PIONEER

Service Manual

8/5

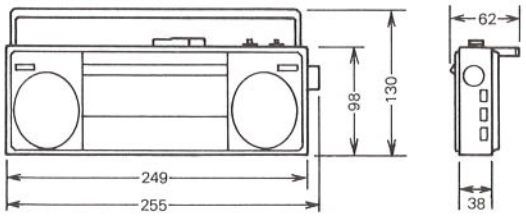
ORDER NO.
HRT-199-0

PORTABLE STEREO FM/AM RADIO CASSETTE RECORDER

SK-Q10 RD BK BU SV/D

SPECIFICATIONS

Max. music power	1,400mW (Total)
Speakers	50mm 8Ω x 2
Frequency response	Normal tape: 50Hz~9kHz
Frequency range	FM: 88~108MHz AM: 525~1,605kHz
Input jack	DC IN 6V
Output jacks	HEAD PHONE 1 HEAD PHONE 2
Power source	DC 6V (four 1.5V "AA" batteries) EXT. DC 6V (AC adaptor [120/220/240 selectable] supplied)
Dimensions	249(W) x 98(H) x 38(D)mm
Weight	780g (include batteries)
(Subfunctions)	Tape selector (PB METAL/ NORMAL), auto-shut off, cue/review, tone control, loudness, BFC
(Indicators)	POWER (red LED), REC (red LED), TUNE (red LED), STEREO (red LED)



Note: Specifications and design are subject to change without notice.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

CONTENTS

1. PARTS LOCATION

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTERN THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

