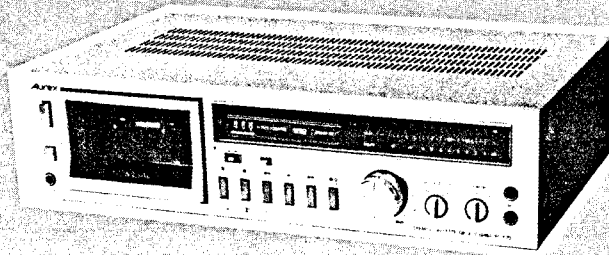


# TOSHIBA

## STEREO CASSETTE DECK

# PC-E70



### Specifications

|                                  |  |                           |   |
|----------------------------------|--|---------------------------|---|
| <b>Heads:</b>                    | Record/playback head:<br>AP (super-hard permalloy)<br>head x 1 | Dolby NR Effect:          | 5 dB improvement at 1 KHz<br>10 dB improvement above<br>5 KHz   |
|                                  | Erase head:<br>AF (4 gap ferrite) head x<br>1                  | Distortion:               | 0.6% at 400 Hz with metal<br>tape   |
| <b>Tape Transport:</b>           | Dual motor IC logic control                                    | <b>Input Level:</b>       | MIC: 0.25mV (600Ω<br>-10KΩ)   |
| <b>Mottor:</b>                   | Capstan drive:<br>DC servo motor x 1                           | <b>Output Level:</b>      | LINE: 70mV (50KΩ)<br>LINE: 0.4V (50KΩ)  |
|                                  | Reel drive:<br>DC motor x 1                                    | <b>Power Supply:</b>      | PHONES: 0.5mW (8Ω)<br>AC 240V ~, 50 Hz<br>(for U.K. and Australia)<br>AC 220V ~, 50 Hz (for<br>European Countries except<br>the U.K.) |
| <b>Wow &amp; Flutter:</b>        | 0.04%WTD, RMS<br>±0.15%(DIN)                                   |                           | AC 115/230V ~ 50/60 Hz<br>(for Middle East, Asia and<br>South America)  |
| <b>Rewind/fast-forward Time:</b> | Approximately 70 seconds<br>(C-60)                             | <b>Power Consumption:</b> | 33W   |
| <b>Frequency Response:</b>       | 30 Hz - 17,000 Hz for<br>chrome type tapes<br>at -20 dB        | <b>Dimensions:</b>        | 420(W) x 110(H) x 280(D)<br>mm (including knobs and<br>feet)  |
|                                  | 30 Hz - 15,000 Hz for<br>normal tapes at -20 dB                | <b>Weight:</b>            | 5 kg  |
|                                  | 30 Hz - 12,500 Hz for<br>metal tapes at 0 dB                   |                           |   |
|                                  | 30 Hz - 8,000 Hz for<br>chrome type tapes at 0 dB              |                           |   |
| <b>Signal-to-noise Ratio:</b>    | 58 dB  |                           |   |

Specifications are subject to change without notice.

TE, TU, AY, VF

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## 1. FEATURES

- Two-motor IC logic control system.
- METAL tape capability and super AP heads—the hyperbolic head surface assures stable tape contact for all tape types. The result is excellent recording/playback performance.
- Newly developed pause/mute function allows precise control of non-recorded spaces between recordings.
- Tape transport control buttons light for clear identification of mode even from a distance.
- LED peak meters.
- Auto-repeat playback.
- Timer recording and timer playback (timer optional).
- Remote control (remote control unit optional).
- Dolby\* NR System.

## 2. BLOCK DIAGRAM

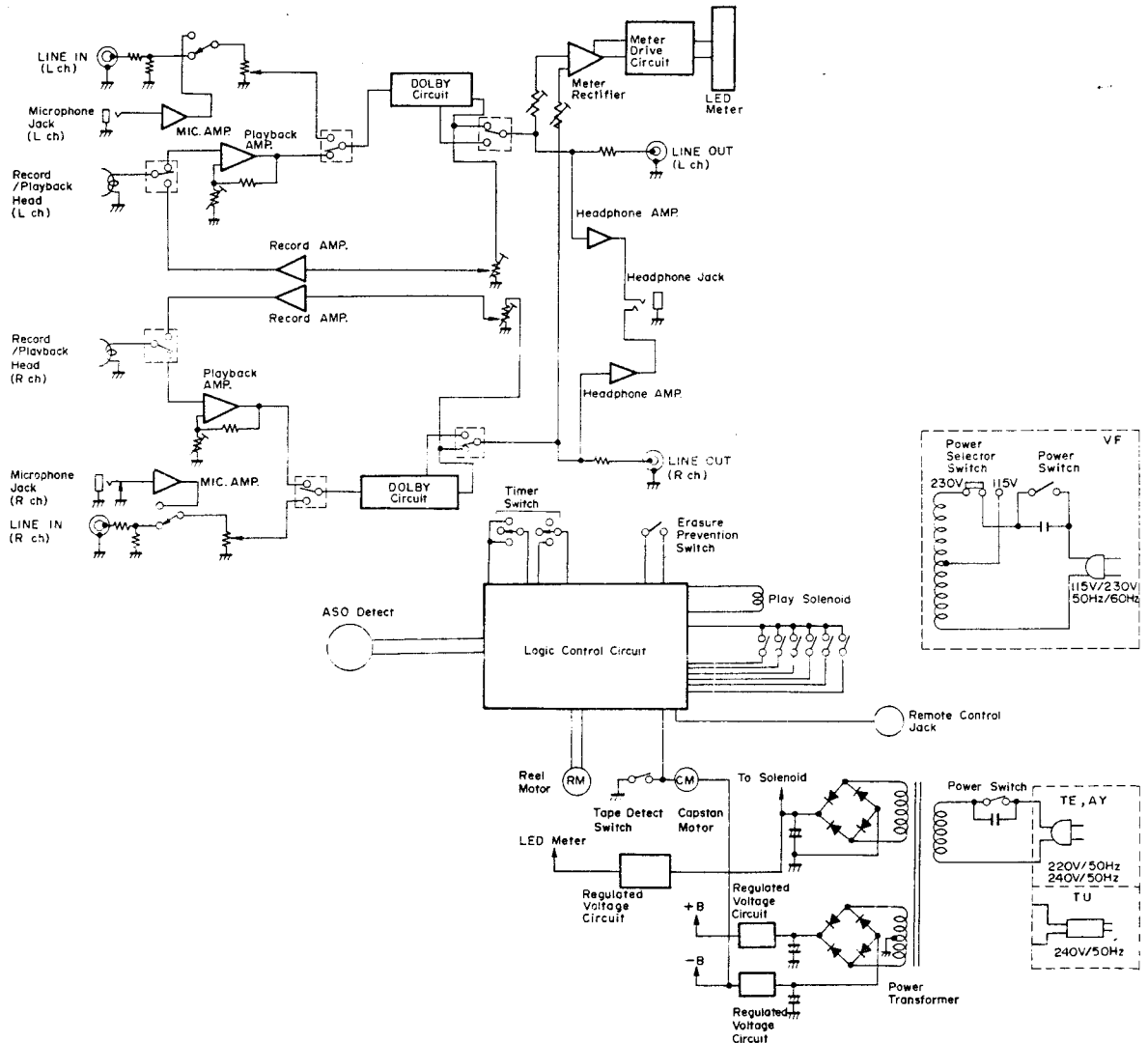


Figure 1

### 3. OPERATING CONTROLS

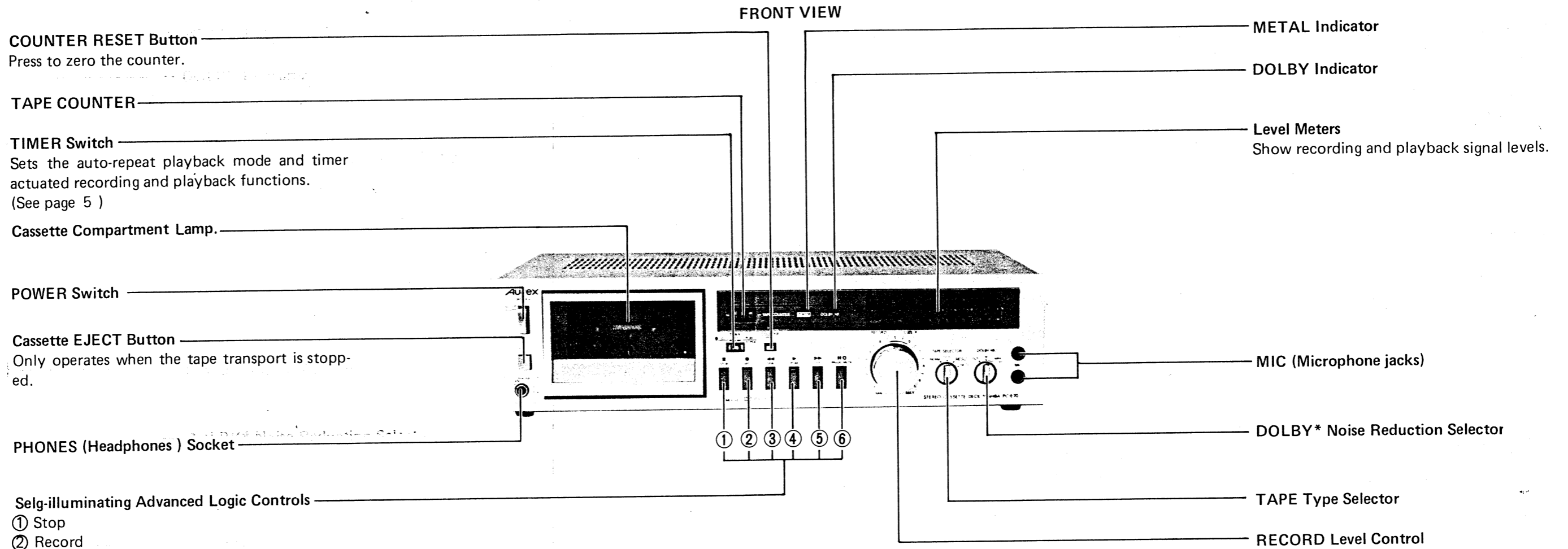


Figure 2

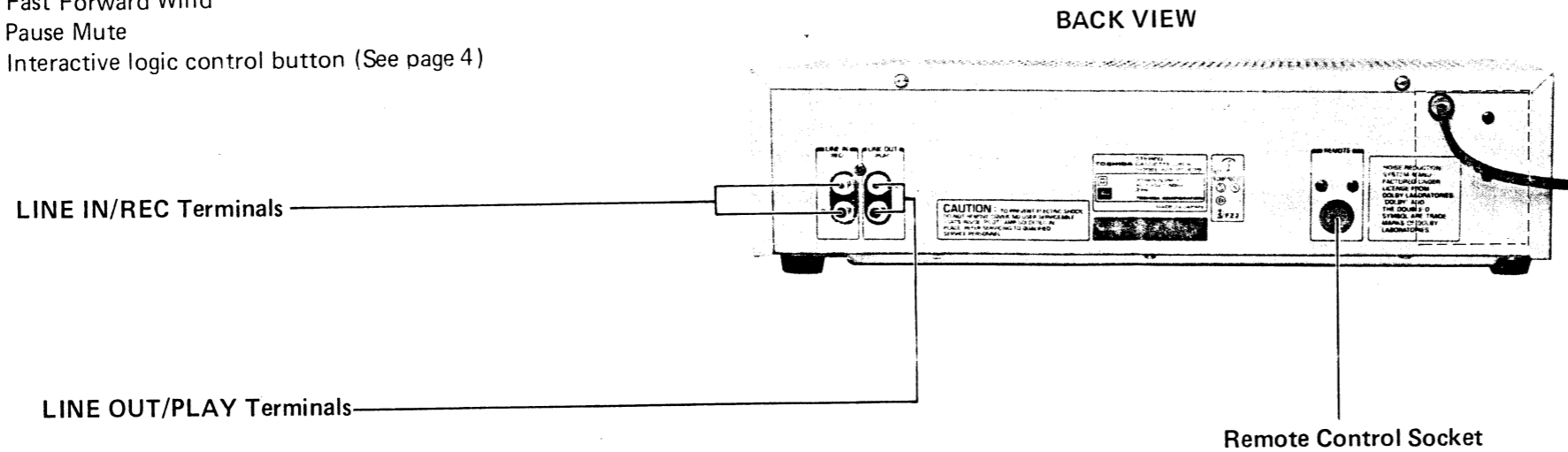


Figure 3

**Voltage Conversion (VF)**  
Loosen two screws and push the point of the screw in the arrow direction, then the voltage can be changed.

