

# SERVICE MANUAL



# SANYO

## STEREO CASSETTE TAPEDECK

# RD 5600

(AUSTRALIA)



### SPECIFICATIONS

|                             |                                                                                                   |                                                   |                                                                                               |
|-----------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Tape:                       | CrO <sub>2</sub> tape, FeCr tape and Normal tape                                                  | Input:                                            | MIC: 10K ohms (0.3mV)<br>REC/PLAY: 10K ohms (1mV)<br>LINE IN: 60K ohms (50mV)                 |
| Recording System:           | AC bias, 1/4 track stereo                                                                         | Output:                                           | REC/PLAY: 3K ohms (0.7V)<br>LINE OUT: 3K ohms (0.7V)<br>HEADPHONES: 8 ohms to 10K ohms (30mV) |
| Erasing System:             | AC erasing, 1/2 track                                                                             | Power Source:                                     | AC: 240V, 50Hz                                                                                |
| Tape Speed                  | 1-7/8 ips. (4.75 cm/sec.)                                                                         | Power Consumption:                                | 13W                                                                                           |
| Recording Time:             | 60 min. (C-60)                                                                                    | Dimensions:                                       | 16-13/16"(W) x 11-7/16"(D) x 6-1/4"(H)<br>(426 x 290 x 158mm)                                 |
| Rewind & Fast Forward Time: | 90 sec. (C-60)                                                                                    | Weight:                                           | Approx. 15 lbs. 15 ozs. (7.2 kg)                                                              |
| Wow & Flutter:              | 0.06% WRMS                                                                                        | *Specifications subject to change without notice. |                                                                                               |
| Frequency Response:         | 30 - 17,000Hz (CrO <sub>2</sub> tape)<br>30 - 17,000Hz (FeCr tape)<br>30 - 13,000Hz (Normal tape) |                                                   |                                                                                               |
| Signal to Noise Ratio:      | 62 dB (Dolby switch ON)<br>54 dB (Dolby switch OFF)                                               |                                                   |                                                                                               |

# REMOVAL OF CABINET

## (1) Removal of cabinet

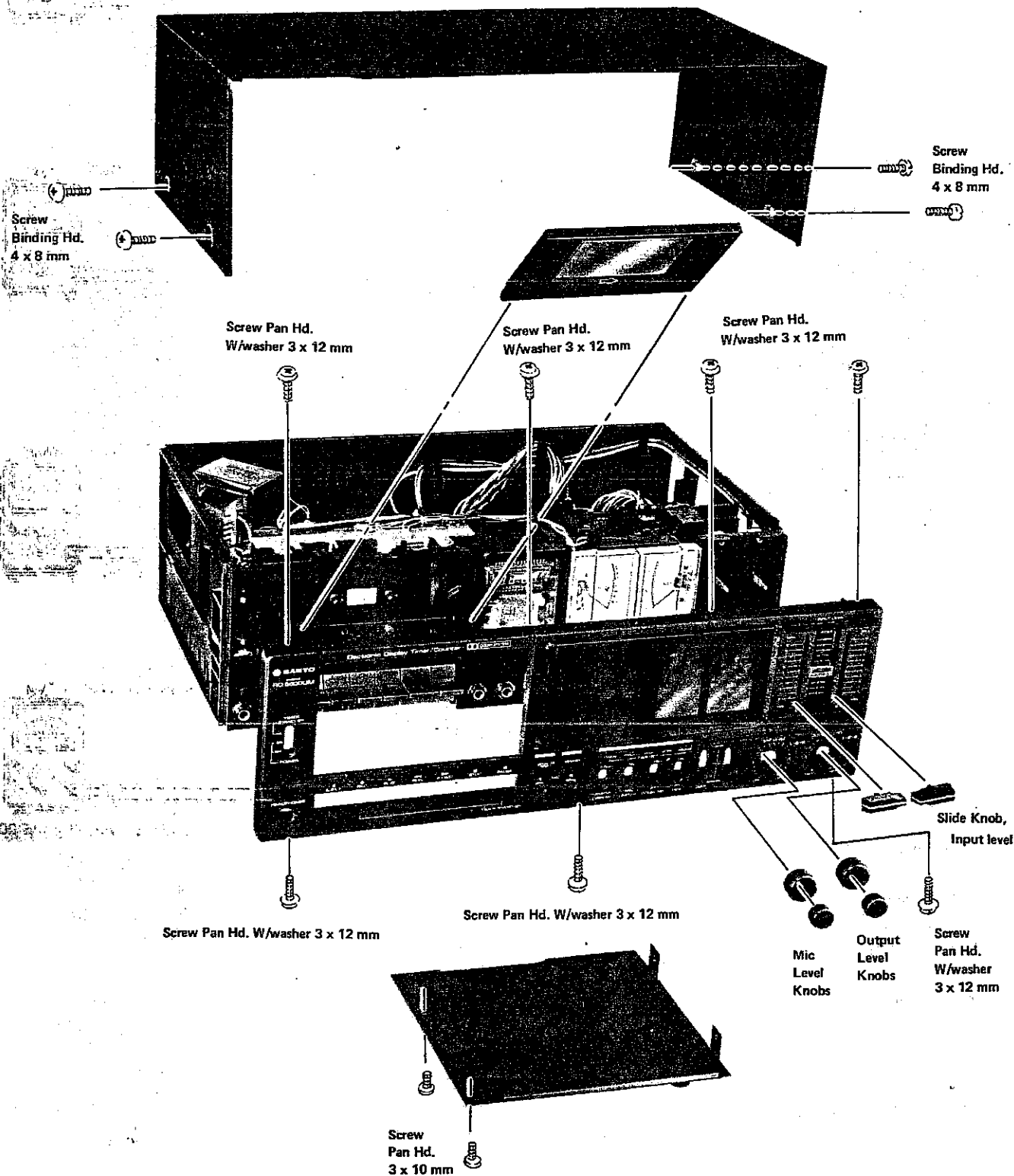
Remove the cabinet (112) by unfastening the four screws (Bind Hd., 4 x 8 mm) fixing the cabinet.

## (2) Removal of front panel

Remove the six knobs (two for external input control, two for microphone level control, and two for output level control) on the front panel of the unit, then remove the front panel (101) by unfastening the seven screws (Pan Hd., tapping, w/washer, 3 x 12 mm) fixing the front panel.

## (3) Removal of bottom lid

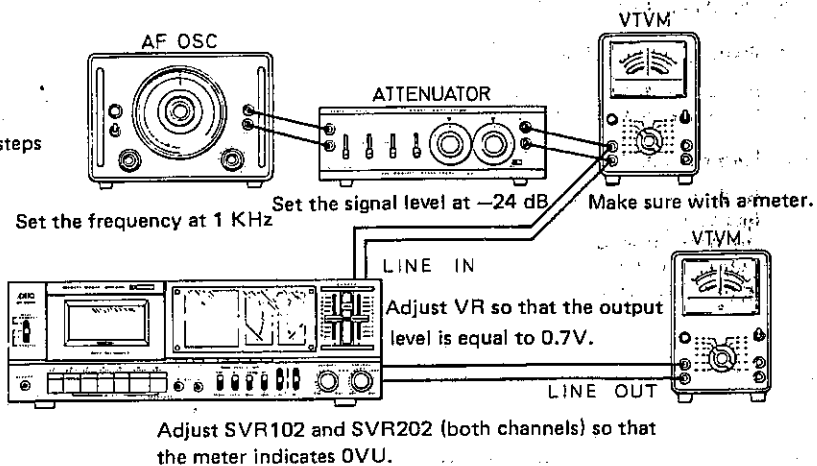
Remove the bottom lid (113) at the bottom of the unit by unfastening the two screws (Pan Hd., tapping, 3 x 10 mm) fixing the bottom lid.



# AMPLIFIER ADJUSTMENTS

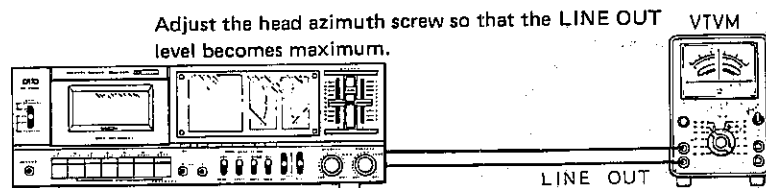
## (1) Adjustment of meter

Dolby switch: OFF  
 Limiter switch: OFF  
 Output switch: OFF  
 Output level control: maximum (also for adjustments in steps 2 through 6 below)



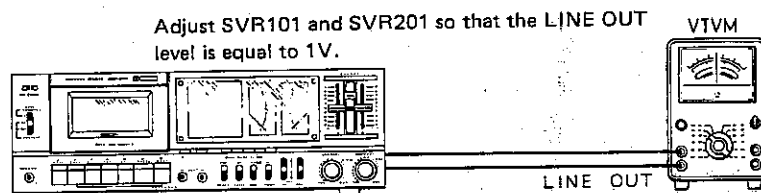
## (2) Adjustment of angle

Equalizer switch: NORMAL  
 Dolby switch: OFF  
 Tape to be used: VTT - 658



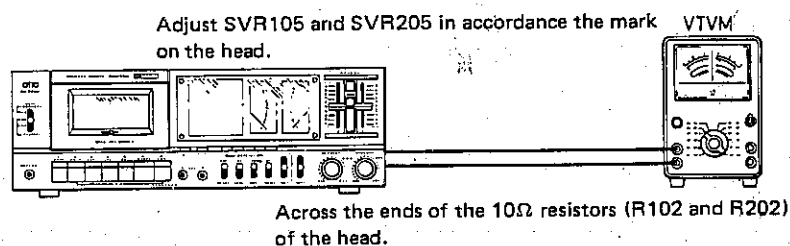
## (3) Adjustment of playback output

Equalizer switch: NORMAL  
 Dolby switch: OFF  
 Tape to be used: MTT - 150

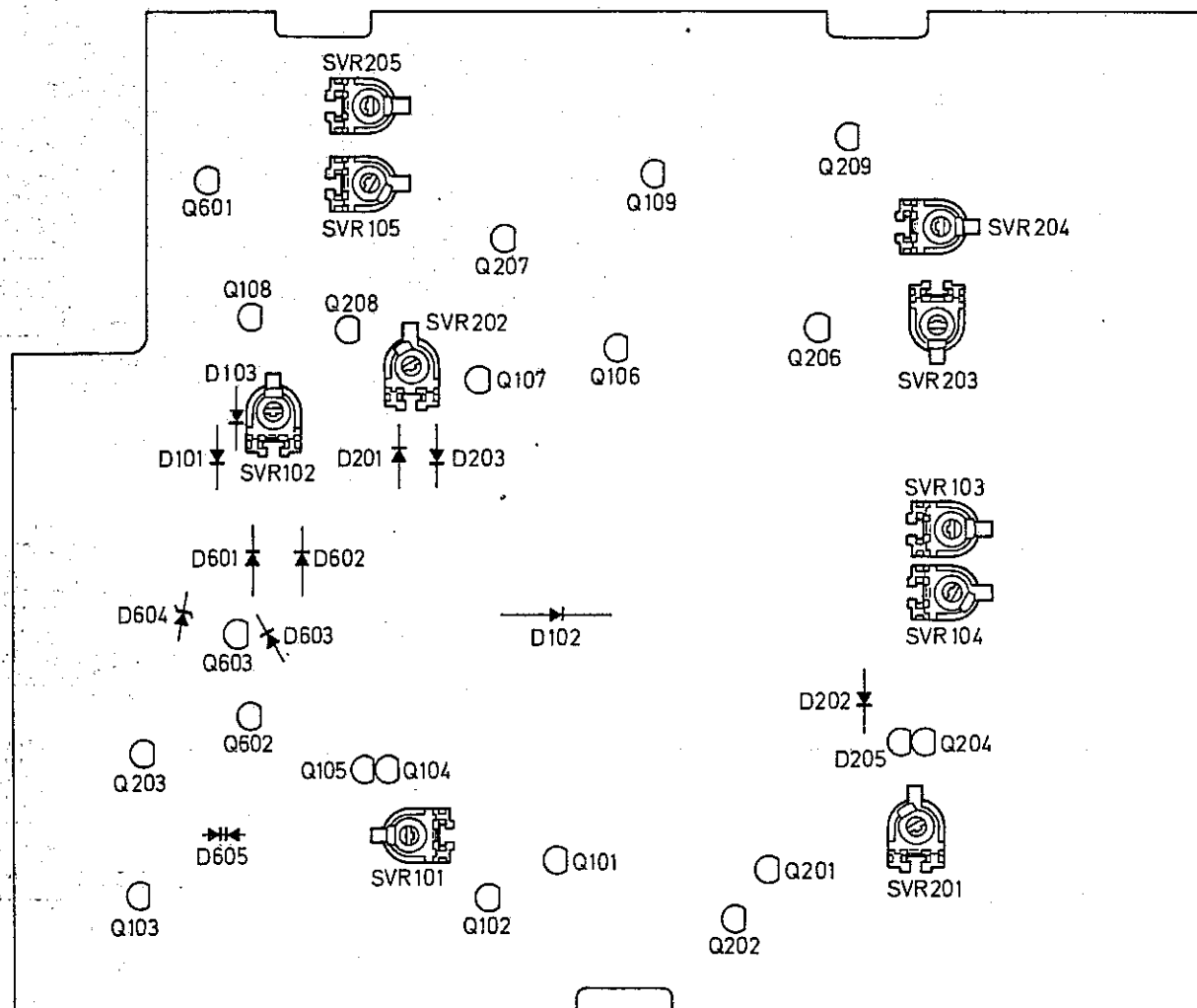


## (4) Adjustment of bias

Equalizer switch: NORMAL  
 Bias switch: NORMAL



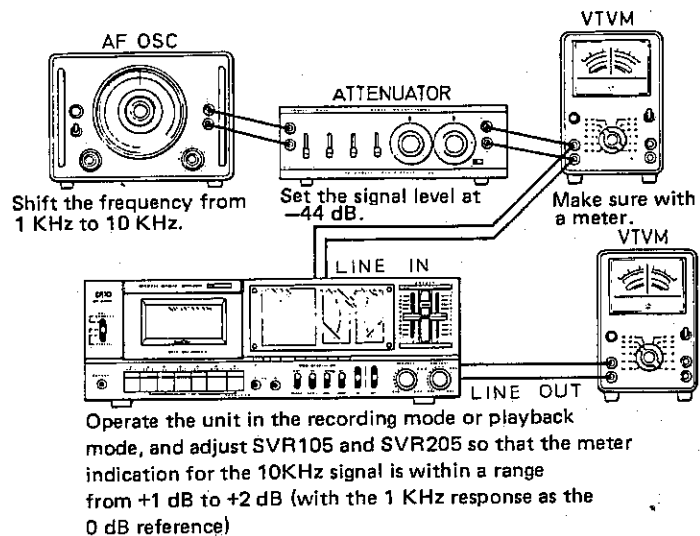
# PARTS LOCATION



| Items of adjustment and checking                           | Tapes to be used        | Points of measurement                                        | Input terminal | Frequency     | Input level | Equalizer SW | Bias SW |
|------------------------------------------------------------|-------------------------|--------------------------------------------------------------|----------------|---------------|-------------|--------------|---------|
| Adjustment of meter                                        | Sanyo measurement tape  | LINE OUT                                                     | LINE IN        | 1KHz          | -24db       |              |         |
| Adjustment of angle                                        | VTT-658<br>10KHz, -15db | LINE OUT                                                     |                |               |             | NORMAL       |         |
| Adjustment of playback output                              | MTT-150<br>DOLBY-TAPE   | LINE OUT                                                     |                |               |             | NORMAL       |         |
| Adjustment of bias                                         | Sanyo measurement tape  | Across the ends of the 10Ω resistors of the head, R102, R202 |                |               |             | NORMAL       | NORMAL  |
| Adjustment of recording/playback frequency characteristics | Sanyo measurement tape  | LINE OUT                                                     | LINE IN        | 1KHz<br>10KHz | -44db       | NORMAL       | NORMAL  |
| Adjustment of outputs                                      | Sanyo measurement tape  | LINE OUT                                                     | LINE IN        | 1KHz          | -24db       | NORMAL       | NORMAL  |

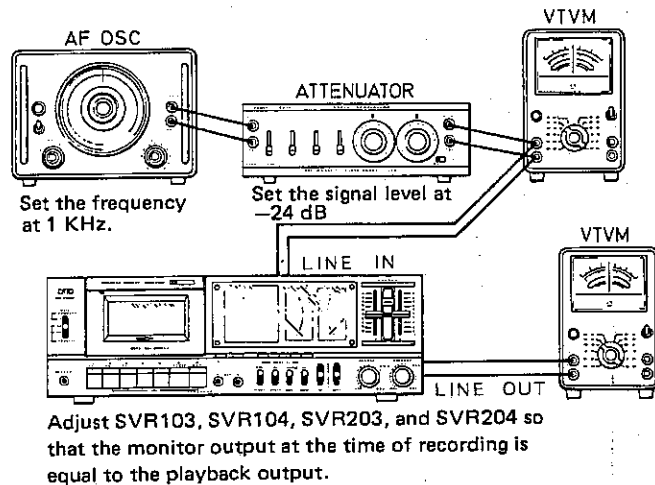
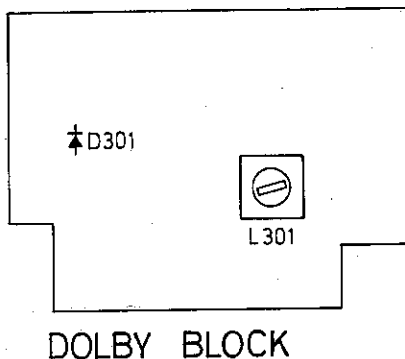
### (5) Adjust of the record/playback frequency characteristics

