

# TOSHIBA

COMPACT DISC DIGITAL AUDIO PLAYER

## XR-Z70/XR-Z70K



Also suitable for:

**Kenwood DP-1100B**

**Uher X-2**

**Luxman DX-103**

**Alpine AD-7200**

**NAD-5200**

### SPECIFICATIONS

Type:	Compact Discplayer with optical pickup	Memory:	Contains up to 16 tracks
Quantization:	16 bit linear	Track Location:	By track and index number
Channels:	2 (stereo)	Power Supply:	220V ~, 50 Hz (for European countries except U.K.)
Frequency Response:	20 Hz - 20 kHz $\pm 0.5$ dB		240V ~, 50 Hz (for United Kingdom and Australia)
Dynamic Range:	Over 90 dB		120V ~, 60 Hz (for U.S.A. and Canada)
Total Harmonic Distortion:	Under 0.007% (1 kHz)	Power Consumption:	22 watts
Channel Separation:	Over 85 dB (1 kHz)	Dimensions:	420(W) x 85(H) x 337(D) mm
Wow and Flutter:	Unmeasurable	Weight:	6.8 kg
Output:	FIXED: 2.0 volts VARIABLE: 0 - 5 volts	Accessories:	Connection cables
Pickup:	Semiconductor laser type		

Specifications are subject to change without notice.

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XR-Z70: FR, TE, TU, AY, TA, TC XR-Z70K: TE, TU

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**Sections 2 - 13 are not scanned because they contain the user manual**

## 1. FEATURES

### ■ Quick Random Access

Permits quick and easy location of the beginning of any track on a disc in the forward or reverse direction.

### ■ 16-Track Memory

Up to 16 tracks can be stored in the memory for play in any order you want.

### ■ Repeat Function

Repeatedly plays an entire disc side or the tracks in the memory with one-touch simplicity.

### ■ Soft-Touch Pushbutton Controls

All controls are feather-touch pushbuttons to make switching quick and responsive.

### ■ Full Range of Indication and Displays

The front panel has eight indicators and three displays to permit quick visual confirmation of all major operating modes.

### ■ Wireless Remote Control

With the optional RM-74 remote control unit, play, pause, memory programming and memory play can be performed without using the front panel controls.

### ■ Multiple Reel Time Display

The time display can be set to show the elapsed playing from the beginning of the disc or each track or the remaining time on a disc.

### ■ Automatic Pause Mode

In this mode, the player switches to the pause mode each time a track ends, a very useful function when using discs for sing-along fun.

**CAUTION:** Before returning the unit to the customer, check that the resistance between both blades of AC plug and any accessible metal parts is more than 3 MΩ after completion of servicing, using the circuit tester. (TA Model only)

## 14. DISASSEMBLY INSTRUCTIONS

### TOP CABINET REMOVAL

1. Remove four screws (A) ( $4\phi \times 6\text{mm}$ ) and two screws (B) ( $3\phi \times 6\text{mm}$ ), and the top cabinet can be removed from unit. (Figure 1, 2 and 3)

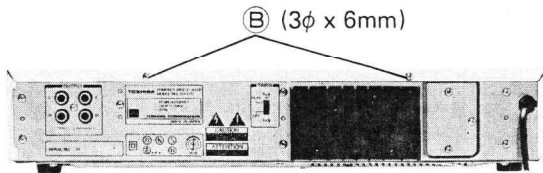


Figure 2

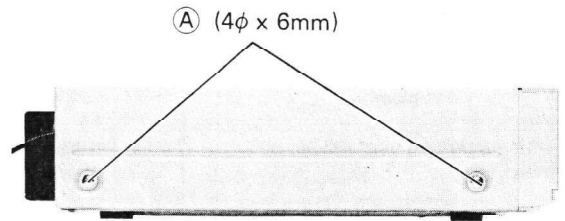


Figure 1

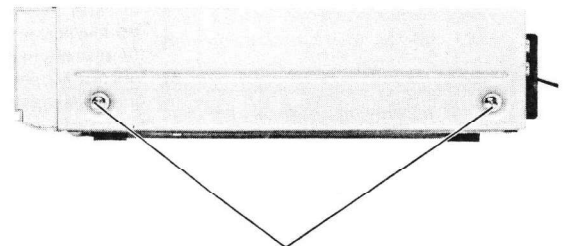


Figure 3

### FRONT PANEL REMOVAL

1. Remove top cover.
2. Turn gear clockwise by your hand, and tray will be opened. (Figure 4)
3. Open disc holder.
4. Remove holder tray panel, while pushing tabs which fix holder tray panel. (Figure 5)
5. Remove two screws (C) ( $3\phi \times 6\text{mm}$ ) securing plate.
6. Close disc holder. (Figure 6)
7. Remove three screws (D) ( $3\phi \times 6\text{mm}$ ), and three screws (E) ( $3\phi \times 8\text{mm}$ ), and the front panel can be removed from unit. (Figure 7 and 8)

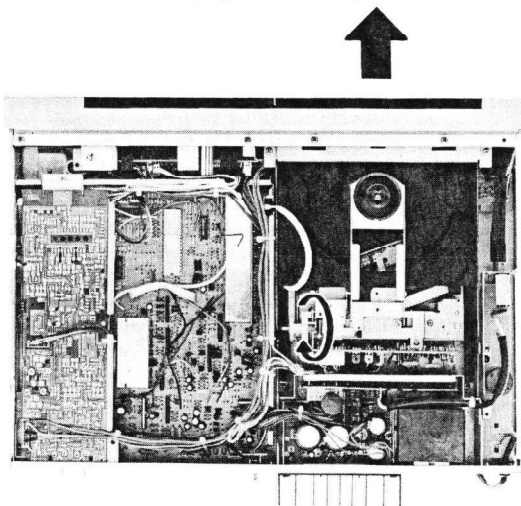


Figure 4

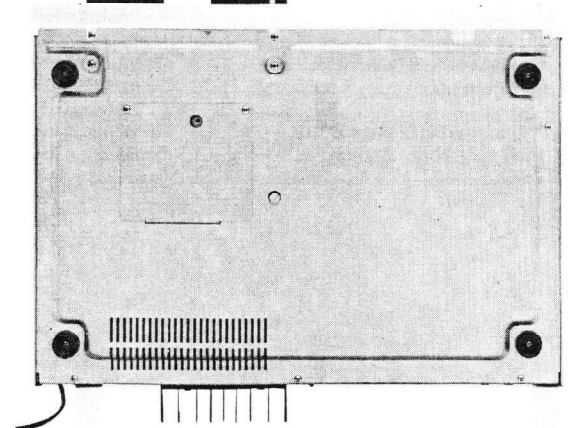
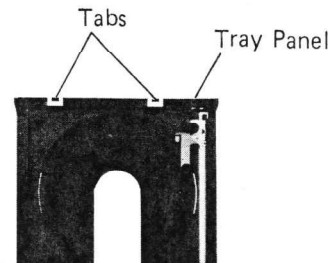


Figure 5

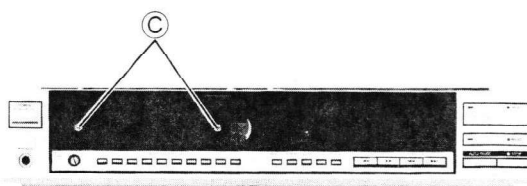


Figure 6

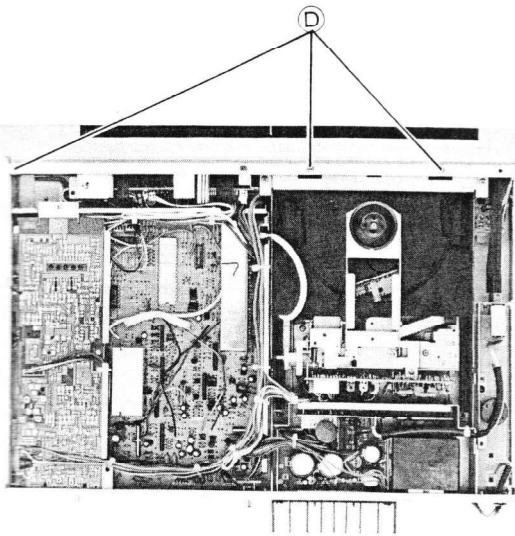


Figure 7

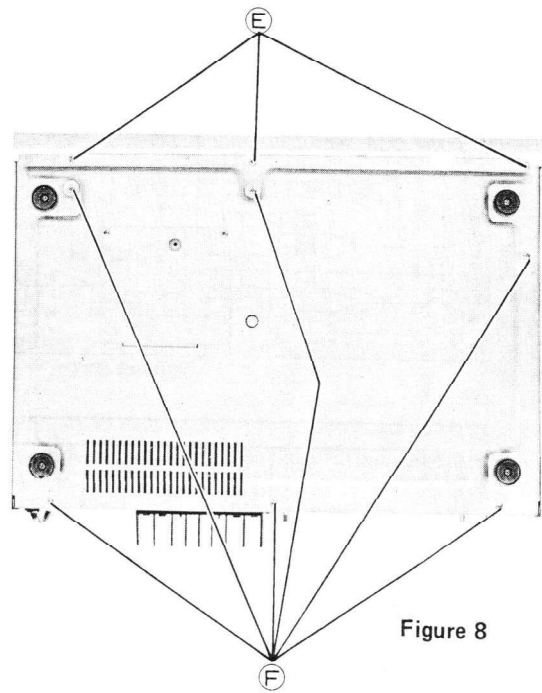


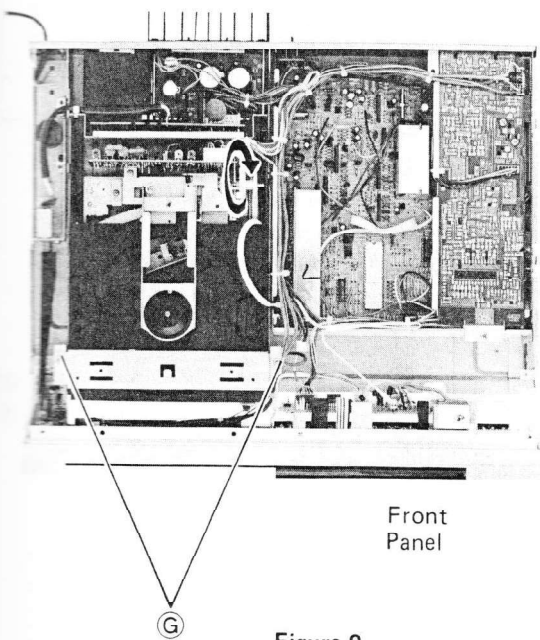
Figure 8

**BOTTOM PLATE REMOVAL**

1. Remove top cover.
2. Remove six screws (F), and bottom plate will be removed. (Figure 9)

**MECHANISM ASS'Y REMOVAL**

1. Leave front panel removed. Open disc holder.
2. Remove stay after removing two screws (G) (3φ x 5mm). (Figure 9)  
Turn gear clockwise by your hand, and tray will be opened.
3. Remove four screws (H) (3φ x 6mm) and the mechanism ass'y can be removed from unit. (Figure 10)



Front  
Panel

Figure 9

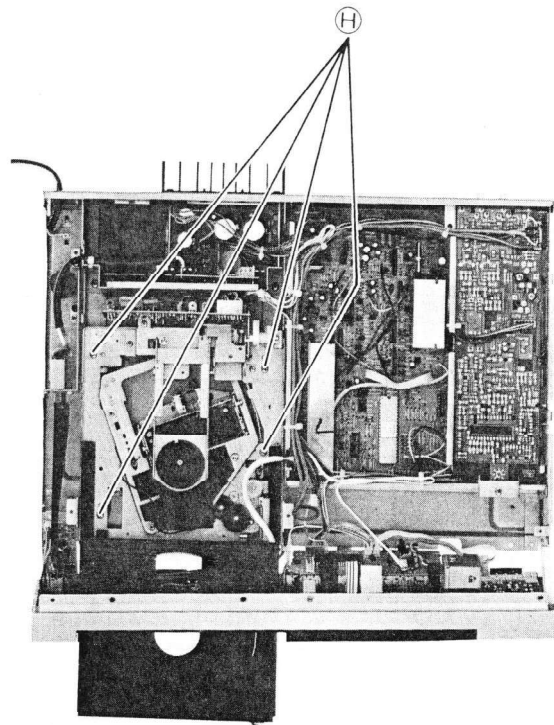


Figure 10

# 15. BLOCK DIAGRAM

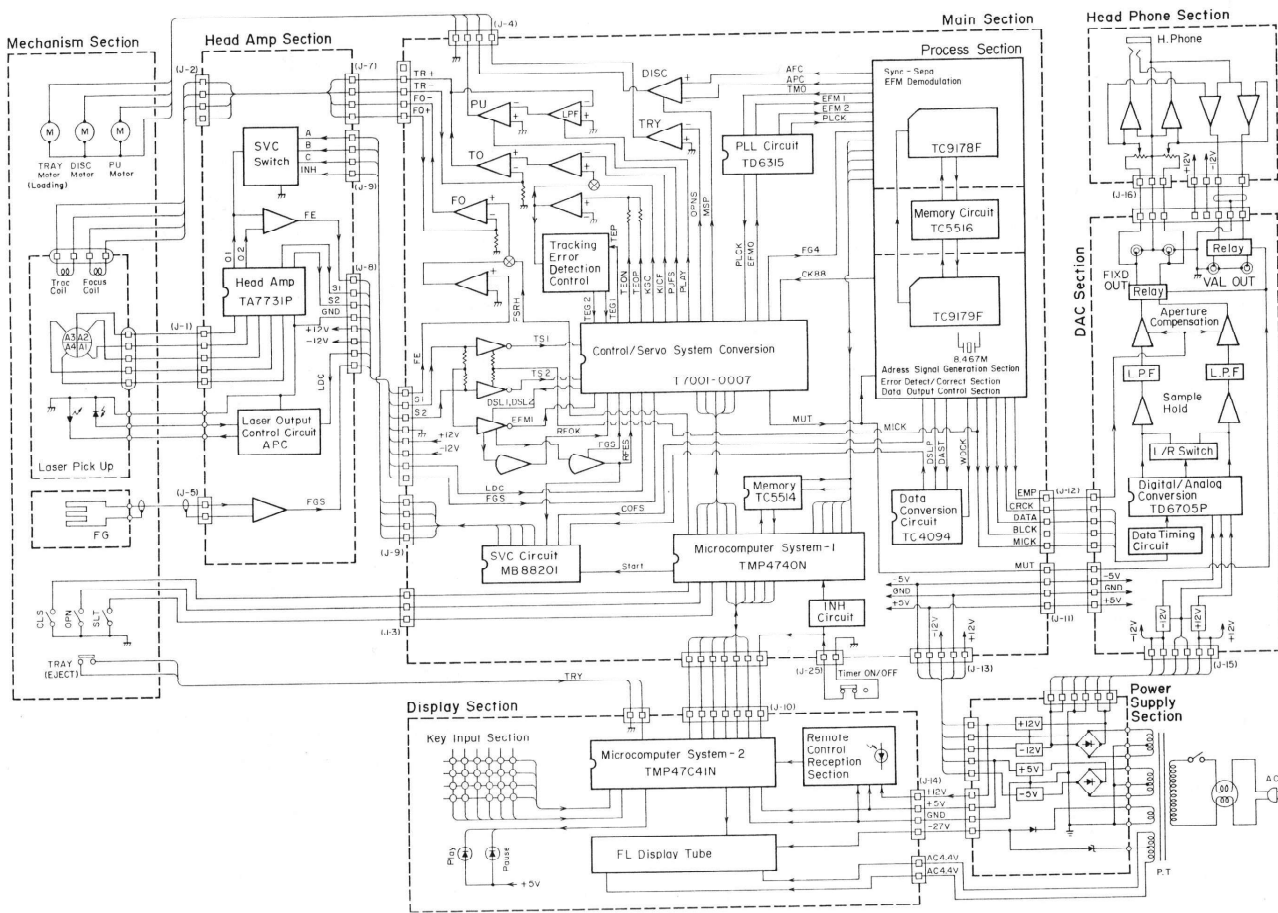


Figure 11

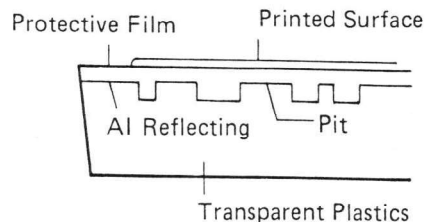
## 16. BRIEF DESCRIPTION ON COMPACT DISC

Conventional 30cm LP and single records are called an "analogue record", whereas an entirely new playback system called a "compact disc system" has been developed. Brief explanations on this are given below.

