TT120 TAPE TRANSPORT SERVICE MANUAL

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SERVICE MANUAL
for
TT120 Tape Transport

Prepared by

SYKES DATATRONICS, INC.

FIELD SERVICE DEPARTMENT

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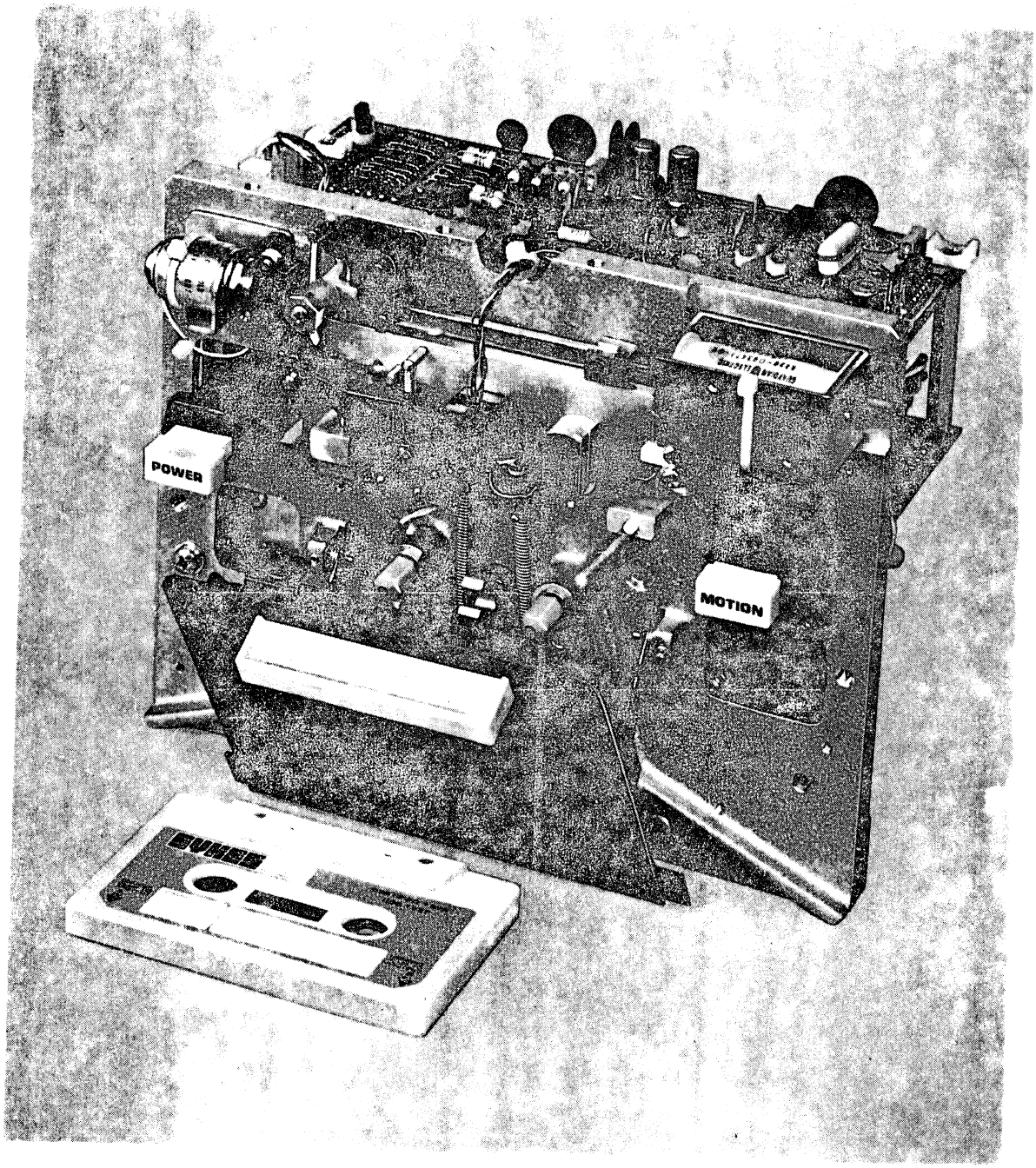


FIGURE 1-1 TT120 TAPE TRANSPORT

1.0 INTRODUCTION

The Sykes Model TT120 Tape Transport, shown in Figure 1-1, is a high-performance, cassette loaded unit which offers a high-speed, bi-directional direct access capability.

The complete unit consists of a single tape deck mechanism, three-motor drive system, motor control electronics and read/write electronics.

Operation of the TT120 can be in either of two modes: incremental (asynchronous) or sequential (synchronous). The direct access capability can be used in combination with either mode, and modes of operation may be intermixed.

In the sequential mode, information is written (and read) sequentially in blocks of variable length.

In the incremental mode, information is written (and read) asynchronously, a character-at-a-time, with no additional buffering required.

In the direct access mode, tape is moved at high speed (forward or reverse) with the tape head retracted. A turns count signal is available for monitoring tape movement. This signal, in conjunction with a Sykes preformatted cassette and appropriate hardware/software, allows the user to access any location on the tape rapidly and precisely.

2.0 GENERAL SPECIFICATIONS

The following specifications apply to the complete Model TT120 Tape Transport (i.e. with read/write assembly) configured for 5 ips read/write speed and used with the Sykes Cassette. Sykes Datatronics, Inc. cannot assume responsibility for operation of the TT120 with other than Sykes Cassettes.

Similar information for TT120 Transports configured for other read/write speeds or with read-after-write head is available in the form of supplements to this manual.

Recording Density	1000 bpi, max; 200 bpi, min 2000 frpi, max; 400 frpi, min
Read/Write Tape Speed	5 inches/second $\pm$ 2%
Start Time (5 ips)	20 milliseconds max
Stop Time (5 ips)	30 milliseconds max
Start Distance (5 ips)	0.10 inches maximum
Stop Distance (5 ips)	0.05 inches maximum
High Speed Search (head retracted)	
Wind/Rewind Time (300' of tape)	35 seconds maximum
Stop Time	260 milliseconds max
Stop Distance	12 inches maximum
Low Speed Search (head engaged)	
Wind/Rewind Time (300' of tape)	6.5 minutes maximum
Stop Time	100 milliseconds max
Stop Distance	1.0 inch maximum

3.0 DESCRIPTION OF EQUIPMENT

The TT120 is available in several standard and optional configurations: 50 Hz or 60 Hz ac power; with standard 80-40 or 60-60 tape head; with optional read-after-write head; with or without a read/write assembly and with 5 ips or one of several other read/write speeds. The majority of these options are discussed under the appropriate headings in this section and others are described in supplements to this manual. The principal features and components of the TT120 complete with read/write assembly are identified in Figures 3-1 and 3-2. (The other options are not visibly different from each other.)

A precision machined, cast aluminum deck plate is the primary structural member of the TT120. All other components are either mounted on or related to it.

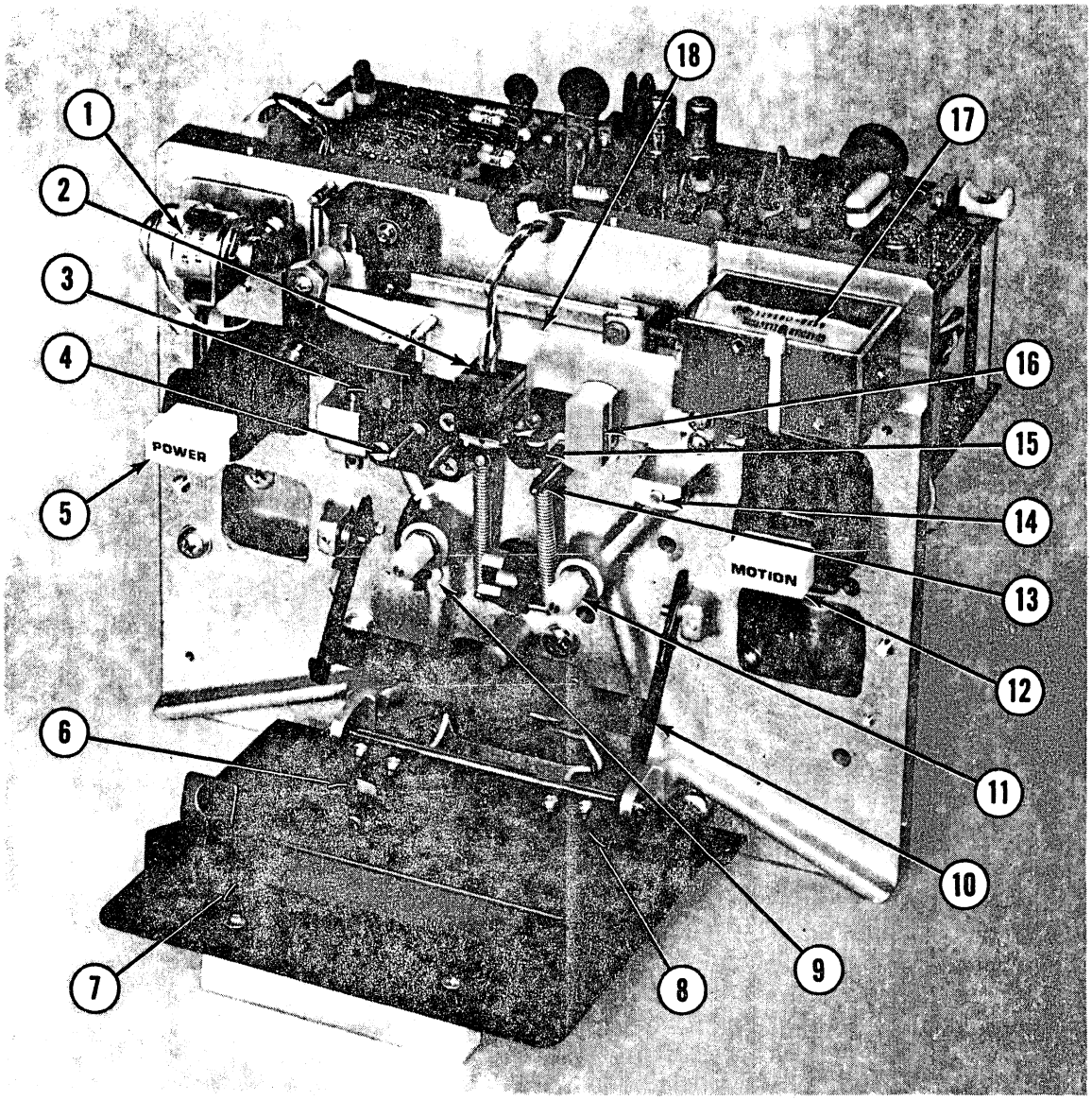
3.1 CASSETTE HOLDER

The cassette holder is hinged on the deck plate. When opened approximately 30^{o}, the holder is stopped by a detent in the ideal position for cassette loading or unloading. The detent, when depressed by the operator, releases the holder to open approximately 90°. This allows access to the tape head and tape guide, for cleaning.

A spring-operated catch provides a positive closing force for cassette positioning. When the tape head slide plate (see paragraph 3.2) is lowered to engage the tape head for reading or writing, a pin on the slide plate enters a hole in the cassette holder, locking the holder in the closed position.

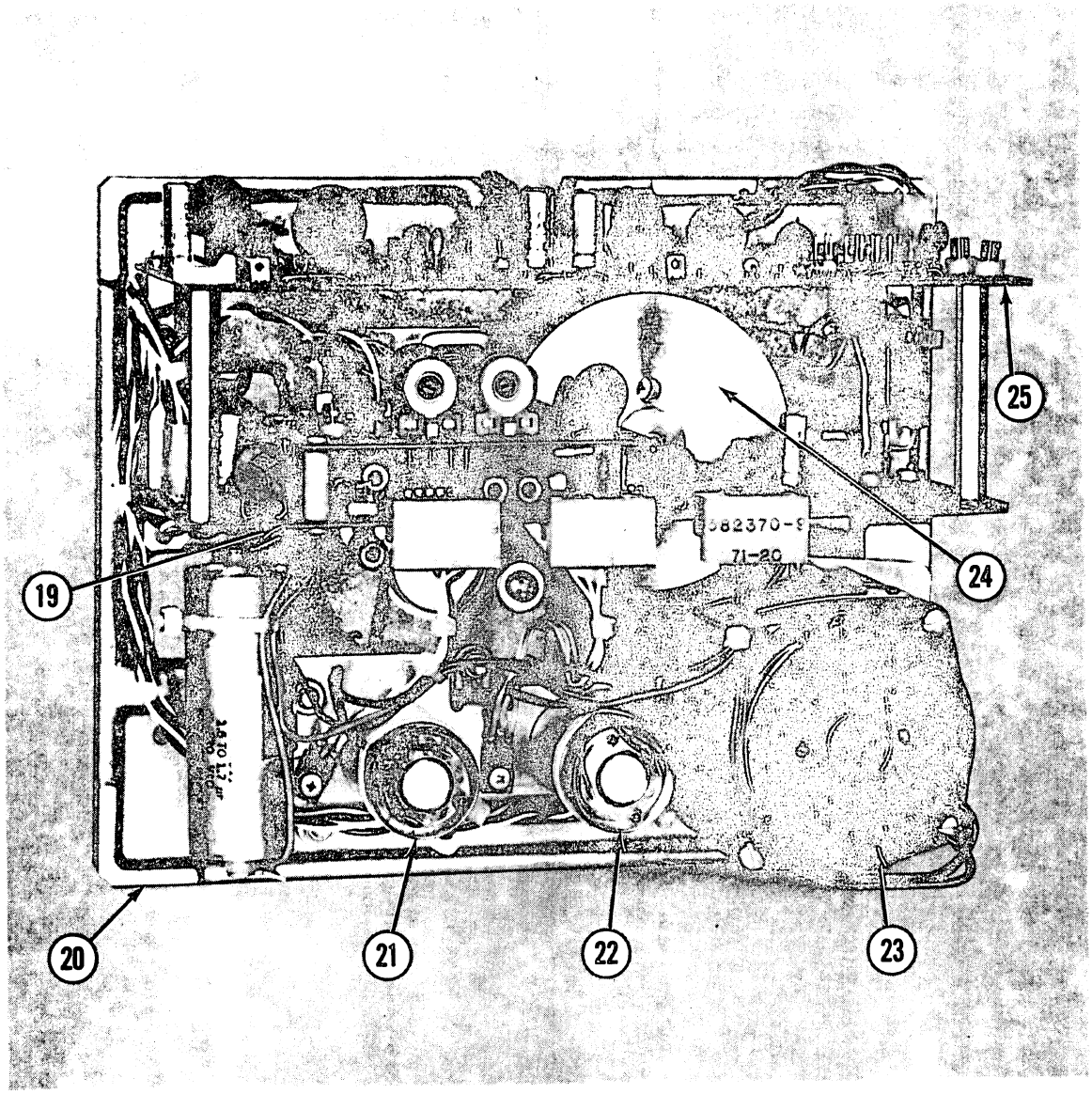
3.2 TAPE HEAD SLIDE PLATE ASSEMBLY

The tape head slide plate serves to move the attached tape head and tape guide to an engaged (low) position or a disengaged (high) position. The assembly slides vertically, with downward motion provided by energizing of a solenoid and upward motion provided by a return spring.



1. PINCH ROLLER SOLENOID
2. MAGNETIC TAPE HEAD
3. PINCH ROLLER ASSEMBLY
4. CAPSTAN
5. POWER SWITCH/INDICATOR (OPTIONAL)
6. TRACK PROTECT SWITCH (TRACK A)
7. CASSETTE HOLDER
8. TRACK PROTECT SWITCH (TRACK B)
9. TURNS COUNT LIGHT SOURCE
10. CASSETTE HOLDER DETENT
11. REEL DRIVE SPINDLES (2)
12. MOTION SWITCH/INDICATOR (OPTIONAL)
13. BOT/EOT SENSE LAMP IN GUIDE POST
14. CASSETTE-IN-PLACE PLUNGER
15. BOT/EOT SENSOR
16. TAPE GUIDE ASSEMBLY
17. TAPE HEAD SLIDE PLATE SOLENOID
18. TAPE HEAD SLIDE PLATE ASSEMBLY

FIGURE 3-1 FRONT VIEW OF TT120 WITH READ/WRITE ASSEMBLY



19. MOTOR CONTROL ASSEMBLY
20. DECK PLATE
21. SUPPLY REEL DRIVE MOTOR
22. TAKE-UP REEL DRIVE MOTOR
23. CAPSTAN MOTOR
24. CAPSTAN AND FLYWHEEL ASSEMBLY
25. READ/WRITE ASSEMBLY

FIGURE 3-2 REAR VIEW OF TT120 WITH READ/WRITE ASSEMBLY

3.2.1 Pinch Roller Assembly

The neoprene rubber pinch roller (shown in Figure 3-1) has two bearings and is free wheeling within its supporting arm. The arm pivots on a stud projecting from the slide plate. This arrangement allows downward pinch roller movement and engagement with the capstan when the pinch roller solenoid is energized.

3.2.2 Magnetic Tape Heads

Two standard head configurations are available. One configuration has two 0.060-inch tracks. The other has one 0.040-inch track and one 0.080-inch track.

3.2.2.1 Tape Head 60-60

Mode	Two-track read or write operation
Packing Density	2000 frpi max, 400 frpi min
Track Widths	Both tracks 0.060 inches nominal
Track Spacing	0.020 inches nominal between tracks
Write Current	3.6 ma peak max through half of head for 150% saturation
Read Voltage across each whole track at:	
400 frpi, 5 ips, 120% recording	
Either Track	4.5 mv p-p min to 10.0 p-p max, with 5.6 K resistive load
2000 frpi, 5 ips, 120% recording	
Either Track	No more than 3 db below the outputs at 400 frpi, as measured above, with same load
Inductance (measured at 1 kHz with 0.5 ma rms test current	
Either Track	75 mh nominal

Crosstalk	20 db below nominal output during playback
Winding Configuration	Two-coil, three-lead, center tapped construction per track.

3.2.2.2 Tape Head 80-40

Mode	Two-track read or write operation
Packing Density	2000 frpi max, 400 frpi min
Track Widths	
Track B (Data)	0.080 inches nominal
Track A (Address)	0.040 inches nominal
Track Spacing	0.020 inches nominal between tracks
Write Current	3.6 ma ± 20% peak max through half the head for 150% saturation
Read Voltage across each whole track at:	
400 frpi, 5 ips, 120% recording	
Track A	16 mv ± 20% with 15 K resistive load
Track B	Half of track B output ± 25% with 5.6 K resistive load load
2000 frpi, 5 ips, 120% recording	No more than 3 db below the outputs at 400 frpi, as measured above, with same respective loads
Inductance (measured at 1 kHz with 0.5 ma rms test current)	
Track B	130 mh nominal
Track A	65 mh nominal
Crosstalk	20 db below nominal output during playback
Winding Configuration	Two-coil, three-lead, center tapped construction per track

3.2.3 Tape Guide Assembly

The aluminum tape guide face is precision-machined and has a hard coating on its 2-microinch finish. Two ceramic pins which project from slots in the body provide guidance for the tape as it approaches the tape head.

3.3 CAPSTAN DRIVE SYSTEM (60HZ AND 50HZ)

The synchronous capstan drive motor provides uni-directional rotation of the flywheel and capstan. The flywheel and capstan are belt driven by the motor. 50 Hz operation is obtained by substitution of a larger diameter capstan drive pulley.

3.3.1 Capstan Motor

The capstan motor is a capacitor-type, synchronous continuous-duty motor. It is totally enclosed and has grease-lubricated ball bearings. Expected life is 10,000 hours running time with 3000 starts over a five-year period.

3.3.2 Capstan and Flywheel Assembly

The capstan shaft is pressed into a flywheel. The capstan shaft passes through a pair of preloaded radial ball bearings which minimize friction.

3.4 REEL DRIVE SYSTEM

Two identical DC motors are employed: one to drive the right hand reel of the cassette, the other to drive the left hand reel. Belts are employed in each case to link the drive spindles and motor pulley wheels. The motors provide tape movement at an average speed of 120 ips during high-speed forward and reverse modes. With proper voltage applications, the motors also provide tape tension and braking during tape operations. The shaft encoder on the left hand reel drive shaft has 320 vanes which interrupt the light path between the turns count lamp and photosensor. The transitions may be used to monitor tape movement at both speeds and in both directions.

3.4.1 Reel Drive Motors

The take-up and supply reel drive motors are permanent magnet DC motors designed to eliminate slot-locking.

3.4.2 Operation at Read/Write Speed

While tape is driven by the capstan/pinch roller drive during the read/write operations, the proper tape tension is maintained by applying "torque" current to the left hand motor and applying "drag" current to the right hand motor.

3.4.3 Operation at High Speed

Tape can be moved in either direction at high speed (120 ips, average). In this mode the left hand reel is held at constant speed by servo control.

3.4.4 Dynamic Braking

Tape motion is stopped by motor current control.

