

**SERVICE
MANUAL**

SD8020

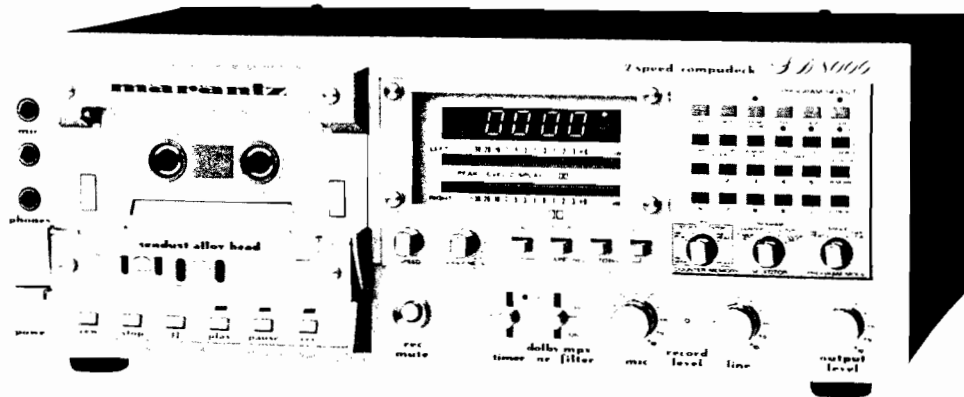


marantz

model SD8020

Stereo Cassette Deck

MARANTZ MODEL SD8000 STEREO CASSETTE DECK



INTRODUCTION

This service manual is 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 instructions 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. P.W. BOARD

As can be seen from the circuit diagram, the chassis, of the Model SD8000 consists of following units. Each unit mounted on a printed circuit board is described with in the square enclosed by bold dotted line on the circuit diagram.

Pre-Amp	mounted on P.W. Board	PK11
Mic & Line Vol	mounted on P.W. Board	PK12
Output Vol	mounted on P.W. Board	PK13
Power Supply	mounted on P.W. Board	P400
Computer	mounted on P.W. Board	PK21
Remote Jack	mounted on P.W. Board	PK26
Digital & Meter LED	mounted on P.W. Board	PK22
Program Selector	mounted on P.W. Board	PK23
Program	mounted on P.W. Board	PK27
Timer Switch	mounted on P.W. Board	PK24
Rec Mute Switch	mounted on P.W. Board	PK25
Relay	mounted on P.W. Board	P800
Photo Cuppler	mounted on P.W. Board	P001
Mecha Logic Switch	mounted on P.W. Board	PK31
Sensor Stop Switch	mounted on P.W. Board	PK32
		PK33
FF. Rew Governor	mounted on P.W. Board	PM01
Fuse (P or N)	mounted on P.W. Board	P900

2. TEST EQUIPMENT REQUIRED FOR SERVICING REPLACEMENT

For measuring and checking the Model SD-8000, the following instruments and materials are necessary.

- Audio Oscillator (AF OSC)
- Attenuator (600 ohm)
- VTVM
- Distortion Meter
- Oscilloscope
- Bandpass Filter
- Wow and Flutter Meter
- Torque Meter (Cassette Type)
- Digital Frequency Counter
- Blank Tape (Completely erased with bulk eraser)

*	AC-211	(Normal)
*	AC-511	(CrO ₂)
*	CS-30	(Fe-Cr)
*	AC-701	(Metal)

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

- Test Tape (New Tape)
 - MTT-111 Wow and Flutter. Tape Speed.
 - MTT-212 Measurement of output level and (MTT-112) Signal to Noise Ratio.
 - MTT-150 Adjustment of output level.
 - MTT-216 Measurement of Frequency Response (MTT-116U) (For Normal)
 - MTT-316 Measurement of Frequency Response (MTT-116K) (For CrO₂, Fe-Cr)
 - MTT-121 Cross Talk.
 - MTT-141 Channel Separation.
 - MTT-112B Playback Signal-to-Noise Ratio. (W.T.D. only)

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CIRCUIT DESCRIPTION

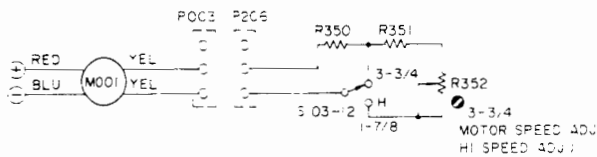
3.1 TAPE SPEED SELECTOR

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. R352 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



3.2 PLAYBACK EQUALIZER CIRCUIT

The playback equalizer circuit is shown below.



S103 Tape Speed Switch
S104 Tape Selector Switch (Normal)

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

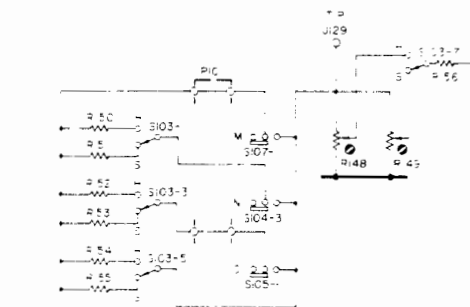
TAPE SELECTOR POSITION	NORMAL	SPECIAL/ CrO ₂	FeCr	METAL
TAPE SPEED 1-7/8 IPS	120 μS	70 μS	70 μS	70 μS
TAPE SPEED 3-3/4 IPS	70 μS	35 μS	35 μS	35 μS

Circuit Function at Each Time Constant

- (1) 120 μS
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 120 μS by C106 and R111 ~ R113.
- (2) 70 μS
When the tape speed is 1-7/8 ips (4.75 cm/sec) and S104 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 is ON, Q104 is also ON. In either case, the playback time constant is set to 70 μS by C106, R111 ~ R113, C114 and R118.
- (3) 35 μS
When the tape speed is 3-3/4 ips (9.5 cm/sec) and S104 is OFF, Q103 is ON and the playback time constant is set to 35 μS by C106, R111 ~ R113, C111, C112 and R116.

3.3 RECORDING CURRENT SETTING CIRCUIT

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



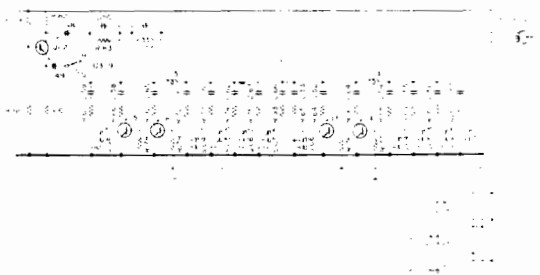
S103 Tape Speed Switch
S104 Tape Selector Normal
S105 Tape Selector Special/CrO₂
S107 Tape Selector Metal

The switch (S106) for the FeCr position is not included in the above circuit. The recording current at this position is determined by R155 and R149 or R154 and R148. The resistors used to determine recording current at each tape speed and each tape selector switch position are shown in the table below.

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

3.4 RECORDING COMPENSATING CIRCUIT

(Tape Speed: 3-3/4 ips)



- S103 Tape Speed Switch
- S105 Tape Selector Switch CrO₂
- S107 Tape Selector Switch Metal

In the circuit diagram, C150 and R163 are used for high range compensation.

L104, R168, R169, R170, R171 and C154, C155, C156, C157 form a peaking circuit. Peaking frequency and the amount of compensation are selected by the tape selector switch.

R165, R193 and C153, C166 are used for medium range compensation. The amount of compensation is selected by the tape selector switch (not available at "Normal" position).

3.5 BIAS OSCILLATOR CIRCUIT/ERASE OSCILLATOR CIRCUIT

The SD8000 has a bias oscillator circuit and an erase oscillator circuit to provide optimum bias and erase current for the use of metal tapes.

- The bias oscillator circuit is driven by a regulated amplifier power supply.
- The erase oscillator circuit is driven by the motor power supply.

The bias current for any particular type of tape is selectable by the circuit shown below (selection of bias current is independent of tape speed).

1. Bias Oscillator Circuit

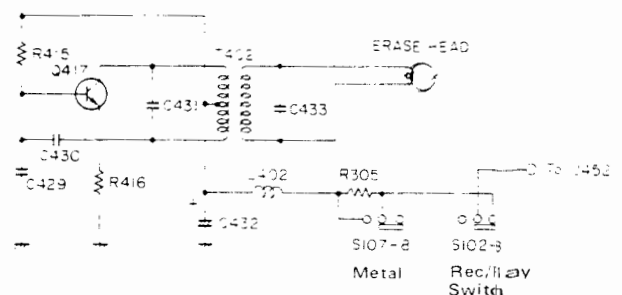
As shown below, by varying the Q302 base voltage, the bias oscillator circuit operational voltage is altered. In case of 4-3/4 i.p.s. (9.5 cm/sec), do not adjust by bias current. Adjust the recording EQ circuit, instead. Incidentally, R310 is the bias fine adjust control on the front panel.



	Normal	CrO ₂	FeCr	Metal
1-7/8 ips (4.75cm/s)	R411 R410	R315	R316	R314

2. Erase Oscillator Circuit

The erase oscillator circuit consists of Q417 and T402. Only in case of metal tapes, R305 is shorted to increase the erase current.



3-6. CONTROL CIRCUIT OPERATION

1. General

The SD8000 tape deck is designed to have a wide variety of functions such as time setting, timer setting, programming, counter function and memory function; all these are accomplished by a single 1-chip, 4-bit microcomputer element μ PD546C.

Although the microcomputer performs complex functions, the control circuit is extremely simple.

In the microcomputer, the memory and control functions are processed together at high speed through the levels and timing of digital pulses available at input and output terminals.

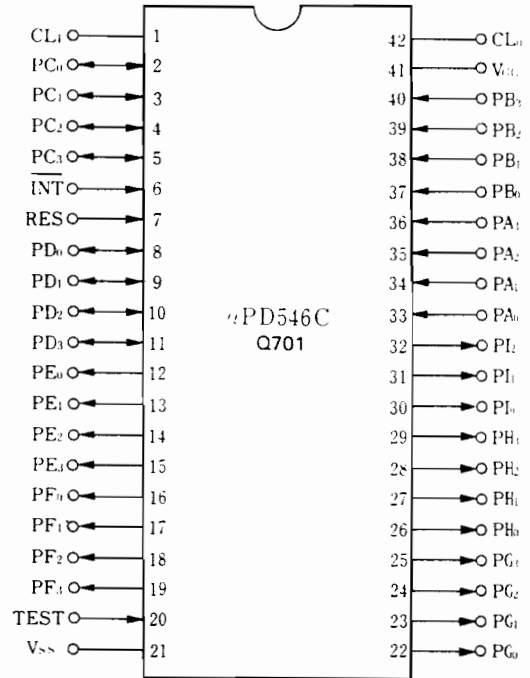
Since this instruction manual is limited in space, it is impossible to explain in detail the methods of measuring and checking the relationship between the input/output signals and their timing. Thus, this manual is intended only to cover the functions of operation buttons and matrix keys.

The SD8000 has various types of keys and switches to provide multiple operations, so special care should be taken when it is necessary to check the cause of trouble or misoperation.

This manual mainly deals with the functions of the SD8000 control circuit. Note that voltages and operating timing given in this manual are for reference purposes and are subject to change according to changes in power supply voltage and production tolerance of components.

2. Microcomputer

Terminal arrangement (front view)



- | | |
|---------------------------------------|-------------------------------|
| CL0:1: Clock oscillator LC (external) | PE3-0: Output port E3-0 |
| INT: Interrupt | PF3-0: Output port F3-0 |
| RES: Reset | PG3-0: Output port G3-0 |
| PA3-0: Input port A3-0 | PH3-0: Output port H3-0 |
| PB3-0: Input port B3-0 | PI2-0: Output port I2-0 |
| PC3-0: Input/output port C3-0 | PD3-0: Input/output port D3-0 |
| PD3-0: Input/output port D3-0 | TEST: Test |

Fig. 2.1 Terminal arrangement (front view)

Block diagram

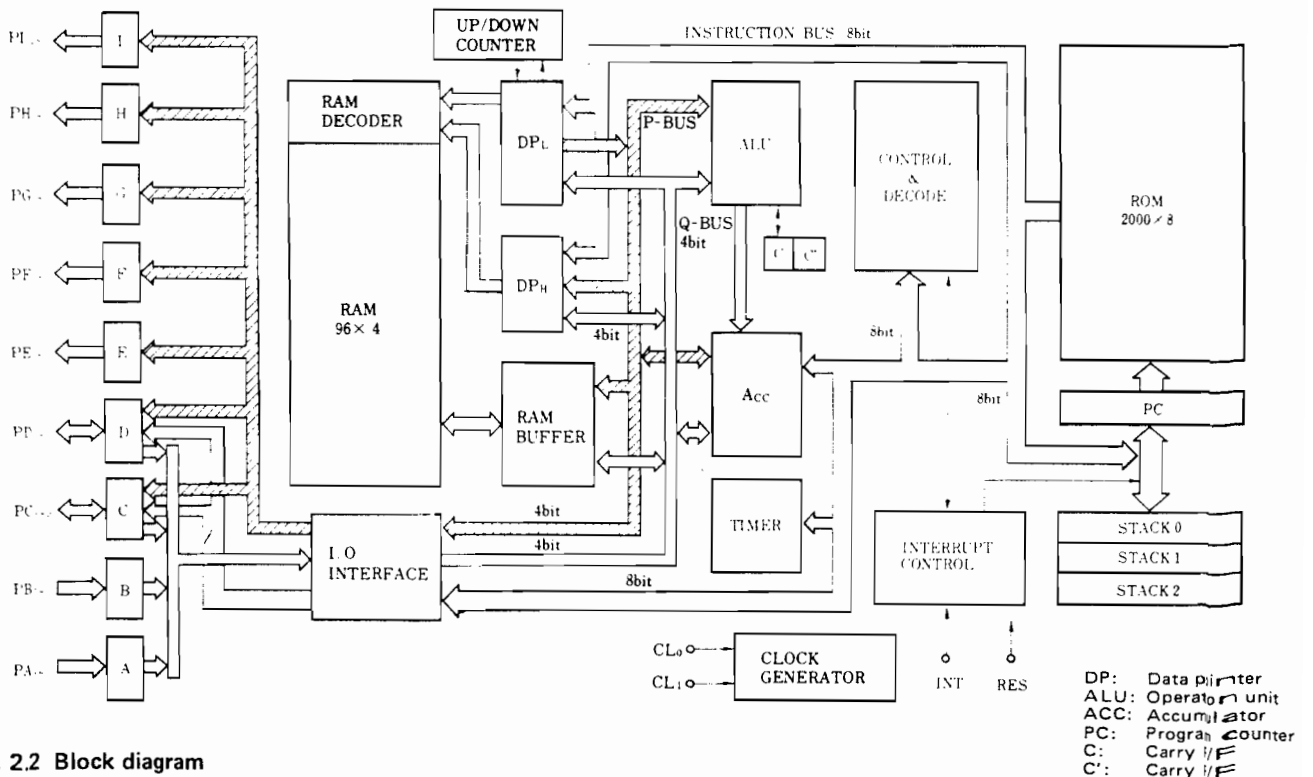


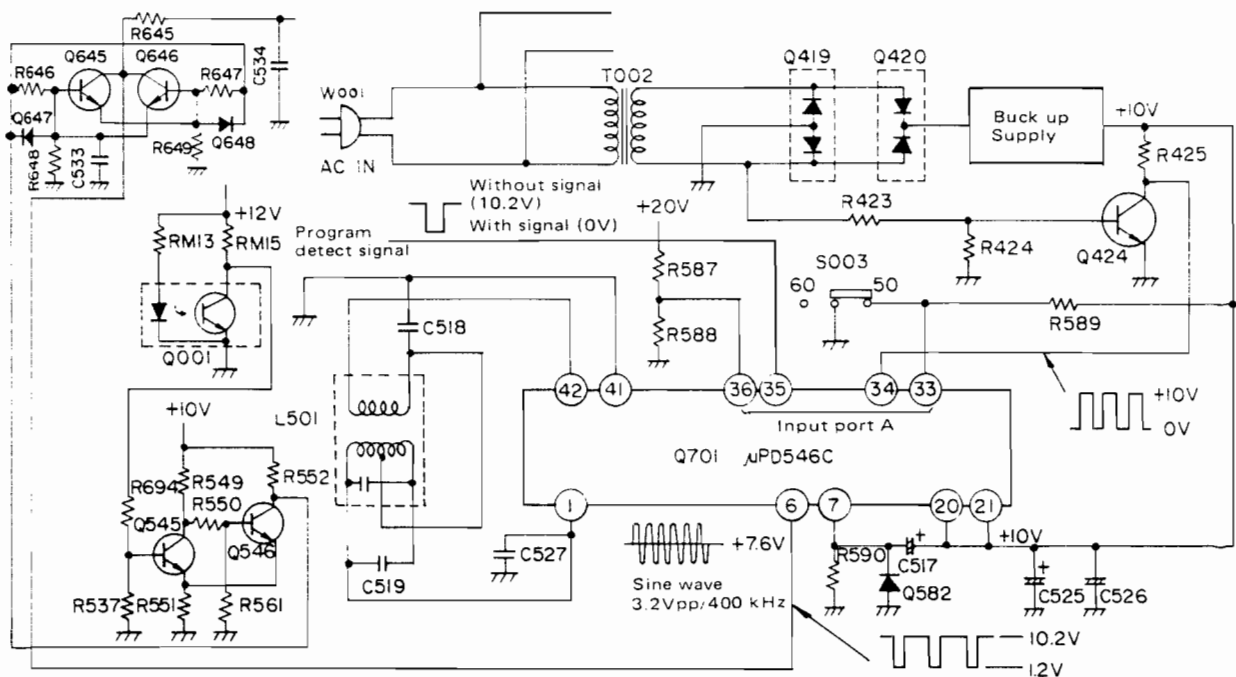
Fig. 2.2 Block diagram

Table 2.1 Functions of input/output signals

No.	Signal	Function	Description	Remarks
1	CL1	Clock 1	Pin 1 on clock oscillator LC	
2	PC0	Input/output port C	E } F } G } H }	Keyboard strobe signal and 7-segment lamp signal Not used as input terminal.
3	PC1			
4	PC2			
5	PC3			
6	INT	Interrupt input	Counter pulse input (detects tape end)	
7	RES	Reset input	Initial reset input	
8	PD0	Input/output port D	A } B } C } D }	Operation button strobe signal } Keyboard strobe signal } Lamp signal, PM, ERROR lamp strobe signal } 7-segment lamp signal No used as input terminal.
9	PD1			
10	PD2			
11	PD3			
12	PE0	Output port E	(4) SELECTOR control signal (3) PROGRAM MODE control signal (2) COUNTER MEMORY control signal (1) TIMER control signal	ERROR lamp signal } 7-segment lamp strobe signal } PM lamp signal } 7-segment lamp signal
13	PE1			
14	PE2			
15	PE3			
16	PF0	Output port F	TIMER ON LED lamp signal TIMER OFF LED lamp signal REC LED lamp signal PRG PAUSE LED lamp signal	
17	PF1			
18	PF2			
19	PF3			
20	TEST	Test input	Not used; connected to V _{SS}	
21	V _{SS}	Power supply	-10V ±1V	
22	PG0	Output port G	TIMER ON signal TIMER LED lamp signal RAM LED lamp signal SAM LED lamp signal	
23	PG1			
24	PG2			
25	PG3			
26	PH0	Output port H	FAST FF REW C/R (CUE REVIEW)	Tape deck operation mode control signal
27	PH1			
28	PH2			
29	PH3			
30	PI0	Output port I	PAUSE PLAY REC	
31	PI1			
32	PI2			
33	PA0	Input port A	Power frequency select signal Power sync signal Program detect signal Time display select signal	
34	PA1			
35	PA2			
36	PA3			
37	PB0	Input port B	4 } 3 } 2 } 1 }	Program signal operation signal
38	PB1			
39	PB2			
40	PB3			
41	V _{GG}	GND	0V	
42	CLO	Clock 0	Pin 0 on clock oscillator LC	

Control signal input circuit

Fig. 2.3 Control signal input circuit



The Items (1) through (8) below are basic requirements for operating the microcomputer.

(1) Pin 1, 42

Pin 1 and pin 42 are the external terminals of the clock oscillator LC. The internal circuits of the microcomputer must be synchronized with the clock signal for proper operation. Incorrect oscillation of clock signal will result in misoperation of the microcomputer.

The clock signal at pin 1 should be a sine wave signal of about 3.2 V_{pp}/400 kHz (including a 7.6V DC component).

(2) Pin 6

Pin 6 is the counter pulse input terminal. Pulses are counted by the up/down counter in the microcomputer. In the PLAY, FF or PAUSE mode, the pulses are counted up; in the REW or REVIEW mode they are counted down. When no counter pulses are preset at this terminal and tape is being transported, the COUNTER MEMORY will not function.

If the pulse input duration is less than 2.0 seconds, the tape deck stops automatically.

(3) Pin 7

Pin 7 is the reset signal input terminal. When a high level signal is applied to it, the internal circuits of the microcomputer are reset and all functions stop.

Pin 7 becomes high level just after the power is connected to the SD8000, regardless of whether the power switch is ON or OFF. Under normal circumstances, the voltage at Pin 7 is 0V.

(4) Pin 20, 21

Pin 20 is a test terminal and Pin 21 is the power terminal.

The test terminal is connected to the power supply since it is not used. The power voltage should be +10V ±1V.

(5) Pin 33

This is an input terminal for the power frequency select signal. The time signal of the SD8000 is obtained by dividing the power frequency, so the frequency divider in the microcomputer needs to be given the proper frequency division ratio according to the power frequency (50 Hz or 60 Hz).

When Pin 33 is 0V (GND), the frequency division ratio is 1/50, and when it is 10V, then the ratio is 1/60.

(6) Pin 34

This is the input terminal for the time and timer signals. A pulse signal of 10V with the power supply frequency should be applied to this terminal. Otherwise the correct time will not be indicated and the timer recording function will not operate correctly.

(7) Pin 35

This is the input terminal for the program detection signal. The programs to be played are controlled by the applied signals. When the deck is in the playback mode, this signal is 0V for recorded portions of tape, and 10V for blank portions between programs (where no signal are recorded on the tape).

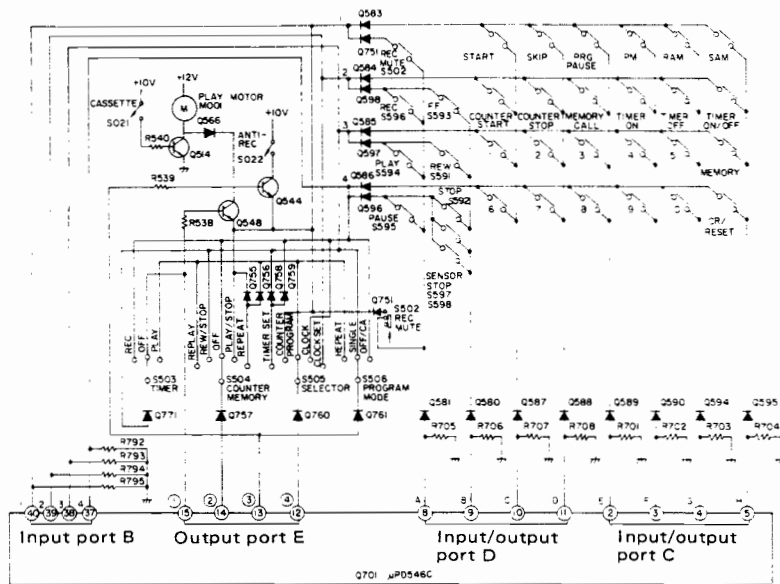
(8) Pin 36

Normally, a voltage of 10V is applied to this terminal. When the voltage becomes 0V, the display automatically indicates the time.

(9) Pin 31

This is the GND terminal.

Fig. 2.4 Operation/program signal input circuit



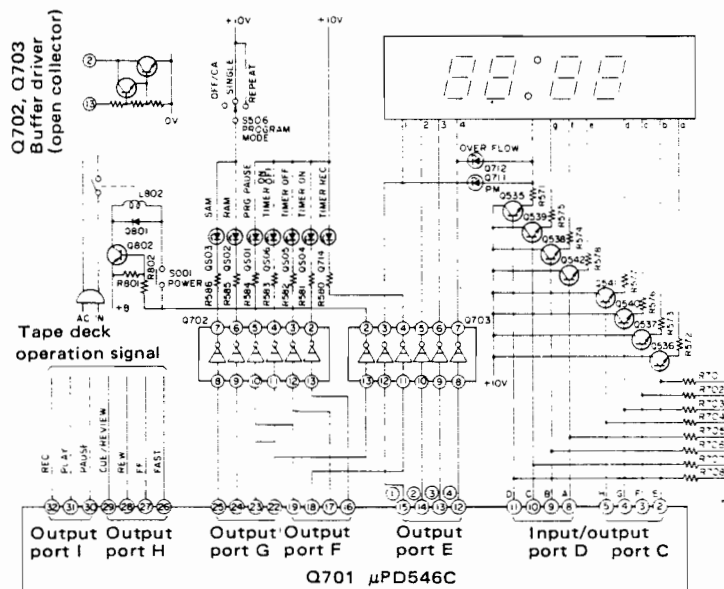
Besides the signals outlined previously, there are the input circuits for the operation signals (PLAY, FF, etc.) to select the mode of operation of the SD8000 and for the program setting signal (START, SKIP, etc.). Refer to Fig. 2.4.

In the microcomputer, these signals are synchronized with the clock signal and processed together to determine the mode of operation with the aid of the operation and program switches, input and output signals and their timing.

Operation/indication signal output circuit

Refer to Fig. 2.5

Fig. 2.5 Control/Indication signal output circuit



(1) Tape deck operation signal

This signal is delivered from output ports H and I to determine the mode of operation of the tape deck. For example, in the PLAY mode, a high level signal is output by Pin 31 and the tape deck remains in the

PLAY mode as long as the signal is high level. In the timer recording (or playback) mode, a high level signal is output from Pin 22 of output port G. For the functions of the circuits in each operating mode, refer to Section 4 "Tape Operation".

3. Circuit

This Section is intended to explain the functions of the motors, solenoids and related circuits.

3.1 Motor and solenoid

(1) Play motor (M001)

This FG servo DC motor is always rotating while a cassette is loaded and drives the capstan, i.e. the tape, at a constant speed. Winding torque is applied to the right reel disk during the PLAY or REC/PLAY mode.

(2) Reel motor (M002)

This FG servo DC motor is used to set the tape in FF, REW or CUE/REVIEW mode (CUE and REVIEW are performed in the fast forward and rewind modes respectively while programs are being played).

In each mode, the tape speed is maintained constant by means of the servo control system of the motor.

The reel motor rotates in the reverse direction when the deck is changed from the fast forward mode to the rewind mode. Either the left or right reel disk is driven according to the direction of the motor.

The reel motor is also used to remove slack in tape.

(3) Play solenoid (L001)

This solenoid functions when the deck is in the PLAY or REC/PLAY mode.

- The head base is lifted and the head contacts the tape.
- The pinch roller contacts the capstan and the tape starts running.
- Slight braking is applied to the left reel disk to provide back tension to the tape.
- The fast forward idler is set in the neutral position.

(4) Brake solenoid (L002)

This solenoid functions when the deck is in the PLAY, REC/PLAY, FF, REW, or CUE/REVIEW mode.

When it operates, the left and right reel disks are released to drive the tape.

(5) CUE/REV solenoid (L003)

This solenoid functions when the deck is in the CUE/REVIEW, PAUSE or REC/PAUSE mode.

In the CUE/REVIEW mode, the head base is lifted up to its middle position to permit the tape to contact the head. In the PAUSE or REC/PLAY mode, the capstan is released from the pinch roller and, at the same time, the play idler is disengaged from the reel to stop tape movement.

(6) Recording solenoid (L004)

This solenoid functions when the tape is in the REC/PLAY or REC/PAUSE mode to set the amplifier to the recording mode. When this solenoid is inoperative, the amplifier is in the playback mode.

3.2 Back-up Circuit

When the power switch is OFF, back-up power is supplied to the microcomputer via T002, rectifier (Q419, Q424) and voltage regulator circuit (Q421 ~ Q423). In this case, the voltage at Pin 36 of Q701 is 0V, thus time is indicated on the display.

During back-up operation, the programs stored in memory remain uncleared.

3.3 Solenoid drive voltage select circuit

The SD8000 is equipped with 4 solenoids. To ensure proper operation of these solenoids, a sufficient drive current is required.

If a large current flows into a solenoid, the solenoid is overheated which, in turn, increases the winding resistance and reduces the force of attraction of the solenoid. However, once the solenoid has been operated with a large current, it operates stable even with a relatively small current.

The SD8000 employs a solenoid drive voltage select circuit to select the operating voltage according to whether the solenoid is in the operating mode or holding mode.

Fig. 3.1 and Fig. 3.2 show the operating principles of the circuit in the PLAY mode.

Fig. 3-1 Solenoid drive voltage select circuit

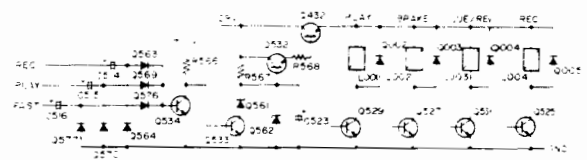
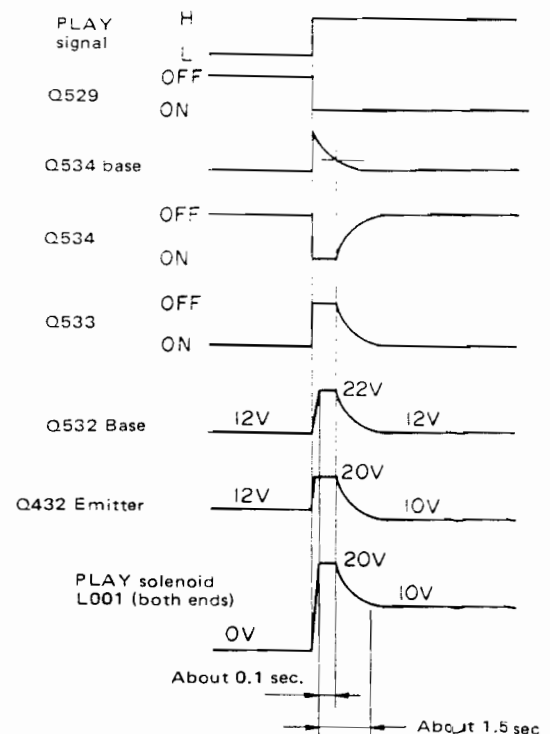


Fig. 3-2 Solenoid operation

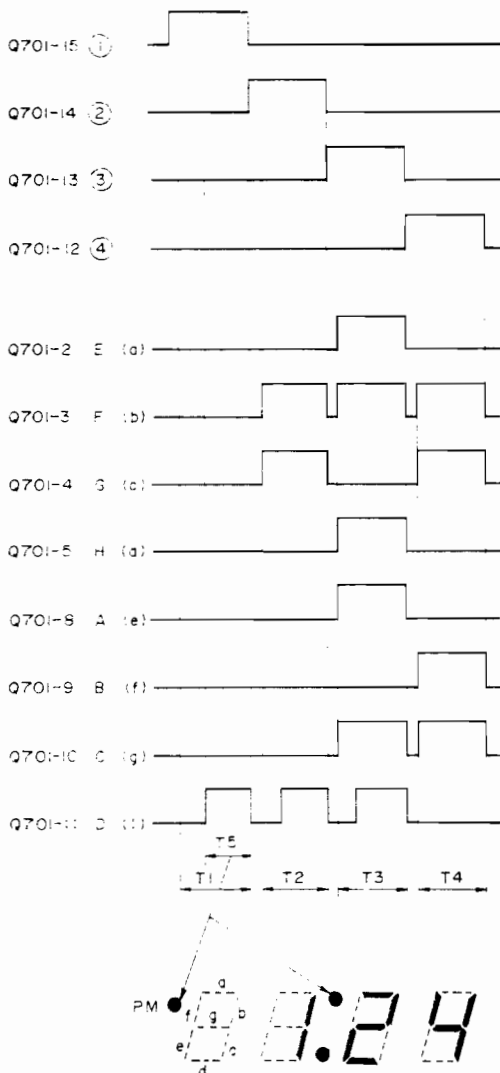


(2) Indication signal – 1

This signal is delivered from input/output ports C and D and output port E to drive the 7-segment LED, PM LED and OVER-FLOW LED in the display. For example, the following steps are taken for the display to indicate "1:24". Refer to Fig. 2.6.

- Strobe signals (1) through (4) are output from output port E, lighting the 7-segment LEDs one by one starting from the top digit.
- The 7-segment lamp signals are output from output ports C and D.
- The lamps of all the digits will light in sequence, but they appear to light simultaneously because the driving cycle is very short.

Fig. 2-6 Principle of displaying "1:24"



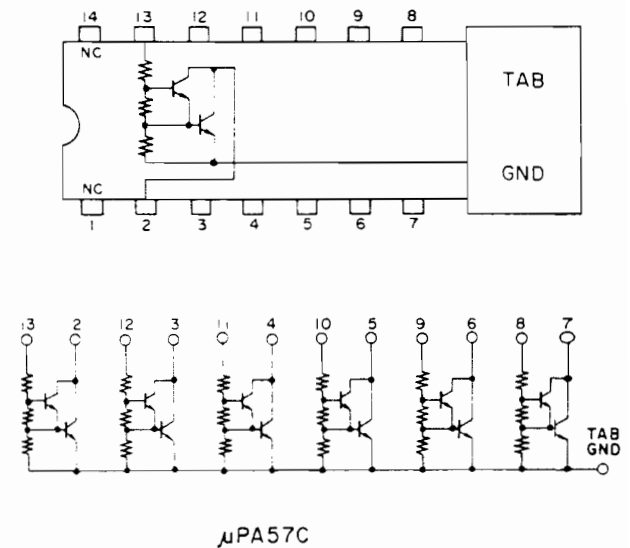
(3) Indication signal – 2

The LED lamp signals, used to indicate the mode of operation of the microcomputer, are output from output port F and output port G (excluding Pin 22).

The conditions required to light the LEDs are given in section 5 "Programming".

The Q702 and Q703 (μ PA57C) are wired as shown in Fig. 2.7 to serve as a buffer driver.

Fig. 2-7 μ PA57C



- a. The PLAY signal level in the output of the micro-computer rises to "H" (this signal turns on Q529 and Q527 through a circuit via a separate route). (Fig. 3-1)
- b. The PLAY signal is differentiated, then passes through Q569 and turns ON Q534 momentarily. Q533 is OFF when Q534 is ON.
- c. When Q533 is OFF, a bias voltage of about 22V is applied to the base of Q532 through Zener diode Q562. At this time, the output of the emitter of Q432 is about 20V. Since Q529 and Q527 are ON, a voltage of 20V is applied to the PLAY solenoid L001 and the BRAKE solenoid L002 and hence they are driven by a large current.
- d. When Q534 is OFF, Q533 is ON so the base of Q532 is biased by Q561. As a result, the bias voltage is reduced to about 12V, causing the voltage at the emitter of Q432 to be reduced to about 10V and thus the solenoid is held closed at about 10V during the PLAY mode.

3.4 Tape end detect circuit

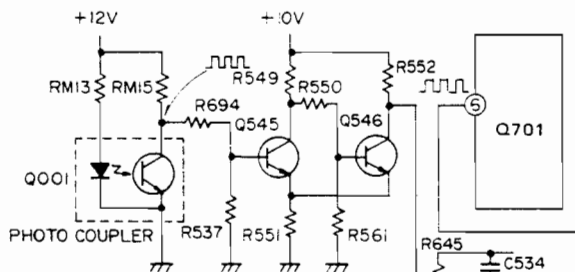


Fig. 3-3 Tape end detect circuit

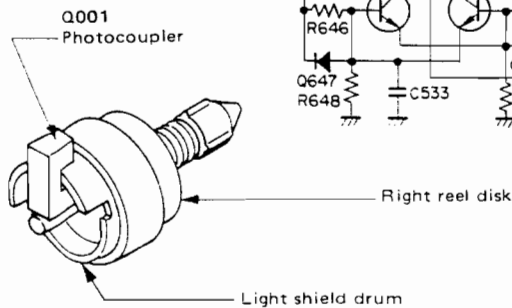


Fig. 3-4 Tapedrive detect mechanism

Fig. 3.3 shows the counter pulse generator circuit which also serves as the tape end detection circuit. Detection of tape end is accomplished by the mechanism shown in Fig. 3.4. When the right reel disk is rotating, the light shield drum attached to the reel disk also rotates. The light shield drum has two slits; photocoupler Q001 contains a light emission diode and a photo transistor. The light from the light emission diode arrives at the photo transistor only when the slits in the light shield drum pass through the photocoupler, energizing the photo transistor. When the light is blocked, the photo transistor is OFF. In other words, the photo transistor turns on twice for each rotation of the right reel disk. Since the photo

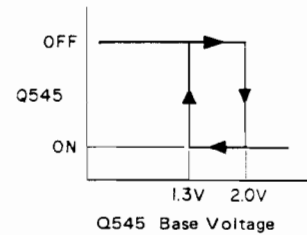
transistor's ON time is not stabilized and since it is de-energized between ON and OFF according to the position of the light shield drum, the waveform of the signal must be shaped by the Schmitt circuit consisting of Q545 and Q546.

As shown in Fig. 3.5, Q545 turns ON when the voltage is below 1.3V. Operation of Q546 is the reverse of Q545.