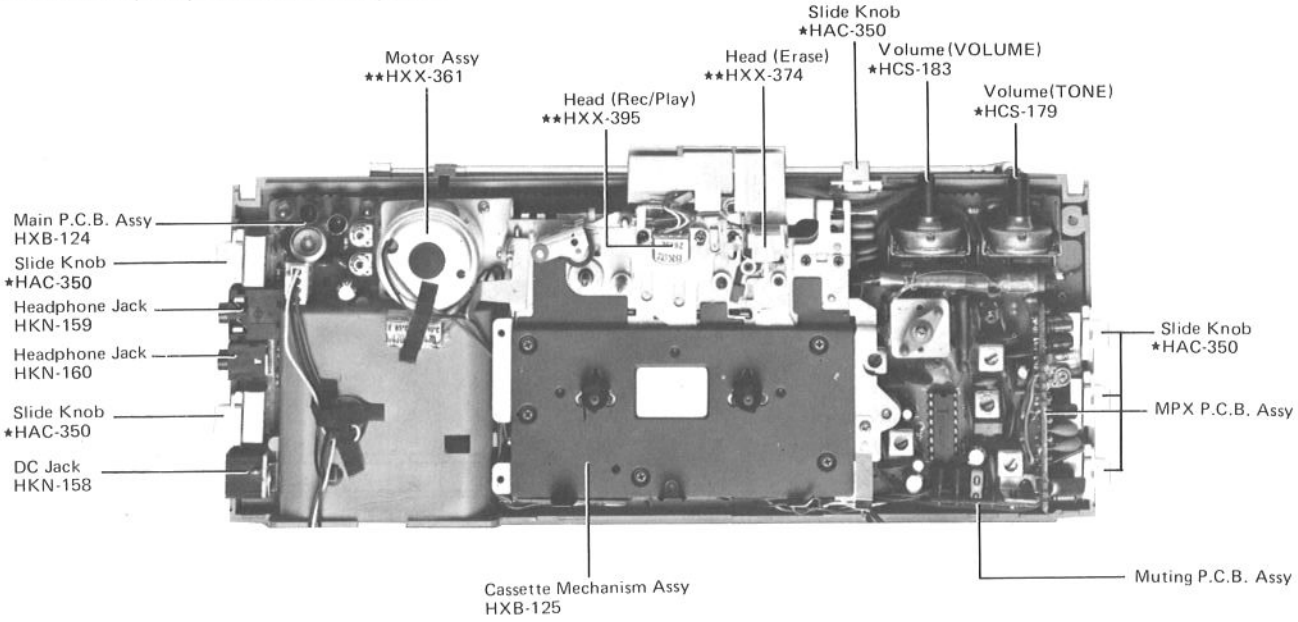


Fig. 1

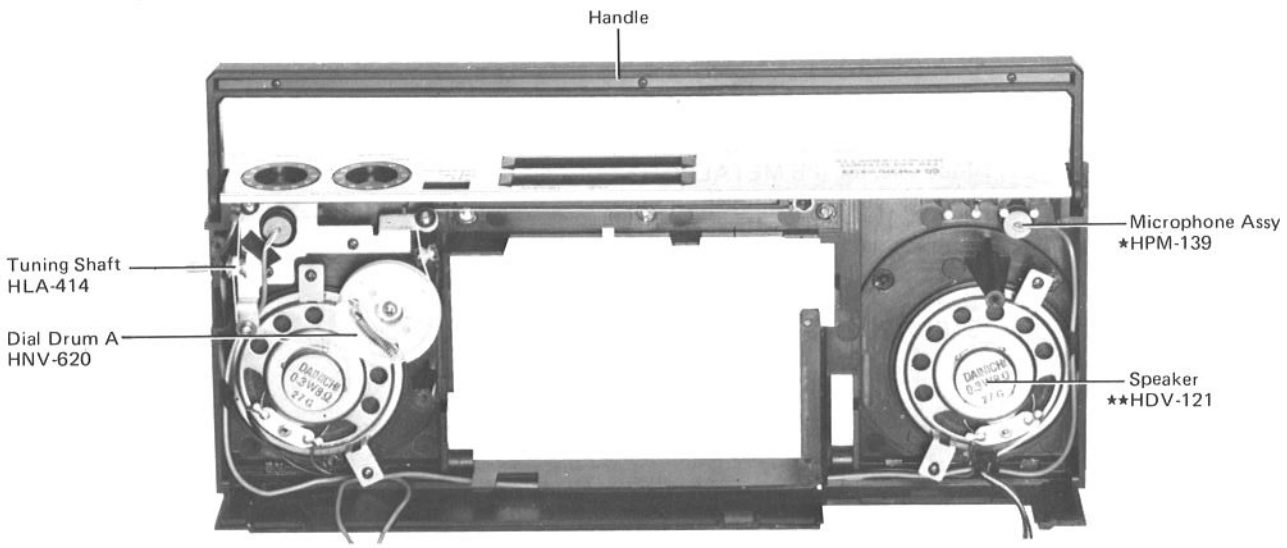


Fig. 2

2. NAME OF PARTS AND THEIR FUNCTIONS

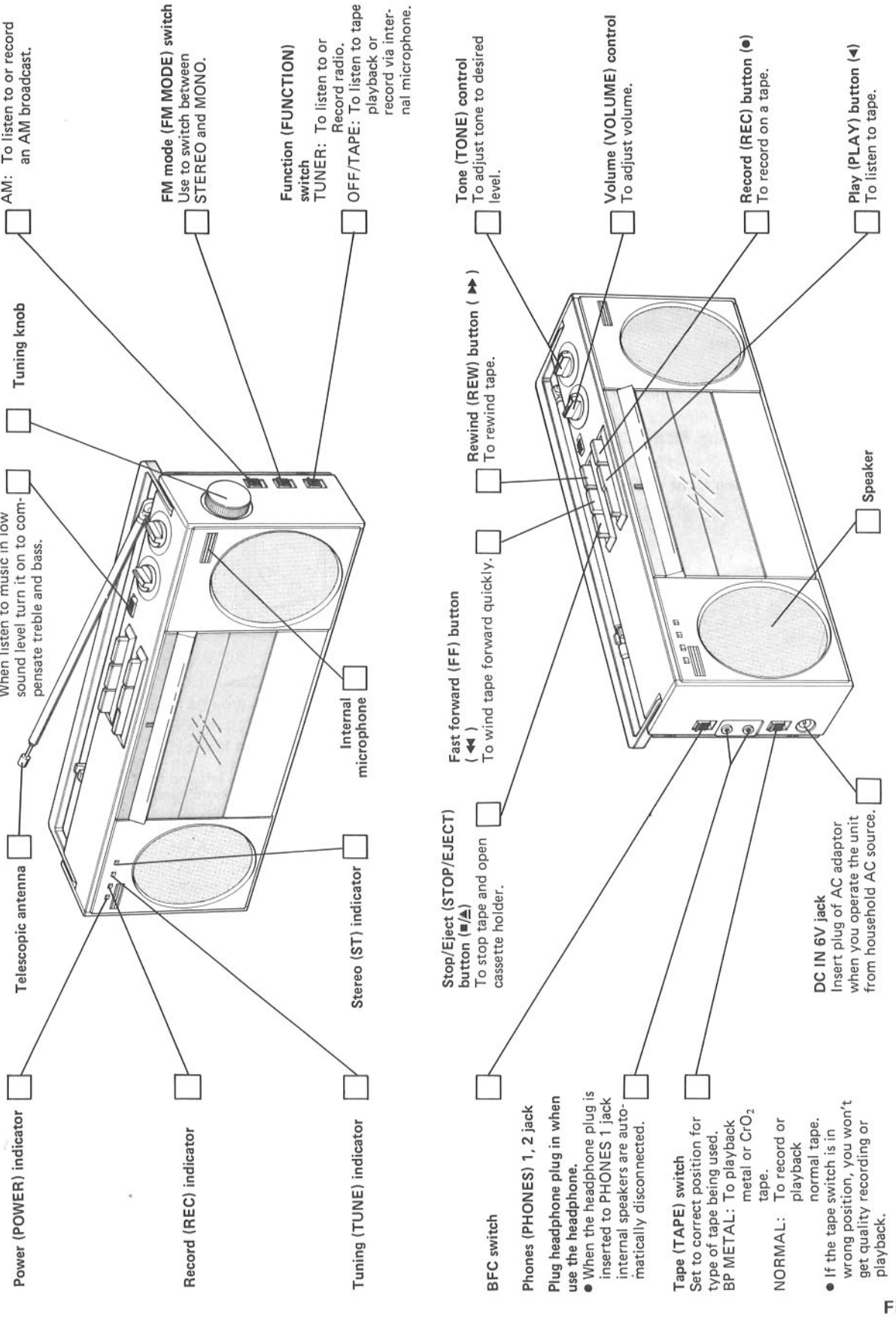


Fig. 3

3. DISASSEMBLY

- **Rod Antenna**

1. Remove a screw which arrow shows and no need to detach the case.

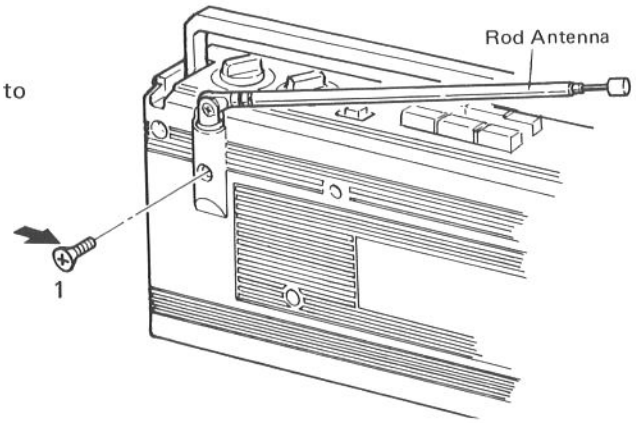


Fig. 4

- **Front Cabinet**

1. Pull tuning knob off.
2. Remove 4 side panel screws.
3. Detach battery lid.
4. Pull Volume and Tone control knobs off.
5. Detach Cassette lid.
6. Remove 2 screws fastening Mechanism Assy to front cabinet.
7. Remove 3 screws fastening front and back cabinet.

