

Service Manual

Portable Stereo CD System

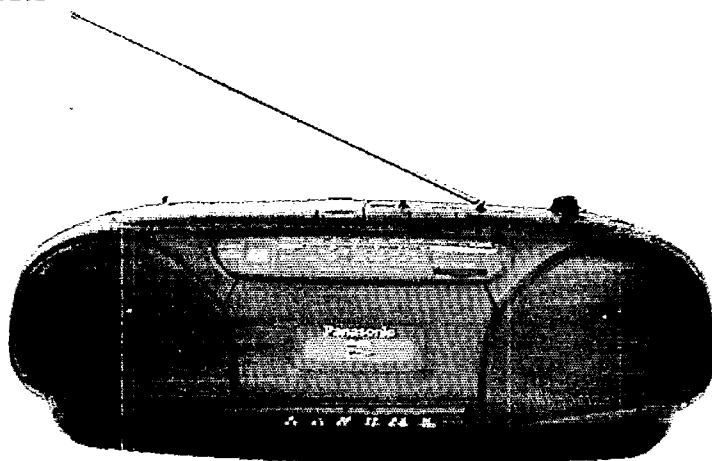
COMPACT
disc
 DIGITAL AUDIO

MASH*
 multi-stage noise shaping

 Radio Cassette
RX-DS10

Colour

(K) . . . Black Type



Area

Suffix for Model No.	Area	Colour
(E)	Europe	(K)
(EB)	Great Britain	
(EG)	Germany and Italy	

* MASH is a trademark of NTT.

TAPE DECK : SG-20 MECHANISM SERIES
TRAVERSE DECK : RAE0113Z MECHANISM SERIES

■ Specifications

■ Radio

Frequency range	
FM	87.5 – 108 MHz
MW(E,EB)	520 – 1610 kHz
LW(E,EB)	148.5 – 285 kHz
AM(EG)	520 – 1610 kHz
Intermediate frequency	
FM	10.7 MHz
AM	459 kHz
Sensitivity	
FM(E,EB)	12.5 dB/50 mW (– 3 dB limit sens.)
FM(EG)	14.5 dB/50 mW (– 3 dB limit sens.)
MW(E,EB)	54 dB/m/50mW
LW(E,EB)	58.5 dB/m/50mW
AM(EG)	54.5 dB/m/50mW

■ Tape Recorder

Track system	4 track, 2 channel, stereo
Recording system	AC bias
Erasing system	Multi pole magnet
Monitor system	Variable sound monitor
Frequency range	
Normal	50 – 12,000 Hz

■ CD Player

Sampling frequency	44.1 kHz
Decoding	16 bit linear
Beam source	Semiconductor laser (wavelength 780nm)
No. of channels	2 channel, stereo
Wow and flutter	Less than possible measurement data
D/A converter	MASH (1 bit DAC)

■ General

Power requirement	
AC	230 – 240V, 50 Hz
Battery	Power consumption; 20W
Power Output	.9V (Six R20/LR20, UM-1 batteries)
Speakers	4W (2W x 2) ...RMS (max.)
Jacks	2 Woofer; 10 cm
Output	Headphones: 32Ω
Dimensions (W x H x D)	470 x 181 x 259 mm
Weight	3.5kg without batteries

Note :

Specifications are subject to change without notice
 Weight and dimensions are approximate.

Panasonic®

© 1995 Matsushita Electronics (S) Pte. Ltd.
 All rights reserved. Unauthorized copying and
 distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

■ Contents

	PAGE		PAGE
• PRECAUTION OF LASER DIODE.....	2	• TROUBLESHOOTING GUIDE.....	25
• HANDLING PRECAUTIONS FOR TRAVERSE DECK.....	3	• TERMINAL FUNCTION OF ICs.....	26 ~ 28
• CAUTION FOR AC MAINS LEAD.....	4	• MECHANISM PARTS LOCATION.....	29
• OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT..	5 ~ 8	• CABINET PARTS LOCATION.....	30 & 31
• TERMINAL GUIDE OF ICs, TRANSISTORS & DIODES.....	9	• MECHANISM PARTS LIST.....	32
• SCHEMATIC DIAGRAM.....	9 ~ 16	• REPLACEMENT PARTS LIST.....	32 ~ 34
• PRINTED CIRCUIT BOARD	16 ~ 19	• RESISTORS & CAPACITORS.....	34 & 35
• WIRE CONNECTION DIAGRAM.....	20	• PACKING MATERIALS AND ACCESSORIES.....	35
• MEASUREMENTS AND ADJUSTMENTS.....	21 ~ 24		

■ Precaution of Laser Diode

CAUTION : This product utilizes a laser diode with the unit turned "ON", invisible laser radiation is emitted from the pick up lens.
Wavelength : 780 nm
Maximum output radiation power from pick up : 100 μ W/VDE

Laser radiation from pick up unit is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

ACHTUNG: Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge : 780nm
Maximale strahlungsleistung der lasereinheit : 100 μ W/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdioden gefährlich ist.
2. Den werkseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVASEL: I dette a apparat anvendes laser.

CAUTION!

THIS PRODUCT UTILIZES A LASER.

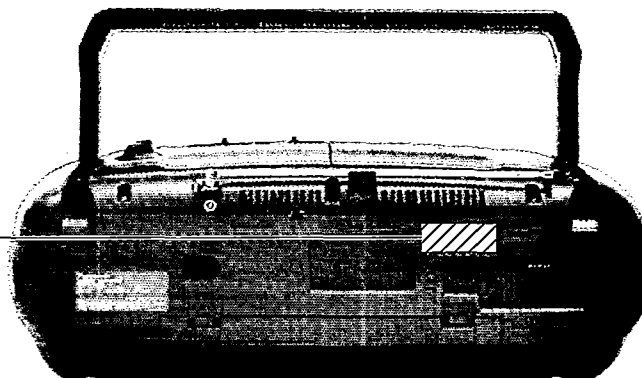
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

■ Use of Caution Labels

RQT4389ZAA

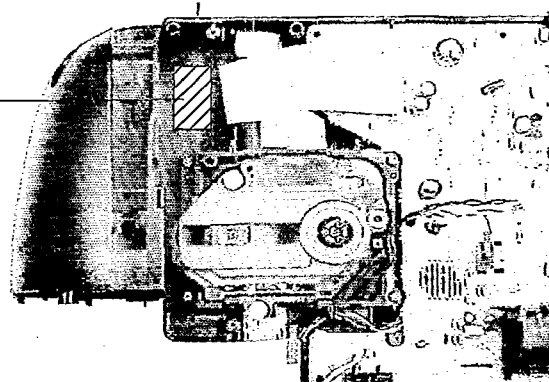


**LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT**



DANGER	INVISIBLE LASER RADIATION WHEN OPEN AND INTER-LOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYSLIG LASERSTRÅLING VED ÅPNING. NÅR SIKKERHEDSÅFBRYDERE ER UD AF FUNKTION, UNDGÅ UDSETTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHJETTAESSA OLET ALTITINNA NÄKYMÄTÖNTÄ LASERSÄTELYLLÄ. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYSLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYSLIG LASERSTRÅLING NÄR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRUTES. UNDGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRÄHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERHÖCKT. NICHT DEM STRAHL AUSSETZEN.

R0LS0119

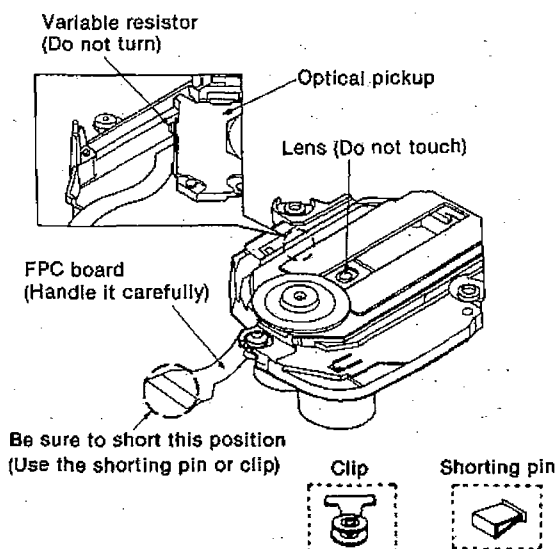


■ Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body. So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

• Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board). When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

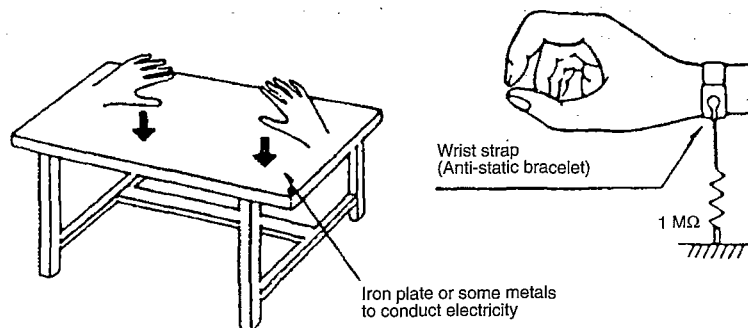


• Grounding for electrostatic breakdown prevention

1. Human body grounding
Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

Caution :

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



■ Caution for AC Mains Lead

[For [EB] area.]

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION !

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OFF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted, please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this lead are coloured in accordance with the following code:

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

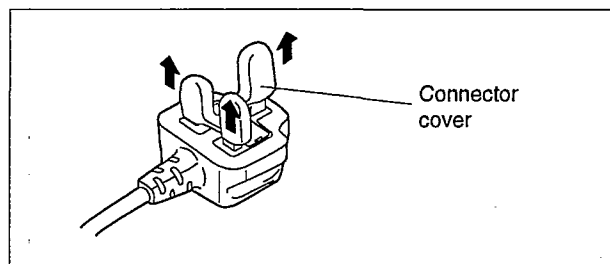
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either or these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth symbol $\perp$.

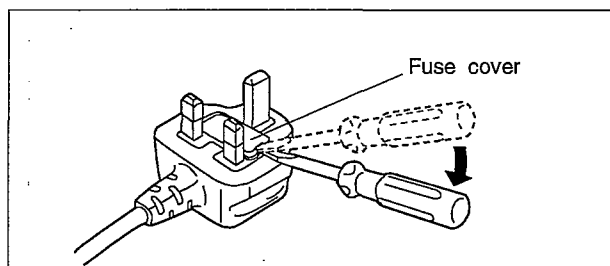
Before use

Remove the connector cover as follows.

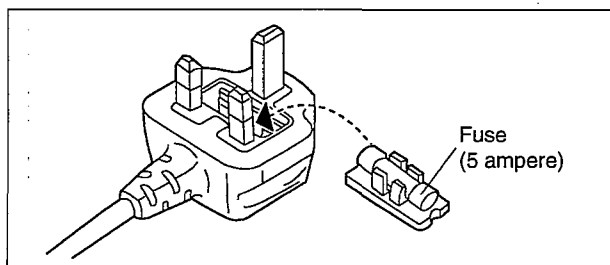


How to replace the fuse

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



■ Operation Checks and Main Component Replacement Procedures

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures.
Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.

• Contents

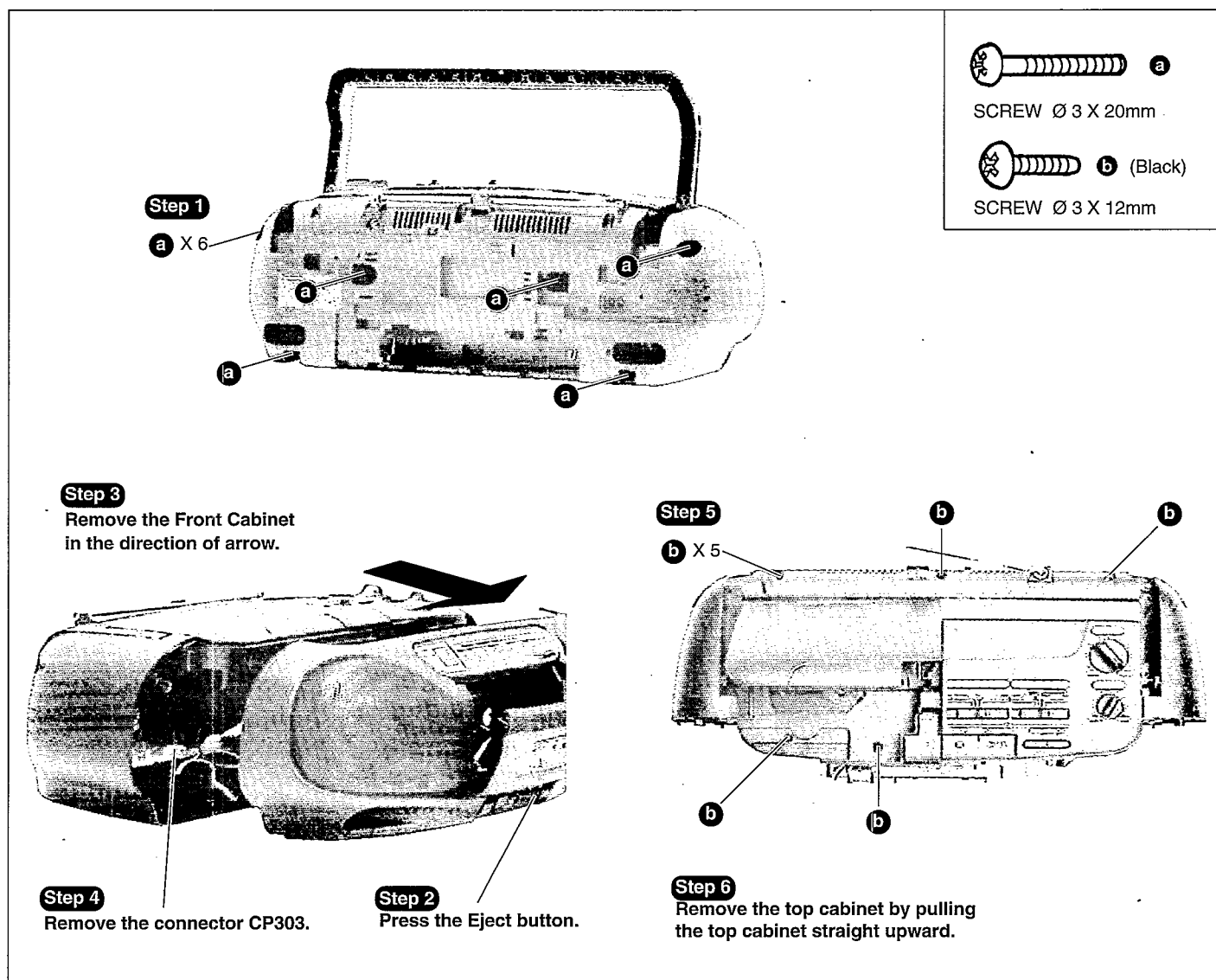
	page
• Disassembly of the Front Cabinet and Top Cabinet	5
• Checking Procedure for each major P.C.B.	
1. Checking for the Main P.C.B.	6
2. Checking for the Servo P.C.B.	6 & 7
3. Checking for the Power P.C.B.	7
• Main Component Replacement Procedures	
1. Replacement of Traverse Deck	7 & 8

Warning : This product uses a laser diode. Refer to caution statement on page 2.

ACHTUNG : •Die lasereinheit nicht zerlegen.

•Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

■ Disassembly of the Front Cabinet and Top Cabinet



■ Checking Procedure For Each Major P.C.B.

1. Checking of the Main P.C.B.

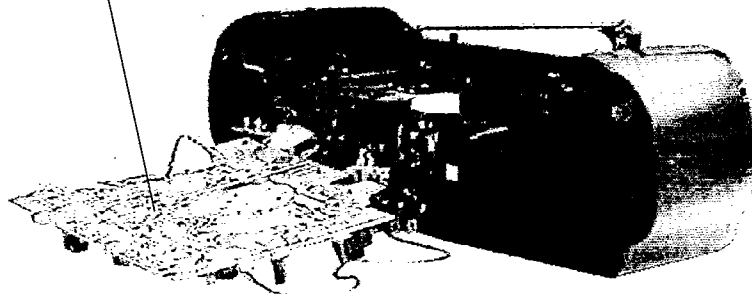
Step 1

Disassemble the Front Cabinet and Top Cabinet.

Step 3

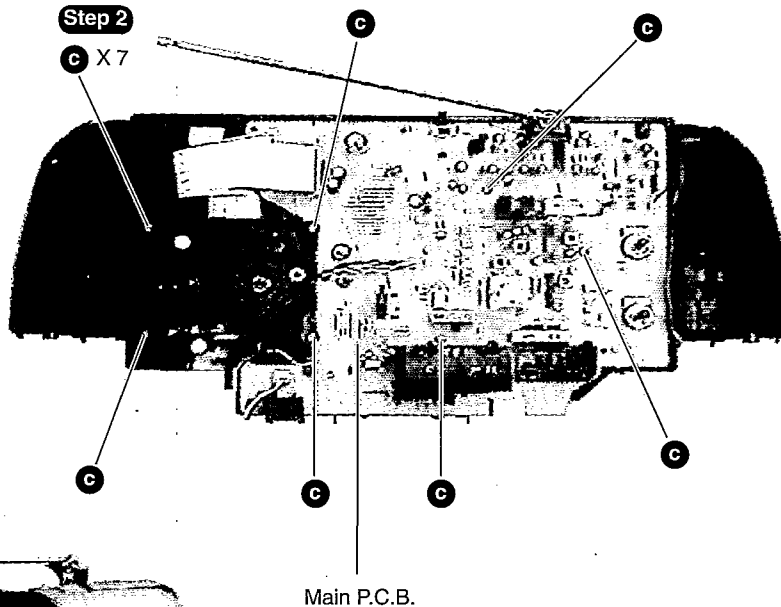
Place the Main P.C.B. as shown below.