Equalizer switch: NORMAL  
Bias switch: NORMAL  
Dolby switch: OFF  
Limiter switch: OFF



### (6) Adjustment of outputs

Equalizer switch: NORMAL  
Bias switch: NORMAL  
Dolby switch: OFF  
Limiter switch: OFF



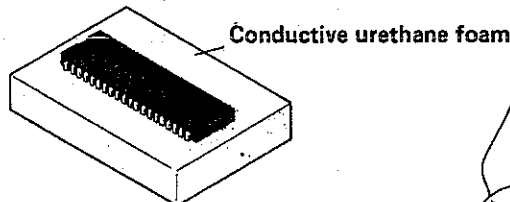
| Dolby SW | Limiter SW | REC SW                           | Places of adjustment     | Methods of adjustment                                                                                                                                                                                                             |
|----------|------------|----------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF      | OFF        | Adjustment                       | SVR 102<br>SVR 202       | Set the unit to the REC. PAUSE state.<br>Adjust REC VR so that the LINE OUT level is equal to 0.7V, then adjust SVR 192 and SVR 202 to obtain 0VU indication of the meter.                                                        |
| OFF      |            |                                  | Re-adjustment of head    | Adjust the head azimuth screw so that the 10 KHz output is maximum for both R and L channels.                                                                                                                                     |
| OFF      |            |                                  | SVR 101<br>SVR 201       | Adjust SVR 101 and SVR 201 so that the LINE OUT level is equal to 1V.                                                                                                                                                             |
|          |            |                                  | SVR 105<br>SVR 205       | Head marks<br>red . . . . . 180μA      blue . . . . . 200μA      white . . . . . 230μA<br>yellow . . . . . 250μA      black . . . . . 280μA                                                                                       |
| OFF      | OFF        | The position of meter adjustment | SVR 105<br>SVR 205       | Operate the unit in the recording mode or playback mode, and adjust SVR 105 and SVR 205 so that the meter indication for the 10 KHz signal is within a range from +1 dB to +2 dB (with the 1 KHz response as the 0 dB reference). |
| OFF      | OFF        | The position of meter adjustment | SVR 103, 104<br>203, 204 | Adjust SVR 103, SVR 104, SVR 203, and SVR 204 so that the monitor output at the time of recording is equal to the record/playback output.                                                                                         |

## SUGGESTIONS FOR HANDLING LSI AND C MOS

### (1) In the case of transit or storage

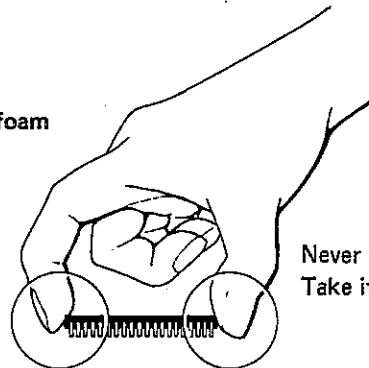
LSI (large-scale integrated circuit) is extremely sensitive and vulnerable to static electricity, and may be damaged if it is exposed to a strong electrostatic field. So, be careful to avoid such a possibility when carrying or storing LSI's. Similar care is necessary in handling C MOS's.

#### (a) To store the LSI



Be sure to keep the LSI inserted in the conductive urethane foam until it is put to use. (This is for keeping the potential at each terminal equal.)

#### (b) How to handle the LSI

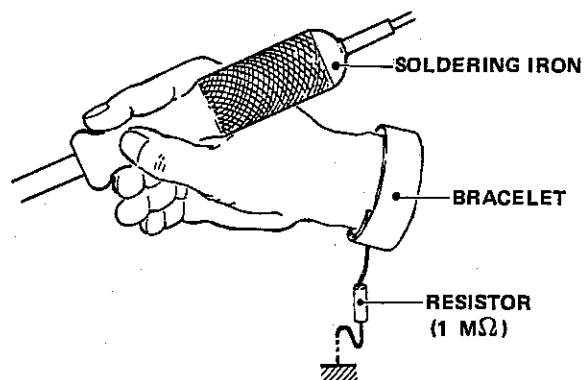
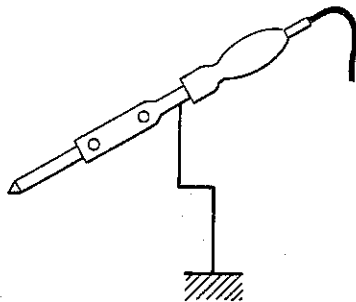


(c) To store the LSI, avoid places where temperature or humidity is high, or where there is a strong magnetic field.

### (2) Suggestions for repairing

(a) Before replacing the LSI, be sure to pull out the power plug. Also, be sure to short-circuit the designated electrolytic condensers (C716, C751, and C752) and discharge them.

(b) All the equipment, measuring instruments, and tools should be grounded. Ground the work table by covering it a conductive sheet.



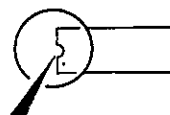
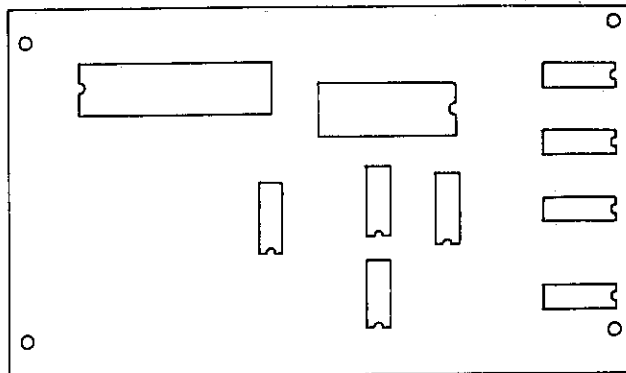
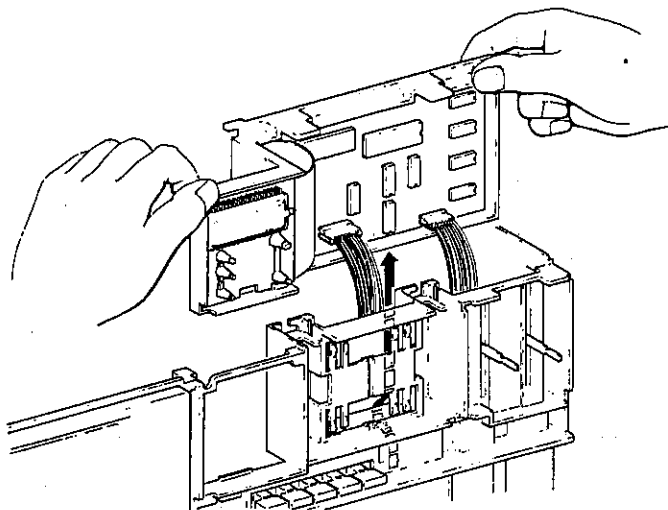
The repairman should ground his body electrically by touching the ground line with his hand before he handles the LSI.

### (3) Suggestions for replacement of LSI

(a) There is a mark on one side of the LSI. This is for preventing you from inserting the LSI in a wrong way.

(b) If power is supplied to the unit with the LSI inserted in a wrong way, the LSI must be discarded. (The LSI may still be good immediately after, but it will break down in the course of use.)

(c) When removing the digital section from the unit, hold the section as shown in the figure below.



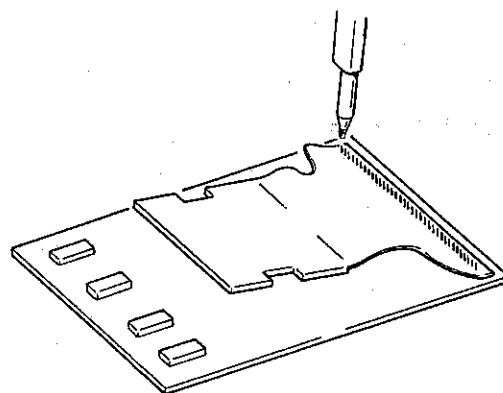
Mark

#### (4) Other suggestions

- (a) Never clean the unit with a dry cloth. (Use one containing antistatics.)
- (b) A tester may be used to measure voltage or current, but not resistance.

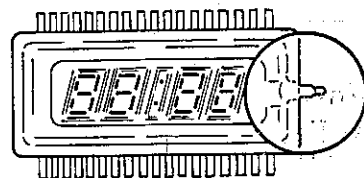
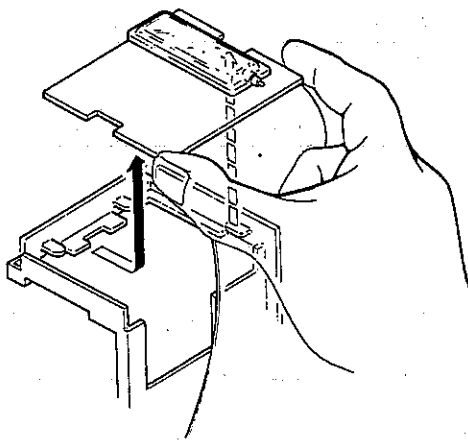
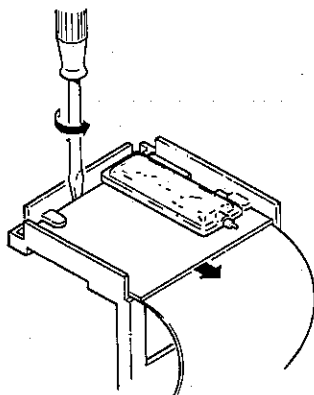
#### F.P.C. (FLEXIBLE PRINTED CIRCUIT)

- (1) Soldering iron should never touch the film, or anywhere except the pattern face.
- (2) Use a soldering iron of less than 30W (with temperature lower than 270°C). Soldering must be done speedily within three seconds.



#### HOW TO HANDLE THE FLUORESCENT DISPLAY TUBE

- (1) The display tube is made of glass. Do not drop it, or give a shock.
- (2) The protruding portion of the display tube very easy to break. Be careful in handling the tube.
- (3) The fluorescent display tube is connected to the ISI. So, carefully read the suggestions in P (2) before replacing the display tube.



## DESCRIPTION OF THE DIGITAL CONTROL SYSTEM

The model RD5600 employs digital techniques in a large measure.

Figure 1 shows a block diagram of the main sections.

Roughly speaking, the circuit is composed of the mechanism section having the auto-stop function, the record/playback circuit with two power-supply circuits, and the digital circuit with the tape counter and the clock.

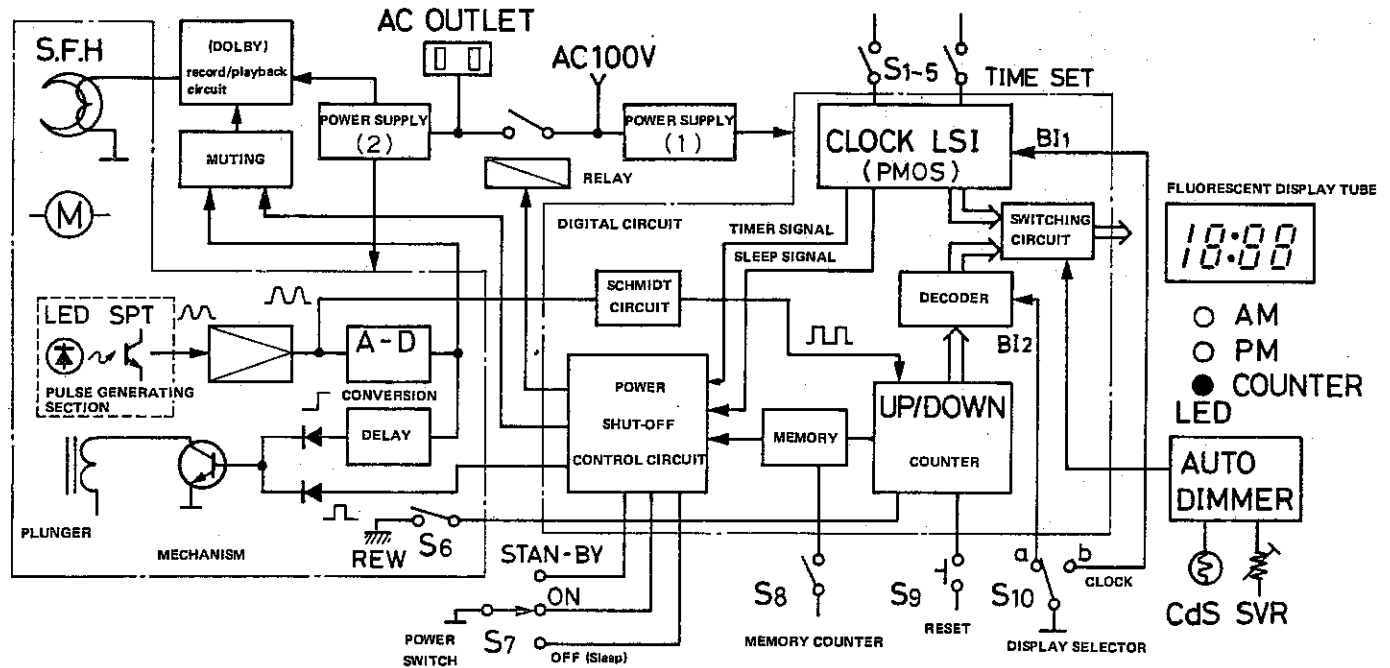


Fig. 1

### (1) Generation of count pulse

The source of the count pulse is a hexagonal reflector attached to the supply reel. Light rays generated from an LED are reflected by this reflector. The reflected light is then directed to a photo-transistor, and amplified by a transistor to become a pulse signal. (See Fig. 2) In order to prevent erroneous operation due to noise, the pulse is put through a wave-shaping circuit shown in Fig. 3, where the noise components are eliminated. The pulse signal is then supplied to the counter circuit board.

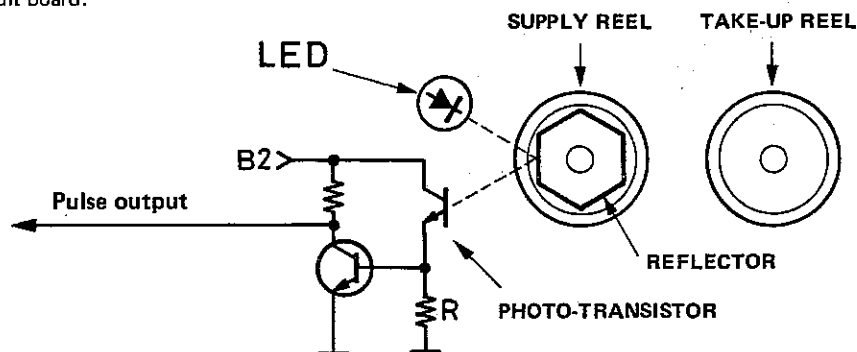


Fig. 2

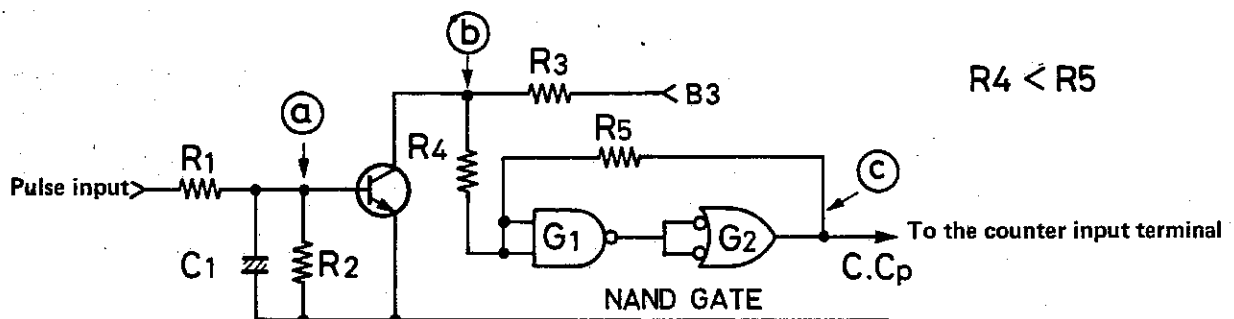


Fig. 3

The pulse frequency is, even in the case of F. FWD operation, only 150 per second, or equivalent to a period of 6.7 ms. So, the magnitudes of R, and C, are so chosen that the time constant determined by them is equal to 5ms. The pulse signal integrated by R, and C, switches transistor Q ON and OFF. But, the output waveform is not sharp enough, so this pulse signal is put through a Schmidt circuit, of MOS NAND gate (G, G2) to make the leading and trailing edges sharper. (See Fig. 4)

## (2) Method of tape counting

As shown in Fig. 5, the tape counter consists of a 4-digit up/down counter using an MOS IC, a c MOC decoder driver for driving a 7-segment display device with the BCD signal, and other auxiliary circuits.

The maximum count of the tape counter is 1999. The pulse frequency and the frequency division ratio are so designed that the tape counter counts about 950 if a C-60 type cassette tape is used, and about 1850 if a C-120 type tape is used.

