THE INFORMATION CONTAINED IN THE TECHNICAL MANUAL PERTAINS TO THE MACHINE BEARING THE FOLLOWING SERIAL NUMBER

_____

TECHNICAL MANUAL

750 SERIES
REEL-TO-REEL
REPRODUCER

INTERNATIONAL TAPETRONICS CORPORATION
2425 South Main Street Bloomington, Illinois 61701 Telephone: 309-828-1381

ADDENDUM

CONTROL SWITCHES PC CARD
750 SERIES REPRODUCER
AND RECORDER/REPRODUCER

TWO SPEED MOTOR WIRING

General Description

This addendum covers the redesigned version of the 750 Series control switches PC Card, #831-0100-003 and includes information and a diagram of the motor wiring used on two speed models of the 750.

Improvements have been made in the 750 control switches PC Card in three areas, the first being rejection of ambient light in the opto-sensor. This is accomplished by using a new sensor which is much less sensitive to light outside of the infra-red region. The second improvement increases the reliability of the control logic section of the circuit by using a 2N6038 Darlington device in the Q104 position. The third improvement is a by-product of the new sensor. There is no longer a sensitivity adjustment control needed because of the stability of the sensor.

Circuit Description

Q101 (photo detector) and Q102 form a Darlington amplifier to provide a signal which is time delayed by R101 and C102 and inverted by Q103 clamping Q104 off. When a tape is threaded through the sensor, the tape interrupts the light path from CR102 to Q101, turning Q101 off. Q102 and Q103 also turn off, allowing Q104 to turn on via current from R105. Feedback from the collector of Q104 through R104 to the base of Q103 provides hysterisis to speed Q104 to saturation. When Q104 turns on, its collector goes low, providing a ground to the relay logic, allowing control operation. Q104 also provides a ground path for CR103, turning it on. Pressing the stop button deprives Q104 of forward bias, turning it off and releasing the relay logic ground.

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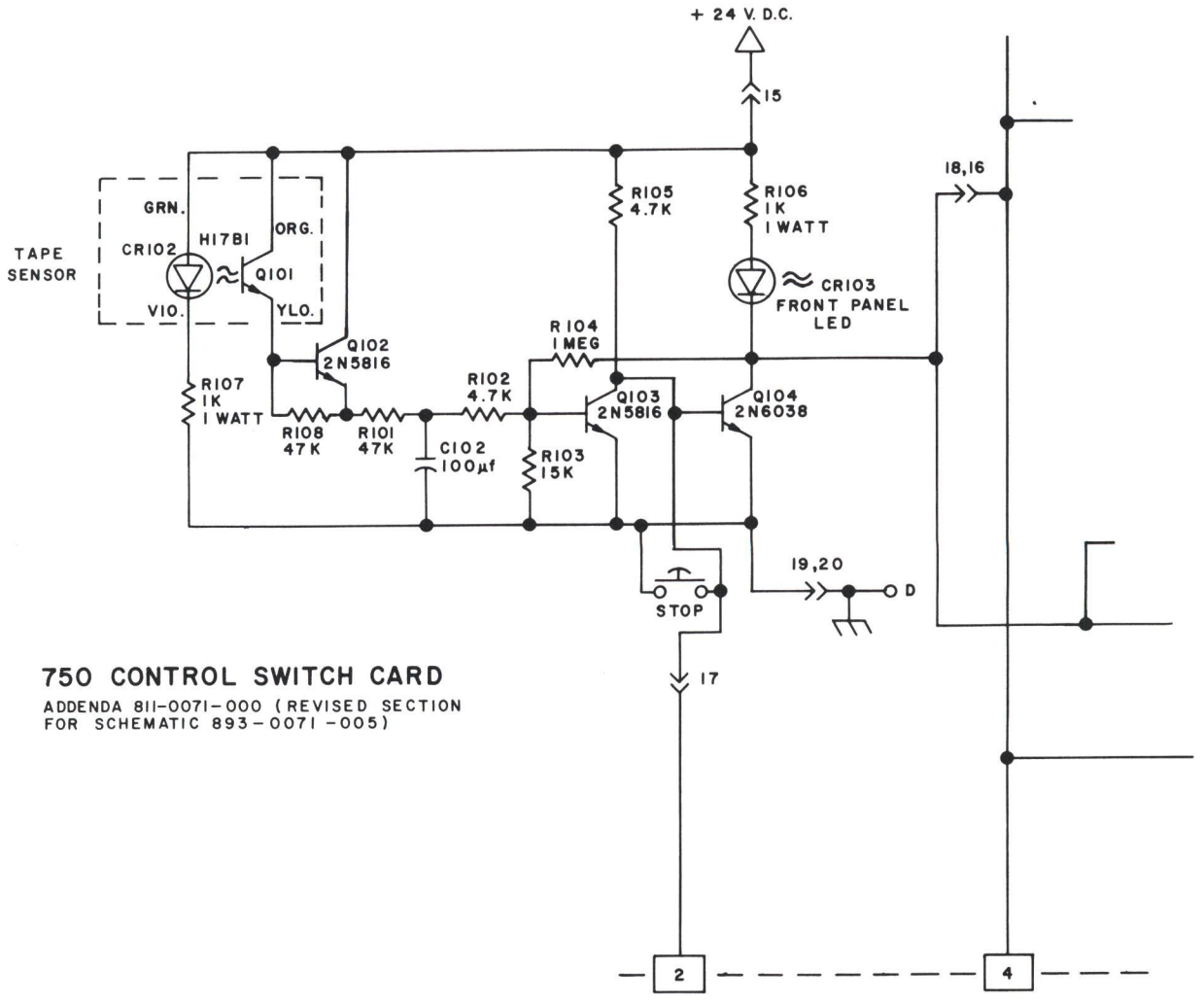
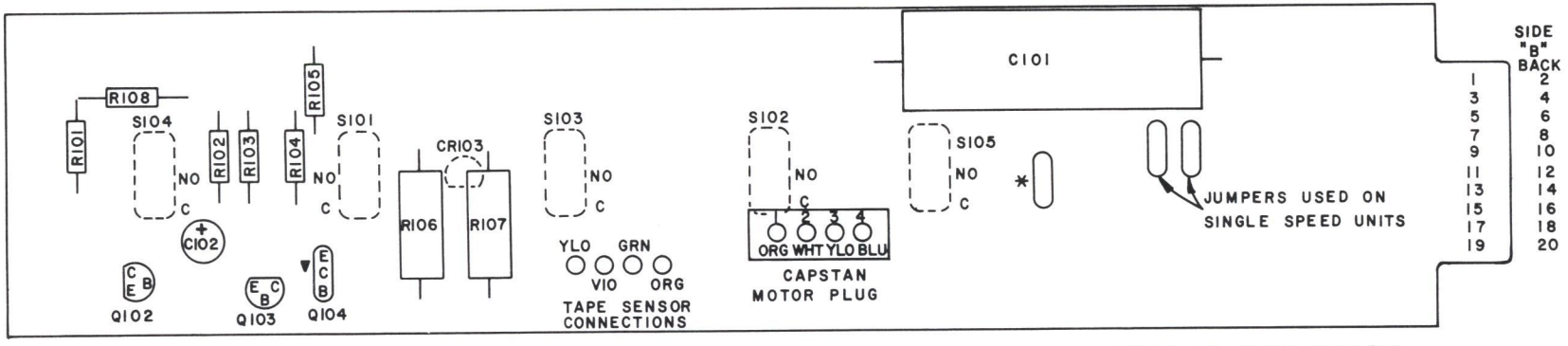
TELEPHONE: 309-828-1381



750 CONTROL SWITCH CARD

ADDENDA 811-0071-000 (REVISED SECTION FOR SCHEMATIC 893-0071-005)



NOTES:

1. * JUMPER MAY BE REPLACED WITH POWER ON-OFF SWITCH
2. DASHED LINES INDICATE COMPONENTS MOUNTED ON SIDE "B".
3. ▼ LETTERED SIDE OF PART. IF NOT MARKED "ECB" ON Q104.

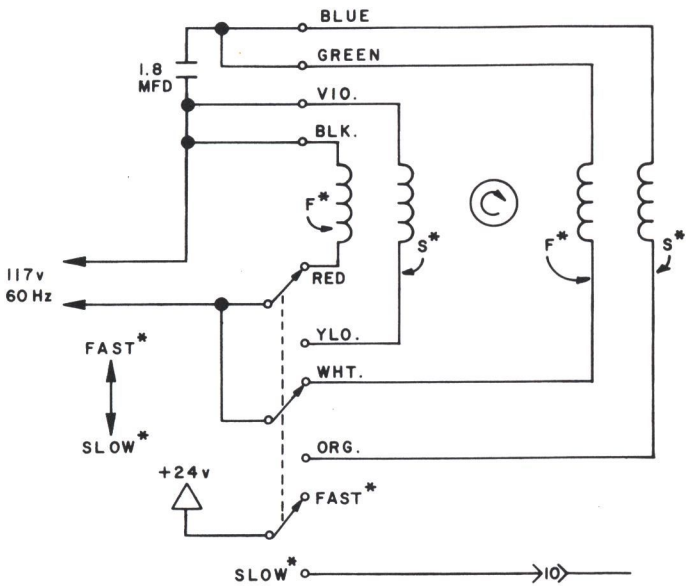
SWITCH PC BOARD ASSEMBLY
831-0100-003
ADDENDA 811-0071-000

Parts List

Quantity	ITC Part Number	Description
1	832-0500-250	Opto Sensor Assembly (Contains Q101 & CR102)
2	626-0463-000	Resistor 1000 ohm 1 watt
2	630-0103-000	Resistor 47K ohm 1/4 watt
2	630-0079-000	Resistor 4.7K ohm 1/4 watt
1	630-0091-000	Resistor 15K ohm 1/4 watt
1	630-0135-000	Resistor 1 meg ohm 1/4 watt
2	590-0017-000	Transistor 2N5816
1	590-0022-000	Transistor 2N6038
1	575-0012-000	Diode LED
1	694-0009-000	Capacitor 100 mfd 10V Tantalum

Two Speed Motor Wiring

The following diagram shows the wiring of the two speed motor and the associated speed switch.



ROTATION: CW VIEWED FROM SHAFT END.

NOTE:

1. * ON RECORD AMP ITS HIGH OR LOW.
   FAST & F = HIGH
   SLOW & S = LOW

750 2 SPEED MOTOR WIRING

MOTOR TYPE SAI-5A/6A
ADDENDA 811-0071-000

2425 South Main
Post Office Box 241
Bloomington, Illinois 61701

INTERNATIONAL TAPETRONICS CORPORATION

MAINTENANCE PARTS PRICE LIST
750 SERIES RECORDER/REPRODUCER

August 1, 1980
Telephone: 309-828-1381
Twx: 510-352-2500 ITC BLMG

ITEM NO.	PART NUMBER	DESCRIPTION	PRICE
ELECTRONIC PARTS			
1	480-0006-000	Relay, 24 VDC, 4 PDT, Clare	$ 7.40
2	575-0007-000	Diode, 1N4005	.25
3	575-0012-000	Diode, LED	.75
4	590-0001-000	Transistor, 2N3053	.75
5	590-0022-000	Transistor, 2N6038	1.75
6	596-0001-000	Transistor, JFET P-Channel 2N3993	2.75
7	590-0017-000	Transistor, 2N5816	.60
8	590-0018-000	Transistor, 2N5817	.60
9	590-0013-010	Transistor, 2N5089	.50
10	575-0011-000	Rectifier, Full Wave Bridge G175KBP04	1.50
11	605-0004-020	IC, Voltage Regulator 7824 TO 220	4.00
12	832-0500-250	Opto Sensor Assembly 750	15.00
13	606-0008-000	IC, LM 378	4.00
14	606-0009-000	IC, LM 382	2.50
15	608-0003-000	IC, AH 5009	10.00
16	554-0002-000	Meter, VU Modutec	30.00
17	513-0004-000	Inductor, VAR 8-20 mH	3.75
18	636-0019-000	Trimmer, Pot 20K OHM	1.75
19	636-0020-000	Trimmer, Pot 1K OHM	2.50
20	636-0014-000	Trimmer, Pot 2.5K OHM	4.00
21	636-0018-000	Trimmer, Pot 10K OHM	1.75
22	636-0017-000	Trimmer, Pot 500 K	1.50
23	683-0012-000	Capacitor, Torque Motor, 7.5 MFD, 236 VAC	9.00
24	685-0012-000	Capacitor, Motor Capstan, 1.8 MFD	5.00
25	532-0001-020	Transformer, Audio Output, PC Card Mount	10.50
26	432-0005-000	Cable, Control Interconnect	27.00
27	432-0006-000	Cable, Audio Interconnect	18.00
28	432-0007-000	Cable, Head Interconnect (Record or Erase)	22.50
29	648-0001-000	Varistor GEV150LA20A	4.75

DM/8-1-80

HEADS

1	504-0013-000	Head, Erase, 1/2 Track PRB2EH4	75.00
2	504-0014-000	Head, Erase, Full Track PR-131EF4NO	75.00
3	504-0003-000	Head, Record, 1/2 Track LP-B2H4R	45.00
4	504-0018-000	Head, Record, Full Track PR-R1F4R-NO	72.50
5	504-0030-000	Head, Reproduce, 1/2 Track 4NR2HX-0	25.00
6	504-0015-000	Head, Reproduce, Full Track, 7NHIFX-0	27.50

PRINTED CICUIT CARDS

1	831-0100-013	P.C. Card, Control Switches R/P	73.00
2	831-0108-003	P.C. Card, Recorder & Meter Amplifier (Mono) 3 3/4 - 7 1/2	150.00
3	831-0108-013	P.C. Card, Recorder & Meter Amplifier (Stereo) 3 3/4 - 7 1/2	245.00
4	831-0108-023	P.C. Card, Recorder and Meter Amplifier (Mono) 7 1/2 - 15	145.00
5	831-0108-033	P.C. Card, Recorder and Meter Amplifier (Stereo) 7 1/2 - 15	250.00
6	831-0107-003	P.C. Card, Bias Oscillator & Recorder Control (Mono) Half Track	115.00
7	831-0107-013	P.C. Card, Bias Oscillator & Recorder Control (Stereo)	180.00
8	831-0107-023	P.C. Card, Bias Oscillator and Recorder Control (Mono) Full Track	125.00
9	831-0109-003	P.C. Card, Mother Board (Mono) (includes output transformer)	80.00
10	831-0109-013	P.C. Card, Mother Board (Stereo) (Includes output transformers)	120.00
11	831-0113-003	P.C. Card, Program Amplifier (Mono)	77.50
12	831-0113-013	P.C. Card, Program Amplifier (Stereo)	140.00
13	831-0105-003	P.C. Card, Motion Sense, 750	45.00

SWITCHES

1	390-0004-000	Switch, Toggle, SPDT	3.65
2	391-0013-000	Switch, Pushbutton	3.00
3	404-0021-000	Lens, White	.25
4	404-0022-000	Lens, Yellow	.25
5	404-0023-000	Lens, Green	.25
6	404-0024-000	Lens, Blue	.25
7	315-0013-000	Knob, Level Control	1.65
8	391-0014-000	Switch Assembly, 3 Station, Stereo, (Recording Amplifier)	10.00
9	391-0016-000	Switch Assembly, 2 Station, Mono, (Recording Amplifier)	7.00
10	391-0015-000	Switch Assembly, 3 Station, Meter Select, (Recording Amplifier)	9.50

MECHANICAL PARTS

1	251-0019-000	Bearing, Ball 750 Tape Guide	7.00
2	272-0022-001	Guide, 750 Tape Guide	5.00
3	300-0036-001	Bearing, Standoff	.50
4	477-0006-002	Solenoid, Front Mount	40.00
5	264-0002-001	Clevis Screw	2.50
6	832-0500-145	Torque Motor Assembly (Supply) (Includes Motion Sense)	155.00
7	832-0500-160	Torque Motor Assembly (Take-Up)	115.00
8	451-0065-003	Motor, Torque	60.00
9	451-0059-020	Motor, Capstan, with plug, 7 1/2 - 15 IPS (SA1-5A)	327.50
10	451-0058-020	Motor, Capstan, wth plug, 3 3/4 - 7 1/2 IPS (SA1-6A)	330.00
11	832-0500-165	Brake, Band Assembly	5.00
12	832-0500-170	Roller Brake Assembly	20.00
13	832-0500-205	Head Cover Assembly	8.00
14	832-0500-105	Foil Sense Assembly	11.50
15	300-0047-000	Spacer, Torque Motor Shaft	2.25
16	359-0002-000	Washer, Roller Spacer	.20

MISCELLANEOUS PARTS

1	837-0008-002	Pressure Roller Assembly	45.00
2	830-0022-001	Gauge, 750 Alignment	25.00
3	878-0045-000	Kit, 750 Motion Sensor	60.00
4	864-0012-000	Retainer, NAB Reel (VIF) (1)	22.50
5	864-0010-000	Retainer, Rubber (1)	1.50
6	831-0075-003	Test Extender (Reproduce) (22 Conductor)	24.00
7	831-0119-003	Test Extender (Recorder) (22 Conductor)	27.50
8	890-0015-000	Instruction Book, 750 Reproducer Section Only	5.00
9	890-0018-000	Instruction Book, 750 Recording Amplifier Only	5.00
10	284-0007-010	Level Knob Hole Plug	.75
11	478-0002-001	Airpot	22.50
12	832-0500-130	Power Transformer Assembly 750 Rec/Play	31.50

All prices are subject to change without notice.

