

Service Manual

Radio Cassette
Portable Stereo Component System

RX-CW30L
(Black)



This is the Service Manual for the following areas.

Z ... For all European areas except United Kingdom and F.R. Germany.

E ... For United Kingdom.

G ... For F.R. Germany.

RX-CW30 MECHANISM SERIES

■ SPECIFICATIONS

General:

Power Requirement: AC; 220V, 50Hz (For **Z**/**G**)
240V 50Hz (For **E** only)
Battery; 12V (Eight "D" Size Flashlight Batteries)
(Panasonic UM-1 or equivalent)

Power Consumption: 33W (AC only)

Power Output: 20W (10W×2)...MPO
15W (7.5W×2)...RMS max.

Speaker: Woofer; 12cm PM Dynamic Speaker (2.7Ω)
Tweeter; (2×4)cm Ceramic Speaker (1.4kΩ)

Input: MIX MIC; sensitivity 5.6mV
applicable microphone impedance 200~600Ω; M3 (φ3.5)
Line in/CD; sensitivity 316mV/47kΩ over

Output: Ext SP; 2.7~8Ω
Headphones; 32Ω, M3 (φ3.5)

Dimensions: [581(W)×187(H)×169(D)]mm
Main unit;
[322(W)×187(H)×169(D)]mm
Speaker box;
[134(W)×187(H)×147(D)]mm

Weight: 4.4kg without batteries

Radio Section:

Radio Frequency Range: FM; 87.5~108MHz
LW; 150~285kHz (200~1053m)
MW; 520~1610kHz (577~186m)
SW; 5.9~18MHz (50.8~16.7m)

Intermediate Frequency: FM; 10.7MHz
AM (LW/MW/SW); 455kHz **Z**/**G**
(470kHz **E**)

Sensitivity: FM; 2μV/50mW output
(-3dB Limit sens)
LW; 79μV/m/50mW output
MW; 79μV/m/50mW output
SW; 5.6μV/50mW output

Tape Deck Section: Tape 1 (Record and Playback)

Frequency Response: 50~12,000Hz (with normal tape)
Recording System: AC bias, AC erase
Tape Speed: 4.8cm/s
Track System: 4-track 2-channel stereo recording and playback

Tape Deck Section: Tape 2 (Playback only)

Frequency Response: 70~14,000Hz (with normal tape)
Tape Speed: 4.8cm/s
Track System: 4-track 2 channel stereo playback

Design and specifications are subject to change without notice.

Panasonic

Matsushita Electric Trading Co., Ltd.

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OPERATING INSTRUCTIONS

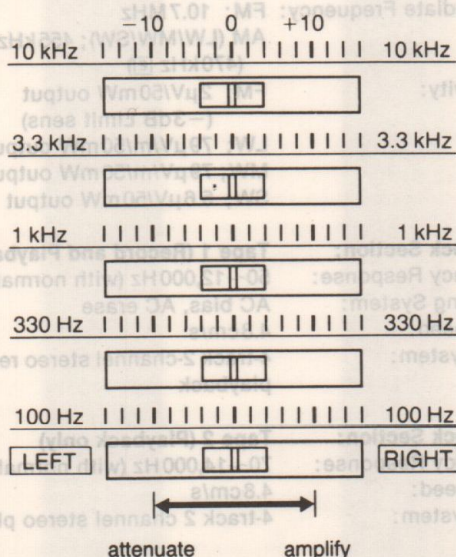
• Graphic Equalizer

Set the Equalizer Mode Selector to "G.EQ".

The Graphic Equalizer allows you to tailor the frequency response of the unit to compensate for room acoustics and other factors which affect frequency response. The overall tone can be altered by adjusting the five controls which control the following frequency bands:

100 Hz, 330 Hz, 1 kHz, 3.3 kHz, 10 kHz.

Positioning the control to the "+" side of the detent (center) will amplify the corresponding frequency band; the "-" side will attenuate it.

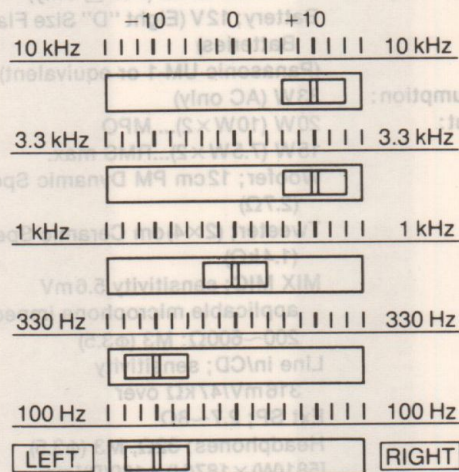


• Frequency Distribution Equalizer

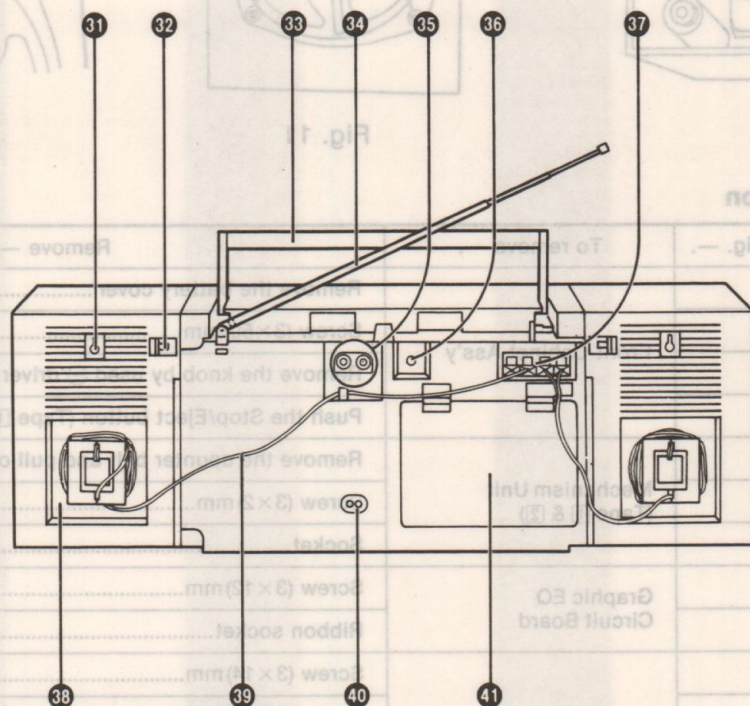
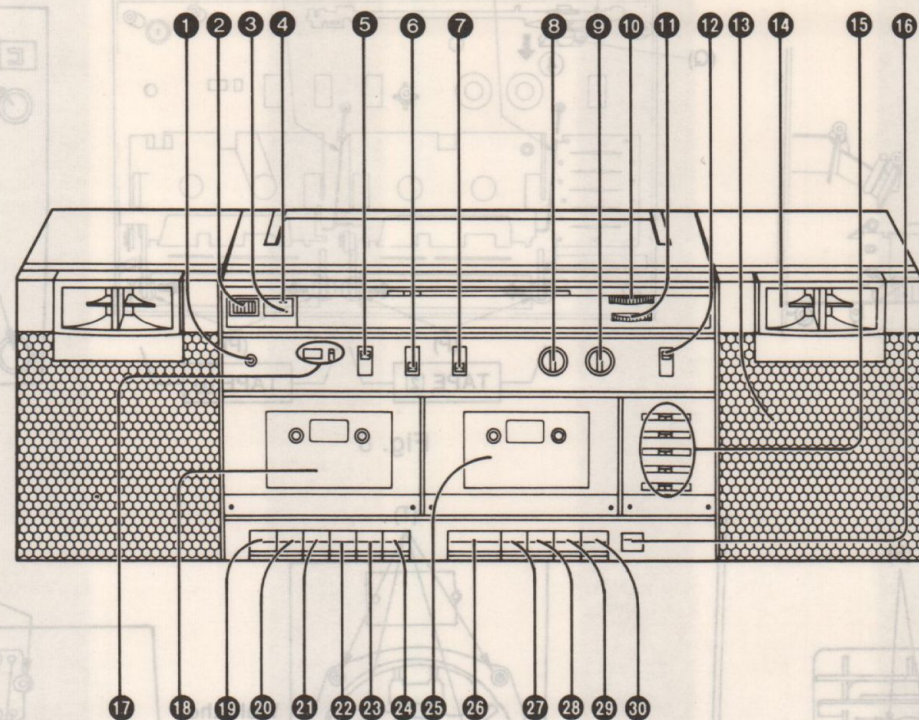
Set the Equalizer Mode Selector to "F.D.EQ".

The Frequency Distribution Equalizer allows you to accent a specific frequency sound and divide it into the right and left speakers as you like.

For example, when listening to the low frequency sound (100 Hz, 330 Hz) from left speaker and high frequency sound (3.3 kHz, 10 kHz) from right speaker, set the controls as shown below.



LOCATION OF CONTROLS AND COMPONENTS



1 Headphones Jack (PHONES) [32Ω/φ3.5]

When using the headphones, avoid listening to sound for a long period of time at excessive volume levels, which may injure your ears.

- 2 Built-in Microphone (MIC)
- 3 Operation Indicator (OPR)
- 4 FM Stereo Indicator (FM ST)
- 5 FM Mode Selector/Beat Proof Switch (FM MODE/B.P)
- 6 Editing Speed Selector (EDITING)
- 7 Function Selector (SELECTOR)
- 8 Balance Control (BALANCE)
- 9 Volume Control (VOLUME)
- 10 Tuning Control (TUNING)
- 11 Fine Tuning Control (FINE TUNING)
- 12 Band Selector (BAND)
- 13 Speakers (Woofer) [12 cm/2.7Ω]
- 14 Speakers (Tweeter) [(2×4) cm/1.4 kΩ]
- 15 Graphic Equalizer/Frequency Distribution Equalizer Controls (GRAPHIC EQ/F.D.EQ)
- 16 Equalizer Mode Selector (EQUALIZER MODE)

Tape 2

- 25 Cassette Compartment
- 26 Playback Button (▶ PLAY)
- 27 Rewind/Review Button (◀ REW/REV)
- 28 Fast Forward/Cue Button (▶▶ FF/CUE)
- 29 Stop/Eject Button (■/▲ STOP/EJECT)
- 30 Pause Button (|| PAUSE)
- 31 Speaker Wall Mounts
- 32 Speaker Release Levers (RELEASE)
- 33 Handle
- 34 Telescopic Antenna
- 35 Line Input/CD Jacks (LINE IN/CD) [316 mV/47 kΩ]
- 36 Mixing Microphone Jack (MIXING MIC) [5.6 mV (200Ω~600Ω)/φ3.5]
- 37 Speaker Terminals (SPEAKER IMP 2.7~8Ω)
- 38 Speaker Cable Compartments
- 39 Speaker Cables
- 40 AC Socket (AC IN~)
- 41 Battery Compartment

Tape 1

17 Tape Counter and Reset Button (TAPE 1 COUNTER)

The digits return to "000" when the Reset Button is pressed. The digits advance with the tape to provide a reference to quickly find a desired portion of the tape.