The output signal from the Schmidt circuit enters the quinary section. This quinary section is determined by the relationship between the maximum count indication and the pulse generating section.

The maximum indication is given by

$$\text{Maximum indication} = \frac{\text{Total number of pulses}}{X}$$

where total number of pulses depends on the type of tape used and the method of pulse generation. In the present unit, the total number of pulses is 9250, assuming the use of the C-120 type cassette tape and a hexagonal reflector. If we assume the maximum indication to be 1999, then the total number of pulses that can be counted will be 9995 with X equal to 5. (Note: Number of reel revolutions is about 1550 with the C-120 type tape, and about 800 with the C-60 type tape.)

The decoder employs the leading zeros in the upper positions are suppressed for ease of reading.

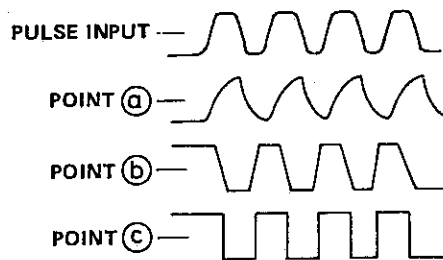
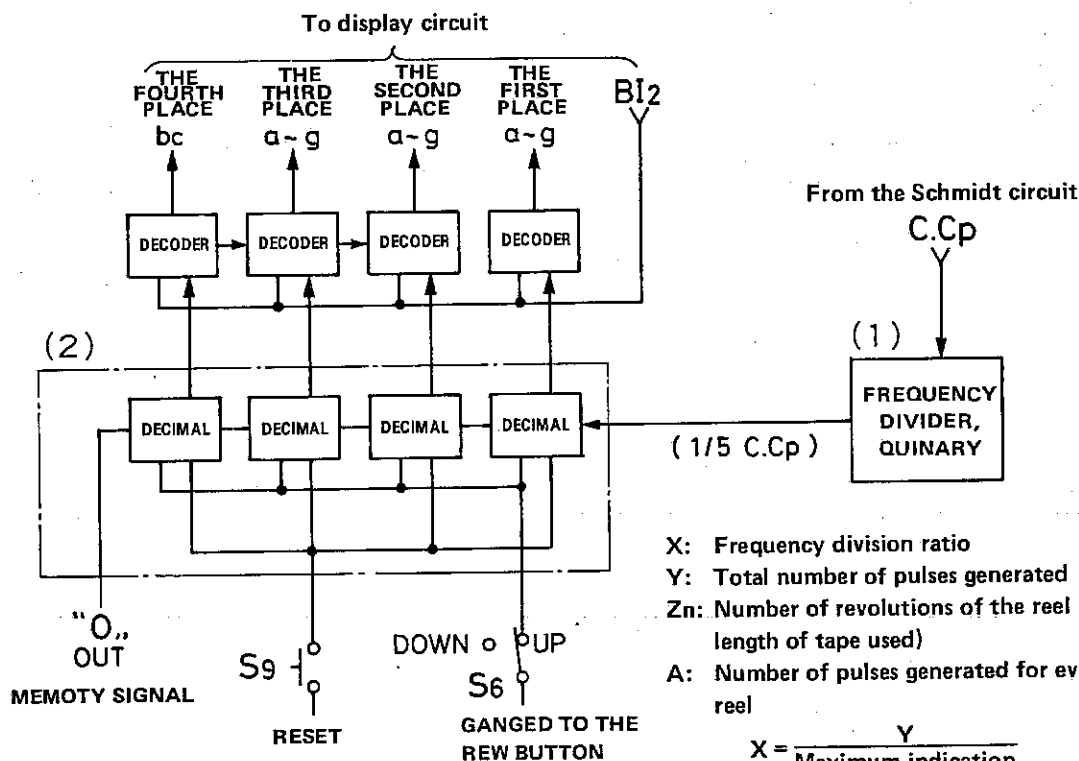


Fig. 4



X: Frequency division ratio

Y: Total number of pulses generated

Zn: Number of revolutions of the reel (depending on the length of tape used)

A: Number of pulses generated for every revolution of the reel

$$X = \frac{Y}{\text{Maximum indication.}}$$

$$Y = A \cdot Z$$

$$Z_1 \approx 1550 \text{ (C-120)}$$

$$Z_2 \approx 800 \text{ (C-60)}$$

Fig. 5

(3) Method of display for counter and clock

Figure 6 shows a unique method of connecting a single display device to outputs of two different circuits. This is one of distinguished features of this unit. This display tube is called "fluorescent display," which was specially developed for this unit. It operates on 12V, lighting in green of high luminance.

Since the output from the clock LSI is at a level of 22V to 24V, and that from the decoder IC is 12V, these two outputs can not be directly connected. In this unique circuit, an AUTO DIMMER is employed in order to solve this problem.

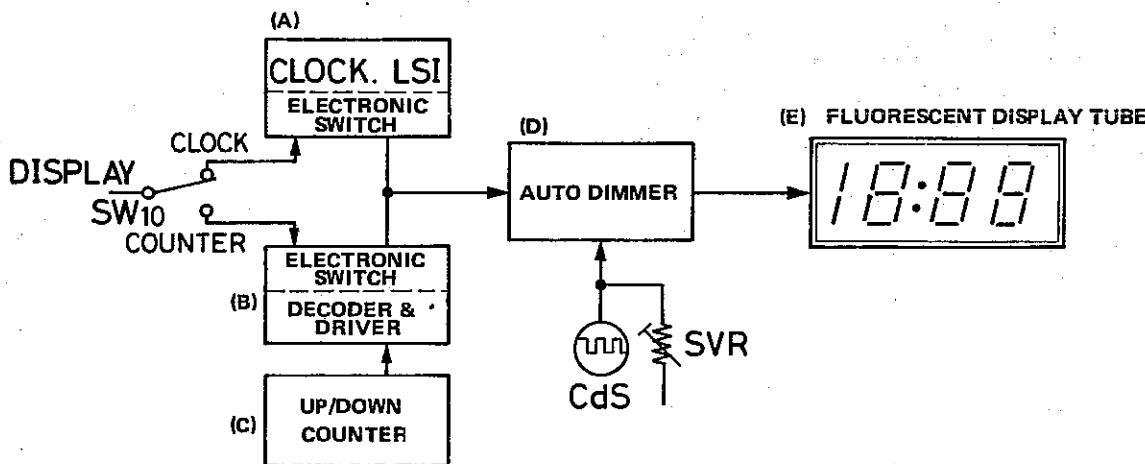


Fig. 6

As is clear from Fig. 7, the output from the decoder IC is connected to the LSE output through a diode (Dp), and then both outputs are supplied to each of the segment plates (P) of the display tube. Switching of display is done by the switch S10a, which closes, alternatively, on the clock side and the counter side, and supplies a voltage of 24V to the blanking (B1) terminal of each IC. The output of the clock LSI is turned ON when 24V is applied to the BI<sub>1</sub> terminal, and the clock LSI will present a high impedance when BI<sub>1</sub> is at a potential of 0V.

The output of the decoder IC is turned OFF when half as great the voltage (since R1 is equal to R2) is applied to the BI<sub>2</sub> terminal, and is turned ON when BI<sub>2</sub> is at a potential of 0V. Consequently, it is possible to select, by means of the switching operation of S10a, an output to be applied to the plate of the display tube. But, with this circuit construction, the brightness of the display tube is different for counter display and clock display since the voltage supplied to the display tube differs by a large margin in these two cases. Thus, some device must be contrived in order to compensate for this difference in lightness.

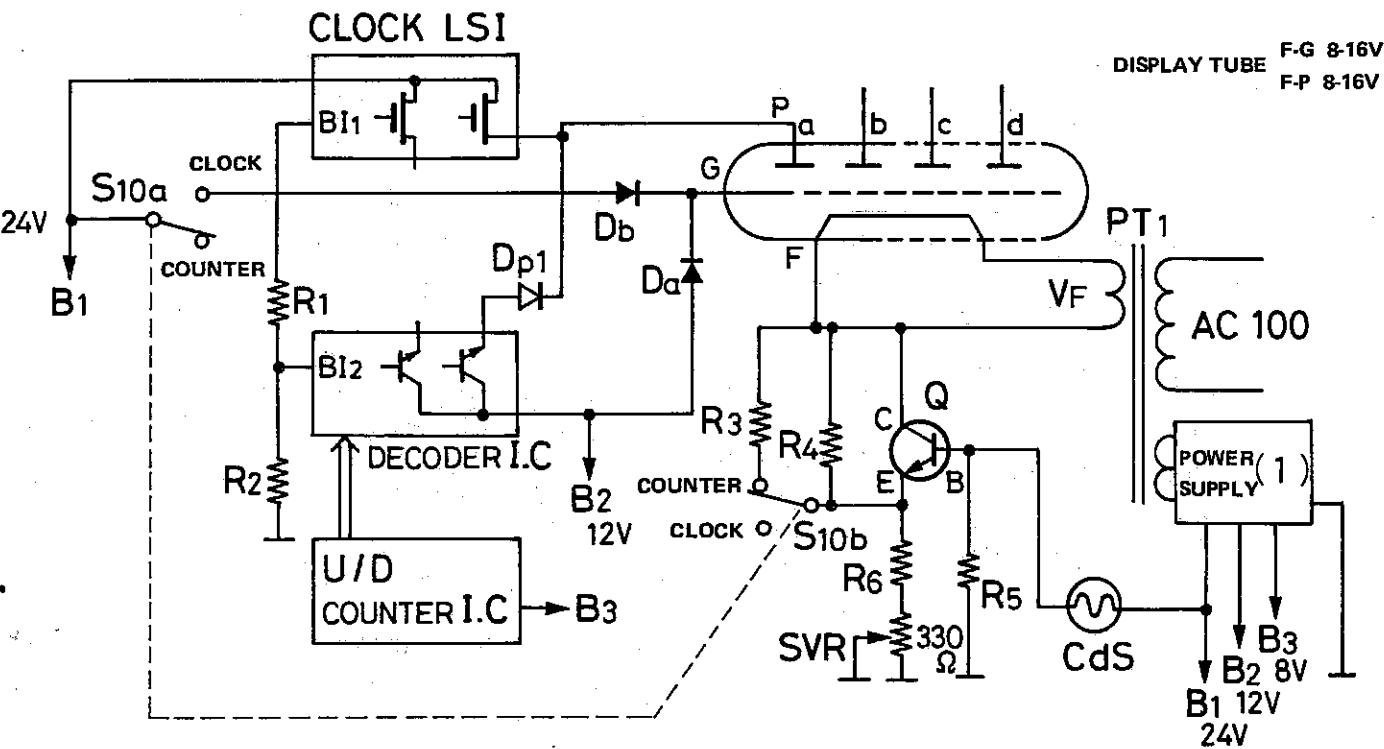


Fig. 7

Our present unit employs a voltage absorber circuit consisting of a CdS and a transistor. This circuit also functions as an automatic dimmer for easy reading of the display.

In Fig. 7, the switch S10b is interlocked with S10a. When the switch is closed on the counter side, R3 will be grounded, and the 330Ω resistance of SVR will be connected in series with the transistor Q. This causes a voltage of about 10V to be applied between P and F of the display tube, and makes it operate in a normal way. At this time, +B1 is applied to Q through CdS, so that the working resistance across C and E of the transistor can be varied with the base voltage, that is, with the amount of photo-resistance presented by CdS. This working resistance across C and E, as a composite resistance in parallel with R3, will change the voltage between P and F of the display tube to vary its brightness. When S10b is closed on the clock side, all the voltage will be applied across the transistor Q, and the voltage between P and F of the display tube will be reduced to somewhere between 10V and 12V, thus making the tube operate in a normal way. Of course, this voltage varies between 3V and 14V depending on the brightness of the environment. R4 is inserted in the circuit in order to ensure a minimum amount of brightness even when the CdS receives no light.

#### (4) Digital control circuit

One of the distinguished features of this unit is that a digital IC is used to constitute all the necessary control circuits.

Figure 8 shows the block diagram of the control circuits, and figures 9 through 11 show the time chart for each of the control circuits. The timer signal and the sleep signal in Fig. 8 are signals from the clock LSI, each generated at the time of the respective operation. The switch S7 is used for selecting "timer stand-by", "sleep shut-off," etc.

The control signals are generated by various combinations of monostable multivibrator I, monostable multivibrator II, selector circuit, and various gates.

- a --- Figure 9 shows the time chart for the timer stand-by operation. When the timer signal is generated at the set time of the timer, the monostable multivibrator I will be triggered to generate the muting signal (MUT) for about three seconds. Near the end of this period, the monostable multivibrator II will be triggered to generate the plunger driving signal (PCS), and start the stand-by operation. Before this happens, the relay driving signal (RYS) is generated at the same time with the generation of the timer signal, and turns the power ON. The timer signal will last for 59 minutes. At the end of this period, as at the beginning, the muting signal (MUT) will be generated, followed by generation of the plunger driving signal (PSC). This causes the mechanism to stop. The relay will be turned OFF immediately after.
- b --- Figure 10 shows the time chart for the sleep timer operation. During the sleep operation in which the sleep signal is present, neither the muting signal (MUT) nor the plunger driving signal (PCS) will be generated. Only at the end of the sleep operation will the muting signal be generated. At the same time with the generation of the muting signal, the plunger driving signal will also be generated, which drives the plunger to stop the mechanism. Near the end of the muting operation, the plunger driving signal will be generated again. If, instead of using the sleep timer, the switch S7 is turned ON and OFF, the time chart for the operation will be the same as Fig. 10.
- c --- Figure 11 shows the time chart for the case of setting S7 at the stand-by position and using the sleep timer. This chart differs from Figs. 9 and 10 in that neither the muting signal nor the plunger driving signal is generated at the time of generation of the sleep signal.

By combining the above operations, from a through c, various control operations such as unattended recording, sleep timer, alarm timer, etc.

