonprocurable.

6.6 USABLE ON CODE

An alphabetical code of capital letters is used in this column to indicate the interchangeability of parts for similar assemblies. The usable on codes are defined at the beginning of each applicable list. When this column is left blank, the part is used on all assemblies.

6.7 ALTERNATE PARTS

When another manufacturer's part may be substituted for a Digitronics part, the code symbol for that manufacturer and the part number appears in parenthesis as the last item in the description of the part. The following is a list of manufacturers and their codes as used in the parts list.

MANUFACTURERS LIST

Code	Manufacturer
00656	Aerovox Corp., New Bedford, Mass.
04643	Digitronics Corp., Albertson, N. Y.
15605	Cuttler-Hammer, Inc., Milwaukee, Wis.
28520	Heyman Mfg. Corp., Kenilworth, N. J.
44655	Ohmite Mfg. Co., Skokie, Ill.
53021	Sangamo Electric Co., Springfield, Ill
56289	Sprague Electric Co., North Adams, Mass
57771	Edwin B. Stimpson Co., Inc., Brooklyn, N. Y.
71002	Birnbach Radio Co., New York, N. Y.
71450	CTS Corp., Elkhart, Ind.
72653	General Cement Div. of Textron Inc., Rockford, Ill.
72962	Elastic Stop Nut Corp. of America, Union, N. J.

MANUFACTURERS LIST (Cont'd.)

Code	Manufacturer	Code	Manufacturer
74840	Illinois Condenser Co., Chicago, Ill.	83330	H. H. Smith Inc., Brooklyn, N. Y.
75382	Kulka Electric Mfg. Co., Inc., Mount Vernon, N. Y.	89110	AMP Inc., Elizabethtown, Pa.
75915	Littelfuse Inc., Des Plaines, Ill.	90201	P. R. Mollory and Co., Detroit, Mich.
76530	Monadnock Mills San Leandro, Calif.	91506	Augat Bros. Inc., Attleboro, Mass.
80207	Unimax Switch Corp., New York, N. Y.	96214	Texas Instruments Inc., Apparatus Div. Dallas, Texas
83086	New Hampshire Ball Bearings Inc., Peterborough, N. H.	97954	U. S. Components Inc., New York, N. Y.

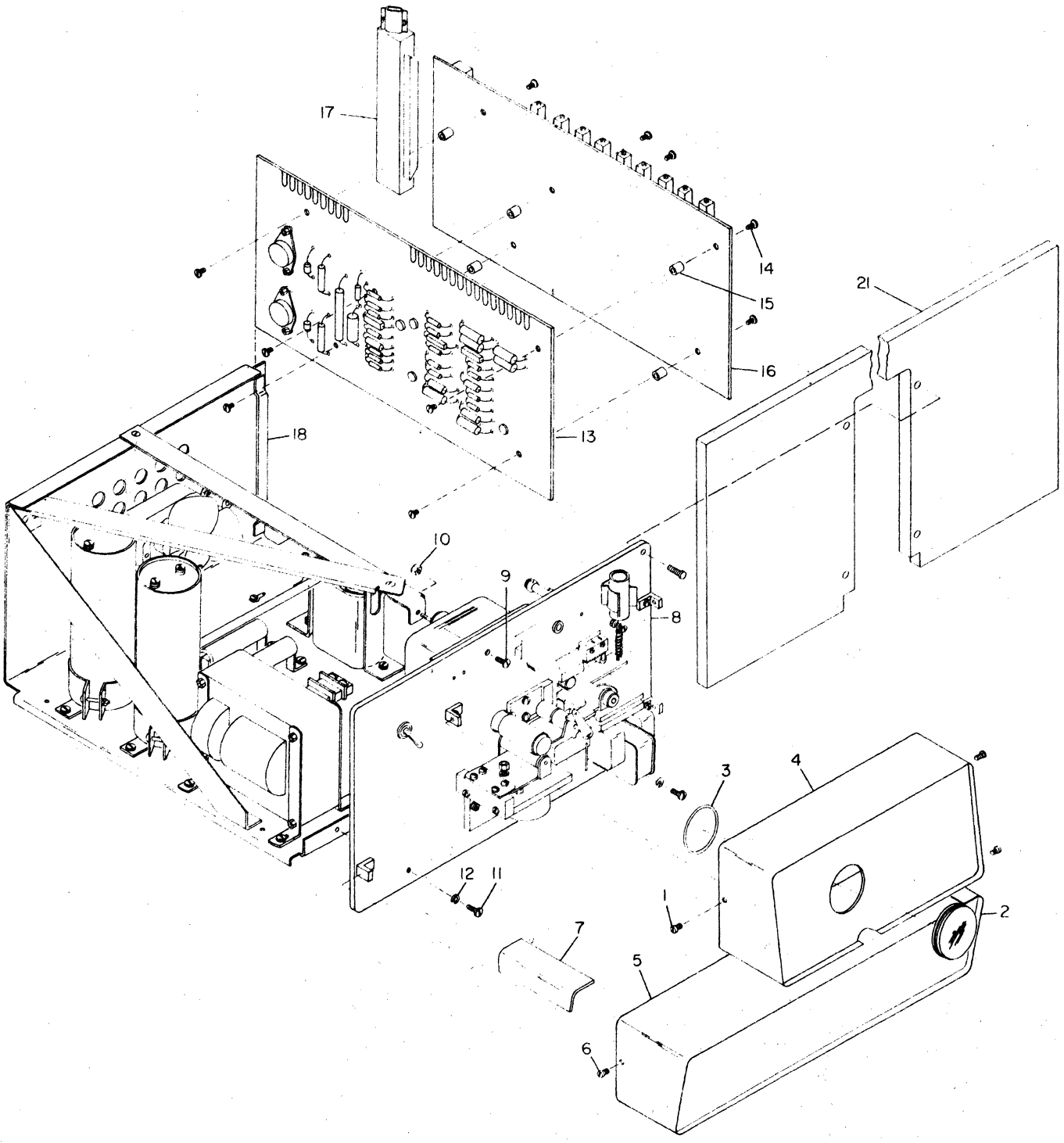


Figure 6-1. Paper Tape Reader Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		PAPER TAPE READER ASSEMBLY		
6-1-	DC-1933	PAPER TAPE READER ASSEMBLY, Model 2500 115V 60 Hz Negative Logic	1	
	DC-1933-1	PAPER TAPE READER ASSEMBLY, Model 2500 115V 50 Hz Negative Logic	1	
	DC-1933-2	PAPER TAPE READER ASSEMBLY, Model 2500 230V 50 Hz Negative Logic	1	
	DC-1933-3	PAPER TAPE READER ASSEMBLY, Model 2500 115V 60 Hz Positive Logic	1	
	DC-1933-4	PAPER TAPE READER ASSEMBLY, Model 2500 115V 50 Hz Positive Logic	1	
	DC-1933-5	PAPER TAPE READER ASSEMBLY, Model 2500 230V 50 Hz Positive Logic	1	
	DC-2854	PAPER TAPE READER ASSEMBLY, Model 2500 115V 60 Hz All Silicon Circuitry	1	
	CC-4003-1	. COVER ASSEMBLY, Upper	1	
		(ATTACHING PARTS)		
-1	TH-SD1203	. SCREW, Machine, ph hd, No. 6-32 x 1/4 in. lg.	2	
		---*---		
-2	AA-4672	. . WINDOW, Reader	1	
		(ATTACHING PARTS)		
-3	AA-4671	. . RETAINER, Window	1	
		---*---		
-4	CC4001-1	. . COVER, Upper	1	
-5	DC4002-1	. COVER ASSEMBLY, Lower	1	
		(ATTACHING PARTS)		
-6	TH-SD1203	. SCREW, Machine, ph hd, No. 6-32 x 1/4 in. lg.	2	
		---*---		
-7	AA-5660	. . PLATE, Wear	2	
-8	CC-1932	. PANEL ASSEMBLY, Front (For breakdown see Figure 6-2)	1	
		(ATTACHING PARTS)		
-9	TH-S11205	. SCREW, Machine, bd hd, No. 6-32 x 3/8 in. lg.	1	
-10	TH-ZA1106	. NUT, Self-locking, hex No. 6-32	1	
-11	TH-S11405	. SCREW, Machine, bd hd, No. 8-32 x 1/4 in. lg.	2	
-12	TH-WB0708	. WASHER, Lock, No. 8	2	
		---*---		
6-1	CC-1930	. PRINTED CIRCUIT PACKAGE ASSEMBLY	1	
-13	DC-1734	. . PRINTED CIRCUIT BOARD ASSEMBLY, MPC- (For breakdown see Figure 6-9)	1	
-14	DC-2852	. . PRINTED CIRCUIT BOARD ASSEMBLY, MPC+ (For breakdown see Figure 6-10)	1	
-15	TH-XA0802	. . SCREW, Nylon, No. 4-40 x 3/16 in. lg.	10	
-16	AA-2908	. . SPACER	5	
		---*---		
-17	DC-1784-0	. . PRINTED CIRCUIT BOARD ASSEMBLY, LAC- (For breakdown see Figure 6-11)	1	
-18	DC-2839	. . PRINTED CIRCUIT BOARD ASSEMBLY, LAC+ (For breakdown see figure 6-13	1	

FIG & INDEX NO.	DIGITRONICS PART No.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		PAPER TAPE READER ASSEMBLY (Cont'd.)		
-19	TPES02302	. CONNECTOR, Receptacle, electrical (97954) (P/N PCC-F2HSL-23)	1	
-20	DC-1035	. ECONOMY READER ASSEMBLY (For breakdown see Figure 6-11)	1	
-21	BC1936	. ADAPTER, Rack, 19 in.	1	

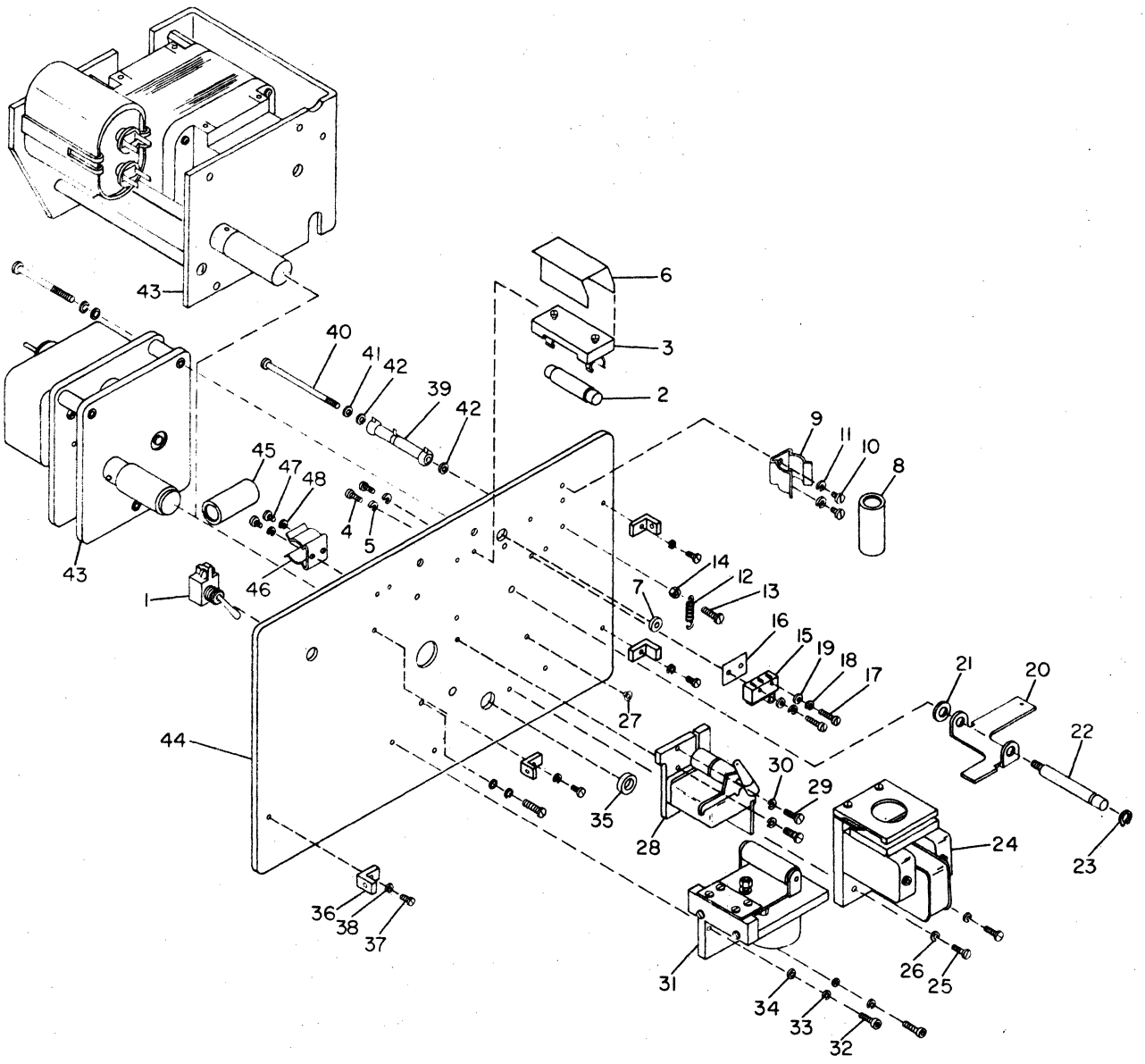


Figure 6-2. Front Panel Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		FRONT PANEL ASSEMBLY		
6-2	CC-1932	PANEL ASSEMBLY, Front (For NHA See Figure 6-1)	REF	
-1	TDT01AR18	. SWITCH, Toggle (15605) (P/N 8295K7)	1	
-2	TLNEE0004	. LAMP	1	
-3	BC-461	. LAMP HOLDER ASSEMBLY (For breakdown see Figure 6-3)	1	
		(ATTACHING PARTS)		
-4	TH-S11204	. SCREW, Machine, No. 6-32 x 5/16 in. lg.	2	
-5	TH-WB0605	. WASHER, Lock, split, No. 6	2	
		---*---		
-6	AA-5628	. INSULATOR, Lampblock	1	
-7	TSBN04002	. BUSHING, Insulator (28520) (P/N SB-375-4)	1	
-8	TSSAA0001	. SPARK SUPPRESSOR (00656) (P/N INR-180-A)	1	
-9	TCLAA0003	. CLIP, Component (91506) (P/N 6014-24)	1	
		(ATTACHING PARTS)		
-10	TH-S10802	. SCREW, Machine, bd hd, No. 4-40 x 3/16 in. lg.	2	
-11	TH-WB0403	. WASHER, Lock, split, No. 4	2	
		---*---		
-12	AA-188	. SPRING, Helical, extension	1	
		(ATTACHING PARTS)		
-13	TH-S11207	. SCREW, Machine, bd hd, No. 6-32 x 1/2 in. lg.	1	
-14	TH-NA1106	. NUT, Plain, hex, No. 6-32	1	
		---*---		
-15	TDA01BS03	. SWITCH (80207) (P/N USM5W)	1	
-16	AA-3158	. INSULATOR	1	
		(ATTACHING PARTS)		
-17	TH-S10307	. SCREW, Machine, bd hd, No. 2-56 x 1/2 in. lg.	2	
-18	TH-WB0201	. WASHER, Lock, split No. 2	2	
-19	TH-WA0206	. WASHER, Flat, plain, No. 2	2	
		---*---		
-20	BA-2917	. ACTUATOR, Switch	1	
-21	AB-636-1	. WASHER, Modified	1	
		(ATTACHING PARTS)		
-22	AA-6599	. STUD, Threaded	1	
-23	TTRFA0513	. RING, Retaining	1	
		---*---		
-24	BC-1142	. BRAKE ASSEMBLY (For breakdown see Figure 6-4)	1	
		(ATTACHING PARTS)		
-25	TH-S11206	. SCREW, Machine, bd hd, No. 6-32 x 7/16 in. lg.	2	
-26	TH-WB0605	. WASHER, Lock, split, No. 6	2	
		---*---		
-27	TSBN02001	. BUSHING, Insulator (28520) (P/N SB-250-2)	1	
-28	BC-1443	. LENS AND HEAD ASSEMBLY, Adjustable guide Negative, (For breakdown see Figure 6-5)	1	

