

MARANTZ

SD6020

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MODEL

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SERVICE MANUAL

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## MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ Company has created the ultimate in stereo sound. Only original MARANTZ parts can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ stereo are generally available within 72 hours throughout the nation via a toll-free line to our National Parts Depot in California. The sales professionals who take your call immediately refer to their own desk top computer terminal and can quickly determine the availability and price information you require. If, for some reason, your order should exceed our available stock, we usually can instantly provide an alternate replacement part or current delivery information. When the order is placed and confirmed, the computer simultaneously generates "hard copy" orders at the distribution center. As hard copies come directly from the computer to the national parts depot, your requested stock is assembled and prepared for shipment and placed on the first available carrier for delivery to you.

### ORDERING PARTS

Phone orders will eliminate mail delays, and we encourage the use of this method. If you order by mail, use MARANTZ parts order forms which are available from our National Parts Depot located at the following address:

SUPERSCOPE NATIONAL PARTS DEPARTMENT  
20525 Nordhoff Street  
Chatsworth, California 91311  
Phone: 1-800-423-5108  
1-213-998-9333

The following information must be supplied to eliminate delays in processing your order:

1. Complete address.
2. Complete part numbers.
3. Complete description of parts.
4. Model number for which part is required (indicate MARANTZ).
5. Account number (for account customers only).

Direct consumers will be provided with the current retail price quotation on available parts in order to advise them of the cost of the parts and shipping.

### OVERSEAS PARTS ORDERING

Parts may also be ordered from the following overseas addresses:

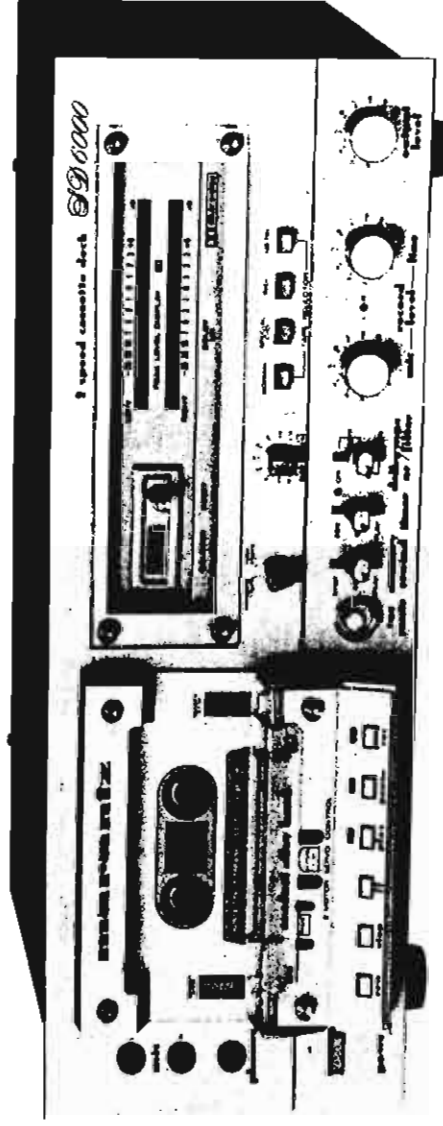
<b>U.S.A.</b> Marantz Company, Inc. National Service Dept. P.O. Box 577 Chatsworth, CA 91311 U.S.A.	<b>CANADA</b> Superscope Canada, Ltd. 3710 Nashua Drive Mississauga Ontario, Canada L4V1M5	<b>AUSTRALIA</b> Marantz Australia 32 Cross Street Brookvale, NSW 2100 Australia	<b>JAPAN</b> Marantz Japan, Inc. 3622 Kamitsuruma Sagamihara-shi Kanagawa, Japan
<b>EUROPE</b> Marantz Europe S.A. 326 Avenue Louise Bte 32 1050 Brussels Belgium	Marantz France 4 rue Bernard Palissy 92600 Asnieres France	Marantz Germany GMBH Max-Planck-Strasse 22 6072 Dreieich West Germany	Marantz Belgium 45 rue Auguste Van Zande 1080 Brussels Belgium
Marantz Svenska A.B. Svartviksvägen 56 Traneberg Box 12016 161 12 Bromma Sweden	Marantz Norske A.S. Refstadalleen 13 Oslo 5 Norway	Marantz GMBH Austria Wiedner Hauptstrasse 98 1050 WIEN AUSTRIA	

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please contact the nearest facility for the necessary assistance.

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## MARANTZ MODEL SD6000 STEREO CASSETTE DECK



### INTRODUCTION

This service manual are prepared for use by Authorized Warranty Station and contains service information for Marantz Stereo Cassette Deck.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation of the Cassette Deck.

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A simple description is included for parts which can be usually obtained through local suppliers.

### 1. PW. BOARDS

As can be seen from the circuit diagram, the chassis of your Cassette Deck consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Photo Capler ..... mounted on P.W. Board P001
2. Pre-Amp ..... mounted on P.W. Board P100
3. INPUT VOL: ..... mounted on P.W. Board P350
4. OUTPUT VOL. .. mounted on P.W. Board P351
5. Power Supply ..... mounted on P.W. Board P400
6. Logic Control ..... mounted on P.W. Board P500
7. Logic Switch ..... mounted on P.W. Board P590
8. Mecha Stop Switch mounted on P.W. Board P591
9. Mecha Stop Switch mounted on P.W. Board P592
10. Remote Switch ... mounted on P.W. Board P593
11. LED Meter Amp .. mounted on P.W. Board P600
12. LED Meter ..... mounted on P.W. Board P650
13. Fuse (P.A.N. only) mounted on P.W. Board P900
14. Timer & Memory .. mounted on P.W. Board P750

### 2. TEST EQUIPMENT REQUIRED FOR SERVICING

For measuring or checking your Cassette Deck, the following instruments and materials are necessary.

- VTVM
- Audio Oscillator (AF OSC)
- Attenuator (600  $\Omega$ )
- Oscilloscope
- Bandpass Filter (1 kHz)
- IEC A-Curve Filter
- Wow and Flutter Meter
- Torque Meter (Cassette Type)
- Digital Frequency Counter
- Distortion Meter
- Blank Tapes (Completely eraser with bulk eraser)
- TDK AC-211 (Normal)
- TDK AC-511 (CrO<sub>2</sub>)
- SONY CS-30 (Fe-Cr)
- TDK AC701 (METAL)

**NOTE: If any doubt is noted in a measured value, use new tape.**

- Test Tapes (New Tape)
- MTT-111 Wow and Flutter, Tape Speed (1-7 1/2 I.P.S.)
- MTT-212 Measurements of Output Level and Signal-to-Noise Ratio
- (MTT-112) Adjustment of Output Level
- MTT-150 Frequency Response (for Normal)
- MTT-216 (MTT-116V)
- MTT-316 Frequency Response (for CrO<sub>2</sub>, Fe-Cr)
- (MTT-116K) Metal)
- MTT-112B Play Back Signal Noise Ratio (W.T.D)
- MTT-121 Cross Talk
- MTT-141 Channel Separation
- MTT-111SP Wow and Flutter, Tape Speed (3-3 1/2 I.P.S.)

### 3. CIRCUIT DESCRIPTION

#### 1 AUDIO SECTION

##### 3.1.1 TAPE SPEED SELECTOR

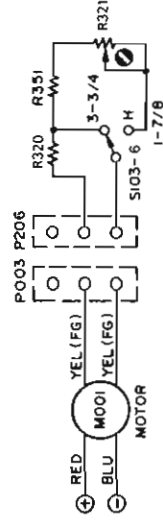
Tape speed is changed by switching the motor speed to 1,800 rpm for 1-7/8 ips (4.75 cm/sec) or to 3,600 rpm for 3-3/4 ips (9.5 cm/sec). In fast-forward or rewind operation, however, the motor always rotates at 1,800 rpm.

1. R321 is used for precisely adjusting the motor speed to 3,600 rpm.
2. To precisely adjust the motor speed to 1,800 rpm, turn the variable resistor built-in the motor.

**NOTE:** The motor speed is known by playing back the test tape MTT-111 and measuring the reproduced frequency.

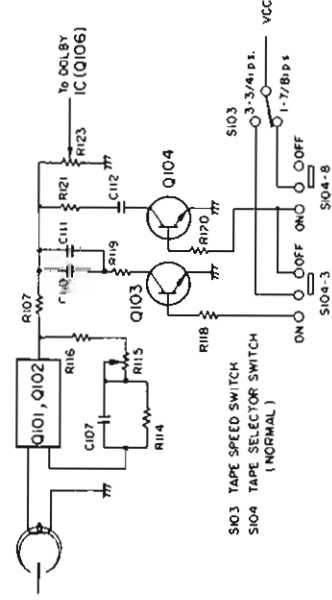
Motor speed (rpm)	Reproduced frequency (Hz)
1800	3000
3600	6000

#### TAPE SPEED SELECTOR



##### 3.1.2 PLAYBACK EQUALIZER CIRCUIT

A block diagram of the playback equalizer circuit is shown below.



Time constants of the playback equalizer circuit at each tape speed and selector position are as follows:

TAPE SELECTOR POSITION	NORMAL	SPECIAL/CrO <sub>1</sub>	FeCr	METAL
TAPE SPEED	1-7/8 IPS	120 μS	70 μS	70 μS
	3-3/4 IPS	70 μS	35 μS	35 μS

#### Circuit Function at Each Time Constant

##### (1) 120μS

S104 is Tape Selector Switch for normal position. In the diagram, this switch is in the depressed position, causing Q103 and Q104 to turn OFF due

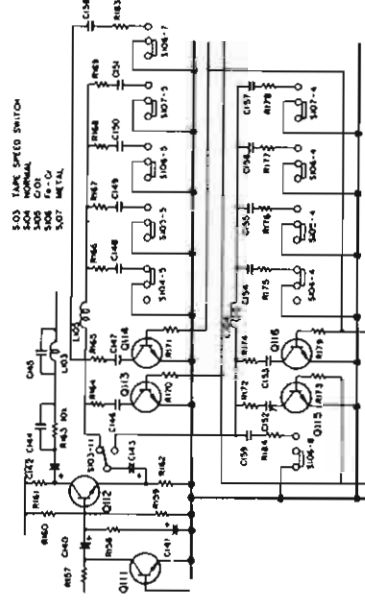
to zero bias voltage. In this case, the playback time constant is set to 120μS by C107 and R114 ~ R116. (2) 70μS

When the tape speed is 1-7/8 ips (4.75 cm/sec) and S104-8 is OFF (S104 turns OFF when the other tape selector switch is depressed) a bias voltage is applied to the base of Q104 which is then turned ON. When the tape speed is 3-3/4 ips and S104-8 is ON, Q104 is also ON. In either case, the playback time constant is set to 70μS by C107, R114 ~ R116, C112 and R121. (3) 35μS

When the tape speed is 3-3/4 ips (9.5 cm/sec) and S104-3 is OFF, Q103 is ON and the playback time constant is set to 35μS by C107, R114 ~ R116, C110, C111 and R119.

##### 3.1.3 RECORDING COMPENSATING CIRCUIT

(Tape Speed: 3-3/4 ips)



##### ● High speed

In the circuit diagram, C144 and R163 are used for high range compensation, and R158 and C141 for low range compensation.

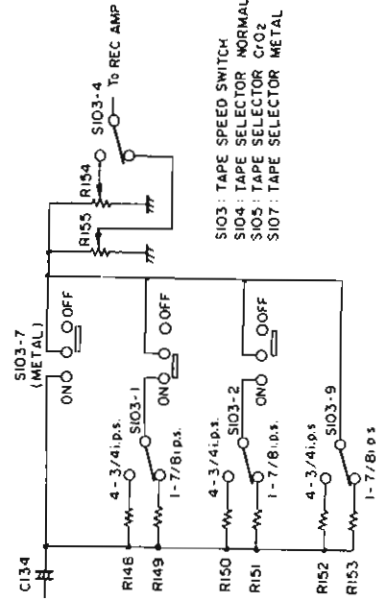
L104, R175 ~ R178 and C154 ~ C156 form a peaking circuit. Peeking frequency and thymount of compensation are selected by the tape selector switch.

R172, R174, R184 and C159, C152, C153 are used for medium range compensation. The amount of compensation is selected by the tape selector switch (not available at 'Normal' position).

Be sure that the control marked wts (NORMAL" is for bias current adjustments in the METAL position.

##### 3.1.4 RECORDING CURRENT SETTING CIRCUIT

Recording currents at each tape speed and each position of the tape selector switch are obtained from the following circuit:

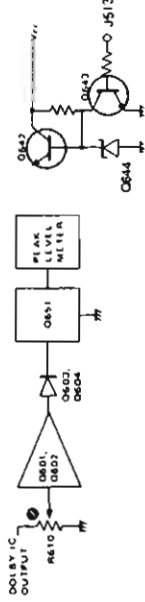


The switch (S106) for the FeCr position is not included in the above circuit. The recording current at this position is determined by R152 and R155 or R153 and R154. The resistors used to determine recording current at each tape speed and each tape selector switch position are shown in the table below.

TAPE SPEED	TAPE SELECTOR POSITION	NORMAL	SPECIAL/ CrO <sub>2</sub>	FeCr	METAL
	1-7/8 IPS		R153	R153	R153
		R149	R151	R155	
		R155	R155		
3-3/4 IPS		R148	R152	R152	R154
		R152	R150	R154	
		R154	R154		

### 3.1.5 LED METER CIRCUIT

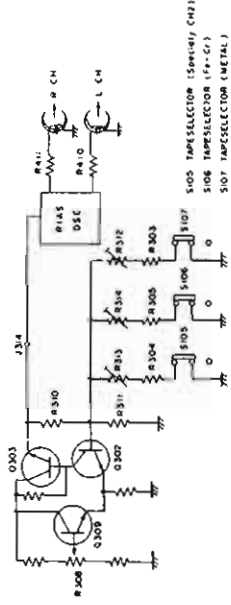
- The signal amplified and rectified by Q601 and Q602 is applied to the LED drive IC(Q651).
- The LED drive IC(Q651) makes LEDs light during playback or recording operation).
- During fast-forward or rewind operation, Q643 is ON, so that the regulating transistor (Q642) in the LED power supply is OFF.
- Since Q642 is OFF, noise signals are prevented from lighting LEDs.



### 3.1.6 BIAS OSCILLATOR CIRCUIT/ERASE OSCILLATOR CIRCUIT

This unit with capabilities to accommodate metal tapes has separate bias and erase oscillator circuits. However, for both Standard and High speeds, the bias current remains unchanged.

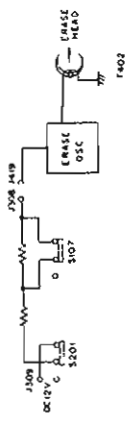
- Bias Oscillator Circuit



As shown in the above drawing, by varying the Q303 base voltage, the bias oscillator circuit operational voltage is altered. Also, in case of 3-3/4 i.p.s. (9.5 cm/sec.), do not adjust by bias current. Adjust the recording EQ circuit, instead. Incidentally, R308 is the bias fine adjust control on the front panel.

	Normal	CrO <sub>2</sub>	FeCr	Metal
1-7/8 ips (4.75 cm/s)	R411, R410	R313	R314	R312

## 2. Erase Oscillator Circuit



The erase oscillator circuit consists of Q417 and T402. Only in case of metal tapes, R322 is shorted to increase the erase current.

## 2 Control Section

### 3.2.1 GENERAL

The control circuit in the SD6000 Cassette Deck consists of IC and transistor logic set up around a microprocessor (Q505) that stores and processes various control signals.

With its dynamic control system, the control signal input circuit features simple circuit configuration and increased reliability.

The SD6000 has two motors and three solenoids, each of which serves the following purposes:

1) Capstan Motor (M001)

This motor turns the capstan at a constant speed so that tape speed is always constant. It also gives a take-up torque to the right-side reel disc when the machine is in the PLAY or REC/PLAY mode.

2) Reel Motor (M002)

The reel motor drives the take-up reel at high speed when the machine is in the Fast Forward or Rewind mode.

The turning direction of the reel motor in Fast Forward is reverse to that in Rewind. The reel disc to be driven by the reel motor is automatically selected in accordance with the turning direction of the reel motor.

The reel motor is also used to take up tape slack.

3) PLAY Solenoid (L001)

The PLAY solenoid is used to put the deck into the PLAY or REC/PLAY mode. When the solenoid is actuated, it moves up the head base to bring the head into contact with the tape and, at the same time, presses the pinch roller against the capstan to transport the tape. It also provides the tape with adequate back tension by applying slight braking to the supply reel.

4) Brake Solenoid (L002)

Operating in the PLAY, REC/PLAY, FF, and REW modes, the brake solenoid releases the brakes applied to both reel discs.

5) Record Solenoid (L003)

Operating in the REC/PLAY or REC/PAUSE mode, the record solenoid puts the internal amplifier into the record mode. When this solenoid is not actuated, the amplifier enters the PLAY mode.

The control circuit uses 5 ICs Q501 to Q505. To operate these ICs properly, the supply voltage (emitter of Q558 or pin 6 of P504) to the ICs must always be within +4.75V to +5.25V.

	Q501 – Q504		Q505	
	Min.	Max.	Min.	Max.
H level output voltage	2.4V	—	2.9V	—
L level output voltage	—	0.4V	—	0.4V
H level input voltage	2.0V	—	2.0V	—
L level input voltage	—	0.8V	—	0.8V

Q501: SN7400  
 Q502: SN7401  
 Q503: SN7401  
 Q504: SN7404  
 Q505: M54410P

In the following circuit descriptions, the initial state of the deck is, unless otherwise stated, the STOP mode. All voltage values and operating times appearing in the descriptions are approximate values. Those values are subject to change due to changes in parts used and supply voltage variations.

### 3.2.2 CONTROL SIGNAL INPUT CIRCUIT

(NOTE: In this section, expressions like "Q503-4 (13)" are used. In this expression "Q503" represents an IC number, "4" represents a logic gate number, and "(13)" represents the pin number of the IC.)

The control signal input circuit uses a dynamic control system. See Figs 2-1 and 2-2.

- 1) Logic gates Q501-1 and Q501-2 constitute a clock pulse generator, which generates a square wave signal of approx. 71 Hz with a duty ratio of 50%.
- 2) Logic gates Q502-1 and Q501-3 constitute a T (Toggle) flip-flop. Its output (strobe A) reverses its state at every negative edge of the input clock, and it has a period twice as long as the clock period.
- 3) A logical product (AND) of strobe A and clock pulse generates strobe B. Strobe A, strobe B, and depression timing of each control button determine the operation command signals coupled to the system control IC (micro-processor).

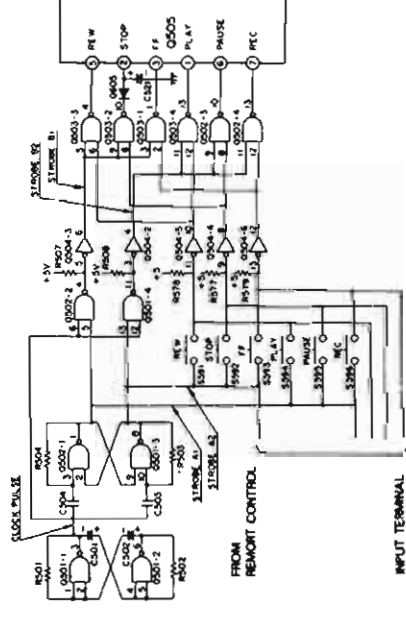


Fig. 2-1. Control signal input circuit

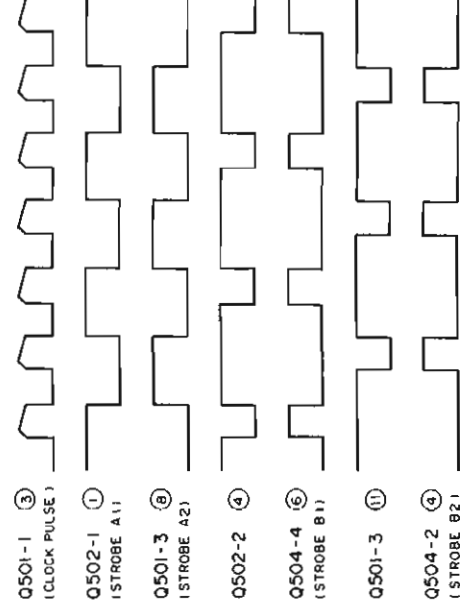


Fig. 2-2. Strobe timing chart

The following paragraphs describe the case where the PLAY button is depressed. See Fig. 2-3.

- 4) When no control button is depressed, pins (9), (11), and (13) of Q504 are all "H". When the PLAY button is depressed, strobe A is momentarily applied to Q504-5(11). After its polarity is reversed by Q504-5, strobe A1 goes to Q503-3(6) and Q503-4(12).

- 5) Q503-4(13) outputs a low-level signal only when strobe B2 and the "H" level of strobe A1 coincide. At the first negative going edge of this low-level output, the system control IC stores the PLAY mode.
- 6) During the period from above item 2) to 4), no coincidence takes place between the "H" levels of strobe B1 and reversed strobe A1. Therefore Q503-3(4) (REW operation command signal) remains "H" level.

As seen from this, sequence control depending on pulse timing is called the dynamic control system. When any other control button than the PLAY button is depressed, a similar sequence is activated to apply an operation command signal to a corresponding input pin of the system control IC.

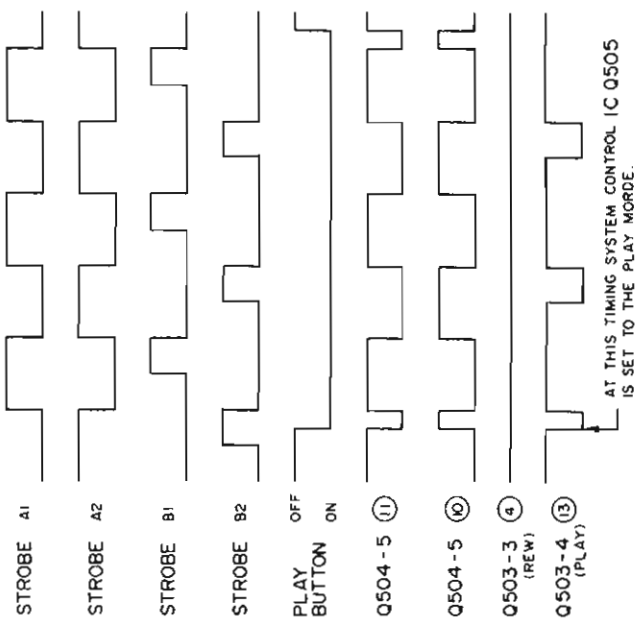


Fig. 2-3. PLAY operation command signal timing chart



### 3.2.3 SYSTEM CONTROL IC OPERATION

#### 3.1. Pin Configuration and Block Diagram

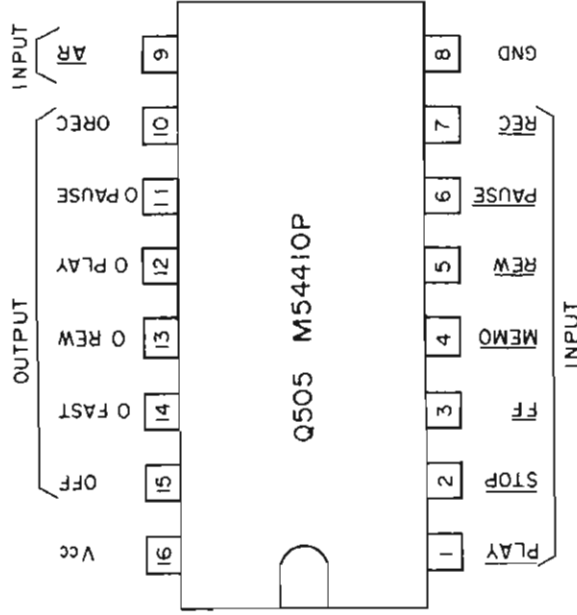


Fig. 3-1. Pin configuration (Top view)

#### 3.2 Pin Mnemonics and Description of Function

Pin No.	Mnemonic	Description	Remarks
1	PLAY	Accepts PLAY start command.	
2	STOP	Accepts STOP command	
3	FF	Accepts FF command	
5	REW	Accepts REW command	
6	PAUSE	Accepts PAUSE command.	
7	REC	Accepts REC command.	
4	MEMO	Memory input	Unused.
9	AR	Record inhibit input	
10	OREC	Outputs "H" level in the PAUSE mode.	
11	OPAUSE	Outputs "H" level in the PAUSE mode.	
12	OPLAY	Outputs "H" level in the PLAY mode.	
13	OREW	Outputs "H" level in the REW mode.	
14	OFAST	Outputs "H" level in the REW or FF mode.	
15	OFF	Outputs "H" level in the FF mode.	
8	GND	Ground Pin	
16	Vcc	Accepts power supply	

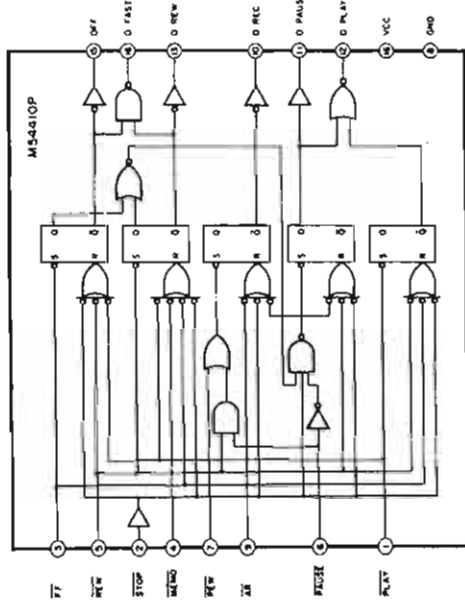


Fig. 3-2. Block diagram

#### 3.3 Input Signal Processing

Input signal	Output							
	OFAST	OFF	OREW	OREC	OPAUSE	OPLAY	Output mode	
STOP	L	L	L	L	L	L	L	STOP Mode
FF	H	H	L	L	L	L	L	FF mode
REW	H	L	L	L	L	L	L	REW mode
PLAY	L	L	L	L	L	L	H	PLAY mode
PAUSE	L	L	L	L	L	L	L	PAUSE mode
REC/PLAY	L	L	L	L	H	L	H	REC/PLAY mode
REC/PAUSE	L	L	L	L	H	H	L	REC/PAUSE mode

- 1) Each mode is set to "H" at the negative going edge of each input signal.
- 2) REC/PLAY means that REC and PLAY inputs are reset to "L" at the same time.
- 3) REC/PAUSE means that REC and PAUSE inputs are reset to "L" at the same time.
- 4) While input AR is "L", OREC is held to "L".
- 5) Each output maintains its state until an input causing a different output mode is received.

### 3.4. Output Mode Transitions

- The following table shows output mode transitions actuated by each input signal.
- Hatched sections in the following table indicate no mode transition.

Current Output mode	Input signal							
	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
STOP mode	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
FF mode	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
REW mode	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
PLAY mode	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
PAUSE mode	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
REC/PLAY MODE	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE
REC/PAUSE mode	STOP	FF	REW	PLAY	PAUSE	REC/PLAY	REC/PLAY	REC/PAUSE

### 3.5. Multiple Button Depression

Since the control signal input circuit is controlled dynamically, if all the operation buttons are depressed at the same time, the system control IC accepts control signals as shown in Fig. 3-3:

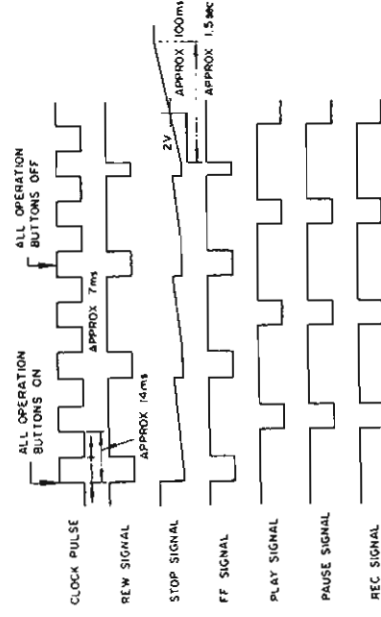


Fig. 3-3. Input signal timing

While the STOP button is depressed, the STOP signal remains at "L" level, and when it is released, the signal is not immediately restored to "H" level because of capacitor C521. Therefore, if any other button is depressed together with the STOP button, the highest priority is always given to the STOP button. Which mode the deck enters when a multiple button depression is released depends on the signal applied to the system control IC immediately before the last button is released.

### 3.6. Output Mode at Power ON

When the power to the deck is turned ON, all the outputs become "L", with the deck in the STOP mode.

### 3.2.4 CIRCUIT OPERATION

#### 4.1. Playback

Pressing the PLAY button sets the system control IC(Q505) into the PLAY mode, with a PLAY signal (H) output from pin 12.

The PLAY signal causes the following operation sequence:

- Transistor Q550 is turned ON. This causes the following control sequence to put the amplifier into the PLAY mode (see Fig. 4-1).
  - Q643 is turned OFF. This activates the voltage regulator that supplies power to the LED meter.
  - Q109 and Q209 are turned OFF, releasing playback muting.
  - Q111 and Q211 are turned OFF, releasing record amplifier muting.