- 18 Cassette Compartment
- 19 Record Button (● RECORD)
- 20 Playback Button (▶ PLAY)
- 21 Rewind Button (◀ REW)
- 22 Fast Forward Button (▶▶ FF)
- 23 Stop/Eject Button (■/▲ STOP/EJECT)
- 24 Pause Button (|| PAUSE)

IMPORTANT (FOR U.K.)

The wires in this mains 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 apparatus 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 which is marked with the letter N or coloured black.
- The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

DISASSEMBLY INSTRUCTIONS

■ MAIN UNIT SECTION

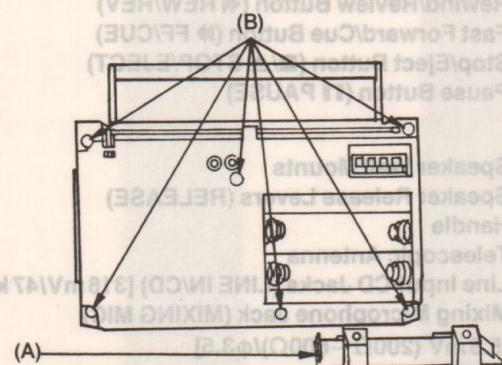


Fig. 1

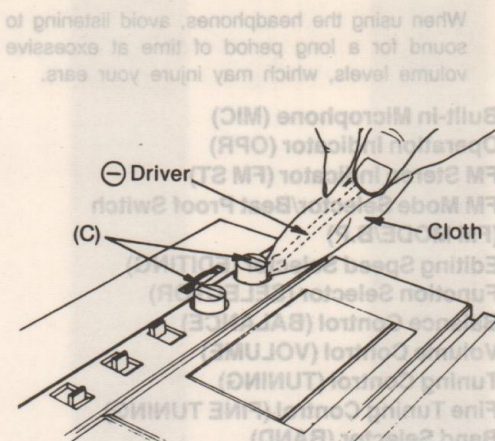


Fig. 2

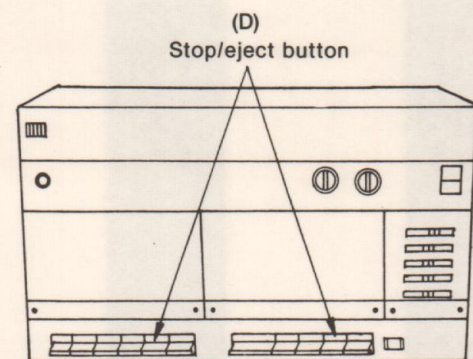


Fig. 3

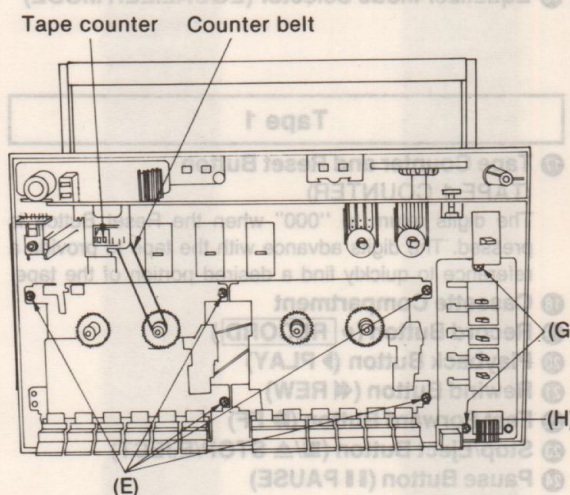


Fig. 4

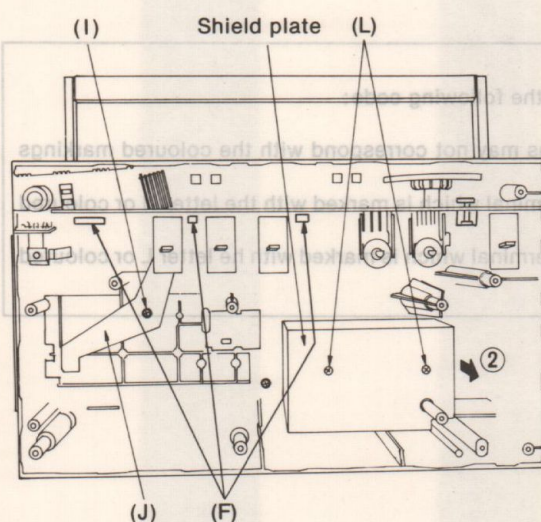


Fig. 5

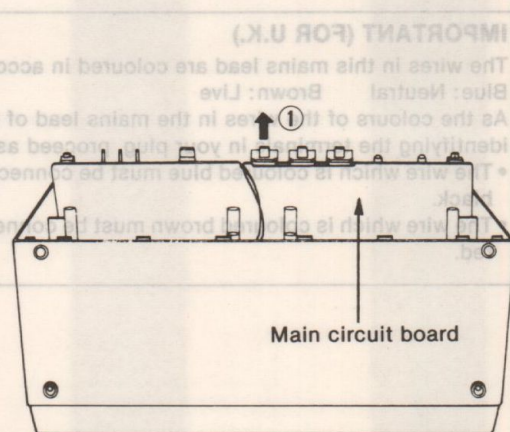


Fig. 6

■ SPEAKER BOX SECTION

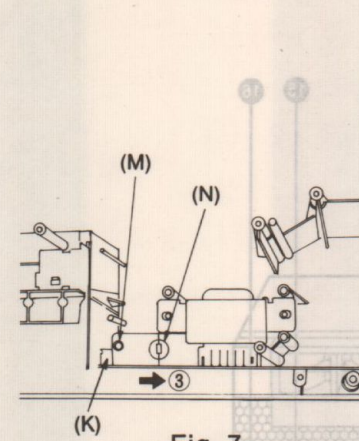


Fig. 7

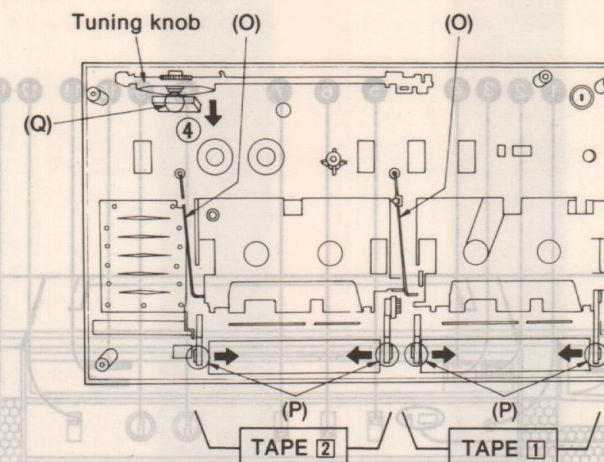


Fig. 8

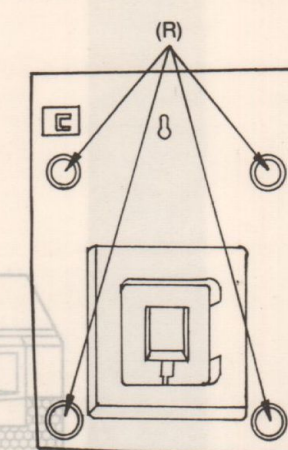


Fig. 9

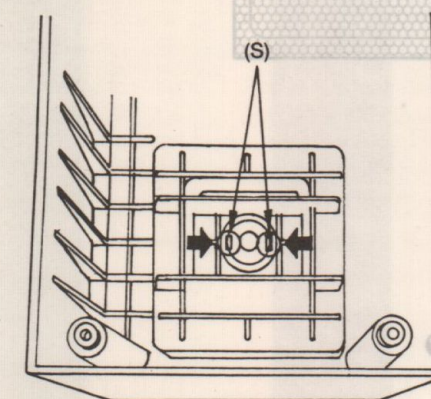


Fig. 10

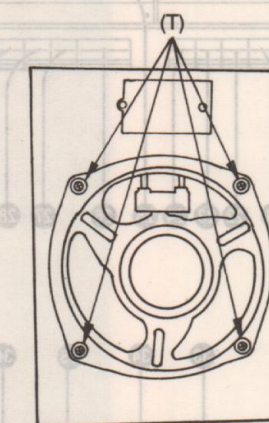


Fig. 11

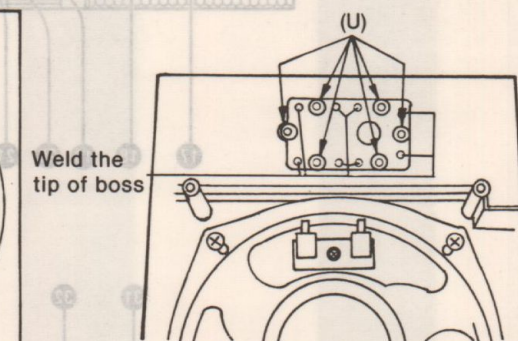


Fig. 12

■ Main Unit Section

Ref No.	Shown in Fig. —	To remove —	Remove —
1	1	Front Cabinet Ass'y	Remove the battery cover (A) × 1
2	1		Screw (3×50)mm (B) × 6
3	2		Remove the knob by used ⊖ driver (C) × 2
4	3	Mechanism Unit (Tape 1 & 2)	Push the Stop/Eject button (Tape 1 & 2) (D) × 2
5	4		Remove the counter belt and pull out the tape counter.
6	4		Screw (3×2)mm (E) × 5
7	5	Graphic EQ Circuit Board	Socket (F) × 3
8	4		Screw (3×12)mm (G) × 2
9	4		Ribbon socket (H) × 1
10	5	Main Circuit Board	Screw (3×14)mm (I) × 1
11	5		Record/playback lever (J) × 1
12	7		Socket (K) × 1
13	6	Power Supply Circuit Board	Pull out the main circuit board in the direction of arrow ①.
14	5		Screw (3×12)mm (L) × 2
15	5		Pull out the shield plate in the direction of arrow ②.
16	7		Screw (3×12)mm (M) × 1
17	7		Remove the rib in the direction of arrow ③. (N) × 1

Ref No.	Shown in Fig. —.	To remove —.	Remove —.
18	8	Cassette Compartment Cover (Tape ① & ②)	Cassette holder spring(O)×1
19	8		Remove the cassette compartment cover by pulling one side at a time toward the front of the set while pushing it with a standard screwdriver in the direction of the arrow.(P)×2
20	8		Tuning Knob Push the rib in the direction of arrow ④.(Q)×1

■ Speaker Box Section

Ref No.	Shown in Fig. —.	To remove —.	Remove —.
21	9	Rear Cabinet Ass'y	Screw (3×25)mm.....(R)×4
22	10	Cord Bushing	Remove the rib in the direction of arrow.(S)×2
23	11	Speaker (Woofer)	Screw (3×8)mm.....(T)×4
24	12	Speaker (Tweeter) (*1)	Weld the tip of boss at the six position.(U)×6

(*1) When replacing the tweeter, attach the tweeter to the speaker cabinet by welding it to the remainder of the boss.