The above price list is provided for our customers' convenience as these commonly used parts are readily available from our stock for maintenance and repair. Because our selling price is based on our actual costs, you may find some items can be purchased at lower costs from an electronics house than from International Tapetronics Corporation.

All pricing above is U.S. Domestic only. Prices will vary outside U.S. Territory. Minimum Order: $15.00

ADDENDUM

SUPPLY TENSION ARM AND TORQUE BOOST ADJUSTMENT FOR 750 REEL-TO-REEL MACHINES

GENERAL DESCRIPTION

All International Tapetronics Corporation 750 Series Reel-to-Reel machines are supplied with an improved tape handling system. This system will allow for optimum control of slack tape and tape "bounce" encountered when the start mode is entered from a ready-stop condition. The new system incorporates controlled air damping on the supply tension arm that works in conjunction with the torque boost circuitry.

Generally, the air damping on the supply tension arm is provided to compensate for the situation whereby the tape loses contact with the heads when the start mode is activated (tape "bounce"). The torque boost adjustment is provided to minimize the amount of slack tape generated between the pressure roller and the take-up reel when the start mode is entered.

The following adjustment procedure is provided should you now be experiencing these problems or should adjustment be necessary in the future. This adjustment procedure supercedes the suggested procedure found on Page 6-1 of the 750 Series Reel-to-Reel Reproducer Technical Manual. Please attach or insert this procedure in your Technical Manual for future reference.

ADJUSTING CONTROL LOCATIONS

The supply tension arm damping control (airpot) is located inside the electronic chassis housing. An access hole is provided on the lower section of the right side panel of the chassis, near the deck plate, when the deck is viewed from the rear. If necessary, the top cover of the electronics chassis housing can be removed for visual location of the airpot assembly.

Warning: The air pot should only be adjusted with an insulated flat blade screwdriver as hazardous voltages are present inside the chassis.

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TELEPHONE: 309-828-1381

The torque boost duration control (potentiometer) is located on the reproducer mother board. Again, there is an access hole in the rear panel of the electronics chassis housing. See Figure 6-4 on page 6-1 of the Technical Manual for location of this potentiometer.

ADJUSTMENT PROCEDURE

It must be remembered that the supply tension arm adjustment and the torque boost duration adjustments work in conjunction with each other. Therefore, adjustment of one will often require readjustment of the other.

A. Torque Boost Adjustment

1. Attach two large reels (10") to the machine and properly thread the tape from the supply reel, through the head assembly, and on to the forward take-up reel.

2. Place the reel switch in the large reel position and fast wind the tape so that almost the entire length of tape is on the forward take-up reel.

3. Repeatedly start and stop the machine and adjust the torque boost time until the slack tape thrown between the pressure roller and the forward take-up reel is minimized.

4. Leave the torque boost adjustment at this setting for the time being.

B. Supply Tension Arm Damping Adjustment

1. With an insulated flat blade screwdriver, adjust the supply tension arm airpot so that the tension arm exhibits a smooth, gentle return to the upward most position. Roughly speaking, it should take approximately one second for the arm to return when pulled down to its lowermost position. After pulling the arm down, allow a moment for the airpot to stabilize before releasing the tension arm.

2. With almost the entire length of tape wrapped on the forward take-up reel, repeatedly start and stop the machine and observe the amount of tape "bounce" present.

3. Adjust the airpot until the tape doesn't lose contact with the heads. Please note that the airpot has an effective range of approximately one quarter of a turn. Therefore, make this adjustment cautiously as a small adjustment change can have major impact in controlling the tape "bounce."

It should be noted, that one additional adjustment that can have a minor effect on controlling tape "bounce" and slack tape, is the rate at which the pressure roller descends to contact the capstan shaft. It is desirable to have the pressure roller descend as quickly as possible to help control these situations. At the same time, some damping action must be maintained to minimize the mechanical noise level of the pressure roller assembly.

The pressure roller damping is adjusted by means of an air release valve on the pressure roller/tape lifter solenoid. (See page 8-2, item 24 in the Technical Manual). To make this adjustment, repeatedly start and stop the machine and rotate the air release valve counter-clockwise until the pressure roller assembly begins to make a "slapping" noise. At that point, slowly rotate the valve clockwise until the "slapping" noise disappears. Leave the solenoid air release valve at this setting.

At this point it would be advisable to again verify the Torque Boost Adjustment, "Item A" and, if necessary, fine-tune the Supply Tension Arm Damping Adjustment "Item B."

This concludes the adjustment procedure. Proper operation can be verified by repeatedly stopping and starting the machine with varying amounts of tape loaded on the forward take-up reel.

832-0011-002
ITC ADDENDA AND INSTRUCTIONS FOR PRESSURE ROLLER REPLACEMENT ON ITC 750 SERIES REEL-TO-REEL

PARTS LIST

Qty	Part Number	Description
1	832-0011-002	Pressure Roller Assembly

The pressure roller supplied with this kit is made of a polyurethane material which has been selected to provide optimum tape drive. The surface of the new pressure roller has been carefully manufactured to the proper diameter to insure proper concentricity (minimum run-out), and the permanently lubricated ball bearing allows the pressure roller to automatically align itself to the capstan shaft.

To install the new pressure roller, first remove the old pressure roller. This can be done by loosening the pressure roller shaft locking screw (Item #66 on Figure 8-2 in the 750 Instruction Book). The old pressure roller can then be removed and the new one installed. Be sure to retighten the lock screw.

IF THE MACHINE PREVIOUSLY HAD A BLUE POLYURETHANE PRESSURE ROLLER, NO FURTHER ADJUSTMENTS ARE NECESSARY. HOWEVER, IF THE MACHINE HAD A BLACK RUBBER PRESSURE ROLLER, THE FOLLOWING ADJUSTMENTS ARE NECESSARY:

INTERNATIONAL TAPETRONICS CORPORATION
P.O. BOX 241 2425 SOUTH MAIN STREET BLOOMINGTON, ILLINOIS 61701

Due to the improved driving characteristics of the polyurethane material, less pressure is required to provide proper tape drive.

Section C, Page 6-2, of the 750 Instruction Book shows the adjustment procedures for the pressure roller pressure. This procedure can be followed with the exception that the new pressure roller should be adjusted as follows:

For 7.5 IPS - 15 IPS machines, the pressure should be adjusted for 6 to 7 pounds.

For 3.75 IPS - 7.5 IPS machines, the pressure should be adjusted to 4½ to 5½ pounds.

If there are any questions about installation or adjustments, please call the ITC Technical Service Department collect at 309-828-1381.

TECHNICAL SERVICE INFORMATION

TO: All ITC Customers
(Please forward to Engineering Department)

RE: Returned Equipment and Components Policy

Dear Chief Engineer:

ITC's objective is to offer the best possible service to our customers. This objective carries through to any equipment that is returned for service--whether it's under warranty or being charged to the customer. Occasionally, however, we've found that our ability to provide this high caliber of service is hampered by our receipt of assemblies and machines without the customer's prior contact with ITC. Special procedures have been developed to allow expedient repair of customer returned items. However, our system only works when we have been notified by the customer that an item will be returned.

Here's how you can help:

1. If a problem is encountered with an ITC machine, call our Technical Service Department collect, at 309-828-1381. Most often, the problem can be diagnosed over the telephone and the necessary replacement part(s) can be shipped. . .often the same day. In most cases, this is the fastest and least expensive method of making the repair for both the customer and ITC.

2. If the problem can't be remedied via telephone conversations, ITC will gladly repair the defective item and return it to you. All we require is notification from you that the item will be returned.

INTERNATIONAL TAPETRONICS CORPORATION
2425 SOUTH MAIN STREET • BLOOMINGTON, ILLINOIS 61701
TELEPHONE: 309-828-1381

3. When returning an item or machine for repair, please take a moment to:

   A. Write a note and describe the problem as fully as possible.

   B. Be sure to include on the list your name, call letters or company name, and phone number.

4. Package the item securely! Often we receive items that have sustained shipping damage. Occasionally, the damage is sufficiently extensive as to prohibit repair. ITC is not liable for shipping damage. Also, we strongly recommend that complete machines be returned in their original packing material. If you don't have the proper shipping materials, ITC can supply them. It takes longer but it is better to be safe than sorry. Remember--you are responsible for shipping damage.

5. Return the machine with prepaid shipping via your choice of transportation. If necessary, ITC will offer suggestions on methods of shipment.

6. It is an excellent idea to insure the parcel. Declared value can be obtained from the appropriate ITC price list.

It is our sincere hope that you will assist us in this matter. When an item is returned without our prior knowledge, every customer suffers.

Thank you for your cooperation.

SECTION X

WARRANTY

750 SERIES

International Tapetronics Corporation (ITC) warrants to Purchaser that the equipment sold is free of defects of workmanship or material and conforms to the specifications referred to or set out herein. This warranty, applying only to the original user, extends from date of shipment for a period of two years. No claim shall be maintained hereunder unless written notice is received by Seller within thirty days after the discovery of the facts giving rise to the claim. The sole or exclusive liability of Seller for breach of warranty shall be to refund the purchase price of the item sold, or at its option, to replace or repair the item or part concerned FOB its factory, or such other place as it may designate. ITC's liability shall arise only if Purchaser causes the defective part or item to be delivered to ITC for inspection upon ITC's request at Purchaser's expense. This warranty shall not be effective if the alleged defect is due to maltreatment, exposure, excessive moisture or any other use of the equipment other than the use for which the manufacturer prescribed.

No warranties expressed or implied shall be applicable to any equipment sold hereunder, and the foregoing shall constitute the Buyer's sole right and remedy under the agreements in this paragraph contained. In no event shall International Tapetronics Corporation have any liability for consequential damages, or for loss, damage, or expense directly or indirectly arising from the use of the products, or any inability to use them either separate or in combination with other equipment or materials, or from any other cause.

ITC's warranty is given solely to the original user and only to the extent above described. No dealer or agent is authorized to make any other or additional guaranty or warranty.

TECHNICAL MANUAL
(890-0015-000)

750 SERIES
REEL-TO-REEL
REPRODUCER

INTERNATIONAL TAPETRONICS CORPORATION
2425 SOUTH MAIN STREET • BLOOMINGTON, ILLINOIS 61701
TELEPHONE: 309-828-1381

THE ITC INSTRUCTION MANUAL

International Tapetronics Corporation manuals are dedicated to assisting the reader-user toward a better understanding of ITC equipment. Most instruction manuals are seldom read except in the time of crisis when equipment malfunction is suspected. When this happens the manual is usually missing, or at best, difficult to locate. So to start things off on the right foot, WHY NOT FIND A CONVENIENT SPOT TO KEEP THIS MANUAL?

We at ITC have tried to produce a usable manual. But being human, we are subject to the frailties of behavior. Therefore, should you discover any errors or omissions, or should you wish to contribute any recommendations, send us your comments. We at ITC will be most appreciative.

TABLE OF CONTENTS

ILLUSTRATIONS

832-0011-002

ITC ADDENDA AND INSTRUCTIONS FOR PRESSURE ROLLER REPLACEMENT ON ITC 750 SERIES REEL-TO-REEL

PARTS LIST

Qty.	Part Number	Description
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To install the new pressure roller, first remove the old pressure roller. This can be done by loosening the pressure roller shaft locking screw (Item #66 on Figure 8-2 in the 750 Instruction Book). The old pressure roller can then be removed and the new one installed. Be sure to retighten the lock screw.

IF THE MACHINE PREVIOUSLY HAD A BLUE POLYURETHANE PRESSURE ROLLER, NO FURTHER ADJUSTMENTS ARE NECESSARY. HOWEVER, IF THE MACHINE HAD A BLACK RUBBER PRESSURE ROLLER, THE FOLLOWING ADJUSTMENTS ARE NECESSARY:

Due to the improved driving characteristics of the polyurethane material, less pressure is required to provide proper tape drive.

Section C, Page 6-2, of the 750 Instruction Book shows the adjustment procedures for the pressure roller pressure. This procedure can be followed with the exception that the new pressure roller should be adjusted as follows:

For 7.5 IPS — 15 IPS machines, the pressure should be adjusted for 6 to 7 pounds.

For 3.75 IPS — 7.5 IPS machines, the pressure should be adjusted to 4½ to 5½ pounds.

If there are any questions about installation or adjustments, please call the ITC Technical Service Department collect at 309-828-1381.

A. GENERAL INFORMATION

ITC's new 750 Series has been designed and built for broadcasters and is ideally suited for use in program automation systems. The 750 Series reel-to-reel reproducer is designed to meet or exceed the NAB standards for reel-to-reel tape reproducing. These units are available in a variety of configurations which include one or two-track capabilities and tape speeds ranging from 3¾ inches per second to 15 inches per second. Also available on special order are two-speed machines which would operate at either 3¾ - 7½ IPS or 7½ - 15 IPS.

B. TAPE TRANSPORT

The ITC 750 reproducers are constructed on a heavy ½-inch thick aluminum tool-plate deck. The tool-plate deck is superior to a cast deck because it is inherently stress-relieved so that thermal changes will not cause instability. To make best use of this tool-plate deck, the brake, tape lifter, and head assemblies are all incorporated within the aluminum plate. Use of the deck plate in this manner not only eliminates extra subassemblies that would normally mount externally but also insures maximum phase alignment stability as well as optimum tape handling characteristics.

The tape drive system uses three individual, permanently lubricated ball bearing motors. The capstan motor is a hysteresis synchronous direct-drive type with a large diameter shaft. The two reel drive motors are four-pole, 1800 RPM, induction motors which develop sufficient torque to provide positive control of most standard size reels.

An air-damped solenoid is used to control the tape lifter/pressure roller assembly. The use of the air damping and Teflon covered plunger in this solenoid results in quiet operation and almost no maintenance. The brake assembly solenoids incorporate fiber liners and, therefore, never require lubrication.

C. HEAD ASSEMBLY

The ITC 750 Series machine is equipped with an unique head assembly which utilizes a high quality professional head nested in a bracket designed to provide total azimuth, height, and zenith adjustment. The head mounting bracket is of very sturdy construction with the azimuth pivot point located directly behind the center of the heads in both a vertical and horizontal plane. This feature permits azimuth adjustment without disturbing the zenith adjustment. The head assembly also includes provision for locking the head in position after adjustment, and the head mounting arrangement permits rapid head replacement when required.

Incorporated into the head assembly is a tape lifter system which provides manual, as well as automatic, operation. Tape is automatically lifted away from the reproduce head during any of the fast wind modes and automatically returned to its normal wrap on the reproduce head in the PLAY or START mode. Automatic operation of the lifter assembly may be defeated in the fast mode simply by pushing the CUE lever toward the reproduce head. The lifters will now remain in this position until the START mode is entered or the CUE lever is manually returned to its "lifted" condition.

As an aid to head maintenance and tape marking/editing, the entire head assembly is housed in a "flip-top" cover. The "flip-top" cover is hinged and sprung in such a manner that it can be easily opened or closed and remain in either state.

D. ELECTRONICS

Simplicity and serviceability are the keys to the electronics incorporated into the 750 Series reel-to-reel reproducers. A mother-daughter board construction, coupled with ribbon cable connectors, virtually eliminates any bulky wiring harnesses. All assemblies, including motors, solenoids, and P.C. boards, plug in for easy serviceability and field replacement. All normal maintenance adjustments are accessible from the front panel of the 750 Series machine. Removal of the switch dress panel exposes equalization and program level calibration. Also available at the front panel are limited range level controls designed to give a 8 dB boost in gain from the calibrated position (vertical) or a 4 dB drop in audio level. A headphone jack is provided for program monitoring purposes.

All electronic logic is either transistor or simple relay type. Transistors and relays plug into sockets mounted on the printed circuit boards.

E. OPTIONS

The following are options which are available on special request.

1. Power on-off switch
2. Two-speed capstan motor — 3¾ - 7½ IPS or 7½ - 15 IPS
3. Motion sensing — includes an additional P.C. board circuit which automatically senses the motion of tape reels when in the fast mode of operation and prevents tape destruction due to an error on the part of the operator. A feature of this motion sense circuit is start memory which al-

lows the start circuit to be entered directly from the fast mode.