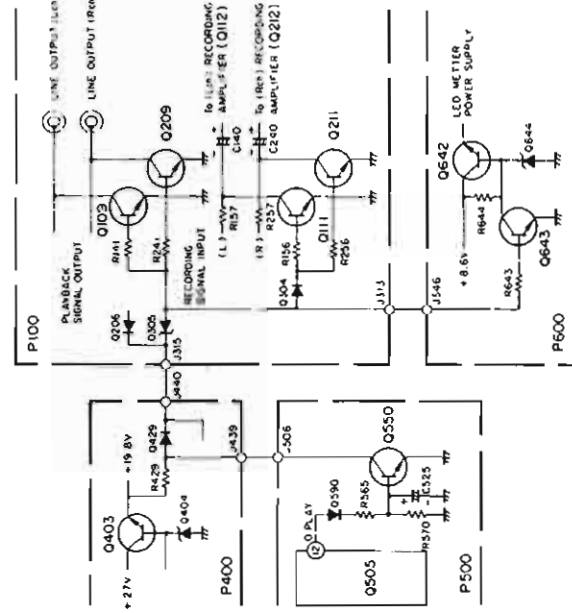


Fig. 4-1. Muting control circuit

- Q553 is turned ON for approx. 0.5 second via C518 AND D594. This actuates the solenoid drive voltage switching circuit consisting of Q555, Q556, Q432, etc. (The circuit operation will be described in section 5.1.) When Q553 is turned ON, Q554 is turned OFF.

During this period, an "H" level signal is coupled to the tape end sensing circuit (Q546, Q549) via R569 and D588. This "H" level signal temporarily suspends the tape end sensing circuit function until tape running is stabilized. (For the details of the tape and sensing circuit, refer to section 5-2.)

- Q540 is turned ON via Q579 and Q580. This causes Q541 to turn ON, actuating the brake solenoid (L002).
- Q536 is turned ON via Q579 and Q581. This lights the PLAY indicator LED (Q591) and, at the same time, turns Q537 ON, actuating the PLAY solenoid (L001).

#### 4.2. PAUSE

Pressing the PAUSE button causes a PAUSE signal (H) to be output from pin 11 of the system control IC.

- 1) The PAUSE signal is coupled to the tape end sensing circuit via R556 and Q587 to make the circuit inactive during the PAUSE mode.
- 2) The PAUSE signal also turns Q510 ON via Q601, Q600, Q599, and Q505, causing the PAUSE indicator or LED (Q592) to go ON.

#### 4.3. RECORD

Pressing the REC and PLAY buttons simultaneously causes PLAY and RECORD signals to be output from pins 12 and 10 of the system control IC respectively.

The PLAY signal, as mentioned earlier (4.1), puts the deck into the PLAY mode.

- 1) The RECORD signal turns on Q538 via Q582 and R545, and lights the RECORD indicator LED (Q593).
- 2) When Q538 is turned ON, Q539 is also turned ON, activating the RECORD solenoid. This puts the amplifier into the RECORD mode.

#### 4.4. REC/PAUSE

Pressing the REC and PAUSE buttons simultaneously causes both the RECORD and PAUSE signals to be output from the system control IC.

Although the RECORD signal puts the amplifier into the RECORD mode, the tape does not start running since no PLAY signal is present. Also in the REC/PAUSE mode, the RECORD signal turns Q550 ON via Q589 and R565, thus releasing amplifier muting.

#### 4.5. Fast Forward

Pressing the FF button causes the FF signal and EAST signal to be output from pins 15 and 14 of the system control IC.

The FF signal causes the following operation sequence:

- 1) Q528 is turned ON via Q573, Q574, and R529. This sets the reel motor drive circuit into the FF mode to cause the right side reel disc to rotate at high speed. (For the details of the reel motor drive circuit, refer to section 5-3.)
- 2) Q540 and Q541 are turned on via Q573, Q575, and Q547, actuating the brake solenoid (L002).

The FAST signal turns Q553 ON for approx. 0.5 second via C516 and Q596. The output of Q553 actuates the solenoid drive voltage switching circuit.

#### 4.6. REWIND

Pressing the REW button causes the REW and FAST signals to be output from pins 13 and 14 of the system control IC respectively.

For the details of the REW circuit, refer to the FF circuit, operation of which is almost identical to the REW operation.

#### 4.7. STOP

The STOP circuit has the following circuit configuration:

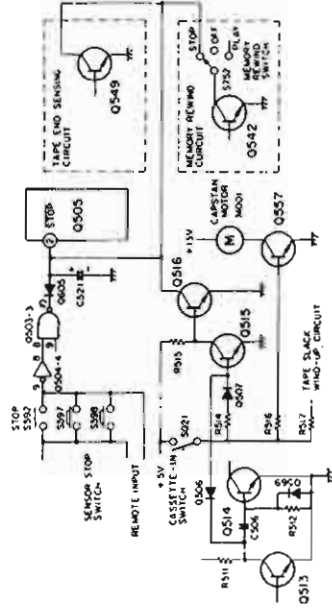


Fig. 4-2. STOP circuit configuration

When an "L" level signal is coupled to pin 2 of the system control IC, the deck is put into the STOP mode. This happens under each of the following conditions:

- 1) When the STOP button is depressed.
- 2) When stop sensor switch S597 or S598 is depressed.
- 3) When the STOP button on the remote control unit is depressed.
- 4) For the approx. 0.3 second in which C521 is charged to high level (approx. 2V) immediately after the power to the deck is turned ON.
- 5) When no cassette is loaded in the deck. In such a case, the cassette-in switch (S021) is open, with Q515 and Q516 turned OFF and ON respectively. When the cassette-in switch is open, Q557 remains OFF, causing the capstan motor (M001) to remain stationary.
- 6) When the end of a tape is reached when the deck is in the PLAY, REC/PLAY, FF, or REW mode. In this case, the tape end sensing circuit is actuated turning Q549 ON. (See section 5.2.)
- 7) When the tape counter returns to "000" with the memory rewind switch in the STOP position and the deck in the REW mode. (See section 5.5.).

**NOTE:** The STOP operation under condition 5) takes priority over the other conditions. Conditions 1) through 4), 6), and 7) take priority over all other operations except the tape-stack wind-up operation.

#### 4.8. Mode Transition

Pressing the FF (or REW) button during PLAY (or REC/PLAY) operation puts the deck into the FF (or REW) mode after temporarily entering the STOP mode. Similarly, transitions FF to REW, REW to FF, FF to PLAY (or REC/PLAY), and REW to PLAY (or REC/PLAY) are all accomplished via the STOP mode. This contributes to stable tape transport operations and eliminates drop-out and tape jamming. See the schematic diagram in Fig. 4-3 and timing chart in Fig. 4-4. The following circuit description uses a transition from REW to PLAY as an example.

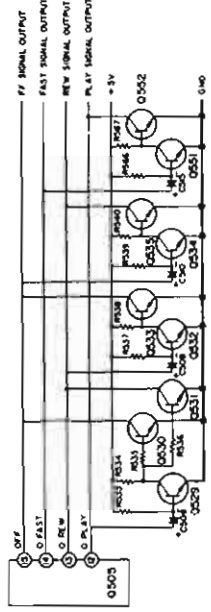


Fig. 4-3. Delay circuit for mode transition

- 1) During the REW mode, OFAST remains at "H" level. Therefore, C515 is charged with Q551 and Q552 turned ON and OFF respectively.
- 2) Pressing the PLAY button resets the REW mode and, instead, sets the PLAY mode inside Q505.
- 3) When the REW mode is reset, OFAST and OREW go from "H" to "L". When OFAST goes to "L", C515 discharges. While the discharging current is present (for approx. 100ms), Q551 and Q552 are turned OFF and ON respectively.
- 4) At this time, the internal circuit of Q505 is already set to the PLAY mode, but OPLAY is held to "L" level while Q552 is turned ON. Therefore, for approx. 100ms immediately after the PLAY button is depressed, the deck remains in the STOP mode.
- 5) After the delay time of approx. 100ms, Q511 is turned ON and Q522 is turned OFF. This makes the OPLAY signal "H" level to put the deck into the PLAY mode.

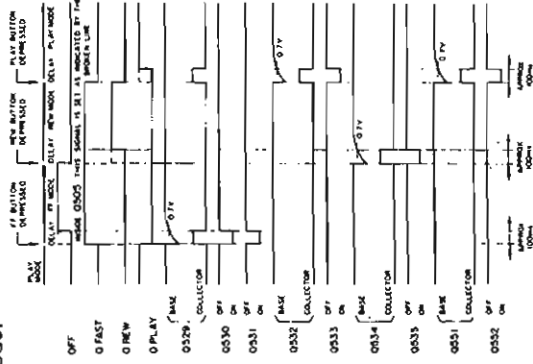


Fig. 4-4. Mode transition timing chart

#### 3.2.5 AUXILIARY CIRCUITS

##### 5.1. Solenoid Driving Voltage Switching Circuit

The SD6000 uses three individual solenoids. To ensure consistent operation of these solenoids, a large enough energizing current is required. However, if a large current is passed through a solenoid for a long period, the winding resistance increases due to heat, resulting in a reduced pulling force and unstable operation. However, although energizing a solenoid requires a relatively large current, once it is energized, a smaller current is enough to maintain it stably. Therefore, the SD6000 has a solenoid drive voltage switching circuit which switches driving voltages for energizing and maintaining solenoids.

The following describes circuit operation with the PLAY mode using an example. Refer to Figs 5-1 and 5-2.

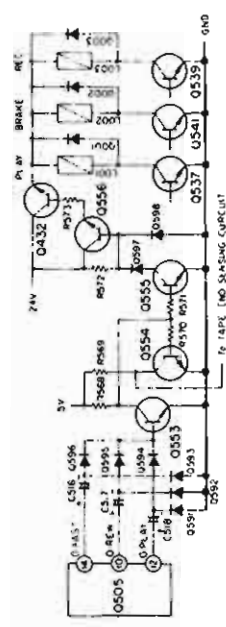


Fig. 5-1. Solenoid driving voltage switching circuit

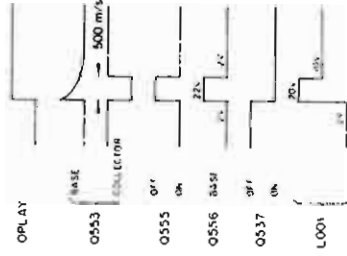


Fig. 5-2. Example of operation (PLAY mode)

- 1) Pressing the PLAY button causes OPLAY to go "H".
- 2) The OPLAY signal turns Q553 ON for approx. 500ms via C518 and Q594. This turns off Q555.
- 3) When Q555 is turned OFF, the base potential of Q556 is held to 22V by zener diode Q598. As a result, approx. 20V is obtained at the emitter of Q431.
- 4) As mentioned in PLAY operation in section 4-1, the OPLAY signal causes Q537 to turn ON, applying +20V DC across play solenoid L001 to energize it.
- 5) Q553 is turned OFF approx. 500ms later, turning Q555 ON. This causes the base of Q556 to be biased to +12V DC by zener diode Q597, reducing the emitter potential of Q432 to +10V. In the PLAY mode, the PLAY solenoid is maintained with this driving voltage of +10V.
- 6) Releasing the PLAY mode causes the OPLAY signal to go "L". This causes the charge across C518 to quickly discharge through Q591, C518, and Q505 to be ready for the following operation.

### 5.2. Tape End Sensing Circuit

When the end of a tape is reached during the PLAY, REC/PLAY, FF, or REW mode, the tape end sensing circuit senses it and sends a stop signal to the system control IC. When the right-side reel disc rotates, the shutter drum also rotates together with the reel disc. The shutter drum is provided with two optical slits. Photo coupler Q001 consists of an LED and photo transistor. The light emitted from the LED reaches the photo transistor only when the shutter drum's slit passes across the photo coupler to turn ON the photo transistor. Refer to Figs 5-4 and 5-5.

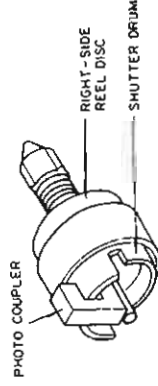


Fig. 5-3. Tape end sensor

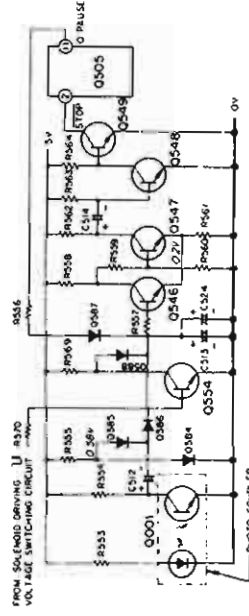


Fig. 5-4. Tape end sensing circuit

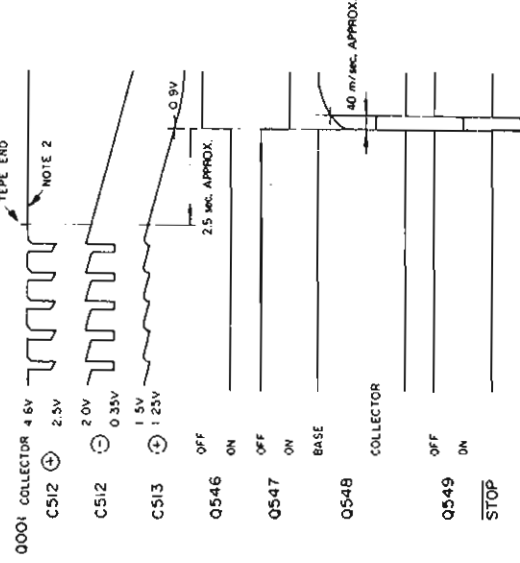


Fig. 5-5. Tape end sensing timing (Voltages represent typical values.)

- 1) When the PLAY, REC/PLAY, FF, or REW mode is actuated, an "L" level signal from the solenoid driving voltage switching circuit turns Q554 OFF for approx. 0.5 second. During this 0.5 sec., C513 and C524 are charged through R569 and C588 to turn Q546 ON and Q547 OFF. Q548 and Q549 remain ON and OFF respectively.
- 2) While tape is running and the reel disc is rotating,

the collector voltage of the photo transistor repeats ON and OFF operation as shown in Fig. 5-5. (As can be seen from the figure, the ON state of the photo transistor is not necessarily the ideal one.)

- 3) Q584 (silicon diode 1S1555) is forward biased via R555 with its anode potential held at approx. 0.58V. When the photo transistor is turned ON, C512 discharges through R555, Q585, C512, and Q001. At the time, the negative-side potential of C512 is clamped to approx. 0.35V, a voltage lower than 0.58 volt by the forward voltage drop across Q585 (Germanium diode 1N34A).
- 4) When the photo transistor is turned OFF, its collector voltage is increased by V with respect to that in the ON state. This voltage variation is transferred to the negative terminal of C512, where the potential becomes (DC clamp voltage) + (positive terminal voltage variation). As a result, voltages V and V appear repeatedly at the negative terminal of C512. The purpose of the DC clamp is described in following item (8).
- 5) When the PLAY, REW, FF, or other mode is actuated, C513 and C524 are charged through R569 and R588. After Q554 is turned ON, the charging current is supplied through Q586. C513 and C524 are charged only when the photo transistor is turned OFF, and are discharged through the base of Q546.
- 6) When the end of tape is reached and tape stops running, the reel disc also stops turning, causing the photo transistor to stop electrical switching. As a result, C513 and C524 are not longer charged, and the voltages across those capacitors are gradually reduced as they discharge through Q546.
- 7) When the potential of C513 and C524 is reduced to approx. 0.9V, Q546 and Q547 are turned OFF and ON respectively. Q546 and Q547 constitute a Schmitt trigger circuit which converts an input signal with gentle slope into an output signal with a steep leading edge. When Q547 is turned ON, Q548 is momentarily turned OFF via C514. During this OFF period of Q548, Q549 is turned ON. This gives an "L" level stop signal to the system control IC, putting the deck in the STOP mode. The tape end sensing period from the time tape running stops to the time when the stop signal is issued is approx. 2.5 seconds.
- 8) The DC clamp circuit consisting of R555, Q584, and Q585 determines the upper limit of charging voltages to C513 and C524 while the photo transistor is turning ON and OFF. As shown in Fig. 5-5, the thresh-old level of the Schmitt circuit is located on a very gentle slope of the discharging curve of C513 and C524. Therefore, if the charging voltage is increased even slightly, the tape end sensing period will be increased remarkably. To prevent this, the DC clamp circuit the tape end sensing period to approx. less than 2.5 seconds.
- 9) In the PAUSE, mode the OPLAY signal is at "H" level, and Q546 is held ON via R556 and Q587. Therefore, no STOP signal is issued if the tape stops running.

### 5.3 Reel Motor Driving Circuit

- 1) Q518 is usually turned ON and hence Q520 is usually turned OFF. As a result, the base of Q519 is biased through R524
- 2) When the system control IC is set into the FF mode, an "H" level OFF signal is coupled to Q528 via Q573, Q574, and R529, and turns it ON then turns Q525 ON. When Q525 is turned ON, its collector potential goes to "L", turning Q524 ON. As a result, a driving current passes through the reel motor (M002) via the power supply, Q524, M002, and Q525, turning the motor counterclockwise (as viewed from the pulley) to drive the right-side reel disc. At this time, the emitter voltage of Q519 is approx. 13V.

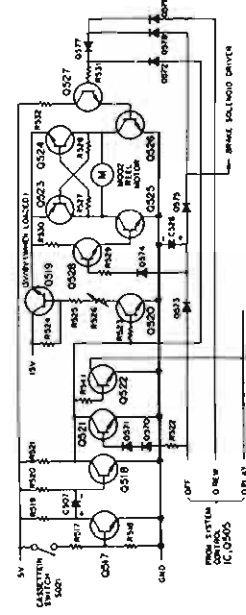


Fig. 5-6. Reel motor driving circuit

- 3) In the REW mode, Q523 and Q526 are turned ON in a similar way to drive the reel motor clockwise (reverse to the FF mode). When the reel motor rotates in the clockwise direction, the FF pulley is automatically switched to the left-side reel disc.

### 5.4 Tape Slack Wind-Up Circuit

Slack tape often causes program drop-out and tape jamming. To prevent this, the SD6000 has a tape slack wind-up circuit that automatically winds up tape slacks when a cassette is loaded into the deck with the power turned ON or when the power to the deck with a cassette loaded into the deck with the power turned ON or when the power to the deck with a cassette loaded is turned ON.

Refer to Fig. 5-6.

When the power to the deck is turned ON with no cassette loaded in the deck, cassette-in switch S021 remains open with Q517 and Q518 turned OFF and ON respectively. When a cassette is loaded in the deck, S021 is closed, turning Q517 ON. As a result, the base potential of Q518 is pulled to the ground level via C507, causing Q518 to turn OFF for approx. 1 second. During this period, an "H" level signal is obtained at the collector of Q518 to be ready for following operations.

- 1) Turning Q522 ON forcibly brings the OPLAY output pin of the system control IC to "L" level. This prevents the deck from being entering the PLAY mode during tape slack wind-up operation.
- 2) Q520 is turned ON via R523. As a result, the base bias of Q519 is given by the ratio of the sum of R525 and R526 to R524, and hence the emitter voltage (when loaded) of Q524, and hence the emitter voltage (when loaded) of Q519 is reduced to approx. 8V.

This sequence is to reduce the reel motor torque and thus to prevent tape from being wound up excessively.

- 3) Q527 is turned ON via Q572 and R531, turning Q526 and Q523. This applies a rewind torque to the left-side reel disc. Although brakes are applied to both reel descs during tape slack winding-up operation, the brake of the left-side reel disc is not very effective because of the reverse direction of rotation, so that tape slack can be wound up even with a lower driving torque.

When the power to the deck with a cassette already loaded in it is turned ON (for example, for timer recording), tape slack is removed in a similar manner. When the PLAY, FF, REW, or STOP button is depressed while tape slack wind-up operation is being carried out, the following operations are activated:

- 4) When the PLAY button is depressed:
  - Q522 remains ON to prevent the OPLAY signal from becoming "H". Therefore, the PLAY mode is not actuated before tape slack is removed and Q522 is turned OFF.
- 5) When the FF button is depressed:
  - The OFF signal causes Q521 to turn ON, releasing the tape slack wind-up function. Therefore, the FF mode is actuated immediately after the FF button is depressed.
- 6) When the REW button is depressed:
  - The REW mode is actuated immediately after the REW button is depressed. However, during the tape slack wind-up period, the reel motor torque remains low.
- 7) When the STOP button is depressed:
  - The tape slack wind-up operation is not interrupted.

## 5.5 Memory Rewind Circuit

S003 is interlocked with the index counter and is turned ON when the counter indication is between "900" to "000". When the deck is placed in the REW mode, the Rew signal is "H", with Q545 and Q544 turned ON and OFF respectively. When tape is rewound and the counter counts down to "000", S003 is turned ON. This causes the base of Q543 to be pulled to the ground level via C511, turning Q543 OFF for approx. 1.6ms. During this short period, a bias voltage is applied to the base of Q542. At the time, if the memory rewind switch (S752) is in the STOP position, Q542 is turned ON to momentarily bring Q505(2) to "L" level. As a result, the deck is put into the STOP mode.

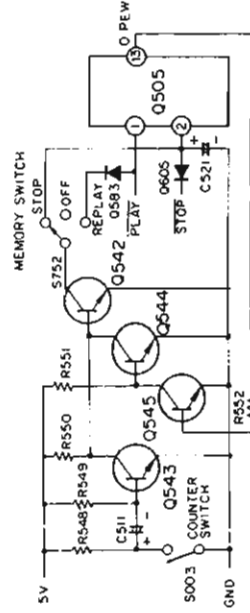


Fig. 5-7. Memory rewind circuit

When S752 is in the OFF position, Q524 remains OFF, and the tape is rewound to the end to cause the tape end sensing circuit to actuate, bringing the deck into the STOP mode. When S752 is in the REPLAY position, Q542 is turned ON, giving the PLAY signal to Q505(1).

As a result, the REW mode is released and the deck is put into the PLAY mode. When S752 is in the STOP or REPLAY position and the deck is in the REW mode, if the end of a tape is reached before the counter reaches "000", the tape end sensing circuit actuates to put the deck into the STOP mode.

When tape stops with S752 in the STOP position, pressing the REW button again rewinds the tape to its end and automatically puts the deck into the STOP mode.

## 5.6 Timer Circuit

The timer circuit is an external timer switch that puts the deck into PLAY or REC/PLAY mode when the power to the deck is turned ON. Refer to Figs 5-8 and 5-9. When the power to the deck is turned ON with the external timer switch (with a cassette loaded and the power switch on the deck in the ON position), the voltage regulator circuit is immediately activated to supply +B voltage (approx. 19.8V). At the time, C505 remains discharged and the base of Q512 is "L". This causes Q512 and Q513 to turn OFF and ON respectively. C505 is charged through R509 with its charged potential gradually increasing. When the voltage across C505 reaches approx. 9.6V (= Q568's zener voltage 9V plus Q512 Vbe 0.6V), Q568 is turned ON, turning Q512 ON.

As a result, Q513 is turned OFF. It takes approx. 5 seconds from the power ON to Q512 ON. When Q513 is turned OFF, a charging current to C506 passes through Q514 via R511, turning Q514 ON for approx. 50ms. At this time, if timer switch S751 is placed in the PLAY position, the PLAY signal ("L") is coupled to Q505 to put the deck into the PLAY mode. If S751 is in the REC position, both the PLAY and REC signals are coupled to Q505.

As a result, if the erasure prevention tab on the cassette being loaded is not removed (S022 open; AR "H"), the deck starts in the REC/PLAY mode. When the erasure prevention tab is removed (S022 closed; AR "L"), the deck starts in the PLAY mode.

When the power to the deck is turned OFF, C505 discharges through Q567 to the power supply, and its potential quickly drops below the threshold levels of Q568 and Q512 to be ready for the subsequent operation. Therefore, the deck can be started or stopped repeatedly until the end of the tape is reached. An appropriate delay is provided for timer starting so the deck is started after tape slacked is removed and circuit voltages are stabilized.

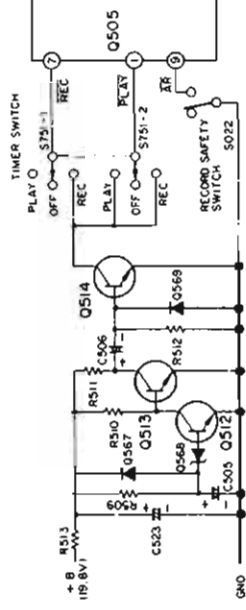
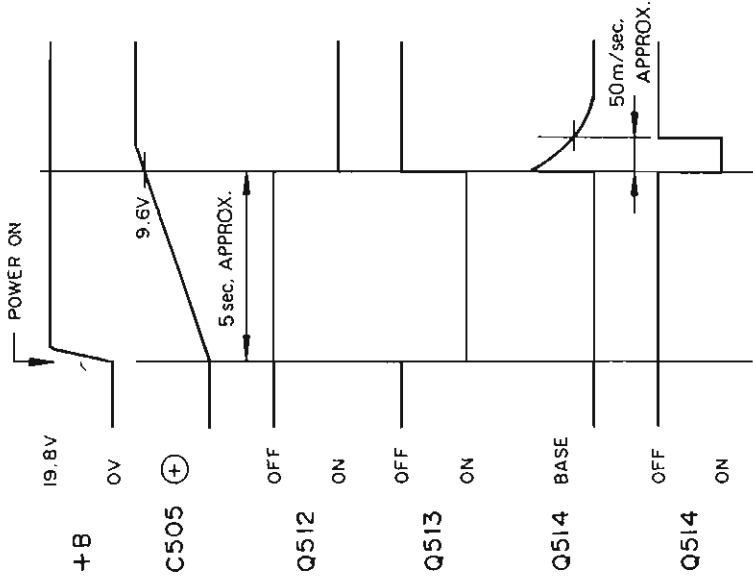


Fig. 5-8. Timer circuit

#### 5.7. Tape Speed Switching Circuit

The tape speed in the PLAY or REC/PLAY mode depends on the rotation speed of the capstan motor (M001). M001 is servo controlled by a frequency generator (FG). In the SD6000, tape speed switching is accomplished by changing the control output of the FG. The speed switching circuit is shown in the following figure.



#### 4. DISASSEMBLY

##### REMOVING THE FRONT PANEL

Remove the screws A, B, C, D, E and F Holding the mechanical unit.

Remove the knobs 1 to 10.

Remove the screws G, H, I, G and K.

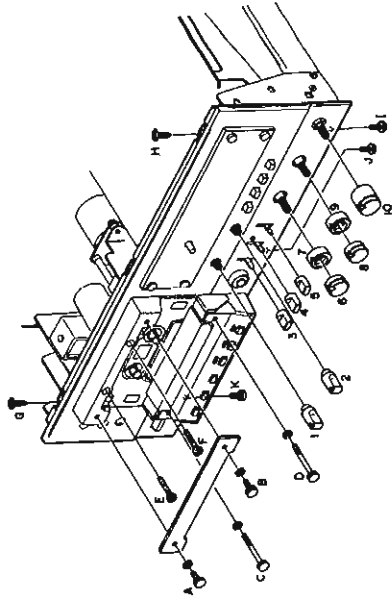
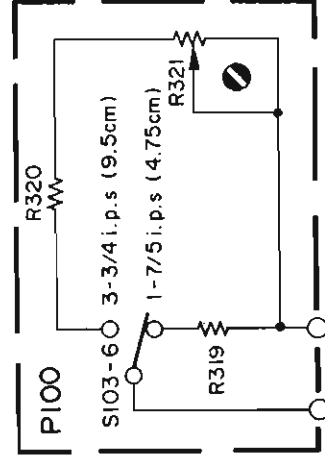


Fig. 5-9. Timer circuit timing sequence



#### 5.8. Power ON Mechanism Operation Inhibit Circuit

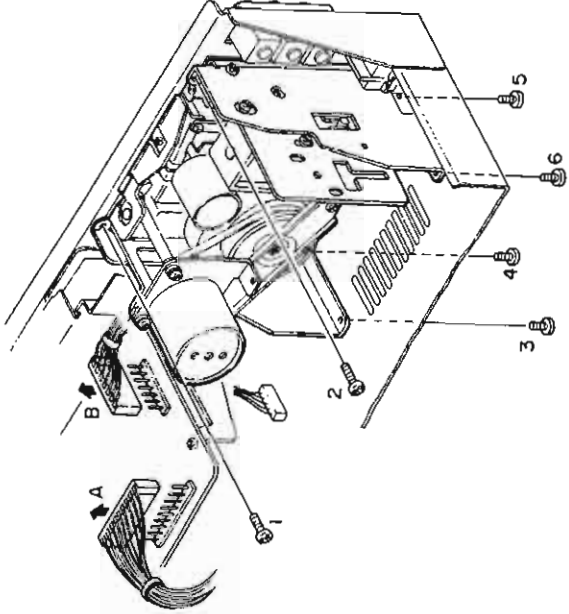
As described in section 5.6, Q513 is turned ON approx. 5 seconds after the power to the deck is turned ON. During this 5 seconds, Q515 is turned OFF due to Q506. When Q515 is turned OFF, Q516 is turned ON. As a result, the deck remains in the STOP mode for approx. 5 seconds after the power is turned ON. During this 5 second period, the deck mechanism can not be operated by any of the operation buttons.