The shaped output waveform is applied to Pin 6 of Q701.

When the output pulse from Q546 stops in the PLAY, FF or REW mode, the microcomputer detects the end of the tape and the tape stops 1.5-2 seconds later.

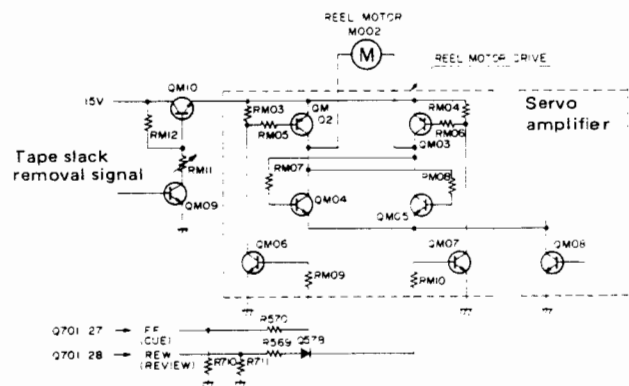
Fig. 3-5 Schmitt operation



3.5 Reel motor drive circuit

(1) Reel motor driver

Fig. 3-6 Reel motor driver



Under normal circumstances, QM09 is OFF and the base of QM10 is biased via RM12. The voltage at the emitter of QM10 is about 14V (load). When a high level FF signal is output from the microcomputer via Q701, QM06 turns ON via R570 and RM09. This reduces the signal level at the collector and thus QM02 turns ON. As a result, a current flows into the base of QM05 which will turn ON.

In the reel motor M002, a current flows along the route QM02 - M002 - QM05 - QM08 so that motor runs in the counterclockwise direction (as viewed from the pulley side) to drive the right reel disk.

The transistor QM08 in the servo amplifier functions as a variable resistor, controlling the reel motor current to provide a constant tape speed (refer to Item 3-8 "I").

In the REW mode, QM07, QM03 and QM04 turn ON. In this case, a current flows into M002 along the route QM03 - M002 - QM04 - QM08, so the motor runs in the reverse direction of this FF mode.

(2) Servo circuit
Refer to Fig. 3.7

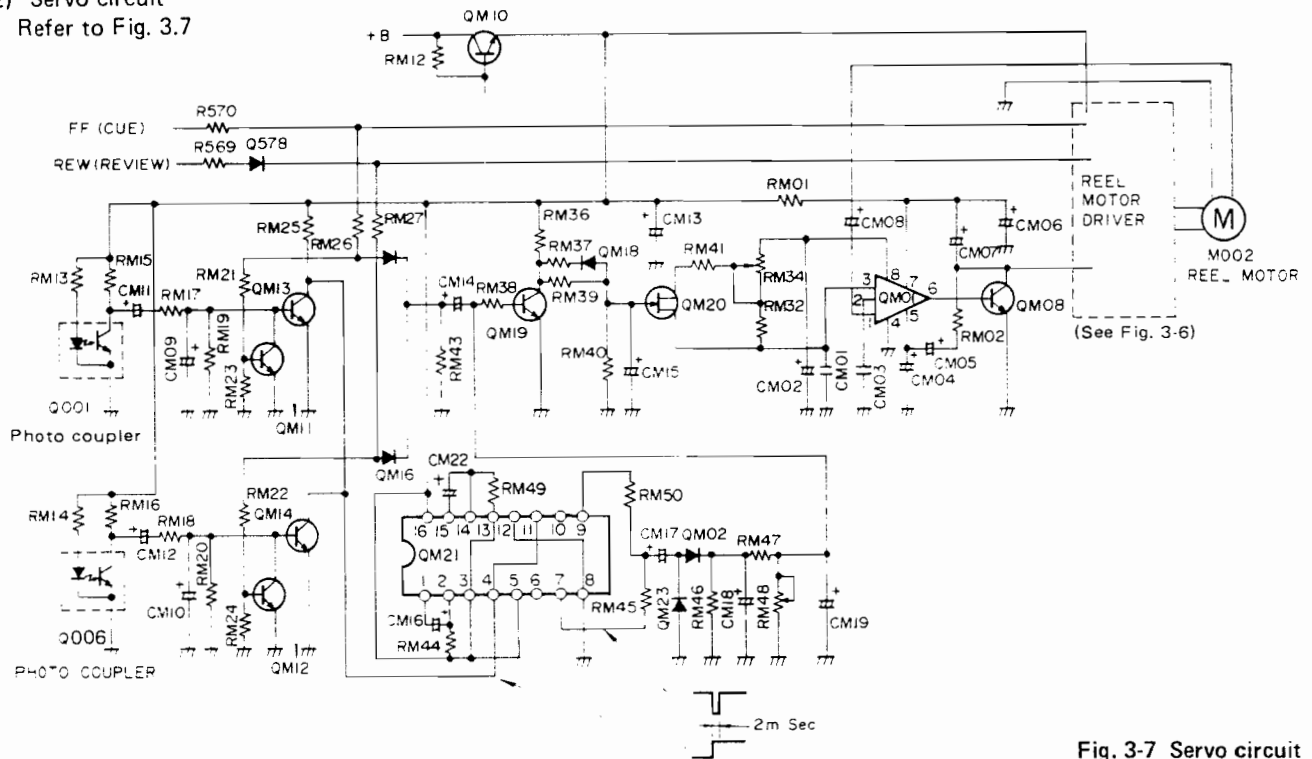


Fig. 3-7 Servo circuit

- a. Photocoupler Q001 is located on the right reel disk and Q006 on the left reel disk.
- b. In the FF mode, a high level signal from the micro-computer passes through R507, RM26 and RM21 to turn QM11 on. The signal from Q001 is not applied to other circuits as long as the tape is in the FF mode. In the REW mode, QM12 is ON and the signal to Q006 stops. (The FF mode operation is explained in the following.)

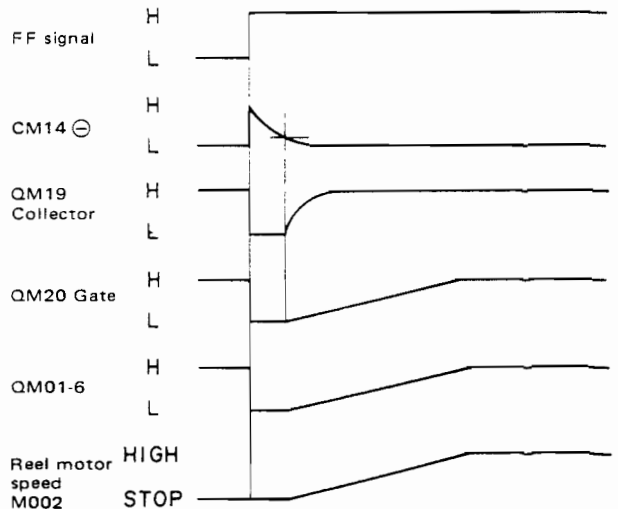
- c. In the STOP mode, CM14 and CM19 are uncharged, so the base of QM19 is at the GND level. QM19 is OFF and the collector voltage of QM19 is about 8.2V. When the FF signal of H level is output from the microcomputer, CM19 is charged through RM26, QM15 and CM14. The FF signal also biases QM19 for about 150 msec via RM38. Therefore, QM19 is turned ON and CM15 is quickly discharged through RM37 and QM18.

When the voltage (QM20 gate voltage) charged in CM15 drops, the resistance across the drain and source of QM20 is increased. With this resistance increased, the DC output voltage from Pin 6 of QM01 drops and the QM08 collector current (reel motor current) is decreased. Therefore, the reel motor starts running at a slower speed just after entering the FF mode. When CM14 is charged with the FAST signal, QM19's base voltage drops and the collector voltage is increased. CM15 is charged through RM36 and RM39 with a long time constant so CM20's gate voltage is increased slowly. As the gate voltage is increased, the drain-source resistance is decreased gradually, while QM01's output voltage is slowly increased. Thus, QM08's collector current is increased, thereby

increasing the speed of the reel motor gradually. Since the reel motor starts running at a slow speed, the tape will not become slack.

- d. In the FF (REW) mode, the tape drive detecting signal is fed from QM14 (QM13) to Pin 4 of QM21. QM21 (μ PD4528C) is a unistable multivibrator which outputs low level pulses with a width of about 2 msec, from Pin 7 at the rise of the trigger pulses given to Pin 4. The pulse-width is determined by the power voltage, CM16 and RM44. Refer to Fig. 3B for the connection of μ PD4528C and its block diagram.

Fig. 3-8-1 Reel motor rising characteristic



e. The output of QM21 is rectified, smoothed and applied to the base of QM19 as a speed control signal. The functions of the servo motor in the FF mode are as follows:

- * At the start of tape, the left reel rotates at a slow speed because there is a large amount of tape. When the tape on the left reel is decreased, the speed of the reel is increased gradually and the interval of the input (trigger) pulses from Pin 7 of QM21 becomes shorter.
- * With the trigger pulse-interval becoming shorter, the interval of the output pulses from Pin 7 of QM21 also become shorter.
- * The interval of the pulses which are differentiated by CM17 and fed to the rectifier circuit become shorter, so the output voltage of the smoothing circuit is increased which increases the voltage at the base of QM19.
- * With the QM19 base voltage increased, the collector current is increased, decreasing the collector voltage. Thus, the voltage at the gate of QM20 is lowered.
- * With the gate voltage lowered, the drain-source resistance is increased, lowering the QM01 output voltage which decreases the QM08 collector current.
- * The QM08 collector current is the current flowing into the reel motor. When this current is decreased, the motor runs at a slower speed. The reel motor drives the right reel disk. If the motor were to run at a constant speed, the tape would run slowly at the beginning of tape and at very high speed at the end of the tape. The servo motor is used to make the tape speed constant throughout the entire length of the tape by reducing the speed of the reel motor while the tape is running.

f. The pulse-width and voltages at the beginning and end of tape are as follows:

	Beginning of tape	End of tape
QM21-4 Trigger pulse interval	50 msec	30 msec
CM19 "+" Smoothing circuit output voltage	0.25V	0.62V
QM19 Collector voltage	8.8V	1.7V
QM20 Gate voltage	0.75V	0.15V
QM08 Collector voltage	5.8V	7.8V
Reel motor speed	Fast	Slow

- g. The purpose of maintaining the tape speed constant in every fast tape-feeding mode is to ensure stable operation of the program detecting function explained in a later section.
- h. The semi-fixed resistor RM34 in Fig. 3.7 is used to determine the maximum speed of the reel motor, while RM48 is used to determine the range of speed of the reel motor or the average speed of the tape.

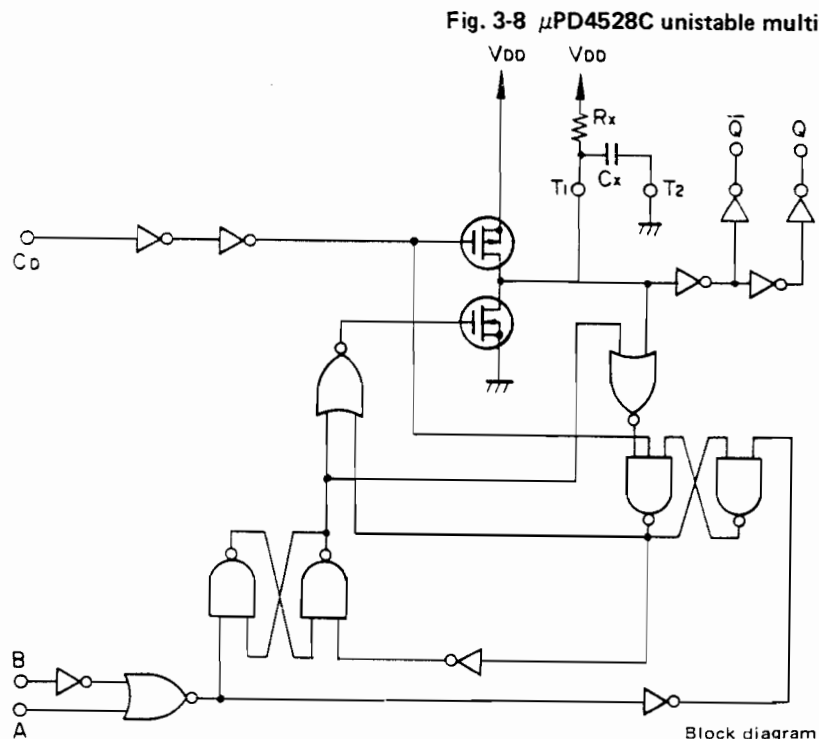
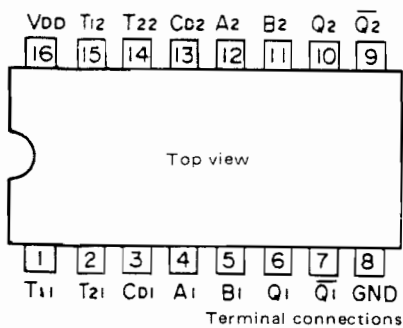


Fig. 3-8 μ PD4528C unstable multivibrator

3.8 Program Detector Circuit

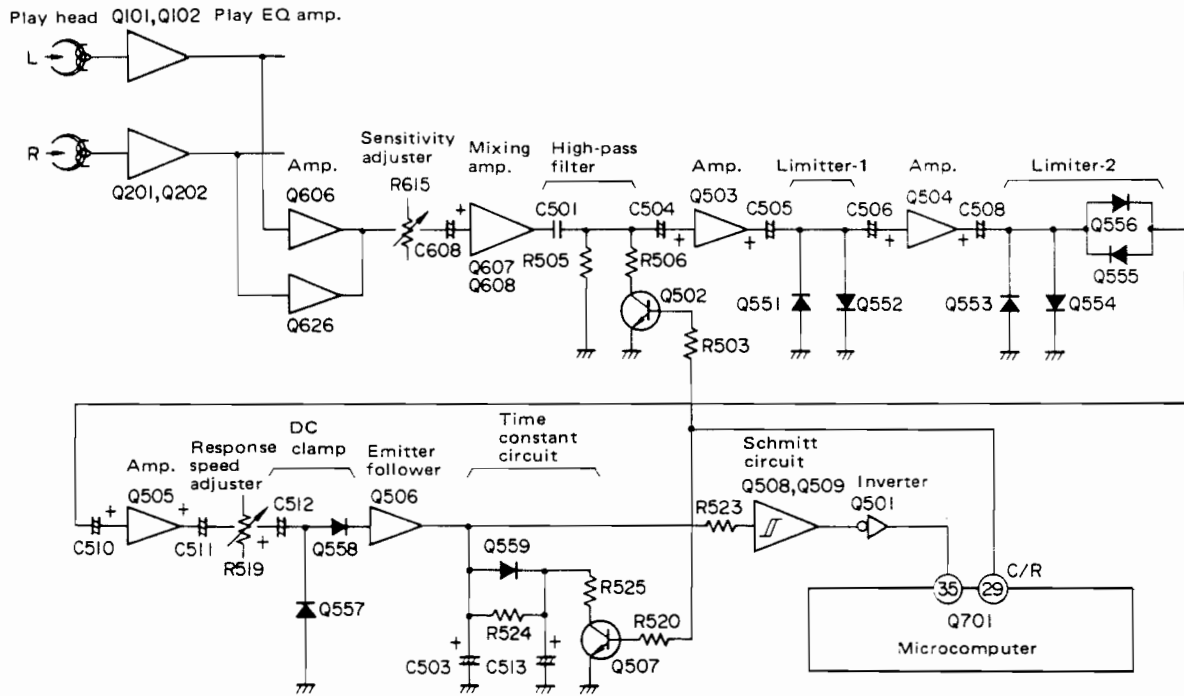
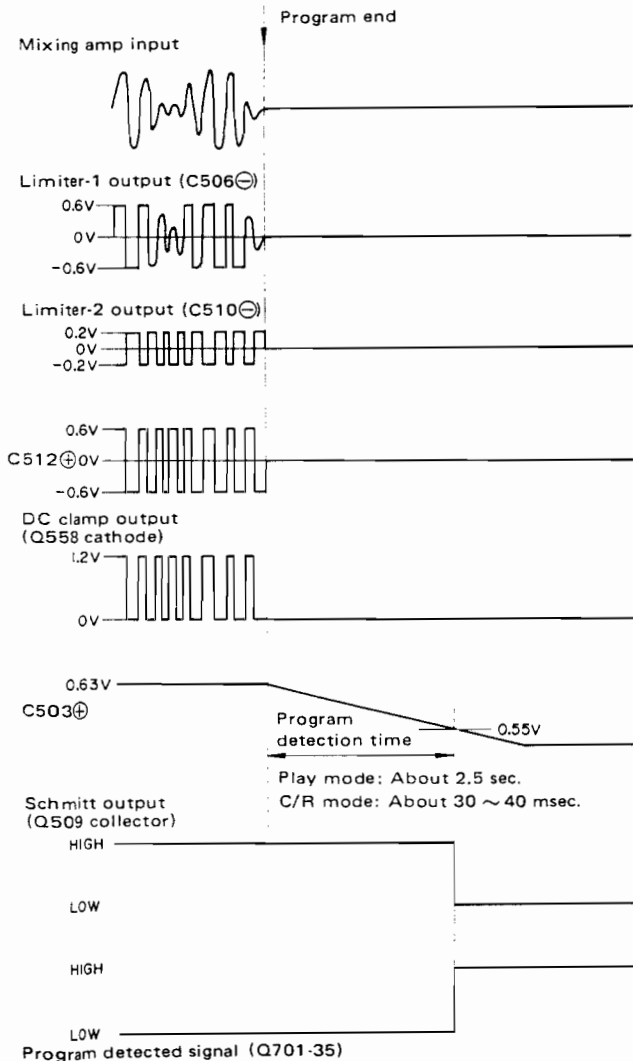


Fig. 3-10 Program detector circuit block diagram

Fig. 3-11 Program detected signal



The program detector circuit detects blank spaces between programs on tape and feeds a high level program control signal to pin 35 of the microcomputer. Fig. 3.10 is a block diagram of the circuit and Fig. 3.11 shows the waveform at each point.

- The play signals from the play EQ amplifiers of the left and right channels are amplified and mixed by Q606 and Q626.
- The mixed signal is further amplified by Q503 via the sensitivity adjuster and the high-pass filter.
- The high-pass filter turns on and off Q502 to change the cut-off frequency. In the CUE/REVIEW mode, the tape runs faster than in the PLAY mode and the play frequency band is shifted up so Q502 turns on. The cut-off frequency of the high-pass filter is shifted up by inserting R506 in parallel with R505. When the tape runs at a high speed as in the CUE/REVIEW Mode, the play signal level is increased. This signal is controlled when R506 is grounded by Q502 and the circuit impedance is reduced.
- The output signal from Q503 is fed to limiter-1 consisting of Q551 and Q552 to limit the maximum amplitude to about 0.6V.
- The output of limiter-1 is amplified by Q504 and is fed to limiter-2 consisting of Q553-Q556. Amplifier Q504 and limiter-2 amplify low level signals whose amplitude was not limited by limiter-1. When the signal is limited, the play signal is changed to a pulse signal. The amplitude of the output signal of limiter-2 is $0V \pm 0.2V$.

- f. This signal is amplified by Q505 and fed to the DC clamping circuit via the response speed control R519 to shift the input signal from R519, which is deflecting in both the positive and negative directions with respect to 0V, to the positive side without changing its amplitude.
- g. The DC shifted signal pulses pass through emitter follower Q506 to charge C503 and C513 in the time constant circuit.
When recorded tape is being played back, charging pulses are continuously applied to C503.
- h. When the signal is present, the charging voltage at C503 is about 0.63V. Q508 and Q509 in the Schmitt circuit are ON and OFF, respectively; Q501 is ON while Q509 is OFF. Pin 35 of the microcomputer is at low level.
- i. When left and right channel play signals are not present, the pulses charging C503 stop so C503 discharges into the Schmitt circuit via R523.
When the potential of C503 drops to about 0.55V, the Schmitt circuit is inverted and Q501 turns off. As a result, a "program detected" signal is applied to Pin 35 of the microcomputer.
- j. In the PLAY mode, the program detection time required to apply a detecting signal after the play signal stops is about 2.5 seconds (in other words, a blank space of about 3-5 seconds is required between programs).
- k. In the CUE/REVIEW mode, the tape runs at a high speed, so the program detecting time needs to be reduced. In this case, C507 is turned on to discharge C503 and C513 through R525 and Q507 so that a detecting time of about 30 mSec to 40 mSec is obtained.
- l. In the CUE/REVIEW mode, if the tape speed varied, the detecting time would vary, resulting in failure to detect programs.
To prevent this, the reel motor is servo controlled to maintain a constant tape speed.
- m. Control R519 is used to adjust the amplitude of the pulses fed to the rectifier circuit. By changing the pulse amplitude, the charging voltage of the time constant circuit is varied together with the detecting time.
- n. Recorded signals of which level indicated with the peak level meter exceeds -35 dB are judged as program signal.
The signal level can be adjusted with R615.

4. Tape Operation

During programming operation, the mode of tape operation cannot be selected with the pushbuttons.

The following describes the functions of pushbuttons and related circuits. Unless it is stated otherwise, the deck is in the STOP mode before any pushbuttons are pressed.

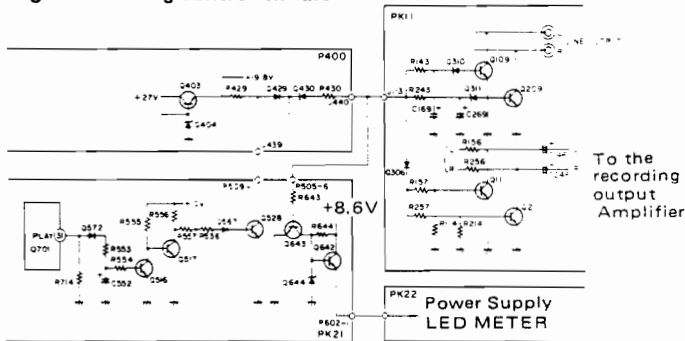
4.1 PLAY mode

With the PLAY button pressed, circuit Q701 in the microcomputer is set to the PLAY mode and a high level PLAY signal is output from pin 31. This signal passes through Q572, R553 and R554 to turn on Q516.

At this time, Q517 is OFF and the signal at the collector is inverted from low to high level and the following operations are performed.

- (1) Q528 is switched ON via R557, R536 and Q536 and the amplifier is set to the PLAY mode (see Fig. 4.1) as follows.

Fig. 4-1 Muting control circuit



- a. Q643 is switched OFF and the voltage regulator circuit operates to supply power to the LED meter.
- b. Q109 and Q209 are switched OFF to release the muting function of the play output circuit.
- c. Q111 and Q211 are switched OFF to release the muting function of the recording output circuit.
- (2) Q534 is switched ON for about 0.5 sec via R557, C515 and Q569. In the circuits following Q534, the solenoid drive voltage is selected as described previously (Item 3.3).
- (3) Q523 and Q527 are switched ON via R557, Q568 and R596. The brake solenoid L002 is activated to release the braking of the reel disks.
- (4) Q522 and Q529 are switched ON via R557 and R563. PLAY LED Q591 lights and play solenoid L001 is activated to set the deck in the PLAY mode.

4.2 REC/PLAY mode

The deck cannot be set to the REC/PLAY mode unless ANTI-REC switch S002 is open. Also, the deck cannot be set to this mode manually unless PROGRAM MODE switch S506 is in the OFF/CA position and COUNTER MEMORY switch S504 is in the OFF, REWIND/STOP or REWIND /REPLAY position.

- (1) By pressing the PLAY and REC buttons simultaneously, a high level play signal and recording signal are present at Pin 31 and Pin 32 of the microcomputer, respectively. The deck is set to the PLAY mode by the play signal.

The recording signal functions as follows:

- a. Q511 is switched ON via Q560, Q530 and R532. Q512 is OFF and Q513 and Q525 are ON.
- b. REC LED Q593 is lit by Q513.
- c. REC solenoid L004 is activated by Q525. REC/PLAY switches S101 and S102 in the amplifier are set to REC. The amplifier is set to the recording mode.
- (2) If, during the PLAY mode, the PLAY and REC buttons are pressed at the same time, the deck is also set to the REC/PLAY mode. In this case, the following operations are performed, as well as the operations given in a through c.
- d. Q512 is switched OFF and the signal at the collector become high level. This signal passes through R535, C514 and Q563 to activate the solenoid drive voltage selector circuit following Q534. Thus, the voltage of the REC solenoid is switched.

- (3) With REC/MUTE switch S502 pressed during the REC/PLAY mode, the recording amplifier is muted and hence the recording signal goes off. At this time, the display indicates second's digits automatically regardless of the position of the program setting switch. The display indicates 0-9 seconds repeatedly while S502 is pressed. As explained previously, a blank space of more than 3 seconds is required for proper operation of the program detection circuit, so that length of blank tape can be determined by the time indicated during the REC/MUTE operation.

4.3 PAUSE mode

(1) PLAY/PAUSE

If the PAUSE button is pressed when the deck is in the STOP, FF or REW mode, the PAUSE signal is not output. By pressing the PAUSE button during the PLAY mode, the PLAY signal (Pin 31 of the micro-computer) becomes low level and the PAUSE signal (Pin 31) becomes high level. With this, the tape is set to the STOP mode and the amplifier is muted.

The high level PAUSE signal has the following functions:

- a. Q524 is switched ON via R541 and the PAUSE LED Q592 is lit.
- b. Q515 is switched ON via Q575 and R558, discharging C522.
- c. Q526 is switched ON via R542 (Q526 does not function at this time).
- d. Q530 and Q531 are switched ON via R548, Q599 and R692. CUE/REV solenoid L004 is activated by Q531 (in this case, the solenoid drive voltage selector circuit does not operate). The CUE/REV solenoid sets the head base between the STOP and PLAY positions. When the PLAY button is pressed in the PLAY/PAUSE mode, the PAUSE signal level becomes low and the PLAY signal level becomes high. The PAUSE signal goes off and then the PLAY signal comes on about 25 msec later. CUE/REV solenoid L003 is OFF and PLAY solenoid L001 is ON.

(2) REC/PAUSE

When the PAUSE button or the REC and PAUSE buttons are pressed in the REC/PLAY mode, the tape is set to the REC/PAUSE mode. In either the REC/PLAY or REC/PAUSE mode, the REC signal is output and the amplifier is set to the recording mode. Other functions are the same as in the PLAY/PAUSE mode.

4.4 FF mode

When the FF button is pressed, FF and FAST signals are output from Pin 27 and Pin 26 of the microcomputer, respectively.

The FF signal has the following functions:

- a. Q549 is switched ON via R579. The slack tape removal circuit stops operating when Q549 is ON.
- b. The reel motor drive circuit is activated via R570. The FAST signal has the following functions:
- c. Q515 is switched ON via Q573 and R558 to disable the PLAY signal circuit.
- d. Q510 is switched ON VIA R531 to disable the REC signal circuit.
- e. Q534 is switched ON momentarily via R559, C516 and Q576 to operate the solenoid drive voltage selector circuit.
- f. Q523 and Q527 are switched ON via R559, Q571 and R596 to operate BRAKE solenoid L002.

4.5 REW mode

When the REW button is pressed, the REW signal and FAST signal are output from Pin 28 and Pin 26 of the microcomputer, respectively. The functions of these signals are practically the same as in the FF mode.

4.6 STOP mode

In any of the following cases, the deck is set to the STOP mode during any mode other than the program mode.

- a. When the STOP button is pressed.
- b. When the SENSOR STOP switch is pressed.
- c. When the tape reaches its end.
- d. When PROGRAM MODE switch S506 is set from the SINGLE position to the OFF/CA position.
- e. When the COUNTER MEMORY switch S504 is set from the PLAY/STOP position to the OFF position with the PROGRAM MODE switch in the OFF/CA position.

During the program mode operation, the SENSOR STOP switch does not function. When unloading the cassette, the program mode operation is stopped and the tape deck is set to the STOP mode. The program mode operation stops by the procedures given in the above items d and e.

4.7 Mode transfer

When the mode of operation is transferred from A to B, the signal in Q701 goes off and then the B signal is output on about 25 to 30 msec later. The tape deck is in the STOP mode until the B signal is output.

When the mode of operation is changed, the tape stops once and then starts again.

4.8 Functions of operation buttons

When more than one operation button are pressed, the priority of the mode is determined by the microcomputer. Except when the PLAY and PAUSE buttons are pressed, the tape mode is determined by the button which is released last. The relationship between the operation buttons and the modes of operation is as follows:

- a. STOP button and any one of REW, FF, PLAY, PAUSE and REC buttons . . . STOP mode.
- b. REW button and FF button . . . STOP mode.
- c. REW (or FF) button and any one of PLAY, PAUSE and REC buttons . . . REW (or FF) mode.
- d. PLAY button and PAUSE button
 - (1) When the PLAY button is pressed first . . . PLAY mode (or the mode of the button released last).
 - (2) When the PAUSE button is pressed first . . . STOP mode (STOP mode when the PLAY button is released first, and PLAY mode when the PAUSE button is released first).

5. Programming

Fig. 2.4 shows the program signal input circuit. The switches in the matrix circuit, program memory and control signal output are controlled by the micro-computer.

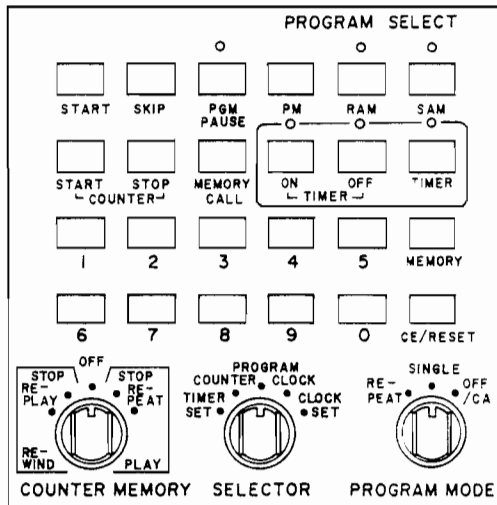
This section explains the operating conditions of the program setting switches and related functions.

The program setting switches have various functions, so special care should be taken when checking for circuit trouble or misoperation.

5.1 Matrix keys

Here, the functions of the program setting matrix keys are explained. For the functions of the 3 switches (COUNTER MEMORY, SELECTOR, PROGRAM MODE) at the lower part of the program setting unit, refer to Section 5-2 and succeeding sections.

Fig. 5-1 Program setting unit



(1) START

This is a program mode start command key.

When the PROGRAM MODE switch is in the SINGLE or REPEAT position and the COUNTER MEMORY switch is in the PLAY/STOP or PLAY/REPEAT position, press the START key and the deck is set to the REW mode regardless of the position of the SELECTOR switch and the information stored in the memory.

(2) SKIP

This key is used to shift from one program to another during program mode operation.

When the PROGRAM MODE switch is in the SINGLE position and the last designated program is being played back, pressing the SKIP key causes the tape deck to enter the STOP mode.

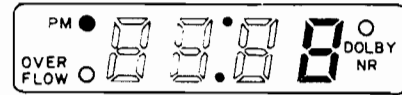
(3) PRG PAUSE

This is the PROGRAM PAUSE key. Press this key during the program mode operation and the tape stops briefly. To resume tape playback, press the same key again.

(4) PM

This key is used to indicate the PM (afternoon) sign on the display. It functions only when the SELECTOR switch is in the CLOCK SET position. By pressing the PM key, the display indicates as shown in Fig. 5.2.

Fig. 5-2 Indication when PM key is pressed



(5) RAM, SAM

These are RANDOM ACCESS MEMORY key and SEQUENTIAL ACCESS MEMORY key, and are used for memorizing, executing and reading programs.

When the RAM key is used, the programs are executed in the order in which they are arranged. When the SAM key is used, the programs are executed in numerical order. If the programs are arranged in the order of 4, 5, 3, 2 and 1, they are executed (readout) by the memory as shown in Table below.

Mode	Read-in		Read-out, Execution	
	Sequence	Mode	Sequence	
RAM	4 - 5 - 3 - 2 - 1	RAM	4 - 5 - 3 - 2 - 1	
		SAM	1 - 2 - 3 - 4 - 5	
SAM	4 - 5 - 3 - 2 - 1	RAM	4 - 5 - 3 - 2 - 1	
		SAM	1 - 2 - 3 - 4 - 5	

The LEDs on the RAM and SAM keys indicate the memory being executed. They will light with the PROGRAM MODE switch in the SINGLE or REPEAT position.

(6) COUNTER/START, STOP

This is used to set the start and stop positions for counter, memory and play operations (STOP, REPEAT).

(7) MEMORY CALL

This is used to check the information stored in memory. It has no effect on the programs being executed and tape deck operation. To cancel memory call, press the MEMORY key. When the CE/RESET key is pressed while the memory is recalled by pressing the MEMORY CALL key, the information in the memory is reset and cleared.

a. Recalling the programs

The preset programs can be recalled when the SELECTOR switch is in the PROGRAM position and the PROGRAM MODE switch is in the SINGLE or REPEAT position. For example, if programs are preset in the RAM in the order of 4, 5, 3, 2 and 1 and the MEMORY CALL key is pressed, the memory is recalled and the display is as shown in the Table below. In this example, the indication is clear from the 6th position, indicating that all the programs have been executed. If no programs are stored in the memory, the indication goes off when the MEMORY CALL key is pressed.

Table 5-2 Program call and indication (example)

Memory call pressed	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Indication	04	05	03	02	01	Cleared	04	05	03

b. Recalling the counter memory

The information in the counter memory is recalled, with PROGRAM MODE . . . OFF/CA, SELECTOR . . . COUNTER, COUNTER MEMORY . . . PLAY/STOP or PLAY/REPEAT.

The start count and stop count informations are recalled and displayed alternately each time the MEMORY CALL key is pressed. When no information is stored in the memory, the display is "000".

c. Recalling the timer settings

The timer-on time and timer-off time are recalled and indicated alternately each time the MEMORY CALL key is pressed while the SELECTOR switch is in the TIMER SET position. The LEDs in the TIMER/ON and TIMER/OFF keys will light alternately to indicate which memory is recalled. If the POWER switch is OFF and the timer start is in the standby mode, the memory recall function is not done. If the TIMER switch (S503) position is changed when recalling timer-on or timer-off timer memory, the memory recall is reset and the actual time is indicated.

(8) TIMER/ON, OFF, TIMER

These 3 keys are used to set the timer.

a. TIMER/ON

Press this key when setting the timer start time. The start time can be set only when the SELECTOR switch is in the TIMER SET position. When the time is set, the LED above the key will light.

b. TIMER/OFF

Press this key when setting the timer stop time. The stop time can be set only when the SELECTOR switch is in the TIMER SET position. When the time is set, the LED above the key will light.

c. TIMER

This key is used to start and stop the timer. Press the key and the LED above the key will light to indicate that the timer is started. If the TIMER/ON or TIMER/OFF key or both are set, the LED above each key will light. When the TIMER key is pressed again, the LED goes off and the execution command is cleared.

If the TIMER/ON or TIMER/OFF key is not set, the LED will not light when the TIMER key is pressed and the timer will not operate.

When either the TIMER/ON or TIMER/OFF key is set, the timer starts operating when the TIMER key is pressed regardless of the positions of the COUNTER MEMORY, selector and PROGRAM MODE switches, thus executing the timer operation. (Timer recording is not performed unless the COUNTER MEMORY is OFF and the PROGRAM MODE is OFF/CA.)

(9) 1-0

These keys are used to set program number, timer and count signals.

a. For example the figures "4, 3, 2, 1" can be set by pressing the keys 4, 3, 2 and 1 in that order.

To set figures "5:30", press the keys 5, 3 and 0 in that order.

b. In setting the count or timer, a maximum of 4 figures can be keyed in. In setting the program number, a maximum of 2 figures. Excess key-in is refused by the microcomputer.

c. If two or more keys are pressed, only the figure designated by the key first pressed is input. No signals are input by other keys while one key is depressed. When the signal is input, the count, time and sequence are indicated in the display. When the figures indicated are stored in the memory of the microcomputer by pressing the MEMORY key, the setting is completed.

(10) MEMORY

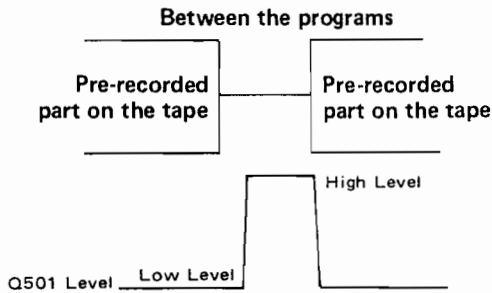
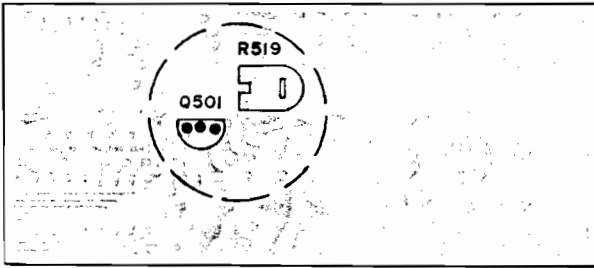
This key is used to store the figures preset in the display in the memory of the microcomputer. It is also used to reset in the memory recall operation.

NOTE: All the figures preset in the display may not be stored in the memory because of "error" or "overflow" (refer to section 5-3 "CLOCK SET, PROGRAM").

(11) CE/RESET

This is the CLEAR ENTRY/RESET key. It is used to clear, indicate and reset the information stored in the memory. For details, refer to section 5-2 and subsequent sections.