4. Audio output transformers (factory installed) — provide 600 ohm balanced output.

F. SPECIFICATIONS

Power: 105 to 125 volts AC, 60 Hz, 150 watts maximum

Wind Time: Less than 60 seconds for 2400 feet of tape
Less than 90 seconds for 3600 feet of tape

Motors: Capstan—direct-drive hysteresis synchronous with electrolyzed shaft and instrument-type permanently lubricated ball bearings

Torque—induction motors (two) with ball bearings provide 20 ounce/inches of torque

Tape Speed: 7½ IPS (other speeds available optionally)

Reel Sizes: Handles ¼ inch-tape and either NAB or EIA hubs with diameters greater than 1¾ inches. Maximum reel flange diameter 10½ inches. Selectable tape tension for small *or* large reels.

Timing Accuracy: 0.2% or better

Flutter (NAB Weighted): 0.07% (at 7½ IPS)

Audio Output: +18 dBm before clipping into 600 ohm load, unbalanced (600 ohm transformers optional)

Distortion: 0.5% maximum total RMS amplifier distortion at +16 dBm output level at 1 kHz

Signal-To-Noise: -52 dB using 400 Hz tone recorded at NAB Standard Reference Level with reproduce amplifier adjusted for +8 dBm output and measuring unweighted noise

-70 dB using 1 kHz tone recorded at 500 nWb/m (approximately 8 dB above NAB Standard Reference Level) and measuring NAB weighted noise

Crosstalk: Better than 50 dB at 1 kHz

Frequency Response: ±2 dB from 50 to 15,000 Hz

Equalization: NAB with adjustment for high frequencies

Headphone Output: 8 ohms or greater

Brakes: Mechanical brakes with stainless steel bands

Remote Control: All operating mode indicators and controls

External Connectors: Latching type, mating plugs furnished

Dimensions: 19" wide (1¼" overhand on each side with 10½" reels)

14" high (2¼" overhand on top with 10½" reels)

9" deep

Weight: 41 lbs. unpacked

A. UNPACKING AND HANDLING

Carefully remove the ITC 750 Series reel-to-reel reproducer from the shipping carton and inspect the unit for damage. All packing material must be retained if a claim for shipping damage is to be filed and, therefore, should be kept on hand until installation has been completed in case concealed damage is discovered. If shipping damage is found, contact International Tapetronics immediately for assistance in claims. It is suggested that packing material be retained for any future use.

B. INSTALLATION IN RACK

750 Series reel-to-reel machines are supplied in a 19-inch rack mounting configuration. To provide adequate ventilation, vertical spacing between reel-to-reel machines and other equipment should be from 1¾ to 3½ inches depending on the temperature inside the closed rack. Please refer to Figure 2-1 for deck size and reel overhang dimensions. Because of the close proximity of the reels with respect to the deck plate, it may be necessary in some applications to space out the 750 Series deck in the rack installation. A simple, inexpensive ¼-inch spacer can be made by using a 10-32 socket head screw with a 1/16-inch flat washer spaced below it. Four of these spacers may be mounted in the rack panel near the location of the four mounting slots in the 750 Series deck.

C. CONNECTING AUDIO LINES

A six pin unwired plug to be used for connecting the audio output of the 750 Series reproducer is provided with each machine. Refer to Figure 2-2 for the connecting of these audio lines. Care should be taken to insure proper phasing of each channel on stereo machines. It is recommended that two conductor shielded cables be used for output connections.

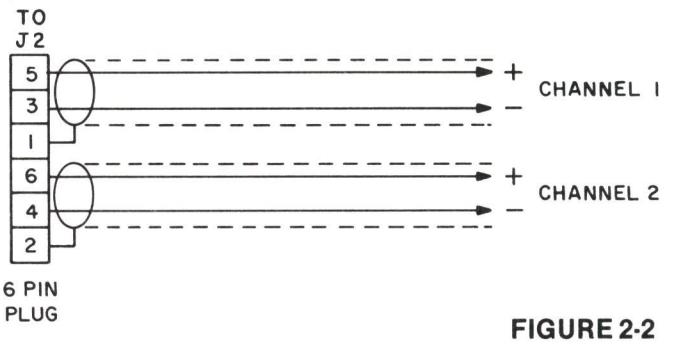
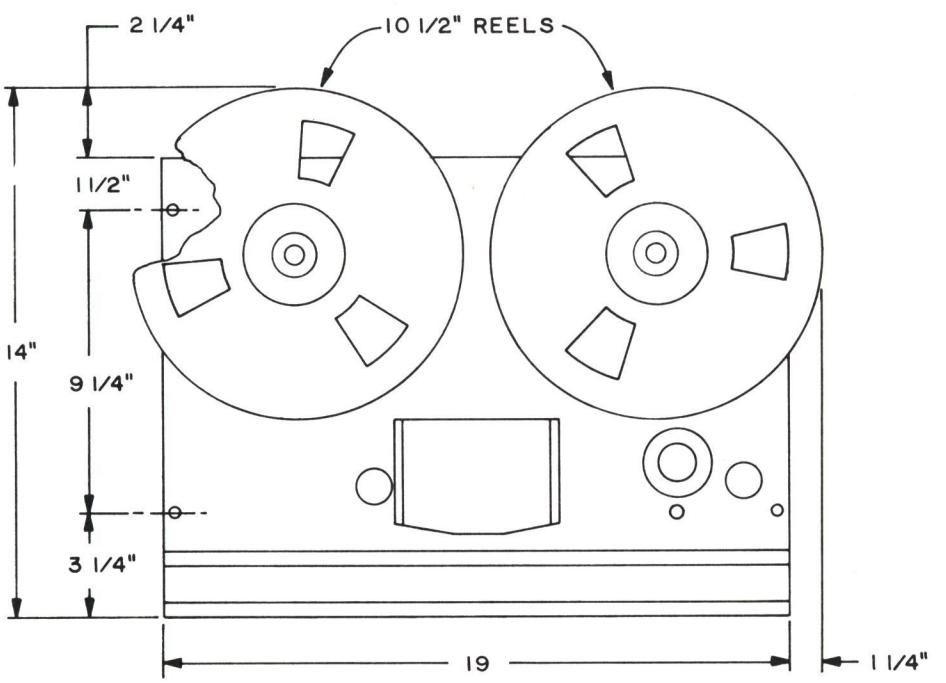


FIGURE 2-2

D. CONNECTING REMOTE CONTROLS

Remote control functions are provided through Connector J-1 for start, stop, fast rewind, fast forward, and associated lamp circuits. All switching functions require a normally open mo-



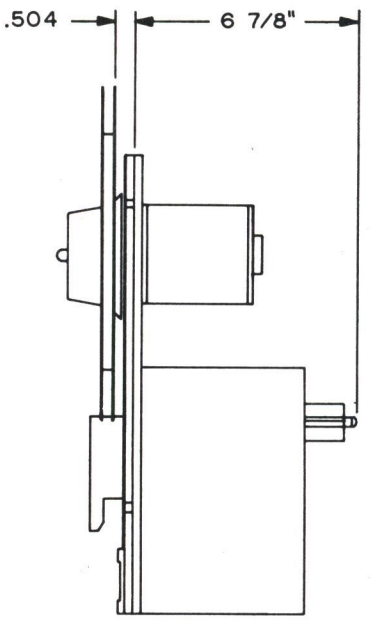


FIGURE 2-1

mentary type switch. A 15 conductor plug is supplied with the machine for wiring the remote functions. Please refer to Figure 2-3 for a sample remote control schematic.

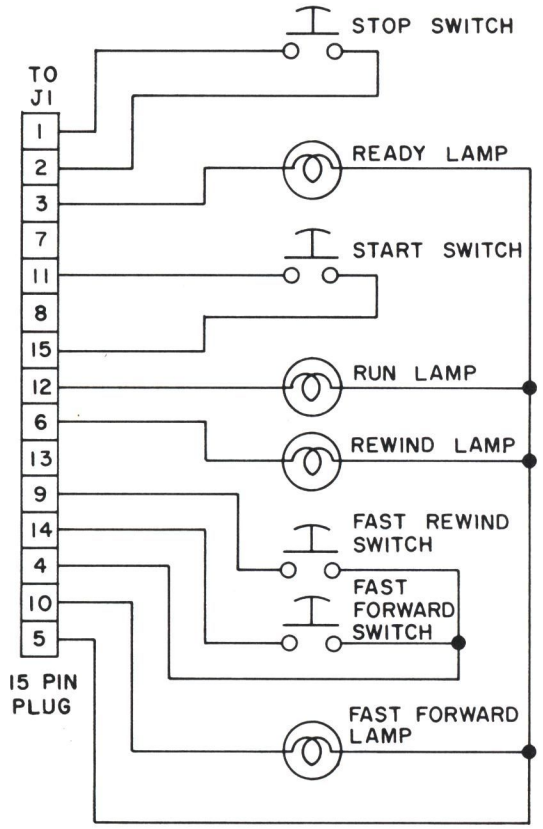


FIGURE 2-3

E. BEFORE OPERATION INITIAL TESTS

Before operating the ITC 750 Series reel-to-reel machine, determine that all motors and rotating parts are free and work easily. Check to see that P.C. cards, relays, and ribbon cable connectors are properly seated. Insure that the line frequency and voltage are correct before plugging in the AC cord. With the insertion of the AC power cord into the appropriate outlet, the capstan motor should begin turning. Proceed now to Section III, Operating Instructions.

A. THREADING THE TAPE

The ITC 750 Series reel-to-reel reproducer is designed in such a manner that tape may be threaded without opening or closing any doors or interfering members. Please refer to Figure 3-1 for a drawing of the tape loading path. If tape has been loaded properly the ready indicator LED on the front panel will illuminate.

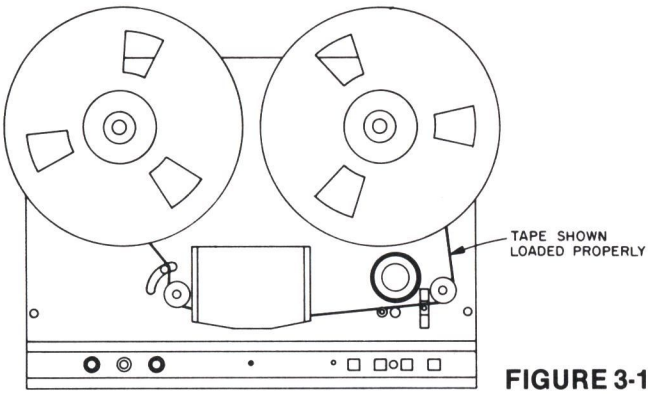
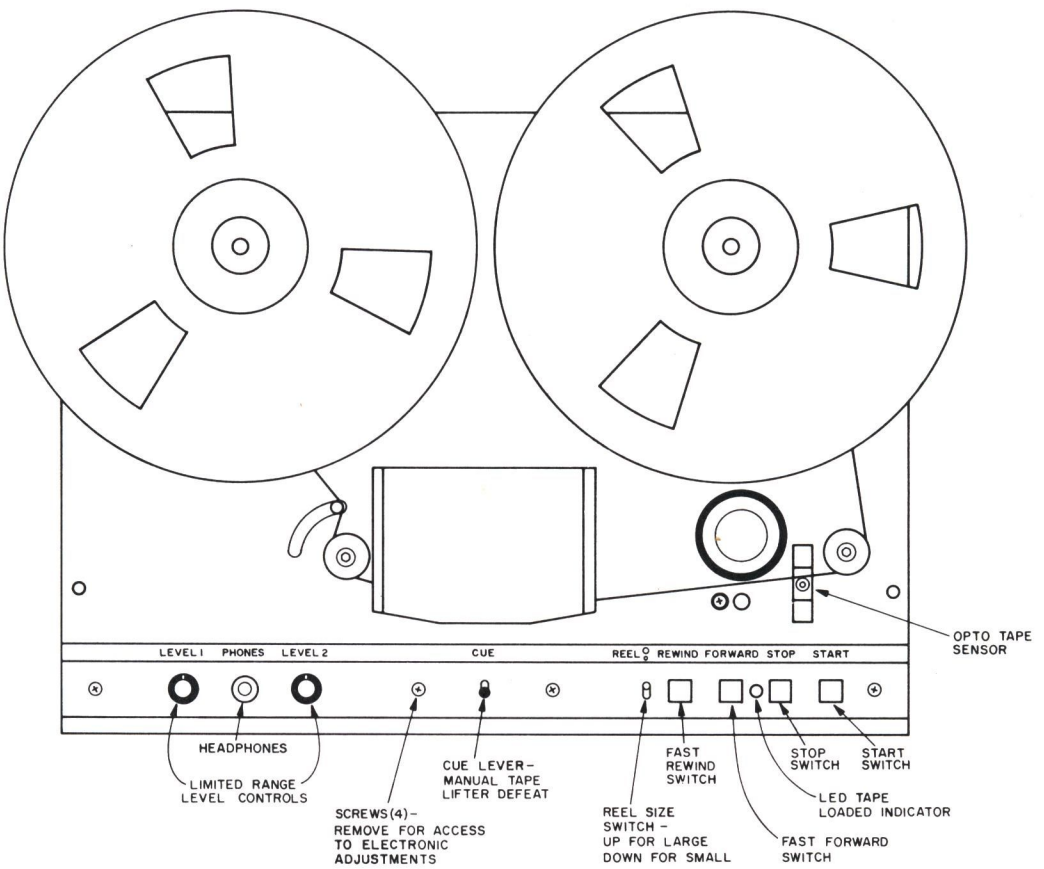


FIGURE 3-1

B. CONTROLS AND INDICATORS

Refer to Figure 3-2 for a front view of the reproducer unit, showing all the various switching functions.

1. The START SWITCH, when pressed, will automatically cause the transport mechanism to move tape at the normal speed required for accurate reproduction of recorded material. The start switch will not function if the tape has been loaded improperly, therefore, not interrupting the LED phototransistor tape sensing switch, located directly after the capstan shaft. When the start switch is pressed, full torque is momentarily applied to the forward reel motor to cause the tape to move instantly. The duration of this "torque boost" may be adjusted on the rear of the machine. The start switch is not active when the machine is in the fast rewind or fast forward mode of operation (unless the machine is equipped with the optional motion sense circuitry). A built-in start mode delay circuit prevents entering the start mode for approximately one second after the fast forward or fast rewind modes of operations. This built-in delay is simply a reminder that the start switch is active during braking out of the fast modes. Therefore, tape could be damaged severely if start is activated.



NOTE:
HOLE PLUGS ARE AVAILABLE SO THAT LEVEL KNOBS MAY BE REMOVED FOR SCREWDRIVER ADJUSTMENT.

FIGURE 3-2

2. The STOP SWITCH is active at all times except when no tape is loaded on the machine. Stop will override all other functions of the 750 Series reel-to-reel reproducer.
3. The FAST REWIND AND FAST FORWARD modes may be entered at all times except when the tape is loaded improperly or an overriding stop signal is present. The machine may be switched directly from the normal start mode to either fast mode.
4. The REEL SIZE SWITCH which is located on the lower right-hand side of the front panel is used for setting the different torques required for different size reel hubs. When using the large NAB type hub, the switch must be in the large reel position. When using a smaller EIA type hub size, the small reel position should be used. Intermixing of different size reels is not recommended as the 750 Series is designed to accept either large NAB hubs *or* small EIA hubs. *If two different size reel hubs are used simultaneously it is recommended that stopping out of either fast mode be accomplished by pressing the opposite fast mode switch until the tape motion has ceased.* The stop switch should then immediately be pressed to set the mechanical brakes.
5. The CUE LEVER simply provides a means for manual operation of the tape lifter assembly. This structure is designed in such a manner that when the cue lever is pushed toward the reproduce head, it will lock in this position. Entering the start mode automatically unlocks this condition and resets it for automatic tape lifter operation. When in a fast mode, the cue lever may be moved up or down for cueing purposes or locked in its "lifters off" position.
6. The red LED indicator on the lower right-hand corner of the 750 Series is a visual indication that tape is loaded properly and that a stop command is not present.
7. LIMITED RANGE FRONT PANEL LEVEL CONTROLS may be used to vary the program output level approximately +8 or -4 dB from the calibrated (vertical) position. To vary program level more than +8 or -4 dB, the switch dress panel must be removed and the full range level calibration controls used.

A. POWER SUPPLIES

Incorporated into the 750 Series reproducers are two power supply circuits. Full wave bridge rectifier CR3 rectifies line voltage and furnishes DC to the filter section made up of R3 and C3. This circuit will charge to a peak of approximately 155 volts DC. The presence of this peak voltage upon initial engagement of a solenoid causes the solenoid plunger(s) to pull in very rapidly, essentially creating a faster start for the tape motion. After this initial surge of power, the voltage will drop down to approximately 110 volts during the various operating modes.

