

TEAC®



SERVICE MANUAL

V-9

Stereo Cassette Deck

1 SPECIFICATIONS AND SERVICE DATA

SPECIFICATIONS

Track System 4-track, 2-channel stereo

2 Heads Erase, record /playback

Type of Tape Cassette tape, C-60 and C-90 (Phillips type)

Tape Speed 4.8 cm/s (1-7/8 ips)

Input (Level and impedance)

MIC: Specified input level; -57 dB (1.09 mV)/10 kohms
Min. input level; -67 dB (346 μ V)

LINE IN: Specified input level; -9 dB (275 mV)/50 kohms
Min. input level; -19 dB (86.9 mV)

DIN*: Min. input level; -45 dB (4.36 mV)
*Pursuant to DIN standards (Europe model only)

Output (level and load impedance)

OUTPUT: Spec. output level; -5 dB (436 mV)/50 kohms

PHONES: Spec. output level; -18 dB (97.5 mV)/8 ohms

Equalization

METAL: 3180 μ s + 70 μ s

Co (CrO₂): 3180 μ s + 70 μ s

NORMAL: 3180 μ s + 120 μ s

Head Configuration

1/2-track, 1-channel erase head

1/4-track, 2-channel record/playback head

3 Motors 1 DC servo motor (for capstan drive)

1 DC motor (for reel drive)

1 DC motor (for mechanism control)

Bias Frequency 100 kHz $\pm$ 5 kHz

Operation Position Horizontal

Power Requirements

100/120/220/240V AC, 50/60 Hz, 30W (General Export Model)

120V AC, 60 Hz, 30W (U.S.A./Canada)

220V AC, 50 Hz, 30W (Europe)

240V AC, 50 Hz, 30W (U.K./Australia)

Weight 5.5 kg (12-2/16 lbs.) net

Dimensions See Fig. 2-2

SERVICE DATA

MECHANICAL

Tape Speed Deviation 3,000 Hz $\pm$ 70 Hz

Tape Speed Drift 70 Hz

Wow and Flutter

Playback: 0.06% (WRMS)

Record/Playback: 0.25% (RMS)

Pinch Roller Pressure 400 g to 490 g (14.1 oz to 17.3 oz)

Reel Torque

Take-up: 50 to 65 g-cm (0.69 to 0.90 oz-inch)

Supply: 1.5 to 3 g-cm (0.021 to 0.042 oz-inch)

F.F.: More than 55 g-cm (0.76 oz-inch)

REW: 80 to 150 g-cm (1.1 to 2.1 oz-inch)

Fast Wind Time

85 sec. or less for MTT-501 (C-60)

Auto End-stop Time 3 sec. or less

TIMER activate Time 3 sec. or less

ELECTRICAL

Frequency Response

See Figs. 5-6 to 5-8.

Signal-to-noise Ratio

Playback **NORMAL:** 46 dB min.

Record/Playback

METAL, Co (CrO₂): 45 dB min.

NORMAL: 44 dB min.

S/N is improved by 5 dB at 1 kHz and 10 dB above 5 kHz when Dolby NR** is used.

Erase Efficiency 65 dB min. at 1 kHz (measured with input 10 dB higher than the specified input level).

Channel Separation 30 dB min. at 1 kHz

Adjacent Track Crosstalk 40 dB min. at 125 Hz

Total Harmonic Distortion 2.2% or less with METAL/Co(CrO₂)
2.0% or less with NORMAL

NOTES:

- Improvements may result in SPECIFICATIONS AND SERVICE DATA changes.
- Value of "dB" in the data refers to 0 dB (0.775 V), except where specified.

CAUTION

⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components — refer to the appropriate parts list and ensure exact replacement.

** Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
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2 CASE AND FRONT PANEL REMOVAL

Disassemble in number-order

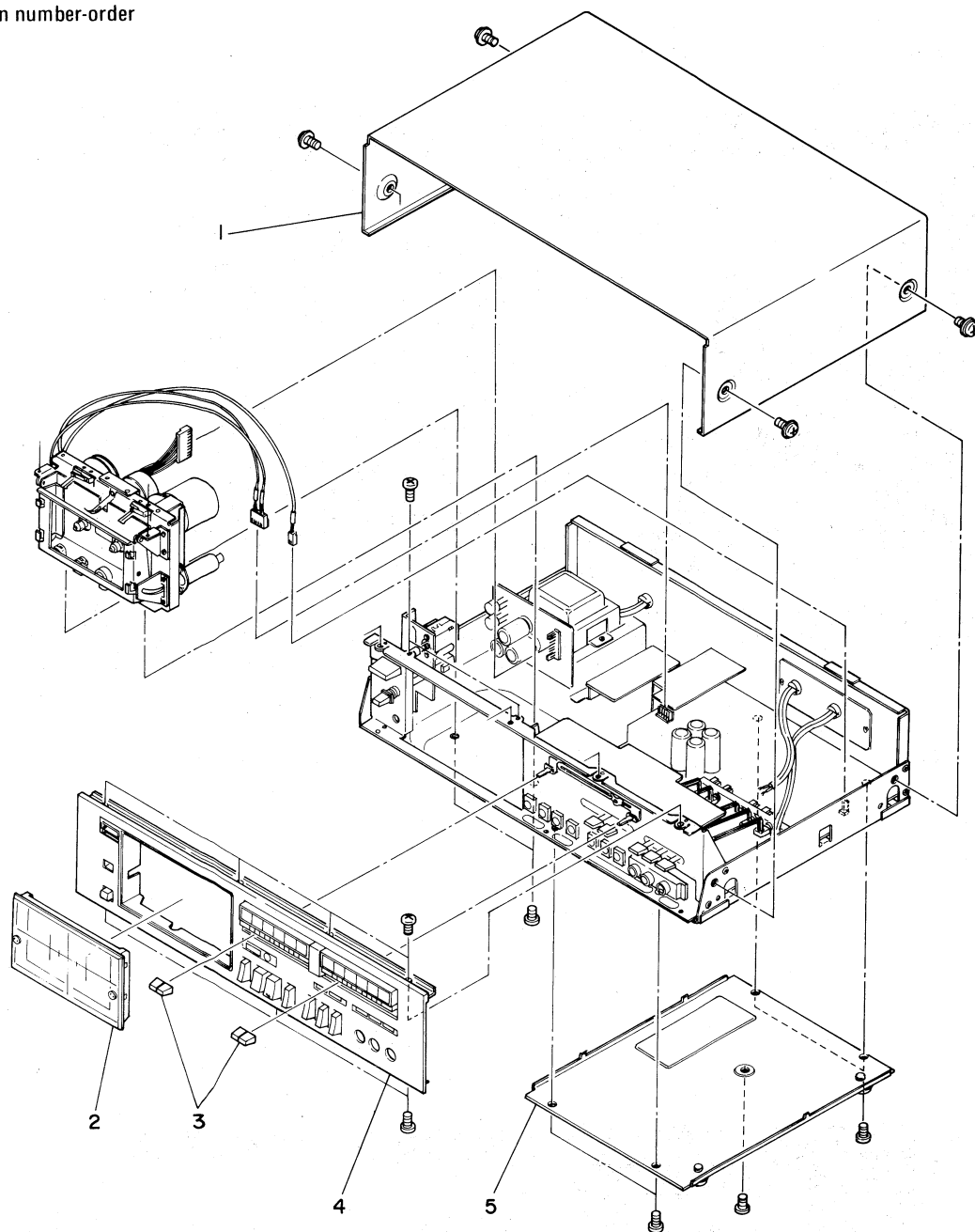


Fig. 2-1

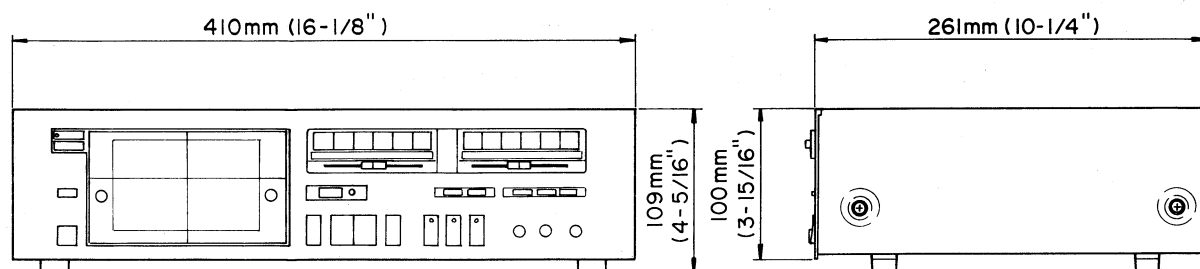
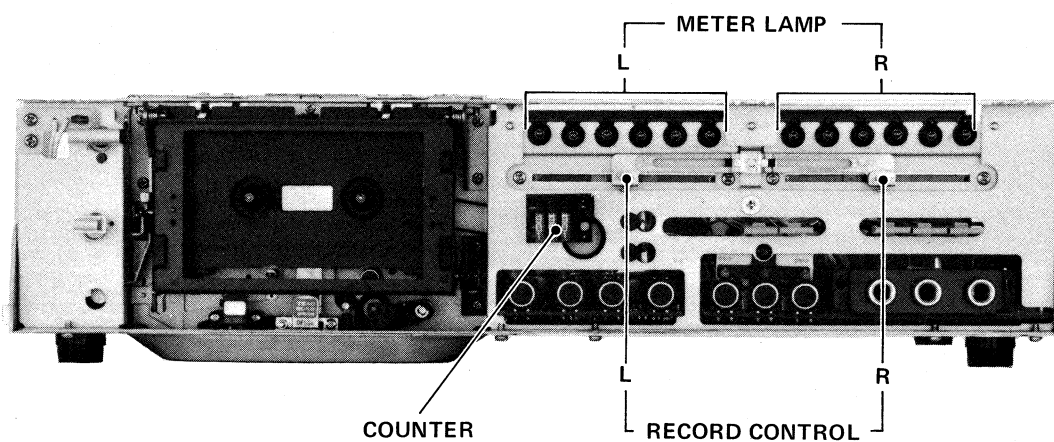
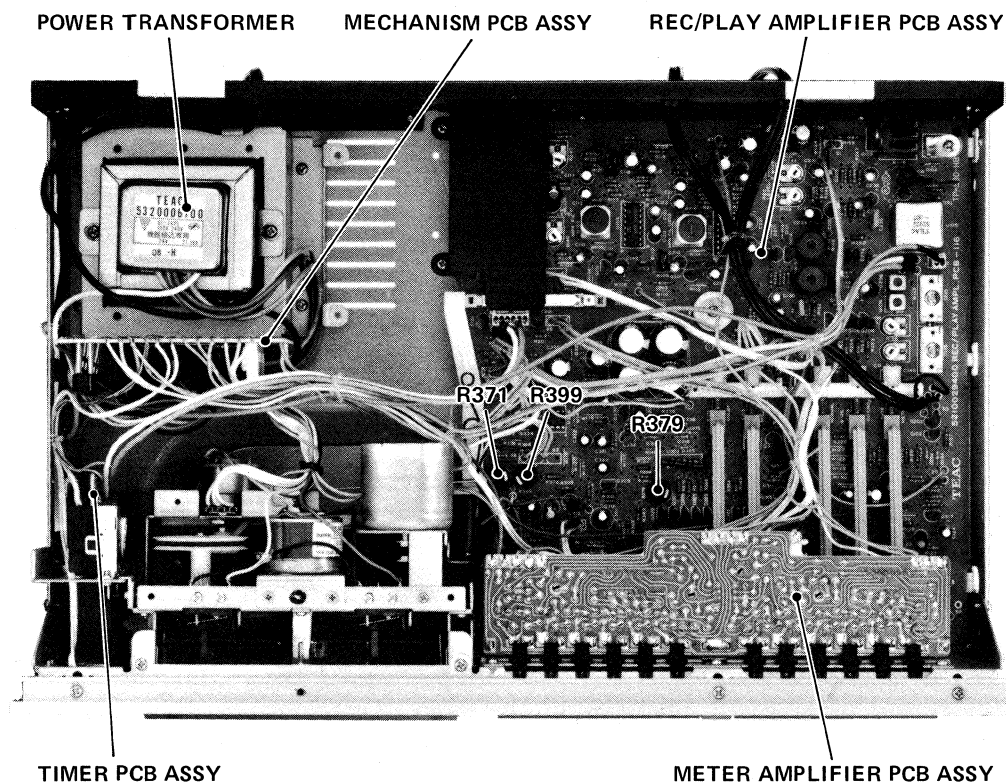
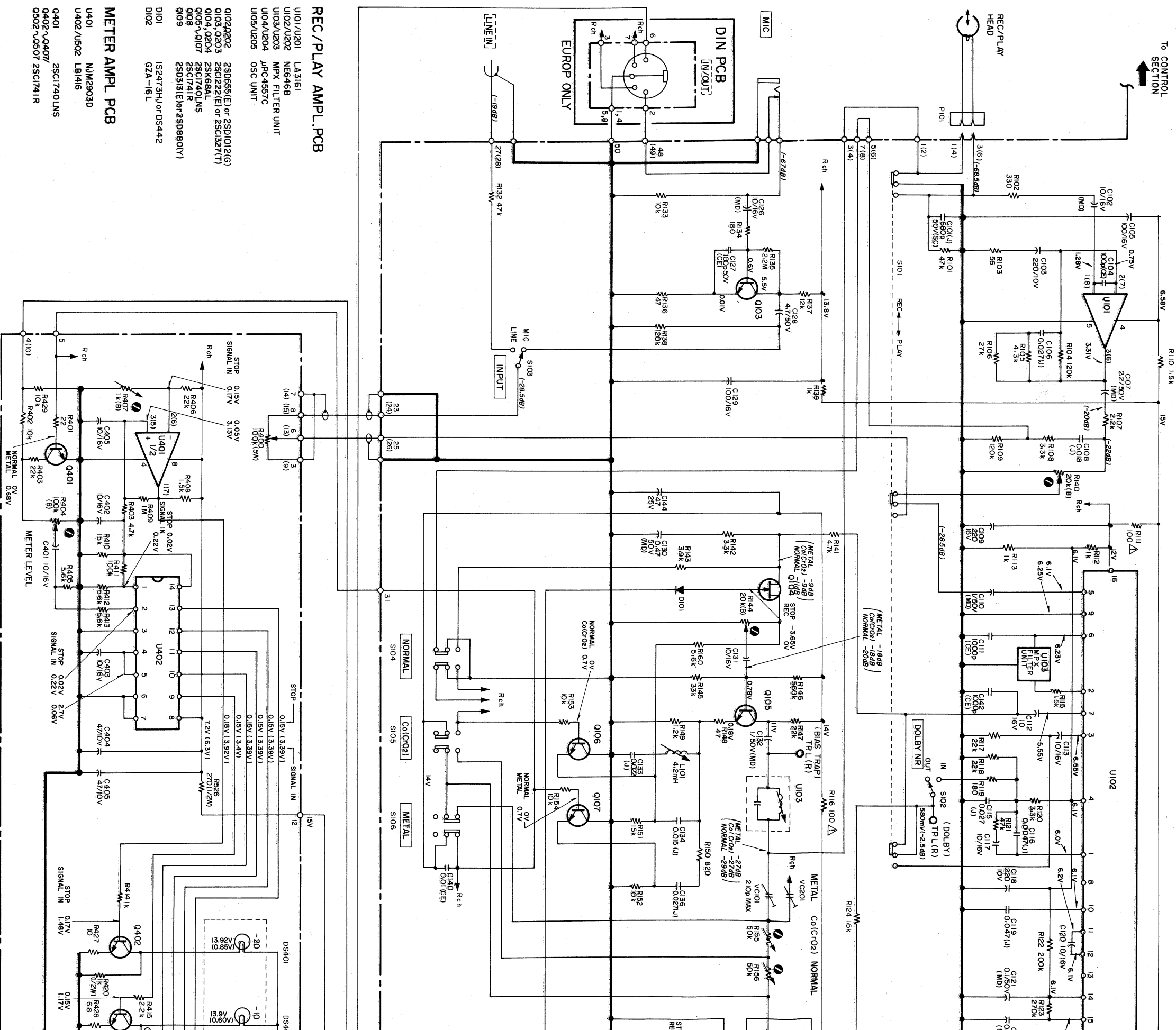