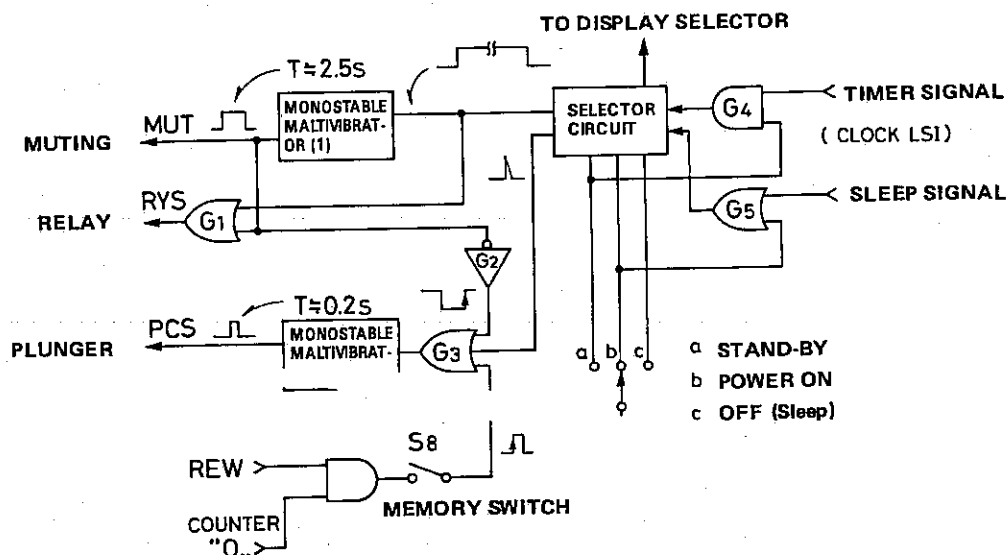


Fig. 8

a1 TIMER

b1 MUTING

c1 PLUNGER OPERATION

d1 RELAY OPERATION

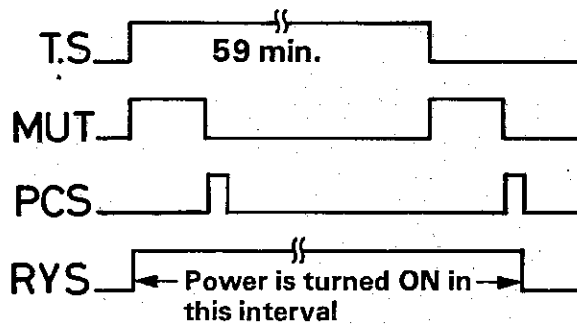


Fig. 9

e2 SLEEP

b2 MUTING

c2 PLUNGER

d2 RELAY

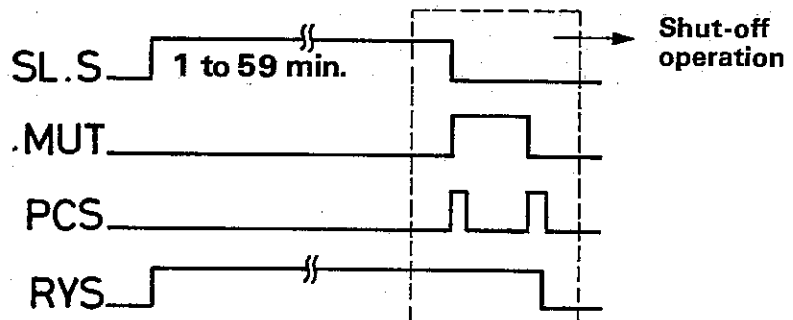


Fig. 10

e3 SLEEP

a3 TIMER

b3 MUTING

c3 PLUNGER

d3 RELAY

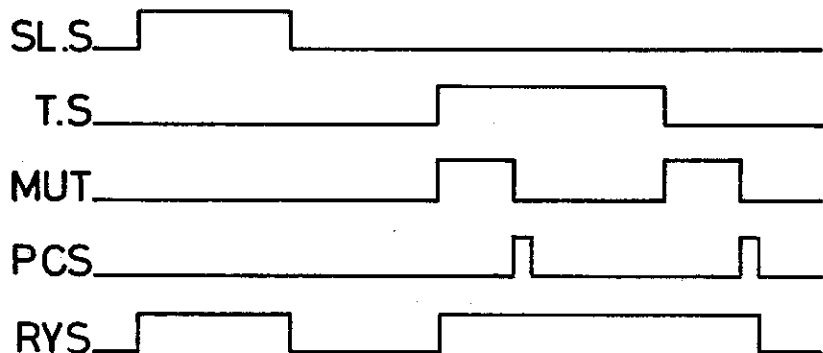


Fig. 11

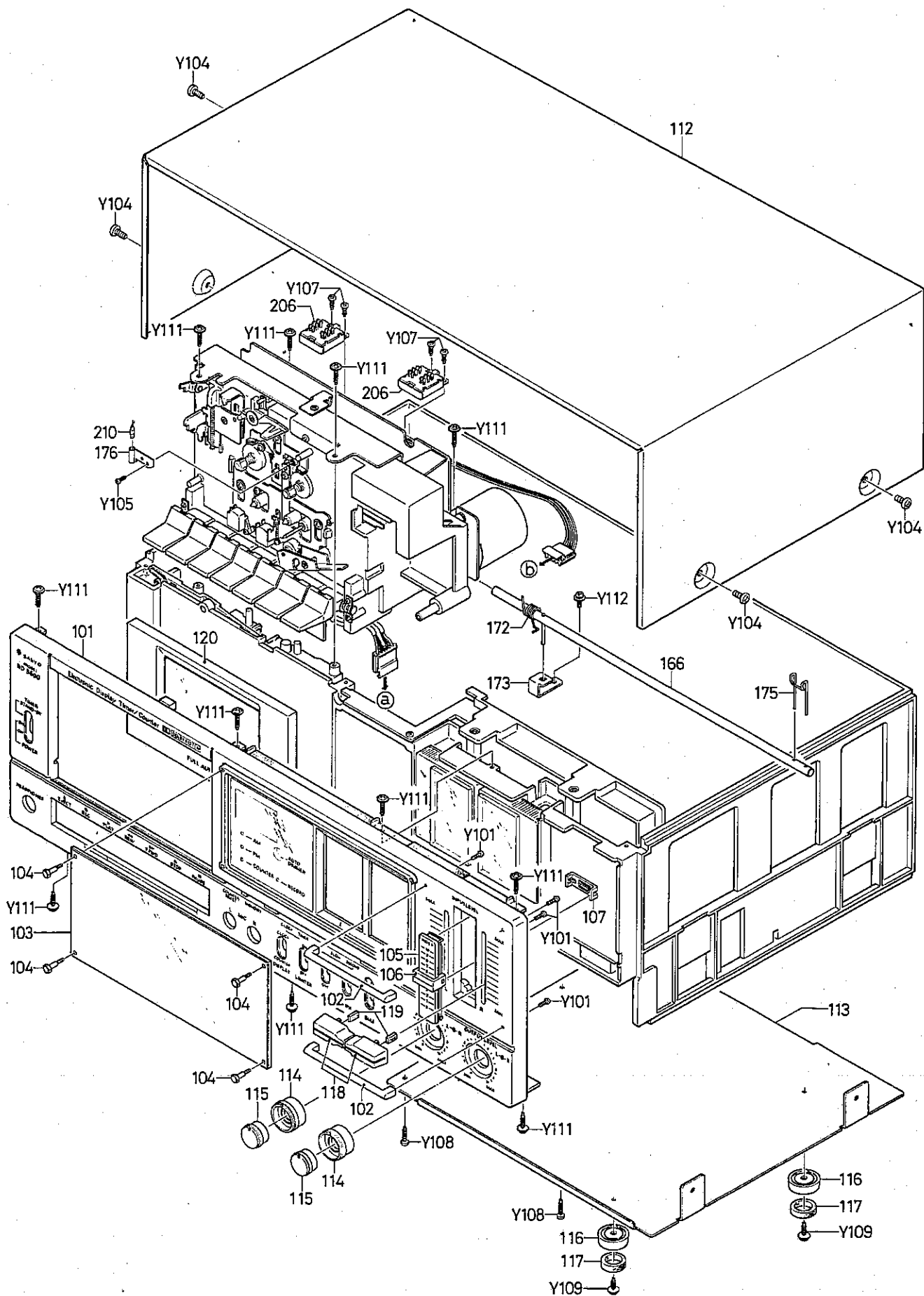
## (5) Other Functions

### Memory counter

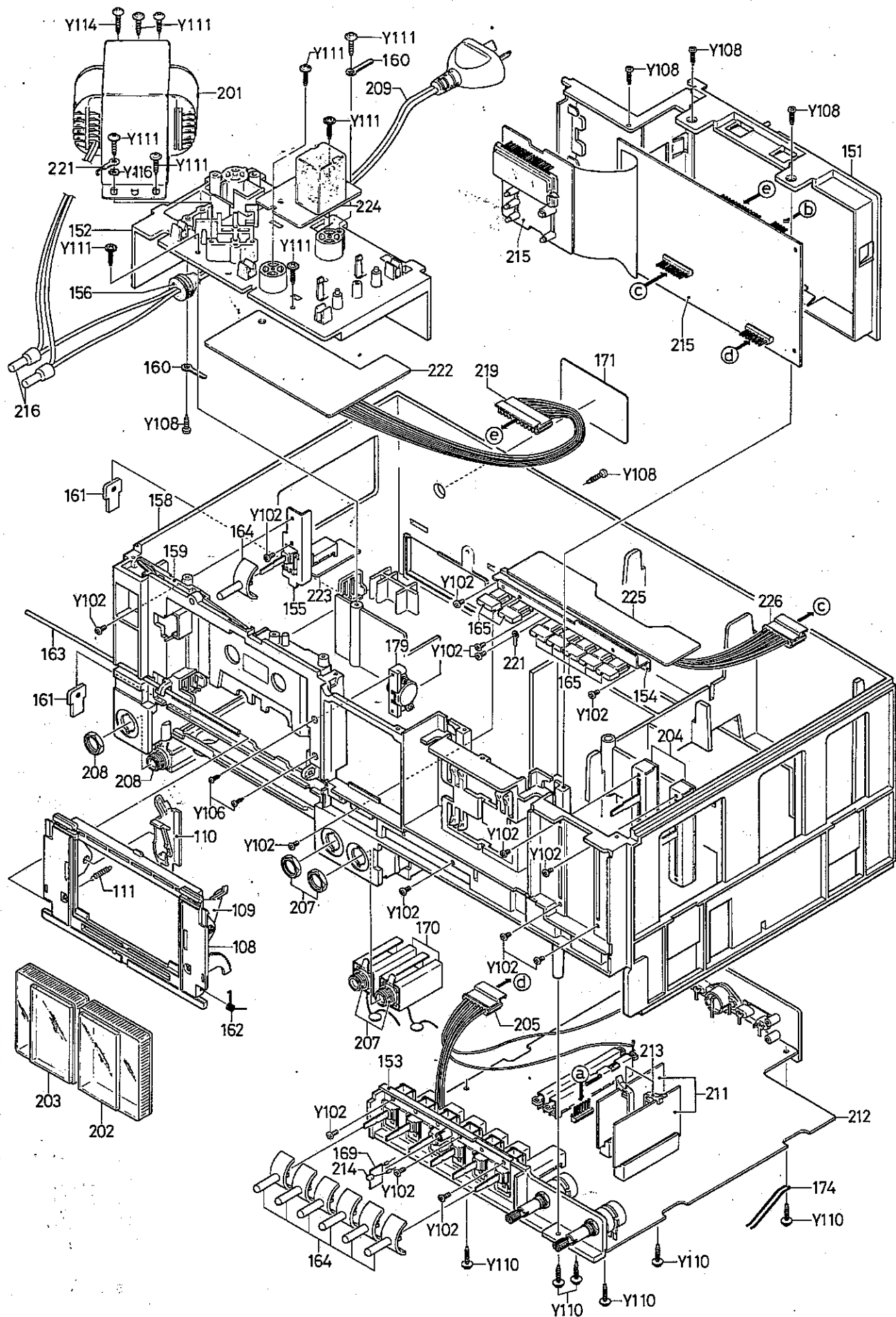
The memory counter will start counting down when the switch S6, which is interlocked with the REW button, is turned OFF. When the counter counts down to zero, a detector circuit will the zero count and generate a signal. This signal is supplied, through the switch S8, to the monostable multivibrator II to generate the plunger driving signal, which stops the mechanism to attain the purpose.

When the power switch S7 is turned OFF, the display will automatically changed into the clock mode to prevent misinterpretation of the display.

# CABINET EXPLODED VIEW



# CHASSIS EXPLODED VIEW



| Ref. No.  | Part No.                             | Description                             | Q'ty |
|-----------|--------------------------------------|-----------------------------------------|------|
| MECHANISM |                                      |                                         |      |
| 1         | 141-2-311T-22302 or 141-2-311T-22303 | Chassis, Mechanism                      | 1    |
| 2         | 141-2-411T-02601                     | Plate Nut, Flywheel Bearing (133) Mtg.  | 1    |
| 3         | 141-2-472T-06000                     | Lug, Flywheel (24) Earth                | 1    |
| 4         | 141-9-731T-53100                     | Slide Assembly, Brake                   | 1    |
| 5         | 141-2-852T-40900                     | Wire Spring, Brake Slide (4) Pressure   | 1    |
| 6         | 141-2-365T-34000                     | Bracket, Switch                         | 1    |
| 7         | 141-2-315T-12701                     | Reinforcement, Chassis                  | 1    |
| 8         | 4-527T-10300                         | DC Motor                                | 1    |
| 9         | 141-2-445T-11801                     | Rubber Cushion, Motor Mtg.              | 3    |
| 10        | 141-2-421T-16000                     | Order Screw, Motor Mtg.                 | 2    |
| 11        | 141-2-461T-26200                     | Pipe, Motor Mtg.                        | 1    |
| 12        | 141-0-661T-71491                     | Pulley Assembly, Motor                  | 1    |
| 13        | 123-2-472R-00401                     | Lug, Motor Earth                        | 2    |
| 14        | 141-0-741T-95791                     | Lever Assembly, Play Push Up            | 1    |
| 15        | 141-2-851T-79800                     | Coil Spring, Lever (14) Mtg.            | 1    |
| 16        | 141-0-741T-18500                     | Lever Assembly, Lever (14) Drive        | 1    |
| 17        | 141-2-683T-29800                     | Ring, Lever (16) Mtg.                   | 1    |
| 18        | 141-2-851T-73500                     | Coil Spring, Play Pressure              | 1    |
| 19        | 141-2-731T-46600                     | Slide, Stop                             | 1    |
| 20        | 141-2-851T-87700                     | Coil Spring, Slide (19) Restore         | 1    |
| 21        | 141-0-545T-03300                     | Lever Assembly, Pinch Roller            | 1    |
| 22        | 141-2-457T-11100                     | Special Washer, Motor Mtg.              | 1    |
| 23        | 141-2-322T-37600                     | Shield Plate, Motor Noise Shield        | 1    |
| 24        | 141-0-521T-07400                     | Flywheel Assembly                       | 1    |
| 25        | 141-2-457T-04300                     | Special Washer, Flywheel (24) Mtg.      | 1    |
| 26        | 141-2-577T-05000                     | Bracket, Bearing                        | 1    |
| 27        | 141-2-524T-07401                     | Bracket, Flywheel (24) Mtg.             | 1    |
| 28        | 141-2-411T-07300                     | Plate Nut, Bracket (26)(27) Mtg.        | 1    |
| 29        | 141-2-573T-06900                     | Bearing, Flywheel Thrust Hold           | 1    |
| 30        | 141-2-855T-02100                     | Coil Spring, Flywheel Thrust Hold       | 1    |
| 31        | 141-2-561T-03800                     | Flat Belt, Main                         | 1    |
| 32        | 141-2-472T-01200                     | Lug, Flywheel Bracket (27) Earth        | 1    |
| 33        | 141-2-472T-01201                     | Lug, Lead Wire Dressing                 | 2    |
| 34        | 141-0-531T-05100                     | Reel Plate Assembly, Take Up Reel       | 1    |
| 35        | 141-2-661T-16103                     | Pulley, F.FWD                           | 1    |
| 36        | 141-2-452T-01200                     | Felt Washer, PLAY Slip                  | 1    |
| 37        | 141-2-661T-15201                     | Pulley, PLAY                            | 1    |
| 38        | 141-2-457T-06200                     | Special Washer, Reel Thrust             | 2    |
| 39        | 141-2-562T-03300                     | Round Belt                              | 1    |
| 40        | 141-0-531T-05200                     | Reel Plate, Supply Reel                 | 1    |
| 41        | 141-2-851T-62900                     | Coil Spring, Back Tension               | 1    |
| 42        | 141-0-622T-02500                     | Roller Assembly, REW Roller             | 1    |
| 43        | 141-2-374T-09901                     | Bracket, Photo Transistor Holder        | 1    |
| 44        | 141-2-374T-10001                     | Bracket, Photo Transistor Holder        | 1    |
| 45        | 141-0-731T-14200                     | Slide Assembly, Head Slide              | 1    |
| 46        | 141-2-855T-02201                     | Coil Spring, PLAY Slide (S7) Connect    | 1    |
| 47        | 141-2-852T-37600                     | Wire Spring, Pinch Roller Pressure      | 1    |
| 48        | 4-242T-20500                         | Magnetic Head, R/P Head                 | 1    |
| 49        | 4-242T-16800                         | Magnetic Head, E Head                   | 1    |
| 50        | 141-2-851T-49700                     | Coil Spring, R/P Head Mtg.              | 1    |
| 51        | 123-2-472R-00200                     | Lug, Head Earth                         | 1    |
| 52        | 141-2-462T-41200                     | Boss, E Head                            | 2    |
| 53        | 141-2-472T-02400                     | Lug, Head Lead Wire Dressing            | 3    |
| 54        | 141-2-821T-10200                     | Tape Guide                              | 1    |
| 55        | 141-2-853T-45401                     | Plate Spring, Head Slide Hold           | 1    |
| 56        | 141-2-855T-14000                     | Coil Spring, Play Slide (57) Restore    | 1    |
| 57        | 141-2-731T-46300                     | Slide, PLAY Slide                       | 1    |
| 58        | 141-2-853T-41400                     | Plate Spring, Head Slide (45) Hold      | 1    |
| 59        | 141-0-731T-14300                     | Slide Assembly, F.FWD Slide             | 1    |
| 60        | 141-2-851T-61300                     | Coil Spring, Slide (59) Restore         | 1    |
| 61        | 141-2-731T-46400                     | Slide, REW Slide                        | 1    |
| 62        | 141-2-731T-23401                     | Slide, REW Turn Over                    | 1    |
| 63        | 141-2-851T-31500                     | Coil Spring, Slide (61)(76)(80) Restore | 3    |
| 64        | 141-2-741T-43001                     | Lever, F.FWD Pressure                   | 1    |
| 65        | 141-2-462T-41300                     | Boss, Slide (67) Mtg.                   | 1    |
| 66        | 141-2-421T-19400                     | Order Screw, P.C.B. Mtg.                | 1    |
| 67        | 141-0-731T-14400                     | Slide Assembly, F.FWD Pressure          | 1    |
| 68        | 141-2-741T-43102                     | Lever, REW Turn Over                    | 1    |
| 69        | 141-0-662T-02200                     | Roller Assembly, F. FWD & REW           | 1    |