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		FRONT PANEL ASSEMBLY (Cont'd)		
6-2-28	BC-1443-1	. LENS AND HEAD ASSEMBLY, 8 channel Negative (For breakdown see Figure 6-5)	1	
	BC-1443-2	. LENS AND HEAD ASSEMBLY, 6/7 channel Negative (For breakdown see Figure 6-5)	1	
	BC-1443-3	. LENS AND HEAD ASSEMBLY, 5 channel Negative (For breakdown see Figure 6-5)	1	
	BC-1443-4	. LENS AND HEAD ASSEMBLY, Teletypesetter Negative (For breakdown see Figure 6-5)	1	
	BC-1443-5	. LENS AND HEAD ASSEMBLY, 8 channel Positive (For breakdown see Figure 6-5)	1	
	BC-1443-8	. LENS AND HEAD ASSEMBLY, Teletypesetter Positive (For breakdown see Figure 6-5)	1	
	BC-1443-9	. LENS AND HEAD ASSEMBLY, Adjustable Guide, Positive (For breakdown see Figure 6-5)	1	
		(ATTACHING PARTS)		
-29	TH-S10805	. SCREW, Machine, bd hd, No. 4-40 x 3/8 in. lg.	2	
-30	TH-WB0403	. WASHER, Lock, split, No. 4	2	
		---*---		
-31	CC-1924	. SOLENOID MOUNT ASSEMBLY (For breakdown see Figure 6-7)	1	
		(ATTACHING PARTS)		
-32	TH-SL4105	. SCREW, Socket head, cap, No. 8-32 x 3/8 in. lg.	2	
-33	TH-WB0708	. WASHER, Lock, split, No. 8	2	
-34	TH-WA0712	. WASHER, Flat, plain No. 8	2	
		---*---		
-35	TSBN06004	. BUSHING, Insulator (28520) (P/N SB-500-6)	1	
-36	AA-4816	. BRACKET, Cover	4	
		(ATTACHING PARTS)		
-37	TH-SG0803	. SCREW, Machine, fl hd, No. 4-40 x 1/4 in. lg.	4	
-38	TH-WB0403	. WASHER, Lock, split, No. 4	4	
		---*---		
-39	TR-AF100D	. RESISTOR, Variable, 10 ohms, 10W (44655) (P-N 1006)	1	
		(ATTACHING PARTS)		
-40	TH-S11239	. SCREW, Machine, bd hd, No. 6-32 x 2 1/16 in. lg.	1	
-41	TH-WB0605	. WASHER, Lock, split, No. 6	1	
-42	TH-YD0609	. WASHER, Insulator (72653) (P-N 6525M)	2	
		---*---		
-43	BC-1935-1	. MOTOR OPTION ASSEMBLY, 300 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-2	. MOTOR OPTION ASSEMBLY, 100 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		FRONT PANEL ASSEMBLY (Cont'd)		
6-2-43	BC-1935-4	. MOTOR OPTION ASSEMBLY, 200 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-5	. MOTOR OPTION ASSEMBLY, 133 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-6	. MOTOR OPTION ASSEMBLY, 75 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-7	. MOTOR OPTION ASSEMBLY, 66 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-8	. MOTOR OPTION ASSEMBLY, 50 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-9	. MOTOR OPTION ASSEMBLY, 95 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-10	. MOTOR OPTION ASSEMBLY, 100 ch/sec @ 115V 50 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-11	. MOTOR OPTION ASSEMBLY, 100 ch/sec @ 230V 50 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-12	. MOTOR OPTION ASSEMBLY, 300 ch/sec @ 115V 50 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-13	. MOTOR OPTION ASSEMBLY, 300 ch/sec @ 230V 50 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-14	. MOTOR OPTION ASSEMBLY, 200 ch/sec @ 115V 50 Hz (For breakdown see Figure 6-8)	1	
	BC-1935-15	. MOTOR OPTION ASSEMBLY, 200 ch/sec @ 230V 50 Hz (For breakdown see Figure 6-8)	1	
	CC7386-1	. MOTOR OPTION ASSEMBLY, Heavy Duty Speed Package, 300 ch/sec. @ 115V, 60 Hz (For breakdown see Figure 6-9)	1	
	CC7386-2	. MOTOR OPTION ASSEMBLY, Heavy Duty Speed Package, 100 ch/sec @ 115V 60 Hz (For breakdown see Figure 6-9)	1	
	CC7386-5	. MOTOR OPTION ASSEMBLY, Heavy Duty Speed Package, 300 ch/sec @ 115V 50 Hz (For breakdown see Figure 6-9)	1	
	CC7386-6	. MOTOR OPTION ASSEMBLY, Heavy Duty Speed Package, 100 ch/sec @ 115V 50 Hz (For breakdown see Figure 6-9)	1	
-44	CE-286	. PANEL, Front	1	
-45	TSSBB0005	. SPARK SUPPRESSOR	1	
-46	TCLAA0003	. CLIP, Component (91506) (P/N 6014-24)	1	
		(ATTACHING PARTS)		
-47	TH-S10802	. SCREW, Machine, bd hd, No. 4-40 x 3/16 in. lg.	2	
-48	TH-WB0403	. WASHER, Lock, split, No. 4	2	
		---*---		

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		LAMP HOLDER ASSEMBLY		
6-3-	BC-461	LAMP HOLDER ASSEMBLY (For NHA see Figure 6-2)	REF	
-1	TCLCA0001	. CLIP, Lamp (91506) (P/N 6009-16C)	2	
-2	TH-LA1001	. TERMINAL, Lug, solder	2	
		(ATTACHING PARTS)		
-3	TH-SI0307	. SCREW, Machine, bd hd, No. 2-56 x 1/2 in. lg.	2	
-4	TH-WA0206	. WASHER, Flat, plain, No. 2	2	
-5	TH-NA0302	. NUT, Plain, hex, No. 2-56	2	
		---*---		
-6	AA-1435	. BLOCK, Lamp mount	1	

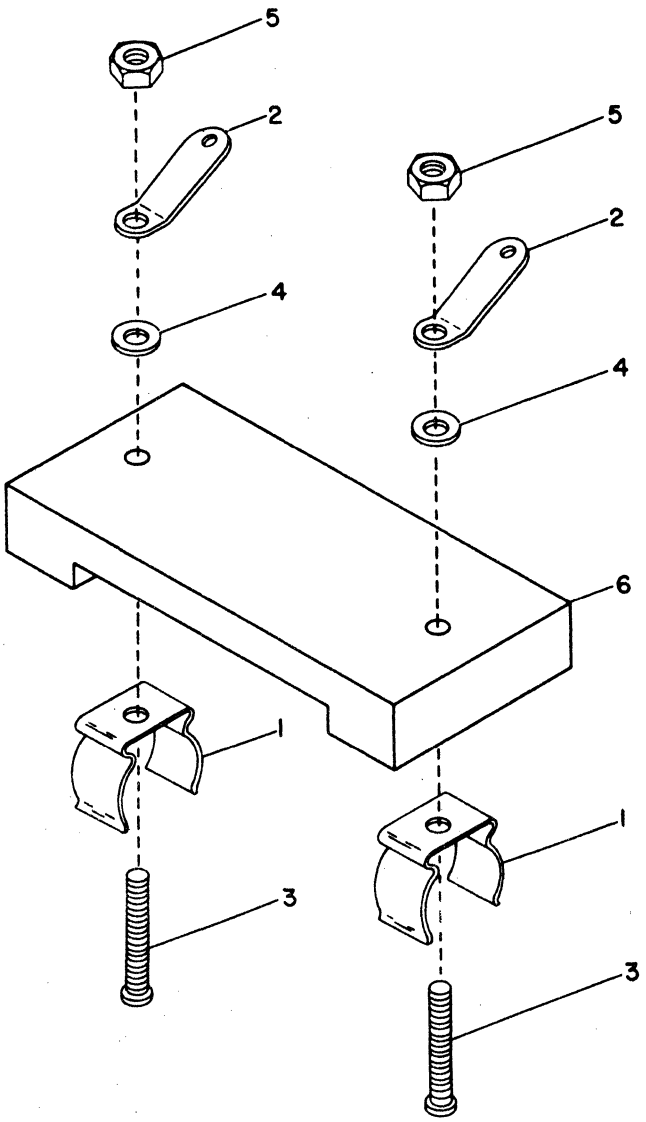


Figure 6-3. Lamp Holder Assembly

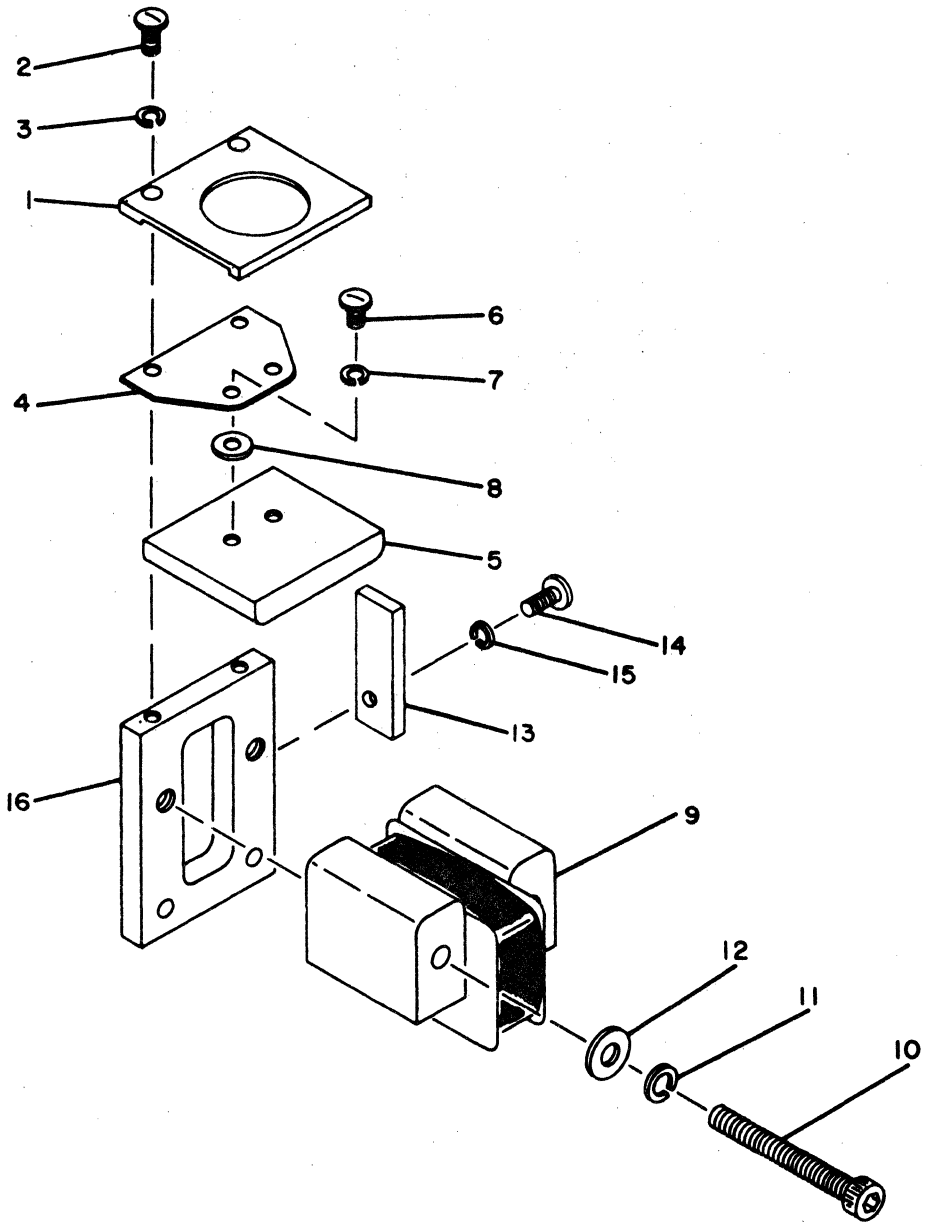


Figure 6-4. Brake Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		BRAKE ASSEMBLY		
6-4-	BC-1142	BRAKE ASSEMBLY (For NHA see Figure 6-2)	REF	
-1	AA-4203	. PLATE, Limiter	1	
		(ATTACHING PARTS)		
-2	TH-SI0804	. SCREW, Machine, bd hd, No. 4-40 x 5/16 in. lg.	2	
-3	TH-WB0403	. WASHER, Lock, split, No. 4	2	
		---*---		
-4	AA-2905	. SPRING	1	
-5	AA-2058	. ARMATURE	1	
		(ATTACHING PARTS)		
-6	TH-SI0802	. SCREW, Machine, bd hd, No. 4-40 x 3/16 in. lg.	2	
-7	TH-WB0403	. WASHER, Lock, split, No. 4	2	
-8	TH-WA0409	. WASHER, Flat, plain, No. 4	2	
		---*---		
-9	BC-1143	. COIL ASSEMBLY	1	
		(ATTACHING PARTS)		
-10	TH-SL1447	. SCREW, Socket hd, cap, No. 8-32 x 1 9/16 in. lg.	2	
-11	TH-WB0708	. WASHER, Lock, split, No. 8	2	
-12	TH-WA0712	. WASHER, Flat, plain, No. 8	2	
		---*---		
-13	AA-6600	. GUIDE, Brake	1	
		(ATTACHING PARTS)		
-14	TH-SI0804	. SCREW, Machine, bd hd, No. 4-40 x 5/16 in. lg.	1	
-15	TH-WB0403	. WASHER, Lock, split, No. 4	1	
		---*---		
-16	BA-2287	. PLATE, Base	1	

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		LENS AND HEAD ASSEMBLY		
6-5-	BC-1443	LENS AND HEAD ASSEMBLY, Adjustable guide Negative logic (For NHA see Figure 6-2)	REF	A
	BC-1443-1	LENS AND HEAD ASSEMBLY, 8 channel, Negative logic (For NHA see Figure 6-2)	REF	B
	BC-1443-2	LENS AND HEAD ASSEMBLY, 6/7 channel, Negative logic (For NHA see Figure 6-2)	REF	C
	BC-1443-3	LENS AND HEAD ASSEMBLY, 5 channel, Negative logic (For NHA see Figure 6-2)	REF	D
	BC-1443-4	LENS AND HEAD ASSEMBLY, Teletypesetter, Negative logic (For NHA see Figure 6-2)	REF	E
	BC-1443-5	LENS AND HEAD ASSEMBLY, 8 channel, Positive logic (For NHA see Figure 6-2)	REF	F
	BC-1443-8	LENS AND HEAD ASSEMBLY, Teletypesetter, Positive logic (For NHA see Figure 6-2)	REF	G
	BC-1443-9	LENS AND HEAD ASSEMBLY, Adjustable Guide, Positive logic (For NHA See Figure 6-2)	REF	H
-1	CC-1320-1	. HEAD ASSEMBLY (For breakdown see Figure 6-6)	1	
-2	AA-2462	. BLOCK, Guide	1	A-D
	AA-2934	. BLOCK, Guide	1	E
		(ATTACHING PARTS)		
-3	TH-SI0805	. SCREW, Machine, bd hd, No. 4-40 x 3/8 in. lg.	2	
-4	TH-WB0403	. WASHER, Lock, split, No. 4	2	
		---*---		
-5	TH-SE0835	. SCREW, Machine, fl. hd, No. 4-40 x 9/16 in. lg.	1	
-6	TH-WB0403	. WASHER, Lock, split, No. 4	1	
6-5-	BC-1441	. GUIDE ASSEMBLY, Adjustable	1	A
-7	TGRAB0002	. . PACKING, Preformed, O-Ring	1	A
-8	S-120-3	. . BALL	1	A
-9	BA-2456	. . HOUSING, Adjustable guide	1	A
		(ATTACHING PARTS)		
-10	TH-SI0803	. . SCREW, Machine, bd hd, No. 4-40 x 1/4 in. lg.	1	A
-11	TH-WA0409	. . WASHER, Flat, plain, No. 4	1	A
		---*---		
-12	AA-2635	. . KNOB	1	A
		(ATTACHING PARTS)		
-13	TH-XC1201	. . SETSCREW, No. 6-32 x 1/8 in. lg.	1	A
		---*---		
-14	BC-1943	. . SHAFT/ARM ASSEMBLY	1	A
6-5-	BC-2475-1	. GUIDE ASSEMBLY, Fixed	1	B
6-5-	BC-2475-2	. GUIDE ASSEMBLY, Fixed	1	C, E
6-5-	BC-2475-3	. GUIDE ASSEMBLY, Fixed	1	D
-15	BA-3301-1	. . HOUSING, Fixed guide	1	B
	BA-3301-2	. . HOUSING, Fixed guide	1	C, E
	BA-3301-3	. . HOUSING, Fixed guide	1	D

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		LENS AND HEAD ASSEMBLY (Cont'd)		
		(ATTACHING PARTS)		
6-5-16	TH-SI0803	. . SCREW, Machine, bd hd, No. 4-40 x	1	B-E
-17	TH-WA0409	. . WASHER, Flat, plain, No. 4	1	B-E
		---*---		
-18	AA-2635	. . KNOB	1	B-E
		(ATTACHING PARTS)		
-19	TH-XB1201	. . SETSCREW, No. 6-32 x 1/8 in. lg.	1	B-E
		---*---		
-20	BC-2474-1	. . SHAFT/ARM ASSEMBLY	1	B-E
-21	BA-6586	. PLATE, Base	1	A-E