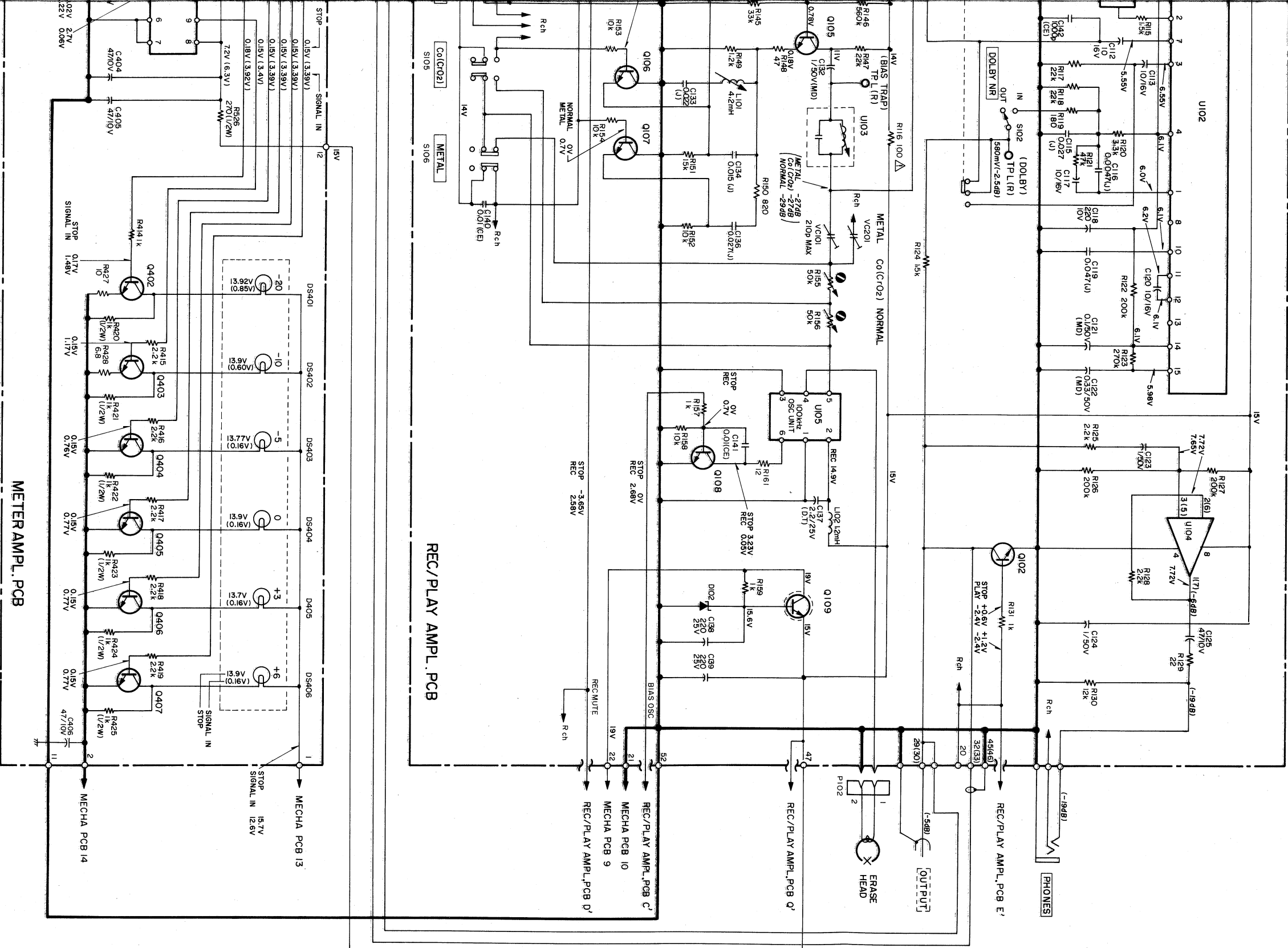
Fig. 2-2 Dimensions

3 PARTS LOCATION





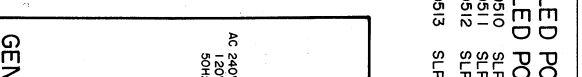
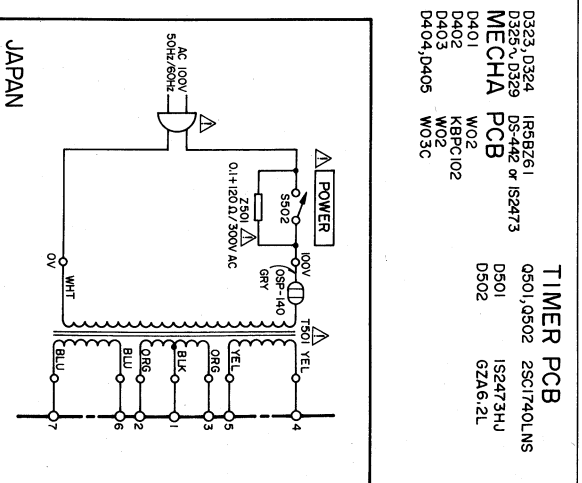
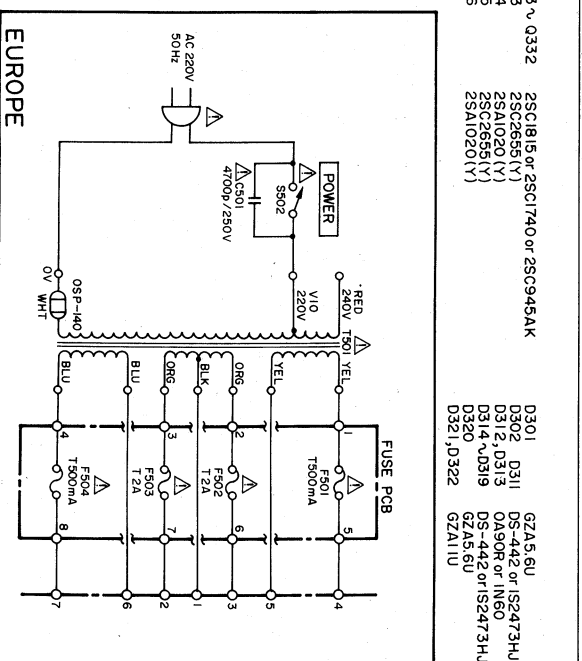
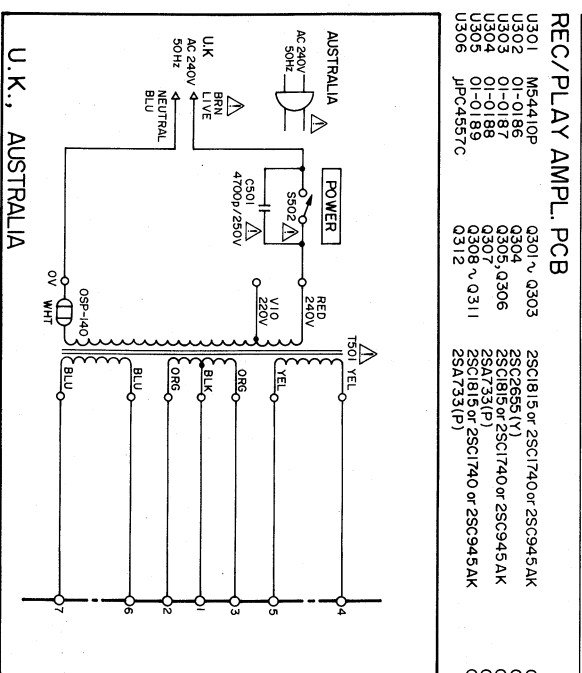
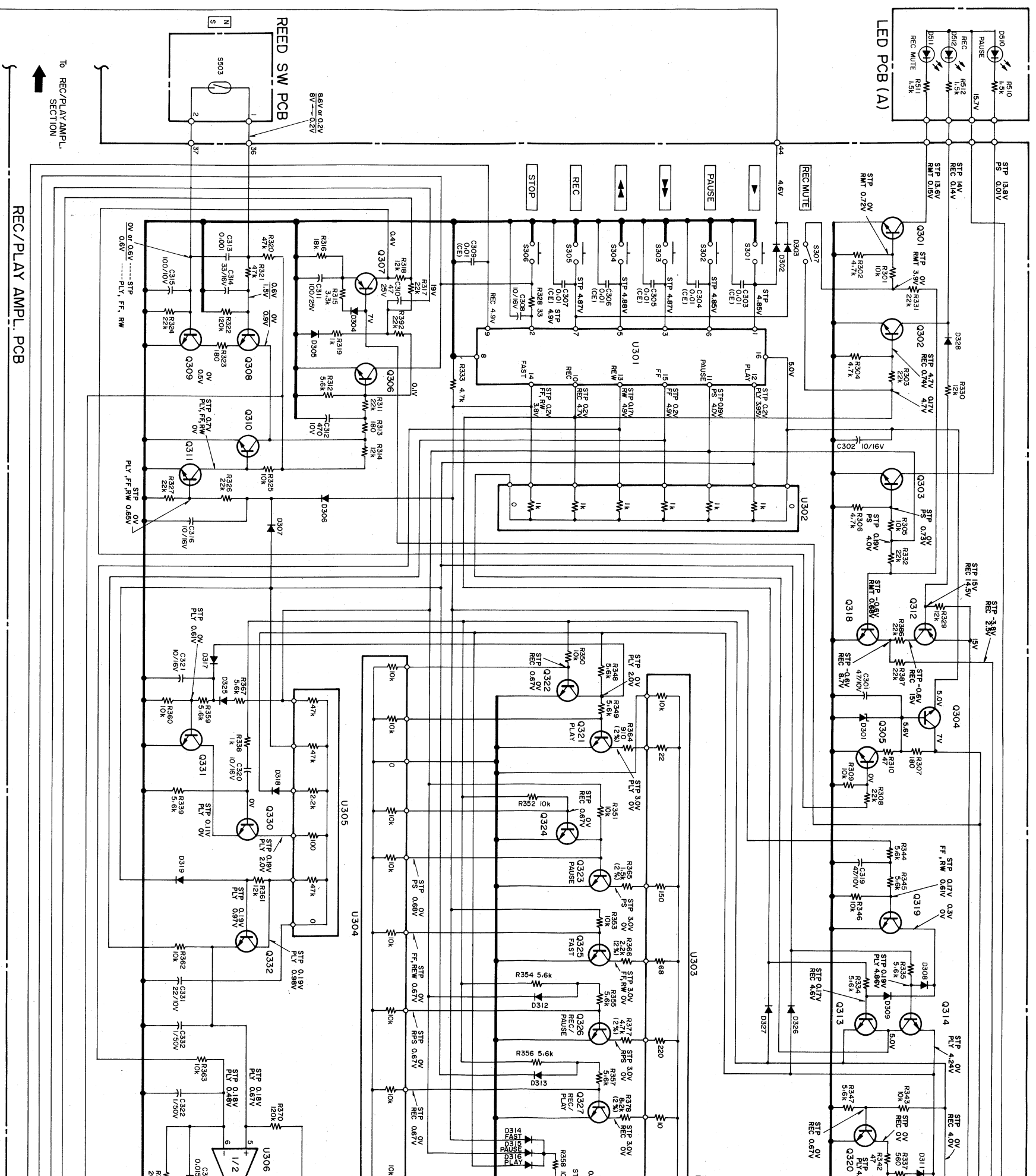
- ## NOTES
1. Schematic diagram shown for left channel unless otherwise noted. Numbers in parenthesis indicate right channel terminals.
 2. All resistors are $\frac{1}{4}$ W, $\pm 5\%$, unless otherwise noted. Resistor values are in ohms ($k=1,000$ ohms, $M=1,000,000$ ohms).
 3. Capacitor values are in microfarads ($p=pico$ farads).
 - (MD) : Electrolytic capacitor MD series
 - (CE) : Ceramic
 - (SC) : Polystyrene
 - (DT) : Dipped Tantalum
- All non-polarized capacitors are $\pm 5\%$ Mylar unless otherwise noted.



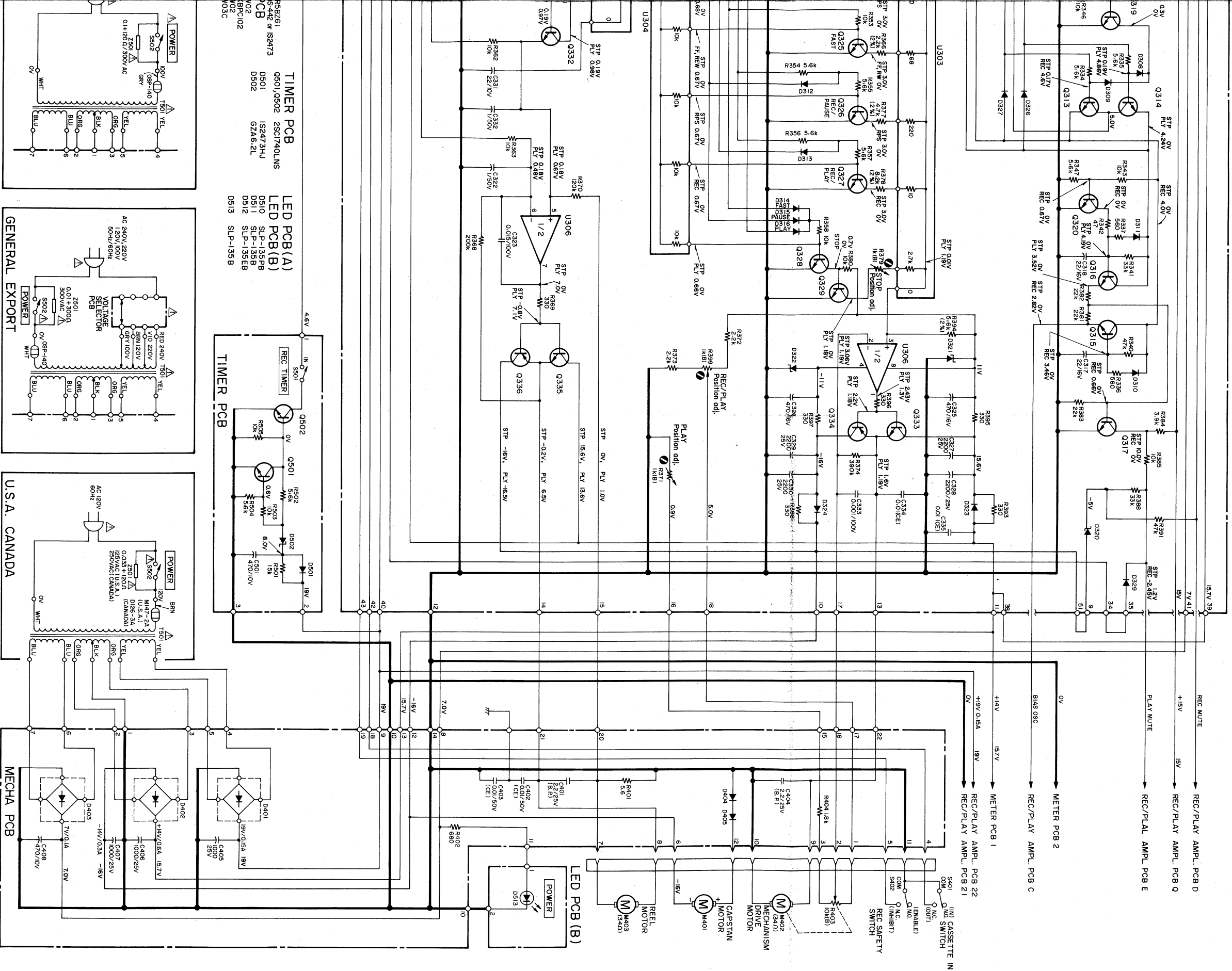
Schematic diagram shown for left channel unless otherwise noted.
Numbers in parenthesis indicate right channel terminals.
Resistors are $\frac{1}{2}$ W, $\pm 5\%$, unless otherwise noted.
Capacitor values are in ohms ($k=1,000$ ohms, $M=1,000,000$ ohms).

Capacitor values are in microfarads (μ =picofarads).
: Electrolytic capacitor MD series
: Ceramic
: Polystyrene
: Dipped Tantalum
Non-polarized capacitors are $\pm 5\%$ Mylar unless otherwise noted.

- Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.
- Voltage and level values are for reference only.
- 0 dB=0.775V
- Front panel indication
- Rear panel indication
- +B power supply circuit



- ## NOTES
1. All resistors are $\frac{1}{2}$ watt, $\pm 5\%$, unless otherwise noted. Resistor values are in ohms ($k=1,000$ ohms).
 2. All capacitor values are in microfarads.
(CE): Ceramic
(B.P.): Bipolar
 3. Each voltage value shown above is the one measured in
All non-polarized capacitors are $\pm 5\%$ Mylar unless
unless specified as follows.
- PLAY: PS: PAUSE
REC: RECORD RPS: REC PAUSE RMT :
FF: FAST FORWARD RW: REWIND



- ```

:RESISTORS ARE 1/4 WATT, ±5%, UNLESS OTHERWISE NOTED.
:CAPACITOR VALUES ARE IN OHMS (K=1,000 OHMS).
:CAPACITOR VALUES ARE IN MICROFARADS.
: Ceramic
:): Bipolar
: Non-polarized capacitors are ±5% Mylar unless otherwise noted.
: The voltage value shown above is the one measured in STOP position.
: as specified as follows.
: PLAY PS: PAUSE
: RECORD PRS: REC PAUSE RMT: REC MUTE
: FAST FORWARD RW: REWIND

```

4. 1 Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.
5.  : Front panel indication
6.  : +B power supply circuit
7.  : -B power supply circuit



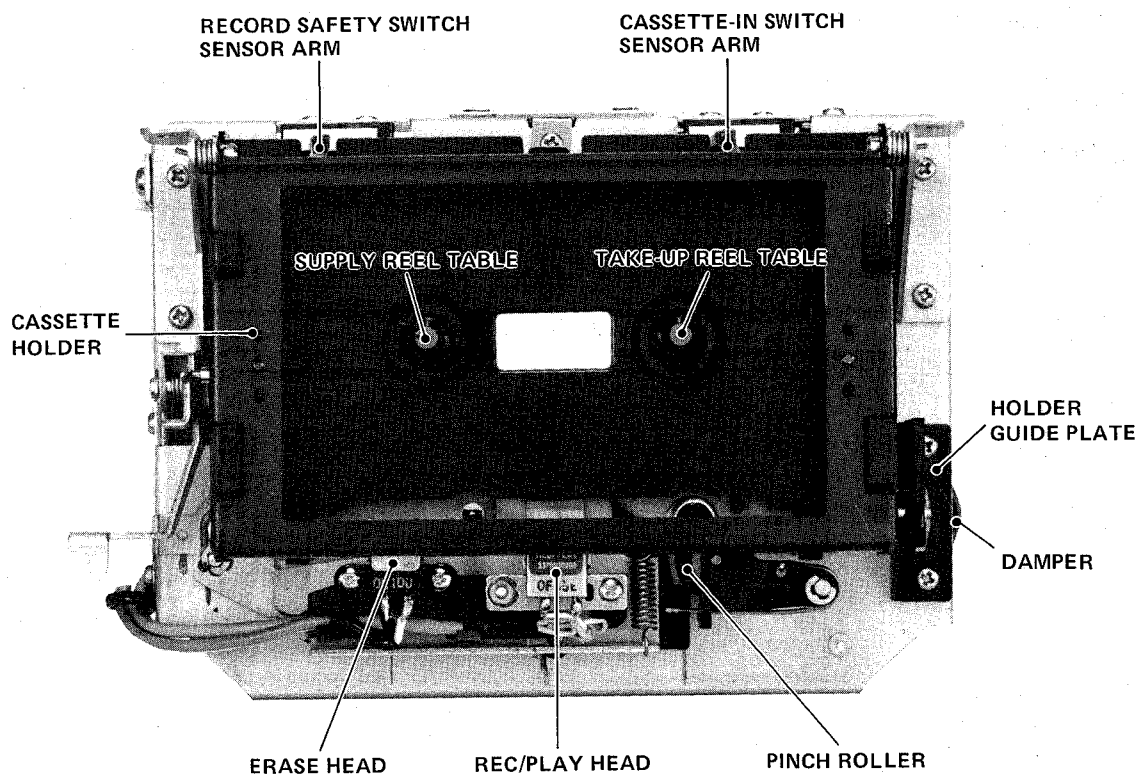


Fig. 3-3 Transport front view

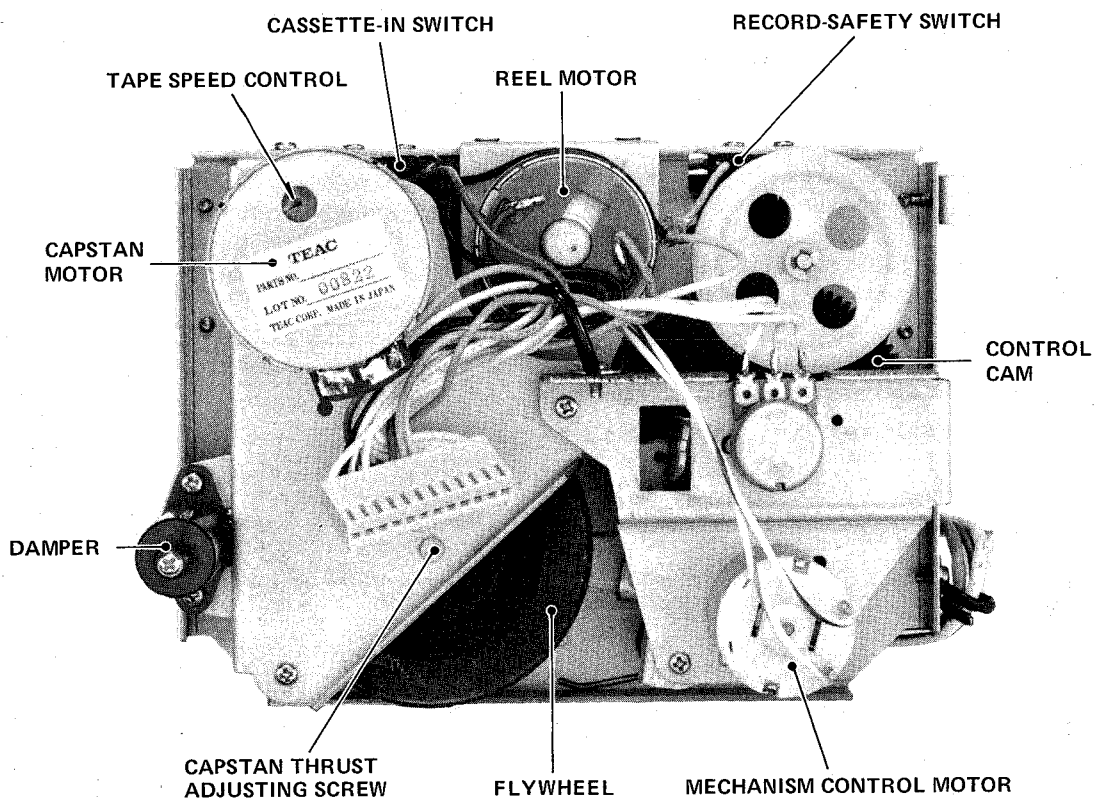


Fig. 3-4 Transport rear view

## 4 MECHANICAL ADJUSTMENT AND CHECKS

### 4-1 CAPSTAN ASSEMBLY THRUST

1. Turn the thrust adjusting screw so that thrust of the capstan shaft is from 0.1 mm to 0.2 mm. For the thrust adjusting screw location, see Fig. 3-4.