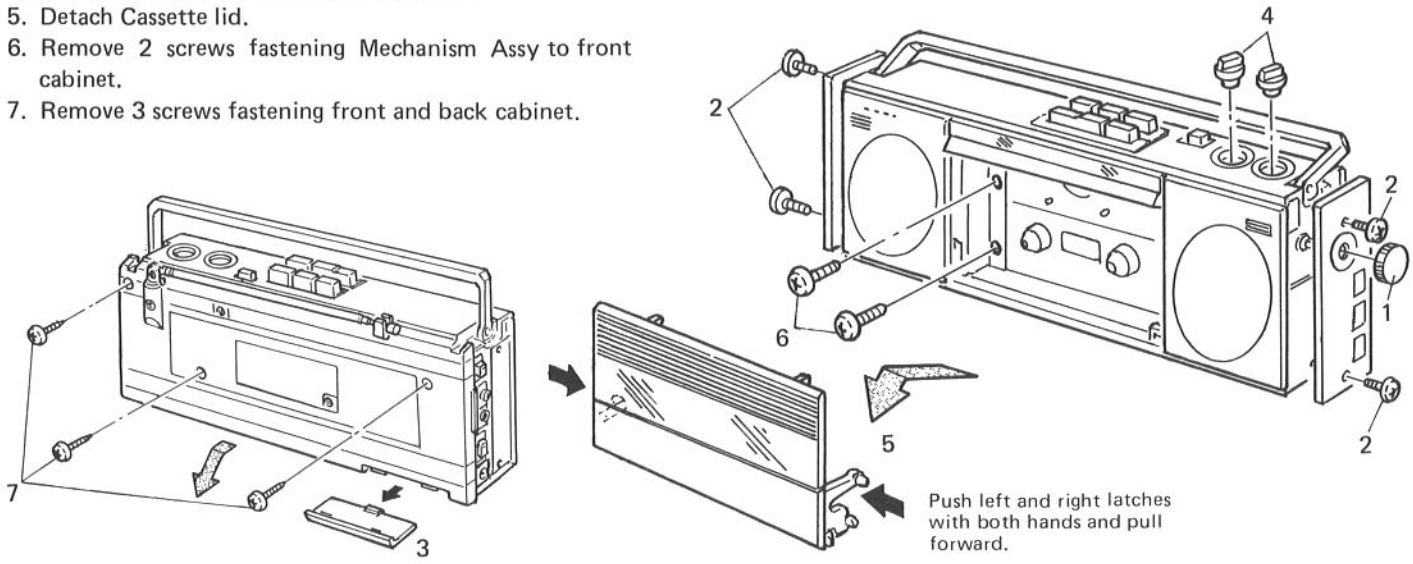


Fig. 5

- **Back Cabinet**

1. Remove 4 main PCB screws.
2. Remove 2 rear screws.

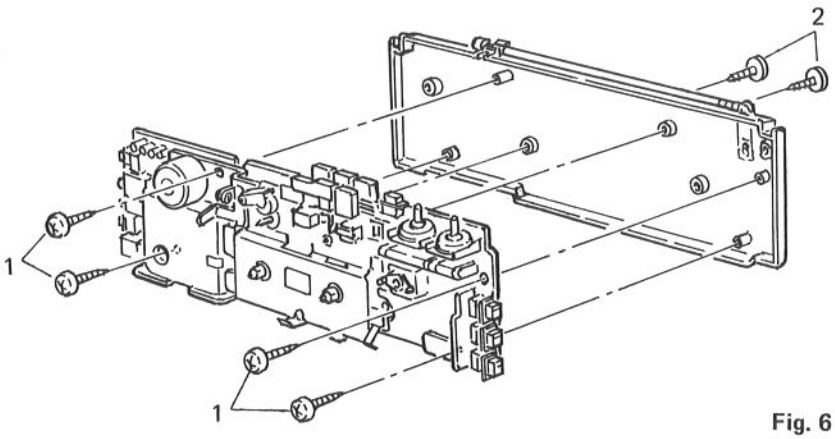


Fig. 6

- **Cassette Mechanism Assy**

1. Remove 2 screws from main PCB side.

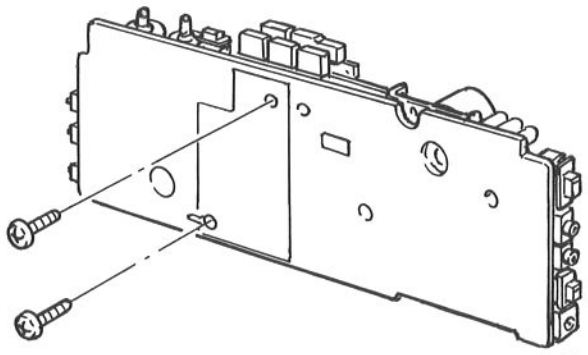