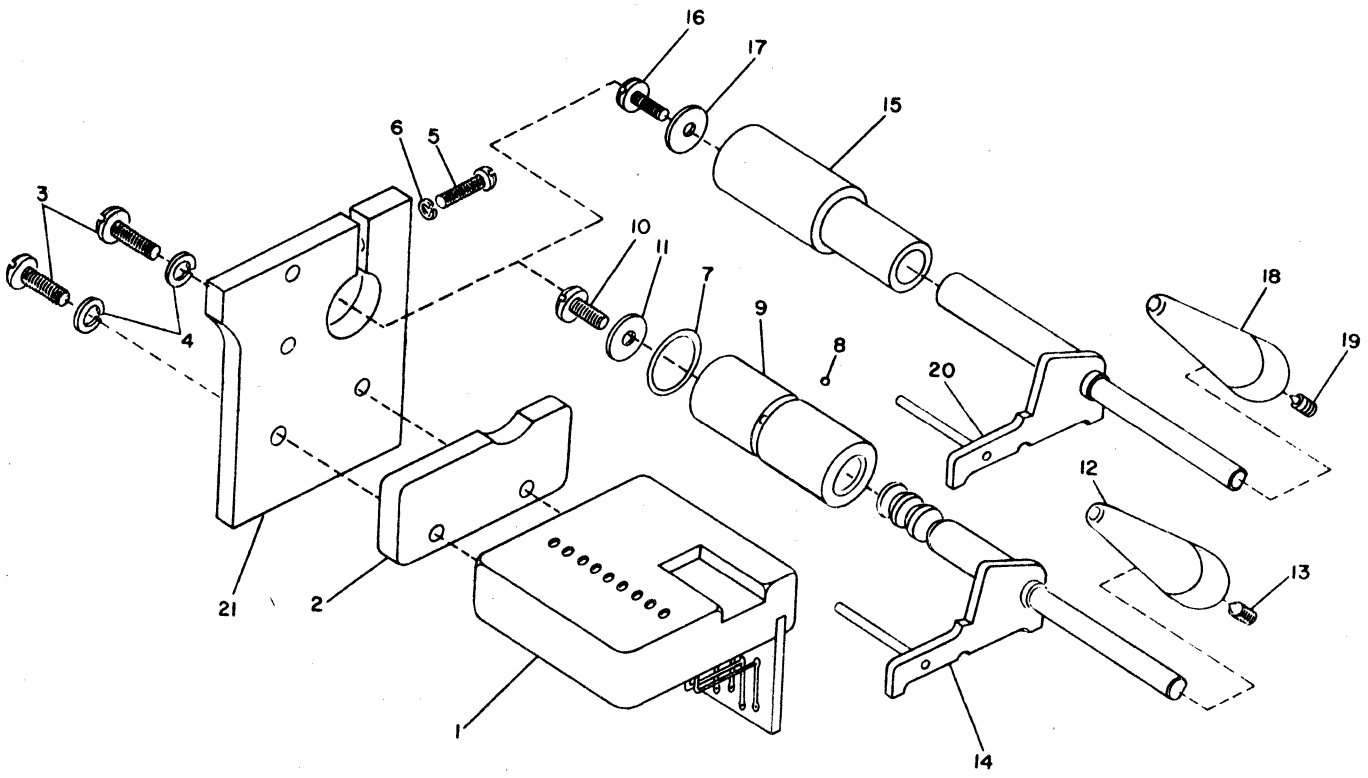


Figure 6-5. Lens And Head Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		HEAD ASSEMBLY		
6-6-	CC-1320-1	HEAD ASSEMBLY (For NHA See Figure 6-5)	REF	
-1	TH-LF1001	. CONNECTOR ASSEMBLY, Single circuit (89110 P/N 42263-2)	11	
-2	AA-2981	. FINGER, Pressure	9	
-3	AA-2985	. SPRING, Flat	9	
		(ATTACHING PARTS)		
-4	TH-SI0302	. SCREW, Machine, bd hd, No. 2-56 x 3/16 in. lg. ---*---	9	
-5	TCRQS0431	. SEMICONDUCTOR DEVICE, Photo (96214 P/N LS431)	9	
-6	TTUBC0041	. SLEEVE, Red, plastic, .015" I.D., .025' O.D.	A/R	
-7	TTUBG0041	. SLEEVE, Blue, plastic, .015" I.D., .025' O.D.	A/R	
-8	AC-1462	. PRINTED CIRCUIT BOARD ASSEMBLY	1	
-9	BA-2461	. HEAD, Photodiode	1	

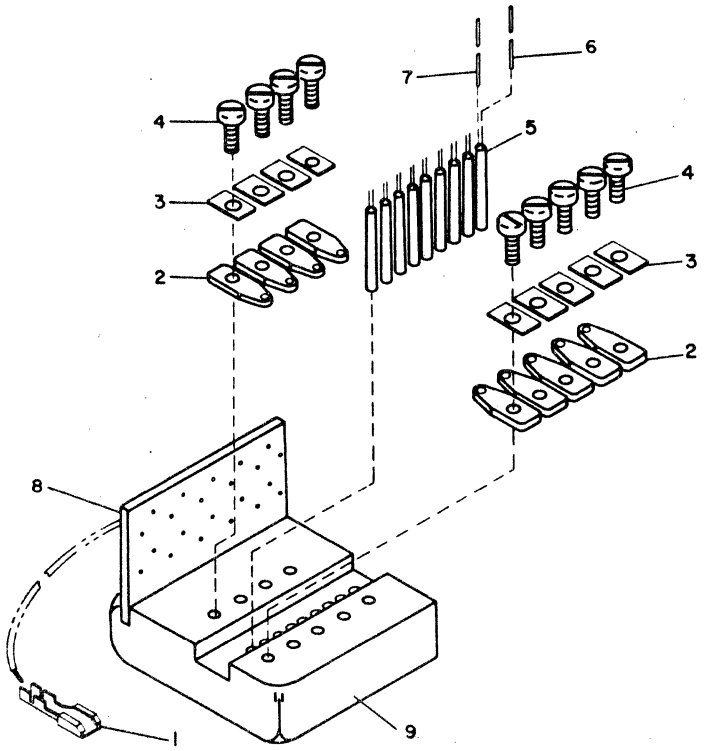


Figure 6-6. Head Assembly

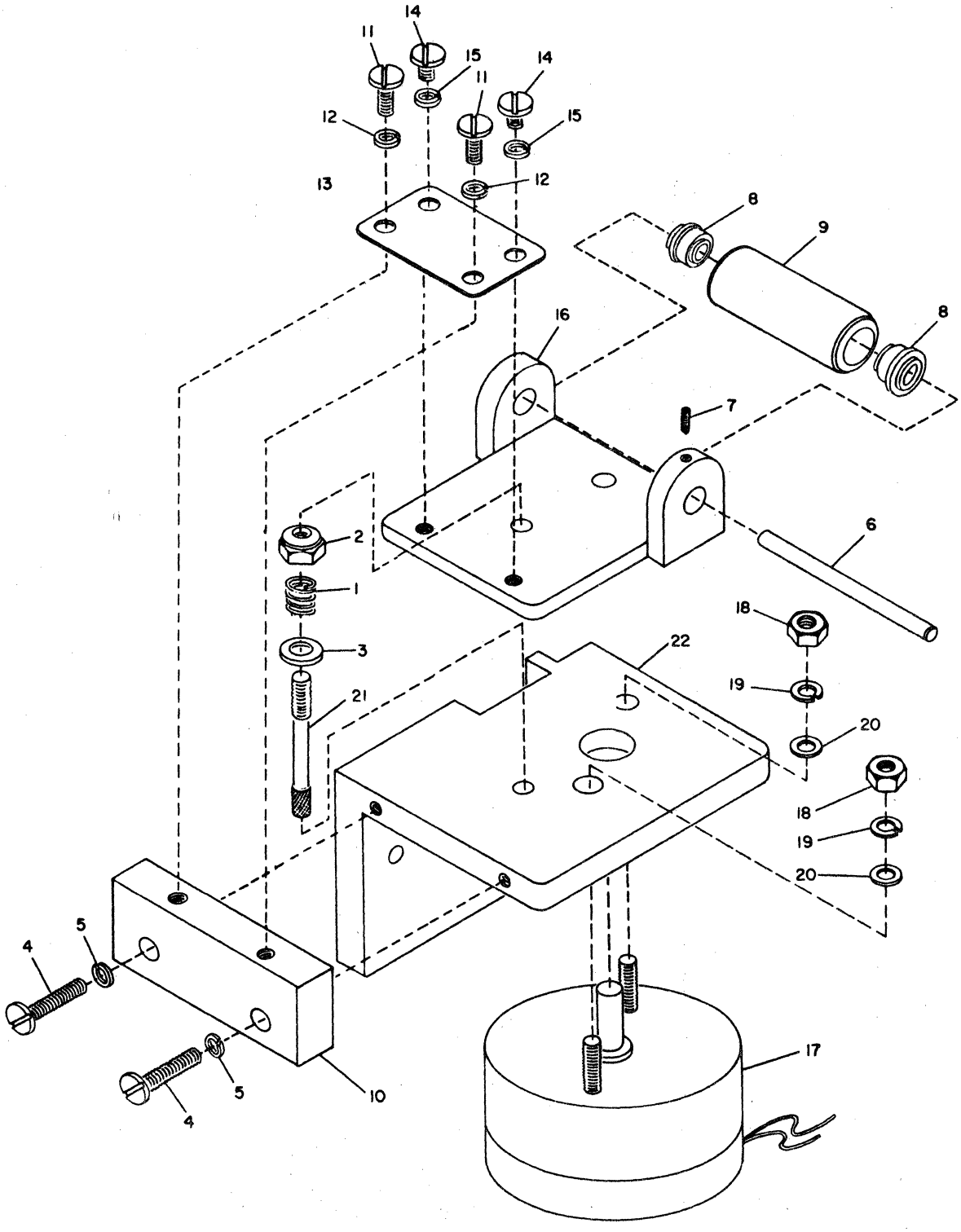


Figure 6-7. Solenoid Mount Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		SOLENOID MOUNT ASSEMBLY		
6-7-	CC-1924	SOLENOID MOUNT ASSEMBLY (For NHA see Figure 6-2)	REF	
-1	AA-2900	. SPRING, Compression, helical	1	
		(ATTACHING PARTS)		
-2	TH-ZA0905	. NUT, Self-locking hex (72962 P/N 79NM-50)	1	
-3	TH-WA-0509	. WASHER, Flat No. 5	1	
		---*---		
6-7-	BC-1033-1	. ROLLER ASSEMBLY	1	
		(ATTACHING PARTS)		
-4	TH-SC1207	. SCREW, Machine, tr hd, No. 6-32 x 1/2 in. lg.	2	
-5	TH-WB0605	. WASHER, Lock, split, No. 6	2	
		---*---		
-6	AA-2224	. . SHAFT, Roller	1	
		(ATTACHING PARTS)		
-7	TH-XB0501	. . SETSCREW, No. 3-48 x 1/8 in. lg.	1	
		--- * ---		
-8	TB-KF2006	. . BEARING, Flanged (83086 P/N SFR2-5PPEE)	2	
-9	AA-2722	. . ROLLER, Tape	1	
-10	BA-2142	. . BLOCK, Roller mount	1	
		(ATTACHING PARTS)		
-11	TH-SC0801	. . SCREW, Machine, tr hd, No. 4-40 x 1/8 in. lg.	2	
-12	TH-WB0403	. . WASHER, Lock, split, No. 4	2	
		---*---		
-13	AA-2144	. . SPRING, Pinch roller	1	
		(ATTACHING PARTS)		
-14	TH-SC0803	. . SCREW, Machine, tr hd, No. 4-40 x 1/4 in. lg.	2	
-15	TH-WB0403	. . WASHER, Lock, split, No. 4	2	
		---*---		
-16	BC-5398-1	. . BRACKET BUTTON SUBASSEMBLY	1	
-17	AC-5650-1	. SOLENOID ASSEMBLY	1	
		(ATTACHING PARTS)		
-18	TH-NA0905	. NUT, Plain, hex, No. 5-40	2	
-19	TH-WB0506	. WASHER, Lock, split, No. 5	2	
-20	TH-WA0509	. WASHER, Flat, plain, No. 5	2	
		---*---		
6-7-	BC-5405	. BRACKET STUD SUBASSEMBLY	1	
-21	A-1078-2	. . STUD, Spring	1	
-22	CA-2890	. . BRACKET, Solenoid mounting	1	

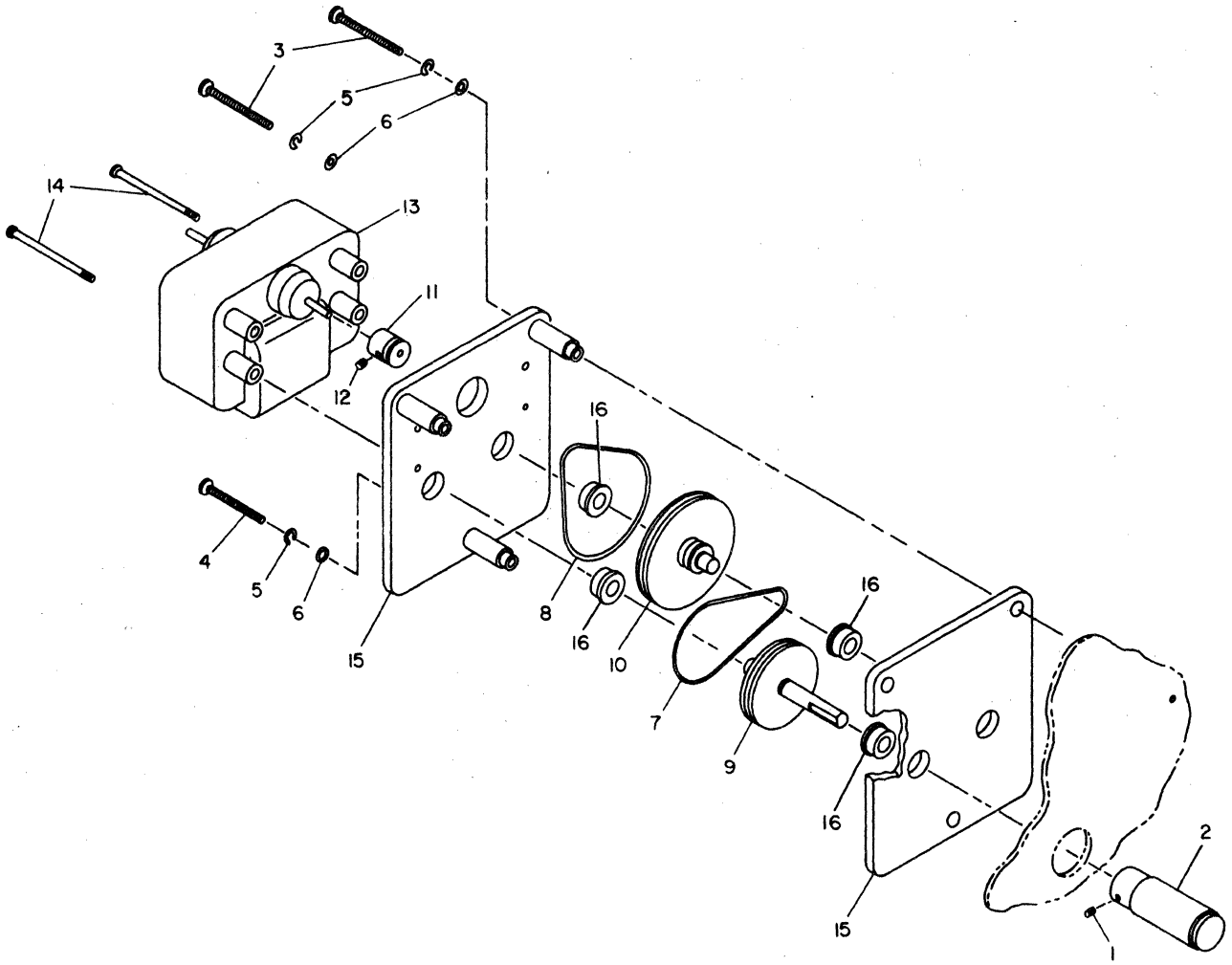


Figure 6-8. Motor Option Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		MOTOR OPTION ASSEMBLY (Standard Speed, Packages)		
6-8-	BC-1935-1	MOTOR OPTION ASSEMBLY, 300 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	A
	BC-1935-2	MOTOR OPTION ASSEMBLY, 100 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	B
	BC-1935-4	MOTOR OPTION ASSEMBLY, 200 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	C
	BC-1935-5	MOTOR OPTION ASSEMBLY, 133 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	D
	BC-1935-6	MOTOR OPTION ASSEMBLY, 75 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	E
	BC-1935-7	MOTOR OPTION ASSEMBLY, 66 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	F
	BC-1935-8	MOTOR OPTION ASSEMBLY, 50 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	G
	BC-1935-9	MOTOR OPTION ASSEMBLY, 95 ch/sec @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	H
	BC-1935-10	MOTOR OPTION ASSEMBLY, 100 ch/sec @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	I
	BC-1935-11	MOTOR OPTION ASSEMBLY, 100 ch/sec @ 230V 50 Hz (For NHA see Figure 6-2, item 43)	REF	J
	BC-1935-12	MOTOR OPTION ASSEMBLY, 300 ch/sec @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	K
	BC-1935-13	MOTOR OPTION ASSEMBLY, 300 ch/sec @ 230V 50 Hz (For NHA see Figure 6-2, item 43)	REF	L
	BC-1935-14	MOTOR OPTION ASSEMBLY, 200 ch/sec @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	M
	BC-1935-15	MOTOR OPTION ASSEMBLY, 200 ch/sec @ 230V 50 Hz (For NHA see Figure 6-2, item 43)	REF	N
6-8-	BC-985	. CAPSTAN ASSEMBLY	1	A-G
	BC-1955	. CAPSTAN ASSEMBLY	1	H
-1	TH-XC1202	. . SETSCREW, Machine, soc hd.No. 6-32 x 3/16 in. lg.	1	
-2	No Number	. . CAPSTAN (Consists of BC-985 less TH-XC1202)	NP	A-G
	No Number	. . CAPSTAN (Consists of BC-1955 less TH-XC1202)	NP	H
6-8-	CC-2197	. MOTOR REDUCER ASSEMBLY, 300 ch/sec @ 115V 60 Hz	1	A
	CC-2196	. MOTOR REDUCER ASSEMBLY, 95 ch/sec, @ 115V 60 Hz	1	B, H
	CC-2549	. MOTOR REDUCER ASSEMBLY, 200 ch/sec, @ 115V 60 Hz	1	C
	CC-2196-1	. MOTOR REDUCER ASSEMBLY, 133 ch/sec, @ 115V 60 Hz	1	D
	CC-2196-2	. MOTOR REDUCER ASSEMBLY, 75 ch/sec, @ 115V 60 Hz	1	E
	CC-2196-3	. MOTOR REDUCER ASSEMBLY, 66 ch/sec, @ 115V 60 Hz	1	F
	CC-2196-4	. MOTOR REDUCER ASSEMBLY, 50 ch/sec, @ 115V 60 Hz	1	G
	CC-2196-5	. MOTOR REDUCER ASSEMBLY, 100 ch/sec, @ 115V 50 Hz	1	I
	CC-2196-6	. MOTOR REDUCER ASSEMBLY, 100 ch/sec, @ 230V 50 Hz	1	J
	CC-2197-1	. MOTOR REDUCER ASSEMBLY, 300 ch/sec, @	1	K