PK11



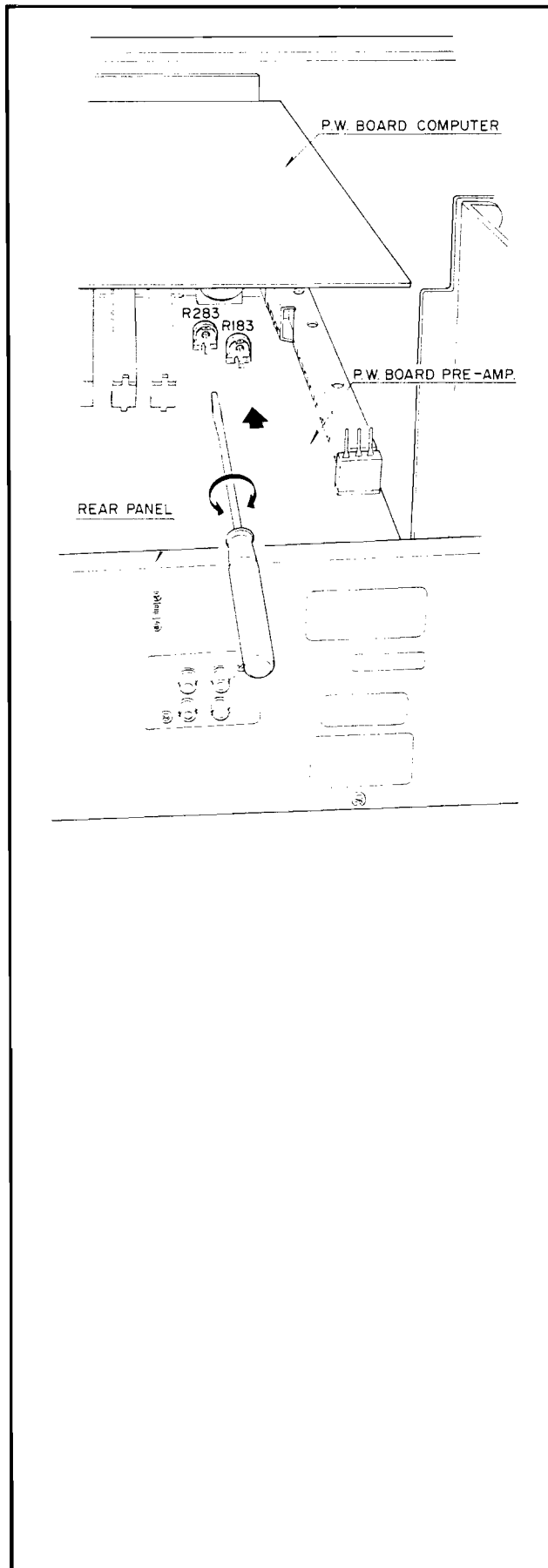
- * Select the Play-Pause mode.
At this time make sure that Q501's collector level becomes "High" for 2 to 3 seconds.
 - * Next release Pause, and make sure that the collector level becomes "Low" in the recorded portion.
5. When in the Cue mode:
- * Put the microcomputer in the Program Playback mode, such as Program Inputs 2 and 4, for example.
 - * Input 2 and 4 and push the Start button.
 - * The unit will Rewind and run the tape in the Cue mode for the first program.
 - * Make sure that between the first and second programs Q501's collector level becomes "High".
 - * If at this time the unit malfunctions, readjust R519. (Readjust so as to lower the overall level.)

NOTE: When R519 is readjusted, make sure performance in the Play mode is natural.

14. Tape Slack Prevention Circuit Adjustments

- a. Set the mechanism operation button to STOP.
- b. Insert a torque cassette, or short-circuit J519 and J502. (By shorting circuit, the reels always rotate.)
- c. Adjust RM11 so that the torque becomes 35 to 50 g-cm.
- d. Remove the shorting wire after adjustment.

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.

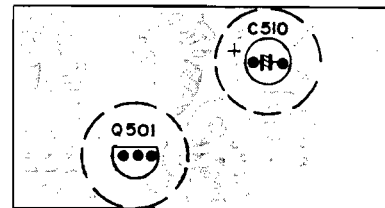


13. Program Selection by Inter-program gaps - Function Adjustments

SETUP

1. Tape speed selector switch: - NORMAL.
2. Tape selector: - Set to accommodate the music tape used.
2. Tapes to be used: - Should have large level differences between programs and inter-program gaps, and have around 4 second gaps between programs. Pre-recorded popular music tapes, for instance, are adequate.
3. Measurement terminals: - C510 negative side
Q501 collector

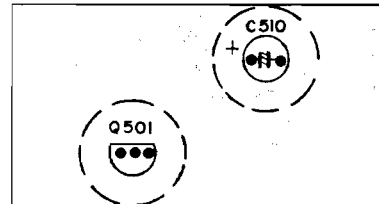
PK21



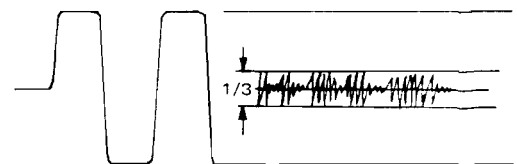
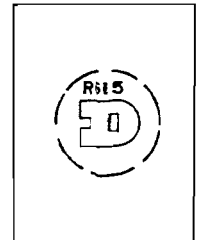
PROCEDURE

1. Connect the Ch. 1 probe of a synchroscope to the Q501 collector.
2. Connect the Ch. 2 probe of the synchroscope to the negative side of C510.
3. Adjust R615 to provide a ratio of 1/3 or less between the noise levels of recorded and non-recorded portions of the tape.

PK21



PK21



Recorded portion

Non-recorded portion

4. Next, adjust R519 as follows:

- * Turn R519 to the extreme counterclockwise.
- * Slowly turning R519 clockwise, watch Q501's collector waveform.
- * Stop turning where, between programs, Q501's collector level becomes "Low".
- * Turn clockwise further by approximately 10° beyond this position.

11. Bias Trap Adjustment

SET UP

1. Power voltage:— 50 Hz/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.

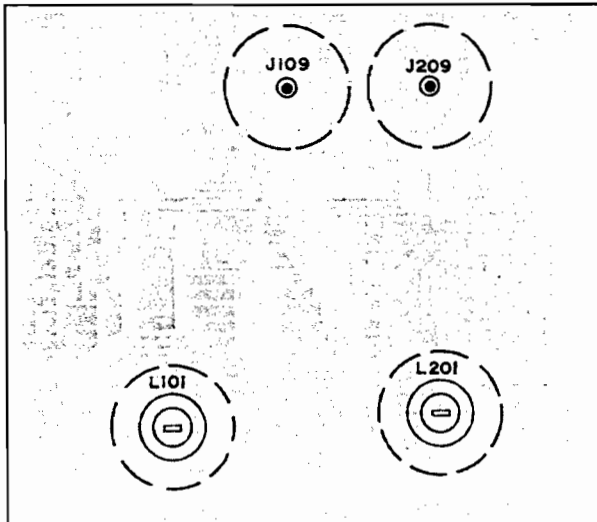
PROCEDURES

1. Set up the unit in the recording mode of operation.
2. Connect the VTVM to J109 and J209 (L ch.) Adjust L101 and L201 (R ch.) for minimum VTVM read.

CAUTIONS

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

PK11



12. Phase Compensator Adjustment

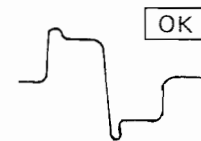
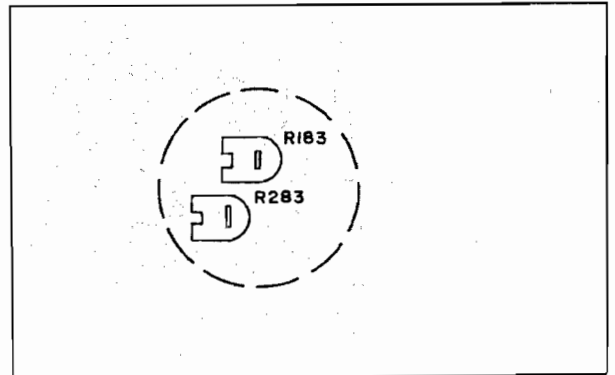
SETUP

1. Power voltage:— 50/60 Hz
2. Input level:— 1 kHz, -60 dB (square wave)
3. Input terminal:— MIC
4. Tape speed selector switch: — HIGH
5. Dolby:— OFF
6. MPX:— OFF
7. Output:— Line Out (connect oscilloscope)

PROCEDURE

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 0 VU.
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.

PK11



X

Record/Play Back Frequency Response Adjustment

Tape	Standard		High	
	EQ	Bias	EQ	Bias
Normal	○	⊗	○	—
Fe Cr	fix	⊙	fix	—
CrO ₂	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).

10. 19 kHz Filter Adjustment

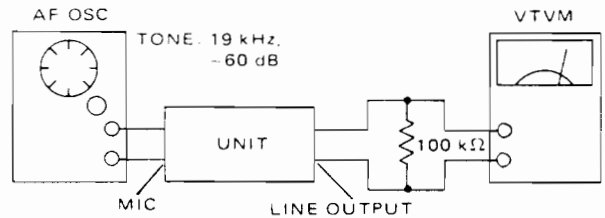
SETUP

1. Power voltage:— 50 Hz/60 Hz AC voltage rated for the unit to be used in a market country.
2. Input terminal:— 19 kHz, -60 dB.
3. Tape selector switch: — NORMAL.
Output terminal:— Line out.
4. Load:— Measuring instrument input impedance.

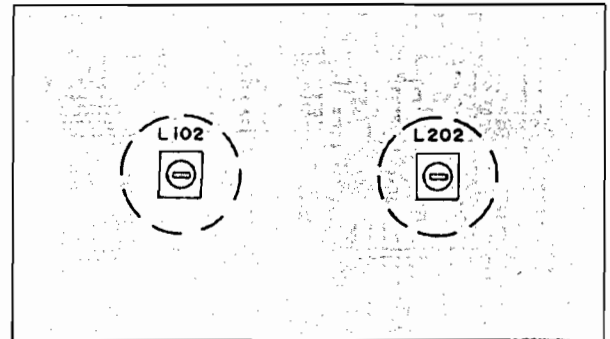
PROCEDURES

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



PK11



8. Recording Equalizer Adjustment

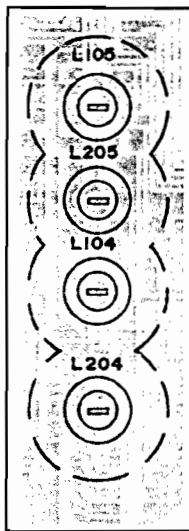
SETUP

1. Power voltage:— 50 Hz/60 Hz AC voltage rated for the unit to be used in a market country.
2. Input level:— -20 dB lower than -60 dB.
3. Tape selector switch: — NORMAL.
4. Output terminal:— R101, R102.

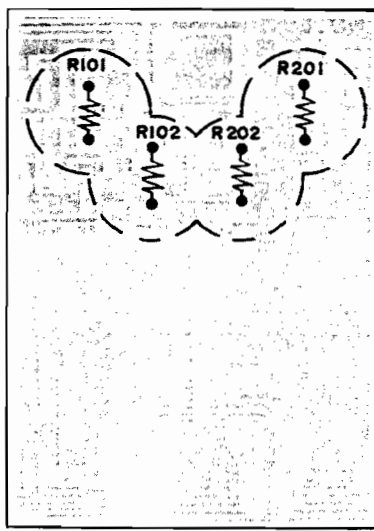
PROCEDURES

1. Stop the recording bias current oscillator. Cutting out the bias circuit.
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 kHz. Connect the VTVM R101, R202. Adjust L105 and L205 for maximum VTVM read. Tape speed selector switch — (Standard speed).
4. In turn, set the Tape selector switch to NORMAL position. Set the audio-frequency oscillator to 22 kHz. Connect the VTVM R101, R201. Adjust L104 and L204 for maximum VTVM read. Tape speed selector switch — (High speed).
5. After adjustment, release the recording bias.

PK11



PK11



CAUTION

The adjusting rod should be non-metallic.

9. Record-Playback Frequency Response Adjustment

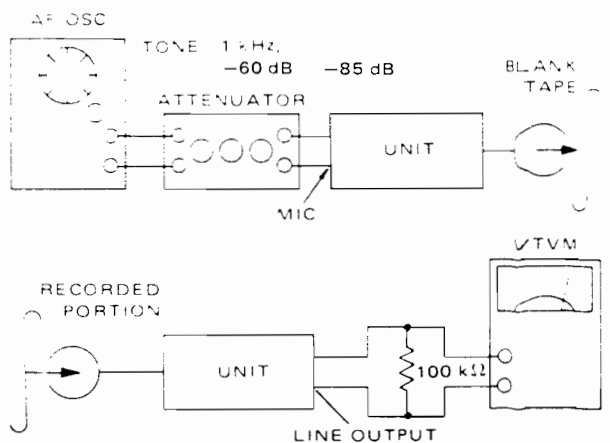
SETUP

1. Power voltage:— 50 Hz/60 Hz AC voltage rated for the unit to be used in a market country.
2. Tape selector switch: — NORMAL.
Tape speed selector switch: — STANDARD & HIGH.
3. Input signal:— 1 kHz, -60 dB with -25 dB referenced as 0 dB.
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 & AC-701.

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 -25 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 ± 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, CrO₂, 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



X

6. Recording Current Adjustment

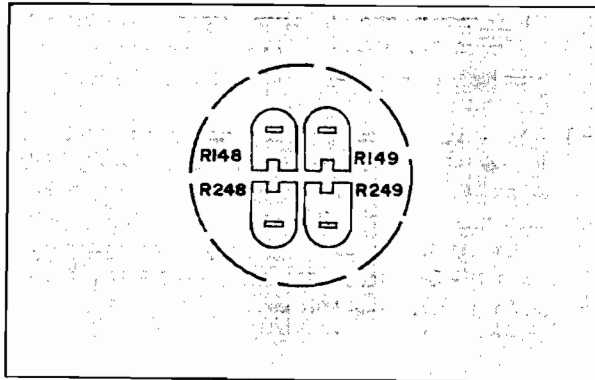
SETUP

1. Power voltage 50/60 Hz AC rated for the unit in the destination country.
2. Input signal:-1 kHz – 60 kB Mic Input
3. Output terminals:- LINE OUT
4. Tape selector switch position: - NORMAL, SPECIAL/CrO₂, Fe-Cr, or Metal
5. Tape speed selector:- STANDARD or HIGH
6. Load:- Measuring instrument input impedance

PROCEDURE

1. In Rec mode, adjust the mic volume to 0 VU. Line Out output at this time is reference level 0 dB.
2. Adjust trimmers to provide a 0 dB output level when tape is recorded and played back.
 STANDARD speed R149 (L ch.) R249 (R ch.)
 HIGH speed R148 (L ch.) R248 (R ch.)

PK11



7. Recording Bias Current Adjustment (Temporal)

SETUP

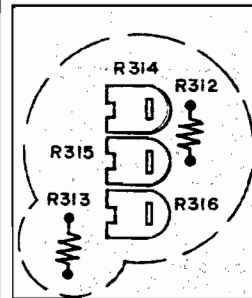
1. Power voltage:- 50 Hz/60 Hz AC voltage rated for the unit to be used in a market country.
2. Tape speed selector switch: – STANDARD.
3. Output terminal: – R101, R201
4. Load:- Measuring instrument input impedance.

PROCEDURES

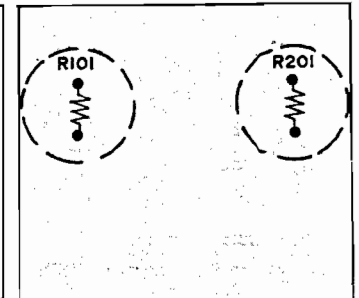
1. Select Rec-Pause mode.
2. Connect a VTVM across R101 (R201 for R ch.)
3. Adjust trimmers to provide the following indications on the VTVM:
 - (1) Tape Selector in NORMAL position: Adjust R410 (L ch.) and R411 (R ch.) to provide 400 mV. (P400)
 - (2) Tape Selector in SPECIAL/CrO₂ position: Adjust R315 (common for L and R) to provide 530 mV. (PK11)
 - (3) Tape Selector in Fe-Cr position: Adjust R316 (Common for L and R) to provide 420 mV. (PK11)
 - (4) Tape Selector in METAL position: Adjust R314 (common for L and R) to provide 700 mV. (PK11)

- NOTE:**
1. Adjust (1) NORMAL position first. If after adjusting other positions R410 or R411 are altered so readjust for all the other positions.
 2. The above adjustments are tentative. Finally, adjustments to provide Rec-Playback frequency characteristics falling within specified ranges are necessary.

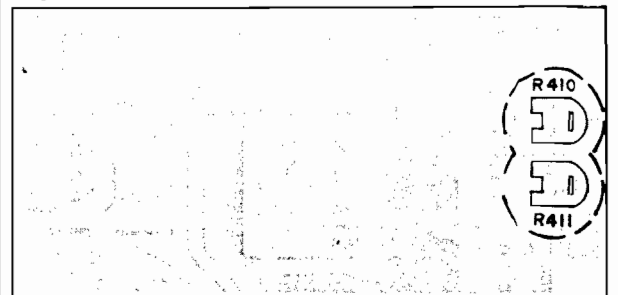
PK11



PK11



P400

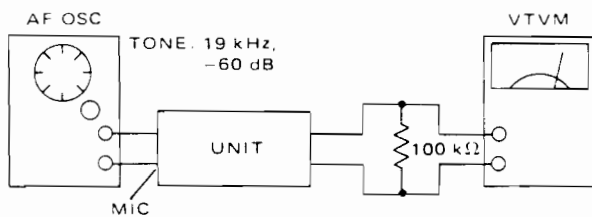


4. LED Meter Adjustment

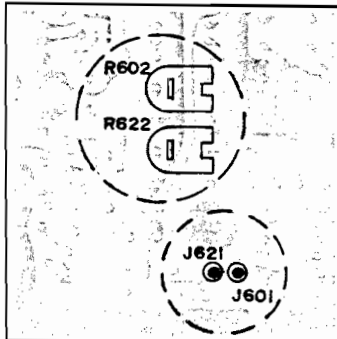
Tape Selector switch – NORMAL position.

PROCEDURES

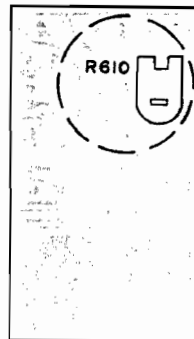
1. Apply a 1 kHz –60 dB signal from the mic.
2. Select the Rec-Pause mode.
3. Adjust the mic volume to provide 3V DC at J601 (L ch.). (J621 for R ch.).
4. Adjust resistor trimmer R602 (R622 for R ch.) so that the "0" LED lights.
5. Adjust the mic volume to provide 580 mV (AC) at J111 (J210 for R ch.).
6. Adjust R610 resistor trimmer (R630 for R ch.) so that the "+2" LED lights.



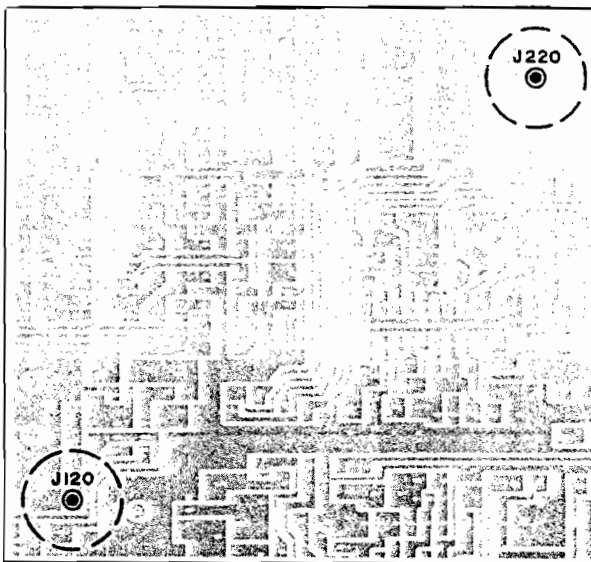
PK21



PK21



PK11



5. Playback Output Adjustment

SETUP

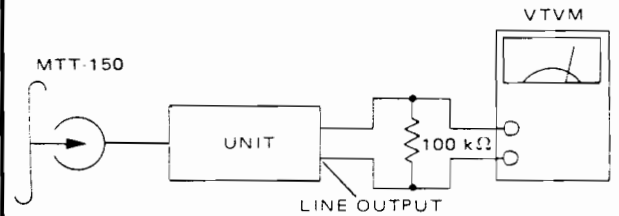
1. Power voltage:– 50 or 60 Hz AC voltage rated for the unit to be used in a market country.
2. Tape selector switch position: – NORMAL.
3. Load:– Measuring instrument input impedance.
4. Output terminal: – J111, J112
5. Test tape used:– MTT-150.
6. Tape speed selector switch: – STANDARD.

PROCEDURES

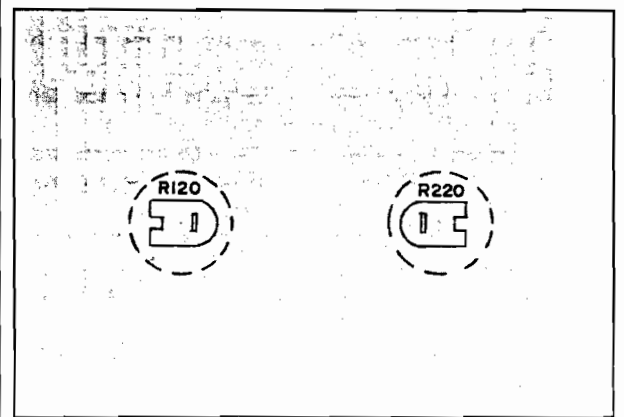
Play the test tape MTT-150 back. Adjust R120 and R220 (50 kΩ each) for 580 mV playback output level.

NOTE: Proceed both for the right and left channels in the same manner.

Mode: Playback



PK11



CAUTION

- This adjustment should be performed after the one for the playback equalizer. If the playback equalizer is adjusted after the playback output adjustment, the playback output should be readjusted.
- This adjustment should be performed after the one for the LED meter adjustment.

X

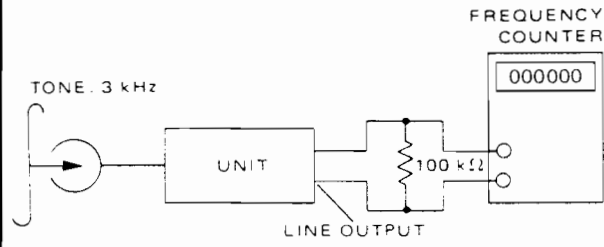
2. Tape Speed Adjustment

SETUP

1. Power voltage:— 50 or 60 Hz AC voltage rated for the unit to be used in a market country.
2. Output terminal:— LINE OUTPUT (or DIN).
3. Test tape used:— MTT-111 (3 kHz Tone) at 1-7/8 IPS.
MTT-111SP at 3-3/4 IPS.
4. Unit position:— Vertical.
5. Tape speed selector switch: — STANDARD or HIGH.

PROCEDURES

1. For 1-7/8 ips, play the mid portion of the test tape MTT-111 back. Adjust the tape speed adjusting variable resistor inside the motor for 2990 to 3010 Hz counter indication.
2. For 3-3/4 ips, play the mid portion of the test tape MTT-111 back. Adjust R352 for 5990 to 6010 Hz counter indication.



CAUTIONS

1. The tape deck should be set up in the normal operating condition.
2. Do not turn the variable resistor more than needed.
3. Do not proceed with adjustment after the tape deck terminure has changed.
4. If a strong shock or vibration is applied to the tape deck after adjustment, make certain that the measured tape speed had not changed.
5. If the tape speed deviation occurs, perform the adjustment again.
6. The counter may indicate a wrong value because of too low counter input level.
7. Before adjustment, allow for 30 seconds or more after depressing of the PLAY pushbutton.

NOTE: Be sure to carry out the 1-7/8 ips tape speed adjustment first.

3. Playback Equalizer Adjustment

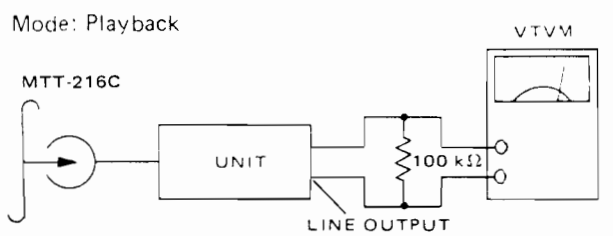
SETUP

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.
6. Tape speed selector switch: — STANDARD.

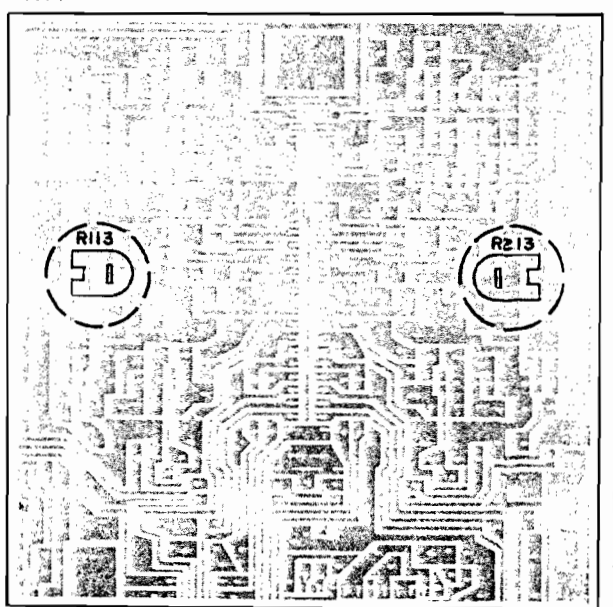
PROCEDURES

1. Play the test tape MTT-216. Let the 315 Hz signal level be reference as 0 dB.
2. Adjust R113 and R213 (5 kΩ each) for 10 kHz frequency response of 0 to -1 dB in reference to the 315 Hz signal level.

- NOTE:**
1. Proceed both for the right and left channels in the same manner.
 2. Note that clockwise turning of R113 and R213 will increase the 10 kHz signal output level.



PK11



6. ELECTRICAL ADJUSTMENT

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 580 mV output at the LINE OUTPUT terminal with the load assuming the measuring instrument input impedance of greater than 100 k Ω and with the TAPE SELECTOR 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.

1. Head Azimuth Adjustment

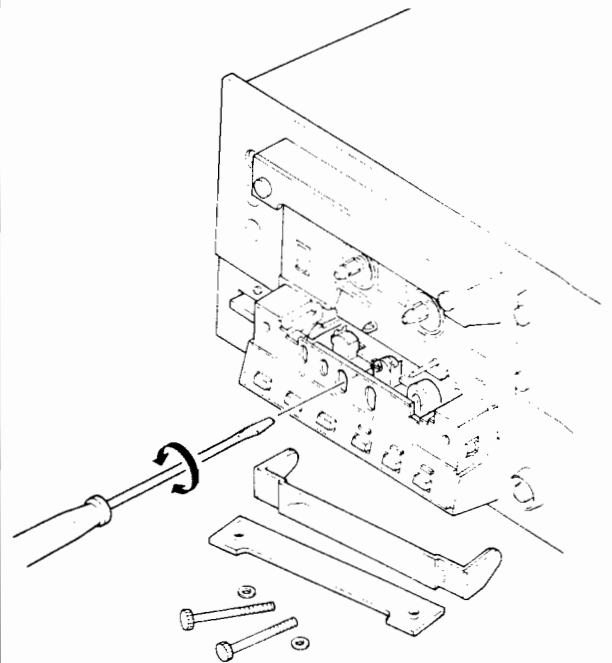
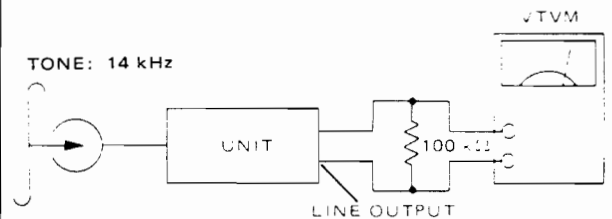
SETUP

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.
6. Tape speed selector switch: — STANDARD.

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. If the peak output reads of the right and left channels are different, set the screws to obtain the mechanical center between the peaks.
3. After adjustment, lock the screw with bond.

Mode: Playback



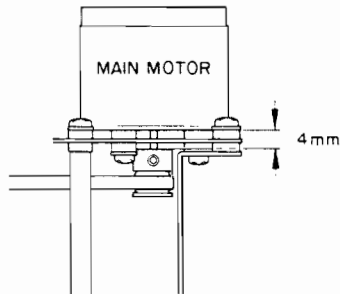
CAUTION

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

6. Motor Pulley Adjustments

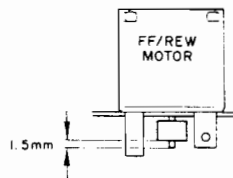
Loosen the set screw and adjust the motor pulley position until the clearance between the pulley and motor is 4 mm as shown. Tighten the set screw.

* Main Motor



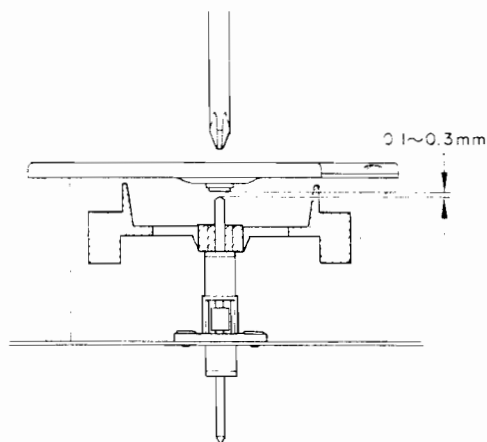
* FF/REW Motor

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



7. Flywheel Thrust

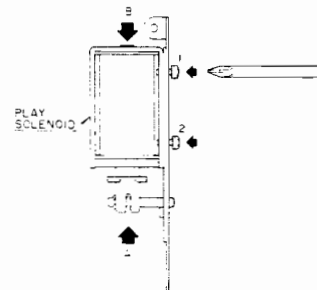
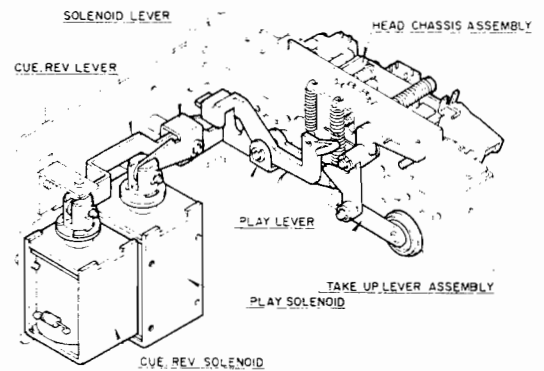
Adjust the thrust screw at the flywheel bracket until the clearance between the capstan tail end and thrust bearing is 0.1 to 0.3 mm as shown, using a Phillips screw driver. For adjusting, feel of axial dropping of the flywheel for proper clearance as this cannot be seen through. Then paint the screw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



8. Solenoid Adjustments

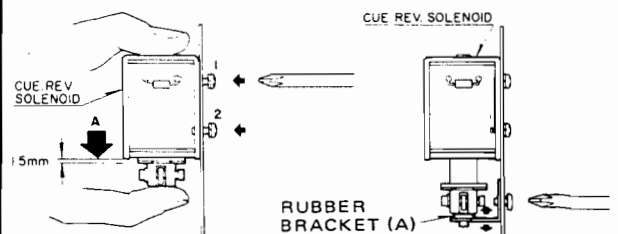
* Main Solenoid

1. Loosen the two Solenoid mounting screws.
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 tape-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).



* Cue/REW Solenoid

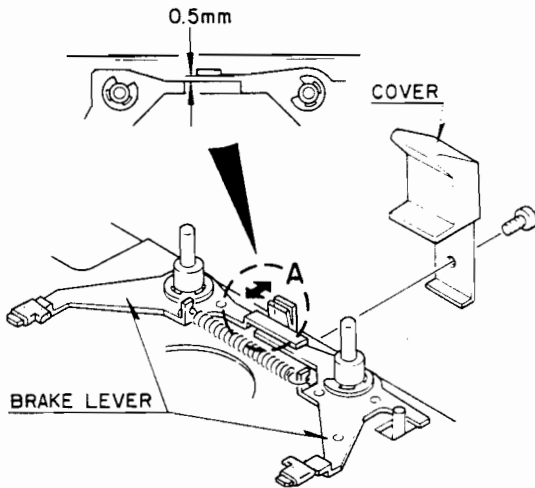
1. Move the head chassis by 1.5 mm from the extreme location where it was pushed.
2. Fasten the Solenoid in this new location. (However, the plunger should remain pushed as far in as possible.)
3. Fasten the mounting rubber bracket (A) so that the plunger touches the rubber when the head chassis moves back all the way.



5. MECHANICAL ADJUSTMENT

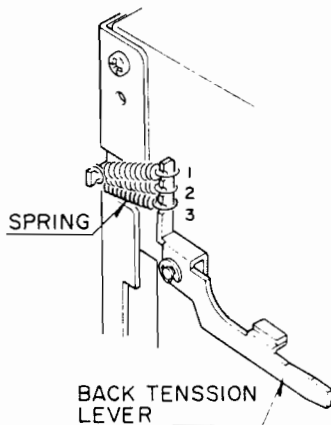
1. Brake Timing Adjustments

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.



2. Back Tension Adjustments

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



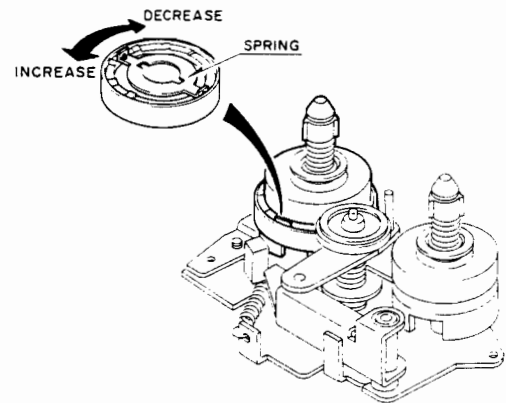
3. Play Torque Adjustment

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.

Torque can be adjusted by shifting position of the spring P/N 4397115040.

The torque ranges from 40 to 70 g-cm.



4. FF and REW Torques are not Adjustable

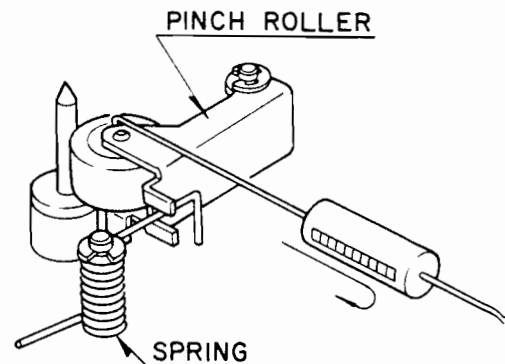
* If FF or REW functions are inadequate, renew the entire block, P/N 4397002420.

* When the motor (Reel motor M002) is worn, FF and REW modes may not function properly. In such a case, renew the motor.

5. Pinch Roller Pressure

$330g \pm 50g$

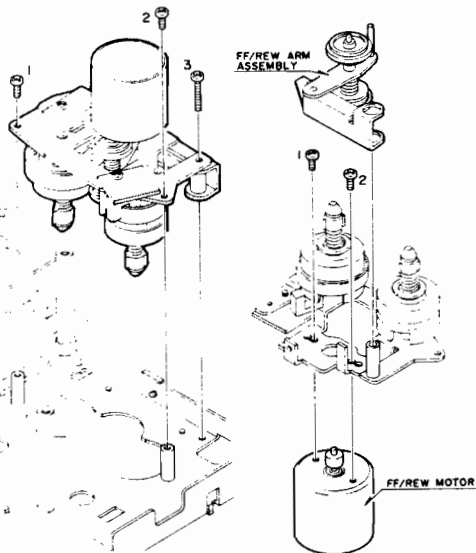
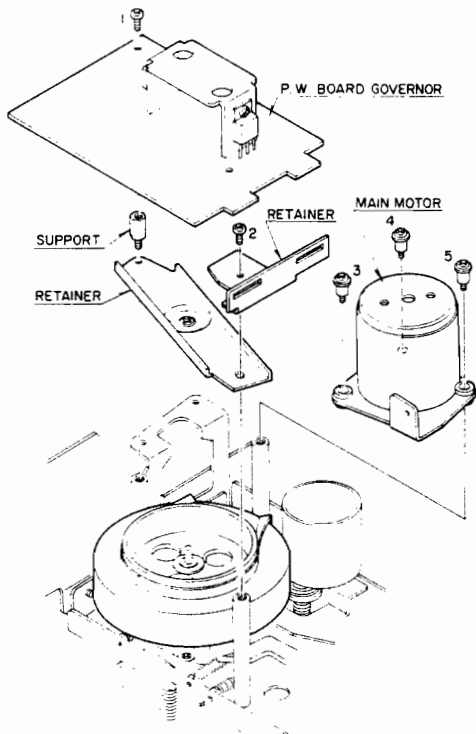
Measure the pressure of the pinch roller using a gauge as shown. For measurement, draw the pinch roller in the arrow direction in which it is detached from the capstan shaft and gradually return it toward the capstan. Read the gauge at the time when the pinch roller starts turning. The standard pressure is $330g \pm 50g$.