### 1. Disc

#### (1) Compact disc (CD) system

- In a conventional analogue record playback system, a needle is put on the groove cut in proportion to an amplitude of a signal to read out music signals by picking up vibrations which are produced by contact of the needle with the groove.
- In a compact disc system, on the other hand, a laser beam converged to nearly one micron is replaced with a needle, and is aimed at an array of pits recorded on a disc to convert variations of light reflection from the pits into digital signals. Therefore, it is not necessary to contact with the disc to produce music signals and the digital signals thus developed are processed with signal processing circuits to reproduce an original sound.



#### (2) DISC has two sides: signal side and label side

- A disc is 12 cm in diameter and 1.2mm thick, and signals are recorded in its non-label side.
- A laser beam of nearly  $800\mu\text{m}$  in the wavelength is directly hit to a disc from its transparent plastic side and reflected at an aluminium reflecting plane to generate a small digital signal, which is consisting of 1 and 0 according to the reflecting factor, with the aid of a photodiode.
- Now imagine it as a TTL auto-focus camera which is a present mainstay in the camera field. The reflecting plane of a disc is a subject. To take out signals uninterruptedly, the camera (laser beam) focus is always being controlled so that the beam spot is focused and a pit array (called a track) is passed through the center of the lens by manipulating the lens back and forth, and right and left.
- In order to obtain the spot about  $1\mu\text{m}$  dia. on the Al reflecting plane, scars and stains on the surface of transparent plastics are the biggest deterrent. Furthermore, because there are important pits just beneath the printing surface separated by a thin protective film, the pits would be damaged even writing down with a pencil or ballpoint pen.

**Note:** The diameter of a pit is as small as  $0.6\mu\text{m}$ .

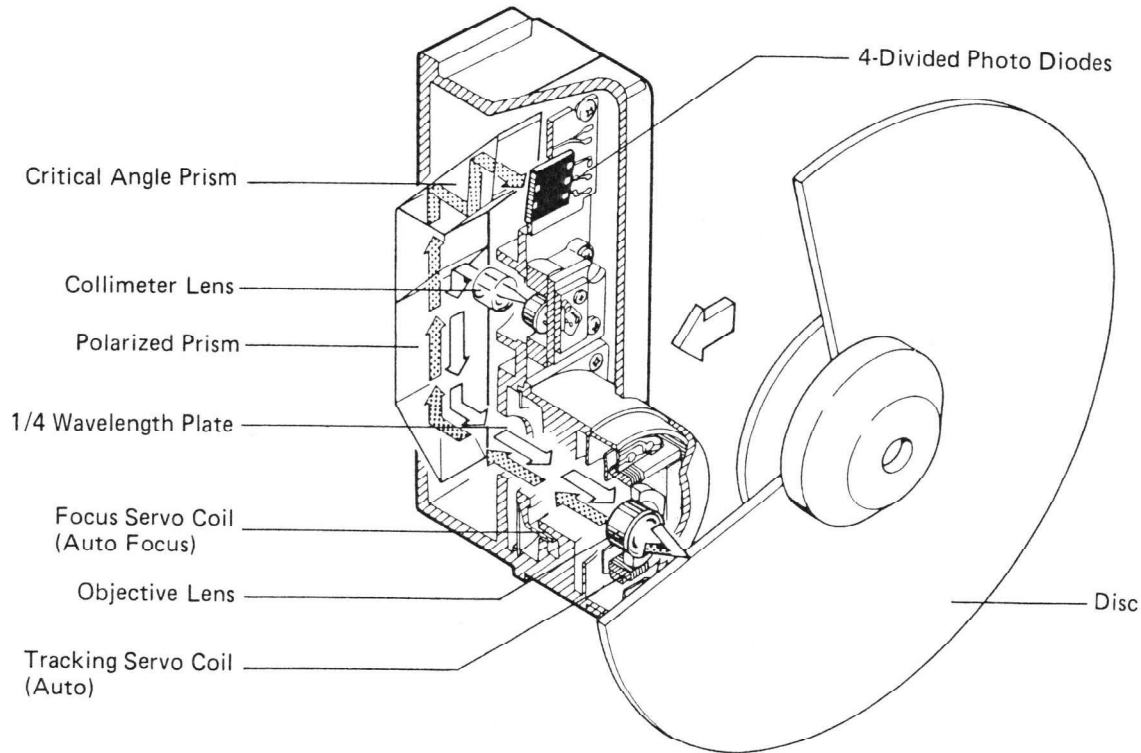
### 2. CD System

#### (1) What kinds of signals are recorded?

- Let's a little more think of a digital signal although this was discussed earlier a couple of times. The packages of a 136 units-per-second signal series (called a frame) are delivered in succession. Analyzing more this package, you can find that it is consisting of 588 bits of 1 or 0. Roles of these 588 bits can be categorized into lots of roles as a music signal which is the mainstay, as a time indication signal, as an inter-music pause signal, etc.

- **TRACK NO.**  
This is usually called a music number. Each music is numbered, and it is given in the descriptions of the disc you have bought. Memorying or searching can be conducted by using this number. (This is also called a "TNO".) This is usually 01 to 99 except some discs starting from a number except 01 (for example, 03 or 04).
  - **INDEX NO.**  
This is used for subdividing one music number. In case of classic musics, each movement or each theme would be numbered. Some sets do not employ this numbering system due to a technical problem, but with XR-Z70, this system is employed to serve for memorying or finding out of a heading address.
  - **TIME**  
This indicates a playback time passing since the start of a track in minutes and in seconds. This is controlled by a quartz, so that the time is quite precise.
  - **A. TIME (Absolute Time)**  
With XR-Z70, this time is not indicated but plays the important role inside the set.
  - **TOC (Table of Contents)**  
On the beginning part of a disc, all of data including the number of musics, a music length, etc. have been recorded. With XR-Z70, because all data are first read out to a memory, an entered datum is compared with its corresponding correct recorded information to display an error indication, for example in case of misoperation of TEN KEY's.
  - **ERROR, CORRECTING SIGNAL, ETC.**  
These are used in internal circuits and serve for correcting errors in which 1 and 0 are changed to 0 and 1, respectively, due to some causes. There are several kinds of signals except these signals.
- (2) The revolving speed of DISC is varied within the range of 500 r.p.m. to 200 r.p.m.
- The playback operation is started from the inner radius of a disc to its outer radius, but the speed of the pit array (track) being scanned beneath the focus point of the laser beam is always kept constant (constant linear velocity: CLV), so that the rotating speed is high at the inner radius of the disc and lower as farther from the center of the disc. After listening to a music at the inner radius, you could find that the revolving speed is sharply changed if you listen to a music at the outer radius.
  - While XR-Z70 employs a constant linear velocity system, conventional analogue records employ a constant revolving speed system. In the compact disc, the rotation is controlled by a control signal obtained from the disc to keep the linear velocity constant.
- (3) Performance is uniform and yet superb
- As you know, transmission of a digital signal is almost not degraded provided that the signal is properly processed. No degradation of a signal during transmission from a recording site to your playback system is the key feature of a digital audio disc (CD system).
  - A flow of audio signals which are varied every moment is sampled at the rate of as high as 44,100 times and the sampled data are represented in terms of 65,536 kinds of data called 16 bit data. With this CD system XR-Z70, signals from a recording site are first converted into digital data of 16-bits ( $2^{16} = 65,536$ ) and then transmitted to your compact disc playback system.
  - The frequency response is almost flat over the range of 4 Hz to 20 kHz. With an analogue transmission peaks or dips appear at some locations, so that it is very difficult to obtain a flat characteristic such as with XR-Z70.
  - The dynamic range is over 90 dB. Noises are almost not the least heard. In an analog system, signal levels to be handled are limited due to increased distortion caused by amplitude limit depending upon characteristic of circuits and components and frequency band limit, but a 16-bit digital signals are not subject to these limitations, achieving the dynamic range as wide as over 90 dB. (For the SN ratio too, the same can be determined.)

- What is the reason why the wow and flutter figure is smaller than the measuring limit? It is that signals read out of a disc are first sorted in a memory and then fed in turn to a D/A converter (A circuit for converting a digital signal to an analogue signal) at a precisely-fixed tempo controlled with a quartz oscillator to reproduce original sounds.



## 17. CAUTIONS ON REPLACEMENT OF PICK-UP

1. When removing the laser pick-up, temporarily connect (solder) the terminals to which red and black leads have been connected to protect the laser pick-up from damage which would be caused during removal work of the pick-up.
2. Disconnect the connector and leads after completion of soldering. Do not touch the terminals on the pick-up by your hand.
3. When mounting a new laser pick-up, first connect the connector and leads and then remove short-circuit spring on the P.C. Board (Refer to Fig. 14 and 15).

When mounting the laser pick-up, the terminals (red and black) of which were soldered in the step 1. above, first connect the connector and leads before unsoldering the terminals (red and black). (Refer to Fig. 15)

\* Use a soldering iron grounded (or iron less leakage).

\* Cover the working bench with a conductive mat which is also grounded.

- Before proceeding job, always touch the conductive mat or ground lead with your both hand to discharge electric charges developed on your body.



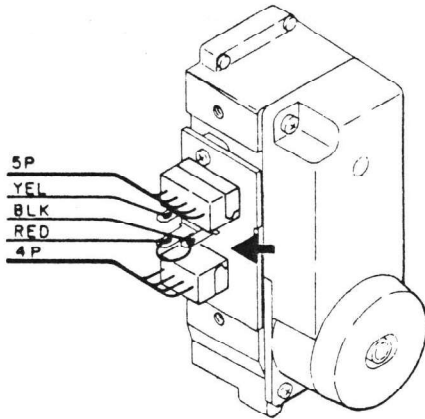


Figure 12

Solder or short-circuit these two terminals before disconnecting the connector leads.

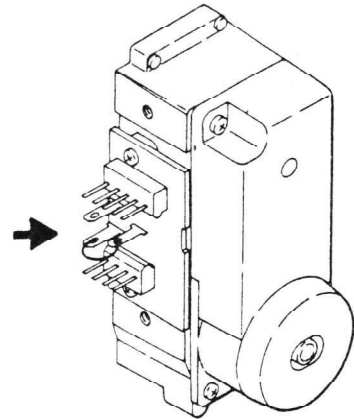


Figure 13

The terminals short-circuited.

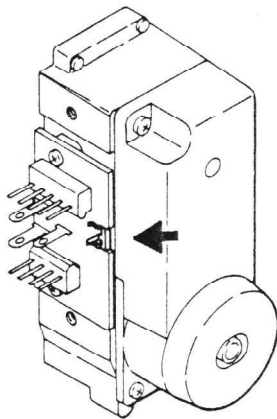


Figure 14

Shorting spring (to short-circuit the terminals)

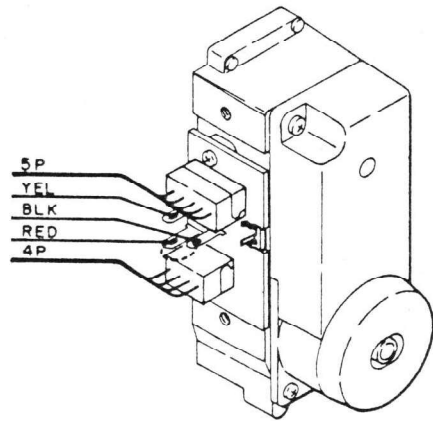
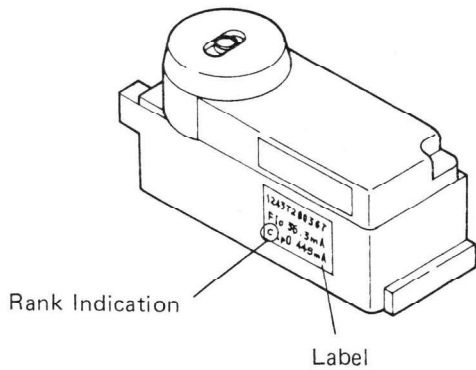


Figure 15

Remove the shorting spring after connection of the connector and leads have been completed.  
Shorting spring

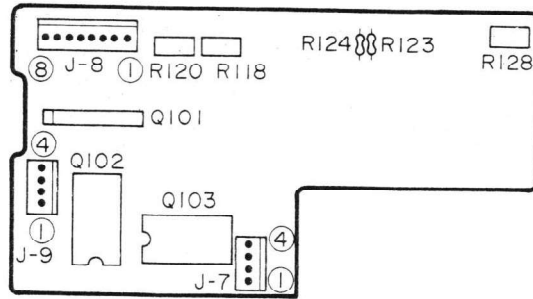
### RANKS OF PICK-UP

The pickups are divided into two rank groups, B and C, and one of ranks is indicated on a label put on a side of the pickup as shown. When a new pickup having the same rank as one of the pickup to be replaced is replaced, no additional resistor replacement is required. However, when the pickup has a different rank, one resistor must be changed as tabulated below, depending on the rank of the pickup to be replaced.