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		MOTOR OPTION ASSEMBLY (Cont'd) (Standard Speed, Packages)		
6-8-	CC-2197-2	. MOTOR REDUCER ASSEMBLY, 300 ch/sec, @ 230V 50 Hz	1	L
	CC-2549-1	. MOTOR REDUCER ASSEMBLY, 200 ch/sec, @ 115V 50 Hz	1	M
	CC-2549-2	. MOTOR REDUCER ASSEMBLY, 200 ch/sec, @ 230V 50 Hz	1	N
		(ATTACHING PARTS)		
-3	TH-SI1713	. SCREW, Machine, bd hd, No. 10-32 x 1-1/4 in. lg.	2	
-4	TH-SI1712	. SCREW, Machine, bd hd, No. 10-32 x 1 1/8 in. lg.	1	
-5	TH-WB0810	. WASHER, Lock, split, No. 10	3	
-6	TH-WA0814	. WASHER, Flat, plain, No. 10	6	
		---*---		
-7	TGRPD0404	. . DRIVE BELT, "O" ring	1	A, C, E-G, I, L
	TGRPD0202	. . DRIVE BELT, "O" ring	1	B, D, H
-8	TGRPD0202	. . DRIVE BELT, "O" ring	1	D, F
	TGRPD0404	. . DRIVE BELT, "O" ring	1	B, E, G, H, I, J, M, N
-9	BC-2152	. . PULLEY ASSEMBLY	1	A, C, K, L, M, N
	BC-2151-2	. . PULLEY ASSEMBLY	1	B, D, F, H I, J
	BC-2152-1	. . PULLEY ASSEMBLY		E, G
-10	BC-2153	. . PULLEY ASSEMBLY	1	B, E-H, I, J
	BC-2153-1	. . PULLEY ASSEMBLY	1	D
-11	AA-3085	. . PULLEY, Motor	1	A
	BA-4638-1	. . PULLEY, Motor	1	B, D, E, H
	AA-3361	. . PULLEY, Motor	1	C
	BA-4638-2	. . PULLEY, Motor	1	F, G
	AA-4142	. . PULLEY, Motor	1	I, J
	AA-4142-2	. . PULLEY, Motor	1	K, L
	AA-4142-4	. . PULLEY, Motor	1	M, N
		(ATTACHING PARTS)		
6-8-12	TH-XB0801	. . SETSCREW, No. 4-40 x 1/8 in. lg.	1	
		---*---		
-13	CT-458-1	. . MOTOR, 115V 60 Hz, (05624 P/N KYAJ9792-1)	1	
	CT-459-1	. . MOTOR, 115V 50 Hz, (05624 P/N KYAJ9792-2)	1	
	CT-460-1	. . MOTOR, 230V 50 Hz, (05624 P/N KYAJ9792-3)	1	
		(ATTACHING PARTS)		
-14	TH-SI0815	. . SCREW, Machine, bd hd, No. 4-40 x 1-9/16 in. lg.	2	
		---*---		
-15	BC-2154-2	. . PLATE ASSEMBLY	1	A, C
	BC-2154-1	. . PLATE ASSEMBLY	1	B, D-H
-16	TB-BR1017	. . . BEARING, Flanged	2	A, C
	TB-BR1017	. . . BEARING, Flanged	4	B, D-H

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		HEAVY DUTY SPEED PACKAGES		
6-9-	CC-7386-1	MOTOR OPTION ASSEMBLY, 300 C/S @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	A
	CC-7386-2	MOTOR OPTION ASSEMBLY, 100 C/S @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	B
	CC-7386-3	MOTOR OPTION ASSEMBLY, 100 C/S @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	C
	CC-7386-4	MOTOR OPTION ASSEMBLY, 100 C/S @ 115V 60 Hz (For NHA see Figure 6-2, item 43)	REF	D
	CC-7386-5	MOTOR OPTION ASSEMBLY, 300 C/S @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	E
	CC-7386-6	MOTOR OPTION ASSEMBLY, 300 C/S @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	F
	CC-7386-7	MOTOR OPTION ASSEMBLY, 300 C/S @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	G
	CC-7386-8	MOTOR OPTION ASSEMBLY, 100 C/S @ 115V 50 Hz (For NHA see Figure 6-2, item 43)	REF	H
6-9-	DC-6982-1	SPEED PACKAGE ASSEMBLY, 300 C/S @ 115V 60 Hz (Howard Motor)	1	
	DC6982-2	SPEED PACKAGE ASSEMBLY, 100 C/S @ 115V 60 Hz (Howard Motor)	1	
	DC-6982-3	SPEED PACKAGE ASSEMBLY, 300 C/S @ 115V 60 Hz (Holt Cabot Motor)	1	
	DC6982-4	SPEED PACKAGE ASSEMBLY, 100 C/S @ 115V 60 Hz (Holt Cabot Motor)	1	
	DC6982-5	SPEED PACKAGE ASSEMBLY, 300 C/S @ 115V 50 Hz (Howard Motor)	1	
	DC6982-6	SPEED PACKAGE ASSEMBLY, 100 C/S @ 115V 50 Hz (Howard Motor)	1	
	DC-6982-7	SPEED PACKAGE ASSEMBLY, 300 C/S @ 115V 50 Hz (Holt Cabot Motor)	1	
	DC6982-8	SPEED PACKAGE ASSEMBLY, 100 C/S @ 115V 50 Hz (Holt Cabot Motor)	1	
		(ATTACHING PARTS)		
-1	TH-SI1406	SCREW, Machine bd hd, No. 8-32 x 7/16 in. lg.	A/R	A-H
-2	TH-WB0708	WASHER, Lock, split, No. 8	A/R	A-H
-3	TH-WA0712	WASHER, Flat, No. 8	A/R	A-H
		---*---		
6-9-	BC-985	. CAPSTAN ASSEMBLY	1	A-H
-4	TH-XC1202	. . SETSCREW, Machine, Soc. hd., No. 6-32 x 3/16 in. lg.	1	A-H
-5	No Number	. . CAPSTAN (Consists of BC-985 less TH-XC1202	NP	A-H
-6	AT374-1	. BELT, Endless	1	A-H
-7	TH-XC1403	. SETSCREW, Machine, Soc. hd., No. 8-32 x 1/4 in. lg.	A/R	A-H
-8	AA6950-1	. PULLEY, Capstan, (300 CPS)	1	A, C
	AA6950-2	. PULLEY, Capstan, (100 CPS)	1	B, D
	AA6950-3	. PULLEY, Capstan, (300 CPS)	1	E, G
	AA6950-4	. PULLEY, Capstan, (100 CPS)	1	F, H
-9	TH-XC1202	. SETSCREW, Machine, S & C hd., No. 6-32 x 3/16 in. lg.	1	A-H

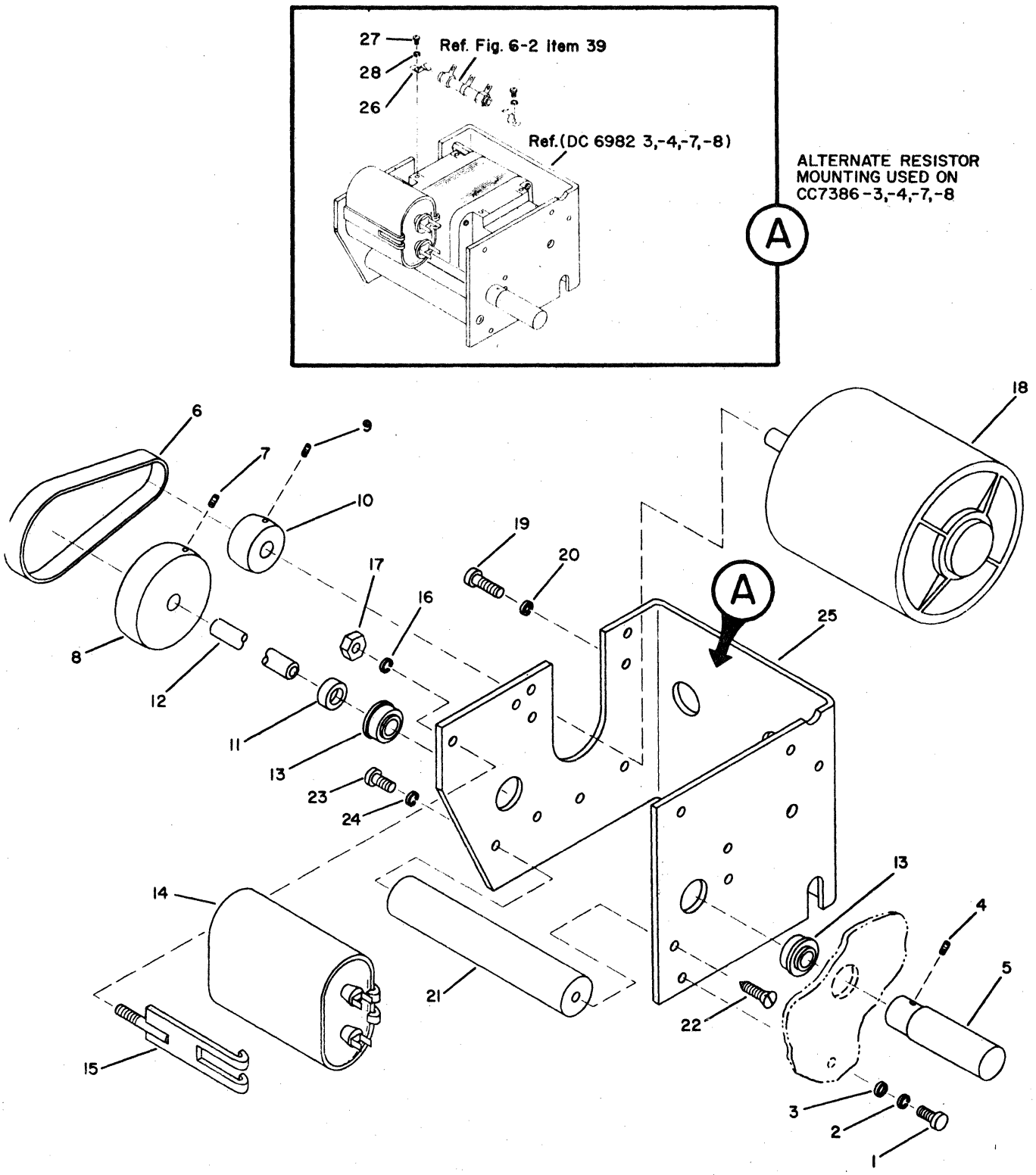


Figure 6-9. Heavy Duty Speed Package

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		HEAVY DUTY SPEED PACKAGES (Cont'd)		
6-9-10	AA6952-1	. PULLEY, Motor (300 CPS)	1	A, C
	AA6952-2	. PULLEY, Motor (300 CPS)	1	G, E
	AA6949-1	. PULLEY, Motor (100 CPS)	1	B, D
	AA6949-2	. PULLEY, Motor (100 CPS)	1	H, F
-11	AA6954-1	. SPACER, Bearing	1	A, C, E, G
	AA6954-2	. SPACER, Bearing	1	B, D, F, H
-12	AA6951-1	. SHAFT	1	A-H
-13	TB-KM2013	. BEARING, Flanged	2	A-H
-14	AE884-1	. CAPACITOR	1	A-H
		(ATTACHING PARTS)		
-15	TMBGC0003	. BRACKET, Mounting	1	A-H
-16	TH-WB0810	. WASHER, Lock, split No. 10	A/R	
-17	TH-NA1608	. NUT, Hex No. 10-32	A/R	
		---*---		
-18	TMLASAX01	. MOTOR (Howard)	1	A, B, E, F
	BC3472-1	. MOTOR (Holt Cabot)	1	C, D, G, H
		(ATTACHING PARTS)		
-19	TH-SI1425	. SCREW, Machine, bd hd, No. 8-32 x 9/16 in. lg.	A/R	
-20	TH-WB0708	. WASHER, Lock, split No. 8	A/R	
		---*---		
6-9-	CC-7332	. MOUNTING BRACKET SUB-ASSEMBLY	1	A-H
-21	AA6955-1	. . SPACER, Post	1	
		(ATTACHING PARTS)		
-22	TH-SG1407	. . SCREW, Machine Fl. Hd. No. 8-32 x 1/2 in. lg.	1	
-23	TH-SI1407	. . SCREW, Machine, bd hd No. 8-32 x 1/2 in. lg.	1	
-24	TH-WB0708	. . WASHER, Lock, split No. 8	1	
		---*---		
-25	DA6953-1	. . BRACKET, Mounting	1	
-26	AB1072	. CLIP, Mounting	1	C, D, G, H
		(ATTACHING PARTS)		
-27	TH-SI1403	. SCREW, Machine bd hd. No. 8-32 x 1/4 in. lg.	2	C, D, G, H
-28	TH-WB0708	. WASHER, Lock, split No. 8	2	C, D, G, H
		---*---		