X

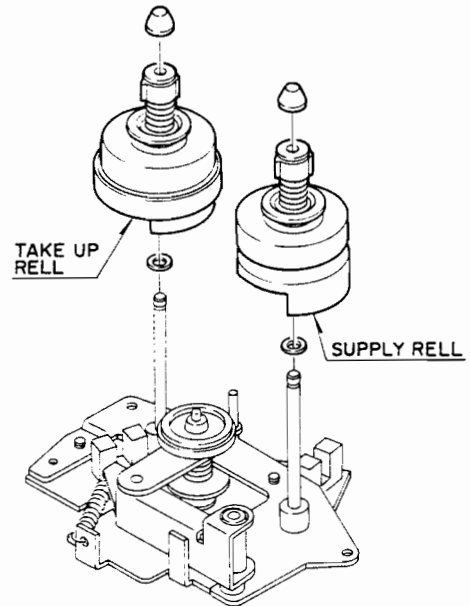
4. Detaching the FF/REW Motor

1. Remove the mechanism block.
2. Remove the solenoid mounting bracket.
3. Remove the main motor mounting bracket.
4. Remove the flywheel (For flywheel detaching procedures, refer to paragraph 9 on Page 29).
5. Remove the 3 FF/REW motor mounting screws, (1), (2), and (3).
6. Remove the 2 mounting screws, (1) and (2), for the motor mounted on the motor mounting bracket.



5. Detaching the Supply and Tape-up Real Disk

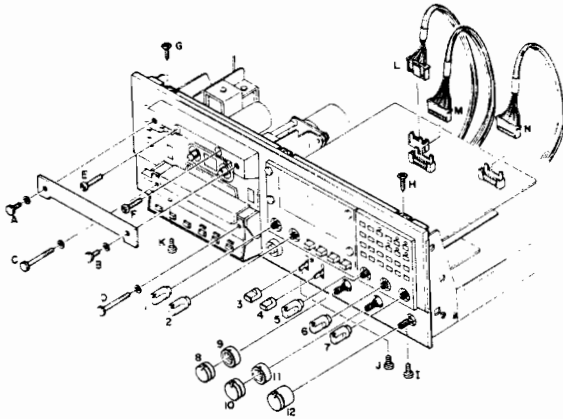
1. Remove the caps A holding the reel disks in place.
2. Release the brake lever and remove the reel disks.



4. DISASSEMBLE

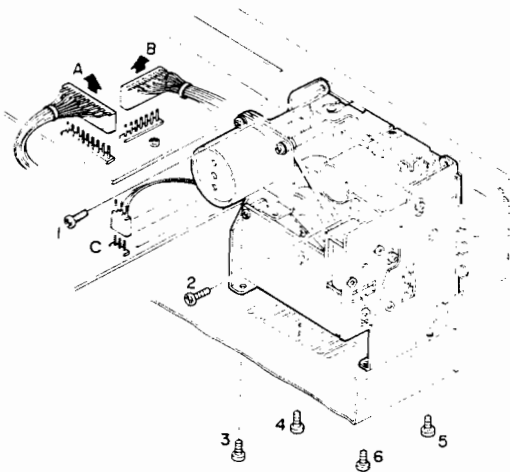
1. Removing the Front Panel

Remove the 12 knobs 1 ~ 11 and 12. Then, remove the 10 screws A, B, C, E, F, G, H, I, J and K. Then, remove the two connector L, M, N.



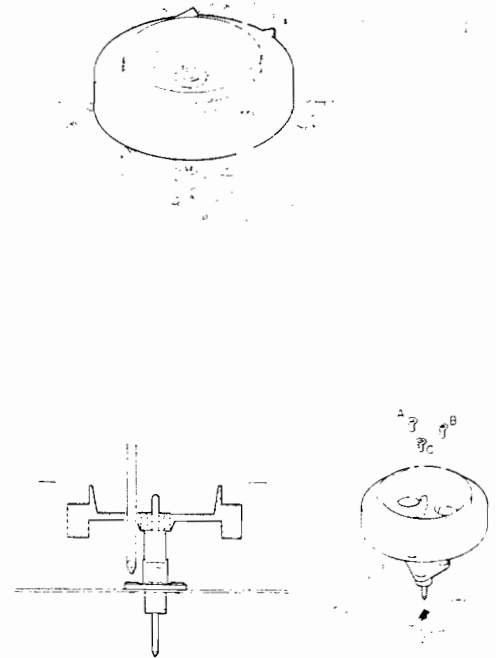
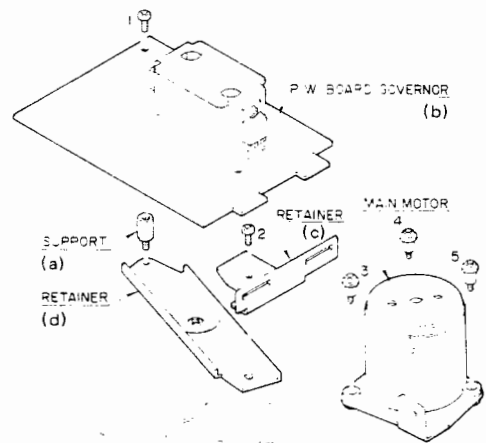
2. Removing the Mechanism Chassis

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



3. Detaching the Flywheel

1. Remove the single mounting screw (1) of the printed wiring board (b).
2. The printed wiring board can now be detached.
3. Remove the support (a) and the single attaching retainer (c) mounting screw (2).
4. The flywheel support retainer (d) can now be detached.
5. Remove the motor mounting bracket (3 screws).
NOTE: Take care to avoid oil getting on the motor belt.
6. Insert a screwdriver through the 3 holes in the flywheel.
7. Remove the 3 spindle bearing mounting screws (A), (B), (C).
8. The flywheel can be detached.



(5) Timer cycle OFF-ON

The tape deck starts operating at the time preset in the timer. This feature is used when using the deck as an alarm or for unattended tape recording. (In this case, the timer-off time should be cleared. When the memory is cleared, the display indicates 0:00. The timer-off function does not function at 0:00).

- a. When the POWER switch is OFF during timer ON stand-by: At the timer ON time, the power supply of the tape deck is turned on. The external devices are also supplied with AC power.
- b. When the POWER switch is ON during timer ON stand-by: AC power is supplied to the tape deck and the external devices.
- c. When the TIMER switch is in the REC position: At timer ON, the tape deck functions as follows (the parentheses indicate operation when the erasure prevention tabs have been removed from the cassette).

Condition 1:	REC/PLAY (PLAY)
Condition 2:	PLAY (Counter memory and program are not possible.)
Condition 3:	PLAY (PLAY Operations are not possible.)
Condition 4:	PLAY (PLAY) "

- d. When the TIMER switch is in the OFF position: The power is controlled by the TIMER ON signal.
- e. When the TIMER switch is in the PLAY position: At timer ON, the tape deck functions as follows.

Condition 1:	PLAY
Condition 2:	Counter memory play operation
Condition 3:	Program play operation
Condition 4:	Program play operation

(6) Timer cycle ON-OFF

Set the tape deck to the PLAY or REC/PLAY mode. The tape deck stops at the preset time. This feature is also used for sleep timer operation.

At timer OFF, the tape deck stops. The tape deck also stops if the tape reaches its end before the timer OFF time. To turn off the AC power at the timer OFF time, proceed as follows:

- a. Turn the POWER switch ON.
- b. Store the timer OFF time, then press the TIMER key to start the timer.
- c. Set the deck to the REC/PLAY mode.
- d. At timer ON, the deck is set to the PLAY or REC/PLAY mode. Turn the POWER switch OFF.
- e. At timer OFF, the tape stops and, at the same time, the AC power to the tape deck and the external devices is turned off.

(7) Timer cycle OFF-ON-OFF

At timer ON, the tape deck is set to the PLAY or REC/PLAY mode; at the timer OFF, the tape deck stops. This feature is also used when using the deck as an alarm or for unattended tape recording. In this case, the timer OFF function is added to the timer cycle OFF-ON in the above item (5). The tape deck stops when the tape reaches its end before the timer OFF time.

If the POWER switch is OFF, the power remains on until the timer OFF time is reached even when the tape stops automatically at the end of the tape.

Note that the timer OFF time should be set to a time later than the timer ON time.

(8) Timer cycle ON-OFF-ON

If the tape deck is in the PLAY or REC/PLAY mode, it will stop at the timer OFF time, and start again at the timer ON time. This feature is also used for sleep timer operation or when used as an alarm. The timer ON time should be set to a time later the timer OFF time. If it is not required to interlock the timer with the power supply, leave the POWER switch in the ON position with the tape deck started, then set the timer OFF and ON times so that the timer operation command is given by the TIMER key.

To interlock the timer with the power supply, use the following procedure:

- a. Turn the POWER switch ON.
- b. Store the timer ON and OFF times, then press the TIMER key.
- c. Set the tape in the PLAY or REC/PLAY mode.
- d. Turn the POWER switch OFF.

(9) Timer setting (special case)

When the hour display is other than 1 through 12, an error signal is generated as noted in section 5.3 "CLOCK SET".

However, the clock can be set to 0:00 only in the following cases.

- * The power is connected to the tape deck and the CE/RESET key is pressed after the POWER switch is set to ON.
- * At the CLOCK SET position of the SELECTOR switch, the CE/RESET key is pressed after the PM key has been pressed.

In either case, the clock starts operating when the CE/RESET key is pressed. Therefore, the timer ON and OFF times can be set using the time when the CE/RESET key is pressed as a reference. In this case, the setting time should be between 1:00 and 11:59, 12:00 PM and 11:59 PM, or 12:00 and 12:59.

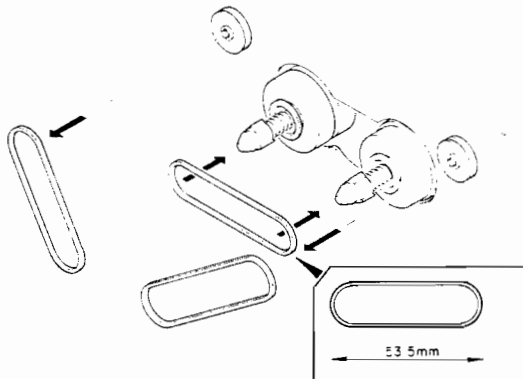
(10) Others

- a. When the time on the clock coincides with the timer ON or OFF time during timer operation, the TIMER ON signal is switched momentarily from low level to high level, or vice versa. For example, if 9:05 is stored in memory and the time on the clock advances to 9:05, the TIMER ON signal is given momentarily. In this case, the TIMER ON signal remains the same even if 9:05 is stored in memory when the clock indicates 9:05.
- b. When the tape deck is in the PLAY or REC/PLAY mode during timer operation, the operating mode remains unchanged even if the TIMER switch is set to another position.

15. Adjustment of Reel Base Speed in FF/REW mode for Adjustment, Use a Digital Stroboscope

1. a. Set the tape in FF mode.
b. Adjust RM34 until the speed of the take-up reel base reaches 1070 rpm.
2. a. Adjust so that the speed of the take-up reel base is equal to the speed of the supply reel base.

Example 1: Use a rubber band as shown below.



2: Engage the rubber band with the reel bases as shown in the illustration.

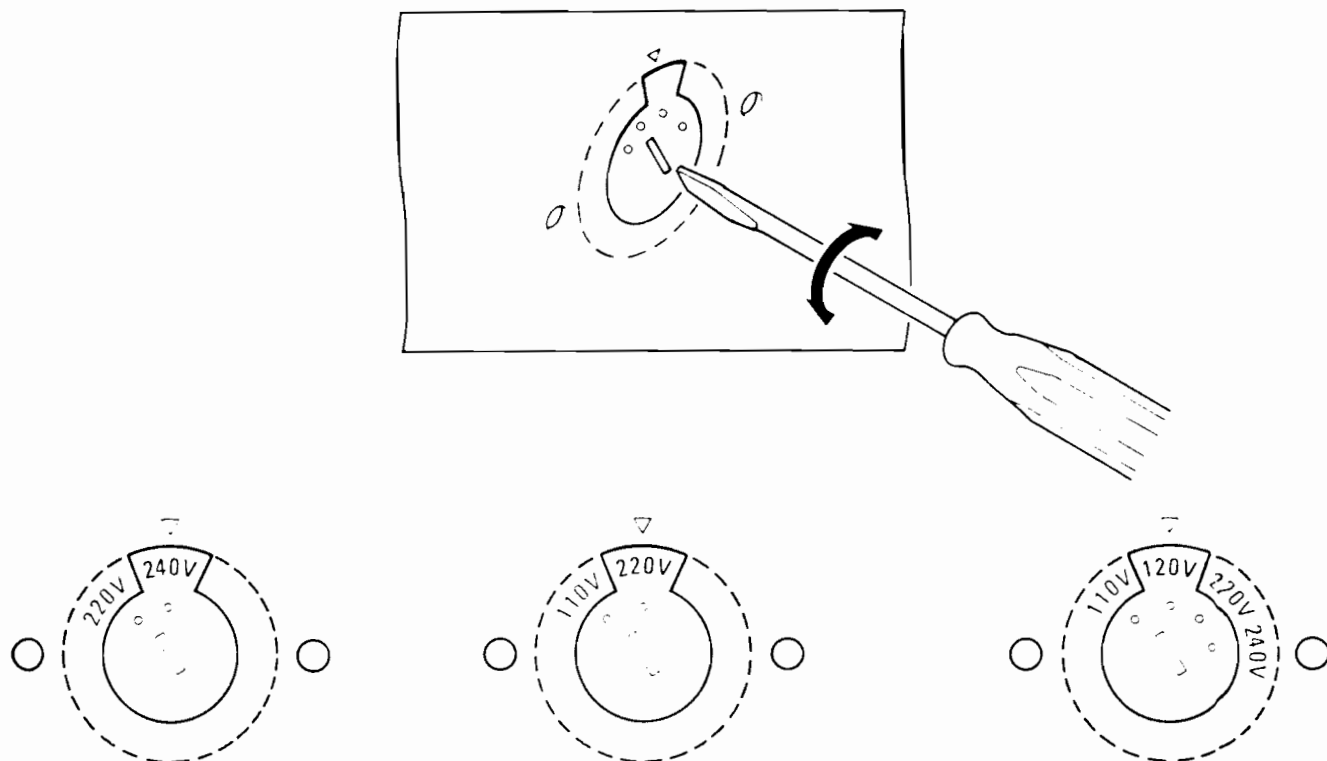
3: Before engaging the rubber band, remove the mechanism case.


- b. Set the tape in FF mode.
c. Adjust RM48 until the speed of the tape-up reel base reaches 700 rpm.

7. VOLTAGE CONVERSION FOR EUROPEAN MODEL

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

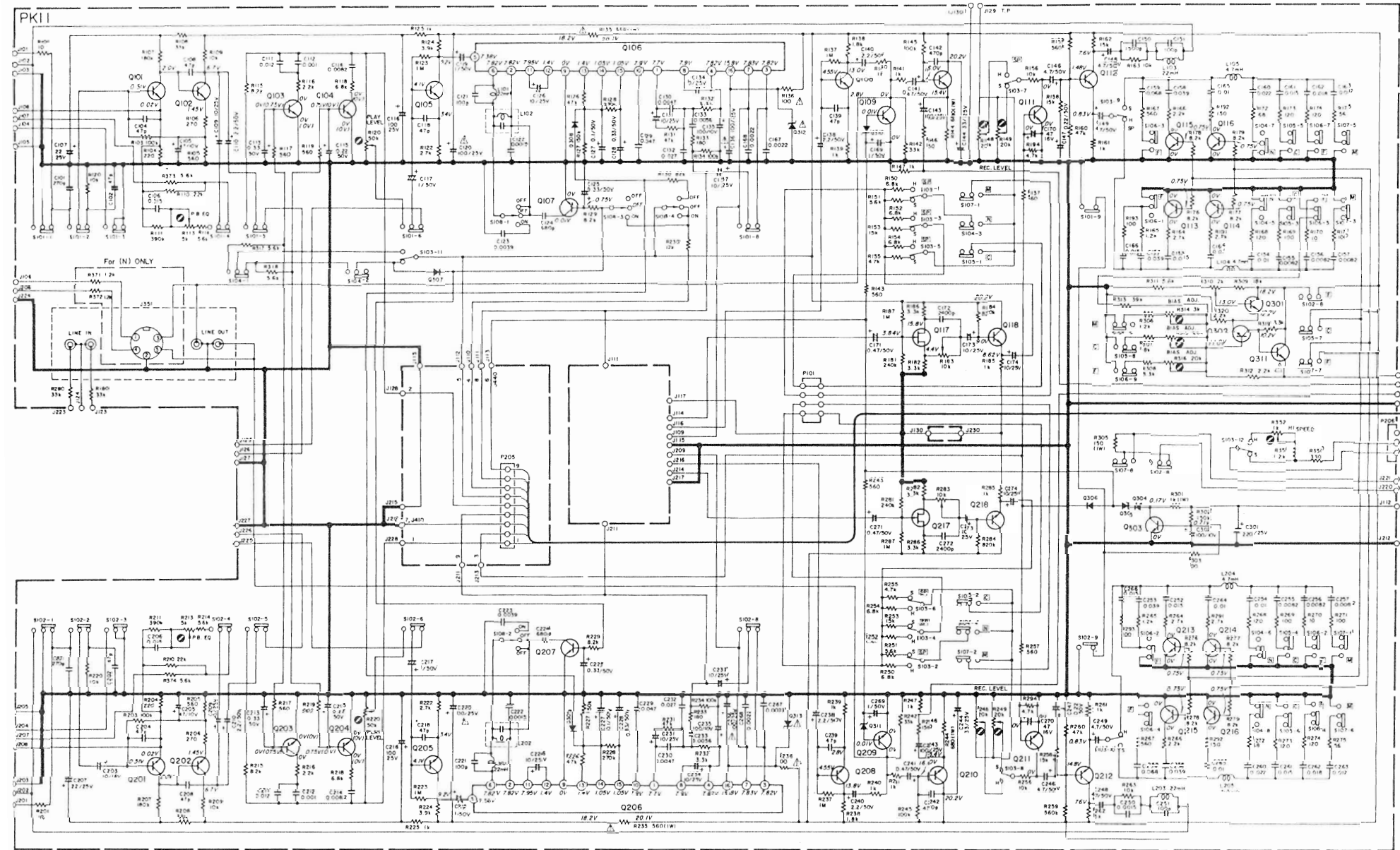
CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE. DO NOT DISASSEMBLE THE VOLTAGE SELECTOR ABSOLUTELY.



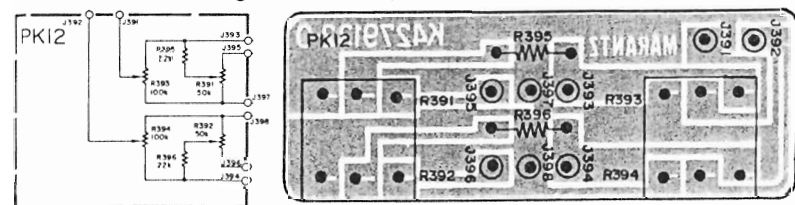
Note on safety: The parts marked with  are important parts on the safety. Please use the parts having the designated parts number without fail.

8. DIAGRAM AND COMPONENT LOCATIONS

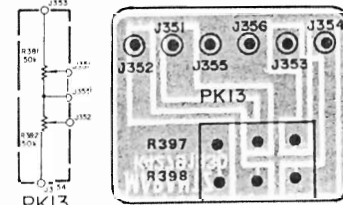
8.1 Pre Amp. Assembly (PK11) Schematic Diagram and Component Locations

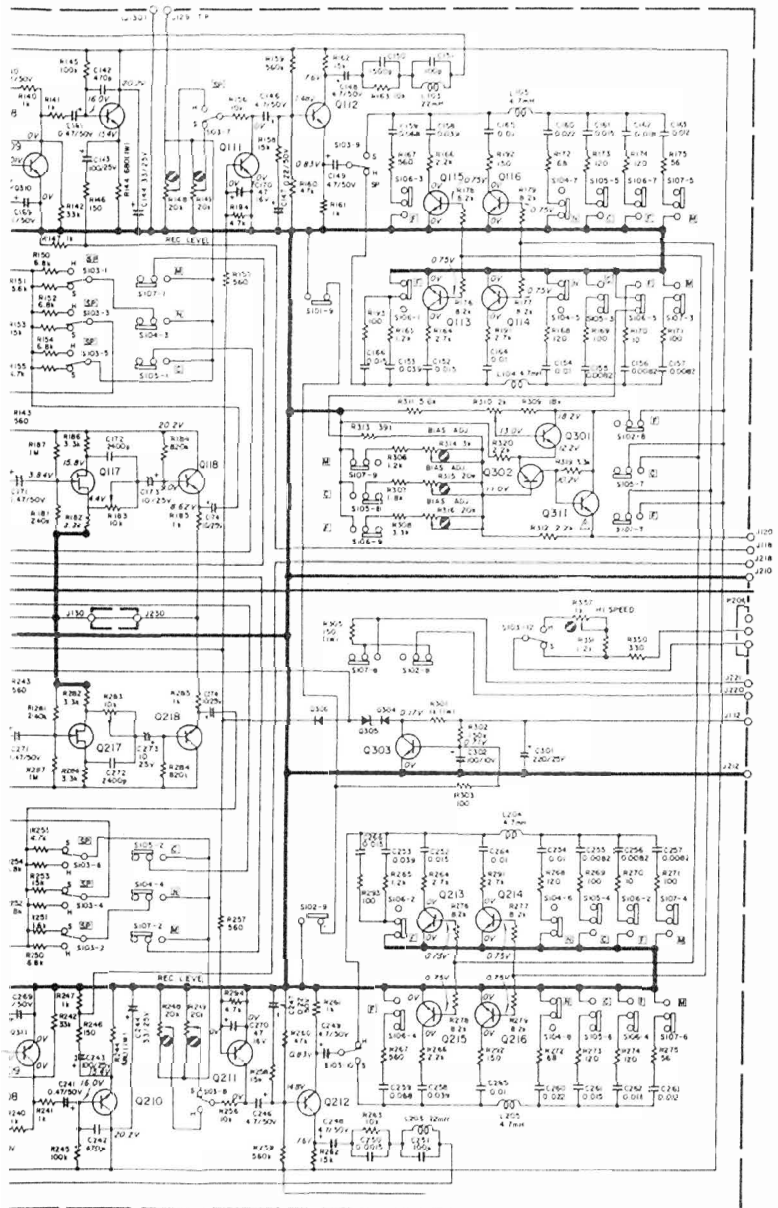


8.2 Mic Line Volume Assembly (PK12) Schematic Diagram and Component Locations

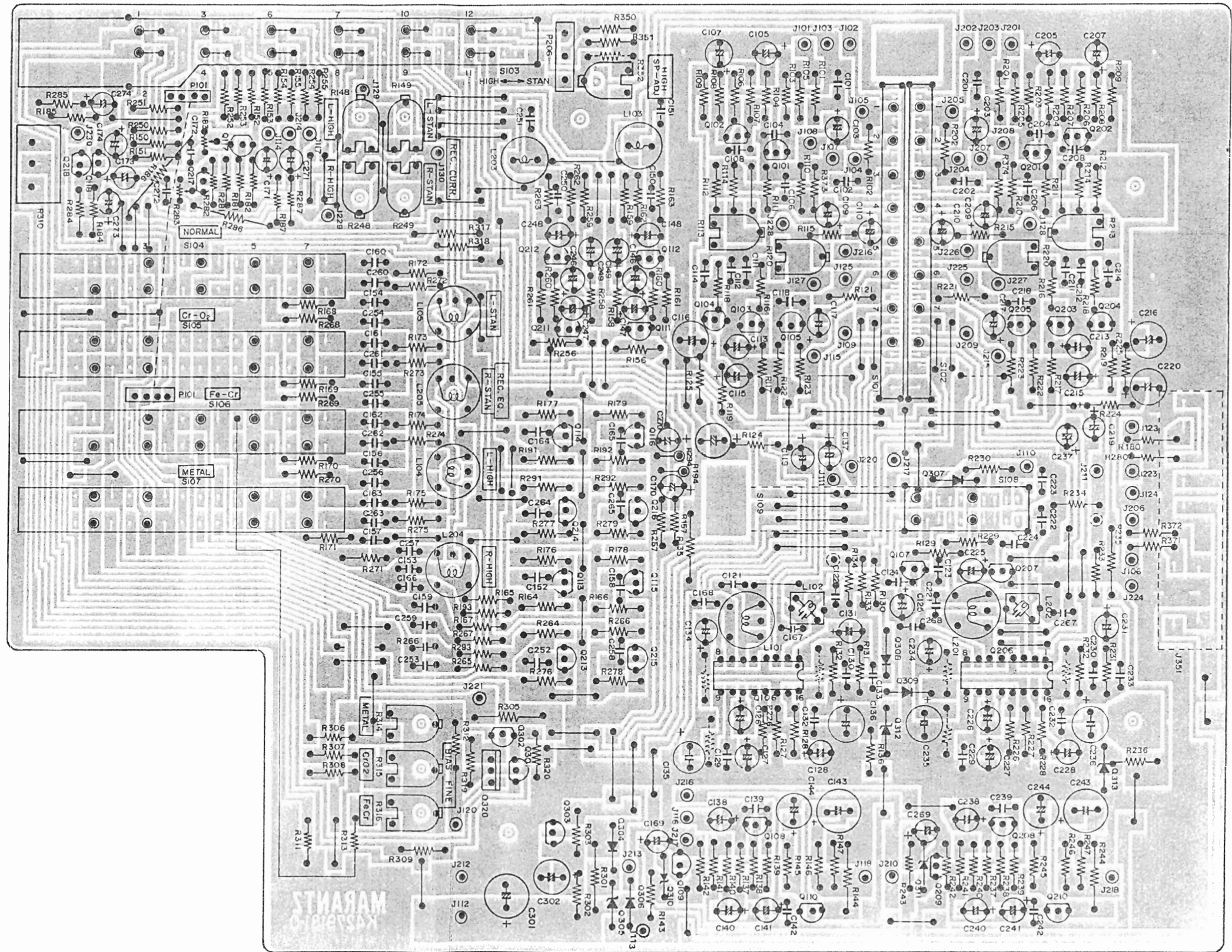


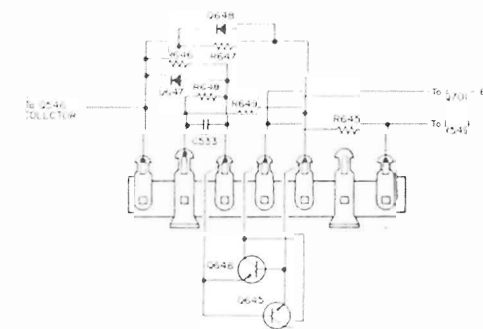
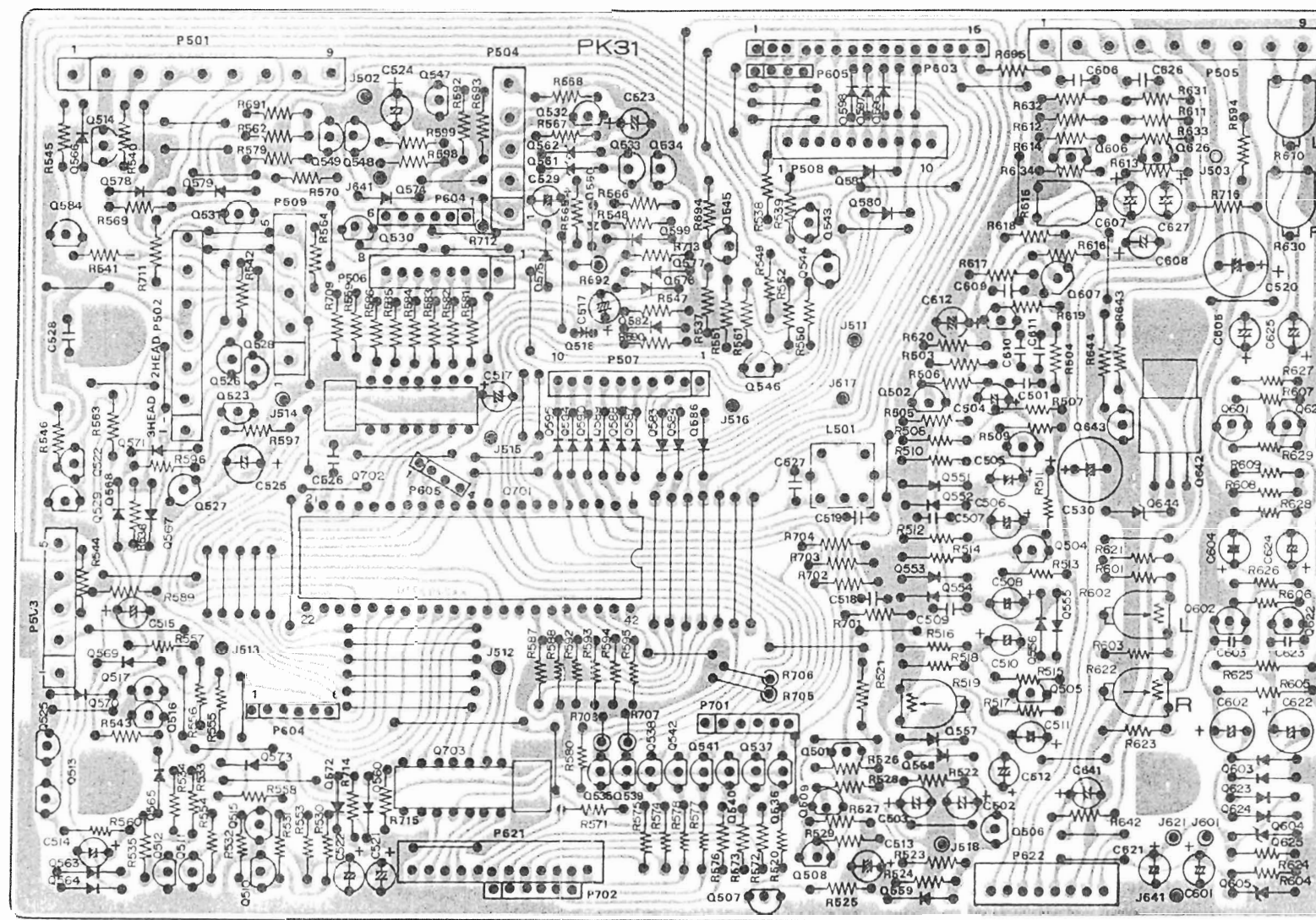
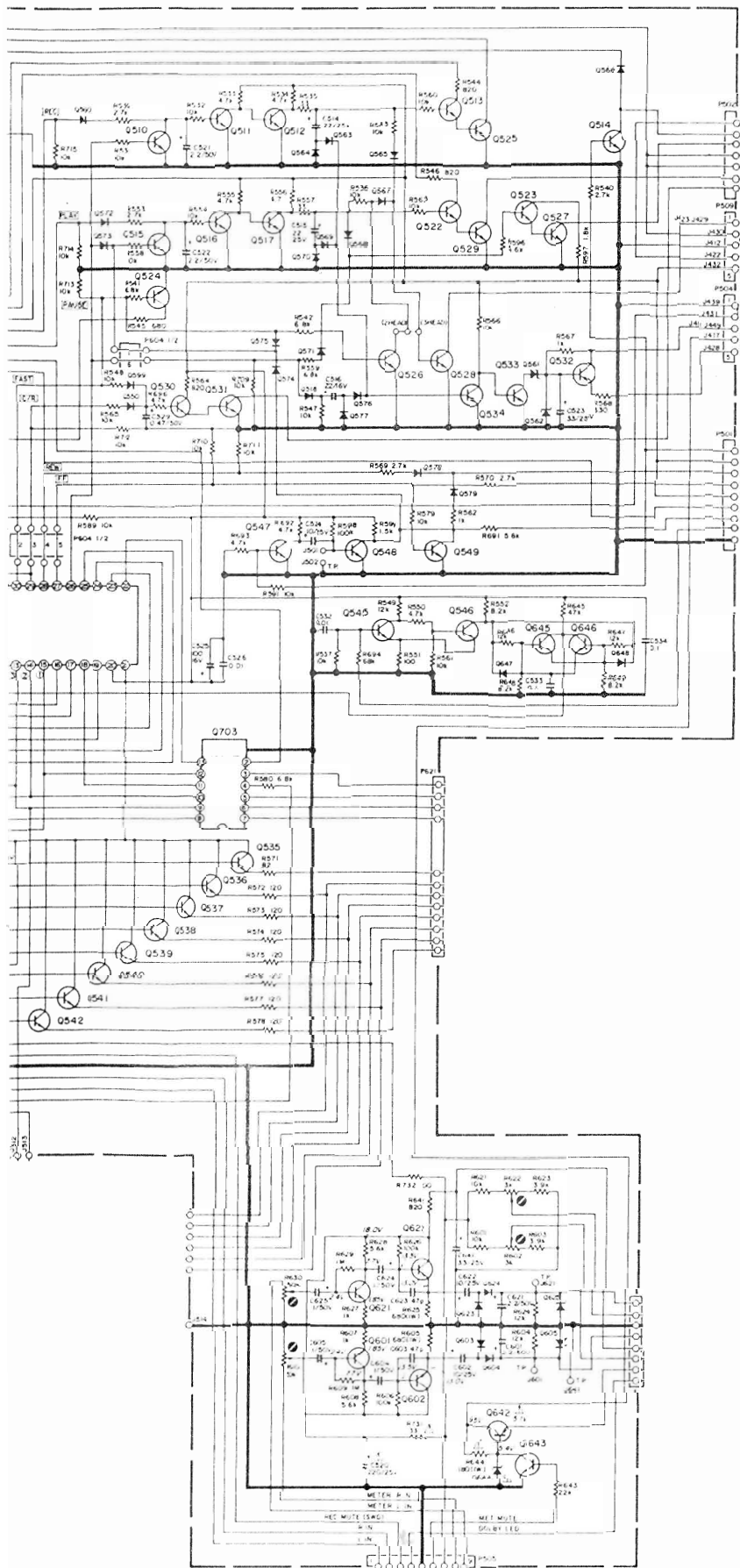
8.3 Output Volume Assembly (PK13) Schematic Diagram and Component Locations



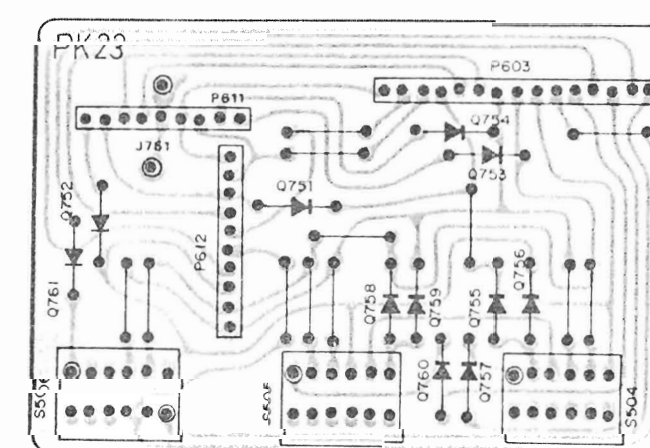
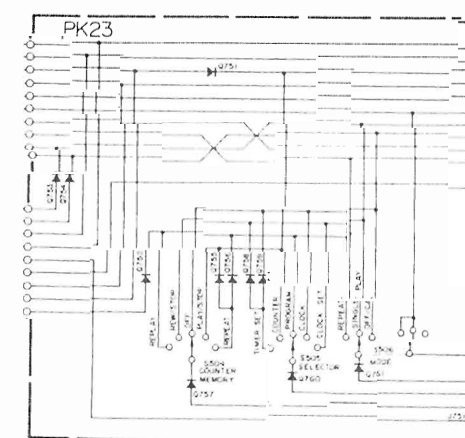