CAUTION ON DISASSEMBLY AND ASSEMBLY

■ DISCONNECTION OF RIBBON CABLES FROM MECHANISM CIRCUIT BOARD

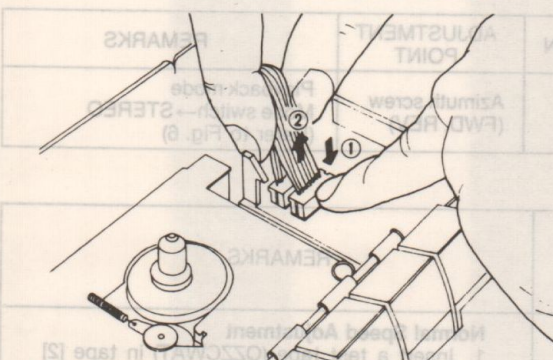


Fig. 13

■ 0 (ZERO) POINT ADJUSTMENT

1. Line up the dial point in the front cabinet assembly with the "0" point graduation as shown in Fig. 15.
2. Turn the variable capacitor gear on the main circuit board all the way in the direction of arrow ③.
3. Next, assemble the front and rear cabinets, and the 0 (zero) point adjustment is complete.

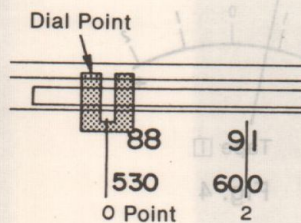


Fig. 15

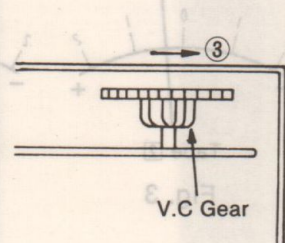


Fig. 16

■ CONNECTION OF RIBBON CABLE

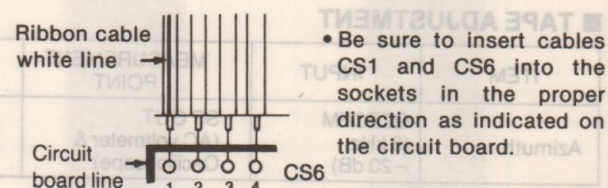


Fig. 14

■ SHIELD PLATE ATTACHMENT

To attach the shield plate to the power transformer, follow the procedure described below.

1. Slide the boss on the rear cabinet ass'y through the shield plate hole as shown in Fig. 17.
2. Lower the shield plate until the sides rest in the five rib assemblies provided. Be sure to secure the shield plate at the correct position. (See Fig. 18)
3. Securely fasten the shield plate and the power transformer to the rear cabinet ass'y using the two screws (A).

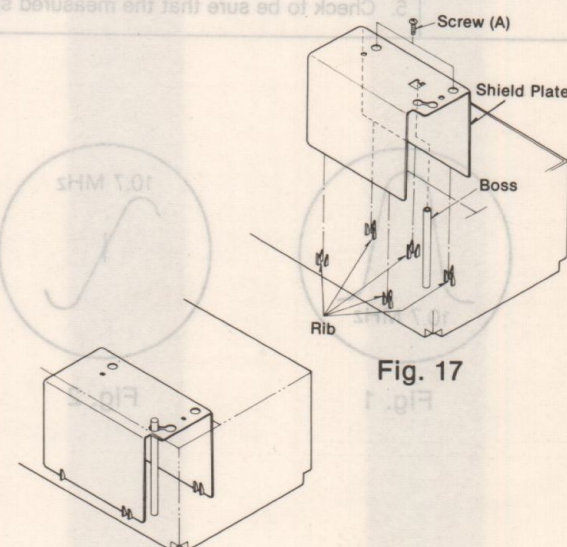


Fig. 17

Fig. 18

■ ASSEMBLY OF TAPE COUNTER

1. Insert the tape counter in the hole (a) on the main circuit board as shown in Fig. 19.
2. Secure the tape counter in place with the positioning pin.
3. Attach the counter belt as shown in Fig. 19, while being careful not to twist the belt or allow grease to come in contact with it.

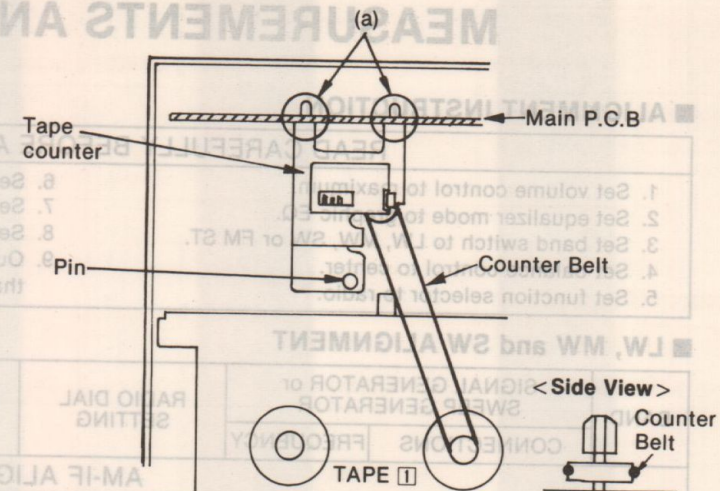


Fig. 19

■ PLACEMENT OF WIRING WHEN ASSEMBLING THE GRAPHIC EQ PC BOARD

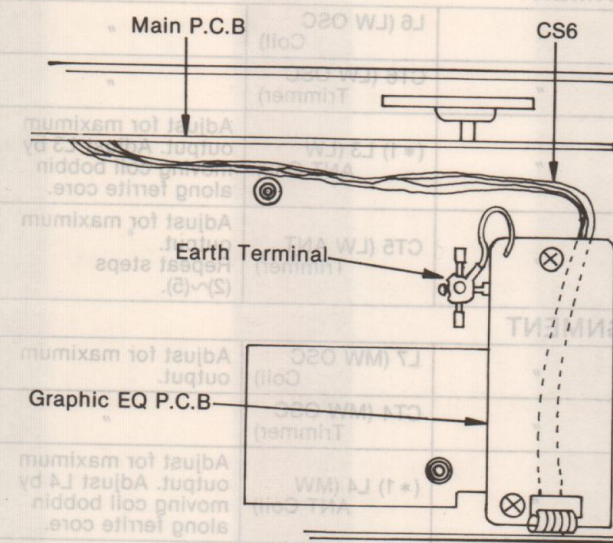


Fig. 20

■ PLACEMENT OF WIRING WHEN ASSEMBLING THE MAIN PC BOARD

When assembling the main circuit board, be sure to lead the ribbon cable (CS1) out from the top.

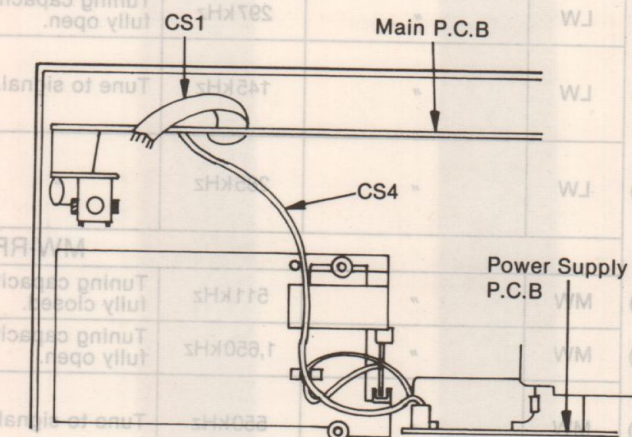


Fig. 21

■ PLACEMENT OF MECHANISM WIRING

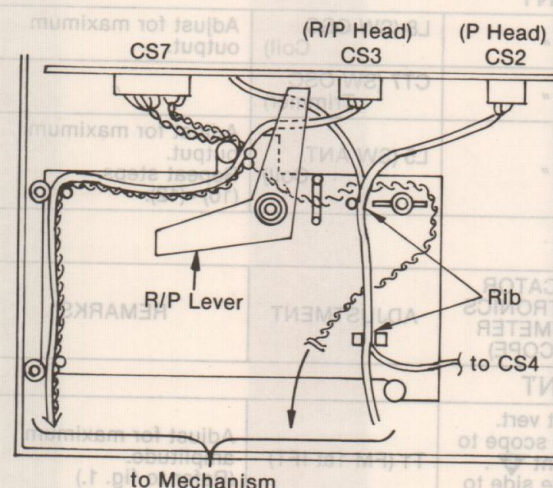
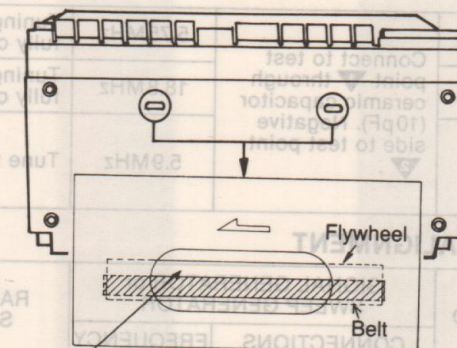


Fig. 22

■ HOW TO REMOVE A TANGLED TAPE

< Bottom View >



Press directly on the exposed flywheel.
(Do not press on the belt.)

Fig. 23

MEASUREMENTS AND ADJUSTMENTS

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Set equalizer mode to graphic EQ.
3. Set band switch to LW, MW, SW or FM ST.
4. Set balance control to center.
5. Set function selector to radio.
6. Set fine tuning to center.
7. Set graphic equalizer to center.
8. Set power source voltage to 12V DC.
9. Output of signal generator should be no higher than necessary to obtain an output reading.