Main P.C.B.(solder side)



Step 2

C X 7



Main P.C.B.



SCREW Ø 3 X 12mm

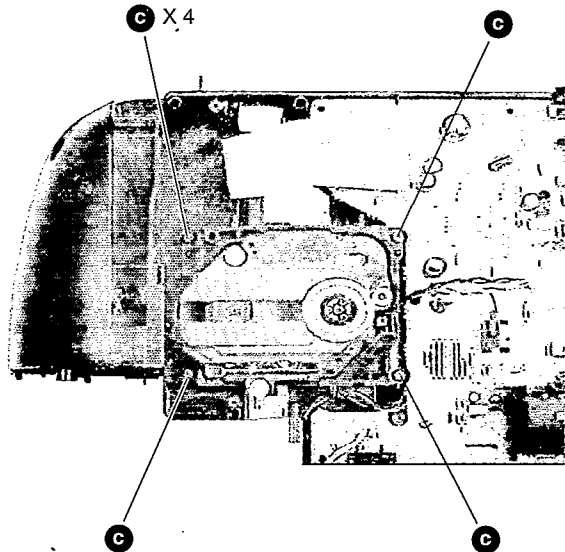
2. Checking of the Servo P.C.B.

Step 1

Disassemble the Front Cabinet and Top Cabinet.

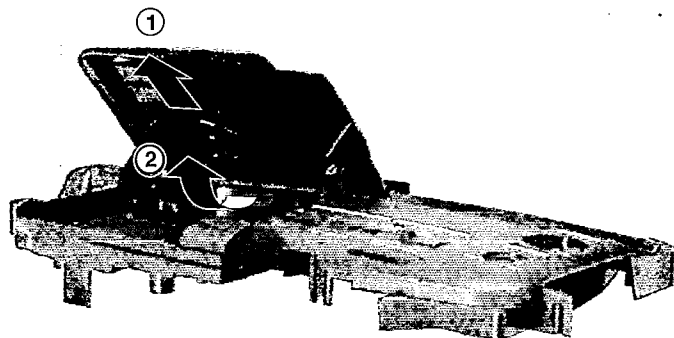
Step 3

C X 4



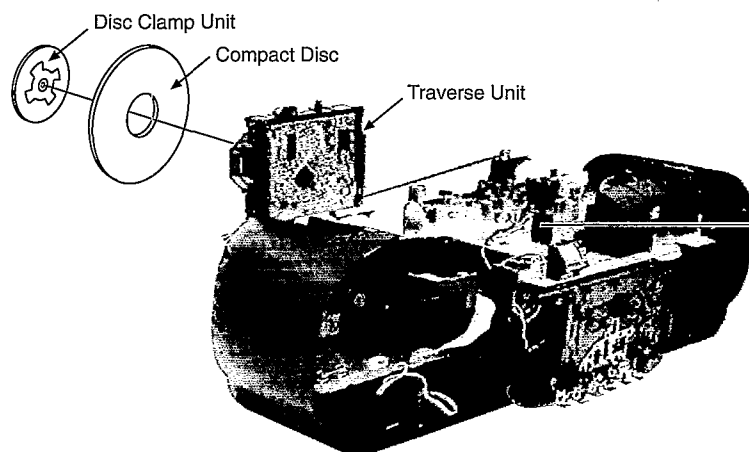
Step 2

Remove the disk clamp unit in the direction of arrow ① follow by ②

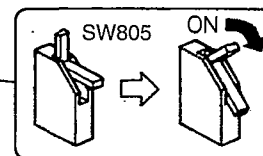


Step 4

Place the Traverse Unit as shown below
and install the compact disk and disk clamp unit.



Note : Before perform checking, make sure the switch SW805 is switch to "ON" position (as shown in diagram).



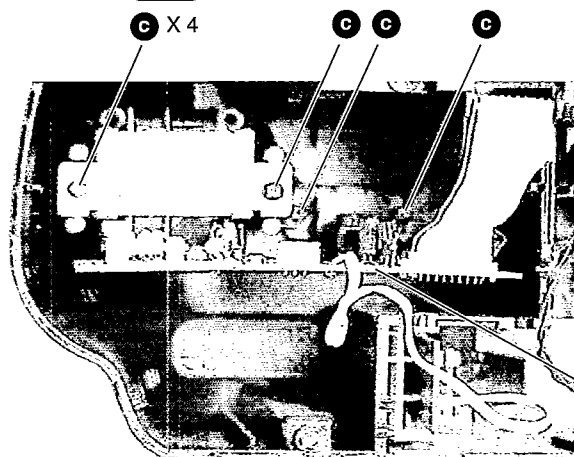
3. Checking of the Power P.C.B.

Step 1

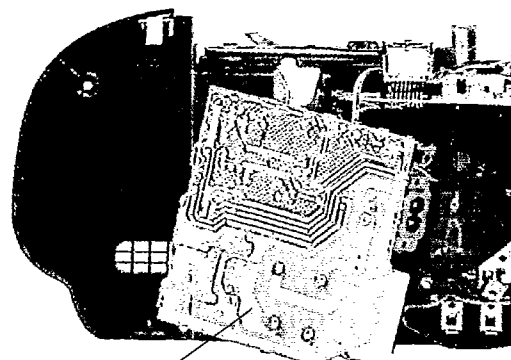
Disassemble the Front Cabinet.

Step 2

C X 4

**Step 3**

Pull out the Power P.C.B.
Place the Power P.C.B. as shown below.



POWER P.C.B.

■ Main Component Replacement Procedures

1. Replacement of the Traverse Deck.

Step 2

Desolder 2 terminals of spindle motor.

Step 3

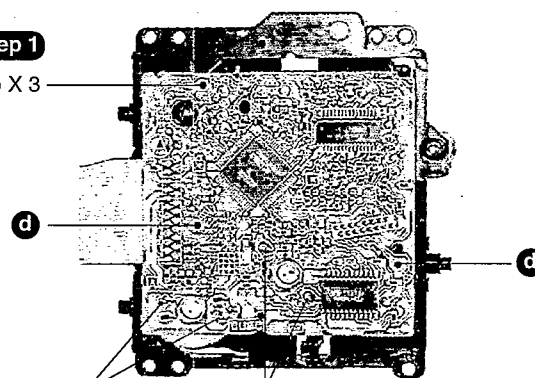
Desolder 2 terminals of traverse motor.



SCREW Ø 2 X 6mm

Step 1

d X 3



Terminals of traverse motor

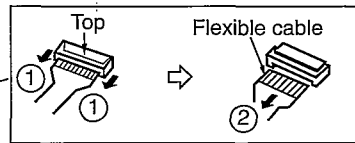
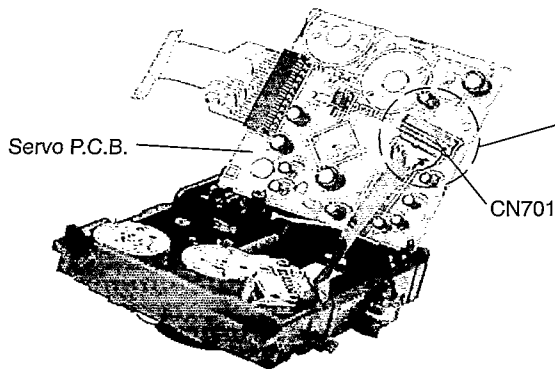
Terminals of spindle motor

Step 4

Remove the flexible cable from CN701.

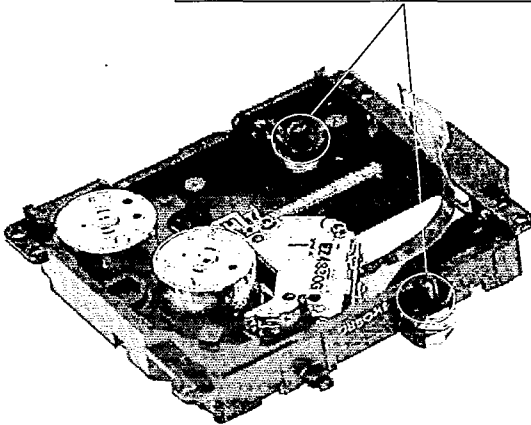
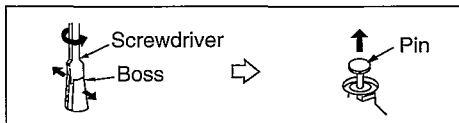
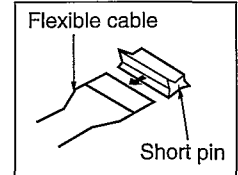
- Removal of the flexible cable.

Push the top of the connector in the direction of arrow ① and pull out the flexible cable in the direction of arrow ②.

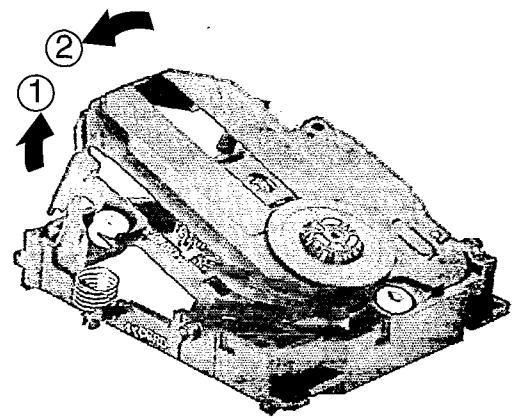


Note:

Insert a short pin into the flexible cable for traverse unit.

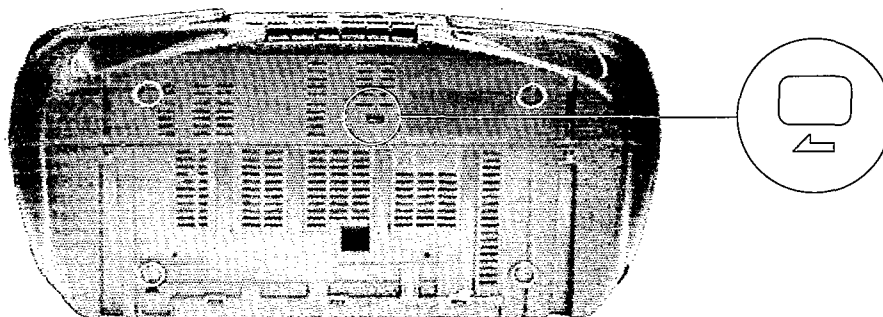
**Step 5**

Widen 2 bosses by using a flat tip screwdriver and remove 2 pins.

**Step 6**

Remove the Traverse Deck Ass'y in the direction of arrow ① follow by ②.

■ What To Do When The Tape Is Entangled



When the tape is caught in the pinch roller, etc., release the tape by turning the pulley on the motor with a screw-driver in the direction of arrow.

Terminal Guide of ICs, Transistors & Diodes

AN8389SE1 	AN8802SCE1V 	MNB4532REBD 64 Pin MN66271RA 80 Pin 	TA8227P 	AN7317 	BA1442A
BA7755A 	AN7205 	PST600DTA 	2SA952LTA 2SC1684STA 2SC2001L1TA 		2SC2785FTA BA1A4MTA BA1A4ZTA BN1A4MTA
2SC1740SRTA BN1A3QTA 	2SB1185E 	2SB709S 	2SJ40CDTA 	RVD1SS133TA 	RL154M11
					RVDMTZ5R6BTA MTZJ6R2ATA MTZJ8R2BTA

Schematic Diagram

NOTES:

- SW1-1 ~ SW1-8 : Band Select Switch. (F...FM, M...MW, L...LW) ...for E,EB areas
- SW1-1 ~ SW1-2 : Band Select Switch. (FM ST...FM STEREO, FM...FM, AM...AM) ...for EG area
- SW301-1 : Beatproof Switch. (I...BEATPROOF I, II...BEATPROOF II, III...BEATPROOF III(E,EB))
- SW301-2 : FM Stereo switch. (M...MONO, ST...STEREO) ...for E,EB areas
- SW302-1 ~ SW302-4 : Function Select Switch. (CD...CD, R...RADIO, T...TAPE/OFF)
- SW303 : Record Switch.
- SW304 : Motor Switch.
- SW801 : CD Play/Pause Switch.
- SW802 : CD Forward Skip/Search Switch.
- SW803 : CD Reverse Skip/Search Switch.
- SW804 : CD Stop Switch.
- SW805 : CD Open/Close Switch.
- VR301-1 ~ VR301-2 : XBS Control VR.
- VR302-1 ~ VR302-2 : Volume Control VR.
- S701 : Rest Switch.
- S501 : AC/Battery Select Switch.(JK501)

Battery Current consumption:

Vol. min..... 40mA (FM)
20mA (AM)(MW/LW)
40mA (TAPE)
60mA (CD)

Vol. max..... 60mA (FM)
60mA (AM)(MW/LW)
90mA (TAPE)
150mA (CD)

Measurement condition:

Radio : FM 60 dB, 30%mod
AM 74 dB/m, 30%mod
Tape : 315 Hz, 0dB
CD : 1kHz, 0dB



- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

No mark ... Tape Playback
() ... AM(MW/LW)

< > ... FM

(()) ... CD

CAUTION !

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

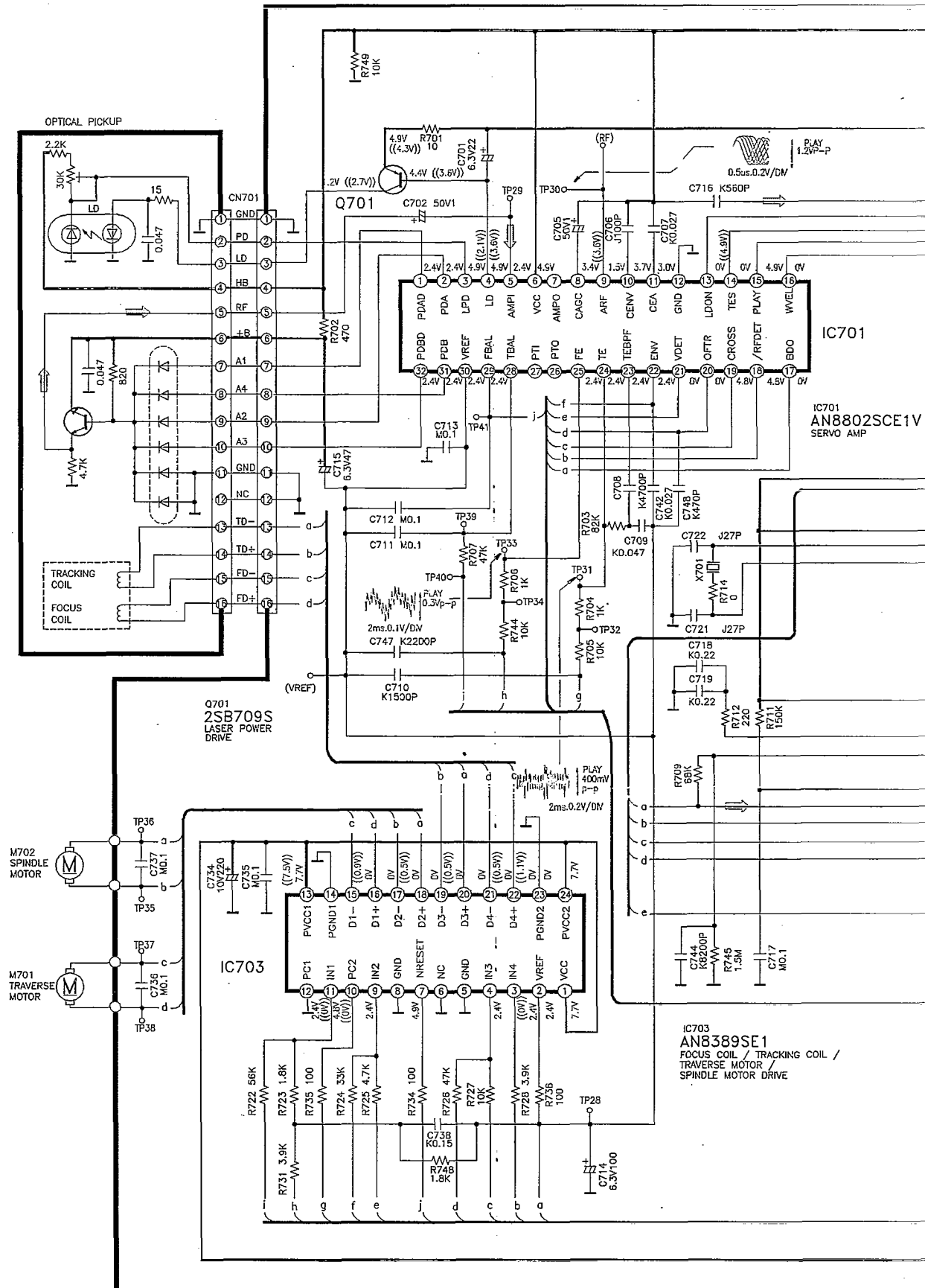
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