(PK13)
Component Locations

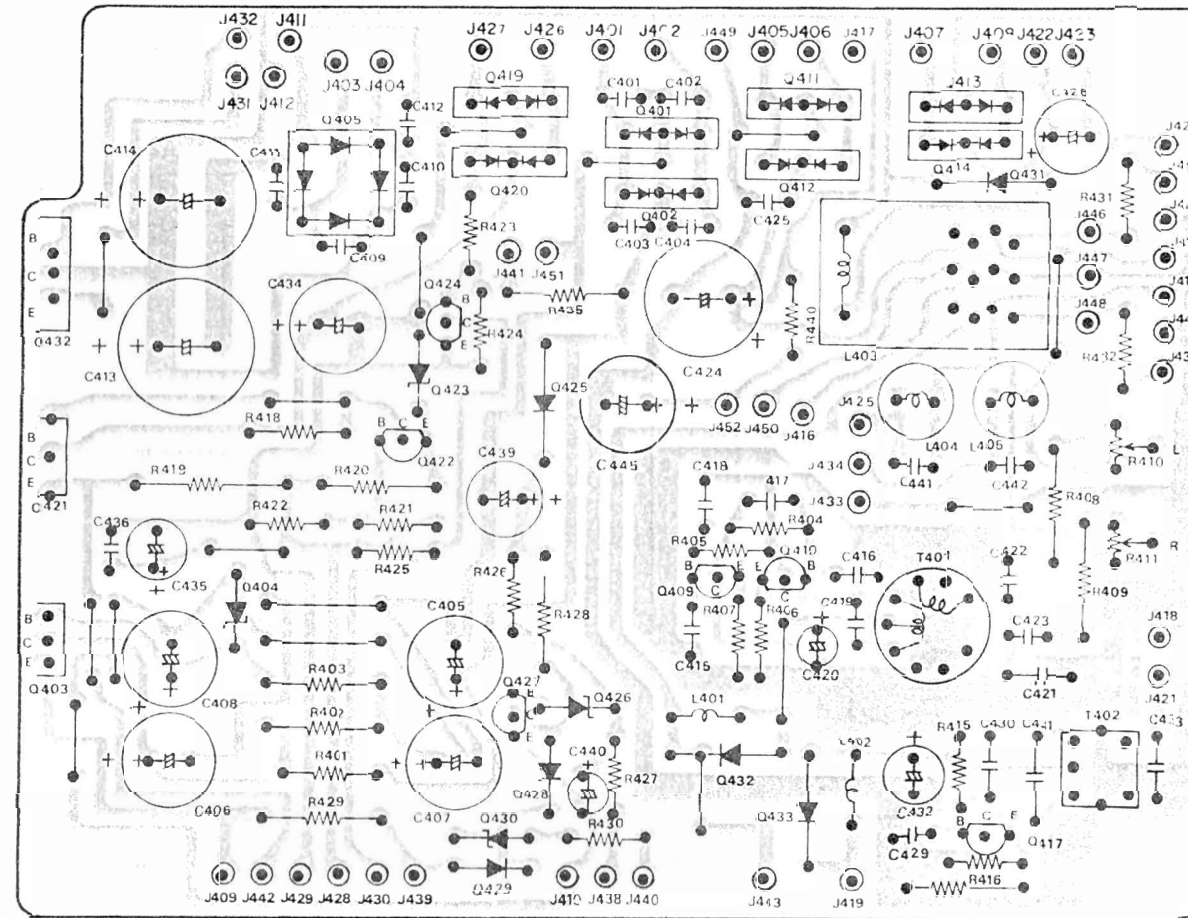
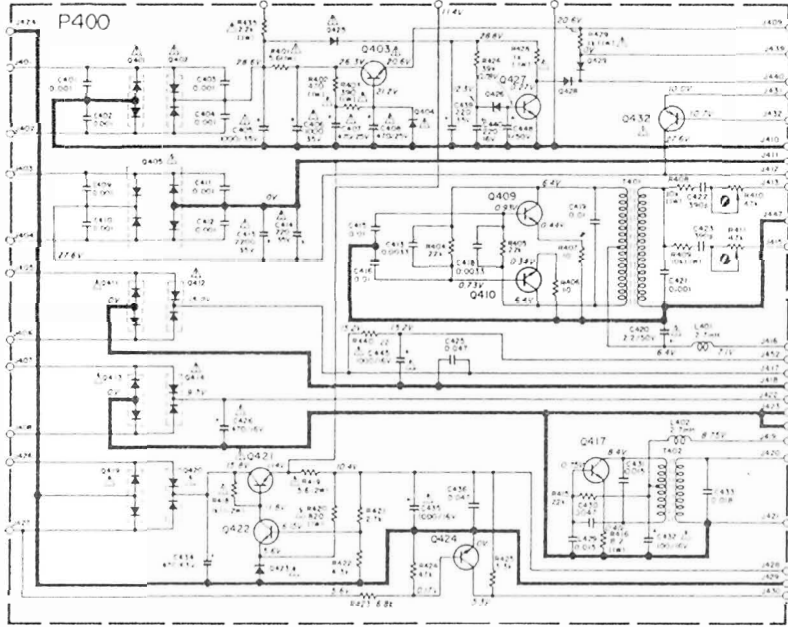




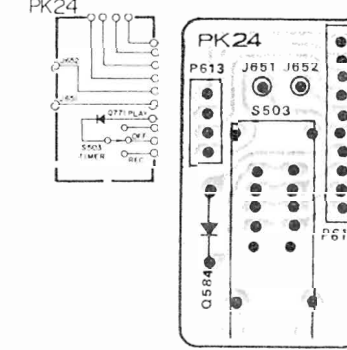
8.5 Program Selector Assembly (PK23) Schematic Diagram and Component Locations



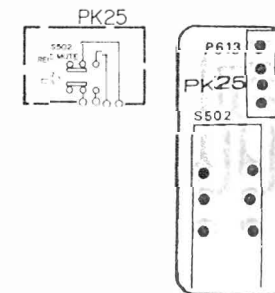
8.6 Power Supply and Bias OSC Assembly (P400) Schematic Diagram and Component Locations



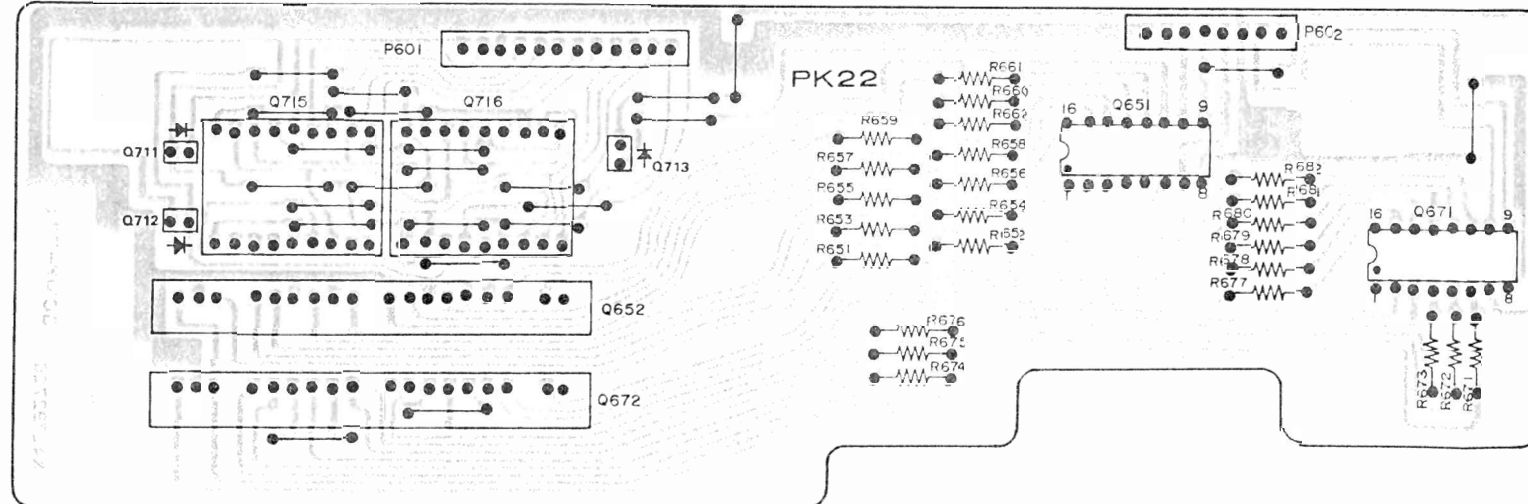
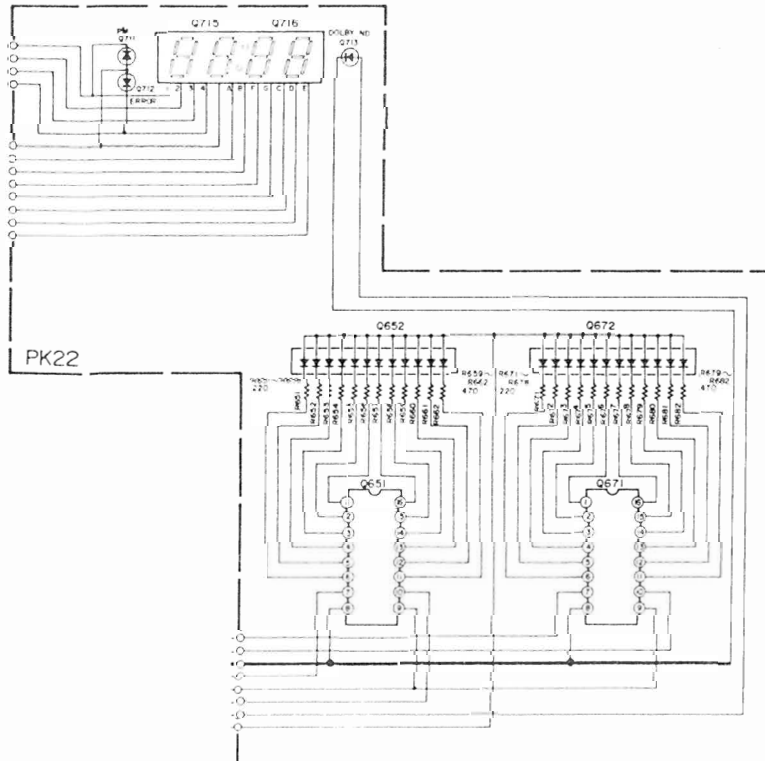
8.8 Timer Switch Assembly (PK24) Schematic Diagram and Component Locations



8.9 Rec-Mute Switch Assembly (PK25) Schematic Diagram and Component Locations

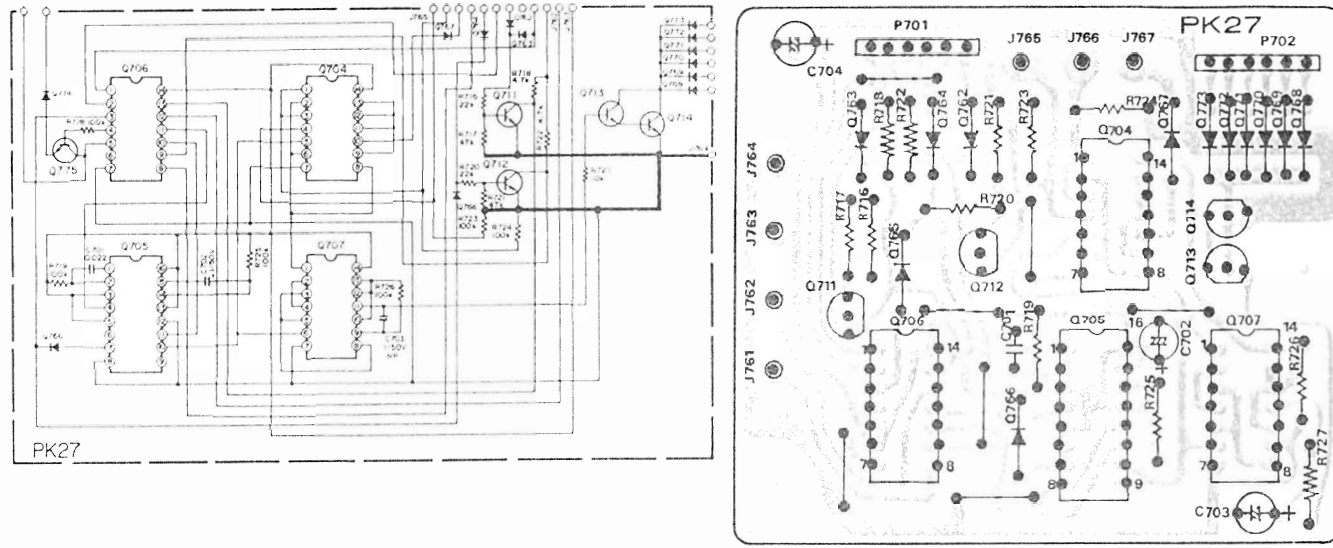


8.7 Digital and Meter LED Assembly (PK22) Schematic Diagram and Component Locations

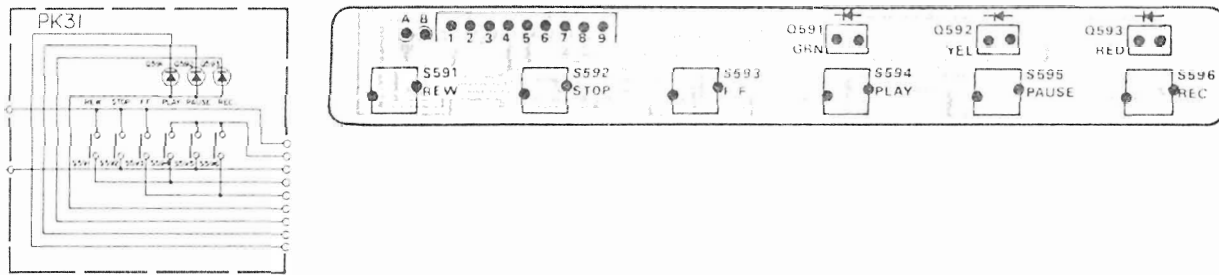


X

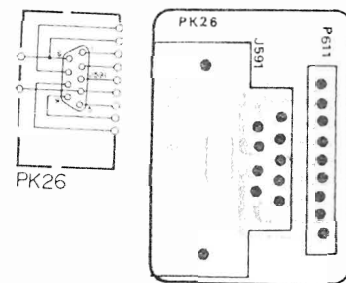
8.10 Program Select Assembly (PK27) Schematic Diagram and Component Locations



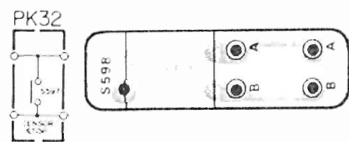
8.11 Logic Control Assembly (PK31) Schematic Diagram and Component Locations



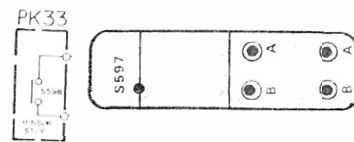
8.12 Remote Jack Assembly (PK26) Schematic Diagram and Component Locations



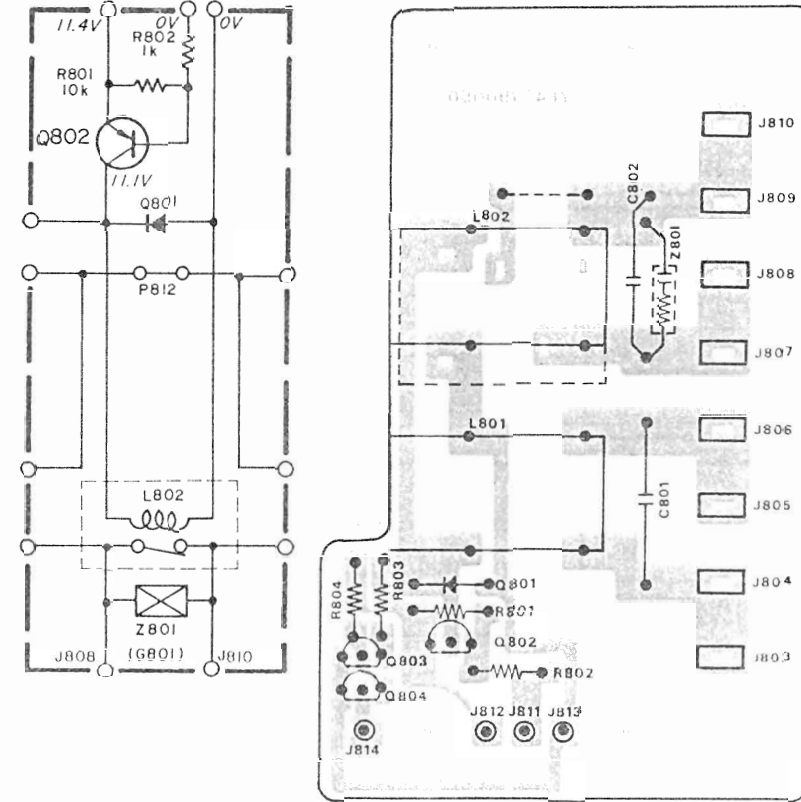
8.13 Safety Switch Assembly (PK32) Schematic Diagram and Component Locations



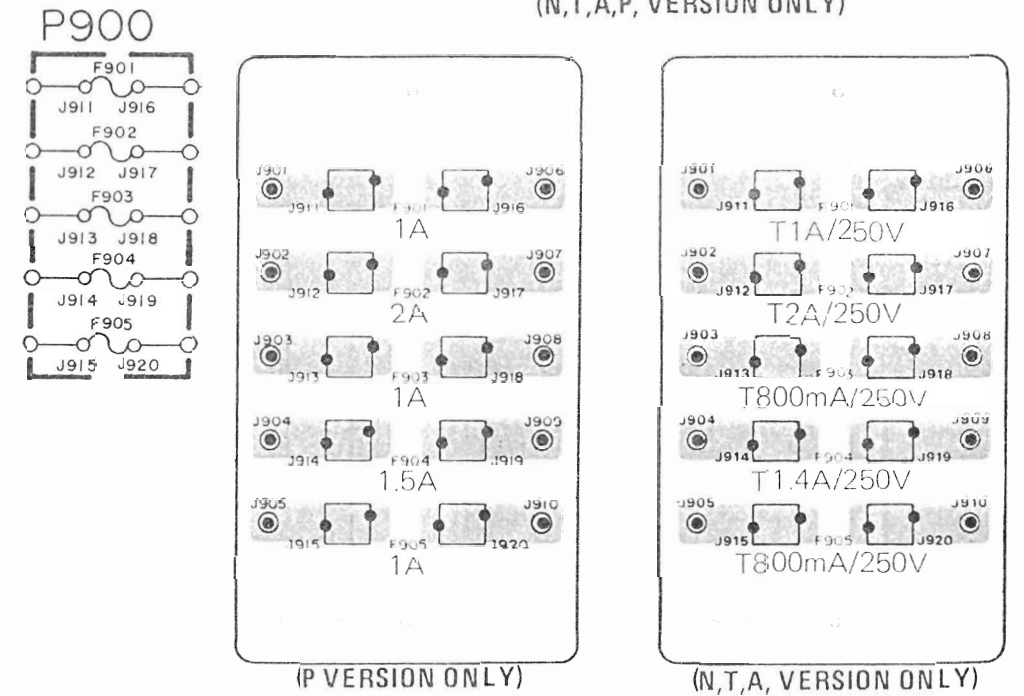
8.14 Safety Switch Assembly (PK33) Schematic Diagram and Component Locations



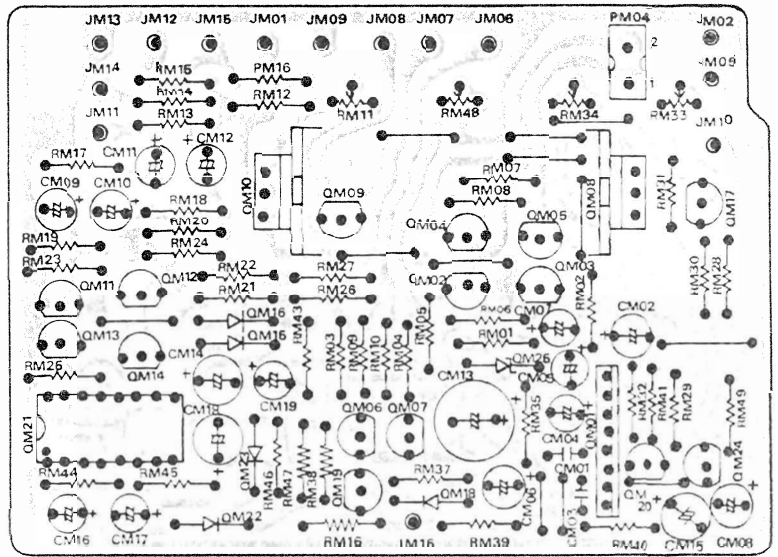
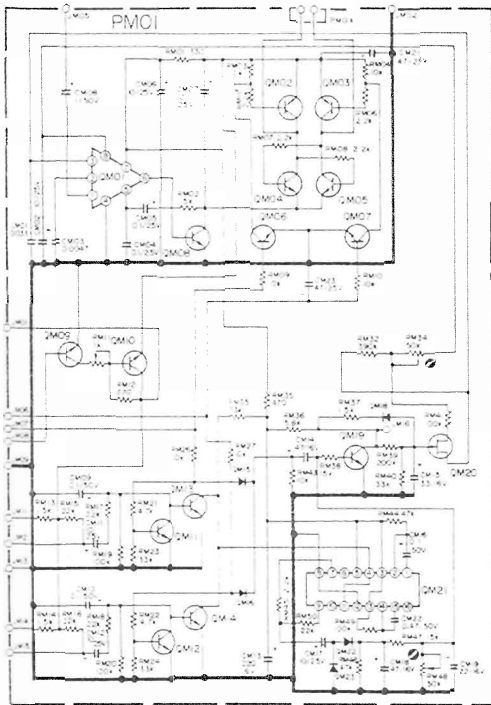
8.15 Timer Relay Assembly (P800) Schematic Diagram and Component Locations



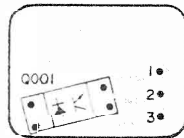
8.16 Fuse Assembly (P900) Schematic Diagram and Component Locations (N,T,A,P, VERSION ONLY)



8.17 Motor Governor Assembly (PM01) Schematic Diagram and Component Locations

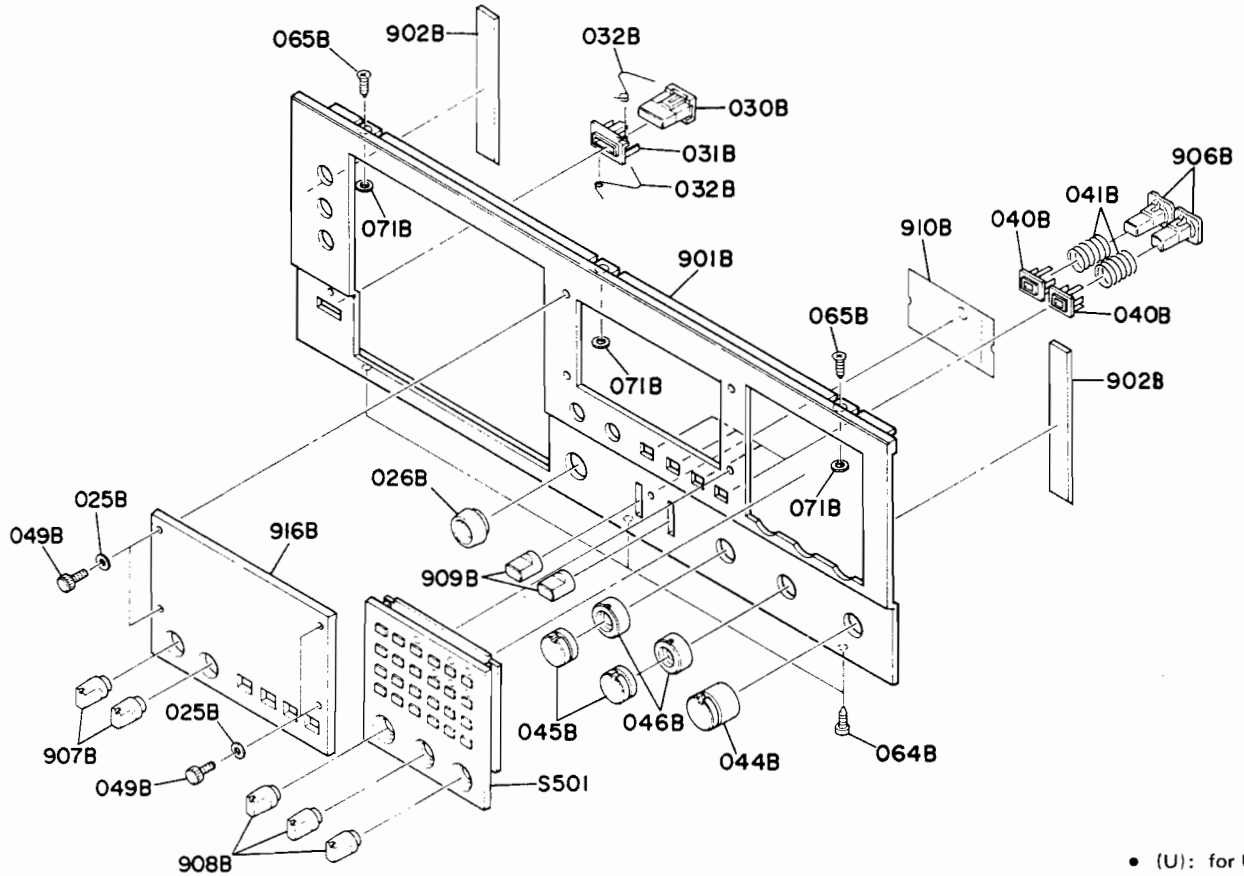


8.18 Photo Coupler Assembly (P001) Component Locations



10. EXPLODED VIEW AND PARTS LIST

• [P01-99] Front Panel

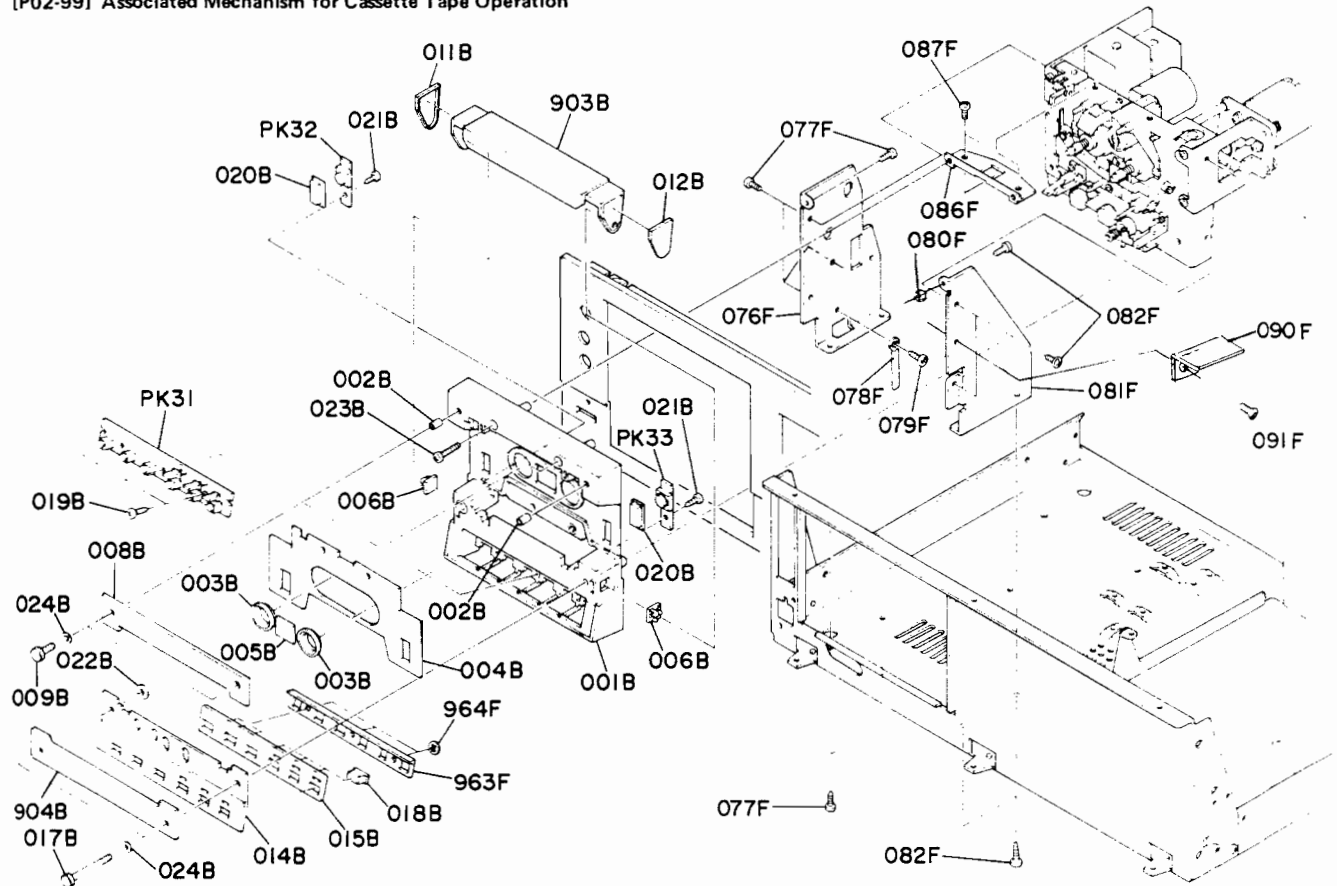


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
A	1	1			4279063400	Front Panel Assembly
A1			1	1	4279063410	Front Panel Assembly
026B	1	1	1	1	4276259010	Bush, Rec Mute
031B	1	1	1	1	2127259010	Bush, Power Switch
040B	4	4	4	4	2112259030	Bush, Tape Selector
901B	1	1			4279063010	Escutcheon, Front Panel
901B			1	1	4279063020	Escutcheon, Front Panel
902B	2	2	2	2	4279118010	Spacer
910B	1	1	1	1	4280107010	Sheet, Lever Switch

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
025B	4	4	4	4	59046502G9	Washer
030B	1	1	1	1	2127154010	Knob, Power Switch
032B	2	2	2	2	2127115010	Spring
041B	4	4	4	4	2112115010	Spring
044B	1	1	1	1	4278154010	Knob, Output
045B	2	2	2	2	4278154020	Knob, Record
046B	2	2	2	2	4278154030	Knob, Record
049B	4	4	4	4	4279112020	Shaft, Meter Window
064B	3	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
065B	2	2	2	2	51500306B0	F.H. Tapped Screw F3 x 6
071B	3	3	3	3	59030808P0	Washer
906B	4	4	4	4	4279154010	Knob, Tape Selector
907B	2	2	2	2	4276154010	Knob, Speed Bias
908B	3	3	3	3	4276154010	Knob
909B	2	2	2	2	2970154020	Knob, Lever Switch
916B	1	1	1	1	4279158010	Window, Dial
S501	1	1	1	1	SK10240010	Keyboard Switch

• [P02-99] Associated Mechanism for Cassette Tape Operation

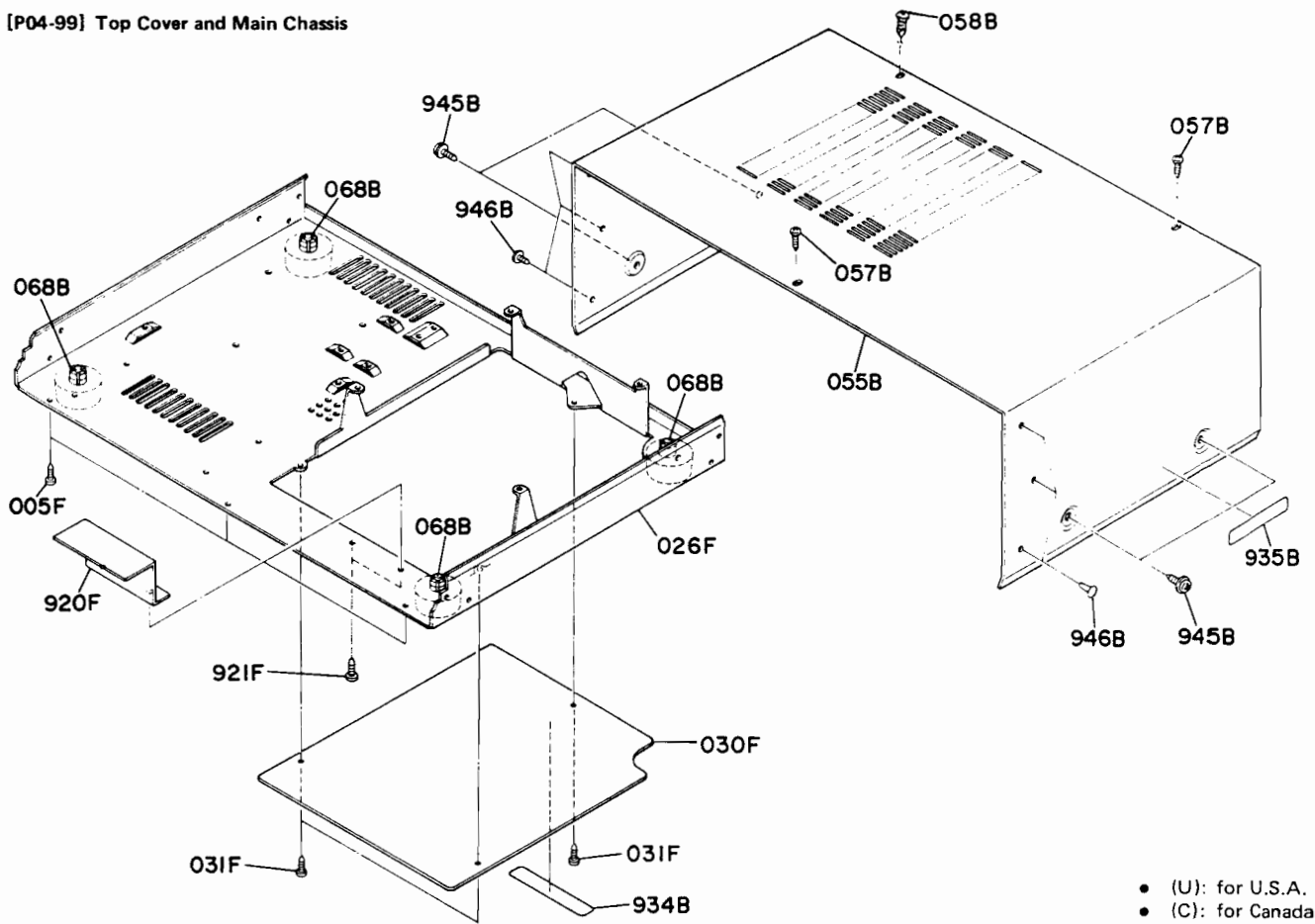


• (U): for U.S.A. • (N): for Europe
• (C): for Canada • (A): for Australia

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
B	1	1	1	1	4279053400	Cover Assembly
001B	1	1	1	1	4279053010	Cover, Mechanism
002B	2	2	2	2	65010306G0	Dodge Insert, S
003B	2	2	2	2	4279353010	Ring, Reel
004B	1	1	1	1	4279063050	Escutcheon, Cassette
005B	1	1	1	1	4279274010	Reflector
C	1	1	1	1	4279053410	Head Cover Assembly
011B	1	1	1	1	4279063060	Escutcheon, Head Cover (L)
012B	1	1	1	1	4279063070	Escutcheon, Head Cover (R)
903B	1	1	1	1	4279053020	Cover, Head
D	1	1	1	1	4279063420	Escutcheon Assembly
014B	1	1	1	1	4279063040	Escutcheon
015B	1	1	1	1	4279259010	Bush

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
006B	2	2	2	2	4279104010	Retainer
008B	1	1	1	1	4279063030	Escutcheon, Brand
009B	2	2	2	2	4279112020	Shaft
017B	2	2	2	2	4279112030	Shaft
018B	6	6	6	6	4279154020	Knob, Meca Button
019B	3	3	3	3	51282606B0	B.H. Tapped Screw B2.6 x 6
020B	2	2	2	2	4279154060	Knob, Sensor
021B	2	2	2	2	51282606B0	B.H. Tapped Screw B2.6 x 6
022B	1	1	1	1	4280121010	Link
023B	2	2	2	2	52730312S9	H.S. Head Bolt 3 x 12
024B	4	4	4	4	59046502G9	Washer
904B	1	1	1	1	4279158050	Window, Azimuth Cover
076F	1	1	1	1	4279160040	Bracket (L)
077F	6	6	6	6	51280306B0	B.H. Tapped Screw B3 x 6
080F	1	1	1	1	59030805P0	Washer
081F	1	1	1	1	4279160050	Bracket (R)
082F	5	5	5	5	5128030680	B.H. Tapped Screw B3 x 6
086F	1	1	1	1	4279160160	Bracket
087F	2	2	2	2	51060303A9	P.H.M. Screw P3 x 3
090F	1	1	1	1	4279104020	Retainer
091F	1	1	1	1	51280308B0	B.H. Tapped Screw B3 x 6
963F	1	1	1	1	4280104010	Retainer
964F	3	3	3	3	64020300C0	RG Ring, CS Type
078F	1	1	1	1	4220005030	Clamper
079F	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6