| Ref. No.  | Part No.         | Description                                | Q'ty |
|-----------|------------------|--------------------------------------------|------|
| MECHANISM |                  |                                            |      |
| 70        | 141-2-851T-47802 | Coil Spring, Slide (67) Mtg.               | 1    |
| 71        | 141-2-855T-10400 | Coil Spring, Lever (64) Mtg.               | 1    |
| 72        | 141-0-741T-18700 | Lever Assembly, REW Lever                  | 1    |
| 73        | 141-2-661T-14902 | Pulley, REW Pulley                         | 1    |
| 74        | 141-2-457T-04100 | Special Washer, Lever (72) Mtg.            | 1    |
| 75        | 141-2-851T-31600 | Coil Spring, Lever (72) Restore            | 1    |
| 76        | 141-2-731T-46200 | Slide, REC Slide                           | 1    |
| 77        | 141-2-741T-93100 | Lever, Safety Recording                    | 1    |
| 78        | 141-2-855T-05000 | Coil Spring, Lever (77) Restore            | 1    |
| 79        | 141-2-731T-45200 | Slide, Miss Recording Detector             | 1    |
| 80        | 141-0-731T-14800 | Slide Assembly, Eject Slide                | 1    |
| 81        | 141-0-741T-18600 | Lever Assembly, Eject Lever                | 1    |
| 82        | 141-2-741T-93300 | Lever, Cam Lever                           | 1    |
| 83        | 141-2-731T-46900 | Slide, Stopper                             | 1    |
| 84        | 141-2-855T-05100 | Coil Spring, Slide (83) Mtg.               | 1    |
| 85        | 141-2-741T-93400 | Lever, Slide (80) Mtg.                     | 1    |
| 86        | 141-2-731T-47200 | Slide, Lever (87) Drive                    | 1    |
| 87        | 141-2-741T-94200 | Lever, Cassette Hold                       | 1    |
| 89        | 141-0-731T-14500 | Slide Assembly, Auto Shut-Off              | 1    |
| 90        | 141-2-855T-04900 | Coil Spring, Slide (89) Lever Restore      | 1    |
| 91        | 141-2-462T-41000 | Boss, Lever (16) Mtg.                      | 1    |
| 92        | 141-2-737T-04700 | Bracket, Button Slide Hold                 | 1    |
| 93        | 141-0-731T-14600 | Slide Assembly, Lock Slide                 | 1    |
| 94        | 141-2-851T-74000 | Coil Spring, Slide (93) Restore            | 1    |
| 95        | 141-2-851T-31600 | Coil Spring, Slide (93) Lever Restore      | 1    |
| 96        | 141-2-611T-09100 | Lever Push Button, EJECT Button            | 1    |
| 97        | 141-2-611T-09101 | Lever Push Button, REC Button              | 1    |
| 98        | 141-2-611T-09102 | Lever Push Button, PLAY, REW, F.FWD Button | 3    |
| 99        | 141-2-612T-03600 | Shaft, Push Button Mtg.                    | 1    |
| 100       | 141-2-853T-45200 | Plate Spring, Shaft (99) Mtg.              | 2    |
| 101       | 141-2-855T-04800 | Coil Spring, Push Button Restore           | 7    |
| 102       | 4-235T-34573     | Socket 6 pin, R/P Head                     | 1    |
| 103       | 4-235T-34600     | Socket 1 pin, E Head                       | 2    |
| 105       | 141-2-731T-45600 | Slide, STOP Slide                          | 1    |
| 106       | 141-2-735T-10400 | Rod, Coil Spring Hook                      | 1    |
| 107       | 141-2-611T-09200 | Push Button Lever, PAUSE Button            | 1    |
| 108       | 141-2-611T-09300 | Push Button Lever, STOP Button             | 1    |
| 109       | 141-2-731T-45800 | Slide, F.FWD PLAY Lock                     | 1    |
| 110       | 141-2-731T-47400 | Slide, F.FWD PLAY Lock                     | 1    |
| 111       | 141-2-852T-37000 | Wire Spring, F.FWD PLAY Lock               | 1    |
| 112       | 141-2-731T-45700 | Slide, REC Slide                           | 1    |
| 113       | 141-2-731T-45500 | Slide, Safety Lock on PLAY                 | 1    |
| 114       | 141-2-851T-59700 | Coil Spring, Slide (113) Restore           | 1    |
| 115       | 141-2-737T-04600 | Bracket, Slide Hold (Lower)                | 1    |
| 116       | 141-2-737T-04800 | Bracket, Slide Hold (Upper)                | 1    |
| 117       | 141-2-853T-46601 | Plate Spring, Button Earth                 | 1    |
| 118       | 141-0-731T-14701 | Slide Assembly, PAUSE Slide                | 1    |
| 119       | 141-2-851T-73800 | Coil Spring, Slide (118) Restore           | 1    |
| 120       | 141-0-369T-00300 | Bracket Assembly, Solenoid Mtg.            | 1    |
| 121       | 141-2-614T-05300 | Lock Lever, PAUSE Lock                     | 1    |
| 122       | 141-2-852T-35600 | Wire Spring, Lock Lever (121) Restore      | 1    |
| 123       | 4-264T-06800     | Magnetic Coil, Solenoid                    | 1    |
| 124       | 141-2-741T-93702 | Lever, PAUSE Lock Release                  | 1    |
| 127       | 4-231T-60200     | Switch                                     | 1    |
| 128       | 123-2-472R-00401 | Lug, PL Lead Wire Dressing                 | 1    |
| 129       | 141-2-378T-08700 | Bracket, Motor (8) Mtg.                    | 1    |
| 130       | 141-2-462T-43900 | Boss, Motor Bracket (129) Mtg.             | 3    |
| 131       | 141-2-445T-19400 | Rubber Cushion, Motor Bracket Mtg.         | 3    |
| 132       | 123-2-472R-00800 | Lug, Motor Bracket Earth                   | 1    |
| 133       | 141-0-573T-02100 | Bearing Assembly, Flywheel (24) Shaft      | 1    |
| 134       | 141-2-457T-10200 | Special Washer, Reel Thrust                | 1    |
| 135       | 141-2-329T-04200 | Reflector, Tape End Detector               | 1    |
| 136       | 4-231T-59700     | Switch, REW Count Down                     | 1    |
| 137       | 141-2-365T-36400 | Bracket, Switch (136) Mtg.                 | 1    |
| 138       | 141-2-852T-41000 | Wire Spring, Lever (87) Pressure           | 1    |
| 139       | 141-2-462T-44200 | Boss, Lever (87) Mtg.                      | 1    |
| 140       | 141-2-855T-14900 | Coil Spring, Slide (141) Restore           | 1    |

| Ref. No.                                                                | Part No.         | Description                               | Q'ty |
|-------------------------------------------------------------------------|------------------|-------------------------------------------|------|
| <b>MECHANISM</b>                                                        |                  |                                           |      |
| 141                                                                     | 141-2-731T-55200 | Slide, PLAY Slide                         | 1    |
| 142                                                                     | 141-2-461T-17600 | Pipe                                      | 1    |
| 143                                                                     | 141-9-226T-93373 | Printed Circuit Board Assembly, Mechanism | 1    |
|                                                                         | 4-231T-50271     | Switch                                    | 1    |
|                                                                         | 4-237T-00100     | Terminal, Wrapping                        | 14   |
|                                                                         | 4-235T-38800     | Socket 5 pin                              | 1    |
| D501                                                                    |                  | Light Emitting Diode SLP114A01B           | 1    |
| PHTr501                                                                 |                  | Photo Transistor PH101L                   | 1    |
| Q501,502,503                                                            |                  | Transistor 2SC945P,Q or 2SC536F,G         | 3    |
| Q504                                                                    |                  | Transistor 2SA659E                        | 1    |
| Q505                                                                    |                  | Transistor 2SD438E                        | 1    |
| D502,503,504,508                                                        |                  | Diode 1S2473                              | 4    |
| D505                                                                    |                  | Diode 1N4001                              | 1    |
| D506                                                                    |                  | Diode DS-17 or DS-131                     | 1    |
| D507                                                                    |                  | Diode DS-18 or DS-132                     | 1    |
| D509                                                                    |                  | Diode 1S2472                              | 1    |
| <b>CAPACITORS</b>                                                       |                  |                                           |      |
| C502                                                                    |                  | Electrolytic 10 $\mu$ F 16WV              | 1    |
| C503                                                                    |                  | Electrolytic 47 $\mu$ F 25WV              | 1    |
| C504,505                                                                |                  | Electrolytic 100 $\mu$ F 16WV             | 2    |
| C506                                                                    |                  | Electrolytic 10 $\mu$ F 25WV              | 1    |
| C507                                                                    |                  | Electrolytic 1000 $\mu$ F 25WV            | 1    |
| C508                                                                    |                  | Electrolytic 470 $\mu$ F 25WV             | 1    |
| <b>RESISTORS</b>                                                        |                  |                                           |      |
| All resistors are Carbon P type $\pm 10\%$ 1/4W unless otherwise noted. |                  |                                           |      |
| R501,505                                                                |                  | 1.2K ohm                                  | 2    |
| R502,504,510,521,523,524                                                |                  | 10K ohm                                   | 6    |
| R503                                                                    |                  | 82K ohm                                   | 1    |
| R507                                                                    |                  | 3.9K ohm                                  | 1    |
| R508,512                                                                |                  | 47K ohm                                   | 2    |
| R509                                                                    |                  | Solid 1.2K ohm $\pm 10\%$ 1/2W            | 1    |
| R511                                                                    |                  | 33K ohm                                   | 1    |
| R513                                                                    |                  | 1K ohm                                    | 1    |
| R514                                                                    |                  | 2.2K ohm                                  |      |
| R515                                                                    |                  | 18K ohm                                   | 1    |
| R516                                                                    |                  | 4.7K ohm                                  | 1    |
| R517                                                                    |                  | Solid 560 ohm $\pm 10\%$ 1/2W             | 1    |
| R518                                                                    |                  | 100 ohm                                   | 1    |
| R519                                                                    |                  | Metal Oxide Film 39 ohm $\pm 10\%$ 2W     | 1    |
| R520                                                                    |                  | Metal Oxide Film 18 ohm $\pm 10\%$ 1W     | 1    |
| R522                                                                    |                  | 5.6K ohm                                  | 1    |
| 144                                                                     | 141-2-445T-17400 | Rubber Cushion, REC Slide Spacer          | 1    |
| 145                                                                     | 141-2-445T-18500 | Rubber Cushion, PLAY Slide Spacer         | 1    |

|     |                                    |    |
|-----|------------------------------------|----|
| Y1  | Pan Head Screw 3 x 2mm             | 1  |
| Y2  | Pan Head Screw 2 x 8mm             | 2  |
| Y3  | Pan Head Screw 2 x 12mm            | 2  |
| Y4  | Pan Head Screw 2 x 6mm             | 2  |
| Y5  | Pan Head Screw 2.6 x 12mm          | 1  |
| Y6  | Pan Head Screw 3 x 4mm             | 2  |
| Y7  | Flat Head Screw 3 x 6mm            | 1  |
| Y8  | Pan Head Screw 3 x 8mm             | 4  |
| Y9  | Pan Head Screw 3 x 10mm            | 1  |
| Y10 | Tapping Screw 2.3 x 6mm            | 7  |
| Y11 | Tapping Screw 2.3 x 8mm            | 1  |
| Y12 | Tapping Screw 3 x 6mm              | 1  |
| Y13 | Tapping Screw 3 x 8mm              | 12 |
| Y14 | Tapping Screw 3 x 14mm             | 1  |
| Y15 | Flat Head Tapping Screw<br>3 x 6mm | 3  |
| Y16 | Flat Head Tapping Screw<br>3x8mm   |    |

- 19 -

| Ref. No.           | Part No.         | Description                                 | Q'ty |
|--------------------|------------------|---------------------------------------------|------|
| <b>PACKING</b>     |                  |                                             |      |
|                    | 141-6-132T-75102 | Individual Carton                           | 1    |
|                    | 141-6-313T-03300 | Side Pad                                    | 2    |
|                    | 141-6-411T-91802 | Instruction Booklet                         | 1    |
|                    | 123-6-453R-00100 | Inspection Sheet                            | 2    |
|                    | 141-6-231T-50705 | Inner Polyethylene Bag, Set                 | 1    |
|                    | 141-6-231T-20300 | Inner Polyethylene Bag, Instruction Booklet | 1    |
|                    | 141-6-231T-10300 | Inner Polyethylene Bag, Power Cord          | 1    |
|                    | 141-6-231T-10200 | Inner Polyethylene Bag, Lead Assembly       | 1    |
|                    | 141-6-479T-25600 | Label, Dolby Label                          | 1    |
|                    | 141-6-479T-26000 | Label, Cabinet                              | 1    |
| <b>ACCESSORIES</b> |                  |                                             |      |
|                    | 4-243T-13301     | Lead Assembly                               | 1    |
|                    | 4-241T-10282     | Magnetic Tape, C-12                         | 1    |
| <b>CABINET</b>     |                  |                                             |      |
| 101                | 141-9-122T-07900 | Front Panel Assembly                        | 1    |
| 102                | 141-2-171T-11900 | Handle                                      | 2    |
| 103                | 141-2-151T-14100 | Decorative Panel, Clock Cover               | 1    |
| 104                | 141-2-421T-21800 | Order Screw, (103) Mtg.                     | 4    |
| 105                | 141-2-153T-26200 | Escutcheon, Input Level Index               | 1    |
| 106                | 141-2-145T-02700 | Index Knob, Input Level Index               | 1    |
| 107                | 141-2-262T-03800 | Bracket Knob, Index Knob Mtg.               | 1    |
| 108                | 141-2-224T-08100 | Bracket Lid, Top Lid                        | 1    |
| 109                | 141-2-331T-02900 | Holder, Cassette Right Side Hold            | 1    |
| 110                | 141-2-331T-03000 | Holder, Cassette Left Side Hold             | 1    |
| 111                | 141-2-851T-99800 | Coil Spring, Holder (109) (110) Mtg.        | 2    |
| 112                | 141-2-111T-30701 | Cabinet                                     | 1    |
| 113                | 141-2-125T-10100 | Bottom Lid                                  | 1    |
| 114                | 141-9-163T-00300 | Rotary Knob Assembly, Mic & Output Level    | 2    |
| 115                | 141-9-163T-00400 | Rotary Knob Assembly, Mic & Output Level    | 2    |
| 116                | 141-2-174T-05100 | Stand, Bottom Lid Mtg.                      | 2    |
| 117                | 141-2-441T-05000 | Felt Cushion, Bottom Lid & Chassis Mtg.     | 4    |
| 118                | 141-2-164T-14900 | Slide Knob, Input Level                     | 2    |
| 119                | 141-2-352T-16200 | Spacer, Slide Knob (118) Inside             | 2    |
| 120                | 141-0-124T-05300 | Top Lid Assembly                            | 1    |
| <b>CHASSIS</b>     |                  |                                             |      |
| 151                | 141-2-312T-14700 | Sub Chassis, Clock                          | 1    |
| 152                | 141-2-312T-14801 | Sub Chassis, Power Supply & PCB             | 1    |
| 153                | 141-2-210T-03600 | Bracket, AMP P.C.B. Mtg.                    | 1    |
| 154                | 141-2-365T-36100 | Switch Bracket, Push Switch Mtg.            | 1    |
| 155                | 141-2-365T-36200 | Switch Bracket, Power Switch                | 1    |
| 156                | 141-2-445T-16200 | Rubber Cushion, Power Cord                  | 1    |
| 157                | 141-2-447T-35100 | Cushion, 10x10x2mm, Sub Chassis             | 1    |
| 158                | 141-9-311T-00202 | Chassis Assembly                            | 1    |
| 159                | 141-2-741T-92700 | Lever, Top Lid Lock                         | 1    |
| 160                | 141-2-472T-01201 | Lug, Lead Wire Dressing                     | 2    |
| 161                | 141-2-411T-07600 | Plate Nut, Cabinet Mtg.                     | 2    |
| 162                | 141-2-851T-99700 | Coil Spring, Top Lid Opener                 | 1    |
| 163                | 141-2-753T-07400 | Shaft, Top Lid                              | 1    |
| 164                | 141-9-262T-00100 | Bracket Knob Assembly, Switch Knob          | 7    |
| 165                | 141-2-161T-35300 | Push Button, Clock Switch                   | 7    |
| 166                | 141-9-753T-00100 | Shaft Assembly, REC/PLAY Select             | 1    |
| 168                | 141-2-472T-06400 | Lug, VR Earth                               | 1    |
| 169                | 141-2-352T-24600 | Spacer, LED Mtg.                            | 1    |
| 170                | 141-2-322T-37800 | Shield Plate, MIC Socket                    | 2    |
| 171                | 141-2-141T-48500 | Rating Plate                                | 1    |
| 172                | 141-2-852T-35800 | Wire Spring, REC/PLAY Select                | 1    |
| 173                | 141-2-731T-46000 | Slide, REC/PLAY Select                      | 1    |
| 174                | 141-2-852T-36600 | Wire Spring, AMP P.C.B. Earth               | 1    |
| 175                | 141-2-852T-37700 | Wire Spring, REC/PLAY Select                | 1    |
| 176                | 141-2-374T-11300 | PL Bracket, Pilot Lamp Mtg.                 | 1    |
| 178                | 141-2-464T-08700 | Fixer, Lead Wire Dressing                   | 12   |
| 179                | 141-0-581T-00600 | Gear Assembly                               | 1    |