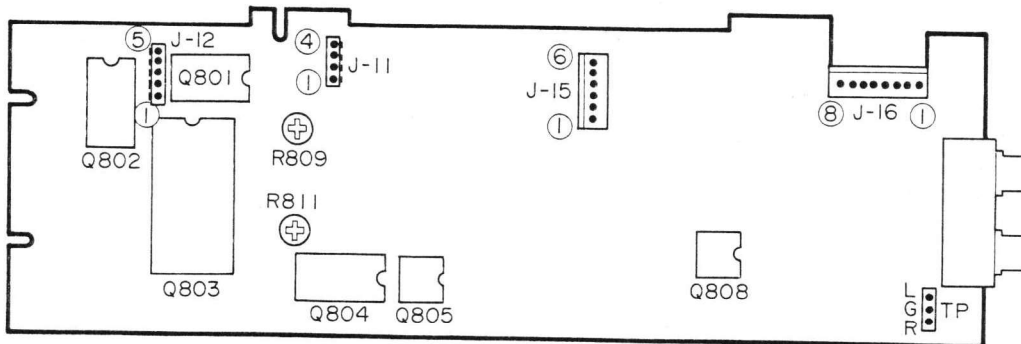


Symbol No.	R124	R123
Rank B	Use 12K ohm	Remove
Rank C	Remove	Use 4.7K ohm

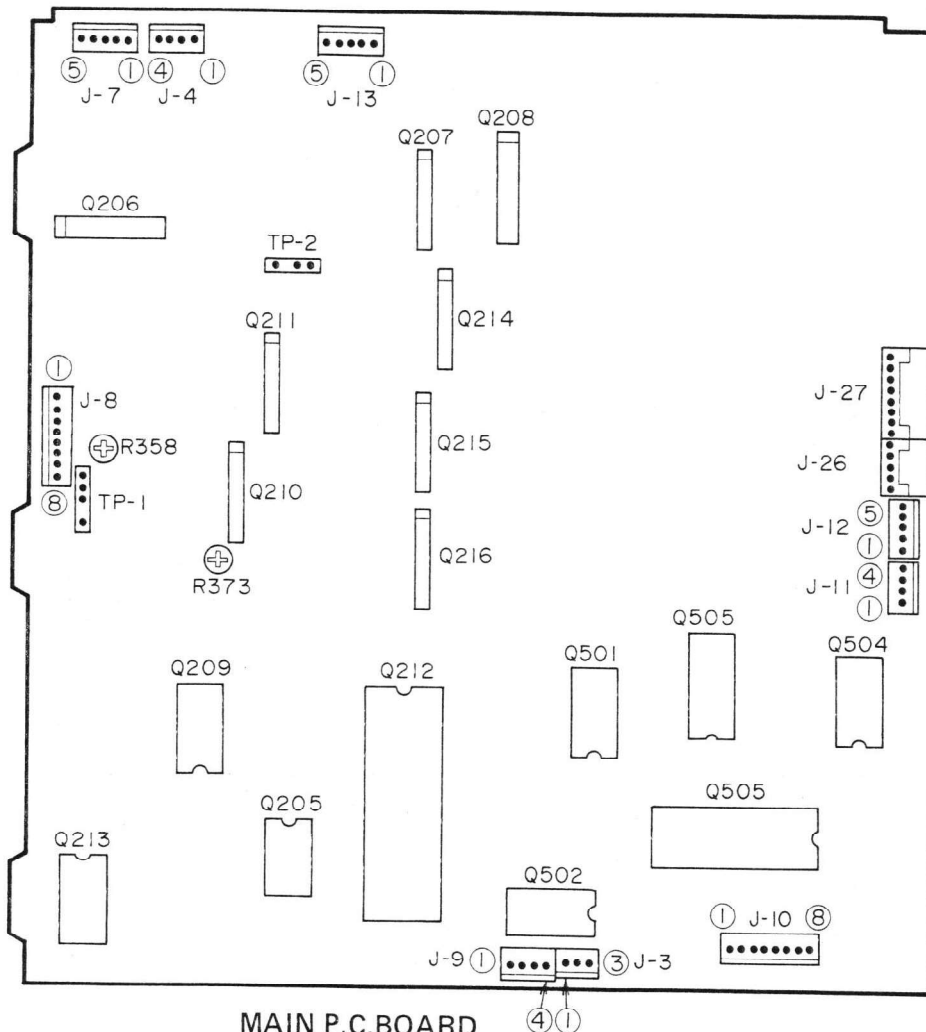
## 18. ADJUSTMENTS



HEAD AMP P.C. BOARD



DAC P.C. BOARD



MAIN P.C. BOARD

Figure 16

### Measurement Jigs

1. Laser Power Checker    3. PU Alignment Jig    5. AC millivoltmeter    8. Oscillator  
2. Oscilloscope    4. Tester    6. Error Checker    9. Test Disc

Step	Measurement Item	Measurement Reference Value	Disc	Operation Button	Test Point	Adjustment Point	Test/Setup	Note
1	Laser Power Adjustment	Light output 300 $\mu$ W	Not loaded	Power ON	Pick-up actuator (Lens)	R128	Figure 17 and 18	Disconnect pin 6 of J8 on Mecha. P.C. Board and short-circuit pin 6 and 7.
2	Focus Offset Adjustment	DC 0 $\pm$ 0.1V	Not loaded	Power ON	J-8 pin 8	R118	Figure 19	
3	Pick-up Height Adjustment	$\pm$ 0.1V DC 0 DC 0 $\pm$ 0.1V	TYPE A	PLAY	J-7 pin 4	Pick-up Lower side	Figure 20	
4	Pick-up Tangential Direction Adjustment	Jitter meter min.	TYPE A	PLAY	Q212 Pin 41	Pick-up Lower side	Figure 21	
5	PU Radial Direction Adjustment	AC voltage min.	TYPE A	PLAY	TP-2 pin 1 Q209 pin 10	Pick-up Lower side	Figure 22	
6	Servo Control Adjustment	Correction factor (1 sec) 300 $\sim$ 1200	TYPE A	PLAY	Main P.C. Board J-27, J-26, J-9 Mecha. P.C. Board J-9	R120	Figure 23	
7	Repeat steps 4 via 6.							

### Servo Circuit Adjustment

Step	Measurement Item	Measurement Reference Value	Disc	Operation Button	Test Point	Adjustment Point	Test/Setup	Note
1	Focus Gain Adjustment	AC 50mV RMS	TYPE	PAUSE	Main P.C. Board TP-1	R358	Figure 24 and 25	
2	Tracking Gain Adjustment	AC 50mV RMS	TYPE	PLAY	Main P.C. Board TP-2	R373	Figure 26 and 27	

### Analog Circuit Adjustment

Step	Measurement Item	Measurement Reference Value	Disc	Operation Button	Test Point	Adjustment Point	Test/Setup	Note
1	DC Offset Adjustment	DC 0V $\pm$ 50mV	TYPE	PAUSE	Dac P.C. Board TP-R, TP-L	R809 R811	Figure 28	

### Laser Power Adjustment

1. Disconnect pin ③ of J8 on Mecha. P.C. Board, and short-circuit pin ② and ③.
2. Turn power on with disc not loaded.
3. Couple laser power checker probe to actuator (lens) section of pick-up;
4. Adjust R128 so that laser power checker indicates  $300\mu\text{W}$ .

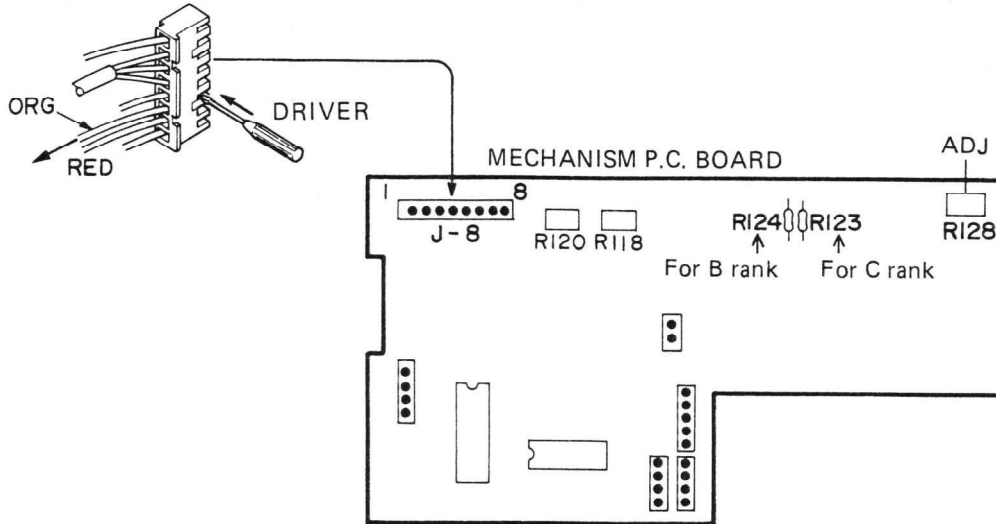


Figure 17

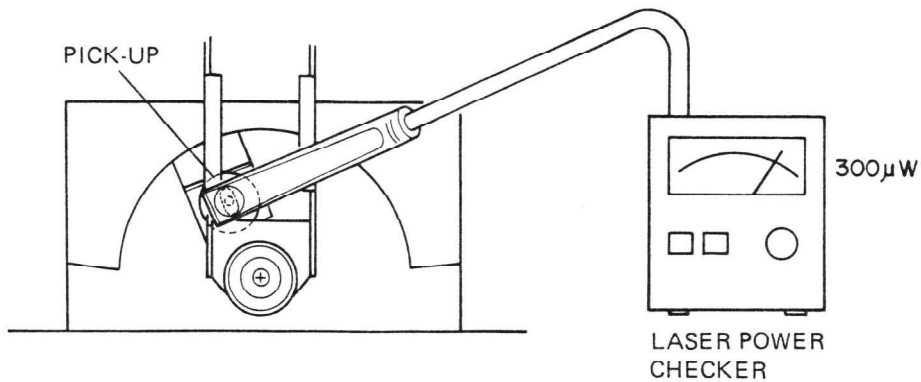


Figure 18

### Focus Offset Adjustment

1. Connect pin ⑧ of J-8 on Mecha. P.C. Board to circuit tester or oscilloscope.
2. Turn power on with disk not loaded.
3. Adjust R118 until  $0\text{V} \pm 0.1\text{V}$  DC is obtained.

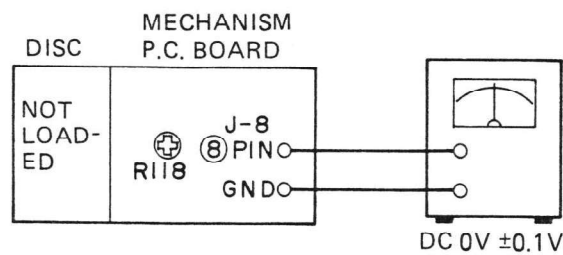


Figure 19

### Pick-up Height Adjustment

1. Remove sub-bottom plate.
2. Connect oscilloscope to pin ④ of J7 on Main P.C. Board.
3. Set the unit to PLAY mode with disc loaded. Adjust three pick-up adjustment screws ① of Mecha. assembly so that oscilloscope wave form is within  $\pm 0.1V$ .

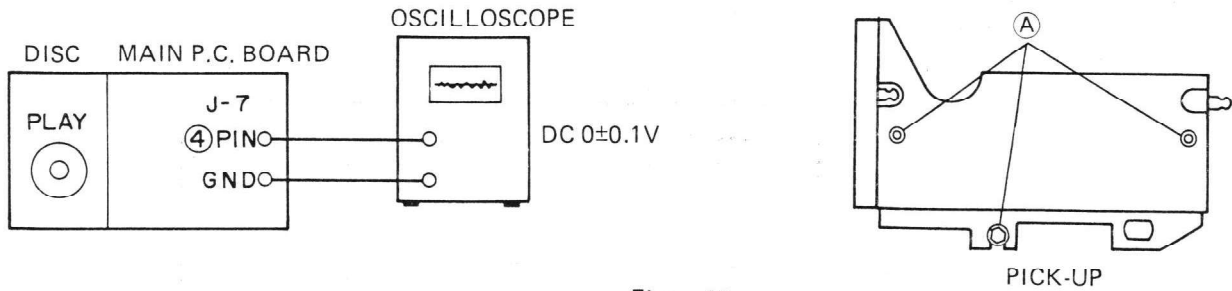


Figure 20

### Pick-up Tangential Direction Adjustment

1. Connect JITTER IN terminal of PU Alignment Jig to pin ④ of Q212 on Main P.C. Board.
2. Set the unit to PLAY mode with disc loaded. Adjust three pick-up adjustment screws ① of Mecha. assembly so that jitter meter of PU Alignment indicates minimum.

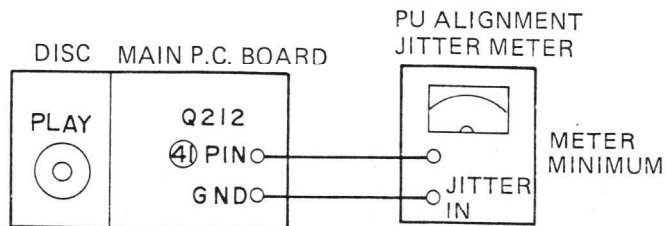


Figure 21

### Pick-up Radial Direction Adjustment

1. Connect TE IN terminal of PU Alignment Jig to pin ① of TP-2 and pin ⑩ of Q209. Connect AC millivoltmeter to TE OUT terminal of PU Alignment Jig.
2. Set the unit to PLAY mode with disc loaded. Adjust three pick-up adjustment screws ① so that AC millivoltmeter indicates minimum.

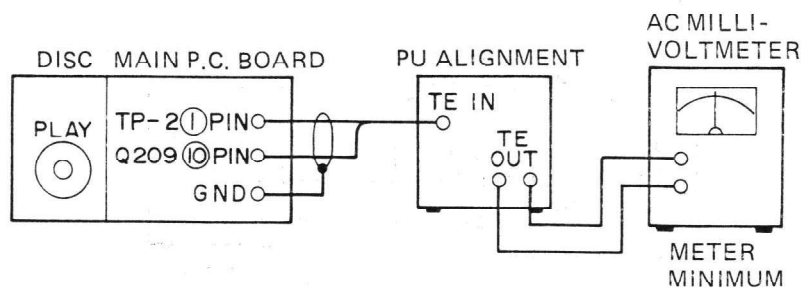


Figure 22

### Servo Control (SVC) Adjustment

1. Connect Error Checker to pin ⑤ of J-26 and pin ⑧ of J-27 on Main P.C. Board.
2. Connect PU Alignment Jig to pin ④ of J-9 on Main P.C. Board and pin ④ of J-9 on Mecha. P.C. Board.
3. Set the unit to PLAY mode with disc loaded.
4. Adjust R120 on Mecha. P.C. Board so that Error Checker indicates correction factor (per/1 sec) of 300 ~ 1200 with SVC switch of PU Alignment Jig set to MANUAL position.

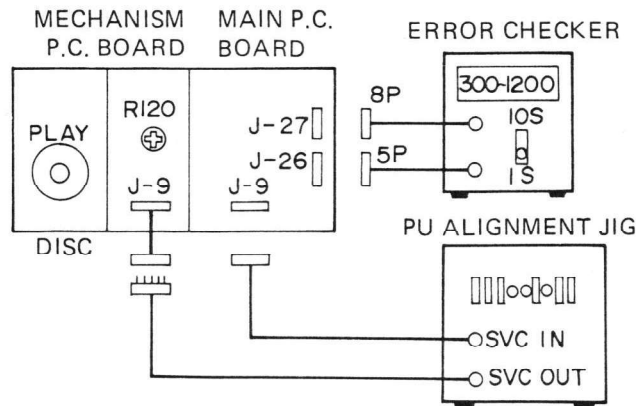


Figure 23

5. Make sure that SVC LEDs on PU alignment jig vary 2 → 1 → 0 → -1 → 0 → 1 → 2 in this sequence when the unit mode is changed from STOP to PLAY with SVC switch on PU Alignment Jig placed in AUTO position.

### Focus Gain Adjustment

1. Connect PU Alignment Jig with TP-1 on Main P.C. Board.
2. Connect AC millivoltmeter and oscillator with PU Alignment Jig.
3. Set the unit to PAUSE mode with disc loaded.
4. Set CAL/OFF switch to CAL position and ON/OFF switch to OFF position.  
Adjust oscillator to provide 50mV RMS output at 1 KHz when measured with AC millivoltmeter.

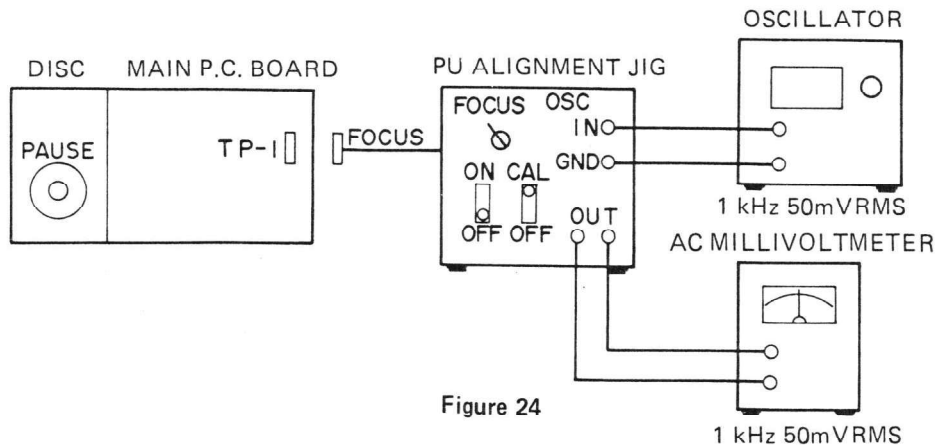


Figure 24

5. Set CAL/OFF switch to OFF and ON/OFF switch to OFF position.  
Adjust R358 on Main P.C. Board so that AC millivoltmeter indicates 50mV RMS at 1 KHz.