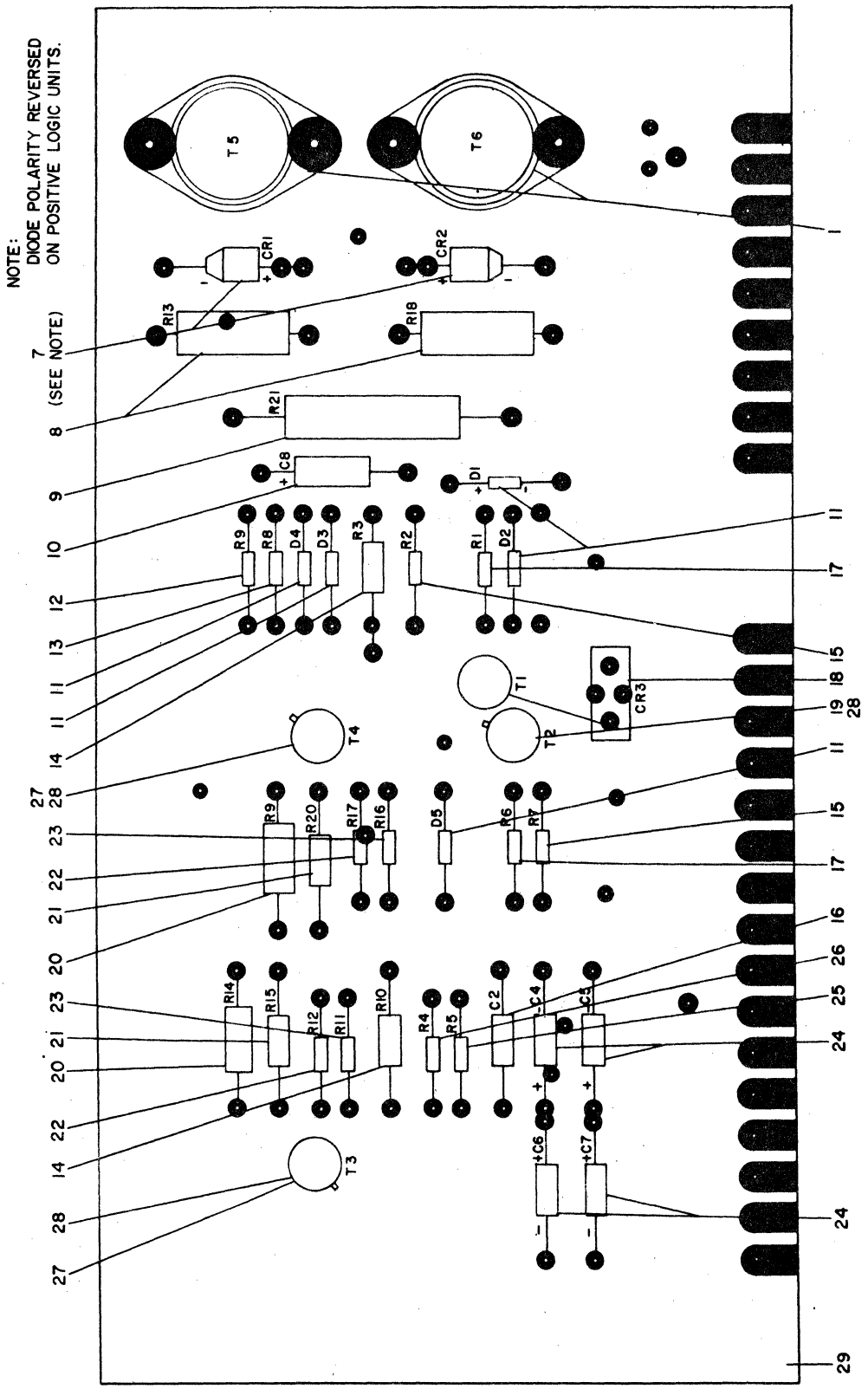


Figure 6-10 MPC Printed Circuit Board Assembly

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
		MPC PRINTED CIRCUIT BOARD ASSEMBLY (POSITIVE AND NEGATIVE LOGIC)		
6-10-	DC-1734	PRINTED CIRCUIT BOARD ASSEMBLY, MPC - negative logic (For NHA see Figure 6-1, item 13)	REF	
	DC-2852	PRINTED CIRCUIT BOARD ASSEMBLY, MPC + logic (For NHA see Figure 6-1, item 14)		
-1	TQ-PA1545	. TRANSISTOR (04643 P/N 2N1545) logic -	2	
	TQ-PD1489	. TRANSISTOR (04643 P/N 2N1489) logic +	2	
		(ATTACHING PARTS)		
-2	TH-SI0807	. SCREW, Machine, bd hd, No. 4-40 x 1/2 in. lg.	4	
-3	TH-WD0408	. WASHER, Lock, external tooth, No. 4	4	
-4	TH-WA0409	. WASHER, Flat, plain, No. 4	4	
-5	TH-YA0406	. WASHER, Insulator (83330 P/N 2162)	4	
-6	TH-NA0704	. NUT, Plain, hex no. 4-40	4	
		---*---		
-7	TCRS2069A	. SEMICONDUCTOR DEVICE, Diode (1N2069A)	2	
-8	TR-WE101C	. RESISTOR, Fixed, wirewound, 100 ohms, ± 5%, 5W (56289 P/N 243E1015)	2	
-9	TR-WF50UC	. RESISTOR, Fixed, wirewound, 5 ohms, ± 5% 10W (56289 P/N 247E5R05)	1	
-10	TC-TH106C	. CAPACITOR, Fixed, tantalytic dielectric, 10 ufd, 35 vdc (74840 P/N SMT1025)	1	
-11	TCRSU0125	. SEMICONDUCTOR DEVICE, Diode	5	
-12	TR-CA103C	. RESISTOR, Fixed, composition, 10K, ± 5%. 1/4W (RC07GF103J)	1	
-13	TR-CA683C	. RESISTOR, Fixed, composition, 68K, ± 5%. 1/4W (RC07GF683J)	1	
-14	TR-CC511C	. RESISTOR, Fixed, composition, 510 ohms, ± 5%, 1W (RC32GF511J)	2	
-15	TR-CA333C	. RESISTOR, Fixed, composition, 33K, ± 5%, 1/4W (RC07GF333J)	2	
-16	TC-ME102C	. CAPACITOR, Fixed, paper dielectric, 1000 uuf, ± 5%, 500 vdc (CCM20C1025)	1	
-17	TR-CA272C	. RESISTOR, Fixed, composition, 2.7K, ± 5%, 1/4W (RC07GF272J)	2	
-18	TCRPSB001	. RECTIFIER (90201 P/N FW50)	1	
-19	TQ-SA0222	. TRANSISTOR (222) (replace- Q-SA1170) - logic	2	
	TQ-SB1659	. TRANSISTOR, GT 1659, + logic	2	
-20	TR-CD510C	. RESISTOR, Fixed, composition, 51 ohms, ± 5%, 2W (RC42GF510J)	2	
-21	TR-CC751C	. RESISTOR, Fixed, composition, 750 ohms, ± 5% 1W (RC32GF751J)	2	
-22	TR-CA752C	. RESISTOR, Fixed, composition, 7.5K, ± 5%, 1/4W (RC07GF752J)	2	
-23	TR-CA511C	. RESISTOR, Fixed, composition, 510 ohms, ± 5% 1/4W (RC07GF511J)	2	
-24	TC-TF476D	. CAPACITOR, Fixed, tantalytic dielectric, 47 ufd, 20 vdc (56289 P/N 150D476X0020R2)	4	
-25	TR-CA153C	. RESISTOR, Fixed, composition, 15K, ± 5%, 1/4W (RC07GF153J)	1	
-26	TR-CA104C	. RESISTOR, Fixed, composition, 100K, ± 5%, 1/4W (RC07GF104J)	1	
-27	TQ-SA0598	. TRANSISTOR (2N598) - logic	2	
	TQ-SB357A	. TRANSISTOR (2N357 A)	2	
-28	TQSA00001	. SPACER, Transistor (76530 P/N 294457)	4	
-29	CA-2736	. PRINTED CIRCUIT BOARD	1	

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY.	USABLE ON CODE
		LAC PRINTED CIRCUIT BOARD ASSEMBLY (POSITIVE & NEGATIVE LOGIC)		
6-11	DC-1784-0	PRINTED CIRCUIT BOARD ASSEMBLY, LAC-(For NHA see Figure 6-1, item 15)	REF	
	DC-2839	PRINTED CIRCUIT BOARD ASSEMBLY, LAC+(For NHA see Figure 6-1, item 18)		
-1	TQ-SAA004	. TRANSISTOR (GA004) -logic	20	
	TQ-SB0005	. TRANSISTOR (GA005) + logic	20	
-2	TQ-SA0222	. TRANSISTOR (222) (replaced TQ-SA1170) -logic	10	
	TQ-SB0111	. TRANSISTOR (111)+ logic	10	
-3	TQSA00001	. SPACER, Transistor (76530 P/N 294457)	30	
-4	TH-LJ1002	. CONNECTOR, Plug, electrical (used on assy. DC-1784-0)(89110 P/N 42263-2)	9	
	TH-LJ1005	. CONNECTOR, Plug, electrical (used on assy. DC2839) one additional connector required on DC2839-2.	9	
-5	TCRSU0125	. SEMICONDUCTOR DEVICE, Diode	11	
-6	TCRZS0747	. SEMICONDUCTOR DEVICE, Diode (1N747)	1	
-7	TCRZS0958	. SEMICONDUCTOR DEVICE, Diode (1N958)	1	
-8	TC-MB331C	. CAPACITOR, Fixed, mica dielectric, 300 uuf, 300 wvdc, 5% (CM20C3315)	2	
-9	TR-VA104E	. RESISTOR, Variable, 100K, ± 20% (71450 P/N XC140PC104A)	1	
-10	TR-VA254E	. RESISTOR, Variable, 250K, ± 20% (71450 P/N XC140PC254B)	8	
-11	TR-CA472C	. RESISTOR, Fixed, composition, 4.7K, ± 5%, 1/4W (RC07GF472J)	1	
-12	TR-CC100C	. RESISTOR, Fixed, composition, 10 ohms, ± 5%, 1W (RC32GF100J)	2	
-13	TR-WE500C	. RESISTOR, Fixed, wirewound, 50 ohms, 5W (44655 P/N 1D 8 F50)	1	
-14	TR-CB331C	. RESISTOR, Fixed, composition, 330 ohms, ± 3% 1/2W (RC20GF331J)	1	
-15	TR-CA471C	. RESISTOR, Fixed composition, 470 ohms, ± 5% 1/4W (RC07GF471J)	1	
-16	TR-CC821C	. RESISTOR, Fixed, composition, 820 ohms, ± 5% 1W (RC32GF821J)	1	
-17	TR-CB102C	. RESISTOR, Fixed, composition, 1K, ± 5%, 1/2W (RC20GF102J)	10	
-18	TR-CA302C	. RESISTOR, Fixed, composition, 3K, ± 5%, 1/4W (RC07GF302J)	1	
-19	TR-CA432C	. RESISTOR, Fixed, composition, 4.3K, ± 5% 1/4W (RC07GF432J)	2	
-20	TR-CA682C	. RESISTOR, Fixed, composition, 6.8K, ± 5%, 1/4W (RC07GF682J)	9	
-21	TR-CA103C	. RESISTOR, Fixed, composition, 10K, ± 5%, 1/4W (RC07GF103J)	9	
-22	TR-CA683C	. RESISTOR, Fixed, composition, 68K, ± 5%, 1/4W (RC07GF683J)	9	
-23	TR-CA393C	. RESISTOR, Fixed, composition, 39K, ± 5%, 1/4W (RC07GF393J)	1	
-24	TR-CA154C	. RESISTOR, Fixed, composition, 150K, ± 5% 1/4W (RC07GF154J)	1	
-25	TR-CA621C	. RESISTOR, Fixed, composition, 620 ohms, ± 5% 1/4W (RC07GF621J)	1	

FIG & INDEX	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY.	USABLE ON CODE
		LAC PRINTED CIRCUIT BOARD ASSEMBLY (POSITIVE & NEGATIVE LOGIC) (Cont'd)		
6-11-26	TR-CB202C	. RESISTOR, Fixed, composition, 2K, ± 5%, 1/2W (RC20GF202J)	2	
-27	TR-CA273C	. RESISTOR, Fixed, composition, 27K, ± 5%, 1/4W (RC07GF273J)	1	
-28	TR-CA272C	. RESISTOR, Fixed, composition, 2.7K. ± 5%, 1/4W (RC07GF272J)	1	
-29	TR-CA473C	. RESISTOR, Fixed, composition, 47K, ± 5%, 1/4W (RC07GF473J)	1	
-30	TJMPO23O1	. CONNECTOR, Receptacle, electrical (97954 P/N UPCC-M2)	1	
		(ATTACHING PARTS)		
-31	TH-SG0802	. SCREW, Machine, fl. hd, No. 4-40 x 3/16 in. lg. ---*---	2	
-32	CB-640-1	. PRINTED CIRCUIT BOARD	1	