Screw Up (230V → 115V)

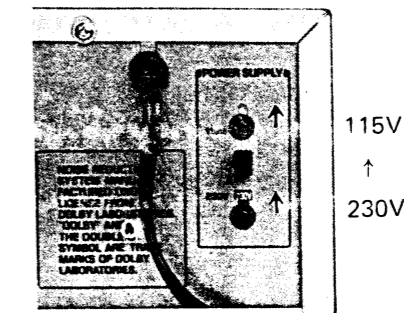


Figure 4

Screw Down (115V → 230V)

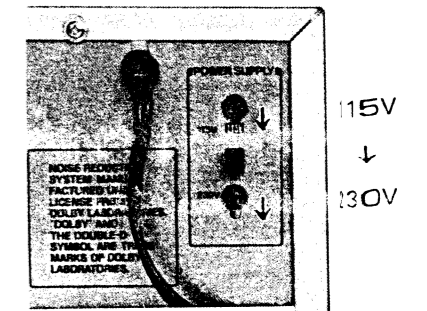
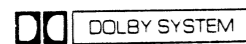


Figure 5

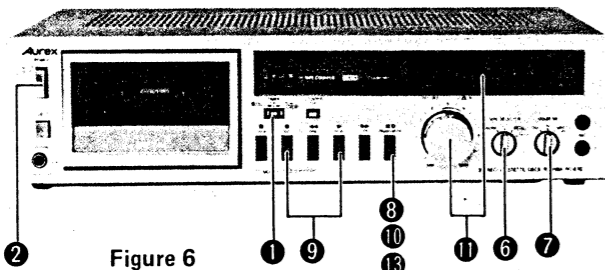


\* Noise Reduction System is manufactured under licence from Dolby Laboratories. "DOLBY" and the Double-D symbol are Trademarks of Dolby Laboratories Inc.

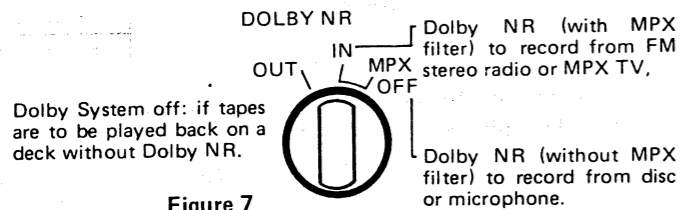


### Recording From Radio, Disc, Another Tape Unit, or TV

(Numbers refer to the steps below)



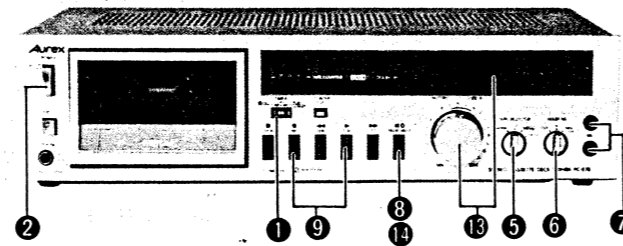
- 1 Set the TIMER switch to OFF.
- 2 Switch on the POWER.
- 3 Check that your tape heads are clean.
- 4 Set up the source that you plan to record—disc, radio, or tape.
- 5 Insert a cassette—with tab for the side you will record.
- 6 Set the TAPE selector to the tape type used: NORM, CrO<sub>2</sub>, METAL or FeCr. The METAL indicator will light for metal tape.
- 7 Set the Dolby NR selector.
  - Dolby NR recordings have reduced tape-hiss on playback.



- 8 Press the PAUSE/MUTE button to enter PAUSE mode.
  - 9 Press the REC and PLAY buttons simultaneously. The PAUSE and REC buttons will light.
  - 10 Cue up the cassette tape: If recording from the very beginning of a cassette side; turn the RECORD level control completely anticlockwise, then press the PAUSE/MUTE button momentarily. The tape will wind on past the leader, and any previous recording will be erased. After several seconds press the PAUSE/MUTE button again.
    - Note: The first few inches of tape may be marked in manufacture and should not be used for hi-fi recording.
  - 11 Play the source (disc, radio), if possible at the loudest part of the programme, and set the RECORD level control so that the peaks of the programme signal light the peak level meters given on page 4.
  - 12 Now, the PC-E70 is ready to start recording. Cue up your source (disc, tape, etc.).
  - 13 Start the source playing, then press the PC-E70 PAUSE/MUTE button momentarily. Recording will start. The PLAY and REC buttons will light, and the PAUSE/MUTE button light will go off.
- 14 Continue to observe the level meters. If a very loud passage exceeds the correct peak levels, reduce the recording level gradually with the RECORD level control. An excessively high recording level will cause audible distortion on playback. Normally, the RECORD level control should not be moved during recording.
  - 15 To stop recording, press either the PAUSE/MUTE button momentarily, or the STOP button. Alternatively, the REW button can be pressed immediately to rewind the tape ready for playback.

### Microphone Recording

(Numbers refer to the steps below)



The same basic procedure as for recording from disc or radio is followed.

- 1 Set the TIMER switch to OFF.
- 2 Switch on the POWER.
- 3 Check that your tape heads are clean.
- 4 Insert a cassette—with tab for the side you will record.
- 5 Set the TAPE selector to the tape type used (see "Recording from disc," above).
- 6 Set the Dolby NR selector.
- 7 Plug the microphone(s) into the MIC jacks on the front panel.
- 8 Press the PAUSE/MUTE button to enter PAUSE mode.
- 9 Press the REC and PLAY buttons simultaneously. The PAUSE and REC buttons will light.
- 10 Cue up the cassette tape (see "Recording from disc," above).
- 11 Position the microphones.
- 12 If feedback (a whining noise) is produced from your speakers, turn down your amplifier volume control.
- 13 While observing the level meters, set the RECORD level control so that the appropriate peak indicators light for a loud passage of sound. Move the microphones, if necessary, to obtain optimum and consistent recording levels. Leave the RECORD level control set throughout a recording if possible, or adjust gradually.
- 14 To start recording, press the PAUSE/MUTE button momentarily. The PLAY and REC buttons will light, and the PAUSE/MUTE button will go off.
- 15 Continue to observe the level meters to ensure that the peaks do not overload (see page 4).

- 16 To stop recording, press the PAUSE/MUTE button momentarily, or the STOP button or REWIND button, depending on the next operation required.

### Fade-up Start

A professional-sounding fade-up start can be easily achieved. Note the exact position of the RECORD level control in step 11, then before step 12, set the RECORD level control to zero. Just after pressing the PAUSE/MUTE button in step 13, smoothly turn the RECORD level control up to the correct position.

### Setting the Recording Level

The correct recording level depends considerably on the type of tape used and the program material being recorded. The correct tape type and recording level should be selected to give the best frequency response yet lowest noise level.

For the following three tape types, the RECORD level control should be set so that the peak level meters light at the loudest passage of that program selection:

| Tape type            | Peak level meters |
|----------------------|-------------------|
| NORMAL (ferric) tape | -3 dB or 0 dB     |
| CHROME tape          | 0 dB or +3 dB     |
| METAL alloy tape     | +3 dB or +5 dB    |

The high frequency response, in particular, depends considerably on the type of tape and the recording level. Metal-alloy tape, for instance, provides better high-frequency response than normal tape, thus giving much better reproduction of higher pitched instruments and voices. This is illustrated in Figure 9.

For the same tape, type at lower recording levels, there is better higher-frequency response as shown in Figure 10. So, to record program material which contains considerable high-frequency sound, set the recording level somewhat lower. The level meter on the PC-E70 is an electronic "digital" indicator, which displays the peaks of the signal, in red over 0 dB and in green below. This allows very precise setting of the recording level.

The Dolby mark and the *adres* mark indicate the Dolby and *adres* calibration positions, respectively. The *adres* mark is for use when the tape deck is connected to an *adres* unit. The *adres* system is Toshiba's new noise reduction and dynamic range expansion system.

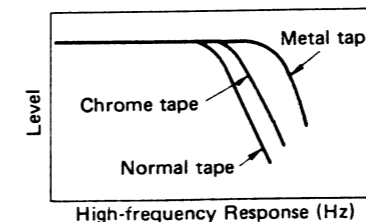


Figure 9 Frequency Response Curves for Different Types of Tape

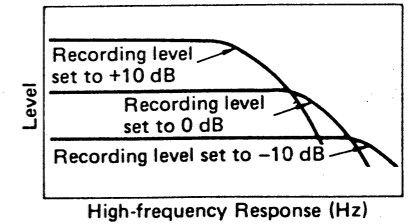


Figure 10 Frequency Response Curves at Different Recording Levels

### Mute Recording

After recording a piece of music, you may want to create a short silent space before further recording. The advanced—logic MUTE feature of the PC-E70 allows you to do this easily and professionally.

At the end of a recording, tape transport is normally stopped by pressing the STOP button or the PAUSE/MUTE button momentarily. If, however, the PAUSE/MUTE button is pressed and held in during recording, the tape continues to run but will be erased. When the button is released, the tape will stop in record standby made ready to continue recording. To start recording again press the PAUSE/MUTE button a second time; when the PAUSE/MUTE button is released, recording will start.

The PAUSE/MUTE button therefore serves a dual purpose: record mute and pause.

For proper operation follow the steps given in the table just below:

This is illustrated below.

|                                | ① Making a non-recorded gap   | ② Releasing the pause mode  |
|--------------------------------|---|---|
| PAUSE/MUTE button operations   | A non-recorded gap can be created by pressing and holding the PAUSE/MUTE button during recording. When the button is released, the tape stops in the pause mode.<br><br>Press | To restart recording, momentarily press the button again.<br><br>Release<br><br>Press momentarily |
| Tape transport and record mode | <br>Non-recorded space<br>Record mute starts.    Tape transport stops.  | <br>Recording starts again.   |

Figure 11

•When the button is pressed during playback, only the pause function operates. The PAUSE/MUTE button is not effective in the fast-forward and rewind modes.

## PLAYBACK

## Normal Playback

(Numbers refer to the steps below)

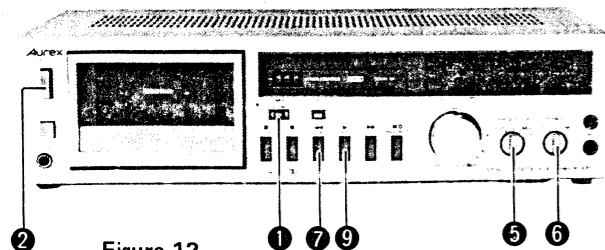


Figure 12

- 1 Set the TIMER switch to OFF.
- 2 Switch the POWER on.
- 3 Take up any slack in the cassette to be played.
- 4 Insert the cassette with the play side facing you.
- 5 Set the TAPE selector for the tape type:  
NORM, CrO<sub>2</sub>, METAL, or FeCr.
- 6 Set the Dolby NR switch to:  
IN for tapes recorded with Dolby NR.  
OUT for other tapes.  
**Note:** The IN and MPX OFF positions give the same operation in playback.
- 7 Press the REW button to wind to the beginning of the tape, or the FF button to Fast-Forward wind to a later selection.
- 8 Set the volume control on your amplifier to a reasonable position, and set the monitor (and tape) switches on your amplifier correctly.
- 9 Press the PLAY button to start playback. The PLAY button lights.
- 10 To go from playback to another mode, the PAUSE/MUTE, REW, FF or STOP buttons may be pressed directly.
- 11 At the end of the tape, playback will automatically stop.

## Auto-repeat Playback

The PC-E70 can play a tape then automatically rewind to the beginning and start playback again repeatedly. Or it can rewind first, then start auto-repeat playback.

- 1 Switch on the POWER.
- 2 Follow steps 3 to 6 of Normal Playback, above.
- 3 Set the TIMER switch to PLAY REPEAT.
- 4 (A) For Playback—rewind—playback:  
Press the PLAY button.  
(B) For rewind—play—rewind:  
Press the REW button.
- 5 To stop auto-repeat playback, press the STOP button.  
**Note:** If the TIMER switch is left in the PLAY/REPEAT position when the deck is switched off. Auto-repeat playback will start automatically when the POWER is next switched on.

## TIMER RECORDING/PLAYBACK

The TIMER switch should normally be set to OFF before the POWER is switched on. With the TIMER switch in the REC or PLAY positions, when power is switched to the deck either at the POWER switch or by an external audio timer, recording or playback will start automatically. Note that the audio timer must also switch on and off the power to the other hi-fi components.

When the end of a tape is reached during unattended recording or playback, the tape stops and the tape transport is automatically disengaged. However, the power to the deck and your stereo system will remain on, causing unnecessary power consumption and possible danger.

To avoid this, it is advisable to use an audio timer that automatically switches the power to the system both on and off.

## Timer Recording

- 1 Set up the cassette deck and amplifier, tuner, etc. for normal recording:
  - Set the TIMER switch on the PC-E70 to OFF.
  - Switch on the POWER.
  - Insert a cassette with a tab on the side to be recorded.
  - Set the TAPE selector and Dolby NR selector.
  - Precisely tune to the desired radio station.
  - Preset the recording level, after pressing the PAUSE/MUTE then the REC and PLAY buttons.
- 2 Set the audio timer to the desired recording start time, and also set it to switch off the power to the system.
- 3 Leave the PC-E70 POWER switch on.
- 4 Set the TIMER switch to REC.

When the time preset on the audio timer is reached, the audio system power will be turned on, and automatic recording will start.