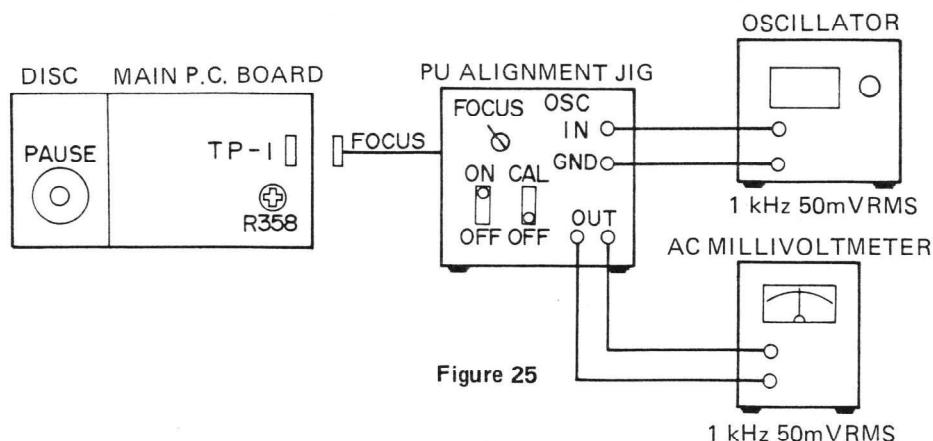


Figure 25

### Tracking Gain Adjustment

1. Connect PU Alignment Jig to TP-2 on Main P.C. Board.
2. Connect AC millivoltmeter and oscillator to PU Alignment Jig.
3. Set the unit to PAUSE mode with disk loaded.
4. Set CAL/OFF switch of PU Alignment Jig to CAL and ON/OFF switch of PU Alignment to OFF. Adjust oscillator to provide 50mV RMS output at 1.8 KHz when measured with AC millivoltmeter.

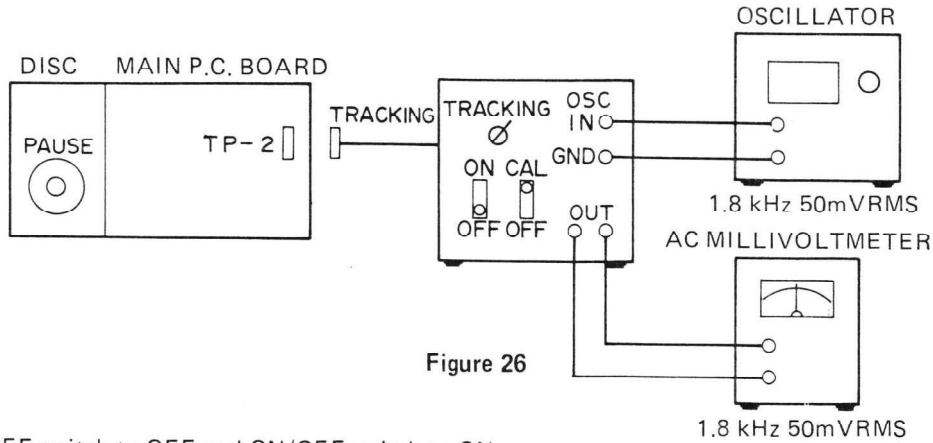


Figure 26

5. Set CAL/OFF switch to OFF and ON/OFF switch to ON. Adjust R373 on Main P.C. Board so that AC millivoltmeter indicates 50mV RMS at 1.8 KHz.

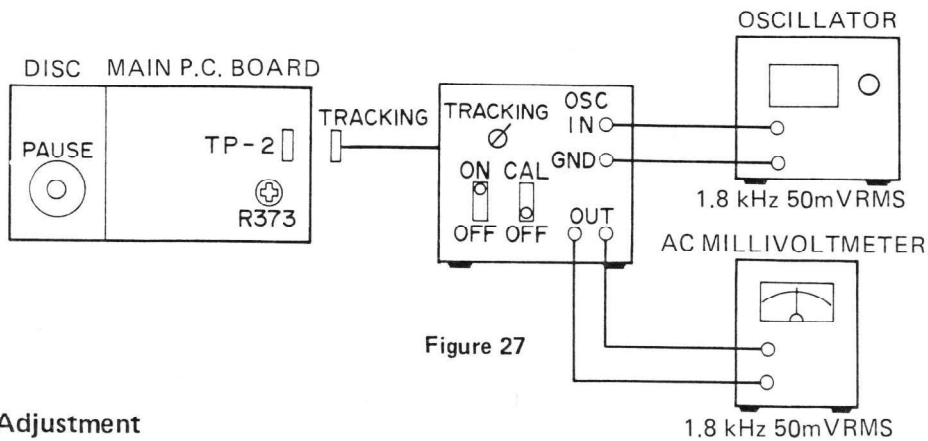


Figure 27

### DC Offset Adjustment

1. Connect TP-R or TP-L on DAC P.C. Board to circuit tester or oscilloscope.
2. Set the unit to PAUSE mode with disk loaded.
3. Adjust R809 or R811 until 0V  $\pm$ 50mV DC is obtained.

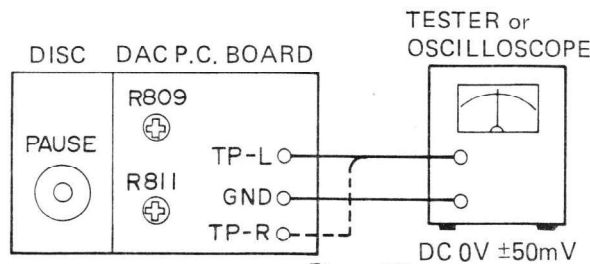


Figure 28

### Clamper Height Adjustment

1. Turn gear clockwise for clamper to hold disc.
2. Adjust screw so that height ratio of lever to clamper becomes 3:2 as illustrated.

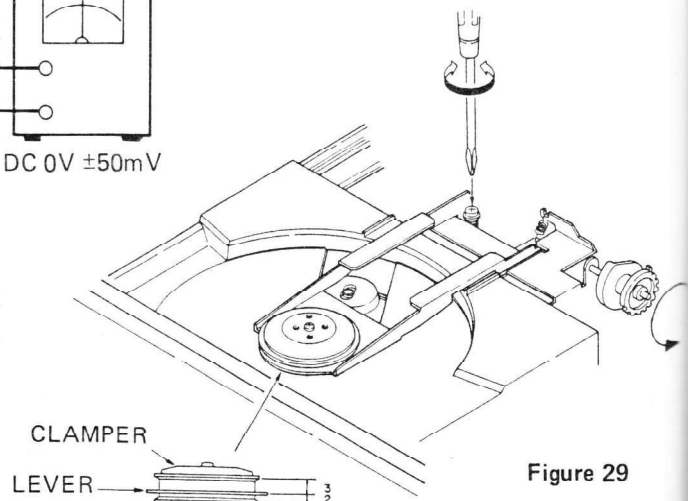
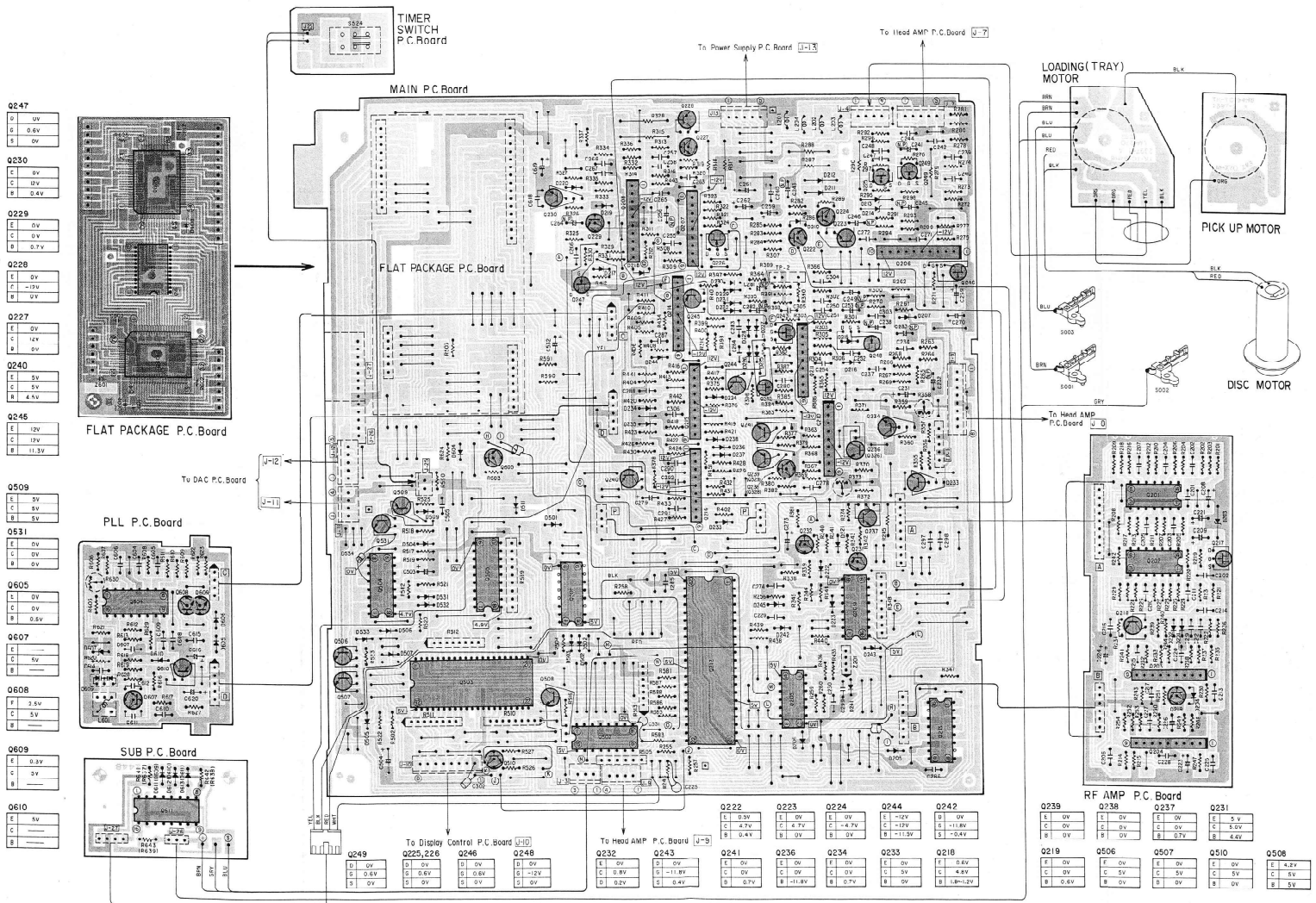