### 4-2 CASSETTE HOLDER

1. Adjust the holder guide plate position so that when the cassette holder in which the cassette tape is loaded is closed, the parallel condition shown in Fig. 4-1 is obtained.

Viewed from right side

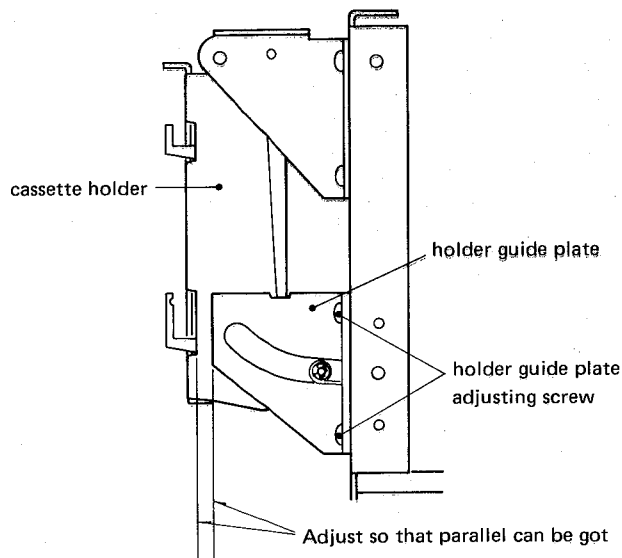


Fig. 4-1

### 4-3 DAMPER ADJUSTMENT

1. Load a TEAC MTT-506 tape (C-60) or equivalent and close the cassette holder.
2. Turn the air adjusting screw so that after pushing the EJECT button, the cassette holder opens completely, taking 0.5 to 1.5 seconds.

**Note:** Be careful not to turn the screw beyond permissible adjustment limit shown in Fig. 4-2.

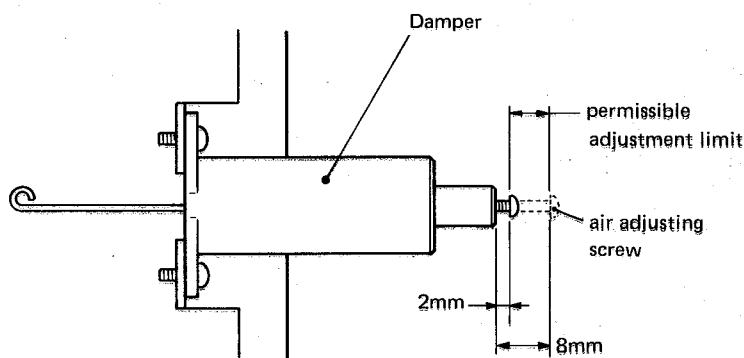


Fig. 4-2

### 4-4 MICRO SWITCH

1. Load any standard cassette and close the cassette holder.
2. Adjust mounting position of two micro switches, cassette-in switch (S401) and record safety switch (S402), so that the actuator position is in the setting range shown by Fig. 4-3.

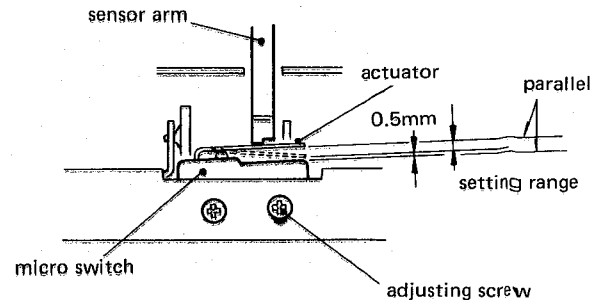


Fig. 4-3

### 4-5 CONTROL CAM

**Note:** For adjustor (R371, R379, R399) locations, see Fig. 3-1.

1. Load any cassette tape with the appropriate record-protect tab attached.
2. Push PLAY (▶) button together with REC button, then check that the center of marker ① coincides with position indicator of the reel motor mounting plate. If not, adjust by using R399.
3. After pushing STOP button, depress the PLAY button. Then check the center of marker ⑥ agrees with the indicator. R371 is provided for this adjustment.
4. Pushing the STOP button, check that the center of marker ③ coincides with the indicator as shown in Fig. 4-4. R379 is for this adjustment.
5. Check that when in REC/PAUSE mode the indicator is within range of marker ②.
6. In the same way as above, check the following.  
F. FWD and REW modes: marker ④.  
PLAY/PAUSE mode: marker ⑤.

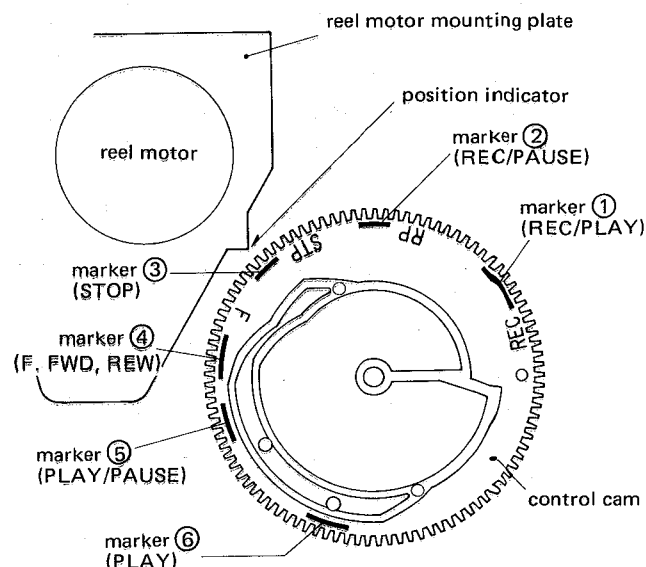


Fig. 4-4 Control cam positioning

#### 4-6 PINCH ROLLER PRESSURE

1. With the cassette holder shut and no tape loaded, put the deck in play mode after pushing the cassette-in switch sensor arm upwards and holding it.
2. Hook a spring scale on the pinch roller assembly, as shown in the illustration.
3. Pull the scale down until there is sufficient force to separate the pinch roller from the capstan shaft.
4. Ease pressure until the pinch roller makes just enough contact with the capstan shaft so that the pinch roller just begins to turn. At this point, note the reading on the scale. It should be from 400 g to 490 g (14.1 oz. to 17.3 oz.)

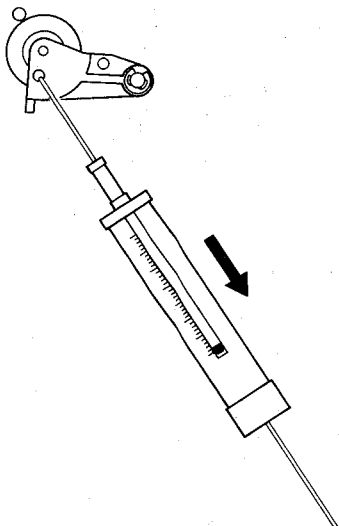


Fig. 4-5

#### 4-7 REEL TORQUE

1. Load the cassette torque meter on the deck and read the pointer indication on the dial scale for each tape transport operation. The measured torque should be within the following values:  
 Take-up: 50 to 65 g-cm (0.69 to 0.90 oz-inch)  
 Supply: 1.5 to 3 g-cm (0.021 to 0.042 oz-inch)  
 F.F.: More than 55 g-cm (0.76 oz-inch)  
 REW: 80 to 150 g-cm (1.1 to 2.1 oz-inch)
2. Take-up torque may be adjusted if required. Within the take-up reel table you will notice three small "teeth" located at 120° around the hub and one marker "tooth" on the periphery. Torque is adjusted by pushing and slightly lifting the "tooth" ① on the ramp\* near the marker up or down. The ramps are like a three step stairway. Maximum torque is when the teeth sit on the highest steps.  
 \* This ramp has catches on each step.

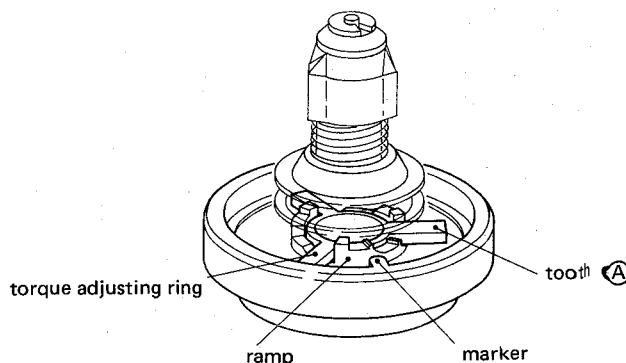


Fig. 4-6 Take-up reel table

#### 4-8 TAPE SPEED

1. Connect a frequency counter to the deck as shown in Fig. 4-7.
2. Play a tape for more than five minutes to warm up the deck, then load a TEAC MTT-111 test tape containing a 3000-Hz test tone and play the test tape from the beginning.
3. While the tape is playing, use a common slotted screwdriver with the handle completely insulated from the blade, and adjust the control on the capstan motor (see Fig. 3-4) for a reading of 3015 to 3025 Hz on the frequency counter.
4. Play the tape at the beginning and at the end, and check that the speed deviation is within the prescribed limits by observing that the reading on the frequency counter never deviates more than  $\pm 70$  Hz from 3000 Hz, nor drifts more than 70 Hz at any given time.

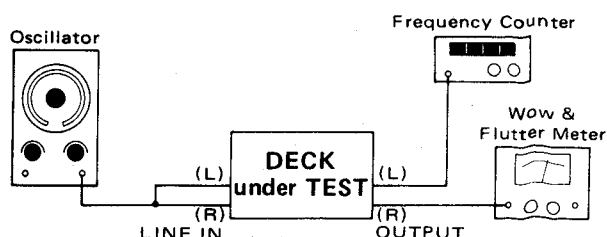


Fig. 4-7

#### 4-9 WOW AND FLUTTER

**Note:** These measurements should be made at the beginning, middle, and the end of the tape.

- 1) **PLAYBACK**
  1. Connect a wow-and-flutter meter to the deck as shown in Fig. 4-7.
  2. Load and play a TEAC MTT-111 test tape.
  3. Check that the reading on the wow-and-flutter meter is within 0.06% (WRMS).
- 2) **RECORD/PLAYBACK**
  4. Load a TEAC MTT-501 test tape (blank) and record a 3000-Hz signal.
  5. Rewind the tape to the beginning of the recorded section, and play it.
  6. The wow and flutter should not be more than 0.25% (RMS).

#### 4-10 LUBRICATION

Lubrication is only required when parts are replaced. For this purpose, use the oil and grease specified below.

Oil: TEAC spindle oil (from TEAC TZ-255 oil kit), Mobil D.T.E. Oil Light, or equivalent

Grease: ORE-LUBE G1/3 or equivalent

1. Apply a drop of oil with an oil applicator to a point about 1/3 the way down the shaft (from the free end) of the flywheel, then insert the shaft into the capstan housing.
2. Apply a suitable amount of light grease to the well of the flywheel bearing.

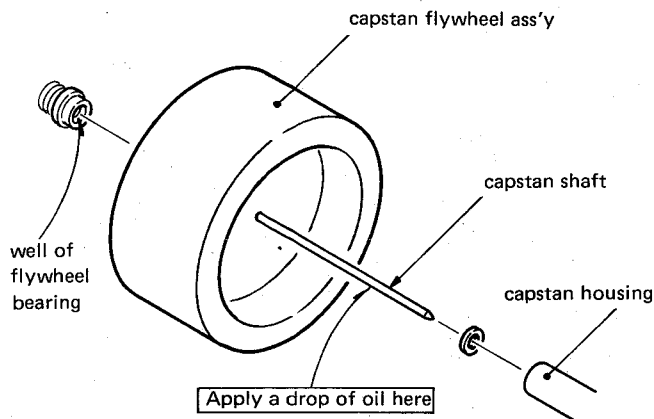


Fig. 4-8

#### 4-11 VOLTAGE SELECTION (FOR GENERAL EXPORT MODELS)

1. Always disconnect the power line cord before making these adjustments.
2. Remove the top cover of the deck by removing the screws from the sides.
3. Locate the voltage selector, shown in the illustration (near the power transformer).
4. Loosen the two screws in the jumper bar and move the bar so that it jumpers the opposing terminals marked with the required voltage (100, 120, 220 or 240).
5. Retighten the screws and replace the top cover.

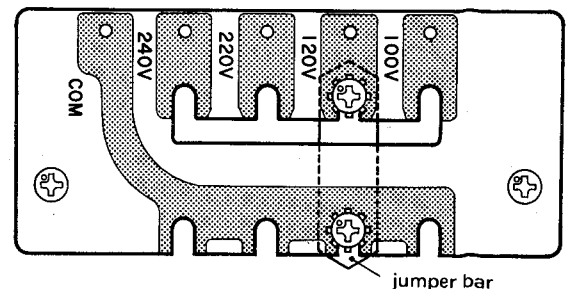


Fig. 4-9

## 5 ELECTRICAL ADJUSTMENT AND CHECKS

#### PRECAUTIONS

1. Before performing adjustments and checks, clean and demagnetize the entire tape path.
2. Make sure the deck is properly set for the voltage in your locality.
3. In general, adjustments and checks are made in the order of L-ch then R-ch. Double REF. Nos. and test point designations indicate L-ch/R-ch. (Example: R404/R504)
4. 0 dB is referenced to 0.775 V. If an AC voltmeter that references 0 dB to 1 V is used, appropriate compensation should be made.
5. The AC voltmeter used in the procedures must have an input impedance of 1M-ohms or more.
6. Note the "Deck settings" at the top of each chart. The settings apply to all checks for a specific chart unless explicitly stated otherwise.

#### -70 dB or more ... What does it mean?

In reference to some specifications, you may come across an expression like: "-70 dB or more". This means that the lower the value of this specification, the greater the absolute value of the specification and the better the performance of the deck. For instance, a noise floor of -76 dB is better than -70 dB, because this means that the level of noise is lower. So in this case, "-70 dB or more" means at least as good a value as -70 dB and maybe even better, i.e., -71 dB.

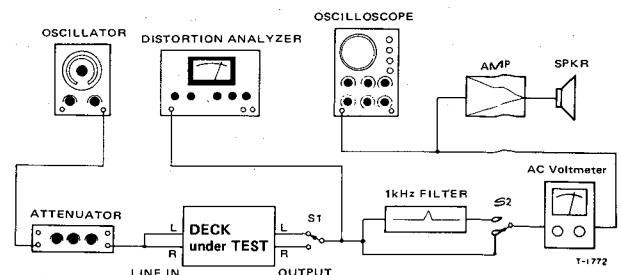


Fig. 5-1 Basic test setup

**TEAC test tapes:**

MTT-150: For Dolby level calibration  
 MTT-316: For playback frequency response check for METAL, Co(CrO<sub>2</sub>)  
 MTT-501: For S/N check with NORMAL

**Deck settings:**  
 DOLBY NR sw: OUT  
 TAPE (BIAS/EQ) sw: METAL

**5-1 PLAYBACK PERFORMANCE**

| ITEM                             | SETTING                                                                                  | INPUT SIGNAL                                 | ADJUST (or CHECK)                   | MEASURING POINT: RESULT                                                               | REMARKS                                       |
|----------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>1. REC/PLAY head azimuth</b>  | Connection: Fig. 5-2<br>OUTPUT cont.: convenient output level position                   | MTT-150                                      | Check                               | OUTPUT:<br>Phase: within 45°                                                          | Refer to Fig. 5-4                             |
|                                  |                                                                                          | MTT-316 (10 kHz)                             | Azimuth nut of R/P heads (Fig. 5-3) | OUTPUT:<br>Max. output at L- & R-ch's (on VTVM)                                       |                                               |
| <b>2. Specified output level</b> | —                                                                                        | MTT-150                                      | R140/R240                           | TP. L/TP. R (DOLBY)<br>580 mV (−2.5 dB)                                               |                                               |
|                                  | —                                                                                        | MTT-150                                      | Check                               | OUTPUT:<br>−5 dB ± 1 dB<br>(388 to 489 mV)                                            | Spec. output level                            |
| <b>3. Peak level meter</b>       | TAPE sw: Co(CrO <sub>2</sub> )                                                           | MTT-150                                      | R404/R504                           | Peak level meter:<br>"0 dB" light: to go ON                                           |                                               |
|                                  | TAPE sw: METAL                                                                           | MTT-150                                      | Check                               | Peak level meter:<br>"0 dB" light: to go OFF                                          |                                               |
| <b>4. Frequency response</b>     | TAPE sw: METAL<br>If 10 kHz output is lower than spec., cut R106 and/or R206 on R/P PCB. | MTT-316                                      | Check                               | OUTPUT:<br>Fig. 5-6                                                                   |                                               |
|                                  | TAPE sw: NORMAL                                                                          | MTT-316                                      | Check                               | OUTPUT: At 10 kHz<br>should be approx. 4 dB<br>higher than measured<br>in above step. |                                               |
| <b>5. Signal-to-noise ratio</b>  | TAPE sw: NORMAL                                                                          | Fully-erased tape:<br>(Use bulk tape eraser) | Check                               | OUTPUT:<br>46 dB min.                                                                 | Ratio of spec.<br>output of<br>−5 dB to noise |