**Note:** Set the TIMER switch to OFF when automatic recording has been completed. If the TIMER switch is accidentally left in the REC position, a portion of a recorded tape may be unintentionally erased when the power is switched on.

## Timer Playback

(for morning alarm, etc.)

- 1 Play the tape to be used for the morning alarm and adjust the amplifier volume control to a suitable volume level.
- 2 Set the audio timer to the desired alarm time, and also set it to switch off the power to the system.
- 3 Set the tape deck TIMER switch to the PLAY position.

When the preset alarm time is reached, the tape deck will automatically start playback.

**Note:** When playback starts the PC-E70 will play in the auto-repeat mode until stopped. When the auto-repeat mode is no longer required, set the TIMER switch to the OFF position.

## 4. DISASSEMBLY INSTRUCTIONS

## Top Cover Removal

1. Remove four screws (A) and (B) from each side of Top Cover (See Figure 13 and 14)
2. Remove two screws (C) from rear panel of unit. (See Figure 15)
3. Lifting the Top Cover upright, pull it back wards and the Top Cover can be removed out.

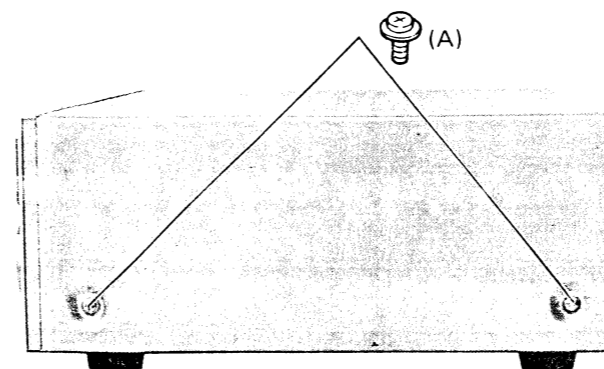


Figure 13

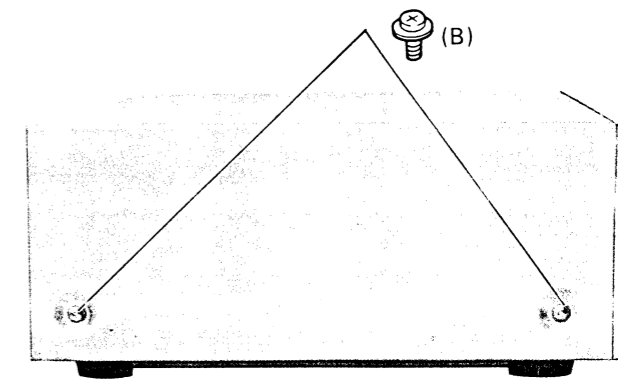


Figure 14

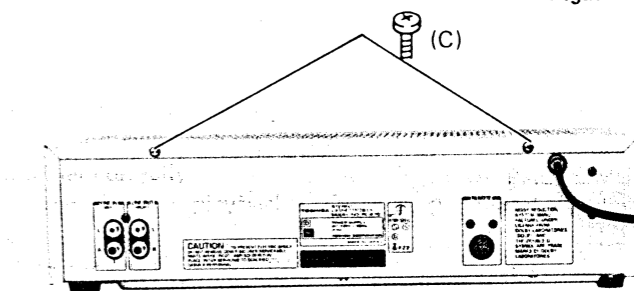


Figure 15

## Bottom Cover Removal

1. Remove the Top Cover.
2. Remove five screws (D) from the bottom plate. (See Figure 16)
3. Remove two screws (E) from side of the unit. (See Figure 17)
4. Bottom Plate can be removed from the unit.

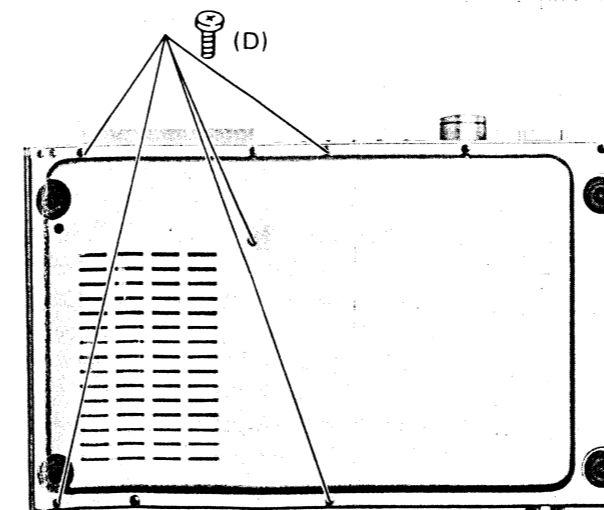


Figure 16

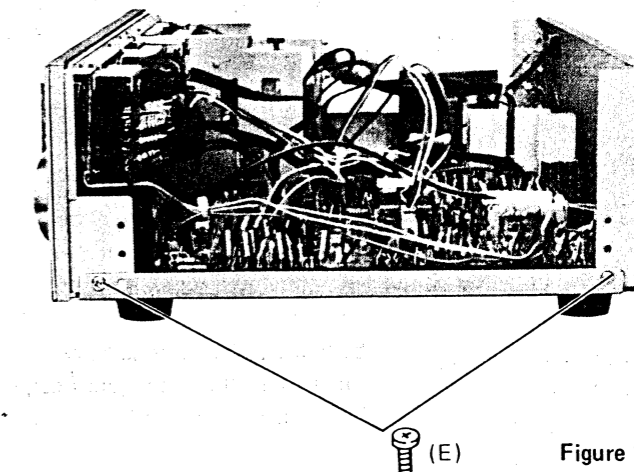


Figure 17

**Cassette Cover Removal**

1. Push the eject button to open the cassette cover.
2. Press the top and bottom of cassette cover with fingers, and upward in direction of the arrow direction (F).

Then the Cassette cover can be removed from unit.

(See Figure 19)

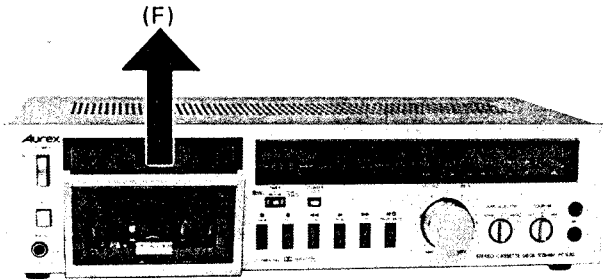


Figure 18

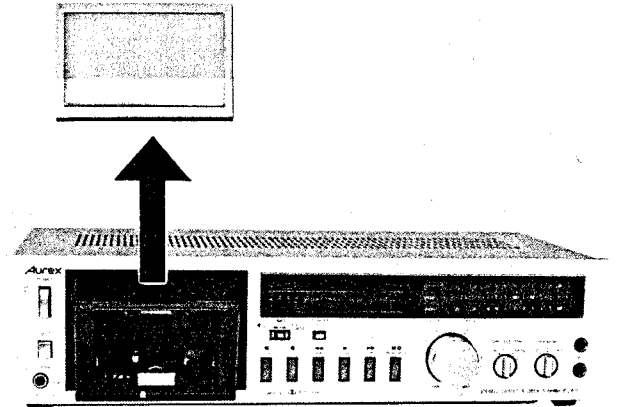


Figure 19

**Front Panel Removal**

1. Remove the top and cassette cover.
2. Remove the three knobs (G). (See Figur 20)
3. Remove thirteen screws (H) and (I). (See Figure 21 and 22)
4. Front panel can be removed from unit.

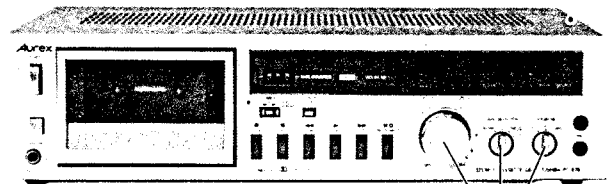


Figure 20

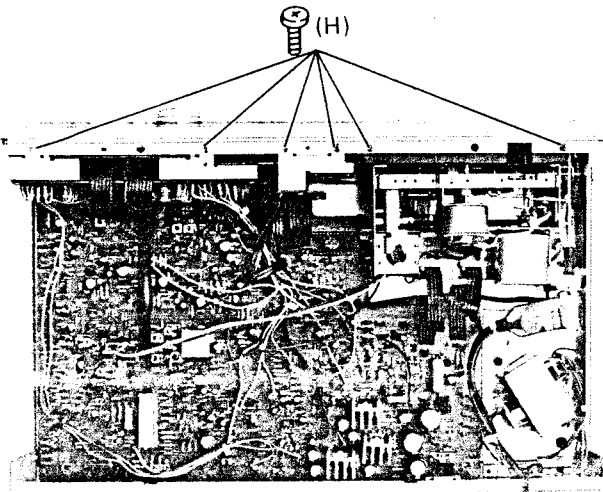


Figure 21

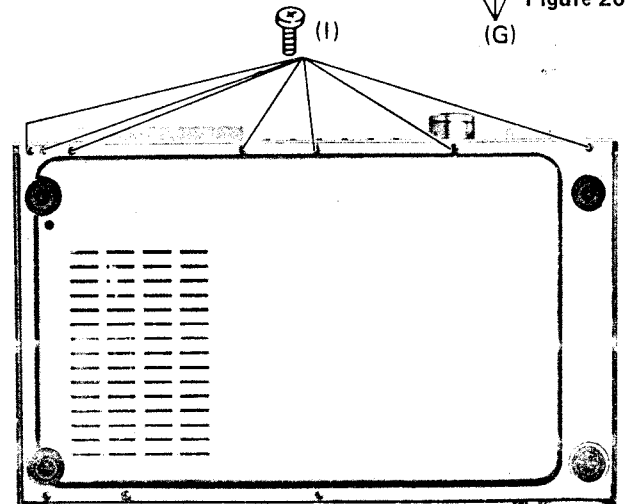


Figure 22

**Mechanism Assembly Removal**

1. Remove cassette cover.
2. Remove six screws (J) and (K) (See Figure 23 and 24)
3. Remove the one leg (L) from the chassis then mechanism assembly can be removed.