Figure 29

XR-Z70 XR-Z70K      XR-Z70 XR-Z70K

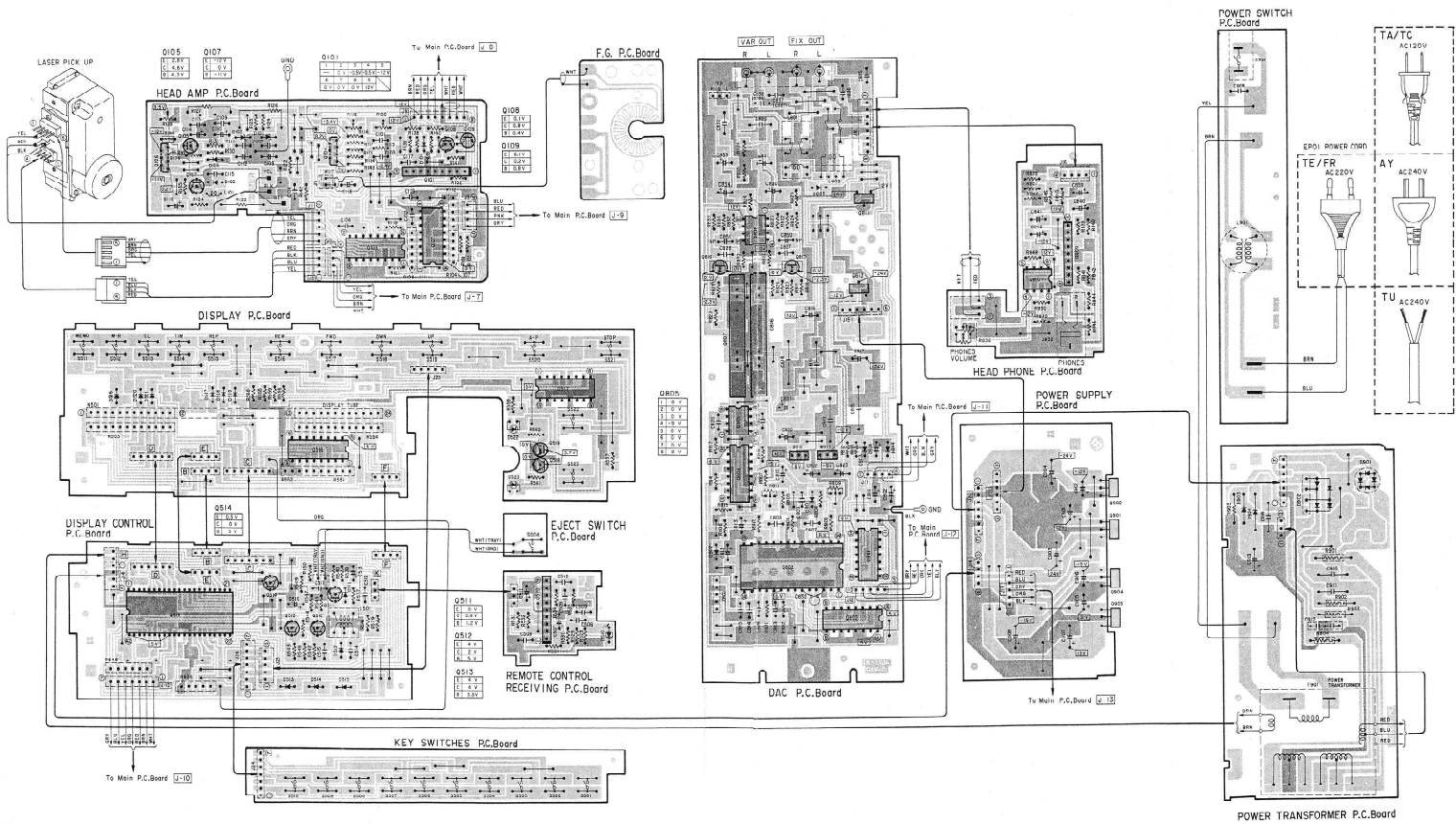
### 19. P.C. BOARD PARTS LOCATIONS



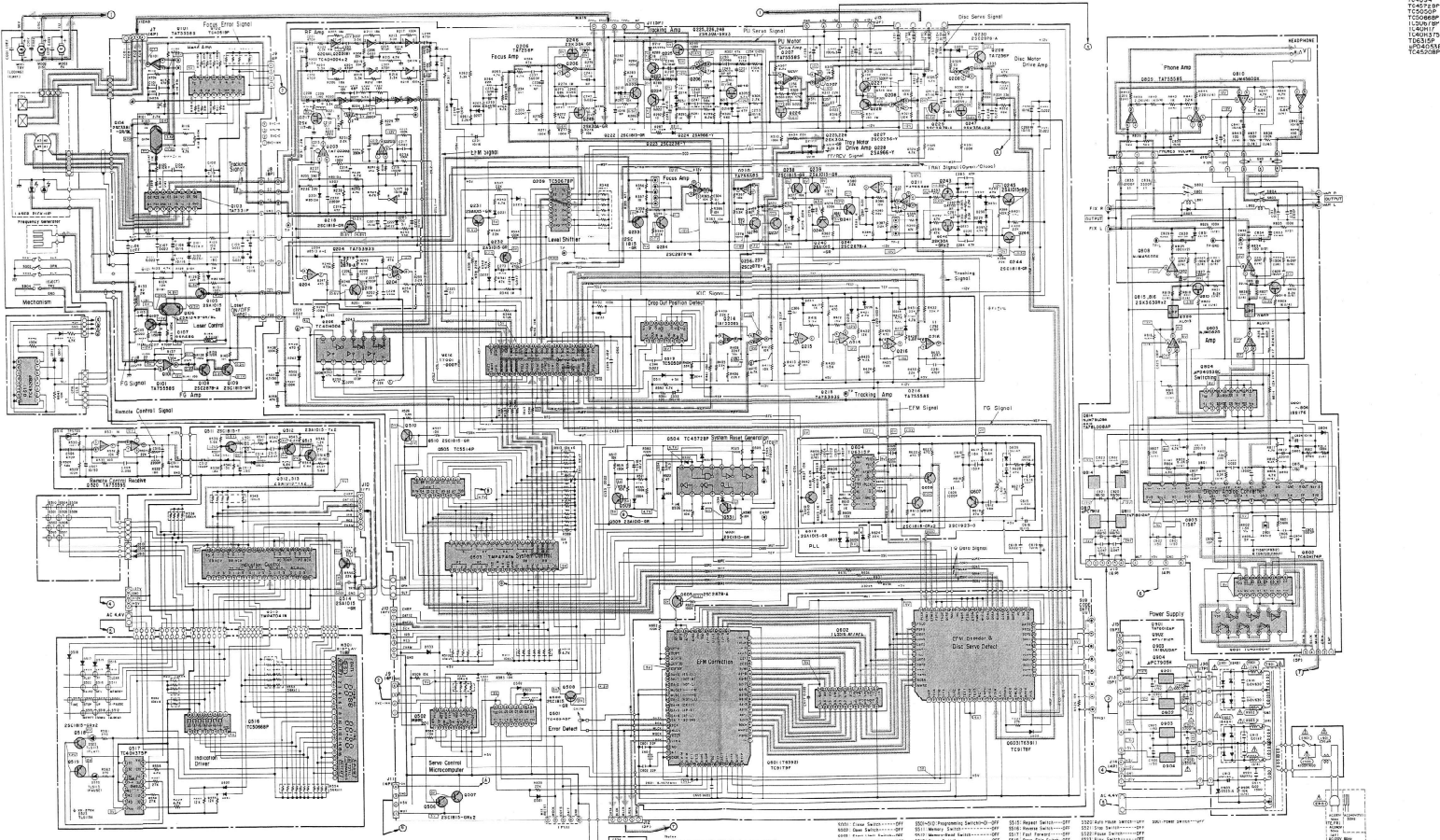


XR-Z70	XR-Z70
XR-Z70K	XR-Z70K

### P.C. BOARD PARTS LOCATIONS




# 20. SCHEMATIC DIAGRAM

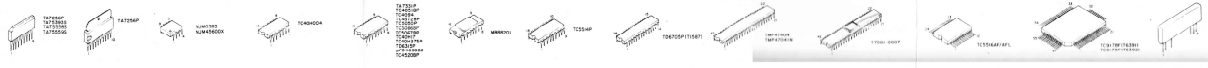
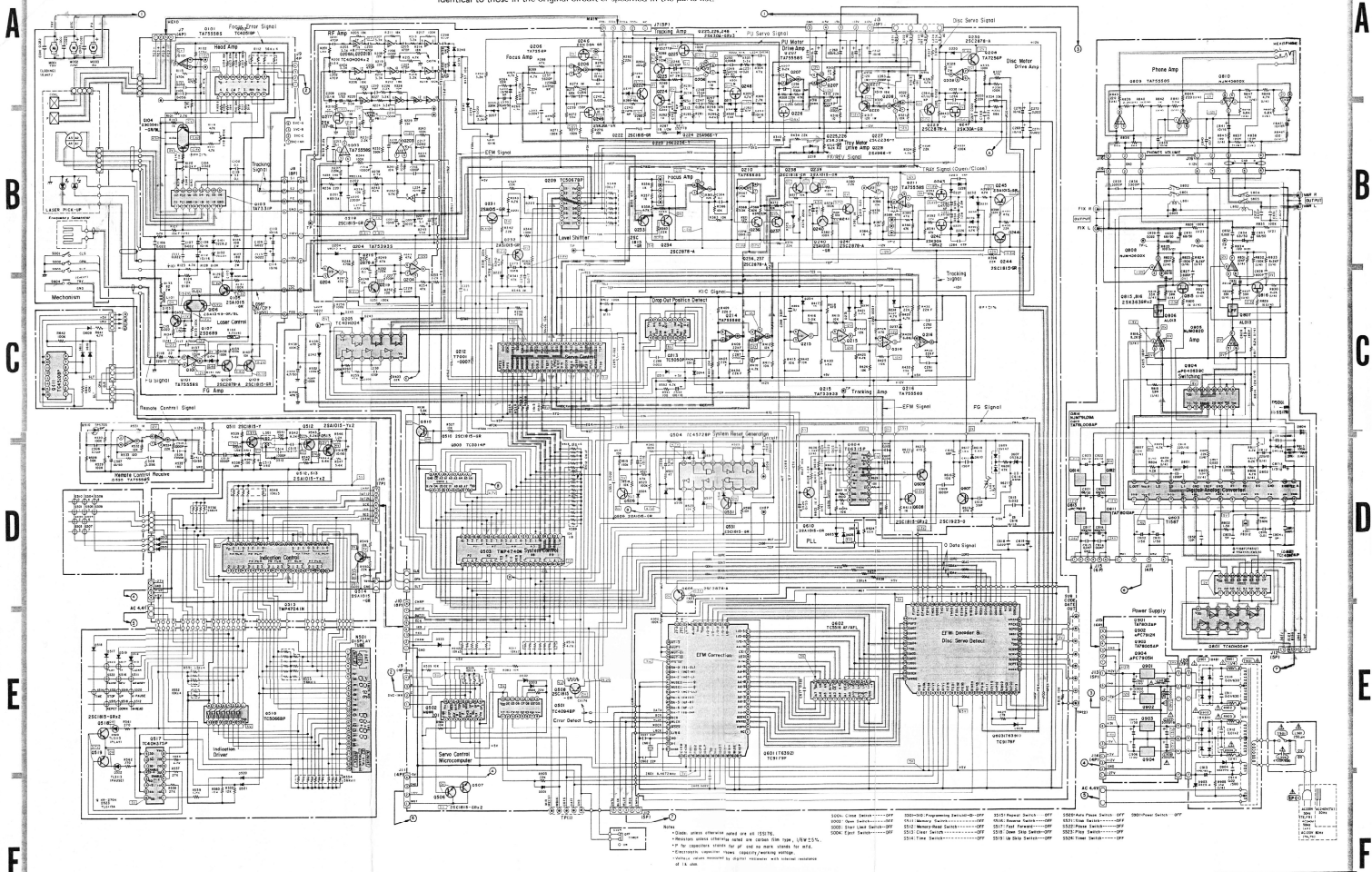


5000: Close Switch.....OFF      5010: Power Switch.....OFF      5020: Reset Switch.....OFF      5030: Auto Focus Switch.....OFF      5040: Power Switch.....OFF  
 5050: Door Switch.....OFF      5060: Motor Start Switch.....OFF      5070: Motor Start Switch.....OFF      5080: Motor Start Switch.....OFF      5090: Motor Start Switch.....OFF  
 \*WARRANTY SERVICE: Please refer to the parts list for the type, lot number, and date of manufacture.  
 \*For the replacement of parts, please refer to the parts list.  
 \*Parts are not to be replaced with other types.  
 \*Always use the original parts when replacing the original parts.

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

**SCHEMATIC DIAGRAM**

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



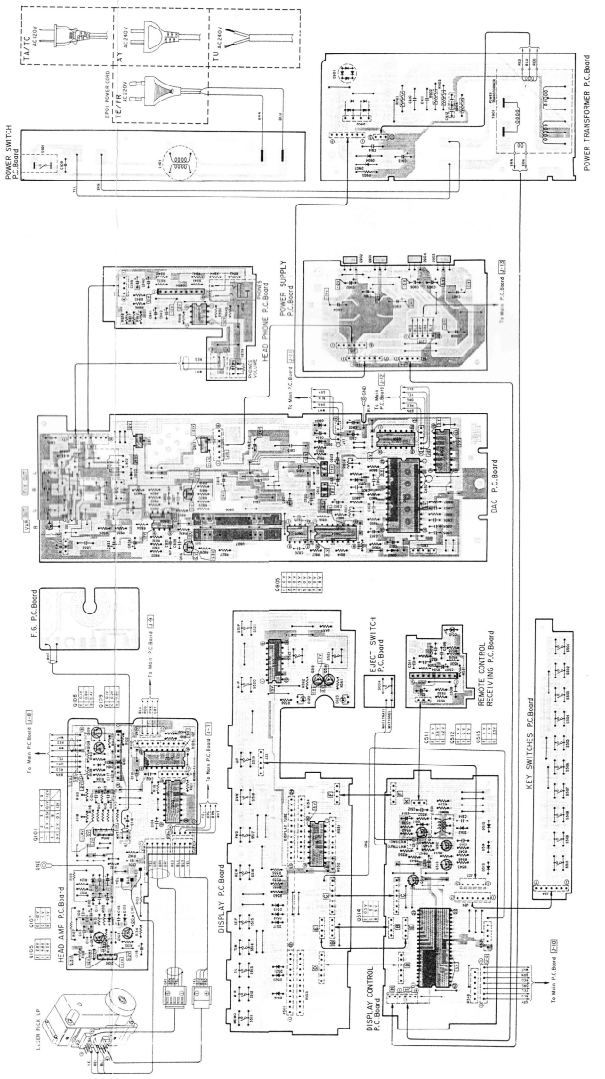
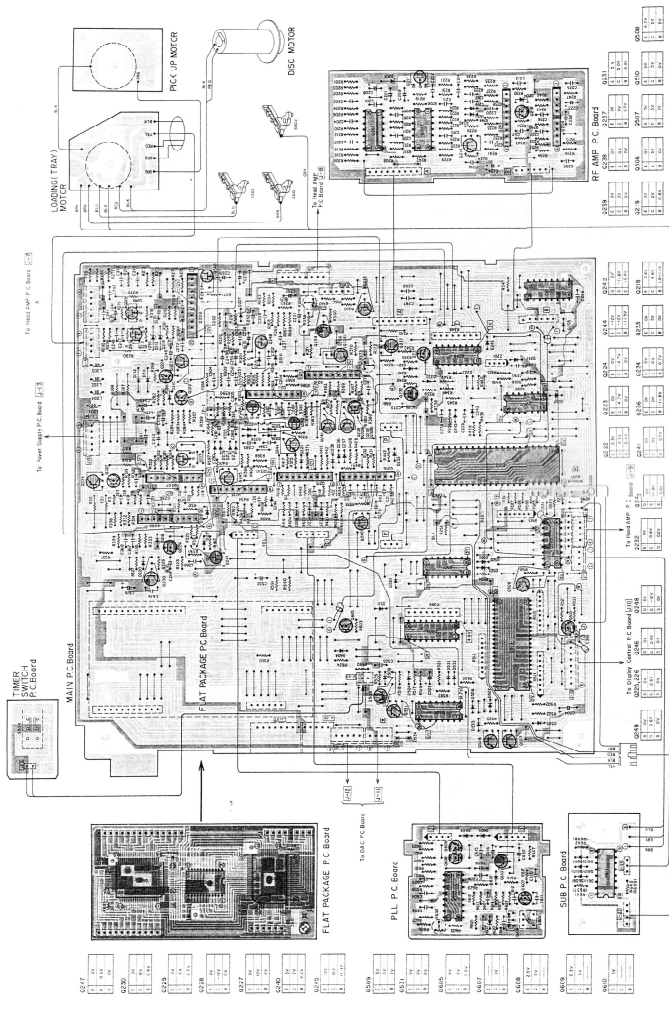
- |                  |                                |                   |                   |
|------------------|--------------------------------|-------------------|-------------------|
| 500. Case Switch | 501. Memory Programming Switch | 502. Power Switch | 503. Power Switch |
| 504. Case Switch | 505. Memory Switch             | 506. Power Switch | 507. Power Switch |
| 508. Case Switch | 509. Memory Switch             | 510. Power Switch | 511. Power Switch |
| 512. Case Switch | 513. Memory Switch             | 514. Power Switch | 515. Power Switch |
| 516. Case Switch | 517. Memory Switch             | 518. Power Switch | 519. Power Switch |
| 520. Case Switch | 521. Memory Switch             | 522. Power Switch | 523. Power Switch |

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**XR-Z70/Z70**  
 FR, TE, TU, AY, JA  
**TOSHIBA** PRINTED IN JAPAN  
 Oct. 1983