#### 4. DISASSEMBLY

##### 4.1 DETACHING MECHANISM BLOCK

- 1) Remove the mechanism operating section housing. (Refer to detaching the front panel.)
- 2) Remove the 6 mechanism mounting screws.
- 3) Remove connectors (A) and (B), (C).

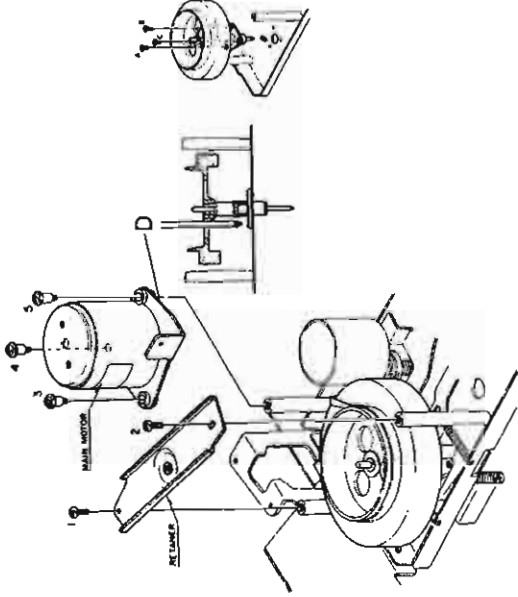


##### 4.2 DETACHING THE FLYWHEEL

- 1) Remove the (1), (2) 2 flywheel support arm mounting screws.
- 2) Detach the flywheel support Retainer.
- 3) Remove the motor mounting Bracket (A) ~ (D) (3 screws).

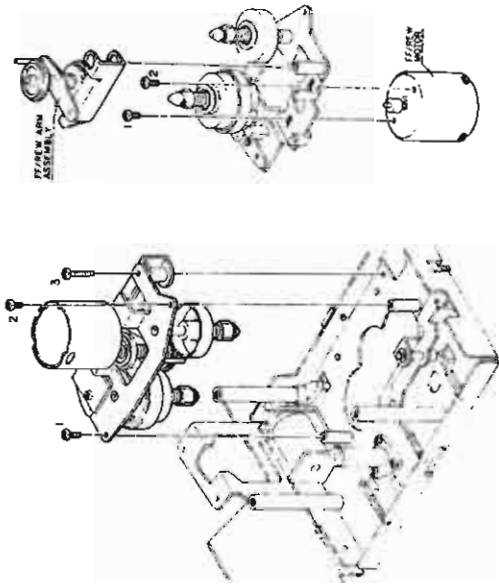
**NOTE:** Take care to avoid oil getting on the motor belt.

- 4) Insert a screwdriver in the 3 holes, (A), (B), and (C), in the flywheel.
- 5) Remove the 3 spindle bearing mounting screws.
- 6) Detach the flywheel.



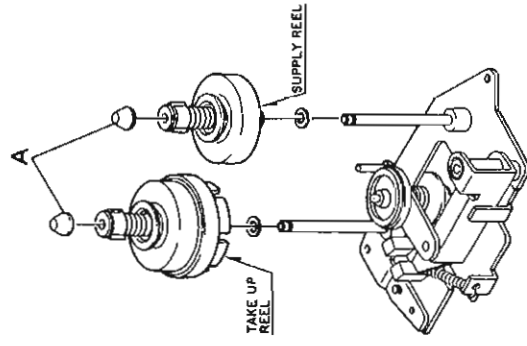
##### 4.3 DETACHING FF/REW MOTOR

- 1) Remove the mechanism block.
- 2) Remove the solenoid mounting arm.
- 3) Remove the main motor mounting arm.
- 4) Remove the flywheel.
- 5) Remove the 3 FF/REW motor mounting screws, (1), (2), and (3).
- 6) Remove the 2 mounting screws, (4) and (5), for the motor mounted on the motor mounting Bracket.



##### 4.4 DETACHING THE SUPPLY AND TAPE-UP REEL DISK

- 1) Remove the caps holding the reel disks in place A.
- 2) Release the brake lever and remove the reel disks.

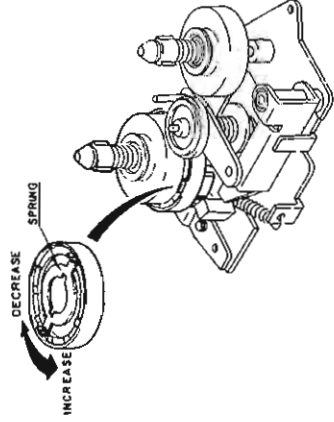


## 5. MECHANICAL ADJUSTMENTS

### 5.1 PLAY TORQUE ADJUSTMENT

Put the two pawls of the circular plate spring on proper stepped position of the reel rest. The adjustable torque range is 40 to 70 g.cm. To make the torque high, put the pawls on a shallow step.

For lower torque, put them on a deeper step.



### 5.2 FF AND REW TORQUES ARE NOT ADJUSTABLE

- If FF or REW functions are inadequate, renew the entire block, P/N 4397002420.
- When the motor (reel motor) is worn, FF and REW modes may not function properly. In such a case, renew the motor.

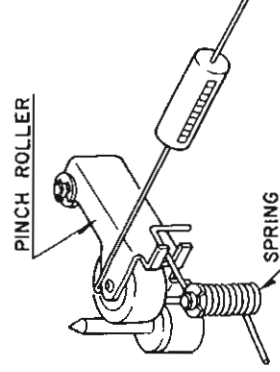
### 5.3 PINCH ROLLER PRESSURE

**330g ± 50g**

Measure the pressure of the pinch roller using a gauge as shown. For measurement, draw the pinch roller in the arrow direction in which it is detached from the capstan shaft and gradually return it toward the capstan.

Read the gauge at the time when the pinch roller starts turning. The standard pressure is 330g ± 50g. If the pinch roller pressure is inadequate, adjust by bending portion (A) of the spring.

**NOTE:** To make the pressure strong, bend in the direction B. To make the pressure weak, bend in the direction C.

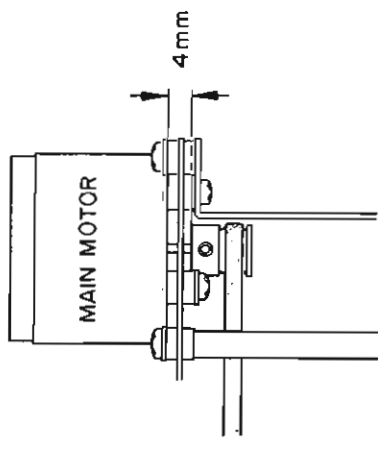


### 5.4 MOTOR PULLEY ADJUSTMENTS

#### (1) Main Motor

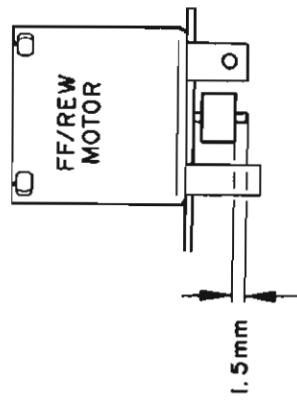
Loosen the set screw and adjust the motor pulley position until the clearance between the pulley and

motor is 4 mm as shown. Tighten the set screw.



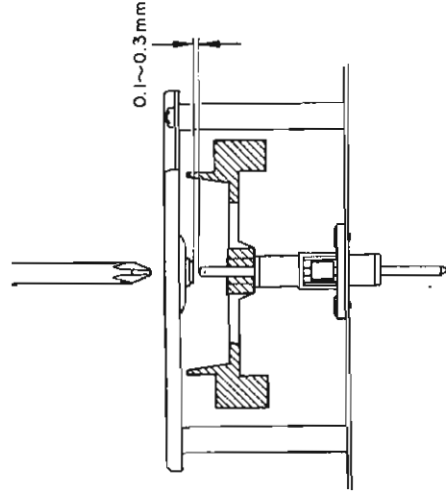
#### (2) FF/REW Motor

Insert the pulley so that the distance between the motor shaft and the pulley is 1.5 mm.



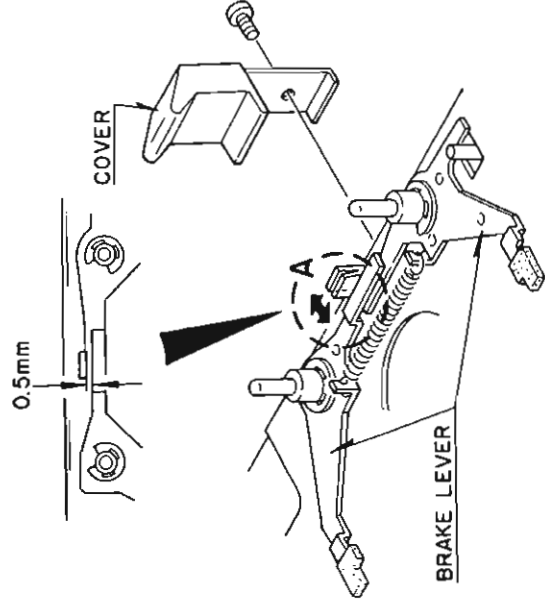
### 5.5 FLYWHEEL THRUST

Adjust the thrust screw at the flywheel bracket until the clearance between the capstan tail end and thrust bearing is 0.1 to 0.3 mm as shown, using a Phillips screw driver. For adjusting, feel of axial dropping of the flywheel for proper clearance as this cannot be seen through. Then paint the screw to lock.



### 5.7 BRAKE ADJUSTMENTS

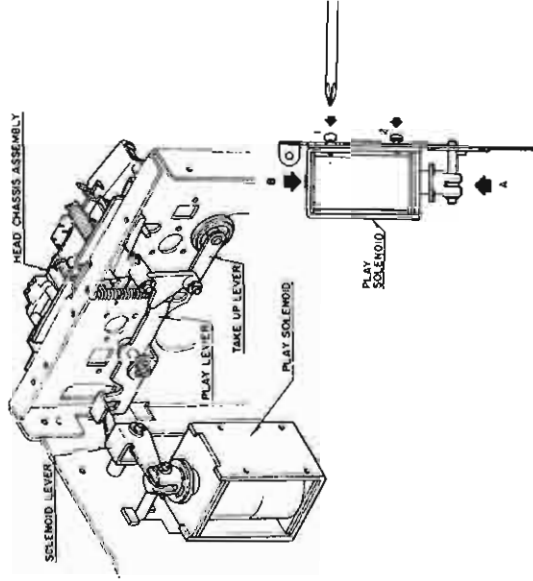
1. Remove the cover.
2. Adjust by bending portion (A) of the brake lever (076N) so that brake timings of the supply and take-up sides coincide with each other.
3. Set brake lever clearances to approximately 0.5 mm on both the supply and take-up sides.



### 5.6 SOLENOID ADJUSTMENTS

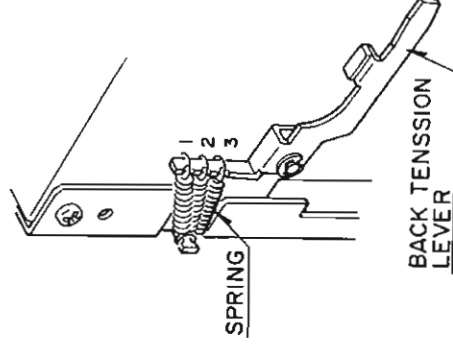
#### ● Main Solenoid

1. Loosen the two Solenoid mounting screws. (1) (2)
2. Push the Solenoid plunger all the way with fingers in the direction of arrow (A). At this point, the head chassis should be in direct contact with the take-up and supply reel sides.
3. Maintaining this condition, tighten Solenoid mounting screws, (1) and (2). At this time, push the Solenoid lightly to the plunger side in the direction of arrow (B)



### 5.8 BACK TENSION ADJUSTMENT

1. Alter the spring location, (1), (2), or (3), so that the back tension is between 3.5 g and 6 g.



## 6. ELECTRICAL ADJUSTMENTS

### Precautions before Adjustment

1. Before playing the test tape back, thoroughly demagnetize the heads, capstan and similar metal parts using an eraser as the test tape-recorded tone is easily erased.
2. Do not place the test tape on any measuring instrument.
3. Do not put the test tape near a place where the eraser is used.
4. Method of Demagnetization: — Turn the eraser power switch on at a remote position far away from the heads. Bring the eraser close to the heads, capstan and other parts to be demagnetized, and move it up and down four or five times to demagnetize. Slowly separate the eraser far away from the parts, and turn the power switch off.
5. Do not use any magnetized adjusting tool. When using it, demagnetize it from time to time in the course of each adjustment.
6. Do not turn semi-fixed resistor more than needed.
7. Do not apply locking bond excessively.

### Definitions

1. The "normal playback state" is an operating state of the tape deck which plays back the MTT-150 test tape and is adjusted so as to produce a 580mV output at the LINE OUTPUT terminal with the load assuming the measuring instrument input impedance of greater than 100 k $\Omega$  and with the TAPE SELECT switch set at the NORMAL position.
2. The "normal recording state" is an operating state of the tape deck which records a 1 kHz signal to a specified recording level for which the recording level control is adjusted with the 1 kHz signal applied at a specified input level to the MIC terminal.  
In the normal recording state, therefore, this tape deck is set up with the level control to the state that the Peak Level Displays may illuminate to the 0 VU with a 1 kHz, 1 mV input signal applied.

## 6.1 HEAD AZIMUTH ADJUSTMENT

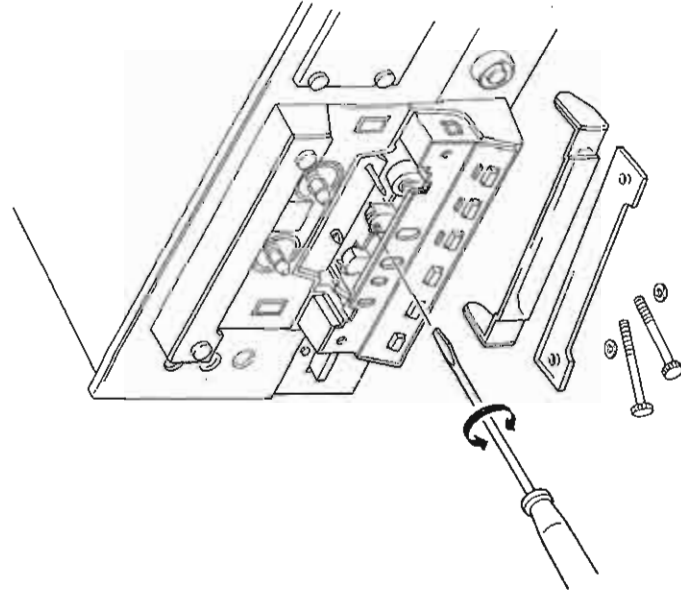
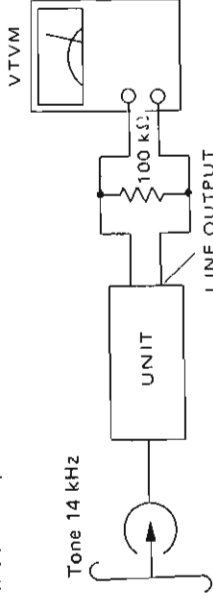
### SET UP

1. Power voltage:- 50 or 60 Hz AC voltage rated for the unit to be used in a market country.
2. TAPE SELECTOR switch position:- NORMAL.
3. Load:- Measuring instrument input impedance.
4. Output terminal used:- LINE OUTPUT.
5. Test tape used:- MTT-216

### PROCEDURES

1. Play the 14 kHz portion of the test tape MTT-216 back. Adjust the head azimuth adjusting screw for maximum VTVM read.
2. STEREO UNIT ONLY. If the peak output reads of the right and left channels are different, set the screws to obtain the mechanical center between the peaks.

Mode: Playback



### CAUTION

After adjustment, repeat the playback and stop setting a few times to make certain of no head azimuth deviation.

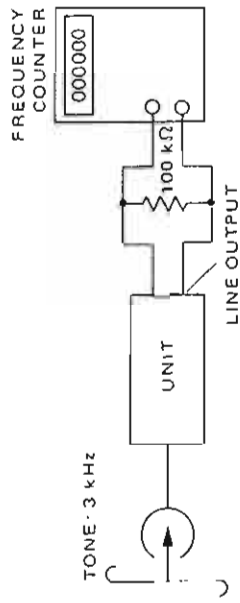
## 6.2 TAPE SPEED ADJUSTMENT

### SET UP

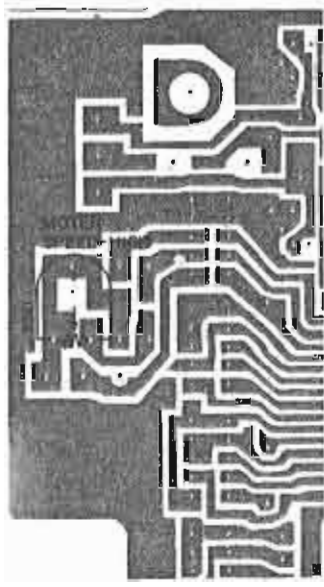
1. POWER VOLTAGE  
50Hz/60Hz AC voltage reted for the unit to be used in a market country.
2. TAPE SPEED SELECTOR switch position:- Stand-ard speed 1-7/8 ips (4.75 cm/s)
3. Output terminal:- LINT OUT
4. Test tape used:- MTT-111 (3 kHz tone)
5. Unit position:- Vertical

### PROCEDURES

1. Play the mid position of the test tape MTT-111 back. (standard speed)  
Adjust the tape speed adjusting semi-fixe resistor in Motor (M001) for 2990 to 3010 counter indication.
2. Play the mid position of the test tape MTT-111 back (High speed).  
Adjust the tape speed adjusting R321 for 5990 to 6010 counter indicator.



P100



### CAUTIONS

1. For adjustment the unit should be set up in the normal operating condition.
2. Do not proceed the semi-fixed resistor more turns than needed.
3. Do not proceed with adjustment after the unit.
4. If a strong shock or similar vibration is applied to the unit after adjustment, make certain that the measured tape speed had not changed.

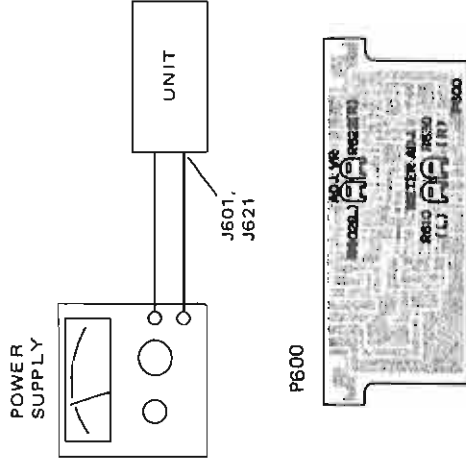
### 6.3 METER ADJUSTMENT

#### SET UP

TAPE SELECTOR switch position:- NORMAL

#### Procedures

1. Apply a 1 kHz -60dB signal from the MIC Terminal
2. Select the Rec-Pause mode.
3. Adjust the mic volume to provide 3V DC at J601 (L ch.), (J621 for R ch.)
4. Adjust resistor trimmer R602 (R622 for R ch.) so that the "g" display LED lights.
5. Adjust the mic volume to provided 580 mV AC at J120 (J220 for R ch.)
6. Adjust R610 resistor trimmer (R630 for R ch.) so that the "+2" display LED lights.



### 6.4 PLAYBACK EQUALIZER ADJUSTMENT

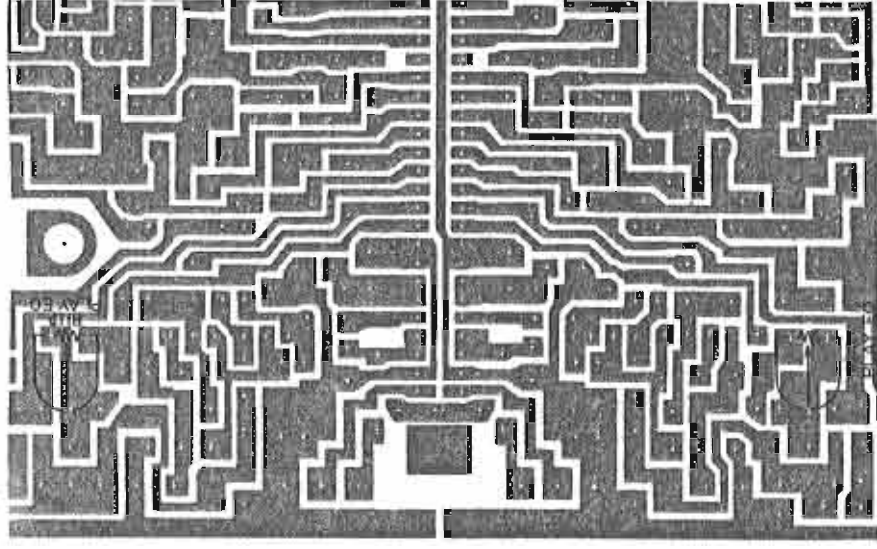
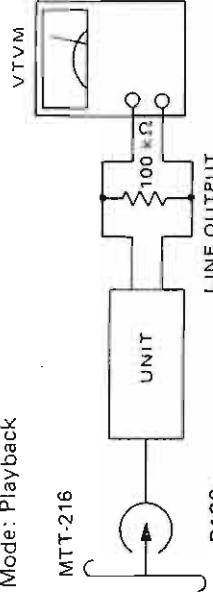
#### SET UP

1. Power voltage:- 50 or 60 Hz AC voltage rated for the unit to be used in a market country.
2. TAPE SELECTOR switch position:- NORMAL.
3. Load:- Measuring instrument input impedance.
4. Output terminal:- LINE OUTPUT.
5. Test tape used: -MTT-216.

#### PROCEDURES

1. Play the test tape MTT-216. Let the 315 Hz signal level be reference as 0 dB.
2. Adjust R115 and R215 (5 k $\Omega$  each) for 10 kHz frequency response of 0 to -1 dB in reference to the 315 Hz signal level.
3. Proceed both for the right and left channels in the same manner.
4. Note that clockwise turning of R115 and R215 will increase the 10 kHz signal output level.

Mode: Playback



### 6.5 PLAYBACK OUTPUT LEVEL ADJUSTMENT

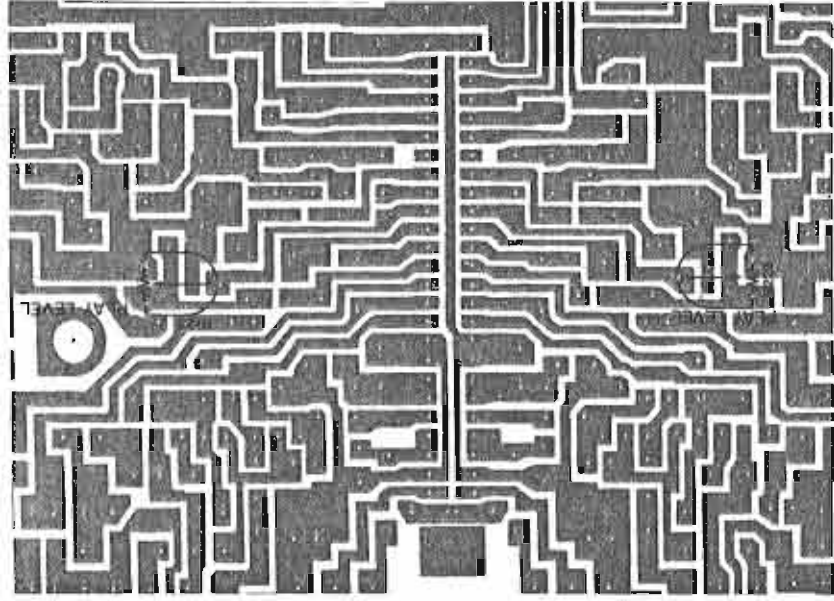
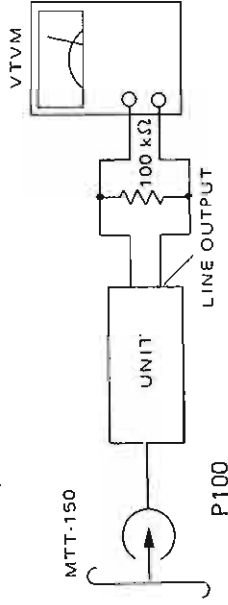
#### SET UP

1. Power Voltage: 50 or 60Hz AC voltage reted for the unit to be used in a market country.
2. TAPE SPEED SELECTOR switch position: STANDARD 1-7/8 ips (4.75 cm/s).
3. Output terminal:- J120, J220.
4. TAPE SELECTOR switch position:- NORMAL
5. Load:- Measuring instrument input impedance.
6. Test tape used:- MTT-150

#### PROCEDURES

1. Play the test tape MTT-150 back.  
Adjust R123 and R223 (50 kΩ each) for 580 mV playback output level.
2. Proceed both for the right and left channels in the same manner.
2. This adjustment should be performed after the one for the meter.

Mode: Playback



### 6.6 RECORDING CURRENT ADJUSTMENT

#### Set up:

1. Power voltage:- 50 or 60 Hz AC voltage rated for the unit in the destination country.
2. Input signal: :- 1 kHz, -60 dB MIC
3. Output terminals:- LINE OUT PUT
4. TAPE SELECTOR switch position:- SPECIAL/  
CrO<sub>2</sub>
5. TAPE SPEED SELECTOR:- STANDARD or HIGH
6. Load:- Measuring instrument input impedance

#### Procedure:

1. In Rec mode, adjust the mic volume to 0VU.  
Line Out output at this time is reference level 0dB.
2. Adjust trimmers to provide a 0dB output level when tape is recorded and played back.

STANDRAD speed	R155 (L ch.)	R255 (R ch.)
HIGH speed	R154 (L ch.)	R254 (R ch.)

### 6.7 RECORDING BIAS CURRENT ADJUSTMENT

#### SET UP

1. Power voltage: - 50 or 60Hz AC voltage rated for the unit to be used in a market country.
2. Tape Speed selector switch position:- standard (1-7/8 IPS, 4.75 cm/s).
3. Output terminal:- R101, R201
4. Load:- Measuring instrument input impedance.

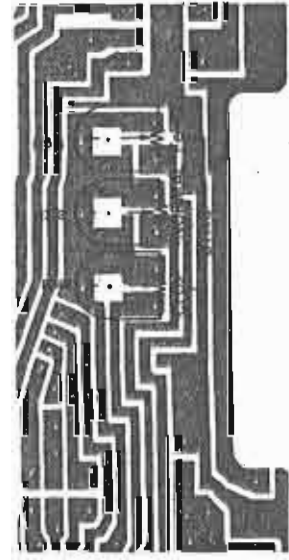
#### Procedure:

1. Select Rec-Pause mode.
2. Connect a VTVM across R101 (R201 for R ch.)
3. Adjust trimmers to provide the following indications on the VTVM:
  - (1) Tape Selector in NORMAL position:  
Adjust R410 (L ch.) and R411 (R ch.) to provide 450 mV.
  - (2) Tape Selector in SPECIAL/CrO<sub>2</sub> position:  
Adjust R313 (common for L and R) to provide 650 mV.
  - (3) Tape Selector in Fe-Cr position:  
Adjust R314 (common for L and r) to provide 510 mV.
  - (4) Tape Selector in METAL position:  
Adjust R312 (common for L and R) to provide 1,200 mV.

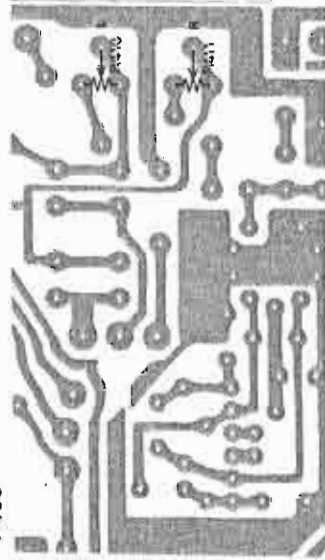
**NOTE 1:** Adjust (1) NORMAL position first. If after adjusting other positions R410 or R411 are altered so readjust for all the other positions.

**NOTE 2:** The above adjustments are tentative. Finally, adjustments to provide Rec-Playback frequency characteristics falling within specified ranges are necessary.