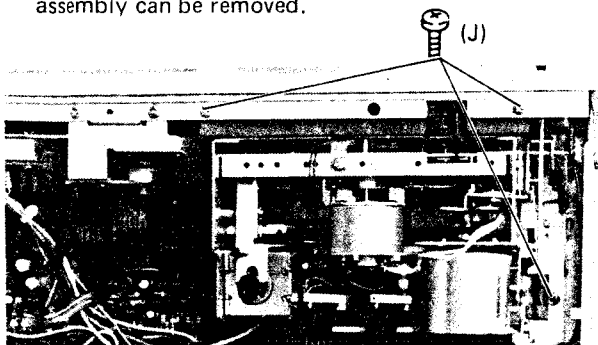


Figure 23

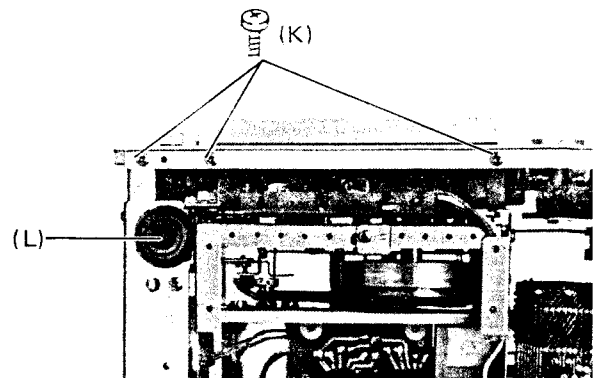


Figure 24

## 5. ADJUSTMENTS

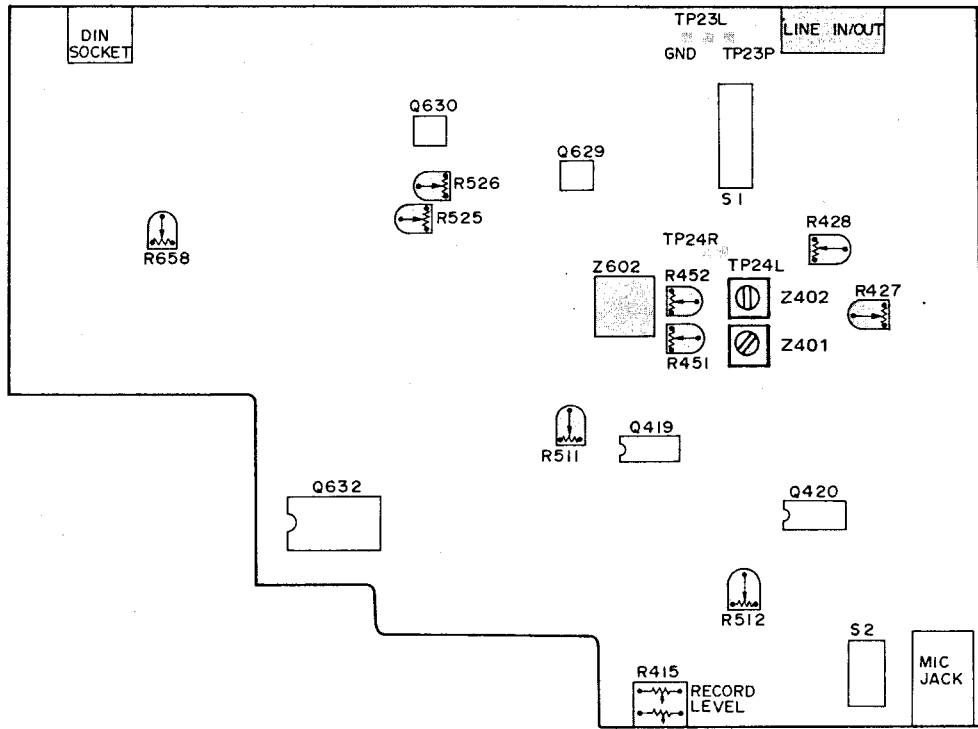


Figure 25

### TEST EQUIPMENTS

1. VTVM (Vacuum Tube Voltmeter)
2. Signal Generator
3. Resistance Attenuator
4. Screwdriver

5. Test Tapes:  
 MTT-114 (10 kHz)  
 MTT-150 (400 Hz)  
 AC-511 (CHROME TAPE)

### RECORD/PLAYBACK HEAD ADJUSTMENT

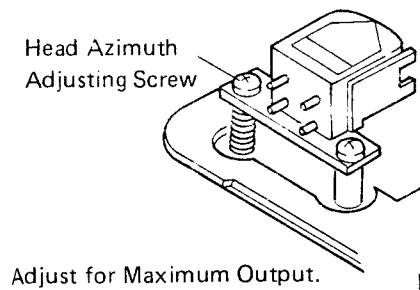


Figure 26

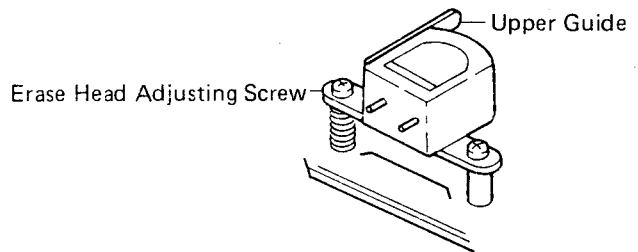


Figure 27

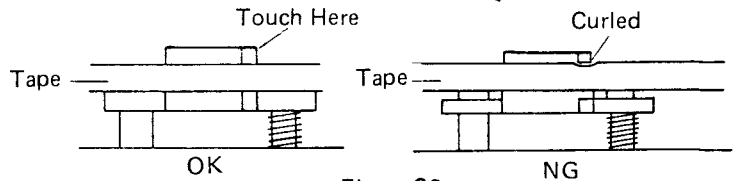


Figure 28

### ERASE HEAD HEIGHT ADJUSTMENT

1. Temporarily mount the erase head so that it will be even by eye measurement.
2. Set in PLAY position with setting a mirror cassette tape, MC-09C.
3. Adjust the height adjusting screw so that the upper edge of the tape will touch at the upper tape guide of the erase head. See figure 28.
4. Confirm whether the upper edge of the tape is not Curled.

5. Paint the adjusting screw with lock paint.  
 P.S. When the mirror cassette is not available, please re-model a normal tape, type C-90 as shown below. See figure 29.

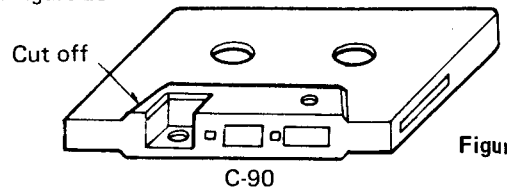


Figure 29



ADJUSTMENT PROCEDURES

| No. | Description                                      | Nominal Specs  | Test Tape  | Volume Control |                  | Switch Position |                                  | Adjustment Posints   | Test Points                    | Test Freq. ATT | Remarks  |
|-----|--|----------------|------------|----------------|------------------|-----------------|----------------------------------|----------------------|--------------------------------|----------------|--|
|     |  |                |            | REC            | TAPE             | DOLBY           |                                  |                      |                                |                |  |
| 1   | Head Azimuth Adjustment                          | MAX.           | MTT-111    |                | NOR              | OUT             | Head Azimuth Adjustment Screw    | LINE OUT             |                                |                | After Adjustment lock with screw point.                                |
| 2   | Tape Speed Measurement                           | 3000±30 Hz     | MTT-111    |                | NOR              | OUT             | Semi-fixed resister in the Motor | LINE OUT             |                                |                |  |
| 3   | Playback Sensitivity Adjustment                  | 580 ± 10mV     | MTT-150    |                | NOR              | OUT             | R427<br>R428                     | LINE OUT             |                                |                |  |
| 4   | Playback Frequency Response Measurement (Normal) | +3<br>-5 dB    | MTT-215C   |                | NOR              | OUT             |                                  | LINE OUT             |                                |                | 10 KHz Level difference for 315 Hz                                     |
| 5   | Playback Frequency Response Measurement (Chrome) | -4 ± 2 dB      | MTT-215C   |                | NOR              | OUT             |                                  | LINE OUT             |                                |                | Change for 10 KHz Normal tape  |
| 6   | Output Noise Level                               | Under 2.0mV    | Blank Tape |                | NOR              | OUT             | LINE OUT                         |                      |                                |                |  |
| 7   | Bias Leakage Adjustment                          | MIN.           |            |                | CrO <sub>2</sub> | OUT             | Z401<br>Z402                     | T.P. 24L<br>T.P. 24R |                                |                |  |
| 8   | Line Input Level Adjustment                      | 580 ± 10mV     |            | Adjustment     | CrO <sub>2</sub> | OUT             | REC Volume                       | LINE OUT             | 400 Hz<br>-17 dB               |                | REC. Volume adjustment must be kept till frequency response adjustment |
| 9   | Meter Adjustment                                 | Meter Indi.    |            |                | CrO <sub>2</sub> | OUT             | R525, 526                        | LED Meter            | 400 Hz -17 dB                  |                |  |
|     |  | Meter Indi.    |            |                | CrO <sub>2</sub> | OUT             |                                  | LED Meter            | 400 Hz -23<br>-23 + 0.5 dB     |                |  |
| 10  | Record Playback Frequency Response Adjustment    | 0 + 2<br>-0 dB | AC-512     |                | CrO <sub>2</sub> | OUT             | R451<br>R452                     | LINE OUT             | 400 Hz to<br>10 kHz<br>- 40 dB |                |  |
| 11  | Record/Playback Sensitivity Adjustment           | 580 ± 10mV     | AC-512     |                | CrO <sub>2</sub> | OUT             | R511<br>R512                     | LINE OUT             | 400 Hz<br>- 17 dB              |                |  |

Measurement Condition Power Supply TE: 220V VF: 230V TU, AY: 240V  
 • Input: 0 dB= 1V rms • LINE IN (Input Impedance): 600 ohm • LINE OUT (Load Impedance): 47 K ohm  
 • Test Point Load Impedance: No Load

(Rec/Play Sensitivity Adjustment)

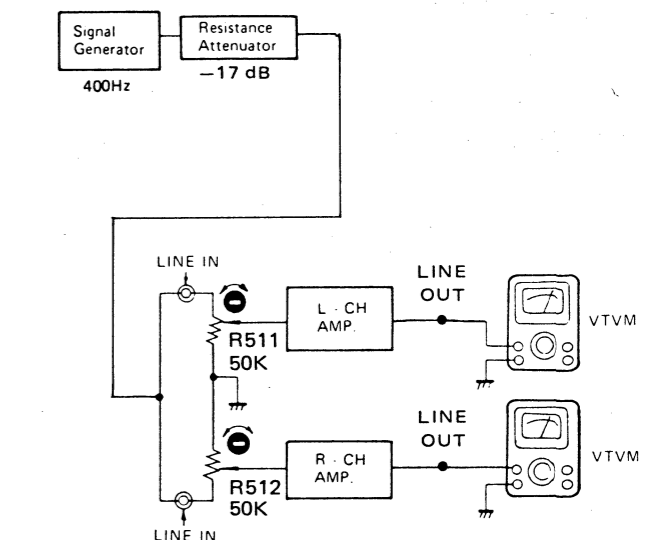


Figure 33

(Rec/Play Frequency Response Adjustment)

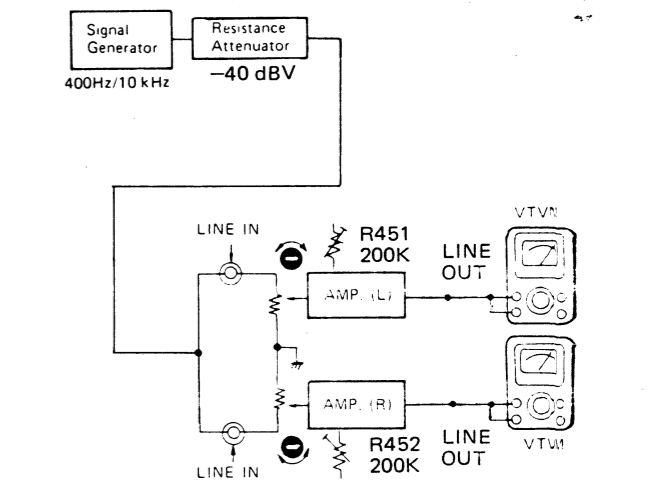


Figure 34

( Playback Sensitivity Adjustment)

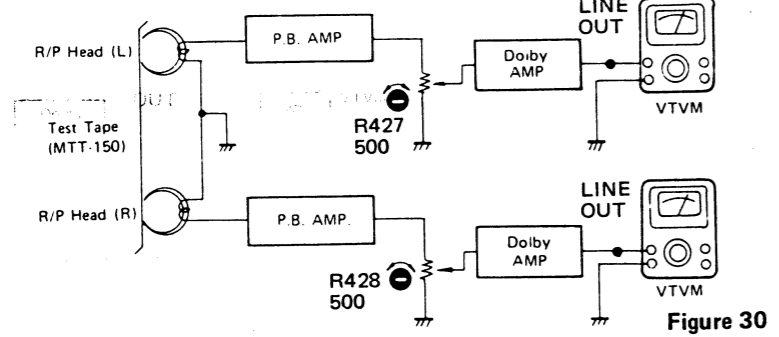


Figure 30

(Bias Lead Adjustment)

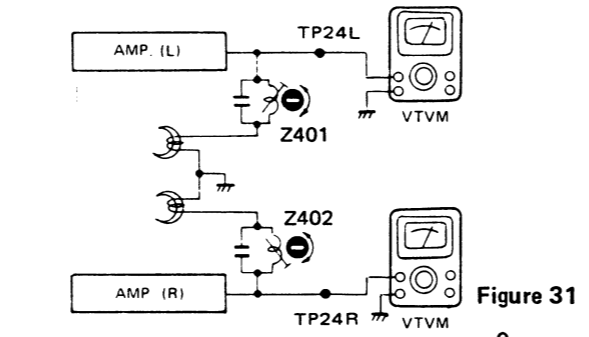


Figure 31

(Line Input Adjustment)