3.5 MOTOR CONTROL ASSEMBLY

The motor control assembly is mounted on the transport casting above the three drive motors. The components of the motor control assembly are as follows:

3.5.1 Power Switch/Indicator (optional)

The power switch/indicator is located on the left hand side of the transport as shown in Figure 3-1. Depression of the switch causes the high side of the ac power line to be connected to the capstan motor and to the power connector. The other contact of the switch is used to interrupt the 24 vdc power. The indicator lamp is connected across the switched 24 vdc and is illuminated as long as 24 vdc power is supplied to the board.

3.5.2 Motion Switch/Indicator (optional)

The motion/switch indicator is located on the right hand side of the transport as shown in Figure 3-1. Depression of this switch enables engaging of the Head. Release of the switch retracts the Head and causes a $\overline{\text{CASSETTE READY}}$ at the interface. The indicator lamp is illuminated by a DTL compatible driver.

3.5.3 Reel Motor Drivers

Each reel motor is controlled by a solid state power amplifier whose output stage is mounted in proximity to its respective motor.

3.5.4 Deck Control Logic

The deck control logic accepts as inputs five standard DTL/TTL logic signals called: (1) Run, (2) Engage Capstan, (3) Direction, (4) Indicator, (5) Engage Head. From these are decoded all necessary control functions.

3.6 SENSORS

Two photo-electric sensors are used in the transport: one to detect clear tape leader and trailer, and one to detect turns count transitions of the shaft encoder.

3.6.1 BOT/EOT (Beginning-of-Tape/End-of-Tape) Sensor

Light from the BOT/EOT light source can pass through transparent tape leader and trailer sections, but not through oxide-coated tape. The beginning of tape and end of tape are sensed as light strikes the photosensor from the light source located in the right cassette locator post, which is beneath the tape.

3.6.2 TURNS COUNT (TC) Sensor

The Turns Count signal is initiated by transitions between light from the TC light source and darkness caused by TC shaft encoder vanes interrupting the light path between the lamp and the related photosensor. The 320-vane shaft encoder is attached to the left hand reel drive pulley.

3.7 CASSETTE-IN-PLACE SWITCH

The cassette-in-place switch is a miniature switch which senses a cassette in operating position. A spring-loaded plunger in the deck plate is depressed by the cassette as the holder is closed, actuating the switch.

3.8 TRACK PROTECT SWITCHES

The two track protect switches are miniature switches which sense the presence of a tab or plug in the related track protect openings in the cassette. As the

cassette is lowered into the holder, the switches are actuated by presence of a tab or plug.

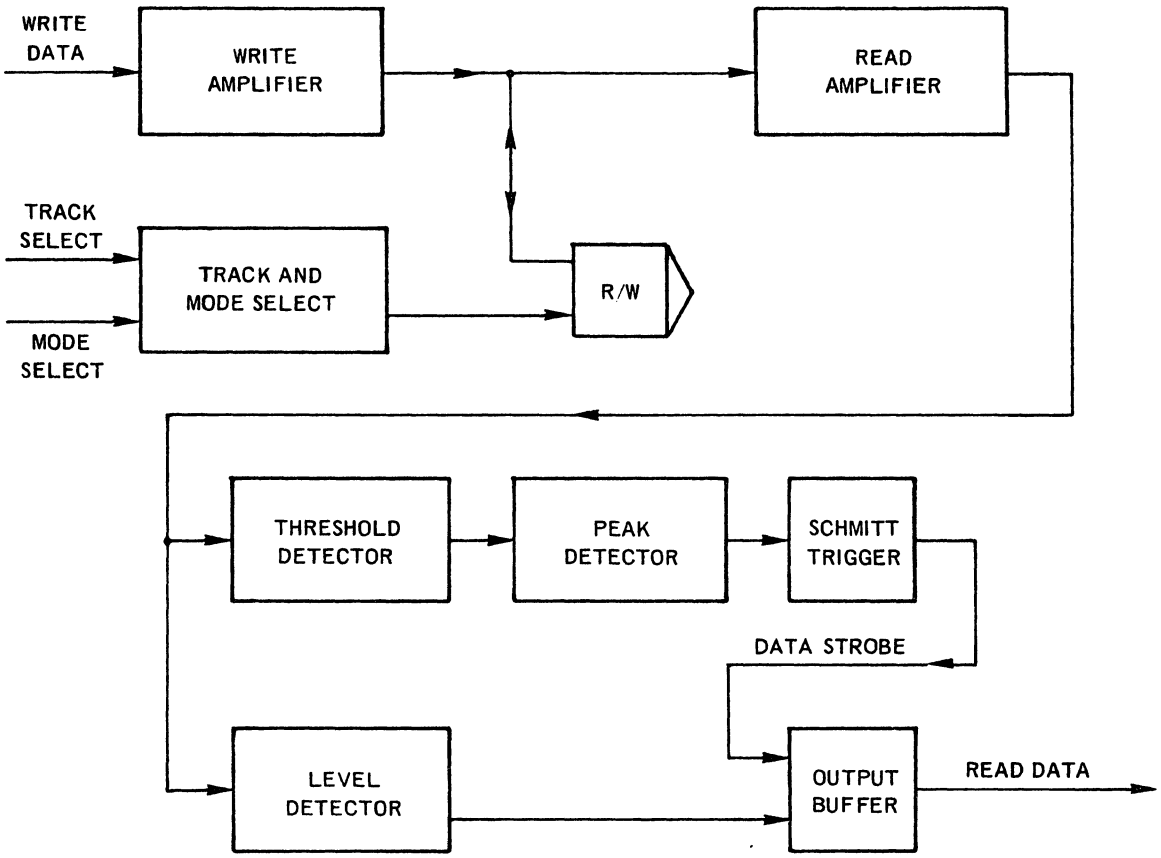


FIGURE 3-3 READ/WRITE ASSEMBLY, BLOCK DIAGRAM

3.9 READ/WRITE ASSEMBLY

The read/write assembly is capable of operation in either of two modes: write or read. In the write mode, the assembly converts digital logic levels to currents which, when connected to the magnetic tape head, will produce flux patterns representative of the input data. In the read mode, the assembly converts the low-level output voltage of the magnetic tape head to a digital logic level whose transitions are reflections of the flux transitions produced. The assembly also contains provisions for selecting either one of two data tracks for the read or write operation. A block diagram of the read/write assembly appears in Figure 3-3.

3.9.1 Functional Description

The track and mode select circuit selects one (and only one) of the two tracks and determines whether data will be written on, or read from that track. If the write operation has been chosen, then the write data at the input of the write amplifier will be converted to a push-pull current in the appropriate track of the magnetic tape head. If the read operation has been chosen, then the output signal of the selected track of the tape head will be transmitted to the read amplifier. This amplifier will then amplify and band limit the signal. It should be noted that during the write operation, extraneous signals may be processed by the read circuitry due to its high gain characteristics.

The output of the read amplifier is passed on to the threshold detector where it is rectified, amplified, and the signal components below a pre-set level are removed. The latter operation removes noise at zero crossings while preserving the signal peaks. This signal is then presented to the peak detector, which produces a pulse for each signal peak. Each pulse corresponds to a flux reversal. The pulses are then shaped and passed on to the output buffer where they are used to strobe the data.

In addition to knowing the point at which a transition occurs, the sense or level of the data must also be determined. This is accomplished by taking a sample of the output of the read amplifier and converting it to a two-level signal in the level detector. This signal is then gated at data transitions in the output buffer and stored until the next transition occurs. This stored signal is the desired read data.

3.9.2 Operational Characteristics

3.9.2.1 Operating Frequency Range

The operating frequency range at 5 ips is 400 frpi to 2000 frpi.

3.9.2.2 Track Select Circuit Settling Time

Settling time of the track select circuit is 8 ms, maximum.

3.9.2.3 Adjustments

Multiturn potentiometers are provided to accommodate a wide range of transducer outputs and to compensate for the different output levels of the two tracks.

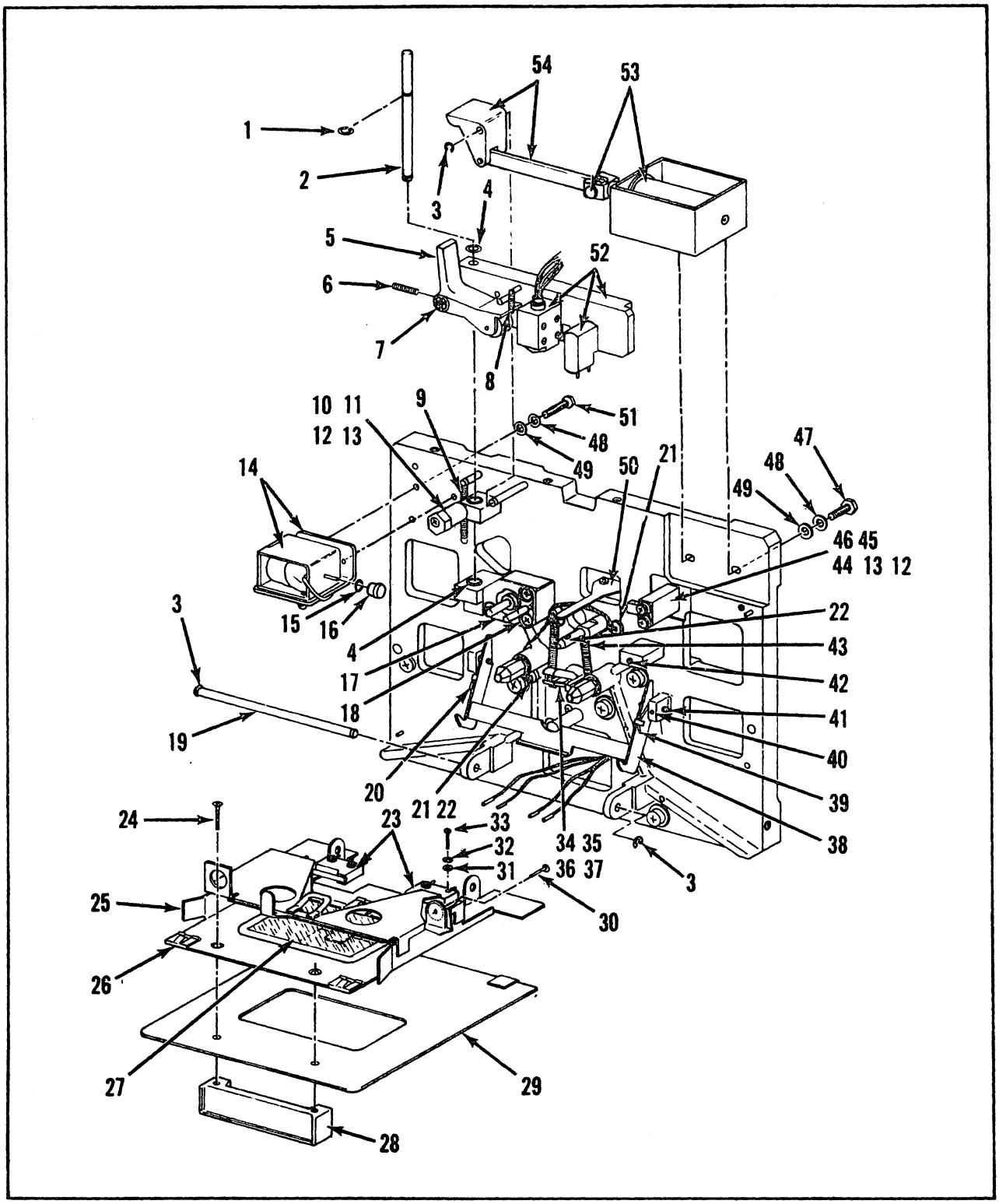


FIGURE 3-4 EXPLODED FRONT VIEW OF TT120 TRANSPORT

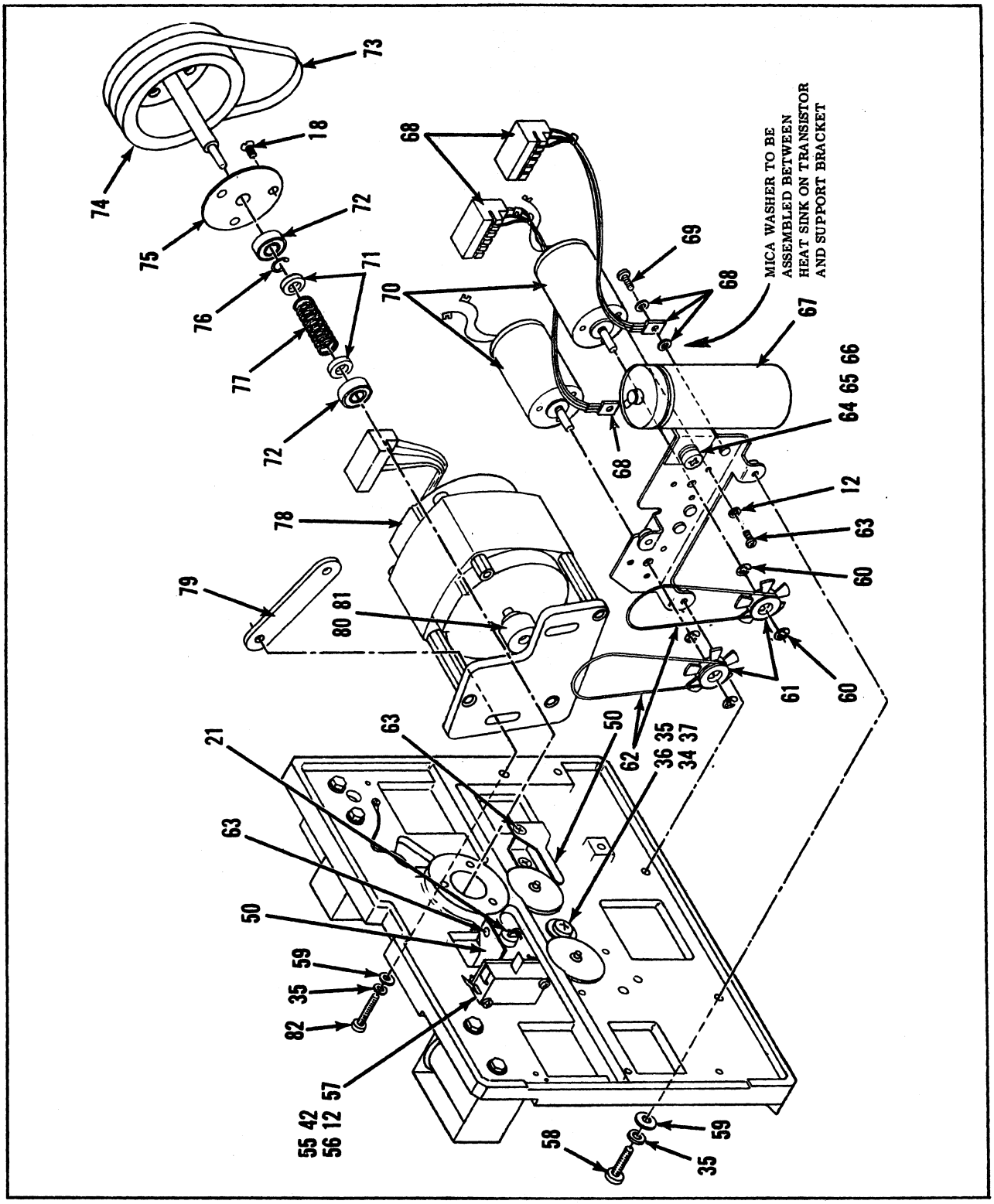


FIGURE 3-5 EXPLODED REAR VIEW OF TT120 TRANSPORT

3.16 PARTS LIST - TT120 TRANSPORT (FRONT & REAR VIEWS)

REF. NO.	SYKES NO.	DESCRIPTION
1	500H60106	RETAINING RING
2	1020B0035	SLIDE SHAFT
3	500H60103	RETAINING RING
4	1001A0072	RUBBER WASHER
5	1020A0014	PINCH ROLLER-ARM ASSEMBLY
6	100H26100	NYLON SET SCREW, 6-32 x 1/4 WITH COMBINATION SOCKET AND SLOTTED END
7	500H70113	CIRCULAR PUSH-ON RING
8	1020B0033	EXTENSION SPRING-ARM
9	800S01002	EXTENSION SPRING
10	1020B0052	SOLENOID STOP
11	100H01412	PHILLIPS PAN HD. SCREW, 4-40 x 3/4
12	200H02401	LOCK WASHER NO. 4
13	200H10401	PLAIN WASHER NO. 4
14	1020A0027	PINCH ROLLER SOLENOID ASSEMBLY - COMPLETE WITH "O" RING AND PLUNGER TIP
15	200S01004	"O"-RING
16	1020B0039	PLUNGER TIP
17	1001A0067	FRONT RETAINING PLATE FOR CAPSTAN BEARINGS
18	100H05404	PHILLIPS FLAT HD SCREW 4-40 x 1/4
19	1001A0050	DOOR PIVOT POST
20	800S03014	TORSION SPRING (WOUND RIGHT)
21	1001A0125	LAMP PLUG
22	1001A0146	LAMP ASSEMBLY, +5v
23	101S01001	SUBMINIATURE SWITCH (2 USED)
24	100H07405	PHILLIPS FLAT HD SELF TAP SCREW 4-40 x 5/16
25	1001A0381	CASSETTE HOLDER ASSEMBLY WELDMENT
26	100H70001	SPEED CLIP
27	1001A0058	WINDOW
28	1001A0044	HANDLE
29	1001A0057	DOOR
30	100H51210	TUBULAR RIVET (PLUNGER)
31	200H10201	PLAIN WASHER NO. 2
32	200H02201	LOCK WASHER NO. 2
33	100H01207	PHILLIPS PAN HD SCREW 2-56 x 7/16
34	200H10802	PLAIN WASHER NO. 8
35	200H02801	LOCK WASHER NO. 8
36	100H01806	PHILLIPS PAN HD SCREW 8-32 x 3/8
37	1001A0341	CATCH ASSEMBLY
38	1001A0120	DOOR DETENT
39	800S03013	TORSION SPRING (WOUND LEFT)
40	100H25402	CUP POINT SET SCREW 4-40 x 1/8
41	200H31416	DOWEL PIN
42	1001A0126	PLUNGER, SWITCH ACTUATING
43	800S01139	EXTENSION SPRING
44	1001B0900	SLIDE GUIDE SPACER
45	100H01414	PHILLIPS PAN HD SCREW 4-40 x 7/8
46	1001A0110	SLIDE PLATE GUIDE
47	100H03604	HEX HD CAP SCREW 6-32 x 1/4
48	200H02601	LOCK WASHER NO. 6
49	200H10601	PLAIN WASHER NO. 6
50	1001A0131	PHOTO DETECTOR BOARD
51	100H03608	HEX HD CAP SCREW, 6-32 x 1/2
52	1020A0008	SLIDE PLATE ASSEMBLY COMPLETE WITH 80-40 HEAD, GUIDE, PINCH ROLLER ARM ASSEMBLY, SPRINGS AND GROUND WIRE
52	1020A0009	SLIDE PLATE ASSEMBLY COMPLETE WITH 60-60 HEAD, GUIDE, PINCH ROLLER ARM ASSEMBLY, SPRINGS AND GROUND WIRE
53	1001A0481	SLIDE PLATE SOLENOID ASSEMBLY COMPLETE WITH CONNECTION PIN
54	1001A0561	SLIDE PLATE CAM AND LINKAGE ARM ASSEMBLY
55	102S01001	SWITCH, CASSETTE IN POSITION
56	100H01410	PHILLIPS PAN HD SCREW 4-40 x 5/8
57	500H51401	HEX NUT 4-40
58	100H01810	PHILLIPS PAN HD SCREW 8-32 x 5/8
59	200H10801	PLAIN WASHER NO. 8
60	500H60004	RETAINING RING, GRIPPING, .120" FREE DIA x .025" THICK
61	1001A0142	PULLEY (DRIVE MOTORS)
62	101B02006	"O" RING BELT
63	100H01404	PHILLIPS PAN HD SCREW 4-40 x 1/4
64	100H01155	PHILLIPS PAN HD SCREW 10-32 x 5/16
65	200H02101	LOCKWASHER NO. 10
66	200H10101	PLAIN WASHER NO. 10
67	1001A0091	CAPSTAN MOTOR CAPACITOR ASSEMBLY