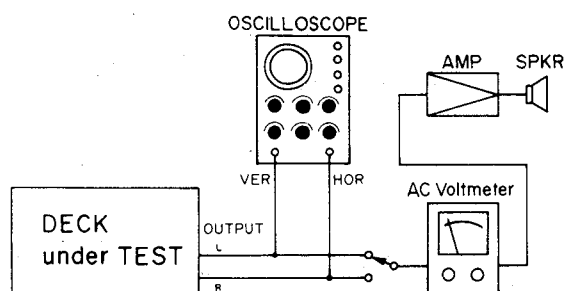


Fig. 5-2 Test setup for azimuth check

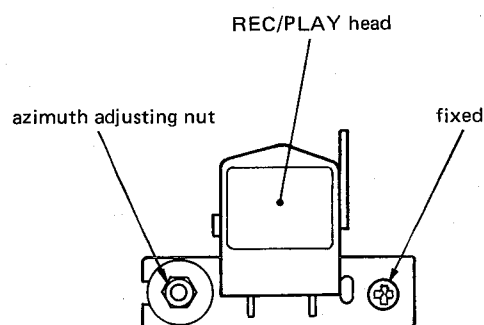


Fig. 5-3 Azimuth nut location

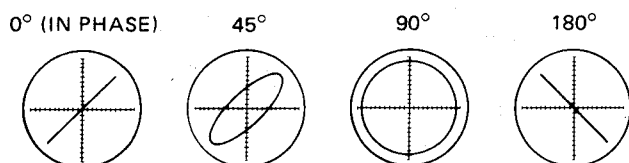


Fig. 5-4 Confirming phase relationship

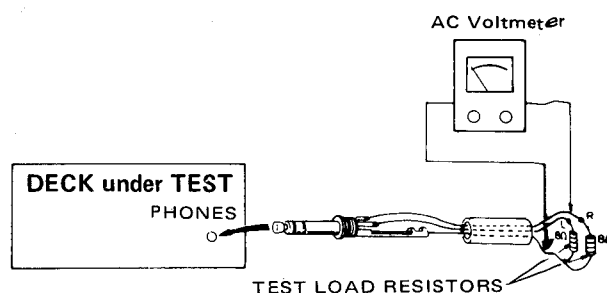


Fig. 5-5 Test setup for headphone check

# 5-2 MONITOR PERFORMANCE

Deck setting:  
REC-PAUSE mode  
DOLBY NR sw.: OUT  
INPUT sw.: LINE

| ITEM                             | SETTING                                                                                                   |                   | INPUT SIGNAL                           | ADJUST<br>(or CHECK)  | MEASURING<br>POINT:<br>RESULT                                                           | REMARKS                                          |
|----------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------|-----------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------|
| 6. Min. input level              | RECORD<br>cont.: Max.                                                                                     | INPUT sw:<br>MIC  | MIC:<br>400 Hz/−67 dB<br>(346 μV)      | Check                 | OUTPUT:<br>−5 dB ±3 dB<br>(308 to 615 mV)                                               | MIC min. input<br>level                          |
|                                  |                                                                                                           | INPUT sw:<br>MIC  | DIN IN:<br>400 Hz/−45 dB<br>(4.36 mV)  | Check                 | OUTPUT:<br>−5 dB ±3 dB<br>(308 to 615 mV)                                               | DIN min. input<br>level (For<br>European models) |
|                                  |                                                                                                           | INPUT sw:<br>LINE | LINE IN:<br>400 Hz/−19 dB<br>(86.9 mV) | Check                 | OUTPUT:<br>−5 dB ±3 dB<br>(308 to 615 mV)                                               | LINE min.<br>input level                         |
| 7. Specified LINE<br>input level | —                                                                                                         |                   | LINE IN:<br>400 Hz/−9 dB<br>(275 mV)   | RECORD cont.<br>(L/R) | TP. L/TP. R (DOLBY)<br>580 mV (−2.5 dB)                                                 | Specified setting<br>of RECORD<br>cont.          |
|                                  | —                                                                                                         |                   | LINE IN:<br>400 Hz/−9 dB<br>(275 mV)   | Check                 | OUTPUT:<br>−5 dB ±1 dB (388<br>to 489 mV)                                               |                                                  |
|                                  | IMPORTANT: Do not change the setting of the Record controls after establishing their setting<br>as above. |                   |                                        |                       |                                                                                         |                                                  |
| 8. Headphone output<br>level     | Connection: Fig. 5-5                                                                                      |                   | LINE IN:<br>400 Hz/−9 dB<br>(275 mV)   | Check                 | PHONES:<br>−18 dB ±3 dB<br>(69.0 to 138 mV)                                             | 8 ohm load                                       |
| 9. Peak level meter              | TAPE sw: Co (CrO <sub>2</sub> )<br>or NORMAL                                                              |                   | LINE IN:<br>400 Hz/−9 dB<br>(275 mV)   | Check                 | Peak level meter:<br>"0 dB" light: to<br>go ON                                          |                                                  |
|                                  |                                                                                                           |                   | LINE IN:<br>400 Hz/−29 dB<br>(27.5 mV) | R407/R507             | Peak level meter:<br>"−20 dB" light:<br>to go ON                                        |                                                  |
|                                  |                                                                                                           |                   |                                        | Check                 | Peak level meter:<br>When TAPE switch is changed to<br>METAL, "−20" light is to go OFF. |                                                  |
|                                  |                                                                                                           |                   | LINE IN<br>400 Hz                      | Check                 | Level at which peak level meter's light goes ON<br>when input level is raised.          |                                                  |
|                                  |                                                                                                           |                   |                                        |                       | P. I. meter's<br>light                                                                  | Input level                                      |
|                                  |                                                                                                           |                   |                                        |                       | −20 dB                                                                                  | −29 dB ±3 dB<br>(19.5 to 38.8 mV)                |
|                                  |                                                                                                           |                   |                                        |                       | −10 dB                                                                                  | −19 dB ±2 dB<br>(69.0 to 109 mV)                 |
|                                  |                                                                                                           |                   |                                        |                       | −5 dB                                                                                   | −14 dB ±1.5 dB<br>(130 to 184 mV)                |
|                                  |                                                                                                           |                   |                                        |                       | 0 dB                                                                                    | −9 dB ±1.5 dB<br>(231 to 327 mV)                 |
|                                  |                                                                                                           |                   |                                        |                       | +3 dB                                                                                   | −6 dB ±1.5 dB<br>(327 to 461 mV)                 |
|                                  |                                                                                                           |                   |                                        |                       | OVER                                                                                    | −3 dB ±1.5 dB<br>(461 to 652 mV)                 |

## DECK settings:

DOLBY NR sw.: OUT

INPUT sw.: LINE

Record Controls (L/R): Specified position (item 7)

## TEAC test tapes:

MTT-5061: For record test with Co (CrO<sub>2</sub>)

MTT-501: For record test with NORMAL

MTT-5072: For record test with METAL

## 5-3 RECORDING PERFORMANCE

| ITEM                             | SETTING                                                                                                                                    | INPUT SIGNAL                                                    | ADJUST<br>(or CHECK) | MEASURING<br>POINT:<br>RESULT                                                         | REMARKS                                             |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------|
| 10. BIAS trap                    | Record-pause mode                                                                                                                          | LINE IN:<br>No signal                                           | U106/U206            | TP. L/TP. R (BIAS<br>TRAP TP)<br>Min. reading                                         |                                                     |
| 11. Record bias                  | 1) Turn trim pots R155 and R156 fully clockwise for each trim pot to have minimum value.<br>Then adjust in the order of steps (2) (3) (4). |                                                                 |                      |                                                                                       |                                                     |
|                                  | 2) TAPE sw.: METAL<br>Tape: MTT-5072                                                                                                       | LINE IN:<br>400Hz & 6.3 kHz<br>alternately/-42 dB<br>(6.15 mV)  | C145/C245            | OUTPUT:<br>Nearly equal level<br>at both frequencies                                  |                                                     |
|                                  | 3) TAPE sw.: Co (CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                      | LINE IN:<br>400 Hz & 6.3 kHz<br>alternately/-42 dB<br>(6.15 mV) | R155.....            | OUTPUT:<br>Nearly equal level<br>at both frequencies                                  | ... For L- &<br>R-ch's                              |
|                                  | 4) TAPE sw.: NORMAL<br>Tape: MTT-501                                                                                                       | LINE IN:<br>400 Hz & 6.3 kHz<br>alternately/-42 dB<br>(6.15 mV) | R156.....            | OUTPUT:<br>Nearly equal level<br>at both frequencies                                  | ... For L- &<br>R-ch's                              |
| 12. Record level                 | TAPE sw.: METAL<br>Tape: MTT-5072                                                                                                          | LINE IN:<br>400 Hz/-12 dB<br>(195 mV)                           | R144/R244            | OUTPUT:<br>-8 dB (308 mV)                                                             |                                                     |
|                                  | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                          | LINE IN:<br>400 Hz/-12 dB<br>(195 mV)                           | Check                | OUTPUT:<br>-8 dB ±1.5 dB<br>(259 to 367 mV)                                           |                                                     |
|                                  | TAPE sw.: NORMAL<br>Tape: MTT-501                                                                                                          | LINE IN:<br>400 Hz/-12 dB<br>(195 mV)                           | Check                | OUTPUT:<br>-8 dB ±1.5 dB<br>(259 to 367 mV)                                           |                                                     |
| 13. Frequency<br>response        | TAPE sw.: METAL<br>Tape MTT-5072                                                                                                           | LINE IN:<br>Required signal/<br>-42 dB (6.15 mV)                | L101/L201            | OUTPUT:<br>Fig. 5-7                                                                   |                                                     |
|                                  | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                          | LINE IN:<br>Required signal/<br>-42 dB (6.15 mV)                |                      | OUTPUT:<br>Fig. 5-7                                                                   |                                                     |
|                                  | TAPE sw.: NORMAL<br>Tape: MTT-501                                                                                                          | LINE IN:<br>Required signal/<br>-42 dB (6.15 mV)                |                      | OUTPUT:<br>Fig. 5-8                                                                   |                                                     |
|                                  | If frequency response is out of specification, recheck #11. "Record bias".                                                                 |                                                                 |                      |                                                                                       |                                                     |
| 14. Total harmonic<br>distortion | Same as 12 above.                                                                                                                          | LINE IN:<br>400 Hz/-12 dB<br>(195 mV)                           | Check                | OUTPUT:<br>2.2% or less with METAL, Co(CrO <sub>2</sub> )<br>2.0% or less with NORMAL |                                                     |
| 15. Signal-to-noise<br>ratio     | TAPE sw.: METAL<br>Tape: MTT-5072                                                                                                          | LINE IN:<br>1 kHz/-9 dB<br>(275 mV)<br>↓<br>no signal           | Check                | OUTPUT:<br>45 dB min.                                                                 | Ratio of spec-<br>ified output of<br>-5 dB to noise |
|                                  | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT5061                                                                                           | LINE IN:<br>1 kHz/-9 dB<br>(275 mV)<br>↓<br>no signal           | Check                | OUTPUT:<br>45 dB min.                                                                 |                                                     |
|                                  | TAPE sw.: NORMAL<br>Tape: MTT-501                                                                                                          | LINE IN:<br>1 kHz/-9 dB<br>(275 mV)<br>↓<br>no signal           | Check                | OUTPUT:<br>44 dB min.                                                                 |                                                     |

| ITEM                         | SETTING                                                                                                                                                                                                                                                                                                                                 | INPUT SIGNAL                                                | ADJUST<br>(or CHECK) | MEASURING<br>POINT:<br>RESULT        | REMARKS                                 |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------|--------------------------------------|-----------------------------------------|
| 16. Erase efficiency         | <ul style="list-style-type: none"> <li>• Connection is same as in Fig. 5-1, but engage 1-kHz filter.</li> <li>• Record a 1-kHz signal. Rewind tape to midpoint of recorded portion. Record a "no signal" portion. Find the difference between the 1-kHz portion and the "no-signal" portion.</li> </ul>                                 |                                                             |                      |                                      |                                         |
|                              | TAPE sw.: METAL<br>Tape: MTT-5072                                                                                                                                                                                                                                                                                                       | LINE IN:<br>1 kHz/+1 dB<br>(0.869 V)<br>↓<br>no signal      | Check                | OUTPUT:<br>65 dB min. ratio          | Ref. Output<br>level:<br>+5 dB (1.38 V) |
| 17. REC MUTE function        | <ul style="list-style-type: none"> <li>• Connection: Fig. 5-1, but engage 1-kHz filter.</li> <li>• Record a 1-kHz signal. Push REC MUTE button for several seconds. (At this time, make sure LED on the button lights). Rewind and play the tape. Find the difference between the 1-kHz portion and the "no-signal" portion.</li> </ul> |                                                             |                      |                                      |                                         |
|                              | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                                                                                                                                                                                                                       | LINE IN:<br>1 kHz/+1 dB<br>(0.869 V)<br>↓<br>no signal      | Check                | OUTPUT:<br>65 dB min. ratio          | Ref. Output<br>level:<br>+5 dB (1.38 V) |
| 18. Channel separation       | <ul style="list-style-type: none"> <li>• Connection Fig. 5-1, but do not connect LINE IN (R), and engage 1-kHz filter.</li> <li>• Set the deck to record mode. Find the difference between the 1-kHz recorded portion (L-ch) and the "no signal" portion (R-ch).</li> </ul>                                                             |                                                             |                      |                                      |                                         |
|                              | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                                                                                                                                                                                                                       | LINE IN:<br>L-ch 1 kHz/−9 dB<br>(275 mV)<br>R-ch No signal  | Check                | OUTPUT:<br>30 dB min. ratio          |                                         |
| 19. Adjacent track crosstalk | <ul style="list-style-type: none"> <li>• Connection: Fig. 5-1, but do not connect LINE IN (L) and OUTPUT (L).</li> <li>• Record a 125-Hz signal on R-ch and note output level. Invert tape and play R-ch track. Check leakage level against the output reference of previously recorded portion.</li> </ul>                             |                                                             |                      |                                      |                                         |
|                              | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                                                                                                                                                                                                                       | LINE IN:<br>L-ch No signal<br>R-ch 125 Hz/−9 dB<br>(275 mV) | Check                | OUTPUT:<br>40 dB min. ratio          |                                         |
| 20. Dolby NR effect          | <ul style="list-style-type: none"> <li>• Record a 1-kHz signal with DOLBY NR switch OUT. Play this portion with DOLBY NR switch set to OUT and set to IN. Obtain the difference in output level between OUT and IN positions. Repeat the above process using a 10-kHz signal.</li> </ul>                                                |                                                             |                      |                                      |                                         |
|                              | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                                                                                                                                                                                                                       | LINE IN:<br>1 kHz/−32 dB<br>(19.5 mV)                       | Check                | OUTPUT:<br>Variation<br>3 dB ~ 8 dB  |                                         |
|                              | TAPE sw.: Co(CrO <sub>2</sub> )<br>Tape: MTT-5061                                                                                                                                                                                                                                                                                       | LINE IN:<br>10 kHz/−42 dB<br>(6.15 mV)                      | Check                | OUTPUT:<br>Variation<br>8 dB ~ 12 dB |                                         |



## 5-4 FREQUENCY RESPONSE

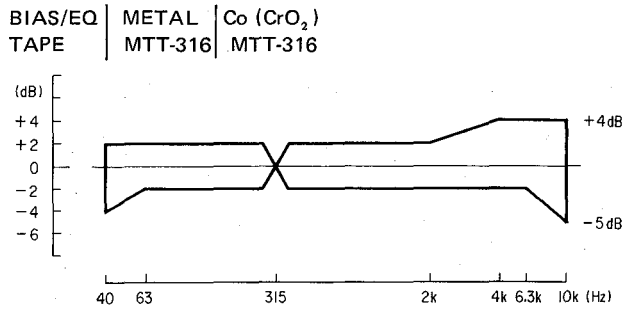


Fig. 5-6 Playback frequency response

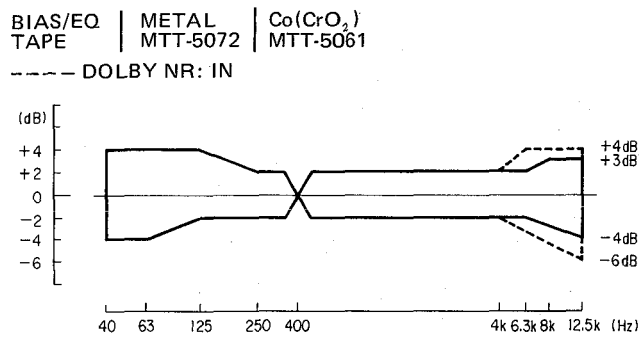


Fig. 5-7 Overall frequency response [METAL, Co (CrO<sub>2</sub>) ]

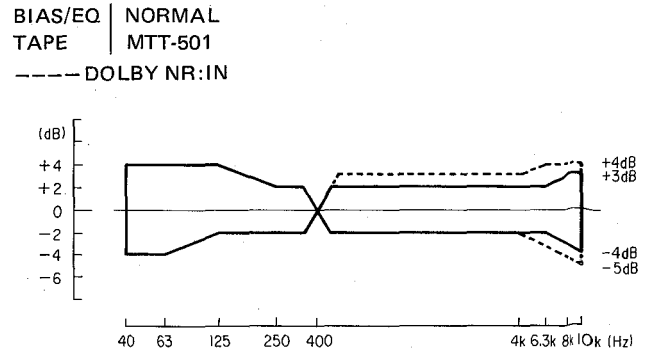


Fig. 5-8 Overall frequency response [NORMAL]

## 5-5 ADJUSTMENT AND TEST POINT LOCATIONS

### REC/PLAY AMPL. PCB

|           |                                      |
|-----------|--------------------------------------|
| R140/R240 | Playback level                       |
| R144/R244 | Record level                         |
| R155      | Record bias – Co (CrO <sub>2</sub> ) |
| R156      | Record bias – NORMAL                 |
| C145/C245 | Record bias – METAL                  |
| L101/L201 | Record frequency response            |
| U106/U206 | Bias trap                            |

### METER AMPL. PCB

|           |                             |
|-----------|-----------------------------|
| R404/R504 | Peak level meter – playback |
| R407/R507 | Peak level meter – monitor  |