The secondary of transformer T1 provides low voltage AC with the center tap grounded to diodes CR1 and CR2. DC is supplied from this full wave rectifier to the filter capacitor C1 and to the input of series regulator U1. This regulated 24 volts DC powers the various controls and audio functions of the 750 Series reproducer.

B. CONTROL LOGIC — TRANSPORT

All control switching in the 750 Series reproducer is a combination of transistor and relay logic.

Stop Circuitry — The stop circuitry has priority over all other control functions of the 750 Series. Therefore, if a stop command is given, no other mode of operation may be entered. Transistor Q104 is a series "ready" ground for all switching logic. This transistor is normally biased through R107 and CR103. If the stop switch S101 is pressed, base-emitter current is removed from transistor Q104 causing the collector voltage to increase to approximately 24 volts DC and cancelling all previous operating modes. If tape is not loaded properly or if a reel of tape runs completely through, the tape sensor will also cause Q104 to "turn off." Phototransistor Q101 will be biased on if it is allowed to "see" the infrared light emitted from diode CR101. This condition would exist with the absence of tape from the sensor. With Q101 biased on, it in turn biases on Q102 at which point the DC is amplified to drive Q103. The collector of Q103 then removes base drive current from Q104 as does the stop switch. Trim pot R102 is provided to adjust for optimum sensitivity of all thicknesses and varieties of magnetic tape. Capacitor C102 prevents false stops of the machine due to minor deteriorated or thin oxide conditions existing on the tape.

Rewind Circuitry — Because the rewind and forward circuits are essentially the same, only the rewind circuitry will be explained in this section. Relay K1 is the control relay for the rewind functions. By depressing the rewind switch, S102, the rewind relay is turned on and a latch is set up through contacts 6 and 10 and back through contacts 9 and 1 of relay K2 to the ready ground circuitry. Contacts 3 and 11 of relay K1 open at this time and prevent start relay K3 from being operated. Relays K1 and K2 are essentially wired in series with each other so that energizing one relay will cause the other to drop out. This is accomplished through latching contacts 6 and 10 of K1 and 5 and 9 of K2. Diodes CR8 and CR10 are used to prevent an inadvertent dual latch of relay K1 and K2. Contacts 8 and 12 (K1) when closed switch voltage to the brake solenoids L1 and L2. Run voltage is supplied through contacts 5 and 9 to the rewind torque motor, B2. Normally closed contacts 9 and 1 set up a potential current path for a "series" switching of the forward and rewind torque motors, a condition which exists during the start mode.

Start Relay — As explained earlier in the section describing the rewind relay, K1, the start relay, K3, cannot be activated if either fast mode is in operation. Therefore, if a reel of tape is loaded properly and if a ready condition exists, a potential ground path for the start switch, S104, exists through contacts 3 and 11 of K2 and 3 and 11 of K1. Pressing the start switch, S104, causes transistor Q2 to be forward biased through R15, R16, the start switch and to ground. Pin 13 of K3 at this point also goes to ground through the start switch and causes K3 to energize and "latch on" through contacts 9 and 5.

Simultaneous with the energizing of relay K3 is the momentary pulsing of relay K4, **Torque Boost.** Transistor Q4 is momentarily forward biased while capacitor C12 is charging and, in turn, causes relay K4 to energize. Once C12 is charged, there no longer is any forward drive current for transistor Q4; thus, relay K4 will drop out. During the pulsing of relay K4, full voltage is applied to the forward torque motor through the paralleled contacts of relay K4 and, therefore, creates momentary "torque boost" which is required to overcome the inertial effects of the forward reel mass.

Paralleled contacts 10/6 and 11/7 of relay K3, when closed cause the pinch roller solenoid, L3, to energize simultaneously with the two brake solenoids, L1 and L2. A closure of contacts 12 and 8 of K3 causes both torque motors, B2 and B3, to rotate. In this condition these motors are connected "in series" with each other and, therefore, eliminate the normally required large power resistor

used to reduce voltage and dissipate power. Further reduction and adjustment of motor torque is accomplished with resistors R7 and R1.

The purpose of transistor Q1 is to provide a momentary disabling of the start relay K3 immediately following either one of the fast wind modes. This is accomplished by forward biasing transistor Q1 in either fast mode through R12 and diode CR11 or CR12. During this time, capacitor C10 discharges through R13 and diode CR11 or CR12 is removed from ground, at which time capacitor C10 begins to charge through R13, R12, and the base-emitter junction of transistor Q1. During this charging period of C10, transistor Q1 is forward biased and, therefore, disables normal forward bias current flow for transistor Q2 through R15 and R16. Transistor Q1 is also part of the motion sensing circuitry (optional) which will be described later in Part D of this section.

All control switching functions of the logic are available on the remote connector J1. In addition to these switching functions, lamp circuits are also provided on pins 6, 10, 12, and 3 of J1. In series with each one of these lamp circuits is a 100 ohm, ½ watt resistor used to limit current and protect the power supply of the 750 Series machine. It is expected that if these lamp circuits are connected, a standard 40 milliamp incandescent lamp will be used. A foil sensing circuit is also connected to the remote connector J1 on pin 7, which when used with a current amplifier can provide automatic sensing of foil on magnetic tape.

C. PROGRAM REPRODUCE AMPLIFIER

The program reproduce amplifier is located on a plug-in PC card which is inserted from the front of the 750 Series reproducer. A single card is used for either stereo or mono configurations. The circuit consists of an equalized preamplifier and a four transistor driver output section. Transistors Q201 and Q202 serve as a preamplifier which is stabilized to prevent performance variations with widely varying temperatures. This is accomplished with DC negative feedback from the emitter of Q202 to the base of Q201. Feedback equalization is used since this reduces gain variations and permits higher input impedance. The equalization components are C205, variable resistor R205, and fixed resistor R203. The output of the preamplifier is connected to a full range calibration control resistor, R210.

Transistor Q203 is a common emitter amplifier stage with biasing resistor R212 connected from base to collector for DC and temperature stability. The output is connected through coupling capacitor C210 and R218 to the front panel level control R219. This potentiometer has a limited range (approximately +8 dB -4 dB from the vertical position) so that performance of the amplifier is not degraded. Audio signals then continue on to the base of transistor Q204 which is the driver for the output complimentary amplifiers Q205 and Q206. To provide stability, Q204, Q205, and Q206 are all direct coupled with resistor R220 providing feedback. If the 750 Series reel-to-reel unit is equipped with the optional 3¾ - 7½ IPS capstan motor, an additional equalization network is connected to the emitter of transistor Q204. This network which consists of transistor Q207 and associated resistors and capacitor provide the extra gain necessary for 3¾ operation as well as additional high frequency contouring.

D. OPTIONAL MOTION SENSOR

The optionally available motion sensor not only provides more reliable tape handling but also adds an automatic feature to the 750 Series — "start memory." The "start memory" circuit simply allows the 750 Series to be transferred directly from a rewind or fast forward mode into the start mode. Pressing the start switch S104 will cause the reels to come to a complete stop prior to automatic transfer into the start mode of operation. Please refer to the motion sense schematic and the 750 Series control schematic for the following circuit description.

The motion sensor circuit which is located directly on the back of the rewind torque motor assembly is controlled by an opto-interrupter module ID301. A chopper disk located directly on the back of the torque motor shaft interrupts this photo module four times for each revolution of the torque motor shaft. These interruptions or pulses are amplified with transistor Q304 and converted to DC through zero bias transistor Q305 and filter capacitor C303. This DC provides forward current drive for transistor Q1, and in turn prevents Q2 from being turned on, therefore disabling relay K3. As soon as reel motion ceases, capacitor C303 discharges and forward current for Q1 is removed. "Start memory" is created by dual transistor latch Q302 and Q303. These transistors are latched on when the start switch S104 is depressed and remain latched until a stop signal is present. The collector of transistor Q303 is connected to pin 13 of relay K3 and thus provides the ground current path for this relay. As soon as motion ceases, transistor Q2 is enabled once again, and, therefore, relay K3 is energized because of the current path available through transistor Q2 and transistor Q303. In order to prevent pulsing of the motion sense circuitry from turning relay K3 off (the chopper disc continues to rotate in start; therefore, pulses occur), the disabling current path for Q2 through R15 to the collector of Q1 is bypassed through R17 and Q3 to ground. Q3 will be normally biased on whenever the start relay is activated and, therefore, will provide a continuous forward

bias for transistor Q2 through R17 until a stop signal is introduced into the circuit. Capacitor C11 is simply used to stabilize transistor Q3 and prevent any transients from activating it falsely.

It should be noted that on units equipped with motion sensing, points G and F are strapped together instead of E and G. In addition to this change, points A and B no longer have a jumper but connect directly to the emitter and collector of transistor Q301 respectively. The purpose of transistor Q301 is to cause the rewind or fast forward relays to unlatch whenever the start switch is depressed. Q301 is essentially in series with the latch circuit to ground for these relays and, therefore, if not forward biased will prevent K1 or K2 from remaining energized. Forward bias for Q301 is removed through diode CR301 whenever the start switch is depressed. This causes either K1 or K2 to de-energize. With this condition existing, the mechanical brakes immediately engage and cause the reel motors to come to a complete stop at which time the machine transfers to the start mode.

A. REEL TURNTABLE HEIGHT

The height of the reel turntable should be adjusted whenever the torque motor assembly is either removed or replaced. Illustrated in Figure 5-1 is the method for adjusting the turntable height using the special gauge (ITC Part Number 830-0022-001). It should be noted that the short end of the gauge is used to set the height of the turntable and that the gauge be squarely and firmly seated against the deck plate for proper adjustment. Loosen the set screw shown in Figure 5-1 and slide the turntable up or down on the torque motor shaft until the proper adjustment is achieved. Be certain that when retightening the set screw it is secured against the *flat* on the torque motor shaft.

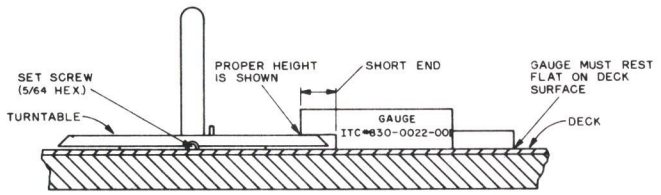


FIGURE 5-1

B. BRAKES

The mechanical brake tensions of the 750 Series are adjusted with an easily accessible thumb screw. See Figure 5-2. To increase brake tension, loosen the thumb screw and slide it away from the brake solenoid. To decrease brake tension, slide the thumb screw toward the brake solenoid and retighten. Brake tensions set at the factory are done so to provide reliable braking of similar size reels. It, therefore, should be noted that the combination of a small 7-inch reel and a large 10½-inch reel could create a potential problem in braking.

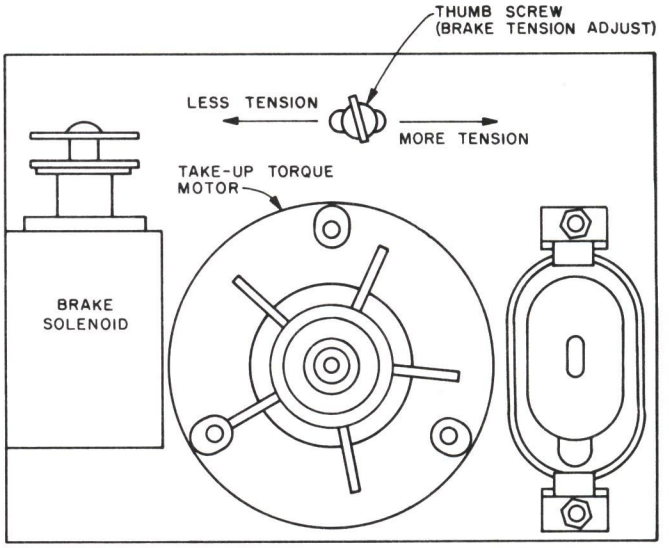


FIGURE 5-2

* BRAKE SLIP TORQUE		
BRAKE	DIRECTION	
	CW	CCW
SUPPLY		16 – 18 oz.
		450 – 500 g
TAKE-UP	16 – 18 oz.	
	450 – 500 g	

* USE 2 ¼" DIAMETER REEL HUB.

FIGURE 5-3

C. HEAD HEIGHT AND ZENITH

The head height and zenith adjustment should be made only in case of head replacement or as a matter of routine maintenance. Please refer

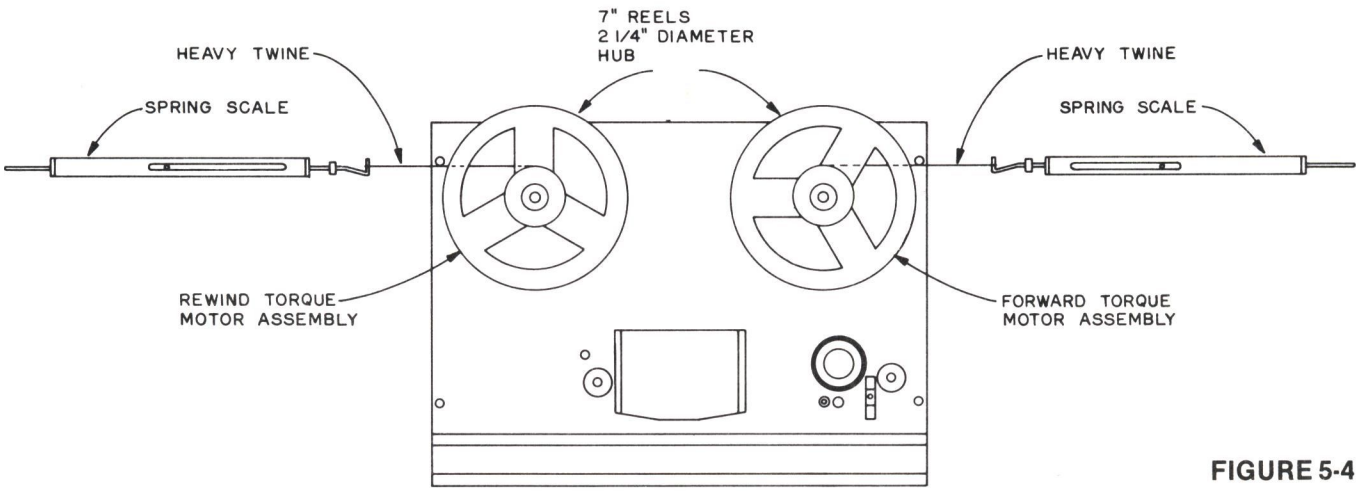


FIGURE 5-4

to Figure 5-5 for location of adjustment points outlined in this section.

1. **Head Assembly Lock Screw** — Loosen the lock screw "L" by turning it counterclockwise about four complete turns.
2. **Coarse Height** — Adjust the front height screw FH so that the top of the upper head track (pole piece) is 9/16 of an inch above the deck plate surface. The alignment tool (part number 830-0022-001) may be used for this purpose. See Figure 5-6.
3. **Coarse Zenith** — Adjust the rear height screw RH until the face of the head is perpendicular* to the surface of the deck plate. Position any known square against the deck plate surface and move it against the face of the head (being careful not to scratch or damage the surface of the head). The square being used should be demagnetized before adjustments are made. When the face of the head is perpendicular, the surface of the head and the "square" will be flush. See Figure 5-7.
4. **Fine Height and Zenith** — This final adadjustment is made using a reel of tape loaded properly on the machine in combination with the square outlined in the previous step, **Coarse Zenith.**
   a. With the reel of tape loaded properly in the machine, press the start switch and observe the tape travel path over the reproduce head. If the tape does not completely cover both pole pieces as shown in Figure 5-8, alternately and in equal amounts, adjust the forward height screw FH and the rear height screw RH to position the head properly behind the tape.
   b. Recheck the zenith of the head as instructed in Step 3. If adjustment is necessary, height must also be rechecked and adjusted until both height and zenith are perfect.