3.16 PARTS LIST - TT120 TRANSPORT (FRONT & REAR VIEWS)

REF. NO.	SYKES NO.	DESCRIPTION
68	1020A0021	POWER TRANSISTOR, NPN-2NS190, ASSEMBLED WITH WIRES AND CONNECTOR. MICA WASHER AND LOCKWASHER INCLUDED.
69	1001H01405	PHILLIPS PAN HD SCREW 4-40 x 5/16
70	1020A0020	DRIVE MOTOR ASSEMBLY, D.C.
71	1001A0129	CAPSTAN SHAFT SPACER
72	100B03001	RADIAL BEARING
73	101B01001	FLAT BELT, CAPSTAN DRIVE
74	1001A0241	CAPSTAN FLYWHEEL AND SHAFT ASSEMBLY
75	1001A0066	REAR RETAINING PLATE
76	500H61106	CRESCENT RETAINING RING
77	800S02028	COMPRESSION SPRING
78	1020A0011	5 IPS, 60 HZ CAPSTAN MOTOR ASSEMBLY (OPTIONAL). COMPLETE WITH BELT, PULLEY, AND MOUNTING PLATE
78	1020A0012	5 IPS, 50 HZ CAPSTAN MOTOR ASSEMBLY (OPTIONAL). COMPLETE WITH BELT, PULLEY, AND MOUNTING PLATE
78	1020A0047	12 IPS, 60 HZ CAPSTAN MOTOR ASSEMBLY (OPTIONAL). COMPLETE WITH BELT, PULLEY, AND MOUNTING PLATE
78	1020A0048	12 IPS, 50 HZ CAPSTAN MOTOR ASSEMBLY (OPTIONAL). COMPLETE WITH BELT, PULLEY, AND MOUNTING PLATE
79	1020A0046	NUT PLATE
80	1001A0035	5 IPS, 60 HZ CAPSTAN MOTOR PULLEY
80	1001A1712	5 IPS, 50 HZ CAPSTAN MOTOR PULLEY
80	1020B0049	12 IPS, 60 HZ CAPSTAN MOTOR PULLEY
80	1020B0051	12 IPS, 50 HZ CAPSTAN MOTOR PULLEY
81	100H24402	SPLINE SOCKET HD SCREW 4-40 x 1/8
82	100H01814	PHILLIPS PAN HD SCREW 8-32 x 7/8

3.17 PARTS LIST - MOTOR CONTROL ASSEMBLY

REF SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
1	TELEPHONE LAMP, 24V, 20MA	100D01003	NPC ELECTRONICS	.90100.013
2	CAP-LENS, "MOTION"	500D01003		
3	CAP-LENS, "POWER"	500D01002		
C1, 3	CAPACITOR, ELECTROLYTIC, 22uF, +100% -10%, 35V	100C03160	TEMPLE	TYPE 411
C2, 4, 6	CAPACITOR, DISC, .022uF, ±20%, 50V	120C03042	CENTRALAB	TYPE UK
C5	CAPACITOR, ELECTROLYTIC, 22uF, ±20%, 25V	105C04027	SPRAGUE	TYPE 196D
C7	CAPACITOR, DISC, .05uF, ±20%, 50V	120C03045	CENTRALAB	TYPE UK
C8	CAPACITOR, ELECTROLYTIC, 50uF, +100%, -10%, 35V	100C03165	TEMPLE	TYPE 411
C9, 10	CAPACITOR, DISC, .01uF, ±20%, 50V	120C03040	CENTRALAB	TYPE UK
CR1	DIODE, ZENER, 4.7V, 1W	200C04104	MOTOROLA	IN4732
CR2-6, 9, 11, 15, 17-21	DIODE, HIGH SPEED SWITCHING	200C01001	GENERAL ELECTRIC	IN4154
CR7, 8, 12, 13, 14, 16, 22	RECTIFIER, 750MA MOLDED SILICON	200C02001	INTERNATIONAL RECT.	IN2070
Q1	TRANSISTOR, PNPN, UNIJUNCTION	203Q01001	G.E. SEMICONDUCTOR	D13T2
Q2, 3, 5, 6, 7, 9, 10	TRANSISTOR, NPN ANNULAR	202Q01001	MOTOROLA	MPS6531
Q4	TRANSISTOR, PNP, POWER	201Q01003	MOTOROLA	2N5193
Q8, 11	TRANSISTOR, NPN, POWER	202Q01003	MOTOROLA	2N5190
R1	RESISTOR, POWER, WIRE WOUND, 2W, ±5%, 250 OHM	102R03059	SPRAGUE	TYPE 448E
R2	RESISTOR, CARBON COMP., 1/4W, ±5%, 560 OHM	100R02067		
R3	RESISTOR, WIRE WOUND, 5-1/4W, ±5%, 150 OHM	102R06258		
R6, 19, 30, 32	RESISTOR, CARBON COMP., 1/4W, ±5%, 4.7K	100R02089		
R4	RESISTOR, CARBON COMP., 1/4W, ±5%, 6.8K	100R02093		
R5	RESISTOR, CARBON COMP., 1/4W, ±5%, 5.6K	100R02091		
R7	RESISTOR, CARBON COMP., 1/4W, ±5%, 3.9K	100R02087		
R8, 12, 13, 17, 24, 29, 32	RESISTOR, CARBON COMP., 1/4W, ±5%, 10K	100R02097		
R9	RESISTOR, CARBON COMP., 1/4W, ±5%, 15K	100R02101		
R10	RESISTOR, CARBON COMP., 1/4W, ±5%, 22K	100R02105		
R11, 31	RESISTOR, CARBON COMP., 1/4W, ±5%, 2K	100R02080		

3.17 PARTS LIST - MOTOR CONTROL ASSEMBLY

REF. SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
R14	RESISTOR, CARBON COMP., 1/2W, ±5%, 1K	100R03073		
R15	RESISTOR, CARBON COMP., 1/2W, ±5%, 22 OHM	100R03033		
R16, 23	RESISTOR, CARBON COMP., 1/4W, ±5%, 1.2K	100R02075		
R18, 25	RESISTOR, CARBON COMP., 1/4W, ±5%, 680 OHM	100R02069		
R20, 22	RESISTOR, WIRE WOUND, 5-1/4W, ±5%, 750 OHM	102R06282		
R21	RESISTOR, WIRE WOUND, 5W, ±5%, 40 OHM	102R06243		
R26	RESISTOR, WIRE WOUND, 5W, ±5%, 300 OHM	102R06266		
R27	RESISTOR, CARBON COMP., 1/4W, ±5%, 75 OHM	100R02046		
R28	RESISTOR, CARBON COMP., 1/2W, ±5%, 1.8K	100R03079		
R34	RESISTOR, WIRE WOUND, 5W, ±5%, 30 OHM	102R06238		
SDS1, SDS2	SWITCH, ILLUMINATED PUSH BUTTON	100S01002		
U1, 3	INTEGRATED CIRCUIT, DTuL HEX INVERTER	100U14004	FAIRCHILD SEMICONDUCTOR	U6A993659X
U2, 4	INTEGRATED CIRCUIT, DTuL QUAD 2 INPUT NAND GATE	100U14003	FAIRCHILD SEMICONDUCTOR	U6A994659X

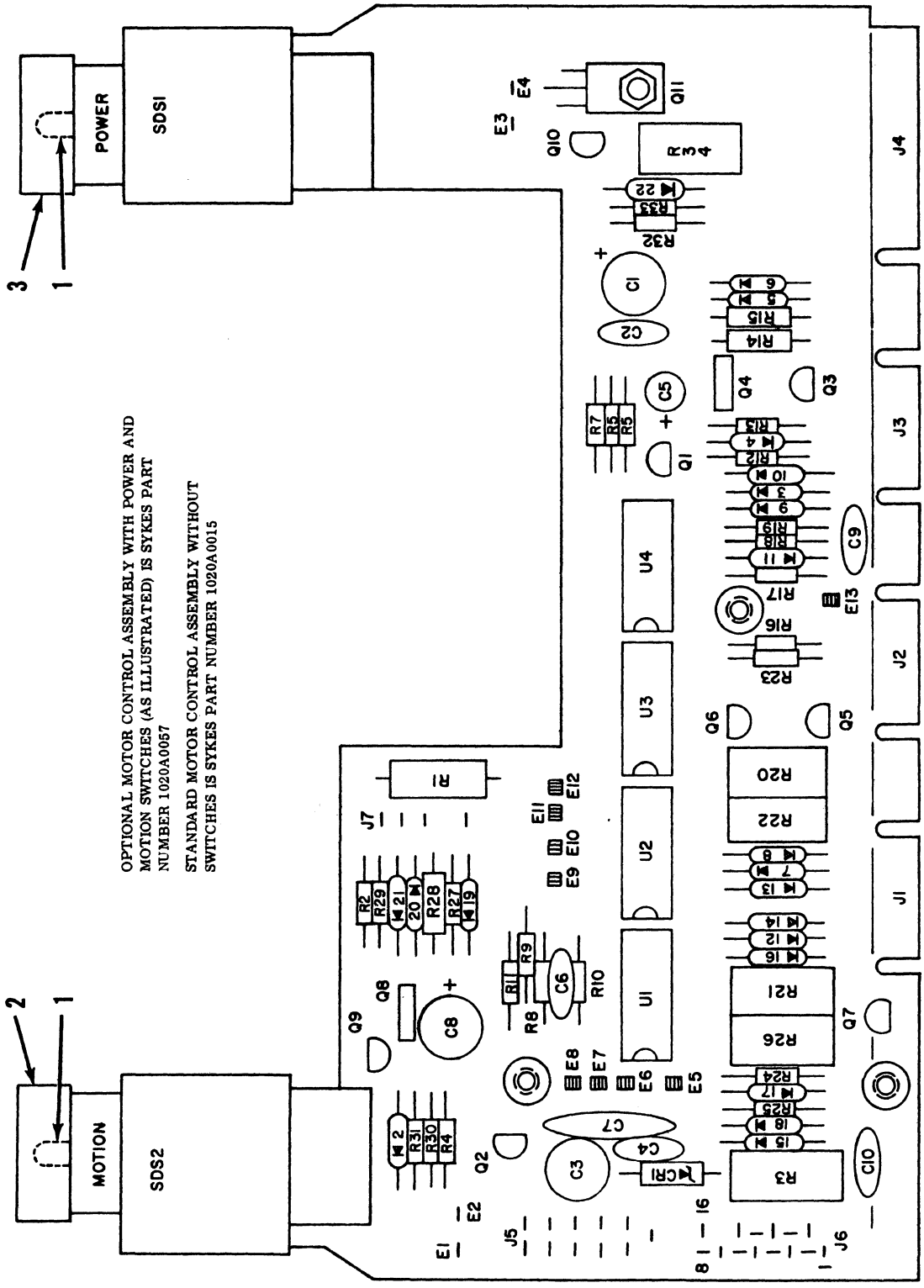


FIGURE 3-6 MOTOR CONTROL ASSEMBLY

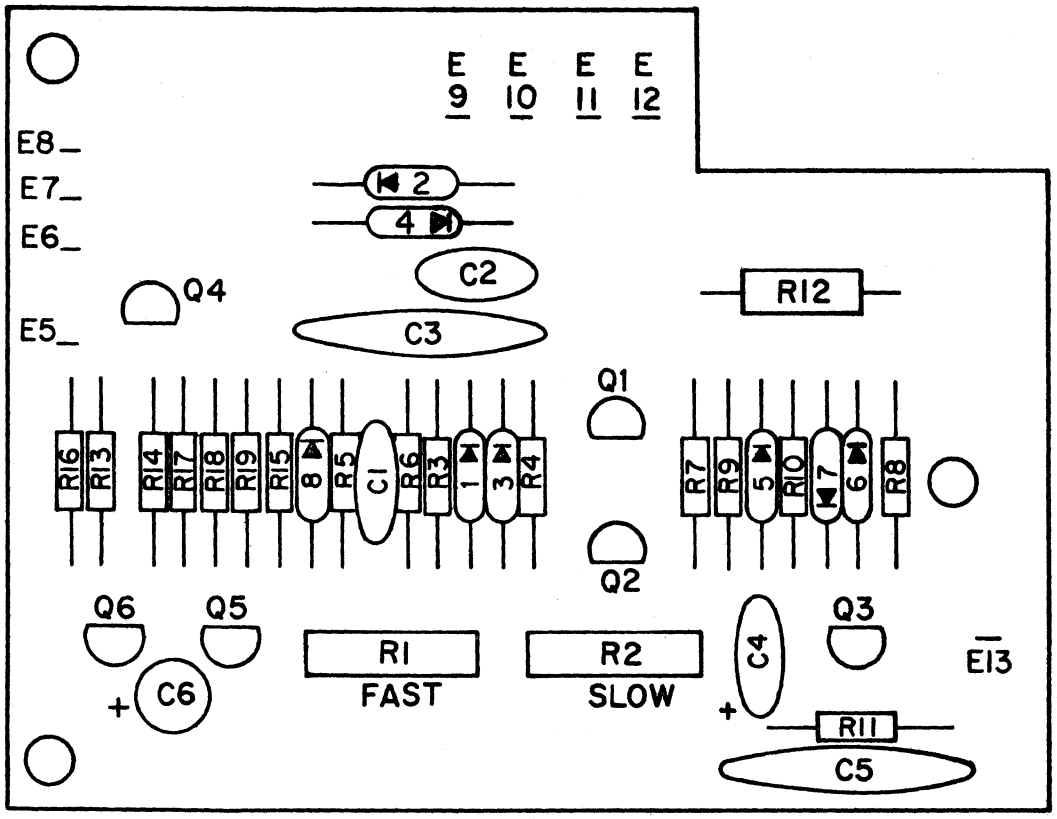


FIGURE 3-7 T. A. AND REEL SERVO CONTROL ASSEMBLY - PART NO. 1020A0043

3.18 PARTS LIST - T. A. AND REEL SERVO CONTROL ASSEMBLY

REF SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
C1	CAPACITOR, DISC, .01uF, ±20%, 50V	120C03040	CENTRALAB	TYPE UK
C2	CAPACITOR, DISC, .1uF, +80 -20%, 10V	120C03011	CENTRALAB	TYPE UK
C3	CAPACITOR, DISC, .05uF, ±20%, 50V	120C03045	CENTRALAB	TYPE UK
C4	CAPACITOR, ELECTROLYTIC, 22uF, ±20%, 25V	105C04027	SPRAGUE	TYPE 196D
C5	CAPACITOR, DISC, 1uF, GMV, 3V	120C03004	CENTRALAB	TYPE UK
C6	CAPACITOR, ELECTROLYTIC, 1.0uF, ±10%, 50V	105C04062		
CR1-8	DIODE, HIGH SPEED SWITCHING	200C01001	GENERAL ELECTRIC	IN4154
Q1	TRANSISTOR, PNPN, UNIJUNCTION	203Q01001	G.E.SEMICONDUCTOR	D13T2
Q2, 3, 4	TRANSISTOR, NPN, ANNULAR	202Q01001	MOTOROLA	MPS6531
Q5, 6	TRANSISTOR, PNP, ANNULAR	201Q01001	MOTOROLA	MPS6534
R1	POTENTIOMETER, CARBON, 1/4W, ±30%, 500 OHM	110R04004	MALLORY	TYPE MTC-1
R2	POTENTIOMETER, CARBON, 1/4W, ±30%, 5K	110R04010	MALLORY	TYPE MTC-1
R3	RESISTOR, CARBON COMP., 1/4W, ±5%, 560 OHM	100R0267		
R4	RESISTOR, CARBON COMP., 1/4W, ±5%, 4.7K	100R02089		
R5, 6, 16, 19	RESISTOR, CARBON COMP., 1/4W, ±5%, 10K	100R02097		
R7, 9, 10, 11	RESISTOR, CARBON COMP., 1/4W, ±5%, 1K	100R02073		
R8	RESISTOR, CARBON COMP., 1/4W, ±5%, 680 OHM	100R02069		
R12	RESISTOR, CARBON COMP., 1/2W, ±5%, 1K	100R03073		
R13, 15	RESISTOR, CARBON COMP., 1/4W, ±5%, 3.9K	100R02087		
R14	RESISTOR, CARBON COMP., 1/4W, ±5%, 1M	100R02145		
R17, 18	RESISTOR, CARBON COMP., 1/4W, ±5%, 22K	100R02105		

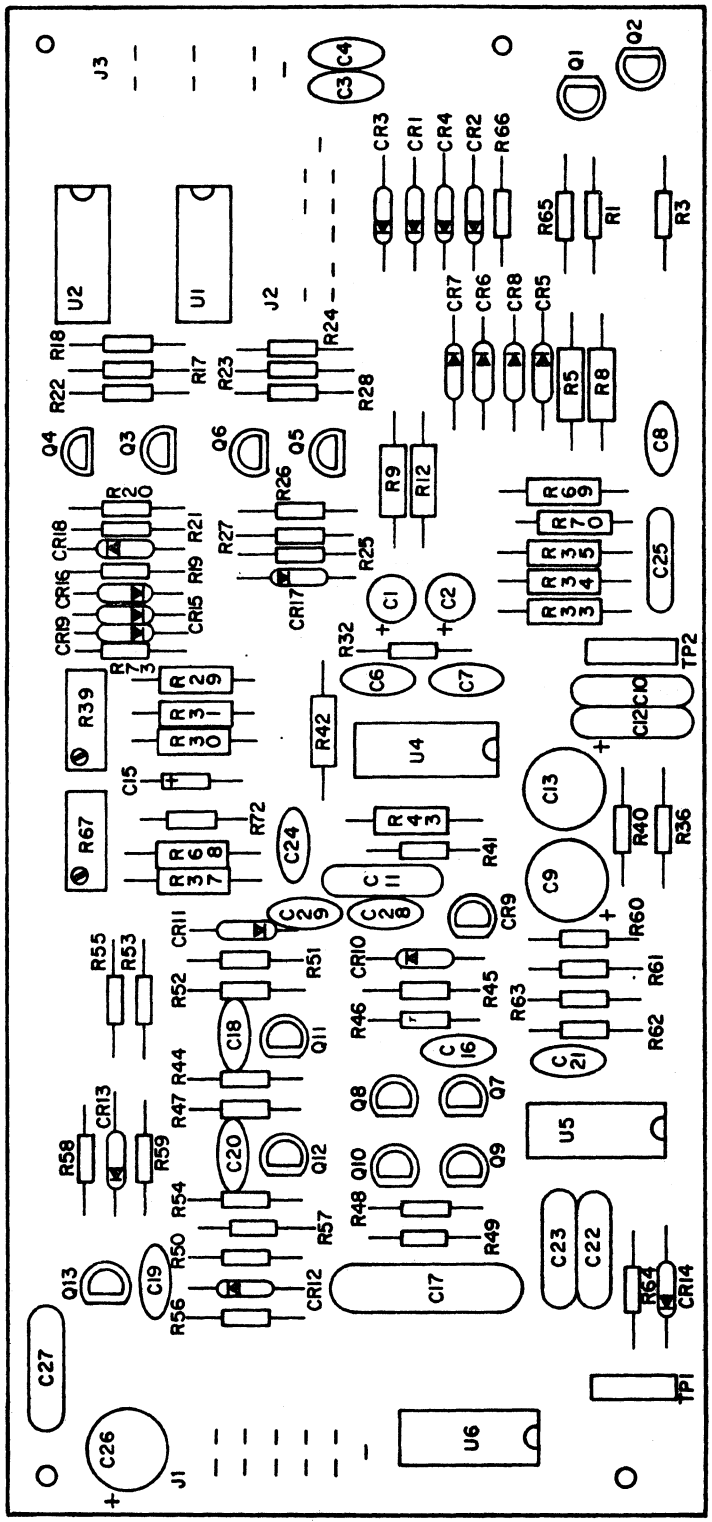


FIGURE 3-8 5 IPS READ/WRITE ASSEMBLY

3.19 PARTS LIST - 5 IPS READ/WRITE ASSEMBLY

REF SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
C1, 2	CAPACITOR, TANTALUM, 1uF, ±10%, 50V	105C04062	SPRAGUE	TYPE 196D
C9, 13, 26	CAPACITOR, ELECTROLYTIC, 22uF, +100%, -10%, 35V	100C03160	TEMPLE	TYPE 411
C3,4	CAPACITOR, DISC, L.V., .01uF, ±20%, 50V	120C03040	CENTRALAB	TYPE UK
C6,7	CAPACITOR, DISC, 300PF, ±10%, 1KV	120C01037	CENTRALAB	TYPE DD
C8,24	CAPACITOR, DISC, .022uF, 50V	120C03042	CENTRALAB	TYPE UK
C10, 11, 12, 22, 23, 27	CAPACITOR, DISC, L.V., .1uF, ±20%, 25V	120C03035	CENTRALAB	TYPE UK
C15	CAPACITOR, ELECTROLYTIC, 1uF, ±10%, 6V	105C02029	SPRAGUE	150D
C16	CAPACITOR, DISC, 220PF, ±10%, 1KV	120C01033	CENTRALAB	TYPE DD
C17	CAPACITOR METALIZED POLYESTER, .47uF, ±20%, 250V	130C01033	AMPEX	C280AE/A470K
C18, 28, 29	CAPACITOR, DISC, .001uF, GMV, 1KV	120C01061	CENTRALAB	TYPE DD
C19, 21	CAPACITOR, DISC, 470PF, GMV, 1KV	120C01044	CENTRALAB	TYPE DD
C20	CAPACITOR, DISC, 100PF, ±10%, 1KV	120C01027	CENTRALAB	TYPE DD
C25	CAPACITOR, DISC, 1.0uF, 3V, NON POLAR	120C03004	CENTRALAB	TYPE UK
CR1-8, CR10-13, CR15-19	DIODE, SILICON SWITCHING	200C01001	GE SEMICONDUCTOR	IN4154
CR9	DIODE, DUAL SILICON	200C01002	MOTOROLA	MSD6102
CR14	DIODE, ZENER, 6V, 500MW	200C04013	INTERNATIONAL RECTIFIER	IN5233
Q1, 2, 9, 11, 12, 13	TRANSISTOR, NPN	202Q01001	MOTOROLA	MPS6531
Q3, 4, 5, 6, 7, 8, 10	TRANSISTOR, PNP	201Q01001	MOTOROLA	MPS6534
R1, 3, 47	RESISTOR, CARBON COMP., 1/4W, ±5%, 3.3K	100R02085		
R5, 8, 68, 69	RESISTOR, METAL FILM, 1/8W, ±1%, 15K	101R01304		
R9, 12, 30, 34	RESISTOR, METAL FILM, 1/8W, ±1%, 10K	101R01287		
R17, 22, 23, 28	RESISTOR, CARBON COMP., 1/4W, ±5%, 39K	100R02111		
R18, 24	RESISTOR, CARBON COMP., 1/4W, ±5%, 15K	100R02101		
R19, 25	RESISTOR, CARBON COMP., 1/4W, ±5%, 8.2K	100R02095		
R20, 26, 46	RESISTOR, CARBON COMP., 1/4W, ±5%, 22K	100R02105		