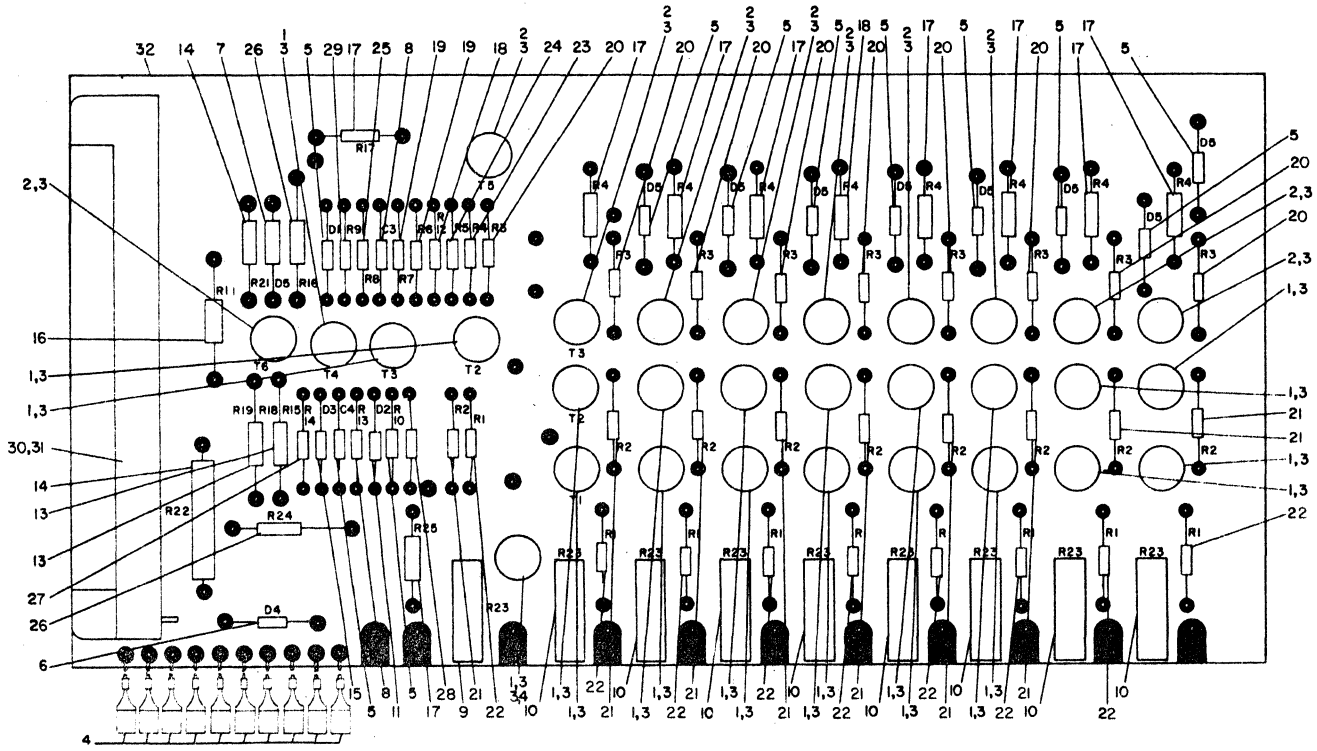


Figure 6-11. LAC Printed Circuit Board Assembly

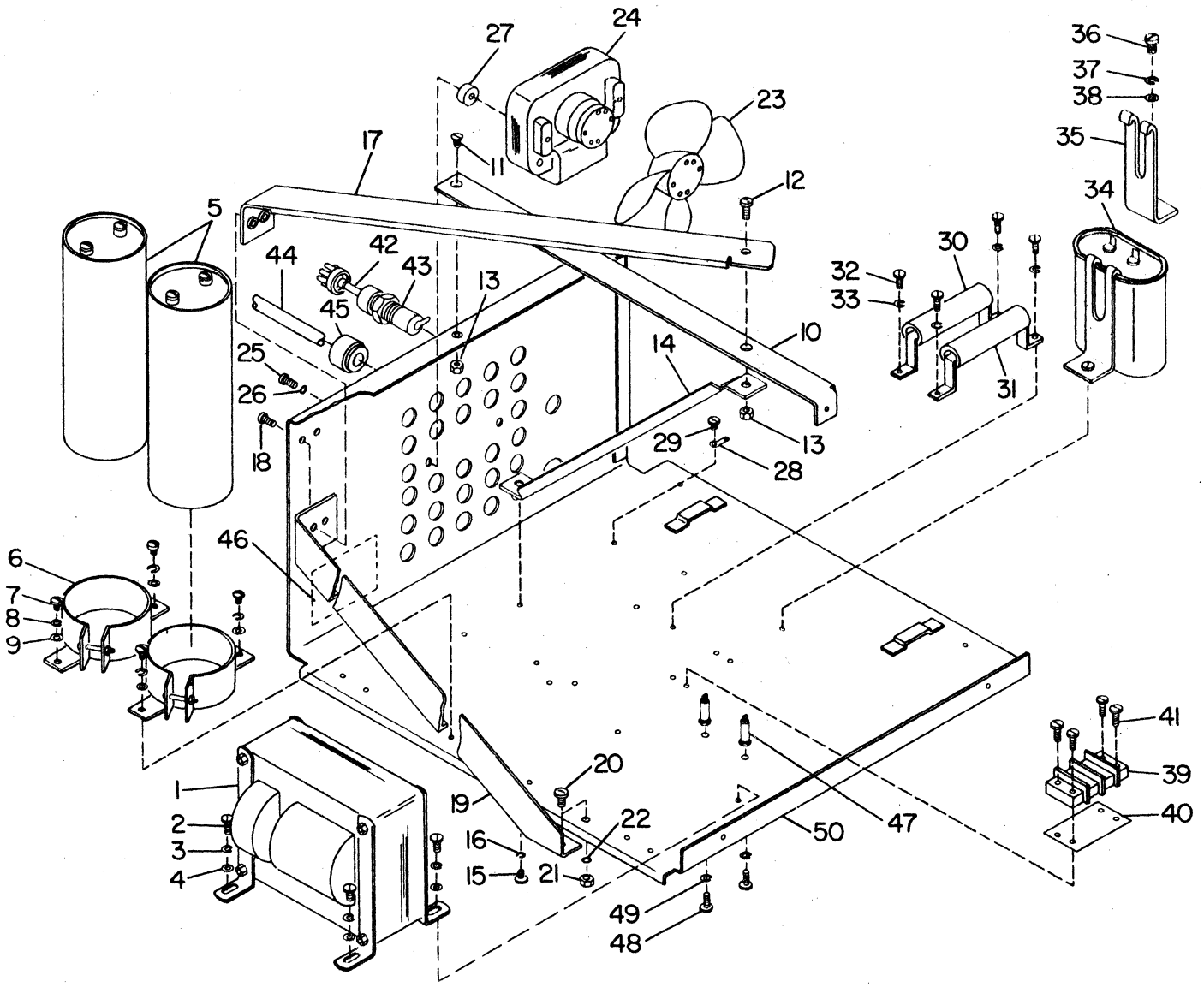


Figure 6-12. Economy Reader Assembly

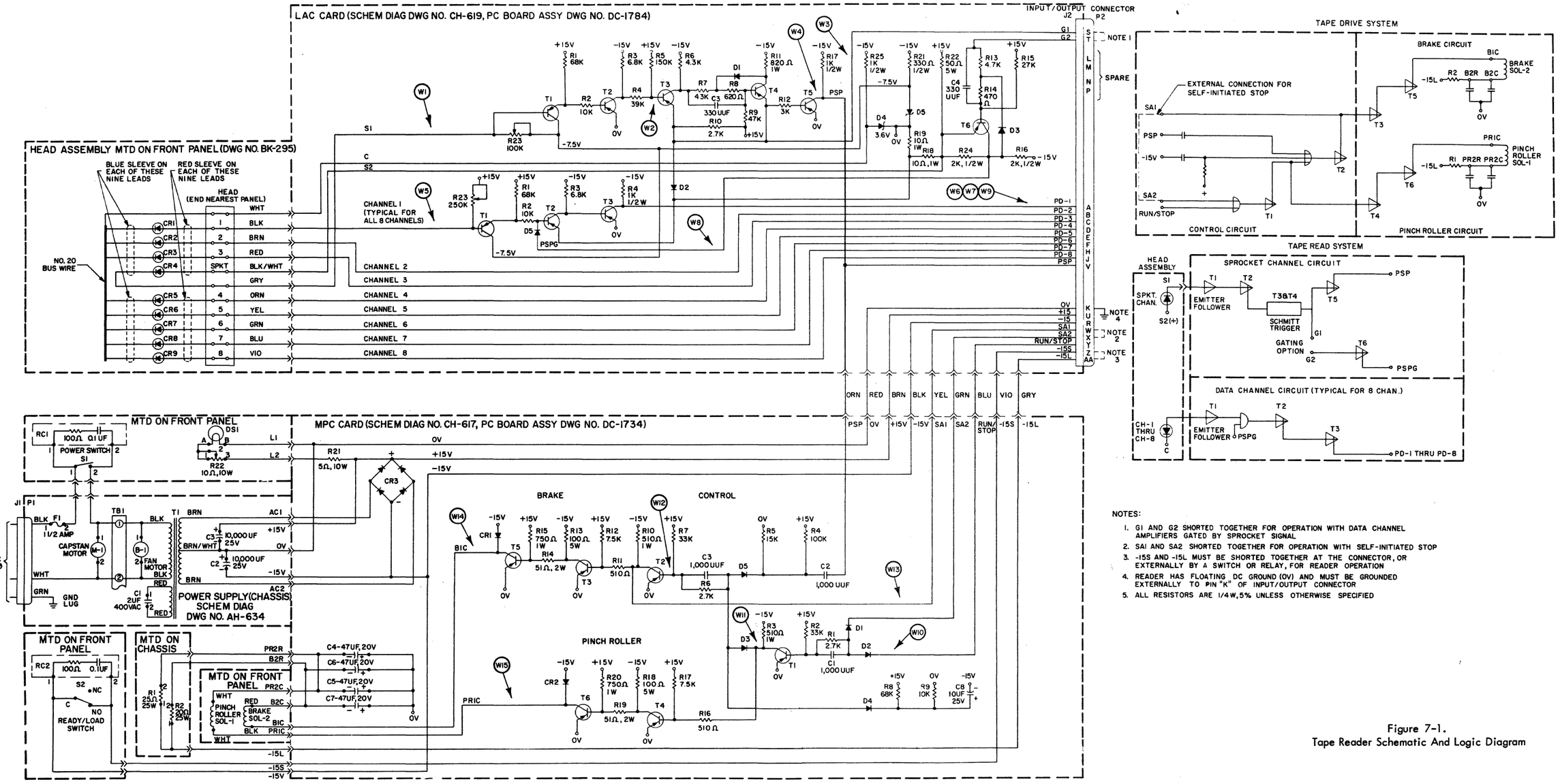
FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY.	USABLE ON CODE
		ECONOMY READER ASSEMBLY		
6-12	DC-1035	ECONOMY READER ASSEMBLY (For NHA see Figure 6-1, item 18)	REF	
-1	BA-2688	. TRANSFORMER	1	
		(ATTACHING PARTS)		
-2	TH-SI1404	. SCREW, Machine, bd hd, No. 8-32 x 5/16 in. lg.	4	
-3	TH-WB0708	. WASHER, Lock, split, No. 8	4	
-4	TH-WA0712	. WASHER, Flat, plain, No. 8	4	
		---*---		
-5	TC-EN109F	. CAPACITOR, Fixed, electrolytic, 10000 uf, 25 vdc (53021 P/N 539-2635-01, Type DCM)	2	
-6	TMBCE0005	. CLAMP, Capacitor	2	
		(ATTACHING PARTS)		
-7	TH-SI1202	. SCREW, Machine, bd hd, No. 6-32 x 3/16 in. lg.	4	
-8	TH-WB0605	. WASHER, Lock, split, No. 6	4	
-9	TH-WA0612	. WASHER, Flat, plain, No. 6	4	
		---*---		
-10	BA-2894	. BRACE, Horizontal	1	
		(ATTACHING PARTS)		
-11	TH-SG1204	. SCREW, Machine, fl hd, No. 6-32 x 5/16 in. lg.	1	
-12	TH-SI1205	. SCREW, Machine, bd hd, No. 6-32 x 3/8 in. lg.	1	
-13	TH-ZA1106	. NUT, Self-locking, hex, No. 6-32	2	
		---*---		
-14	BA-2893	. BRACE, Diagonal	1	
		(ATTACHING PARTS)		
-15	TH-SI1202	. SCREW, Machine bd hd, No. 6-32 x 3/16 in. lg.	1	
-16	TH-WB0605	. WASHER, Lock, split, No. 6	1	
		---*---		
-17	BX-129	. CROSS SUPPORT BRACE	1	
		(ATTACHING PARTS)		
-18	TH-SG0804	. SCREW, Machine, fl hd, No. 4-40 x 5/16 in. lg.	2	
		---*---		
-19	BA-6956-1	. ANGLE SUPPORT BRACE	1	
		(ATTACHING PARTS)		
-20	TH-SI1205	. SCREW, Machine, bd hd, No. 6-32 x 3/8 in. lg.	1	
-21	TH-ZA1106	. NUT, Self-locking, hex, No. 6-32	1	
-22	TH-WA0612	. WASHER, Flat, plain, No. 6	1	
		---*---		
-23	TBBPB0202	. FAN BLADE, Plastic	1	
-24	TBLAA0001	. BLOWER ASSEMBLY	1	
		(ATTACHING PARTS)		
-25	TH-SI1705	. SCREW, Machine, bd hd, No. 10-32 x 3/8 in. lg.	2	
-26	TH-WB0810	. WASHER, Lock, split, No. 10	2	
-27	BA-2495-9	. SPACER	2	
		---*---		

FIG & INDEX NO.	DIGITRONICS PART No.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY.	USABLE ON CODE
		ECONOMY READER ASSEMBLY (Cont'd)		
6-12-28	TH-LA2007	. LUG, Ground	1	
		(ATTACHING PARTS)		
-29	TH-SI1201	. SCREW, Machine, bd hd, No. 6-32 x 1/8 in. lg.	1	
		---*---		
-30	TR-UI250C	. RESISTOR, Fixed, film, 25 ohms, 25W (44655 P/N 0200C)	1	
-31	TR-UI200C	. RESISTOR, Fixed, film, 20 ohms, 25W (44655 P/N 2K40F)	1	
		(ATTACHING PARTS)		
-32	TH-SI1202	. SCREW, Machine, bd hd, No. 6-32 x 3/16 in. lg.	4	
-33	TH-WB0605	. WASHER, Lock, split, No. 6	4	
		---*---		
-34	AE-883-1	. CAPACITOR, Fixed, electrolytic	1	
-35	BB-628-1	. BRACKET, Capacitor mounting	1	
		(ATTACHING PARTS)		
-36	TH-SI1203	. SCREW, Machine, bd hd, No. 6-32 x 1/4 in. lg.	2	
-37	TH-WB0605	. WASHER, Lock, split, No. 6	2	
-38	TH-WA0612	. WASHER, Flat, plain, No. 6	2	
		---*---		
-39	TTBAA0502	. TERMINAL BOARD (75382 P/N 600-2)	1	
-40	TMSAA0102	. MARKER STRIP (75382 P/N 600-2)	1	
		(ATTACHING PARTS)		
-41	TH-SI1205	. SCREW, Machine, bd hd, No. 6-32 x 3/8 in. lg.	4	
		---*---		
-42	TF-AJ0106	. FUSE, Cartridge, 1-1/2 amp, slo blo (75915, Type 3 AG)	1	
-43	TXCBS0106	. FUSE HOLDER (75915 P/N 342004)	1	
-44	TLCMC0003	. LINE CORD (71002 P/N 347)	1	
-45	TSRAA0001	. BUSHING, Strain relief (28520 P/N SRGP-1)	1	
-46	CA-4899-1	. PLATE, Identification	1	
-47	TSFAA0602	. INSULATOR, Standoff	2	
		(ATTACHING PARTS)		
-48	TH-SI1204	. SCREW, Machine, bd hd, No. 6-32 x 5/16 in. lg.	2	
-49	TH-WB0605	. WASHER, Lock, split, No. 6	2	
		---*---		
-50	DE-287	. CHASSIS	1	

SECTION VII

REFERENCE DRAWING

This section contains the reference Schematic And Logic Diagram for the Model 2500 Perforated Tape Reader.



NOTES:

1. G1 AND G2 SHORTED TOGETHER FOR OPERATION WITH DATA CHANNEL AMPLIFIERS GATED BY SPROCKET SIGNAL
2. SA1 AND SA2 SHORTED TOGETHER FOR OPERATION WITH SELF-INITIATED STOP
3. -15S AND -15L MUST BE SHORTED TOGETHER AT THE CONNECTOR, OR EXTERNALLY BY A SWITCH OR RELAY, FOR READER OPERATION
4. READER HAS FLOATING DC GROUND (0V) AND MUST BE GROUNDED EXTERNALLY TO PIN "K" OF INPUT/OUTPUT CONNECTOR
5. ALL RESISTORS ARE 1/4W, 5% UNLESS OTHERWISE SPECIFIED

Figure 7-1.
Tape Reader Schematic And Logic Diagram

APPENDIX A

CLAIM FOR DAMAGE IN SHIPMENT

The instrument should be tested as soon as it is received. If it fails to operate properly, or is damaged in any way, a claim should be filed with the carrier. A full report of the damage should be obtained by the claim agent, and this report should be forwarded to us. We will then advise you of the disposition to be made of the equipment and arrange for repair or replacement. Include model number, type number, and serial number when referring to this instrument for any reason.

WARRANTY

Digitronics warrants that all equipment, spare components and piece parts furnished hereunder will be free and clear of all liens and encumbrances, and that all such equipment, spare components and piece parts shall be free from defects in design, workmanship and material under normal use and service provided, however, that no warranty is made with respect to any equipment if any change or modification has been made therein without the written consent of Digitronics. No other warranty, either expressed or implied, is made by Digitronics. If Digitronics is advised within twelve months from date of delivery to the customer that component parts furnished hereunder do not meet the warranties hereunder, Digitronics will supply replacement part(s) to the customer or will repair the defective part(s) at Digitronics' main plant or factory service center. When Digitronics elects to repair defective part(s) at main plant or factory service centers and Digitronics has been advised of part(s) being defective within ninety (90) days from date of delivery of component part(s) to the customer, there will be no labor charge to the customer. Mechanical and electrical items which are of an expendable nature including (but not limited to) capstans, fuses, lamps, transistors, and/or crystal diodes, are specifically excluded from any warranty; however, Digitronics will extend to the customer any applicable warranty which Digitronics may have received from its suppliers for such excluded items. If any fault develops, the following steps should be taken:

1. Notify Digitronics Corporation at the address given below, giving full details of the difficulty, and include the model number, type number, and serial number. On receipt of this information, we will give you service instructions or shipping data.

   Digitronics Corporation
   53 John Street
   Cumberland, Rhode Island 02864
   Attention: Factory Service Center

2. On receipt of shipping instructions, forward the instrument prepaid, and repairs will be made at the factory service center. If requested, an estimate will be made before work begins provided the instrument is not covered by the warranty.

SHIPPING

All shipments of Digitronics Corporation instruments should be made via Railway Express. The instruments should be packed in their original shipping container or (as a minimum) a wooden box, and should be surrounded by 2 or 3 inches of excelsior or similar shock absorbing material.

APPENDIX B

MANUFACTURING SPECIFICATION

The Manufacturing Specification (MS) number, located on the equipment nameplate, presents in skelton form the specification to which the equipment was manufactured. It identifies the unit's speed, type of head assembly, paint, etc. From this MS number, you can readily determine the major characteristics and assembly part numbers of your particular unit by comparing it with the detailed Manufacturing Specifications provided on the following pages. Use the following example as a guide for interpreting your unit's characteristics from the MS number.

MS number from nameplate 135A - 1A - 2A1 - 3E - 4A - 5A - 5B

135A	2500
1A	115 V 60 Hz Negative Logic
2A1	Rack mounted, painted AT67
3E	Speed is 100 Char/Sec @ 115V 60 Hz
4A	Adjustable Guide - all levels Neg.
5A	Shipping Contents (Reader and
5B	Maintenance Manual)

MODEL 2500

MANUFACTURING SPECIFICATION MS-135-A

ITEM	DESCRIPTION	DWG. NUMBER
1	Reader Assembly	
1A	115V 60 Hz Negative Logic	DC-1933
1C	115V 50 Hz Negative Logic	DC-1933-1
1D	230V 50 Hz Negative Logic	DC-1933-2
1E	115V 60 Hz Positive Logic	DC-1933-3
1F	115V 50 Hz Positive Logic	DC-1933-4
1G	230V 50 Hz Positive Logic	DC-1933-5
1H	115V 60 Hz All Silicon	DC-1854
1B	Particularizing Drawing	_____
2	Mounting	
2A1	Rack Adapter, Painted AT67	BC-1936
2A2	Rack Adapter, Unpainted (Primed)	BC-1936-1
2B1	Case Assembly, Painted AT67	CC-1937
2B2	Case Assembly, Unpainted (Primed)	CC-1937-1
2C	Particularizing Drawing	_____
3	Motor Speed	
3A	400 c/s @ 115V 60 Hz. Std. Speed	BC-1935-3
3B	300 c/s @ 115 V 60 Hz. Pkg.	BC-1935-1
3C	200 c/s @ 115 V 60 Hz. Pkg.	BC-1935-4
3D	133 c/s @ 115 V 60 Hz. Pkg.	BC-1935-5
3E	100 c/s @ 115 V 60 Hz. Pkg.	BC-1935-2
3F	95 c/s @ 115V 60 Hz. Pkg.	BC-1935-9
3G	75 c/s @ 115V 60 Hz. Pkg.	BC-1935-6
3H	66 c/s @ 115V 60 Hz. Pkg.	BC-1935-7
3I	50 c/s @ 115V 60 Hz. Pkg.	BC-1935-8
3J	Particularizing Drawing	_____
	Heavy Duty Speed Package	
3K	300 c/s @ 115V 60 Hz	CC-7386-1
3L	100 c/s @ 115V 60 Hz	CC-7386-2
3M	300 c/s @ 115V 50 Hz	CC-7386-5
3N	100 c/s @ 115V 50 Hz	CC-7386-6
	Standard Speed Package	
3P	100 c/s @ 115V 50 Hz	BC-1935-10
3Q	100 c/s @ 230V 50 Hz	BC-1935-11
3R	300 c/s @ 115V 50 Hz	BC-1935-12
3S	300 c/s @ 230V 50 Hz	BC-1935-13
3T	200 c/s @ 115V 50 Hz	BC-1935-14
3U	200 c/s @ 230V 50 Hz	BC-1935-15

MODEL 2500

MANUFACTURING SPECIFICATION MS-135-A (Cont'd.)

ITEM	DESCRIPTION	DWG. NUMBER
4	Tape Guide/Head Assembly	
4A	Adjustable Guide All Levels Neg.	BC-1443
4B	Fixed Guide 8 Levels Neg.	BC-1443-1
4C	Fixed Guide 6/7 Levels Neg.	BC-1443-2
4D	Fixed Guide 5 Levels Neg.	BC-1443-3
4E	Fixed Guide Teletypesetter Neg.	BC-1443-4
4G	Fixed Guide 8 Levels Pos.	BC-1443-5
4H	Fixed Guide Teletypesetter Pos.	BC-1443-8
4J	Adjustable Guide All Levels Pos.	BC-1443-9
4F	Particularizing Drawing	———
5	Shipping Contents	
5A	Reader	
5B	Manual	
5C	Cleaning Kit	MS-133

APPENDIX C

TRANSISTOR AND DIODE SPECIFICATIONS

The transistors and diodes used in the Model 2500 Tape Reader are listed below. The numbers which are indicated with an asterisk (*) are components which are sorted to Digitronics specifications and are not commercially available. The following pages contain the electrical and physical specifications for these components.

TRANSISTORS	DIGITRONICS PART NUMBER
2N357A	TQ-SB357A
2N598	TQ-SA0598
2N1489	TQ-PD1489
2N1545	TQ-PA1545
*GA004 (Commercial equivalent: 2N1309)	TQ-SAA004
*GA005 (Commercial equivalent: 2N1308)	TQ-SB0005
*222 (Commercial equivalent: 2N1305)	TQ-SA0222
GT-1659	TQ-SB1659

DIODES	DIGITRONICS PART NUMBER
1N2069	TCRS2069A
1N747	TCRZS0747
1N958	TCRZS0958
*125 (Commercial equivalent: 1N3666)	TCRSU0125

I. TRANSISTOR	CLASS	MATERIAL	POLARITY
TQS -GA004	SWITCH	Ge	PNP

II. PARAMETERS (at 25 degrees C unless otherwise noted)

POWER DISSIPATION 150 mw DERATING FACTOR 2 MW/° C

IC (max) 50 ma

BVCB (min) 25 V @ Ic = 25 ua *VCE (max) 0.5 V @ Ic = 5 MA, Ib = 1MA

BVCES (min) 20 V @ Ic = 25 ua *VCE (max) @

BVCEO (min) @ *VBE (max) 0,5V @ Ic = 5MA, Ib = 1MA

BVEB (min) 15 V @ Ie = 25 ua *VBE (max) @

ICBO (max) 3 ua @ Vcb = 10V

hFE (min) 80 @ Ic = 5 ma VCE = 0.5 V

hFE (min) @

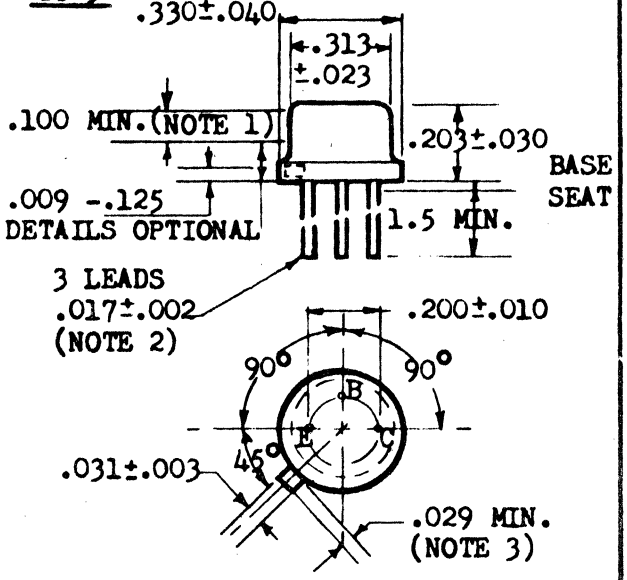
* SATURATION

NOTE: Time response as per ED-68 with

Tf = 1us MAX, To = 0.5us MAX

environmental as per ED-67.