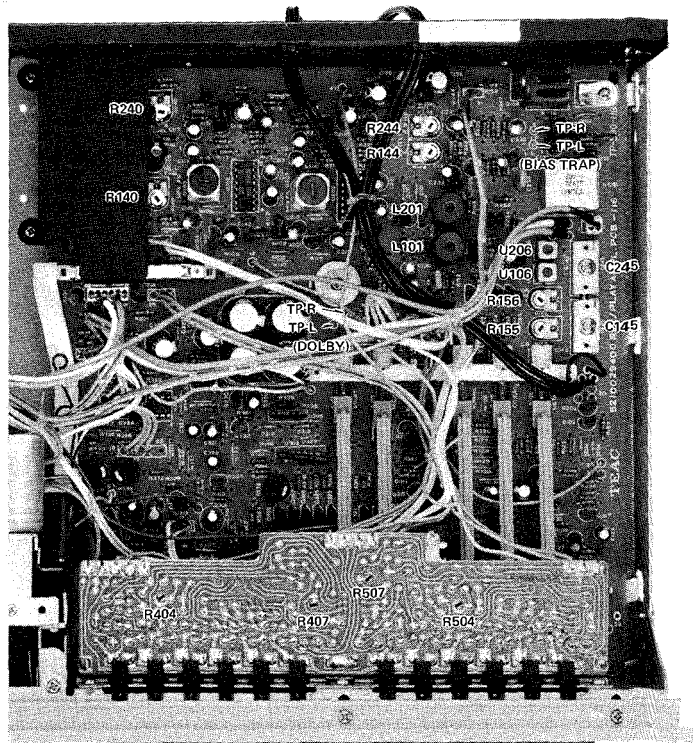
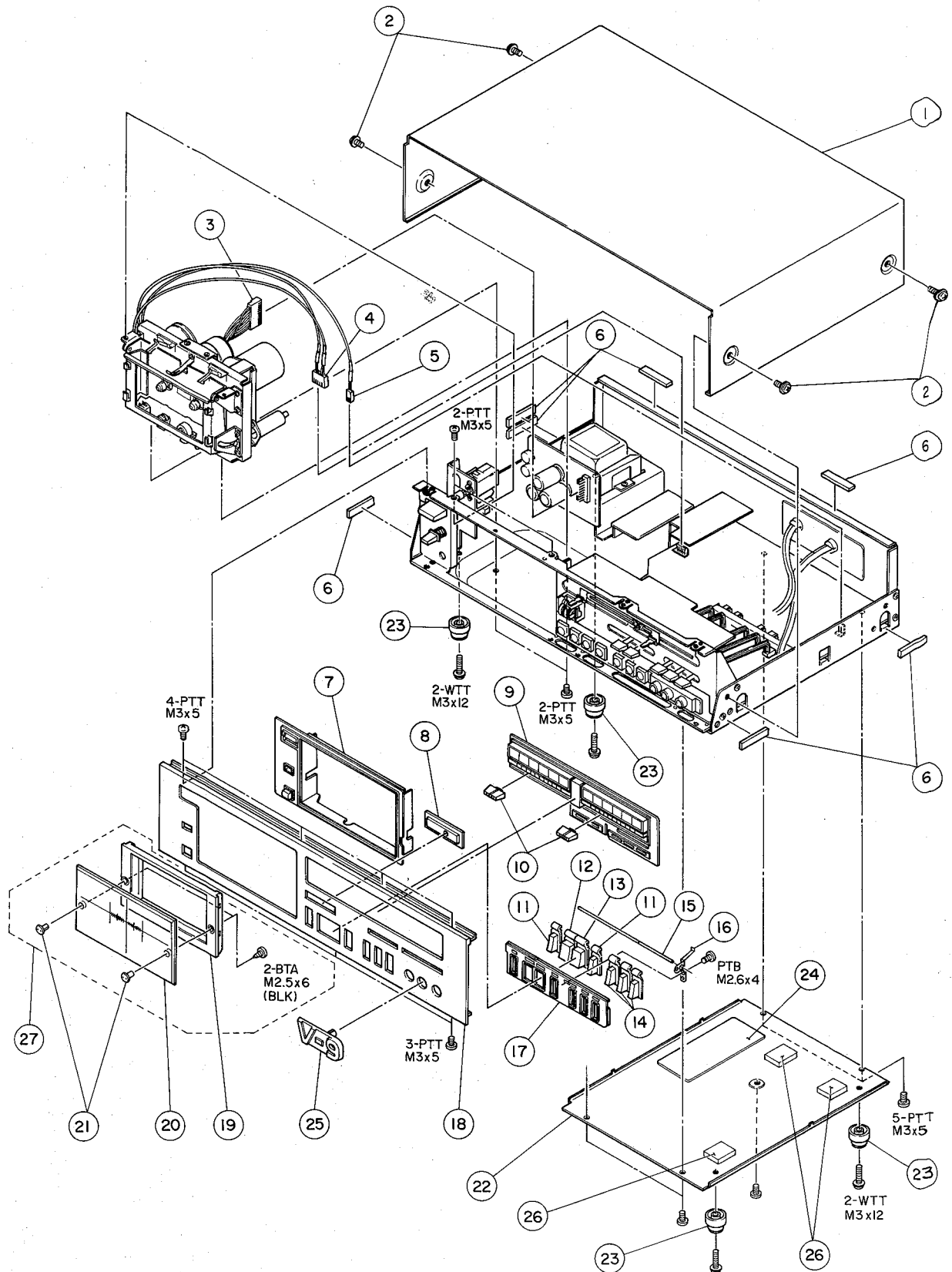


Fig. 5-9

## 6 EXPLODED VIEWS AND PARTS LIST

### EXPLODED VIEW - 1



Parts marked with \*require longer delivery time.

| REF. NO. | PARTS NO.   | DESCRIPTION                            | REMARKS      |
|----------|-------------|----------------------------------------|--------------|
| 1 - 1    | *5800119500 | Cover, Top                             |              |
| 1 - 2    | *5783114006 | Screw, M4 x 6 (BLK Ni)                 |              |
| 1 - 3    | *5122174000 | Connector Socket, 12P (WHT)            |              |
| 1 - 4    | *5122168000 | Connector Socket, 6P (WHT)             |              |
| 1 - 5    | *5122164000 | Connector Socket, 2P (WHT)             |              |
| 1 - 6    | *5555570000 | Cushion, Top Cover; B                  |              |
| 1 - 7    | *5800112701 | Escutcheon Assy, Cassete               |              |
| 1 - 8    | *5800118001 | Escutcheon, Counter                    |              |
| 1 - 9    | *5800111201 | Escutcheon Assy, Meter [All except US] |              |
|          | *5800145901 | Escutcheon Assy, Meter [US]            |              |
| 1 - 10   | 5800118100  | Knob, VR; A                            |              |
| 1 - 11   | 5800113501  | Button, B                              |              |
| 1 - 12   | 5800113701  | Button, D                              |              |
| 1 - 13   | 5800113601  | Button, C                              |              |
| 1 - 14   | 5800113402  | Button, A                              |              |
| 1 - 15   | *5800113901 | Shaft, Button                          |              |
| 1 - 16   | *5800114001 | Plate, GND; A                          |              |
| 1 - 17   | *5800113800 | Escutcheon, Control                    |              |
| 1 - 18   | *5640012700 | Panel Assy, Front [All except US]      |              |
|          | *5640012710 | Panel Assy, Front [US]                 |              |
| 1 - 19   | *5800122500 | Cover, Cassete; (2)                    | Part of 1-27 |
| 1 - 20   | *5800123200 | Cover, Cassete; (1)                    | Part of 1-27 |
| 1 - 21   | *5800116800 | Bushing                                | Part of 1-27 |
| 1 - 22   | *5800112301 | Cover, Bottom                          |              |
| 1 - 23   | *5800116100 | Foot                                   |              |
| 1 - 24   | *5800125901 | Plate, Shield; B                       |              |
| 1 - 25   | *5800142300 | Cover, Jack                            |              |
| 1 - 26   | *5800148500 | Spacer                                 |              |
| 1 - 27   | 5640012800  | Cover Assy, Cassete                    |              |

### INCLUDED ACCESSORIES

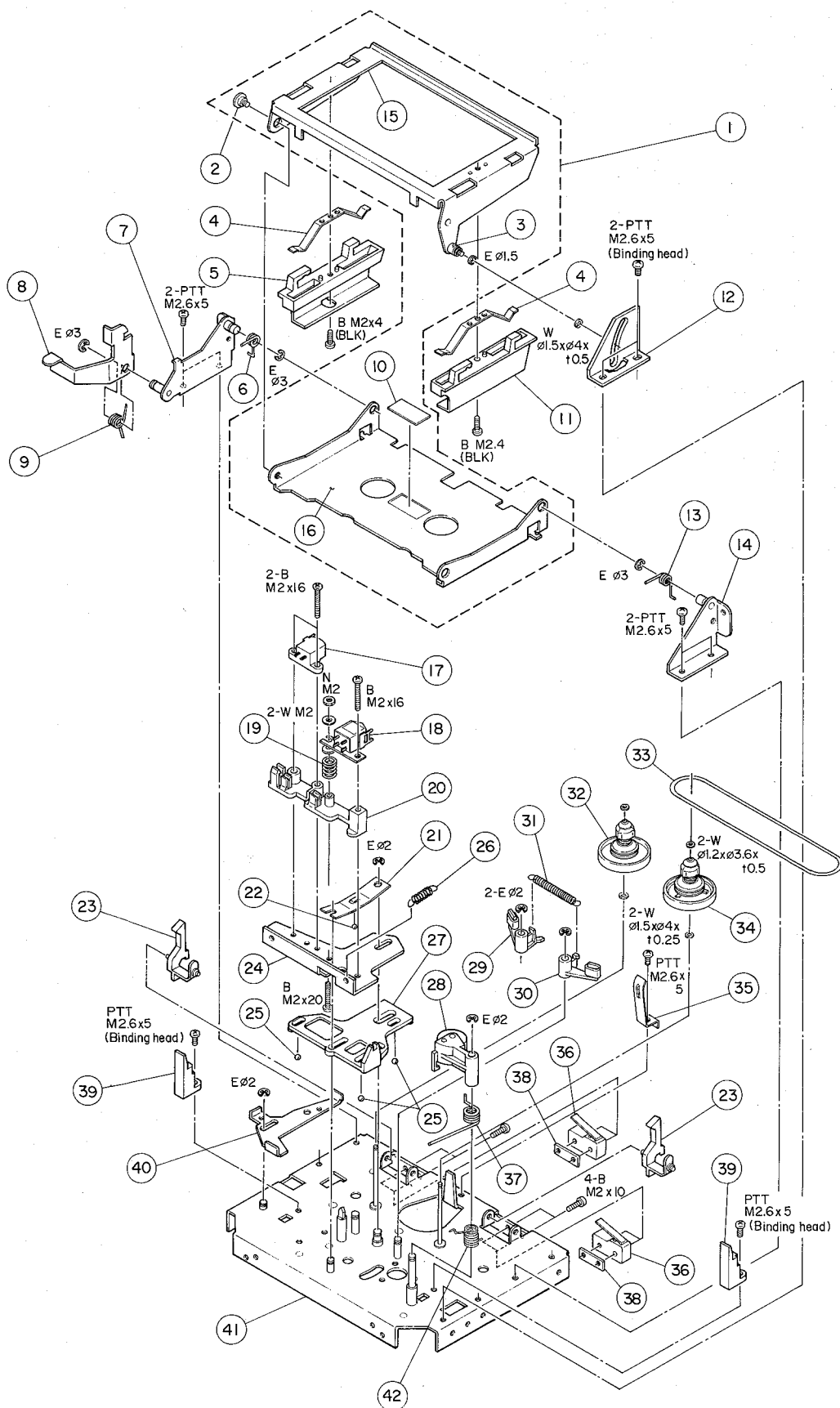
| REF. NO. | PARTS NO.  | DESCRIPTION                               | REMARKS |
|----------|------------|-------------------------------------------|---------|
|          | 5700011100 | V-9 Owner's manual [J]                    |         |
|          | 5700011200 | V-9 Owner's manual [US]                   |         |
|          | 5700011300 | V-9 Owner's manual [All except J, US]     |         |
|          | 5101369000 | Information Supplement [J]                |         |
|          | 5101345000 | Information Supplement [US]               |         |
|          | 5101495000 | Information Supplement [All except J, US] |         |

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: AUSTRALIA  
[J]: JAPAN

[C]: CANADA  
[E]: EUROPE

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[UK]: U.K.

EXPLODED VIEW - 2



Parts marked with \*require longer delivery time.

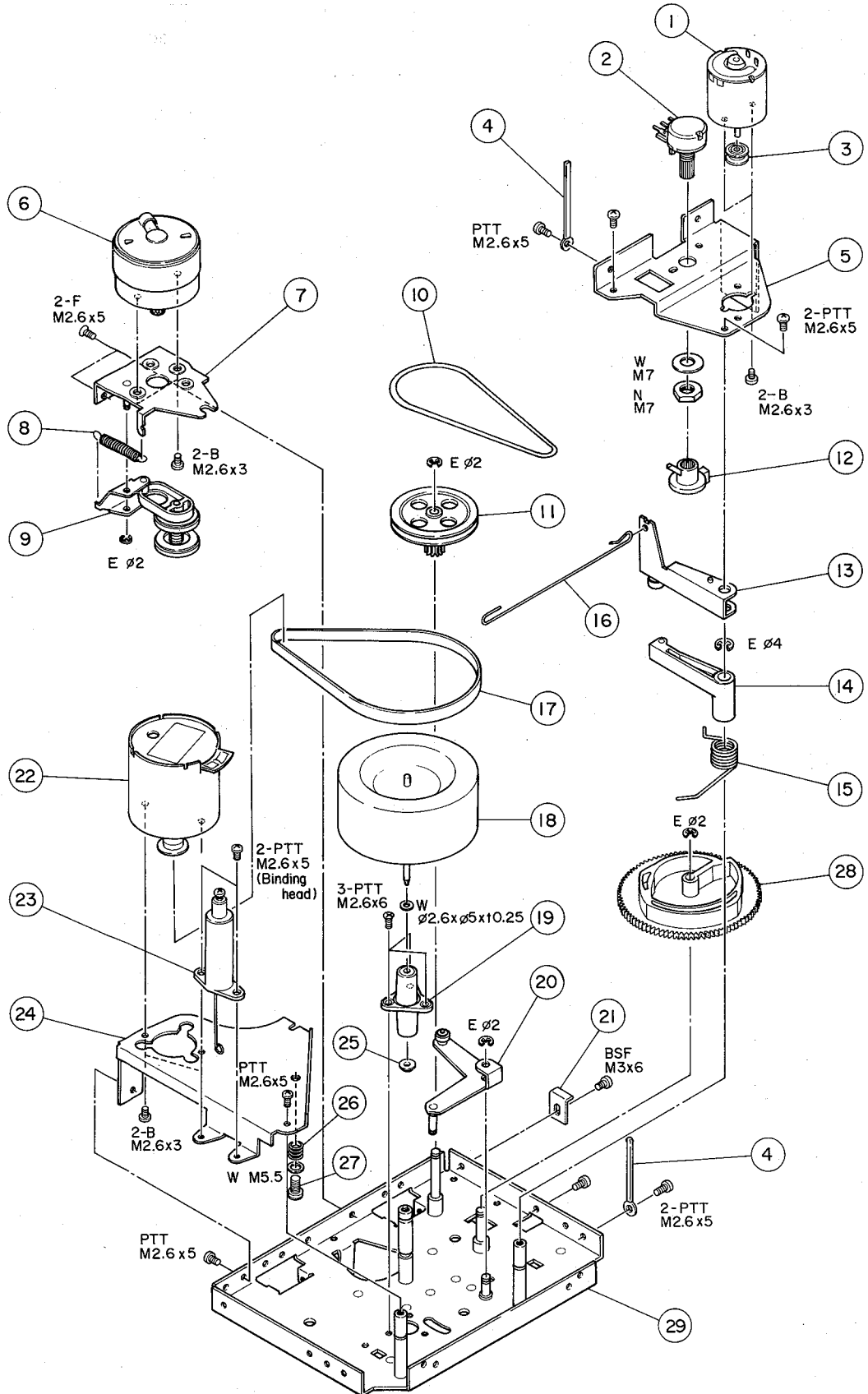
| REF. NO. | PARTS NO.   | DESCRIPTION                    | REMARKS                          |
|----------|-------------|--------------------------------|----------------------------------|
| 2 - 1    | *5800131902 | Holder Sub-assy, Cassette      | Part of 2-1 A-304<br>Part of 2-1 |
| 2 - 2    | *5581056000 | Screw, Shoulder; A             |                                  |
| 2 - 3    | *5800120100 | Roller, Guide                  |                                  |
| 2 - 4    | *5800115400 | Spring, Cassette Pressure      |                                  |
| 2 - 5    | *5800109600 | Holder, L                      |                                  |
| 2 - 6    | *5800115500 | Spring, Holder; L              | Part of 2-1                      |
| 2 - 7    | *5800121300 | Bracket Assy, Holder; L        |                                  |
| 2 - 8    | *5800119100 | Arm, Eject                     |                                  |
| 2 - 9    | *5800115700 | Spring, Lock                   |                                  |
| 2 - 10   | *5800117500 | Seal, Cassette                 |                                  |
| 2 - 11   | *5800122100 | Holder, R                      | Part of 2-1                      |
| 2 - 12   | *5800119000 | Bracket, Holder Guide          |                                  |
| 2 - 13   | *5800115600 | Spring, Holder; R              |                                  |
| 2 - 14   | *5800121400 | Bracket Assy, Holder; R        |                                  |
| 2 - 15   | *5800122901 | Holder Sub-assy, Cassette; (1) |                                  |
| 2 - 16   | *5800122400 | Holder, Cassette; (2)          | Part of 2-1                      |
| 2 - 17   | 5378900300  | Head, Erase                    |                                  |
| 2 - 18   | 5378600200  | Head, REC/PLAY                 |                                  |
| 2 - 19   | *5800114700 | Spring, Head                   |                                  |
| 2 - 20   | *5800122600 | Stand, Head                    |                                  |
| 2 - 21   | *5800114900 | Spring, Base Plat Pressure     | A-450                            |
| 2 - 22   | 5540055000  | Steel Ball, $\phi$ 2           |                                  |
| 2 - 23   | *5800117301 | Arm, Sensor                    |                                  |
| 2 - 24   | *5800119300 | Plate, Head Base               |                                  |
| 2 - 25   | 5540056000  | Steel Ball, $\phi$ 3           |                                  |
| 2 - 26   | *5800114100 | Spring, Head Base              | A-400                            |
| 2 - 27   | *5800122800 | Plate, Slider                  |                                  |
| 2 - 28   | 5800120400  | Arm Assy, Pinch Roller         |                                  |
| 2 - 29   | *5800131601 | Arm Assy, Brake; L             |                                  |
| 2 - 30   | *5800131701 | Arm Assy, Brake; R             |                                  |
| 2 - 31   | *5800114800 | Spring, Brake                  |                                  |
| 2 - 32   | 5800107300  | Table Assy, Reel; Supply       |                                  |
| 2 - 33   | 5800106700  | Belt, Counter                  |                                  |
| 2 - 34   | 5800108701  | Table Assy, Reel, Take-up      |                                  |
| 2 - 35   | *5800115002 | Spring, Cassette Pressure      |                                  |
| 2 - 36   | 5301455300  | Switch, Micro                  | A-400                            |
| 2 - 37   | *5800115300 | Spring, Pinch Roller Arm       |                                  |
| 2 - 38   | *5554447000 | Plate, Micro Switch            |                                  |
| 2 - 39   | *5800117400 | Guide, Cassette                |                                  |
| 2 - 40   | *5800119200 | Plate, Stopper                 |                                  |
| 2 - 41   | *5800109701 | Chassis Assy, Mechanism        |                                  |
| 2 - 42   | *5800152600 | Spring, Arm Return             |                                  |

[US]: U.S.A.  
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[J]: JAPAN

[C]: CANADA  
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[UK]: U.K.