3.19 PARTS LIST - 5 IPS READ/WRITE ASSEMBLY

REF SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
R21, 27, 45, 56, 62, 63	RESISTOR CARBON COMP., 1/4W, ±5%, 10K	100R02097		
R29, 31, 33, 35, 42, 43	RESISTOR, METAL FILM, 1/8W, ±1%, 110K	101R01385		
R32, 64	RESISTOR, CARBON COMP., 1/4W, ±5%, 470 OHM	100R02065		
R36, 40	RESISTOR, CARBON COMP., 1/4W, ±5%, 22 OHM	100R02033		
R37	RESISTOR, METAL FILM, 1/8W, ±1%, 54.9K	101R01356		
R39, 67	POTENTIOMETER, WIRE WOUND, SQ. CASE, 1W, 5K	110R02026		
R41	RESISTOR, CARBON COMP., 1/4W, ±5%, 33 OHM	100R02037		
R44	RESISTOR, CARBON COMP., 1/4W, ±5%, 75K	100R02118		
R48	RESISTOR, CARBON COMP., 1/4W, ±5%, 2.7K	100R02083		
R49	RESISTOR, CARBON COMP., 1/4W, ±5%, 100 OHM	100R02049		
R50, 59, 70	RESISTOR, CARBON COMP., 1/4W, ±5%, 1K	100R02073		
R51, 57	RESISTOR, CARBON COMP., 1/4W, ±5%, 68K	100R02117		
R52, 54	RESISTOR, CARBON COMP., 1/4W, ±5%, 3.9K	100R02087		
R53	RESISTOR, CARBON COMP., 1/4W, ±5%, 330 OHM	100R02061		
R55, 72	RESISTOR, CARBON COMP., 1/4W, ±5%, 82K	100R02119		
R58	RESISTOR, CARBON COMP., 1/4W, ±5%, 2K	100R02080		
R60, 61	RESISTOR, CARBON COMP., 1/4W, ±5%, 47K	100R02113		
R65, 66	RESISTOR, CARBON COMP., 1/4W, ±5%, 6.8K	100R02093		
R73	RESISTOR, CARBON COMP., 1/4W, ±5%, 220 OHM	100R02057		
TP1, 2	TEST POINT RECEPTACLE, ORANGE	101J01006		
U1	INTEGRATED CIRCUIT, HLL DTuL HIGH VOLTAGE HEX INVERTER	100U14009	FAIRCHILD SEMI-CONDUCTOR	U6A911259X
U2	INTEGRATED CIRCUIT, DTuL HEX INVERTER	100U14004	FAIRCHILD SEMI-CONDUCTOR	U6A993659X
U4	INTEGRATED CIRCUIT, DUAL OPERATIONAL AMPLIFIER	100U14006	FAIRCHILD SEMI-CONDUCTOR	U6A7739393
U5	INTEGRATED CIRCUIT, DIFF-ERENTIAL COMPARATOR	100U14010	TEXAS INSTRUMENTS	SN72710N
U6	INTEGRATED CIRCUIT, DTuL DUAL FLIP-FLOP	100U14005	FAIRCHILD SEMI-CONDUCTOR	U6A909359X

3.20 PARTS LIST - 12 IPS READ/WRITE ASSEMBLY

REF SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
C1, 2	CAPACITOR, TANTALUM, 1uF, ±10%, 50V	105C04062	SPRAGUE	TYPE 196D
C3, 4	CAPACITOR, DISC, L.V., .01uF, ±20%, 50V	120C03040	CENTRALAB	TYPE UK
C6, 7	CAPACITOR, DISC, 300PF, ±10%, 1KV	120C01037	CENTRALAB	TYPE DD
C9, 13, 26	CAPACITOR, ELECTROLYTIC, 22uF, +100%, -10%, 35V	100C03160	TEMPLE	TYPE 411
C10, 11, 12, 22, 23, 27	CAPACITOR, DISC, L.V., .1uF, ±20%, 25V	120C03035	CENTRALAB	TYPE UK
C15	CAPACITOR, ELECTROLYTIC, 1uF, ±10%, 6V	105C02029	SPRAGUE	150D
C16, 20	CAPACITOR, DISC, 100PF, ±10%, 1KV	120C01027	CENTRALAB	TYPE DD
C17	CAPACITOR METALIZED POLYESTER .47uF, ±20%, 250V	130C01033	AMPEX	C280AE/A470K
C18, 19, 21	CAPACITOR, DISC, 470PF, GMV, 1KV	120C01044	CENTRALAB	TYPE DD
C28, 29	CAPACITOR, DISC, .001uF, GMV, 1KV	120C01061	CENTRALAB	TYPE DD
CR1-8, CR10-13, CR15-19	DIODE, SILICON SWITCHING	200C01001	GE SEMICONDUCTOR	IN4154
CR9	DIODE, DUAL SILICON	200C01002	MOTOROLA	MSD6102
CR14	DIODE, ZENER, 6V, 500MW	200C04013	INTERNATIONAL RECTIFIER	IN5233
Q1, 2, 9, 11, 12, 13	TRANSISTOR, NPN	202Q01001	MOTOROLA	MPS6531
Q3-8, 10	TRANSISTOR, PNP	201Q01001	MOTOROLA	MPS 6534
R1, 3, 47	RESISTOR, CARBON COMP., 1/4W, ±5%, 3.3K	100R02085		
R5, 8	RESISTOR, METAL FILM, 1/8W, ±1%, 15K	101R01304		
R9, 12	RESISTOR, METAL FILM, 1/8W, ±1%, 10K	101R01287		
R17, 22, 23, 28	RESISTOR, CARBON COMP., 1/4W, ±5%, 39K	100R02111		
R18, 24	RESISTOR, CARBON COMP., 1/4W, ±5%, 15K	100R02101		
R19, 25	RESISTOR, CARBON COMP., 1/4W, ±5%, 8.2K	100R02095		
R20, 26, 46	RESISTOR, CARBON COMP., 1/4W, ±5%, 22K	100R02105		
R21, 27, 45, 56, 62, 63	RESISTOR, CARBON COMP., 1/4W, ±5%, 10K	100R02097		
R29, 33, 42, 43	RESISTOR, METAL FILM, 1/8W, ±1%, 110K	101R01385		

3.20 PARTS LIST - 12 IPS READ/WRITE ASSEMBLY

REF SYMBOL	DESCRIPTION	SYKES NO.	MANUFACTURER	MANUFACTURER PART NO.
R31, 35	RESISTOR, METAL FILM, 1/8W, ±1%, 90.9K	101R01377		
R32, 64	RESISTOR, CARBON COMP., 1/4W, ±5%, 470 OHM	100R02065		
R36, 40	RESISTOR, CARBON COMP., 1/4W, ±5%, 22 OHM	100R02033		
R37	RESISTOR, METAL FILM, 1/8W, ±1%, 54.9K	101R01356		
R39, 67	POTENTIOMETER, WIRE WOUND SQ. CASE, 1W, 5K	110R02026		
R41	RESISTOR, CARBON COMP., 1/4W, ±5%, 33 OHM	100R02037		
R44	RESISTOR, CARBON COMP., 1/4W, ±5%, 75K	100R02118		
R48	RESISTOR, CARBON COMP., 1/4W, ±5%, 2.7K	100R02083		
R49	RESISTOR, CARBON COMP., 1/4W, ±5%, 100 OHM	100R02049		
R50, 59, 70	RESISTOR, CARBON COMP., 1/4W, ±5%, 1K	100R02073		
R51, 57	RESISTOR, CARBON COMP., 1/4W, ±5%, 68K	100R02117		
R52, 54	RESISTOR, CARBON COMP., 1/4W, ±5%, 3.9K	100R02087		
R53	RESISTOR, CARBON COMP., 1/4W, ±5%, 330 OHM	100R02061		
R55, 72	RESISTOR, CARBON COMP., 1/4W, ±5%, 82K	100R02119		
R58	RESISTOR, CARBON COMP., 1/4W, ±5%, 2K	100R02080		
R60, 61	RESISTOR, CARBON COMP., 1/4W, ±5%, 47K	100R02113		
R65, 66	RESISTOR, CARBON COMP., 1/4W, ±5%, 6.8K	100R02093		
R73	RESISTOR, CARBON COMP., 1/4W, ±5%, 220 OHM	100R02057		
TP1, 2	TEST POINT RECEPTACLE, ORANGE	101J01006		
U1	INTEGRATED CIRCUIT, HLL DTuL HIGH VOLTAGE HEX INVERTER	100U14009	FAIRCHILD SEMICONDUCTOR	U6A911259X
U2	INTEGRATED CIRCUIT, DTuL HEX INVERTER	100U14004	FAIRCHILD SEMICONDUCTOR	U6A993659X
U4	INTEGRATED CIRCUIT, DUAL OPERATIONAL AMPLIFIER	100U14006	FAIRCHILD SEMICONDUCTOR	U6A7739393
U5	INTEGRATED CIRCUIT, DIFFERENTIAL COMPARATOR	100U14010	TEXAS INSTRUMENTS	SN72710N
U6	INTEGRATED CIRCUIT, DTuL DUAL FLIP-FLOP	100U14005	FAIRCHILD SEMICONDUCTOR	U6A909359X

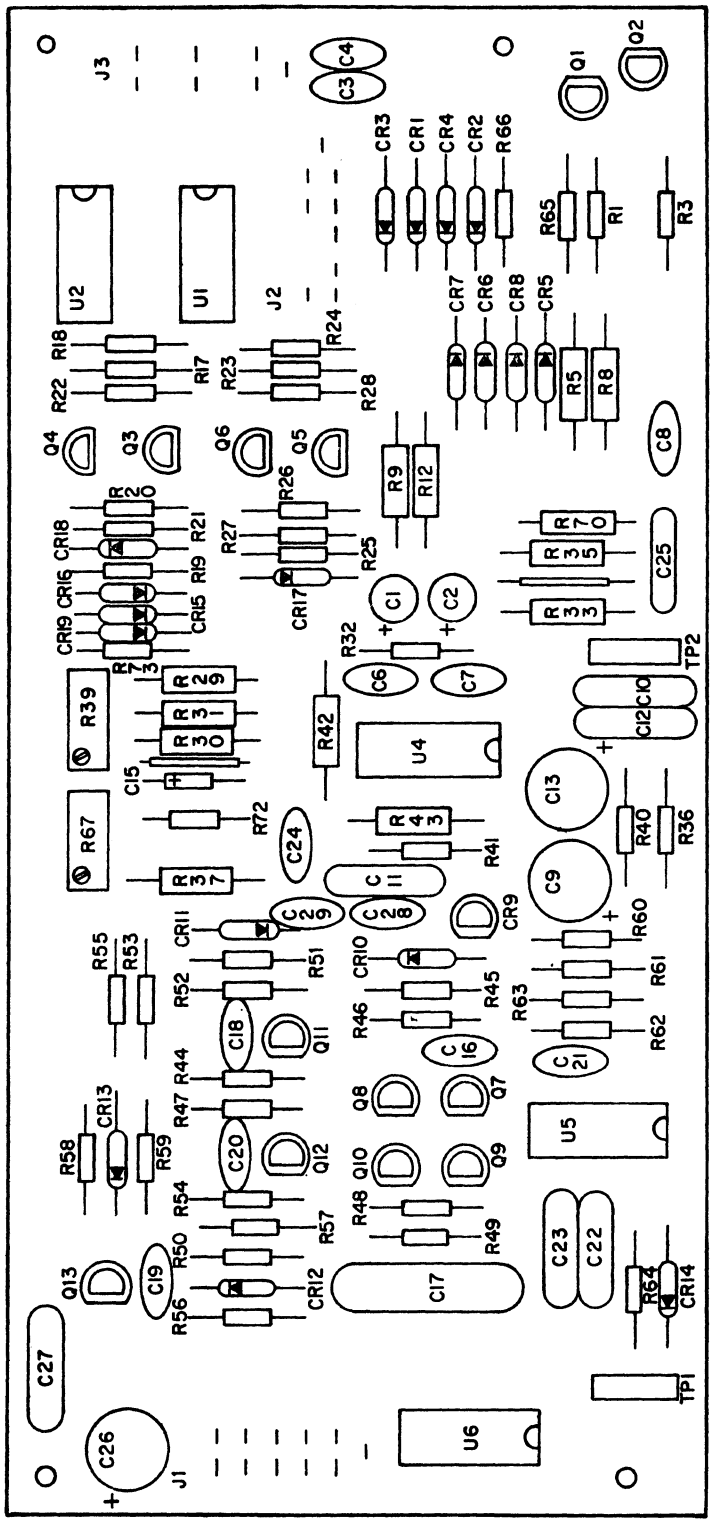


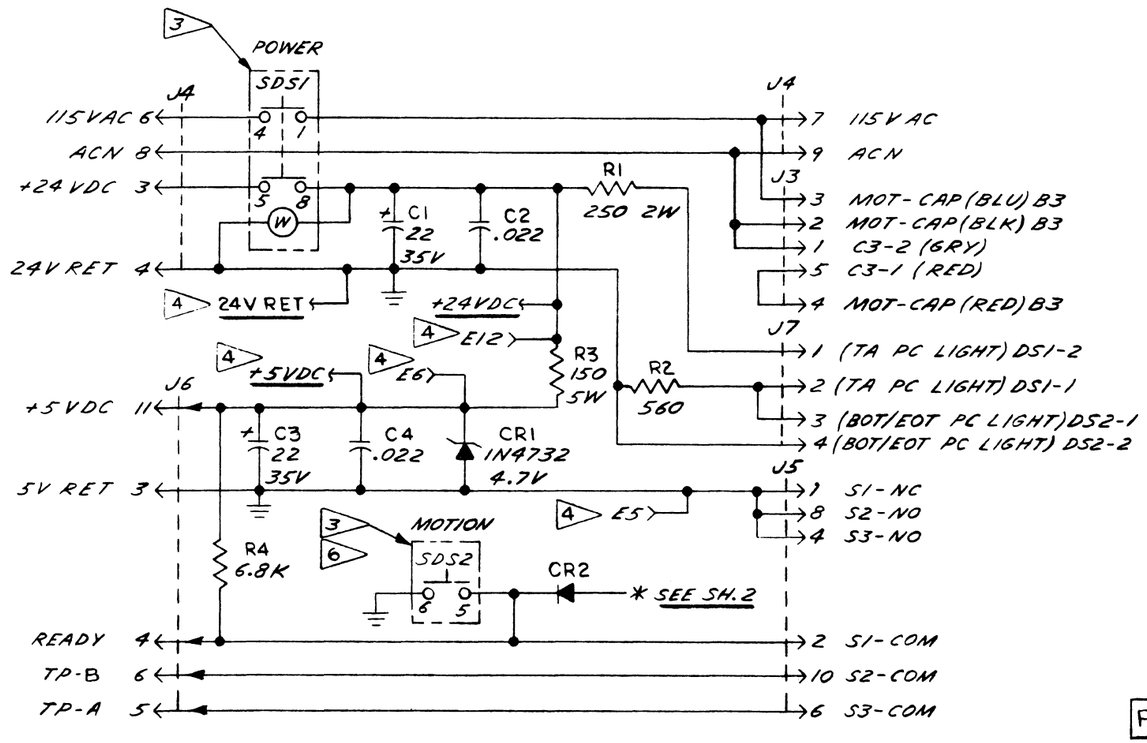
FIGURE 3-9 12 IPS READ/WRITE ASSEMBLY

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS, 1/4 W, 5%
   CAPACITANCE VALUES ARE IN MICROFARADS
   DIODES ARE IN4154
   TRANSISTORS ARE MPS 6531
2. 5V RET. & 24V RET. ARE COMMON
3. POWER & MOTION INDICATOR SWITCHES SDS1 & SDS2 ARE OPTIONAL. WHEN NOT USED JUMPER POSITIONS 4 TO 1 & 5 TO 8 ON THE SDS1 POWER SWITCH AREA.
4. SEE SHEET 2 FOR ADDITIONAL POWER DISTRIBUTION
5. POWER DISTRIBUTION TO INTEGRATED CIRCUITS

COMP	+5VDC	GRD
U1-4	14	7

6. SDS2 SHOWN IN THE 'ON' POSITION



POWER DISTRIBUTION/TURN ON

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
SCHEMATIC MOTOR CONTROL
DC SOLID STATE

DWG. NO. 1020B0016

SHEET 1 OF 2

FIGURE 3-10 TT120 MOTOR CONTROL ASSEMBLY DIAGRAM (SHEET 1)

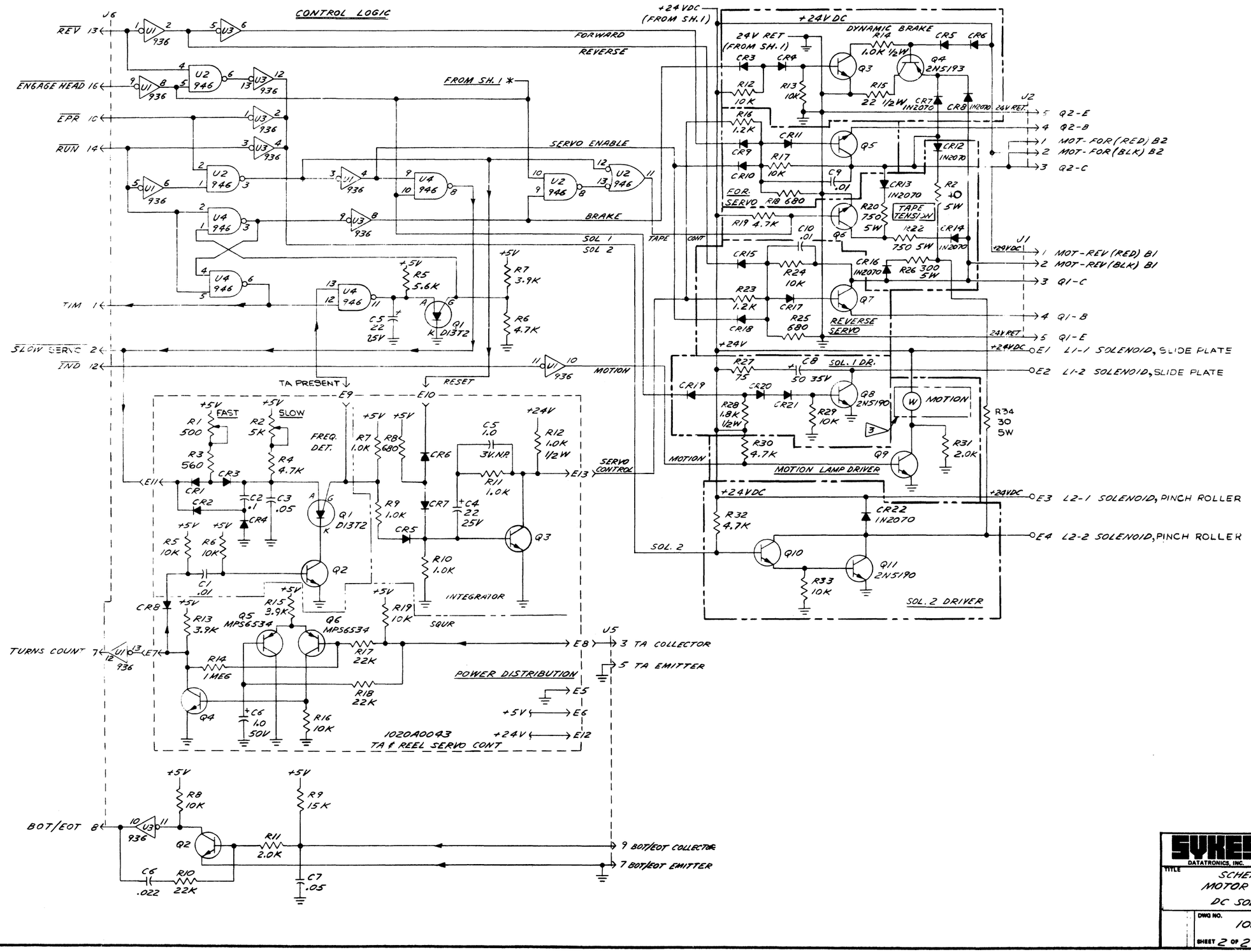


FIGURE 3-11 TT120 MOTOR CONTROL ASSEMBLY DIAGRAM (SHEET 2)

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE: SCHEMATIC MOTOR CONTROL DC SOLID STATE

DWG NO. 1020B0016

SHEET 2 OF 2

NOTE:
UNLESS OTHERWISE SPECIFIED:
ALL RESISTOR VALUES ARE IN OHMS, 1/4 W ± 5%
ALL CAPACITOR VALUES ARE IN MICROFARADS
ALL DIODES ARE IN4151
ALL TRANSISTORS ARE MPS6534

WRITE AMPLIFIER
READ AMPLIFIER
TRACK SELECT
PEAK DETECTOR
DATA RECOVERY
POWER DISTRIBUTION

PWR DISTRIBUTION to INTERGRATED CIRCUITS, UNLESS OTHERWISE SPECIFIED.