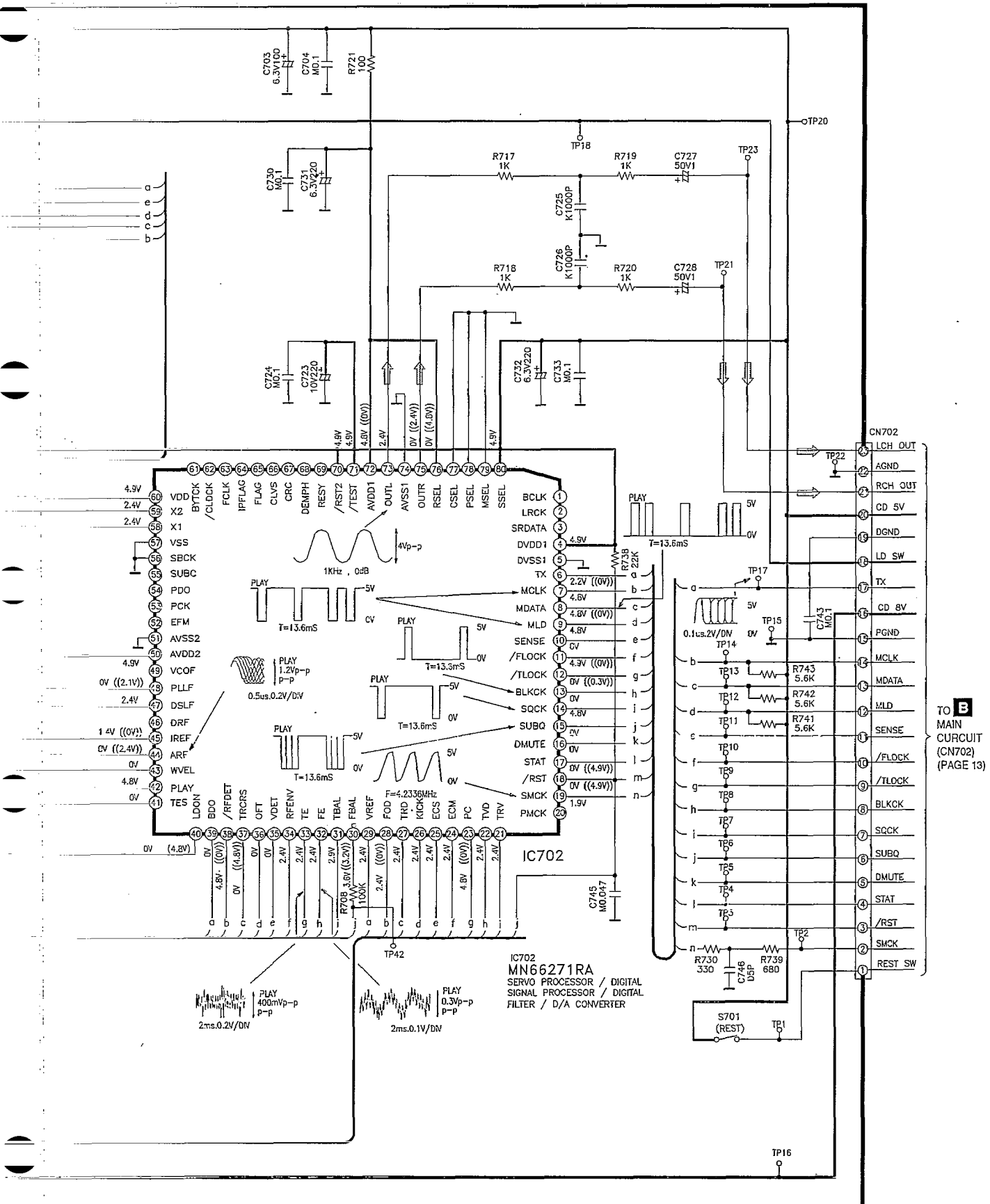
Important safety notice :

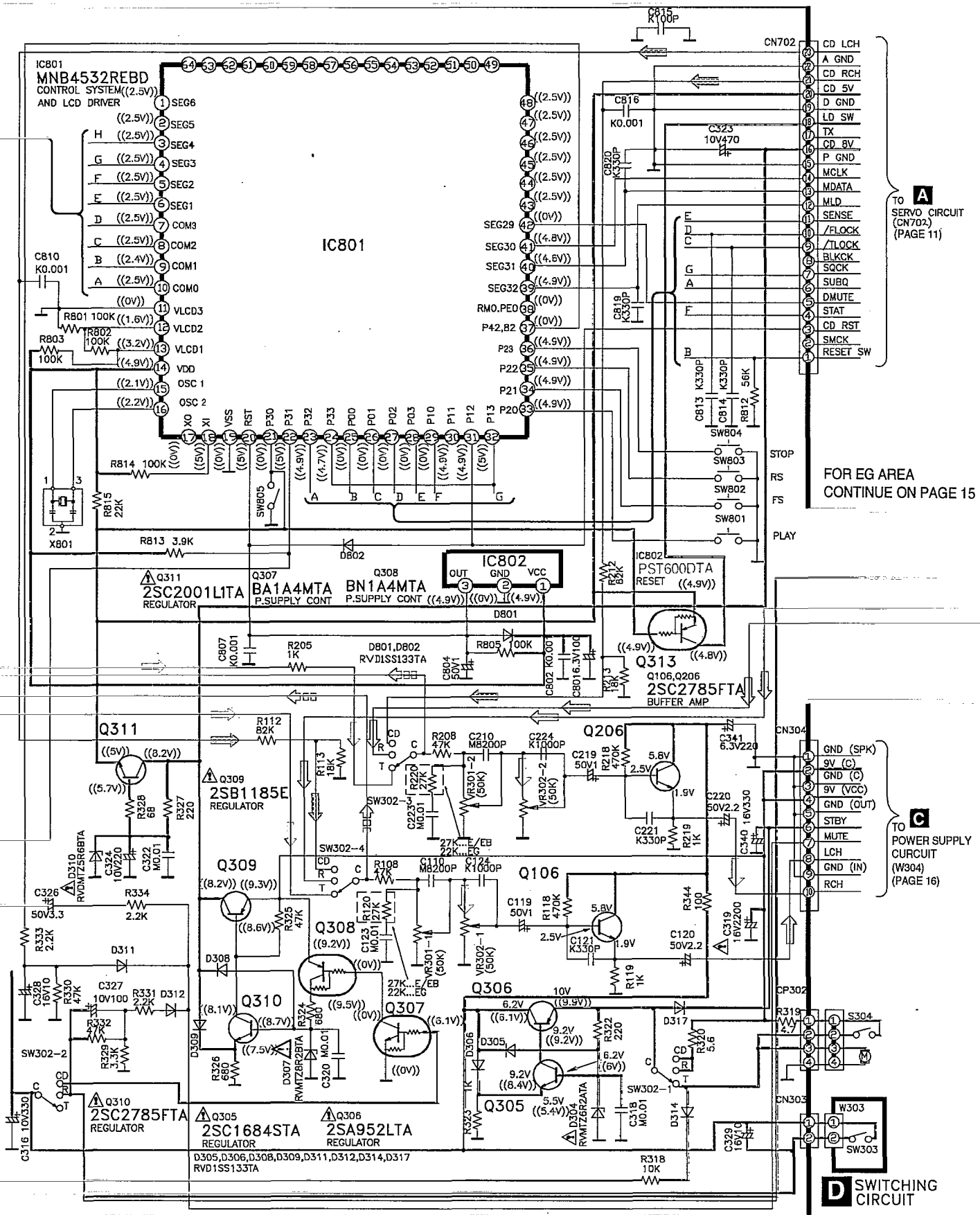
Components identified by mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

- This schematic diagram may be modified at anytime with the development of new technology.