EXPLODED VIEW - 3



Parts marked with \*require longer delivery time.

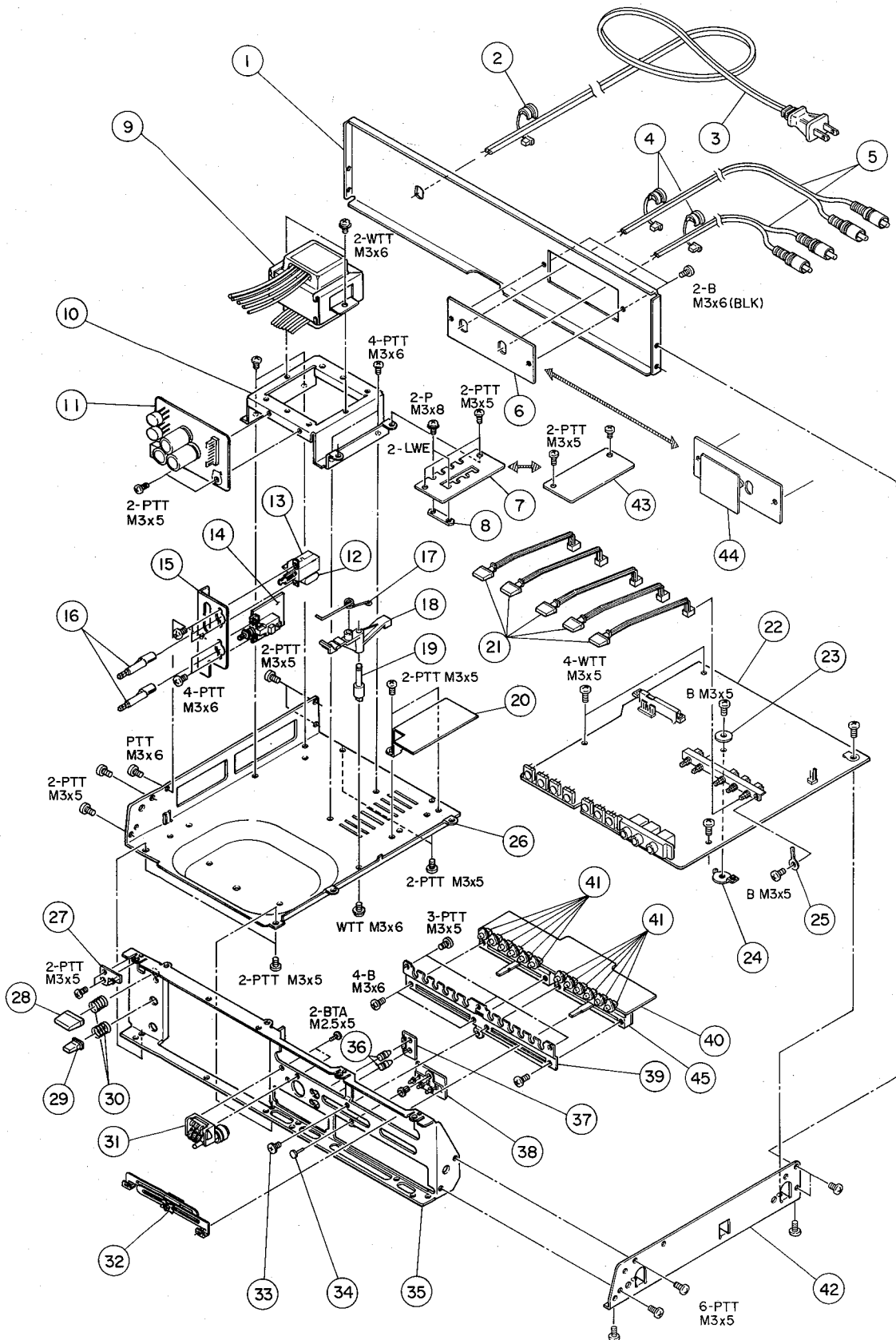
| REF. NO. | PARTS NO.   | DESCRIPTION                    | REMARKS |
|----------|-------------|--------------------------------|---------|
| 3 - 1    | 5370001400  | Motor, Control; DC             |         |
| 3 - 2    | 5282009601  | Var. Res., 10k $\Omega$ (B)    |         |
| 3 - 3    | *5800123300 | Pulley, V                      |         |
| 3 - 4    | *5581038000 | Clamper, Cord; A               |         |
| 3 - 5    | *5800122200 | Bracket, Motor                 |         |
| 3 - 6    | 5370001200  | Motor Assy, Reel; DC           |         |
| 3 - 7    | *5800121800 | Bracket Assy, Reel Motor       |         |
| 3 - 8    | *5800115800 | Spring, Idler Arm              |         |
| 3 - 9    | 5800107800  | Idler Assy                     |         |
| 3 - 10   | 5800106800  | Belt, Reduction Pulley         |         |
| 3 - 11   | *5800117200 | Pulley, Reduction              |         |
| 3 - 12   | *5800116700 | Joint                          |         |
| 3 - 13   | *5800107001 | Lever Sub-assy, Record         |         |
| 3 - 14   | *5800105400 | Arm Assy, Balance              |         |
| 3 - 15   | *5800114600 | Spring, Balance Arm            |         |
| 3 - 16   | *5800114400 | Rod, Record                    |         |
| 3 - 17   | 5800106900  | Belt, Capstan Drive            |         |
| 3 - 18   | 5800106401  | Flywheel Assy, Capstan         |         |
| 3 - 19   | *5800106200 | Housing Assy, Capstan          |         |
| 3 - 20   | *5800105801 | Arm Assy, Base Plate Actuating |         |
| 3 - 21   | *5800148600 | Stopper                        |         |
| 3 - 22   | 5370001100  | Motor Assy, Capstan; DC        |         |
| 3 - 23   | *5800131802 | Damper Assy                    |         |
| 3 - 24   | *5800122301 | Bracket, Flywheel              |         |
| 3 - 25   | *5534130000 | Retainer, Oil                  |         |
| 3 - 26   | *5800161400 | Spring, Thrust                 |         |
| 3 - 27   | *5800156300 | Screw, Thrust                  |         |
| 3 - 28   | *5800122700 | Cam, Control                   |         |
| 3 - 29   | *5800109701 | Chassis Assy, Mechanism        |         |

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[C]: CANADA  
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[GE]: GENERAL EXPORT  
 [UK]: U.K.

EXPLODED VIEW - 4





Parts marked with \*require longer delivery time.

| REF. NO. | PARTS NO.    | DESCRIPTION                                  | REMARKS |
|----------|--------------|----------------------------------------------|---------|
| 4 - 1    | *5800112502  | Panel Rear                                   |         |
| 4 - 2    | *5534660000  | Strain Relief, AC Power Cord [All except UK] |         |
|          | *5534661000  | Strain Relief, AC Power Cord [UK]            |         |
| 4 - 3    | △*5128034000 | Cord, AC Power [J]                           |         |
|          | △*5128075000 | Cord, AC Power [US, C, GE]                   |         |
|          | △*5128047000 | Cord, AC Power [UK]                          |         |
|          | △*5350008200 | Cord, AC Power [E]                           |         |
|          | △*5350008300 | Cord, AC Power [A]                           |         |
| 4 - 4    | *5534660000  | Strain Relief, Cord                          |         |
| 4 - 5    | *5350008600  | Cord, In-output [All except US]              |         |
|          | *5350008700  | Cord, In-output [US]                         |         |
| 4 - 6    | *5800117801  | Plate, In-output; A [All except E]           |         |
|          | *5800117901  | Plate, In-output; B [E]                      |         |
| 4 - 7    | *5200034900  | PCB Assy, VOLTAGE SELECTOR [GE]              |         |
| 4 - 8    | *5555062000  | Bar, Jumper; A [GE]                          |         |
| 4 - 9    | △ 5320005800 | Transformer, Power [J]                       |         |
|          | △ 5320005900 | Transformer, Power [US]                      |         |
|          | △ 5320006000 | Transformer, Power [C]                       |         |
|          | △ 5320006100 | Transformer, Power [GE]                      |         |
|          | △ 5320006201 | Transformer, Power [E, UK, A]                |         |
| 4 - 10   | *5800118600  | Bracket, Transformer                         |         |
| 4 - 11   | *5200029701  | PCB Assy, MECHANISM                          |         |
| 4 - 12   | △ 5052905000 | Spark Killer, 0.1μF + 120Ω/300V [J]          |         |
|          | △ 5052906000 | Spark Killer, 0.33μF + 120Ω/250V [US]        |         |
|          | △ 5052911000 | Spark Killer, 0.033μF + 120Ω/250V [C]        |         |
|          | △ 5292002500 | Spark Killer, 0.01μF/300Ω [GE]               |         |
|          | △ 5267702500 | Spark Killer, 0.047μF/250V [E, UK, A]        |         |
| 4 - 13   | △ 5134018000 | Switch, Power [US, C]                        |         |
|          | △ 5134120000 | Switch, Power [J]                            |         |
|          | △ 5134044000 | Switch, Power [E, UK, A]                     |         |
|          | △ 5134009000 | Switch, Power [GE]                           |         |
| 4 - 14   | *5200029800  | PCB Assy, TIMER                              |         |
| 4 - 15   | *5800118400  | Bracket, Switch                              |         |
| 4 - 16   | *5800116200  | Rod, A                                       |         |
| 4 - 17   | *5800115200  | Spring, Record                               |         |
| 4 - 18   | *5800116600  | Arm Record                                   |         |
| 4 - 19   | *5800112100  | Shaft, Record Arm                            |         |
| 4 - 20   | *5800125801  | Plate, Shield; A                             |         |
| 4 - 21   | 5800119801   | Knob, A                                      |         |
| 4 - 22   | *5200029405  | PCB Assy, REC/PLAY [All except US]           |         |
|          | *5200029415  | PCB Assy, REC/PLAY [US]                      |         |
| 4 - 23   | *5580007000  | Washer, φ3.2 x φ17.8 x t0.8                  |         |
| 4 - 24   | *5800009000  | Bracket, PCB                                 |         |
| 4 - 25   | *5786700300  | Lug, GND                                     |         |
| 4 - 26   | *5800112201  | Chassis, Left                                |         |
| 4 - 27   | *5200030300  | PCB Assy, LED (B)                            |         |
| 4 - 28   | 5800119700   | Button, P                                    |         |
| 4 - 29   | 5800119600   | Button, T                                    |         |
| 4 - 30   | *5800130200  | Spring, GND; B                               |         |
| 4 - 31   | *5800119900  | Counter, Tape                                |         |
| 4 - 32   | *5800145502  | Slider Assy                                  |         |
| 4 - 33   | *5581055000  | Screw, Shoulder; D                           |         |
| 4 - 34   | *5534118000  | Push Rivet                                   | A-400   |
| 4 - 35   | *5800112401  | Chassis, Front                               |         |
| 4 - 36   | *5534448000  | Cushion, Rubber                              | A-103   |
| 4 - 37   | *5200029900  | PCB Assy, REED SWITCH                        |         |
| 4 - 38   | *5200030200  | PCB Assy, LED (A)                            |         |
| 4 - 39   | *5800119402  | Bracket, VR                                  |         |
| 4 - 40   | *5200029601  | PCB Assy, METER                              |         |
| 4 - 41   | 5310005300   | Lamp, DC14V                                  |         |
| 4 - 42   | *5800112600  | Chassis, Right                               |         |
| 4 - 43   | *5200030100  | PCB Assy, FUSE [E]                           |         |
| 4 - 44   | *5200030000  | PCB Assy, DIN [E]                            |         |
| 4 - 45   | 5284005200   | Var. Res., Slide                             |         |

[US]: U.S.A.  
 [A]: AUSTRALIA  
 [J]: JAPAN

[C]: CANADA  
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[GE]: GENERAL EXPORT  
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# ASSEMBLING HARDWARE CODING LIST

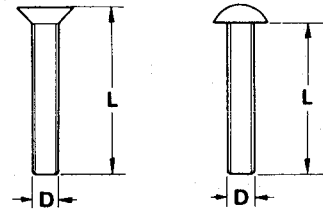
All screws conform to ISO standards, and have crossrecessed heads, unless otherwise noted. ISO screws have the head inscribed with a point as in the figure to the right.



FOR EXAMPLE:

B M 3 x 6

----- Length in mm (L)  
----- Diameter in mm (D) \*  
----- Metric System  
----- Nomenclature