• [P04-99] Top Cover and Main Chassis

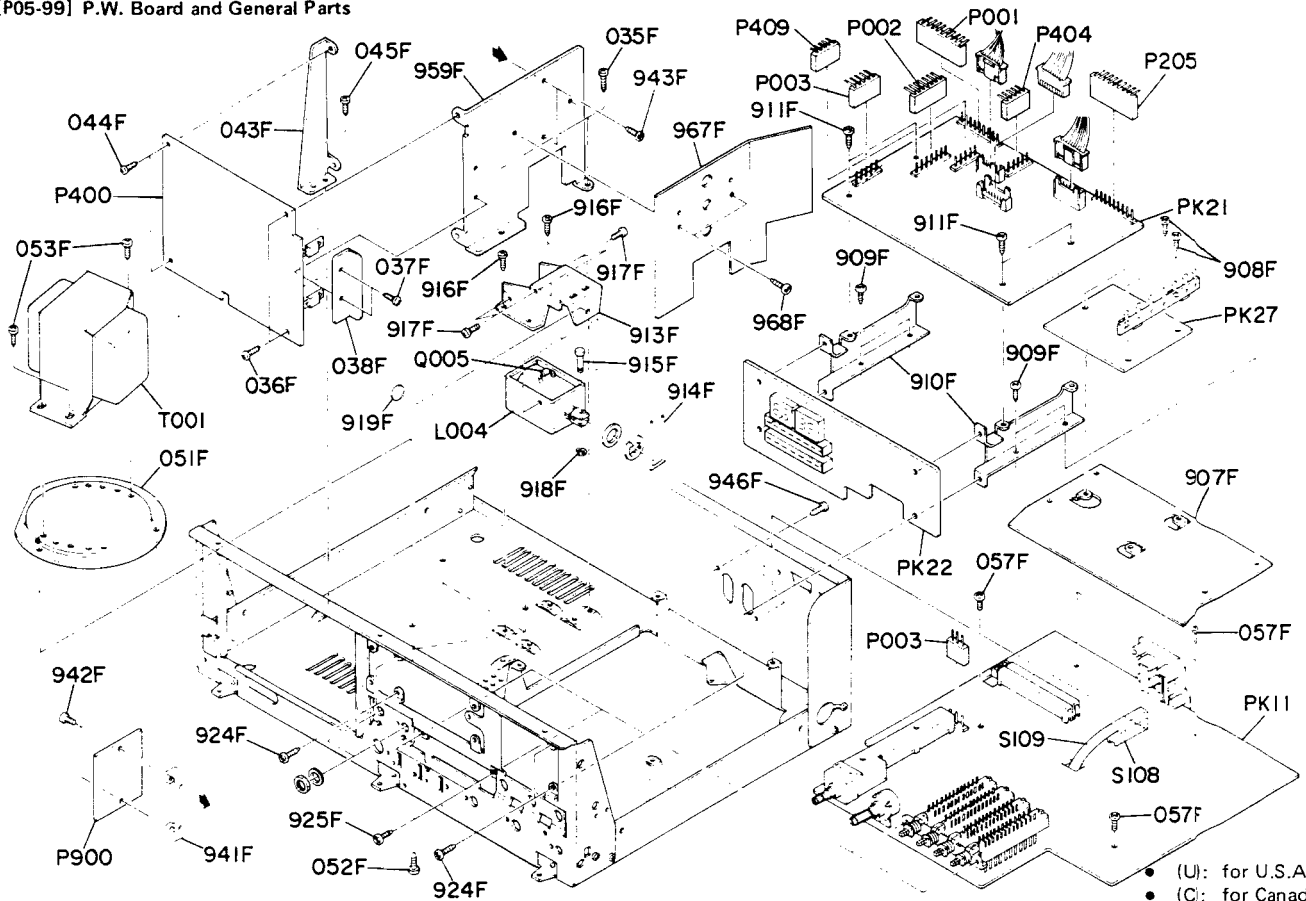


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
055B	1	1	1	1	4279257010	Lid, Top Cover
057B	2	2	2	2	51280308U0	B.H. Tapped Screw B3 x 8
058B	1	1	1	1	51280305U0	B.H. Tapped Screw
068B	4	4	4	4	2259057010	Leg
934B	1	1	1	1	3889861010	Label
934B	1	1	1	1	4113861020	Label
935B	1	1	1	1	2932861010	Label
935B	1	1	1	1	2911861140	Label
945B	4	4	4	4	51480406S9	F. Washer Screw 4 x 6
946B	6	6	6	6	2991259010	Bushing

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
005F	3	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
026F	1	1	1	1	4279105010	Chassis
030F	1	1	1	1	4279257020	Lid
031F	3	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
920F	1	1	1	1	4279109030	Shield
921F	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6

• [P05-99] P.W. Board and General Parts

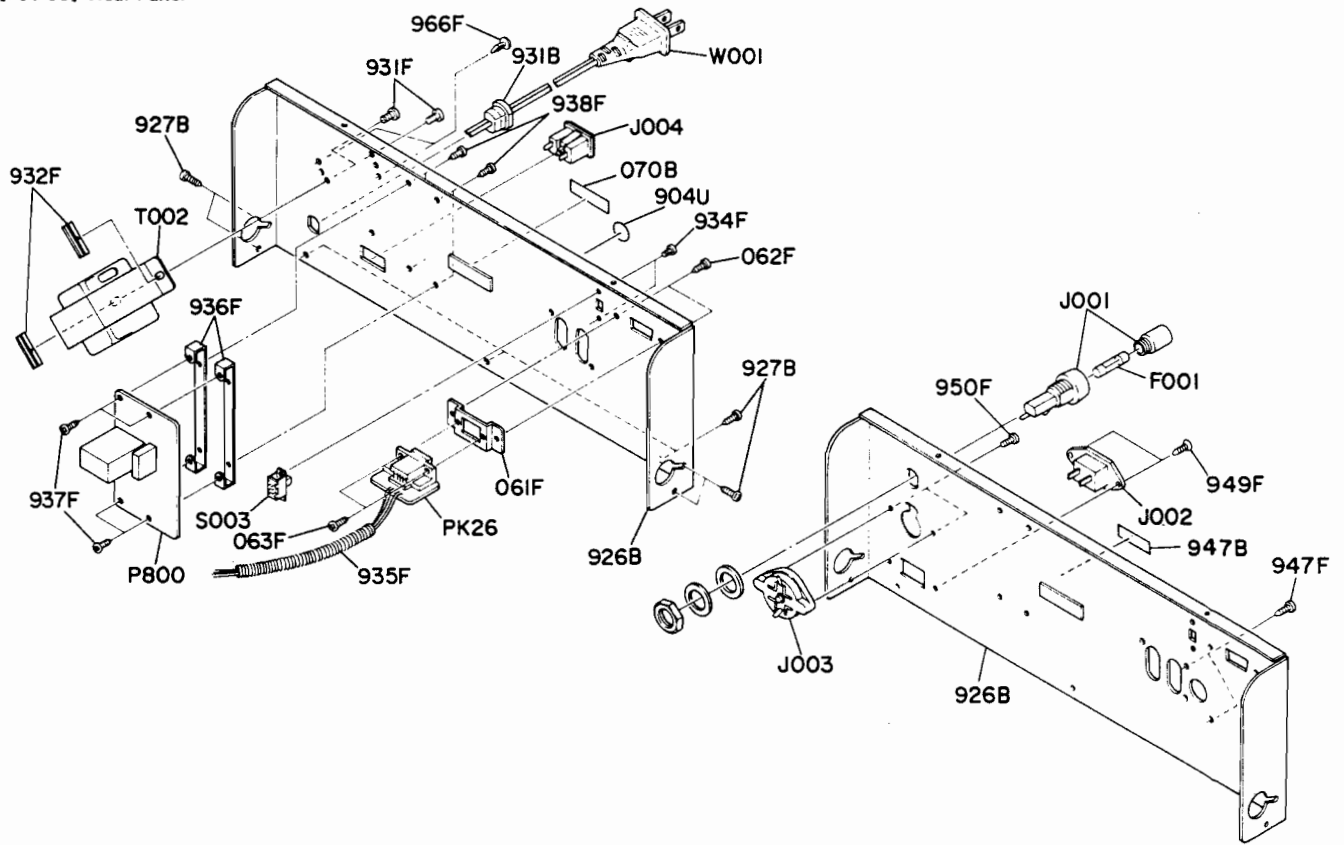


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
035F	2	2	2	2	51280308B0	B.H. Tapped Screw B3 x 8
036F	2	2	2	2	51280310B0	B.H. Tapped Screw B3 x 10
037F	2	2	2	2	51280310B0	B.H. Tapped Screw B3 x 10
038F	1	1	1	1	4279005010	Clamper
043F	1	1	1	1	4279160060	Bracket
044F	2	2	2	2	51280310B0	B.H. Tapped Screw B3 x 10
045F	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
051F	1	1	1	1	4279160110	Bracket, Transf.
052F	3	3	3	3	51280406B0	B.H. Tapped Screw B4 x 6
053F	4	4	4	4	51280408B0	B.H. Tapped Screw B4 x 8
057F	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
907F	1	1	1	1	4279109020	Shield
908F	3	3	3	3	51280306B0	B.H. Tapped Screw B3 x 6
909F	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
910F	2	2	2	2	4279160080	Bracket
911F	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
913F	1	1	1	1	4279160070	Bracket, Solenoid
914F	1	1	1	1	4279115020	Spring, Rec
915F	1	1	1	1	4279112010	Shaft
916F	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
917F	4	4	4	4	51100305A9	B.H.M. Screw B3 x 5
918F	1	1	1	1	64000200R0	RG Ring, E Type
919F	1	1	1	1	4279056010	Buffer
924F	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
925F	2	2	2	2	51100306A9	B.H.M. Screw B3 x 6
941F			1	1	3890160040	Bracket

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
942F			2	2	51100306A9	B.H.M. Screw B3 x 6
943F			2	2	51100306A9	B.H.M. Screw B3 x 6
946F	2	2	2	2	51280308U0	B.H. Tapped Screw B3 x 8
959F	1	1	1	1	4279267020	Heat Sink
L004	1	1	1	1	ME10630010	Solenoid Coil, Rec
Q005	1	1	1	1	HD20023100	Diode 10E-1
S108	1	1	1	1	SS04030130	Slide Switch
S109	1	1	1	1	SB11910010	Switch Band, FLX
± T001	1	1			TS16621010	Power Transformer
± T001			1	1	TS16621020	Power Transformer
P001	1	1	1	1	YJ06001430	Jack (9P)
P002	1	1	1	1	YJ06001260	Jack (7P)
P003	1	1	1	1	YJ06001040	Jack (3P)
P003	1	1	1	1	YJ06001250	Jack (5P)
P205	1	1	1	1	YJ06001070	Jack (9P)
P404	1	1	1	1	YJ06001250	Jack (5P)
P409	1	1	1	1	YJ06001250	Jack (5P)
967F	1	1	1	1	4279109050	Shield
968F	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6

• [P06-99] Rear Panel



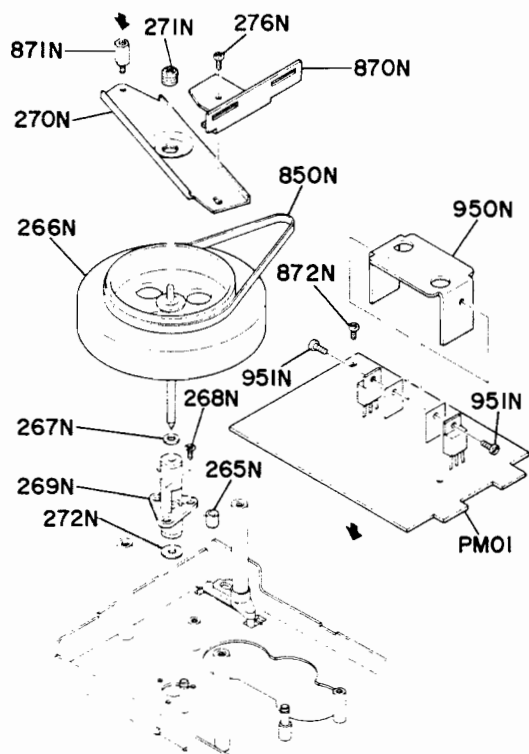
- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
070B	1	1	1	1	2112265010	Indicator, Serial No.
926B	1	1			4279160020	Bracket, Rear Panel
926B			1	1	4279160030	Bracket, Rear Panel
927B	7	7	7	7	51280306U0	B.H. Tapped Screw B3 x 6
931B	1	1			1455259030	Bushing
947B			1	1	4581861010	Label
061F	1	1	1	1	4279160120	Bracket, Remote Jack
062F	2	2	2	2	51280306U0	B.H. Tapped Screw B3 x 6
063F	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
931F	2	2	2	2	51100408S9	B.H.M. Screw B4 x 8
932F	2	2	2	2	2922005010	Clamper
934F	2	2	2	2	51100203S0	B.H.M. Screw B2 x 3
935F	1	1	1	1	4279109040	Shield
936F	2	2	2	2	3889160090	Bracket
937F	4	4	4	4	51100306A9	B.H.M. Screw B3 x 6
938F	4	4	4	4	51100306S9	B.H.M. Screw B3 x 6
947F			2	2	51280308U0	B.H. Tapped Screw B3 x 8
949F			2	2	51500308U0	F.H. Taptite Screw F3 x 8
950F			2	2	51280310U0	B.H. Tapped Screw B2 x 10
966F	2	2	2	2	74420029G0	Hole Plug
967F	1	1	1	1	4279109050	Shilde
968F	2	2	2	2	51280306B0	B.H. Tapped Screw

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
904U	1				9511101070	Label, UL
904U		1			2457861040	Label, CSA
⌆J001			1	1	YJ08000290	Jack, Fuse Holder
⌆J002			1	1	YP04000610	Plug, AC Inlet
⌆J003			1	1	BY05080010	Voltage Selector
⌆J004	1	1			YJ040000560	Jack, AC Outlet
S003	1	1	1	1	SS02020610	Slide Switch
⌆T002	1	1			TS15406240	Power Transformer
⌆T002			1	1	TS15406250	Power Transformer
⌆W001	1	1			YC02000140	A.C. Power Cord
⌆F001			1	1	FS10080800	Fuse 0.8A

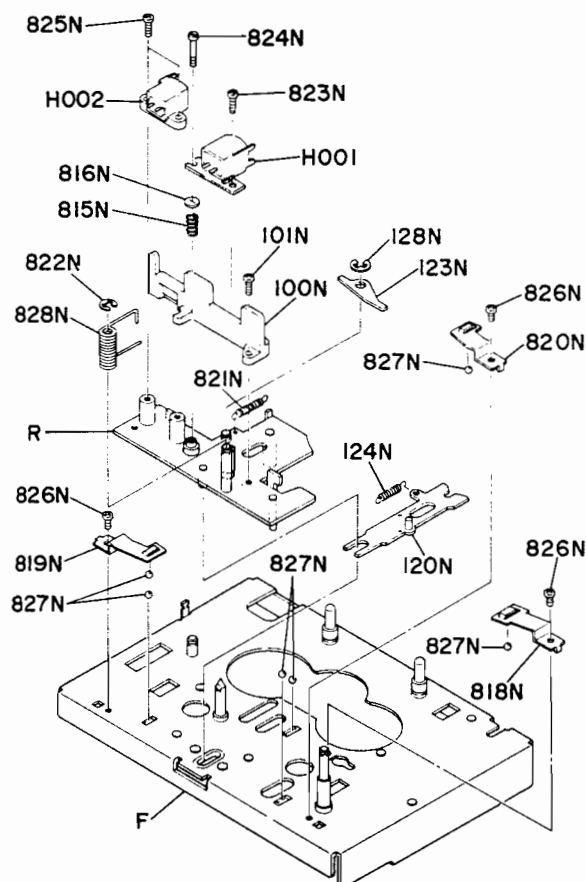
- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

• [P07-99] Flywheel



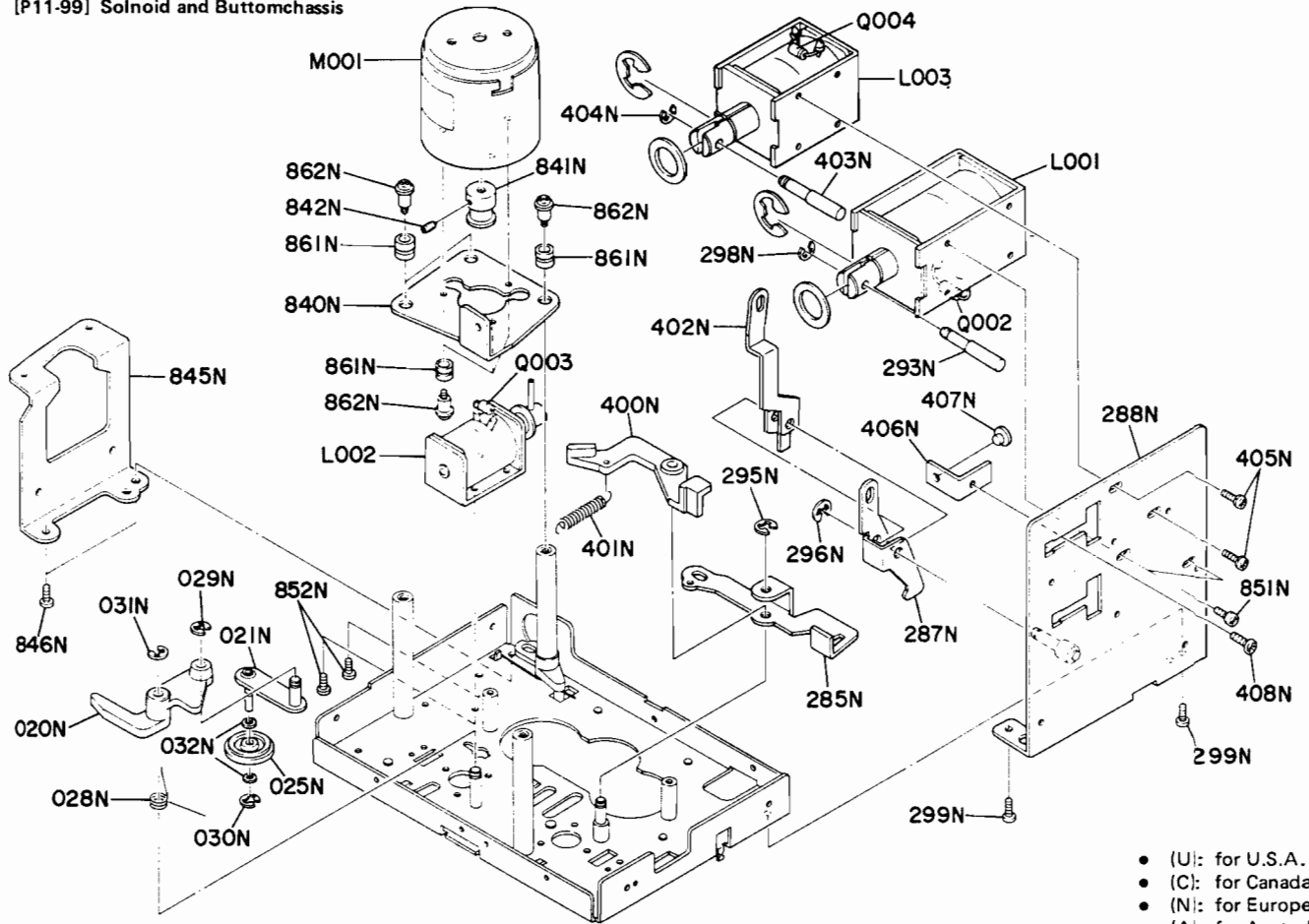
REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
Q	1	1	1	1	4397106400	Sustainer Assembly
265N	1	1	1	1	4397262030	Collar
266N	1	1	1	1	4397273500	Flywheel (K)
267N	1	1	1	1	59030802G9	Spacer
269N	1	1	1	1	4397106020	Sustainer, Capstan
268N	3	3	3	3	51042604A0	F.H.M. Screw F2.6 x 4
270N	1	1	1	1	4397104010	Retainer
271N	1	1	1	1	3483164020	Adjuster
272N	1	1	1	1	4397118010	Spacer
276N	1	1	1	1	51060305A9	P.H.M. Screw P3 x 5
850N	1	1	1	1	4397264010	Belt
870N	1	1	1	1	4397104050	Retainer
871N	1	1	1	1	2838101010	Support
872N	1	1	1	1	51060304A9	P.H.M. Screw P3 x 4
950N	1	1	1	1	4397267010	Heatsink
951N	2	2	2	2	50060305B9	Screw 3 x 5

• [P08-99] Head Chassis



REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
F	1	1	1	1	4397105400	Chassis Assembly
R	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	51060206A0	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	LH42102020	Rec/Play Head
H002	1	1	1	1	LH31000480	Erase Head

• [P11-99] Solenoid and Buttomchassis

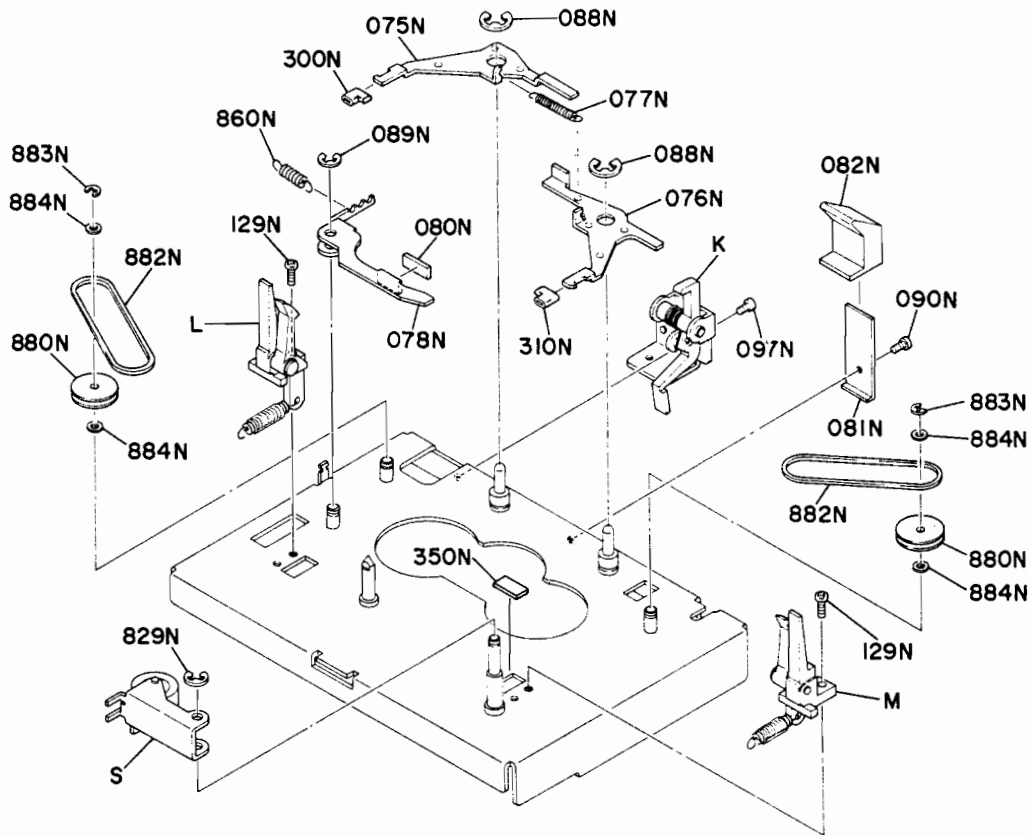


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
020N	1	1	1	1	4397354080	Lever, Take up
021N	1	1	1	1	4397002500	Arm (K) Take up
025N	1	1	1	1	4397001510	Idler, Take up
028N	1	1	1	1	4397115150	Spring
029N	1	1	1	1	64000200R0	RG Ring, E Type
030N	1	1	1	1	64001200R0	RG Ring, E Type
031N	1	1	1	1	64002500R0	RG Ring, E Type
032N	2	2	2	2	59163202G9	Washer
285N	1	1	1	1	4397354070	Lever, Play
287N	1	1	1	1	4397354060	Lever, Solenoid
288N	1	1	1	1	4397160510	Bracket (K)
293N	1	1	1	1	4397254080	Pin
295N	1	1	1	1	64000300R0	RG Ring, E Type
296N	1	1	1	1	64000300R0	RG Ring, E Type
298N	1	1	1	1	64002500R0	RG Ring, E Type
299N	2	2	2	2	51100306A9	B.H.M. Screw 83 x 6
400N	1	1	1	1	4397354110	Lever
401N	1	1	1	1	4397115170	Spring
402N	1	1	1	1	4397354120	Lever
403N	1	1	1	1	4397254130	Pin
404N	1	1	1	1	64002500R0	RG Ring, E Type
405N	2	2	2	2	51440306A9	L. Washer Screw L3 x 6
406N	1	1	1	1	4397114010	Stopper
407N	1	1	1	1	3312056030	Buffer
408N	1	1	1	1	51100405A9	B.H.M. Screw 84 x 5

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
840N	1	1	1	1	4397160020	Bracket, Motor
841N	1	1	1	1	4397262010	Pulley
842N	1	1	1	1	51690305Q9	Socket Screw, HP 3 x 5
845N	1	1	1	1	4397160060	Bracket, Motor
846N	2	2	2	2	51060304A9	P.H.M. Screw P3 x 4
851N	2	2	2	2	51440306A9	L. Washer Screw L3 x 6
852N	2	2	2	2	51102604A0	B.H.M. Screw 82.6 x 4
861N	6	6	6	6	4383259010	Bushing
862N	6	6	6	6	4367112150	Shaft
△ L001	1	1	1	1	ME10630010	Solenoid Coil, Play
△ L002	1	1	1	1	ME10410010	Solenoid Coil, Brake
△ L003	1	1	1	1	ME10510010	Solenoid Coil, CJE/REV
△ M001	1	1	1	1	MM11205010	D.C. Motor, 12V 2 Speed
Q002	1	1	1	1	HD20023100	Diode 10E-1
Q003	1	1	1	1	HD20023100	Diode 10E-1
Q004	1	1	1	1	HD20023100	Diode 10E-1

• [P12-99] Parts Assembly on the Top Chassis

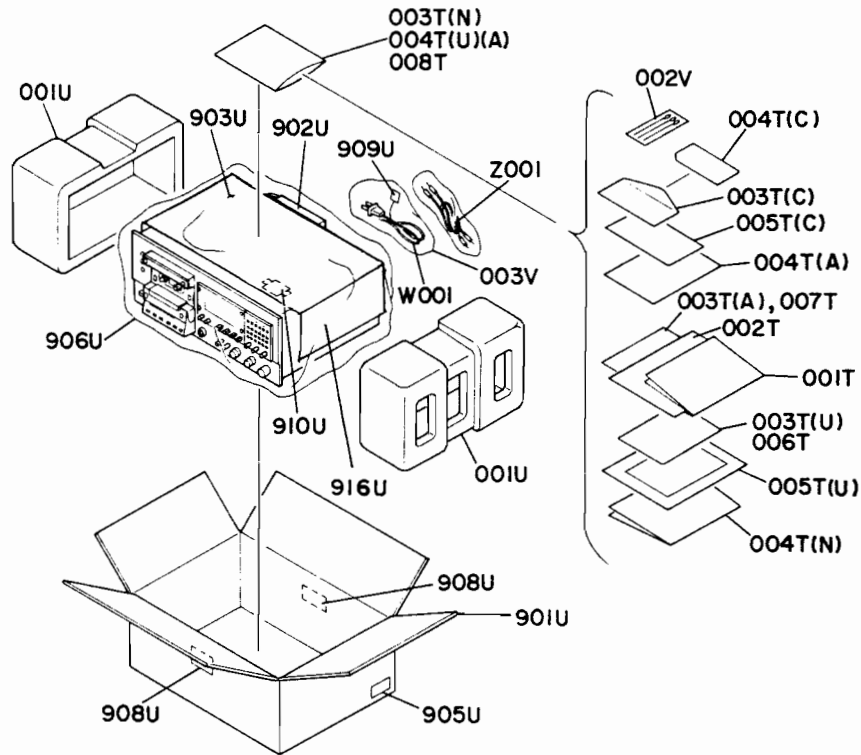


- (U): for U.S.A.
- (C): for Canada
- (N): for Europe
- (A): for Australia

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
K	1	1	1	1	4397104420	Retainer Assembly
L	1	1	1	1	4397104400	Retainer Assembly, Cassette
M	1	1	1	1	4397104410	Retainer Assembly, Cassette
S	1	1	1	1	4397354410	Lever Assembly, Pinch Roller
075N	1	1	1	1	4397354040	Brake Lever (L)
076N	1	1	1	1	4397354030	Brake Lever (R)
077N	1	1	1	1	4397115100	Spring
078N	1	1	1	1	4397354090	Lever, Back Tension
080N	1	1	1	1	4397061030	Clutch, Back Tension
081N	1	1	1	1	4397115020	Spring
082N	1	1	1	1	4397053020	Cover
088N	2	2	2	2	64000400R0	RG Ring, E Type
089N	1	1	1	1	64002500R0	RG Ring, E Type

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
090N	1	1	1	1	51062603A0	P.H.M. Screw P2.6 x 3
097N	1	1	1	1	51062604A0	P.H.M. Screw P2.6 x 4
300N	1	1	1	1	4367263010	Brake
301N	1	1	1	1	4367263010	Brake
350N	1	1	1	1	4397120010	Insulator
829N	1	1	1	1	64002500R0	RG Ring, E Type
860N	1	1	1	1	4397115210	Spring, Back Tension
880N	2	2	2	2	4397262040	Pulley
882N	2	2	2	2	4397264020	Belt
883N	2	2	2	2	64001500R0	RG Ring, E Type
884N	4	4	4	4	59020402G9	Washer
129N	2	2	2	2	51062606A0	P.H.M. Screw P2.6 x 6

• [H01-99] Packing Materials



- (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		
001T	1	1			4279851210	Instructions
001T			1		4279351310	Instructions
002T	1	1			4279851220	Instructions
002T			1		4279851030	Instructions
003T	1				2818854020	Guarantee Card
003T		1			2918813010	Envelope
003T			1		9013025010	Polyethy Bag
003T				1	2205851040	Instructions
004T	1				9013025010	Polyethy Bag
004T		1			9630000180	Guarantee Card
004T			1		4279856010	Circuit Diagram
004T				1	9631000090	Guarantee Card
005T	1				2225813010	Envelope
005T		1			9650000050	S. Station Card
006T		1			2818854040	Guarantee Card
007T		1			4292851220	Instructions
008T		1			9013025010	Polyethy Bag

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
001U	2	2	2	2	4279809010	Cushion
901U	1	1			4279801010	Packing Case
901U			1	1	4279801030	Packing Case
902U	1	1			2864804010	Sleeve
903U	1	1	1	1	2918107150	Sheet
905U	2				9526019010	Serial No. Card
905U		2			9526019020	Serial No. Card
905U			2	2	9526019030	Serial No. Card
906U	1	1	1	1	9090909040	Polyethy Sheet
908U	2				9510901020	Label, Address
909U			1	1	9560000040	Hang Tag
910U			1		2731821010	Silicagel
916U	1	1	1	1	2918107320	Sheet
002V	1	1	1	1	4136071010	Cleaner
003V	1	1	1	1	9011325010	Polyethy Bag
△W001				1	ZC01805020	A.C. Power Cord
△W001				1	ZC02006030	A.C. Power Cord
Z001	2	2	2	2	ZD01000170	Connective Cord

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

11. ELECTRICAL PARTS LIST

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
PK11	1	1	1	1	YK42791310	PK11-PRE-AMP. CIRCUIT BOARD
	1	1	1	1	ZZ42791310	P.W. Board, Pre-Amp. P.W. Board Assembly
PK11-CAPACITORS						
C101	1	1	1	1	DF55271090	Film 270pF ±5%
C102	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C103	1	1	1	1	EE10601640	Elect 10μF 16V
C104	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C105	1	1	1	1	EA47601030	Elect 47μF 10V
C106	1	1	1	1	DF15153300	Film 0.015μF ±5%
C107	1	1	1	1	EA22602530	Elect 22μF 25V
C108	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C109	1	1	1	1	EA10602530	Elect 10μF 25V
C110	1	1	1	1	EA22505030	Elect 2.2μF 50V
C111	1	1	1	1	DF15123300	Film 0.012μF ±5%
C112	1	1	1	1	DF15102300	Film 0.001μF ±5%
C113	1	1	1	1	EA33405030	Elect 0.33μF 50V
C114	1	1	1	1	DF15822300	Film 0.0082μF ±5%
C115	1	1	1	1	EA33405030	Elect 0.33μF 50V
C116	1	1	1	1	EA10702530	Elect 100μF 25V
C117	1	1	1	1	EA10505030	Elect 1μF 50V
C118	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C119	1	1	1	1	EE10505040	Elect 1μF 50V
△ C120	1	1	1	1	EA10702530	Elect 100μF 25V
C121	1	1	1	1	DD15101300	Ceramic 100pF ±5%
C122	1	1	1	1	DF15152300	Film 0.0015pF ±5%
C123	1	1	1	1	DF15392300	Film 0.0039μF ±5%
C124	1	1	1	1	DF55681090	Film 680pF ±5%
C125	1	1	1	1	EA33405030	Elect 0.33μF 50V
C126	1	1	1	1	EA10602530	Elect 10μF 25V
C127	1	1	1	1	EA10405030	Elect 0.1μF 50V
C128	1	1	1	1	EA33405030	Elect 0.33μF 50V
C129	1	1	1	1	DF15473300	Film 0.047μF ±5%
C130	1	1	1	1	DF15473300	Film 0.047μF ±5%
C131	1	1	1	1	EA10602530	Elect 10μF 25V
C132	1	1	1	1	DF15273300	Film 0.027μF ±5%
C133	1	1	1	1	DF15562300	Film 0.0056μF ±5%
C134	1	1	1	1	EA10602530	Elect 10μF 25V
C135	1	1	1	1	EA10701030	Elect 100μF 10V
△ C136	1	1	1	1	EA10702530	Elect 100μF 25V
C137	1	1	1	1	EA10602530	Elect 10μF 25V
C138	1	1	1	1	EA22505030	Elect 2.2μF 50V
C139	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C140	1	1	1	1	EA22505030	Elect 2.2μF 50V
C141	1	1	1	1	EA47405030	Elect 0.47μF 50V
C142	1	1	1	1	DD15471370	Ceramic 470pF ±5%
C143	1	1	1	1	EA10702530	Elect 100μF 25V
C144	1	1	1	1	EA33602530	Elect 33μF 25V
C146	1	1	1	1	EA47505030	Elect 4.7μF 50V
C147	1	1	1	1	EE22405040	Elect 0.22μF 50V
C148	1	1	1	1	EA47505030	Elect 4.7μF 50V
C149	1	1	1	1	EA47505030	Elect 4.7μF 50V
C150	1	1	1	1	DF15152300	Film 0.0015μF ±5%
C151	1	1	1	1	DF55101090	Film 100pF ±5%
C152	1	1	1	1	DF15153300	Film 0.015μF ±5%
C153	1	1	1	1	DF15393300	Film 0.039μF ±5%
C154	1	1	1	1	DF15103300	Film 0.01μF ±5%
C155	1	1	1	1	DF15822300	Film 0.0082μF ±5%
C156	1	1	1	1	DF15822300	Film 0.0082μF ±5%

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
C157	1	1	1	1	DF15822300	Film 0.0082μF ±5%
C158	1	1	1	1	DF15393300	Film 0.039μF ±5%
C159	1	1	1	1	DF15683300	Film 0.068μF ±5%
C160	1	1	1	1	DF15223300	Film 0.022μF ±5%
C161	1	1	1	1	DF15153300	Film 0.015μF ±5%
C162	1	1	1	1	DF15183300	Film 0.018μF ±5%
C163	1	1	1	1	DF15123300	Film 0.012μF ±5%
C164	1	1	1	1	DF15103300	Film 0.01μF ±5%
C165	1	1	1	1	DF15103300	Film 0.01μF ±5%
C166	1	1	1	1	DF15153300	Film 0.015μF ±5%
C167	1	1	1	1	DF17222300	Film 0.0022μF ±20%
C168	1	1	1	1	DF17222300	Film 0.0022μF ±20%
C169	1	1	1	1	EA10505030	Elect 1μF 50V
C170	1	1	1	1	EA47601630	Elect 47μF 16V
C171	1	1	1	1	EA47405030	Elect 0.47μF 50V
C172	1	1	1	1	DF55242090	Film 2400pF ±5%
C173	1	1	1	1	EA10602530	Elect 10μF 25V
C174	1	1	1	1	EA10602530	Elect 10μF 25V
C201	1	1	1	1	DF55271090	Film 270pF ±5%
C202	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C203	1	1	1	1	EE10601640	Elect 10μF 16V
C204	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C205	1	1	1	1	EA47601030	Elect 47μF 10V
C206	1	1	1	1	DF15153300	Film 0.015μF ±5%
C207	1	1	1	1	EA22602530	Elect 22μF 25V
C208	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C209	1	1	1	1	EA10602530	Elect 10μF 25V
C210	1	1	1	1	EA22505030	Elect 2.2μF 50V
C211	1	1	1	1	DF15123300	Film 0.012μF ±5%
C212	1	1	1	1	DF15102300	Film 0.001μF ±5%
C213	1	1	1	1	EA33405030	Elect 0.33μF 50V
C214	1	1	1	1	DF15822300	Film 0.0082μF ±5%
C215	1	1	1	1	EA33405030	Elect 0.33μF 50V
C216	1	1	1	1	EA10702530	Elect 10μF 25V
C217	1	1	1	1	EA10505030	Elect 1μF 50V
C218	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C219	1	1	1	1	EE10505040	Elect 1μF 50V
△ C220	1	1	1	1	EA10702530	Elect 100μF 25V
C221	1	1	1	1	DD15101300	Ceramic 100pF ±5%
C222	1	1	1	1	DF15152300	Film 0.0015pF ±5%
C223	1	1	1	1	DF15392300	Film 0.0039μF ±5%
C224	1	1	1	1	DF55681090	Film 680pF ±5%
C225	1	1	1	1	EA33405030	Elect 0.33μF 50V
C226	1	1	1	1	EA10602530	Elect 10μF 25V
C227	1	1	1	1	EA10405030	Elect 0.1μF 50V
C228	1	1	1	1	EA33405030	Elect 0.33μF 50V
C229	1	1	1	1	DF15473300	Film 0.047μF ±5%
C230	1	1	1	1	DF15472300	Film 0.0047μF ±5%
C231	1	1	1	1	EA10602530	Elect 10μF 25V
C232	1	1	1	1	DF15273300	Film 0.027μF ±5%
C233	1	1	1	1	DF15562300	Film 0.0056μF ±5%
C234	1	1	1	1	EA10602530	Elect 10μF 25V
C235	1	1	1	1	EA10701030	Elect 100μF 10V
△ C236	1	1	1	1	EA10702530	Elect 100μF 25V
C237	1	1	1	1	EA10602530	Elect 10μF 25V
C238	1	1	1	1	EA22505030	Elect 2.2μF 50V
C239	1	1	1	1	DD15470370	Ceramic 47pF ±5%
C240	1	1	1	1	EA22505030	Elect 2.2μF 50V
C241	1	1	1	1	EA47405030	Elect 0.47μF 50V
C242	1	1	1	1	DD15471370	Ceramic 470pF ±5%
C243	1	1	1	1	EA10702530	Elect 100μF 25V
C244	1	1	1	1	EA33602530	Elect 33μF 25V
C246	1	1	1	1	EA47505030	Elect 4.7μF 50V
C247	1	1	1	1	EE22405040	Elect 0.22μF 50V
C248	1	1	1	1	EA47505030	Elect 4.7μF 50V