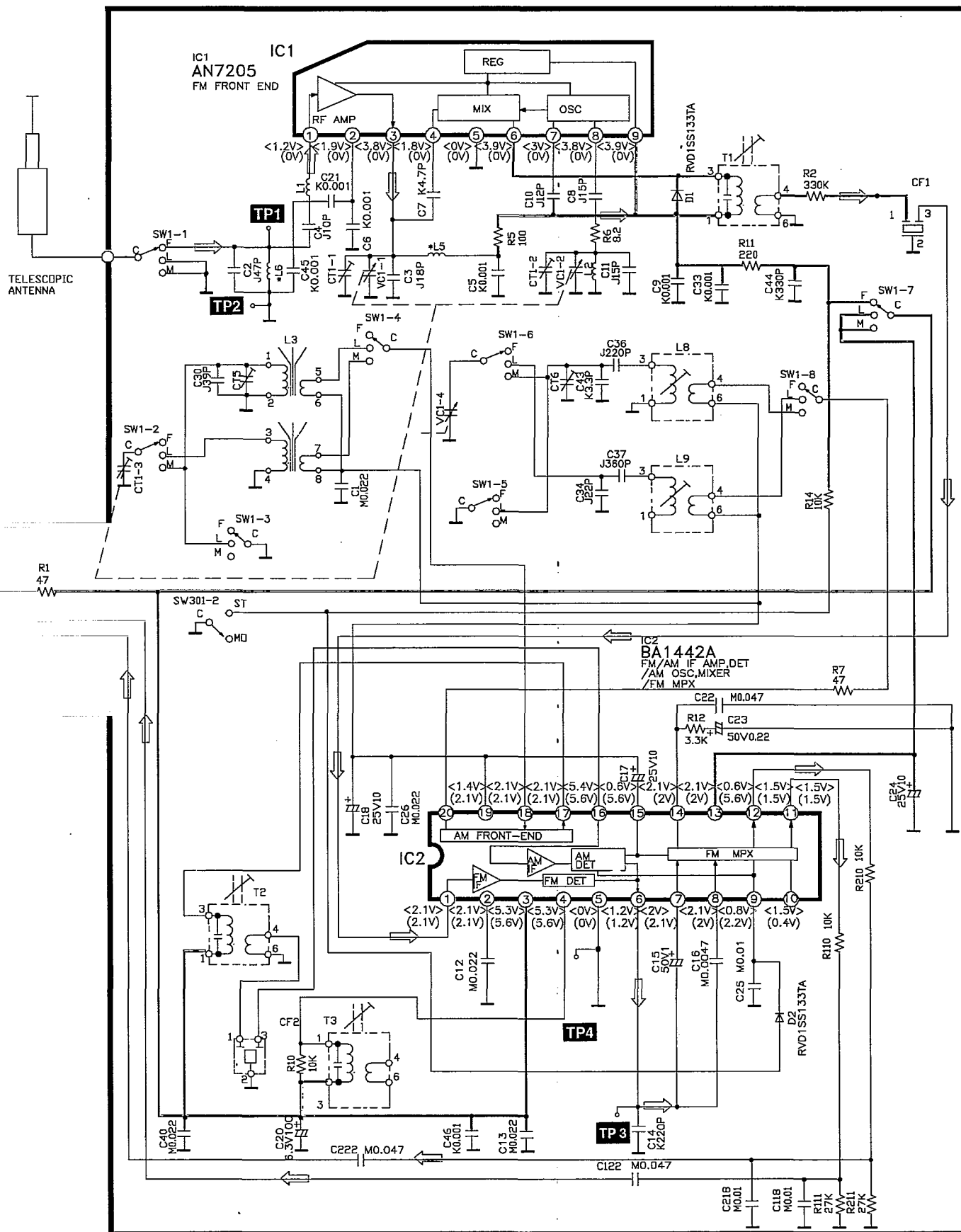
A SERVO CIRCUIT





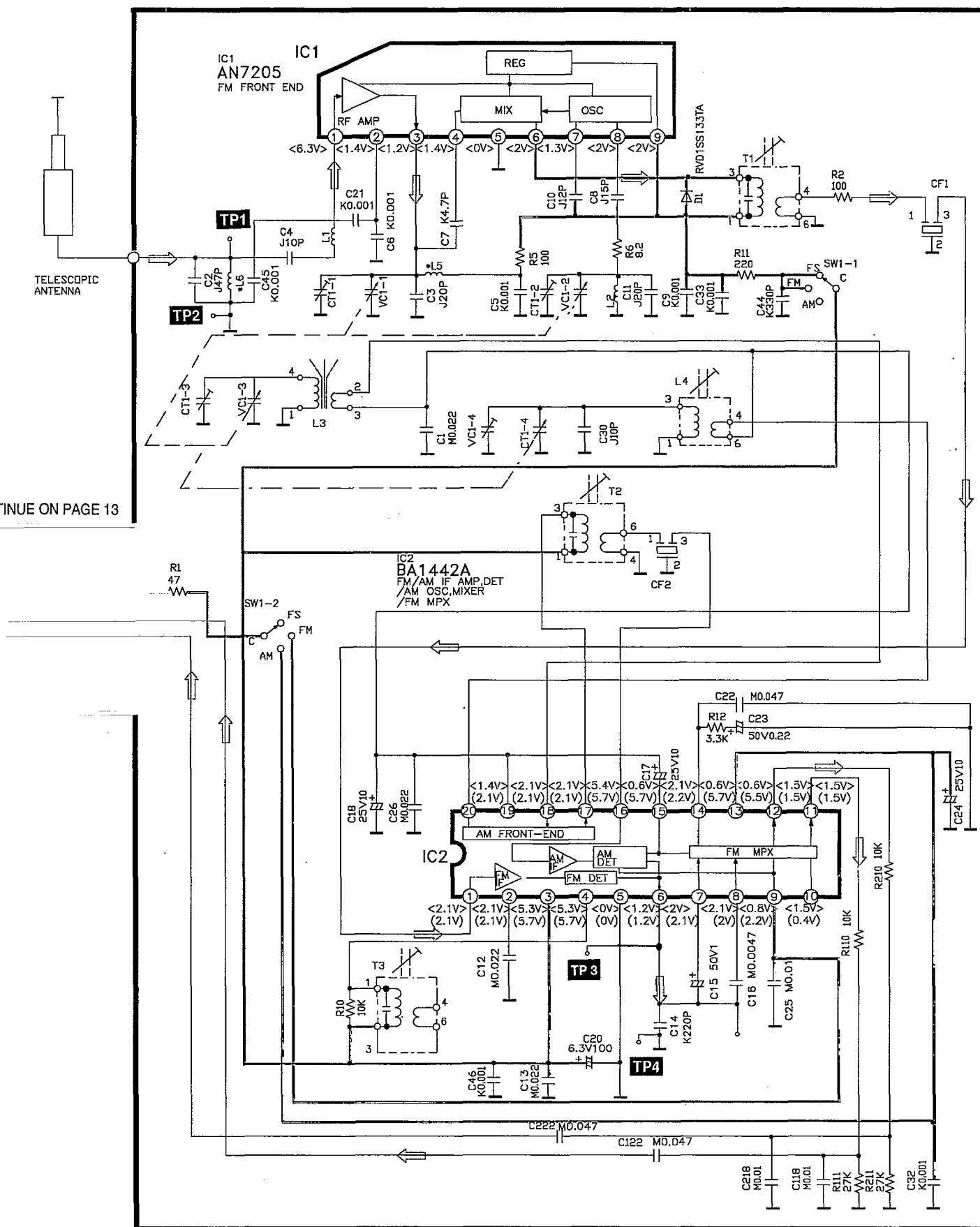


FOR E,EB AREAS

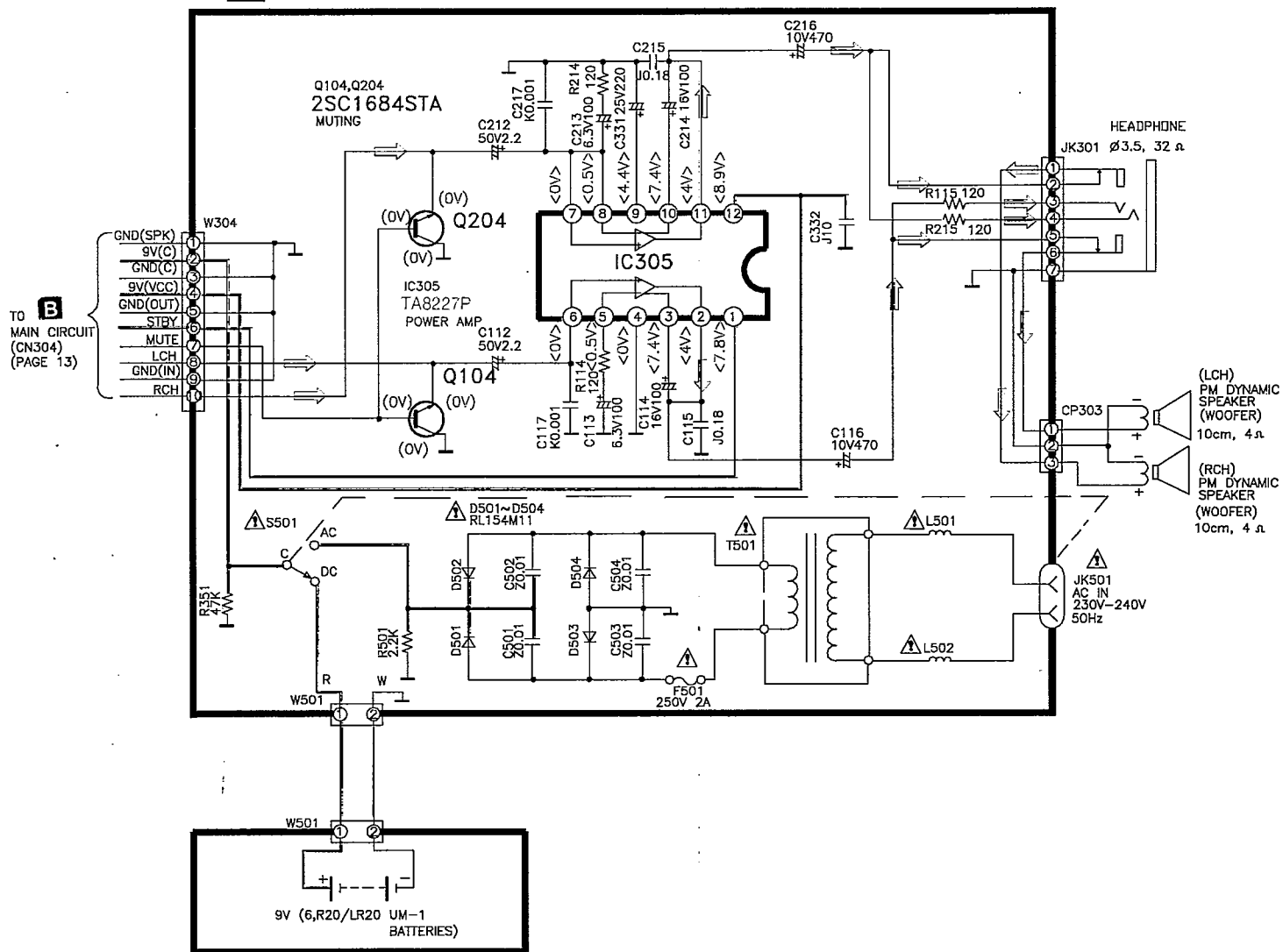


FOR EG AREA

CONTINUE ON PAGE 13



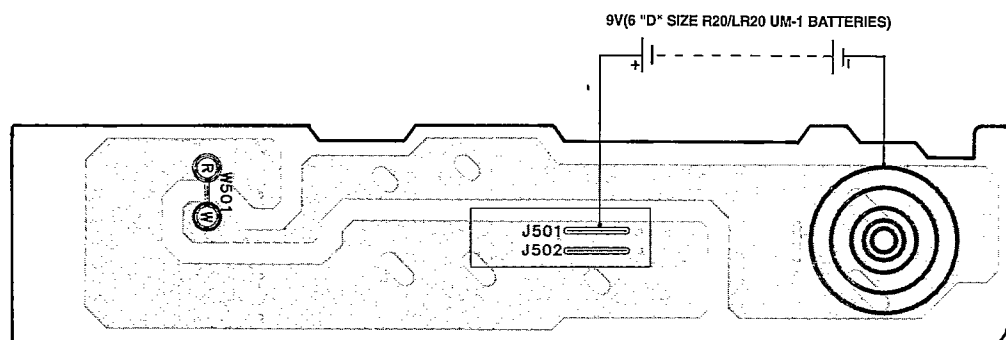
C POWER SUPPLY CIRCUIT

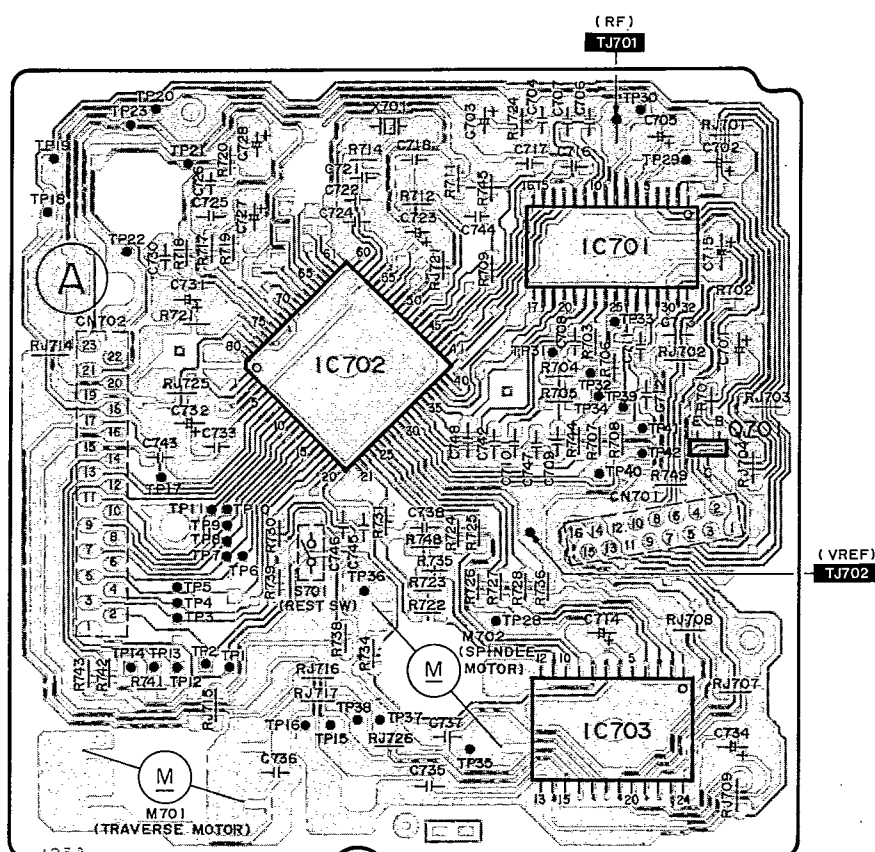
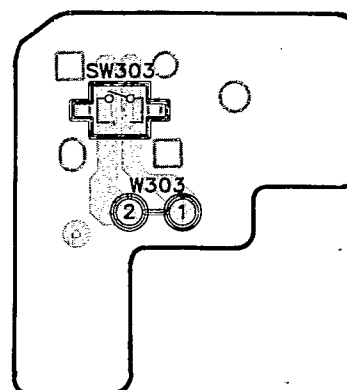
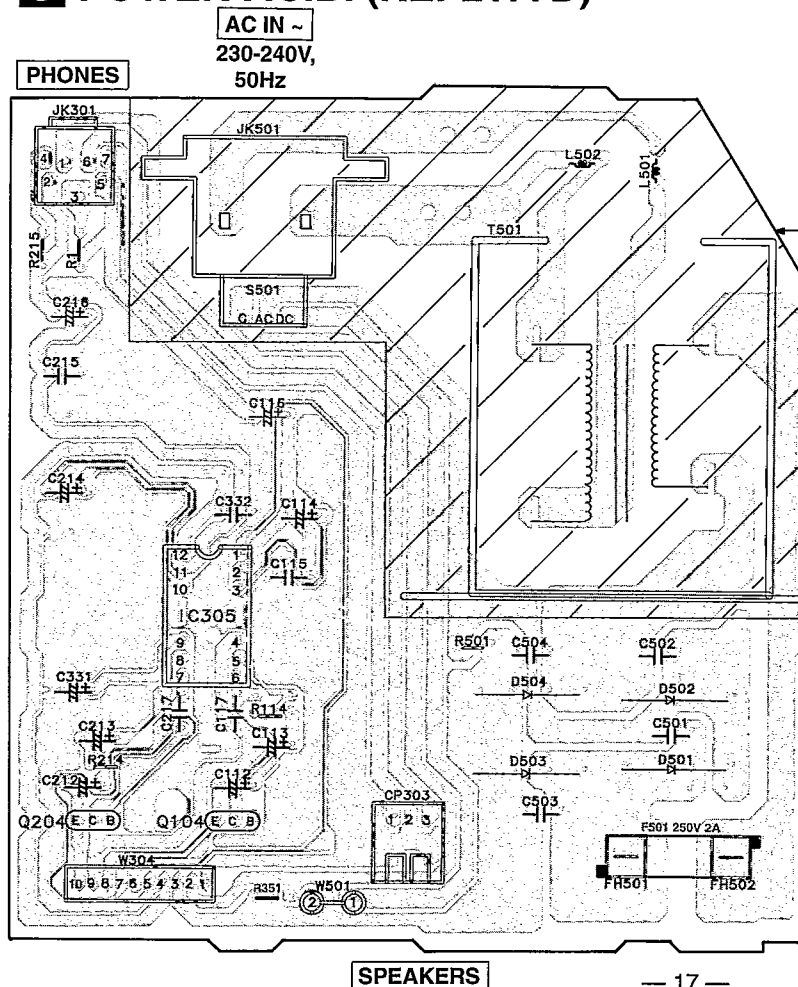


E BATTERY CIRCUIT

Printed Circuit Board

E BATTERY P.C.B. (REP2177D)

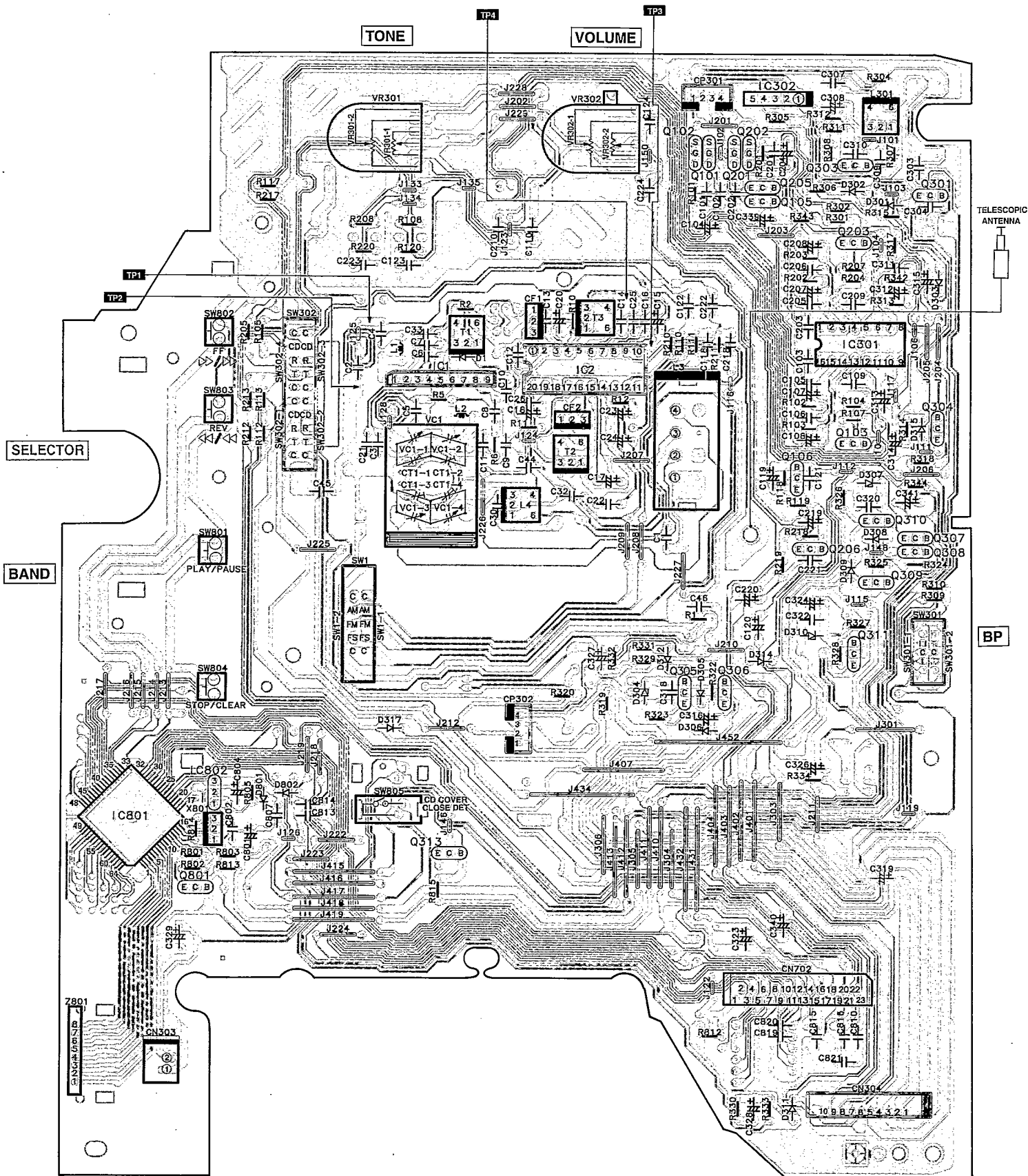


A SERVO P.C.B. (REP1650A-N)**D SWITCH P.C.B. (REP2178D)...E,EB (REP2178E)...EG****C POWER P.C.B. (REP2177D)**

CAUTION
RISK OF ELECTRIC SHOCK
AC voltage line. Please do not
touch this portion.



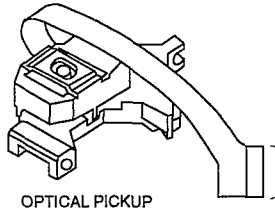
B MAIN P.C.B. (REP2178E)...EG



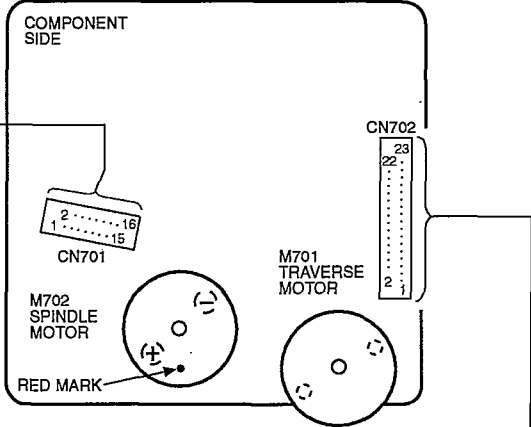
Wire Connection Diagram

NOTES
WIRE COLOUR:

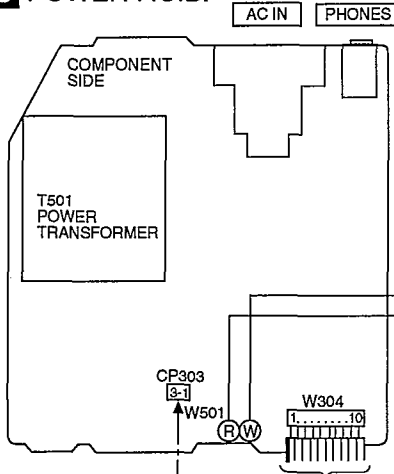
YEL.....YELLOW
WHT.....WHITE
RED.....RED
BLK.....BLACK
GRY.....GRAY
BRN.....BROWN
SLD.....SHIELD WIRE



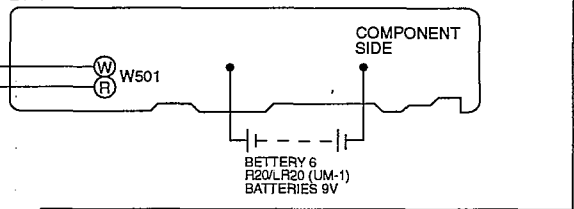
A SERVO P.C.B.



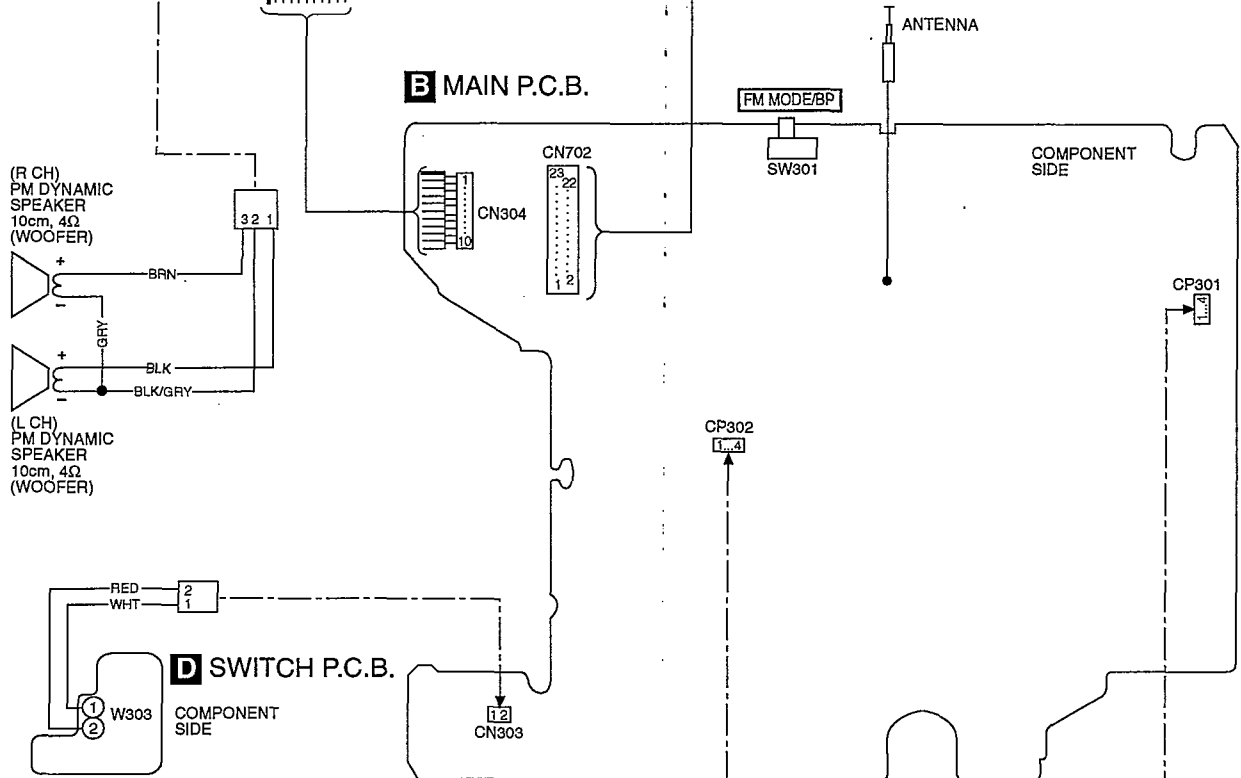
C POWER P.C.B.



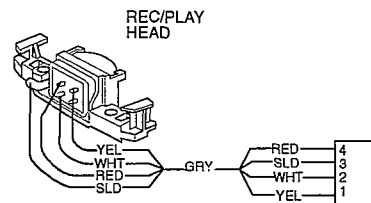
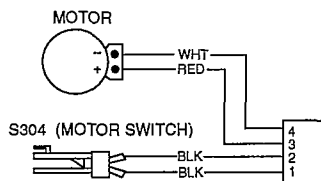
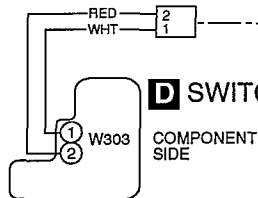
E BATTERY P.C.B.



B MAIN P.C.B.



D SWITCH P.C.B.



■ Measurements And Adjustments

■ TUNER SECTION

• ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

- Set power source voltage to 9 V DC.
- Set volume control to maximum
- Set band switch to AM(LW,MW) or FM
- Set selector switch to RADIO
- Set XBS control to minimum
- Output of signal generator should be no higher than necessary to obtain an output reading.

Note : LW-RF alignment should be performed before MW-RF alignment.
No FM STEREO alignment is required due to Tuner IC (BA1442A) is used.