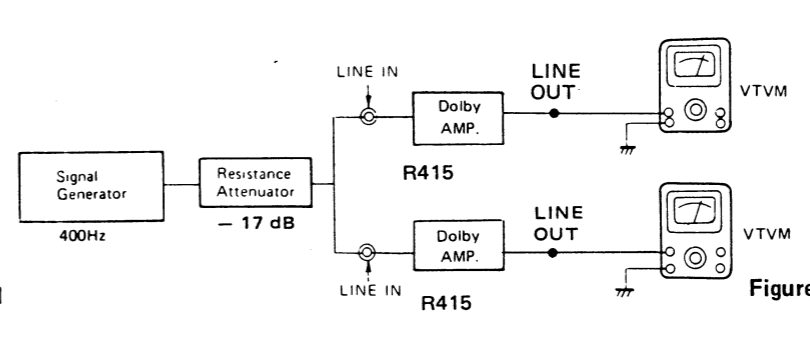
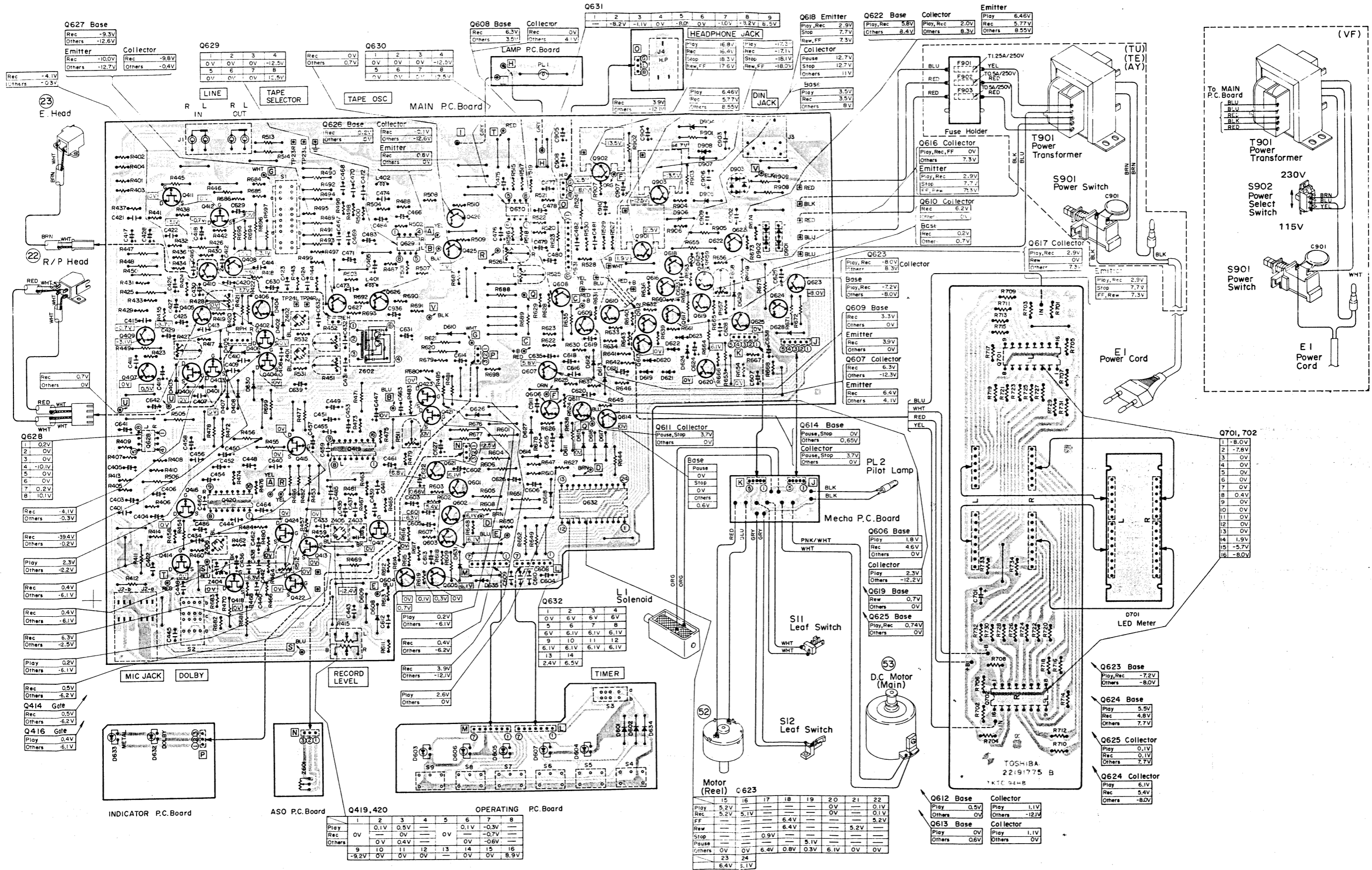


Figure 32

# 6. ELECTRICAL PARTS LOCATIONS



**Q627 Base**

|        |        |
|--------|--------|
| Rec    | -9.3V  |
| Others | -12.6V |

**Emitter**

|        |        |
|--------|--------|
| Rec    | -10.0V |
| Others | -12.7V |

**Collector**

|        |       |
|--------|-------|
| Rec    | -9.6V |
| Others | -0.4V |

**Q629**

|    |    |    |        |
|----|----|----|--------|
| 0V | 0V | 3  | 4      |
| 0V | 0V | 0V | -12.5V |
| 5  | 6  | 7  | 8      |
| 0V | 0V | 0V | 12.5V  |

**Q630**

|        |      |
|--------|------|
| Rec    | 0V   |
| Others | 0.7V |

**Q630**

|    |    |    |        |
|----|----|----|--------|
| 1  | 2  | 3  | 4      |
| 0V | 0V | 0V | -12.5V |
| 5  | 6  | 7  | 8      |
| 0V | 0V | 0V | 2.5V   |

**Q608 Base**

|        |      |
|--------|------|
| Rec    | 6.3V |
| Others | 3.5V |

**Collector**

|        |      |
|--------|------|
| Rec    | 0V   |
| Others | 4.1V |

**Q631**

|       |       |    |       |    |       |       |      |   |
|-------|-------|----|-------|----|-------|-------|------|---|
| 1     | 2     | 3  | 4     | 5  | 6     | 7     | 8    | 9 |
| -8.2V | -1.1V | 0V | -8.0V | 0V | -1.0V | -3.2V | 6.5V |   |

**HEADPHONE JACK**

|        |       |
|--------|-------|
| Play   | 16.8V |
| Rec    | 16.4V |
| Stop   | 16.3V |
| Rew,FF | 17.6V |

**DIN JACK**

|        |       |
|--------|-------|
| Play   | 6.46V |
| Rec    | 5.77V |
| Stop   | 5.55V |
| Rew,FF | 8.55V |

**Q618 Emitter**

|          |      |
|----------|------|
| Play,Rec | 2.9V |
| Stop     | 7.7V |
| Rew,FF   | 7.3V |

**Collector**

|          |       |
|----------|-------|
| Play,Rec | 12.7V |
| Stop     | 12.7V |
| Others   | 11V   |

**Base**

|        |      |
|--------|------|
| Play   | 3.5V |
| Rec    | 3.5V |
| Others | 8V   |

**Q622 Base**

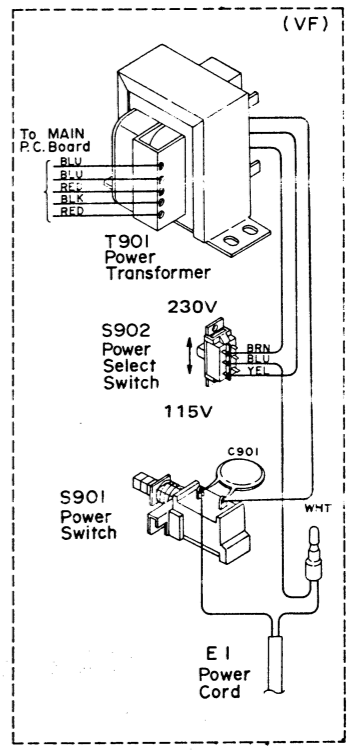
|          |      |
|----------|------|
| Play,Rec | 5.8V |
| Others   | 8.4V |

**Collector**

|          |      |
|----------|------|
| Play,Rec | 2.0V |
| Others   | 8.3V |

**Emitter**

|        |       |
|--------|-------|
| Play   | 6.46V |
| Rec    | 5.77V |
| Others | 8.55V |



**Q628**

|   |        |
|---|--------|
| 1 | 0V     |
| 2 | 0V     |
| 3 | 0V     |
| 4 | -10.1V |
| 5 | 0V     |
| 6 | 0V     |
| 7 | 0.2V   |
| 8 | 10.1V  |

**Rec**

|        |       |
|--------|-------|
| Rec    | -4.1V |
| Others | -0.3V |

**Play**

|        |       |
|--------|-------|
| Play   | 2.3V  |
| Others | -2.2V |

**Rec**

|        |       |
|--------|-------|
| Rec    | 0.4V  |
| Others | -6.1V |

**Rec**

|        |       |
|--------|-------|
| Rec    | 0.4V  |
| Others | -6.1V |

**Play**

|        |       |
|--------|-------|
| Play   | 0.2V  |
| Others | -6.1V |

**Q626 Base**

|        |      |
|--------|------|
| Rec    | 0.2V |
| Others | 0V   |

**Collector**

|        |      |
|--------|------|
| Rec    | 0.2V |
| Others | 0V   |

**Emitter**

|        |      |
|--------|------|
| Rec    | 0.2V |
| Others | 0V   |

**Q609 Base**

|        |      |
|--------|------|
| Rec    | 3.3V |
| Others | 0V   |

**Emitter**

|        |      |
|--------|------|
| Rec    | 3.9V |
| Others | 0V   |

**Collector**

|        |        |
|--------|--------|
| Rec    | 6.3V   |
| Others | -12.3V |

**Emitter**

|        |      |
|--------|------|
| Rec    | 6.4V |
| Others | 4.1V |

**Q611 Collector**

|            |      |
|------------|------|
| Pause,Stop | 3.7V |
| Others     | 0V   |

**Q614 Base**

|            |       |
|------------|-------|
| Pause,Stop | 0V    |
| Others     | 0.65V |

**Collector**

|            |      |
|------------|------|
| Pause,Stop | 3.7V |
| Others     | 0V   |

**Q616 Collector**

|             |      |
|-------------|------|
| Play,Rec,FF | 0V   |
| Others      | 7.3V |

**Emitter**

|          |      |
|----------|------|
| Play,Rec | 2.9V |
| Stop     | 7.7V |
| Rew,FF   | 7.3V |

**Q617 Collector**

|          |      |
|----------|------|
| Play,Rec | 2.9V |
| Stop     | 7.7V |
| Others   | 7.3V |

**Q618 Emitter**

|          |      |
|----------|------|
| Play,Rec | 2.9V |
| Stop     | 7.7V |
| FF,Rew   | 7.3V |

**Q606 Base**

|        |      |
|--------|------|
| Play   | 1.8V |
| Rec    | 4.6V |
| Others | 0V   |

**Collector**

|        |        |
|--------|--------|
| Play   | 2.3V   |
| Others | -12.2V |

**Q619 Base**

|        |      |
|--------|------|
| Rew    | 0.7V |
| Others | 0V   |

**Q625 Base**

|          |       |
|----------|-------|
| Play,Rec | 0.74V |
| Others   | 0V    |

**Q623 Base**

|          |       |
|----------|-------|
| Play,Rec | -7.2V |
| Others   | -8.0V |

**Q624 Base**

|        |      |
|--------|------|
| Play   | 5.5V |
| Rec    | 4.8V |
| Others | 7.7V |

**Q625 Collector**

|        |      |
|--------|------|
| Play   | 0.1V |
| Rec    | 0.1V |
| Others | 7.7V |

**Q624 Collector**

|        |       |
|--------|-------|
| Play   | 6.1V  |
| Rec    | 5.4V  |
| Others | -8.0V |

**Q701, 702**

|    |       |
|----|-------|
| 1  | -8.0V |
| 2  | -7.8V |
| 3  | 0V    |
| 4  | 0V    |
| 5  | 0V    |
| 6  | 0V    |
| 7  | 0V    |
| 8  | 0.4V  |
| 9  | 0V    |
| 10 | 0V    |
| 11 | 0V    |
| 12 | 0V    |
| 13 | 0V    |
| 14 | 1.9V  |
| 15 | -5.7V |
| 16 | -8.0V |

**Q414 Gate**

|        |       |
|--------|-------|
| Rec    | 0.5V  |
| Others | -6.2V |

**Q416 Gate**

|        |       |
|--------|-------|
| Play   | 0.4V  |
| Others | -6.1V |

**Q419, 420**

|        |      |      |    |    |    |    |      |
|--------|------|------|----|----|----|----|------|
| Play   | 0.1V | 0.5V | —  | —  | —  | —  | —    |
| Rec    | —    | —    | —  | 0V | —  | —  | —    |
| Others | —    | —    | —  | —  | —  | —  | —    |
| 9      | 10   | 11   | 12 | 13 | 14 | 15 | 16   |
| -8.2V  | 0V   | 0V   | 0V | —  | 0V | 0V | 8.9V |

**Q632**

|      |      |      |      |
|------|------|------|------|
| 1    | 2    | 3    | 4    |
| 0V   | 6V   | 6V   | 6V   |
| 5    | 6    | 7    | 8    |
| 6V   | 6.1V | 6.1V | 6.1V |
| 9    | 10   | 11   | 12   |
| 6.1V | 6.1V | 6.1V | 6.1V |
| 13   | 14   | 15   | 16   |
| 2.4V | 6.5V | —    | —    |

**Q633**

|      |      |      |      |
|------|------|------|------|
| 1    | 2    | 3    | 4    |
| 0V   | 6V   | 6V   | 6V   |
| 5    | 6    | 7    | 8    |
| 6V   | 6.1V | 6.1V | 6.1V |
| 9    | 10   | 11   | 12   |
| 6.1V | 6.1V | 6.1V | 6.1V |
| 13   | 14   | 15   | 16   |
| 2.4V | 6.5V | —    | —    |

**INDICATOR P.C. Board**

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 0V | 0V | 0V | 0V | 0V | 0V | 0V | 0V |

**ASO P.C. Board**

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 0V | 0V | 0V | 0V | 0V | 0V | 0V | 0V |

**OPERATING P.C. Board**

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 0V | 0V | 0V | 0V | 0V | 0V | 0V | 0V |

**Q623 Base**

|          |       |
|----------|-------|
| Play,Rec | -7.2V |
| Others   | -8.0V |

**Q624 Base**

|        |      |
|--------|------|
| Play   | 5.5V |
| Rec    | 4.8V |
| Others | 7.7V |

**Q625 Collector**

|        |      |
|--------|------|
| Play   | 0.1V |
| Rec    | 0.1V |
| Others | 7.7V |