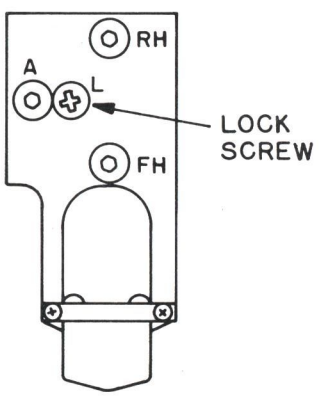


FIGURE 5-5

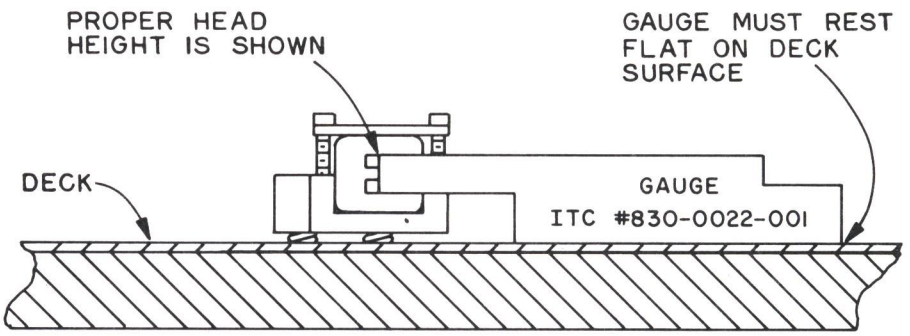


FIGURE 5-6

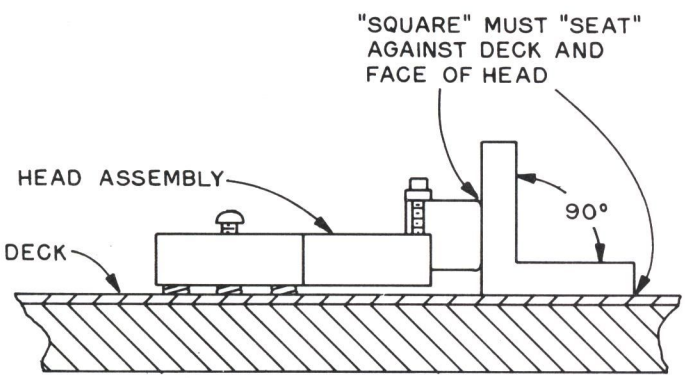


FIGURE 5-7

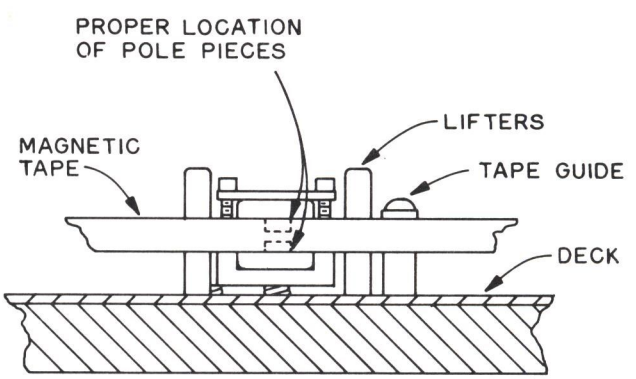


FIGURE 5-8

A. TORQUE MOTORS

In order to adjust the reel motor torques properly, the large reel torque must be adjusted first with the reel size switch, S105, in the large reel position. Once this adjustment has been made (see Figure 6-1 for adjusting resistors), transfer the reel size switch, S105, to the small reel position and adjust the small reel torque. Please refer to Figure 6-2 for the proper torque settings. It should be noted that either torque motor may be used for setting the proper tension as these motors are connected in series during the start mode of operation, and, therefore, their torques will be essentially the same. While the torques are being measured, the reel motor not being used to set the torque should be held in place and not allowed to rotate, as this will affect the final torque setting. Power resistors used to adjust torque settings on the 750 Series are accessible by removing the stainless steel cover located directly on top of the electronics housing on the back of the 750 Series deck.

CAUTION: REMOVE POWER CORD FROM SOCKET BEFORE ADJUSTING RESISTORS.

* MOTOR TORQUE ADJUST		
REEL SIZE SWITCH	ADJUSTING RESISTOR	TORQUE SETTING
LARGE	R 7	6.0 oz. – 170 g
SMALL	R 1	3.0 oz. – 85 g

* USE 2 ¼" DIAMETER REEL HUB.

FIGURE 6-2

B. TORQUE BOOST

The torque boost time is controlled using potentiometer R23 (screwdriver adjustment) located on the mother printed circuit board. This potentiometer is accessible from the rear panel of the electronics housing on the 750 Series deck.

For proper adjustment of the torque boost time, attach two large reels to the machine, thread them properly, and fast wind the tape so that almost the entire length of the tape is on the forward take-up reel. Make certain that the reel size switch is in the large reel position. Repeatedly start and stop the machine and adjust the torque boost time until the tape always remains properly wrapped around the reproduce head on start and does not have any tendency to jump off of the head. Refer to Figure 6-4 for location of the torque boost potentiometer.

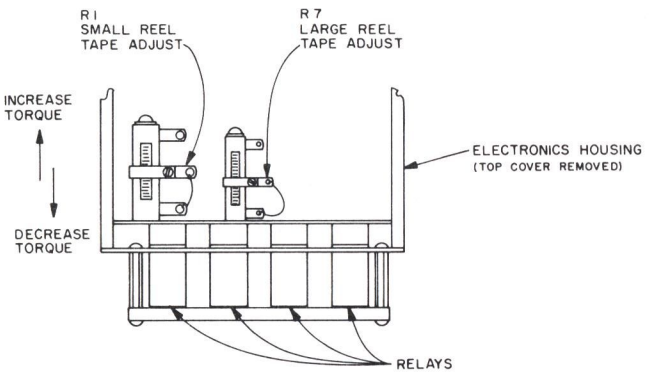


FIGURE 6-1

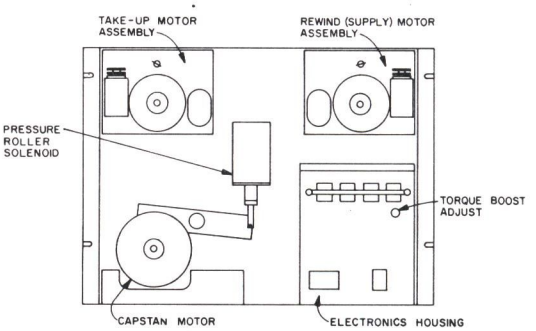


FIGURE 6-4

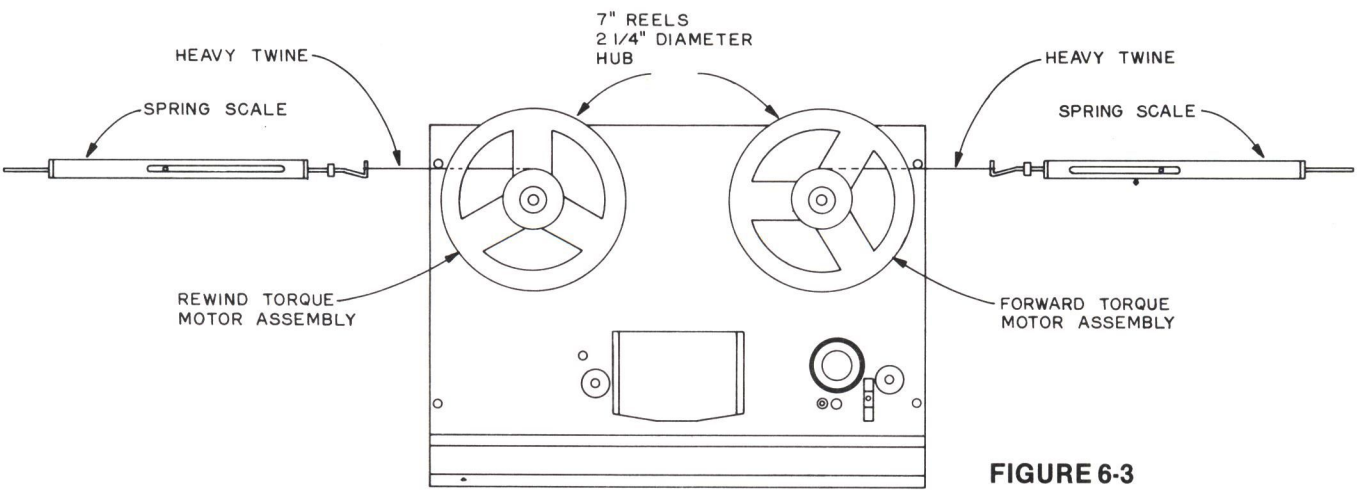


FIGURE 6-3

C. PRESSURE ROLLER PRESSURE

This adjustment will normally be required only after parts replacement; but for best results, the check of the pressure roller pressure should be on the routine maintenance schedule.

1. Attach one end of a strong piece of twine around the pressure roller shaft and the other end to a spring scale capable of measuring up to 10 pounds. See figure 6-5
2. Start the machine into the run mode and begin pulling on the spring scale directly opposite the direction the solenoid is pulling (so as to disengage the pressure roller from the capstan).
3. The instant the pressure roller leaves the capstan is the point at which the measurement must be taken. The pulling force at this point should be between 9 and 10 pounds or 4.5 kilograms. See Figure 6-5.
4. If adjustment is required, loosen the clevis lock nut and rotate the solenoid plunger as follows. See Figure 6-6.
   a. To increase pressure, rotate the plunger clockwise as viewed from the clevis end (plunger will penetrate deeper into the solenoid). Do not allow the plunger to "bottom out" to the seat of the solenoid.
   b. To decrease pressure, rotate the plunger counterclockwise.
5. Once adjustment is correct, retighten the clevis lock nut.

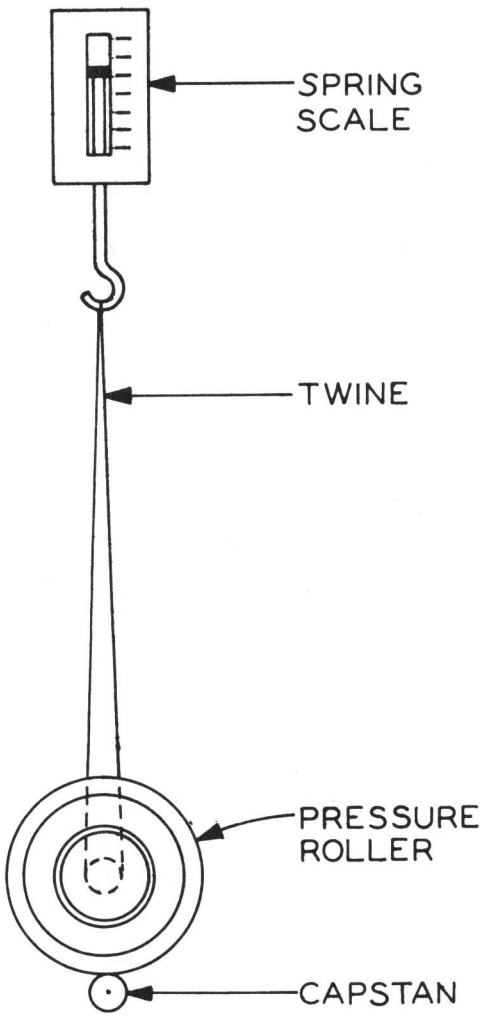


FIGURE 6-5

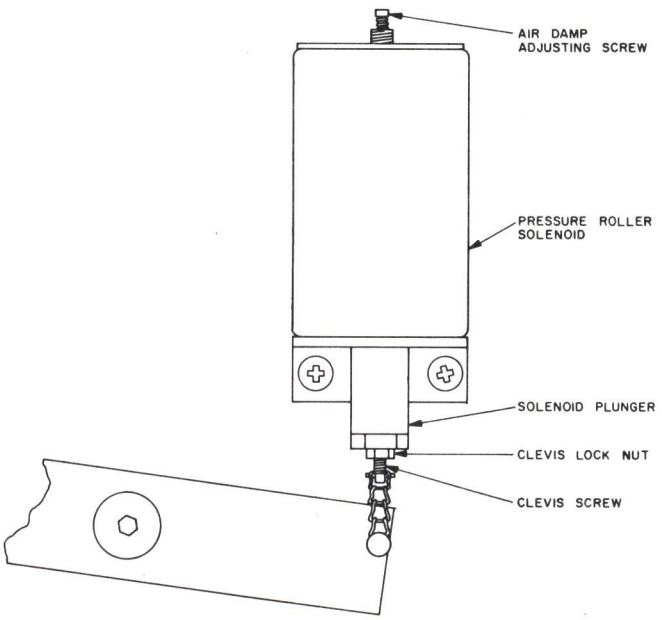


FIGURE 6-6

A. REPRODUCE HEAD — AZIMUTH AND PHASING

1. Monophonic Head Azimuth Alignment — Before attempting these adjustments, insure that the head height and zenith adjustments as outlined in Section V-C are accurate.
   a. Connect a 600 ohm load to the output terminals (3 and 5) at connector J2 and connect a high impedance volt meter across this load.
   b. Properly thread a standard alignment tape in the machine and start the transport mechanism in motion.
   c. When the 15 kHz azimuth tone is present, adjust the azimuth screw A (refer to Figure 7-1) of the reproduce head until a maximum audio output level is observed.
   d. Carefully tighten lockscrew L while observing the volt meter to insure that no change in output level occurs.

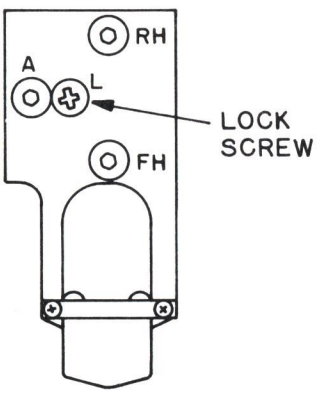


FIGURE 7-1

2. Stereo Head System Azimuth Adjustment (Phasing) — Two track stereo reproducing results are subject to several contributing mechanical inaccuracies, which can cause a shift in simultaneously monitored reproducer outputs. In stereo systems these shifts are generally not perceptible in reproduction;however, in cases where monophonic "dubbing" or channel "summing" is desired, phase shifts can result in serious amplitude variations or complete audio dropout at the higher frequencies. The most common causes of these problems are:
   a. Improper azimuth of the head with respect to any other reproducer or recorder in a system.
   b. Improper tape guidance (skew) within the head assembly or within the complete tape guidance system.

Azimuth (phasing) adjustment should be made in the following manner:

a. Connect 600 ohm loads across both the Channel 1 and Channel 2 outputs. Connect a high impedance volt meter to the Channel 1 output and begin playing a properly threaded full track 400 Hz reference level tape. Set the Channel 1 gain control R219 for +8 dBm output. Now connect the volt meter to the Channel 2 output and adjust the Channel 2 gain control R247 for +8 dBm output.

b. While playing the 15 kHz full track azimuth tone, carefully adjust the playback azimuth screw A (see Figure 7-1) for a maximum reading of the volt meter. Observe the mechanical position of the azimuth screw.

c. Move the volt meter to the Channel 1 output. Now move the azimuth screw a small amount in either direction and observe the volt meter reading as an increasing or decreasing output. Continue moving the screw in the direction that causes increasing output until a maximum is obtained.

d. Observe direction and amount the screw was turned to obtain maximum on the other channel. Set screw A to the midpoint between the settings to obtain AVERAGE azimuth for the two channels.

e. Connect the horizontal input of any scope so equipped to the Channel 2 output. Insert a full track frequency alignment tape and start the machine. Adjust the horizontal gain provided on the scope to a suitable amplitude. Remove the horizontal input.

f. Connect the vertical input to the same Channel 2 output; adjust the vertical gain to provide deflection equal to that of the horizontal above.

g. Now connect the horizontal input to the Channel 1 output. Advance the tape to the 400 Hz section. A pattern as shown in Figure 7-2 should now appear. If not, reverse the two leads of the horizontal input. This pattern represents the "zero" or near "zero" phase shift pattern of the system.

h. Allow the tape to run to the 5 kHz section and observe if phase shift has occurred. (Refer to Figures 7-2 through 7-5.) If phase shift has occurred, adjust the azimuth screw A to correct this phase shift in the exact reverse rotation to which it has occurred. This means that if the pattern was increased counterclockwise from "zero" shift as frequency increased, screw A should be turned in such a way as to cause the scope display to rotate counterclockwise back to the "zero" position.

i. Now allow the tape to continue through the various frequencies observing the scope display to insure that no 180° reversals occur. At 15 kHz final adjustment of screw A can be made to provide best average phase shift. It is normal for shift "jitter" of several degrees to occur at the highest frequencies so settings should be based on the best average results. It is desirable to run the tape several times observing that phase reversals do not occur at any frequencies. Tighten the lockscrew L carefully and observe that no change occurs. (Readjust if necessary.)

j. Figures 7-2 through 7-5 show the proper phase angles which would be observed on probably the majority of oscilloscopes available today. It should be noted, however, that some oscilloscopes will produce the opposite direction of deflection when "in phase" signals are connected to the vertical and horizontal inputs. Therefore, before making any stereo phasing adjustments, determine which angle of deflection will be produced on the scope being used when "in phase" signals are connected to its horizontal and vertical inputs. (Follow step g.)