■ LW, MW and SW ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
AM-IF ALIGNMENT						
(1)	MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455kHz (470kHz ...[E] only) 30% Mod. at 400Hz	Point of non-interference. (on/ about 600kHz)	Output meter across voice coil.	T2 (AM IFT) Adjust for maximum output.
LW-RF ALIGNMENT						
(2)	LW	"	136kHz	Tuning capacitor fully closed.	"	L6 (LW OSC Coil) "
(3)	LW	"	297kHz	Tuning capacitor fully open.	"	CT6 (LW OSC Trimmer) "
(4)	LW	"	145kHz	Tune to signal.	"	(*1) L3 (LW ANT Coil) Adjust for maximum output. Adjust L3 by moving coil bobbin along ferrite core.
(5)	LW	"	285kHz	"	"	CT5 (LW ANT Trimmer) Adjust for maximum output. Repeat steps (2)~(5).
MW-RF ALIGNMENT						
(6)	MW	"	511kHz	Tuning capacitor fully closed.	"	L7 (MW OSC Coil) Adjust for maximum output.
(7)	MW	"	1,650kHz	Tuning capacitor fully open.	"	CT4 (MW OSC Trimmer) "
(8)	MW	"	550kHz	Tune to signal.	"	(*1) L4 (MW ANT Coil) Adjust for maximum output. Adjust L4 by moving coil bobbin along ferrite core.
(9)	MW	"	1,500kHz	"	"	CT3 (MW ANT Trimmer) Adjust for maximum output. Repeat steps (6)~(9).
(*1) Cement antenna bobbin with wax after completing alignment.						
SW-RF ALIGNMENT						
(10)	SW	Connect to test point ▼ through ceramic capacitor (10pF). Negative side to test point ▼.	5.75MHz	Tuning capacitor fully closed.	"	L8 (SW OSC Coil) Adjust for maximum output.
(11)	SW		18.8MHz	Tuning capacitor fully open.	"	CT7 (SW OSC Trimmer) "
(12)	SW		5.9MHz	Tune to signal.	"	L5 (SW ANT Coil) Adjust for maximum output. Repeat steps (10)~(12).

■ FM ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
FM-IF ALIGNMENT						
(1)	FM	High side thru. 0.001μF to test point ▼3. Negative side to test point ▼2.	10.7MHz (SWP.)	Point of non-interference. (on/ about 90MHz)	Connect vert. amp. of scope to test point ▼3. Negative side to test point ▼4.	T1 (FM 1st IFT) Adjust for maximum amplitude. (Refer to fig. 1.)
(2)	FM	"	"	"	"	T4 (FM 2nd IFT) Adjust for maximum amplitude. (Refer to fig. 2.)

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
FM-RF ALIGNMENT						
(3) FM	Connect to test point ▼ through FM dummy antenna. Negative side to test point 2.	86.2MHz (87.5MHz... [G] only)	Variable capacitor fully closed.	Output meter across voice coil.	L2 (FM OSC Coil)	(*2) Adjust for maximum output.
(4) FM		109.2MHz (108MHz... [G] only)	Variable capacitor fully open.	"	CT2 (FM OSC Trimmer)	"
(5) FM		106MHz	Tune to signal.	"	CT1 (FM ANT Trimmer)	(*2) Adjust for maximum output. Repeat steps (3)~(5).
CT2 adjustment to center before FM-RF ALIGNMENT. (For F.R. Germany)						
(*2) Three output responses will be present; proper tuning is the center frequency.						

■ SEPARATION ALIGNMENT

ITEM	FM SIGNAL GENERATOR SOURCE CONNECTION	EQUIPMENT CONNECTION ELECTRONIC COUNTER	ADJUSTMENT	SPECIFICATION	REMARKS
Adjustment of pilot signal.	98MHz, 60dB Connect to test point ▼ through FM dummy antenna. Negative side to test point ▼.	7...(+) 6...(-)	VR1	19kHz	Adjust VR1, for 19kHz (±100Hz) reading on electronics counter.

■ TAPE ADJUSTMENT

ITEM	INPUT	MEASUREMENT POINT	SPECIFICATION	ADJUSTMENT POINT	REMARKS
Azimuth	QZZCFM (8 kHz, -20 dB)	SP OUT (AC voltmeter & Oscilloscope)	Maximum output.	Azimuth screw (FWD, REV)	Playback mode Mode switch→STEREO (Refer to Fig. 6)

■ TAPE SPEED ADJUSTMENT

ITEM	FM SIGNAL GENERATOR SOURCE CONNECTION	EQUIPMENT CONNECTION ELECTRONIC COUNTER	ADJUSTMENT	REMARKS
Tape speed adjustment (Tape [1] & [2])	QZZCWAT (3kHz)/ QZZCWC (1.5kHz)	Headphone Jack (32Ω)	VR305 [Tape 2]	Normal Speed Adjustment 1. Insert a test tape (QZZCWAT) in tape [2] and playback. 2. Adjust VR305 until the measured value becomes 3,010±30Hz. (Refer to Fig. 3 & 4 when using a drift meter.) 3. Check tape [1] in the same way to make sure it satisfies the specification. Tape [1].....-30±45Hz of the speed of tape [2]. If it doesn't repeat steps 1 and 2 above. Note: This set uses one drive motor, so be sure to perform the adjustment in tape [2]. High Speed Measurement 4. Short the high speed jumper lead to set the high speed mode. (Refer to Fig. 7) 5. Check to be sure that the measured speed is at least 1.8 times (5400Hz over) faster than normal speed.

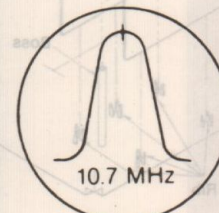


Fig. 1

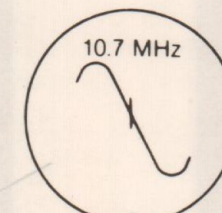


Fig. 2

● NEEDLE POSITION OF THE DRIFT METER



Fig. 3



Fig. 4

■ ALIGNMENT POINTS

* Please refer to Circuit Board and Wiring Connection Diagram which is located test point.

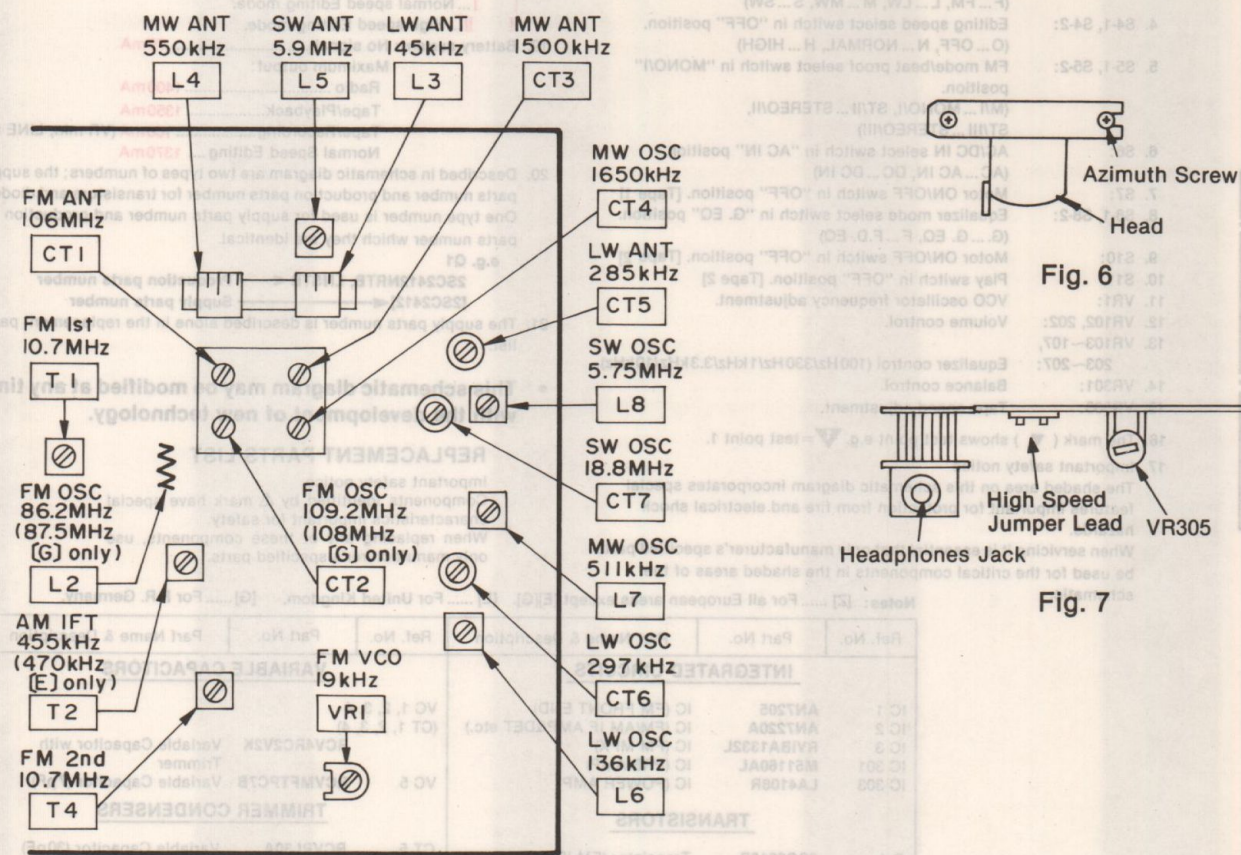


Fig. 5

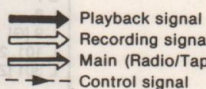
Notes:

E...For United Kingdom.
G...For F.R. Germany.

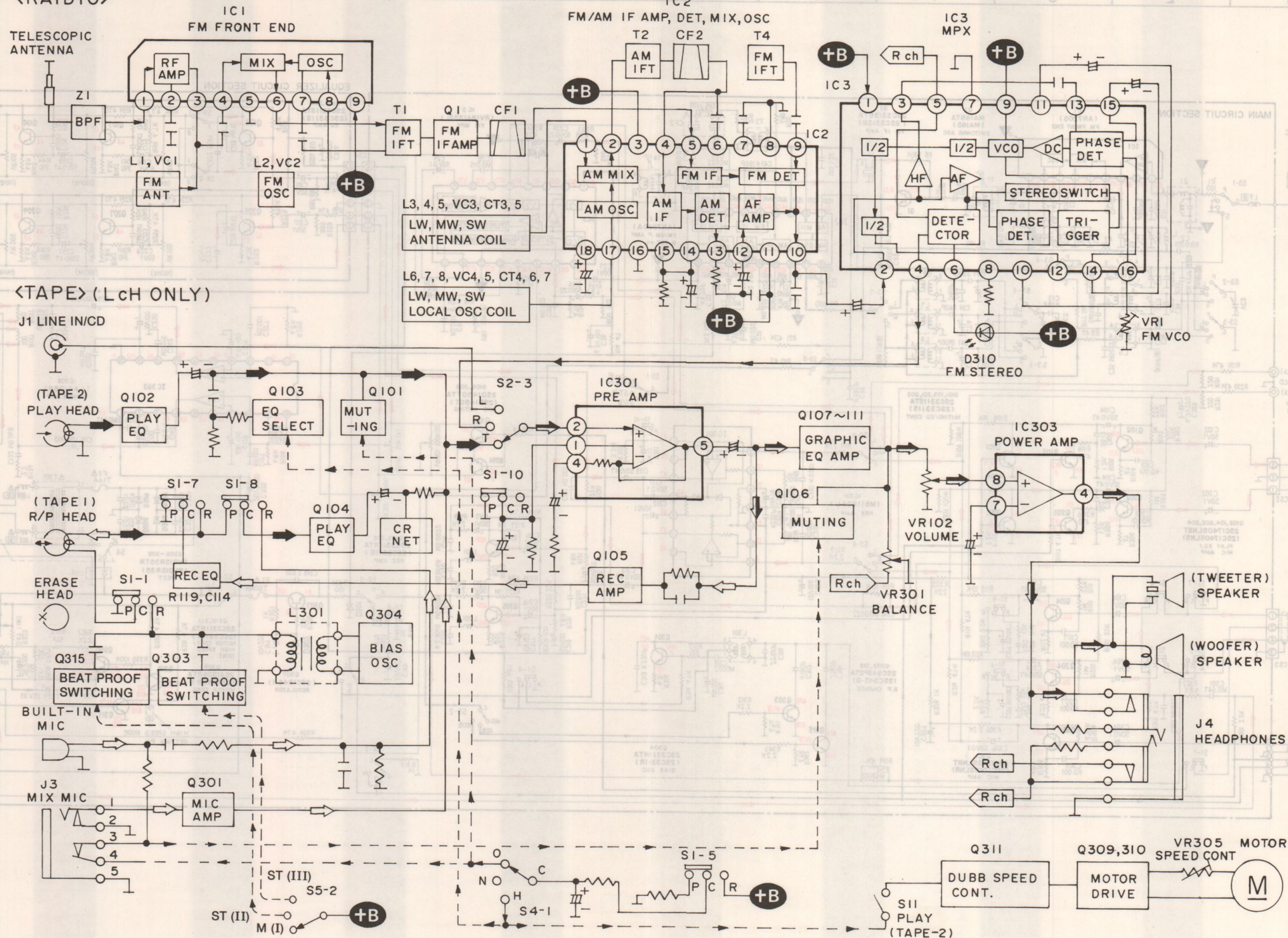
NOTES: (For BLOCK DIAGRAM)