- (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		
C249	1	1	1	1	EA47505030	Elect 4.7 μ F 50V
C250	1	1	1	1	DF15152300	Film 0.0015 μ F \pm 5%
C251	1	1	1	1	DF55101090	Film 100pF \pm 5%
C252	1	1	1	1	DF15153300	Film 0.015 μ F \pm 5%
C253	1	1	1	1	DF15393300	Film 0.039 μ F \pm 5%
C254	1	1	1	1	DF15103300	Film 0.01 μ F \pm 5%
C255	1	1	1	1	DF15822300	Film 0.0082 μ F \pm 5%
C256	1	1	1	1	DF15822300	Film 0.0082 μ F \pm 5%
C257	1	1	1	1	DF15822300	Film 0.0082 μ F \pm 5%
C258	1	1	1	1	DF15393300	Film 0.039 μ F \pm 5%
C259	1	1	1	1	DF15683300	Film 0.068 μ F \pm 5%
C260	1	1	1	1	DF15223300	Film 0.022 μ F \pm 5%
C261	1	1	1	1	DF15153300	Film 0.015 μ F \pm 5%
C262	1	1	1	1	DF15183300	Film 0.018 μ F \pm 5%
C263	1	1	1	1	DF15123300	Film 0.012 μ F \pm 5%
C264	1	1	1	1	DF15103300	Film 0.01 μ F \pm 5%
C265	1	1	1	1	DF15103300	Film 0.01 μ F \pm 5%
C266	1	1	1	1	DF15153300	Film 0.015 μ F \pm 5%
C267	1	1	1	1	DF17222300	Film 0.0022 μ F \pm 20%
C268	1	1	1	1	DF17222300	Film 0.0022 μ F \pm 20%
C269	1	1	1	1	EA10505030	Elect 1 μ F 50V
C270	1	1	1	1	EA47601630	Elect 47 μ F 16V
C271	1	1	1	1	EA47405030	Elect 0.47 μ F 50V
C272	1	1	1	1	DF55242090	Film 2400pF \pm 5%
C273	1	1	1	1	EA10602530	Elect 10 μ F 25V
C274	1	1	1	1	EA10602530	Elect 10 μ F 25V
C276	1	1	1	1	DK18104010	Ceramic 0.1 μ F
C277	1	1	1	1	DK18104010	Ceramic 0.1 μ F
C301	1	1	1	1	EA22702530	Elect 220 μ F 25V
C302	1	1	1	1	EA10701030	Elect 100 μ F 10V
PK11-RESISTORS (All Resistors are \pm 5% & 1/4W)						
R101	1	1	1	1	GD05100140	10 Ω
R102	1	1	1	1	GD05103140	10K Ω
R103	1	1	1	1	GD05104140	100K Ω
R104	1	1	1	1	GD05221140	220 Ω
R105	1	1	1	1	GD05561140	560 Ω
R106	1	1	1	1	GD05271140	270 Ω
R107	1	1	1	1	RN05184140	180K Ω
R108	1	1	1	1	GD05333140	33K Ω
R109	1	1	1	1	GD05103140	10K Ω
R110	1	1	1	1	GD05223140	22K Ω
R111	1	1	1	1	GD05394140	390K Ω
R113	1	1	1	1	RA05020160	5K Ω Trimming, P.B. EQ
R114	1	1	1	1	GD05562140	5.6K Ω
R115	1	1	1	1	GD05822140	8.2K Ω
R116	1	1	1	1	RN05222140	2.2K Ω
R117	1	1	1	1	GD05822140	8.2K Ω
R118	1	1	1	1	GD05682140	6.8K Ω
R119	1	1	1	1	GD05561140	560 Ω
R120	1	1	1	1	RA05030090	50K Ω Trim., Play Level
R121	1	1	1	1	7506100190	Jumper
R122	1	1	1	1	RN05272140	2.7K Ω
R123	1	1	1	1	RN05105140	1M Ω
R124	1	1	1	1	RN05392140	3.9K Ω
R125	1	1	1	1	GD05102140	1K Ω
R126	1	1	1	1	GD05473140	47K Ω
R127	1	1	1	1	GD05154140	150K Ω
R128	1	1	1	1	GD05274140	270K Ω
R129	1	1	1	1	GD05822140	8.2K Ω
R130	1	1	1	1	GD05823140	82K Ω
R131	1	1	1	1	GD05473140	47K Ω
R132	1	1	1	1	GD05332140	3.3K Ω
R133	1	1	1	1	GD05181140	180 Ω
R134	1	1	1	1	GD05104140	100K Ω
Δ R135	1	1	1	1	GA05561010	560 Ω 1W

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
Δ R136	1	1	1	1	GG05101140	100 Ω
R137	1	1	1	1	RN05105140	1M Ω
R138	1	1	1	1	GD05182140	1.8K Ω
R139	1	1	1	1	GD05102140	1K Ω
R140	1	1	1	1	GD05102140	1K Ω
R141	1	1	1	1	GD05102140	1K Ω
R142	1	1	1	1	GD05333140	33K Ω
R143	1	1	1	1	GD05561140	560 Ω
R144	1	1	1	1	GA05681010	680 Ω 1W
R145	1	1	1	1	GD05104140	100K Ω
R146	1	1	1	1	GD05151140	150 Ω
R147	1	1	1	1	GD05102140	1K Ω
R148	1	1	1	1	RA02030060	20K Ω Trimming, Rec Level
R149	1	1	1	1	RA02030060	20K Ω Trimming, Rec Level
R152	1	1	1	1	GD05682140	6.8K Ω
R153	1	1	1	1	GD05153140	15K Ω
R154	1	1	1	1	GD05682140	6.8K Ω
R155	1	1	1	1	GD05472140	4.7K Ω
R156	1	1	1	1	GD05103140	10K Ω
R157	1	1	1	1	GD05561140	560 Ω
R158	1	1	1	1	GD05153140	15K Ω
R159	1	1	1	1	GD05564140	560K Ω
R160	1	1	1	1	GD05473140	47K Ω
R161	1	1	1	1	GD05102140	1K Ω
R162	1	1	1	1	GD05153140	15K Ω
R163	1	1	1	1	GD05103140	10K Ω
R164	1	1	1	1	GD05272140	2.7K Ω
R165	1	1	1	1	GD05122140	1.2K Ω
R166	1	1	1	1	GD05222140	2.2K Ω
R167	1	1	1	1	GD05561140	560 Ω
R168	1	1	1	1	GD05121140	120 Ω
R169	1	1	1	1	GD05101140	100 Ω
R170	1	1	1	1	GD05100140	10 Ω
R171	1	1	1	1	GD05101140	100 Ω
R172	1	1	1	1	GD05680140	68 Ω
R173	1	1	1	1	GD05121140	120 Ω
R174	1	1	1	1	GD05121140	120 Ω
R175	1	1	1	1	GD05560140	56 Ω
R176	1	1	1	1	GD05822140	8.2K Ω
R177	1	1	1	1	GD05822140	8.2K Ω
R178	1	1	1	1	GD05822140	8.2K Ω
R179	1	1	1	1	GD05822140	8.2K Ω
R180	1	1	1	1	GD05333140	33K Ω
R181	1	1	1	1	GD05244140	240K Ω
R182	1	1	1	1	GD05332140	3.3K Ω
R183	1	1	1	1	RA01030240	10K Ω Trimming
R184	1	1	1	1	GD05824140	820K Ω
R185	1	1	1	1	GD05102140	1K Ω
R186	1	1	1	1	GD05332140	3.3K Ω
R187	1	1	1	1	RN05105140	1M Ω
R191	1	1	1	1	GD05272140	2.7K Ω
R192	1	1	1	1	GD05151140	150 Ω
R193	1	1	1	1	GD05101140	100 Ω
R194	1	1	1	1	GD05472140	4.7K Ω
R201	1	1	1	1	GD05100140	10 Ω
R202	1	1	1	1	GD05103140	10K Ω
R203	1	1	1	1	GD05104140	100K Ω
R204	1	1	1	1	GD05221140	220 Ω
R205	1	1	1	1	GD05561140	560 Ω
R206	1	1	1	1	GD05271140	270 Ω
R207	1	1	1	1	RN05184140	180K Ω
R208	1	1	1	1	GD05333140	33K Ω

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

REF. DESIG.	QTY				PART NO.	DESCRIPTION
	U	C	N	A		
R209	1	1	1	1	GD05103140	10K Ω
R210	1	1	1	1	GD05223140	22K Ω
R211	1	1	1	1	GD05394140	390K Ω
R213	1	1	1	1	RA05020160	5K Ω Trimming, P.B. EQ
R214	1	1	1	1	GD05562140	5.6K Ω
R215	1	1	1	1	GD05822140	8.2K Ω
R216	1	1	1	1	RN05222140	2.2K Ω
R217	1	1	1	1	GD05822140	8.2K Ω
R218	1	1	1	1	GD05682140	6.8K Ω
R219	1	1	1	1	GD05561140	560 Ω
R220	1	1	1	1	RA05030090	50K Ω Trimming, Play Level
R221	1	1	1	1	7506100190	Jumper
R222	1	1	1	1	RN05272140	2.7K Ω
R223	1	1	1	1	RN05105140	1M Ω
R224	1	1	1	1	RN05392140	3.9K Ω
R225	1	1	1	1	GD05102140	1K Ω
R226	1	1	1	1	GD05473140	47K Ω
R227	1	1	1	1	GD05154140	150K Ω
R228	1	1	1	1	GD05274140	270K Ω
R229	1	1	1	1	GD05822140	8.2K Ω
R230	1	1	1	1	GA05123140	12K Ω
R231	1	1	1	1	GD05473140	47K Ω
R232	1	1	1	1	GD05332140	3.3K Ω
R233	1	1	1	1	GD05181140	180 Ω
R234	1	1	1	1	GD05104140	100K Ω
R235	1	1	1	1	GA05561010	560 Ω 1W
R236	1	1	1	1	GG05101140	100 Ω
R237	1	1	1	1	RN05105140	1M Ω
R238	1	1	1	1	GD05182140	1.8K Ω
R239	1	1	1	1	GD05102140	1K Ω
R240	1	1	1	1	GD05102140	1K Ω
R241	1	1	1	1	GD05102140	1K Ω
R242	1	1	1	1	GD05333140	33K Ω
R243	1	1	1	1	GD05561140	560 Ω
R244	1	1	1	1	GA05681010	680 Ω 1W
R245	1	1	1	1	GD05104140	100K Ω
R246	1	1	1	1	GD05151140	150 Ω
R247	1	1	1	1	GD05102140	1K Ω
R248	1	1	1	1	RA02030060	20K Ω Trimming, Rec Level
R249	1	1	1	1	RA02030060	20K Ω Trimming, Rec Level
R251	1	1	1	1	GD05562140	5.6K Ω
R252	1	1	1	1	GD05682140	6.8K Ω
R253	1	1	1	1	GD05153140	15K Ω
R254	1	1	1	1	GD05682140	6.8K Ω
R255	1	1	1	1	GD05472140	4.7K Ω
R256	1	1	1	1	GD05103140	10K Ω
R257	1	1	1	1	GD05561140	560 Ω
R258	1	1	1	1	GD05153140	15K Ω
R259	1	1	1	1	GD05564140	560K Ω
R260	1	1	1	1	GD05473140	47K Ω
R261	1	1	1	1	GD05102140	1K Ω
R262	1	1	1	1	GD05153140	15K Ω
R263	1	1	1	1	GD05103140	10K Ω
R264	1	1	1	1	GD05272140	2.7K Ω
R265	1	1	1	1	GD05122140	1.2K Ω
R266	1	1	1	1	GD05222140	2.2K Ω
R267	1	1	1	1	GD05561140	560 Ω
R268	1	1	1	1	GD05121140	120 Ω
R269	1	1	1	1	GD05101140	100 Ω

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
R270	1	1	1	1	GD05100140	10 Ω
R271	1	1	1	1	GD05101140	100 Ω
R272	1	1	1	1	GD05680140	68 Ω
R273	1	1	1	1	GD05121140	120 Ω
R274	1	1	1	1	GD05121140	120 Ω
R275	1	1	1	1	GD05560140	56 Ω
R276	1	1	1	1	GD05822140	8.2K Ω
R277	1	1	1	1	GD05822140	8.2K Ω
R278	1	1	1	1	GD05822140	8.2K Ω
R279	1	1	1	1	GD05822140	8.2K Ω
R280	1	1	1	1	GD05333140	33K Ω
R281	1	1	1	1	GD05244140	240K Ω
R282	1	1	1	1	GD05332140	3.3K Ω
R283	1	1	1	1	RA01030240	10K Ω Trimming
R284	1	1	1	1	GD05824140	820K Ω
R285	1	1	1	1	GD05102140	1K Ω
R286	1	1	1	1	GD05332140	3.3K Ω
R287	1	1	1	1	RN05105140	1M Ω
R291	1	1	1	1	GD05272140	2.7K Ω
R292	1	1	1	1	GD05151140	150 Ω
R293	1	1	1	1	GD05101140	100 Ω
R294	1	1	1	1	GD05472140	4.7K Ω
R301	1	1	1	1	GA05102010	1K Ω 1W
R302	1	1	1	1	GD05154140	150K Ω
R303	1	1	1	1	GD05101140	100 Ω
R305	1	1	1	1	GD05151010	150 Ω 1W
R306	1	1	1	1	GD05122140	1.2K Ω
R307	1	1	1	1	RN05392140	3.9 Ω
R308	1	1	1	1	GD05332140	3.3K Ω
R309	1	1	1	1	GD05183140	18K Ω
R310	1	1	1	1	RK02020070	2K Ω Variable, Bias Fine
R311	1	1	1	1	GD05562140	5.6K Ω
R312	1	1	1	1	RN05222140	2.2K Ω
R313	1	1	1	1	GD05393140	39K Ω
R314	1	1	1	1	RA03020030	3K Ω Trimming, Bias Adj
R315	1	1	1	1	RA02030060	20K Ω Trimming, Bias Adj
R316	1	1	1	1	RA02030060	20K Ω Trimming, Bias Adj
R317	1	1	1	1	GD05562140	5.6K Ω
R318	1	1	1	1	GD05562140	5.6K Ω
R319	1	1	1	1	GD05332140	3.3K Ω
R350	1	1	1	1	GD05331140	330 Ω
R351	1	1	1	1	GD05122140	1.2K Ω
R352	1	1	1	1	RA01020110	1K Ω Trimming, Hi-Speed
R371	1	1	1	1	GD05102140	1.2K Ω
R372	1	1	1	1	GD05102140	1.2K Ω
R373	1	1	1	1	GD05562140	5.6K Ω
R374	1	1	1	1	GD05562140	5.6K Ω
Q101	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q102	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q103	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q104	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q105	1	1	1	1	HT314001E0	Transistor 2SC1400
Q106	1	1	1	1	HC10001360	IC LM1011AN
Q107	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q108	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q109	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q110	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q111	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q112	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q113	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q114	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q115	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q116	1	1	1	1	HT326341S0	Transistor 2SC2634(S)

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

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
Q117	1	1	1	1	HF200301C0	F.E.T. 2SK30A(Y)
Q118	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q201	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q202	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q203	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q204	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q205	1	1	1	1	HT314001E0	Transistor 2SC1400
Q206	1	1	1	1	HC10001360	IC LM1011AN
Q207	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q208	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q209	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q210	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q211	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q212	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q213	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q214	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q215	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q216	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q217	1	1	1	1	HF200301C0	F.E.T. 2SK30A(Y)
Q218	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q301	1	1	1	1	HT309451P0	Transistor 2SC945(P)
Q302	1	1	1	1	HT309451P0	Transistor 2SC945(P)
Q303	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q304	1	1	1	1	HD20011050	Diode 1S1555
Q305	1	1	1	1	HD30033090	Zener WZ052
Q306	1	1	1	1	HD20011050	Diode 1S1555
Q307	1	1	1	1	HD20011050	Diode 1S1555
Q308	1	1	1	1	HD20011050	Diode 1S1555
Q309	1	1	1	1	HD20011050	Diode 1S1555
Q310	1	1	1	1	HD30002060	Zener RD-3.9
Q311	1	1	1	1	HD30002060	Zener RD-3.9
± Q312	1	1	1	1	HD30030090	Zener WZ177
± Q313	1	1	1	1	HD30030090	Zener WZ177
± Q320	1	1	1	1	HT403131E0	Transistor 2SD313(E)
L101	1	1	1	1	LC22260050	Choke Coil 22mH, Bias Trap
L102	1	1	1	1	LS70305010	M.P.X. Coil 22mH, 19KHz
L103	1	1	1	1	LC22260060	Choke Coil 22mH, Bias Trap
L104	1	1	1	1	LC24750030	Choke Coil 4.7mH, Rec
L105	1	1	1	1	LC24750030	Choke Coil 4.7mH, Rec
L201	1	1	1	1	LC22260050	Choke Coil 22mH, Bias Trap
L202	1	1	1	1	LS70305010	M.P.X. Coil 22mH, 19KHz
L203	1	1	1	1	LC22260060	Choke Coil 22mH, Bias Trap
L204	1	1	1	1	LC24750030	Choke Coil 4.7mH, Rec
L205	1	1	1	1	LC24750030	Choke Coil 4.7mH, Rec
S101	1	1	1	1	SS09020120	Slide Switch, Rec/Play
S102	1	1	1	1	SS09020120	Slide Switch, Rec/Play
S103	1	1	1	1	SR12020020	Rotary Switch, Speed Select
S104	1	1	1	1	SP10040030	Push Switch, Normal
S105	1	1	1	1	SP10040030	Push Switch, CrO ₂
S106	1	1	1	1	SP10040030	Push Switch, FeCr
S107	1	1	1	1	SP10040030	Push Switch, Metal
S108	1	1	1	1	SS04030130	Slide Switch, MPX/Dolby
S109	1	1	1	1	SB11910010	Switch Band, Fix
S110	1	1	1	1	SC00030030	Switch, 3 Position
P205	1	1	1	1	YJ06001430	Jack, (9P)
P206	1	1	1	1	YP06001040	Plug, (3P)
J351	1	1			YT02040260	Terminal, (4P) RCA
J351			1	1	YT02050020	Terminal, (4P) RCA/Din
PK12	1	1	1	1	YK42791320	PK12-MIC LINE VOLUME CIRCUIT BOARD
	1	1	1	1	ZZ42791320	P.W. Board, Mic Line Vol. P.W. Board Assembly

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
R391	1	1	1	1	RD05030110	50KΩ(A) Variable, Mic Vol.
R392	1	1	1	1	RD05030110	50KΩ(A) Variable, Mic Vol.
R393	1	1	1	1	RD01040100	100KΩ(A) Variable, Line Vol.
R394	1	1	1	1	RD01040100	100KΩ(A) Variable, Line Vol.
R395	1	1	1	1	GD05223140	22KΩ ±5% ¼W
R396	1	1	1	1	GD05223140	22KΩ ±5% ¼W
PK13	1	1	1	1	YK42791330	PK13-OUTPUT VOLUME CIRCUIT BOARD
	1	1	1	1	ZZ42791330	P.W. Board, Output Volume P.W. Board Assembly
R381	1	1	1	1	RM05030830	PK13-RESISTORS
R382	1	1	1	1	RM05030830	50KΩ(A) Variable, Output
PK21	1	1	1	1	YK42792710	PK21-COMPUTER CIRCUIT BOARD
	1	1	1	1	ZZ42792710	P.W. Board, Computer P.W. Board Assembly
C501	1	1	1	1	DF15152300	PK21-CAPACITORS
C502	1	1	1	1	EA33505030	Film 0.0015μF ±5%
C503	1	1	1	1	EA22601630	Elect 3.3μF 50V
C504	1	1	1	1	DF15103300	Elect 22μF 16V
C505	1	1	1	1	EA47505030	Film 0.01μF ±5%
C506	1	1	1	1	EA10505030	Elect 4.7μF 50V
C507	1	1	1	1	DF15562300	Elect 1μF 50V
C508	1	1	1	1	EA47505030	Film 0.0056μF ±5%
C509	1	1	1	1	DF15102300	Elect 4.7μF 50V
C510	1	1	1	1	EA10505030	Film 0.001μF ±5%
C511	1	1	1	1	EA47505030	Elect 1μF 50V
C512	1	1	1	1	EA10405030	Elect 4.7μF 50V
C513	1	1	1	1	EA47502530	Elect 0.1μF 50V
C514	1	1	1	1	EA22602530	Elect 4.7μF 25V
C515	1	1	1	1	EA22602530	Elect 22μF 25V
C516	1	1	1	1	EA22601630	Elect 22μF 25V
C517	1	1	1	1	EA10602530	Elect 22μF 16V
C518	1	1	1	1	DF15472300	Elect 10μF 25V
C519	1	1	1	1	DD15330370	Film 0.0047μF ±5%
± C520	1	1	1	1	EA22702530	Ceramic 33pF ±5%
C521	1	1	1	1	EA22601630	Elect 220μF 25V
C522	1	1	1	1	EA22505030	Elect 22μF 16V
C523	1	1	1	1	EA33602530	Elect 2.2μF 50V
C524	1	1	1	1	EA10602530	Elect 33μF 25V
C525	1	1	1	1	EA10701630	Elect 10μF 25V
C526	1	1	1	1	DK18103320	Elect 100μF 16V
C527	1	1	1	1	DD15330370	Ceramic 0.01μF
C528	1	1	1	1	DK18103320	Ceramic 33pF ±5%
C529	1	1	1	1	EA47405030	Ceramic 0.01μF
C530	1	1	1	1	EA22702530	Elect 0.47μF 50V
C531	1	1	1	1	EA22601630	Elect 220μF 25V
C532	1	1	1	1	DK16103300	Elect 22μF 16V
C533	1	1	1	1	DK18104010	Ceramic 0.01μF
C601	1	1	1	1	EA22505030	Ceramic 0.1μF
C602	1	1	1	1	EA10602530	Ceramic 0.1μF
C603	1	1	1	1	DD15470370	Elect 0.1μF
C604	1	1	1	1	EA10505030	Elect 2.2μF 50V
C605	1	1	1	1	EA10505030	Elect 10μF 25V
C606	1	1	1	1	DF15103300	Ceramic 47pF ±5%
C607	1	1	1	1	DF15103300	Elect 1μF 50V
C608	1	1	1	1	DF15333300	Elect 1μF 50V
C609	1	1	1	1	DD15470370	Film 0.01μF ±5%
C610	1	1	1	1	DD15470370	Film 0.01μF ±5%
C611	1	1	1	1	DD15561370	Film 0.03μF ±5%

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

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
C612	1	1	1	1	DF15682300	Film 0.0068 μ F \pm 5%
C621	1	1	1	1	EA22505030	Elect 2.2 μ F 50V
C622	1	1	1	1	EA10602530	Elect 10 μ F 25V
C623	1	1	1	1	DD15470370	Ceramic 47pF \pm 5%
C624	1	1	1	1	EA10505030	Elect 1 μ F 50V
C625	1	1	1	1	EA10505030	Elect 1 μ F 50V
C626	1	1	1	1	DF15103300	Elect 0.01 μ F \pm 5%
C627	1	1	1	1	DF15103300	Film 0.01 μ F \pm 5%
C628	1	1	1	1	DF15103300	Film 0.01 μ F \pm 5%
C629	1	1	1	1	DF15332300	Film 0.0032 μ F \pm 5%
C641	1	1	1	1	EA33602530	Elect 33 μ F 25V
PK21-RESISTORS (All Resistors are \pm 5% & $\frac{1}{4}$ W)						
R501	1	1	1	1	GD05104140	100K Ω
R502	1	1	1	1	GD05102140	1K Ω
R503	1	1	1	1	GD05333140	33K Ω
R504	1	1	1	1	GD05823140	82K Ω
R506	1	1	1	1	GD05102140	1K Ω
R507	1	1	1	1	GD05184140	180K Ω
R508	1	1	1	1	GD05103140	10K Ω
R509	1	1	1	1	GD05562140	5.6K Ω
R510	1	1	1	1	GD05221140	220 Ω
R511	1	1	1	1	GD05184140	180K Ω
R512	1	1	1	1	GD05103140	10K Ω
R513	1	1	1	1	GD05562140	5.6K Ω
R514	1	1	1	1	GD05221140	220 Ω
R515	1	1	1	1	GD05104140	100K Ω
R516	1	1	1	1	GD05103140	10K Ω
R517	1	1	1	1	GD05152140	1.5K Ω
R518	1	1	1	1	GD05201140	200 Ω
R519	1	1	1	1	RA01030260	10K Ω Trimming, Gain Cont.
R520	1	1	1	1	GD05333140	33K Ω
R521	1	1	1	1	GD05222140	2.2K Ω
R522	1	1	1	1	GD05122140	1.2K Ω
R523	1	1	1	1	GD05102140	1K Ω
R524	1	1	1	1	GD05562140	5.6K Ω
R525	1	1	1	1	GD05822140	8.2K Ω
R526	1	1	1	1	GD05473140	47K Ω
R527	1	1	1	1	GD05100140	10 Ω
R528	1	1	1	1	GD05222140	2.2K Ω
R529	1	1	1	1	GD05472140	4.7K Ω
R530	1	1	1	1	GD05272140	2.7K Ω
R531	1	1	1	1	GD05103140	10K Ω
R532	1	1	1	1	GD05103140	10K Ω
R533	1	1	1	1	GD05472140	4.7K Ω
R534	1	1	1	1	GD05472140	4.7K Ω
R535	1	1	1	1	GD05330140	33 Ω
R536	1	1	1	1	GD05103140	10K Ω
R537	1	1	1	1	GD05103140	10K Ω
R538	1	1	1	1	GD05104140	100K Ω
R539	1	1	1	1	GD05104140	100K Ω
R540	1	1	1	1	GD05272140	2.7K Ω
R541	1	1	1	1	GD05682140	6.8K Ω
R542	1	1	1	1	GD05682140	6.8K Ω
R543	1	1	1	1	GD05103140	10K Ω
R544	1	1	1	1	GD05821140	820 Ω
R545	1	1	1	1	GD05681140	680 Ω
R546	1	1	1	1	GD05821140	820 Ω
R547	1	1	1	1	GD05103140	10K Ω
R548	1	1	1	1	GD05103140	10K Ω
R549	1	1	1	1	GD05123140	12K Ω
R550	1	1	1	1	GD05472140	4.7K Ω
R551	1	1	1	1	GD05101140	100 Ω
R552	1	1	1	1	GD05822140	8.2K Ω

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
R553	1	1	1	1	GD05272140	2.7K Ω
R554	1	1	1	1	GD05103140	10K Ω
R555	1	1	1	1	GD05472140	4.7K Ω
R556	1	1	1	1	GD05472140	4.7K Ω
R557	1	1	1	1	GD05330140	33 Ω
R558	1	1	1	1	GD05103140	10K Ω
R559	1	1	1	1	GD05682140	6.8K Ω
R560	1	1	1	1	GD05103140	10K Ω
R561	1	1	1	1	GD05103140	10K Ω
R562	1	1	1	1	GD05102140	1K Ω
R563	1	1	1	1	GD05103140	10K Ω
R564	1	1	1	1	GD05821140	820 Ω
R565	1	1	1	1	GD05103140	10K Ω
R566	1	1	1	1	GD05103140	10K Ω
R567	1	1	1	1	GD05102140	1K Ω
R568	1	1	1	1	GD05331140	330 Ω
R569	1	1	1	1	GD05272140	2.7K Ω
R570	1	1	1	1	GD05272140	2.7K Ω
R571	1	1	1	1	GD05820140	82 Ω
R572	1	1	1	1	GD05121140	120 Ω
R573	1	1	1	1	GD05121140	120 Ω
R574	1	1	1	1	GD05121140	120 Ω
R575	1	1	1	1	GD05121140	120 Ω
R576	1	1	1	1	GD05121140	120 Ω
R577	1	1	1	1	GD05121140	120 Ω
R578	1	1	1	1	GD05121140	120 Ω
R579	1	1	1	1	GD05103140	10K Ω
R580	1	1	1	1	GD05681140	680 Ω
R581	1	1	1	1	GD05152140	1.5K Ω
R582	1	1	1	1	GD05152140	1.5K Ω
R583	1	1	1	1	GD05152140	1.5K Ω
R584	1	1	1	1	GD05152140	1.5K Ω
R585	1	1	1	1	GD05152140	1.5K Ω
R586	1	1	1	1	GD05152140	1.5K Ω
R587	1	1	1	1	GD05332140	3.3K Ω
R588	1	1	1	1	GD05332140	3.3K Ω
R589	1	1	1	1	GD05103140	10K Ω
R590	1	1	1	1	GD05103140	10K Ω
R591	1	1	1	1	GD05103140	10K Ω
R592	1	1	1	1	GD05103140	10K Ω
R593	1	1	1	1	GD05103140	10K Ω
R594	1	1	1	1	GD05103140	10K Ω
R595	1	1	1	1	GD05103140	10K Ω
R596	1	1	1	1	GD05562140	5.6K Ω
R597	1	1	1	1	GD05182140	1.8K Ω
R598	1	1	1	1	GD05104140	100K Ω
R599	1	1	1	1	GD05152140	1.5K Ω
R601	1	1	1	1	GD05103140	10K Ω
R602	1	1	1	1	RA03020030	3K Ω Trimming
R603	1	1	1	1	GD05392140	3.9K Ω
R604	1	1	1	1	GD05123140	12K Ω
R605	1	1	1	1	GA05681010	680 Ω 1W
R606	1	1	1	1	GD05104140	100K Ω
R607	1	1	1	1	GD05102140	1K Ω
R608	1	1	1	1	GD05562140	5.6K Ω
R609	1	1	1	1	GD05105140	1M Ω
R610	1	1	1	1	RA05030090	50K Ω Trimming
R611	1	1	1	1	GD05224140	220K Ω
R612	1	1	1	1	GD05473140	47K Ω
R613	1	1	1	1	GD05272140	2.7K Ω
R614	1	1	1	1	GD05122140	1.2K Ω
R615	1	1	1	1	RA05030090	50K Ω Trimming
R616	1	1	1	1	GD05273140	27K Ω
R617	1	1	1	1	GD05151140	150 Ω
R618	1	1	1	1	GD05124140	120K Ω

- (U): for U.S.A.
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REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
R619	1	1	1	1	GD05472140	4.7KΩ
R620	1	1	1	1	GD05561140	560Ω
R621	1	1	1	1	GD05103140	10KΩ
R622	1	1	1	1	RA03020030	3KΩ Trimming
R623	1	1	1	1	GD05392140	3.9KΩ
R624	1	1	1	1	GD05123140	12KΩ
R625	1	1	1	1	GA05681010	680Ω 1W
R626	1	1	1	1	GD05104140	100KΩ
R627	1	1	1	1	GD05102140	1KΩ
R628	1	1	1	1	GD05562140	5.6KΩ
R629	1	1	1	1	GD05105140	1MΩ
R630	1	1	1	1	RA05030090	50KΩ Trimming
R631	1	1	1	1	GD05224140	220KΩ
R632	1	1	1	1	GD05473140	47KΩ
R633	1	1	1	1	GD05272140	2.7KΩ
R634	1	1	1	1	GD05122140	1.2KΩ
R642	1	1	1	1	GG05821140	820Ω
R643	1	1	1	1	GD05562140	5.6KΩ
△ R644	1	1	1	1	GA05181010	180Ω 1W
R645	1	1	1	1	GD05473140	47KΩ
R646	1	1	1	1	GD05123140	12KΩ
R647	1	1	1	1	GD05123140	12KΩ
R648	1	1	1	1	GD05822140	8.2KΩ
R649	1	1	1	1	GD05822140	8.2KΩ
R691	1	1	1	1	GD05562140	5.6KΩ
R692	1	1	1	1	GD05472140	4.7KΩ
R693	1	1	1	1	GD05472140	4.7KΩ
R694	1	1	1	1	GD05683140	68KΩ
R695	1	1	1	1	GD05123140	12KΩ
R696	1	1	1	1	GD05472140	4.7KΩ
R697	1	1	1	1	GD05562140	5.6KΩ
R701	1	1	1	1	GD05473140	47KΩ
R702	1	1	1	1	GD05473140	47KΩ
R703	1	1	1	1	GD05473140	47KΩ
R704	1	1	1	1	GD05473140	47KΩ
R705	1	1	1	1	GD05473140	47KΩ
R706	1	1	1	1	GD05473140	47KΩ
R707	1	1	1	1	GD05473140	47KΩ
R708	1	1	1	1	GD05473140	47KΩ
R709	1	1	1	1	GD05103140	10KΩ
R710	1	1	1	1	GD05103140	10KΩ
R711	1	1	1	1	GD05103140	10KΩ
R712	1	1	1	1	GD05103140	10KΩ
R713	1	1	1	1	GD05103140	10KΩ
R714	1	1	1	1	GD05103140	10KΩ
R715	1	1	1	1	GD05103140	10KΩ
△ R731	1	1	1	1	GG05330140	33Ω
R732	1	1	1	1	GD05101140	100Ω
PK21-SEMICONDUCTORS						
Q501	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q502	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q503	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q504	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q505	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q506	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q507	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q508	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q509	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
Q510	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q511	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q512	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q513	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q514	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q515	1	1	1	1	HT326341S0	Transistor 2SC2634(S)

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
Q516	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q517	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q518	1	1	1	1	HD20011050	Diode 1S1555
Q522	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q523	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q524	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q525	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q526	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q527	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q528	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q529	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q530	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q531	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
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	HT326341S0	Transistor 2SC2634(S)
Q538	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q539	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q540	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q541	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
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	HT326341T0	Transistor 2SC2634(T)
Q546	1	1	1	1	HT326341T0	Transistor 2SC2634(T)
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	HD20011050	Diode 1S1555
Q551	1	1	1	1	HD20011050	Diode 1S1555
Q552	1	1	1	1	HD20011050	Diode 1S1555
Q553	1	1	1	1	HD20011050	Diode 1S1555
Q554	1	1	1	1	HD20011050	Diode 1S1555
Q555	1	1	1	1	HD20011050	Diode 1S1555
Q556	1	1	1	1	HD20011050	Diode 1S1555
Q557	1	1	1	1	HD10001010	Diode 1N34A
Q558	1	1	1	1	HD10001010	Diode 1N34A
Q559	1	1	1	1	HD10001010	Diode 1N34A
Q560	1	1	1	1	HD20011050	Diode 1S1555
Q561	1	1	1	1	HD30013060	Zener RD11EB3
Q562	1	1	1	1	HD30014060	Zener RD24EB2
Q563	1	1	1	1	HD20011050	Diode 1S1555
Q564	1	1	1	1	HD20011050	Diode 1S1555
Q565	1	1	1	1	HD20011050	Diode 1S1555
Q566	1	1	1	1	HD20011050	Diode 1S1555
Q567	1	1	1	1	HD20011050	Diode 1S1555
Q568	1	1	1	1	HD20011050	Diode 1S1555
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	HD20011050	Diode 1S1555
Q583	1	1	1	1	HD20011050	Diode 1S1555

- (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		
Q584	1	1	1	1	HD20011050	Diode 1S1555
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
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	HD20011050	Diode 1S1555
Q598	1	1	1	1	HD20011050	Diode 1S1555
Q599	1	1	1	1	HD20011050	Diode 1S1555
Q601	1	1	1	1	HT326341S0	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
Q606	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q607	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q608	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
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
Q626	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
△ 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
Q645	1	1	1	1	HT309451P0	Transistor 2SC945P
Q646	1	1	1	1	HT309451P0	Transistor 2SC945P
Q647	1	1	1	1	HD20011050	Diode 1S1555
Q648	1	1	1	1	HD20011050	Diode 1S1555
Q701	1	1	1	1	HC10027060	IC μ PD546C
Q702	1	1	1	1	HC10016060	IC μ PA57C
Q703	1	1	1	1	HC10016060	IC μ PA57C
PK21-MISCELLANEOUS						
L501	1	1	1	1	LI10015010	I.F.T. Coil
P501	1	1	1	1	YP06001070	Plug, (9P)
P502	1	1	1	1	YP06001060	Plug, (7P)
P503	1	1	1	1	YP06001050	Plug, (5P)
P504	1	1	1	1	YP06001050	Plug, (5P)
P505	1	1	1	1	YP06001070	Plug, (9P)
P506	1	1	1	1	YP06001740	Plug, (8P)
P507	1	1	1	1	YP06001750	Plug, (10P)
P508	1	1	1	1	YP06001750	Plug, (10P)
P509	1	1	1	1	YP06001050	Plug, (5P)
P621	1	1	1	1	YJ06002280	Jack, (12P)
P622	1	1	1	1	YJ06002270	Jack, (8P)
J601	1	1	1	1	YL01070080	Lug, (7P)
PK22-DIGITAL & METER LED CIRCUIT BOARD						
PK22	1	1	1	1	YK42792720	P.W. Board, Digital & Meter LED
	1	1	1	1	ZZ42792720	P.W. Board Assembly
PK22-RESISTORS (All Resistors are $\pm 5\%$ & $\frac{1}{4}W$)						
R651	1	1	1	1	GD05221140	220 Ω
R652	1	1	1	1	GD05221140	220 Ω
R653	1	1	1	1	GD05221140	220 Ω
R654	1	1	1	1	GD05221140	220 Ω
R655	1	1	1	1	GD05221140	220 Ω
R656	1	1	1	1	GD05221140	220 Ω
R657	1	1	1	1	GD05221140	220 Ω
R658	1	1	1	1	GD05221140	220 Ω