**Q624 Collector**

|        |       |
|--------|-------|
| Play   | 6.1V  |
| Rec    | 5.4V  |
| Others | -8.0V |

**Q612 Base**

|        |      |
|--------|------|
| Play   | 0.5V |
| Rec    | 0V   |
| Others | 0V   |

**Collector**

|        |      |
|--------|------|
| Play   | 1.1V |
| Rec    | 1.1V |
| Others | 0V   |

**Q613 Base**

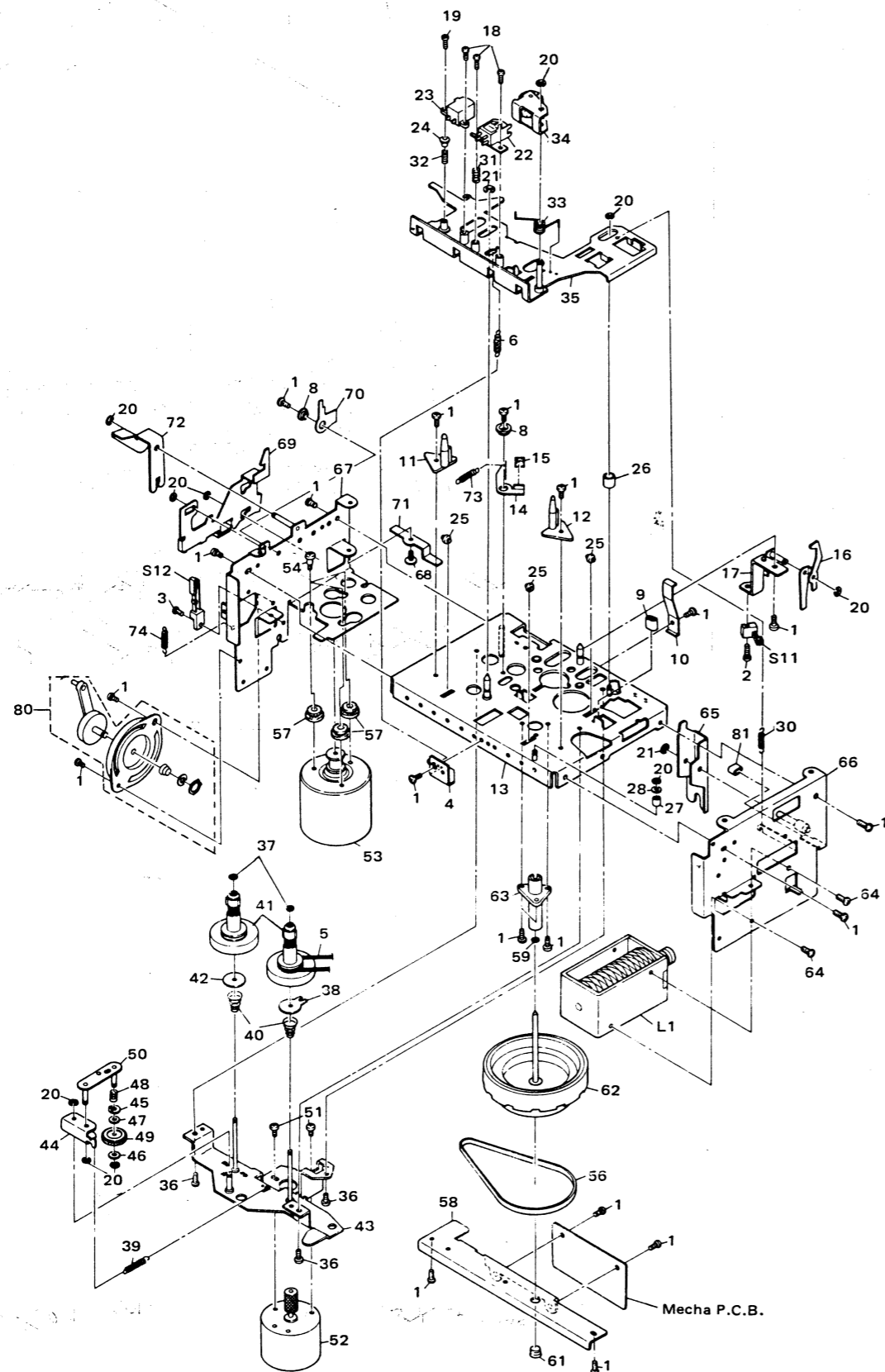
|        |      |
|--------|------|
| Play   | 0V   |
| Rec    | 0.6V |
| Others | 0V   |

**Collector**

|        |      |
|--------|------|
| Play   | 1.1V |
| Rec    | 1.1V |
| Others | 0V   |

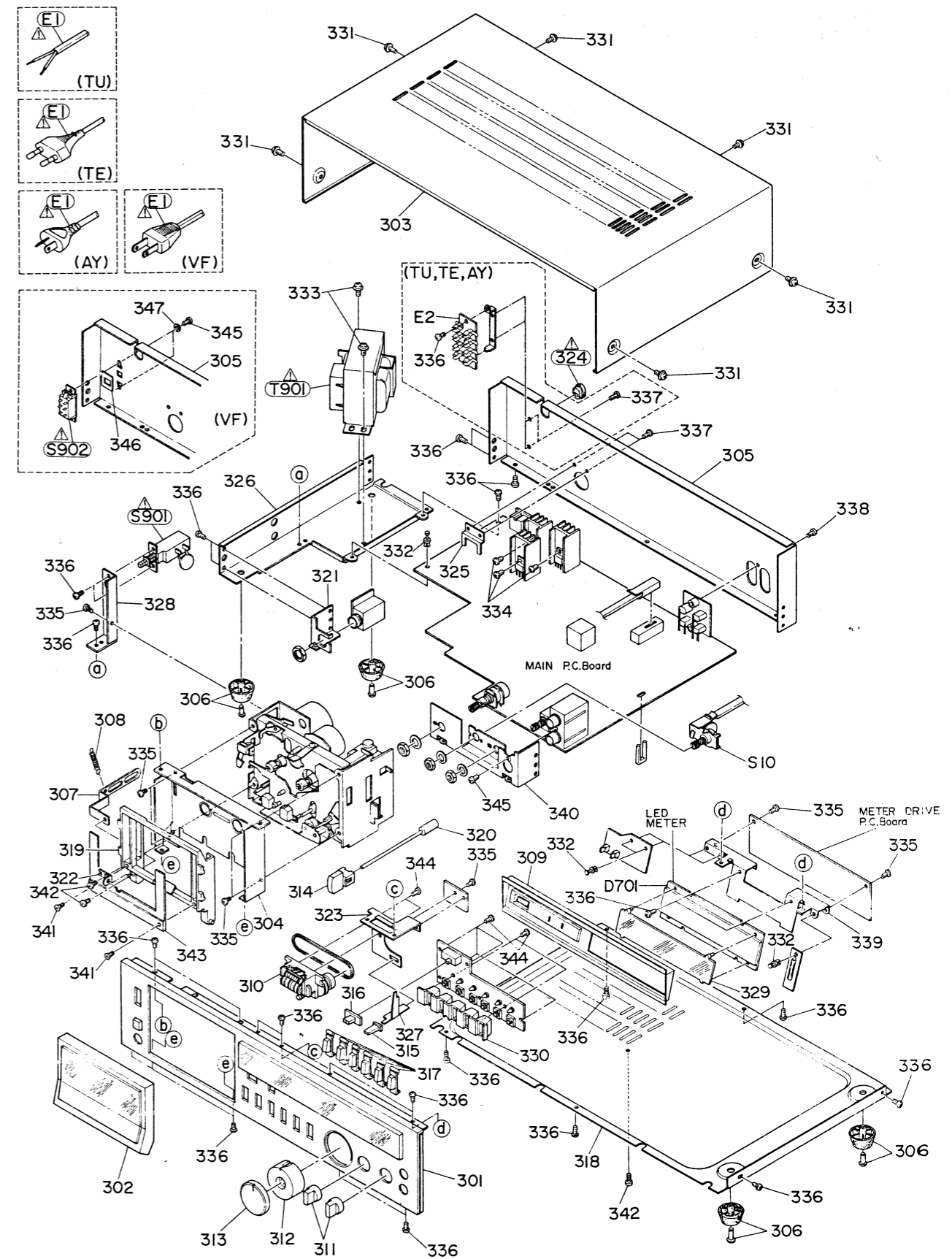


### 8. MECHANICAL PARTS LOCATIONS



**Note:** The parts without Key No. on this exploded parts list are unserviceable parts.

### 9. CABINET PARTS LOCATIONS



**Note:** The parts without Key No. on this exploded parts list are unserviceable parts.

## 10. PARTS LIST

**CAUTION:**

The  $\triangle$  mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

| Symbol No.           | Part No. | Description                         | Symbol No. | Part No. | Description                   |
|----------------------|----------|-------------------------------------|------------|----------|-------------------------------|
| <b>CABINET PARTS</b> |          |                                     |            |          |                               |
| 301                  | 25819459 | Front Panel Ass'y                   | 18         | 22707451 | Screw, BID $\phi$ 2 x 5mm     |
| 302                  | 25817809 | Cover Ass'Y, Cassette               | 19         | 22707505 | Screw, BID $\phi$ 2 x 6mm     |
| 303                  | 22841229 | Top Cover                           | 20         | 22703118 | E Washer $\phi$ 2             |
| 304                  | 25817829 | Cover Ass'y, Mechanism              | 21         | 22703279 | E Washer $\phi$ 3             |
| 305                  | 25838522 | Jack Plate (TE)                     | 22         | 22217357 | Head, Record/Playback HRPT-77 |
|                      | 25838523 | Jack Plate (TU, AY)                 | 23         | 22218213 | Head, Erase HET-43            |
|                      | 25838533 | Jack Plate (VF)                     | 24         | 25726489 | Sleeve, Erase Head            |
| 306                  | 22828048 | Leg                                 | 25         | 25753325 | Roller                        |
| 308                  | 25771412 | Spring, Cassette UP                 | 26         | 25753347 | Roller-H                      |
| 309                  | 25814361 | Decoration Ass'y                    | 27         | 25753348 | Roller-HL                     |
| 310                  | 25873224 | Counter                             | 28         | 25764400 | Washer, $\phi$ 3              |
| 311                  | 25837494 | Knob, DOLBY NR/TAPE<br>SELECTOR     | 30         | 25771951 | Spring                        |
| 312                  | 25837469 | Knob, Rec-R                         | 31         | 25772240 | Spring, Head                  |
| 313                  | 25837468 | Knob, Rec-L                         | 32         | 25772438 | Spring, Erase Head            |
| 314                  | 22884010 | Knob, Power                         | 33         | 25773469 | Spring, Pressure Lever        |
| 315                  | 25837467 | Knob, Counter                       | 34         | 25717473 | Pressure Roller               |
| 316                  | 25837475 | Knob, Timer                         | 35         | 25791213 | Chassis Ass'y, Head           |
| 317                  | 25838448 | Knob, Mechanism                     | 36         | 22707494 | Screw, DTBID $\phi$ 2.6 x 4mm |
| 319                  | 25817828 | Holder Ass'y, Cassette              | 37         | 25764549 | Washer, $\phi$ 1.7            |
| $\triangle$ 324      | 25845528 | Bush, Cord                          | 38         | 25766019 | Washer, Back Tension          |
| 329                  | 25838444 | Dial Plate, Meter                   | 39         | 25771586 | Spring                        |
| 331                  | 22707522 | Screw, $\phi$ 3 x 6mm, Chrome       | 40         | 25772254 | Spring, Back Tension          |
| 332                  | 22705022 | Rivet, Plastic, 3 $\phi$ x 5.5mm    | 41         | 25712360 | Reel Drum Ass'y               |
| 333                  | 22707521 | Screw, FLDT $\phi$ 3 x 6mm, BLK     | 42         | 25764570 | Washer, $\phi$ 2.1            |
| 334                  | 22707350 | Screw, DTBID $\phi$ 2.6 x 5mm       | 43         | 25791191 | Reel Mount Ass'y              |
| 335                  | 22707397 | Screw, DTBID $\phi$ 2.6 x 5mm, BLK  | 45         | 25735246 | Retainer, Spring              |
| 336                  | 22707445 | Screw, DTBID $\phi$ 3 x 6mm         | 46         | 25735252 | Washer, Stopper               |
| 337                  | 22707446 | Screw, DTBID $\phi$ 3 x 6mm, BLK    | 47         | 25762401 | Felt, FF                      |
| 338                  | 22701326 | Screw, Tapping $\phi$ 3 x 8mm, BLK  | 48         | 25772572 | Spring, Idler, FF             |
| 341                  | 22707626 | Screw, FLT $\phi$ 2.6 x 8mm, BLK    | 49         | 25713372 | Idler Ass'y, FF               |
| 342                  | 22707366 | Screw, DTBID $\phi$ 2.6 6mm         | 50         | 25791141 | Plate B Ass'y, Idler          |
| 344                  | 22707301 | Screw, Tapping $\phi$ 2.6 x 8mm     | 51         | 22701389 | Screw, BID $\phi$ 2.6 x 3mm   |
| 345                  | 22707165 | Screw, 3 $\phi$ x10 mm,BID,BLK (VF) | 52         | 25791216 | Motor Ass'y, Reel             |
| 346                  | 22950753 | Label, Voltage (VF)                 | 53         | 25791297 | Motor Ass'y, Main             |
| 347                  | 22703203 | Washer, 3 $\phi$ (VF)               | 54         | 22707429 | Screw, Motor                  |
|                      |          |                                     | 56         | 25755448 | Belt, Main                    |
|                      |          |                                     | 57         | 25761238 | Cushion, Motor                |
|                      |          |                                     | 59         | 25764398 | Washer $\phi$ 2.5             |
|                      |          |                                     | 61         | 25783219 | Screw, THRUST, Flywheel       |
|                      |          |                                     | 62         | 25717451 | Flywheel Ass'y                |
|                      |          |                                     | 63         | 25718158 | Holder Ass'y, Capstan         |
|                      |          |                                     | 64         | 22707452 | Screw, BID $\phi$ 3 x 6mm     |
|                      |          |                                     | 68         | 22701472 | Screw, FLT                    |
|                      |          |                                     | 73         | 25771630 | Spring                        |
|                      |          |                                     | 74         | 25776180 | Spring                        |
|                      |          |                                     | 76         | 22703269 | Washer $\phi$ 3               |
|                      |          |                                     | 80         | 25791074 | Damper Ass'y                  |
|                      |          |                                     | 82         | 25771898 | Spring                        |
| <b>MECHANISM</b>     |          |                                     |            |          |                               |
| 1                    | 22707350 | Screw, DTBID $\phi$ 2.6 x 5mm       |            |          |                               |
| 2                    | 22707169 | Screw, BID $\phi$ 2.6 x 10mm        |            |          |                               |
| 3                    | 22707617 | Screw, DTPAN $\phi$ 2.6 x 6mm       |            |          |                               |
| 5                    | 25755351 | Belt, Counter                       |            |          |                               |
| 8                    | 25724420 | Bush                                |            |          |                               |
| 9                    | 25761400 | Stopper, Head Chassis               |            |          |                               |
| 11                   | 25783222 | Guide-AL                            |            |          |                               |
| 12                   | 25783223 | Guide-AR                            |            |          |                               |
| 15                   | 25762384 | Felt, Frictione                     |            |          |                               |