P100



P400



### 6.8 RECORDING EQUALIZER ADJUSTMENT

#### SET UP

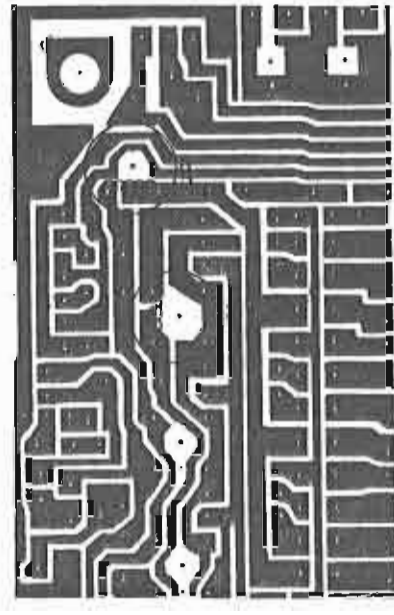
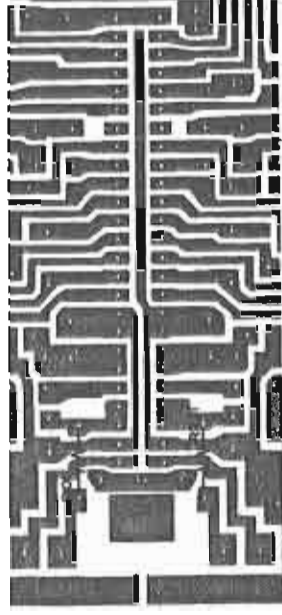
1. Power voltage:- 50 or 60Hz AC voltage rated for the unit to be used in a market country.
2. Input level:- -60 dBV
3. Output terminal:- R101, R201
4. TAPE SELECTOR switch position:- NORMAL.

#### PROCEDURES

1. Stop the recording bias current oscillator.  
Cutting out the bias circuit Jumper Wire. Remove wires from J314 and
2. Set up the unit to the normal recording state. Reduce the input level by 20 dB.
3. Set the TAPE SELECTOR switch to the NORMAL position. Set the audio-frequency oscillator to 15.5 kHz.  
Connect the VTVM R101, R201. Adjust L105 and L205 for maximum VTVM read TAPE SPEED SELECTOR switch position:- Standard).
4. In turn, set the TAPE SELECTOR switch to the High position.  
Set the audio-frequency oscillator to 22 kHz. Connect the VTVM R101, R201. Adjust L104 and L204 for maximum VTVM read.
5. After adjustment, release the recording bias.
6. Proceed both for the right and left channels in the same manner.

#### CAUTION

The adjusting rod should be non-metallic.





### 6.9 RECORD-PLAYBACK FREQUENCY RESPONSE ADJUSTMENT

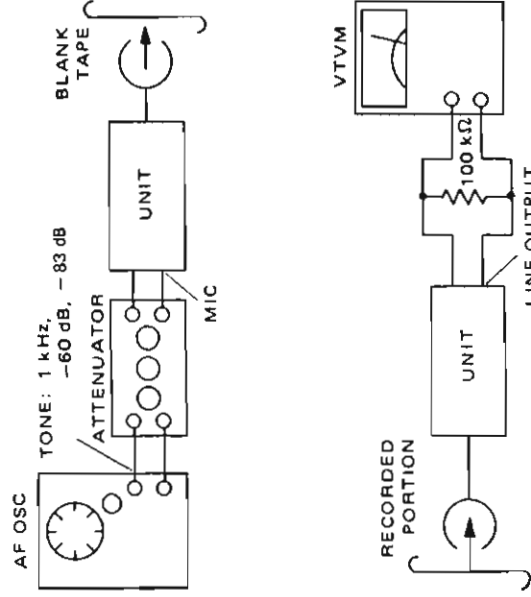
#### SET UP:

1. Power voltage:- 50 or 60Hz AC voltage rated for the unit to be used in a market country.
2. TAPE SELECTOR switch position:- NORMAL
3. TAPE SPEED selector switch position:- STANDARD & HIGH
3. Input signal:  
1 kHz, -60dB
4. Output terminal: LINE OUT
5. Load:- Measuring instrument input impedance.
6. Playback output level:- same as the recorded signal level.
7. Blank tape used:- AC-211, AC-511, CS-30 & AC701

#### Procedures:

1. Connect the input signal to the MIC terminal. Set up the unit to the normal recording state.
2. In turn, reduce the input level by -23 dB with the use of the attenuator. Record the 1 kHz and 10 kHz tones.
3. Play the 1 kHz 25 dB down recorded tone back as 0 dB.  
Adjust the recording bias current until the 10 kHz response is within  $\pm 0.5$  dB as referenced to the 1 kHz, 0 dB response.
4. Follow similar sequence for the other TAPE SELECTOR switch positions (Fe-Cr, CrO<sub>2</sub>, and Metal) and adjust the bias current so the frequency response falls within the specified range.
5. When the tape speed is High, adjust Rec. Eq for all the TAPE SELECTOR switch positions to provide response within specifications.
6. Proceed both for the right and left channels in the same manner.
7. If the recording current is recorded reduced in the above adjustment, be sure to measure the distortion.

Mode: Record



Tape	Standard		High	
	EQ	Bias	EQ	Bias
Normal	○	⊗	○	—
FeCr	Fix	⊗	Fix	—
CrO <sub>2</sub>	Fix	⊗	Fix	—
Metal	Fix	⊗	Fix	—

1. Columns marked ○, ⊗, and ⊙ include adjusting arrangement.
2. ○ Concerning fixed EQ columns, only Normal Tape is marked adjustable but if readjusted for Normal Tape, the other tape positions are also affected.
3. ⊗ includes trimming controls for both L ch. and R ch. (2)  
⊙ includes a trimming control common for L ch. and R ch. (1)

### 6.10 BIAS TRAP ADJUSTMENT

#### SET UP

1. Power voltage, 50 or 60 Hz AC voltage rated for the unit to be used in a market country.
2. LEVEL CONTROL position:- Volume Max
3. TAPE SELECTOR switch position:- METAL

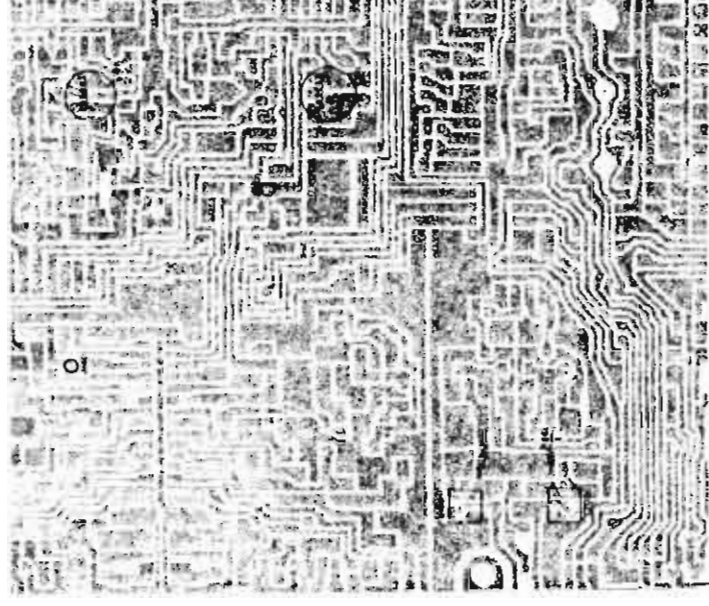
#### PROCEDES

1. Set up the unit in the recording mode of operation.
2. Connect the VTVM to J140 and J240.  
Adjust L101 and L201 for minimum VTVM read.
3. Inturn, connect the VTVM to R161, and R261.  
Adjust L103 and L203 for minimum VTVM read.

#### COUTIONS

1. If the leak bias is less than the specified value, the bias trap needs not to be adjusted since the adjusting coil is factory preset.
2. The adjusting rod used should be nonmetallic.

P100



### 6.11 19kHz FILTER ADJUSTMENT

#### SET UP

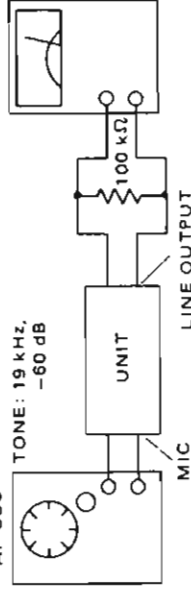
1. Power voltage:- 50 or 60Hz AC voltage rated for the unit to be used in a market country.
2. Input Level:- 19 kHz -60 dB
3. TAPE SELECTOR switch position:- NORMAL.
4. Output terminal:- Line out
5. Load:- Measuring instrument input impedance.

#### PROCEDURES

1. Connect the 19 kHz, -60 dB input signal to the Mic input terminal. Adjust the level control for 0 VU.
2. In turn, MPX FILTER switch to the ON position. Adjust the L102 and L202 for minimum output level at the Line out.
3. Proceed both for the right and left channels in the same manner.

Mode: Record

AF OSC



#### CAUTIONS

1. The 19 kHz input signal should be as precise as  $19 \pm 0.5$  kHz
2. If the filter characteristic is better than -30 dB, the adjusting coil needs not to be adjusted since it is factory set.

### 6.12 PHASE COMPENSATOR ADJUSTMENT

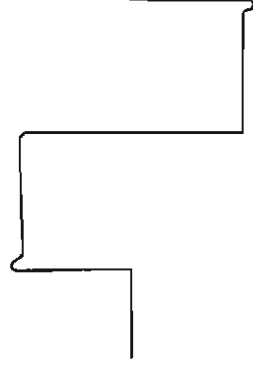
#### SET UP

1. Power voltage:- 50 or 60Hz AC voltage rated for the unit to be used in a market country.
2. Input level:- 1 KHz, -60dB (square wave).
3. Input terminal:- MIC.
4. TAPE SPEED SELECTOR: HIGH position.
5. Dolby:- OFF
6. MPX:- OFF
7. Output terminal:- LINE OUTPUT (connect oscilloscope)

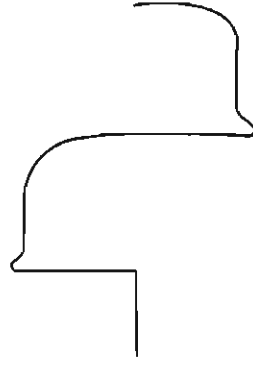
#### Procedures

1. Set the tape in recording mode.
2. Depress the PAUSE button to set the tape in REC-PAUSE mode.
3. Adjust the MIC volume control until the LED meter indicates 0VU.
4. Reduce the MIC input level by 10 dB (-70 dB)
5. Under this condition, release the REC-PAUSE mode and start recording. Play the recorded tape and adjust R183 and R283 until the waveform shown below is obtained. If required, repeat recording and playback.

OK



NG



### 6.13 TAPE SLACK PREVENTION CIRCUIT ADJUSTMENTS

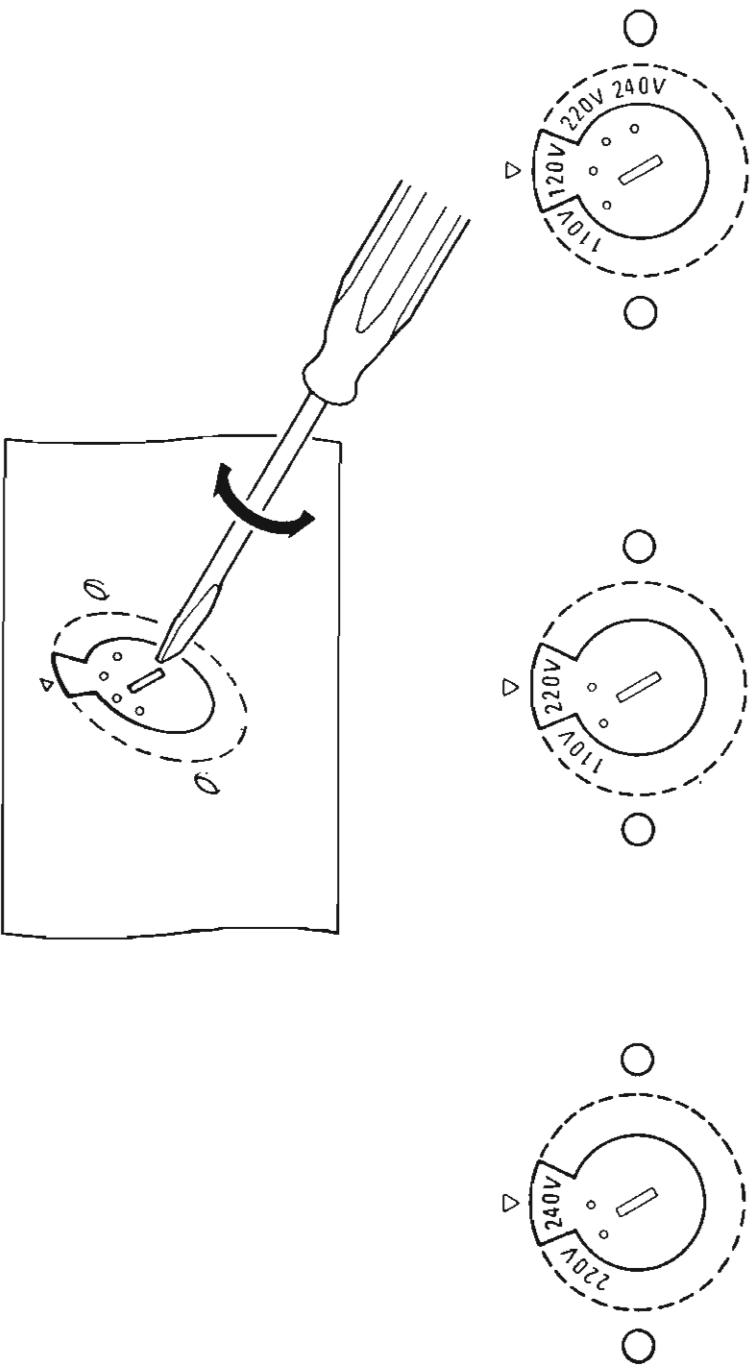
- 1) a. Select Stop mode.
- b. Insert a torque cassette.
- c. Adjust R526 so that at this time the torque becomes 35 to 50 g.cm.

**NOTE:** This circuit functions only for a second or two after switching the power on. Therefore, the torque cassette procedure should be repeated several times to adjust to the specified torque.

## 7. VOLTAGE CONVERSION

To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

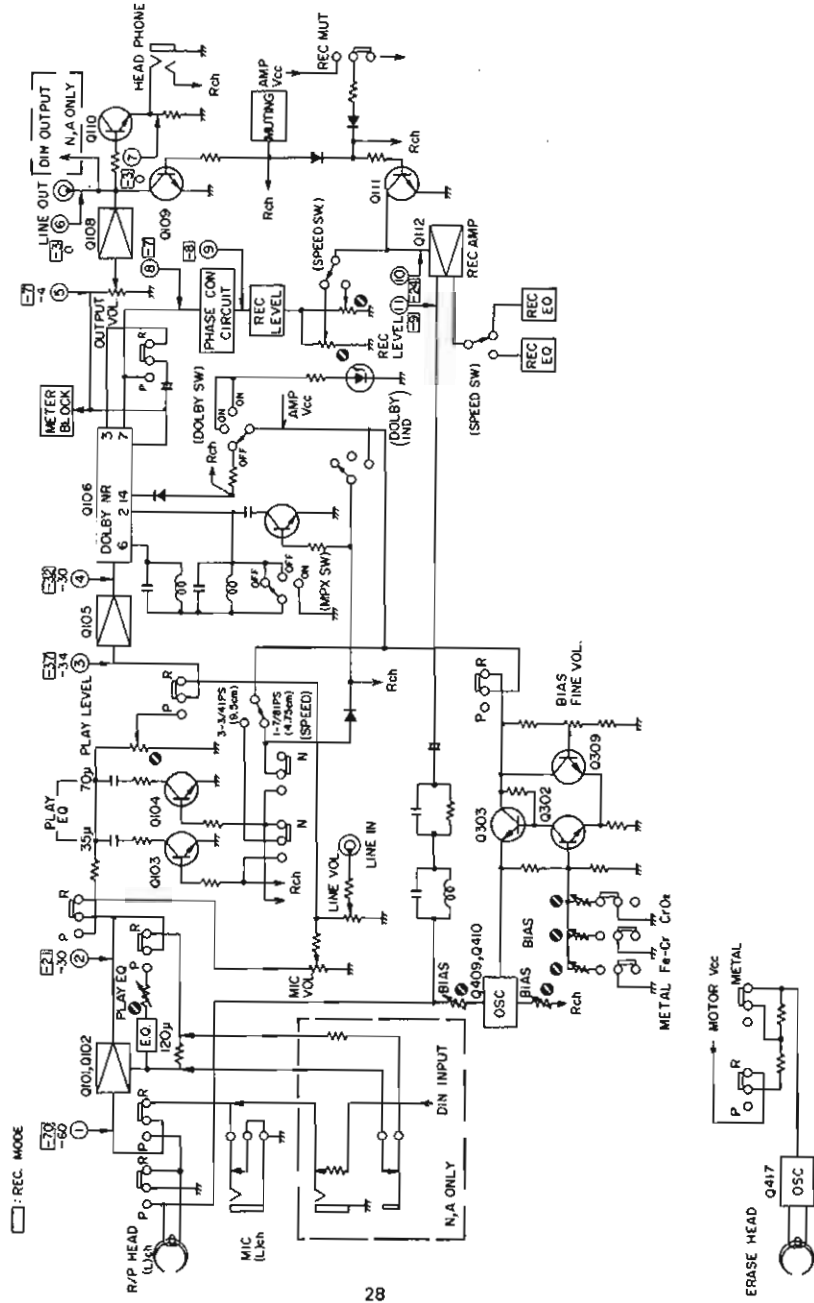
**CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE. DO NOT DISASSEMBLE THE VOLTAGE SELECTOR ABSOLUTELY.**



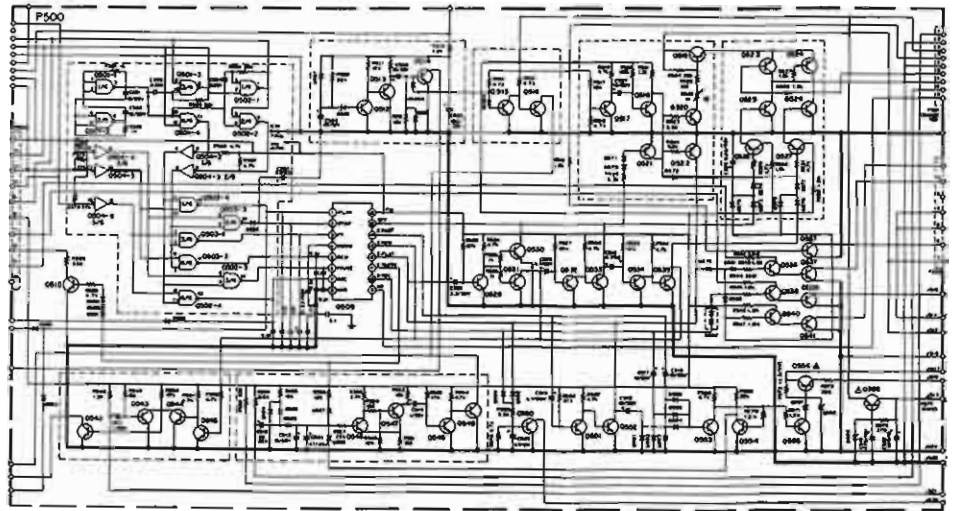
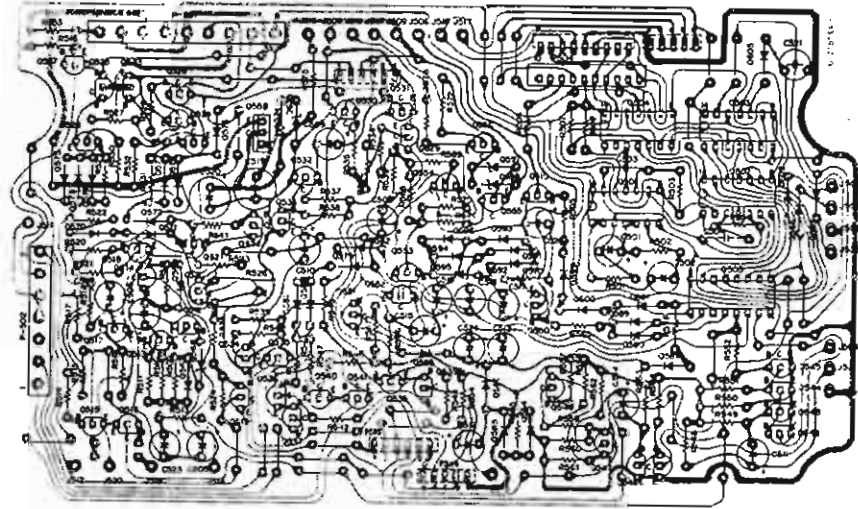
**NOTE ON SAFETY: THE PARTS MARKED WITH  ARE IMPORTANT PARTS ON THE SAFETY. PLEASE USE THE PARTS HAVING THE DESIGNATED PARTS NUMBERS WITHOUT FAIL.**

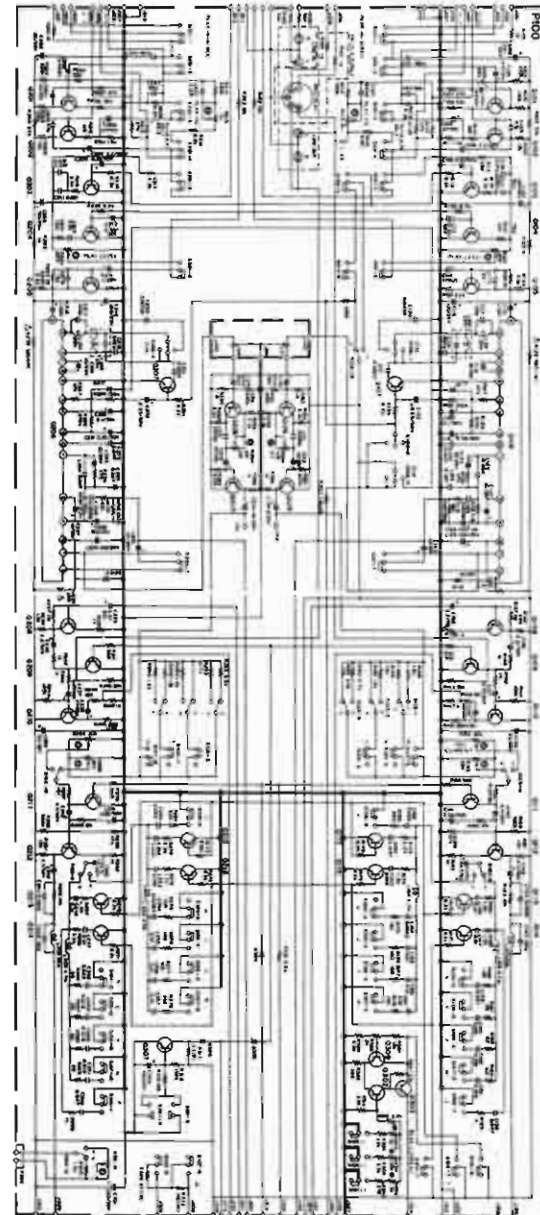
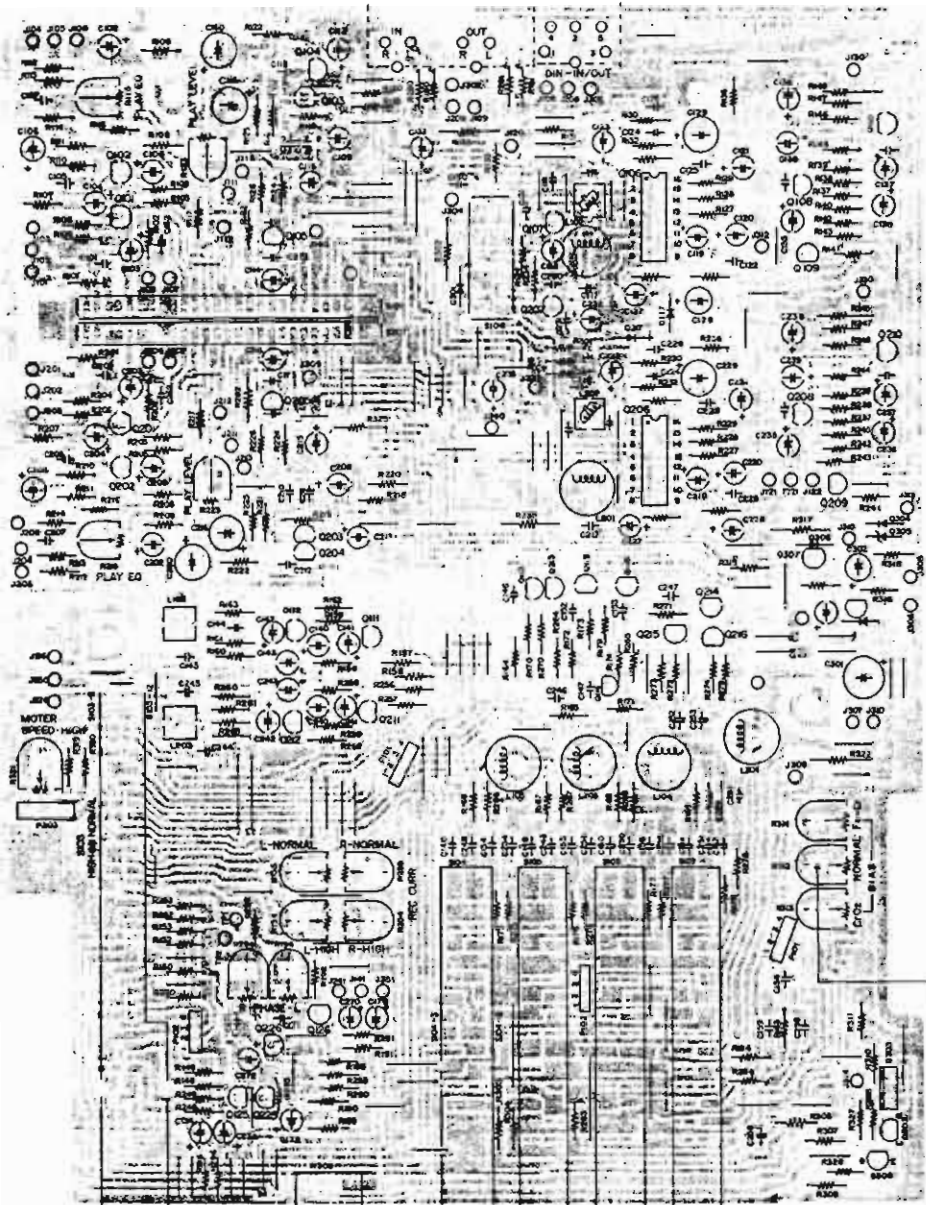
8. DIAGRAMS

8.1 BLOCK & LEVEL DIAGRAM



LOGIC CONTROL SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P500





The operation of the standard speed is similar to that of the high speed.