• AM-IF ALIGNMENT

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown IN Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
Fashion a loop of several turns of wire and radiate a signal into the loop ant. of receiver.	459 kHz 30 % Mod. at 400 Hz	Point of non-interference.(on/about 600kHz)	Headphone Jack (32Ω) (Fabricate the plug as shown in Fig.2 and then connect the lead wires of the plug to the measuring instrument.)	T2(AM IFT)	Adjust for maximum output.

• AM-RF ALIGNMENT(EG)

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown in Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
"	514 ± 3 kHz	Tuning capacitor fully closed.	"	L4 (AM OSC Coil)	Adjust for maximum output.
"	1639 ± 5 kHz	Tuning capacitor fully opened.	"	CT1-4 (AM OSC Trimmer)	Adjust for maximum output.
"	550 kHz	Tune to signal	"	[*1] L3 (AM ANT Coil)	Adjust for maximum output. Adjust L3 by moving coil bobbin along ferrite core.
"	1500 kHz	"	"	CT1-3 (AM ANT Trimmer)	Adjust for maximum output.
[*1] Fix antenna coil with wax after completing alignment.					

• MW-RF ALIGNMENT(E,EB)

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown in Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
"	511 kHz	Tuning capacitor fully closed.	"	L9 (MW OSC Coil)	Adjust for maximum output.
"	1650 kHz	Tuning capacitor fully opened.	"	CT1-4 (MW OSC Trimmer)	Adjust for maximum output.
"	550 kHz	Tune to signal	"	[*1] L3-1 (MW ANT Coil)	Adjust for maximum output. Adjust L3-1 by moving coil bobbin along ferrite core.
"	1500 kHz	"	"	CT1-3 (MW ANT Trimmer)	Adjust for maximum output.
[*1] Fix antenna coil with wax after completing alignment.					

• LW-RF ALIGNMENT(E,EB)

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown in Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
"	136 kHz	Tuning capacitor fully closed.	"	L8 (LW OSC Coil)	Adjust for maximum output.
"	297 kHz	Tuning capacitor fully opened.	"	CT6 (LW OSC Trimmer)	Adjust for maximum output.
"	145 kHz	Tune to signal	"	[*1] L3-2 (LW ANT Coil)	Adjust for maximum output. Adjust L3-2 by moving coil bobbin along ferrite core.
"	285 kHz	"	"	CT5 (LW ANT Trimmer)	Adjust for maximum output.
[*1] Fix antenna coil with wax after completing alignment.					

• FM-IF ALIGNMENT

Connect to test point TP1 through ceramic capacitor. Negative side to test point TP2 .	10.7 MHz (Sweep)	Point of non-interference.(on/about 90 MHz)	Connect vert. amp. of scope to test point TP3 . Negative side to test point TP4 .	T1(FM 1st)	Waveform is shown in Fig. 3
"	"	"	"	T3(FM 2nd)	Waveform is shown in Fig. 4

• FM-RF ALIGNMENT

Connect to test point TP1 through FM dummy antenna. Negative side to test point TP2 .	86.2MHz (E,EB) 87.35MHz (EG) ± 50 kHz	Variable capacitor fully closed.	Headphone Jack (32Ω) (Fabricate the plug as shown in Fig.2 and then connect the lead wires of the plug to the measuring instrument.)	L2 (FM OSC Coil)	[*2] Adjust for maximum output.
	109.2MHz (E,EB) 108.3MHz (EG) ± 50 kHz	Variable capacitor fully opened.	"	CT1-2 (FM OSC Trimmer)	"
	106MHz	Tune to signal	"	CT1-1 (FM ANT Trimmer)	"
[*2] Three output response will be present; proper tuning is the center frequency.					

■ CASSETTE DECK SECTION

• ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT
Note : Azimuth Head Alignment is not required due to Aztec Head is used in the cassette mechanism.

• TAPE SPEED ALIGNMENT

TEST TAPE	EQUIPMENT CONNECTION ELECTRONIC COUNTER	ADJUSTMENT	SPECIFICATION	REMARKS
QZZCWAT (3kHz)	Headphone Jack (32Ω) (Fabricate the plug as shown in Fig.2 and then connect the lead wires of the plug to the measuring instrument.)	Motor VR. (show in Fig.5)	3000 ± 90Hz	1. Set the unit to 'TAPE' position. 2. Playback the middle part of the test tape (QZZCWAT). 3. Adjust motor VR for output value of 3000 ± 90Hz shown on frequency counter.

ALIGNMENT POINTS

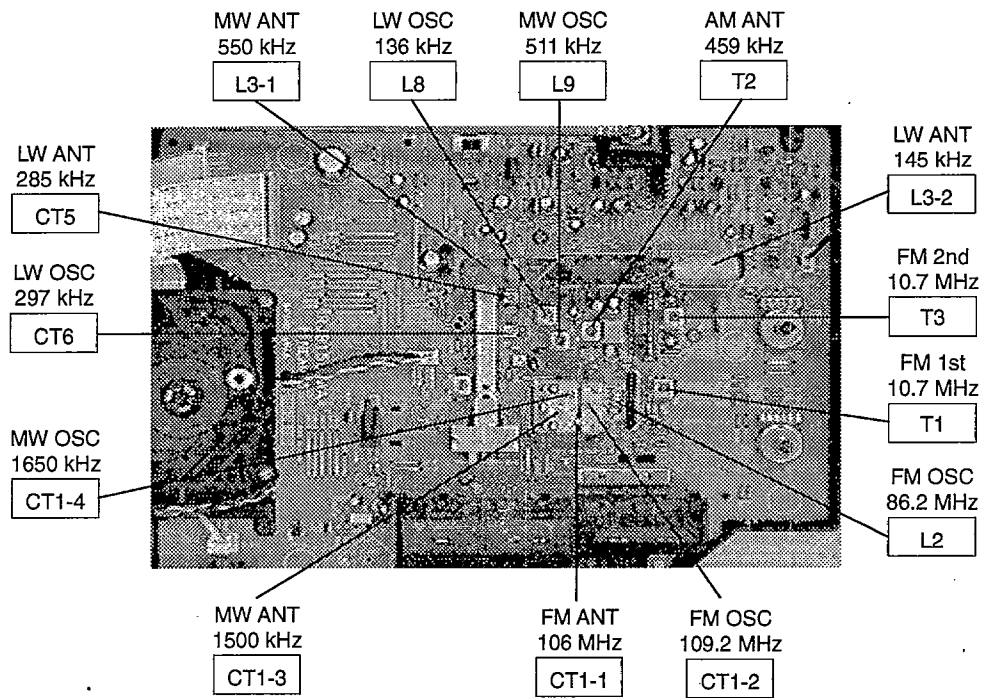


Fig. 1
(E,EB)

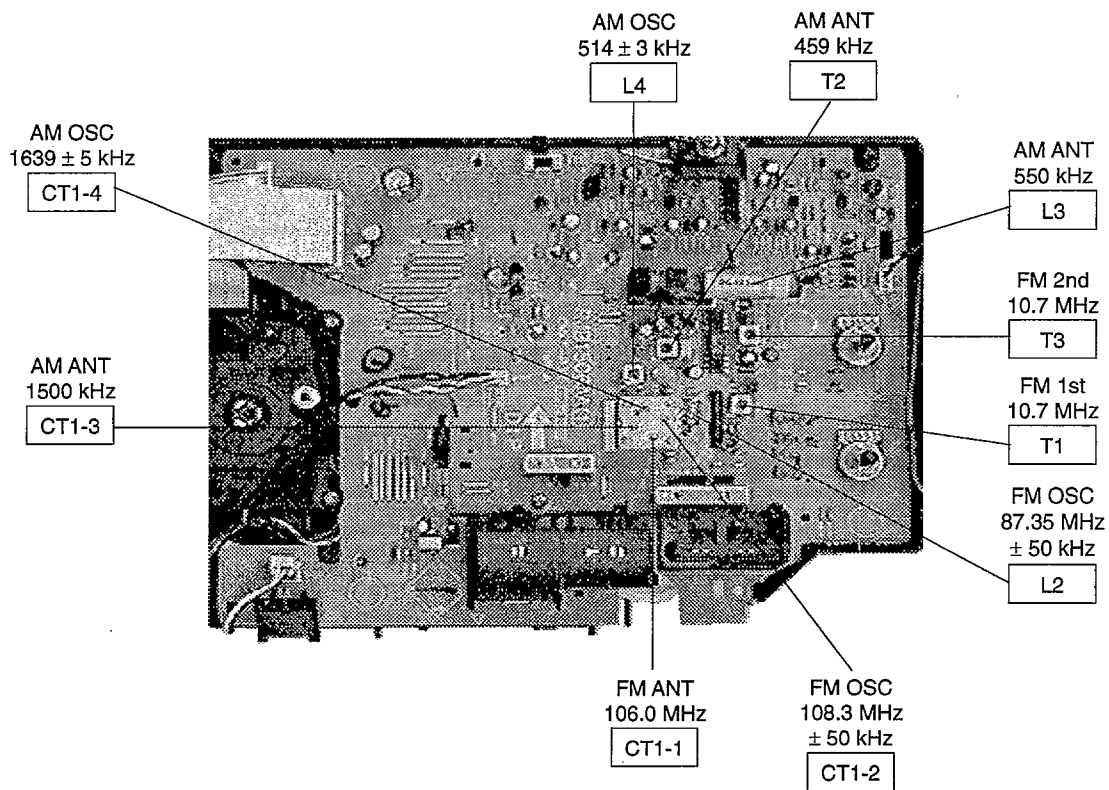


Fig. 1
(EG)

To Headphone

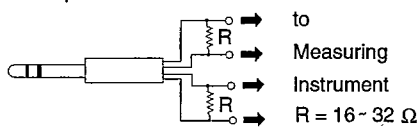


Fig. 2

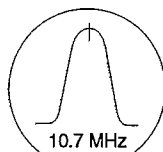


Fig. 3



Fig. 4

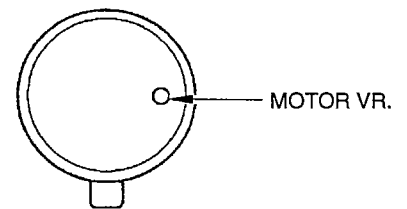


Fig. 5

CD PLAYER SECTION

Warning : This product uses a laser diode. Refer to caution statements on page 3.

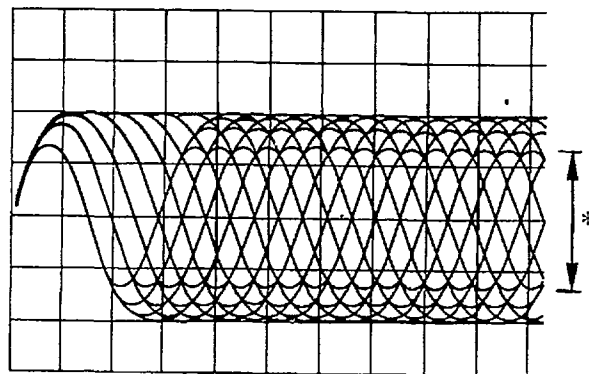
Caution : It is very dangerous to look or touch the laser beam. (laser radiation is invisible)
With the unit turned "on", laser radiation is emitted from the pickup lens.
Avoid exposure to the laser beam, especially when performing adjustments.

Measuring Instruments and Special Tools

- * Test discs
 1. Playability test disc (SZZP1054C).
 2. Uneven test disc (SZZP1056C).
- * Musical program disc (ordinary).
- * Dual-beam oscilloscope with bandwidth of 30 MHz or better (with EXT. trigger and 1 : 1 probe).
- * Allen wrench (M2.0) (SZZP1101C).
- * Lock paint (RZZ0L01)

(1) MECHANICAL ADJUSTMENT

- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
 - Make adjustments to improve playability if the traverse deck has not been replaced.
1. Connect the oscilloscope's CH. 1 probe across **TJ701** (RF) (+) and **TJ702** (V-Ref.) (−) on the servo P.C.B. (Refer to Fig. 1 on page 17)
Oscilloscope setting : VOLT 200mV.
SWEEP 0.5μs.
Input coupling AC.
 2. Switch the player power **ON**, and play track 19 on the test disc (SZZ1056C).
(Playing any other track will prevent the HEX screws from being accessed.)
 3. Leave the player in play mode.
 4. Alternately adjust the HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
(Refer to Fig. 2 on page 17)
 5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



* Most stretched eye pattern

(3) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* Checking skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

* Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* Checking Playability

1. Play the 0.7mm black dot and the 0.7mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

• Adjustment points

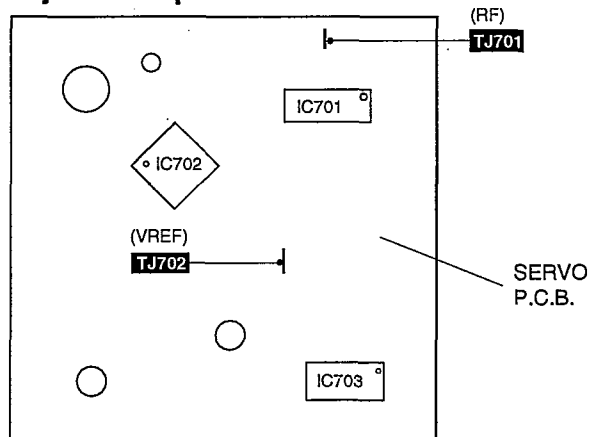


Fig.1

Mechanical adjustment screws

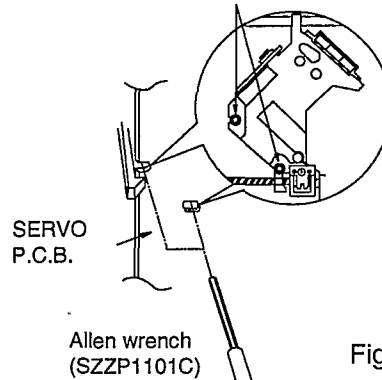
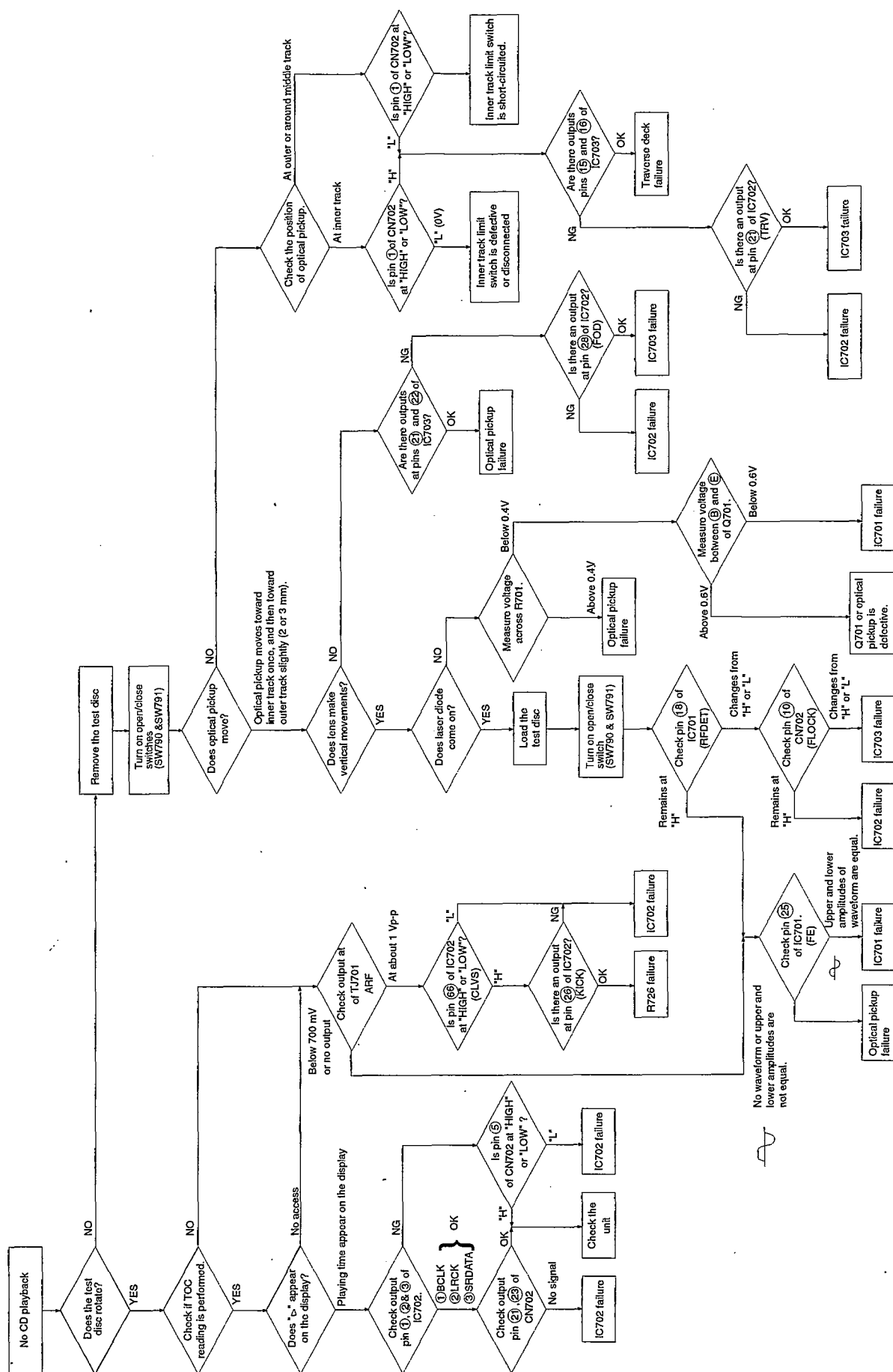