| Symbol No.  | Part No. | Description  |
|---|----------|--|
| <b>TRANSISTORS, ICS &amp; DIODES</b>  |          |  |
| Q401, 402<br>403, 404<br>411, 412<br>413, 414<br>415, 416<br>417, 418<br>421, 422<br>423, 424   |          | Transistor, 2SK30A-GR  |
| Q405, 406<br>Q407, 408<br>Q409, 410<br>Q419, 420<br>Q425, 426                                   | 22114681 | Transistor, 2SC2240-GR<br>Transistor, 2SA970-BL<br>Transistor, 2SC2240-BL<br>IC, NE646BN-C<br>Transistor, 2SC1815-GR   |
| Q601, 602<br>604, 605<br>610, 613<br>614, 620<br>625, 627                                       |          | Transistor, 2SC1815-GR   |
| Q603, 606<br>607, 608<br>609, 612<br>624, 626   |          | Transistor, 2SA1015-GR   |
| Q611<br>Q615, 619<br>Q616, 617<br>Q618, 623<br>Q621<br>Q622<br>Q628, 629<br>630<br>Q631<br>Q632 | 22114470 | Transistor, 2SC982TM<br>Transistor, 2SC2120-Y<br>Transistor, 2SA950-Y<br>Transistor, 2SC2655-Y<br>Transistor, 2SC1959-Y<br>Transistor, 2SA1020-Y<br>IC, NJM4558D-A<br>IC, TA7318P-2<br>IC, TC9121P |
| Q701, 702   |          | IC, TA7612AP   |
| Q901, 902<br>Q903   |          | Transistor, 2SC1173-Y<br>Transistor, 2SA473-Y  |
| D401, 402<br>403, 404<br>405, 406<br>407, 408   |          | Diode, 1S1553V   |
| D601, 602<br>608, 609<br>610, 611<br>612, 613<br>614, 615<br>616, 617<br>618, 619<br>620, 621   |          | Diode, 1S1555V   |

| Symbol No.   | Part No.   | Description  |
|--|--|--|
| D622, 623<br>624, 627<br>629, 630<br>631, 634<br>635   |  | Diode, 1S1555V   |
| D603<br>D604<br>D605<br>D606, 607<br>D625<br>D626<br>D628<br>D632<br>D633  |  | Diode, TL0108, LED<br>Diode, TLR124, LED<br>Diode, TLG 124A, LED<br>Diode, TLY108, LED<br>Termister, D33A<br>Diode, 02Z6.8A<br>Diode, S5277B<br>Diode, TLG205, LED<br>Diode, TLY205, LED   |
| D701   |  | Diode, S4424, LED Meter  |
| △ D901<br>△ D902<br>△ D903<br>D904, 905<br>D906<br>D907, 908   | 22115485   | Diode, 1B2Z1<br>Diode, 1B2C1<br>Diode, WL02M<br>Diode, 05Z13L<br>Diode, 05Z10-U<br>Diode, 1S1553V  |
| <b>ELECTRICAL PARTS</b>  |  |  |
| △ L1<br>L401, 402<br>△ T901<br>△<br>△<br>S1<br>S2<br>S3<br>S4 ~ 9<br>S10<br>S11<br>S12<br>△ S901<br>△ S902<br>J1<br>J2<br>J3<br>J4 | 22147224<br>22232207<br>22223866<br>22223867<br>22223868<br>22195553<br>22195624<br>22195566<br>22195623<br>22195626<br>22195199<br>22195603<br>22195686<br>22146186<br>22163759<br>22163675<br>22167893<br>22163777 | Coil, Solenoid<br>Coil, 2.2mH<br>Transformer, Power (Γ E)<br>Transformer, Power (Γ U, AY)<br>Transformer, Power (V F)<br>Switch, Slide, Tape Selector<br>Switch, Rotary, Dolby<br>Switch, Slide Timer<br>Switch, Key, Mechanism<br>Remote Wire 4P, (S1)<br>Switch, Leaf Erasure Prevention<br>Switch, Leaf, Motor<br>Switch, Power<br>Switch, Voltage Selector (VF)<br>Jack, US-4P<br>Jack, 6.5φ-2P Microphone<br>Socket, DIN-7P<br>Jack, 6φ Headphone |

| Symbol No.  | Part. No. | Description                   |
|---|-----------|-------------------------------|
| Z401, 402<br>405, 406                               | 22153116  | Filter, DOLBY BL              |
| Z403, 404   | 22153117  | Filter, DOLBY BK              |
| Z601  | 22120053  | MPE, DM101A                   |
| Z602  | 22132530  | Bias Oscillator Unit          |
| PL1   | 22113508  | Lamp, 14V, 70mA Meter Plate   |
| PL2   | 22113509  | Lamp, 12V 40mA Mechanism      |
| △ F901  | 22144357  | Fuse, T1.25A/250V (TE,TU,AY)  |
| △ F902, 903   | 22144408  | Fuse, T500mA/250V(TE,TU,AY)   |
| △ E1  | 22176286  | Cord, Power, E2ES (TE)        |
| △   | 22176536  | Cord, Power, BS (TU)          |
| △   | 22176125  | Cord, Power, EP (VF)          |
| △   | 22176588  | Cord, Power, A2SA-7A (AY)     |
| △ E2  | 22165078  | Holder, Fuse, 4P (TE, TU, AY) |
| <b>CAPACITORS</b>                                   |           |                               |
| D = ±0.5 pF, J = ±5%, K=±10%, M=±20%, Z = -20 +80%  |           |                               |
| ABBREVIATIONS: CD = Ceramic Disk, EL = Electrolytic |           |                               |
| MY = Mylar, PS = Polystyrene BL = Barrier Layer     |           |                               |
| C401, 402   | 22349102  | CD, 1000 pF, 50V K            |
| C403, 404   | 22488339  | EL, 3.3mfd, 50V               |
| C405, 406   | 22488339  | EL, 3.3mfd, 50V               |
| C407, 408   | 22361509  | CD, 5pF, 50V, D               |
| C409, 410   | 22362180  | CD, 18pF, 50V, K              |
| C411, 412   | 22349151  | CD, 150pF, 50V, K             |
| C413, 414   | 22349331  | CD, 330pF, 50V, K             |
| C415, 416   | 22362180  | CD, 18pF, 50V, K              |
| C417, 418   | 22488479  | EL, 4.7mfd, 50V               |
| C419, 420   | 22483101  | EL, 100mfd, 10V               |
| C421, 422   | 22371153  | MY, 0.015mfd, 50V, J          |
| C423, 424   | 22349331  | CD, 330pF, 50V, K             |
| C425, 426   | 22483470  | EL, 47mfd, 10V                |
| C427, 428   | 22483101  | EL, 100mfd, 10V               |
| C429, 430   | 22483101  | EL, 100mfd, 10V               |
| C431, 432   | 22349151  | CD, 150pF, 50V, K             |
| C433, 434   | 22349151  | CD, 150pF, 50V, K             |
| C435, 436   | 22488100  | EL, 10mfd, 50V                |
| C437, 438   | 22371472  | MY, 4700pF, 50V, J            |
| C439, 440   | 22371562  | MY, 5600pF, 50V, J            |
| C441, 442   | 22371273  | MY, 0.027mfd, 50V, J          |
| C443, 444   | 22349331  | CD, 330pF, 50V K              |
| C445, 446   | 22371472  | MY, 4700pF, 50V, K            |

| Symbol No. | Part. No. | Description          |
|------------|-----------|----------------------|
| C447, 448  | 22483221  | EL, 220mfd, 10V      |
| C449, 450  | 22480006  | EL, 0.33mfd, 50V     |
| C451, 452  | 22480003  | EL, 0.1mfd, 50V      |
| C453, 454  | 22488100  | EL, 10mfd, 50V       |
| C455, 456  | 22372473  | MY, 0.047mfd, 50V, K |
| C457, 458  | 22483221  | EL, 220mfd, 10V      |
| C459, 460  | 22349102  | CD, 1000pF, 50V, Z   |
| C461, 462  | 22488479  | EL, 4.7mfd, 50V      |
| C463, 464  | 22488479  | EL, 4.7mfd, 50V      |
| C465, 466  | 22480004  | EL, 0.15mfd, 50V     |
| C467, 468  | 22360330  | BL, 0.033mfd, 25V, M |
| C469, 470  | 22360327  | BL, 0.01mfd, 25V, M  |
| C471, 472  | 22360328  | BL, 0.015mfd, 50V, M |
| C473, 474  | 22371223  | MY, 0.022mfd, 50V, J |
| C475, 476  | 22488339  | EL, 3.3 mfd, 50V     |
| C477, 478  | 22485330  | EL, 33mfd, 16V       |
| C479, 480  | 22488339  | EL, 3.3mfd, 50V      |
| C481, 482  | 22349332  | CD, 3300pF, 50V, K   |
| C483, 484  | 22488339  | EL, 3.3mfd, 50V      |
| C485, 486  | 22488100  | EL, 10mfd, 50V       |
| C601       | 22485220  | EL, 22mfd, 16V       |
| C602       | 22485330  | EL, 33mfd, 16V       |
| C603       | 22485101  | EL, 100mfd, 16V      |
| C604       | 22483101  | EL, 100mfd, 10V      |
| C605       | 22488100  | EL, 10mfd, 50V       |
| C606       | 22488109  | EL, 1mfd, 50V        |
| C607       | 22488109  | EL, 1mfd, 50V        |
| C608       | 22349102  | CD, 1000pF, 50V, Z   |
| C609       | 22349102  | CD, 1000pF, 50V, Z   |
| C610       | 22349102  | CD, 1000pF, 50V, Z   |
| C612       | 22342103  | CD, 0.01mfd, 50V, Z  |
| C613       | 22485220  | EL, 22mfd, 16V       |
| C614       | 22488100  | EL, 10mfd, 50V       |
| C615       | 22488339  | EL, 3.3mfd, 50V      |
| C616       | 22360484  | CD, 0.047mfd, 50V, Z |
| C618       | 22483101  | EL, 100mfd, 10V      |
| C619       | 22488229  | EL, 2.2mfd, 50V      |
| C620       | 22360484  | CD, 0.047mfd, 50V, Z |
| C621       | 22488339  | EL, 3.3mfd, 50V      |
| C622       | 22483101  | EL, 100mfd, 10V      |
| C623       | 22485330  | EL, 33mfd, 16V       |
| C624       | 22488479  | EL, 4.7mfd, 50V      |
| △ C625     | 22486101  | EL, 100mfd, 25V      |
| C626       | 22488100  | EL, 10mfd, 50V       |
| C627       | 22483101  | EL, 100mfd, 10V      |
| C628       | 22342103  | CD, 0.01mfd, 50V, Z  |
| C629       | 22488109  | EL, 1mfd, 50V        |
| C630       | 22485330  | EL, 33mfd, 16V       |
| C631       | 22485101  | EL, 100mfd, 16V      |
| C632       | 22380101  | PS, 3900pF, 200V, K  |
| C635       | 22485330  | EL, 33mfd, 16V       |
| C636       | 22488109  | EL, 1mfd, 50V        |