| Ref. No.                   | Part No.         | Description                                | Q'ty |
|----------------------------|------------------|--------------------------------------------|------|
| <b>ELECTRICAL PARTS</b>    |                  |                                            |      |
| 201                        | 4-251T-68400     | Power Transformer                          | 1    |
| 202                        | 4-511T-07379     | Meter, Right Side                          | 1    |
| 203                        | 4-511T-07380     | Meter, Left Side                           | 1    |
| 204                        | 4-222T-49171     | Slide Variable Resistor, Line In           | 2    |
| 205                        | 4-235T-39000     | Socket, AMP & Clock Connect                | 1    |
| 206                        | 4-231T-43000     | Switch, Muting                             | 2    |
| 207                        | 4-235T-30600     | Socket, MIC                                | 2    |
| 208                        | 4-235T-30500     | Socket, Head Phone                         | 1    |
| 209                        | 4-243T-76600     | Power Cord                                 | 1    |
| 210                        | 4-612T-06494     | Pilot Lamp, Cassette Light                 | 1    |
| 213                        | 141-2-464T-22800 | Fixer, Dolby P.C.B                         | 2    |
| 214                        | 141-0-382T-00200 | Terminal Assembly, Dolby ON/OFF Indicator  | 1    |
|                            | 141-2-382T-05300 | Terminal SLP114B Lead Wire Extend          | 2    |
|                            |                  | Diode SLP114B Red                          | 1    |
| 216                        | 141-2-382T-07100 | Terminal, Power Cord                       | 2    |
| 219                        | 4-235T-42300     | Socket, From Power Supply P.C.B            | 1    |
| 221                        | 141-2-472R-00401 | Lug, P.C.B (225) & P.T Earth               | 2    |
| 226                        | 4-235T-38900     | Socket 7 pin                               | 1    |
|                            | 4-230T-09900     | Printed Circuit Board, Display             | 1    |
|                            | 4-985T-00100     | Fluorescent Display                        | 1    |
|                            | 141-2-352T-22800 | Spacer, REC Indicator                      | 1    |
|                            | 141-2-352T-22900 | Spacer, Counter Indicator                  | 1    |
|                            | 4-980T-00100     | CDSS                                       | 1    |
|                            |                  | LED SLP114B, REC & Counter Indicator       | 4    |
|                            |                  | Diode 1S2473 or 1S1555                     | 3    |
| <b>DOLBY PCB ASSY</b>      |                  |                                            |      |
| 211                        | 140-9-230T-06000 | Printed Circuit Board Assembly, Dolby      | 2    |
| L301,401                   | 4-252T-02800     | Choke Coil 23mH                            | 2    |
| L302,402                   | 4-252T-05600     | Choke Coil 36mH                            | 2    |
| IC301,401                  |                  | IC NE545B                                  | 2    |
| D301,401                   |                  | Diode 1S188                                | 2    |
| <b>CAPACITORS</b>          |                  |                                            |      |
| C317,417                   |                  | Ceramic 90pF ±20% 50WV                     | 2    |
| C318,418                   |                  | Ceramic 220pF ±20% 50WV                    | 2    |
| C314,414                   |                  | Mylar 0.0022μF ±10% 50WV                   | 2    |
| C315,415                   |                  | Mylar 0.0027μF ±10% 50WV                   | 2    |
| C311,411                   |                  | Mylar 0.0047μF ±5% 50WV                    | 2    |
| C312,412                   |                  | Mylar 0.0056μF ±5% 50WV                    | 2    |
| C313,413                   |                  | Mylar 0.027μF ±5% 50WV                     | 2    |
| C319,419                   |                  | Mylar 0.047μF ±10% 50WV                    | 2    |
| C305,405, 308,408          |                  | Aluminum Electrolytic 0.1μF +150-10% 16WV  | 4    |
| C309,409                   |                  | Aluminum Electrolytic 0.33μF +150-10% 16WV | 2    |
| C301,401, 302,402          |                  | Electrolytic 1μF 25WV                      | 4    |
| C303,403, 306,406, 307,407 |                  | Electrolytic 10μF 16WV                     | 6    |
| C310,410                   |                  | Electrolytic 220μF 16WV                    | 2    |
| <b>RESISTORS</b>           |                  |                                            |      |
| R311,411                   |                  | Carbon 120 ohm ±10% 1/4W                   | 2    |
| R306,406                   |                  | Carbon 180 ohm ±10% 1/4W                   | 2    |
| R301,401, 302,402          |                  | Carbon 1K ohm ±10% 1/4W                    | 4    |
| R304,404                   |                  | Carbon 3.3K ohm ±10% 1/4W                  | 2    |
| R305,405                   |                  | Carbon 47K ohm ±10% 1/4W                   | 2    |
| R303,403                   |                  | Carbon 100K ohm ±10% 1/4W                  | 2    |
| R310,410                   |                  | Carbon 150K ohm ±10% 1/4W                  | 2    |
| R308,408                   |                  | Carbon 270K ohm ±10% 1/4W                  | 2    |
| R309,409                   |                  | Carbon 680K ohm ±10% 1/4W                  | 2    |
| R307,407                   |                  | Carbon 1M ohm ±10% 1/4W                    | 2    |

## PARTS LIST

| Ref. No.                                 | Part No.         | Description                             | Q'ty | Ref. No.                                                             | Part No. | Description                              | Q'ty |
|------------------------------------------|------------------|-----------------------------------------|------|----------------------------------------------------------------------|----------|------------------------------------------|------|
| AMP PCB ASSY                             |                  |                                         |      | AMP PCB ASSY                                                         |          |                                          |      |
| 212                                      | 140-9-230T-57900 | Printed Circuit Board Assembly, AMP     | 1    | C107,207,109,209,111,211,114,214,115,215,117,217,122,222,123,223,606 |          | Electrolytic 1μF 25WV                    | 17   |
| S103                                     | 4-231T-62400     | Switch, Equalizer Select                | 1    | C103,203                                                             |          | Electrolytic 2.2μF 25WV                  | 2    |
| S104                                     | 4-231T-62300     | Switch, Bias Select                     | 1    | C611                                                                 |          | Aluminum Electrolytic 4.7μF +40-20% 16WV | 1    |
|                                          | 141-2-472T-06100 | Lug, Volume Earth                       | 1    | C102,202,116,216,118,218,120,220,121,221,621                         |          | Electrolytic 4.7μF 25WV                  | 11   |
|                                          | 141-2-322T-37000 | Shield Plate                            | 1    | C119,219                                                             |          | Electrolytic 22μF 16WV                   | 2    |
| S106                                     | 4-231T-58972     | Switch, Dolby                           | 1    | C106,206                                                             |          | Electrolytic 47μF 6.3WV                  | 2    |
| S105,107,108                             | 4-231T-59072     | Switch, Limiter & MPX & Display         | 3    | C604                                                                 |          | Electrolytic 47μF 16WV                   | 1    |
|                                          | 4-235T-36471     | Socket, Dolby                           | 2    | C605                                                                 |          | Electrolytic 47μF 25WV                   | 1    |
|                                          | 4-235T-33800     | Socket, Line In & Line Out & DIN        | 1    | C602,603,609,610,615                                                 |          | Electrolytic 220μF 16WV                  | 5    |
| S101                                     | 4-231T-45600     | Switch, REC/PLAY Select                 | 1    | C608                                                                 |          | Electrolytic 220μF 25WV                  | 1    |
| S102                                     | 4-231T-45672     | Switch, REC/PLAY Select                 | 1    | C607                                                                 |          | Electrolytic 1000μF 25WV                 | 1    |
|                                          | 4-236T-10273     | Plug 6pin, REC/PLAY Head                | 1    | RESISTORS                                                            |          |                                          |      |
|                                          | 4-237T-00100     | Terminal, Wrapping Pin                  | 44   | R615                                                                 |          | Solid 8.2 ohm ±10% 1/2W                  | 1    |
|                                          | 4-222T-53100     | Variable Resistor, MIC & Line Out       | 2    | R619                                                                 |          | Carbon 8.2 ohm ±10% 1/4W                 | 1    |
| SVR101,103,104,201,203,204               | 4-222T-39475     | Semi Variable Resistor, REC & PLAY Gain | 6    | R102,202,623                                                         |          | Carbon 10 ohm ±10% 1/4W                  | 3    |
| SVR102,202                               | 4-222T-39476     | Semi Variable Resistor, Meter Adjust    | 2    | R621                                                                 |          | Carbon 15 ohm ±10% 1/4W                  | 1    |
| SVR105,205                               | 4-222T-39478     | Semi Variable Resistor, Bias Adjust     | 2    | R616                                                                 |          | Carbon 27 ohm ±10% 1/4W                  | 1    |
| L101,201                                 | 4-258T-12800     | OSC Coil                                | 1    | R604                                                                 |          | Carbon 39 ohm ±10% 1/4W                  | 1    |
| L102,202                                 | 4-253T-01019     | Choke Coil                              | 2    | R609                                                                 |          | Carbon 100 ohm ±10% 1/4W                 | 1    |
| L203                                     | 4-252T-05600     | Choke Coil 36mH                         | 2    | R107,207                                                             |          | Carbon 180 ohm ±10% 1/4W                 | 2    |
|                                          | 4-252T-06700     | Choke Coil                              | 1    | R137,237,618                                                         |          | Carbon 220 ohm ±10% 1/4W                 | 3    |
| TRANSISTORS                              |                  |                                         |      | R603                                                                 |          | Carbon 330 ohm ±10% 1/4W                 | 1    |
| Q101,102,103,201,202,203                 |                  | Transistor 2SC1571G                     | 6    | R155                                                                 |          | Carbon 390 ohm ±10% 1/4W                 | 1    |
| Q105,107,108,109,205,207,208,209,601,603 |                  | Transistor 2SC536G AUD                  | 10   | R255                                                                 |          | Carbon 390 ohm ±10% 1/4W                 | 1    |
| Q104,106,204,206                         |                  | Transistor 2SC945P                      | 4    | R148,248,622                                                         |          | Carbon 470 ohm ±10% 1/4W                 | 3    |
| Q602                                     |                  | Transistor 2SD400F                      | 1    | R118,218,133,233                                                     |          | Carbon 560 ohm ±10% 1/4W                 | 4    |
| DIODES                                   |                  |                                         |      | R129,229,617                                                         |          | Carbon 680 ohm ±10% 1/4W                 | 3    |
| D101,103,201,203                         |                  | Diode 1S188AM                           | 4    | R136,236                                                             |          | Solid 680 ohm ±10% 1/2W                  | 2    |
| D102,202,601,602,603                     |                  | Diode 1S2473                            | 5    | R602                                                                 |          | Carbon 820 ohm ±10% 1/4W                 | 1    |
| D604                                     |                  | Diode WZ172                             | 1    | R151                                                                 |          | Carbon 1K ohm ±10% 1/4W                  | 1    |
| CAPACITORS                               |                  |                                         |      | R110,210,123,223,251,606,608                                         |          | Carbon 1K ohm ±10% 1/4W                  | 7    |
| C136,234                                 |                  | Ceramic 33pF ±20% 50WV                  | 2    | R147,247                                                             |          | Carbon 1.2K ohm ±10% 1/4W                | 1    |
| C112,212                                 |                  | Ceramic 68pF ±20% 50WV                  | 2    | R245                                                                 |          | Carbon 1.5K ohm ±10% 1/4W                | 1    |
| C130,230                                 |                  | Ceramic 100pF ±10% 50WV                 | 2    | R144,244,145                                                         |          | Carbon 1.5K ohm ±10% 1/4W                | 3    |
| C105,110,205,210,235                     |                  | Ceramic 100pF ±20% 50WV                 | 5    | R130,230,131,231                                                     |          | Carbon 1.8K ohm ±10% 1/4W                | 4    |
| C104,204,131,231,132                     |                  | Ceramic 220pF ±10% 50WV                 | 5    | R116,216,614                                                         |          | Carbon 2.2K ohm ±10% 1/4W                | 3    |
| C617                                     |                  | Ceramic 330pF ±10% 50WV                 | 1    | R122,222,127,227                                                     |          | Carbon 2.2K ohm ±10% 1/4W                | 4    |
| C137                                     |                  | Ceramic 330pF ±20% 50WV                 | 1    | R119,219                                                             |          | Carbon 2.7K ohm ±10% 1/4W                | 2    |
| C101,201,129,229,232                     |                  | Ceramic 470pF ±10% 50WV                 | 5    | R605,607                                                             |          | Carbon 3.3K ohm ±10% 1/4W                | 2    |
| C133,233                                 |                  | Ceramic 0.022μF ±80-20% 50WV            | 2    | R146,246                                                             |          | Carbon 3.9K ohm ±10% 1/4W                | 2    |
| C140                                     |                  | Mylar 0.001μF ±10% 50WV                 | 1    | R140,240                                                             |          | Carbon 4.7K ohm ±10% 1/4W                | 2    |
| C126,226,614                             |                  | Mylar 0.0022μF ±10% 50WV                | 3    | R103,203,126,226,139,239,611                                         |          | Carbon 5.6K ohm ±10% 1/4W                | 7    |
| C125,225,139,239                         |                  | Mylar 0.0033μF ±10% 50WV                | 4    | R109,209,135,235,612                                                 |          | Carbon 6.8K ohm ±10% 1/4W                | 5    |
| C113,213                                 |                  | Mylar 0.0039μF ±10% 50WV                | 2    | R153,253                                                             |          | Carbon 8.2K ohm ±10% 1/4W                | 2    |
| C108,208                                 |                  | Mylar 0.0068μF ±10% 50WV                | 2    | R104                                                                 |          | Carbon 10K ohm ±10% 1/4W                 | 1    |
| C124,224                                 |                  | Mylar 0.015μF ±10% 50WV                 | 2    | R101,201,138,238,204                                                 |          | Carbon 10K ohm ±10% 1/4W                 | 5    |
| C128,228                                 |                  | Mylar 0.022μF ±10% 50WV                 | 2    | R106,206                                                             |          | Carbon 12K ohm ±10% 1/4W                 | 2    |
| C612,613                                 |                  | Mylar 0.022μF ±20% 50WV                 | 2    | R113,213                                                             |          | Carbon 15K ohm ±10% 1/4W                 | 2    |
| C616                                     |                  | Mylar 0.033μF ±20% 50WV                 | 1    |                                                                      |          |                                          |      |
| C127,227                                 |                  | Mylar 0.047μF ±10% 50WV                 | 2    |                                                                      |          |                                          |      |
| C138,238                                 |                  | Aluminum Electrolytic 0.33μF 10WV       | 2    |                                                                      |          |                                          |      |

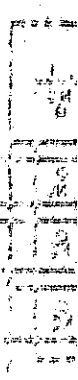
# PARTS LIST

| Ref. No.                              | Part No.         | Description                                        | Q'ty |
|---------------------------------------|------------------|----------------------------------------------------|------|
| <b>AMP PCB ASSY</b>                   |                  |                                                    |      |
| R114,214, 143,243, 620                |                  | Carbon 18K ohm $\pm 10\%$ 1/4W                     | 5    |
| R121,221, 141,241                     |                  | Carbon 22K ohm $\pm 10\%$ 1/4W                     | 4    |
| R124,224                              |                  | Carbon 27K ohm $\pm 10\%$ 1/4W                     | 2    |
| R112,212, 115,215                     |                  | Carbon 33K ohm $\pm 10\%$ 1/4W                     | 4    |
| R205,615                              |                  | Carbon 47K ohm $\pm 10\%$ 1/4W                     | 2    |
| R150,250                              |                  | Carbon 47K ohm $\pm 10\%$ 1/4W                     | 2    |
| R120,220                              |                  | Carbon 56K ohm $\pm 10\%$ 1/4W                     | 2    |
| R132,232, 105,610                     |                  | Carbon 100K ohm $\pm 10\%$ 1/4W                    | 4    |
| R125,225                              |                  | Carbon 150K ohm $\pm 10\%$ 1/4W                    | 2    |
| R108,208, 134,234                     |                  | Carbon 180K ohm $\pm 10\%$ 1/4W                    | 4    |
| R142,242                              |                  | Carbon 220K ohm $\pm 10\%$ 1/4W                    | 2    |
| R613                                  |                  | Carbon 680K ohm $\pm 10\%$ 1/4W                    | 1    |
| R128,228                              |                  | Carbon 820K ohm $\pm 10\%$ 1/4W                    | 2    |
| R149,249, 117                         |                  | Carbon 1M ohm $\pm 10\%$ 1/4W                      | 3    |
| R217                                  |                  | Carbon 1M ohm $\pm 10\%$ 1/4W                      | 1    |
| R154,254                              |                  | Carbon 1.8M ohm $\pm 10\%$ 1/4W                    | 2    |
| <b>COUNTER &amp; DISPLAY PCB ASSY</b> |                  |                                                    |      |
| 215                                   | 140-9-230T-80600 | Printed Circuit Board Assembly, Counter & Display  | 1    |
| RA-1                                  | 4-221T-01500     | Resistor                                           | 1    |
| CN-P2                                 | 4-236T-10272     | Plug 5pin, For Socket from Mechanism               | 1    |
| CN-P3                                 | 4-236T-10275     | Plug 8pin, For Socket (205)                        | 1    |
| CN-P4                                 | 4-236T-10276     | Plug 9pin, For Socket (226)                        | 1    |
| CN-P1                                 | 4-236T-10280     | Plug 13pin, For Socket (219)                       | 1    |
| CN-P5                                 | 4-236T-11980     | Plug 10pin, For Flexible P.C.B                     | 1    |
| CN-P5                                 | 4-236T-11995     | Plug 25pin, For Flexible P.C.B                     | 1    |
|                                       | 4-237T-00100     | Terminal, Wrapping Pin                             | 1    |
| <b>TRANSISTOR</b>                     |                  |                                                    |      |
| Q1,2,3                                |                  | Transistor 2SC536E or F or G                       | 3    |
| Q4                                    |                  | Transistor 2SC536F                                 | 1    |
| Q5,6,7                                |                  | Transistor 2SC945P or Q                            | 3    |
| <b>DIODE</b>                          |                  |                                                    |      |
| D1                                    |                  | Diode MV11T                                        | 1    |
| D2~27                                 |                  | Diode 1S2473 or 1S1555                             | 26   |
| <b>IC</b>                             |                  |                                                    |      |
| IC1,3,5                               |                  | IC TC4011P, NAND Gate                              | 3    |
| IC2                                   |                  | IC TC4049P, Inverter                               | 1    |
| IC4                                   |                  | IC TC4001P, NOR Gate                               | 1    |
| IC6                                   |                  | IC TC5010P, U/D Counter                            | 1    |
| IC7,8,9                               |                  | IC TC5002P, Decoder                                | 3    |
| IC10                                  |                  | LSI MM5316N, Clock                                 | 1    |
| <b>CAPACITOR</b>                      |                  |                                                    |      |
| C10,11, 12,15                         |                  | Ceramic 330pF $\pm 10\%$ 50WV                      | 4    |
| C4,5,6, 16,19                         |                  | Ceramic 0.01 $\mu$ F $\pm 80\%$ 50WV               | 5    |
| C14,17                                |                  | Mylar 0.01 $\mu$ F $\pm 20\%$ 50WV                 | 2    |
| C1                                    |                  | Mylar 0.022 $\mu$ F $\pm 20\%$ 50WV                | 1    |
| C9,13                                 |                  | Aluminum Electrolytic 0.47 $\mu$ F $\pm 40\%$ 16WV | 2    |
| C2                                    |                  | Aluminum Electrolytic 1 $\mu$ F $\pm 40\%$ 16WV    | 1    |
| C8                                    |                  | Aluminum Electrolytic 2.2 $\mu$ F $\pm 40\%$ 16WV  | 1    |
| C3,7                                  |                  | Electrolytic 10 $\mu$ F 16WV                       | 2    |
| <b>RESISTOR</b>                       |                  |                                                    |      |
| R1                                    |                  | Carbon 330 ohm $\pm 5\%$ 1/4W                      | 1    |
| R49                                   |                  | Carbon 560 ohm $\pm 5\%$ 1/4W                      | 1    |
| R2,24                                 |                  | Carbon 1K ohm $\pm 5\%$ 1/4W                       | 2    |
| R4,10                                 |                  | Carbon 1K ohm $\pm 5\%$ 1/4W                       | 2    |
| R28,29                                |                  | Carbon 2.2K ohm $\pm 5\%$ 1/4W                     | 2    |
| R50                                   |                  | Carbon 3.3K ohm $\pm 5\%$ 1/4W                     | 1    |
| R6,19, 51                             |                  | Carbon 4.7K ohm $\pm 5\%$ 1/4W                     | 3    |
| R8,9                                  |                  | Carbon 8.2K ohm $\pm 5\%$ 1/4W                     | 1    |
| R22                                   |                  | Carbon 8.2K ohm $\pm 5\%$ 1/4W                     | 1    |