- | | |
|--------------------------------|--|
| 1. S1-1~S1-10: | REC/PLAY select switch in "PLAY" position.
(...PLAY, R... REC) |
| 2. S2-1 ~ S2-4: | Function select switch in "TAPE/OFF" position.
(T ... TAPE/OFF, R ... RADIO, L ... LINE IN) |
| 3. S3-1~S3-8: | Band select switch in "FM" position.
(F ... FM, L ... LW, M ... MW, S ... SW) |
| 4. S4-1, S4-2: | Editing speed select switch in "OFF" position.
(O ... OFF, N ... NORMAL, H ... HIGH) |
| 5. S5-1, S5-2: | FM mode/beat proof select switch in "MONO/I" position.
(M/I ... MONO/I, ST/III ... STEREO/II,
ST/III ... STEREO/III) |
| 6. S6: | AC/DC IN select switch in "AC IN" position.
(AC ... AC IN, DC ... DC IN) |
| 7. S7: | Motor ON/OFF switch in "OFF" position. [Tape 1] |
| 8. S8-1, S8-2: | Equalizer mode select switch in "G. EQ" position.
(G ... G. EQ, F ... F.D. EQ) |
| 9. S10: | Motor ON/OFF switch in "OFF" position. [Tape 2] |
| 10. S11: | Play switch in "OFF" position. [Tape 2] |
| 11. VR1: | VCO oscillator frequency adjustment. |
| 12. VR102, 202: | Volume control. |
| 13. VR103 ~ 107,
203 ~ 207: | Equalizer control (100Hz/330Hz/1kHz/3.3kHz/10kHz). |
| 14. VR301: | Balance control. |
| 15. VR305: | Tape speed adjustment. |

 Playback signal
 Recording signal
 Main (Radio/Tape/Recording) signal
 Control signal

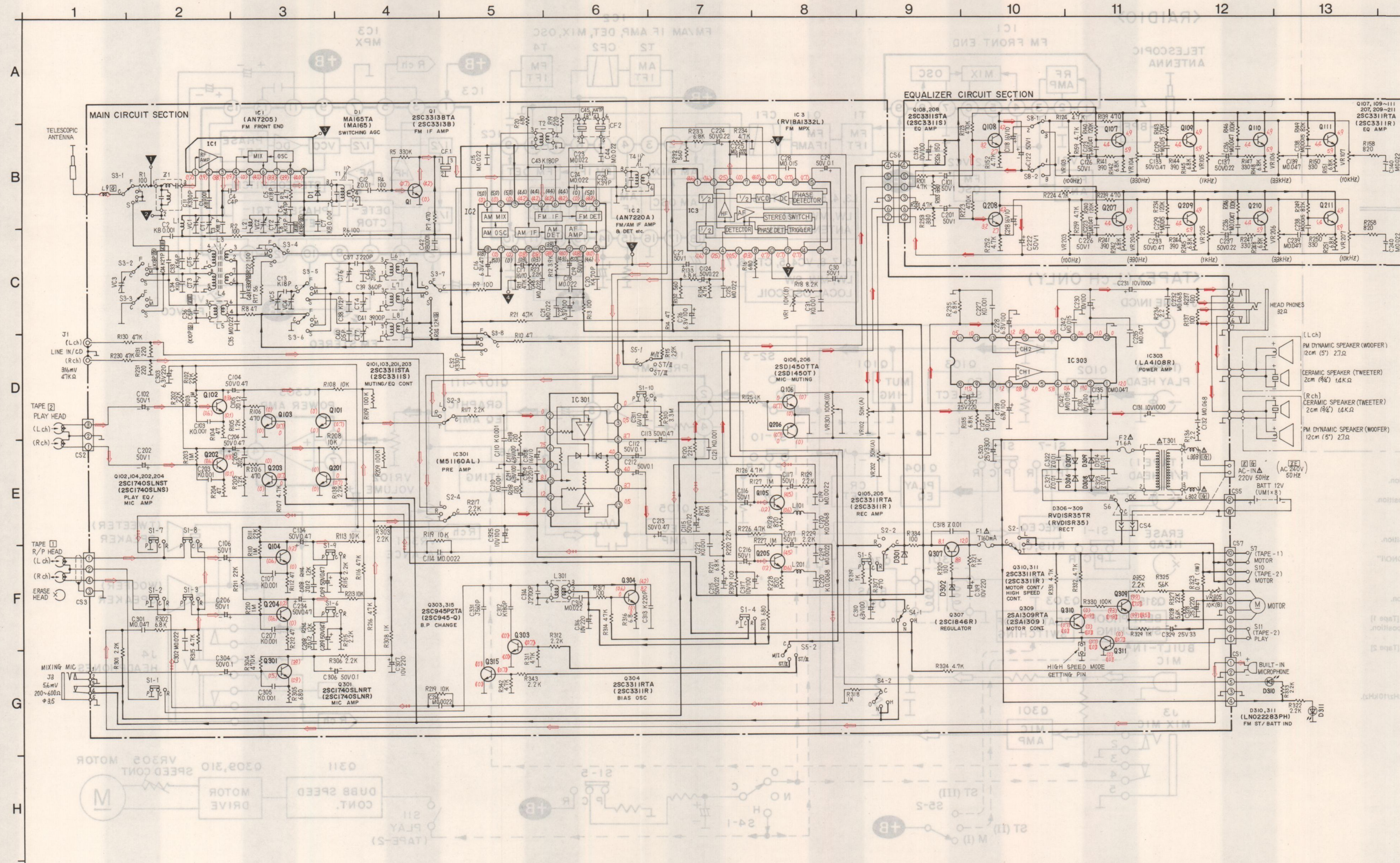


<RAIDIO>



SCHEMATIC DIAGRAM

- Radio (FM) Signal Line
→ Tape 1 (PLAYBACK) Signal Line
→ Tape 2 (PLAYBACK) Signal Line
- Input (LINE IN/MIC) Signal Line
→ Tape (RECORD) Signal Line
→ Main (Radio/Tape) Signal Line
- +⊕ Voltage Line



NOTES:

- S1-1~S1-10: REC/PLAY select switch in "PLAY" position.
 - S2-1~S2-4: Function select switch in "TAPE/OFF" position. (T...TAPE/OFF, R...RADIO, L...LINE IN)
 - S3-1~S3-8: Band select switch in "FM" position. (F...FM, L...LW, M...MW, S...SW)
 - S4-1, S4-2: Editing speed select switch in "OFF" position. (O...OFF, N...NORMAL, H...HIGH)
 - S5-1, S5-2: FM mode/beat proof select switch in "MONO/II" position. (M/I...MONO/II, ST/II...STEREO/II, ST/III...STEREO/III)
 - S6: AC/DC IN select switch in "AC IN" position. (AC...AC IN, DC...DC IN)
 - S7: Motor ON/OFF switch in "OFF" position. [Tape 1]
 - S8-1, S8-2: Equalizer mode select switch in "G. EQ" position. (G...G. EQ, F...F.D. EQ)
 - S10: Play switch in "OFF" position. [Tape 2]
 - VR1: VCO oscillator frequency adjustment.
 - VR102, 202: Volume control.
 - VR103~107, 203~207: Equalizer control (100Hz/330Hz/1kHz/3.3kHz/10kHz).
 - VR301: Balance control.
 - VR305: Tape speed adjustment.
- The mark (▼) shows test point e.g. ▼ = test point 1.
- Important safety notice**
The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.
18. DC voltage measurement are taken with electronics voltmeter from negative terminal of battery.
No mark...Playback position, <...>...FM position, ()...AM position, ()...Recording position, <...>...BP (II) position, ()...BP (III) position, ()...Normal speed Editing mode, ()...High speed Editing mode.
19. Battery current: No signal...79mA
Maximum output:
Radio...1400mA
Tape/Playback...1350mA
Tape/Recording...160mA (VR min, LINE IN)
Normal Speed Editing...1370mA
20. Described in schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type number is used for supply parts number and production parts number which they are identical.
e.g. Q1
2SC2412NRTB, LNSTB ← Production parts number
[2SC2412] ← Supply parts number
21. The supply parts number is described alone in the replacement parts list.
- This schematic diagram may be modified at any time with the development of new technology.**