| Symbol No.   | Part. No. | Description                     |
|--|-----------|---------------------------------|
| C638   | 22488100  | EL, 10mfd, 50V                  |
| C639   | 22485330  | EL, 33mfd, 16V                  |
| C640   | 22349221  | CD, 220pF, 50V, K               |
| C641   | 22485330  | EL, 33mfd, 16V                  |
| C642   | 22485330  | EL, 33mfd, 16V                  |
| C701   | 22483331  | EL, 330mfd, 10V                 |
| △ C901   | 22340147  | CD, 0.01mfd, 400V               |
| △ C902   | 22486222  | EL, 2200mfd, 25V                |
| △ C903   | 22486102  | EL, 1000mfd, 25V                |
| C904   | 22485221  | EL, 220mfd, 16V                 |
| C905   | 22485471  | EL, 470mfd, 16V                 |
| △ C906   | 22486102  | EL, 1000mfd, 25V                |
| C907   | 22485221  | EL, 220mfd, 16V                 |
| C908   | 22485471  | EL, 470mfd, 16V                 |
| C909   | 22485221  | EL, 220mfd, 16V                 |
| C910   | 22485471  | EL, 470mfd, 16V                 |
| △ C911   | 22488479  | EL, 4.7mfd, 50V                 |
| <b>RESISTORS</b>   |           |                                 |
| All resistors are carbon film 1/4W, ±5%, unless otherwise noted. |           |                                 |
| K = 1000. M = 1000000  |           |                                 |
| R401, 402  | 22545333  | 33K ohm                         |
| R403, 404  | 22555104  | 100K ohm                        |
| R405, 406  | 22555222  | 2.2K ohm                        |
| R407, 408  | 22555104  | 100K ohm                        |
| R409, 410  | 22545102  | 1K ohm                          |
| R411, 412  | 22545471  | 470 ohm                         |
| R413, 414  | 22555473  | 47K ohm                         |
| R415   | 22655425  | 50K ohm, A, Variable, Rec Level |
| R417, 418  | 22555104  | 100K ohm                        |
| R419, 420  | 22555473  | 47K ohm                         |
| R421, 422  | 22545472  | 4.7K ohm                        |
| R423, 424  | 22555104  | 100K ohm                        |
| R425, 426  | 22545154  | 150K ohm                        |
| R427, 428  | 22658501  | 500 ohm, Semi-fixed Variable    |
| R429, 430  | 22555224  | 220K ohm                        |
| R431, 432  | 22555682  | 6.8K ohm                        |
| R433, 434  | 22555470  | 47 ohm                          |
| R435, 436  | 22555222  | 2.2K ohm                        |
| R437, 438  | 22555392  | 3.9K ohm                        |
| R441, 442  | 22555332  | 3.3K ohm                        |
| R443, 444  | 22555123  | 12K ohm                         |
| R445, 446  | 22545106  | 10M ohm                         |
| E447, 448  | 22545392  | 3.9K ohm                        |
| R449, 450  | 22545392  | 3.9K ohm                        |

| Symbol No. | Part. No. | Description                      |
|------------|-----------|----------------------------------|
| R451, 452  | 22658470  | 200K ohm, B, Semi-fixed Variable |
| R453, 454  | 22545106  | 10M ohm                          |
| R455, 456  | 22545106  | 10M ohm                          |
| R457, 458  | 22555102  | 1K ohm                           |
| R459, 460  | 22555104  | 100K ohm                         |
| R461, 462  | 22555473  | 47K ohm                          |
| R463, 464  | 22555332  | 3.3K ohm                         |
| R465, 466  | 22555105  | 1M ohm                           |
| R467, 468  | 22555101  | 100 ohm                          |
| R469, 470  | 22545106  | 10M ohm                          |
| R471, 472  | 22545271  | 270 ohm                          |
| R473, 474  | 22555274  | 270K ohm                         |
| R475, 476  | 22555224  | 220K ohm                         |
| R477, 478  | 22545271  | 270 ohm                          |
| R479, 480  | 22555103  | 10K ohm                          |
| R481, 482  | 22545106  | 10M ohm                          |
| R483, 484  | 22555103  | 10K ohm                          |
| R485, 486  | 22545106  | 10M ohm                          |
| R487, 488  | 22555123  | 12K ohm                          |
| R489, 490  | 22545183  | 18K ohm                          |
| R491, 492  | 22545473  | 47K ohm                          |
| R493, 494  | 22545273  | 27K ohm                          |
| R495, 496  | 22555272  | 2.7K ohm                         |
| R497, 498  | 22555103  | 10K ohm                          |
| R499, 500  | 22555472  | 4.7K ohm                         |
| R501, 502  | 22555104  | 100K ohm                         |
| R503, 504  | 22555470  | 47 ohm                           |
| R505, 506  | 22545471  | 470 ohm                          |
| R507, 508  | 22555222  | 2.2K ohm                         |
| R509, 510  | 22555472  | 4.7K ohm                         |
| R511, 512  | 22658464  | 50K ohm, Semi-fixed Variable     |
| R513, 514  | 22545102  | 1K ohm                           |
| R515, 516  | 22555104  | 100K ohm                         |
| R517, 518  | 22555332  | 3.3K ohm                         |
| R519, 520  | 22555123  | 12K ohm                          |
| R521, 522  | 22545471  | 470 ohm                          |
| R523, 524  | 22545471  | 470 ohm                          |
| R525, 526  | 22658464  | 50K ohm, Semi-fixed Variable     |
| R527, 528  | 22555103  | 10K ohm                          |
| R529, 530  | 22555152  | 1.5K ohm                         |
| R531, 532  | 22555103  | 10K ohm                          |
| R601       | 22545221  | 220 ohm                          |
| R602       | 22555562  | 5.6K ohm                         |
| R603       | 22555224  | 220K ohm                         |
| R604       | 22545333  | 33K ohm                          |
| R605       | 22545103  | 10K ohm                          |
| R606       | 22545472  | 4.7K ohm                         |
| R607       | 22555333  | 33K ohm                          |
| R608       | 22545472  | 4.7K ohm                         |



| Symbol No. | Part No. | Description                  |
|------------|----------|------------------------------|
| R609       | 22545473 | 47K ohm                      |
| R610       | 22555683 | 68K ohm                      |
| R611       | 22555223 | 22K ohm                      |
| R612       | 22555103 | 10K ohm                      |
| R613       | 22555104 | 100K ohm                     |
| R614       | 22555222 | 2.2K ohm                     |
| R615       | 22555103 | 10K ohm                      |
| R616       | 22555104 | 100K ohm                     |
| R617       | 22555103 | 10K ohm                      |
| R618       | 22555222 | 2.2K ohm                     |
| R619       | 22555103 | 10K ohm                      |
| R620       | 22545154 | 150K ohm                     |
| R621       | 22545473 | 47K ohm                      |
| R622       | 22555333 | 33K ohm                      |
| R623       | 22555104 | 100K ohm                     |
| R624       | 22555333 | 33K ohm                      |
| R625       | 22555104 | 100K ohm                     |
| R626       | 22555472 | 4.7K ohm                     |
| R627       | 22555472 | 4.7K ohm                     |
| R628       | 22555153 | 15K ohm                      |
| R629       | 22555103 | 10K ohm                      |
| R630       | 22555104 | 100K ohm                     |
| R631       | 22555223 | 22K ohm                      |
| R632       | 22555222 | 2.2K ohm                     |
| R633       | 22555473 | 47K ohm                      |
| R634       | 22555333 | 33K ohm                      |
| R635       | 22545472 | 4.7K ohm                     |
| R636       | 22555222 | 2.2K ohm                     |
| R637       | 22555104 | 100K ohm                     |
| R638       | 22545333 | 33K ohm                      |
| R639       | 22555333 | 33K ohm                      |
| R640       | 22555104 | 100K ohm                     |
| R641       | 22555472 | 4.7K ohm                     |
| R642       | 22555333 | 33K ohm                      |
| R643       | 22555104 | 100K ohm                     |
| R644       | 22545472 | 4.7K ohm                     |
| R645       | 22555473 | 47K ohm                      |
| R646       | 22555473 | 47K ohm                      |
| R647       | 22555101 | 100 ohm                      |
| R648       | 22555121 | 120 ohm                      |
| R649       | 22545121 | 120 ohm                      |
| R650       | 22555121 | 120 ohm                      |
| R651       | 22545121 | 120 ohm                      |
| R652       | 22545121 | 120 ohm                      |
| R653       | 22545223 | 22K ohm                      |
| R654       | 22555104 | 100K ohm                     |
| R655       | 22570300 | 27 ohm, 2W, Metal film       |
| R656       | 22555391 | 390 ohm                      |
| R657       | 22555470 | 47 ohm                       |
| R658       | 22658491 | 300 ohm, Semi-fixed Variable |
| R659       | 22555122 | 1.2K ohm                     |
| R660       | 22555102 | 1K ohm                       |
| R661       | 22555102 | 1K ohm                       |
| R662       | 22545332 | 3.3K ohm                     |

| Symbol No. | Part No. | Description                      |
|------------|----------|----------------------------------|
| R663       | 22555103 | 10K ohm                          |
| R664       | 22545102 | 1K ohm                           |
| R665       | 22555103 | 10K ohm                          |
| R666       | 22555103 | 10K ohm                          |
| R667       | 22555103 | 10K ohm                          |
| R668       | 22555103 | 10K ohm                          |
| R669       | 22545223 | 22K ohm                          |
| R671       | 22545102 | 1K ohm                           |
| R672       | 22545103 | 10K ohm                          |
| R673       | 22555102 | 1K ohm                           |
| R674       | 22555102 | 1K ohm                           |
| R675       | 22570547 | 10 ohm, 3.15W, Metal Oxided Film |
| R676       | 22545102 | 1K ohm                           |
| R677       | 22545560 | 56 ohm                           |
| R678       | 22555105 | 1M ohm                           |
| R679       | 22555224 | 220K ohm                         |
| R680       | 22555224 | 220K ohm                         |
| R681       | 22545102 | 1K ohm                           |
| R682       | 22555154 | 150K ohm                         |
| R683       | 22555224 | 220K ohm                         |
| R684       | 22555102 | 1K ohm                           |
| R685       | 22555473 | 47K ohm                          |
| R686       | 22555224 | 220K ohm                         |
| R687       | 22555223 | 22K ohm                          |
| R688       | 22545472 | 4.7K ohm                         |
| R689       | 22545223 | 22K ohm                          |
| R690       | 22555333 | 33K ohm                          |
| R691       | 22555103 | 10K ohm                          |
| R692       | 22555103 | 10K ohm                          |
| R693       | 22555104 | 100K ohm                         |
| R694       | 22547331 | 330 ohm, ½W                      |
| R695       | 22547391 | 390 ohm, ½W                      |
| R696       | 22570305 | 68 ohm, 2W, Metal Oxided Film    |
| R697       | 22545472 | 4.7K ohm                         |
| R698       | 22555104 | 100K ohm                         |
| R699       | 22555224 | 220K ohm                         |
| R701, 702  | 22555104 | 100K ohm                         |
| R703, 704  | 22555273 | 27K ohm                          |
| R705, 706  | 22555103 | 10K ohm                          |
| R707, 708  | 22555681 | 680 ohm                          |
| R709, 710  | 22555821 | 820 ohm                          |
| 711, 712   |          |                                  |
| 713, 714   |          |                                  |
| 715, 716   |          |                                  |
| 717, 718   |          |                                  |
| 719, 720   |          |                                  |
| 721, 722   |          |                                  |
| 723, 724   |          |                                  |
| R725, 726  | 22555681 | 680 ohm                          |
| 727, 728   |          |                                  |
| 729, 730   |          |                                  |
| 731, 732   |          |                                  |

| Symbol No.         | Part No. | Description                 |
|--------------------|----------|-----------------------------|
| R733, 734          | 22555821 | 820 ohm                     |
| R901               | 22547331 | 330 ohm, ½W                 |
| R902               | 22545560 | 56 ohm                      |
| R903               | 22547471 | 330 ohm, ½W                 |
| R904               | 22555560 | 56 ohm                      |
| R905               | 22547181 | 180 ohm, ½W                 |
| R906               | 22555560 | 56 ohm                      |
| R907               | 22555102 | 1K ohm                      |
| <b>ACCESSORIES</b> |          |                             |
|                    | 22164775 | Cord, Joint                 |
|                    | 22164314 | Plug, AC Adapter (VF)       |
|                    | 22990756 | Cleener, Head               |
|                    | 22902792 | Owner's Manual (TE, TU, AY) |
|                    | 22902811 | Owner's Manual (VF)         |

**TOSHIBA CORPORATION**

2-1, GINZA 5-CHOME, CHUO-KU, TOKYO 104, JAPAN