TO 5



NOTES FOR TO 5:

1. Controlled for automatic handling. Dia. not to exceed .010.
2. Lead dia. variation between .050 and .250 from base seat as specif. Between .250 and 1.5 a max. of .021 dia. is held.
3. Measure from max. dia. of the actual device.

DIGITRONICS
ALBERTSON, NEW YORK

TITLE: TRANSISTOR

REV	E.C.O.	CHKD.	APP'D.	MO. DAY YR.	USED ON:	DRAWING NO.
A				9/25/62	DIGITRONICS PART NUMBERS	TQ-SAA004

I. TRANSISTOR	CLASS	MATERIAL	POLARITY
GA 005 *	SWITCH	Ge	NPN

II. PARAMETERS (at 25 degrees C unless otherwise noted)

POWER DISSIPATION 150 MW DERATING FACTOR 2 MW/° C

IC (max) 50 MA

BVCBO (min) 25V	@ Ic = 25 ua	*VCE (max) 0.5V	@ Ic = 5Ma, Ib = 1MA
BVCES (min) 20	@ Ic = 25 ua	*VCE (max)	@
BVCEO (min)	@	*VBE (max) 0.5V	@ Ic = 5MA, Ib = 1MA
BVEBO (min) 15V	@ Ie = 25 ua	*VBE (max)	@
ICBO (max) 3 ua	@ Vcb = 10V		
hFE (min) 80	@ Ic = 5MA, Vce = 0.5V		
hFE (min)	@		

* SATURATION

NOTE: Time response as per ED-69

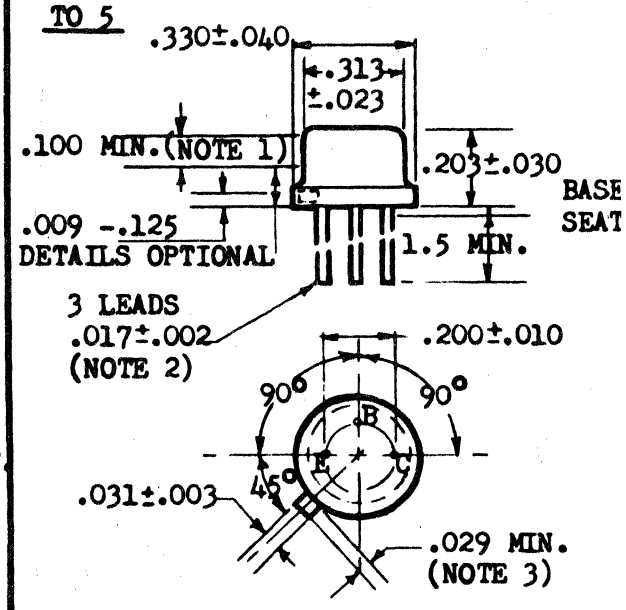
Tf = 1.0us MAX, To = 0.5us MAX

environmental as per ED-67.

* WE ARE NOW BUYING

GA 1240 AS REPLACEMENT.

TO 5



NOTES FOR TO 5:

1. Controlled for automatic handling. Dia. not to exceed .010.
2. Lead dia. variation between .050 and .250 from base seat as specif. Between .250 and 1.5 a max. of .021 dia. is held.
3. Measure from max. dia. of the actual device.

DIGITRONICS
ALBERTSON, NEW YORK

TITLE:

TRANSISTOR

REV	E.C.O.	CHKD.	APP'D.	MO. DAY YR.
B				7-21-64
A				9/25/62

USED ON: DIGITRONICS PART NUMBERS

DRAWING NO. TQ_SB0005

I. TRANSISTOR	CLASS	MATERIAL	POLARITY
222	SWITCH	Ge	PNP

II. PARAMETERS (at 25 degrees C unless otherwise noted)

POWER DISSIPATION 150 MW DERATING FACTOR 2MW/° C

IC (max) 100 MA

BVCBO (min) 30V @ Ic = 40ua *VCE (max) 0.5V @ Ic =100 MA Ib = 5MA

BVCES (min) 30V @ Ic = 100ua *VCE (max) ____ @ ____

BVCEO (min) ____ @ ____ *VBE (max) 0.55V @ Ib = 5MA Ic = 100 MA

BVEBO (min) 12V @ Ie =5ua *VBE (max) ____ @ ____

ICBO (max) 10ua @ Vcb =12V (50ua at 65°C)

hFE (min) 50 @ Ic =50MA Vc =0.5V

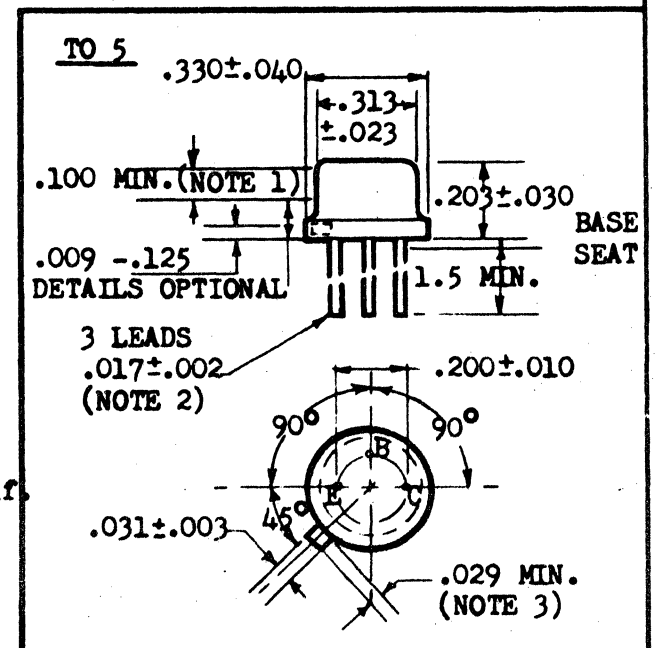
hFE (min) 30 @ Ic =100MA Vc = 0.5V

* SATURATION

NOTE: 1. Time Response as per ED-68
with Tf =0.7us MAX, To =0.4us MAX.

2. Environmental as per ED-67.

3. Replaces TQ-SA1228
TQ-SA1229
TQ-SA1170



NOTES FOR TO 5:

1. Controlled for automatic handling. Dia. not to exceed .010.
2. Lead dia. variation between .050 and .250 from base seat as specif. Between .250 and 1.5 a max. of .021 dia. is held.
3. Measure from max. dia. of the actual device.

DIGITRONICS
ALBERTSON, NEW YORK

TITLE: TRANSISTOR

REV	E.C.O.	CHKD	APP'D	MO. DAY YR.
		lc	CB	12-4-69
				9/13/62

USED ON:

DRAWING NO. TQ- SA0222

I. DIODE	CLASS	MATERIAL	CATAGORY
125	SWITCHING	GERMANIUM	GOLD BONDED JUNCT (UNIVERSAL TYPE)

II. PARAMETERS (at 25 degrees C unless otherwise noted)

POWER DISSIPATION 80 mw @ ϕ^{-1} = 1mw/°C

PIV 35 V (min) @ 100 ua

I reverse 10 V (min) @ 10 ua
50ua @ 55°C

V forward 0.45 @ 10 ma

I peak _____ @ _____

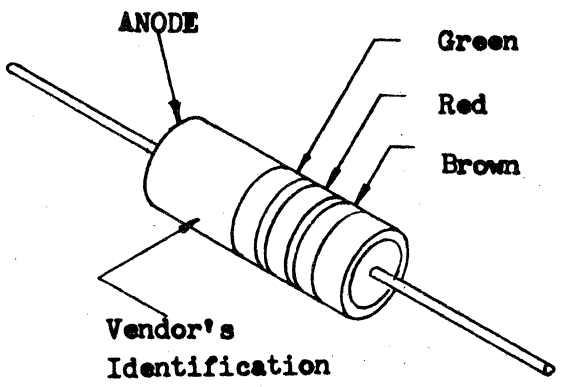
I average 70 ma @ 0.7 V (max)

I surge 300 ma @ $V_f \leq$ 1.5 V per 10 ms @ 5CPS (5% duty cycle)

NOTE: 1. Recovery as per ED-10
with tr $\leq$ 0.3 usec

2. Environmental as per ED-67.

3. Replaces DX2 (S-151)
, DX3 (S-152)
GTD230 (S-153)



DIGITRONICS
ALBERTSON, NEW YORK

TITLE:
DIODE, 125

REV	E.C.O.	CHKD.	APP'D.	MO. DAY YR.
A				9/13/62

USED ON:

DRAWING NO TCR SU0125

RECOMMENDED SPARES LIST

MODEL 2500

"A" LIST
(Serviceman's Spares)

The "A" List is recommended for all those expecting to perform corrective maintenance and should be procured and maintained as a minimum complement.

"A" List contains:

a. At least one each; all mechanically wearing parts, including bearings.

b. At least one each; all switches, solenoids, lamps, fuses, diodes, and transistors.

"B" LIST
(District Office Spares)

The "B" List is an addition and is supplemental to the "A" List, and should be procured and maintained as a complement to the "A" List.

"B" List contains:

a. Parts supplemental to the "A" List which are most subject to wear, and random failure or damage.

b. Power transformers and other parts rarely subject to failure or damage.

"C" LIST
(National Office Spares)

The "C" List consists of major assemblies and parts. The "C" List is compiled on the basis of individual considerations relating to costs, maintenance procedures, quantity of equipment, and length of time between servicing:

"C" List contains:

Major assemblies for which component parts are included in previous lists.

ORGANIZATION

Each list is composed of five columns: DESCRIPTION, PART NO., QTY., UNIT PRICE, and USABLE ON CODE. The DESCRIPTION column provides the name and descriptive information for each part listed; and where applicable, the manufacturer's name and part number appear in parenthesis following the description. The PART NO. column provides the Digitronics part number for each part listed. The QTY. column indicates the quantity of each part required to provide adequate coverage for up to three units. The USABLE ON CODE column indicates the units on which each part is used, to differentiate between parts used on standard units and those used on units containing extra-cost options. The codes used are as follows:

A - Standard 2500
B - 2500 with positive (+10 volt, hole; 0 volt, no-hole) outputs
C - 2500 modified for 115 volt, 50 cycle input power
D - 2500 modified for 115 volt, 50/60 cycle input power
E - 2500 modified for 220-230 volt, 50 cycle input power
F - 2500AS (high temperature unit)

When the USABLE ON CODE column is left blank for a part, it indicates that the part is used on all codes (A through F).

MODEL 2500 RECOMMENDED SPARES LIST (Cont'd.)

"A" LIST

DESCRIPTION	PART NO.	QTY.	UNIT PRICE	USABLE ON CODE
Actuator, switch	BA2917	1	$ 3.49	
*Armature, brake	AA2058	1	18.00	
Bearing, flanged	TB-BR1017	4	5.40	
Bearing, flanged (New Hampshire P/N SFR2-5PPEE)	TB-KF0006	2	7.52	
*Capacitor, fixed, electrolytic 10,000 uf, 25 vdc (Sangamo P/N 539-2635-01, Type DCM)	TC-EN109F	1	9.62	
Capstan Assembly (except 95 char./sec. units)	BC985	1	15.00	
Capstan Assembly (95 char./sec. units only)	BC1955	1	55.20	
*Coil Assembly, brake	BC1143	1	50.40	
*Connector, mating (U.S. Components P/N UPCC-F2HSL-23)	TPES02302	1	17.94	
Diode	TCRSU0125	10	1.02	A, B, C, D, E
Diode	TCRSS2702	10	17.25	F
Diode (1N2069A)	TCRS2069A	4	1.26	
Diode, zener (1N747)	TCRZS0747	1	3.84	
Diode, zener (1N958)	TCRZS0958	1	4.04	
Fuse, 1 $\frac{1}{2}$ amp, slo-blo (Littelfuse Type 3AG)	TF-AJ0106	5	.55	
Lamp, exciter	TLNEE0004	1	.60	
*Motor, drive	CC5449-1	1	21.56	A, B, F
*Motor, drive	CC5450-1	1	22.01	C, D
*Motor, drive	CC5451-1	1	26.14	E
Neutral Density Filter (used for amplifier adjustment)	AA4559	1	30.53	
"O" Ring Drive Belt, motor assembly (66, 95, 100, and 133 char./sec. units only)	TGRPD0202	1	2.22	
"O" Ring Drive Belt, motor assembly (except 133 char./sec. units)	TGRPD0404	1	2.22	
**Printed Circuit Board Assembly, LAC	DC1784	1	223.39	A, C, D, E
**Printed Circuit Board Assembly, LAC (+)	DC2839-1	1	192.48	B
**Printed Circuit Board Assembly, LAC-SI (+)	DC2993-1	1	236.25	F
**Printed Circuit Board Assembly, MPC	DC1734	1	82.40	A, C, D, E
**Printed Circuit Board Assembly, MPC (+)	DC2852-1	1	131.89	B
**Printed Circuit Board Assembly, MPC-SI (+)	DC2992-1	1	232.50	F
Rectifier (P.R. Mallory P/N FW50)	TCRPSB001	1	4.30	
Resistor, fixed film, 20 ohm, 25 watt	TR-U1200C	1	1.22	
Resistor, fixed film, 25 ohm, 25 watt	TR-UI250C	1	1.56	
Resistor, variable, wirewound, 10 ohm, 10 watt (Ohmite P/N 1006)	TR-AF100D	1	2.04	
Roller, tape	AA2722	2	6.96	
Setscrew, No. 3-48 x 1/8 in. lg.	TH-XB0501	2	.25	
Shaft, roller	AA2224	1	.56	
*Solenoid Assembly, pinch roller	AC5650-1	1	21.74	
Spark Suppressor (Aerovox P/N INR-180-A)	TSSAA0001	1	1.04	
Spring, helical	AA188	1	.60	
Spring, flat (pinch roller assembly)	AA2144	2	1.80	
Spring, helical (pinch roller assembly)	AA2900	2	1.32	
Spring, brake	AA2905	1	2.42	
Stud, threaded	AA6599	1	1.73	
Switch (Unimax P/N USM5W)	TDA01BS03	1	4.06	

*Purchase if "A" List only is considered. If "B" List is procured, part may be eliminated from "A" List.
**To be purchased at the discretion of maintenance and procurement personnel, depending on maintenance procedures.

MODEL 2500
RECOMMENDED
SPARES LIST (Cont'd.)

"A" LIST (Cont'd.)

DESCRIPTION	PART NO.	QTY.	UNIT PRICE	USABLE ON CODE
Switch, toggle (Cutler-Hammer P/N 8295K7)	TDT01AS18	1	$ 1.52	
Transistor (2N1545)	TQ-PA1545	4	5.28	A, C, D, E,
Transistor (2N1489)	TQ-PD1489	4	18.60	B, F
Transistor (2N598) (replaces TQ-SA317A)	TQ-SA0598	4	3.48	A, C, D, E
Transistor (2N357A)	TQ-SB357A	4	7.93	B
Transistor	TQ-SD5664	7	17.32	F
Transistor	TQ-SAA004	10	2.22	A, C, D, E
Transistor	TQ-SB0005	10	2.22	B
Transistor	TQ-SD5665	15	14.66	F
Transistor (replaces TQ-SA1170)	TQ-SA0222	10	1.01	A, C, D, E
Transistor (replaces TQ-SB1659)	TQ-SB0111	10	1.04	B

MODEL 2500 RECOMMENDED SPARES LIST (Cont'd.)

"B" LIST

DESCRIPTION	PART NO.	QTY.	UNIT PRICE	USABLE ON CODE
*Armature, brake	AA2058	2	$ 18.00	
*Bearing, flanged	TB-BR1017	8	5.40	
*Bearing, flanged (New Hampshire P/N SFR2-5PPEE)	TB-KF0006	4	7.52	
*Capacitor, fixed, electrolytic, 10,000 uf, 25 vdc (Sangamo P/N 539-2635-01, Type DCM)	TC-EN109F	1	9.62	
Capacitor, fixed, 2 uf, 440 vac	AE883-1	1	6.28	
*Capstan Assembly (except 95 char./sec. units)	BC985	1	15.00	
*Capstan Assembly (95 char./sec. units only)	BC1955	1	55.20	
*Coil Assembly, brake	BC1143	2	50.40	
*Connector, mating (U.S. Components P/N UPCC-F2HSL-23)	TPES02302	2	17.94	
Fan Blade, plastic	TBBPB0202	1	1.50	
*Motor, drive	CC5449-1	1	21.56	A, B, F
*Motor, drive	CC5450-1	1	22.01	C, D
*Motor, drive	CC5451-1	1	26.14	E
Motor, fan	TBLAA0001	1	13.80	A, B, C, D, F
Motor, fan	TBLAD0004	1	33.53	E
*"O" Ring Drive Belt, motor assembly (66, 95, 100, and 133 char./sec. units only)	TGRPD0202	2	2.22	
*"O" Ring Drive Belt, motor assembly (except 133 char./sec. units only)	TGRPD0404	2	2.22	
*Printed Circuit Board Assembly, LAC	DC1784	1	223.39	A, C, D, E
*Printed Circuit Board Assembly, LAC (+)	DC2839-1	1	192.48	B
*Printed Circuit Board Assembly, LAC-SI (+)	DC2993-1	1	236.25	F
*Printed Circuit Board Assembly, MPC	DC1734	1	82.40	A, C, D, E
*Printed Circuit Board Assembly, MPC (+)	DC2852	1	189.32	B
*Printed Circuit Board Assembly, MPC-SI (+)	DC2992-1	1	232.50	F
*Roller, tape	AA2722	4	6.96	
*Solenoid Assembly, pinch roller	AC5650-1	2	21.74	
*Spring, brake	AA2905	2	2.42	
Transformer	BA2688	1	39.92	A, B
Transformer	BA3698	1	48.13	C
Transformer	BA4207	1	57.42	D
Transformer	BA4544	1	60.52	E
Transformer	BA3648	1	47.78	F

* Recommended supplemental quantities of "A" List.