POWER SUPPLY SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P400

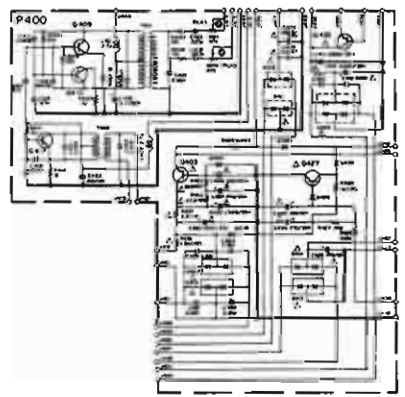
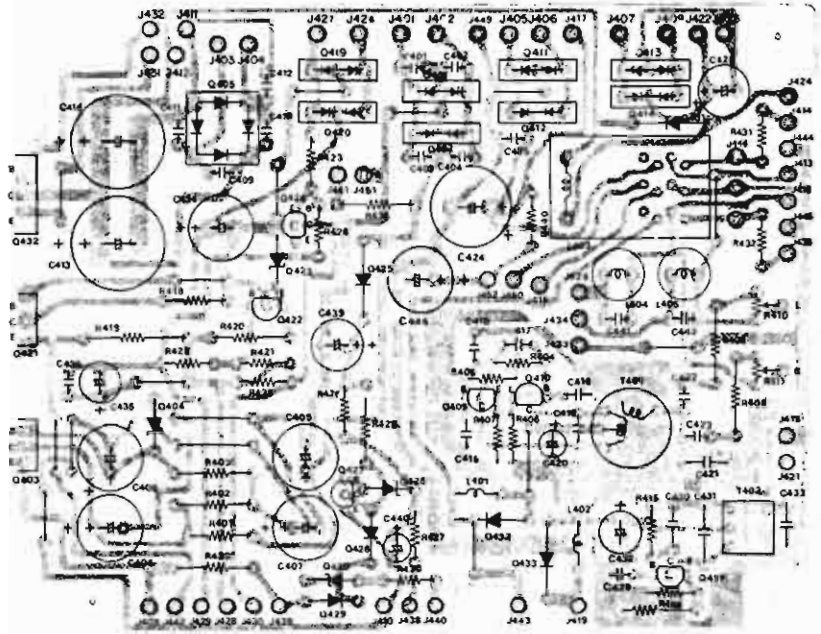
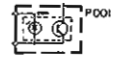


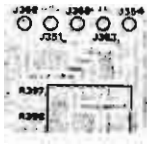
PHOTO CAPLER SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P001



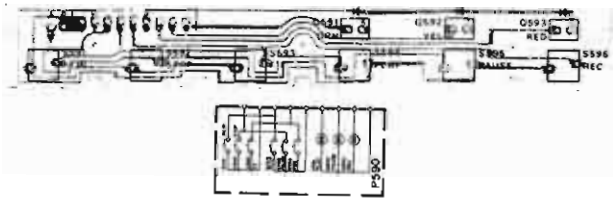
INPUT VOL. SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P350



OUTPUT VOL. SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P351



LOGIC SWITCH SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P590



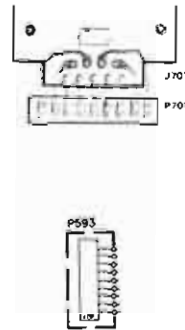
MECHA STOP SWITCH SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P591



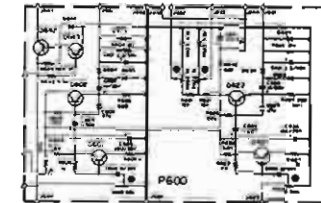
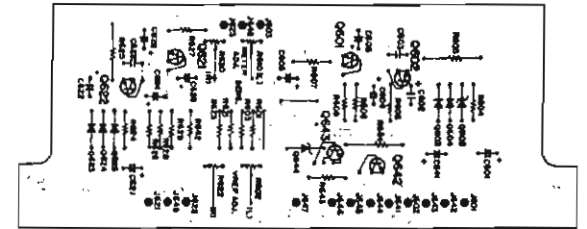
MECHA STOP SWITCH SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P592



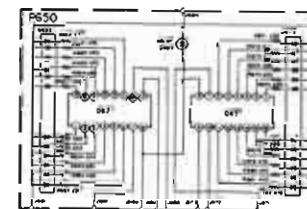
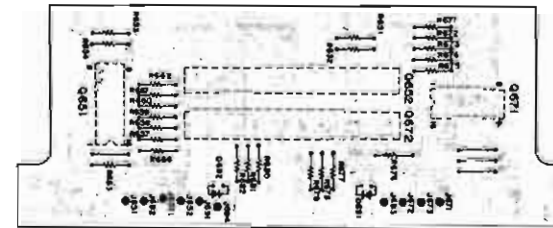
REMOTE SWITCH SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P593



LED METER AMP SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P600



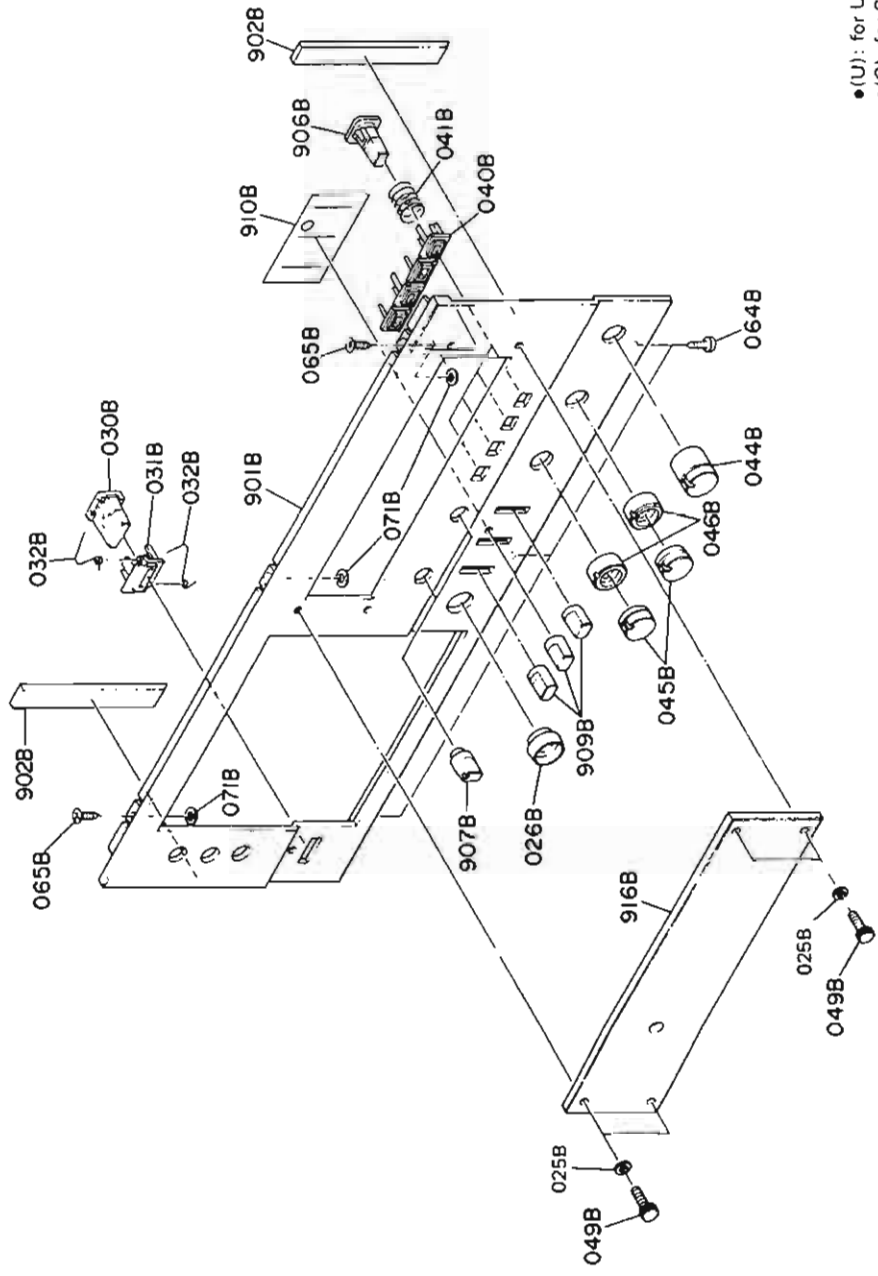
LED METER SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS - P650





# EXPLODED VIEWS AND PARTS LIST

## [P01-99] FRONT PANEL



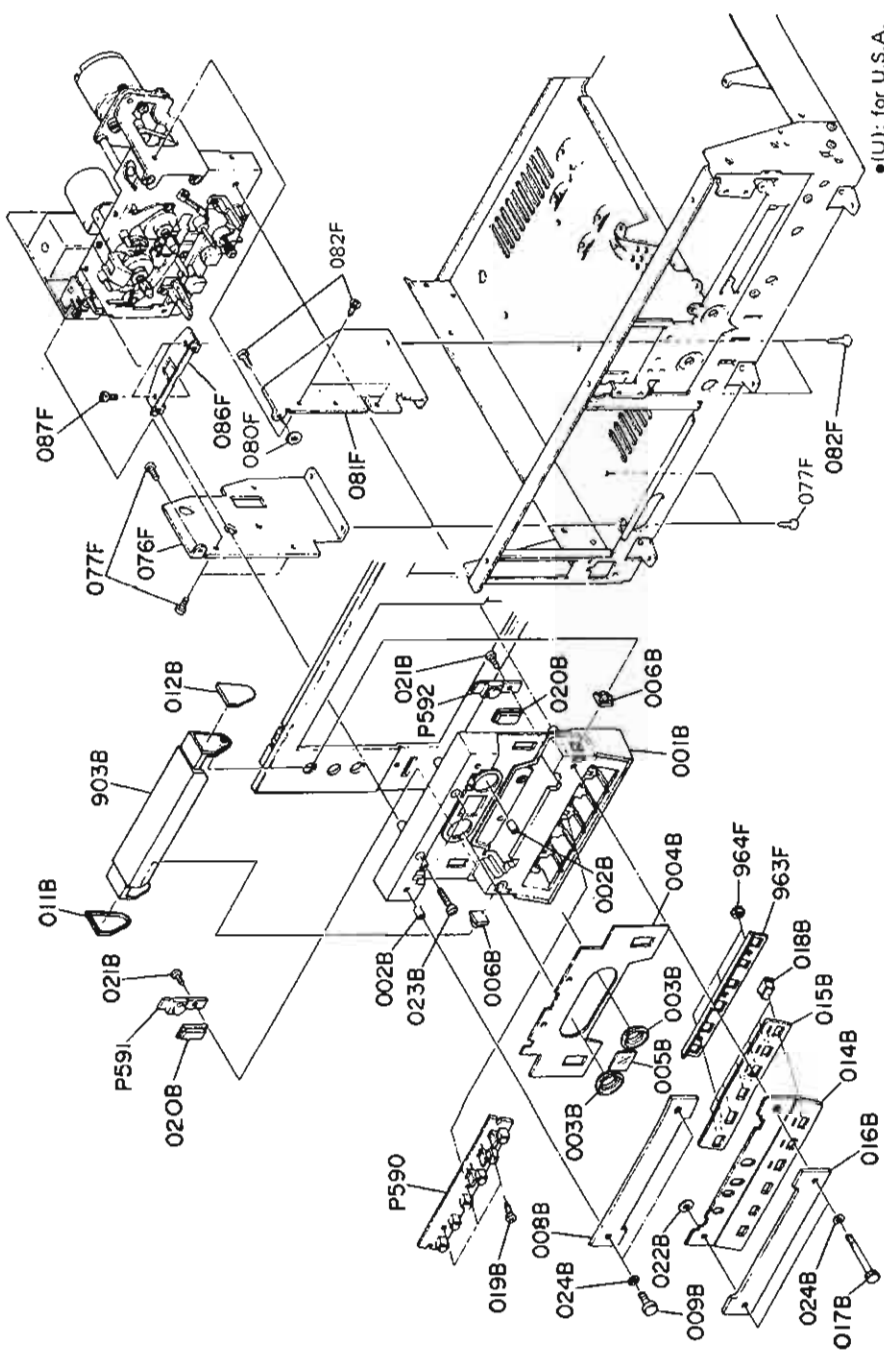
- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
A	1	1			4278063400	Front Panel Assembly
A1	1	1			4278063410	Front Panel Assembly
026B	1	1			4276259010	Bush, Rec Mute
031B	1	1			2127259010	Bush, Power Switch
040B	4	4			2112259030	Bush, Tape Selector
901B	1				4278063010	Escutcheon, Front Panel
902B	2	2			4279118010	Escutcheon, Front Panel
910B	1				4280107010	Spacer
						Sheet, Lever Switch
025B	4	4			59046502G9	Washer
071B	3	3			59030808P0	Washer

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
030B	1	1			2127154010	Knob, Power Switch
032B	2	2			2127115010	Spring
041B	4	4			2112115010	Spring
044B	1	1			4278154010	Knob, Output
045B	2	2			4278154020	Knob, Record
046B	2	2			4278154030	Knob, Record
049B	4	4			4279112020	Shaft, Meter Window
064B	3	3			5128030680	B.H. Tapped Screw B3 x 6
065B	2	2			5150030680	F.H. Tapped Screw F3 x 6
906E	4	4			2112154010	Knob, Tape Selector
907B	2	2			4276154010	Knob, Speed/Bias
909B	3	3			2970154020	Knob, Lever Switch
916B	1	1			4278158010	Window, Dial



[P04-99] ASSOCIATED MECHANISM FOR CASSETTE TAPE OPERATION

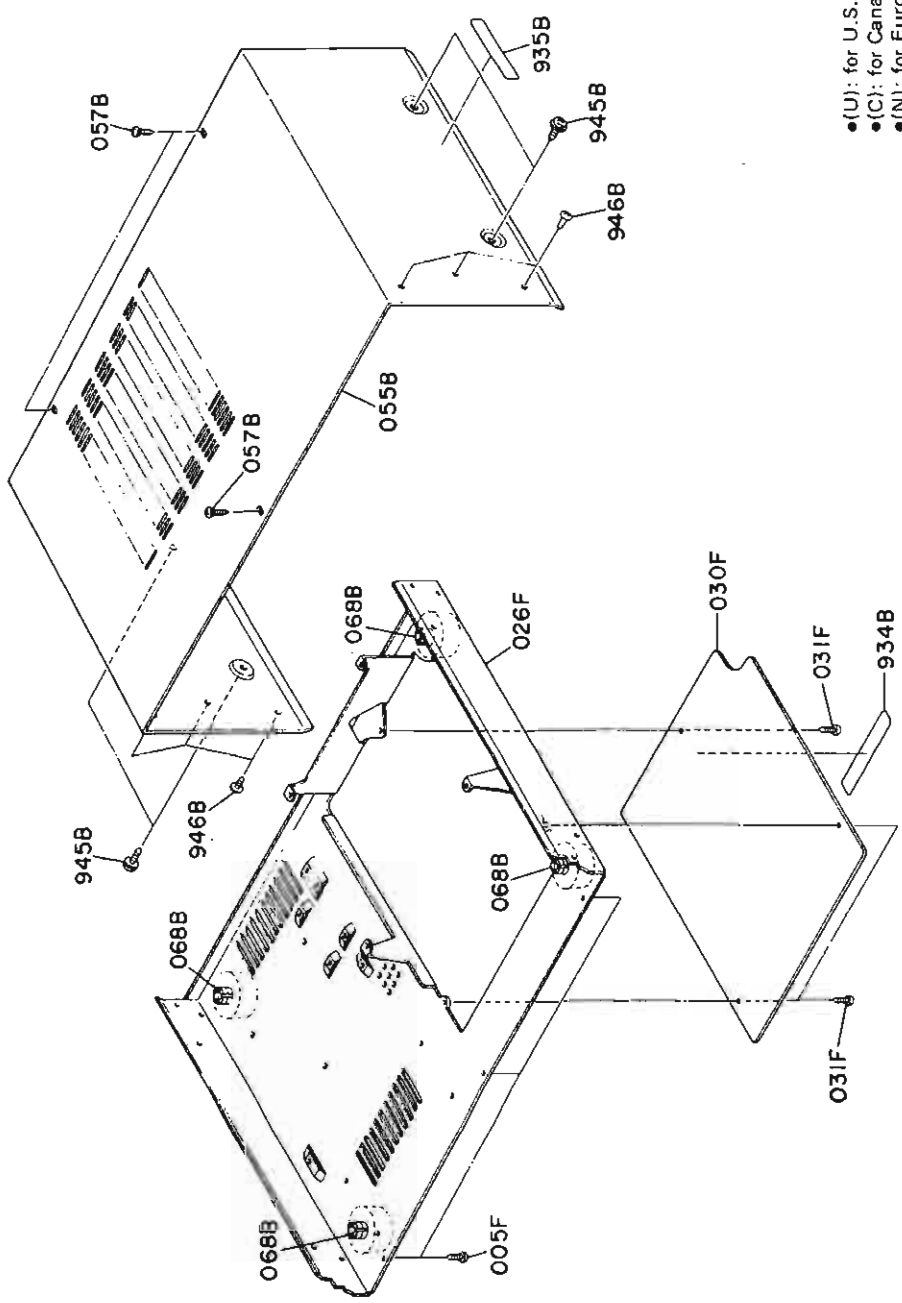


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N		
B	1	1	1	4279053400	Cover Assembly
001B	1	1	1	4279053010	Cover, Mechanism
002B	2	2	2	85010306G0	Dodge Insert, S
003B	2	2	2	4279353010	Ring, Reel
004B	1	1	1	4279063050	Escutcheon, Cassette
005B	1	1	1	4279274010	Reflector
C	1	1	1	4279053410	Head Cover Assembly
011B	1	1	1	4279063060	Escutcheon, Head Cover (L)
012B	1	1	1	4279063070	Escutcheon, Head Cover (R)
903B	1	1	1	4279053020	Cover, Head
D	1	1	1	4279063420	Escutcheon Assembly
014B	1	1	1	4279063040	Escutcheon
015B	1	1	1	4279259010	Bush

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N		
006B	2	2	2	4279104010	Retainer
008B	1	1	1	4279063030	Escutcheon, Brand
009B	2	2	2	4279112020	Shaft
016B	1	1	1	4279158050	Window, Azimuth Cover
017B	2	2	2	4279112030	Shaft
018B	6	6	6	4279154020	Knob, Meca Button
019B	3	3	3	5128260680	B.H. Tapped Screw 82.6 x 6
020B	2	2	2	4279154060	Knob, Sensor
021B	2	2	2	5128260680	B.H. Tapped Screw 82.6 x 6
022B	1	1	1	4280121010	Link
023B	2	2	2	5273031259	H.S. Head Bolt 3 x 12
024B	4	4	4	59046502G9	Washer
076F	1	1	1	4279160040	Bracket (L)
077F	6	6	6	5128030680	B.H. Tapped Screw 83 x 6
080F	1	1	1	59030805P0	Washer
081F	1	1	1	4279160050	Bracket (R)
082F	5	5	5	5128030680	B.H. Tapped Screw 83 x 6
086F	1	1	1	4279160160	Bracket
087F	2	2	2	51060303A9	P.H.M. Screw P3 x 3
963F	1	1	1	4280104010	Retainer
964F	3	3	3	64020300Q0	RG Ring, CS Type

[P03-99] TOP COVER & MAIN CHASSIS

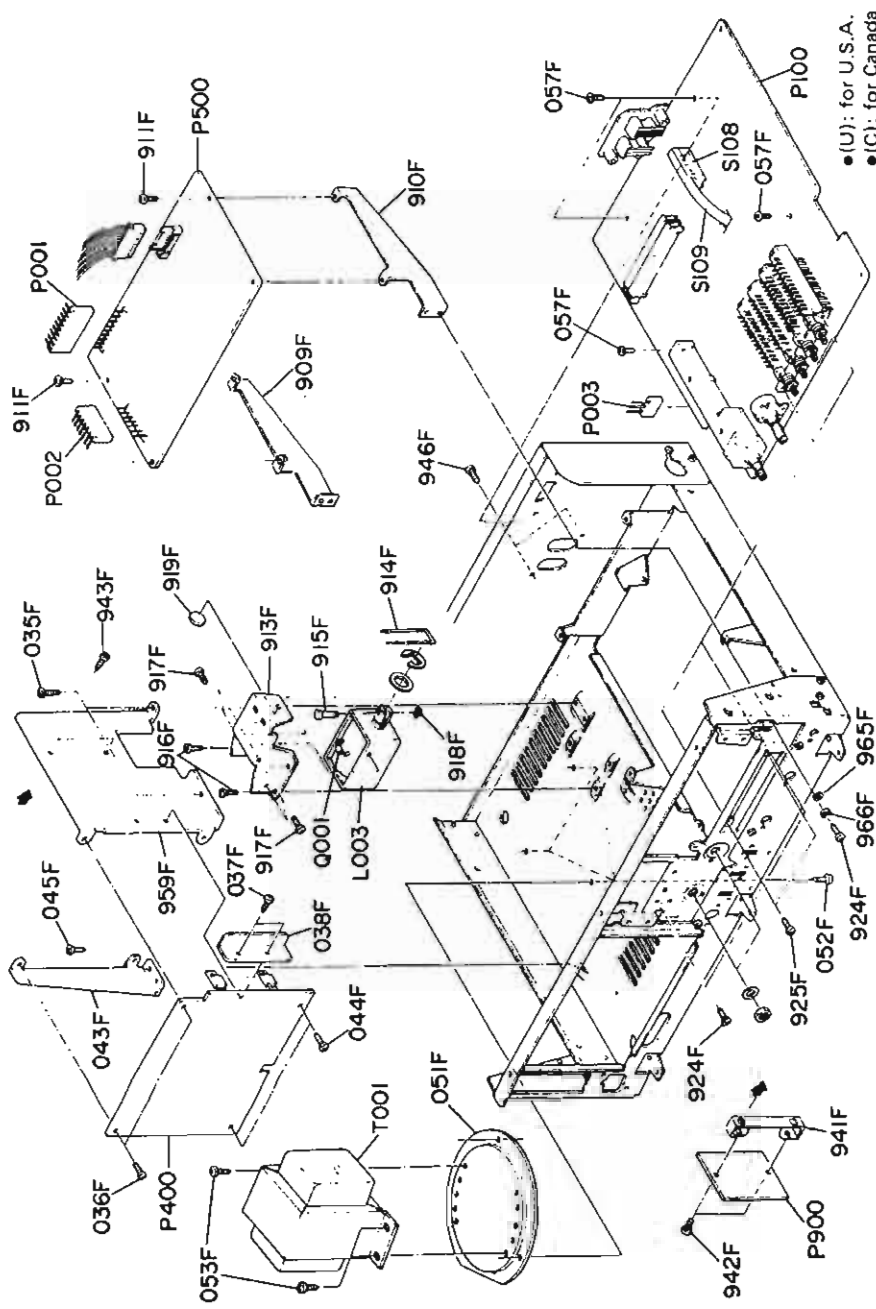


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	A		
055B	1	1	1	4279257010	Lid, Top Cover
057B	3	3	3	51280308U0	B.H. Tapped Screw B3 x 8
068B	4	4	4	2259057010	Leg
934B	1	1	1	3889861010	Label
934B	1	1	1	4113861020	Label
935B	1	1	1	2932861010	Label
935B	1	1	1	2911861140	Label
945B	4	4	4	51480406S9	F. Washer Screw 4 x 6
946B	6	6	6	2991259010	Bushing

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	A		
005F	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
026F	1	1	1	4279105010	Chassis
030F	1	1	1	4279257020	Lid
031F	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6

[M01-99] P.W. BOARD & GENERAL PARTS

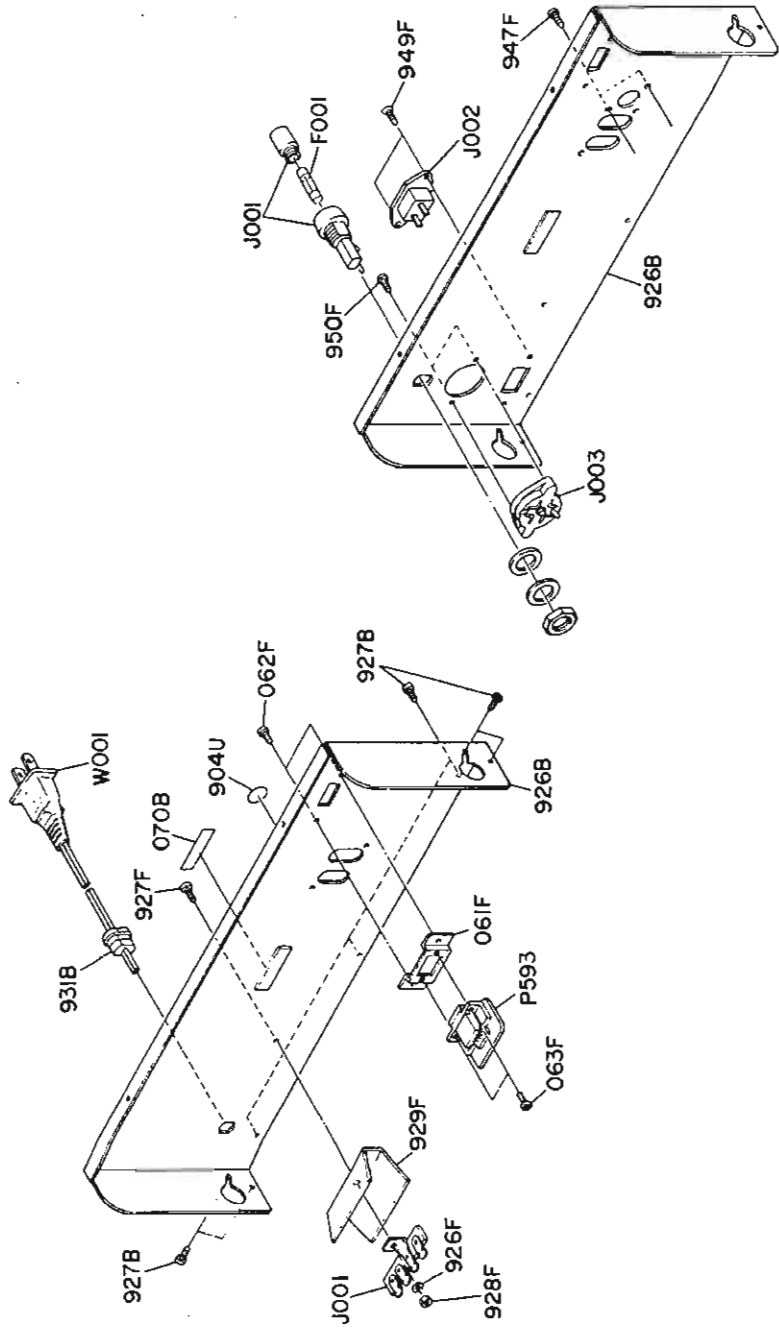


●(U): for U.S.A.  
 ●(C): for Canada  
 ●(N): for Europe  
 ●(A): for Australia

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
035F	2	2	2	5128030880	B. H. Tapped Screw B3 x 8
036F	2	2	2	5128031080	B. H. Tapped Screw B3 x 10
037F	2	2	2	5128031080	B. H. Tapped Screw B3 x 10
038F	1	1	1	4279005010	Clamper
043F	1	1	1	4279160080	Bracket
044F	2	2	2	5128031080	B. H. Tapped Screw B3 x 10
045F	1	1	1	5128030680	B. H. Tapped Screw B3 x 6
051F	1	1	1	4279160110	Bracket, Transf.
052F	3	3	3	5128040680	B. H. Tapped Screw B4 x 6
053F	4	4	4	5128040880	B. H. Tapped Screw B4 x 6
057F	4	4	4	5128030680	B. H. Tapped Screw B3 x 6
909F	1	1	1	4278160080	Bracket
910F	1	1	1	4278160090	Bracket
911F	4	4	4	5128030680	B. H. Tapped Screw B3 x 6
913F	1	1	1	4279160070	Bracket, Solenoid
914F	1	1	1	4279115020	Spring, Rec
915F	1	1	1	4279112010	Shaft
916F	4	4	4	5128030680	B. H. Tapped Screw B3 x 6
917F	4	4	4	51100305A9	B. H. M. Screw B3 x 5
918F	1	1	1	64000200R0	RG Ring, E Type
941F	1	1	1	3890160040	Bracket
942F	2	2	2	51100306A9	B. H. M. Screw B3 x 6
943F	2	2	2	51100306A9	B. H. M. Screw B3 x 6
959F	1	1	1	4279267010	Heat sink
965F	1	1	1	62030039WC	Washer (Spring)
966F	1	1	1	54110149A0	Flat Washer, L.
969F	1	1	1	54040302N0	Washer (Spring)

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
919F	1	1	1	4279056010	Buffer
923F	4	4	4	5128030680	B. H. Tapped Screw B3 x 5
925F	2	2	2	51100306A9	B. H. M. Screw B3 x 6
946F	2	2	2	51280308U0	B. H. Tapped Screw B3 x 8
Δ L003	1	1	1	ME10630010	Solenoid Coil, Rec
Q001	1	1	1	HD20023100	Diode 10E-1
S108	1	1	1	SS04030130	Slide Switch
S109	1	1	1	SB11910010	Switch Band, FLX
Δ T001	1	1	1	TS16621010	Power Transformer
Δ T001	1	1	1	TS16621020	Power Transformer
T00*	1	1	1	TS16621040	Power Transformer
P001	1	1	1	YJ06001430	Jack (9P)
P002	1	1	1	YJ06001260	Jack (7P)
P003	1	1	1	YJ06001040	Jack (3P)

(P05-99) REAR PANEL

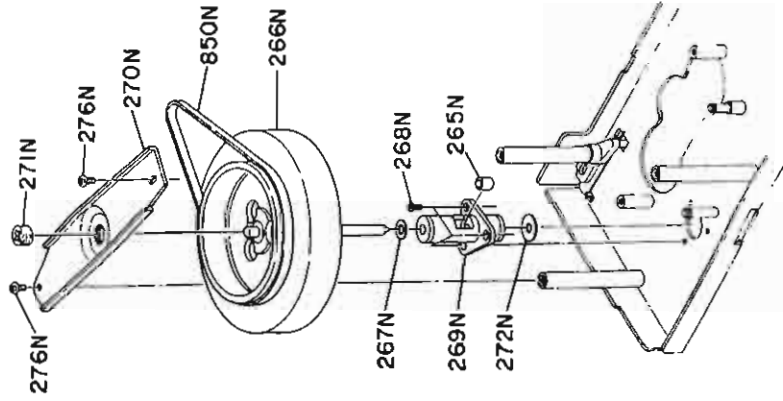


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Austral

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	A		
070B	1	1	1	2112265010	Indicator, Serial No.
926B	1	1	1	4278160020	Bracket, Rear Panel
926B	7	7	7	4278160030	Bracket, Rear Panel
927B	7	7	7	51280306U0	B.H. Tapped Screw B3 x 6
931B	1	1	1	1455259030	Bushing
947B	1	1	1	4581861010	Label
061F	1	1	1	4279160120	Bracket, Remote Jack
062F	2	2	2	51280306U0	B.H. Tapped Screw B3 x 6
063F	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
926F	1	1	1	54040302A0	Spring Washer
927F	1	1	1	51100308S9	B.H.M. Screw B3 x 8
928F	1	1	1	53110303A9	Hexagon Nut
929F	1	1	1	4114120010	Insulator