0° PHASE SHIFT

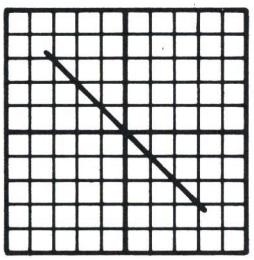


FIGURE 7-2

45° PHASE SHIFT

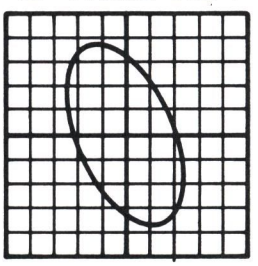


FIGURE 7-3

90° or 270° PHASE SHIFT

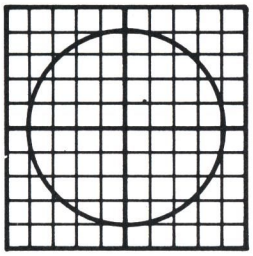


FIGURE 7-4

180° PHASE SHIFT

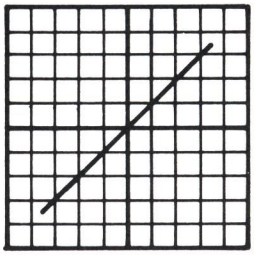


FIGURE 7-5

B. REPRODUCE AMPLIFIER EQUALIZATION

In order to adjust the reproduce amplifier equalization, the front switch dress panel must first be removed. The reproduce equalization is adjusted with variable resistor R205 (R233 on two track models) and should be done so using a reliable standard response tape. The equalization control(s) (see Figure 7-6) should be adjusted to provide the flattest response possible when using the standard frequency response tape. It is important that before making any equalization adjustments, the azimuth (phasing on stereo units) be accurately set.

C. REPRODUCE AMPLIFIER LEVEL

The output level of the reproduce amplifier is factory adjusted for +8 dBm while playing an NAB standard reference tone. (The front panel level control must be in the "calibrated" or vertical position.) The limited range front panel level control may be used to change the gain approximately +8 dB or -4 dB. If more output level variation is necessary, the internal level control R210 (also R238 on two track models) must be used. If an output level of less than 0 dBm is required, an external loss pad should be used to maintain a maximum signal-to-noise ratio. The limited range front panel level controls are accessible without removing the switch dress panel, but in order to obtain access to the full range controls, resistors R210 and R238, the switch dress panel must first be removed. (See Figure 7-6 for location of the calibration controls.)

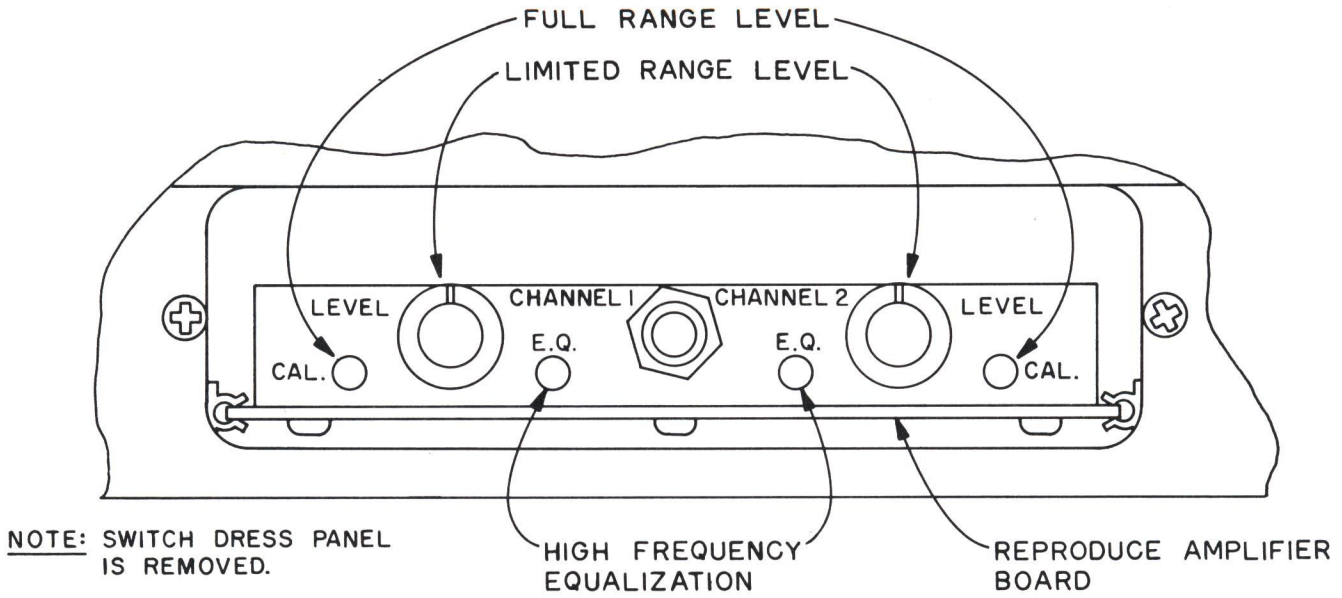


FIGURE 7-6

A. TORQUE MOTOR ASSEMBLIES

SYMBOL	PART NUMBER	DESCRIPTION
1	355-0801-000	Screw, set 8-32 × ¼ socket
2	253-0048-001	Block, L.H. brake (rewind)
	253-0049-001	Block, R.H. brake (take-up)
3	282-0029-000	Pin, .187 × 1 1/8
4	300-0040-000	Stand off, ¼ × ½ - 6 - 32 round
5	370-0403-000	Nut, 4-40 × ¼ Hex, KEPS
6	254-0050-001	Bracket, angle
7	350-0407-000	Screw, 4-40 × 5/16 Phillips panhead
8	360-1001-000	Washer, flat #10 × 3/8
9	370-1003-000	Nut, 10-32 × 3/8 square
10	352-0001-000	Screw, thumb 10-32 × 5/8
11	350-0811-000	Screw, 8-32 × 3/8 Phillips flathead
12	353-0004-000	Screw, 10-32 × 7/8 Button head
13	360-0604-000	Washer, .203"I.D. × 1"O.D. × 1/16" flat
14	300-0042-000	Spacer, steel .203"I.D. × 9/32" O.D. × 1/4" long
15	359-0017-000	Washer, Urethane 3/4 × 1/2 × 1/16
16	477-0015-000	Solenoid, brake
17	282-0001-021	Pin, roll 5/16 × 1/2
18	291-0013-002	Roller, brake
19	301-0002-001	Spring, Expansion
20	370-0802-000	Nut, 8-32 × 11/32 Hex
21	832-0500-165	Strap, brake and lining assembly
22	350-0411-000	Screw, 4-40 × 3/8 Phillips flathead
23	350-0811-000	Screw, 8-32 × 3/8 Phillips flathead
24	350-0801-000	Screw, 8-32 × 1/4 Phillips panhead
25	283-0040-003	Plate, motor mounting L.H. (rewind)
	283-0041-003	Plate, motor mounting R.H. (take-up)
26	683-0012-000	Capacitor 7.5 mfd. 236 VAC
27	724-0007-000	Bracket, capacitor mounting
28	451-0057-020	Motor, Torque (without plug)

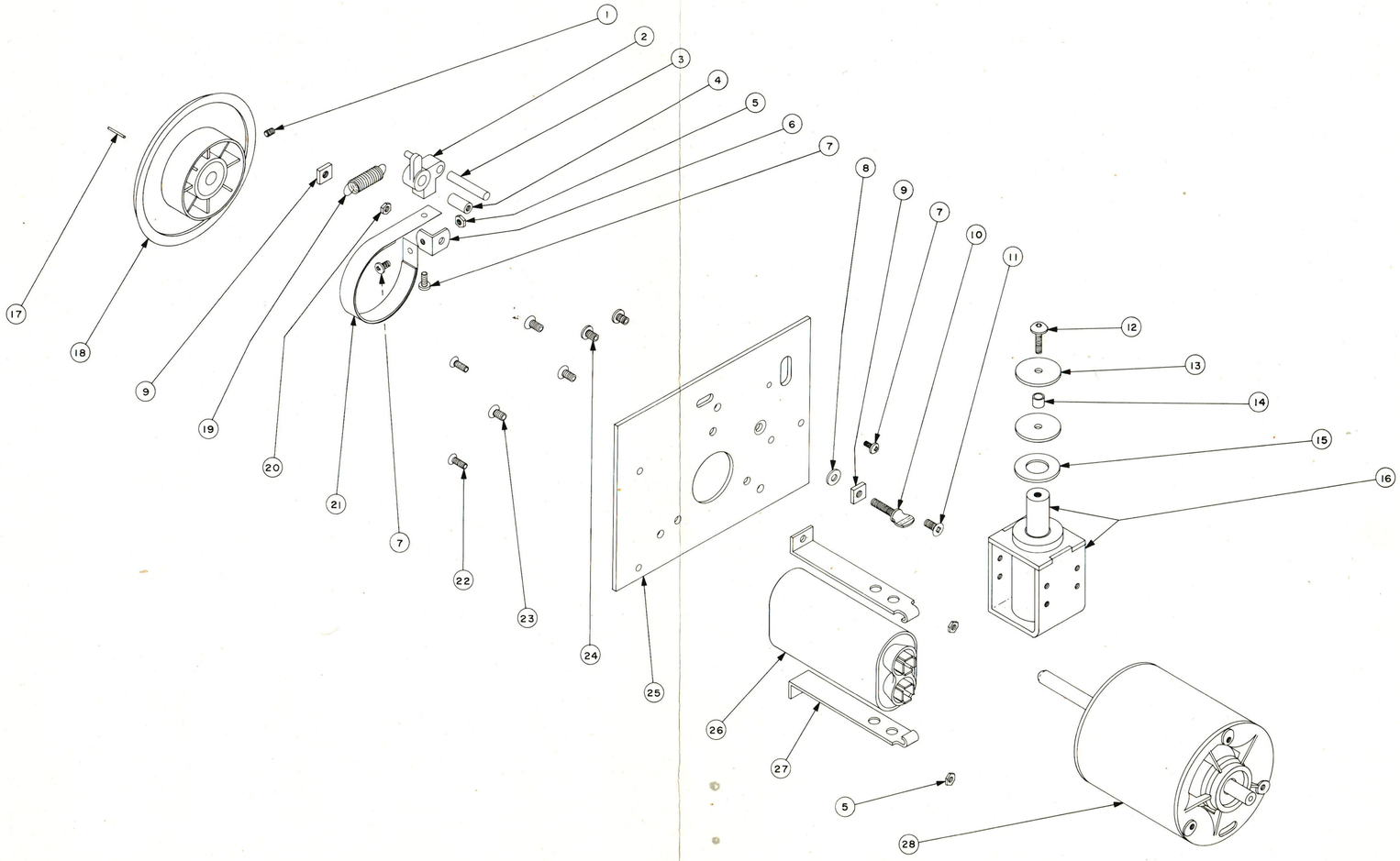


FIGURE 8-1

B. TRANSPORT CHASSIS ASSEMBLY

SYMBOL	PART NUMBER	DESCRIPTION
1	267-0018-004	Deck
2	283-0042-004	Plate, Dress
3	350-0609-000	Screw, 6-32 × 3/8" black
4	359-0015-000	Washer, #6 fiber 1/4 O.D.
5	268-0013-003	Escutcheon, 750
6	300-0038-000	Standoff, 6-32 × 1/4 Hex
7	300-0009-000	Standoff, 1/4 × 1 1/4 × 6-32
8	265-0034-002	Cover, Switch
9	350-0607-000	Screw, 6-32 × 5/16 Phillips Panhead
10	353-0022-000	Screw,6-32 × 5/8 Flat Socket Head
11	832-0500-250	Tape Sensor Assembly
12	350-1019-000	Screw, 10-24 × 7/8 FH Socket
13	300-0036-001	Cap, Bearing
14	251-0019-000	Bearing, Ball
15	334-0003-001	Standoff, bearing
16	350-0428-000	Screw, 4-40 × 3/4 Phillips Panhead
17	360-0402-000	Washer #4 × 5/16 flat
18	272-0014-001	Guide, Capstan Tape
19	433-0001-000	Line Cord
20	418-0001-000	Fuseholder
21	417-0007-000	Fuse, 2 Amp. Slo Blo
22	350-0626-000	Screw,6-32 × 3/4 Phillips Panhead
23	---	Electronics Assembly
24	477-0006-002	Solenoid & Plunger Assembly
25	277-0002-021	Chain, Ladder (6 links)
26	526-0005-000	Transformer NT 1228
27	350-1002-000	Screw, 10-24 × 3/8 Phillips Panhead
28	370-1001-000	Nut, 10-32 × 3/8 Hex
29	264-0002-001	Screw, Clevis
30	282-0001-021	Pin, Roll, 1/16 × 1/2
31	355-0808-000	Screw, Set 6-32 × 1/8
32	255-0002-000	Rubber, Bumper tip
33		
33	282-0010-011	Pin, Dowel 1/8 × 5/8
34	235-0002-000	Urethane Stock, 1 inch wide
35	441-0001-000	Tubing, shrink
36	282-0031-000	Pin, Roll 1/8 × 1
37	301-0030-000	Spring, Tape Lifter Return
38	350-0809-000	Screw, 8-32 × 1 Phillips Panhead
39	282-0028-000	Pin, Dowel 3/16 × 1 1/4
40	253-0050-001	Block, Tape lifter
41	353-0025-000	Screw, 1/4-20 × 1/2 FH Socket
42	250-0009-001	Arm, Rear Lifter
43	282-0032-001	Pin, Foil Sensing
44	300-0041-001	Spacer, Foil Sensing
45	250-0010-001	Arm, Tension
46	282-0017-001	Pin, Dowel 1/8 × 3/4
47	301-0031-000	Spring,Tension Arm Compression
48	359-0010-001	Washer, Nylon 1/4 × 1/2
49	349-0001-001	Screw, Shoulder 1/4 × 3/4
50	350-1021-000	Screw, 6-32 × 2 Slotted PHD
51	312-0001-001	Cable and Clip, Tension Arm
52	301-0005-000	Spring, Expansion
53	251-0013-000	Bearing, Ball
54	360-1003-000	Washer, #10 × 1/2 Flat
55	350-1007-000	Screw, 10-24 × 5/8 Phillips Panhead
56	322-0001-000	Ball, Steel 1/4" diameter
57	301-0003-001	Spring, Compression 1/4 × 5/8
58	832-0500-160	Take Up Torque Motor Assembly
59	832-0500-140	Supply Torque Motor Assembly
60	284-0003-001	Dress Cap
61	301-0014-000	Spring, Dress Cap Retainer
62	289-0010-000	"C" Retaining Clip
63	359-0007-000	Washer, Felt
64	291-0010-001	Pressure Roller
65	296-0019-001	Shaft, Pressure Roller
66	350-0611-000	Screw, 6-32 × 1/2 Phillips Panhead
67	250-0008-002	Arm, Pressure Lever
68	251-0001-041	Bearing, Oilite 1/2 × 5/8 × 1
69	349-0003-001	Screw, Shoulder 1/2 × 1
70	353-0004-000	Screw, 10-32 × 7/8 Button Head Socket
71	832-0500-350	Motor, Capstan 60 Hz 7 1/2 IPS
72	350-1002-000	Screw, 10-24 × 3/8 Phillips Panhead
73	316-0002-000	Capacitor Insulator
74	441-023-000	Tubing, 1/4 inch clear