Fig.2

■ Troubleshooting Guide



■ Terminal Functions Of ICs

• IC701 (AN8802SCE1V) Servo Amplifier

Pin No.	Mark	I/O	Function
1	PDAD	I	PDA channel signal input with delay
2	PDA	I	PDA channel signal input without delay
3	LPD	I	Laser PD connection
4	LD	O	Power supply for LD driving
5	AMPI	I	RF amplifier input
6	VCC	I	Power supply connection
7	AMPO	O	RF amplifier output (Not used, open)
8	CAGC	I	AGC loop filter connection
9	ARF	O	RF AGC output
10	CENV	I	Capacitor connection for RF detection
11	CEA	I	Capacitor connection for HPF amplifier
12	GND	—	Ground connection
13	LDON	I	ON/OFF input of LD APC("H" : ON, "L" : OFF)
14	TES	I	Tracking error shunt signal input
15	PLAY	I	Play signal input ("H" : PLAY)
16	WVEL	I	Double speed ("H" : double, "L" : single)

Pin No.	Mark	I/O	Function
17	BDO	O	Dropout detection control
18	/RFDET	O	RF detection signal ("L" : detection)
19	CROSS	O	Tracking error zero cross output
20	OFTR	O	Off-track detection ("H" : detection)
21	VDET	O	Vibration detection signal output("H" : detection)
22	ENV	O	Envelope output terminal
23	TEBPF	I	Vibration detection signal input
24	TE	O	Tracking error signal output
25	FE	O	Focus error signal output
26	PTO	O	Potential amplifier inversion input (Not used, open)
27	PTI	I	Potential amplifier inversion output (Not used, open)
28	TBAL	I	Tracking balance signal input
29	FBAL	I	Focus balance signal input
30	VREF	O	Reference voltage output
31	PDB	I	Photo detection Bch input without delay
32	PDBD	I	Photo detection Bch input with delay

• IC703 (AN8389SE1) Focus coil / Tracking coil / Traverse motor / Spindle motor driver

Pin No.	Mark	I/O	Function
1	VCC	I	Power supply terminal
2	VREF	I	Reference voltage input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	Ground connection
6	NC	—	Ground connection
7	NRESET	I	Reset input
8	GND	—	Ground connection
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (Not used, open)

Pin No.	Mark	I/O	Function
13	PVCC1	I	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1-	O	Motor driver (1) reverse-action output
16	D1+	O	Motor driver (1) forward-action output
17	D2-	O	Motor driver (2) reverse-action output
18	D2+	O	Motor driver (2) forward-action output
19	D3-	O	Motor driver (3) reverse-action output
20	D3+	O	Motor driver (3) forward-action output
21	D4-	O	Motor driver (4) reverse-action output
22	D4+	O	Motor driver (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVCC2	I	Power supply (2) for driver

• IC702 (MN66271RA) Servo processor / Digital signal processor / Digital filter / D/A converter

Pin No.	Mark	I/O	Function
1	BCLK	O	Serial bit clock terminal (Not used, open)
2	LRCK	O	L/R discriminating signal (Not used, open)
3	SRDATA	O	Serial data (Not used, open)
4	DVDD1	I	Power supply (digital circuit) terminal
5	DVSS1	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Microprocessor command clock signal
8	MDATA	I	Microprocessor command data signal
9	MLD	I	Microprocessor command load signal
10	SENSE	O	Sense signal output (OFT,FESL,MAGEND,NAJEND,POSAD,SFG)
11	/FLOCK	O	Optical servo condition(focus)("L" : lead-in)
12	/TLOCK	O	Optical servo condition(tracking)("L" : lead-in)
13	BLKCK	O	Sub-code block clock (f=75Hz)
14	SQCK	I	External clock signal input for sub-code Q register.
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input ("H" : mute)
17	STAT	O	Status signal output (CRC,CUE,CLVS,TTSTVP,FCLV,SQCK)
18	/RST	I	Reset input
19	SMCK	O	1/2-divided clock signal of crystal oscillating at MSEL = "H" (fSMCK=8.4672MHz) 1/4-divided clock signal of crystal oscillating at MSEL="L" (fSMCK=4.2336MHz)
20	PMCK	O	1/192-divided clock signal of crystal oscillating (fPMCK=88.2kHz) (Not used, open)
21	TRV	O	Traverse servo control output
22	TVD	O	Traverse drive signal output
23	PC	O	Spindle motor ON signal output ("L" : ON)
24	ECM	O	Spindle motor drive signal output (forced mode output)
25	ECS	O	Spindle motor drive signal output (servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	D/A (drive) output (TVD,ECS,TRD,FOD, FBAL,TBAL) Reference voltage input.
30	FBAL	O	Focus balance adjustment output (Not used,open)
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input ("H" : detection)

Pin No.	Mark	I/O	Function
36	OFT	I	Off-track signal input ("H" : off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L" : detection)
39	BDO	I	Dropout signal input ("H" : Dropout)
40	LDON	O	Laser on signal output ("H" : ON)
41	TES	O	Tracking error shunt signal output ("H" : shunt)
42	PLAY	O	Play signal out ("H" : PLAY)
43	WVEL	O	Double speed status signal output ("H" : DS)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias (Not used, open)
47	DSLIF	I/O	DSL loop filter
48	PLLIF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter (Not used, open)
50	AVDD2	I	Power supply input (for analog circuit)
51	AVSS2	—	GND (for analog circuit)
52	EFM	O	EFM signal output (Not used, open)
53	PCK	O	PLL extraction clock output (Not used, open) (fPCK=4.321 MHz during normal playback)
54	PDO	O	Phase comparison signal of EFM and PCK signals (Not used, open)
55	SUBC	O	Sub-code serial data output (Not used, open)
56	SBCK	I	Sub-code frame clock signal output (fCLDCK=7.35kHz during normal playback)
57	VSS	—	GND
58	X1	I	Crystal oscillating circuit input (f=16.9344MHz)
59	X2	O	Crystal oscillating circuit output (f=16.9344MHz)
60	VDD	I	Power supply input (for oscillating circuit)
61	BYTCK	O	Byte clock output (Not used, open)
62	/CLDCK	O	Clock input for sub-code serial data (Not used, open)
63	FCLK	O	Crystal frame clock signal output (fCLK=7.35kHz, double=14.7kHz)
64	IPFLAG	O	Interpolation flag output ("H" : interpolation) (Not used, open)
65	FLAG	O	Flag output (Not used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output (("H" : CLV, "L" : rough servo) (Not used, open)
67	CRC	O	Sub-code CRC checked output (("H" : OK, "L" : NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output (("H" : ON) (Not used, open)
69	RESY	O	Frame resynchronizing signal output (Not used, open)
70	/RST2	I	Reset input through MASH circuit ("L" : Reset)
71	/TEST	I	Test input

Pin No.	Mark	I/O	Function
72	AVDD1	I	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AVSS1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level, RSEL="H", at "L" level, RSEL="L")
77	CSEL	I	Crystal oscillating frequency designation input

Pin No.	Mark	I/O	Function
			"L" : 16.9344MHz "H" : 33.8688MHz
78	PSEL	I	Test input (normally "L") (Not used, open)
79	MSEL	I	Output mode switching of SUBQ terminal ("H" : Q code buffer mode)
80	SSEL	I	Output frequency switching for SMCK terminal "H" : SMCK=8.4672MHz "L" : MCK=4.2336MHz (Not used, open)

• IC801 (MNB4532REBD) System Microprocessor

Pin No.	Mark	I/O	Function
1	SEG6	O	Not used
2	SEG5	O	
3-6	SEG4~SEG1	O	LCD segment output
7-10	COM3~COM0	O	LCD common output
11-13	VLCD3~VLCD1	I	LCD bias voltage
14	VDD	I	VDD (+5.0V)
15	OSC1	I	System clock OSC
16	OSC2	O	
17	X0	I	Not used
18	X1	O	Not used, connect to VDD through resistor
19	VSS	I	GND
20	RST	I	System reset signal input
21	P30	I	CD close detect switch signal input
22	P31	I	REC detect signal input
23	P32	I	CD subcode data input
24	P33	I	CD subcode clock input
25	P00	I	Reset SW (S701) signal input
26	P01	I	CD tracking signal input

Pin No.	Mark	I/O	Function
27	P02	I	CD focus lock signal input
28	P03	I	CD sense signal input
29	P10	I	CD status signal input
30	P11	I/O	Not used
31	P12	O	CD reset signal input
32	P13	O	CD subcode clock output
33	P20	I	CD play/pause switch input
34	P21	I	CD F.Skip/F.Search switch input
35	P22	I	CD R.Skip/R.Search switch input
36	P23	I	CD stop switch input
37	P42	O	AF muting control signal output
38	RMO.PEO	I/O	Not used
39	SEG32	O	CD signal process IC strobe signal output
40	SEG31	O	CD signal process IC data output
41	SEG30	O	CD signal process IC control signal output
42	SEG29	O	CD muting control signal output
43-64	—	O	Not used

Mechanism Parts Location (RAA0903)

1 2 3 4

Note :

When changing mechanism parts, apply grease to areas marked "XX" as shown in diagram.

SPECIFICATION

Playback torque	25~55 g.cm
Fast forward torque	65~130 g.cm
Rewind torque	65~130 g.cm