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	A		
947F	2	2	2	51280308U0	B.H. Tapped Screw B3 x 8
949F	2	2	2	51500308U0	F.H. Taprite Screw F3 x 8
950F	2	2	2	51280310U0	B.H. Tapped Screw B2 x 10
904U	1	1	1	9511101070	Label, UL
904U	1	1	1	2457861040	Label, CSA
J001	1	1	1	YL01040160	Terminal
J001	1	1	1	YJ08000290	Jack, Fuse Holder
ΔJ002	1	1	1	YP04000610	Plug, AC Inlet
ΔJ003	1	1	1	BY050800010	Voltage Selector
ΔW001	1	1	1	YC02000140	A.C. Power Cord
ΔF001	1	1	1	FS10080800	Fuse 0.8A

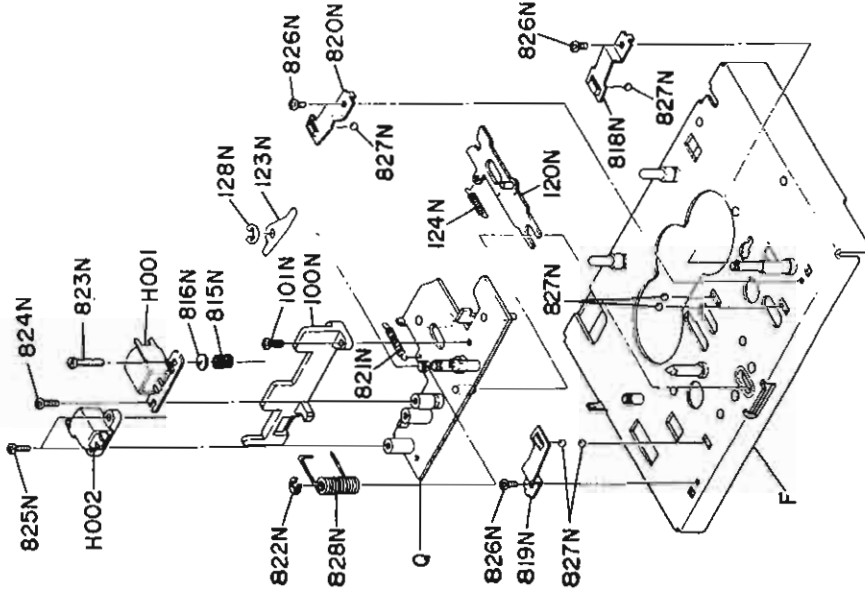
[P07-99] FLYWHEEL



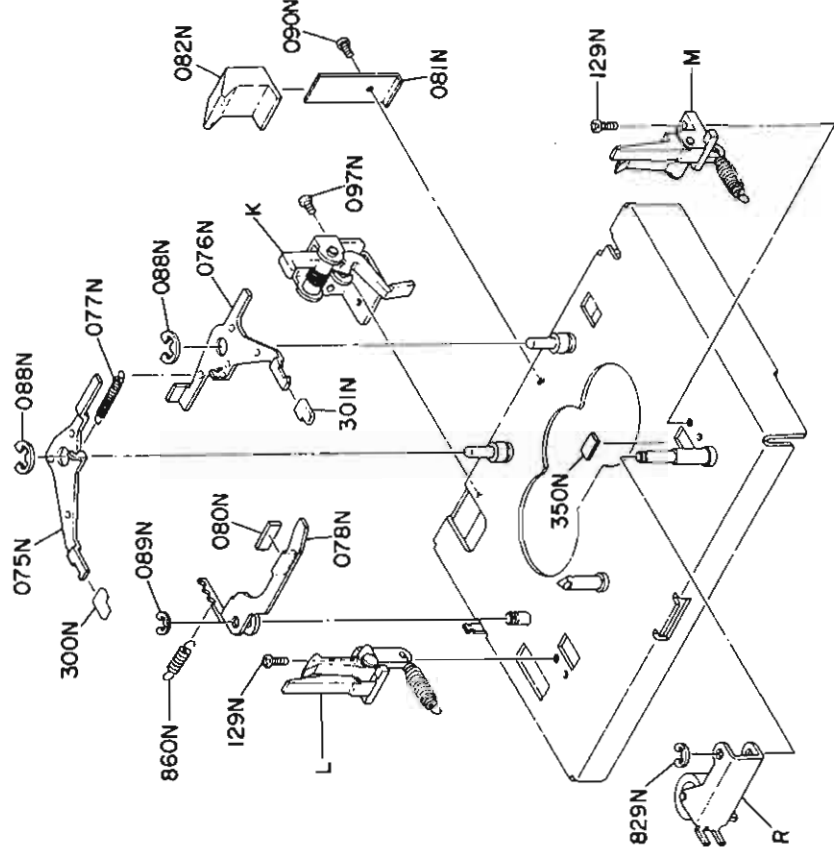
- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
265N	1	1	1	1	4397262030	Color Flywheel
266N	1	1	1	1	4397273500	Spacer
267N	1	1	1	1	59030802G9	F.H.M. Screw P2.6 x 4
268N	3	3	3	3	51042604A0	Sustainer, Capstan
269N	1	1	1	1	4397106020	Retainer
270N	1	1	1	1	4397104010	Adjuster
271N	1	1	1	1	3483164020	Spacer
272N	1	1	1	1	4397118010	P.H.M. Screw P3 x 5
276N	2	2	2	2	51060305A9	Belt
850N	1	1	1	1	4397264010	

[P06-99] HEAD CHASSIS



REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
F	1	1	1	1	4397105400	Chassis Assembly
Q	1	1	1	1	4397105410	Chassis Assembly, Head
100N	1	1	1	1	4397053010	Cover, Head Chassis
101N	1	1	1	1	51060206A0	P.H.M. Screw P2 x 6
120N	1	1	1	1	4397354500	Lever, (K) F/R
123N	1	1	1	1	4397002050	Arm, F/R
124N	1	1	1	1	4397115190	Spring
128N	1	1	1	1	64002500R0	RG Ring, E Type
815N	1	1	1	1	4380115090	Spring, Azimuth
816N	1	1	1	1	3444118070	Spacer
818N	1	1	1	1	4397115070	Spring
819N	1	1	1	1	4397115080	Spring (L)
820N	1	1	1	1	4397115090	Spring (R)
821N	1	1	1	1	4397115130	Spring
822N	1	1	1	1	64002500R0	RG Ring, E Type
823N	1	1	1	1	51060204A0	P.H.M. Screw P2 x 4
824N	1	1	1	1	4397254090	Pin
825N	2	2	2	2	51060208A0	P.H.M. Screw P2 x 6
826N	3	3	3	3	51062603A0	P.H.M. Screw P2.6 x 3
827N	6	6	6	6	61025010T0	Ball
828N	1	1	1	1	4397115050	Spring
H001	1	1	1	1	LH42122010	Rec/Play Head
H002	1	1	1	1	LH31000510	Erase Head

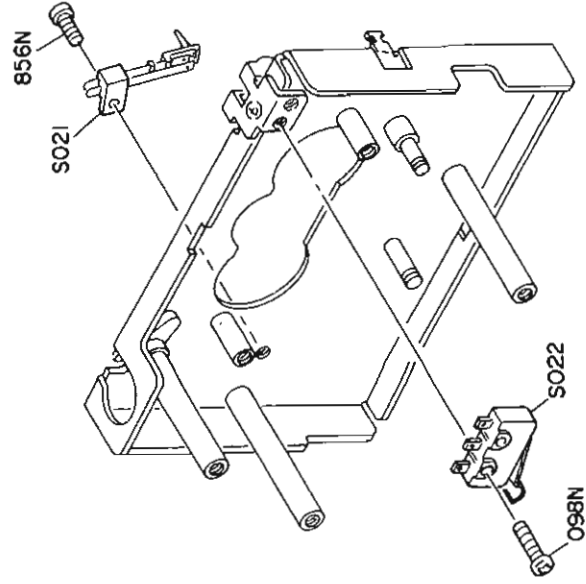


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N/A		
090N	1	1	1	51062603A0	P.H.M. Screw P2.6 x 3
097N	1	1	1	51062604A0	P.H.M. Screw P2.6 x 4
300N	1	1	1	4367263010	Brake
301N	1	1	1	4367263010	Brake
350N	1	1	1	4397120010	Insulator
829N	1	1	1	64002500R0	RG Ring, E Type
860N	1	1	1	4397115210	Spring, Back Tension
129N	2	2	2	51062606A0	P.H.M. Screw P2.6 x 6
K	1	1	1	4397104420	Retainer Assembly
L	1	1	1	4397104400	Retainer Assembly, Cassette
M	1	1	1	4397104410	Retainer Assembly, Cassette
R	1	1	1	4397354410	Lever Assembly, Pinch Roller
075N	1	1	1	4397354040	Brake Lever (L)
076N	1	1	1	4397354030	Brake Lever (R)
077N	1	1	1	4397115100	Spring
078N	1	1	1	4397354090	Lever, Back Tension
080N	1	1	1	4397061030	Clutch, Back Tension
081N	1	1	1	4397115020	Spring
082N	1	1	1	4397053020	Cover
088N	2	2	2	64000400R0	RG Ring, E Type
089N	1	1	1	64002500R0	RG Ring, E Type

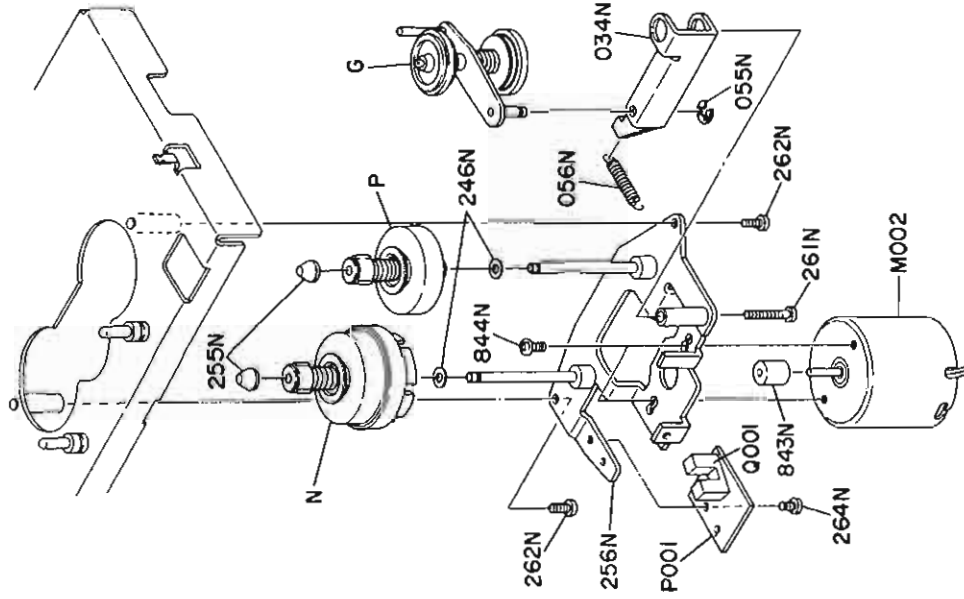


[P08-99] SWITCH LOCATION FOR TAPE OPERATION



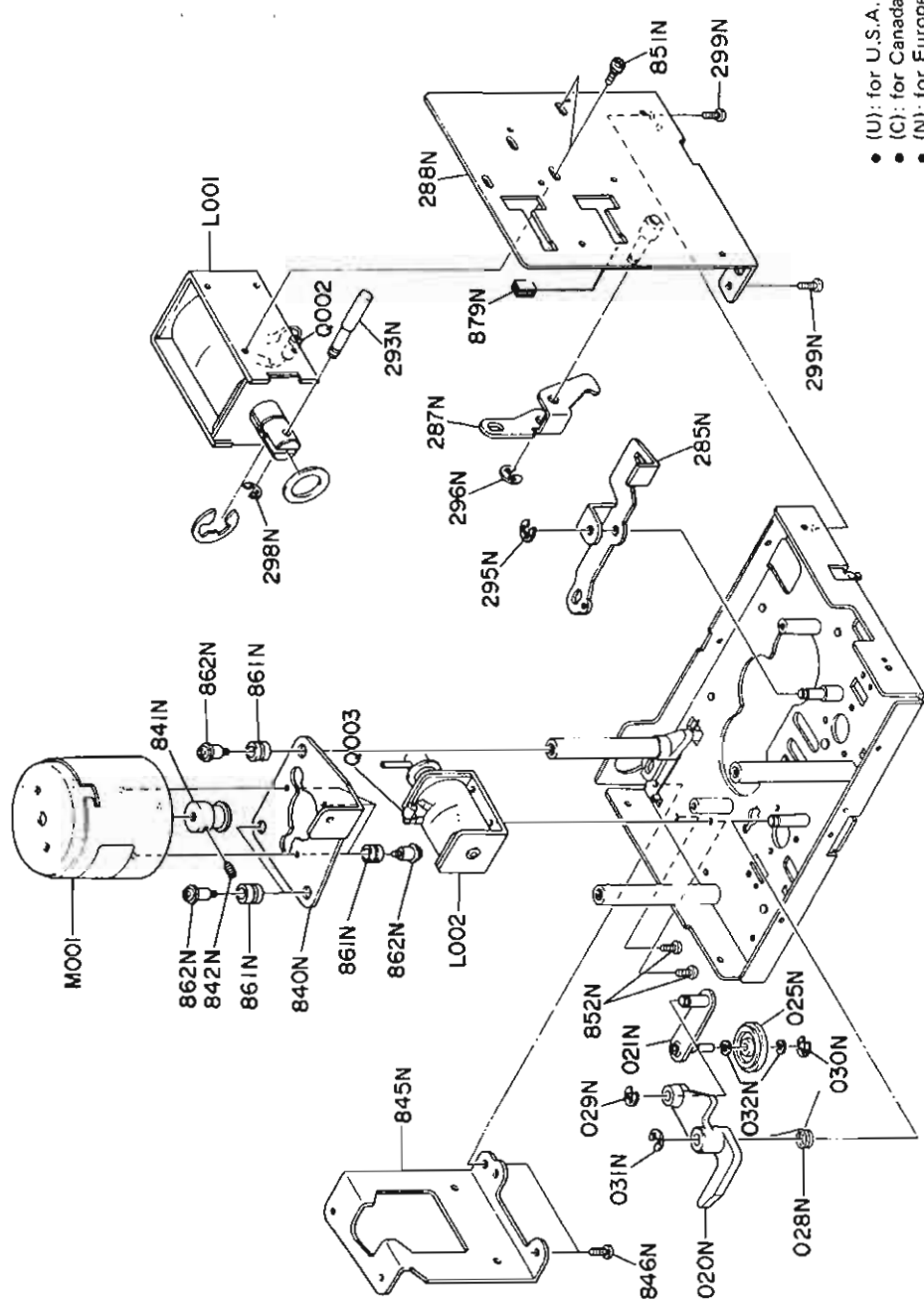
- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N		
098N	1	1	1	51060208A0	P.H.M. Screw P2 x 8
856N	1	1	1	51062605A0	P.H.M. Screw P2.6 x 5
S021	1	1	1	SM01010740	Mini Switch, Cassette
S022	1	1	1	SC01020340	Micro Switch



REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N		
G	1	1	1	4397002420	Arm Assembly, FF/REW
N	1	1	1	4397004400	Table Assembly, Take up
P	1	1	1	4397004410	Table Assembly, Supply
034N	1	1	1	4397354150	Lever, F/R
055N	1	1	1	64002500R0	FG Ring, E Type
056N	1	1	1	4397115010	Spring
246N	2	2	2	59020402G9	Washer
255N	2	2	2	4367067010	Cap, Reel Table
256N	1	1	1	4397160500	Bracket (k) Reel
261N	1	1	1	51062620A0	P.H.M. Screw P2.6 x 20
262N	2	2	2	51062606A0	P.H.M. Screw P2.6 x 6
264N	1	1	1	51062604A0	P.H.M. Screw P2.6 x 4
843N	1	1	1	4397262020	Pulley, Reel Motor
844N	2	2	2	51062603A0	P.H.M. Screw P2.6 x 3
M002	1	1	1	MM11200120	D.C. Motor, FF/REW
Q001	1	1	1	HW10001030	Photo Unit
P001	1	1	1	YF43970010	P.W. Board, Photo Coupler
	1	1	1	ZZ43970010	P.W. Board Assembly

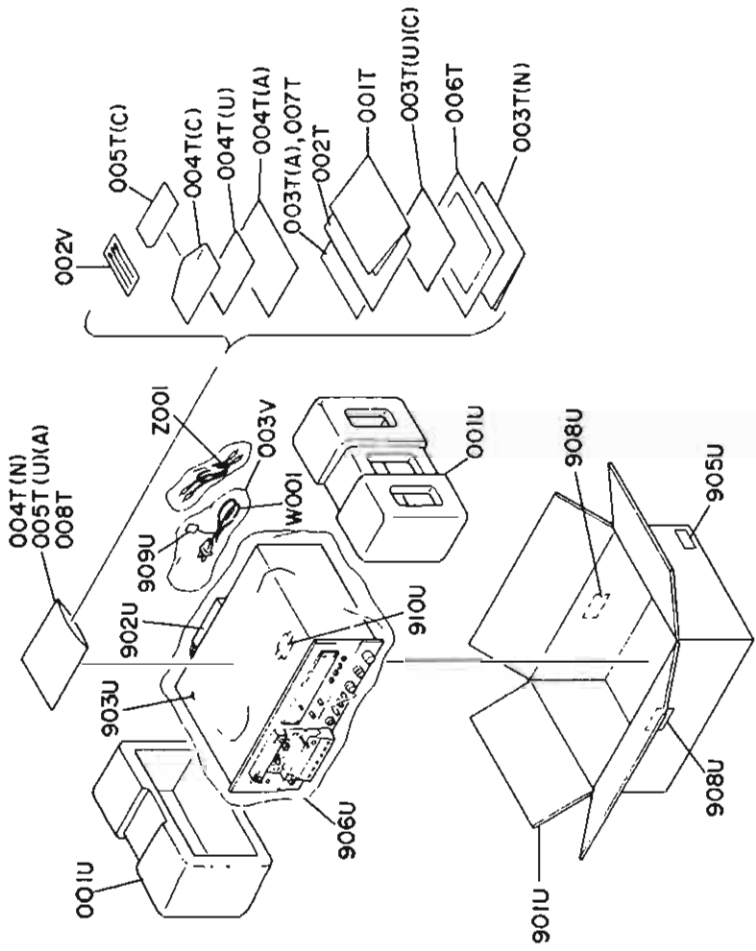
[P09-99] PARTS ASSEMBLED ON TOP OF CHASSIS



- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australi

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	A		
020N	1	1	1	4397354080	Lever, Take up
021N	1	1	1	4397002500	Arm (K) Take up
025N	1	1	1	4367001510	Idler, Take up
028N	1	1	1	4397115150	Spring
029N	1	1	1	64000200R0	RG Ring, E Type
030N	1	1	1	64001200R0	RG Ring, E Type
031N	1	1	1	64002500R0	RG Ring, E Type
032N	2	2	2	59163202G9	Washer
285N	1	1	1	4397354070	Lever, Play
287N	1	1	1	4397354060	Lever, Solenoid
288N	1	1	1	4397160510	Bracket (K)
293N	1	1	1	4397254080	Pin
295N	1	1	1	64000300R0	RG Ring, E Type
296N	1	1	1	64000300R0	RG Ring, E Type
298N	1	1	1	64002500R0	RG Ring, E Type
299N	2	2	2	51100306A9	B.H.M. Screw B3 x 6
840N	1	1	1	4397160020	Bracket, Motor
841N	1	1	1	4397262010	Pulley
842N	1	1	1	51690305G9	Socket Screw, HP 3 x 5
845N	1	1	1	4397160060	Bracket, Motor
846N	2	2	2	51060304A9	P.H.M. Screw P3 x 4
851N	2	2	2	51440306A9	L. Washer Screw L3 x 6
852N	2	2	2	51102604A0	B.H.M. Screw B2.6 x 4
861N	6	6	6	4383259010	Bushing
862N	6	6	6	4367112150	Shaft
879N	1	1	1	4103114030	Stopper
Δ L001	1	1	1	ME10630010	Solenoid Coil, Play
Δ L002	1	1	1	ME10410010	Solenoid Coil, Brake
Δ M001	1	1	1	MM11205010	D.C. Motor, 12V 2 Speed
Q002	1	1	1	HD20023100	Diode 10E-1
Q003	1	1	1	HD20023100	Diode 10E-1

[H01-99] PACKING MATERIALS



- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
001T	1				4278851010	Instructions
001T	1	1			4278851310	Instructions
002T	1			1	4278851020	Instructions
002T	1			1	4278851220	Instructions
003T	1			1	4278851320	Instructions
003T	1			1	2818854020	Guarantee Card
003T	1			1	2818854040	Guarantee Card
003T	1			1	4278856010	Circuit Diagram
004T	1			1	2205851040	Instructions
					2225813010	Envelope
004T				1	2918813010	Envelope
004T				1	9013025010	Polyethy Bag
004T				1	9631000090	Guarantee Card
005T	1			1	9013025010	Polythy Bag
005T				1	9630000180	Guarantee Card
006T				1	9650000050	S. Station Card
007T				1	4292851220	Instructions
008T				1	9013025010	Polyethy Bag

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
001U	2	2	2	2	4279809010	Cushion
901U	1	1			4278801010	Packing Case
901U	1	1		1	4278801020	Packing Case
902U	1	1		1	2864804010	Sleeve
903U	1	1		1	2918107150	Sheet
905U	2				9526019010	Serial No. Card
905U				2	9526019020	Serial No. Card
905U				2	9526019030	Serial No. Card
906U	1	1	1	1	9090909040	Polyethy Sheet
908U				2	9510901020	Label, Address
909U				1	9560000040	Hang Tag
910U				1	2731821010	Silicagel
002V	1	1	1	1	4136071010	Cleaner
003V	1	1	1	1	9011325010	Polyethy Bag
ΔW001				1	ZC01805020	A.C. Power Cord
ΔW001				1	ZC02006030	A.C. Power Cord
Z001	2	2	2	2	ZD01000170	Connective Cord

**ELECTRICAL PARTS**

- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Austral

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
P001	1	1	1	YF43970010	<b>P001-PHOTO CAPLER CIRCUIT BOARD</b>
	1	1	1	ZZ43970010	P.W. Board, Photo Capler P.W. Board Assembly
	1	1	1	HW10001030	Photo Unit
	1	1	1	YG42780010	<b>P100-PRE-AMP. CIRCUIT BOARD</b>
P100	1	1	1	ZZ42780010	P.W. Board, Pre-Amp.
	1	1	1	ZZ52788010	P.W. Board Assembly
	1	1	1	DF55221090	<b>P100-CAPACITORS</b>
C101	1	1	EA22602530	Film 220pF ±5%	
C102	1	1	EA47502540	Elect 22nF 25V	
C103	1	1	EA47601030	Elect 4.7nF 25V	
C104	1	1	EA47601030	Elect 47nF 10V	
C105	1	1	EA47601030	Elect 47nF ±5%	
C106	1	1	DF15153300	Ceramic 47pF 10V	
C107	1	1	EA22505030	Film 0.015μF ±5%	
C108	1	1	EA33405030	Elect 2.2μF 50V	
C109	1	1	EA33405030	Elect 0.33μF 50V	
C110	1	1	DF15123300	Film 0.012μF ±5%	
C111	1	1	DF15102300	Film 0.001μF ±5%	
C112	1	1	DF15103300	Film 0.01μF ±5%	
C113	1	1	EA33405030	Elect 0.33μF 50V	
C114	1	1	EA10505030	Elect 1μF 50V	
C115	1	1	EE10505040	Elect 1μF 50V	
C116	1	1	EA10702530	Elect 100μF 25V	
C117	1	1	DD15101350	Ceramic 100pF ±5%	
C118	1	1	DF15152300	Film 0.0015μF ±5%	
C119	1	1	EA10602530	Elect 10μF 25V	
C120	1	1	EA10405030	Elect 0.1μF 50V	
C121	1	1	EA33405030	Elect 0.33μF 50V	
C122	1	1	DF15473300	Film 0.047μF ±5%	
C123	1	1	EA10602530	Elect 10μF 25V	
C124	1	1	DF15472300	Film 0.0047μF ±5%	
C125	1	1	DF15273300	Film 0.027μF ±5%	
C126	1	1	DF15562300	Film 0.0056μF ±5%	
C127	1	1	EA10602530	Elect 10μF 25V	
C128	1	1	EA10701030	Elect 100μF 10V	
C129	1	1	EA10702530	Elect 100μF 25V	
C130	1	1	DF15392300	Film 0.0039μF ±5%	
C131	1	1	DF55681090	Film 680pF ±5%	
C132	1	1	EA33405030	Elect 0.33μF 50V	
C133	1	1	EA10602530	Elect 10μF 25V	
C134	1	1	EA10602530	Elect 10μF 25V	
C135	1	1	EA22505030	Elect 2.2μF 50V	
C136	1	1	EA22505030	Elect 2.2μF 50V	
C137	1	1	EA47405030	Elect 0.47μF 50V	
C138	1	1	EA47602530	Elect 47nF 25V	
C139	1	1	EA33602530	Elect 33μF 25V	
C140	1	1	EA47505030	Elect 4.7nF 50V	
C141	1	1	EA22405030	Elect 0.22μF 50V	
C142	1	1	EA47505030	Elect 4.7μF 50V	
C143	1	1	EA47505030	Elect 4.7μF 50V	
C144	1	1	DF15152300	Film 0.0015μF ±5%	
C145	1	1	DF55101090	Film 100pF ±5%	

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
C146	1	1	1	DF15103300	Film 0.01μF ±5%
C147	1	1	1	DF15153300	Film 0.015μF ±5%
C148	1	1	1	DF15223300	Film 0.022μF ±5%
C149	1	1	1	DF15183300	Film 0.018μF ±5%
C150	1	1	1	DF15223300	Film 0.022μF ±5%
C151	1	1	1	DF15183300	Film 0.018μF ±5%
C152	1	1	1	DK18102300	Film 0.001μF ±5%
C153	1	1	1	DK18102300	Film 0.001μF ±5%
C154	1	1	1	DF15103300	Film 0.01μF ±5%
C155	1	1	1	DF15103300	Film 0.01μF ±5%
C156	1	1	1	DF15103300	Film 0.01μF ±5%
C157	1	1	1	DF15822300	Film 0.0082μF ±5%
C158	1	1	1	DF15473300	Film 0.047μF ±5%
C159	1	1	1	DF15393300	Film 0.039μF ±5%
C160	1	1	1	EA10702530	Elect 100μF ±25V
C162	1	1	1	DD15560330	Ceramic 56pF ±5%
C163	1	1	1	DF15182300	Film 0.0018μF ±5%
C170	1	1	1	EA47405030	Elect 0.47μF 50V
C171	1	1	1	DF65242010	Film 2400pF ±5%
C172	1	1	1	EA10602530	Elect 10μF 25V
C173	1	1	1	DD15160300	Ceramic 16pF ±5%
C201	1	1	1	DF55221090	Film 220pF ±5%
C202	1	1	1	EA22602530	Elect 22μF 25V
C208	1	1	1	EA22505030	Elect 2.2μF 50V
C209	1	1	1	EA33405030	Elect 0.33μF 50V
C210	1	1	1	DF15123300	Film 0.012μF ±5%
C204	1	1	1	EA47601030	Elect 47pF 10V
C205	1	1	1	DD15470370	Ceramic 47pF ±5%
C206	1	1	1	EA47601030	Elect 47pF 10V
C207	1	1	1	DF15153300	Film 0.015μF ±5%
C208	1	1	1	EA22505030	Elect 2.2μF 50V
C209	1	1	1	EA33405030	Elect 0.33μF 50V
C210	1	1	1	DF15123300	Film 0.012μF ±5%
C211	1	1	1	DF15102300	Film 0.001μF ±5%
C212	1	1	1	DF15103300	Film 0.01μF ±5%
C213	1	1	1	EA33405030	Elect 0.33μF 50V
C214	1	1	1	EA10505030	Elect 1μF 50V
C215	1	1	1	EE10505040	Elect 1μF 50V
C216	1	1	1	EA10702530	Elect 100μF 25V
C217	1	1	1	DD15101350	Ceramic 100pF ±5%
C218	1	1	1	DF15152300	Film 0.0015μF ±5%
C219	1	1	1	EA10602530	Elect 10μF 25V
C220	1	1	1	EA10405030	Elect 0.1μF 50V
C221	1	1	1	EA33405030	Elect 0.33μF 50V
C222	1	1	1	DF15473300	Film 0.047μF ±5%
C223	1	1	1	EA10602530	Elect 10μF 25V
C224	1	1	1	DF15472300	Film 0.0047μF ±5%
C225	1	1	1	DF15273300	Film 0.027μF ±5%
C226	1	1	1	DF15562300	Film 0.0056μF ±5%
C227	1	1	1	EA10602530	Elect 10μF 25V
C228	1	1	1	EA10701030	Elect 100μF 10V
C229	1	1	1	EA10702530	Elect 100μF 25V
C230	1	1	1	DF15392300	Film 0.0039μF ±5%
C231	1	1	1	DF55681090	Film 680pF ±5%
C232	1	1	1	EA33405030	Elect 0.33μF 50V
C233	1	1	1	EA10602530	Elect 10μF 25V
C234	1	1	1	EA10602530	Elect 10μF 25V
C235	1	1	1	EA22505030	Elect 2.2μF 50V