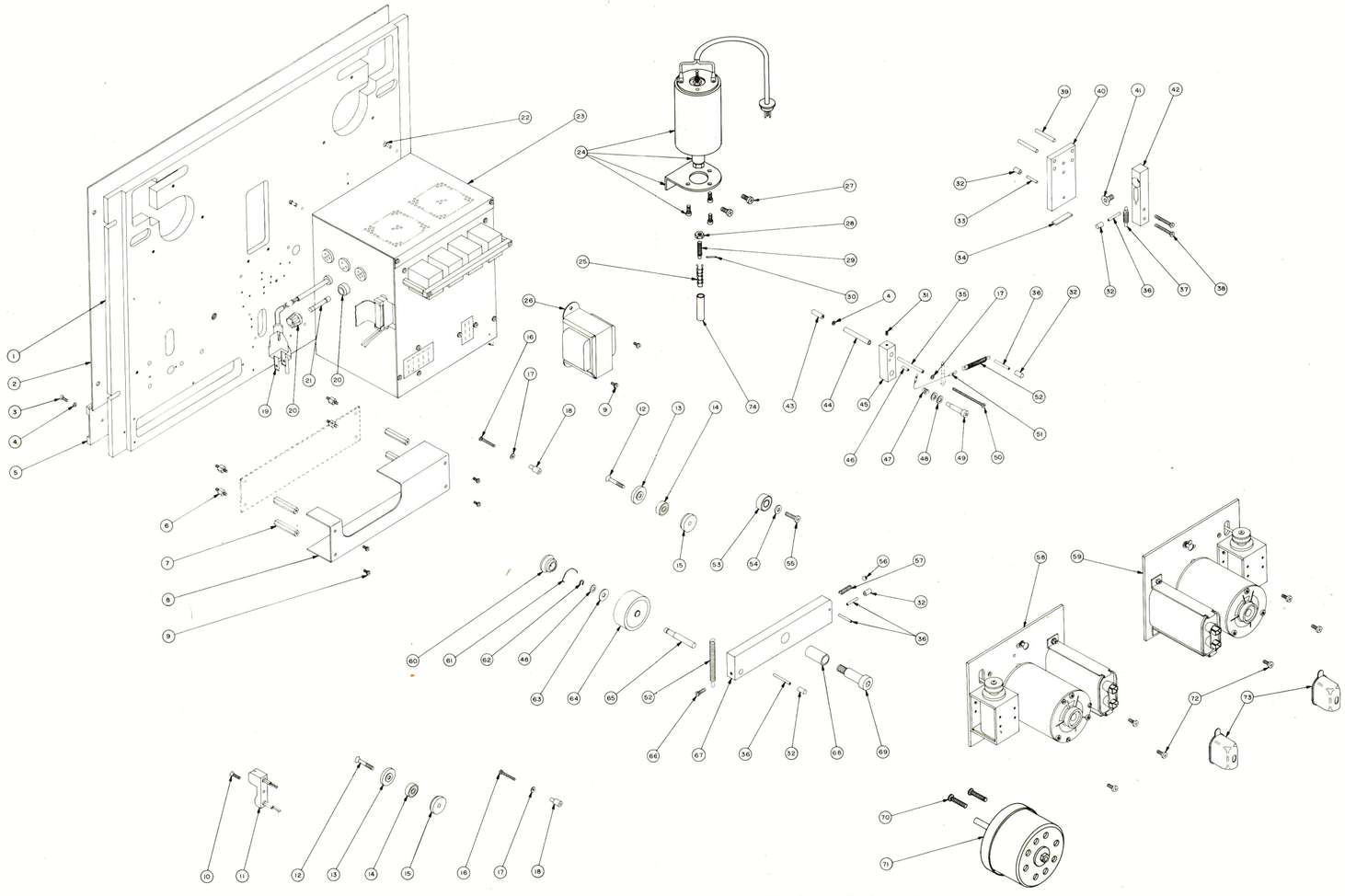
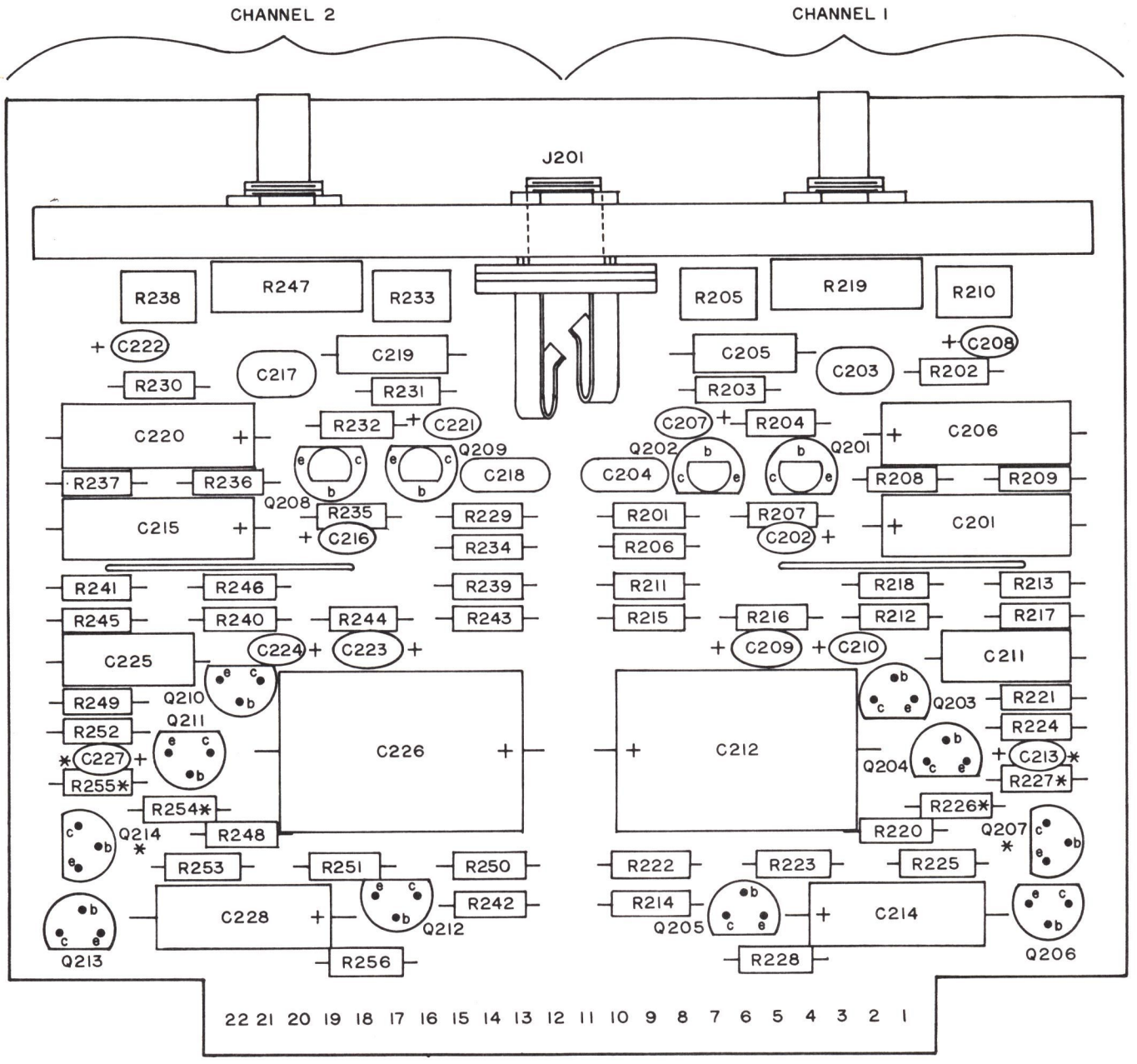


FIGURE 8-2

A. Printed Circuit Boards



NOTES:
1. * USED ON 2 SPEED 3¾ – 7½ IPS MODELS ONLY.

MONO REPRODUCE AMPLIFIER
831-0089-003
STEREO REPRODUCE AMPLIFIER
831-0089-013

FIGURE 9-1

1. Reproduce Amplifier

SYMBOL	PART NUMBER	DESCRIPTION
	CAPACITORS	
C201	696-0078-000	100 mfd 12 v, electrolytic
C202	694-0003-000	4.7 mfd. 35 v, tantalum
C203	677-0001-000	100 pfd. 300 v, silver mica
C204	677-0003-000	300 pfd. 300 v, silver mica
C205	681-0046-000	.01 mfd. 200 v, paper
C206	696-0078-000	100 mfd. 12 v, electrolytic
C207	694-0003-000	4.7 mfd. 35 v, tantalum
C208	694-0003-000	4.7 mfd. 35 v, tantalum
C209	694-0007-000	47 mfd. 20 v, tantalum
C210	694-0003-000	4.7 mfd. 35 v, tantalum
C211	681-0050-000	.022 mfd. 200 v, paper
C212	687-0007-000	470 mfd. 25 v, electrolytic
C213	694-0005-000	1 mfd. 35 v, tantalum
C214	696-0122-000	50 mfd. 25 v, electrolytic

C215	696-0078-000	100 mfd. 12 v, electrolytic
C216	694-0003-000	4.7 mfd. 35 v, tantalum
C217	677-0001-000	100 pfd. 300 v, silver mica
C218	677-0003-000	300 pfd. 300 v, silver mica
C219	681-0046-000	.01 mfd. 200 v, paper
C220	696-0078-000	100 mfd. 12 v, electrolytic
C221	694-0003-000	4.7 mfd. 35 v, tantalum
C222	694-0003-000	4.7 mfd. 35 v, tantalum
C223	694-0007-000	47 mfd. 20 v, tantalum
C224	694-0003-000	4.7 mfd. 35 v, tantalum
C225	681-0050-000	.022 mfd. 200 v, paper
C226	687-0007-000	470 mfd. 25 v, electrolytic
C227	694-0005-000	1 mfd. 35 v, tantalum
C228	696-0122-000	50 mfd. 25 v, electrolytic

PHONE JACK

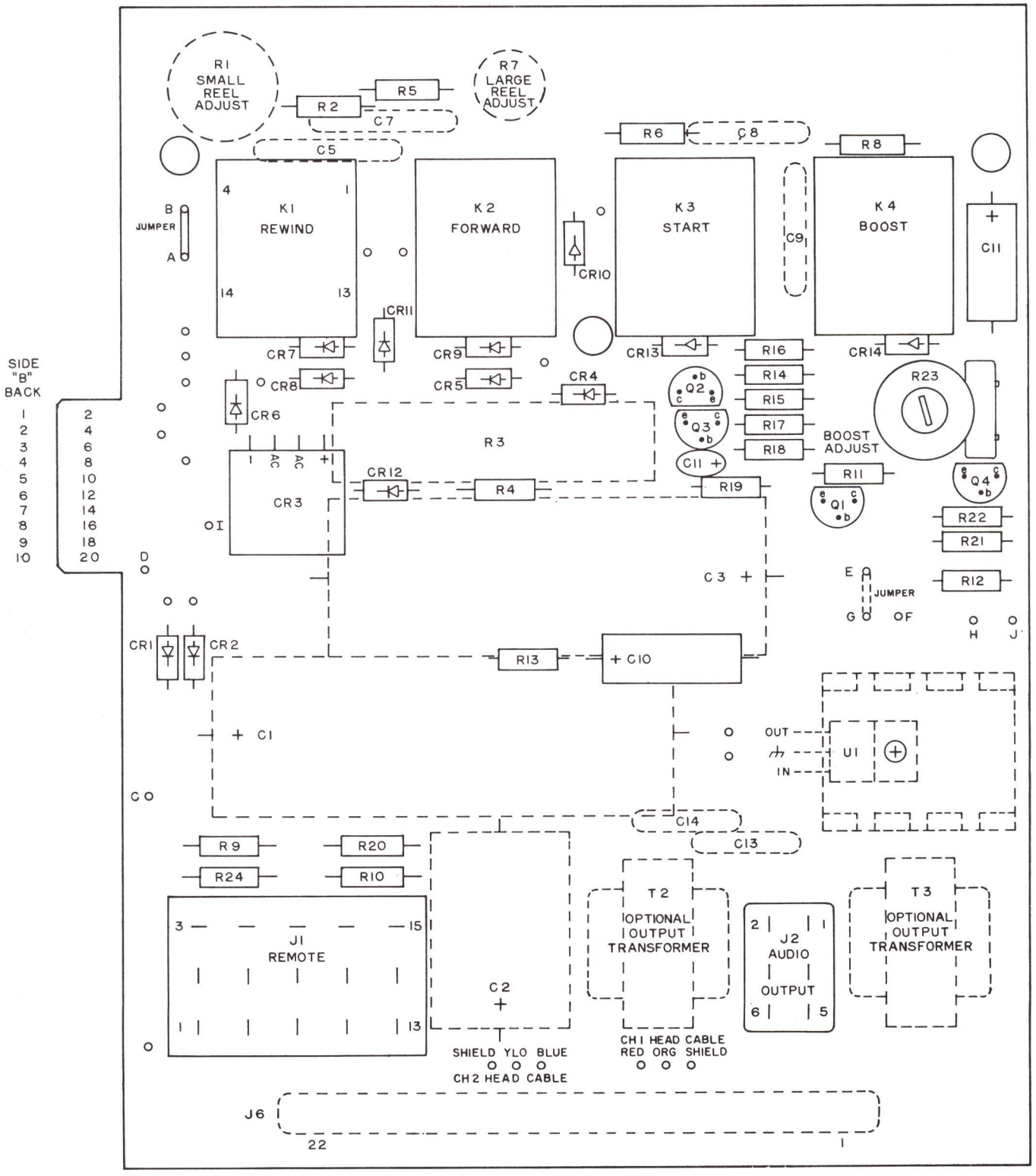
J201	380-0035-000	Phone Jack

TRANSISTORS

Q201	590-0013-000	2N5089, NPN
Q202	590-0013-000	2N5089, NPN
Q203	590-0017-000	2N5816, NPN
Q204	590-0017-000	2N5816, NPN
Q205	590-0017-000	2N5816, NPN
Q206	590-0018-000	2N5817, PNP
Q207	590-0017-000	2N5816, NPN
Q208	590-0013-000	2N5089, NPN
Q209	590-0013-000	2N5089, NPN
Q210	590-0017-000	2N5816, NPN
Q211	590-0017-000	2N5816, NPN
Q212	590-0017-000	2N5816, NPN
Q213	590-0018-000	2N5817, PNP
Q214	590-0017-000	2N5816, NPN

RESISTORS
(All ¼ watt, carbon film, 5% tolerance unless otherwise noted)

R201	630-0103-000	47k ohms
R202	630-0051-000	330 ohms
R203	630-0075-000	3.3k ohms
R204	630-0111-000	100k ohms
R205	636-0010-000	10k ohms, potentiometer
R206	630-0071-000	2.2k ohms
R207	630-0047-000	220 ohms
R208	630-0067-000	1.5k ohms
R209	630-0055-000	470 ohms
R210	636-0010-000	10k ohms, potentiometer
R211	630-0085-000	8.2k ohms
R212	630-0107-000	68k ohms
R213	630-0087-000	10k ohms
R214	630-0031-000	47 ohms
R215	630-0063-000	1k ohm
R216	630-0071-000	2.2k ohms
R217	630-0051-000	330 ohms
R218	630-0071-000	2.2k ohms
R219	636-0011-000	25k ohms, potentiometer
R220	630-0115-000	150k ohms
R221	630-0095-000	22k ohms
R222	630-0071-000	2.2k ohms
R223	630-0047-000	220 ohms
R224	630-0039-000	100 ohms
R225	630-0023-000	22 ohms
R226	630-0091-000	15k ohms
R227	630-0079-000	4.7k ohms
R228	630-0039-000	100 ohms
R229	630-0103-000	47k ohms
R230	630-0051-000	330 ohms
R231	630-0075-000	3.3k ohms
R232	630-0111-000	100k ohms
R233	636-0010-000	10k ohms, potentiometer
R234	630-0071-000	2.2k ohms
R235	630-0047-000	220 ohms
R236	630-0067-000	1.5k ohms
R237	630-0055-000	470 ohms
R238	636-0010-000	10k ohms, potentiometer
R239	630-0085-000	8.2k ohms
R240	630-0107-000	68k ohms
R241	630-0087-000	10k ohms
R242	630-0031-000	47 ohms
R243	630-0063-000	1k ohm
R244	630-0071-000	2.2k ohms
R245	630-0051-000	330 ohms
R246	630-0071-000	2.2k ohms
R247	636-0011-000	25k ohms, potentiometer
R248	630-0115-000	150k ohms
R249	630-0095-000	22k ohms
R250	630-0071-000	2.2k ohms
R251	630-0047-000	220 ohms
R252	630-0039-000	100 ohms
R253	630-0023-000	22 ohms
R254	630-0091-000	15k ohms
R255	630-0079-000	4.7k ohms
R256	630-0039-000	100 ohms



NOTES:

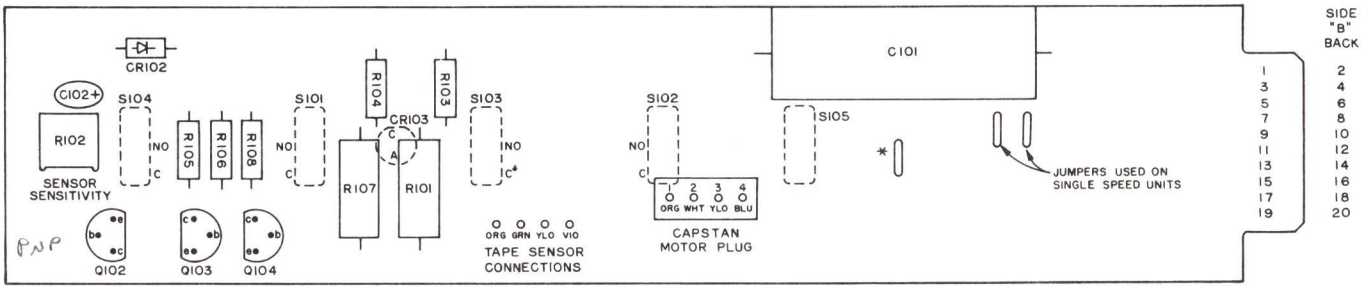
1. LETTERS "∘I" DESIGNATE CONNECTIONS FROM MOTION SENSE BOARD IF SO EQUIPPED.
2. JUMPER TOGETHER 'G' AND 'F', REMOVE JUMPER BETWEEN 'E' AND 'G', REMOVE JUMPER BETWEEN 'A' AND 'B' AND REMOVE JUMPER BETWEEN 'H' AND 'J' IF EQUIPPED WITH MOTION SENSE.
3. DASHED LINES INDICATE COMPONENTS MOUNTED ON SIDE "B".