REPLACEMENT PARTS LIST

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

Notes: [Z]..... For all European areas except [E][G]. [E]..... For United Kingdom. [G]..... For F.R. Germany.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS			VARIABLE CAPACITORS		
IC 1	AN7205	IC (FM FRONT END)	VC 1, 2, 3, 4	CT 1, 2, 3, 4	
IC 2	AN7220A	IC (FM/AM IF AMP&DET etc.)	RCV4RC2V2K		Variable Capacitor with Trimmer
IC 3	RV18A1332L	IC (FM MPX)	VC 5	RCVM7TPC7B	Variable Capacitor (7pF)
IC 301	M51160AL	IC (PRE AMP)	TRIMMER CONDENSERS		
IC 303	LA4108R	IC (POWER AMP)	CT 5	RCVPL30A	Variable Capacitor (30pF)
TRANSISTORS			CT 6	RCVPL20A	Variable Capacitor (20pF)
Q 1	2SC3313B	Transistor (FM IF AMP)	CT 7	RCVPL10A	Variable Capacitor (10pF)
Q 101, 103, 108, 201, 203, 208	2SC3311S	Transistor (Muting, EQ CONT, EQ AMP)	VARIABLE RESISTORS		
Q 102, 104, 202, 204	2SC1740SLNS	Transistor (PLAY EQ/MIC AMP)	VR 1	QVNB3A00B10	Variable Resistor (VCO Adj.)
Q 105, 107, 109, 110, 111, 205, 207, 209, 210, 211, 304, 310, 311	2SC3311R	Transistor (REC AMP, G. EQ AMP, BIAS OSC etc.)	VR 102, 202	EWCUHAF10A54	Variable Resistor (Volume)
Q 106, 206	2SD1450T	Transistor (Muting)	VR 103, 104, 105, 106, 107, 203, 204, 205, 206, 207	EWASAC95G5	Variable Resistor (EQ VR)
Q 301	2SC1740SLNR	Transistor (MIC AMP)	VR 301	EWB8MAF10G15	Variable Resistor (Balance)
Q 303, 315	2SC945-Q	Transistor (B.P. CHANGE)	VR 305	RVNCC14B1	Variable Resistor (Tape Speed Adj.)
Q 307	2SA1846R	Transistor (REGULATOR)	CERAMIC FILTERS		
Q 309	2SA1309R	Transistor (Motor Speed Control)	CF 1	RVF107WMZ	Ceramic Filter, FM
DIODES & RECTIFIER			CF 2 [Z][G]	RVFSFZ455B	Ceramic Filter, AM
D 1	MA165	Diode (SWITCHING)	CF 2 [E]	QCRZ2470A7W	Ceramic Filter, AM
D 301	RVDMT25R1C	Diode (STAB)	FILTER		
D 302	RVDMT29R1B	Diode (REGULATOR)	Z 1	RXABPMB6A	Component Combinations
D 306, 307, 308, 309	RV01SR35	Diode (RECT)	FUSES		
D 310	LN02283PH	LED (FM ST/BATT)	F 1	XBA2C016TB0	Fuse (160mA) Δ
COILS			F 2	XBA2C16TB0U	Fuse (1.6A) Δ
L 2 [Z][E]	RL04Y44	Coil, FM OSC	SWITCHES		
L 2 [G]	RL04N198	Coil, FM OSC	S 1	RSH2J04W	Push Switch (REC/PLAY Changing)
L 3, 4	RLF6W9	Coil, AM ANT	S 2	RSS3D16Z	Slide Switch (Function)
L 5	RLA3B41	Coil, SW ANT	S 3	RSS4H03Z	Slide Switch (Band)
L 6	RL01B12	Coil, LW OSC	S 4, 5	RSS3B26Z	Slide Switch (Editing, FM Mode/B.P.)
L 7	RL02B108	Coil, MW OSC	S 7, 10	RFA49Z	Leaf Switch (Motor)
L 8	RL03B87	Coil, SW OSC	S 8	ESB6488	Push Switch (EQ Mode)
L 9 [G]	RLQY30S1	Coil, Choke	S 11	RFA42Z	Leaf Switch (PLAY)
L 101, 201	RLQZB822K	Coil, Choke	JACKS		
L 301 [Z][E]	RL09B17	Coil, Bias OSC	J 1, 2	RJF1081Y	Jack, Line In
L 302, 303 [G]	RLQZB470K	Coil, Choke Δ	J 3	RJJ1D25Z	Jack, Mixing MIC
TRANSFORMERS			J 4	RJJ1D29Z	Jack, Headphones
T 1, 4	RL14B153	IFT, FM	J 5 (S6) [Z][G]	RJJA6Z	Jack, AC In Δ
T 2	RL12B153	IFT, AM	J 5 (S6) [E]	RJJA7Z	Jack, AC In Δ
T 301 [Z][G]	RLT5L4G3A	Power Transformer Δ			
T 301 [E]	RLT5L4A3A	Power Transformer Δ			

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM MODEL

ELECTRICAL PARTS LIST

Numbering System of Resistor

Example	ERD	25	F	J	101	Example	ECKD	1H	102	Z	F
Type	Wattage	Shape	Tolerance	Value (100Ω)	Value (1000 pF)	Type	Voltage	Value (1000 pF)	Tolerance	Peculiarity	
ERX	2	AN	J			ECEA	50	M	R47		
Type	Wattage	Shape	Tolerance	Value (2.2Ω)	Value (0.47 μF)	Type	Voltage	Peculiarity	Value (0.47 μF)		

Numbering System of Capacitor

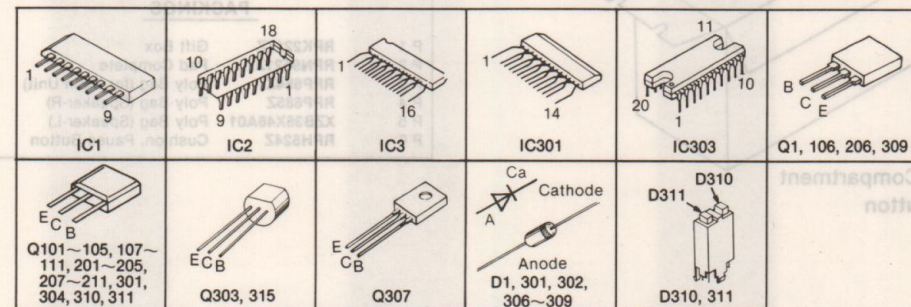
Resistor Type	Wattage	Tolerance
ERD: Carbon	10 : 1/8 W	±5%
ERG: Metal Film	12 : 1/2 W	±5%
ERX: Metal Film	25 : 1/4 W	±5%
ERQ: Fuse Type Metal	1 : 1 W	±80%
RRD: Carbon (Chip Type)	18 : 1/8 W	±5%

Capacitor Type	Voltage	Tolerance
ECEA: Electrolytic	0J : 6.3 V	C : ±0.25 pF
ECCD: Ceramic	1A : 10 V	J : ±5%
ECKD: Ceramic	1C : 16 V	K : ±10%
ECQM: Polyester	1E : 25 V	Z : +80%, -20%
ECQP: Polypropylene	1H : 50 V	P : +100%, -0%
ECET: Electrolytic	1V : 35 V	
ECEA□□□□: Non Polar Electrolytic	25 : 25 V	
ECUX: Ceramic (Chip Type)	16 : 16 V	

Notes:

[Z] For all European areas except [E][G].
[E] For United Kingdom.
[G] For F.R. Germany.

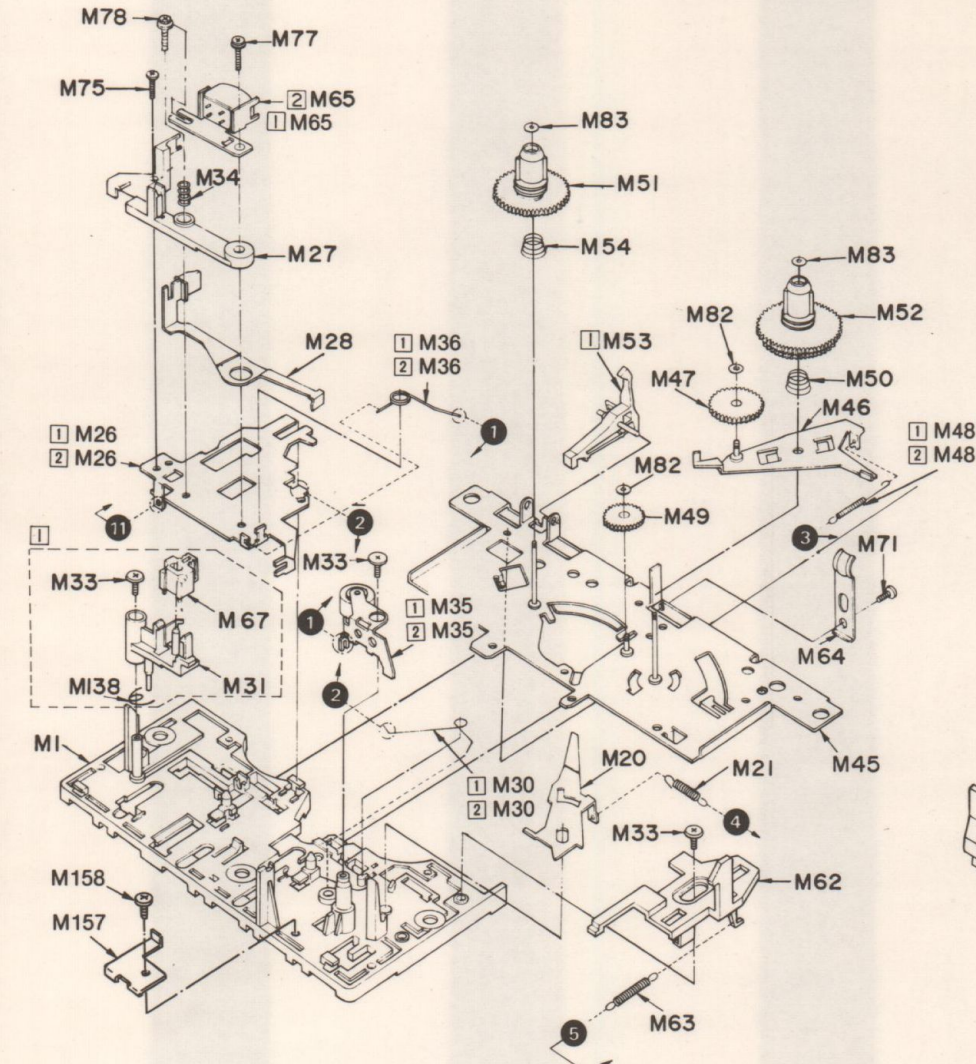
Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
CAPACITORS				RESISTORS			
C 1, 2, 7, 42	ECCD1H102KB	C 36 [Z][E]	ECCD1H050C	R 103, 110, 127, 203, 210, 227	ERDS2TJ105		
C 3, 5, 13	ECCD1H180KC	C 37	ECQP2A221JZ	R 108, 113, 119, 208, 213, 219	ERDS2TJ103		
C 4	ECCD1H040C	C 41	ECQP2A392JZ	R 109, 209, 330	ERDS2TJ104		
C 6, 45	ECCD1H470KC	C 43, 312	ECCD1H181K	R 118, 218	ERDS2TJ121		
C 8, 14 [G]	ECCD1H180KC	C 46	ECQP2A151JZ	R 121, 133, 135, 142, 145, 148, 151, 221, 233, 235, 242, 245, 248, 251, 302	ERDS2TJ682		
C 8 [Z][E]	ECCD1H120KC	C 103, 107, 110, 121, 127, 203, 207, 210, 221, 227, 305	RCBS1H102KB	R 125, 308, 318, 319, 321, 329, 258	ERDS2TJ102		
C 11, 32	ECCD1H331K	C 104, 113, 133, 134, 204, 213, 233, 234	ECEA1HUR47	R 111, 116, 130, 210, 230, 314	ERDS2TJ473		
C 12, 318, 321, 322, 323, 324	ECCD1H103ZF			R 12, 15, 23, 115, 117, 129, 138, 215, 217, 229, 301, 303, 306, 312, 325, 343	ERDS2TJ222		
C 14 [Z][E]	ECCD1H270KC			R 16, 20, 305, 313	ERDS2TJ681		
C 15, 18, 21, 23, 24, 35, 44, 46, 125, 140, 225, 240, 302, 315	ECFT1C223MD			R 17	ERDS2TJ560		
C 16	ECEA0JU470			R 18	ERDS2TJ822		
C 17, 308, 311	ECEA1CU100			R 19, 131, 231, 21, 101, 107, 124, 126, 134, 152, 159, 201, 224, 226, 234, 252, 259, 311, 315, 324, 331, 332, 342	ERDS2TJ472		
C 19, 29, 112, 212, 304, 306	ECEA1HUOR1			R 24 [G]	ERDS2TJ122		
C 20	ECCD1H471KB			R 102, 111, 120, 202, 211, 220, 327, 352	ERDS2TJ223		
C 22, 26, 111, 128, 211, 228, 310	ECEA0JU101						
C 25	ECCD1H390KC						
C 27, 30, 101, 102, 106, 116, 117, 122, 126, 201, 202, 206, 216, 217, 222, 226	ECEA1HU010						
C 31	ECFT1C153MD						
C 33	ECQM1H102KV						
C 36 [G]	ECCD1H100KC						