- (U): for U.S.A.
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- (A): for Australia

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
C236	1	1	1	1	EA22505030	Elect 2.2 $\mu$ F 50V
C237	1	1	1	1	EA47405030	Elect 0.47 $\mu$ F 50V
C238	1	1	1	1	EA47602530	Elect 47 $\mu$ F 25V
C239	1	1	1	1	EA33602530	Elect 33 $\mu$ F 25V
C240	1	1	1	1	EA47505030	Elect 4.7 $\mu$ F 50V
C241	1	1	1	1	EA22405030	Elect 0.22 $\mu$ F 50V
C242	1	1	1	1	EA47505030	Elect 4.7 $\mu$ F 50V
C243	1	1	1	1	EA47505030	Elect 4.7 $\mu$ F 50V
C244	1	1	1	1	DF15152300	Film 0.0015 $\mu$ F $\pm$ 5%
C245	1	1	1	1	DF55101090	Film 100pF $\pm$ 5%
C246	1	1	1	1	DF15103300	Film 0.01 $\mu$ F $\pm$ 5%
C247	1	1	1	1	DF15153300	Film 0.015 $\mu$ F $\pm$ 5%
C248	1	1	1	1	DF15223300	Film 0.022 $\mu$ F $\pm$ 5%
C249	1	1	1	1	DF15183300	Film 0.018 $\mu$ F $\pm$ 5%
C250	1	1	1	1	DF15223300	Film 0.022 $\mu$ F $\pm$ 5%
C251	1	1	1	1	DF15183300	Film 0.018 $\mu$ F $\pm$ 5%
C252	1	1	1	1	DK18102300	Film 0.047 $\mu$ F $\pm$ 5%
C253	1	1	1	1	DK18102300	Film 0.001 $\mu$ F $\pm$ 5%
C254	1	1	1	1	DF15103300	Film 0.01 $\mu$ F $\pm$ 5%
C255	1	1	1	1	DF15103300	Film 0.01 $\mu$ F $\pm$ 5%
C256	1	1	1	1	DF15103300	Film 0.01 $\mu$ F $\pm$ 5%
C257	1	1	1	1	DF15822300	Film 0.0082 $\mu$ F $\pm$ 5%
C258	1	1	1	1	DF15473300	Film 0.047 $\mu$ F $\pm$ 5%
C259	1	1	1	1	DF15393300	Film 0.033 $\mu$ F $\pm$ 5%
C260	1	1	1	1	EA10702530	Elect 100 $\mu$ F 25V
C262	1	1	1	1	DD15560330	Ceramic 56pF $\pm$ 5%
C270	1	1	1	1	EA47405030	Elect 0.47 $\mu$ F 50V
C271	1	1	1	1	DF65242010	Film 2400pF $\pm$ 5%
C272	1	1	1	1	EA10602530	Elect 10 $\mu$ F 25V
C273	1	1	1	1	DD15160300	Ceramic 16pF $\pm$ 5%
C301	1	1	1	1	EA22702530	Elect 220 $\mu$ F 25V
C302	1	1	1	1	EA10701030	Elect 100 $\mu$ F 10V
C303	1	1	1	1	DK18104010	Ceramic 0.1 $\mu$ F
C304	1	1	1	1	DK18104010	Ceramic 0.1 $\mu$ F
C263	1	1	1	1	DF15182300	Film 0.0018 $\mu$ F $\pm$ 5%
<b>P100-RESISTORS</b> (All Resistors are $\pm$ 5% & $\frac{1}{4}$ W)						
R101	1	1	1	1	GD05100140	10 $\Omega$
R102	1	1	1	1	GD05822140	8.2K $\Omega$
R103	1	1	1	1	GD05224140	220K $\Omega$
R104	1	1	1	1	GD05683140	68K $\Omega$
R105	1	1	1	1	GD05104140	100K $\Omega$
R106	1	1	1	1	GD05223140	22K $\Omega$
R107	1	1	1	1	GD05271140	270 $\Omega$
R108	1	1	1	1	GD05333140	33K $\Omega$
R109	1	1	1	1	GD05103140	10K $\Omega$
R110	1	1	1	1	GD05101140	100 $\Omega$
R112	1	1	1	1	GD05562140	5.6K $\Omega$
R111	1	1	1	1	GD05152140	1.5K $\Omega$
R113	1	1	1	1	GD05273140	27K $\Omega$
R114	1	1	1	1	GD05394140	390K $\Omega$
R115	1	1	1	1	RA05020160	5K $\Omega$ Trimming, P.B EQ
R116	1	1	1	1	GD05682140	6.8K $\Omega$
R117	1	1	1	1	GD05822140	8.2K $\Omega$
R118	1	1	1	1	GD05822140	8.2K $\Omega$
R119	1	1	1	1	GD05332140	3.3K $\Omega$
R120	1	1	1	1	GD05822140	8.2K $\Omega$
R121	1	1	1	1	GD05682140	6.8K $\Omega$
R122	1	1	1	1	GD05102140	1K $\Omega$
R123	1	1	1	1	RA05030090	50K $\Omega$ Trimming, P.B Level
R124	1	1	1	1	GD05105140	1M $\Omega$
R125	1	1	1	1	GD05392140	3.9K $\Omega$
R126	1	1	1	1	GD05222140	2.2K $\Omega$

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
R127	1	1	1	1	GD05473140	47K $\Omega$
R128	1	1	1	1	GD05154140	150K $\Omega$
R129	1	1	1	1	GD05274140	270K $\Omega$
R130	1	1	1	1	GD05473140	47K $\Omega$
R131	1	1	1	1	GD05181140	180 $\Omega$
R132	1	1	1	1	GD05332140	3.3K $\Omega$
R133	1	1	1	1	GD05104140	100K $\Omega$
R134	1	1	1	1	GD05822140	8.2K $\Omega$
† R135	1	1	1	1	GA05561010	560 $\Omega$ 1W
‡ R136	1	1	1	1	GG05391140	390 $\Omega$
R137	1	1	1	1	GD05105140	1M $\Omega$
R138	1	1	1	1	GD05182140	1.8K $\Omega$
R139	1	1	1	1	GD05102140	1K $\Omega$
R140	1	1	1	1	GD05102140	1K $\Omega$
R141	1	1	1	1	GD05561140	560 $\Omega$
R142	1	1	1	1	GD05102140	1K $\Omega$
R143	1	1	1	1	GD05333140	33K $\Omega$
R144	1	1	1	1	GD05104140	100K $\Omega$
R145	1	1	1	1	GA05681010	680 $\Omega$ 1W
R146	1	1	1	1	GD05151140	150 $\Omega$
R147	1	1	1	1	GD05102140	1K $\Omega$
R148	1	1	1	1	GD05183140	18 K $\Omega$
R150	1	1	1	1	GD05822140	8.2 K $\Omega$
R151	1	1	1	1	GD05272140	2.7 K $\Omega$
R152	1	1	1	1	GD05682140	6.8 K $\Omega$
R153	1	1	1	1	GD05472140	4.7 K $\Omega$
R154	1	1	1	1	RA02030060	20K $\Omega$ Trimming, Rec Level
R155	1	1	1	1	RA02030060	20K $\Omega$ Trimming, Rec Level
R156	1	1	1	1	GD05561140	560 $\Omega$
R157	1	1	1	1	GD05103140	10K $\Omega$
R158	1	1	1	1	GD05103140	10K $\Omega$
R159	1	1	1	1	GD05473140	47K $\Omega$
R160	1	1	1	1	GD05564140	560K $\Omega$
R161	1	1	1	1	GD05153140	15K $\Omega$
R162	1	1	1	1	GD05102140	1K $\Omega$
R163	1	1	1	1	GD05103140	10K $\Omega$
R164	1	1	1	1	GD05182140	1.8K $\Omega$
R165	1	1	1	1	GD05152140	1.5K $\Omega$
R166	1	1	1	1	GD05680140	68 $\Omega$
R167	1	1	1	1	GD05680140	68 $\Omega$
R168	1	1	1	1	GD05121140	120 $\Omega$
R169	1	1	1	1	GD05121140	120 $\Omega$
R170	1	1	1	1	GD05822140	8.2K $\Omega$
R171	1	1	1	1	GD05822140	8.2K $\Omega$
R172	1	1	1	1	GD05392140	3.9K $\Omega$
R173	1	1	1	1	GD05822140	8.2K $\Omega$
R174	1	1	1	1	GD05182140	1.8K $\Omega$
R175	1	1	1	1	GD05221140	220 $\Omega$
R176	1	1	1	1	GD05181140	180 $\Omega$
R177	1	1	1	1	GD05121140	120 $\Omega$

- (U): for U.S.A.
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- (A): for Austral

REF. DESIG.	QTY			PART NO.	DESCRIPTION	REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N/A				U	C	N/A		
R178	1	1	1	GD05151140	150Ω	R250	1	1	1	GD05822140	8.2KΩ
R179	1	1	1	GD05822140	8.2KΩ	R251	1	1	1	GD05272140	2.7KΩ
R180	1	1	1	GD05333140	33KΩ	R252	1	1	1	GD05682140	6.8KΩ
R181	1	1	1	GD05102140	1KΩ	R253	1	1	1	GD05472140	4.7KΩ
R183	1	1	1	GD05582140	5.8KΩ	R254	1	1	1	RA02030060	20KΩ Trimming, Rec Level
R184	1	1	1	GD05821140	820Ω	R255	1	1	1	RA02030060	20KΩ Trimming, Rec Level
R190	1	1	1	GD05105140	1MΩ	R256	1	1	1	GD05551140	560Ω
R191	1	1	1	GD05244140	240KΩ	R257	1	1	1	GD05103140	10KΩ
R192	1	1	1	GD05332140	3.3KΩ	R258	1	1	1	GD05103140	10KΩ
R193	1	1	1	GD05332140	3.3KΩ	R259	1	1	1	GD05473140	47KΩ
R194	1	1	1	RA01030260	10KΩ Trimming	R260	1	1	1	GD05564140	560KΩ
R195	1	1	1	GD05824140	820KΩ	R261	1	1	1	GD05153140	15KΩ
R196	1	1	1	GD05102140	1KΩ	R262	1	1	1	GD05102140	1KΩ
R201	1	1	1	GD05100140	10Ω	R263	1	1	1	GD05103140	10KΩ
R202	1	1	1	GD05822140	8.2KΩ	R264	1	1	1	GD05182140	1.8KΩ
R203	1	1	1	GD05224140	220KΩ	R265	1	1	1	GD05152140	1.5KΩ
R204	1	1	1	GD05683140	68KΩ	R266	1	1	1	GD05680140	68Ω
R205	1	1	1	GD05104140	100KΩ	R267	1	1	1	GD05680140	68Ω
R206	1	1	1	GD05223140	22KΩ	R268	1	1	1	GD05121140	120Ω
R207	1	1	1	GD05271140	270Ω	R269	1	1	1	GD05121140	120Ω
R212	1	1	1	GD05392140	3.9KΩ	R270	1	1	1	GD05822140	8.2KΩ
R208	1	1	1	GD05333140	33KΩ	R271	1	1	1	GD05822140	8.2KΩ
R209	1	1	1	GD05103140	10KΩ	R272	1	1	1	GD05392140	3.9KΩ
R210	1	1	1	GD05101140	100Ω	R273	1	1	1	GD05822140	8.2KΩ
R211	1	1	1	GD05152140	1.5KΩ	R274	1	1	1	GD05182140	1.8KΩ
R212	1	1	1	GD05562140	5.6KΩ	R275	1	1	1	GD05221140	220Ω
R213	1	1	1	GD05273140	27KΩ	R276	1	1	1	GD05181140	180Ω
R214	1	1	1	GD05394140	390KΩ	R277	1	1	1	GD05121140	120Ω
R215	1	1	1	RA05020160	5KΩ Trimming, P.B EQ	R278	1	1	1	GD05151140	150Ω
R216	1	1	1	GD05682140	6.8KΩ	R279	1	1	1	GD05822140	8.2KΩ
R217	1	1	1	GD05822140	8.2KΩ	R280	1	1	1	GD05333140	33KΩ
R218	1	1	1	GD05822140	8.2KΩ	R281	1	1	1	GD05102140	1KΩ
R219	1	1	1	GD05332140	3.3KΩ	R283	1	1	1	GD05582140	5.8Ω
R220	1	1	1	GD05822140	8.2KΩ	R284	1	1	1	GD05820140	820Ω
R221	1	1	1	GD05682140	6.8KΩ	R290	1	1	1	GD05105140	1MΩ
R222	1	1	1	GD05102140	1KΩ	R291	1	1	1	GD05244140	240KΩ
R223	1	1	1	RA05030090	50KΩ Trimming, P.B Level	R292	1	1	1	GD05332140	3.3KΩ
R224	1	1	1	GD05105140	1MΩ	R293	1	1	1	GD05332140	3.3KΩ
R225	1	1	1	GD05392140	3.9KΩ	R294	1	1	1	RA01030260	10KΩ Trimming
R226	1	1	1	GD05222140	2.2KΩ	R295	1	1	1	GD05824140	820KΩ
R227	1	1	1	GD05473140	47KΩ	R296	1	1	1	GD05102140	1KΩ
R228	1	1	1	GD05154140	150KΩ	R301	1	1	1	GD05823140	82KΩ
R229	1	1	1	GD05274140	270KΩ	R302	1	1	1	GA05182010	1.8KΩ 1W
R230	1	1	1	GD05473140	47KΩ	R303	1	1	1	GD05271140	270Ω
R231	1	1	1	GD05181140	180Ω	R304	1	1	1	GD05472140	4.7KΩ
R232	1	1	1	GD05332140	3.3KΩ	R305	1	1	1	GD05332140	3.3KΩ
R233	1	1	1	GD05104140	100KΩ	R306	1	1	1	GA05100010	10Ω 1W
R234	1	1	1	GD05822140	8.2KΩ	R307	1	1	1	GD05183140	18KΩ
△R235	1	1	1	GA05561010	560Ω 1W	R308	1	1	1	RK02020070	2KΩ Variable, Bias Fine
△R236	1	1	1	GA05391140	390Ω	R309	1	1	1	GD05562140	5.6KΩ
R237	1	1	1	GD05105140	1MΩ	R310	1	1	1	GD05222140	2.2KΩ
R238	1	1	1	GD05182140	1.8KΩ	R311	1	1	1	GD05393140	39KΩ
R239	1	1	1	GD05102140	1KΩ	R312	1	1	1	RA03020030	3KΩ Trimming, Bias Adj.
R240	1	1	1	GD05102140	1KΩ	R313	1	1	1	RA05020160	5KΩ Trimming, Bias Adj.
R241	1	1	1	GD05561140	560Ω	R314	1	1	1	RA02030060	20KΩ Trimming, Bias Adj.
R242	1	1	1	GD05102140	1KΩ						
R243	1	1	1	GD05333140	33KΩ						
R244	1	1	1	GD05104140	100KΩ						
R245	1	1	1	GA05681010	680Ω 1W						
R246	1	1	1	GD05151140	150Ω						
R247	1	1	1	GD05102140	1KΩ						
R248	1	1	1	GD05183140	18KΩ						

- (U): for U.S.A.
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REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
R315	1	1	1	GD05101140	100Ω
R316	1	1	1	GD05154140	150KΩ
R317	1	1	1	GA05102010	1KΩ 1W
R318	1	1	1	GD05822140	8.2KΩ
R319	1	1	1	GD05331140	330Ω
R320	1	1	1	GD05152140	1.5KΩ
R321	1	1	1	RA01020110	1KΩ Trimming, Hi-Speed
R322	1	1	1	GA05151010	150Ω 1W
R325	1	1	1	GA05470010	47Ω 1W
R327	1	1	1	GD05332140	3.3KΩ
R328	1	1	1	GD05391140	390Ω
Q101	1	1	1	HT111271T0	<b>P100-SEMICONDUCTORS</b>
Q102	1	1	1	HT326341T0	Transistor 2SA1127(T)
Q103	1	1	1	HT326341S0	Transistor 2SC2634(T)
Q104	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q105	1	1	1	HT314001E0	Transistor 2SC2634(S)
Q106	1	1	1	HC10001360	IC LM1011AN
Q107	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q108	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q109	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q110	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q111	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q112	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q113	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q114	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q115	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q116	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q117	1	1	1	HD20011050	Diode 1S1555
Q125	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q126	1	1	1	HF200301E0	F.E.T. 2SK30A(D)
Q201	1	1	1	HT111271T0	Transistor 2SA1127(T)
Q202	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q203	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q204	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q205	1	1	1	HT314001E0	Transistor 2SC1400(E)
Q206	1	1	1	HC10001360	IC LM1011AN
Q207	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q208	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q209	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q210	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q211	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q212	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q213	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q214	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q215	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q216	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q217	1	1	1	HD20011050	Diode 1S1555
Q225	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q226	1	1	1	HF200301E0	F.E.T. 2SK30A(D)
Q301	1	1	1	HD20011050	Diode 1S1555
Q302	1	1	1	HT309451P0	Transistor 2SC945(P)
Q118	1	1	1	HD30024090	Zener WZ120
Q218	1	1	1	HD30024090	Zener WZ120
REF. DESIG. <th colspan="3">QTY</th> <th rowspan="2">PART NO.</th> <th rowspan="2">DESCRIPTION</th>	QTY			PART NO.	DESCRIPTION
U	C	A			
Q303	1	1	1	HT403131E0	Transistor 2SD313(E)
Q304	1	1	1	HD20011050	Diode 1S1555
Q305	1	1	1	HD30033090	Zener WZ052
Q306	1	1	1	HD20011050	Diode 1S1555
Q307	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q309	1	1	1	HT309451P0	Transistor 2SC945(P)
L101	1	1	1	LC22260050	<b>P100-MISCELLANEOUS</b>
L102	1	1	1	LS70305010	Choke Coil 22mH, Bias Trap
L103	1	1	1	LC22260070	M.P.X. Coil 22mH, 19KHz
L104	1	1	1	LC24750030	Choke Coil 22mH, Bias Trap
L105	1	1	1	LC24750030	Choke Coil 4.7mH, Rec EQ
L201	1	1	1	LC22260050	Choke Coil 4.7mH, Rec EQ
L202	1	1	1	LS70305010	Choke Coil 22mH, Bias Trap
L203	1	1	1	LC22260070	M.P.X. Coil 22mH, 19KHz
L204	1	1	1	LC24750030	Choke Coil 22mH, Bias Trap
L205	1	1	1	LC24750030	Choke Coil 4.7mH, Rec EQ
S101	1	1	1	SS09020120	Slid Switch, Rec/Play (L)
S103	1	1	1	SR12020020	Rotary Switch, Speed
S104	1	1	1	SP10040030	Push Switch, Normal
S105	1	1	1	SP10040030	Push Switch, CrO <sub>2</sub>
S106	1	1	1	SP10040030	Push Switch, Fe-Cr
S107	1	1	1	SP10040030	Push Switch, Metal
S108	1	1	1	SS04030130	Slid Switch, Dolby/MPX
S109	1	1	1	SB11910010	Switch Band, FLX
S110	1	1	1	SC00030030	Switch, 3 Position
S201	1	1	1	SS09020120	Slid Switch, Rec/Play (R)
J101	1	1	1	YT02040260	Terminal, 4P RCA
J101	1	1	1	YT02050020	Terminal, 4P RCA/Din
P350	1	1	1	YK42781520	<b>P350-MIC/LINE VOL. CIRCUIT BOARD</b>
P350	1	1	1	ZZ42781520	P.W. Board, Mic/Line Vol. P.W. Board Assembly
R391	1	1	1	RD05030110	<b>P350-RESISTORS</b>
R392	1	1	1	RD05030110	50KΩ(A) Variable, Mic
R393	1	1	1	RD01040100	50KΩ(A) Variable, Mic
R394	1	1	1	RD01040100	100KΩ(A) Variable, Line
R395	1	1	1	GD05223140	100KΩ(A) Variable, Line
R396	1	1	1	GD05223140	22KΩ ±5% ¼W
R396	1	1	1	GD05223140	22KΩ ±5% ¼W
P351	1	1	1	YK42781530	<b>P351-OUTPUT VOLUME CIRCUIT BOARD</b>
P351	1	1	1	ZZ42781530	P.W. Board, Output Volume P.W. Board Assembly
R397	1	1	1	RM05030830	<b>P351-RESISTORS</b>
R398	1	1	1	RM05030830	50KΩ(A) Variable, Output
R398	1	1	1	RM05030830	50KΩ(A) Variable, Output

- (U): for U.S.A
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				DESCRIPTION	PART NO.
	U	C	N	A		
P400	1	1	1	1	<b>P400-POWER SUPPLY CIRCUIT BOARD</b> P.W. Board, Power Supply P.W. Board Assembly	YF42790040 ZZ42780040
C401	1	1	1	1	<b>P400-CAPACITORS</b> Ceramic 0.001 $\mu$ F 35V	DK18102300
C402	1	1	1	1	Ceramic 0.001 $\mu$ F 35V	DK18102300
C403	1	1	1	1	Ceramic 0.001 $\mu$ F 25V	DK18102300
C404	1	1	1	1	Ceramic 0.001 $\mu$ F 25V	DK18102300
C405	1	1	1	1	Ceramic 0.001 $\mu$ F 35V	EA10803530
C406	1	1	1	1	Elect 1000 $\mu$ F 35V	EA10803530
C407	1	1	1	1	Elect 470pF 25V	EA47702530
C408	1	1	1	1	Elect 220 $\mu$ F 25V	EA22702530
C409	1	1	1	1	Ceramic 0.001 $\mu$ F	DK18102300
C410	1	1	1	1	Ceramic 0.001 $\mu$ F	DK18102300
C411	1	1	1	1	Ceramic 0.001 $\mu$ F	DK18102300
C412	1	1	1	1	Ceramic 0.001 $\mu$ F	DK18102300
C413	1	1	1	1	Elect 2200 $\mu$ F 35V	EA22803530
C414	1	1	1	1	Elect 2200 $\mu$ F 35V	EA22803530
C415	1	1	1	1	Film 0.01 $\mu$ F $\pm$ 5%	DF75103510
C416	1	1	1	1	Film 0.01 $\mu$ F $\pm$ 5%	DF75103510
C417	1	1	1	1	Film 0.0033 $\mu$ F $\pm$ 5%	DF75332510
C418	1	1	1	1	Film 0.0033 $\mu$ F $\pm$ 5%	DF75332510
C419	1	1	1	1	Film 0.0047 $\mu$ F $\pm$ 5%	DF75472520
C420	1	1	1	1	Elect 2.2 $\mu$ F 50V	EA22505030
C421	1	1	1	1	Film 0.001 $\mu$ F $\pm$ 5%	DF75102510
C422	1	1	1	1	Film 390pF $\pm$ 5%	DF55391510
C423	1	1	1	1	Film 390pF $\pm$ 5%	DF55391510
C424	1	1	1	1	Elect 2200 $\mu$ F 25V	EA22802530
C425	1	1	1	1	Ceramic 0.047 $\mu$ F	DK18473310
C426	1	1	1	1	Elect 470 $\mu$ F 16V	EA47701630
C429	1	1	1	1	Film 0.015 $\mu$ F $\pm$ 5%	DF75153510
C430	1	1	1	1	Film 0.015 $\mu$ F $\pm$ 5%	DF75153510
C431	1	1	1	1	Film 0.047 $\mu$ F $\pm$ 5%	DF75473510
C432	1	1	1	1	Elect 100 $\mu$ F 16V	EA10701630
C433	1	1	1	1	Film 0.018 $\mu$ F $\pm$ 5%	DF75183510
C439	1	1	1	1	Elect 220 $\mu$ F 35V	EA22703530
C440	1	1	1	1	Elect 100 $\mu$ F 16V	EA10701630
C448	1	1	1	1	Elect 1 $\mu$ F 50V	EA10505030
R401	1	1	1	1	<b>P400-RESISTORS</b> (All Resistors are $\pm$ 5% & $\frac{1}{4}$ W)	GA05056010
R402	1	1	1	1	5.6 $\Omega$ 1W	GA05471010
R403	1	1	1	1	470 $\Omega$ 1W	GA05391010
R404	1	1	1	1	390 $\Omega$ 1W	GA05391010
R405	1	1	1	1	22K $\Omega$	GD05223140
R406	1	1	1	1	10 $\Omega$	GD05223140
R407	1	1	1	1	10 $\Omega$	GD05100140
R408	1	1	1	1	10K $\Omega$ 1W	GD05100140
R409	1	1	1	1	10K $\Omega$ 1W	GJ05103010
R410	1	1	1	1	47K $\Omega$ Trimming, Bias	GJ05103010
R411	1	1	1	1	47K $\Omega$ Trimming, Bias	RA04730090
R415	1	1	1	1	15K $\Omega$	RA04730090
R416	1	1	1	1	12 $\Omega$	GD05153140
R426	1	1	1	1	100K $\Omega$	GD05120140
R427	1	1	1	1	100K $\Omega$	GD05104140
R428	1	1	1	1	100 $\Omega$	GD05101140
R429	1	1	1	1	1K $\Omega$ 1W	GA05102010
R435	1	1	1	1	1.8K $\Omega$ 1W	GA05102010

REF. DESIG.	Q'TY				DESCRIPTION	PART NO.
	U	C	N	A		
Q401	1	1	1	1	<b>P400-SEMICONDUCTORS</b> Diode MI-151R	HD20020080
Q402	1	1	1	1	Diode MI-151	HD20019080
Q403	1	1	1	1	Transistor 2SD3131(F)	HT403131F0
Q404	1	1	1	1	Zener WZ-210	HD30048090
Q405	1	1	1	1	Diode 5AVB, RED	HD20008290
Q409	1	1	1	1	Transistor 2SC1384(R)	HT313841R0
Q410	1	1	1	1	Transistor 2SC1384(R)	HT313841R0
Q411	1	1	1	1	Diode MI-151R	HD20020080
Q412	1	1	1	1	Diode MI-151	HD20019080
Q413	1	1	1	1	Diode MI-151R	HD20020080
Q414	1	1	1	1	Diode MI-151	HD20019080
Q417	1	1	1	1	Transistor 2SC1384(R)	HT313841R0
Q425	1	1	1	1	Diode 10E-1 LF	HD20023100
Q426	1	1	1	1	Zener WZ090	HD30029090
Q427	1	1	1	1	Transistor 2SC2634(S)	HT326341S0
Q428	1	1	1	1	Diode 1S1555	HD20011050
Q429	1	1	1	1	Diode 1S1555	HD20011050
Q432	1	1	1	1	Transistor 2SD3131(E)	HT403131E0
L401	1	1	1	1	<b>P400-MISCELLANEOUS</b> Choke Coil 2.7 $\mu$ H	LC12750020
L402	1	1	1	1	Choke Coil 2.7 $\mu$ H	LC12750020
T401	1	1	1	1	OSC Transformer Bias	TC10140110
T402	1	1	1	1	OSC Transformer Erase 65KHz	TC10140130
P500	1	1	1	1	<b>P500-LOGIC CONTROL CIRCUIT BOARD</b> P.W. Board, Logic Control P.W. Board Assembly	YK42781510 ZZ42781510
C501	1	1	1	1	<b>P500-CAPACITORS</b> Elect 10 $\mu$ F 25V	EA10602530
C502	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C503	1	1	1	1	Film 1000pF $\pm$ 5%	DF15102350
C504	1	1	1	1	Film 1000pF $\pm$ 5%	DF15102350
C505	1	1	1	1	Elect 100 $\mu$ F 16V	EA10701630
C506	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C507	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C508	1	1	1	1	Elect 3.3 $\mu$ F 50V	EA33505030
C509	1	1	1	1	Elect 3.3 $\mu$ F 50V	EA33505030
C510	1	1	1	1	Elect 3.3 $\mu$ F 50V	EA33505030
C511	1	1	1	1	Elect 33 $\mu$ F 25V	EA33602530
C512	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C514	1	1	1	1	Elect 1 $\mu$ F 50V	EA10505030
C515	1	1	1	1	Elect 2.2 $\mu$ F 50V	EA22505030
C516	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C517	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C518	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530
C519	1	1	1	1	Elect 470 $\mu$ F 10V	EA47701030
C520	1	1	1	1	Elect 470 $\mu$ F 10V	EA47701030
C521	1	1	1	1	Elect 47 $\mu$ F 10V	EA47601030
C523	1	1	1	1	Elect 100 $\mu$ F 25V	EA10702530
C524	1	1	1	1	Elect 33 $\mu$ F 25V	EA33602530
C525	1	1	1	1	Elect 47 $\mu$ F 10V	EA47601030
C526	1	1	1	1	Elect 0.22 $\mu$ F 50V	EA22405030
C527	7	7	7	7	Ceramic 0.01 $\mu$ F 50V	DK18103320
C533	1	1	1	1	Elect 0.22 $\mu$ F 50V	EE22405040
C534	1	1	1	1	Ceramic 0.1 $\mu$ F 50V	DK18104010
C535	1	1	1	1	Ceramic 0.01 $\mu$ F 50V	DK18103320
C536	1	1	1	1	Ceramic 0.01 $\mu$ F 50V	DK18103320
C537	1	1	1	1	Elect 10 $\mu$ F 25V	EA10602530



- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	N		
R501	1	1	1	GD05102140	P500-RESISTORS (All Resistors are ±5% & ¼W)
R502	1	1	1	GD05102140	
R503	1	1	1	GD05223140	
R504	1	1	1	GD05223140	
R505	1	1	1	GD05472140	
R506	1	1	1	GD05331140	
R507	1	1	1	GD05472140	
R508	1	1	1	GD05472140	
R509	1	1	1	GD05823140	
R510	1	1	1	GD05123140	
R511	1	1	1	GD05123140	
R512	1	1	1	GD05103140	
R513	1	1	1	GD05122140	
R514	1	1	1	GD05472140	
R515	1	1	1	GD05472140	
R516	1	1	1	GD05182140	
R517	1	1	1	GD05103140	
R518	1	1	1	GD05472140	
R519	1	1	1	GD05472140	
R520	1	1	1	GD05104140	
R521	1	1	1	GD05152140	1.5KΩ
R522	1	1	1	GD05332140	3.3KΩ
R523	1	1	1	GD05562140	5.6KΩ
R524	1	1	1	GD05331140	330Ω
R525	1	1	1	GD05222140	2.2KΩ
R526	1	1	1	RA01030260	10KΩ Trimming
R527	1	1	1	GD05182140	1.8KΩ
R528	1	1	1	GD05182140	1.8KΩ
R529	1	1	1	GD05472140	4.7KΩ
R530	1	1	1	GD05122140	1.2KΩ
R531	1	1	1	GD05472140	4.7KΩ
R532	1	1	1	GD05122140	1.2KΩ
R533	1	1	1	GD05473140	4.7KΩ
R534	1	1	1	GD05472140	4.7KΩ
R535	1	1	1	GD05102140	1KΩ
R536	1	1	1	GD05102140	1KΩ
R537	1	1	1	GD05473140	4.7KΩ
R538	1	1	1	GD05472140	4.7KΩ
R539	1	1	1	GD05473140	4.7KΩ
R540	1	1	1	GD05472140	4.7KΩ
R541	1	1	1	GD05562140	5.6KΩ
R542	1	1	1	GD05331140	330Ω
R543	1	1	1	GD05182140	1.8KΩ
R544	1	1	1	GD05331140	330Ω
R545	1	1	1	GD05182140	1.8KΩ
R546	1	1	1	GD05122140	1.2KΩ
R547	1	1	1	GD05182140	1.8KΩ
R548	1	1	1	GD05152140	1.5KΩ
R549	1	1	1	GD05103140	10KΩ
R550	1	1	1	GD05472140	4.7KΩ
R577	1	1	1	GD05273140	27KΩ
R578	1	1	1	GD05273140	27KΩ
R579	1	1	1	GD05273140	27KΩ
R551	1	1	1	GD05472140	4.7KΩ
R552	1	1	1	GD05472140	4.7KΩ
R553	1	1	1	GD05331140	330Ω
R554	1	1	1	GD05103140	10KΩ
R555	1	1	1	GD05103140	10KΩ
R556	1	1	1	GD05103140	10KΩ
R557	1	1	1	GD05223140	22KΩ
R558	1	1	1	GD05222140	2.2KΩ
R559	1	1	1	GD05101140	100Ω
R560	1	1	1	GD05103140	10KΩ
R561	1	1	1	GD05101140	100Ω
R562	1	1	1	GD05103140	10KΩ
R563	1	1	1	GD05473140	4.7KΩ
R564	1	1	1	GD05472140	4.7KΩ
R565	1	1	1	GD05332140	3.3KΩ
R566	1	1	1	GD05473140	4.7KΩ
R567	1	1	1	GD05472140	4.7KΩ
R568	1	1	1	GD05472140	4.7KΩ
R569	1	1	1	GD05223140	22KΩ
R570	1	1	1	GD05122140	1.2KΩ
R571	1	1	1	GD05122140	1.2KΩ
R572	1	1	1	GG05102120	1KΩ ½W
R573	1	1	1	GD05331140	330Ω
R574	1	1	1	GA05271010	270Ω 1W
R575	1	1	1	GA05100010	10Ω 1W
R576	1	1	1	GD05472140	4.7KΩ
R580	1	1	1	GD05822140	8.2KΩ
Q501	1	1	1	HC10004110	IC SN7000
Q502	1	1	1	HC10016110	IC SN7401
Q503	1	1	1	HC10016110	IC SN7401
Q504	1	1	1	HC10006110	IC SN7404
Q505	1	1	1	HC10008200	IC M54410P
Q506	1	1	1	HD20011050	Diode 1S1555
Q507	1	1	1	HD20011050	Diode 1S1555
Q510	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q511	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q512	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q513	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q514	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q515	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q516	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q517	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q518	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q519	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q520	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q521	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q522	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q523	1	1	1	HT106841R0	Transistor 2SA684(R)
Q524	1	1	1	HT106841R0	Transistor 2SA684(R)
Q525	1	1	1	HT320601R0	Transistor 2SC2060(R)

- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
Q526	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q527	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q528	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q529	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q530	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q531	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q532	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q533	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q534	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q535	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q536	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q537	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q538	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q539	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q540	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q541	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q542	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q543	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q544	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q545	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q546	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q547	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q548	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q549	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q550	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q551	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q552	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q553	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q554	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q555	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q556	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q557	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q558	1	1	1	1	HT403131E0	Transistor 2SD313(E)
Q566	1	1	1	1	HD20011050	Diode 1S1555
Q567	1	1	1	1	HD20011050	Diode 1S1555
Q568	1	1	1	1	HD30029090	Zener WZ090
Q569	1	1	1	1	HD20011050	Diode 1S1555
Q570	1	1	1	1	HD20011050	Diode 1S1555
Q571	1	1	1	1	HD20011050	Diode 1S1555
Q572	1	1	1	1	HD20011050	Diode 1S1555
Q573	1	1	1	1	HD20011050	Diode 1S1555
Q574	1	1	1	1	HD20011050	Diode 1S1555
Q575	1	1	1	1	HD20011050	Diode 1S1555
Q576	1	1	1	1	HD20011050	Diode 1S1555
Q577	1	1	1	1	HD20011050	Diode 1S1555
Q578	1	1	1	1	HD20011050	Diode 1S1555
Q579	1	1	1	1	HD20011050	Diode 1S1555
Q580	1	1	1	1	HD20011050	Diode 1S1555
Q581	1	1	1	1	HD20011050	Diode 1S1555
Q582	1	1	1	1	HV000003120	Varistor MV13

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
Q583	1	1	1	1	HD20011050	Diode 1S1555
Q584	1	1	1	1	HD20011050	Diode 1S1555
Q585	1	1	1	1	HD10001010	Diode 1N34A
Q586	1	1	1	1	HD20011050	Diode 1S1555
Q587	1	1	1	1	HD20011050	Diode 1S1555
Q588	1	1	1	1	HD20011050	Diode 1S1555
Q589	1	1	1	1	HD20011050	Diode 1S1555
Q590	1	1	1	1	HD20011050	Diode 1S1555
Q591	1	1	1	1	HD20011050	Diode 1S1555
Q592	1	1	1	1	HD20011050	Diode 1S1555
Q593	1	1	1	1	HD20011050	Diode 1S1555
Q594	1	1	1	1	HD20011050	Diode 1S1555
Q595	1	1	1	1	HD20011050	Diode 1S1555
Q596	1	1	1	1	HD20011050	Diode 1S1555
Q597	1	1	1	1	HD30013060	Zener RD11EB3
Q598	1	1	1	1	HD30014060	Zener RD24EB2
Q599	1	1	1	1	HD20011050	Diode 1S1555
Q600	1	1	1	1	HD20011050	Diode 1S1555
Q601	1	1	1	1	HD20011050	Diode 1S1555
Q602	1	1	1	1	HD20011050	Diode 1S1555
Q603	1	1	1	1	HD30015060	Zener RD5.6EB2
Q604	1	1	1	1	HD20011050	Diode 1S1555
Q605	1	1	1	1	HD20011050	Diode 1S1555
Q606	1	1	1	1	HD20011050	Diode 1S1555
P590	1	1	1	1	YH42791310	P590-LOGIC SWITCH
	1	1	1	1	ZZ42781310	CIRCUIT BOARD
						P.W. Board, Logic Switch
						P.W. Board Assembly
Q591	1	1	1	1	HI10015020	P590-L.E.D.
Q592	1	1	1	1	HI10016020	L.E.D. LN317GP, Play
Q593	1	1	1	1	HI10014020	L.E.D. LN417YP, Pause
						L.E.D. LN217RP, Rec
S591	1	1	1	1	SK02010020	P590-SWITCHES
S592	1	1	1	1	SK02010020	Keyboard Switch, Rew
S593	1	1	1	1	SK02010020	Keyboard Switch, Stop
S594	1	1	1	1	SK02010020	Keyboard Switch, FF
S595	1	1	1	1	SK02010020	Keyboard Switch, Play
S596	1	1	1	1	SK02010020	Keyboard Switch, Pause

- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
P591	1	1	1	1	YH42791320 ZZ42781320	P591-MECHA STOP CIRCUIT BOARD P.W. Board, Mecha Stop P.W. Board Assembly
S597	1	1	1	1	SP01010350	Push Switch, Stop Touch
P592	1	1	1	1	YH42791330 ZZ42781330	P592-MECHA STOP CIRCUIT BOARD P.W. Board, Mecha Stop P.W. Board Assembly
S598	1	1	1	1	SP01010350	Push Switch, Stop Touch
P593	1	1	1	1	YK42781550 ZZ42781550	P593-REMOTE CIRCUIT BOARD P.W. Board, Remote P.W. Board Assembly
J701	1	1	1	1	Y-900000220	Jack, (9P)
P600	1	1	1	1	YK42762210 ZZ42782210	P600-LED METER CIRCUIT BOARD P.W. Board, LED Meter P.W. Board Assembly
C601	1	1	1	1	EA22505030	P600-CAPACITORS Elect 2.2 $\mu$ F 50V
C602	1	1	1	1	EA10602530	Elect 10 $\mu$ F 25V
C603	1	1	1	1	DD15470370	Ceramic 47pF $\pm$ 5%
C604	1	1	1	1	EA10505030	Elect 1 $\mu$ F 50V
C605	1	1	1	1	EA10505030	Elect 1 $\mu$ F 50V
C621	1	1	1	1	EA10702530	Elect 100 $\mu$ F 25V
C622	1	1	1	1	EA22505030	Elect 2.2 $\mu$ F 50V
C623	1	1	1	1	EA10602530	Elect 10 $\mu$ F 25V
C624	1	1	1	1	DD15470370	Ceramic 47pF $\pm$ 5%
C625	1	1	1	1	EA10505030	Elect 1 $\mu$ F 50V
C626	1	1	1	1	EA10505030	Elect 1 $\mu$ F 50V
C641	1	1	1	1	EA10702530 EA33601630	Elect 100 F 25V Elect 33 $\mu$ F 16V

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
R601	1	1	1	1	GD05103140	P600-RESISTORS (All Resistors are $\pm$ 5% & $\frac{1}{4}$ W) 10K $\Omega$
R602	1	1	1	1	RA03020030	3K $\Omega$ Trimming
R603	1	1	1	1	GD05392140	3.9K $\Omega$
R604	1	1	1	1	GD05123140	12K $\Omega$
R605	1	1	1	1	GA05681010	680 $\Omega$ 1W
R606	1	1	1	1	GD05104140	100K $\Omega$
R607	1	1	1	1	GD05102140	1K $\Omega$
R608	1	1	1	1	GD05662140	5.6K $\Omega$
R609	1	1	1	1	GD05105140	1M $\Omega$
R610	1	1	1	1	RA05030090	50K $\Omega$ Trimming
R621	1	1	1	1	GD05103140	10K $\Omega$
R622	1	1	1	1	RA03020030	3K $\Omega$ Trimming
R623	1	1	1	1	GD05392140	3.9K $\Omega$
R624	1	1	1	1	GD05123140	12K $\Omega$
R625	1	1	1	1	GA05681010	680 $\Omega$ 1W
R626	1	1	1	1	GD05104140	100K $\Omega$
R627	1	1	1	1	GD05102140	1K $\Omega$
R628	1	1	1	1	GD05662140	5.6K $\Omega$
R629	1	1	1	1	GD05105140	1M $\Omega$
R630	1	1	1	1	RA05030090	50K $\Omega$ Trimming
R642	1	1	1	1	GG05821140	820 $\Omega$
R643	1	1	1	1	GD05223140	22K $\Omega$
R644	1	1	1	1	GA05181010	180 $\Omega$ 1W
R645	1	1	1	1	GG05330140	33 $\Omega$
Q601	1	1	1	1	HT326341S0	P600-SEMICONDUCTORS Transistor 2SC2634(S)
Q602	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q603	1	1	1	1	HD10001010	Diode 1N34A
Q604	1	1	1	1	HD10001010	Diode 1N34A
Q605	1	1	1	1	HD30031090	Zener WZ081
Q621	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q622	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q623	1	1	1	1	HD10001010	Diode 1N34A
Q624	1	1	1	1	HD10001010	Diode 1N34A
Q625	1	1	1	1	HD30031090	Zener WZ081
Q642	1	1	1	1	HT403131E0	Transistor 2SD313(E)
Q643	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q644	1	1	1	1	HD30033090	Zener WZ052

- (U): for U.S.A
- (C): for Canada
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REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
P650	1	1	1	YK42762220 Z242782220	P650-LED METER CIRCUIT BOARD P.W. Board, LED Meter P.W. Board Assembly
R651	1	1	1	GD05221140	P650-RESISTORS (All Resistors are $\pm 5\%$ & $\frac{1}{4}W$ ) 220 $\Omega$
R652	1	1	1	GD05221140	220 $\Omega$
R653	1	1	1	GD05221140	220 $\Omega$
R654	1	1	1	GD05221140	220 $\Omega$
R655	1	1	1	GD05221140	220 $\Omega$
R656	1	1	1	GD05221140	220 $\Omega$
R657	1	1	1	GD05221140	220 $\Omega$
R658	1	1	1	GD05221140	220 $\Omega$
R659	1	1	1	GD05471140	470 $\Omega$
R660	1	1	1	GD05471140	470 $\Omega$
R661	1	1	1	GD05471140	470 $\Omega$
R662	1	1	1	GD05471140	470 $\Omega$
R671	1	1	1	GD05221140	220 $\Omega$
R672	1	1	1	GD05221140	220 $\Omega$
R673	1	1	1	GD05221140	220 $\Omega$
R674	1	1	1	GD05221140	220 $\Omega$
R675	1	1	1	GD05221140	220 $\Omega$
R676	1	1	1	GD05221140	220 $\Omega$
R677	1	1	1	GD05221140	220 $\Omega$
R678	1	1	1	GD05221140	220 $\Omega$
R679	1	1	1	GD05471140	470 $\Omega$
R680	1	1	1	GD05471140	470 $\Omega$
R681	1	1	1	GD05471140	470 $\Omega$
R682	1	1	1	GD05471140	470 $\Omega$
Q651	1	1	1	HC10001320	P650-SEMICONDUCTORS IC IR2418
Q652	1	1	1	H111201320	L.E.D. GL112
Q671	1	1	1	HC10001320	IC IR2418
Q672	1	1	1	H111201320	L.E.D. GL112
Q693	1	1	1	H110014020	L.E.D. LN217
P750	1	1	1	YK42781540 Z242781540	P750-TIMER & MEMORY CIRCUIT BOARD P.W. Board, Timer & Memory P.W. Board Assembly
S751	1	1	1	SC04030080	Switch, Timer
S752	1	1	1	SC02030110	Switch, Memory
R751	1	1	1	GA05182010	Resistor 1.8K $\Omega$ $\pm 5\%$ 1W

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	C	A		
P900	1	1	1	WF42790020 ZZ42788020	P900-FUSE CIRCUIT BOARD P.W. Board, Fuse P.W. Board Assembly
J911	1	1	1	FS10100800	Fuse 1A
J914	1	1	1	FS10200800	Fuse 2A
J916	1	1	1	FS10080800	Fuse 0.8A
J919	1	1	1	FS10140800	Fuse 1.4A
J911	4	4	4	YJ08000200	Jack, Fuse Clip
J914	4	4	4	YJ08000200	Jack, Fuse Clip

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

# MODEL SD 6000 TECHNICAL SPECIFICATIONS

[FOR U.S.A. & CANADA]

Type	Front loading 4-Track, 2-Channel Stereo Record/Playback System
Tape	Phillips-type Compact Cassette
Tape Speeds	High: 3-3/4 ips (9.52 cm/sec) Standard: 1-7/8 ips (4.76 cm/sec)
Motor Drive System	DC Servo Motor (x2) with Single Capstan Drive
Heads	2 Head System Erase Head: Ferrite Record/Play Head: Sendust Alloy
Level Indicators	Left and Right LED Peak Level Displays
Noise Reduction System	Dolby NR
Semiconductors	
Transistors	93
IC's	9
Diodes	61
LED's	7
Wow and Flutter (WRMS)	High Speed 0.03%
Standard Speed	0.05%

## Frequency Response (Overall, -20 dB below 0 VU)

Metal	30 Hz ~ 22 kHz (±3 dB)	30 Hz ~ 19 kHz (±3 dB)
Ferrichrome (FeCr)	30 Hz ~ 21 kHz (±3 dB)	30 Hz ~ 17 kHz (±3 dB)
Chromium Dioxide (CrO <sub>2</sub> )	30 Hz ~ 21 kHz (±3 dB)	30 Hz ~ 17 kHz (±3 dB)
Ferric (Normal)	30 Hz ~ 18 kHz (±3 dB)	30 Hz ~ 15 kHz (±3 dB)

## Signal-to-Noise Ratio

Dolby ON	71 dB (over 5 kHz)	69 dB (over 5 kHz)
Dolby OFF	61 dB	58 dB

## Outputs

Line: Level	650 mV
Impedance	1.2 kΩ
Headphone: Level	43 mV
Impedance	150 Ω

## Inputs (Level at 0 VU)

Line: Sensitivity	-23 dBV (70 mV)
Impedance	82 kΩ
Mic: Sensitivity	-72 dBV (0.25 mV)
Impedance	Low Z

## Fast Rewind Time

Approx. 85 sec. (C-60 cassette)

## Fast Forward Time

Approx. 85 sec. (C-60 cassette)

## Bias Frequency

100 kHz

## Power Requirements

120 V AC, 60 Hz

## Power Consumption

25 Watts

## Dimensions (W x H x D)

16-3/8 in. x 5-3/4 in. x 11-5/8 in.

(41.6 cm) x (14.6 cm) x (29.5 cm)

## Net Weight

19 lbs. 13 ozs. (9 kg)

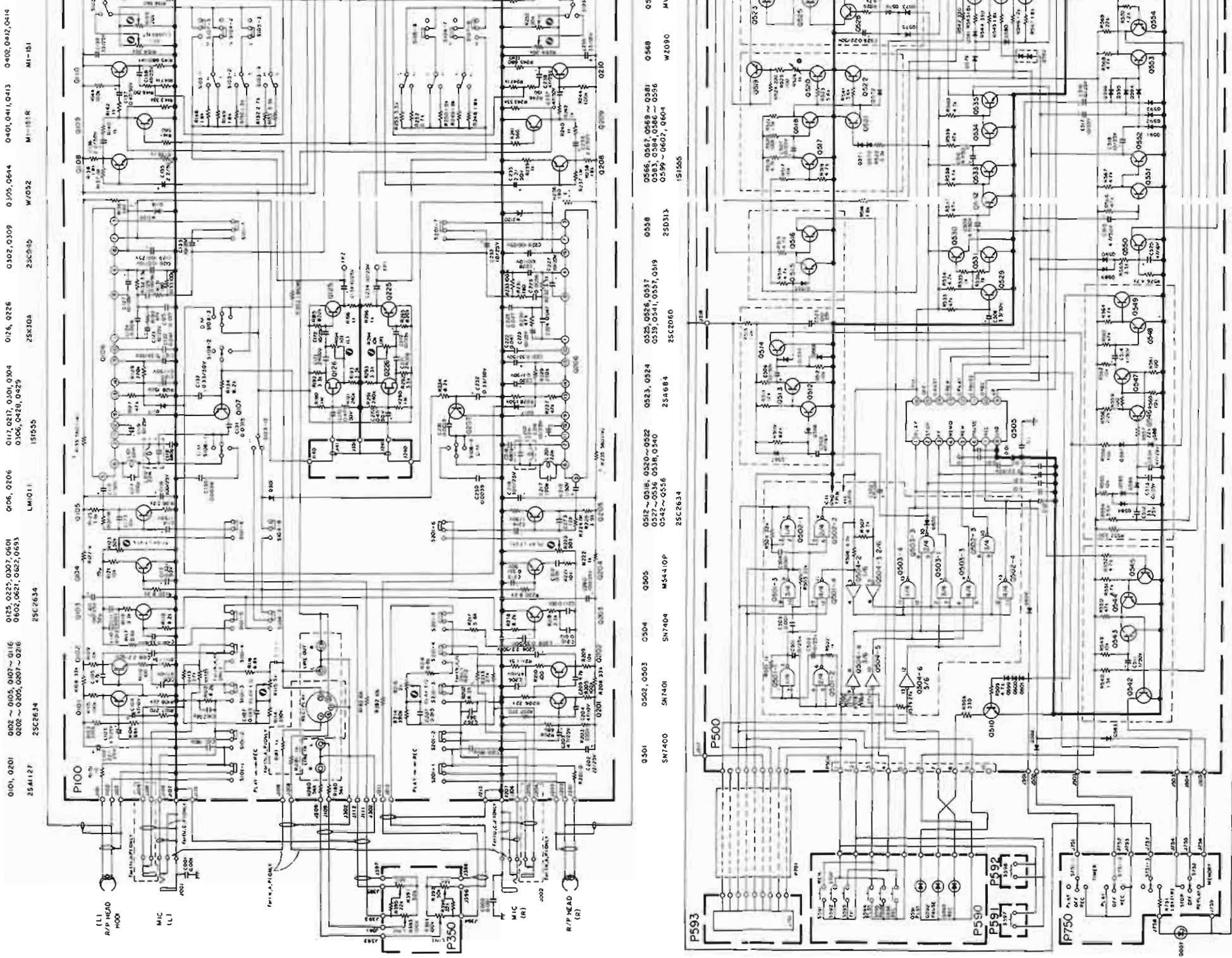
## NOTES:

- Reference recording level: 0 VU (160 nW/M)
- Reference frequency: 315 Hz
- Wow and flutter measured at: 3.0 kHz NAB WGTD RMS
- Frequency response measured at: 20 dB below 0 VU recording level reference (Dolby off)
- S/N ratio measured at the recorded level equivalent to 3% THD, IEC "A" WGTD, 70 μSec. EQ.
- Recording reference tapes:  
Normal: TDK AC 211  
CrO<sub>2</sub>: TDK AC 511  
FeCr: Sony CS 30  
Metal: 3M MetaFine

[FOR EUROPE]

Style . . . . .	Direct Load
Tape Drive System . . . . .	Single Capstan Drive
Cartridge . . . . .	Philips type compact cassette
Track System . . . . .	Compatible Stereo 4-track 2-channel
Tape Speed . . . . .	4.75 cm/sec. & 9.5 cm/sec.
Heads . . . . .	2 Head System
Composition . . . . .	Rec/Play: Sendust Alloy
	Erase: Ferrite
Motor . . . . .	DC Servo Controlled Motor x 2
Meters . . . . .	LED Peak x 2
Recording System . . . . .	AC Bias
Erasing System . . . . .	AC Erase
Semiconductor Complement	
Transistors . . . . .	93
Diodes . . . . .	61
IC's . . . . .	9
LED's . . . . .	7
Overall Frequency Response (Dolby off):	Tape Speed:
	at 20 dB for 4.75 cm/sec.
Ferric Oxide Tape . . . . .	30 Hz ~ 15 kHz ( $\pm 3$ dB)
CrO <sub>2</sub> Tape . . . . .	30 Hz ~ 16 kHz ( $\pm 3$ dB)
Fe-Cr Tape . . . . .	30 Hz ~ 17 kHz ( $\pm 3$ dB)
Metal Tape . . . . .	30 Hz ~ 17.5 kHz ( $\pm 3$ dB)
	at 10 dB for 9.5 cm/sec.
Ferric Oxide Tape . . . . .	30 Hz ~ 18 kHz ( $\pm 3$ dB)
CrO <sub>2</sub> Tape . . . . .	30 Hz ~ 18.5 kHz ( $\pm 3$ dB)
Fe-Cr Tape . . . . .	30 Hz ~ 19 kHz ( $\pm 3$ dB)
Metal . . . . .	30 Hz ~ 20 kHz ( $\pm 3$ dB)
Total Harmonic Distortion	
Ferric Oxide Tape . . . . .	2%
CrO <sub>2</sub> Tape . . . . .	2.5%
Fe-Cr Tape . . . . .	2.5%
Metal . . . . .	2.5%
	Tape Speed: 4.75 cm/sec.
Wow and Flutter (DIN WTD) . . . . .	0.12%
Fast Rewind Time . . . . .	60 sec.
Fast Forward Time . . . . .	60 sec.
AC Line Voltage . . . . .	220 V AC, 50 Hz
	(E/N versions are featuring an external voltage selector for use on 110/220 V.)
	T/A versions 220/240 V AC, 50/60 Hz.)
Power Consumption . . . . .	45 W
Dimensions (W x H x D) . . . . .	416 mm x 146 mm x 243 mm
Weight . . . . .	8 kg

SCHEMATIC DIAGRAM



0101, 0201 25A1127 25C2634  
 0102 ~ 0105, 0107 ~ 0116 0125, 0225, 0307, 0601  
 0202 ~ 0205, 0307 ~ 0216 0602, 0621, 0622, 0653  
 0006, 0206 LM1011 25C2634  
 0117, 0217, 0301, 0304 0126, 0226 25K30A  
 0306, 0428, 0429 151055  
 0302, 0309 0305, 0644 W/032 25C2645  
 0401, 0411, 0413 0400, 0411, 0413 MI-151R  
 0402, 0412, 0414 0405, 0412, 0414 MI-151  
 0501 SN7400 SN7401 SN7404 M54-10P 25C2634  
 0502, 0503 0504 0505 0512 ~ 0518, 0520 ~ 0522 0523, 0524 0525, 0526, 0537 0538 0556, 0567, 0569 ~ 0381 0388  
 0519 ~ 0524, 0536, 0540 0542 ~ 0556 25C2634  
 0599 ~ 0607, 0604 25D311 25C2060  
 151505  
 0608, 0609 0210  
 0610, 0611, 0612, 0613, 0614, 0615, 0616, 0617, 0618, 0619, 0620, 0621, 0622, 0623, 0624, 0625, 0626, 0627, 0628, 0629, 0630, 0631, 0632, 0633, 0634, 0635, 0636, 0637, 0638, 0639, 0640, 0641, 0642, 0643, 0644, 0645, 0646, 0647, 0648, 0649, 0650, 0651, 0652, 0653, 0654, 0655, 0656, 0657, 0658, 0659, 0660, 0661, 0662, 0663, 0664, 0665, 0666, 0667, 0668, 0669, 0670, 0671, 0672, 0673, 0674, 0675, 0676, 0677, 0678, 0679, 0680, 0681, 0682, 0683, 0684, 0685, 0686, 0687, 0688, 0689, 0690, 0691, 0692, 0693, 0694, 0695, 0696, 0697, 0698, 0699, 0700, 0701, 0702, 0703, 0704, 0705, 0706, 0707, 0708, 0709, 0710, 0711, 0712, 0713, 0714, 0715, 0716, 0717, 0718, 0719, 0720, 0721, 0722, 0723, 0724, 0725, 0726, 0727, 0728, 0729, 0730, 0731, 0732, 0733, 0734, 0735, 0736, 0737, 0738, 0739, 0740, 0741, 0742, 0743, 0744, 0745, 0746, 0747, 0748, 0749, 0750, 0751, 0752, 0753, 0754, 0755, 0756, 0757, 0758, 0759, 0760, 0761, 0762, 0763, 0764, 0765, 0766, 0767, 0768, 0769, 0770, 0771, 0772, 0773, 0774, 0775, 0776, 0777, 0778, 0779, 0780, 0781, 0782, 0783, 0784, 0785, 0786, 0787, 0788, 0789, 0790, 0791, 0792, 0793, 0794, 0795, 0796, 0797, 0798, 0799, 0800