COMP	+5VDC	+12VDC	GRD
U1	——	14	7
U2	14		7
U6	14		7

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

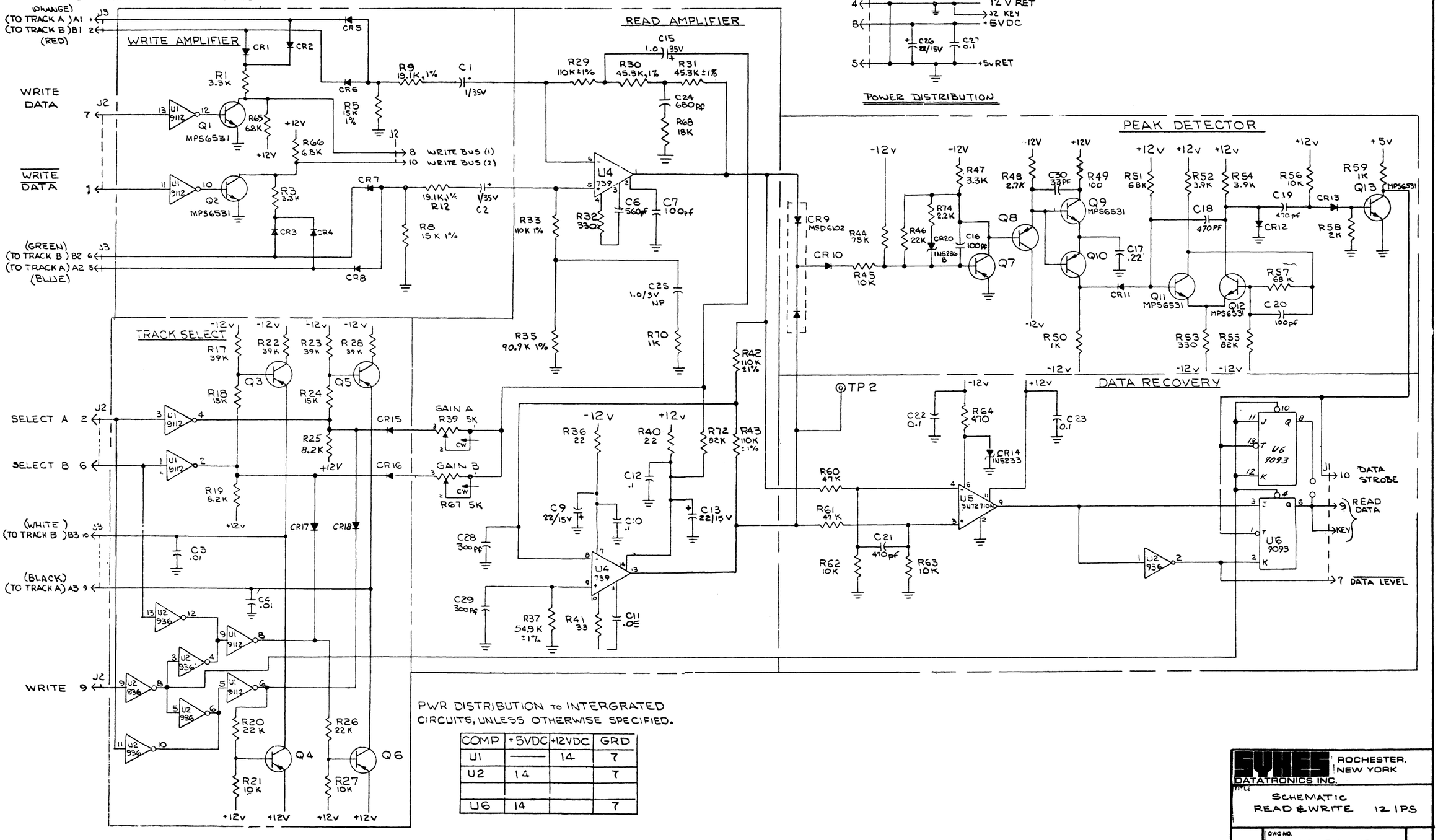
TITLE
SCHEMATIC
READ & WRITE

DWG NO.
1001A0272

SHEET 1 OF 1

FIGURE 3-12 TT120 READ/WRITE ASSEMBLY SCHEMATIC DIAGRAM - 5 IPS

NOTE:
UNLESS OTHERWISE SPECIFIED:
ALL RESISTOR VALUES ARE IN OHMS, 1/4 W ± 5%
ALL CAPACITOR VALUES ARE IN MICROFARADS
ALL DIODES ARE IN4151
ALL TRANSISTORS ARE MPS6534



PWR DISTRIBUTION TO INTERGRATED CIRCUITS, UNLESS OTHERWISE SPECIFIED.

COMP	+5VDC	+12VDC	GRD
U1	——	14	7
U2	14		7
U6	14		7

SYKES DATATRONICS INC. ROCHESTER, NEW YORK

TITLE: SCHEMATIC READ & WRITE 12 IPS

DWG NO. 1020B0059

SHEET 1 OF 1

FIGURE 3-13 TT120 READ/WRITE ASSEMBLY SCHEMATIC DIAGRAM - 12 IPS

4.0 CASSETTE REQUIREMENTS

The TT120 accepts all reel-to-reel cassettes whose external dimensions conform with Standard Cassette Specifications as published by N. V. Phillips Phonographisches Industrie. The magnetic tape contained must be preceded by and followed by approximately twenty inches of transparent tape for BOT and EOT sensing.

Although the TT120 will operate with any cassette meeting the above requirements, the performance and reliability of both the cassette and the transport can be guaranteed only if Sykes Cassettes are used. Cassettes available from Sykes contain 300 feet of certified computer grade Mylar magnetic tape 0.150 inches wide, with 0.5-mil backing thickness and 0.2-mil oxide thickness. Approximately 20 inches of 1.5-mil-thick clear tape leader and trailer is attached between the ends of magnetic tape and the reels. Cassettes have two track protection openings with removable closure tabs, replaceable by plugs. In conjunction with two miniature switches on the transport, these provide protection against writing on the tape tracks.

The oxide tape quality specifications are:

Coercivity:	330 +10 -35 Oerstad
Retentivity (B_r):	1100 $\pm$ 100 Gauss
Squareness (B_r/B_s):	0.80

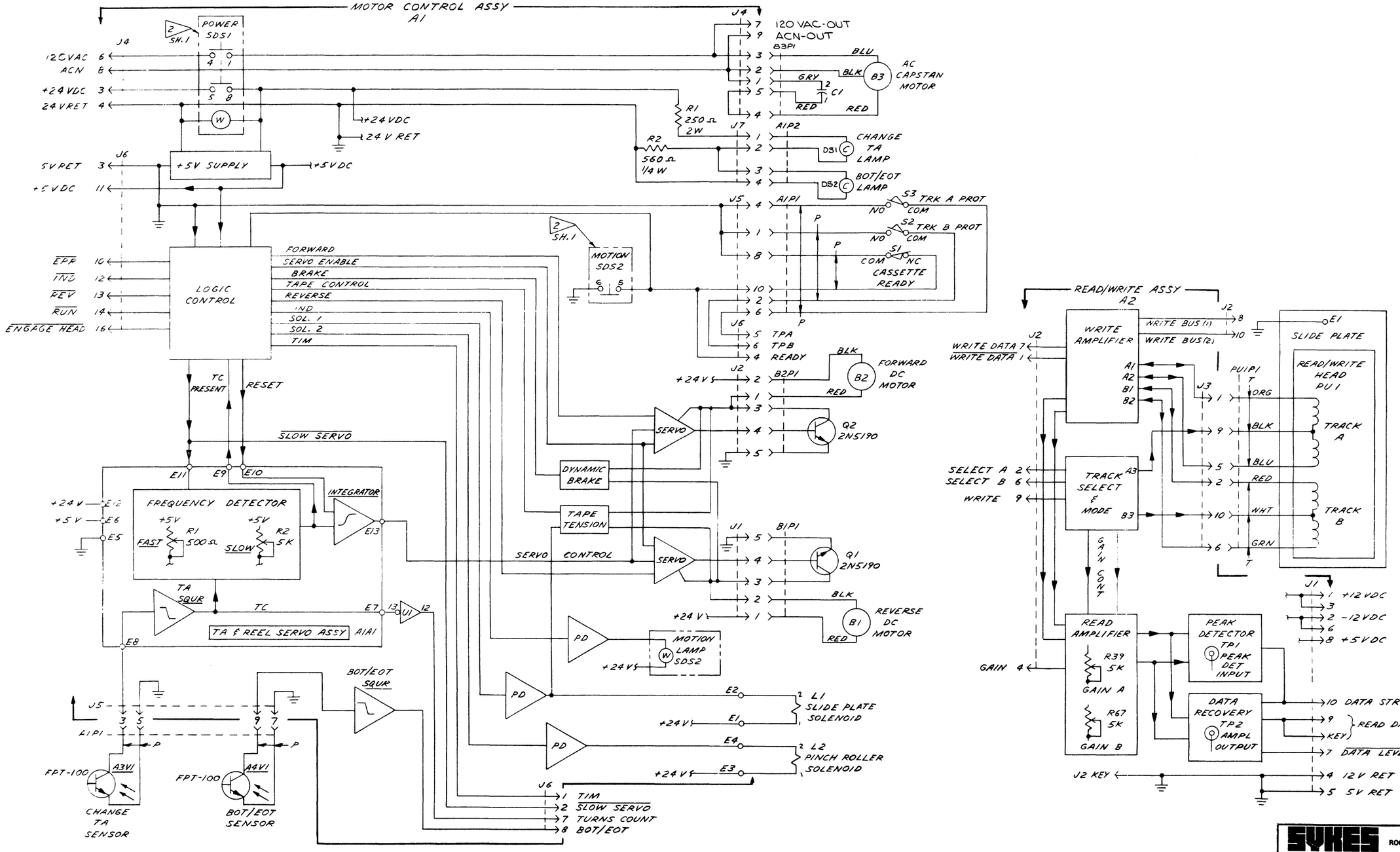


FIGURE 5-1 TT120 TAPE DECK SCHEMATIC DIAGRAM

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
SCHEMATIC
TAPE DECK TT-120

DWG NO.
1020B0002

5.0 INTERFACE DESCRIPTION

The TT120 is available both with and without a read/write assembly. The only signal interfaces between the basic transport and read/write assembly are the leads from the tape head. Consequently, to avoid repetition, the following paragraphs present the interfaces for the basic transport, then for the read/write assembly. Figures 5-2 and 5-3 are photographs showing the specific interface connectors and leads for the TT120 without and with the read/write assembly, respectively. Figure 5-1 is a block diagram of the TT120.

5.1 BASIC TRANSPORT

Inputs and outputs of the basic transport are shown in Figure 5-1 and in Figure 5-2.

5.1.1 Description of Outputs

5.1.1.1 Cassette Ready (J6-4)

J6-4 is a DTL compatible logic signal whose positive state indicates that a cassette is in place and the motion switch (if any) is actuated. This lead is forced to ground level by an open door, no cassette, or release of the motion switch.

5.1.1.2 Tape Head, Track A and Track B

Each track of the tape head consists of two coils connected in a three-lead, center tapped configuration. The leads are terminated in connector P1 as follows:

P1-2 (red)	Positive current in this lead represents negative magnetization on tape track B.
P1-6 (green)	Positive current is in this lead and represents positive magnetization on tape track B.

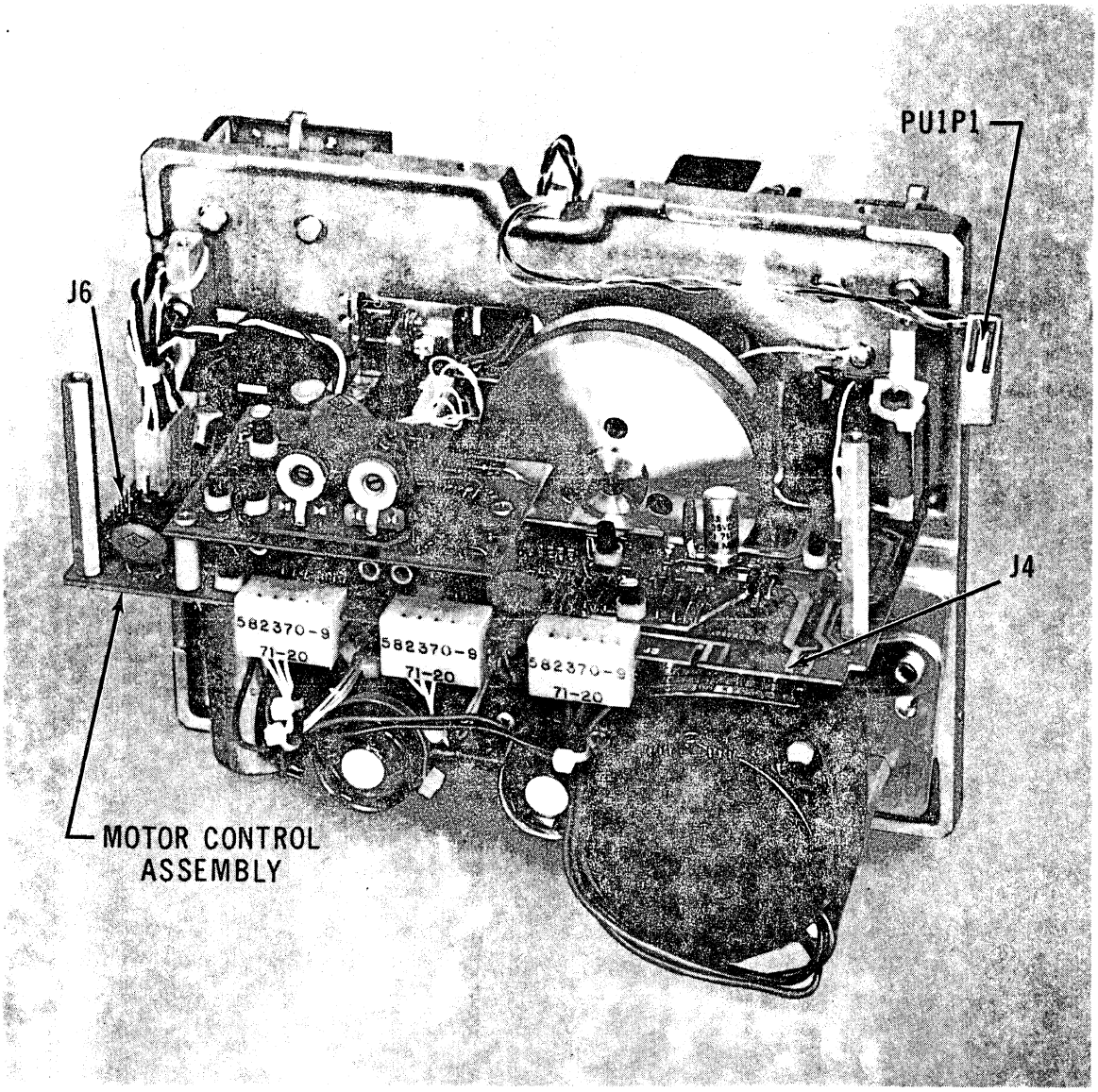


FIGURE 5-2 INTERFACE CONNECTORS OF TT120
WITHOUT READ/WRITE ASSEMBLY

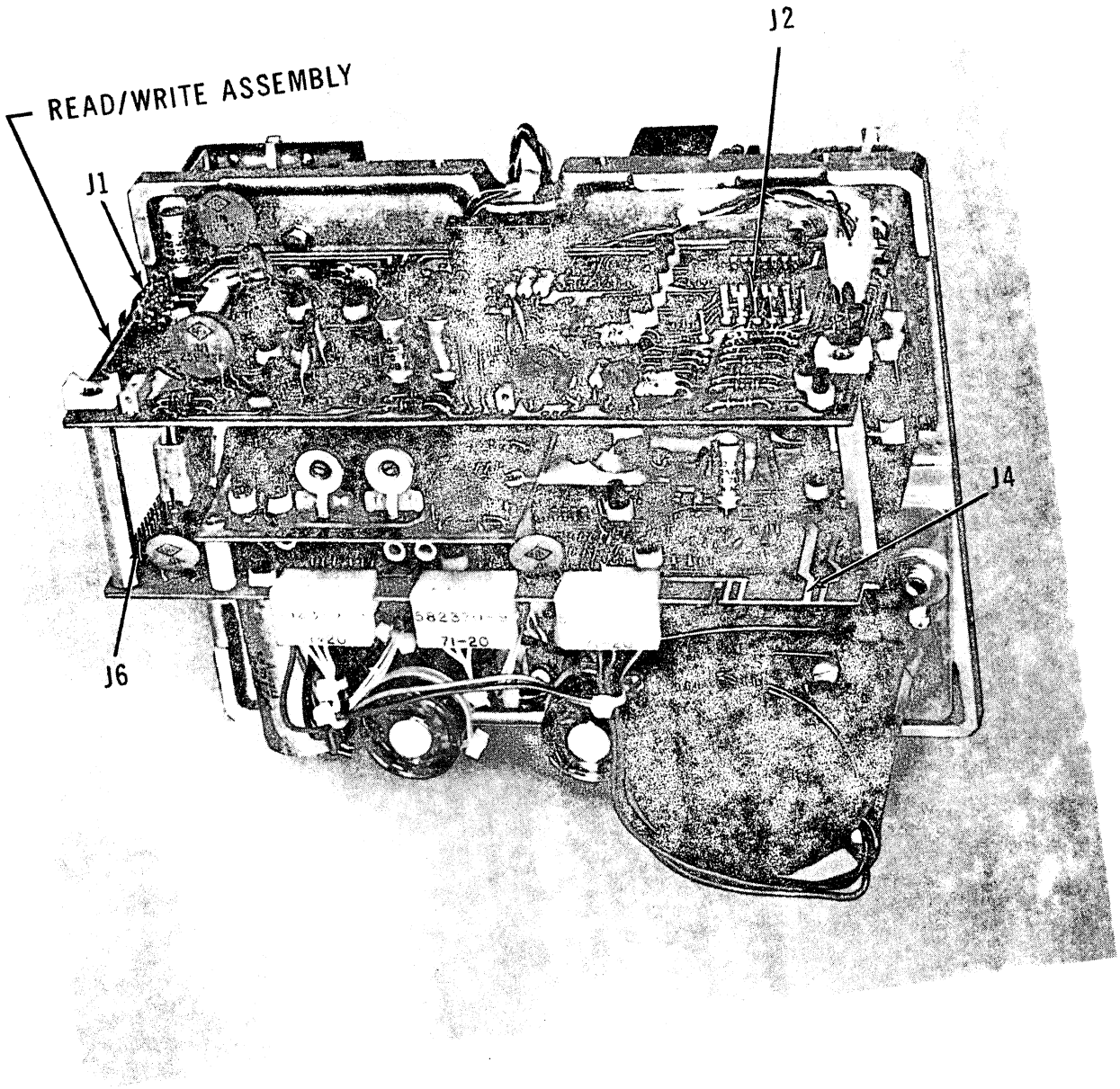


FIGURE 5-3 INTERFACE LEADS AND CONNECTORS OF TT120 WITH READ/WRITE ASSEMBLY

P1-10 (white)	This lead is the center tap of the track B winding.
P1-1 (orange)	Track A lead which corresponds to track B (green).
P1-5 (blue)	Track A lead which corresponds to track B (red).
P1-9 (black)	Track A lead which corresponds to track B (white).

5.1.1.3 120 VAC Out (J4-7)

J4-7 is the switched output of the 120 vac input.

5.1.1.4 Track Protect A (J6-5)

J6-5 is the lead of the normally open contact of the track protect A switch. Contacts are rated for a 500-ma resistive load and returned to signal ground.