A

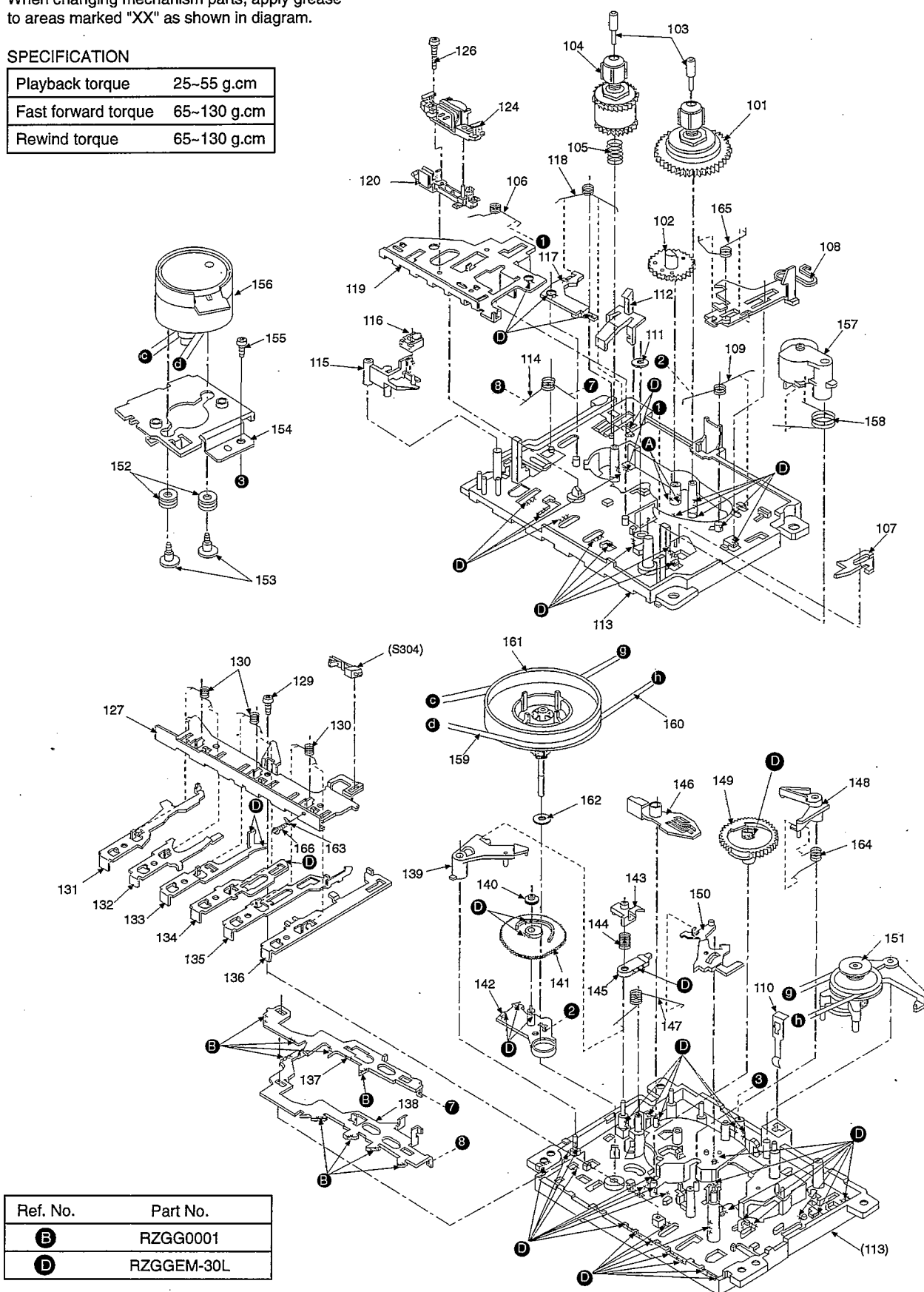
B

C

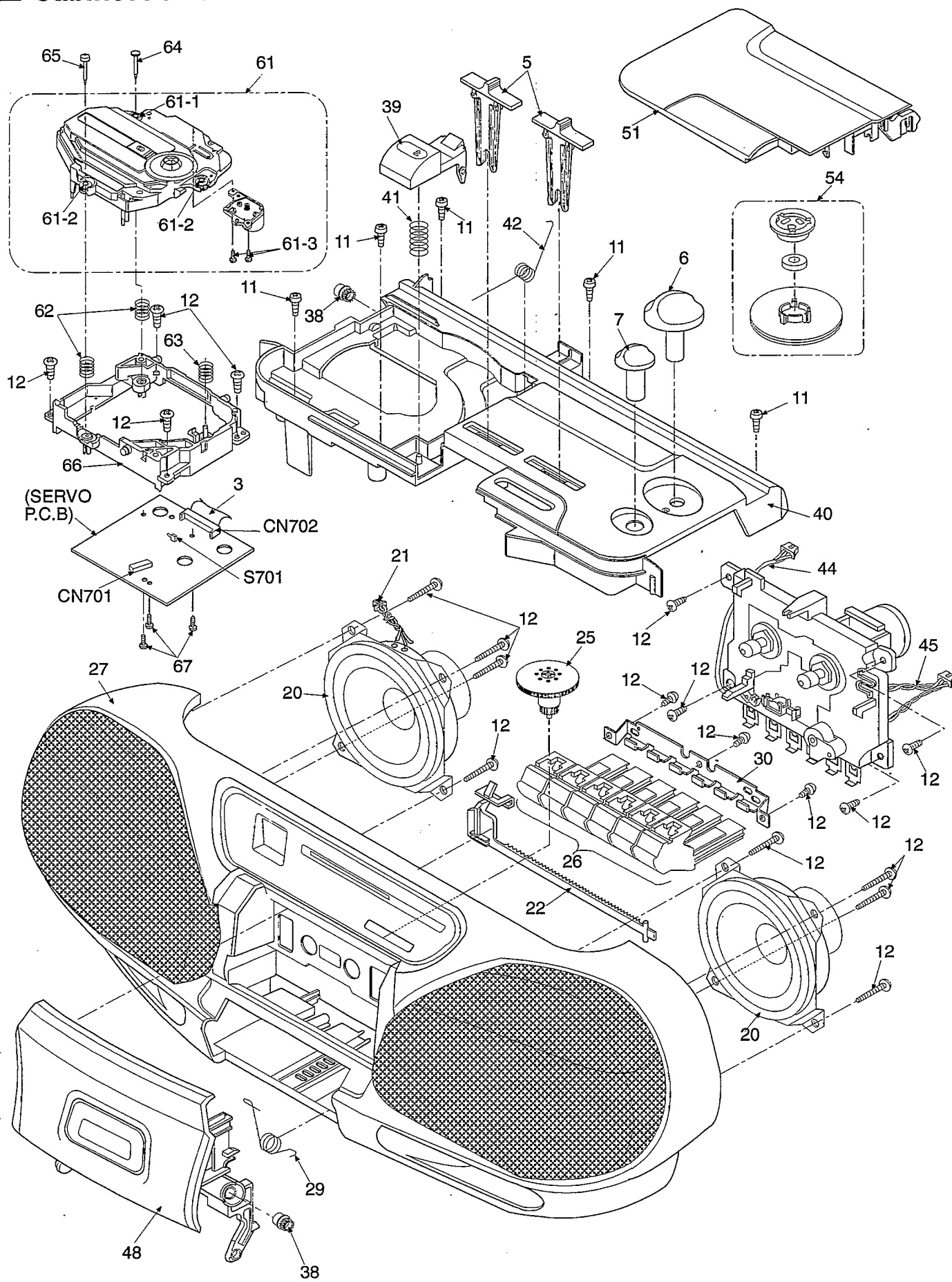
D

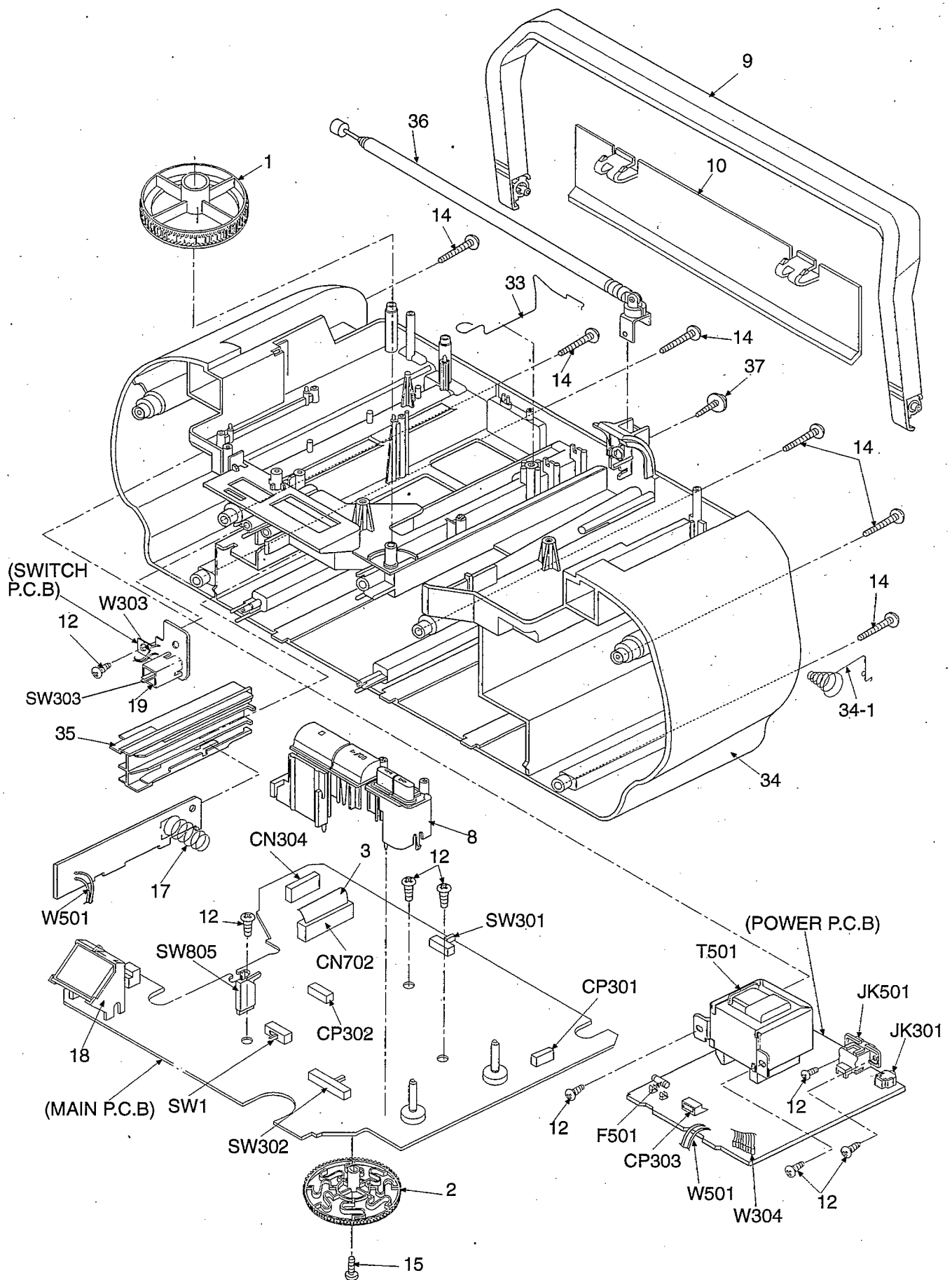
E

F



■ Cabinet Parts Location





Mechanism Parts List

Notes : [M] in Remarks column indicates parts supplied by MESA

Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks
		CASSETTE DECK		120	RMQ0384	HEAD BASE	[M]	146	RML0071	SWAY LEVER	[M]
				124	RBR4CY016-M	R/P HEAD	[M]	147	RMB0045	AS SPRING	[M]
101	RXR0004	TAKE UP REEL ASS'Y	[M]	126	XTN2+14F	SCREW	[M]	148	RXL0042	TRIGGER LEVER ASS'Y	[M]
102	RDG0059	FF RELAY GEAR	[M]	127	RMA0109	BACK PLATE	[M]	149	RDK0005	CAM GEAR	[M]
103	RMS0055	REEL SHAFT	[M]	129	XTN2+6J	SCREW		150	RML0073-1	AS PROTECT LEVER	[M]
104	RXR0005	SUPPLY REEL ASS'Y	[M]	130	RMB0043-1	SPRING	[M]	151	RXP0014	RF CLUTCH ASS'Y	[M]
105	RMB0125	SPRING	[M]	131	RMM0027	PAUSE ROD	[M]	152	RMG0102	MOTOR RUBBER CUSHION	[M]
106	RMB0047	SPRING	[M]	132	RMM0026	STOP ROD	[M]	153	RHD26002	SCREW	
107	RML0076	EJECT SELECTION LVR	[M]	133	RMM0025	FF ROD	[M]	154	RMA0108	MOTOR BRACKET	[M]
108	RMM0029	EJECT SLIDE LEVER	[M]	134	RMM0024	REW ROD	[M]	155	XTN26+8J	SCREW	
109	RMB0048	SPRING	[M]	135	RMM0023	PLAY ROD	[M]	156	RFM187ZA	MOTOR ASS'Y	[M]
110	RMC0061	SPRING	[M]	136	RMM0028	REC ROD	[M]	157	RXP0015	PINCH ROLLER ASS'Y	[M]
111	RHW16009	CAPSTAN WASHER	[M]	137	RML0078	FUNCTION PLATE	[M]	158	RMB0049	SPRING	[M]
112	RML0081-1	RECORD SAFETY LEVER	[M]	138	RML0077	LOCK PLATE	[M]	159	RDV0007	BELT,MAIN	[M]
113	RFU189ZA	MECHANISM BASE ASS'Y	[M]	139	RML0072	AS RELEASE LEVER	[M]	160	RDV0006-1	RF BELT	[M]
114	RMB0046-1	SPRING	[M]	140	RMR0227	IDLER GEAR BUSH	[M]	161	RXP0012	FLYWHEEL ASS'Y	[M]
115	RML0080	ERASE HEAD ARM	[M]	141	RDG0057	IDLER GEAR	[M]	162	RHW21008	FLYWHEEL WASHER	[M]
116	RBR2CY009	ERASE HEAD	[M]	142	RML0074	IDLER LEVER	[M]	163	RJR0033	EARTH LUG	[M]
117	RML0116	BRAKE ARM	[M]	143	RMR0211	PAUSE BUSH	[M]	164	RMB0044	TRIGGER SPRING	[M]
118	RMB0109-1	SPRING	[M]	144	RMB0053	SPRING	[M]	165	RME0098-2	EJECT SLIDE LEVER SP	[M]
119	RMA0696	HEAD PANEL	[M]	145	RML0082	PAUSE LEVER	[M]	166	XTN2+4F	EARTH LUG SCREW	

Repalcement Parts List

Notes: * Important safety notice:

Components identified by  mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low noise (resistors), etc are used.

When replacing any of these components, be sure to use only manufacturer's specified parts shown in the parts list.

* The parenthesized indications in the Remarks columns specify the areas or colour. (Refer to the cover page for area or colour)

Parts without these indications can be used for all areas.

* [M] Indicates in the Remarks columns indicates parts supplied by MESA.

* Warning : This product uses a laser diode. Refer to caution statements on page 2.

ACHTUNG : * Die lasereinheit nicht zerlegen.

• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		27	RFKXGXS10EK	FRONT CAB. ASS'Y	[M](E,EB)	61	RAE0113Z	TRAVERSE UNIT	
				27	RFKXGXS10EGK	FRONT CAB. ASS'Y	[M](EG)	61-1	SHGD112	FLOATING RUBBER (A)	
1	RDG0315	MIDDLE GEAR	[M]	29	RME0206	CASS. OPEN SPRING	[M]	61-2	SHGD113-1	FLOATING RUBBER (B)	
2	RDG5845ZAB	VARICON GEAR	[M]	30	RMV0165	MECHA BUTTON HOLDER	[M]	61-3	XQS2+A35FZ	SCREW	
3	REE0654	FFC WIRE	[M]	33	RJR0151	R. ANT TERMINAL	[M]	62	RME0109	FLOATING SPRING A	
5	RGV0159-K	FUNCTION KNOB	[M]	34	RFKHXDS10EK	BACK CAB. ASS'Y	[M](E)	63	RME0142	FLOATING SPRING B	
6	RGW0232-K	VOL. KNOB	[M]	34	RFKHXDS10EBK	BACK CAB. ASS'Y	[M](EB)	64	RMS0123-1	FIXED PIN A	
7	RGW0233-K	TONE KNOB	[M]	34	RFKHXDS10EGK	BACK CAB. ASS'Y	[M](EG)	65	RMS0350	FIXED PIN B	
8	RGZ0028-K	CD OPR BUTTON	[M]	34-1	RJC91006	BATT. TERMINAL	[M]	66	RMR0698-K	TRAVERSE CHASSIS	
9	RKH0031-K	HANDLE	[M]	35	RMQ0544	SAFETY COVER	[M]	67	XTV2+6G	SCREW	
10	RKK347ZB-0	BATTERY COVER	[M]	36	XEARR210C-Y	R.ANTENNA	[M]			INTEGRATED CIRCUITS	
11	XTV3+12GFZ	TOP CAB SCREW		37	XYN3+F8FY	R.ANT. SCREW					
12	XTV3+12G	SP. MOUNTING SCREW		38	RDG0183-L	DAMPER GEAR	[M]				
14	XTV3+20G	CASING SCREW		39	RGU1272-K	CD EJECT BUTTON	[M]	IC1	AN7205	AMP IC	
15	XYN26+C6	SCREW		40	RKQ0181B-K	TOP CAB	[M](E,EB)	IC2	BA1442A	MPX / IF IC	[M]
17	RJC511YA	UM-1 BATT SPRING	[M]	40	RFKXGXS10EGK	TOP CAB. ASS'Y	[M](EG)	IC301	AN7317	PLAYBACK/RECORD AMP	[M]
18	RMN0342	LCD HOLDER	[M]	41	RMB0244	CD EJECT BUTT. SPRING	[M]	IC302	BA7755A	SW IC	
19	RMR0897-K	LEAF SW COVER	[M]	42	RME0147	CD OPEN SPRING	[M]	IC305	TA8227P	POWER IC	[M]
20	EAS10P241JE3	SPEAKER	[M]	44	REX0750	MECHA HEAD WIRE	[M]	IC801	MNB4532REBD	CD CONTROL MCON	[M]
21	REX0751	SP. CONNECT WIRE	[M]	45	REX0752	MECHA MOTOR WIRE	[M]	IC802	PST600DTA	RESET IC	
22	RGJ0019-W	POINTER	[M]	48	RFKLXDS10EK	CASS HOLDER ASS'Y	[M]				
25	RGW0231-K	TUNING KNOB	[M]	51	RKF0446-K	CD LID	[M]				
26	RGZ0027B-K	MECHA BUTTON	[M]	54	RFKNRXDS15PA	CLAMPER ASS'Y	[M]				

Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks
TRANSISTORS				VARIABLE CAPACITORS				OSCILLATORS			
Q101	2SJ40CDTA	TRANSISTOR		VC1	RCV4RC2V2K-M	VARICON	(E,EB)	X801	EF0EC4194T4	4.19MHZ RESONATOR	
Q102	2SJ40CDTA	TRANSISTOR		VC1	RCV4LC2VK-A	VARIABLE CAPACITOR	(EG)				
Q103	2SC1684STA	TRANSISTOR		CT5	ECRLA030E53R	TRIMMER CAPACITOR	(E,EB)			FUSES	
Q104	2SC1684STA	TRANSISTOR		CT6	ECRLA020E53R	TRIMMER CAPACITOR	(E,EB)	F501	XBA2C20TB0	FUSE	⚠
Q105	BA1A4ZTA	TRANSISTOR	[M]							FUSE HOLDERS	
Q106	2SC2785FTA	TRANSISTOR				SWITCHES					
Q201	2SJ40CDTA	TRANSISTOR		S304	RSH1A003-U	SW, MOTOR	[M]				
Q202	2SJ40CDTA	TRANSISTOR		S501	RJJ1SE01-1H	SW, AC IN(JK501)	⚠	FH501	EYF52BC	FUSE HOLDER	
Q203	2SC1684STA	TRANSISTOR		SW1	RSS3H001-H	SW, BAND	[M](E,EB)	FH502	EYF52BC	FUSE HOLDER	
Q204	2SC1684STA	TRANSISTOR		SW1	RSS3B45XA-H	SW, BAND	[M](EG)			JACKS	
Q205	BA1A4ZTA	TRANSISTOR	[M]	SW301	RSS3B31ZA-H	SW, FM MODE/BPF.	[M](E,EB)				
Q206	2SC2785FTA	TRANSISTOR		SW301	RSS2A56ZA-H	SW, BP SW	[M](EG)	JK301	RJJ37TK01-C	H.P JACK	
Q301	2SC1740SRTA	TRANSISTOR	(E,EB)	SW302	RSS3D001-H	SW, SELECTOR	[M]	JK501	RJJ1SE01-1H	AC JACK	⚠
Q302	2SC1740SRTA	TRANSISTOR	(E,EB)	SW303	RSH1A004-1	SW, REC. LEAF	[M]				
Q303	2SC1684STA	TRANSISTOR		SW801	EVQ21405R	SW, PLAY/PAUSE				<SERVO>	
Q304	BA1A4MTA	TRANSISTOR	[M]	SW802	EVQ21405R	SW, FF SKIP/SEARCH					
Q305	2SC1684STA	TRANSISTOR	⚠	SW803	EVQ21405R	SW, REV SKIP/SEARCH				INTEGRATED CIRCUITS	
Q306	2SA952LTA	TRANSISTOR	[M]⚠	SW804	EVQ21405R	SW, STOP					
Q307	BA1A4MTA	TRANSISTOR	[M]	SW805	RSH1A012-U	SW, CD LEAF		IC701	AN8802SCE1V	IC, HEAD AMP	
Q308	BN1A4MTA	TRANSISTOR	[M]			CONNECTORS		IC702	MN66271RA	IC, DIGITAL LSI	
Q309	2SB1185E	TRANSISTOR	⚠	CN303	RJS2T5ZA	FROM REC SW (2P)		IC703	AN8389SE1	IC, 4-CH DRIVER	
Q310	2SC2785FTA	TRANSISTOR	⚠	CN304	RJS1A5210	10 PINS WIRE HOLDER	[M]			TRANSISTOR	
Q311	2SC2001L1TA	TRANSISTOR	⚠	CN702	RJS1A6823	23P FPC CONNECTOR					
Q313	BN1A3QTA	TRANSISTOR	[M]	CP301	RJP4G18ZA	SOCKET		Q701	2SB709S	TRANSISTOR	
Q801	BA1A4MTA	TRANSISTOR	[M]	CP302	RJP4G18ZA	SOCKET				SWITCH	
		DIODES		CP303	RJP3G9YA	SP PLUG (3P)					
D1	RVD1SS133TA	DIODE				COILS & TRANSFORMERS		S701	RSM0006-P	SW, RESET	
D2	RVD1SS133TA	DIODE	(E,EB)	L1	RLQY30S1W	COIL	[M]			CONNECTORS	
D301	RVD1SS133TA	DIODE		L2	RL04P002-E	FM OSC COIL	[M]				
D302	RVD1SS133TA	DIODE		L3	RLV6C009-0	AM FERRITE ANT	[M](E,EB)	CN701	RJU035T016-1	16 PIN FFC CONNECTOR	
D303	RVD1SS133TA	DIODE		L3	RLV2C023-0	AM FERRITE ANT	[M](EG)	CN702	RJS1A6723-1Q	23 PIN FFC CONNNECTOR	
D304	MTZJ6R2ATA	DIODE	⚠	L4	RL02B105-M	AM OSC COIL	(EG)			OSCILLATOR	
D305	RVD1SS133TA	DIODE		L8	RL01B13-M	LW (OSC COIL)	(E,EB)				
D306	RVD1SS133TA	DIODE		L9	RL02B108-M	NIL	(E,EB)	X701	RSXZ16M9M02T	CERAMIC OSC	
D307	MTZJ8R2BTA	DIODE	[M]⚠	L301	RL09B17-T	BIAS OSC COIL				CHIP JUMPERS	
D308	RVD1SS133TA	DIODE		L501	RL500050T-Y	RF CHOKE COIL	⚠	RJ701	ERJ8GEY0R00A	0	1/10W
D309	RVD1SS133TA	DIODE		L502	RL500050T-Y	RF CHOKE COIL	⚠	RJ702	ERJ8GEY0R00A	0	1/10W
D310	RVDMTZ5R6BTA	DIODE	⚠	T1	RLI4B153-M	FM IFT		RJ703	ERJ8GEY0R00A	0	1/10W
D311	RVD1SS133TA	DIODE		T2	RLI2B458-M	AM IFT		RJ704	ERJ8GEY0R00A	0	1/10W
D312	RVD1SS133TA	DIODE		T3	RLI4B153-M	FM IFT		RJ707	ERJ8GEY0R00A	0	1/10W
D314	RVD1SS133TA	DIODE		T501	RTP1K1B005-X	POWER TRANSFORMER	[M]⚠	RJ708	ERJ8GEY0R00A	0	1/10W
D315	RVD1SS133TA	DIODE				DISPLAY		RJ709	ERJ8GEY0R00A	0	1/10W
D317	RVD1SS133TA	DIODE		Z801	RSL5140-L	LCD	[M]	RJ714	ERJ8GEY0R00A	0	1/10W
D501	RL154M11	DIODE	⚠			CERAMIC FILTERS		RJ715	ERJ8GEY0R00A	0	1/10W
D502	RL154M11	DIODE	⚠	CF1	RVF107WDZT	CERAMIC FILTER		RJ716	ERJ8GEY0R00A	0	1/10W
D503	RL154M11	DIODE	⚠	CF2	RVFSFU459B	AM CERAMIC FILTER		RJ717	ERJ8GEY0R00A	0	1/10W
D504	RL154M11	DIODE	⚠					RJ721	ERJ8GEY0R00A	0	1/10W
D801	RVD1SS133TA	DIODE						RJ724	ERJ8GEY0R00A	0	1/10W
D802	RVD1SS133TA	DIODE						RJ725	ERJ8GEY0R00A	0	1/10W
		VARIABLE RESISTORS						RJ726	ERJ8GEY0R00A	0	1/10W
VR301	EW2C2UAF20C15	TONE VOLUME	[M]								
VR302	EW2C4UAF20B54	VOLUME	[M]								

Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks
RJ799	ERJ6GEY0R00A	0 1/10W									
		TEST JUMPERS									
TJ701	EYF8CU	TEST JUMPER									
TJ702	EYF8CU	TEST JUMPER									

Resistors & Capacitors

Notes :

- * Capacitor values are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF), F=Farads.
- * Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM).
- * Bracketed indications in Ref. No. columns specify the area (Refer to the first page for area).
- Parts without these indications can be used for all areas.
- * [M] Indicates in the values & remarks column indicates parts supplied by MESA

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R218	ERDS2TJ474T	470K 1/4W	R705	ERJ6GEYJ103V	10K 1/10W			CAPACITORS
			R219	ERDS2TJ102T	1K 1/4W	R706	ERJ6GEYJ102V	1K 1/10W			
R1	ERDS2TJ470T	47 1/4W	R220	ERDS2TJ273T	27K 1/4W(E,EB)	R707	ERJ6GEYJ473V	47K 1/10W	C1	ECFR1C223MR	0.022 16V
R2	ERDS2TJ334T	330K 1/4W(E,EB)	R220	ERDS2TJ223T	22K 1/4W(EG)	R708	ERJ6GEYJ104V	100K 1/10W	C2	ECBT1H470J5	47P 50V
R2	ERDS2TJ101T	100 1/4W(EG)	R301	ERDS2TJ334T	330K 1/4W	R709	ERJ6GEYJ683V	68K 1/10W	C3	ECBT1H180JC5	18P 50V(E,EB)
R5	ERDS2TJ101T	100 1/4W	R302	ERDS2TJ334T	330K 1/4W	R711	ERJ6GEYJ154V	150K 1/10W	C3	ECBT1H200JC5	20P 50V(EG)
R6	ERDS2TJ8R2T	8.2 1/4W	R304	ERDS2TJ221T	220 1/4W	R712	ERJ6GEYJ221V	220 1/10W	C4	ECBT1H100JC5	10P 50V
R7	ERDS2TJ470T	47 1/4W(E,EB)	R305	ERDS2TJ392T	3.9K 1/4W	R717	ERJ6GEYJ102V	1K 1/10W	C5	ECBT1H102KB5	1000P 50V
R10	ERDS2TJ103T	10K 1/4W	R306	ERDS2TJ222T	2.2K 1/4W	R718	ERJ6GEYJ102V	1K 1/10W	C6	ECBT1H102KB5	1000P 50V
R11	ERDS2TJ221T	220 1/4W	R307	ERDS2TJ221T	220 1/4W	R719	ERJ6GEYJ102V	1K 1/10W	C7	ECBT1H4R7KC5	4.7P 50V
R12	ERDS2TJ332T	3.3K 1/4W	R308	ERDS2TJ563T	56K 1/4W	R720	ERJ6GEYJ102V	1K 1/10W	C8	ECBT1H150JC5	15P 50V
R14	ERDS2TJ103T	10K 1/4W(E,EB)	R309	ERDS2TJ473T	47K 1/4W(E,EB)	R721	ERJ6GEYJ101V	100 1/10W	C9	ECBT1H102KB5	1000P 50V
R101	ERDS2TJ183T	18K 1/4W	R310	ERDS2TJ472T	4.7K 1/4W(E,EB)	R722	ERJ6GEYJ563V	56K 1/10W	C10	ECBT1H120JC5	12P 50V
R102	ERDS2TJ470T	47 1/4W	R311	ERDS2TJ4R7T	4.7 1/4W	R723	ERJ6GEYJ182V	1.8K 1/10W	C11	ECBT1H150JC5	15P 50V(E,EB)
R103	ERDS2TJ472T	4.7K 1/4W	R312	ERDS2TJ561T	560 1/4W	R724	ERJ6GEYJ333V	33K 1/10W	C11	ECCR1H200JS5	20P 50V[M](EG)
R104	ERDS2TJ333T	33K 1/4W	R313	ERDS2TJ475T	4.7M 1/4W	R725	ERJ6GEYJ472V	4.7K 1/10W	C12	ECBT0J223MS5	0.022 6.3V
R105	ERDS2TJ102T	1K 1/4W	R314	ERDS2TJ470T	47 1/4W	R726	ERJ6GEYJ473V	47K 1/10W	C13	ECBT0J223MS5	0.022 6.3V
R107	ERDS2TJ473T	47K 1/4W	R315	ERDS2TJ682T	6.8K 1/4W	R727	ERJ6GEYJ103V	10K 1/10W	C14	ECBT1H221KB5	220P 50V
R108	ERDS2TJ473T	47K 1/4W	R317	ERDS2TJ153T	15K 1/4W	R728	ERJ6GEYJ392V	3.9K 1/10W	C15	ECEA1HKA010B	1 50V
R110	ERDS2TJ103T	10K 1/4W	R318	ERDS2TJ103T	10K 1/4W	R730	ERJ6GEYJ331V	330 1/10W	C16	ECBT1C472MR5	4700P 16V
R111	ERDS2TJ273T	27K 1/4W	R319	ERX12SJ4R7E	4.7 1/2W [M]	R731	ERJ6GEYJ392V	3.9K 1/10W	C17	ECEA1EU100B	10 25V
R112	ERDS2TJ823T	82K 1/4W	R320	ERDS2TJ5R6T	5.6 1/4W	R734	ERJ6GEYJ101V	100 1/10W	C18	ECEA1EU100B	10 25V
R113	ERDS2TJ183T	18K 1/4W	R322	ERDS2TJ221T	220 1/4W	R735	ERJ6GEYJ101V	100 1/10W	C20	ECEA0JKA101B	100 6.3V
R114	ERDS2TJ121T	120 1/4W	R323	ERDS2TJ102T	1K 1/4W	R736	ERJ6GEYJ101V	100 1/10W	C21	ECBT1H102KB5	1000P 50V
R115	ERDS2TJ121T	120 1/4W	R324	ERDS2TJ681T	680 1/4W	R738	ERJ6GEYJ223V	22K 1/10W	C22	ECFR1C473MR	0.047 16V
R117	ERDS2TJ103T	10K 1/4W	R325	ERDS2TJ473T	47K 1/4W	R739	ERJ6GEYJ681V	680 1/10W	C23	ECEA1HUR22B	0.22 50V
R118	ERDS2TJ474T	470K 1/4W	R326	ERDS2TJ681T	680 1/4W	R741	ERJ6GEYJ562V	5.6K 1/10W	C24	ECEA1EU100B	10 25V
R119	ERDS2TJ102T	1K 1/4W	R327	ERDS2TJ221T	220 1/4W	R742	ERJ6GEYJ562V	5.6K 1/10W	C25	ECBT1C103MS5	0.01 16V
R120	ERDS2TJ273T	27K 1/4W(E,EB)	R328	ERDS2TJ680T	68 1/4W	R743	ERJ6GEYJ562V	5.6K 1/10W	C26	ECBT0J223MS5	0.022 6.3V
R120	ERDS2TJ223T	22K 1/4W(EG)	R329	ERDS2TJ332T	3.3K 1/4W	R744	ERJ6GEYJ103V	10K 1/10W	C30	ECBT1H390J5	39P 50V(E,EB)
R201	ERDS2TJ183T	18K 1/4W	R330	ERDS2TJ473T	47K 1/4W	R745	ERJ6GEYJ155V	1.5M 1/10W	C30	ECBT1H100J5	10P 50V(EG)
R202	ERDS2TJ470T	47 1/4W	R331	ERDS2TJ222T	2.2K 1/4W	R748	ERJ6GEYJ182V	1.8K 1/10W	C32	ECBT1H102KB5	1000P 50V(EG)
R203	ERDS2TJ472T	4.7K 1/4W	R332	ERDS2TJ473T	47K 1/4W	R749	ERJ6GEYJ103V	10K 1/8W	C33	ECBT1H102KB5	1000P 50V
R204	ERDS2TJ333T	33K 1/4W	R333	ERDS2TJ222T	2.2K 1/4W	R801	ERDS2TJ104T	100K 1/4W	C34	ECBT1H220JC5	22P 50V(E,EB)
R205	ERDS2TJ102T	1K 1/4W	R334	ERDS2TJ222T	2.2K 1/4W	R802	ERDS2TJ104T	100K 1/4W	C36	ECQP2A221JZT	220P 100V(E,EB)
R207	ERDS2TJ473T	47K 1/4W	R342	ERDS2TJ222T	2.2K 1/4W	R803	ERDS2TJ104T	100K 1/4W	C37	ECQP1361JZT	360P 100V[M](E,EB)
R208	ERDS2TJ473T	47K 1/4W	R343	ERDS2TJ222T	2.2K 1/4W	R805	ERDS2TJ104T	100K 1/4W	C39	ECQP2A151JZT	150P 100V(E,EB)
R210	ERDS2TJ103T	10K 1/4W	R344	ERDS2TJ101T	100 1/4W	R812	ERDS2TJ563T	56K 1/4W	C40	ECBT0J223MS5	0.022 6.3V(E,EB)
R211	ERDS2TJ273T	27K 1/4W	R351	ERDS2TJ473T	47K 1/4W	R813	ERDS2TJ392T	3.9K 1/4W	C43	ECBT1H3R3KC5	3.3P 50V(E,EB)
R212	ERDS2TJ823T	82K 1/4W	R501	ERDS2TJ222T	2.2K 1/4W	R814	ERDS2TJ104T	100K 1/4W	C44	ECBT1H331KB5	330P 50V
R213	ERDS2TJ183T	18K 1/4W	R701	ERJ6GEYJ100V	10 1/10W	R815	ERDS2TJ223T	22K 1/4W	C45	ECBT1H102KB5	1000P 50V
R214	ERDS2TJ121T	120 1/4W	R702	ERJ6GEYJ471V	470 1/10W				C46	ECBT1H102KB5	1000P 50V
R215	ERDS2TJ121T	120 1/4W	R703	ERJ6GEYJ823V	82K 1/10W				C101	ECBT1C122MR5	1200P 16V
R217	ERDS2TJ103T	10K 1/4W	R704	ERJ6GEYJ102V	1K 1/10W				C102	ECBT1H102KB5	1000P 50V

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C103	ECBT1H102KB5	1000P 50V	C214	ECEA1CU101B	100 16V	C328	ECEA1CKA100B	10 16V	C726	ECUV1H102KBN	1000P 50V
C104	ECEA1CKA100B	10 16V	C215	ECQV1H184JZ3	0.18 50V	C329	ECEA1CKA100B	10 16V	C727	ECEA1HPK010I	1 50V
C105	ECBT1H101KB5	100P 50V	C216	ECEA1AU471B	470 10V	C331	ECEA1EU221B	220 25V	C728	ECEA1HPK010I	1 50V
C106	ECFR1C333KR	0.033 16V	C217	ECBT1H102KB5	1000P 50V	C332	ECQV1H105JZ3	10 50V	C730	ECUZ1E104MBN	0.1 25V
C107	ECEA0JU101B	100 6.3V	C218	ECFR1C103MR	0.01 16V	C339	ECEA1AKA220B	22 10V	C731	ECEA0JKA221I	220 6.3V
C108	ECEA1HU010B	1 50V	C219	ECEA1HU010B	1 50V	C340	ECEA1CU331B	330 16V	C732	ECEA0JKA221I	220 6.3V
C109	ECBT1H101KB5	100P 50V	C220	ECEA1HKA2R2B	2.2 50V(E,EB)	C341	ECEA0JKA221B	220 6.3V	C733	ECUZ1E104MBN	0.1 25V
C110	ECBT1C822MS5	8200P 16V	C220	ECEA1HU2R2B	2.2 50V(EG)	C501	ECQB1H104JF3	0.1 50V	C734	ECEA1AKA221I	220 10V
C112	ECEA1HU2R2B	2.2 50V	C221	ECBT1H331KB5	330P 50V	C502	ECQB1H104JF3	0.1 50V	C735	ECUZ1E104MBN	0.1 25V
C113	ECEA0JU101B	100 6.3V	C222	ECFR1C473MR	0.047 16V	C503	ECQB1H104JF3	0.1 50V	C736	ECUZ1E104MBN	0.1 25V
C114	ECEA1CU101B	100 16V	C223	ECBT1C103MS5	0.01 16V	C504	ECQB1H104JF3	0.1 50V	C737	ECUZ1E104MBN	0.1 25V
C115	ECQV1H184JZ3	0.18 50V	C224	ECBT1H102KB5	1000P 50V	C701	ECEA0JKA220I	22 6.3V	C738	ECUV1C154KBN	0.15 16V
C116	ECEA1AU471B	470 10V	C303	ECQP2A151JZT	150P 100V	C702	ECEA1HKA010I	1 50V	C742	ECUV1E273KBN	0.027 25V
C117	ECBT1H102KB5	1000P 50V	C304	ECBT1C103MS5	0.01 16V	C703	ECEA0JKA101I	100 6.3V	C743	ECUZ1E104MBN	0.1 25V
C118	ECFR1C103MR	0.01 16V	C305	ECBT1C103MS5	0.01 16V(E,EB)	C704	ECUZ1E104MBN	0.1 25V	C744	ECUV1E822KBN	8200P 25V
C119	ECEA1HU010B	1 50V	C306	ECQP2A331JZT	330P 100V(E,EB)	C705	ECEA1HKA010I	1 50V	C745	ECUV1C473MBN	0.047 16V
C120	ECEA1HKA2R2B	2.2 50V(E,EB)	C307	ECQP2A182JZT	1800P 100V	C706	ECUV1H101JCN	100P 50V	C746	ECUV1H050DCN	5P 50V
C120	ECEA1HU2R2B	2.2 50V(EG)	C308	ECEA1AU101B	100 10V	C707	ECUV1E273KBN	0.027 25V	C747	ECUV1H222KBN	2200P 50V
C121	ECBT1H331KB5	330P 50V	C309	ECBT1C682MR5	6800P 16V	C708	ECUV1H472KBN	4700P 50V	C748	ECUV1H471KBM	470P 50V
C122	ECFR1C473MR	0.047 16V	C310	ECBT1C103MS5	0.01 16V	C709	ECUV1C473KBN	0.047 16V	C801	ECEA0JKA101B	100 6.3V
C123	ECBT1C103MS5	0.01 16V	C311	ECFR1C473MR	0.047 16V	C710	ECUV1H152KBN	1500P 50V	C802	ECBT1H102KB5	1000P 50V
C124	ECBT1H102KB5	1000P 50V	C312	ECEA1CU100B	10 16V	C711	ECUZ1E104MBN	0.1 25V	C804	ECEA1HKA010B	1 50V
C201	ECBT1C122MR5	1200P 16V	C313	ECEA1AU330B	33 10V	C712	ECUZ1E104MBN	0.1 25V	C807	ECBT1H102KB5	1000P 50V
C202	ECBT1H102KB5	1000P 50V	C314	ECEA1AU101B	100 10V	C713	ECUV1C104MBM	0.1 16V	C810	ECBT1H102KB5	1000P 50V
C203	ECBT1H102KB5	1000P 50V	C315	ECEA1AU220B	22 10V	C714	ECEA0JKA101I	100 6.3V	C813	ECBT1H331KB5	330P 50V
C204	ECEA1CKA100B	10 16V	C316	ECEA1AU331B	330 10V	C715	ECEA0JKA470I	47 6.3V	C814	ECBT1H331KB5	330P 50V
C205	ECBT1H101KB5	100P 50V	C318	ECBT1C103MS5	0.01 16V	C716	ECUV1H561KBN	560P 50V	C815	ECBT1H101KB5	100P 50V
C206	ECFR1C333KR	0.033 16V	C319	ECEA1CU222B	2200 16V	C717	ECUZ1E104MBN	0.1 25V	C816	ECBT1H102KB5	1000P 50V
C207	ECEA0JU101B	100 6.3V	C320	ECBT1C103MS5	0.01 16V	C718	ECUV1C224KBM	0.22 16V	C819	ECBT1H331KB5	330P 50V
C208	ECEA1HU010B	1 50V	C322	ECBT1C103MS5	0.01 16V	C721	ECUV1H270JCN	27P 50V	C820	ECBT1H331KB5	330P 50V
C209	ECBT1H101KB5	100P 50V	C323	ECEA1AU471B	470 10V	C722	ECUV1H270JCN	27P 50V	C821	ECBT1H331KB5	330P 50V
C210	ECBT1C822MS5	8200P 16V	C324	ECEA1AU221B	220 10V	C723	ECEA1AKA221I	220 10V			
C212	ECEA1HU2R2B	2.2 50V	C326	ECEA1HU3R3B	3.3 50V	C724	ECUV1C104MBM	0.1 16V			
C213	ECEA0JU101B	100 6.3V	C327	ECEA1AU101B	100 10V	C725	ECUV1H102KBN	1000P 50V			

Packing Materials & Accessories

Notes: * Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low noise (resistors), etc are used.

When replacing any of these components, be sure to use only manufacturer's specified parts shown in the parts list.

* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area)

Parts without these indications can be used for all areas.

* The "(SF)" mark denotes the standard part.

* [M] Indicates in the Remarks columns indicates parts supplied by MESA.

Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks	Ref No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIALS		P3	RPN0910	POLYFOAM	[M]	A1	RQT3211-B	INSTR. MANUAL	[M](EB)
				P4	RPN0911	POLYFOAM	[M]	A1	RQT3212-D	INSTR. MANUAL	[M](EG)
P1	RPG2714	GIFT BOX	[M](E)			ACCESSORIES		A2	VJA0733	AC-CORD (SF)	(EB)
P1	RPG2716	GIFT BOX	[M](EB)					A2	RJA0019-2K	AC CORD (SF)	(E,EG)
P1	RPG2715	GIFT BOX	[M](EG)								
P2	RPH0131	MIRAMAT SHEET	[M]	A1	RFKSXD510EK	INSTR. MANUAL ASS'Y	[M](E)				

793