MODEL 2500 RECOMMENDED SPARES LIST (Cont'd.)

"C" LIST

DESCRIPTION	PART NO.	QTY.	UNIT PRICE	USABLE ON CODE
Brake Assembly	BC1142	1	$ 88.67	
Capstan Assembly (except 95 char./sec. units)	BC985	1	15.00	
Capstan Assembly (95 char./sec. units only)	BC1955	1	55.20	
Guide Assembly, adjustable	BC1441	1	37.98	
Guide Assembly, fixed, 1 in. tape (8 level)	BC2475-1	1	36.30	
Guide Assembly, fixed, 7/8 in. tape (6/7 level and teletypesetter)	BC2475-2	1	36.30	
Guide Assembly, fixed, 11/16 in. tape (5 level)	BC2475-3	1	27.74	
Head Assembly	CC1320-1	1	310.62	A, C, D, E
Head Assembly	CC1320-3	1	310.62	B, F
Motor Reducer Assembly, 300 char./sec.	CC2197	1	71.21	A, B, F
. Pulley Assembly	BC2152	1	22.28	A, B, F
. Pulley, motor	AA3085	1	3.42	A, B, F
Motor Reducer Assembly, 300 char./sec.	CC2197/AP97	1	71.21	C, D
. Pulley Assembly	BC2152	1	22.28	C, D
. Pulley, motor	AA4142-2	1	3.62	C, D
Motor Reducer Assembly, 300 char./sec.	CC2197/AP81	1	71.21	E
. Pulley Assembly	BC2152	1	22.28	E
. Pulley, motor	AA4142-2	1	3.62	E
Motor Reducer Assembly, 200 char./sec.	CC2549	1	75.66	A, B, F
. Pulley Assembly	BC2152	1	22.28	A, B, F
. Pulley, motor	AA3361	1	7.85	A, B, F
Motor Reducer Assembly, 200 char./sec.	CC2549/AP134	1	75.66	C
. Pulley Assembly	BC2152	1	22.28	C
. Pulley, motor	AA4142-2	1	3.62	C
Motor Reducer Assembly, 133 char./sec.	CC2196-1	1	107.53	A, B, F
. Pulley Assembly	BC2151-2	1	25.01	A, B, F
. Pulley Assembly	BC2153-1	1	25.41	A, B, F
. Pulley, motor	BA4638-1	1	2.59	A, B, F
Motor Reducer Assembly, 95 and 100 char./sec.	CC2196	1	106.64	A, B, F
. Pulley Assembly	BC2151-2	1	25.01	A, B, F
. Pulley Assembly	BC2153-1	1	25.41	A, B, F
. Pulley, motor	BA4638-1	1	2.59	A, B, F
Motor Reducer Assembly, 95 and 100 char./sec.	CC2196/AP82	1	106.64	C, D
. Pulley Assembly	BC2151-2	1	25.01	C, D
. Pulley Assembly	BC2153-1	1	25.41	C, D
. Pulley, motor	AA4142-1	1	3.52	C, D
Motor Reducer Assembly, 95 and 100 char./sec.	CC2196/AP117	1	106.64	E
. Pulley Assembly	BC2151-2	1	25.01	E
. Pulley Assembly	BC2153-1	1	25.41	E
. Pulley, motor	AA4142-1	1	3.52	E

MODEL 2500 RECOMMENDED SPARES LIST (Cont'd.)

"C" LIST (Cont'd.)

DESCRIPTION	PART NO.	QTY.	UNIT PRICE	USABLE ON CODE
Motor Reducer Assembly, 75 char./sec.	CC2196-2	1	$ 86.35	A, B, F
. Pulley Assembly	BC2152-1	1	8.52	A, B, F
. Pulley Assembly	BC2153	1	22.57	A, B, F
. Pulley, motor	BA4638-1	1	2.59	A, B, F
Motor Reducer Assembly, 66 char./sec.	CC2196-3	1	112.68	A, B, F
. Pulley Assembly	BC2151-2	1	25.01	A, B, F
. Pulley Assembly	BC2153	1	22.57	A, B, F
. Pulley, motor	BA4638-2	1	9.18	A, B, F
Motor Reducer Assembly, 50 char./sec.	CC2196-4	1	92.42	A, B, F
. Pulley Assembly	BC2152-1	1	8.52	A, B, F
. Pulley Assembly	BC2153	1	22.57	A, B, F
. Pulley, motor	BA4638-2	1	9.18	A, B, F
"O" Ring, adjustable guide assembly	TGRAB0002	1	.25	
"O" Ring Drive Belt, motor assembly (66, 95, 100, and 133 char./sec. units only)	TGRPD0202	1	2.22	
"O" Ring Drive Belt, motor assembly (except 133 char./sec.	TGRPD0404	1	2.22	
Printed Circuit Board Assembly, LAC	DC1784	1	223.39	A, C, D, E
Printed Circuit Board Assembly, LAC (+)	DC2839-1	1	192.48	B
Printed Circuit Board Assembly, LAC-SI (+)	DC2993-1	1	236.25	F
Printed Circuit Board Assembly, MPC	DC1734	1	82.40	A, C, D, E
Printed Circuit Board Assembly, MPC (+)	DC2852	1	189.32	B
Printed Circuit Board Assembly, MPC-SI (+)	DC2992-1	1	232.50	F
Roller Assembly	BC1033	1	59.21	
Solenoid Mount Assembly, pinch roller	CC1924	1	146.48	

Reprint Courtesy Digitronics Corp.

ddress comments regarding this publication to Digitronics Publication Dept., Albertson, L. I., N. Y.

September, 1966 MS 135-074

ADDENDUM FOR MODEL 2500 WITH SPECIAL RFI FLANGED PANEL

1. GENERAL

This addendum describes the modification to the standard unit required for the special RFI flanged panel and shall govern wherever it conflicts with the manual.

2. FRONT PANEL ASSEMBLY

The drawings for the special RFI flanged panel used on this unit are BC6256 and DA6451. The screening drawing for this panel is DE876. Drawing DE876 replaces the standard panel screening drawing DE286 (Figure 6-2, item 44).

3. DRAWINGS

The additional drawing required for this unit are listed below and located on the following pages.

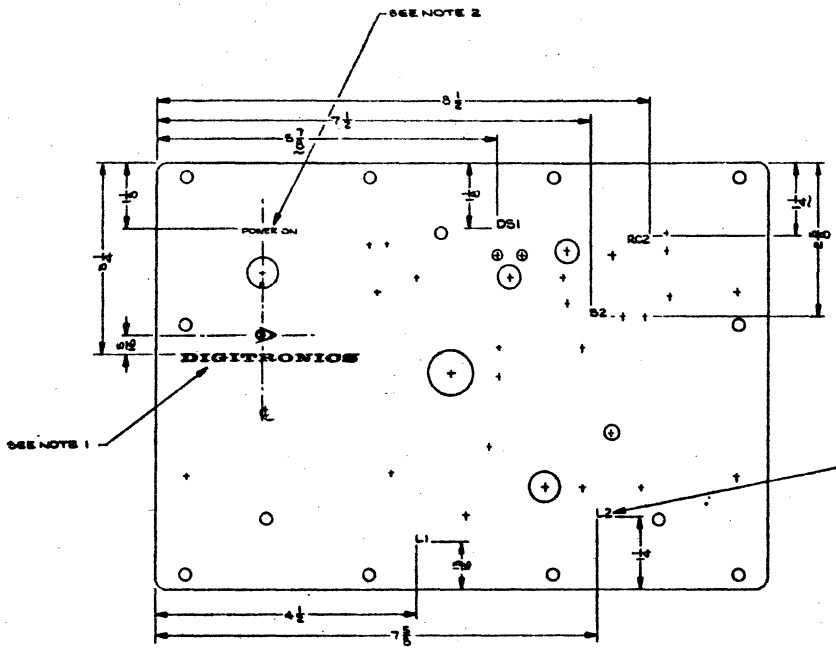
DE876

BC6256

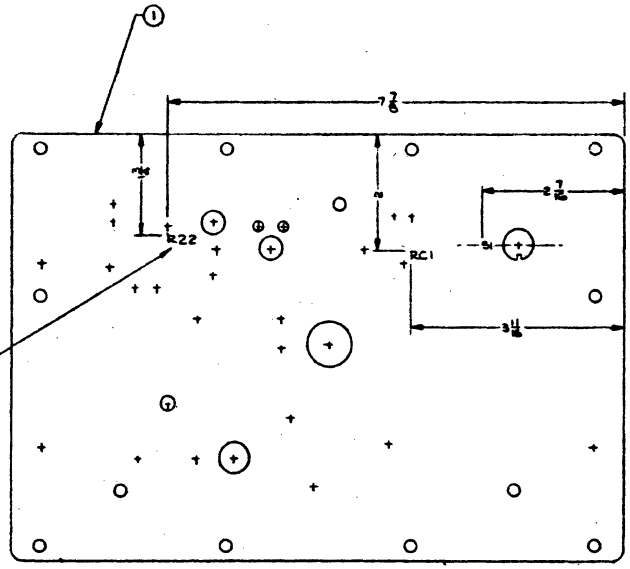
DA6451

DE876A

QTY	ITEM	DRWG. NO.	DESCRIPTION
1	001	DE873	PANEL, SCREENED
1	001	DE0253-01	PANEL ASSY



FRONT VIEW



REAR VIEW

SEE NOTE 3

NOTES:

4. DIMENSIONS, DIMENSION LINES AND ARROWS ARE FOR REFERENCE ONLY.
3. STAMP OR SILK SCREEN ALL OTHER CHARACTERS (BOTH FRONT & REAR) 1/8 HIGH GOTHIC STYLE IN BLACK, LOCATED AS SHOWN AND COVER WITH CLEAR LACQUER.
2. SILK SCREEN CHARACTERS "POWER ON" .065 HIGH VENUS BOLD EXTENDED STYLE IN BLACK LOCATED AS SHOWN.
1. SILK SCREEN CHARACTERS "DIGITRONICS" & TRADEMARK IN BLUE (PAINT SPEC AT-9") LOCATED AS SHOWN.

A	5382	JS	DD	9/7	9-13-66

DIGITRONICS

MATERIAL: .040 AL

FINISH:

SCALE: 1/1

PANEL, SCREENED

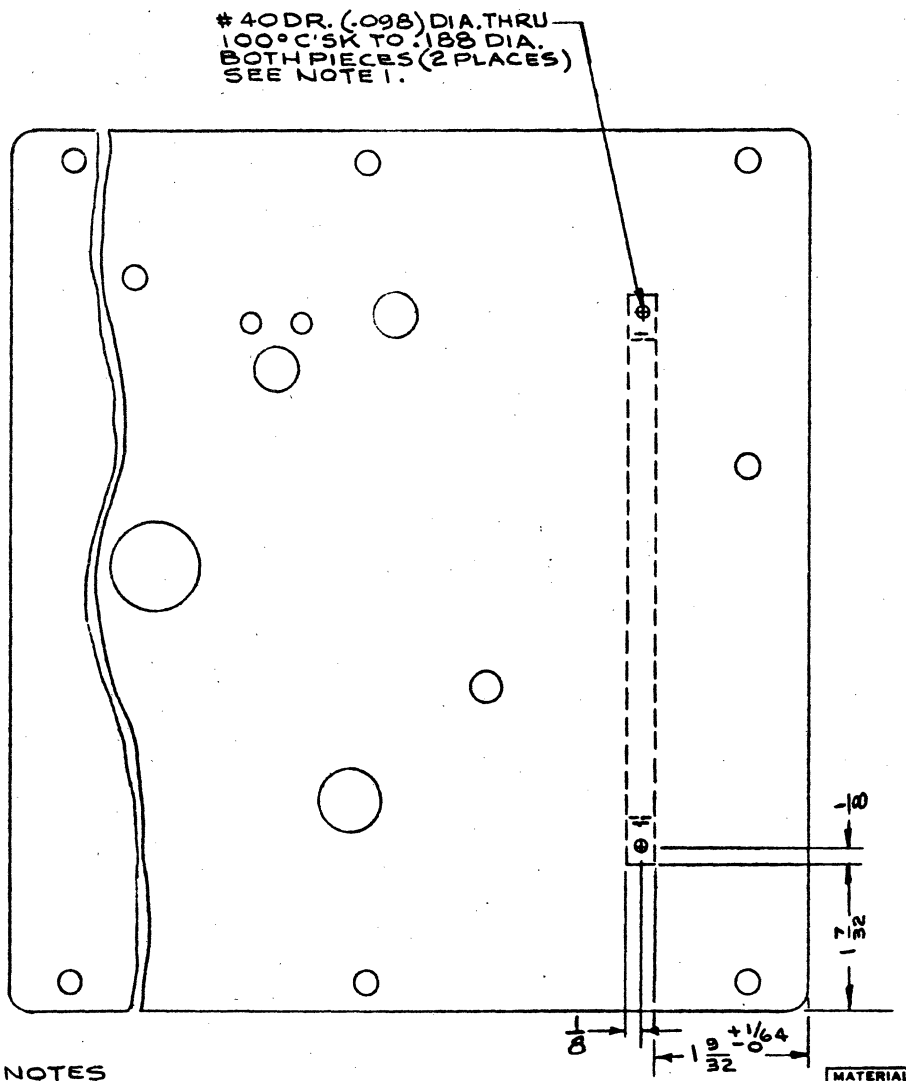
SHEET 1 OF 1

DE876

DRWG. NO. BC6256

-1	DRWG. NO. BC6256	DESCRIPTION PANEL & GUIDE ASSY.

QTY	ITEM	DRWG. NO.	DESCRIPTION
1	001	DA6451	PANEL, TAPE READER
1	002	AA2892-1	GUIDE, PC BOARD
2	003	TH-VB0404	RIVETS



NOTES
1. RIVETS TO BE FLUSH WITH FACE OF PANEL AFTER FINISHING.
2. ON FRONT SURFACE & EDGES FINISH PER .DS123 CLEAR ANODIZE. REAR SURFACE .FINISH PER MIL-C-5541 CLEAR

REV.	E.C.O. NO.	DWN.	CHKD.	APP'D.	MO. DAY YR
A					
ORIGINAL ISSUE		EB	CB	MZ	9-9-66

DIGITRONICS
ALBERTSON, NEW YORK

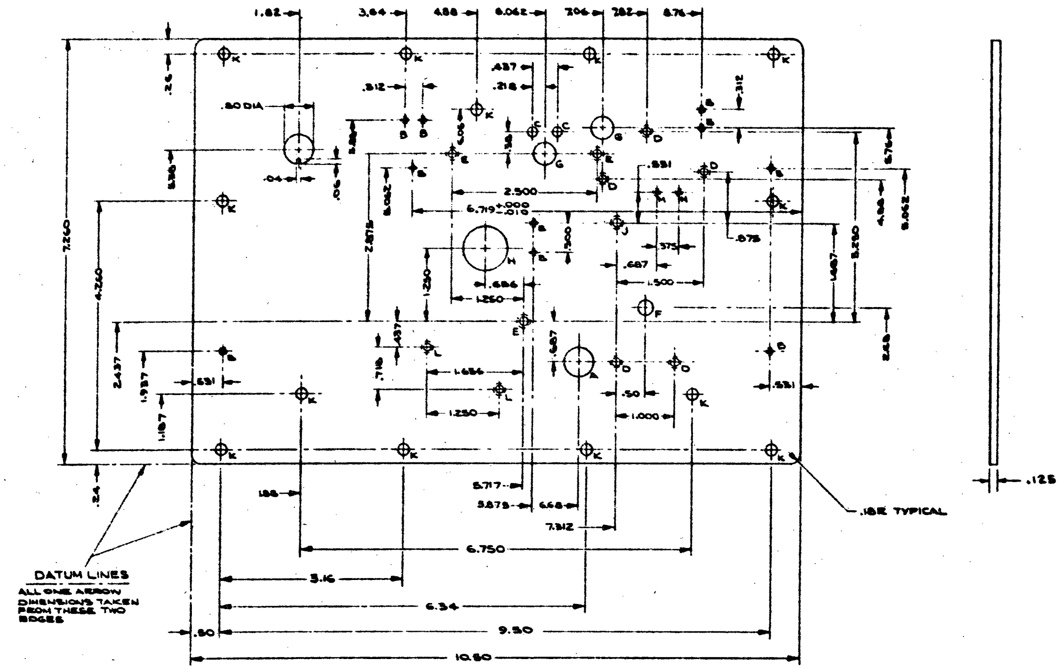
MATERIAL	SCALE: 1/1
FINISH NOTED	
TOLERANCES UNLESS OTHERWISE NOTED: DEC. ± .005 | FRAC. ± 1/64 | ANGLE ± 1/2°	

TITLE: PANEL & GUIDE ASSY.

SHEET 1 OF 1 DRAWING NO BC6256

DA 6451 B

QTY	ITEM	DRWG. NO.	DESCRIPTION
	-1		



HOLE	DESCRIPTION	QUAN
M	#2-56 TAP	2
L	#8-32 TAP	2
K	.187 DIA	13
J	#10-24 TAP	1
H	.750 DIA	1
G	.375 DIA	2
F	.250 DIA	1
E	#10-32 TAP	3
D	#6-32 TAP	5
C	.156 DIA	2
B	#4-40 TAP	10
A	.5000 DIA	1

REV	E.C.O. NO.				DATE
B	5382				9-12-66
A	4937				10-1-65
ORIGINAL ISSUE					7-9-65

DIGITRONICS

MATERIAL: ALUM. 6061-T6 1/8 THK.

SCALE: 1/1

TITLE: PANEL TAPE READER

SHEET 1 OF 1

DRAWING NO. DA6451