5.1.1.5 Track Protect B (J6-6)

J6-6 is the lead of the normally open contact of the track protect B switch. Contacts are rated for a 500-ma resistive load and returned to signal ground.

5.1.1.6 TURNS COUNT (J6-7)

J6-7 is a DTL logic level signal which alternates between one and zero as a 320 vane shaft encoder on the left hand spindle interrupts the light path to the Turns Count photo detector. This signal is used to monitor tape movement.

5.1.1.7 BOT/EOT (J6-8)

J6-8 is a DTL logic level signal indicating a logic one when oxide-coated tape covers the right cassette locator pin and a logic zero when clear leader covers this locator pin.

5.1.1.8 Slow F/R (J6-2)

J6-2 is a DTL logic level signal whose zero state indicates that the slow forward or slow reverse mode has been selected.

5.1.1.9 Transport in Motion (J6-1)

J6-1 is a DTL logic level signal whose zero state indicates the absence of motion.

5.1.1.10 +5 VDC (J6-11)

J6-11 is the output for +5 vdc supply, maximum external load is 60 milliamperes.

5.1.2 Description of Inputs

5.1.2.1 120 VAC (J4-6)

J4-6 is the input for 120 vac power.

5.1.2.2 AC Neutral (J4-8)

J4-8 is the ac neutral line.

5.1.2.3 +24 VDC (J4-3)

J4-3 is the input for +24 VDC power. Maximum drain is 2 amp.

5.1.2.4 +24 VDC Return (J4-4)

J4-4 is the return for +24 VDC power.

5.1.2.5 Signal Ground (J6-3)

J6-3 is the return line for logic level signals.

5.1.2.6 Polarizing Key (J6-9)

J6-9 should be used to key connector J6.

5.1.2.7 Run (J6-14)

J6-14 is the input to the control logic whose zero level enables motion. The input driving this circuit must be DTL compatible.

5.1.2.8 Engage Capstan (J6-10)

J6-10 is the input to the control logic whose zero level causes the pinch roller to engage the capstan. The input driving this circuit must be DTL compatible.

5.1.2.9 Direction (J6-13)

J6-13 is the input to the control logic whose zero level commands reverse motion. The input driving this circuit must be DTL compatible.

5.1.2.10 Engage Head (J6-16)

J6-16 is the input to the control logic whose zero level causes the head to engage the tape path. The input driving this circuit must be DTL compatible.

5.1.2.11 Indicator (J6-12)

J6-12 is the input to the control logic whose zero level causes illumination of the motion indicator (if present). The input driving this circuit must be DTL compatible.

5.1.3 Control Logic

The following table shows the control signal inputs required to execute the transport functions. (0 indicates 0 V; 1 indicates +5 v; x indicates either 1 or 0):

Transport Function	Run	Engage Capstan	Direction	Indicator	Engage Head
Fast Forward	0	1	1	x	1
Fast Reverse	0	1	0	x	1
Read/Write	0	0	1	x	0
Stop	1	1	x	x	x
Slow Forward	0	1	1	x	0
Slow Reverse	0	1	0	x	0
Motion Indicator On	x	x	x	0	x

5.2 READ/WRITE ASSEMBLY

Inputs and outputs of the read/write assembly are shown in Figure 5-1 and in Figure 5-3.

5.2.1 Description of Input Signals

The following logic signals are all DTL levels where +5 V is a logical "1" and 0 V is a logical "0".

5.2.1.1 +12 VDC (J1-1)

J1-1 is the input for +12 vdc power.

5.2.1.2 -12 VDC (J1-2)

J1-2 is the input for the -12 vdc power.

5.2.1.3 12 VDC Return (J1-4)

J1-4 is the return line for +12 vdc and -12 vdc power.

5.2.1.4 +5 VDC (J1-8)

J1-8 is the input for +5 vdc power.

5.2.1.5 +5 VDC Return (J1-5)

J1-5 is the return line for +5 vdc power.

5.2.1.6 SELECT A (J2-2) and SELECT B (J2-6) Signals

The SELECT A and SELECT B signals must always be complementary in nature and direct the circuitry to choose either track A or track B for operation in the selected mode. When SELECT A is a "1" and SELECT B is a "0", track A has been selected.

5.2.1.7 WRITE (J2-9) Signal

The WRITE signal determines the mode of operation and is a "1" when writing and a "0" when reading.

5.2.1.8 WRITE DATA (J2-7), WRITE DATA - NOT (J2-1) Signals

The WRITE DATA and WRITE DATA - NOT signals must be the complementary representation of the data to be written on the selected track and will generate the appropriate currents in the transducer for the duration of the WRITE signal. Their transitions must occur within one microsecond of each other. These signals need not be complementary during read operation and may assume either logic level. These signals must be free of transitions while in the read mode to preclude coupling noise in the read amplifier.

5.2.2 Description of Output Signals

5.2.2.1 READ DATA (J1-9) Signal

The READ DATA Signal is a DTL logic level which is a reproduction of the recorded signal.

5.2.2.2 DATA STROBE (J1-10) Signal

The DATA STROBE Signal is a positive pulse (nominal width 3 microseconds) used to strobe the data into the output flip flop (READ DATA). The READ DATA output changes on the trailing edge (positive to ground transition of the DATA STROBE Signal). The signal will drive 1 ma at 3 volts min and sink 16 ma at 0.4 volts max.

5.2.2.3 DATA LEVEL - NOT (J1-7) Signal

The DATA LEVEL - NOT signal is the inverted output of the Level Detector circuitry. It contains valid information several microseconds before the rising edge and after the falling edge of DATA STROBE. A logical "1" level

indicates that READ DATA will change to a "0" after the falling transition of DATA STROBE. The signal is capable of sinking up to 16 ma when at "0".

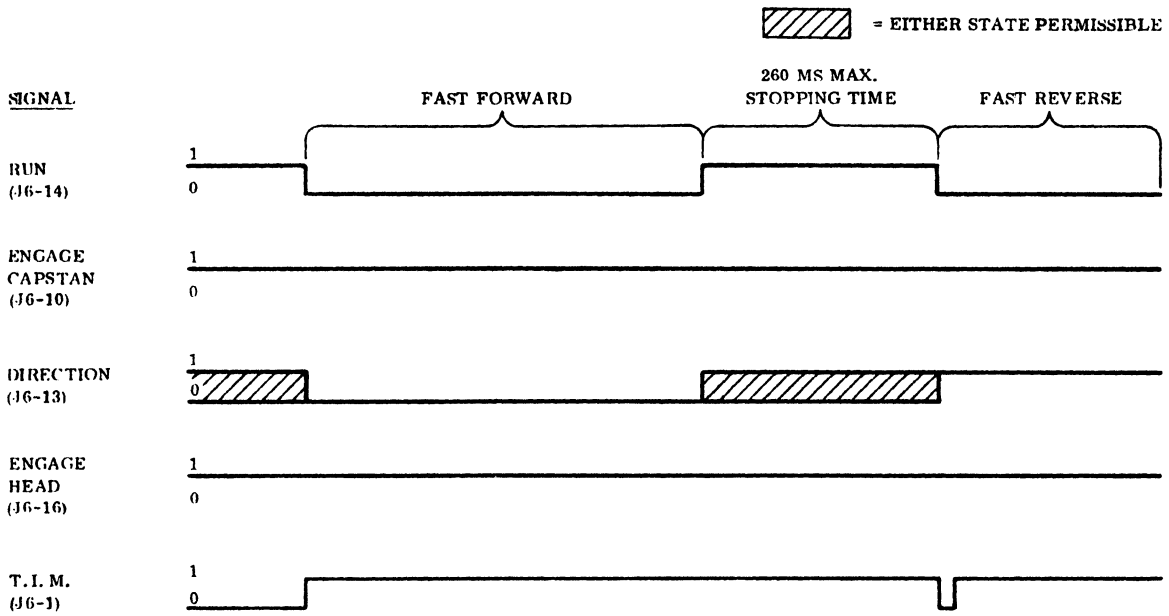


Figure 5-4 Timing Requirements for Typical Forward-Reverse Sequence

5.3 TIMING REQUIREMENTS

Figure 5-4 is a timing diagram of a forward-reverse sequence.

Note that transport motion should not be attempted during stopping.

Figure 5-5 shows a typical read/write cycle (write mode is selected in the example shown). Normal speed (forward) has been selected along with the write mode (as described under paragraph 5.2.1). Data changes should be inhibited for a period of 20 milliseconds from the start of the command to allow stabilization of tape speed.

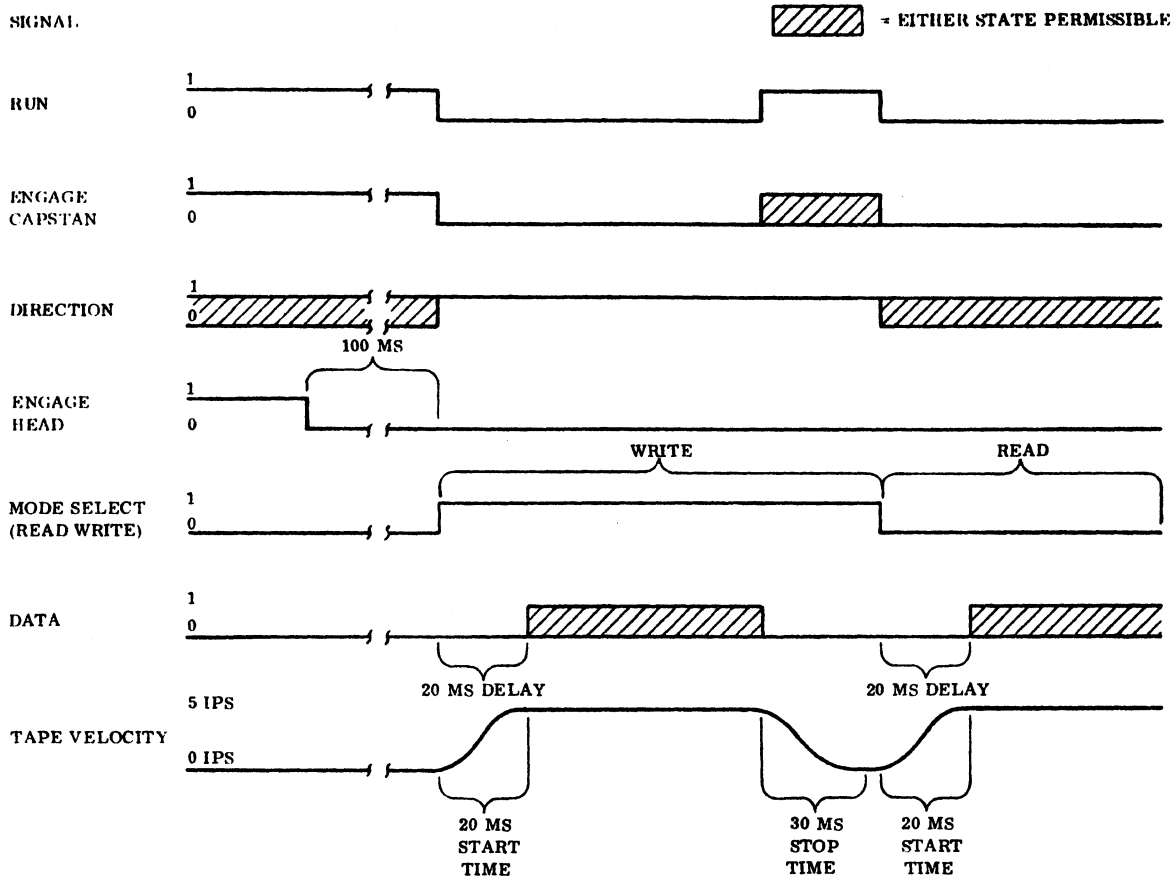


Figure 5-5 Timing Requirements for Typical Read/Write Sequence

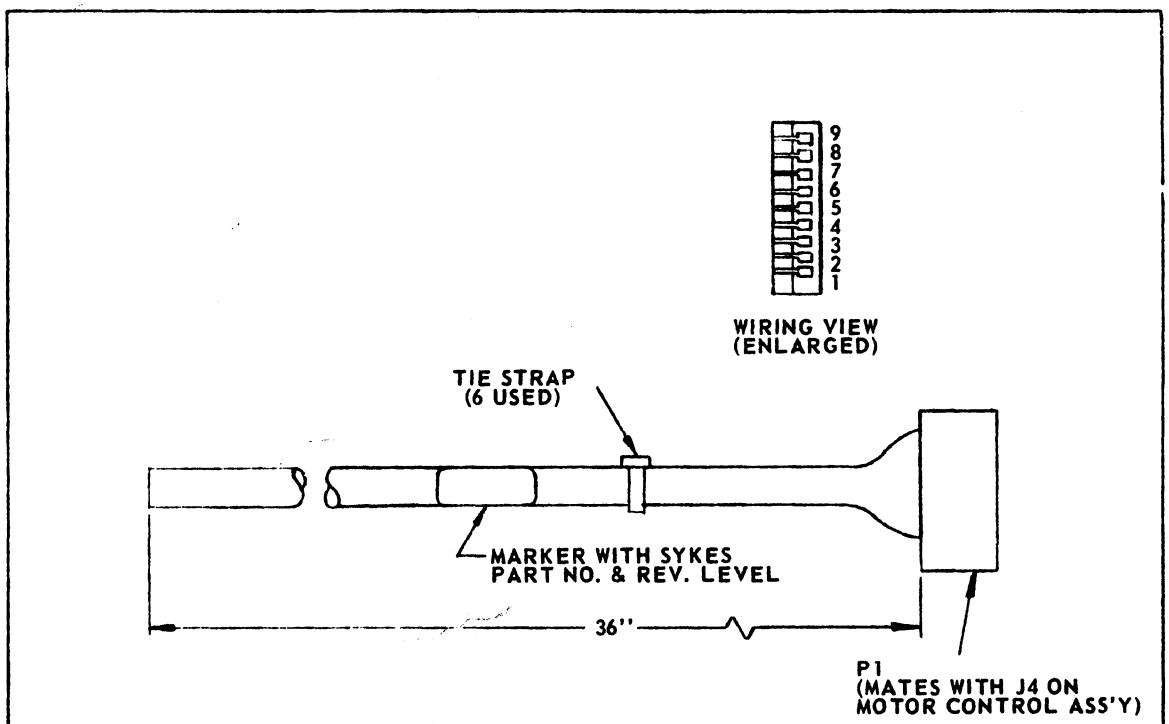
5.4 INTERFACE WIRE HARNESSES

5.4.1 High Level Harness

The high level harness shown in Figure 5-6 provides wiring and a connector plug for inputs to connector J4 on the motor control assembly.

5.4.2 Low Level Harness

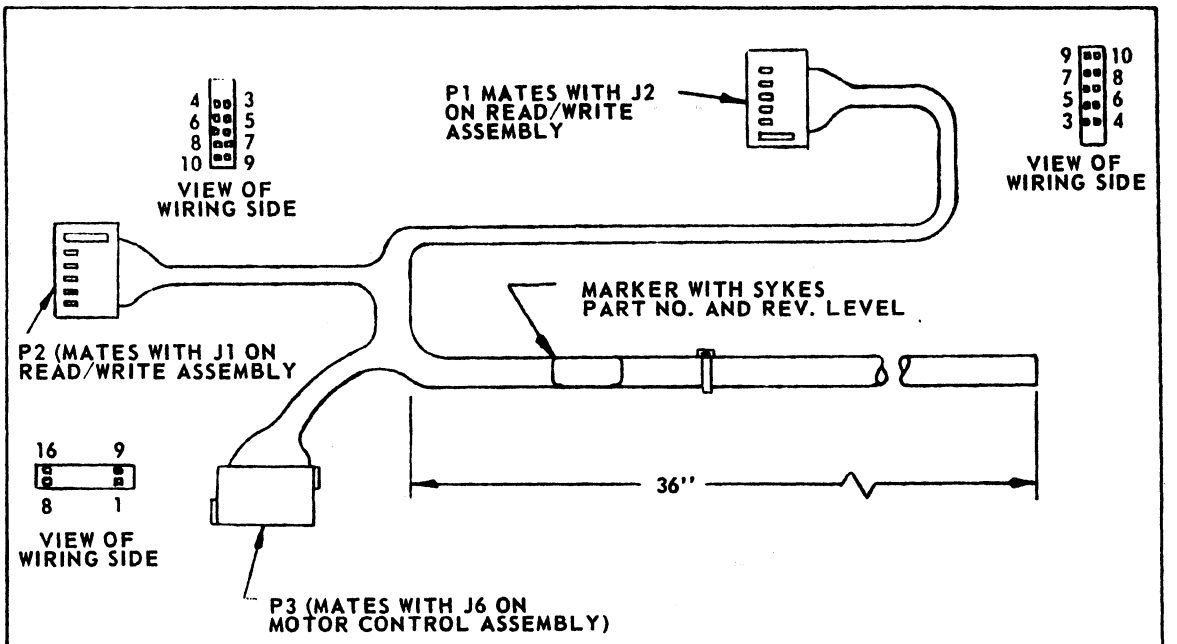
The low level harness shown in Figure 5-7 provides wiring and mating connector plugs for inputs and outputs to connectors J1 and J2 on the read/write assembly and J6 on the motor control assembly. (Refer to Figure 5-3.)



– WIRE LIST –

IDENT	COLOR	GAUGE (AWG)	POSITION IN P1
1	wht	22	3
2	blk	22	4
4	red	18	6
5	red	18	7
6	gry	18	8
7	gry	18	9

FIGURE 5-6 TT120 HIGH LEVEL HARNESS ASSEMBLY



– WIRE LIST –

IDENT.	COLOR	GAUGE (AWG)	POSITION IN P1	POSITION IN P2	POSITION IN P3
1	wht		1		
2	wht		2		
3	wht		4		2
4	wht		6		
5	wht		7		
6	wht		9		
7	wht			1	
8	blu			2	
9	blk			4	
10	blk	22		5	
11	wht			8	
12	wht			9	
13	wht				1
15	blk				3
16	wht				4
17	wht				5
18	wht				6
19	wht				7
20	wht				8
21	wht				10
23	wht				12
24	wht				13
25	wht				14
26	wht				16

FIGURE 5-7 TT120 LOW LEVEL HARNESS ASSEMBLY

5.4.3 Interface Harness Connectors

The Interface Harness Connectors are listed in the following table, with connectors described according to the mates indicated in Figure 5-3:

Connector	Sykes Part No.	Mfr and Part No. *
J1 and J2 Mates	100J02001	AMP, Inc. 86100-1
Contacts for J1 and J2 Mates	103E07001**	AMP, Inc. 86292-1
J4 Mate	100J11001	AMP, Inc. 480460-0
Contacts for J4 Mate	102E20010***	AMP, Inc. 60511-1 or 60618-1
J6 Mate	100J01004	AMP, Inc. 1-86148-5
Contacts for J6 Mate	103E01007**	AMP, Inc. 85969-2 or 86016-2
Key for J6 Mate	103E01100	——

* Equivalent may be used
** For 20 to 22 AWG wire
*** For 18 to 22 AWG wire

5.5 GROUNDING

To provide reliable operation, the deck casting of the TT120 Transport must be connected directly to the ground of its operating system.

6.0 POWER REQUIREMENTS

6.1 BASIC TRANSPORT

The power requirements for the basic transport are as follows:

105-135 vac. Running power, 15 watts at 120 vac.

+24 vdc ± 10%, 2.0A max.

6.2 READ/WRITE ASSEMBLY

The power requirements for the read/write assembly are as follows:

+12 vdc ± 5%, 75 ma.

-12 vdc ± 5%, 75 ma.

+5 vdc ± 5%, 60 ma.

6.3 TOTAL TRANSPORT

The power requirements for the total transport are as follows:

105-135 vac, 60 (or 50) Hz, single phase, 15 watts.

+24 vdc ± 10% at 2.0 amp, 500 mv p-p ripple.

+12 vdc ± 5% at 75 ma.

-12 vdc ± 5% at 75 ma.

+5 vdc ± 5% at 60 ma.

7.0 INSTALLATION REQUIREMENTS

7.1 ENVIRONMENTAL REQUIREMENTS

The TT120 Tape Transport will function satisfactorily under temperature and humidity conditions suitable for operation of equipment in a computer system; temperature ranging from 40° to 100°F (4° to 38°C), relative humidity ranging from 20% to 90% without condensation, and altitude to 10,000 feet. During shipment, the unit will withstand temperatures varying between -4° and 150°F (-20° and 65°C) and altitude to 20,000 feet.

7.2 SPACE REQUIREMENTS

The TT120 is 6.7 inches high, 8.2 inches wide and 5 inches deep. The cassette holder front plate extends 4.5 inches in front of the deck plate when open 90°. Other pertinent dimensions are indicated in Figure 7-1.