■ ELECTRICAL PARTS LOCATIONS

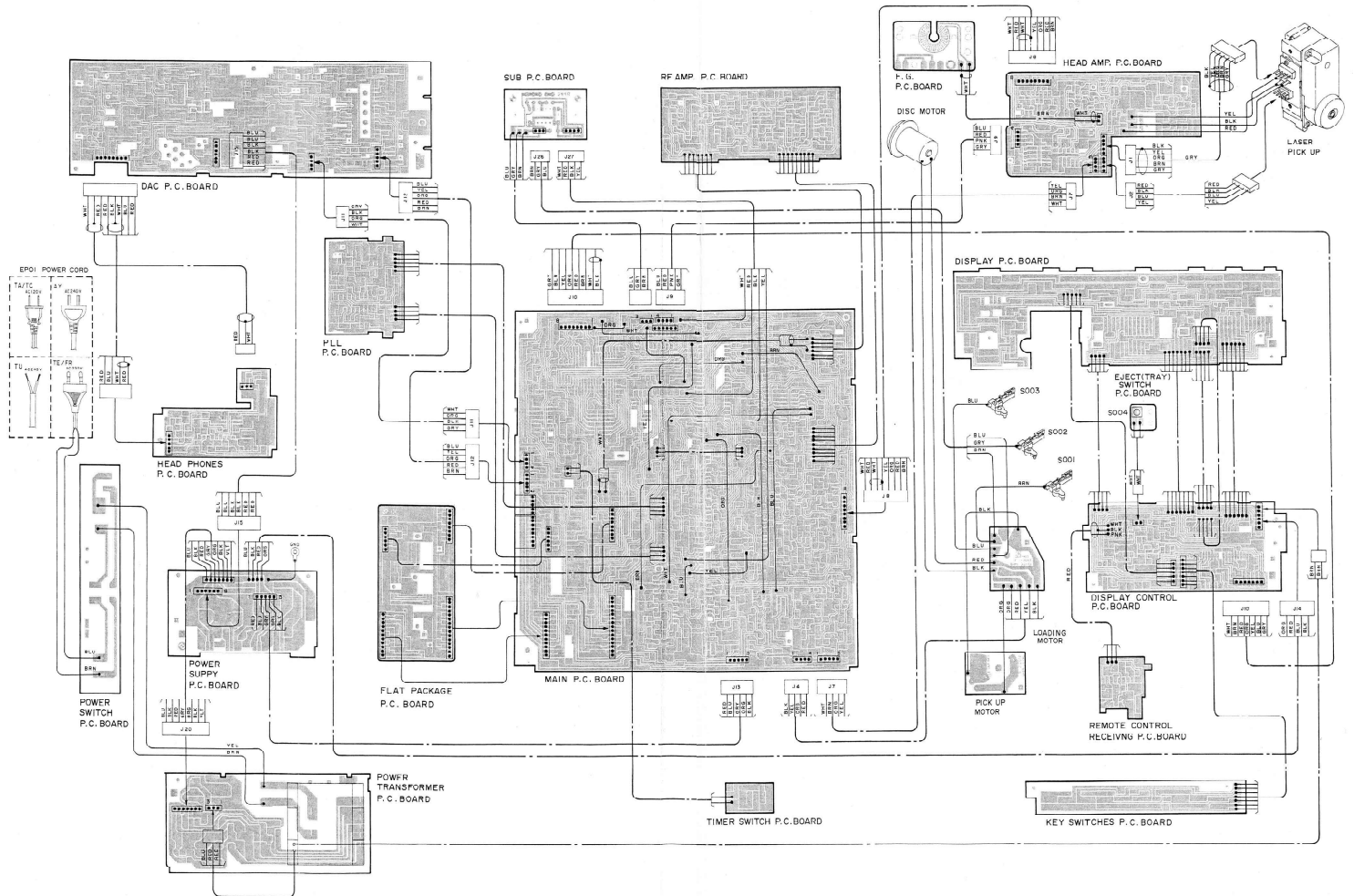
A  
B  
C  
D  
E  
F

A  
B  
C  
D  
E  
F



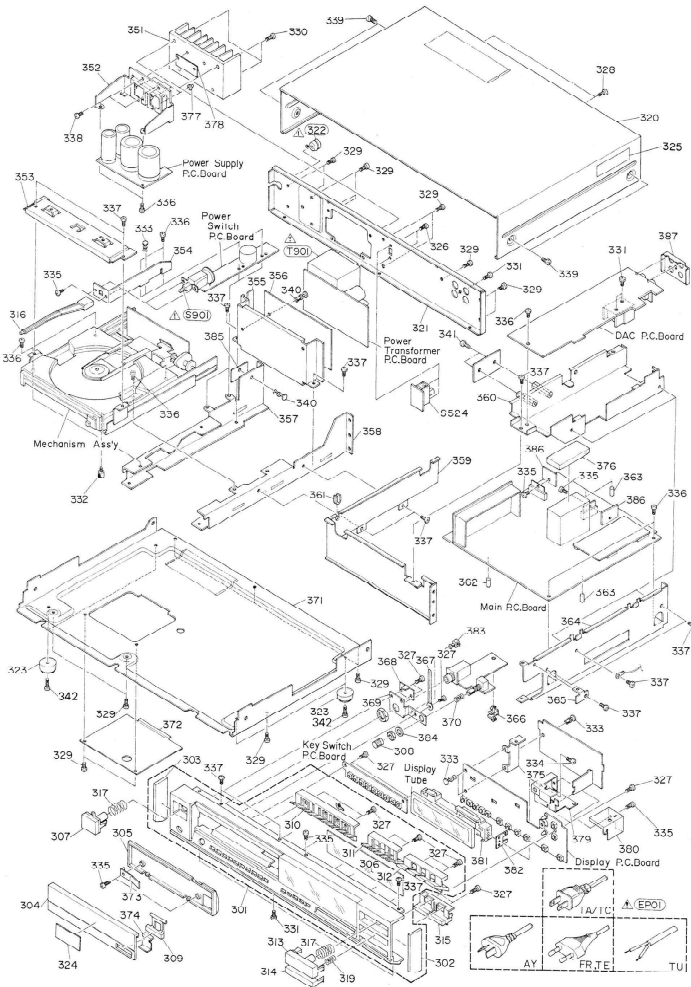
XR-Z70 XR-Z70K  
XR-Z70K XR-Z70K

## 21. WIRING DIAGRAM



XR-Z70  
XR-Z70K

## 22. EXPLODED VIEW CABINET



NOTE: Parts excluded in the parts list are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering they items.

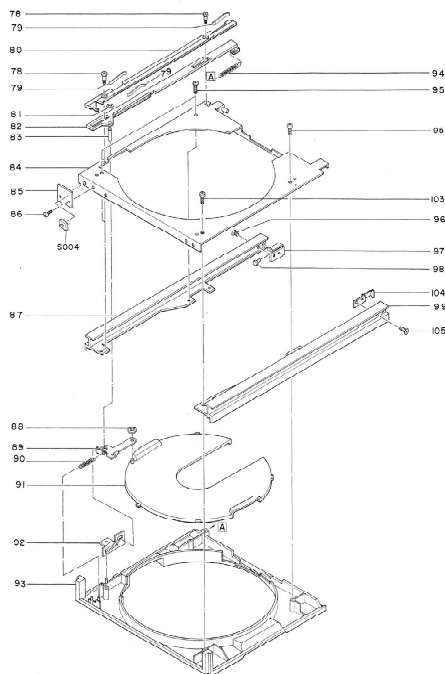
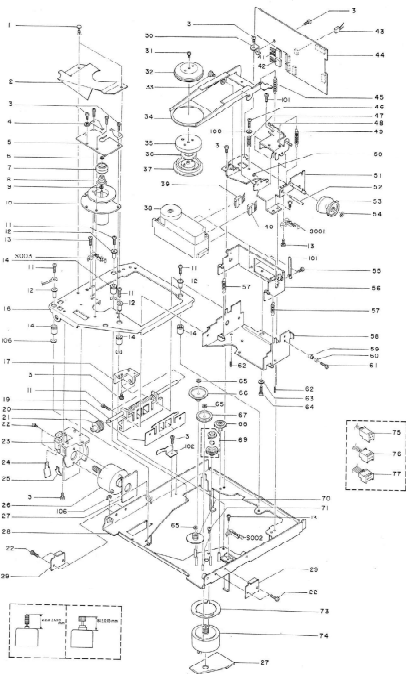
## 23. CABINET PARTS LIST

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

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
301	22825236	Front Panel Ass'y (Z70)	320	22841402	Top Cover (Z70K)
301	22825272	Front Panel Ass'y (Z70K)	321	22714288	Jack Plate (TE)(Z70)
301	22825281	Front Panel Ass'y (Z70-FR)	321	22714297	Jack Plate (TU, AY)(Z70)
302	22883060	Side Panel, Right (Z70)	321	22714296	Jack Plate (TA, TC)(Z70)
302	22883077	Side Panel, Right (Z70K)	321	22714293	Jack Plate (TE)(Z70K)
303	22883064	Side Panel, Left (Z70)	321	22714302	Jack Plate (TU)(Z70K)
303	22883061	Side Panel, Left (Z70K)	321	22714300	Jack Plate (Z70 FR)
304	22825255	Tray Panel Ass'y (Z70)	$\Delta$ 322	25845528	Cord Bush
304	22825274	Tray Panel Ass'y (TE)(Z70K)	323	20842172	Foot
304	22825279	Tray Panel Ass'y (TU)(Z70K)	324	22906443	Caution Label, Screw
304	22825282	Tray Panel Ass'y (Z70-FR)	325	22906500	Label, Class 1
305	22883066	Front Mold Tray	326	22708119	Screw, $\phi$ 2.6 x 4mm, BID (Z/U)
306	22837498	Filter	326	22701327	Screw, $\phi$ 2.6 x 4mm, BID (Z70K)
307	22884317	Knob Ass'y, Power (Z70)	327	22707913	Screw, $\phi$ 2.6 x 6mm, BID Tapping (Z70)
307	22884349	Knob Ass'y, Power (Z70K)	328	22708116	Screw, $\phi$ 3 x 6mm, BID Tapping (Z70)
307	22884360	Knob Ass'y, Power (Z70-FR)	328	22707682	Screw, $\phi$ 3 x 6mm, BID Tapping (Z70K)
308	22884338	Knob, Phones (Z70)	329	22708117	Screw, $\phi$ 3 x 6mm, BID Tapping
308	25837566	Knob, Phones (Z70K)	330	22707911	Screw, $\phi$ 3 x 8mm, BID Tapping
309	22884312	Knob, Open-Close (Z70)	331	22708118	Screw, $\phi$ 3 x 8mm, BID Tapping
309	22884344	Knob, Open-Close (Z70K)	332	22708062	Screw, Special
309	22884361	Knob, Open-Close (Z70-FR)	333	22705020	Plastic Rivet, $\phi$ 3 x 4.5mm
310	22884337	Knob, 1/2/3/4/5/6/7/8/9/0 (Z70)	334	22707979	Screw, $\phi$ 2.6 x 8mm, BID Tapping
310	22884345	Knob, 1/2/3/4/5/6/7/8/9/0 (Z70K)	335	22707066	Screw, $\phi$ 3 x 6mm, BID Tapping
311	22884315	Knob, Memory/Memory-Read/Clear/Time/Repeat (Z70)	336	22708021	Screw, $\phi$ 3 x 6mm, BID Tapping
311	22884346	Knob, Memory/Memory-Read/Clear/Time/Repeat (Z70K)	337	22707910	Screw, $\phi$ 3 x 6mm, BID Tapping
312	22804314	Knob, Reverse/FF/Down/Up (Z70)	338	22707042	Screw, $\phi$ 3 x 6mm, BID Tapping
312	22884347	Knob, Reverse/FF/Down/Up (Z70K)	339	22707750	Screw, $\phi$ 4 x 6mm, FTBID (Z70)
313	22884336	Knob Ass'y, Play (Z70)	339	22707040	Screw, $\phi$ 4 x 6mm, FTBID (Z70K)
313	22884351	Knob Ass'y, Play (Z70K)	340	22705021	Plastic Rivet, $\phi$ 3 x 3.5mm
313	22884359	Knob Ass'y, Play (Z70-FR)	341	22701313	Screw, $\phi$ 3 x 4mm, BID Tapping
314	22884335	Knob Ass'y, Pause (Z70)	342	22707165	Screw, $\phi$ 3 x 10mm, BID Tapping
314	22884350	Knob Ass'y, Pause (Z70K)			
314	22884358	Knob Ass'y, Pause (Z70-FR)			
315	22884320	Knob Ass'y, Auto-Pause/Stop (Z70)			
315	22884348	Knob Ass'y, Auto-Pause/Stop (Z70K)			
316	22764216	Joint Knob			
317	25777314	Spring, Knob			
319	25777316	Spring, Knob			
320	22841390	Top Cover (Z70)			

XR-Z70 XR-Z70K  
XR-Z70K XR-Z70K

### 24. EXPLODED VIEW MECHANISM



NOTE: Parts excluded in the parts list are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

### 25. MECHANISM PARTS LIST

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
1	27700071	Pinion Blank, $\phi 5 \times 3.5$ mm	71	22707716	Screw, $\phi 2.6 \times 3.5$ mm, BID
3	22707366	Screw, $\phi 2.6 \times 6$ mm, BID	73	20748106	Spacer, Motor
5	22192367	Frequency Generator P.C. Board	74	20701285	Loading Motor Ass'y
6	25704548	Washer, $\phi 1.7$	78	27708084	Screw, Special
7	20723117	Genie Ring, Disc-Motor	79	25779369	Spring, Hack
8	25777270	Spring, Disc-Motor	80	20727072	Drive Rack
10	25791684	Disc-Motor Ass'y	81	22703118	E-Ring, $\phi 2$
11	22707626	Screw, $\phi 2.6 \times 12$ mm, BID	82	20727073	Clamp Rack
12	20773260	Spacer	83	20704009	Link Pin
13	22701200	Screw, $\phi 2 \times 6$ mm, PAN	85(EP03)	22192342	Eject Switch P.C. Board
14	25701505	Cushion, Rubber	86	22707893	Screw, $\phi 2.6 \times 6$ mm, BID
17	20778154	Thin Holder	88	20798033	CS Ring
19	20727089	Guide Rack Ass'y	90	25778656	Spring
20	25779386	Spring, Plate, Guide Hack	91	22681225	Disk Trav. B
21	20727064	Gear, WH	93	22681224	Disk Trav. A
22	22707151	Screw, $\phi 2.6 \times 5$ mm, BID	94	25776613	Spring
23	20748002	Motor Mount	95	22707829	Screw, $\phi 2.6 \times 10$ mm, BID
24	25779394	Spring Plate, Motor Mount	96	22707895	Screw, $\phi 2.6 \times 4$ mm, FLT
25	25779383	Spring Plate, Motor Mount	98	206881298	Lubricator, Hubber
26	20791284	Pick-up Motor Ass'y	100	22703281	Washer, $\phi 2.6$
28	20741372	Main Chassis Ass'y	101	22708056	Screw, $\phi 2 \times 6$ mm, BID
31	22707686	Screw, $\phi 2 \times 4$ mm, BID	102	25779406	Spring Plate
32	20774098	Clampup Plate	103	22707842	Screw, $\phi 3 \times 8$ mm, BID
33	22701472	Screw, $\phi 2.6 \times 13$ mm, FLT	105	22701268	Tapping Screw, $\phi 2 \times 3$ mm, FLT
35	20748068	Clampup Yoke	106	25766174	Washer, $\phi 3.4$
36	20754089	Clampup Magnet			
37	20754001	Clampup			
38(EP02)	22155201	Laser Pick-up, OHP-32			
45	25778617	Spring			
46	22707169	Screw, $\phi 2.6 \times 10$ mm, BID			
47	25772270	Spring			
49	25778667	Spring			
50	22703117	E-Ring, $\phi 1.5$			
53	20727074	Clampup Gear			
54	22703279	E-Ring, $\phi 3$			
55	22701313	Screw, $\phi 3 \times 4$ mm, BID			
57	25778694	Spring, Pick-up			
59	20773341	Bushing			
60	20773043	Roller			
61	22708172	Screw, $\phi 2 \times 8$ mm, BID			
62	22708058	Screw, $\phi 2.6 \times 7.5$ mm, Special			
63	22703269	Washer, $\phi 3$			
64	22707660	Screw, $\phi 3 \times 10$ mm, Special			
65	20778135	Washer, $\phi 2.1$			
66	20727007	Gear, B			
67	20727068	Gear, C			
68	20727071	Gear, E			
69	20721080	Gear Ass'y, D			
70	20727086	Gear, A			

## 26. PARTS LIST

**CAUTION:**

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

Symbol No.	Part No.	Description
<b>TRANSISTORS, ICS &amp; DIODES</b>		
Q101	B0350510	IC, TA75558S
Q102	B0470512	IC, TC4051BP
Q103	22117353	IC, TA7731P
Q104	A6361110	Transistor, 2SC3381-GR/BL
Q105	A6534060	Transistor, 2SA1015-GR
Q106	A6547960	Transistor, 2SA1349-GR/BL
Q107	A6844400	Transistor, 2SD689
Q108	A6342200	Transistor, 2SC2878-A
Q109	A6317460	Transistor, 2SC1815NEW-GR
Q201, 202	B0471040	IC, TC40H004P
Q203	B0350510	IC, TA75558S
Q204	B0349250	IC, TA75393S
Q205	B0471040	IC, TC40H004P
Q206	B0320320	IC, TA7256P
Q207	B0350510	IC, TA75558S
Q208	B0320320	IC, TA7256P
Q209	B0480672	IC TC5067BP
Q210, 211	B0350510	IC, TA75558S
Q212	22117354	IC, T7001-0007
Q213	B0480500	IC, TC5050P
Q214	B0350510	IC, TA75558S
Q215	B0349250	IC, TA75393S
Q216	B0350510	IC, TA75558S
Q217	A6042750	Transistor, 2SK170-BL
Q218	A6317460	Transistor, 2SC1815NEW-GR
Q219	A6342200	Transistor, 2SC2878-A
Q222	A6317460	Transistor, 2SC1815NEW-GR
Q223	A6325540	Transistor, 2SC2236-Y
Q224	A6533240	Transistor, 2SA966-Y
Q225, 226	A6048370	Transistor, 2SK30ATM-GR
Q227	A6325540	Transistor, 2SC2236-Y
Q228	A6533240	Transistor, 2SA966-Y
Q229, 230	A6342200	Transistor, 2SC2878-A
Q231, 232	A6534060	Transistor, 2SA1015-GR
Q233	A6317460	Transistor, 2SC1815NEW-GR
Q234, 236, 237	A6342200	Transistor, 2SC2878-A
Q238	A6317460	Transistor, 2SC1815NEW-GR
Q239, 240	A6534060	Transistor, 2SA1015-GR
Q241	A6342200	Transistor, 2SC2878-A
Q242, 243	A6048370	Transistor, 2SK30ATM-GR