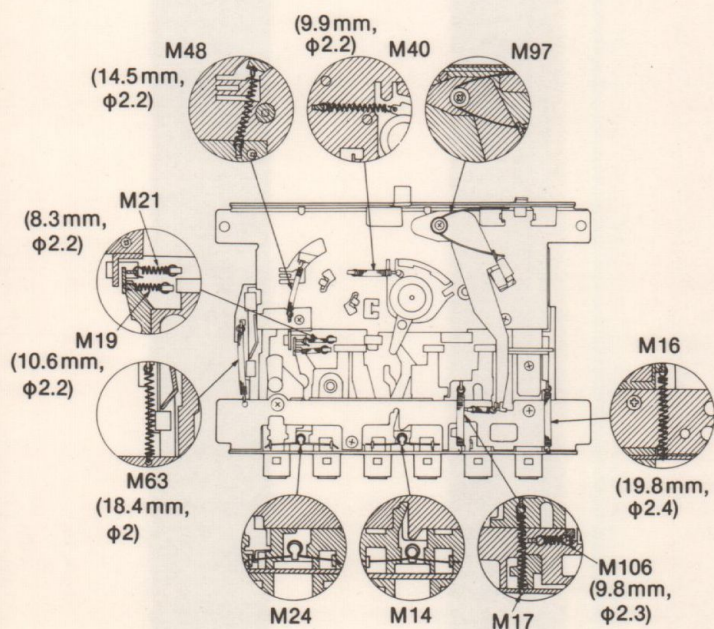
Ref. No.	Part No.	Part Name & Description
ACCESSORIES		
A 1 [E]	RJA86Z	Power Cord Δ
A 1 [Z][G]	RJA20Z	Power Cord Δ
A 2	RQX4739Z	Operating Instructions
PACKINGS		
P 1	RPK2217Z	Gift Box
P 2	RPN9521Z	Pad Complete
P 3	RPB684Z	Poly Bag (for Main Unit)
P 4	RPB685Z	Poly Bag (Speaker-R)
P 5	XZB36X46A01	Poly Bag (Speaker-L)
P 6	RPH524Z	Cushion, Pause Button

MECHANISM PARTS LOCATION

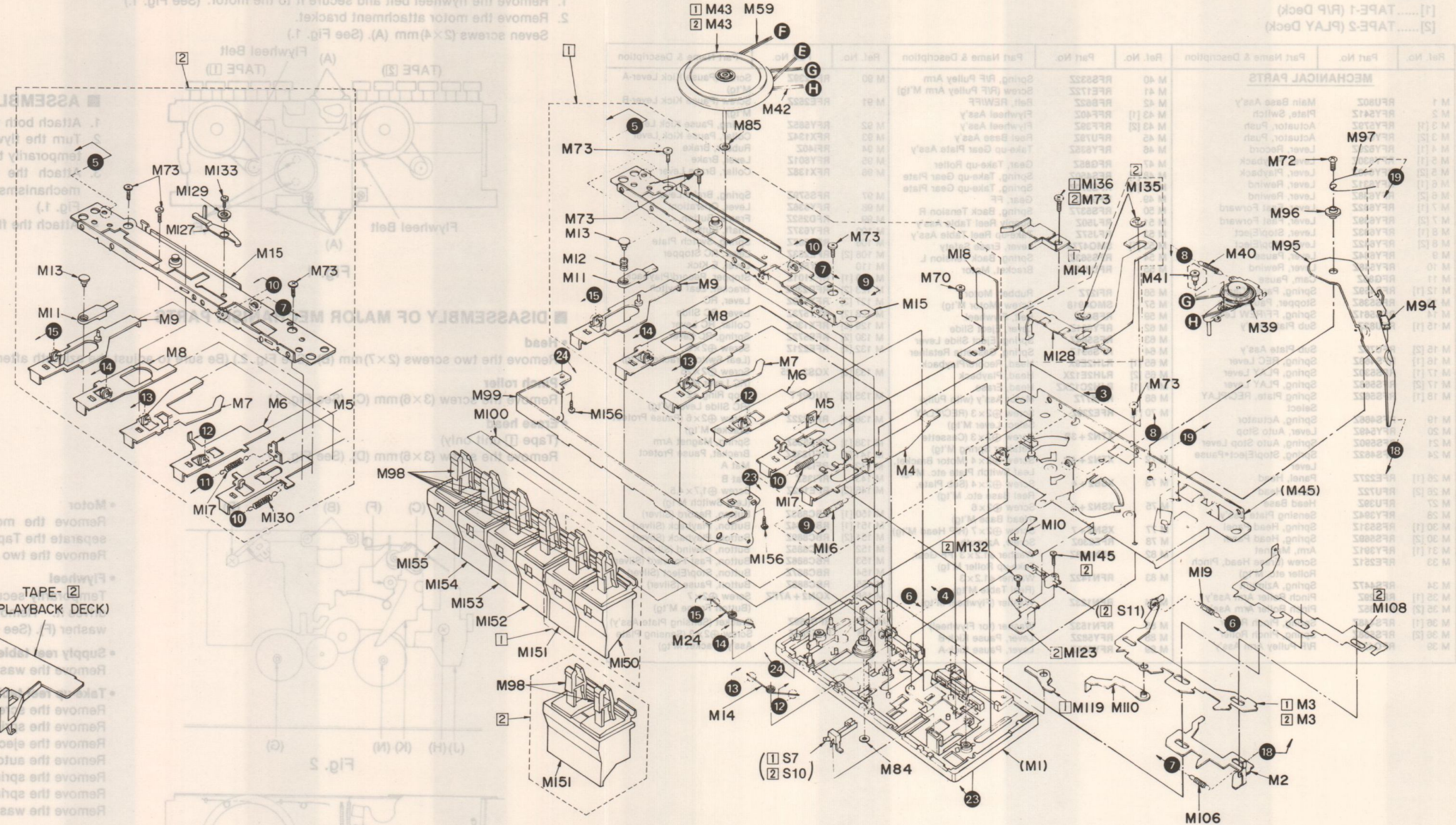
< Front View >



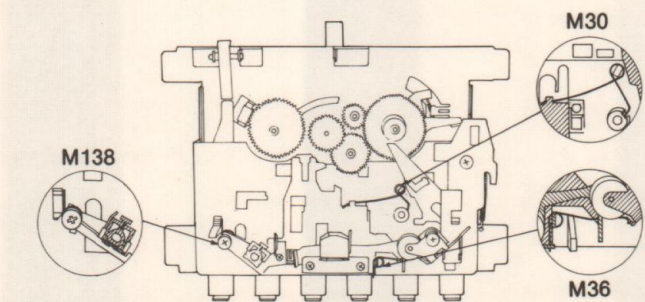
• **SPRING LOCATION (Rear View)**



<Rear View>



• **SPRING LOCATION (Front View)**



Notes:

- ①.....TAPE-1 (R/P Deck)
②.....TAPE-2 (PLAY Deck)

Specifications

Takeup Tension	More than 150 g
Playback torque	25~55 g · cm
Fast Forward torque	55~130 g · cm
Rewind torque	55~130 g · cm
Pressure of pressure roller	300~400 g
Wow and flutter	Less than 0.2% (WRMS)

Mechanism Operation: Full Auto Stop.

MECHANISM PARTS LIST

REPLACEMENT PARTS LIST
The color name in parentheses () in the parts list is the color of the part.