| Ref. No.                              | Part No.         | Description                                          | Q'ty |
|---------------------------------------|------------------|------------------------------------------------------|------|
| <b>COUNTER &amp; DISPLAY PCB ASSY</b> |                  |                                                      |      |
| R15,16, 17,18, 31,33, 39,45           |                  | Carbon 10K ohm $\pm 5\%$ 1/4W                        | 8    |
| R14                                   |                  | Carbon 10K ohm $\pm 5\%$ 1/4W                        | 1    |
| R20                                   |                  | Carbon 12K ohm $\pm 5\%$ 1/4W                        | 1    |
| R7                                    |                  | Carbon 15K ohm $\pm 5\%$ 1/4W                        | 1    |
| R12                                   |                  | Carbon 15K ohm $\pm 5\%$ 1/4W                        | 1    |
| R11                                   |                  | Carbon 33K ohm $\pm 5\%$ 1/4W                        | 1    |
| R21                                   |                  | Carbon 33K ohm $\pm 5\%$ 1/4W                        | 1    |
| R13                                   |                  | Carbon 47K ohm $\pm 5\%$ 1/4W                        | 1    |
| R34~38, 40,43, 44,46, 47,5            |                  | Carbon 100K ohm $\pm 5\%$ 1/4W                       | 11   |
| R23,25,26,27,52                       |                  | Carbon 100K ohm $\pm 5\%$ 1/4W                       | 5    |
| R3                                    |                  | Carbon 220K ohm $\pm 5\%$ 1/4W                       | 1    |
| R32                                   |                  | Carbon 560K ohm $\pm 5\%$ 1/4W                       | 1    |
| R30                                   |                  | Carbon 1.5M ohm $\pm 5\%$ 1/4W                       | 1    |
| <b>POWER SUPPLY PCB ASSY</b>          |                  |                                                      |      |
| 222                                   | 140-9-230T-58700 | Printed Circuit Board Assembly, Power Supply         | 1    |
| R66                                   | 4-222T-32571     | Semi Variable Resistor                               | 1    |
|                                       | 4-237T-00100     | Terminal, Wrapping Pin                               | 17   |
| Q8                                    |                  | Transistor 2SC945P or Q                              | 1    |
| Q9                                    |                  | Transistor 2SD330E                                   | 1    |
| D63                                   |                  | Diode DS17                                           | 1    |
| D64                                   |                  | Diode DS18                                           | 1    |
| D60                                   |                  | Diode 1S2473 or 1S1555                               | 1    |
| D62                                   |                  | Diode WZ230                                          | 1    |
| <b>CAPACITORS</b>                     |                  |                                                      |      |
| C62                                   |                  | Electrolytic 4.7 $\mu$ F 35WV                        | 1    |
| C65                                   |                  | Electrolytic 10 $\mu$ F 25WV                         | 1    |
| C63                                   |                  | Electrolytic 22 $\mu$ F 35WV                         | 1    |
| C64                                   |                  | Electrolytic 33 $\mu$ F 16WV                         | 1    |
| C61                                   |                  | Electrolytic 330 $\mu$ F 35WV                        | 1    |
| <b>RESISTORS</b>                      |                  |                                                      |      |
| R70                                   |                  | Carbon 10 ohm $\pm 5\%$ 1/4W                         | 1    |
| R65,67                                |                  | Carbon 100 ohm $\pm 5\%$ 1/4W                        | 2    |
| R61                                   |                  | Metal Oxide Film 220 ohm $\pm 5\%$ 1W                | 1    |
| R69                                   |                  | Solid 560 ohm $\pm 10\%$ 1/2W                        | 1    |
| R62,68                                |                  | Carbon 1K ohm $\pm 5\%$ 1/4W                         | 2    |
| R63                                   |                  | Carbon 2.2K ohm $\pm 5\%$ 1/4W                       | 1    |
| R64                                   |                  | Carbon 15K ohm $\pm 5\%$ 1/4W                        | 1    |
| <b>POWER SWITCH PCB ASSY</b>          |                  |                                                      |      |
| 223                                   | 140-9-230T-34400 | Printed Circuit Board Assembly, Power Switch         | 1    |
|                                       | 4-231T-62300     | Switch, Power ON/OFF & Timer STAND-BY                | 1    |
| <b>RELAY PCB ASSY</b>                 |                  |                                                      |      |
| 224                                   | 140-9-230T-59100 | Printed Circuit Board Assembly Relay                 | 1    |
|                                       | 4-232T-04800     | Relay                                                | 1    |
|                                       |                  | Diode 1N4001                                         | 1    |
| D90                                   | 4-237T-00100     | Terminal, Wrapping Pin                               | 7    |
| D91                                   |                  | Diode DS17                                           | 1    |
| <b>CLOCK CONTROL SW PCB ASSY</b>      |                  |                                                      |      |
| 225                                   | 140-9-230T-34200 | Printed Circuit Board Assembly, Clock Control Switch | 1    |
| S1,2                                  | 4-231T-62200     | Switch                                               | 2    |
| S3~7                                  | 4-231T-62100     | Switch                                               | 7    |
| R71                                   |                  | Carbon P 1K ohm $\pm 5\%$ 1/4W                       | 1    |
| <b>SCREW MOUNTING</b>                 |                  |                                                      |      |
| Y101                                  |                  | Pan Head Screw 2.6 x 8mm                             | 4    |
| Y102                                  |                  | Pan Head Screw 3 x 6mm                               | 16   |
| Y104                                  |                  | Binding Head Screw 4 x 8mm                           | 4    |
| Y105                                  |                  | Tapping Screw 2.3 x 6mm                              | 1    |
| Y106                                  |                  | Tapping Screw 2.6 x 8mm                              | 2    |
| Y107                                  |                  | Tapping Screw 3 x 8mm                                | 4    |
| Y108                                  |                  | Tapping Screw 3 x 10mm                               | 5    |
| Y109                                  |                  | Tapping Screw with Washer 3 x 8mm                    | 2    |

## PARTS LIST

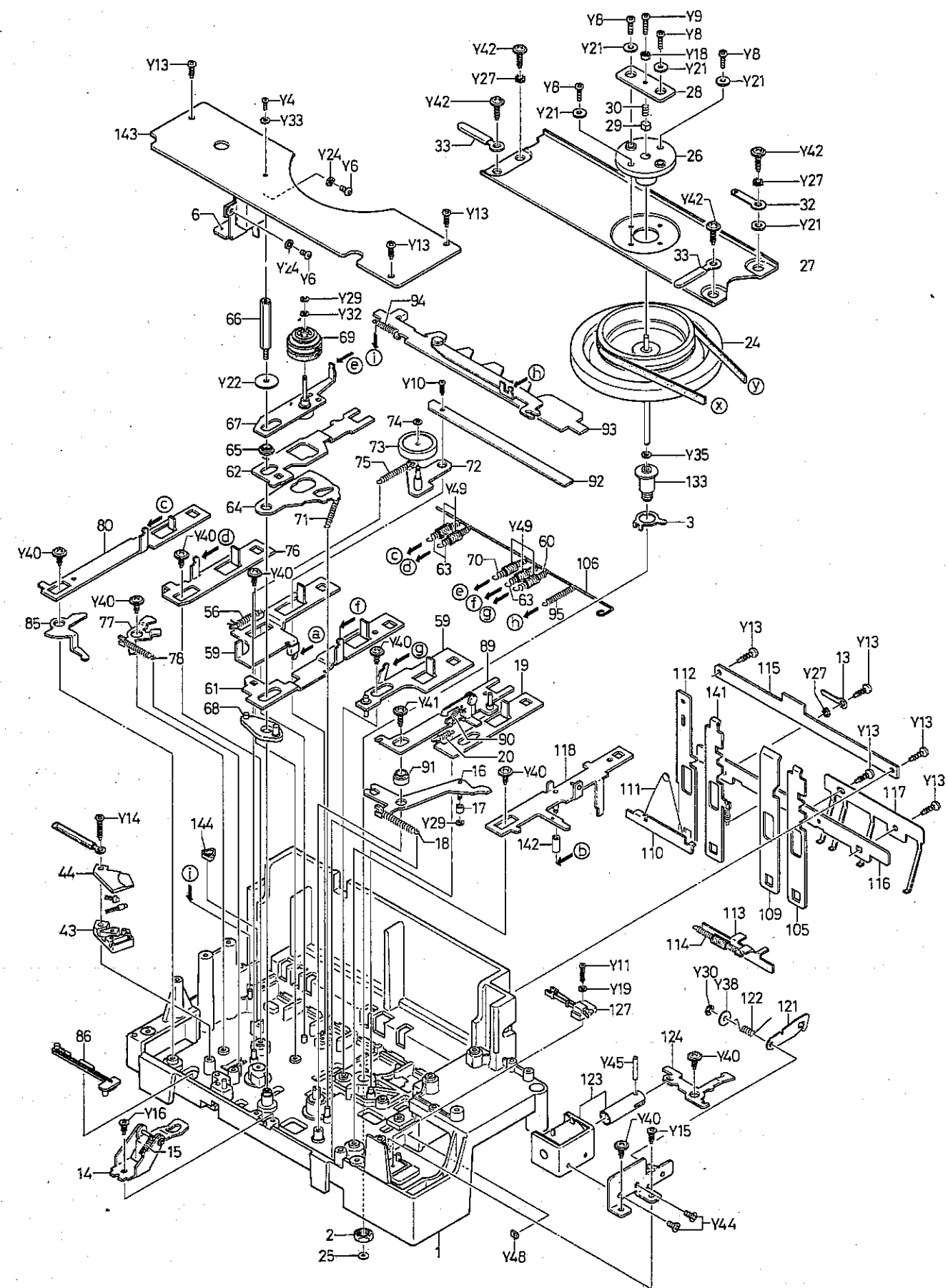
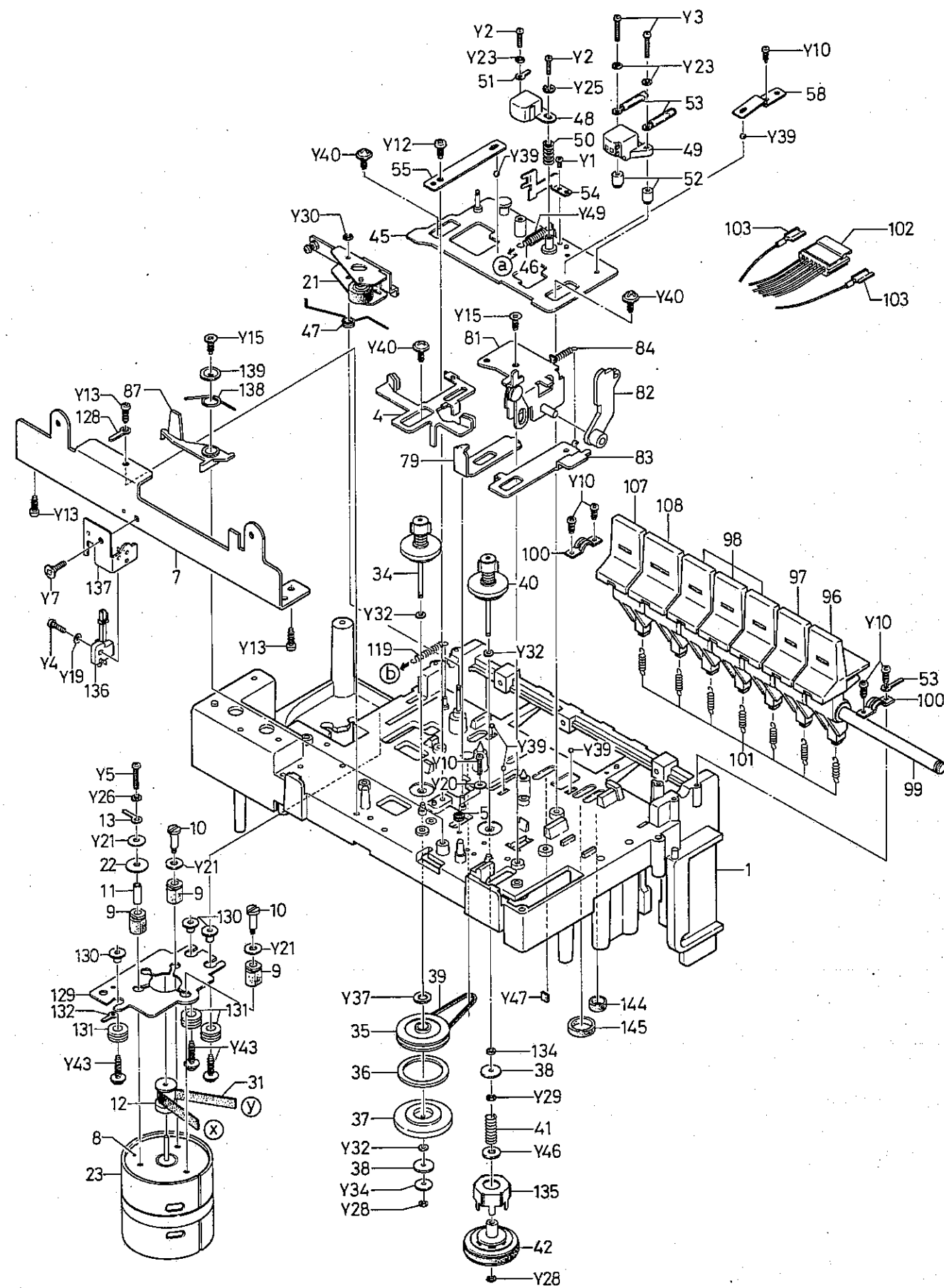
| Ref.<br>No.    | Part No. | Description                                                | Q'ty |
|----------------|----------|------------------------------------------------------------|------|
| SCREW MOUNTING |          |                                                            |      |
| Y110           |          | Tapping Screw with Washer<br>3 x 10mm                      | 6    |
| Y111           |          | Tapping Screw with Washer<br>3 x 12mm                      | 19   |
| Y112           |          | Pre-assembled Screw with Washer<br>& Spring Washer 3 x 6mm | 1    |
| Y114           |          | Tapping Screw with Washer<br>3 x 16mm                      | 1    |
| Y115           |          | Washer 4 x 8.5 x 0.45mm                                    | 2    |
| Y116           |          | External Tooth Lock Washer<br>3 x 6.5 x 0.45mm             | 1    |