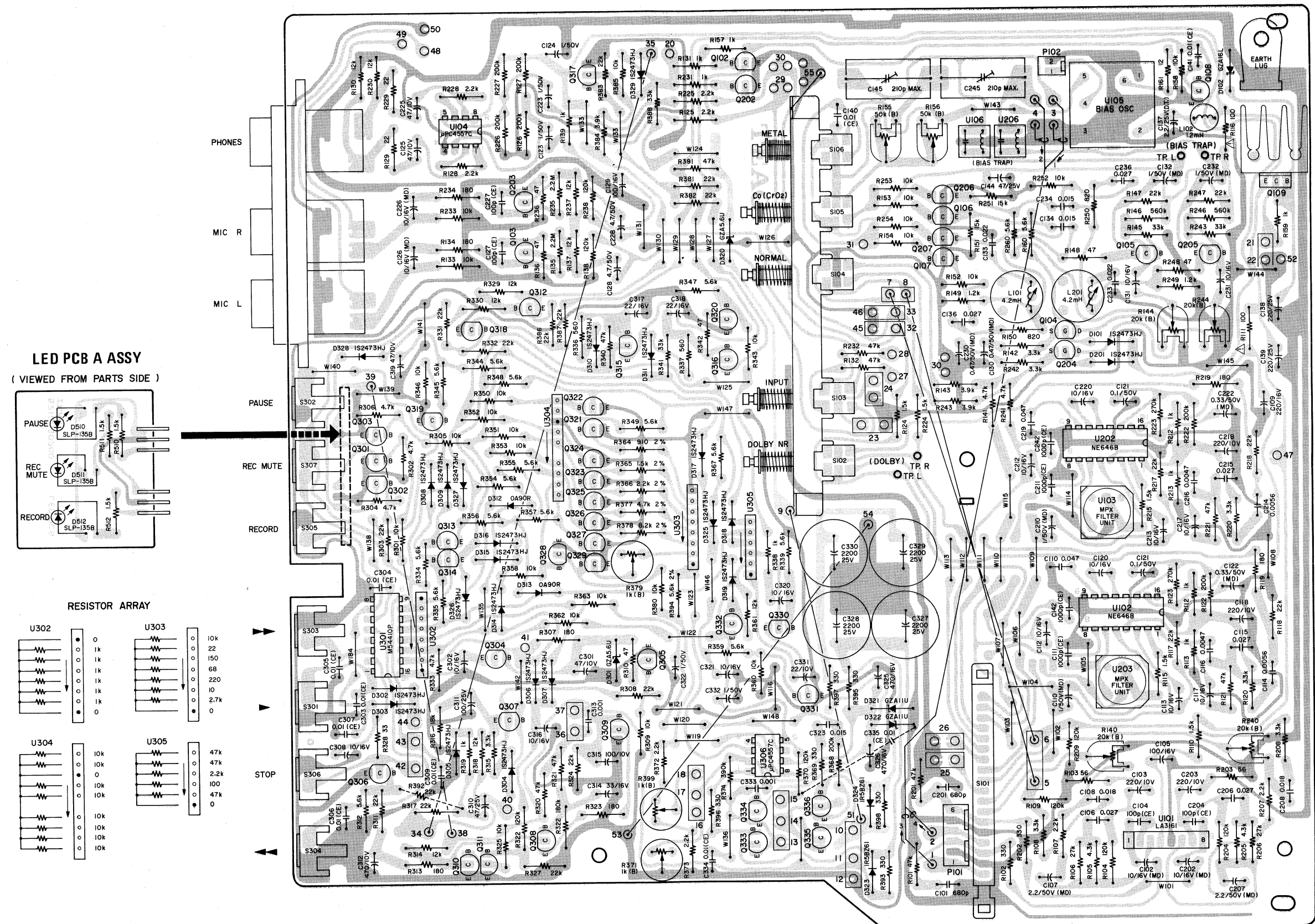


\* Inner dia. for washers and nuts

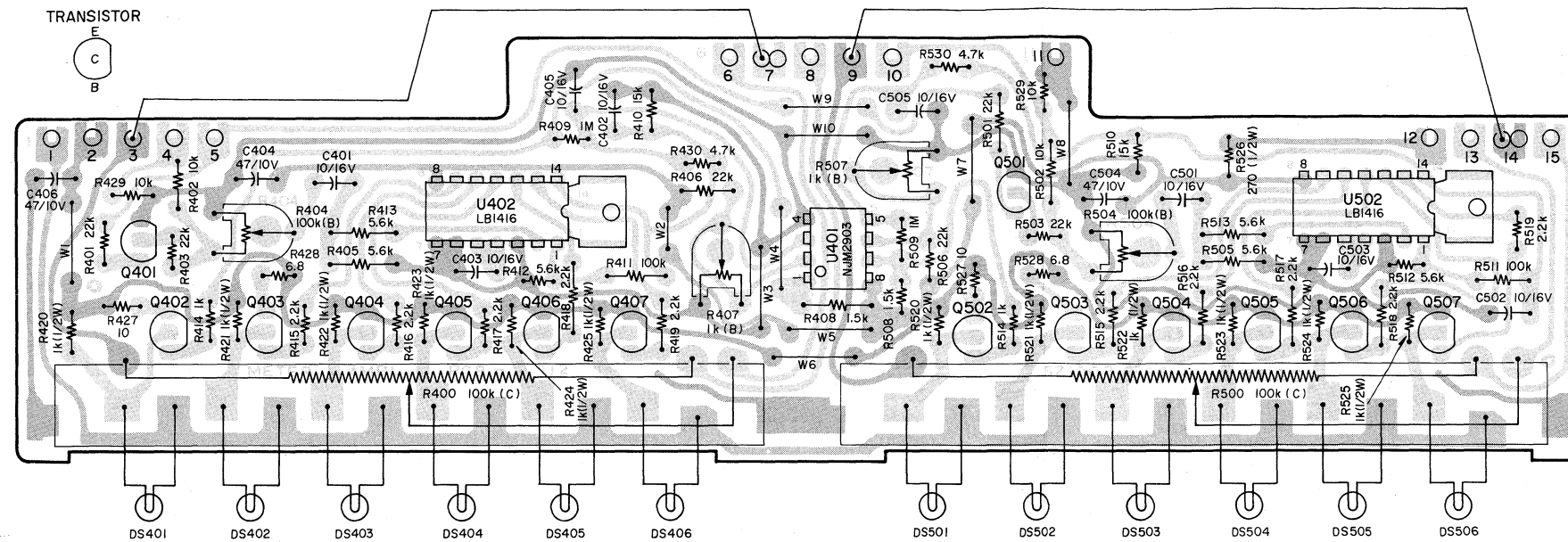
|               | Code       | Name                            | Type |               | Code       | Name                                | Type |
|---------------|------------|---------------------------------|------|---------------|------------|-------------------------------------|------|
| MACHINE SCREW | <b>R</b>   | Round Head Screw                |      | TAPPING SCREW | <b>BTA</b> | Binding Head Tapping Screw(A Type)  |      |
|               | <b>P</b>   | Pan Head Screw                  |      |               | <b>BTB</b> | Binding Head Tapping Screw(B Type)  |      |
|               | <b>T</b>   | Stove Head Screw (Truss)        |      |               | <b>RTA</b> | Round Head Tapping Screw(A Type)    |      |
|               | <b>B</b>   | Binding Head Screw              |      |               | <b>RTB</b> | Round Head Tapping Screw(B Type)    |      |
|               | <b>F</b>   | Flat Countersunk Head Screw     |      | SETSCREW      | <b>SF</b>  | Hex Socket Setscrew(Flat Point)     |      |
|               | <b>O</b>   | Oval Countersunk Head Screw     |      |               | <b>SC</b>  | Hex Socket Setscrew(Cup Point)      |      |
| WOOD SCREW    | <b>RW</b>  | Round Head Wood Screw           |      |               | <b>SS</b>  | Slotted Socket Setscrew(Flat Point) |      |
| TAPTITE SCREW | <b>PTT</b> | Pan Head Taptite Screw          |      | WASHER        | <b>E</b>   | E-Ring (Retaining Washer)           |      |
|               | <b>WTT</b> | Washer Head Taptite Screw       |      |               | <b>W</b>   | Flat Washer (Plain)                 |      |
| SEMS SCREW    | <b>BSA</b> | Binding Head SEMS Screw(A Type) |      |               | <b>SW</b>  | Lock Washer (Spring)                |      |
|               | <b>BSB</b> | Binding Head SEMS Screw(B Type) |      |               | <b>LWI</b> | Lock Washer (Internal Teeth)        |      |
|               | <b>BSF</b> | Binding Head SEMS Screw(F Type) |      |               | <b>LWE</b> | Lock Washer (External Teeth)        |      |
|               | <b>PSA</b> | Pan Head SEMS Screw(A Type)     |      |               | <b>TW</b>  | Trim Washer (Countersunk)           |      |
|               | <b>PSB</b> | Pan Head SEMS Screw(B Type)     |      | NUT           | <b>N</b>   | Hex Nut                             |      |

**PC Boards shown viewed from foil side except LED PCB A ASSY**

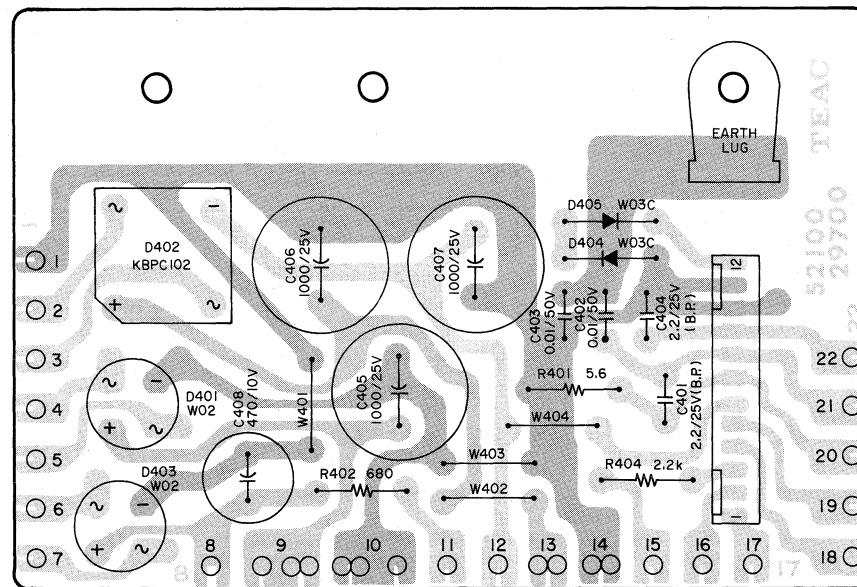
## REC/PLAY AMP PCB ASSY



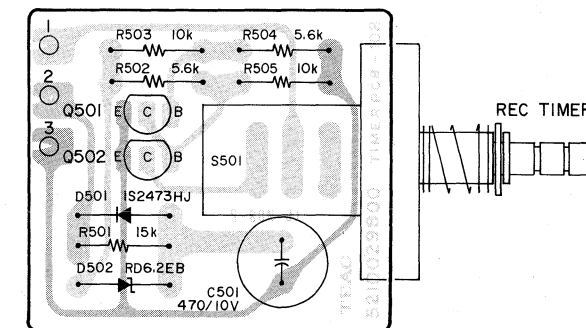
# METER PCB ASSY



## MECHANISM PCB ASSY



## TIMER SW PCB ASSY



### NOTES

- The colors used on the PCB illustrations have the following significance:
  - +B power supply circuit
  - B power supply circuit
  - GND
  - Other
- Resistor values are in ohms (k=1,000 ohms, M=1,000,000 ohms).
- Capacitor values are in microfarads (p=picofarads).
  - (MD) : Electrolytic capacitor MD series
  - (CE) : Ceramic
  - (SC) : Polystyrene
  - (DT) : Dipped Tantalum
  - (BP) : Bipolar
- All non-polarized capacitors are  $\pm 5\%$  Mylar unless otherwise noted.
  - Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.

## REC/PLAY AMP PCB ASSY

| REF. NO.                                                                                   | PARTS NO.           | DESCRIPTION               |
|--------------------------------------------------------------------------------------------|---------------------|---------------------------|
|                                                                                            | 5200029405          | PCB Assy [All except US]  |
|                                                                                            | 5200029415          | PCB Assy [US]             |
|                                                                                            | 5210029400          | PCB [All except US]       |
|                                                                                            | 5210029410          | PCB [US]                  |
| <b>IC's</b>                                                                                |                     |                           |
| U101                                                                                       | 5147062000          | LA3161                    |
| U102, U202                                                                                 | 5147046000          | NE646B                    |
| U104                                                                                       | 5220405000          | $\mu$ PC4557C             |
| U301                                                                                       | 5147047000          | M54410P                   |
| U306                                                                                       | 5220405000          | $\mu$ PC4557C             |
| <b>TRANSISTORS</b>                                                                         |                     |                           |
| Q102, Q202                                                                                 | 5145185000          | 2SD655E                   |
| Q103, Q203                                                                                 | 5042495000          | 2SC1222E                  |
| Q104, Q204                                                                                 | 5145102000          | FET 2SK68AL               |
| Q105, Q205                                                                                 | 5145092000          | 2SC1740LNS                |
| Q106, Q206                                                                                 | 5145092000          | 2SC1740LNS                |
| Q107, Q207                                                                                 | 5145092000          | 2SC1740LNS                |
| Q108                                                                                       | 5145099000          | 2SC1741R                  |
| Q109                                                                                       | 5145087000          | 2SD313E                   |
| Q301~Q303                                                                                  | 5145151000          | 2SC1815GR                 |
| Q304                                                                                       | 5230773800          | 2SC2655Y                  |
| Q305, Q306                                                                                 | 5145151000          | 2SC1815GR                 |
| Q307                                                                                       | 5042553000          | 2SA733P                   |
| Q308~Q311                                                                                  | 5145151000          | 2SC1815GR                 |
| Q312                                                                                       | 5042553000          | 2SA733P                   |
| Q313~Q332                                                                                  | 5145151000          | 2SC1815GR                 |
| Q333                                                                                       | 5230773800          | 2SC2655Y                  |
| Q334                                                                                       | 5230014000          | 2SA1020Y                  |
| Q335                                                                                       | 5230773800          | 2SC2655Y                  |
| Q336                                                                                       | 5230014000          | 2SA1020Y                  |
| <b>DIODES</b>                                                                              |                     |                           |
| D101, D201                                                                                 | 5143118000          | 1S2473HJ                  |
| D102                                                                                       | 5224521700          | Zener, GZA16L             |
| D301                                                                                       | 5224519600          | Zener, GZA5.6U            |
| D302~D311                                                                                  | 5143118000          | 1S2473HJ                  |
| D312, D313                                                                                 | 5224012800          | 0A90R                     |
| D314~D319                                                                                  | 5143118000          | 1S2473HJ                  |
| D320                                                                                       | 5224519600          | Zener, GZA5.6U            |
| D321, D322                                                                                 | 5224521000          | Zener, GZA11U             |
| D323, D324                                                                                 | 5224014000          | 1R5BZ61                   |
| D325~D329                                                                                  | 5143118000          | 1S2473HJ                  |
| <b>CARBON RESISTORS</b>                                                                    |                     |                           |
| All resistors are rated $\pm 5\%$ tolerance and $\frac{1}{4}$ watt unless otherwise noted. |                     |                           |
| R101, R201                                                                                 | 5183122000          | 47k $\Omega$              |
| R102, R202                                                                                 | 5183070000          | 330 $\Omega$              |
| R103, R203                                                                                 | 5183052000          | 56 $\Omega$               |
| R104, R204                                                                                 | 5183132000          | 120k $\Omega$             |
| R105, R205                                                                                 | 5183097000          | 4.3k $\Omega$             |
| R106, R206                                                                                 | 5183116000          | 27k $\Omega$              |
| R107, R207                                                                                 | 5183090000          | 2.2k $\Omega$             |
| R108, R208                                                                                 | 5183094000          | 3.3k $\Omega$             |
| R109, R209                                                                                 | 5183132000          | 120k $\Omega$             |
| R110                                                                                       | 5183086000          | 1.5k $\Omega$             |
| R111                                                                                       | $\Delta$ 5184249000 | 100 $\Omega$ Nonflammable |
| R112, R212                                                                                 | 5183082000          | 1k $\Omega$               |
| R113, R213                                                                                 | 5183082000          | 1k $\Omega$               |
| R115, R215                                                                                 | 5183086000          | 1.5k $\Omega$             |
| R116                                                                                       | $\Delta$ 5184249000 | 100 $\Omega$ Nonflammable |

| REF. NO.   | PARTS NO.  | DESCRIPTION   |
|------------|------------|---------------|
| R117, R217 | 5183114000 | 22k $\Omega$  |
| R118, R218 | 5183114000 | 22k $\Omega$  |
| R119, R219 | 5183064000 | 180 $\Omega$  |
| R120, R220 | 5183094000 | 3.3k $\Omega$ |
| R121, R221 | 5183122000 | 47k $\Omega$  |
| R122, R222 | 5183137000 | 200k $\Omega$ |
| R123, R223 | 5183140000 | 270k $\Omega$ |
| R124, R224 | 5183086000 | 1.5k $\Omega$ |
| R125, R225 | 5183090000 | 2.2k $\Omega$ |
| R126, R226 | 5183137000 | 200k $\Omega$ |
| R127, R227 | 5183137000 | 200k $\Omega$ |
| R128, R228 | 5183090000 | 2.2k $\Omega$ |
| R129, R229 | 5183042000 | 22 $\Omega$   |
| R130, R230 | 5183108000 | 12k $\Omega$  |
| R131, R231 | 5183082000 | 1k $\Omega$   |
| R132, R232 | 5183122000 | 47k $\Omega$  |
| R133, R233 | 5183106000 | 10k $\Omega$  |
| R134, R234 | 5183064000 | 180 $\Omega$  |
| R135, R235 | 5183162000 | 2.2M $\Omega$ |
| R136, R236 | 5183050000 | 47 $\Omega$   |
| R137, R237 | 5183108000 | 12k $\Omega$  |
| R138, R238 | 5183132000 | 120k $\Omega$ |
| R139       | 5183082000 | 1k $\Omega$   |
| R141, R241 | 5183098000 | 4.7k $\Omega$ |
| R142, R242 | 5183094000 | 3.3k $\Omega$ |
| R142, R243 | 5183096000 | 3.9k $\Omega$ |
| R145, R245 | 5183118000 | 33k $\Omega$  |
| R146, R246 | 5183148000 | 560k $\Omega$ |
| R147, R247 | 5183114000 | 22k $\Omega$  |
| R148, R248 | 5183050000 | 47 $\Omega$   |
| R149, R249 | 5183084000 | 1.2k $\Omega$ |
| R150, R250 | 5183080000 | 820 $\Omega$  |
| R151, R251 | 5183110000 | 15k $\Omega$  |
| R152, R252 | 5183106000 | 10k $\Omega$  |
| R153, R253 | 5183106000 | 10k $\Omega$  |
| R154, R254 | 5183106000 | 10k $\Omega$  |
| R157       | 5183082000 | 1k $\Omega$   |
| R158       | 5183106000 | 10k $\Omega$  |
| R159       | 5183082000 | 1k $\Omega$   |
| R160, R260 | 5183100000 | 5.6k $\Omega$ |
| R161       | 5183036000 | 12 $\Omega$   |
| R301       | 5183106000 | 10k $\Omega$  |
| R302       | 5183098000 | 4.7k $\Omega$ |
| R303       | 5183114000 | 22k $\Omega$  |
| R304       | 5183098000 | 4.7k $\Omega$ |
| R305       | 5183106000 | 10k $\Omega$  |
| R306       | 5183098000 | 4.7k $\Omega$ |
| R307       | 5183064000 | 180 $\Omega$  |
| R308       | 5183114000 | 22k $\Omega$  |
| R309       | 5183106000 | 10k $\Omega$  |
| R310       | 5183050000 | 47 $\Omega$   |
| R311       | 5183114000 | 22k $\Omega$  |
| R312       | 5183100000 | 5.6k $\Omega$ |
| R313       | 5183064000 | 180 $\Omega$  |
| R314       | 5183108000 | 12k $\Omega$  |
| R315       | 5183094000 | 3.3k $\Omega$ |
| R316       | 5183112000 | 18k $\Omega$  |
| R317       | 5183114000 | 22k $\Omega$  |
| R318       | 5183108000 | 12k $\Omega$  |
| R319       | 5183082000 | 1k $\Omega$   |
| R320       | 5183122000 | 47k $\Omega$  |
| R321       | 5183122000 | 47k $\Omega$  |
| R322       | 5183132000 | 120k $\Omega$ |

[US]: U.S.A.  
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| REF. NO.          | PARTS NO.  | DESCRIPTION           |
|-------------------|------------|-----------------------|
| R323              | 5183064000 | 180Ω                  |
| R324              | 5183114000 | 22kΩ                  |
| R325              | 5183106000 | 10kΩ                  |
| R326              | 5183114000 | 22kΩ                  |
| R327              | 5183114000 | 22kΩ                  |
| R328              | 5183046000 | 33Ω                   |
| R329              | 5183108000 | 12kΩ                  |
| R330              | 5183108000 | 12kΩ                  |
| R331              | 5183114000 | 22kΩ                  |
| R332              | 5183114000 | 22kΩ                  |
| R333              | 5183098000 | 4.7kΩ                 |
| R334              | 5183100000 | 5.6kΩ                 |
| R335              | 5183100000 | 5.6kΩ                 |
| R336              | 5183076000 | 560Ω                  |
| R337              | 5183076000 | 560Ω                  |
| R338              | 5183082000 | 1kΩ                   |
| R339              | 5183100000 | 5.6kΩ                 |
| R340              | 5183122000 | 47kΩ                  |
| R341              | 5183118000 | 33kΩ                  |
| R342              | 5183050000 | 47Ω                   |
| R343              | 5183106000 | 10kΩ                  |
| R344, R345        | 5183100000 | 5.6kΩ                 |
| R346              | 5183106000 | 10kΩ                  |
| R347~R349         | 5183100000 | 5.6kΩ                 |
| R350~R353         | 5183106000 | 10kΩ                  |
| R354~R357         | 5183100000 | 5.6kΩ                 |
| R358              | 5183106000 | 10kΩ                  |
| R359, R360        | 5183100000 | 5.6kΩ                 |
| R361              | 5183108000 | 12kΩ                  |
| R362, R363        | 5183100000 | 5.6kΩ                 |
| R364              | 5185091000 | 910Ω 2%               |
| R365              | 5185096000 | 1.5kΩ 2%              |
| R366              | 5185100000 | 2.2kΩ 2%              |
| R367              | 5183100000 | 5.6kΩ                 |
| R368              | 5183137000 | 200kΩ                 |
| R369              | 5183070000 | 330Ω                  |
| R370              | 5183132000 | 120kΩ                 |
| R372, R373        | 5183090000 | 2.2kΩ                 |
| R374              | 5183144000 | 390kΩ                 |
| R377              | 5185108000 | 4.7kΩ 2%              |
| R378              | 5185114000 | 8.2kΩ 2%              |
| R380              | 5183106000 | 10kΩ                  |
| R381~R383         | 5183114000 | 22kΩ                  |
| R384              | 5183096000 | 3.9kΩ                 |
| R385              | 5183106000 | 10kΩ                  |
| R386, R387        | 5183114000 | 22kΩ                  |
| R388              | 5183118000 | 33kΩ                  |
| R391              | 5183122000 | 47kΩ                  |
| R392              | 5183114000 | 22kΩ                  |
| R393              | 5183070000 | 330Ω                  |
| R394              | 5185110000 | 5.6kΩ 2%              |
| R395~R398         | 5183070000 | 330Ω                  |
| <b>CAPACITORS</b> |            |                       |
| C101, C201        | 5059827000 | Polyst. 680pF 50V 10% |
| C102, C202        | 5173571800 | Elec. 10μF 16V        |
| C103, C203        | 5173053800 | Elec. 220μF 10V       |
| C104, C204        | 5172312000 | Ceramic 100pF 50V 10% |
| C105              | 5173045800 | Elec. 100μF 16V       |
| C106, C206        | 5170435000 | Mylar 0.027μF 100V 5% |
| C107, C207        | 5173480800 | Elec. 2.2μF 50V       |
| C108, C208        | 5170431000 | Mylar 0.018μF 100V 5% |
| C109              | 5173054800 | Elec. 220μF 16V       |