Notes:
[1].....TAPE-1 (R/P Deck)
[2].....TAPE-2 (PLAY Deck)

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS								
M 1	RFU80Z	Main Base Ass'y	M 40	RFS532Z	Spring, R/F Pulley Arm	M 90	RFE239Z	Screw (Pause Kick Lever-A M'tg)
M 2	RFY541Z	Plate, Switch	M 41	RFE172Z	Screw (R/F Pulley Arm M'tg)	M 91	RFE252Z	Screw (Pause Kick Lever-B M'tg)
M 3 [1]	RFY579Z	Actuator, Push	M 42	RFB62Z	Belt, REW/FF	M 92	RFY585Z	Spring, Pause Kick Lever
M 3 [2]	RFY641Z	Actuator, Push	M 43 [1]	RFF40Z	Flywheel Ass'y	M 93	RFX134Z	Collar, Pause Kick Lever
M 4 [1]	RFY629Z	Lever, Record	M 43 [2]	RFF39Z	Flywheel Ass'y	M 94	RFI40Z	Rubber, Brake
M 5 [1]	RFY630Z	Lever, Playback	M 45	RFU79Z	Reel Base Ass'y	M 95	RFY601Z	Lever, Brake
M 5 [2]	RFY640Z	Lever, Playback	M 46	RFY635Z	Take-up Gear Plate Ass'y	M 96	RFX138Z	Collar, Brake Lever
M 6 [1]	RFY631Z	Lever, Rewind	M 47	RFG85Z	Gear, Take-up Roller	M 97	RFS579Z	Spring, Brake Lever
M 6 [2]	RFY638Z	Lever, Rewind	M 48 [1]	RFS450Z	Spring, Take-up Gear Plate	M 98	RFY636Z	Lever, Operation
M 7 [1]	RFY632Z	Lever, Fast Forward	M 48 [2]	RFS570Z	Spring, Take-up Gear Plate	M 99	RFD252Z	Frame, Button
M 7 [2]	RFY639Z	Lever, Fast Forward	M 49	RFG62Z	Gear, FF	M 100	RFY637Z	Shaft, Button
M 8 [1]	RFY633Z	Lever, Stop/Eject	M 50	RFS537Z	Spring, Back Tension R	M 106	RFS567Z	Spring, Switch Plate
M 8 [2]	RFY642Z	Lever, Stop/Eject	M 51	RFJ50Z	Supply Reel Table Ass'y	M 108 [2]	RFE253Z	Lever, RC Stopper
M 9	RFY634Z	Lever, Pause	M 52	RFJ57Z	Take-up Reel Table Ass'y	M 110	RFY591Z	Lever, E Kick
M 10	RFY548Z	Lever, Rewind	M 53 [1]	SMQ4778	Lever, Erase Safety	M 119 [1]	RFX101Z	Stopper, Record/Playback
M 11	RFG86Z	Cam, Pause	M 54	RFS563Z	Spring, Back Tension L	M 123 [2]	RFD230Z	Bracket, Leaf Switch
M 12 [1]	RFS459Z	Spring, Pause Cam	M 55	RFD228Z	Bracket, Motor	M 127 [2]	RFY589Z	Lever, RC
M 13	RFS536Z	Stopper, Pause Cam	M 56	RFI27Z	Rubber, Motor	M 128 [2]	RFY573Z	Lever, RC Slide
M 14	RFS561Z	Spring, FF/REW Lever	M 57	SMQ4918	Screw (Motor M'tg)	M 129 [2]	RFX130Z	Collar, RC Lever
M 15 [1]	RFU83Z	Sub Plate Ass'y	M 59	RFB63Z	Belt, Flywheel	M 130 [2]	RFS572Z	Spring, RC Lever
M 15 [2]	RFU70Z	Sub Plate Ass'y	M 62	RFY581Z	Lever, Eject Slide	M 132 [2]	RFE221Z	Screw $\phi 2 \times 5$ (Leaf Switch Bracket M'tg)
M 16 [1]	RFS463Z	Spring, REC Lever	M 63	RFS564Z	Spring, Eject Slide Lever	M 133 [2]	XQS2 + 25	Screw $\phi 2 \times 25$ (RC Lever M'tg)
M 17 [1]	RFS530Z	Spring, PLAY Lever	M 64	RFS591Z	Spring, Cassette Retainer	M 135 [2]	XUC2FT	Stop Ring $\phi 2$ (RC Slide Lever M'tg)
M 17 [2]	RFS566Z	Spring, PLAY Lever	M 65 [1]	RJH2E9X	Head, Record/Playback	M 136 [1]	RFE222Z	Screw $\phi 2 \times 6$ (Pause Protect Bracket M'tg)
M 18 [1]	RFS562Z	Spring Plate, REC/PLAY Select	M 65 [2]	RJH2E12X	Head, Playback	M 138 [1]	RFS535Z	Spring, Magnet Arm
M 19	RFS466Z	Spring, Actuator	M 67 [1]	RJH2C12XZ	Head, Erase	M 141 [1]	RFD232Z	Bracket, Pause Protect
M 20	RFY549Z	Lever, Auto Stop	M 68	RFM77Z	Motor Ass'y (with Pulley)	M 142	RFI39Z	Mat A
M 21	RFS590Z	Spring, Auto Stop Lever	M 70 [1]	RFE229Z	Screw $\phi 2 \times 3$ (REC/PLAY Select Lever M'tg)	M 143	RFI35Z	Mat B
M 24	RFS462Z	Spring, Stop/Eject•Pause Lever	M 71	XTN2 + 3B	Screw $\phi 2 \times 3$ (Cassette Retainer Spring M'tg)	M 145 [2]	RFE102Z	Screw $\phi 1.7 \times 4.5$ (Leaf Switch M'tg)
M 26 [1]	RFE227Z	Panel, Head	M 72	XTN2 + 4B	Screw $\phi 2 \times 4$ (Motor Bracket, Leaf Switch Plate etc. M'tg)	M 150 [1]	RBC883Z	Button, Record (Silver)
M 26 [2]	RFU72Z	Panel, Head	M 73	XSB2 + 4	Screw $\phi 2 \times 4$ (Sub Plate, Reel Base etc. M'tg)	M 151 [1]	RBC884Z	Button, Playback (Silver)
M 27	RFU39Z	Head Base	M 75	XSN2 + 6	Screw $\phi 2 \times 6$ (Head Base M'tg)	M 151 [2]	RBC889Z	Button, Playback (Silver)
M 28	RFY394Z	Sensing Plate Ass'y	M 77	XSN2 + 7	Screw $\phi 2 \times 7$ (R/P Head M'tg)	M 152	RBC885Z	Button, Rewind (Silver)
M 30 [1]	RFS531Z	Spring, Head Panel	M 78	RFE230Z	Washer $\phi 1.2 \times 3$ (FF Gear, Take-up Roller M'tg)	M 153	RBC886Z	Button, Fast Forward (Silver)
M 30 [2]	RFS569Z	Spring, Head Panel	M 82	RFN143Z	Washer $\phi 1.2 \times 3$ (Reel Table M'tg)	M 154	RBC887Z	Button, Stop/Eject (Silver)
M 31 [1]	RFY391Z	Arm, Magnet	M 83	RFN142Z	Washer $\phi 1.2 \times 3$ (Reel Table M'tg)	M 155	RBC888Z	Button, Pause (Silver)
M 33	RFE251Z	Screw (Erase Head, Pinch Roller etc. M'tg)	M 84	RFN123Z	Washer (Flywheel M'tg)	M 156	XQN2 + A7FZ	Screw $\phi 2 \times 7$ (Button Frame M'tg)
M 34	RFS447Z	Spring, Azimuth	M 85	RFN153Z	Washer (for Flywheel)	M 157	RFD269Z	Bracket (Sensing Plate Ass'y)
M 35 [1]	RFR29Z	Pinch Roller Arm Ass'y	M 88	RFY582Z	Lever, Pause Kick-B	M 158	RFE280Z	Screw $\phi 2 \times 3$ (Sensing Plate Ass'y Bracket M'tg)
M 35 [2]	RFR35Z	Pinch Roller Arm Ass'y	M 89	RFY583Z	Lever, Pause Kick-A			
M 36 [1]	RFS448Z	Spring, Pinch Roller						
M 36 [2]	RFS568Z	Spring, Pinch Roller						
M 39	RFQ42Z	R/F Pulley Arm Ass'y						

HOW TO DISASSEMBLY & ASSEMBLY

DISASSEMBLY OF MECHANISM UNIT

Removal of the motor attachment bracket will separate the Tape 1 and Tape 2 units.
1. Remove the flywheel belt and secure it to the motor. (See Fig. 1.)
2. Remove the motor attachment bracket.
Seven screws (2×4)mm (A). (See Fig. 1.)

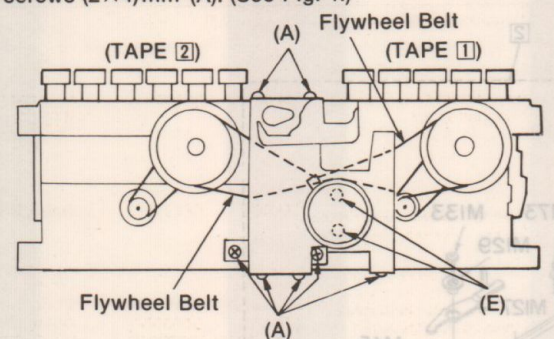


Fig. 1

DISASSEMBLY OF MAJOR MECHANISM PARTS

- Head
Remove the two screws (2×7)mm (B). (See Fig. 2.) (Be sure to adjust the azimuth after reattaching.)
- Pinch roller
Remove the screw (3×6)mm (C). (See Fig. 2.)
- Erase head
(Tape 1 unit only)
Remove the screw (3×6)mm (D). (See Fig. 2.)

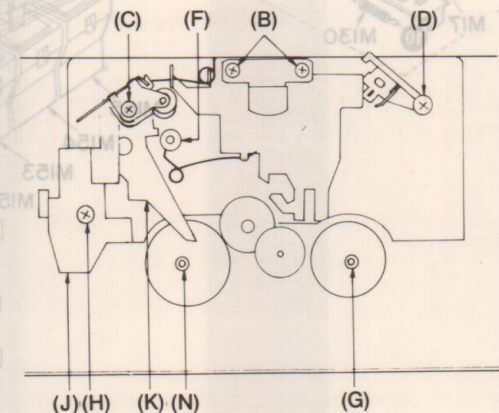


Fig. 2

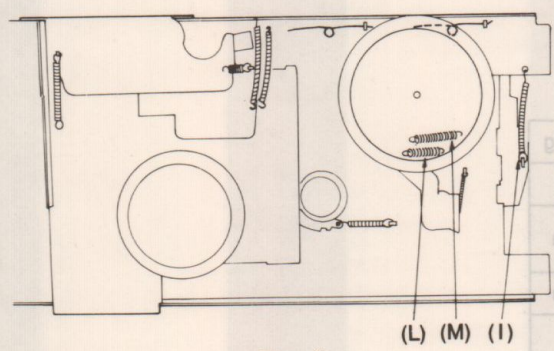


Fig. 3

ASSEMBLY OF MOTOR ASS'Y

1. Attach both flywheel belts to the motor pulley.
2. Turn the flywheel belts to the rear and attach them temporarily to the motor terminal (broken lines).
3. Attach the motor ass'y to tape 1 and tape 2 mechanisms with the seven screws (2×4)mm (A). (See Fig. 1.)
4. Attach the flywheel belts to the flywheels (solid line).

- Motor
Remove the motor attachment bracket, which will separate the Tape 1 and Tape 2 unit. (See Fig. 1.)
Remove the two colored screws (E). (See Fig. 1.)
- Flywheel
Temporarily secure the flywheel belt to the motor that drives it. Remove the Fast Forward belt. Remove the washer (F). (See Fig. 2.)
- Supply reel table
Remove the washer (G). (See Fig. 2.)
- Take-up reel table
Remove the screw (3×6)mm (H). (See Fig. 2.)
Remove the spring (I). (See Fig. 3.)
Remove the eject slide lever (J). (See Fig. 2.)
Remove the auto stop lever (K). (See Fig. 2.)
Remove the spring (L). (See Fig. 3.)
Remove the spring (M). (See Fig. 3.)
Remove the washer (N). (See Fig. 2.)