Symbol No.	Part No.	Description
Q244	A6317460	Transistor, 2SC1815NEW-GR
Q245	A6534060	Transistor, 2SA1015-GR
Q246, 247, 248, 249	A6048370	Transistor, 2SK30ATM-GR
Q501	B0470942	IC, TC4094BP
Q502	22117295	IC, MB88201
Q503	22117355	IC, TMP4740N-5909
Q504	B0475722	IC, TC4572BP
Q505	B0483181	IC, TC5514APL-3
Q506, 507, 508	A6317460	Transistor, 2SC1815NEW-GR
Q509	A6534060	Transistor, 2SA1015-GR
Q510	A6317460	Transistor, 2SC1815NEW-GR
Q511	A6317440	Transistor, 2SC1815NEW-Y
Q512, 513	A6534040	Transistor, 2SA1015-Y
Q514	A6534060	Transistor, 2SA1015-GR
Q515	22117356	IC, TMP47C41N-8905
Q516	B0480662	IC, TC5066BP
Q517	B0474750	IC, TC40H375P
Q518, 519	A6317460	Transistor, 2SC1815NEW-GR
Q520	B0350610	IC, TA75559S
Q531	A6317460	Transistor, 2SC1815NEW-GR
Q604	22117357	IC, TD6315P
Q605	A6342200	Transistor, 2SC2878-A
Q607	A6319020	Transistor, 2SC1923-O
Q608, 609	A6317460	Transistor, 2SC1815NEW-GR
Q610	A6534060	Transistor, 2SA1015-GR
Q611	B0475202	IC, TC4520BP
Q801	B0471040	IC, TC40H004P
Q802	B0472740	IC, TC40H174P
Q803	22117358	IC, T1587
Q804	22117199	IC, $\mu$ PD4053BC
Q805	22117148	IC, NJM082D
Q806, 807	22117232	IC, AL013
Q808	22114866	IC, NJM4560DX
Q809	B0350510	IC, TA75558S
Q810	22114866	IC, NJM4560DX
Q811	B0373230	IC, TA78012AP
Q812	B0372860	IC, TA78L008AP
Q813	22117294	IC, $\mu$ PC7912H
Q814	22117222	IC, NJM79L09A
Q815, 816	A6058510	Transistor, 2SK363-GR
Q901	B0373230	IC, TA78012AP
Q902	22117294	IC, $\mu$ PC7912H



Symbol No.	Part No.	Description
Q903	B0372540	IC, TA78005AP
Q904	22117099	IC, $\mu$ PC7905H
D101	A7110208	Diode, 05Z8.2-Y
D102	A7110041	Diode, 05Z5.1-Y
D103, 104, 105	A7160570	Diode, 1SS176
D201, 202	A7316171	Diode, M8513A-O
D203	A7110041	Diode, 05Z5.1-Y
D204	A7316171	Diode, M8513A-O
D205, 206, 207, 210	A7160570	Diode, 1SS176
D211, 212	A7978380	Diode, S5277B
D213, 214	A7110041	Diode, 05Z5.1-Y
D215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238	A7160570	Diode, 1SS176
D241, 242, 243, 244, 245	A7160570	Diode, 1SS176
D501, 502, 503, 504, 505, 506, 507, 509	A7160570	Diode, 1SS176
D510	A8652040	Diode, TPS703A
D511, 512	A7160570	Diode, 1SS176
D513, 514, 515	A7246703	Diode, 1S1555V
D516, 517, 518, 519, 520, 521	A7160570	Diode, 1SS176
D522	A8636410	Diode, TLS113
D523	A8636410	Diode, TLS113 (Z70)
D523	A8605666	Diode, TLG113A (Z70K)
D531, 532, 533, 534	A7160570	Diode, 1SS176
D604, 605, 606	A7160570	Diode, 1SS176
D607	A7110208	Diode, 05Z8.2-Y
D609	A7288890	Diode, 1SV147
D610, 611, 612, 613	A7160570	Diode, 1SS176

Symbol No.	Part No.	Description
D801, 802	A7160570	Diode, 1SS176
D803, 304, 805	A7160570	Diode, 1SS176
$\Delta$ D901	A7670000	Diode, 1B4B1
$\Delta$ D902	A7670800	Diode, 1B4B41
D903	A7110017	Diode, 05Z5.6-Y
D904	A7978385	Diode, S5277D
<b>COILS &amp; TRANSFORMERS</b>		
L101	22211288	Coil, Noise Prevention
L201, 202, 203, 204	22291189	Choke Coil, 10 $\mu$ H
L501	22245392	Coil, Tuning 38 kHz
L601	22245445	Coil, PLL OSC
L801	22148686	Relay (with S801, 802)
L802	22148681	Relay (with S803, 804)
$\Delta$ L901	22211301	Choke Coil, 250 $\mu$ H
$\Delta$ T901	22224241	Power Transformer (TE, FR)
$\Delta$ T901	22224301	Power Transformer (TU, AY)
$\Delta$ T901	22224302	Power Transformer (TA, TC)
<b>ELECTRICAL PARTS</b>		
S001	22196297	Leaf Switch, Close
S002	22196297	Leaf Switch, Open
S003	22196297	Leaf Switch, Start Limit
S004	22196381	Key Switch, Eject (Tray)
S501, 502	22196359	Key Switch, 1/2
S503, 504	22196359	Key Switch, 3/4
S505, 506	22196359	Key Switch, 5/6
S507, 508	22196359	Key Switch, 7/8
S509, 510	22196359	Key Switch, 9/0
S511, 512	22196359	Key Switch, Memory/ Memory-Read
S513, 514	22196359	Key Switch, Clear/Time
S515	22196359	Key Switch, Repeat
S516, 517	22195924	Key Switch, Reverse/FF
S518, 519	22196359	Key Switch, Down/Up
S520, 521	22196359	Key Switch, Auto-Pause/ Stop
S522, 523	22196359	Key Switch, Pause/Play
S524	22196363	Slide Switch, Timer

Symbol No.	Part No.	Description
△ S901	22196362	Push Switch, Power
J801	22163831	Jack, US4P (Z70)
J802	22197031	Jack, φ6, Phones
N501	22104598	Display Tube
Z201	22130729	Composite Part, 10K/1S1555 x 2
Z601	22153264	Crystal, 8.4672MHz
Z801	22153310	Filter, F1382K
△ EP01	22176286	Power Cord (TE, FR)
△ EP01	22176641	Power Cord (TU)
△ EP01	22176588	Power Cord (AY)
△ EP01	22176645	Power Cord (TA, TC)
EP02	22155201	Laser Pick-up, OPH-32
EP03	22192342	Eject Switch P.C. Board
EP04	22192432	Flat Package P.C. Board Ass'y (with Q601, 602, 603, D608, Z601)
<b>CAPACITORS</b>		
J = ±5%, K = ±10%, M = ±20%, Z = -20+80%, P = -0+100%		
ABBREVIATIONS: MY = Mylar, BL = Barrier Layer		
CD = Ceramic Disk, EL = Electrolytic,		
PS = Polystyrene, PP = Polypropylene,		
MPF = Metalized Polyester Film,		
NP = Non Polarity		
C001, 002	22342223	CD, 0.022mfd, 50V, Z
C003	22342223	CD, 0.022mfd, 50V, Z
C101	22371563	MY, 0.056mfd, 50V, J
C102	22360333	BL, 0.1mfd, 25V, M
C103	22371563	MY, 0.056mfd, 50V, J
C104	22342223	CD, 0.022mfd, 50V, Z
C106, 107	22342223	CD, 0.022mfd, 50V, Z
C108	22485100	EL, 10mfd, 16V
C109	22342223	CD, 0.022mfd, 50V, Z
C110	22485100	EL, 10mfd, 16V
C111	22342223	CD, 0.022mfd, 50V, Z
C112	22485100	EL, 10mfd, 16V
C113	22342223	CD, 0.022mfd, 50V, Z
C114	22485100	EL, 10mfd, 16V
C115	22342223	CD, 0.022mfd, 50V, Z
C116	22488109	EL, 1mfd, 50V
C117	22349472	CD, 4700pF, 50V, K
C118	22483221	EL, 200mfd, 10V
C119	22360333	BL, 0.1mfd, 25V, M
C201, 202	22349471	CD, 470pF, 50V, K
C203, 204	22349471	CD, 470pF, 50V, K

Symbol No.	Part No.	Description
C205	22349471	CD, 470pF, 50V, K
C206	22342223	CD, 0.022mfd, 50V, Z
C207	22349471	CD, 470pF, 50V, K
C208	22485100	EL, 10mfd, 16V
C209	22488109	EL, 1mfd, 50V
C210	22380274	PS, 68pF, 50V, J
C211	22349102	CD, 1000pF, 50V, K
C212, 213	22360333	BL, 0.1mfd, 25V, M
C214	22349102	CD, 1000pF, 50V, K
C215	22371272	MY, 2700pF, 50V, J
C216	22349102	CD, 1000pF, 50V, K
C217	22371823	MY, 0.082mfd, 50V, J
C219	22362470	CD, 47pF, 50V, K
C220	22349222	CD, 2200pF, 50V, K
C221	22485100	EL, 10mfd, 16V
C222	22342223	CD, 0.022mfd, 50V, Z
C223, 224	22485100	EL, 10mfd, 16V
C225	22360333	BL, 0.1mfd, 25V, M
C226	22360333	BL, 0.1mfd, 25V, M
C227	22371472	MY, 4700pF, 50V, J
C228	22349331	CD, 330pF, 50V, K
C229	22371223	MY, 0.022mfd, 50V, J
C230	22362101	CD, 100pF, 50V, K
C231	22485100	EL, 10mfd, 16V
C232	22470011	EL, 0.47mfd, 50V, NP
C233	22470010	EL, 10mfd, 16V, NP
C234	22371104	MY, 0.1mfd, 50V, J
C237	22371562	MY, 5600pF, 50V, J
C238	22470011	EL, 0.47mfd, 50V, NP
C239	22362151	CD, 150pF, 50V, K
C240	22371563	MY, 0.056mfd, 50V, J
C241	22470010	EL, 10mfd, 16V, NP
C242	22342223	CD, 0.022mfd, 50V, Z
C243	22470010	EL, 10mfd, 16V, NP
C244	22342223	CD, 0.022mfd, 50V, Z
C245	22470012	EL, 47mfd, 16V, NP
C246	22470010	EL, 10mfd, 16V, NP
C247	22371563	MY, 0.056mfd, 50V, J
C248	22362151	CD, 150pF, 50V, K
C249	22470011	EL, 0.47mfd, 50V, K
C250	22371682	MY, 6800pF, 50V, J
C251	22371103	MY, 0.01mfd, 50V, J
C252	22362470	CD, 47pF, 50V, K
C253	22470010	EL, 10mfd, 16V, NP
C254	22371563	MY, 0.056mfd, 50V, J
C255	22342223	CD, 0.022mfd, 50V, Z
C256	22470010	EL, 10mfd, 16V, NP
C257	22362101	CD, 100pF, 50V, K
C258	22342223	CD, 0.022mfd, 50V, Z
C259, 260	22483101	EL, 100mfd, 10V
C261, 262	22485100	EL, 10mfd, 16V
C263	22349102	CD, 1000pF, 50V, K

Symbol No.	Part No.	Description
C264	22470012	EL, 47mfd, 16V, NP
C265	22342223	CD, 0.022mfd, 50V, Z
C266	22371392	MY, 3900pF, 50V, J
C267, 268	22342223	CD, 0.022mfd, 50V, Z
C269, 270	22485100	EL, 10mfd, 16V
C271, 272	22342223	CD, 0.022mfd, 50V, Z
C273	22485100	EL, 10mfd, 16V
C274	22371473	MY, 0.047mfd, 50V, J
C278	22371153	MY, 0.015mfd, 50V, J
C279	22488109	EL, 1mfd, 50V
C280	22371103	MY, 0.01mfd, 50V, J
C281, 282	22470011	EL, 0.47mfd, 50V, NP
C283, 284	22362470	CD, 47pF, 50V, K
C285, 286	22342223	CD, 0.022mfd, 50V, Z
C287	22371223	MY, 0.022mfd, 50V, J
C288	22349331	CD, 330pF, 50V, K
C290	22349102	CD, 1000pF, 50V, K
C291, 292	22349471	CD, 470pF, 50V, K
C297, 298	22349471	CD, 470pF, 50V, K
C299	22342223	CD, 0.022mfd, 50V, Z
C302	22488479	EL, 4.7mfd, 50V
C303	22371472	MY, 4700pF, 50V, J
C304	22360333	BL, 0.1mfd, 25V, M
C305	22362820	CD, 82pF, 50V, K
C306	22360333	BL, 0.1mfd, 25V, M
C503	22485100	EL, 10mfd, 16V
C504	22482332	EL, 3300mfd, 6.3V
C505	22371562	MY, 5600pF, 50V, J
C506	22349471	CD, 470pF, 50V, K
C507	22488100	EL, 10mfd, 50V
C508	22371563	MY, 0.056mfd, 50V, J
C509, 510	22371222	MY, 2200pF, 50V, J
C511	22488100	EL, 10mfd, 50V
C512	22349102	CD, 1000pF, 50V, K
C513	22488109	EL, 1mfd, 50V
C514	22321057	PP, 1000pF, 50V, J
C515	22371473	MY, 0.047mfd, 50V, J
C516	22488100	EL, 10mfd, 50V
C517	22342223	CD, 0.022mfd, 50V, Z
C531	22342103	CD, 0.01mfd, 50V, Z
C532	22485101	EL, 100mfd, 16V
C604	22342223	CD, 0.022mfd, 50V, Z
C605	22321055	PP, 680pF, 50V, J
C606	22371223	MY, 0.022mfd, 50V, J
C607, 608	22342223	CD, 0.022mfd, 50V, Z
C609	22349102	CD, 1000pF, 50V, K

Symbol No.	Part No.	Description
C610	22380274	PP, 68pF, 50V, J
C611	22321083	PP, 150pF, 50V, J
C612	22360137	CD, 39pF, 50V, J, CH
C614	22321056	PP, 820pF, 50V, J
C615	22342223	CD, 0.022mfd, 50V, Z
C616	22485100	EL, 10mfd, 16V
C618	22342223	CD, 0.022mfd, 50V, Z
C619	22485100	EL, 10mfd, 16V
C620	22488100	EL, 10mfd, 50V
C801, 802	22488109	EL, 1mfd, 50V
C803, 804	22361509	CD, 5pF, 50V, D
C805	22349102	CD, 1000pF, 50V, K
C806	22342103	CD, 0.01mfd, 50V, Z
C807, 808	22321058	PP, 1200pF, 50V, J
C809	22371223	MY, 0.022mfd, 50V, J
C810	22443221	EL, 220mfd, 10V
C812	22443221	EL, 220mfd, 10V
C813	22448109	EL, 1mfd, 50V
C814, 815	22370332	PP, 0.047mfd, 50V, K
C816, 817	22440664	EL, 100mfd, 50V
C820, 821	22440657	EL, 68mfd, 50V
C822, 823	22443220	EL, 22mfd, 10V
C824	22445100	EL, 10mfd, 16V
C825, 826	22321084	PP, 180pF, 50V, J
C827, 828	22371182	MY, 1800pF, 50V, J
C829	22370334	PP, 0.022mfd, 50V, K
C830, 831	22440657	EL, 68mfd, 50V
C832	22370334	PP, 0.022mfd, 50V, K
C833, 834	22440657	EL, 68mfd, 50V
C835, 836	22380249	PS, 3300pF, 125V, K
C837, 838	22371332	MY, 3300pF, 50V, J
C839, 840	22445100	EL, 10mfd, 16V
C841, 842	22445100	EL, 10mfd, 16V
C850, 851	22485220	EL, 22mfd, 16V
C852	22361100	CD, 10pF, 50V, J
C901, 902	22485109	EL, 1mfd, 50V
△ C903, 904	22440661	EL, 1000mfd, 50V
C905, 906	22485109	EL, 1mfd, 50V
△ C907, 908	22485332	EL, 3300mfd, 16V
△ C909	22340150	CD, 4700pF, 400V, P (TE, TU, AY)
△ C909	22340140	CD, 0.01mfd, 125V, P (TA, TC)
C910, 911	22370301	MPF, 0.01mfd, 630V, K
C912	22340158	CD, 0.01mfd, 250V x 2
C913	22488471	EL, 470mfd, 50V
C914	22340032	CD, 0.02mfd, 500V, Z