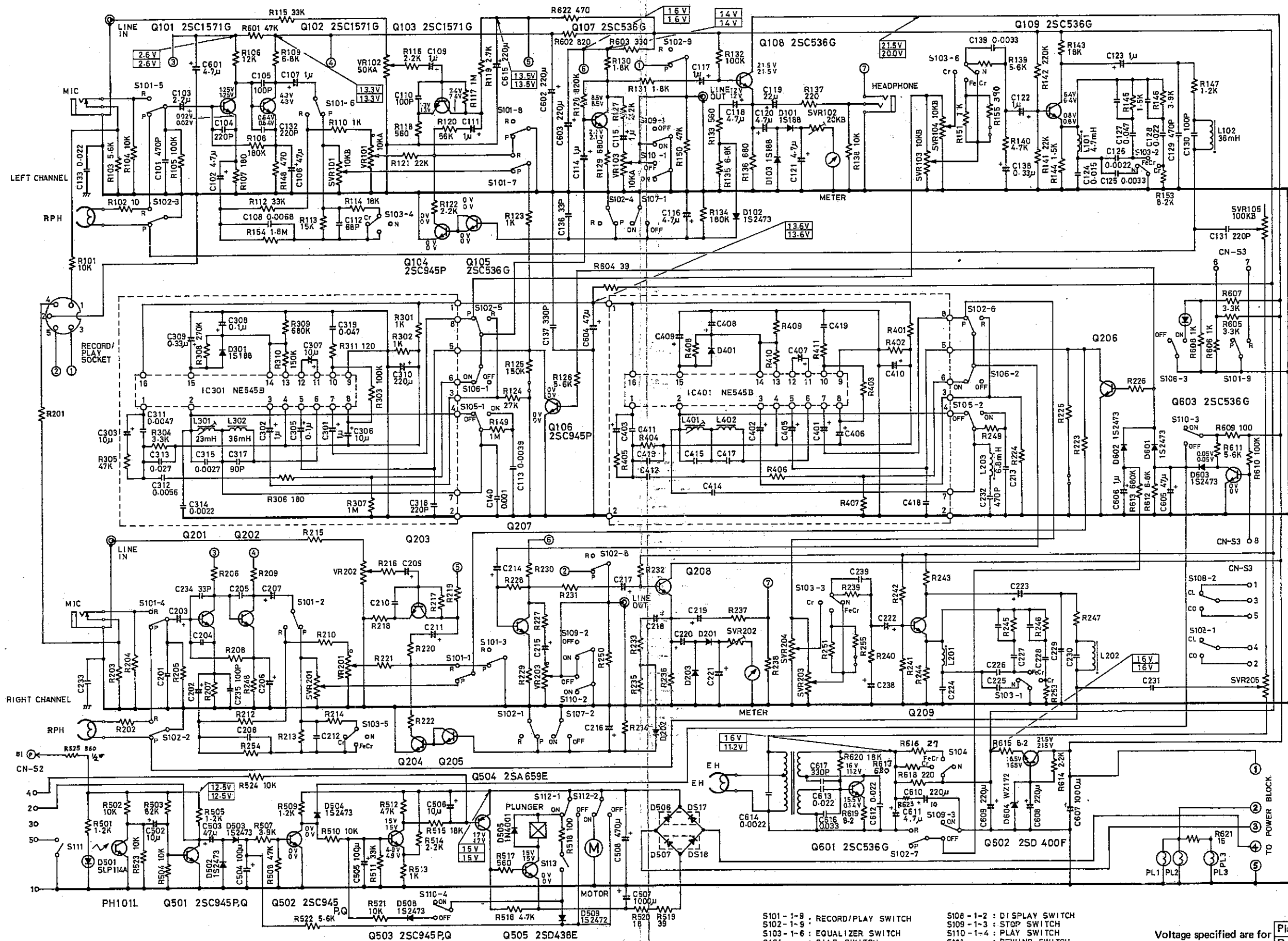
**SANYO ELECTRIC TRADING CO., LTD.**  
33, Hiyoshi-cho 2-chome, Moriguchi-shi,  
Osaka-fu, 570 Japan

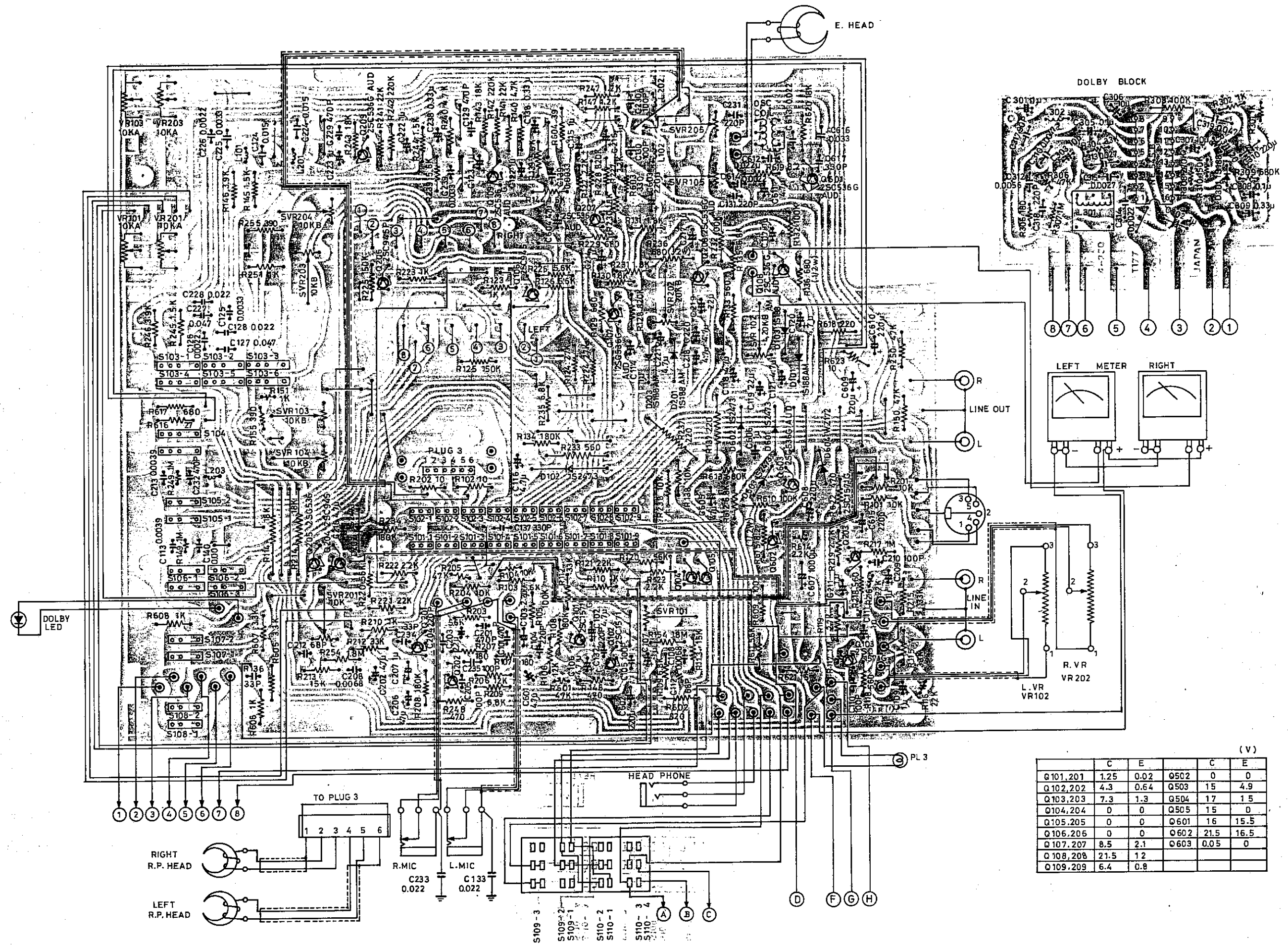
Nov/'77/500 SI

Printed in Japan

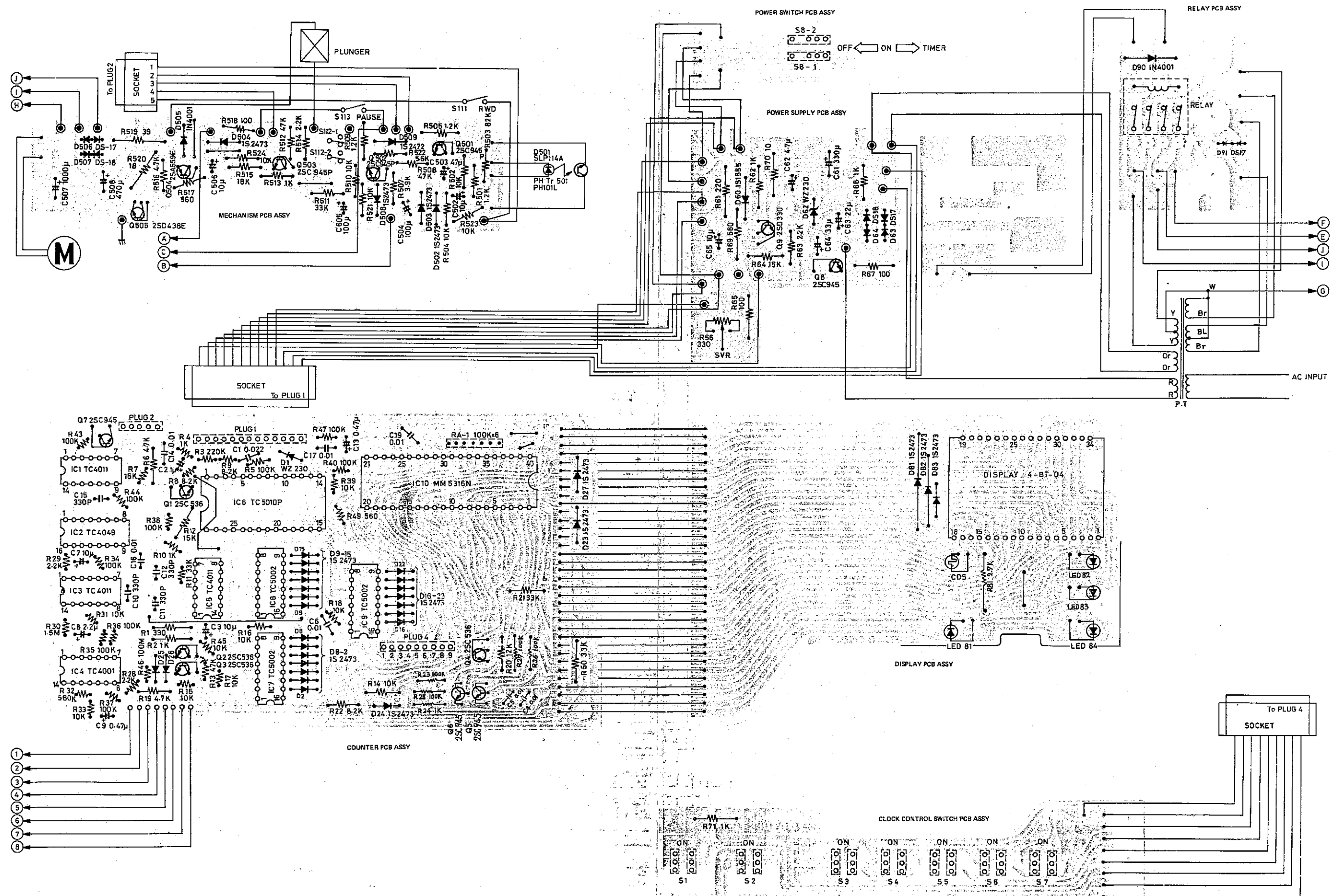


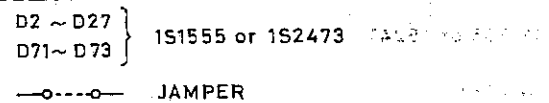
# SCHEMATIC DIAGRAM (AMPLIFIER)

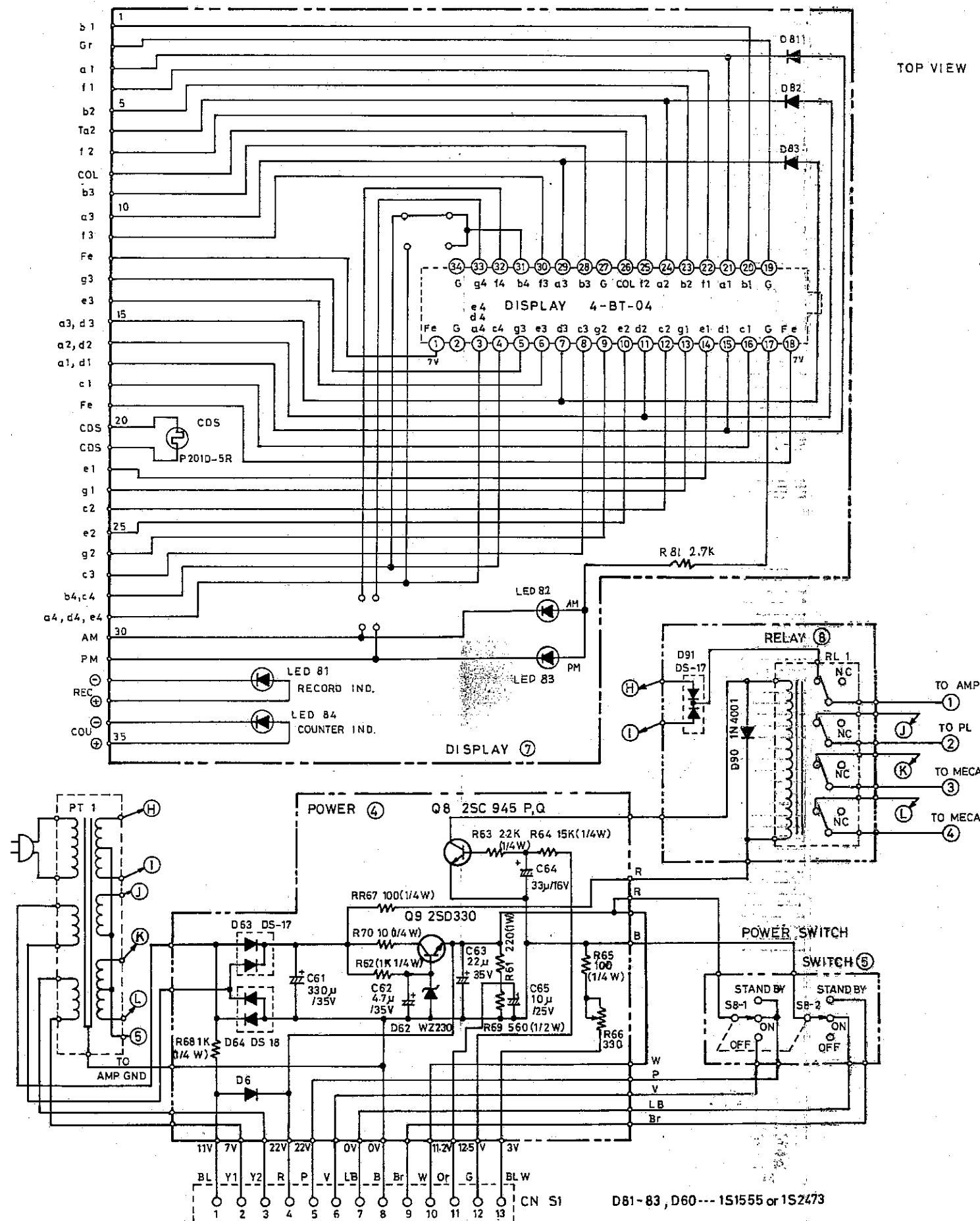
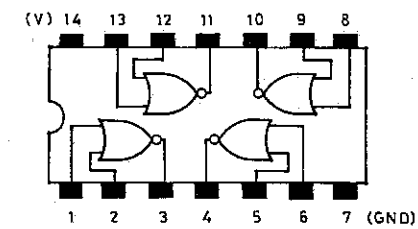
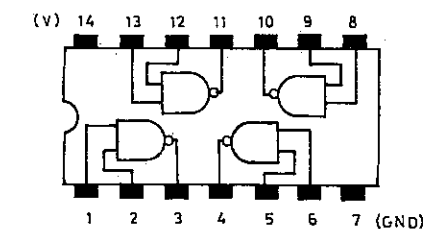




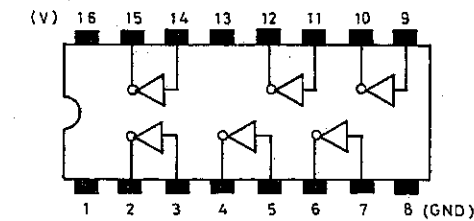
|          | C    |      | E    |      | (V)  |  |
|----------|------|------|------|------|------|--|
| Q101.201 | 1.25 | 0.02 | Q502 | 0    | 0    |  |
| Q102.202 | 4.3  | 0.64 | Q503 | 15   | 4.9  |  |
| Q103.203 | 7.3  | 1.3  | Q504 | 17   | 1.5  |  |
| Q104.204 | 0    | 0    | Q505 | 15   | 0    |  |
| Q105.205 | 0    | 0    | Q601 | 16   | 15.5 |  |
| Q106.206 | 0    | 0    | Q602 | 21.5 | 16.5 |  |
| Q107.207 | 8.5  | 2.1  | Q603 | 0.05 | 0    |  |
| Q108.208 | 21.5 | 12   |      |      |      |  |
| Q109.209 | 6.4  | 0.8  |      |      |      |  |





NOR GATE (IC 4)  
TC 4001PNAND GATE (IC 1,3,5)  
TC 4011P

INVERTER (IC 2) TC4049P

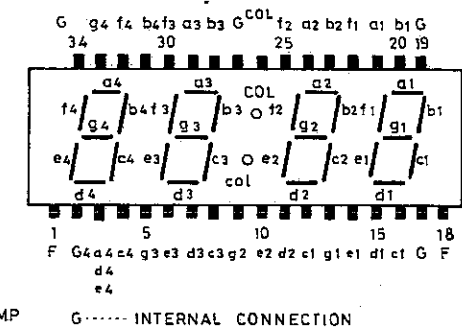
NEGATIV POSITIV  
→ NOR GATE

→ NAND GATE

→ INVERTER

→ INVERTER

FLUORESCENT DISPLAY 4-BT-04



EXPLODED VIEW (MECHANISM)