7.3 COOLING AND PRESSURIZATION

If the TT120 is mounted in an enclosure, a fan with at least 40 cfm capacity should be employed to cool the motors. To keep out dust and lint, it is recommended that the enclosure be designed so that the fan provides internal pressurization. The air intake must contain an air filter. It is recommended that the air outlet be located forward of the deck plate. Air will escape through the cassette holder opening when a cassette is inserted or removed, preventing entry of dust or lint.

7.4 MOUNTING REQUIREMENTS

The TT120 was designed to operate in the upright position shown in Figure 7-1. To prevent stress on the deck plate, holes in the bottom and lower sides of the deck plate should be employed for retention of the TT120 in an enclosure. Care should be taken to avoid attachment of any structural members or covers to the deck plate in a manner causing stress on the plate (and possible warping which might impair operation of the solenoid linkage or other mechanisms).

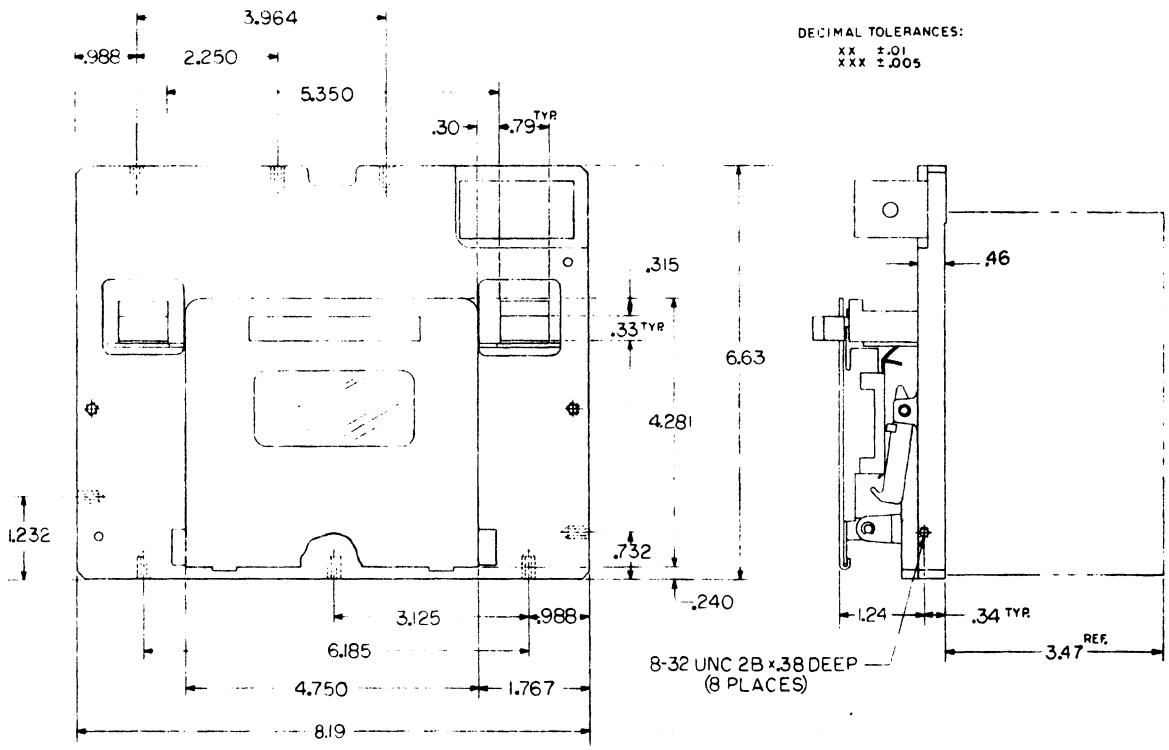


FIGURE 7-1 TT120 DIMENSIONS

8.0 ALIGNMENT AND MAINTENANCE PROCEDURES

8.1 CAPSTAN DRIVE BELT

The drive belt tension should allow approximately 1/8-inch deflection on the belt midway between pulleys when a 1/2-pound pressure is applied. If this is not the case, proceed as follows:

1. Loosen the capstan drive motor mounting bracket screw located approximately one inch below the power switch.

2. Reposition capstan drive motor until the conditions stated above are met.

3. Tighten the mounting bracket screw securely.

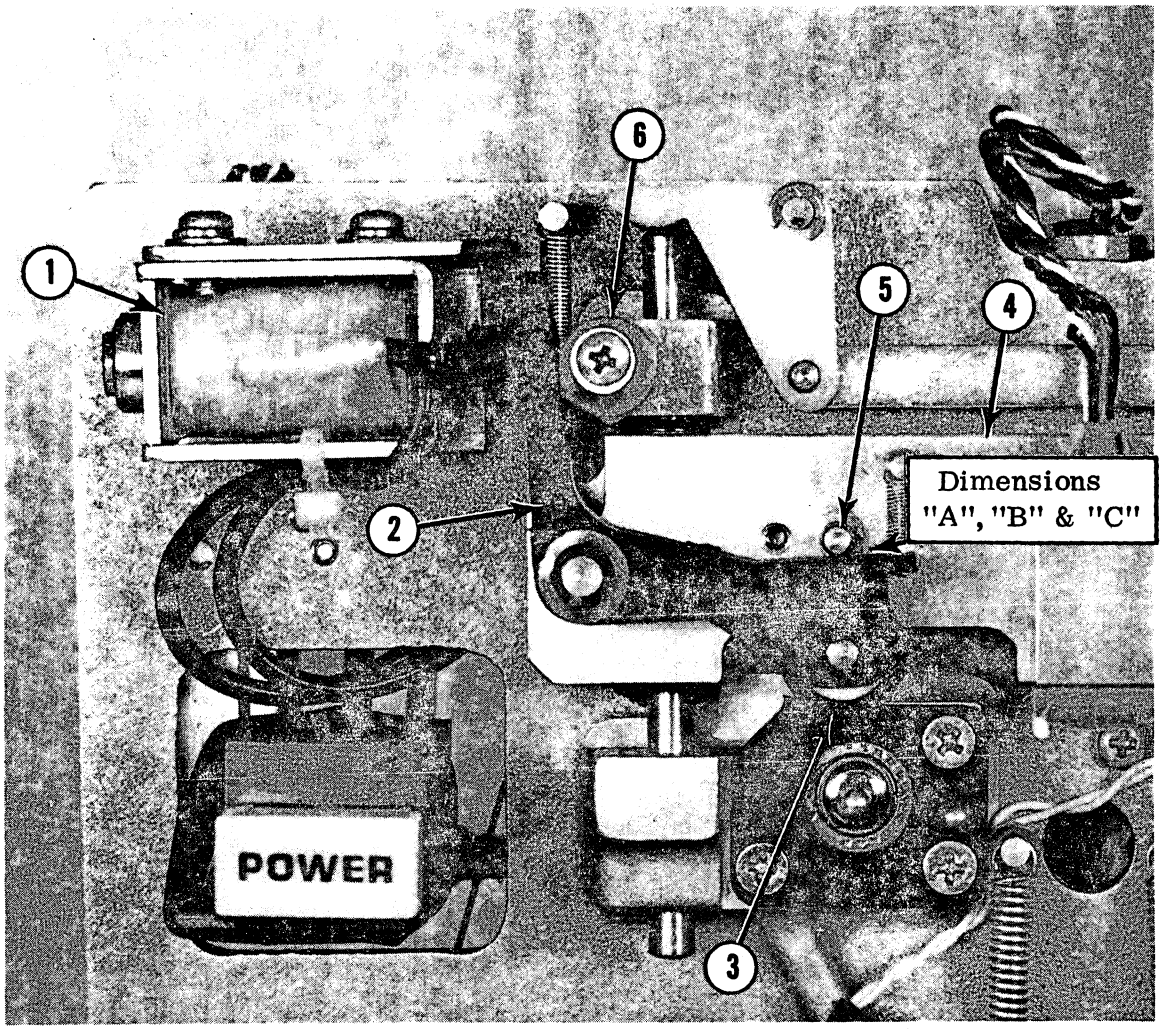
8.2 PINCH ROLLER AND PINCH ROLLER SOLENOID

The pinch roller should be compressed .013-inch when the slide plate is in the low position and the pinch roller solenoid is energized. To test /or adjust for proper pinch roller/capstan contact proceed as follows:

Refer to Figure 8-1 for parts identification.

1. Disconnect the forward drive motor at J2 on the motor control board, place the cassette holder in the head cleaning position, place a cover over the BOT/EOT light source, depress the cassette ready switch (place tape over the switch).

2. Adjust the slide plate solenoid in the standard manner (Refer 8.3). Energize the slide plate solenoid which will lower the slide plate. Rotate the pinch roller solenoid stop cam to give the largest possible gap between the pinch roller housing and solenoid stop cam. Move the pinch roller solenoid to the left, out of the way.



1. Pinch Roller Solenoid
2. Pinch Roller Housing
3. Pinch Roller
4. Slide Plate
5. Pinch Roller Housing Stop Pin
6. Solenoid Stop Cam

FIGURE 8-1 PINCH ROLLER ADJUSTMENT

3. Using drill blanks or a pin guage set* determine the distance between the pinch roller housing and pinch roller housing stop pin, with the pinch roller just touching the capstan. This is dimension "A".

* Pin guage set, approximate range .050" to .070", in increments of .001".

4. With the Deltrol solenoid add .023" to dimension "A". With the Guardian Solenoid add .015" to dimension "A". This value will be refered to as dimension "B".

5. Insert the drill blank equal to dimension "B" between the pinch roller housing and the pinch roller housing stop pin. Energize the pinch roller solenoid and move it to the right until the drill blank becomes free. Lock the solenoid in this position and remove the drill blank.

6. Snug up the screw in the center of the solenoid stop cam. With the Deltrol or the Guardian solenoid add .013" to dimension "A"; this is dimension "C". Using a drill blank equal to dimension "C", rotate the solenoid stop cam clockwise until this guage fits snugly between the pinch roller housing and the pinch roller housing stop pin. Tighten the solenoid stop locking screw. Cycle the solenoid several times checking with the guage to see that the setting holds.

7. Place a small drop of Glyptol (or equivalent sealer) on the solenoid stop screw head. Solenoid and pinch roller are now adjusted and ready for use.

8.3 SLIDE PLATE SOLENOID

Normally, adjustment of the solenoid mounting position should be required only when a new solenoid is installed. If new solenoid is installed proceed as follows:

1. Remove the read/write board.

2. Loosen the solenoid mounting screws.

3. Insert the solenoid adjustment guage* into the base of the solenoid frame, directly opposite the plunger tip.

4. Hold the clevis and push the plunger firmly into solenoid, moving the tape head slide plate to the extreme low (tape head engaged) position, tighten the solenoid mounting screws securely.

* If the solenoid adjustment guage is not available, insert a 5/8-inch length of AWG 28 guage magnet wire (.013 inch dia. copper) into the base of the solenoid frame.

5. Remove the solenoid adjustment guage.

6. Replace the read/write board.

8.4 TAPE HEAD AND READ/WRITE ASSEMBLY

The following procedure must be followed when either a carriage assembly or read/write assembly is installed:

Note: TT120 Transports shipped after 6/1/72 (and any transports receiving depot maintenance after 6/1/72) include a modification of the read/write assembly - the addition of a variable gain network which automatically increases amplitude when signal dropouts occur. Read/write boards including the variable gain feature can be identified by the number 392 printed on the board. Also the absence of TP1. Upon reaching step 6 in the following procedure, follow the optional steps a and b which are appropriate.

1. Permanently mount and connect the read/write board. This includes connecting the head leads and the connectors mating with J1 and J2. The final alignment of the tape head carriage assembly should have been made. Any alterations will necessitate readjustment.

2. Clean the head and tape path with head cleaner solution and a lint-free cloth, "Kimwipe", or foam cotton swab.

3. Place a blank (unformatted) tape cassette in the cassette holder.

4. Issue a forward-to-load-point command. This step should be performed before any write or read operation in this adjustment procedure.

5. Record a bit pattern of (LSB, 01010101, MSB) on Track B; then on Track A. Refer to step 4 for positioning of tape. The length of each recording on tape will be governed by the duration of the following operations and is left to the discretion of the operator.

6. If read/write assembly includes variable gain network:

   a. With an oscilloscope connected to TP2 read Track B and adjust R67 for 16 volts p-p.

   b. Read Track A and adjust R39 until the wave form of step 2a is observed on the oscilloscope.

If read/write assembly does not include variable gain network:

a. With an oscilloscope connected to TP1 (1 megohm, 50 pf maximum load), read Track B and adjust R67 for a maximum signal of 9 volts. Properly adjusted, the negative peaks should vary between 6 and 9 volts.

b. Read Track A and adjust R39 until the wave form of step 6a is observed on the oscilloscope.

7. Seal the adjustment screws with a sealant. The adjustment is complete.

8.5 BOT/EOT SENSE LAMP POSITION

The following adjustment is required when a BOT/EOT sense lamp is installed:

1. Adjust the BOT/EOT lamp depth until the output of the phototransistor, J5 pin 9 on the motor control board, is at a minimum. Minimum "on" voltage should not exceed 500 mv.

2. Block the BOT/EOT light source completely and check to see that the output of the phototransistor is 1.05 volts or greater.

3. Secure the BOT/EOT lamp.

8.6 TA SENSE LAMP POSITION

The following adjustment is required when a TA sense lamp is installed:

1. Place the cassette holder in the head cleaning position; place a cover over the BOT/EOT light source and depress the cassette ready switch.

2. Issue a fast servo command and adjust the position of the TA lamp until the output of the phototransistor (J5, P3) on the motor control board is 1±.1 volt minimum.

3. Issue a slow servo command, the output of the phototransistor should not be saturated at the above position.

4. Secure the TA lamp. Adjustment is complete.

8.7 PREVENTIVE MAINTENANCE PROCEDURES

Universally recognized procedures for proper handling of magnetic tape and tape equipment should be adhered to. The tape head, tape guide, and pinch roller should be cleaned on a regular schedule.

8.7.1 Cleaning Tape Head, Tape Guide, and Pinch Roller

The tape head, tape guide, and pinch roller should be cleaned routinely. The recommendation is once a day, or after eight hours of operation, whichever comes first.

With the cassette holder in the fully open position (as described under paragraph 3.1), the tape head slide plate can be pulled to the low position by inserting a mechanical pencil or similar object in the slot provided in the slide shaft. This will make the parts to be cleaned accessible.

Cleaning should be accomplished with the cassette holder empty. The tape head, tape guide, and pinch roller should be wiped clean with a foam or cotton swab (such as a "Q-tip") or a lint-free tissue or cloth (such as a "Kimwipe") saturated with a quality magnetic tape head cleaner (such as MS-200 Magnetic Tape Head Cleaner, manufactured by Miller-Stephenson Chemical Company). PRESSURE ROLLER AND CAPSTAN MUST NOT BE FLOODED WITH CLEANER. KEEP SHARP OR HARD OBJECTS AWAY FROM THE TAPE PATH AS PERMANENT DAMAGE MAY RESULT.

8.7.2 Handling and Storing Tape Cassettes

Care must be taken to protect magnetic tapes from dust and lint contamination or physical damage, since these can prevent proper contact of tape with the read/write head, thus reducing signal strength or obliterating information. Accidental exposure to any external magnetic field can produce similar results.

Cassettes should be rewound to expose transparent leader before removal from the transport. In this way, the possibility of physical damage to oxide-coated tape will be minimized; however, the transparent leader and the oxide-coated tape must be given equal protection from fingerprints, dust and dirt, since these can be transferred between wraps of tape on the reels.

8.7.3 Cleaning the Slide Plate Solenoid

The slide plate solenoid must be cleaned every six months or 100,000 actuations of the solenoid if reliability is to be expected.

To clean the slide plate solenoid:

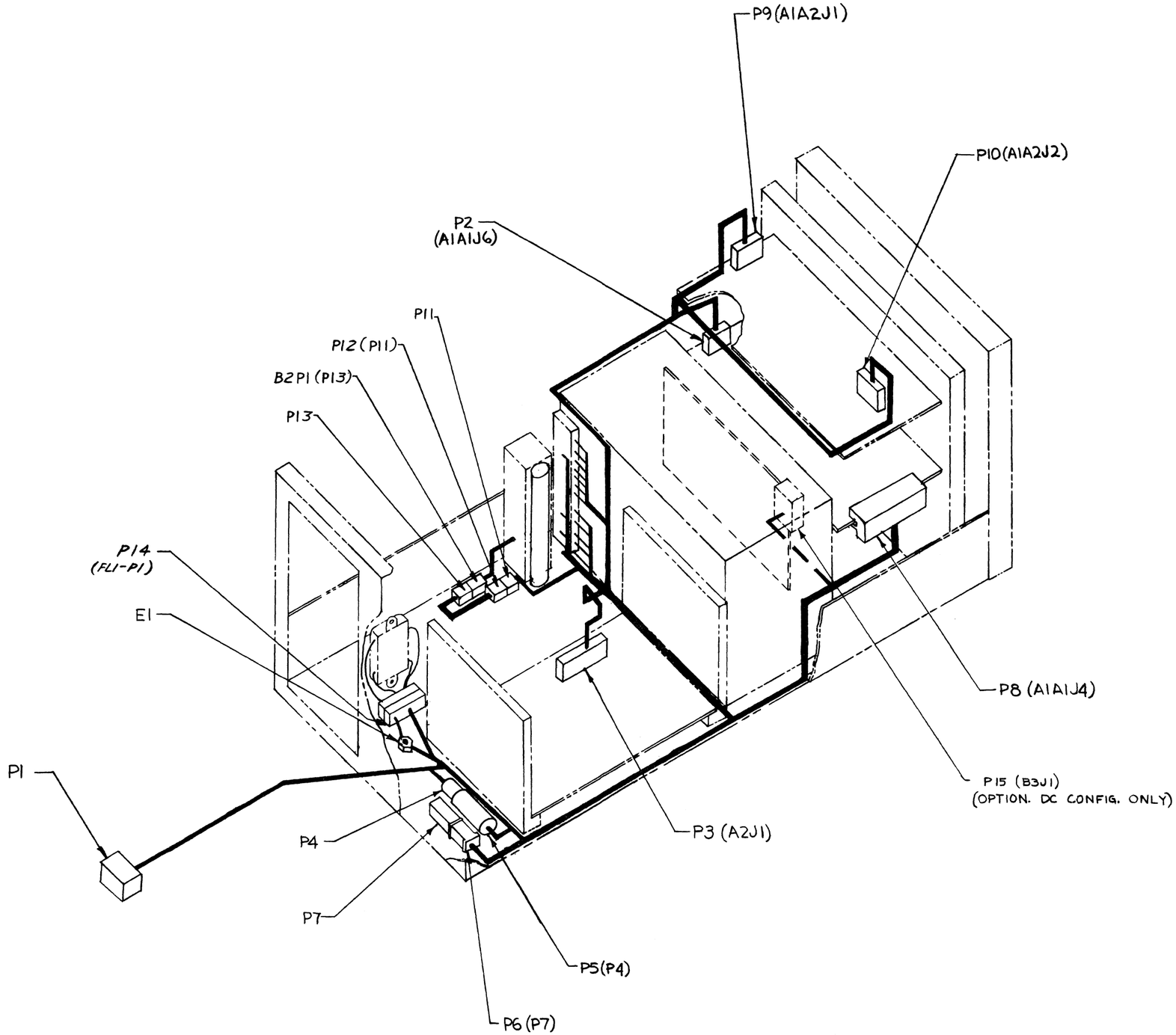
1. Pull the solenoid plunger pin out and remove the plunger.

2. Using a foam or cotton swab (such as a "Q-tip") saturated with a cleaner (Tape head cleaner such as MS-200 Magnetic Tape Head Cleaner can be used), thoroughly clean out the solenoid cavity.

3. Clean and replace the solenoid plunger and pin.

8.7.4 Routine Adjustments

All the adjustments discussed in this section should be checked at least once every six months.



SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE

C/C 120
HARNESS LAYOUT

DWG NO. 1020T1200

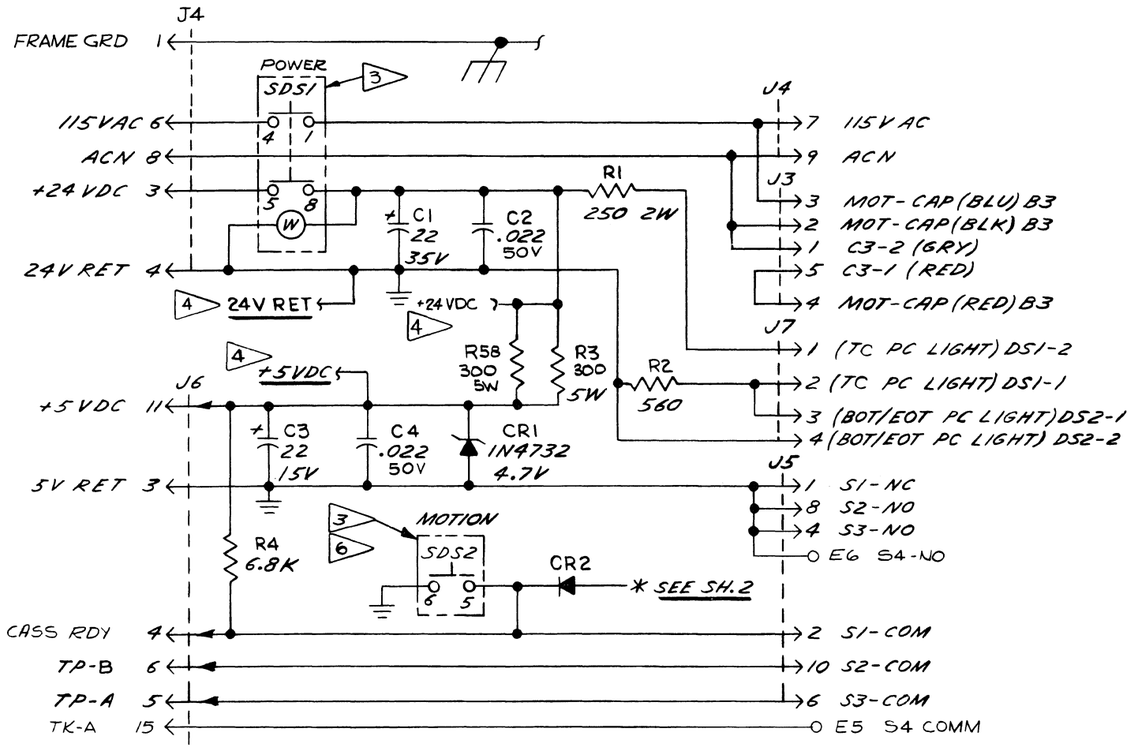
SHEET OF

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS, 1/4 W, 5%
   CAPACITANCE VALUES ARE IN MICROFARADS
   DIODES ARE IN4151
   TRANSISTORS ARE MPS 6531
2. 5V RET. & 24V RET. ARE COMMON
3. POWER & MOTION INDICATOR SWITCHES SDS1 & SDS2 ARE OPTIONAL. WHEN NOT USED JUMPER POSITIONS 4 TO 1 & 5 TO 8 ON THE SDS1 POWER SWITCH AREA.
4. SEE SHEET 2 FOR ADDITIONAL POWER DISTRIBUTION
5. POWER DISTRIBUTION TO INTEGRATED CIRCUITS

COMP	+5VDC	GRD
U1-4	14	7

6. SDS2 SHOWN IN THE 'ON' POSITION
7. SEE SHT 2



POWER DISTRIBUTION/TURN ON

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
SCHEMATIC MOTOR CONTROL
DC SOLID STATE

DWG. NO. 1020B4026

SHEET 1 OF 2

LOGIC CONTROL

J6

DIR 13

ENGAGE HEAD/ 16

ENGAGE CAP/ 10

RUN/ 14

TIM 1

SLOW SERVO/ 2
IND/ 12

TURNS COUNT 7

BOT-EOT/ 8

FORWARD

REVERSE

FROM SW.1 *

SERVO ENABLE

BRAKE

SOL 1

SOL 2

MOTION

TA PRESENT

RESET

+5V

+24V

FREQ. DET.

INTEGRATOR

SQUR

(FROM SW.1)
+24VDC

24V RET.

DYNAMIC BRAKE

FOR SERVO

TAPE TENSION

REVERSE SERVO

SOL. 1 DRIVER

MOTION LAMP DRIVER

SOL. 2 DRIVER

SOL. 2

J2

2 MOT-FOR (BLK) B2

5 Q2-E

1 MOT-FOR (RED) B2

4 Q2-B

3 Q2-C

J1

+24V 1 MOT-REV.(RED) B1

2 MOT REV (BLK) B1

3 Q1-C

24V RET. 5 Q1-E

+24V 4 Q1-B

E1 L1-1 SOLENOID

E2 L1-2 SOLENOID

+24VDC E3 L2-1 SOLENOID, PINCH ROLLER

E4 L2-2 SOLENOID, PINCH ROLLER

J5

3 TC COLLECTOR

5 TC EMITTER

9 BOT/EOT COLLECTOR

7 BOT/EOT EMITTER

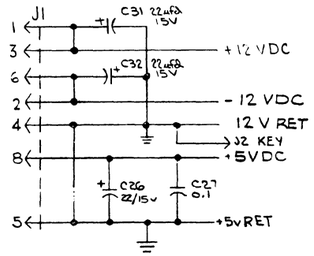
SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
SCHEMATIC
MOTOR CONTROL
DC SOLID STATE

DWG NO. 1020B4026

SHEET 2 OF 2

NOTE:
UNLESS OTHERWISE SPECIFIED:
ALL RESISTOR VALUES ARE IN OHMS, 1/4 W ± 5%
ALL CAPACITOR VALUES ARE IN MICROFARADS
ALL DIODES ARE IN4151
ALL TRANSISTORS ARE MPS6534



POWER DISTRIBUTION

PWR DISTRIBUTION TO INTERGRATED CIRCUITS, UNLESS OTHERWISE SPECIFIED.

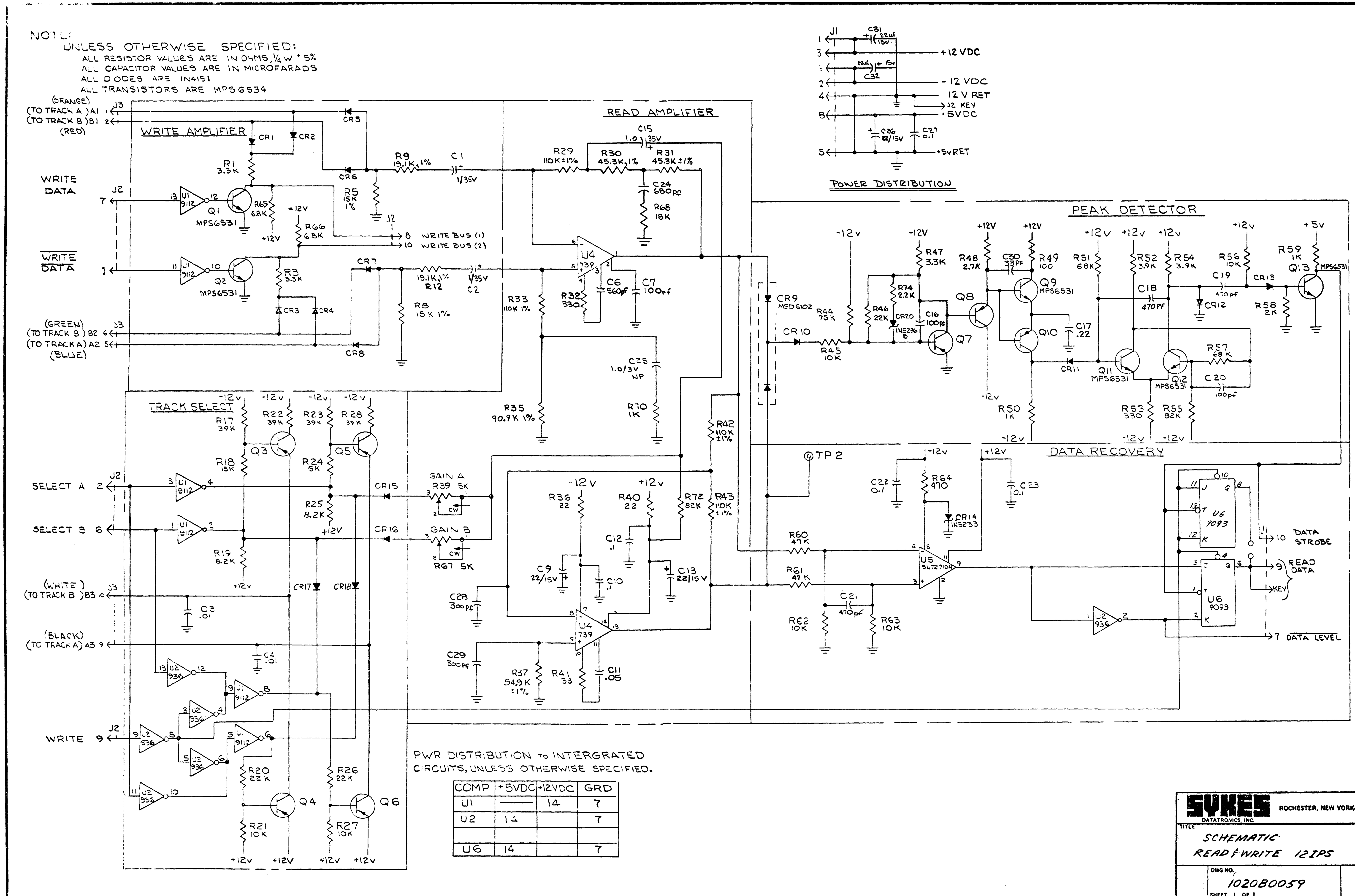
COMP	+5VDC	+12VDC	GRD
U1	——	14	7
U2	14		7
U6	14		7

SYKES ROCHESTER, NEW YORK

TITLE
SCHEMATIC
READ & WRITE 51PS

DWG NO
10010270Z

SHEET 1 OF 1



NOTE:
UNLESS OTHERWISE SPECIFIED:
ALL RESISTOR VALUES ARE IN OHMS, 1/4 W ± 5%
ALL CAPACITOR VALUES ARE IN MICROFARADS
ALL DIODES ARE 1N4151
ALL TRANSISTORS ARE MPS6534

PWR DISTRIBUTION TO INTERGRATED CIRCUITS, UNLESS OTHERWISE SPECIFIED.

COMP	+5VDC	+12VDC	GRD
U1	——	14	7
U2	14		7
U6	14		7

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE SCHEMATIC READ & WRITE 12IPS

DWG NO. 1020B0059

SHEET 1 OF 1

MOTOR CONTROL ASSY
A1

POWER SDS1
2 SH.1
J4
2C.AC 6
AC V 8
+24VDC 3
24VRET 4
FRAME GRD 1
+24VDC
24 V RET
+5V SUPPLY
+5VDC
5V RET 3
+5VDC 11
J6

EPR 10
IND 12
REV 13
RUN 14
ENGAGE HEAD 16
LOGIC CONTROL
FORWARD
SERVO ENABLE
BRAKE
TAPE CONTROL
REVERSE
IND
SOL. 1
SOL. 2
TIM
IC PRESENT
RESET
SLOW SERVO

MOTION SDS2
2 SH.1
6 5

J4
7 120 VAC-OUT
9 ACN-OUT
J3
B3PI
3 BLU
2 BLK
1 GRY
5 C1 2 1
4 RED
B3 AC CAPSTAN MOTOR
RED
R1 250Ω 2W
R2 560Ω 1/4W
J7
A1P2
1
2 DS1 CHANGE TA LAMP
3
4 DS2 BOT/EOT LAMP
J5
A1P1
4 S3 TRK A PROT NO COM
1 S2 TRK B PROT NO COM
8 S1 COM NC CASSETTE READY
P
10
2
6
P
J6
5 TPA
6 TPB
4 READY
J2
+24V 2
1
3
B2PI
BLK
RED
B2 FORWARD DC MOTOR
SERVO
4
5
Q2 2N5190
DYNAMIC BRAKE
TAPE TENSION
J1
B1P1
5
SERVO CONTROL
SERVO
4
3
2
Q1 2N5190
BLK
+24 V 1
B1 REVERSE DC MOTOR
RED
PD
MOTION LAMP SDS2
+24V
PD
E2 2 L1 SLIDE PLATE SOLENOID
+24V E1
PD
E4 2 L2 PINCH ROLLER SOLENOID
+24V E3
J6
1 TIM
2 SLOW SERVO
7 TURNS COUNT
8 BOT/EOT

INTEGRATOR
FREQUENCY DETECTOR
+5V R1 500Ω FAST
+5V R2 5K SLOW
+5V R29 25K
TA SQUR
TC
13 U1 12
TA & REEL SERVO
+5v R34 25K
BOT/EOT SQUR
J5
3 5 9 7
A1P1
P
FPT-100 A3V1
CHANGE TA SENSOR
FPT-100 A4V1
BOT/EOT SENSOR

READ/WRITE ASSY
A2
J2
WRITE DATA 7
WRITE DATA 1
WRITE AMPLIFIER
WRITE BUS (1) 8
WRITE BUS (2) 10
A1
A2
B1
B2
J3
1
9
5
2
10
6
PU1P1
ORG
BLK
BLU
RED
WHT
GRN
E1 SLIDE PLATE
READ/WRITE HEAD PU1
TRACK A
TRACK B
SELECT A 2
SELECT B 6
WRITE 9
TRACK SELECT & MODE
A3
B3
GAIN CONT
READ AMPLIFIER
R39 5K GAIN A
R67 5K GAIN B
GAIN 4
PEAK DETECTOR TP1 PEAK DET INPUT
DATA RECOVERY TP2 AMPL OUTPUT
J1
1 +12 VDC
3
2 -12VDC
6
8 +5VDC
10 DATA STROBE
9 READ DATA
KEY
7 DATA LEVEL
J2 KEY
4 12 V RET
5 5V RET

SYRES DATATRONICS, INC. ROCHESTER, NEW YORK
TITLE
SCHEMATIC
TAPE DECK TT-120
DWG NO. 1020B0002
REV
SHEET OF

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. ALL RESISTORS ARE 1/4W 5% CARBON
   B. ALL DIODES ARE IN4154

POWER DISTRIBUTION		
COMP	+5V PIN	GRD PIN
4 & 9-54	14	7
55 & 78	5	10

	SIPS	GIPS	12 IPS
MDT	20-S	40-S	40-S
	10-T	0-T	5-T
R/WEN	20-X	20-X	20-X
	0-W	5-W	16-W

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE: SCHEMATIC CC 120 TRANSPORT CONTROL BD

DWG NO. 1020B 1021 REV

SHEET OF

WRITE 5
DI-1 4
READ 3
READ DATA 7
5KHZ 33
400 KHZ
+5V
WORD SYNC 11
6 PARITY OUT
RSS 39
+5V
40 CHARACTER IN ERROR
38 SYNC EST.
U16
DO5 16
DO6 15
DO7 14
DO8 13
25 REG 1-5
DO1 21
DO2 20
DO3 19
DO4 18
22 REG 1-1
23 REG 1-2
17 REG 1-3
24 REG 1-4
WDS 30
READ SAMPLE 31
26 REG 1-6
27 REG 1-7
28 REG 1-8
PARITY SEARCH 36
U16
U10
U16
U5
U16
U15
37 XFER ENABLE
34 XFER ENABLE
REG 2 CLK 9
WORD SYNC 10
OCS 29
R/W ENABLE 32
35 NINE
8 EIGHT

NOTES:

1. L1 10μH, C2 .1μF, C1 20μF
   +5VDC
   GRD

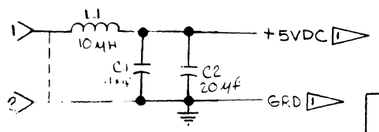
PWR DISTRIBUTION		
COMP. DESIG.	+5VDC TO PIN	GRD TO PIN
U1, U3, U4, U5, U7, U8 U10 THRU U19	14	7
U2 QU6, U9	16	8
U2	14, 2, 3	7

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
SCHEMATIC, DATA REG AND PATH CONT

DWG NO. 1001A0252
SHEET 1 OF 1

NOTES:



PWR DISTRIBUTION		
COMP. DESIG.	+5VDC TO PIN	GRD TO PIN
U1,U2, U5,U6	14	7
U3,U4	16	8
U7	13,14	7

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE

SCHEMATIC, REGISTER 2 CONT

DWG. NO. 10010112

SHEET 1 OF 1

READ DATA 4

WDS 14

READ 25

NINE 18

WRITE 17

R/W ENABLE 16

XTAL 400 KHZ

Y1

+5V

CW

TP1

37 READ SAMPLE

29 10 KHZ

31 $\overline{5\text{KHZ}}$

33 5KHZ

35 WORD SYNC

23 $\overline{\text{WORD SYNC}}$

27 $\overline{\text{PARITY SEARCH}}$

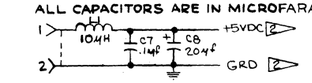
P.S.

SYNC EST 21

12 400 KHZ

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL RESISTORS ARE IN OHMS, 1/4W, ±5%
   ALL CAPACITORS ARE IN MICROFARADS



PWR DISTRIBUTION		
COMP. DESIG.	+5VDC TO PIN	GRD TO PIN
U1, U6, U10 U11, U12, U15, U16	14	7
U3	1, 3, 4, 14	7
U4	16	6, 7, 8
U5	2, 3, 11, 12, 14	7
U7	11, 14, 10	7
U8	10, 14	7
U9	13, 14	7,
U13	2, 12, 14	3, 7 11
U14	2, 11, 12, 14	7
U17	2, 3, 14	7
U2	+5V FILTERED FROM R7 TO PINS 2, 4, 5, 10, 12, 13, 14	7

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
5 IPS SCHEMATIC,
DATA CLOCK GENERATION

DWG NO.
10010122

SHEET 1 OF 1

READ DATA 4

WDS 14

READ 25

NINE 18

WRITE 17

R/W ENABLE 16

29 10 KHZ

31 5KHZ

33 5KHZ

35 WORD SYNC

23 WORD SYNC

27 PARITY SEARCH

37 READ SAMPLE

P.S.

SYNC EST 21

12 400 KHZ

TP1

XTAL 960 KHZ

Y1

R1 2K
R2 1K
R3 1K
R4 2K
R5 1K
R6 1K
R7 10
R8 10K
R9 22.6K ±1%

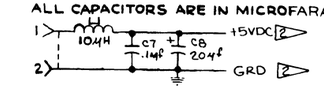
C1 .01
C2 330 PF
C3 300 PF
C4 .01
C6 .01

CW

+5V

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL RESISTORS ARE IN OHMS, 1/4W, ±5%
   ALL CAPACITORS ARE IN MICROFARADS



2)

PWR DISTRIBUTION		
COMP. DESIG.	+5VDC TO PIN	GRD TO PIN
U1, U6, U10, U11, U12 U15, U16	14	7
U3	1, 3, 4, 14	7
U4	16	6, 7, 8
U5	2, 3, 11, 12, 14	7
U7	11, 14, 10	7
U8	10, 14	7
U9	13, 14	7
U13	2, 12, 14	3, 7 11
U14	2, 11, 12, 14	7
U17	2, 3, 14	7
U2	+5V FILTERED FROM R7 TO PINS 2, 4, 5, 10, 12, 13, 14	7

SYKES DATATRONICS, INC. ROCHESTER, NEW YORK

TITLE
12 IPS SCHEMATIC,
DATA CLOCK GENERATION

DWG NO.
1020B1019

SHEET 1 OF 1

NOTES:

1. I.C. POWER DISTRIBUTION

COMPONENT	+5VDC	GRD
U1-4,7,11,13,14,18,21	16	8
U8,19	5	12
U16	14	—
U3,6,9,10,12,15,17,20	14	7

DOT 18
DO2 17
RESET 23
DO7 37
OCS 38
POR 35
MOTION 36
ENGAGE HEAD 22
READ DATA
J2-12 J3-12 J4-12 J5-12
STALL 5
RUN 13
CASS. RDY. J2-32 J3-32 J4-32 J5-32
EOT J2-16 J3-16 J4-16 J5-16
MOT IND 14
WRITE 7
SEL. A 32
TA J2-13 J3-13 J4-13 J5-13
TIM J2-27 J3-27 J4-27 J5-27
DIR 8
ENGAGE CAP. 29
WRITE DATA 25
TPA J2-30 J3-30 J4-30 J5-30
TPB J2-31 J3-31 J4-31 J5-31
WRITE DATA J1-24
+5VDC 21
SIG GRD 1 2
+12V 19
-12V 39

ENGAGE HEAD → J2-28 J3-28 J4-28 J5-28
3 PRD
12 READ DATA
16 STALL
RUN → J2-29 J3-29 J4-29 J5-29
15 CASS. RDY.
26 EOT
31 EOT
MOT IND → J2-14 J3-14 J4-14 J5-14
WRITE → J2-15 J3-15 J4-15 J5-15
SEL.A → J2-7 J3-7 J4-7 J5-7
SEL.B → J2-2 J3-2 J4-2 J5-2
33 TA
10 TIM
DIR → J2-9 J3-9 J4-9 J5-9
ENGAGE CAP. → J2-10 J3-10 J4-10 J5-10
WRITE DATA → J2-6 J3-6 J4-6 J5-6
28 TPA
6 TPB
WRITE DATA → J2-5 J3-5 J4-5 J5-5
+5V → J2-4 J3-4 J4-4 J5-4
+12V → J2-1 J3-1 J4-1 J5-1
-12V → J2-8 J3-8 J4-8 J5-8

L1 10uh
C1 0.1uF
C2 22uF

POWER DISTRIBUTION

TITLE C/C 220 DECK SELECT
DATATRONICS, INC. ROCHESTER, NEW YORK
DWG NO. 102082021
SHEET 1 OF 1