Symbol No.	Part No.	Description
<b>RESISTORS</b>		
All resistors are carbon film, 1/6W, $\pm 5\%$ unless otherwise noted.		
F = $\pm 1\%$ , 1K ohm = 1000 ohm, 1M ohm = 1000000 ohm		
R101	22584272	2.7K ohm
R102	22584474	470K ohm
R103	22584472	4.7K ohm
R104, 105, 106, 107	22130727	Composite Part, 16K/20K/24K/180K ohm
R108, 109, 110, 111	22130728	Composite Part, 82K/39K/30K/51K ohm
R112	22540661	Composite Part, 56K ohm x 4
R113, 114	22584473	47K ohm
R115	22584474	470K ohm
R116, 117	22584472	4.7K ohm
R118	22658726	10K ohm, Semi-fixed Variable
R119	22570649	3.9K ohm, 1/4W, F, Metal Film
R120	22658725	10K ohm, Semi-fixed Variable
R121	22570599	15K ohm, 1/4W, F, Metal Film
R122	22584472	4.7K ohm
R123	22584472	4.7K ohm (C Rank only)
R124	22584123	12K ohm (B Rank only)
R126	22570616	100 ohm, 2W, Metal Oxide Film
R127	22570619	180 ohm, 2W, Metal Oxide Film
R128	22658725	10K ohm, Semi-fixed Variable
R129	22584223	22K ohm
R130	22584683	68K ohm
R131	22584104	100K ohm
R133	22570615	82 ohm, 2W, Metal Oxide Film
R134	22555109	1 ohm, 1/4W
R135	22584104	100K ohm
R136	22584220	22 ohm
R137	22584334	330K ohm
R138, 139	22584104	100K ohm
R140	22584103	10K ohm
R141	22584101	100 ohm
R142, 143	22584102	1K ohm
$\Delta$ R144	22500274	4.7 ohm, 1/4W, Fusible
R201, 202	22584152	1.5K ohm
R203, 204	22584332	3.3K ohm
R205, 206	22584183	18K ohm
R207	22584332	3.3K ohm
R208, 209	22584223	22K ohm
R210	22584332	3.3K ohm
R211, 212	22584183	18K ohm

Symbol No.	Part No.	Description
R213	22584332	3.3K ohm
R214	22584183	18K ohm
R215	22584472	4.7K ohm
R216	22584332	3.3K ohm
R217, 218	22584104	100K ohm
R219	22584470	47 ohm
R220	22584332	3.3K ohm
R221	22584105	1M ohm
R222	22584104	100K ohm
R223	22584103	10K ohm
R224	22584332	3.3K ohm
R225	22584103	10K ohm
R226, 227	22584332	3.3K ohm
R228	22584103	10K ohm
R229	22584333	33K ohm
R230	22584225	2.2M ohm
R231	22584222	2.2K ohm
R232	22584394	390K ohm
R233, 234	22584104	100K ohm
R235	22584391	390 ohm
R236	22584221	220 ohm
R237	22584224	220K ohm
R238	22584472	4.7K ohm
R239	22584103	10K ohm
R240	22584472	4.7K ohm
R241	22584103	10K ohm
R242	22584472	4.7K ohm
R243, 244	22584104	100K ohm
R245	22547331	330 ohm, 1/2W
R246	22584474	470K ohm
R247	22584471	470 ohm
R248	22584103	10K ohm
R249	22584473	47K ohm
R250	22584124	120K ohm
R251	22584104	100K ohm
R252	22584101	100 ohm
R253, 254,	22584473	47K ohm
R255	22584222	2.2K ohm
R256, 257	22584104	100K ohm
R258, 259	22584473	47K ohm
R260	22584473	47K ohm
R261	22584222	2.2K ohm
R262	22584332	3.3K ohm
R263	22584224	220K ohm
R264	22584223	22K ohm
R265, 266	22584472	4.7K ohm
R267, 268	22584473	47K ohm
R269	22584472	4.7K ohm
R270	22584102	1K ohm
R271	22584104	100K ohm
R272	22584333	33K ohm
R273	22584683	68K ohm
R274	22584105	1M ohm

Symbol No.	Part No.	Description
R276	22584223	22K ohm
R277	22584104	100K ohm
R278	22584100	10 ohm
R279	22570263	120 ohm, 1W, Metal Oxide Film
R280, 281	22555109	1 ohm, 1/4W
R282	22584223	22K ohm
R283	22584105	1M ohm
R284	22584104	100K ohm
R285	22584103	10K ohm
R286	22584102	1K ohm
R287, 288,	22547180	18 ohm, 1/2W
R289	22584100	10 ohm
R290	22570612	47 ohm, 2W, Metal Oxide Film
R291	22584102	1K ohm
R292	22584100	10 ohm
R293	22584102	1K ohm
R295	22584104	100K ohm
R296	22584105	1M ohm
R297	22584563	56K ohm
R298	22548473	47K ohm
R299	22584822	8.2K ohm
R300	22584561	560 ohm
R301	22584105	1M ohm
R302	22584473	47K ohm
R303	22584332	3.3K ohm
R304	22584473	47K ohm
R305	22584472	4.7K ohm
R306	22584272	2.7K ohm
R307	22584822	8.2K ohm
R308	22584224	220K ohm
R309	22584473	47K ohm
R310	22584104	100K ohm
R311	22584683	68K ohm
R312	22584822	8.2K ohm
R313	22584223	22K ohm
R315	22570608	22 ohm, 2W, Metal Oxide Film
R316	22584100	10 ohm
R317, 318	22570263	120 ohm, 1W, Metal Oxide Film
R319	22584183	18K ohm
R320	22584101	100 ohm
R321, 322	22584103	10K ohm
R323	22584183	18K ohm
R324	22584472	4.7K ohm
R325	22584223	22K ohm
R326	22584472	4.7K ohm
R327	22584334	330K ohm
R328	22570610	33 ohm, 2W, Metal Oxide Film

Symbol No.	Part No.	Description
R330	22584105	1M ohm
R331	22584104	100K ohm
R332	22584683	68K ohm
R333	22584223	22K ohm
R334	22584333	33K ohm
R335	22584104	100K ohm
R336	22584104	100K ohm
R337	22584473	47K ohm
R338, 339	22584224	220K ohm
R340	22584472	4.7K ohm
R341	22584473	47K ohm
R342	22584223	22K ohm
R343	22584472	4.7K ohm
R344	22584104	100K ohm
R345	22584474	470K ohm
R346	22584105	1M ohm
R347	22584223	22K ohm
R348	22540651	Composite Part, 10K ohm x 7
R355	22584473	47K ohm
R356, 357	22584102	1K ohm
R358	22658710	4.7K ohm, Semi-fixed Variable
R359	22584103	10K ohm
R360	22584223	22K ohm
R362	22584473	47K ohm
R363	22584103	10K ohm
R365	22584103	10K ohm
R366	22584104	100K ohm
R367	22584103	10K ohm
R368	22584332	3.3K ohm
R369	22584823	82K ohm
R370	22584332	3.3K ohm
R371	22584223	22K ohm
R372	22584103	10K ohm
R373	22658710	4.7K ohm, Semi-fixed Variable
R374	22584223	22K ohm
R375	22584102	1K ohm
R376	22584224	220K ohm
R377	22584103	10K ohm
R378	22584104	100K ohm
R379	22584103	10K ohm
R380	22584222	2.2K ohm
R381	22584103	10K ohm
R382	22584104	100K ohm
R383, 384	22584102	1K ohm
R385	22584223	22K ohm
R386	22584103	10K ohm
R387	22584222	2.2K ohm
R388, 389	22584473	47K ohm
R390, 391	22584473	47K ohm
R392, 393	22584473	47K ohm

Symbol No.	Part No.	Description
R394, 395	22584225	2.2M ohm
R396	22584223	22K ohm
R397	22584472	4.7K ohm
R398	22584223	22K ohm
R399	22584472	4.7K ohm
R400	22584223	22K ohm
R401	22584473	47K ohm
R402	22584104	100K ohm
R404	22584333	33K ohm
R405, 406	22570498	22K ohm, 1/4W, F, Metal Film
R408, 409	22570498	22K ohm, 1/4W, F, Metal Film
R410	22584472	4.7K ohm
R411, 412	22584103	10K ohm
R413	22584103	10K ohm
R415	22584103	10K ohm
R416	22584332	3.3K ohm
R417	22584102	1K ohm
R418	22584471	470 ohm
R419	22584103	10K ohm
R420	22584152	1.5K ohm
R421	22584472	4.7K ohm
R422	22584123	12K ohm
R423	22584472	4.7K ohm
R424	22584103	10K ohm
R425	22584103	10K ohm
R426	22584471	470 ohm
R427	22584472	4.7K ohm
R428	22584682	6.8K ohm
R429	22584472	4.7K ohm
R430, 431	22570498	22K ohm, 1/4W, F, Metal Film
R432, 433	22570498	22K ohm, 1/4W, F, Metal Film
R434	22584223	22K ohm
R435, 436	22584103	10K ohm
R437	22584103	10K ohm
R438	22584104	100K ohm
R439	22584471	470 ohm
R440	22584103	10K ohm
R441	22584103	10K ohm
R442	22584103	10K ohm
R443	22584100	10 ohm
R502	22584104	100K ohm
R503, 504	22584223	22K ohm
R505	22540658	Composite Part, 10K ohm x 5
R509	22584103	10K ohm
R510	22130726	Composite Part, 10K ohm x 6
R511, 512	22130725	Composite Part, 10K ohm x 7

Symbol No.	Part No.	Description
R513	22130724	Composite Part, 10K ohm x 6
R516	22584472	4.7K ohm
R517, 518	22584103	10K ohm
R519	22584154	150K ohm
R520	22584104	100K ohm
R521	22584473	47K ohm
R522	22584470	47 ohm
R523	22584103	10K ohm
R525	22584104	100K ohm
R526	22584562	5.6K ohm
R527	22584103	10K ohm
R528	22584563	56K ohm
R529, 530	22584104	100K ohm
R531	22584102	1K ohm
R532	22584103	10K ohm
R533	22584101	100 ohm
R534	22584223	22K ohm
R535	22584181	180 ohm
R536	22540676	Composite Part, 56K ohm x 4
R537	22584152	1.5K ohm
R538	22584182	1.8K ohm
R539	22584562	5.6K ohm
R540	22584151	150 ohm
R541	22584391	390 ohm
R542, 543	22584822	8.2K ohm
R544, 545	22584682	6.8K ohm
R546	22584122	1.2K ohm
R547	22584562	5.6K ohm
R548	22540658	Composite Part, 10K ohm x 5
R549	22584103	10K ohm
R550	22584223	22K ohm
R551	22540684	Composite Part, 1.5K ohm x 4
R552	22540659	Composite Part, 10K ohm x 4
R553, 554	22540656	Composite Part, 56K ohm x 11
R555	22584123	12K ohm
R556	22584472	4.7K ohm
R557, 558	22584273	27K ohm
R559	22584472	4.7K ohm
R560	22584123	12K ohm
R561, 562	22584271	270 ohm
R581	22584102	1K ohm
R582	22584104	100K ohm
R583	22543103	10K ohm, 1/8W
R584	22543103	10K ohm, 1/8W
R585, 586	22584102	1K ohm
R587, 588	22584102	1K ohm
R589	22540660	Composite Part, 10K ohm x 8

Symbol No.	Part No.	Description
R600	22584103	10K ohm
R601	22584101	100 ohm
R602	22584472	4.7K ohm
R603	22584104	100K ohm
R605	22570482	1K ohm, 1/4W, F, Metal Film
R606	22570483	1.2K ohm, 1/4W, F, Metal Film
R607, 608	22584102	1K ohm
R609	22584103	10K ohm
R610, 611	22584102	1K ohm
R612, 613	22584102	1K ohm
R616	22584101	100 ohm
R617	22584152	1.5K ohm
R618	22584562	5.6K ohm
R619	22584273	27K ohm
R620	22584473	47K ohm
R621	22584102	1K ohm
R622, 623	22584471	470 ohm
R624	22584223	22K ohm
R627	22584103	10K ohm
R628	22584122	1.2K ohm
R629	22584103	10K ohm
R635, 636	22584331	330 ohm
R637, 638	22584331	330 ohm
R639, 640	22555109	1 ohm, 1/4W
R641	22584472	4.7K ohm
R642	22584104	100K ohm
R643	22584103	10K ohm
R801	22584564	560K ohm
R802	22584152	1.5K ohm
R803	22555332	3.3K ohm, 1/4W
R804	22555472	4.7K ohm, 1/4W
R805	22555223	22K ohm, 1/4W
R806	22555472	4.7K ohm, 1/4W
R807	22555123	12K ohm, 1/4W
R808	22555822	8.2K ohm, 1/4W
R809	22658710	4.7K ohm, Semi-fixed Variable
R810	22555822	8.2K ohm, 1/4W
R811	22658710	4.7K ohm, Semi-fixed Variable
R812	22555274	270K ohm, 1/4W
R813	22555104	100K ohm, 1/4W
R814	22555123	12K ohm, 1/4W
R815	22555392	3.9K ohm, 1/4W
R816, 817	22555822	8.2K ohm, 1/4W
R818	22555393	39K ohm, 1/4W
R819	22555333	33K ohm, 1/4W
R820	22555102	1K ohm, 1/4W

Symbol No.	Part No.	Description
R821	22555822	8.2K ohm, 1/4W
R822	22570498	22K ohm, 1/4W, F, Metal Film
R823	22555154	150K ohm, 1/4W
R824	22570493	8.2K ohm, 1/4W, F, Metal Film
R825	22550518	100 ohm, 1/2W
R826	22550554	100K ohm, 1/4W
R827	22555393	39K ohm, 1/4W
R828	22555333	33K ohm, 1/4W
R829	22555102	1K ohm, 1/4W
R830	22555822	8.2K ohm, 1/4W
R831	22570498	22K ohm, 1/4W, F, Metal Film
R832	22555154	150K ohm, 1/4W
R833	22570493	8.2K ohm, 1/4W, F, Metal Film
R834	22550518	100 ohm, 1/2W
R835	22550554	100K ohm, 1/2W
R836	22611411	5K ohm, A, Variable, Phones
R837, 838	22555104	100K ohm, 1/4W
R839	22555222	2.2K ohm, 1/4W
R840	22555102	1K ohm, 1/4W
R841	22555222	2.2K ohm, 1/4W
R842	22555102	1K ohm, 1/4W
R843, 844	22555221	220 ohm, 1/4W
R845, 846	22555101	100 ohm, 1/4W
R847	22555472	4.7K ohm, 1/4W
R848	22555682	6.8K ohm, 1/4W
R849	22555472	4.7K ohm, 1/4W
R850	22555682	6.8K ohm, 1/4W
△	R901, 902	22500345 1 ohm, 1/4W, Fusible
△	R903, 904	22500358 1 ohm, 1/4W, Fusible
	R905	22545103 10K ohm, 1/4W
ACCESSORIES		
AC01	22903858	Owner's Manual (TE)
AC01	22903940	Owner's Manual (TU, AY)
AC01	22903903	Owner's Manual (TA)
AC01	22903904	Owner's Manual (TC)
AC01	22903912	Owner's Manual (Z70-FR)
AC02	22170504	Connector Cord (Z70K-TE)
AC02	22164775	Connector Cord (Z70-TE, TU, AY, FR, TA, TC) (Z70K-TU)
AC03	22903942	Sub Manual (TE)
AC03	22903943	Sub Manual (TU, AY, TA, TC)
AC04	22957653	Caution Sheet (Z70-TE, TU, AY) (Z70K-TE, TU)

**TOSHIBA CORPORATION**

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