MOTHER PC BOARD
831-0101-003

FIGURE 9-2

SYMBOL	PART NUMBER	DESCRIPTION
	CAPACITORS	
C1	696-0028-000	1100 mfd. 50 v, electrolytic
C2	696-0165-000	500 mfd. 25 v, electrolytic
C3	696-0207-000	200 mfd. 250 v, electrolytic
C5	686-0001-000	.1 mfd. 500 v, ceramic disc
C7	686-0001-000	.1 mfd. 500 v, ceramic disc
C8	686-0001-000	.1 mfd. 500 v, ceramic disc
C9	686-0001-000	.1 mfd. 500 v, ceramic disc
C10	696-0122-000	50 mfd. 25 v, electrolytic
C11	694-0002-000	10 mfd. 20 v, tantalum
C12	696-0117-000	10 mfd. 25 v, electrolytic
C13	686-0003-000	.05 mfd. ceramic disc
C14	686-0003-000	.05 mfd. ceramic disc
	DIODES	
CR1	575-0007-000	1N4005
CR2	575-0007-000	1N4005
CR3	575-0011-000	75KBP04 Bridge Rectifier
CR4	575-0007-000	1N4005
CR5	575-0007-000	1N4005
CR6	575-0007-000	1N4005
CR7	575-0007-000	1N4005
CR8	575-0007-000	1N4005
CR9	575-0007-000	1N4005
CR10	575-0007-000	1N4005
CR11	575-0007-000	1N4005
CR11	575-0007-000	1N4005
CR12	575-0007-000	1N4005
CR13	575-0007-000	1N4005
CR14	575-0007-000	1N4005
	CONNECTORS	
J1	380-0045-000	15 pin socket, PC
J2	380-0044-000	6 pin socket, PC
J6	380-0038-000	22 pin card edge connector
	RELAYS	
K1, K2		
K3, K4	480-0001-000	4 PDT (24 v)
	487-0003-000	Socket, relay (PC mount)
	TRANSISTORS	
Q1	590-0018-000	2N5817
Q2	590-0018-000	2N5817
Q3	590-0017-000	2N5816
Q4	590-0018-000	2N5817
	RESISTORS (All 5% tolerance unless noted)	
R1	638-0002-000	250 ohms, 25 watts, adjustable
R2	626-0231-000	47 ohms,½ watt,carbon comp.
R3	628-0179-000	50 ohms,20 watts,wire wound
R4	630-0107-000	68k ohms, ½ watt, carbon film
R5	626-0231-000	47 ohms,½ watt,carbon comp.
R6	626-0231-000	47 ohms,½ watt,carbon comp.
R7	638-0005-000	150 ohms, 12 watts, adjustable
R8	626-0231-000	47 ohms,½ watt,carbon comp.
R9	630-0239-000	100 ohms,½ watt, carbon film
R10	630-0239-000	100 ohms,½ watt, carbon film
R11	630-0091-000	15k ohms, ¼ watt, carbon film
R12	630-0079-000	4.7k ohms,¼ watt,carbon film
R13	630-0055-000	470 ohms,¼ watt, carbon film
R14	630-0079-000	4.7k ohms,¼ watt,carbon film
R15	630-0079-000	4.7k ohms,¼ watt,carbon film
R16	630-0079-000	4.7k ohms,¼ watt,carbon film
R17	630-0087-000	10k ohms, ¼ watt, carbon film
R18	630-0107-000	68k ohms, ¼ watt, carbon film
R19	630-0091-000	15k ohms, ¼ watt, carbon film
R20	630-0239-000	100 ohms,½ watt, carbon film
R21	630-0087-000	10k ohms, ¼ watt, carbon film
R22	636-0055-000	470 ohms,¼ watt, carbon film
R23	636-0004-000	10k ohms, potentiometer
R24	630-0239-000	100 ohms,½ watt, carbon film
	TRANSFORMERS	
T2	532-0001-020	Audio output, PC mount, NT1277
T3	532-0001-020	Audio output, PC mount, NT1277
	INTEGRATED CIRCUIT	
U1	605-0004-000	24 v series regulator—7824

3. Control Switch Assembly



NOTES:
1. * JUMPER MAY BE REPLACED WITH POWER-ON-OFF SWITCH.
2. DASHED LINES INDICATE COMPONENTS MOUNTED ON SIDE "B".

SWITCH PC BOARD ASSEMBLY
831-0100-003

FIGURE 9-3

SYMBOL	PART NUMBER	DESCRIPTION
	CAPACITORS	
C101	685-0011-000	1.2 mfd. 400 vdc
C102	694-0002-000	10 mfd. 20 v, tantalum
	DIODES	
CR101	575-0013-000	T1L32 — LED (infra-red)
CR102	575-0007-000	1N4005
CR103	575-0012-000	MV5054-1 Red LED

TRANSISTORS

Q101	590-0021-000	T1L78, Photo, NPN
Q102	590-0018-000	2N5817, PNP
Q103	590-0017-000	2N5816, NPN
Q104	590-0017-000	2N5816, NPN

RESISTORS
(All 5% tolerance unless noted)

R101	626-0463-000	1k ohm, 1 watt, carbon comp.
R102	636-0013-000	100k ohms, potentiometer
R103	630-0115-000	150k ohms, ¼ watt, carbon film
R104	630-0103-000	47k ohms, ¼ watt, carbon film
R105	630-0095-000	22k ohms, ¼ watt, carbon film
R106	630-0095-000	22k ohms, ¼ watt, carbon film
R107	626-0463-000	1k ohm, 1 watt, carbon comp.
R108	630-0063-000	1k ohm, ¼ watt, carbon film

SWITCHES

S101	391-0013-000	Pushbutton, SPDT momentary
S102	391-0013-000	Pushbutton, SPDT momentary
S103	391-0013-000	Pushbutton, SPDT momentary
S104	391-0013-000	Pushbutton, SPDT momentary
S105	390-0004-000	Toggle, SPDT, optional power switch
	404-0021-000	Lens, white
	404-0022-000	Lens, yellow
	404-0023-000	Lens, green
	404-0024-000	Lens, blue

4. Motion Sensor

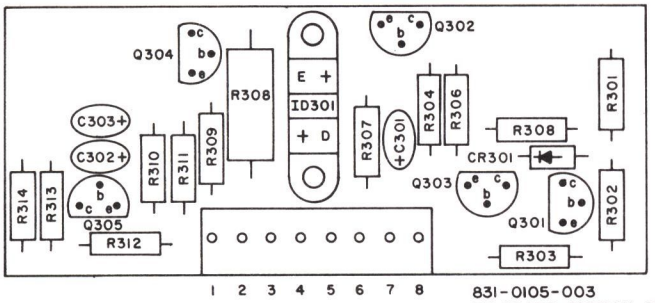


FIGURE 9-4

SYMBOL	PART NUMBER	DESCRIPTION
	CAPACITORS	
C301	694-0002-000	10 mfd. 20 v, tantalum
C302	694-0005-000	1 mfd. 35 v, tantalum
C303	694-0002-000	10 mfd. 20 v, tantalum
	DIODE	
CR301	575-0007-000	1N4005
	PHOTO INTERRUPTER	
ID301	652-0001-000	H13A1

TRANSISTORS

Q301	590-0017-000	2N5816, NPN
Q302	590-0018-000	2N5817, PNP
Q303	590-0017-000	2N5816, NPN
Q304	590-0017-000	2N5816, NPN
Q305	590-0017-000	2N5816, NPN

RESISTORS
(All ¼ watt, 5% carbon film unless otherwise noted)

R301	630-0083-000	6.8k ohms
R302	630-0075-000	3.3k ohms
R303	630-0079-000	4.7k ohms
R304	630-0071-000	2.2k ohms
R305	630-0099-000	33k ohms
R306	630-0079-000	4.7k ohms
R307	630-0079-000	4.7k ohms
R308	626-0463-000	1k ohm, 1 watt, carbon comp.
R309	630-0107-000	68k ohms
R310	630-0087-000	10k ohms
R311	630-0099-000	33k ohms
R312	630-0095-000	22k ohms
R313	630-0087-000	10k ohms
R314	630-0055-000	470 ohms

B. Miscellaneous Electronic Parts

SYMBOL	PART NUMBER	DESCRIPTION
	MOTORS	
B1	451-0053-020	Motor, capstan, 450 RPM, 117 VAC, 7½ IPS
B2	451-0057-020	Motor, torque, 1800 RPM, 117 VAC
B3	451-0057-020	Motor, torque, 1800 RPM, 117 VAC
	CAPACITORS	
C4	683-0012-000	7.5 mfd. 236 VAC, oil filled
C6	683-0012-000	7.5 mfd. 236 VAC, oil filled
	CONNECTORS	
J3	380-0007-000	6 pin socket
J4	380-0001-000	3 pin socket
J5	380-0007-000	6 pin plug
	380-0046-000	20 pin ribbon card edge connector
	TRANSFORMER	
T1	526-0005-000	Power, NT1228
	SOLENOIDS	
L1	477-0015-003	Brake, 117 VDC
L2	477-0015-003	Brake, 117 VDC
L3	477-0006-002	Pressure roller, 117 VDC, front mount
	TAPE SENSOR	
CR101 & Q101	832-0500-250	Sensor assembly—complete

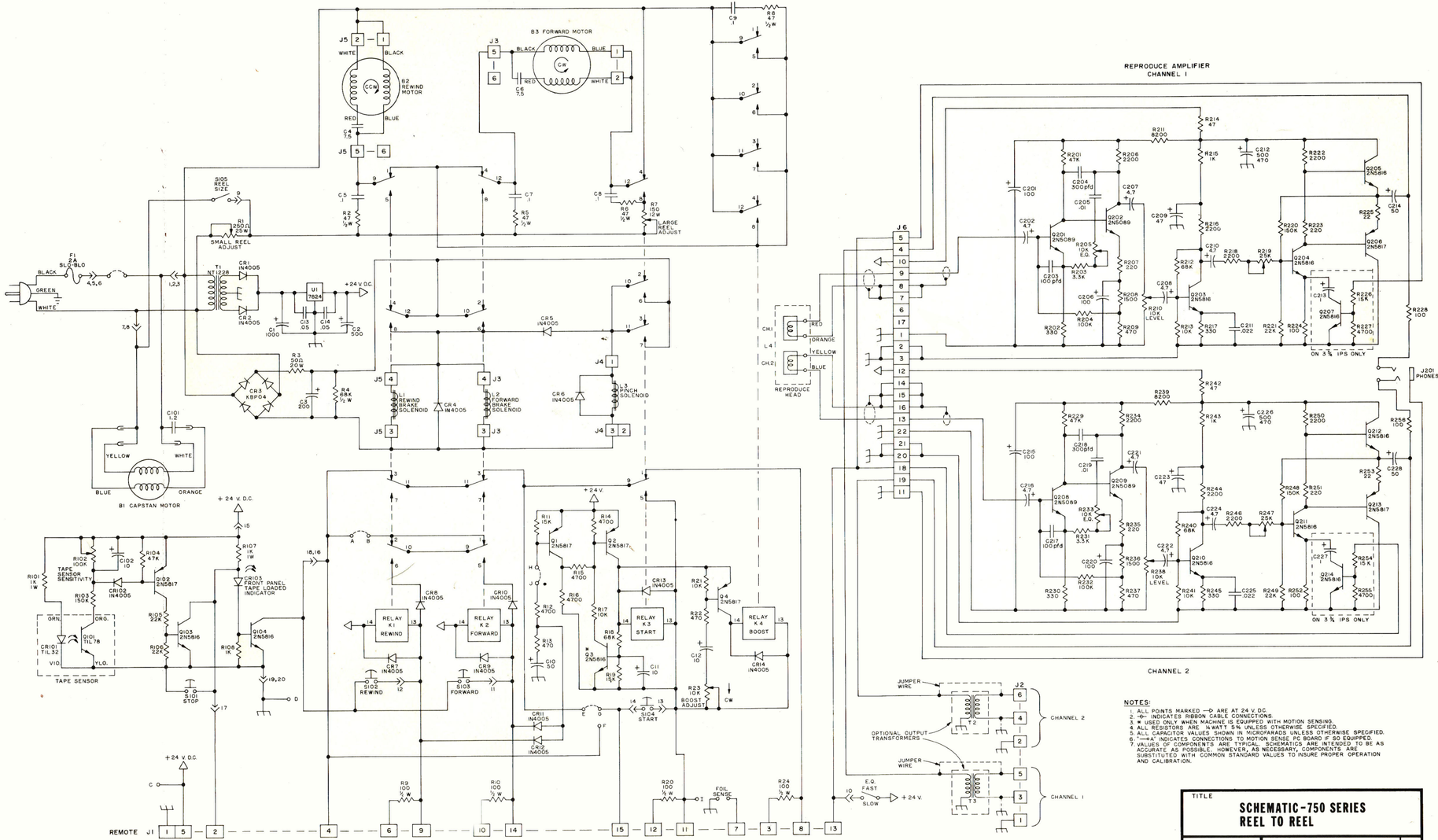
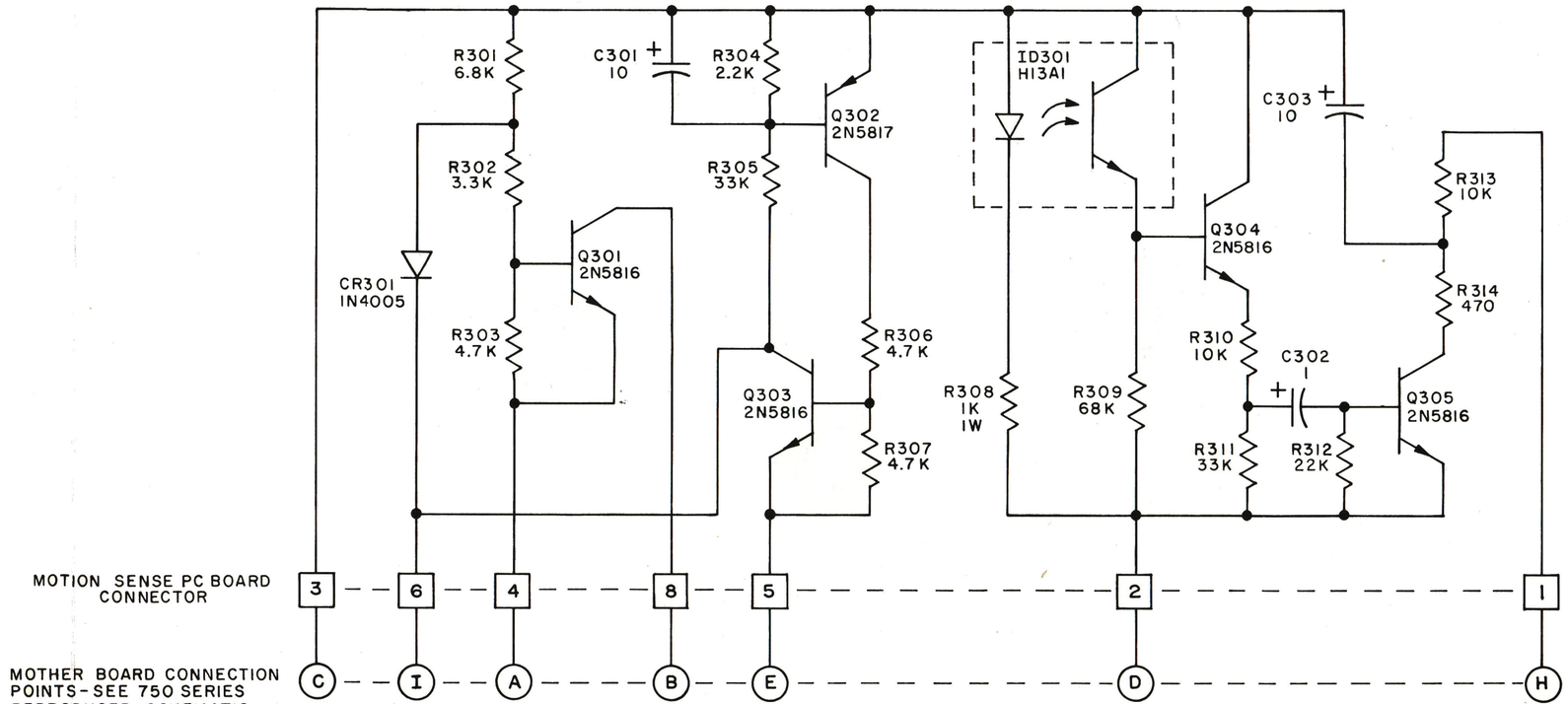


FIGURE 9-5

TITLE	
SCHEMATIC-750 SERIES REEL TO REEL	
it	893-0073-005
	DRAWING NUMBER / REV.



NOTES:

1. ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE NOTED.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.

TITLE
SCHEMATIC-MOTION SENSE PC BOARD - 750 SERIES

893-0074-002
PART NUMBER
EV.

FIGURE 9-6