| REF. NO.                  | PARTS NO.  | DESCRIPTION             |
|---------------------------|------------|-------------------------|
| C110, C210                | 5173556800 | Elec. 1μF 50V           |
| C111, C211                | 5172324000 | Ceramic 0.001μF 50V 10% |
| C112, C212                | 5173010800 | Elec. 10μF 16V          |
| C113, C213                | 5173010800 | Elec. 10μF 16V          |
| C114, C214                | 5170419000 | Mylar 0.0056μF 100V 5%  |
| C115, C215                | 5170435000 | Mylar 0.027μF 100V 5%   |
| C116, C216                | 5170417000 | Mylar 0.0047μF 100V 5%  |
| C117, C217                | 5173010800 | Elec. 10μF 16V          |
| C118, C218                | 5173053800 | Elec. 220μF 10V         |
| C119, C219                | 5170441000 | Mylar 0.047μF 100V 5%   |
| C120, C220                | 5173010800 | Elec. 10μF 16V          |
| C121, C221                | 5173550800 | Elec. 0.1μF 50V         |
| C122, C222                | 5173553800 | Elec. 0.33μF 50V        |
| C123, C223                | 5172992800 | Elec. 1μF 50V           |
| C124                      | 5172992800 | Elec. 1μF 50V           |
| C125, C225                | 5173035800 | Elec. 47μF 10V          |
| C126, C226                | 5173571800 | Elec. 10μF 16V          |
| C127, C227                | 5172312000 | Ceramic 100pF 50V 10%   |
| C128, C228                | 5173006800 | Elec. 4.7μF 50V         |
| C129                      | 5173045800 | Elec. 100μF 16V         |
| C130, C230                | 5173554800 | Elec. 0.47 50V          |
| C131, C231                | 5173010800 | Elec. 10μF 16V          |
| C132, C232                | 5173556800 | Elec. 1μF 50V           |
| C133, C233                | 5170433000 | Mylar 0.022μF 100V 5%   |
| C134, C234                | 5170429000 | Mylar 0.015μF 100V 5%   |
| C136, C236                | 5170435000 | Mylar 0.027μF 100V 5%   |
| C137                      | 5171659000 | Dip. Tant. 2.2μF 25V    |
| C138                      | 5173055800 | Elec. 220μF 25V         |
| C139                      | 5173055800 | Elec. 220μF 25V         |
| C140                      | 5172336000 | Ceramic 0.01μF 50V 10%  |
| C141                      | 5172336000 | Ceramic 0.01μF 50V 10%  |
| C142, C242                | 5172324000 | Ceramic 0.001μF 50V 10% |
| C144                      | 5173037800 | Elec. 47μF 25V          |
| C301                      | 5173035800 | Elec. 47μF 10V          |
| C302                      | 5173010800 | Elec. 10μF 16V          |
| C303~C307                 | 5172336000 | Ceramic 0.01μF 50V 10%  |
| C308                      | 5173010800 | Elec. 10μF 16V          |
| C309                      | 5172336000 | Ceramic 0.01μF 50V 10%  |
| C310                      | 5173037800 | Elec. 47μF 25V          |
| C311                      | 5173046800 | Elec. 100μF 25V         |
| C312                      | 5173071800 | Elec. 470μF 10V         |
| C313                      | 5170401000 | Mylar 0.001μF 100V 5%   |
| C314                      | 5173027800 | Elec. 33μF 16V          |
| C315                      | 5173044800 | Elec. 100μF 10V         |
| C316                      | 5173010800 | Elec. 10μF 16V          |
| C317, C318                | 5173018800 | Elec. 22μF 16V          |
| C319                      | 5173035800 | Elec. 47μF 10V          |
| C320, C321                | 5173010800 | Elec. 10μF 16V          |
| C322                      | 5172992800 | Elec. 1μF 50V           |
| C323                      | 5170429000 | Mylar 0.015μF 100V 5%   |
| C325                      | 5173072800 | Elec. 470μF 16V         |
| C326                      | 5173072800 | Elec. 470μF 16V         |
| C327~C330                 | 5172978800 | Elec. 2200μF 25V        |
| C331                      | 5173017800 | Elec. 22μF 10V          |
| C332                      | 5172992800 | Elec. 1μF 50V           |
| C333                      | 5170401000 | Mylar 0.001μF 100V 5%   |
| C334, C335                | 5172336000 | Ceramic 0.01μF 50V 5%   |
| <b>VARIABLE RESISTORS</b> |            |                         |
| R140, R240                | 5280003602 | Semi-fixed 20kΩ (B)     |
| R144, R244                | 5280003602 | Semi-fixed 20kΩ (B)     |
| R155                      | 5280004002 | Semi-fixed 50kΩ (B)     |
| R156                      | 5280004002 | Semi-fixed 50kΩ (B)     |

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| REF. NO.                  | PARTS NO.  | DESCRIPTION                |
|---------------------------|------------|----------------------------|
| R371                      | 5280025603 | Semi-fixed 1k $\Omega$ (B) |
| R379                      | 5280025603 | Semi-fixed 1k $\Omega$ (B) |
| R399                      | 5280025603 | Semi-fixed 1k $\Omega$ (B) |
| <b>TRIMMER CAPACITORS</b> |            |                            |
| C145, C245                | 5267205300 | 30—210pF                   |
| <b>COILS</b>              |            |                            |
| L101, L201                | 5286000100 | Choke 4.2mH (Variable)     |
| L102                      | 5160151000 | Choke 1.2mH (fixed)        |
| <b>MISCELLANEOUS</b>      |            |                            |
| U103, U203                | 5292802500 | Filter, Low-pass           |
| U105                      | 5292200700 | OSC Unit, 100kHz           |
| U106, U206                | 5286000200 | Coil, Trap; 100kHz         |
| U302                      | 5293000300 | Resistor Array             |
| U303                      | 5293000400 | Resistor Array             |
| U304                      | 5293000500 | Resistor Array             |
| U305                      | 5293000800 | Resistor Array             |
| S101                      | 5300907800 | Switch, Slide; 6-2         |
| S102~S105                 | 5300020600 | Switch, Push; 8-2 (5-gang) |
| S301~S307                 | 5302100500 | Switch, Tact               |
| P101                      | 5122130000 | Connector Plug, 6P (WHT)   |
| P102                      | 5122126000 | Connector Plug, 2P (WHT)   |
| TP1~TP4                   | 5544750000 | Pin (4 used)               |
|                           | 5124063000 | Jack, 3-gang               |
|                           | 5555590000 | Plate, GND; A              |
|                           | 5553132000 | Heatsink                   |

**METER PCB ASSY**

| REF. NO.                                                                                   | PARTS NO.  | DESCRIPTION   |
|--------------------------------------------------------------------------------------------|------------|---------------|
|                                                                                            | 5200029601 | PCB Assy      |
|                                                                                            | 5210029600 | PCB           |
| <b>IC's</b>                                                                                |            |               |
| U401                                                                                       | 5147059000 | NJM2903D      |
| U402, U502                                                                                 | 5220405800 | LB1416        |
| <b>TRANSISTORS</b>                                                                         |            |               |
| Q401, Q501                                                                                 | 5145092000 | 2SC1740LNS    |
| Q402, Q502                                                                                 | 5145099000 | 2SC1741R      |
| Q403, Q503                                                                                 | 5145099000 | 2SC1741R      |
| Q404, Q504                                                                                 | 5145099000 | 2SC1741R      |
| Q405, Q505                                                                                 | 5145099000 | 2SC1741R      |
| Q406, Q506                                                                                 | 5145099000 | 2SC1741R      |
| Q407, Q507                                                                                 | 5145099000 | 2SC1741R      |
| <b>CARBON RESISTORS</b>                                                                    |            |               |
| All resistors are rated $\pm 5\%$ tolerance and $\frac{1}{4}$ watt unless otherwise noted. |            |               |
| R401, R501                                                                                 | 5240171400 | 22k $\Omega$  |
| R402, R502                                                                                 | 5240170600 | 10k $\Omega$  |
| R403, R503                                                                                 | 5240171400 | 22k $\Omega$  |
| R405, R505                                                                                 | 5240170000 | 5.6k $\Omega$ |
| R406, R506                                                                                 | 5240171400 | 22k $\Omega$  |
| R408, R508                                                                                 | 5240168600 | 1.5k $\Omega$ |
| R409, R509                                                                                 | 5240175400 | 1M $\Omega$   |

| REF. NO              | PARTS NO.  | DESCRIPTION                              |
|----------------------|------------|------------------------------------------|
| R410, R510           | 5240171000 | 15k $\Omega$                             |
| R411, R511           | 5240173000 | 100k $\Omega$                            |
| R412, R512           | 5240170000 | 5.6k $\Omega$                            |
| R413, R513           | 5240170000 | 5.6k $\Omega$                            |
| R414, R514           | 5240168200 | 1k $\Omega$                              |
| R415, R515           | 5240169000 | 2.2k $\Omega$                            |
| R416, R516           | 5240169000 | 2.2k $\Omega$                            |
| R417, R517           | 5240169000 | 2.2k $\Omega$                            |
| R418, R518           | 5240169000 | 2.2k $\Omega$                            |
| R419, R519           | 5240169000 | 2.2k $\Omega$                            |
| R420, R520           | 5180082000 | 1k $\Omega$ $\frac{1}{2}$ W              |
| R421, R521           | 5180082000 | 1k $\Omega$ $\frac{1}{2}$ W              |
| R422, R522           | 5180082000 | 1k $\Omega$ $\frac{1}{2}$ W              |
| R423, R523           | 5180082000 | 1k $\Omega$ $\frac{1}{2}$ W              |
| R424, R524           | 5180082000 | 1k $\Omega$ $\frac{1}{2}$ W              |
| R425, R525           | 5180082000 | 1k $\Omega$ $\frac{1}{2}$ W              |
| R526                 | 5180068000 | 270 $\Omega$ $\frac{1}{2}$ W             |
| R427, R527           | 5240163400 | 10 $\Omega$                              |
| R428, R528           | 5240163000 | 6.8 $\Omega$                             |
| R429, R529           | 5240170600 | 10k $\Omega$                             |
| R430, R530           | 5240169800 | 4.7k $\Omega$                            |
| <b>CAPACITORS</b>    |            |                                          |
| C401, C501           | 5173010800 | Elec. 10 $\mu$ F 16V                     |
| C402, C502           | 5173010800 | Elec. 10 $\mu$ F 16V                     |
| C403, C503           | 5173010800 | Elec. 10 $\mu$ F 16V                     |
| C404, C504           | 5173035800 | Elec. 47 $\mu$ F 10V                     |
| C405, C505           | 5173010800 | Elec. 10 $\mu$ F 16V                     |
| C406                 | 5173035800 | Elec. 47 $\mu$ F 10V                     |
| <b>MISCELLANEOUS</b> |            |                                          |
| R400, R500           | 5284005200 | Var. Res., 100k $\Omega$ (C)             |
| R404, R504           | 5280004202 | Var. Res., Semi-fixed; 100k $\Omega$ (B) |
| R407, R507           | 5280002802 | Var. Res., Semi-fixed; 1k $\Omega$ (B)   |

**MECHANISM PCB ASSY**

| REF. NO.                | PARTS NO.  | DESCRIPTION                      |
|-------------------------|------------|----------------------------------|
|                         | 5200029701 | PCB Assy                         |
|                         | 5210029700 | PCB                              |
| <b>DIODES</b>           |            |                                  |
| D401                    | 5228005000 | W02                              |
| D402                    | 5228005100 | KBPC102                          |
| D403                    | 5228005000 | W02                              |
| D404, D405              | 5143315000 | W03C                             |
| <b>CARBON RESISTORS</b> |            |                                  |
| R401                    | 5183028000 | 5.6 $\Omega$ $\frac{1}{4}$ W 5%  |
| R402                    | 5183078000 | 680 $\Omega$ $\frac{1}{4}$ W 5%  |
| R404                    | 5183090000 | 2.2k $\Omega$ $\frac{1}{4}$ W 5% |
| <b>CAPACITORS</b>       |            |                                  |
| C401                    | 5171472000 | Elec. 2.2 $\mu$ F 25V (B.P.)     |
| C402, C403              | 5172336000 | Ceramic 0.01 $\mu$ F 50V 10%     |
| C404                    | 5171472000 | Elec. 2.2 $\mu$ F 25V (B.P.)     |
| C405                    | 5173082800 | Elec. 1000 $\mu$ F 25V           |
| C406, C407              | 5173082800 | Elec. 1000 $\mu$ F 25V           |
| C408                    | 5173071800 | Elec. 470 $\mu$ F 10V            |

[US]: U.S.A.  
[A]: AUSTRALIA  
[J]: JAPAN

[C]: CANADA  
[E]: EUROPE

[GE]: GENERAL EXPORT  
[UK]: U.K.

| REF. NO.             | PARTS NO.  | DESCRIPTION               |
|----------------------|------------|---------------------------|
| <b>MESCELLANEOUS</b> |            |                           |
|                      | 5122136000 | Connector Plug, 12P (WHT) |
|                      | 5555590000 | Plate, GND; A             |

**TIMER SW PCB ASSY**

| REF. NO.                | PARTS NO.  | DESCRIPTION                      |
|-------------------------|------------|----------------------------------|
|                         | 5200029800 | PCB Assy                         |
|                         | 5210029800 | PCB                              |
| <b>TRANSISTORS</b>      |            |                                  |
| Q501, Q502              | 5145092000 | 2SC1740LNS                       |
| <b>DIODES</b>           |            |                                  |
| D501                    | 5143118000 | 1S2473HJ                         |
| D502                    | 5224519700 | Zener, GZA6.2L                   |
| <b>CARBON RESISTORS</b> |            |                                  |
| R501                    | 5183110000 | 15k $\Omega$ 1/4W 5%             |
| R502                    | 5183100000 | 5.6k $\Omega$ 1/4W 5%            |
| R503                    | 5183106000 | 10k $\Omega$ 1/4W 5%             |
| R504                    | 5183100000 | 5.6k $\Omega$ 1/4W 5%            |
| R505                    | 5183106000 | 10k $\Omega$ 1/4W 5%             |
| <b>MISCELLANEOUS</b>    |            |                                  |
| C501                    | 5173071800 | Capacitor, Elec. 470 $\mu$ F 10V |
| C501                    | 5134092000 | Switch, Push 2-2                 |

**LED PCB A ASSY**

| REF. NO   | PARTS NO.  | DESCRIPTION                       |
|-----------|------------|-----------------------------------|
|           | 5200030200 | PCB Assy                          |
|           | 5210030200 | PCB                               |
| R510~R512 | 5183086000 | Carbon Res. 1.5k $\Omega$ 1/4W 5% |
|           | 5122403000 | Pin, Connector                    |
| D510~D512 | 5225005400 | LED, SLP-135B (Red)               |
|           | 5800115900 | Spacer, LED; A                    |

**LED PCB B ASSY (PC Board Omitted)**

| REF. NO. | PARTS NO.  | DESCRIPTION         |
|----------|------------|---------------------|
|          | 5200030300 | PCB Assy            |
|          | 5210030300 | PCB                 |
|          | 5225005400 | LED, SLP-135B (Red) |
|          | 5800116000 | Spacer, LED; B      |

**REED SW PCB ASSY (PC Board Omitted)**

| REF. NO. | PARTS NO.  | DESCRIPTION     |
|----------|------------|-----------------|
|          | 5200029900 | PCB Assy        |
|          | 5210029900 | PCB             |
|          | 5138006000 | Switch, Reed    |
|          | 5534448000 | Cushion, Rubber |

**DIN PCB ASSY [E] (PC Board Omitted)**

| REF. NO | PARTS NO.  | DESCRIPTION     |
|---------|------------|-----------------|
|         | 5200030000 | PCB Assy        |
|         | 5210030000 | PCB             |
|         | 5334010400 | Socket, DIN; 5P |

**FUSE PCB ASSY [E] (PC Board Omitted)**

| REF. NO    | PARTS NO.    | DESCRIPTION           |
|------------|--------------|-----------------------|
|            | 5200030100   | PCB Assy              |
|            | 5210030100   | PCB                   |
| F501       | △ 5041138000 | Fuse, T500mA 250V     |
| F502, F503 | △ 5142189000 | Fuse, T2A 250V        |
| F504       | △ 5041138000 | Fuse, T500mA 250V     |
|            | 5142087000   | Holder, Fuse (8 used) |

[US]: U.S.A.  
[A]: AUSTRALIA  
[J]: JAPAN

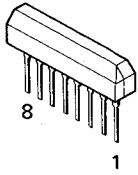
[C]: CANADA  
[E]: EUROPE

[GE]: GENERAL EXPORT  
[UK]: U.K.

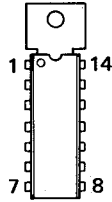


# SEMICONDUCTOR ELECTRODES

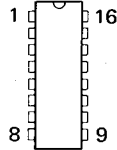
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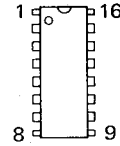
LB1416  
(TOP VIEW)



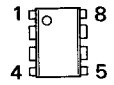
M54410P  
(TOP VIEW)



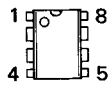
NE646B  
(TOP VIEW)



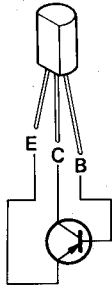
NJM2903D  
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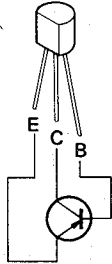
$\mu$ PC4557C  
(TOP VIEW)



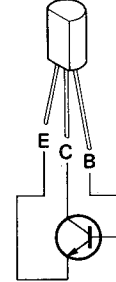
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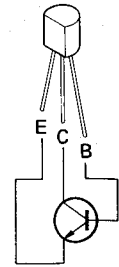
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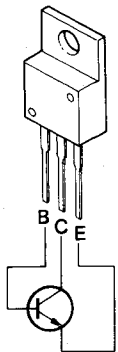
2SC2655Y



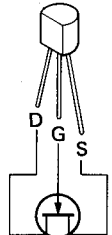
2SC1222E  
2SC1740LNS  
2SC1741R  
2SC1815GR  
2SD655E



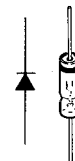
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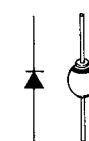
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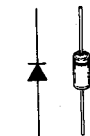
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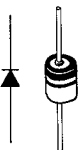
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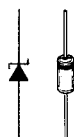
1S2473HJ



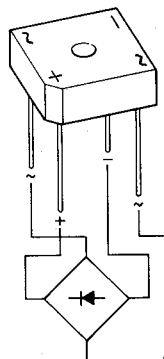
W03C



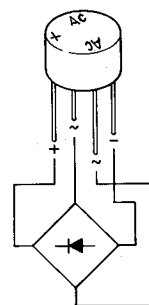
GZA5.6U  
GZA6.2L  
GZA11U  
GZA16L



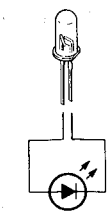
KBPC102



W02



SLP-135B



# V-9

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