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
R659	1	1	1	1	GD05471140	470 Ω
R660	1	1	1	1	GD05471140	470 Ω
R661	1	1	1	1	GD05471140	470 Ω
R662	1	1	1	1	GD05471140	470 Ω
R671	1	1	1	1	GD05221140	220 Ω
R672	1	1	1	1	GD05221140	220 Ω
R673	1	1	1	1	GD05221140	220 Ω
R674	1	1	1	1	GD05221140	220 Ω
R675	1	1	1	1	GD05221140	220 Ω
R676	1	1	1	1	GD05221140	220 Ω
R677	1	1	1	1	GD05221140	220 Ω
R678	1	1	1	1	GD05221140	220 Ω
R679	1	1	1	1	GD05471140	470 Ω
R680	1	1	1	1	GD05471140	470 Ω
R681	1	1	1	1	GD05471140	470 Ω
R682	1	1	1	1	GD05471140	470 Ω
PK22-SEMICONDUCTORS						
Q651	1	1	1	1	HC10001320	IC IR2418B
Q652	1	1	1	1	HI11201320	L.E.D. GL112M4
Q671	1	1	1	1	HC10001320	IC IR2418B
Q672	1	1	1	1	HI11201320	L.E.D. GL112M4
Q711	1	1	1	1	HI10011050	L.E.D. TLR226
Q712	1	1	1	1	HI10011050	L.E.D. TLR226
Q713	1	1	1	1	HI10011050	L.E.D. TLR226
Q715	1	1	1	1	HQ10201020	Display Unit LN524RK
Q716	1	1	1	1	HQ10201020	Display Unit LN524RK
PK23-PROGRAM SELECTOR CIRCUIT BOARD						
PK23	1	1	1	1	YK42792730	P.W. Board, Program Selector
	1	1	1	1	ZZ42792730	P.W. Board Assembly
PK23-SEMICONDUCTORS						
Q751	1	1	1	1	HD20011050	Diode 1S1555
Q752	1	1	1	1	HD20011050	Diode 1S1555
Q753	1	1	1	1	HD20011050	Diode 1S1555
Q754	1	1	1	1	HD20011050	Diode 1S1555
Q755	1	1	1	1	HD20011050	Diode 1S1555
Q756	1	1	1	1	HD20011050	Diode 1S1555
Q757	1	1	1	1	HD20011050	Diode 1S1555
Q758	1	1	1	1	HD20011050	Diode 1S1555
Q759	1	1	1	1	HD20011050	Diode 1S1555
Q760	1	1	1	1	HD20011050	Diode 1S1555
Q761	1	1	1	1	HD20011050	Diode 1S1555
PK23-SWITCHES						
S504	1	1	1	1	SR02050140	Rotary Switch, Memory Count
S505	1	1	1	1	SR02050140	Rotary Switch, Selector
S506	1	1	1	1	SR02030070	Rotary Switch, Program
PK24-TIMER SWITCH CIRCUIT BOARD						
PK24	1	1	1	1	YK42792740	P.W. Board, Timer Switch
	1	1	1	1	ZZ42792740	P.W. Board Assembly
PK24-SEMICONDUCTORS						
Q714	1	1	1	1	HI10009300	L.E.D. AR2132D
Q771	1	1	1	1	HD20011050	Diode 1S1555
PK24-SWITCH						
S503	1	1	1	1	SC02030110	Switch, Timer

- (U): for U.S.A.
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REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
PK25	1	1	1	1	YK42792750 ZZ42792750	PK25-REC-MUTE SWITCH CIRCUIT BOARD P.W. Board, Rec-Mute Switch P.W. Board Assembly
S502	1	1	1	1	SP02010430	Push Switch, Rec-Mute
PK26	1	1	1	1	YK42792760 ZZ42792760	PK26-REMOTE JACK CIRCUIT BOARD P.W. Board, Remote Jack P.W. Board Assembly
R771	1	1	1	1	GD05104140	Resistor 100K Ω \pm 5% $\frac{1}{4}$ W
Q722	1	1	1	1	HT107331T0	Transistor 2SC733(T)
J591	1	1	1	1	YJ90000220	Jack, Remote (9P)
PK27	1	1	1	1	YF42792770 ZZ42792770	PK27-PROGRAM SELECT CIRCUIT BOARD P.W. Board, Program Select P.W. Board Assembly
C701	1	1	1	1	DF15223300	Film 0.022 μ F \pm 5%
C702	1	1	1	1	EA10505030	Elect 1 μ F 50V
C703	1	1	1	1	EQ10505010	Elect 1 μ F 50V
						PK27-CAPACITORS
						Film 0.022 μ F \pm 5%
						Elect 1 μ F 50V
						Elect 1 μ F 50V
						PK27-RESISTORS
						(All Resistors are \pm 5% & $\frac{1}{4}$ W)
R716	1	1	1	1	GD05223140	22K Ω
R717	1	1	1	1	GD05473140	47K Ω
R718	1	1	1	1	GD05472140	4.7K Ω
R719	1	1	1	1	GD05104140	100K Ω
R720	1	1	1	1	GD05223140	22K Ω
R721	1	1	1	1	GD05473140	47K Ω
R722	1	1	1	1	GD05472140	4.7K Ω
R723	1	1	1	1	GD05104140	100K Ω
R724	1	1	1	1	GD05104140	100K Ω
R725	1	1	1	1	GD05104140	100K Ω
R726	1	1	1	1	GD05104140	100K Ω
R727	1	1	1	1	GD05103140	10K Ω
R728	1	1	1	1	GD05104140	100K Ω
						PK27-SEMICONDUCTORS
Q704	1	1	1	1	HC402300U0	IC, PD4023C or MC14023
Q705	1	1	1	1	HC452800B0	IC, PD4528C or MC14528B
Q706	1	1	1	1	HC401100U0	IC, PD4011C or MC14011
Q707	1	1	1	1	HC401100U0	IC, PD4011C or MC14011
Q711	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q712	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q713	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q714	1	1	1	1	HT320601R0	Transistor 2SC2060(R)
Q762	1	1	1	1	HD20011050	Diode 1S1555
Q763	1	1	1	1	HD20011050	Diode 1S1555
Q764	1	1	1	1	HD20011050	Diode 1S1555
Q765	1	1	1	1	HD20011050	Diode 1S1555
Q766	1	1	1	1	HD20011050	Diode 1S1555
Q767	1	1	1	1	HD20011050	Diode 1S1555
Q768	1	1	1	1	HD20011050	Diode 1S1555
Q769	1	1	1	1	HD20011050	Diode 1S1555
Q770	1	1	1	1	HD20011050	Diode 1S1555
Q771	1	1	1	1	HD20011050	Diode 1S1555
Q772	1	1	1	1	HD20011050	Diode 1S1555
Q773	1	1	1	1	HD20011050	Diode 1S1555
Q774	1	1	1	1	HD20011050	Diode 1S1555
Q775	1	1	1	1	HT326341S0	Transistor 2SC2634(S)

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
PK31	1	1	1	1	YH42791310 ZZ42791310	PK31-LOGIC CONTROL CIRCUIT BOARD P.W. Board, Logic Control P.W. Board Assembly
Q591	1	1	1	1	H110015020	PK31-L.E.D. L.E.D. LN317GP
Q592	1	1	1	1	H110016020	L.E.D. LN417YP
Q593	1	1	1	1	H110014020	L.E.D. LN217RP
						PK31-SWITCHES
S591	1	1	1	1	SK02010020	Keyboard Switch, REW
S592	1	1	1	1	SK02010020	Keyboard Switch, Stop
S593	1	1	1	1	SK02010020	Keyboard Switch, FF
S594	1	1	1	1	SK02010020	Keyboard Switch, Play
S595	1	1	1	1	SK02010020	Keyboard Switch, Pause
S596	1	1	1	1	SK02010020	Keyboard Switch, Rec
P591	1	1	1	1	YB00450080	Connective Cord (10P)
						PK32- SAFETY SWITCH CIRCUIT BOARD
PK32	1	1	1	1	YH42791320 ZZ42791320	P.W. Board, Safety Switch P.W. Board Assembly
S597	1	1	1	1	SP01010350	Push Switch, Safety
						PK33- SAFETY SWITCH CIRCUIT BOARD
PK33	1	1	1	1	YH42791330 ZZ42791330	P.W. Board, Safety Switch P.W. Board Assembly
S598	1	1	1	1	SP01010350	Push Switch, Safety
						PM01-MOTOR GOVERNOR CIRCUIT BOARD
PM01	1	1	1	1	YF43970020 ZZ42971020	P.W. Board, Motor Governor P.W. Board Assembly
						PM01-CAPACITORS
C011	1	1	1	1	EQ22601610	Elect 22 μ F 16V
CM01	1	1	1	1	DF15333300	Film 0.033 μ F \pm 5%
CM02	1	1	1	1	EA10602530	Elect 10 μ F 25V
CM03	1	1	1	1	DF15472300	Film 0.0047 μ F \pm 5%
CM04	1	1	1	1	EA10405030	Elect 0.1 μ F 50V
CM05	1	1	1	1	EA10405030	Elect 0.1 μ F 50V
CM06	1	1	1	1	EA10602530	Elect 10 μ F 25V
CM07	1	1	1	1	EA10602530	Elect 10 μ F 25V
CM08	1	1	1	1	EA10505030	Elect 1 μ F 50V
CM09	1	1	1	1	EA10405030	Elect 0.1 μ F 50V
CM10	1	1	1	1	EA10405030	Elect 0.1 μ F 50V
CM11	1	1	1	1	EA10602530	Elect 10 μ F 25V
CM12	1	1	1	1	EA10602530	Elect 10 μ F 25V
CM13	1	1	1	1	EA22701630	Elect 220 μ F 16V
CM14	1	1	1	1	EA47601630	Elect 47 μ F 16V
CM15	1	1	1	1	EA33601630	Elect 33 μ F 16V
CM16	1	1	1	1	EA47405030	Elect 0.47 μ F 50V
CM17	1	1	1	1	EA10602530	Elect 10 μ F 25V
CM18	1	1	1	1	EA47601630	Elect 47 μ F 16V
CM19	1	1	1	1	EA22601630	Elect 22 μ F 16V
CM20	1	1	1	1	EA47602530	Elect 47 μ F 25V
CM21	1	1	1	1	EA47602530	Elect 47 μ F 25V
CM22	1	1	1	1	EA10405030	Elect 0.1 μ F 50V
CM23	1	1	1	1	EA47602530	Elect 47 μ F 25V
						PM01-RESISTORS
						(All Resistors are \pm 5% & $\frac{1}{4}$ W)
RM01	1	1	1	1	GG05331140	330 Ω
RM02	1	1	1	1	GD05153140	15K Ω
RM03	1	1	1	1	GD05103140	10K Ω

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

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
RM04	1	1	1	1	GD05103140	10K Ω
RM05	1	1	1	1	GD05222140	2.2K Ω
RM06	1	1	1	1	GD05222140	2.2K Ω
RM07	1	1	1	1	GD05222140	2.2K Ω
RM08	1	1	1	1	GD05222140	2.2K Ω
RM09	1	1	1	1	GD05103140	10K Ω
RM10	1	1	1	1	GD05103140	10K Ω
RM11	1	1	1	1	RA01020300	1K Ω Trim. Auto Tension
RM12	1	1	1	1	GG05181140	180 Ω
RM13	1	1	1	1	GD05152140	1.5K Ω
RM14	1	1	1	1	GD05152140	1.5K Ω
RM15	1	1	1	1	GD05223140	22K Ω
RM16	1	1	1	1	GD05223140	22K Ω
RM17	1	1	1	1	GD05223140	22K Ω
RM18	1	1	1	1	GD05223140	22K Ω
RM19	1	1	1	1	GD05104140	100K Ω
RM20	1	1	1	1	GD05104140	100K Ω
RM21	1	1	1	1	GD05472140	4.7K Ω
RM22	1	1	1	1	GD05472140	4.7K Ω
RM23	1	1	1	1	GD05333140	33K Ω
RM24	1	1	1	1	GD05333140	33K Ω
RM25	1	1	1	1	GD05333140	33K Ω
RM26	1	1	1	1	GD05103140	10K Ω
RM27	1	1	1	1	GD05103140	10K Ω
RM32	1	1	1	1	GD05394140	390K Ω
RM34	1	1	1	1	RA05030160	50K Ω Trim. CUE/REV
RM35	1	1	1	1	GG05471140	470 Ω
RM36	1	1	1	1	GD05562140	5.6K Ω
RM37	1	1	1	1	GD05152140	1.5K Ω
RM38	1	1	1	1	GD05153140	15K Ω
RM39	1	1	1	1	GD05204140	200K Ω
RM40	1	1	1	1	GD05333140	33K Ω
RM41	1	1	1	1	GD05104140	100K Ω
RM43	1	1	1	1	GD05103140	10K Ω
RM44	1	1	1	1	GD05104140	100K Ω
RM45	1	1	1	1	GD05222140	2.2K Ω
RM46	1	1	1	1	GD05473140	47K Ω
RM47	1	1	1	1	GD05153140	15K Ω
RM48	1	1	1	1	RA05030160	50K Ω Trim. Center Speed
RM49	1	1	1	1	GD05473140	47K Ω
RM50	1	1	1	1	GD05222140	2.2K Ω
QM01	1	1	1	1	HC10004250	PM01-SEMICONDUCTORS
QM02	1	1	1	1	HT106841R0	IC CX-065A
QM03	1	1	1	1	HT106841R0	Transistor 2SA684(R)
QM04	1	1	1	1	HT313841R0	Transistor 2SC1384(R)
QM05	1	1	1	1	HT313841R0	Transistor 2SC1384(R)
QM06	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM07	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM08	1	1	1	1	HT403131E0	Transistor 2SD313(E)
QM09	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM10	1	1	1	1	HT403131E0	Transistor 2SD313(E)
QM11	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM12	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM13	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM14	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM15	1	1	1	1	HD20011050	Diode 1S1555
QM16	1	1	1	1	HD20011050	Diode 1S1555
QM18	1	1	1	1	HD20011050	Diode 1S1555
QM19	1	1	1	1	HT309451R0	Transistor 2SC945(R)
QM20	1	1	1	1	HF200301C0	F.E.T. 2SK30A(Y)
QM21	1	1	1	1	HC452800B0	IC μ PD4528C or MC14528B
QM22	1	1	1	1	HD10001010	Diode 1N34A
QM23	1	1	1	1	HD10001010	Diode 1N34A

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
P400	1	1	1	1	YF42790040	P400-POWER SUPPLY & BIAS OSC CIRCUIT BOARD
	1	1			ZZ42791040	P.W. Board, Power Supply & Bias OSC
			1	1	ZZ42798040	P.W. Board Assembly
						P.W. Board Assembly
C401	1	1	1	1	DK18102300	P400-CAPACITORS
C402	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C403	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C404	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C405	1	1	1	1	EA10803530	Elect 1000 μ F 35V
C406	1	1	1	1	EA10803530	Elect 1000 μ F 35V
C407	1	1	1	1	EA47702530	Elect 470 μ F 25V
C408	1	1	1	1	EA47702530	Elect 470 μ F 25V
C409	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C410	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C411	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C412	1	1	1	1	DK18102300	Ceramic 0.001 μ F
C413	1	1	1	1	EA22803530	Elect 2200 μ F 35V
C414	1	1	1	1	EA22803530	Elect 2200 μ F 35V
C415	1	1	1	1	DF75103510	Film 0.01 μ F \pm 5%
C416	1	1	1	1	DF75103510	Film 0.01 μ F \pm 5%
C417	1	1	1	1	DF75332510	Film 0.0033 μ F \pm 5%
C418	1	1	1	1	DF75332510	Film 0.0033 μ F \pm 5%
C419	1	1	1	1	DF75103510	Film 0.01 μ F \pm 5%
C420	1	1	1	1	EA22505030	Elect 2.2 μ F 50V
C421	1	1	1	1	DF75102510	Film 0.001 μ F \pm 5%
C422	1	1	1	1	DF55391510	Film 390pF \pm 5%
C423	1	1	1	1	DF55391510	Film 390pF \pm 5%
C424	1	1	1	1	EA22802530	Elect 2200 μ F 25V
C425	1	1	1	1	DK18473320	Ceramic 0.047 μ F
C426	1	1	1	1	EA47701630	Elect 470 μ F 16V
C429	1	1	1	1	DF75153510	Film 0.015 μ F \pm 5%
C430	1	1	1	1	DF75473510	Film 0.047 μ F \pm 5%
C431	1	1	1	1	DF75153510	Film 0.015 μ F \pm 5%
C432	1	1	1	1	EA10701630	Elect 100 μ F 16V
C433	1	1	1	1	DF75183510	Film 0.018 μ F \pm 5%
C434	1	1	1	1	EA47706330	Elect 470 μ F 63V
C435	1	1	1	1	EA10801630	Elect 1000 μ F 16V
C436	1	1	1	1	DK18473320	Ceramic 0.047 μ F
C439	1	1	1	1	EA22703530	Elect 220 μ F 35V
C440	1	1	1	1	EA22701630	Elect 220 μ F 16V
C445	1	1	1	1	EA10801630	Elect 1000 μ F 16V
C448	1	1	1	1	EA10505030	Elect 1 μ F 50V
R401	1	1	1	1	GG05056010	5.6 Ω 1W
R402	1	1	1	1	GA05471010	470 Ω 1W
R403	1	1	1	1	GA05391010	390 Ω 1W
R404	1	1	1	1	GD05223140	22K Ω
R405	1	1	1	1	GD05223140	22K Ω
R406	1	1	1	1	GD05100140	10 Ω
R407	1	1	1	1	GD05100140	10 Ω
R408	1	1	1	1	GJ05103010	10K Ω 1W
R409	1	1	1	1	GJ05103010	10K Ω 1W
R410	1	1	1	1	RA04730090	47K Ω Trim. Bias Current

- (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		
R411	1	1	1	1	RA04730090	47K Ω Trim. Bias Current
R415	1	1	1	1	GD05223140	22K Ω
R416	1	1	1	1	GA05082010	8.2 Ω 1W
R417	1	1	1	1	GG05220140	22 Ω
▲R418	1	1	1	1	GG05102120	1K Ω 1/2W
▲R419	1	1	1	1	GA05056020	5.6 Ω 2W
▲R420	1	1	1	1	GA05821010	820 Ω 1W
R421	1	1	1	1	GD05272140	2.7K Ω
R422	1	1	1	1	GD05432140	4.3K Ω
R423	1	1	1	1	GD05682140	6.8K Ω
R424	1	1	1	1	GD05473140	47K Ω
R425	1	1	1	1	GD05332140	3.3K Ω
R426	1	1	1	1	GD05393140	39K Ω
▲R428	1	1	1	1	GA05102010	1K Ω 1W
▲R429	1	1	1	1	GA05102010	1K Ω 1W
R430	1	1	1	1	75061001P0	Jumper
R435	1	1	1	1	GA05222010	2.2K Ω 1W
▲R440	1	1	1	1	GG05220140	22 Ω
P400-SEMICONDUCTORS						
▲Q401	1	1	1	1	HD20020080	Diode MI-151R
▲Q402	1	1	1	1	HD20019080	Diode MI-151
▲Q403	1	1	1	1	HT403131F0	Transistor 2SD313(F)
▲Q404	1	1	1	1	HD30048090	Zener WZ-210
▲Q405	1	1	1	1	HD20008290	Diode S4VB
Q409	1	1	1	1	HT313841R0	Transistor 2SC1384(R)
Q410	1	1	1	1	HT313841R0	Transistor 2SC1384(R)
▲Q411	1	1	1	1	HD20020080	Diode MI-151R
▲Q412	1	1	1	1	HD20019080	Diode MI-151
▲Q413	1	1	1	1	HD20020080	Diode MI-151R
▲Q414	1	1	1	1	HD20019080	Diode MI-151
Q417	1	1	1	1	HT313841R0	Transistor 2SC1384(R)
▲Q419	1	1	1	1	HD20020080	Diode MI-151R
▲Q420	1	1	1	1	HD20019080	Diode MI-151
▲Q421	1	1	1	1	HT403131F0	Transistor 2SD313(F)
▲Q421	1	1	1	1	HT407181B0	Transistor 2SD718(Q)
Q422	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
▲Q423	1	1	1	1	HD30015060	Zener RD5.6EB2
Q424	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
▲Q425	1	1	1	1	HD20022100	Diode 10E1-FA
Q426	1	1	1	1	HD30029090	Zener WZ-090
Q427	1	1	1	1	HT326341S0	Transistor 2SC2634(S)
Q428	1	1	1	1	HD20011050	Diode 1S1555
Q429	1	1	1	1	HD20011050	Diode 1S1555
Q430	1	1	1	1	75061001P0	Jumper
▲Q432	1	1	1	1	HT403131E0	Transistor 2SD313(E)
P400-MISCELLANEOUS						
L401	1	1	1	1	LC12750020	Choke Coil 2.7 μ H
L402	1	1	1	1	LC12750020	Choke Coil 2.7 μ H
T401	1	1	1	1	TC10140110	OSC Transf. Bias 105KHz
T402	1	1	1	1	TC10140120	OSC Transf. Erase 65KHz
P404	1	1	1	1	YJ06001430	Jack, (9P)
P509	1	1	1	1	YP06001050	Plug, (5P)

REF. DESIG.	Q'TY				PART NO.	DESCRIPTION
	U	C	N	A		
P800-TIMER RELAY CIRCUIT BOARD						
P800	1	1	1	1	YF42790050	P.W. Board, Timer Relay
	1	1	1	1	ZZ42790050	P.W. Board Assembly
P800-CAPACITORS						
G802			1	1	DF17223800	Film 0.022 μ F \pm 20%
P800-RESISTORS						
R801	1	1	1	1	GD05103140	10K Ω \pm 5% 1/4W
R802	1	1	1	1	GD05102140	1K Ω \pm 5% 1/4W
P800-SEMICONDUCTORS						
Q801	1	1	1	1	HD20022100	Diode 10E-1
Q802	1	1	1	1	HT106841R0	Transistor 2SA684(R)
P800-MISCELLANEOUS						
J803						
?	8	8	8	8	YP10001530	Plug
J810						
J851	3	3	3	3	YP10001130	Plug, Wire Wrap
L802	1	1			LY10120140	Relay, G2W-1112V UL, CSA
L802			1	1	LY10120150	Relay, G2W-1112V Semko
Z801	1				BF10400030	Cap. Comp. Spark Killer
G801		1			BF33300020	Cap. Comp. Spark Killer
P900-FUSE CIRCUIT BOARD						
P900			1	1	WF42790020	P.W. Board, Fuse
			1	1	ZZ42798020	P.W. Board Assembly
P900-FUSE						
▲F901			1	1	FS10100800	Fuse, 1A Semko
▲F902			1	1	FS10200800	Fuse, 2A Semko
▲F903			1	1	FS10080800	Fuse, 0.8A Semko
▲F904			1	1	FS10140800	Fuse, 1.4A Semko
▲F905			1	1	FS10080800	Fuse, 0.8A Semko
P900-JACK						
J911						
?			10	10	YJ08000200	Fuse Clip
J920						
P001-PHOTO COUPLER CIRCUIT BOARD						
P001	2	2	2	2	YF43970010	P.W. Board, Photo Coupler
	2	2	2	2	ZZ43970010	P.W. Board Assembly
Q001	2	2	2	2	HW10001030	Photo Unit

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

12. TECHNICAL SPECIFICATIONS

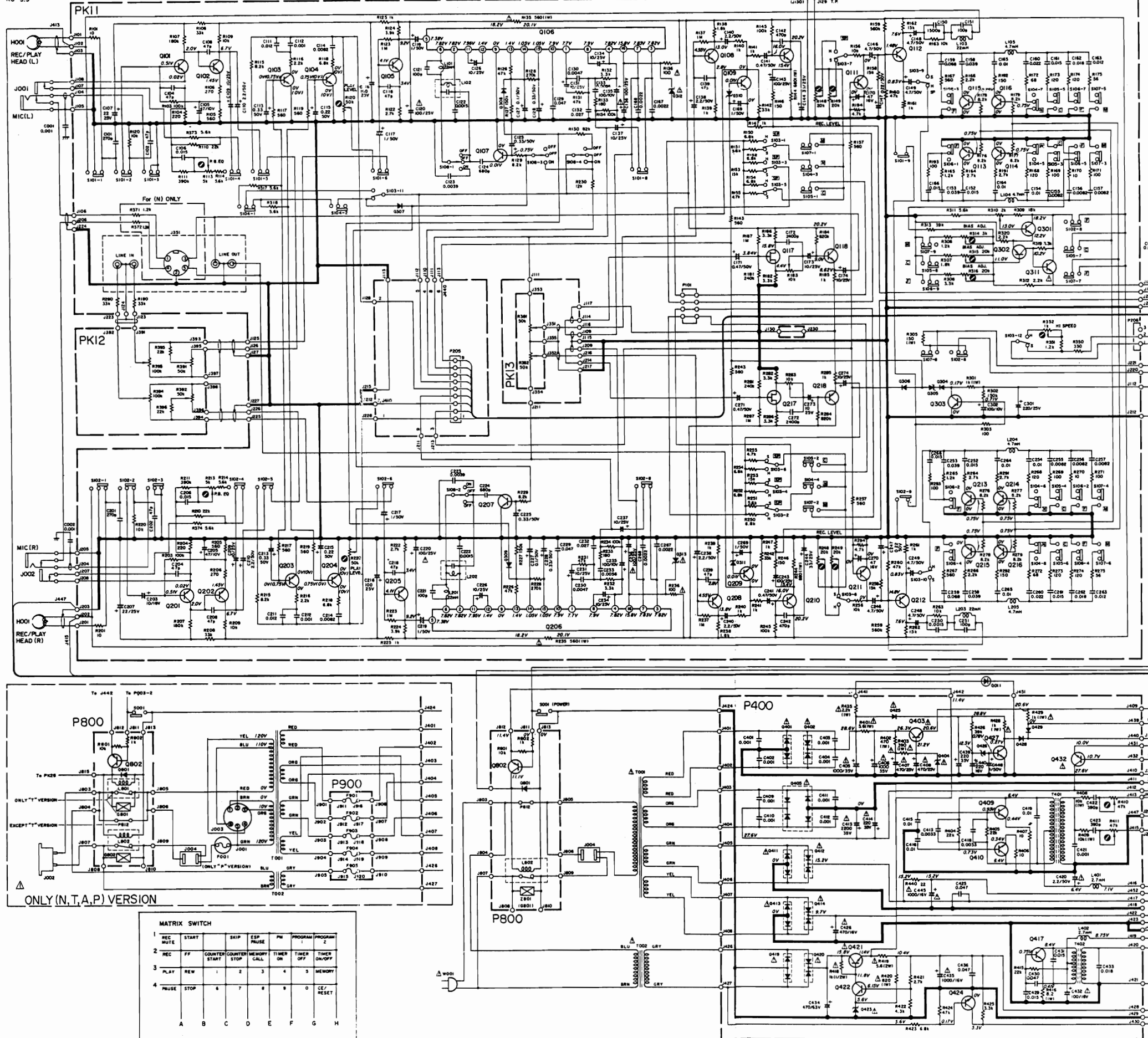
Type	Front loading 4-Track, 2-Channel Stereo Record/Playback System	
Tape	Phillips-type Compact Cassette	
Tape Speeds	High: 3-3/4 ips (9.52 cm/sec) Standard: 1-7/8 ips (4.76 cm/sec)	
Motor Drive System	DC Servo Motor (x2) with Single Capstan Drive	
Heads	2 Head System	
	Erase Head: Ferrite	
	Record/Play Head: Sendust Alloy	
Level Indicators	Left and Right LED Peak Level Displays	
Noise Reduction System	Dolby NR	
Semiconductors		
Transistors	91	
IC's	7	
Diodes	71	
LED's	18	
Wow and Flutter (WRMS)	High Speed	Standard Speed
	0.03%	0.05%
Frequency Response		
(Overall, -20 dB below 0 VU)		
Metal	25 Hz ~ 23 kHz (±3 dB)	25 Hz ~ 20 kHz (±3 dB)
Ferrichrome (FeCr)	25 Hz ~ 22 kHz (±3 dB)	25 Hz ~ 18 kHz (±3 dB)
Chromium Dioxide (CrO ₂)	25 Hz ~ 22 kHz (±3 dB)	25 Hz ~ 17 kHz (±3 dB)
Ferric (Normal)	25 Hz ~ 20 kHz (±3 dB)	25 Hz ~ 16 kHz (±3 dB)
Signal-to-Noise Ratio		
Dolby ON	72 dB (over 5 kHz)	69 dB (over 5 kHz)
Dolby OFF	62 dB	59 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	30 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	22 lbs. 1 oz. (10 kg)	

NOTES:

1. Reference recording level: 0 VU (160 nW/M)
2. Reference frequency: 315 Hz
3. Wow and flutter measured at: 3.0 kHz NAB WGTD RMS
4. Frequency response measured at: 20 dB below 0 VU recording level reference (Dolby off)
5. S/N ratio measured at the recorded level equivalent to 3% THD, IEC "A" WGTD, 70 μSec. EQ.
6. Recording reference tapes:
 - Normal: TDK AC 211
 - CrO₂: TDK AC 511
 - FeCr: Sony CS 30
 - Metal: TDK AC-701

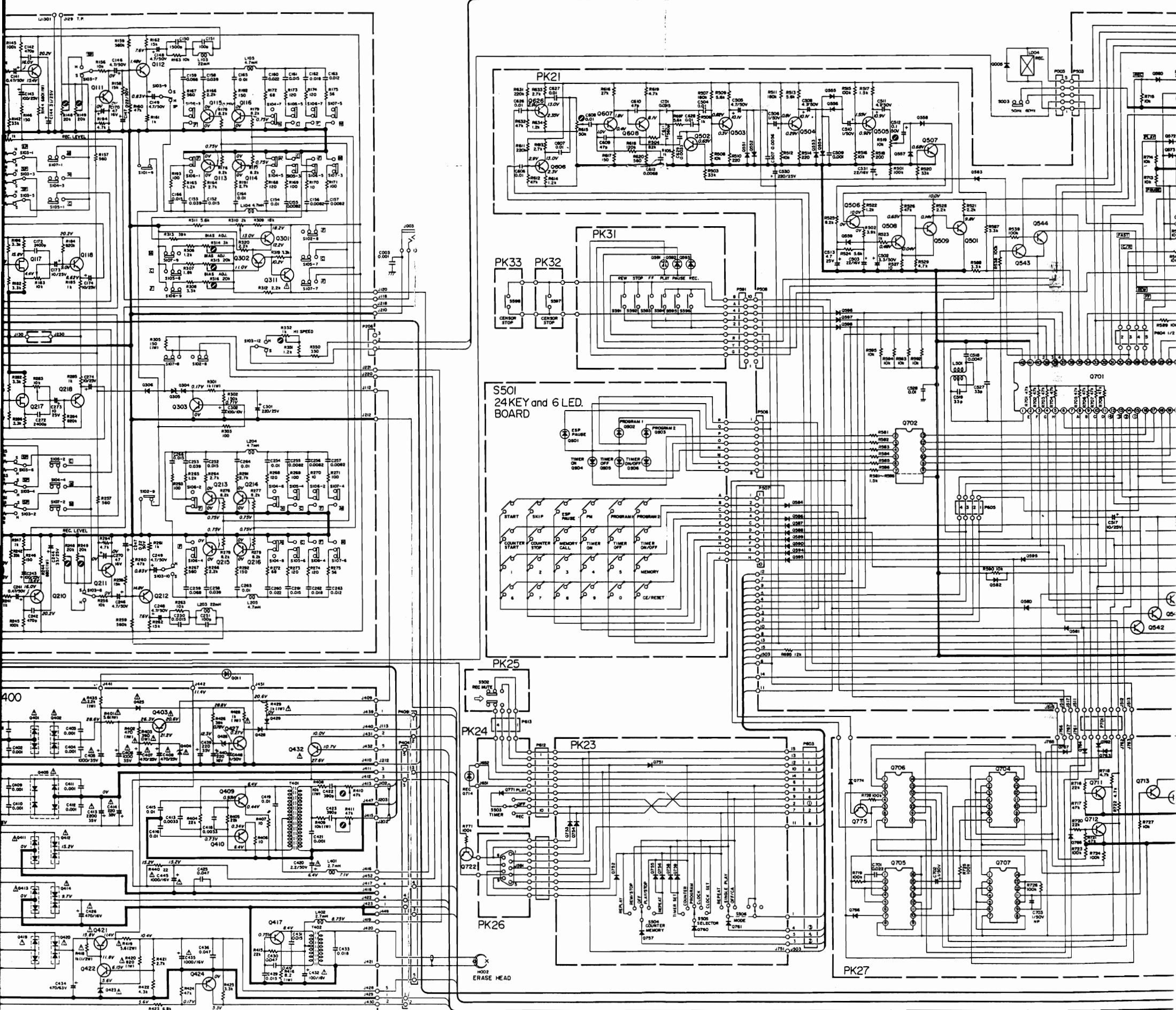
13. SCHEMATIC DIAGRAM

- Q105, Q205 HT314001E0 25C1400(E)
 Q310, Q311 HD30002060 RO-3.9
- SEMICONDUCTORS
 Q001 HW10001030
 Q002 ~ Q004 HD20023100 10E1LF
 Q011 HI10009300 AR2132D
 Q101, Q102, Q110, Q118, Q201 Q202, Q210, Q218, Q303 HT326341TD 25C2634(T)
 Q103, Q104, Q203 HT326341SD 25C2634(S)
 Q107 ~ Q109, Q111 ~ Q116 Q207 ~ Q209, Q211 ~ Q216, Q213, Q214
 Q106, Q206 HC10001360 LM101IAN
 Q117, Q217 HF309451PO 25K30A(Y)
 Q301, Q302 HT309451PO 25C945(P)
 Q304, Q306 ~ Q309 HD20011050 151555
 Q305 HD30033090 WZ052
 Q312, Q313 HD30033090 WZ177
 Q320 HT403131E0 25D313(E)
 Q401, Q411, Q414, Q419 HD2002008 M-151R



Note on safety: The parts marked with Δ are important parts on the safety. Please use the parts having the designated parts number without fail.

02 SIPO (P) 0304,0306~0309 HD2001050 IS1555 0305 HD30033090 WZ052 0312,0313 HD30030090 WZ177 0320 HT403131E0 2S0313(E) 0401,0411,0413 0414,0419 HD20020080 MI-151R 0402,0412,0420 HD30019080 MI-151 0403 HT403131E0 2S013(E) 0404 HD30048090 WZ-210 0405 HD20008290 S4VB 0409,0410,0417 HT313841R0 2S01384(R) 0421 HT407181B0 2S0718(O) 0425 HD20022100 10E1-FA 0426 HD30029090 WZ-090 0422,0424,0427 HT326341S0 2S02634(S) 0428,0429 HD2001050 IS1555



SWITCHES

- S101: REC/PLAY SWITCH (REC)
- S102: REC/PLAY SWITCH (REC)
- S103: TAPE SPEED SWITCH (STANDARD)
- S104: TAPE SELECTOR (NORMAL)
- S105: TAPE SELECTOR (Special/CrO₂)
- S106: TAPE SELECTOR (FeCr)
- S107: TAPE SELECTOR (Metal)

Components and wiring are subject to change for modification without notice.

MODEL SD 8000 TECHNICAL SPECIFICATIONS (DIN)

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	91	
Diodes	71	
IC's	7	
LED's	8	
Overall Frequency Response (Dolby off):	Tape Speed:	Tape Speed:
Ferric Oxide Tape	at 20 dB for 4.75 cm/sec.	at 10 dB for 9.5 cm/sec.
CrO ₂ Tape	25 Hz ~ 16 kHz (±3 dB)	25 Hz ~ 18.5 kHz (±3 dB)
Fe-Cr Tape	25 Hz ~ 17.5 kHz (±3 dB)	25 Hz ~ 19 kHz (±3 dB)
Metal Tape	25 Hz ~ 18 kHz (±3 dB)	25 Hz ~ 19.5 kHz (±3 dB)
	25 Hz ~ 18.5 kHz (±3 dB)	25 Hz ~ 20.5 kHz (±3 dB)
Total Harmonic Distortion		
Ferric Oxide Tape	2%	
CrO ₂ Tape	2.5%	
Fe-Cr Tape	2.5%	
Metal	2.5%	
	Tape Speed: 4.75 cm/sec.	Tape Speed: 9.5 cm/sec.
Wow and Flutter (DIN WTD)	0.10%	0.07%
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	63 W	
Dimensions (W x H x D)	416 mm x 146 mm x 243 mm	
Weight	9.1 kg	