Fig. 7

- **Speaker**

1. Undo 2 screws and slide speaker lock metal. Dial drum is in the way to remove left speaker: slide down and pull forward to detach it.

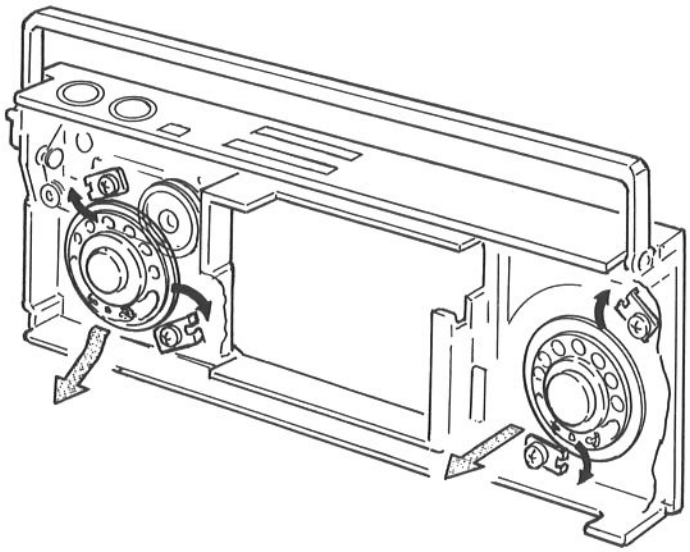
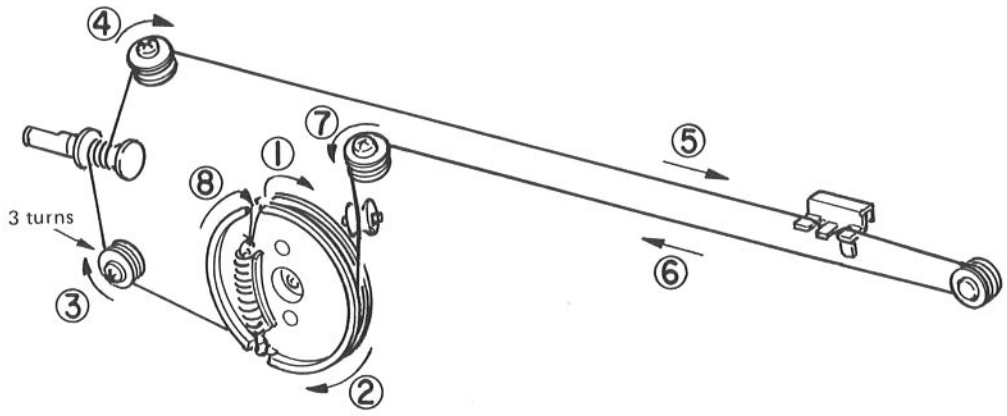


Fig. 8

4. DIAL STRINGING



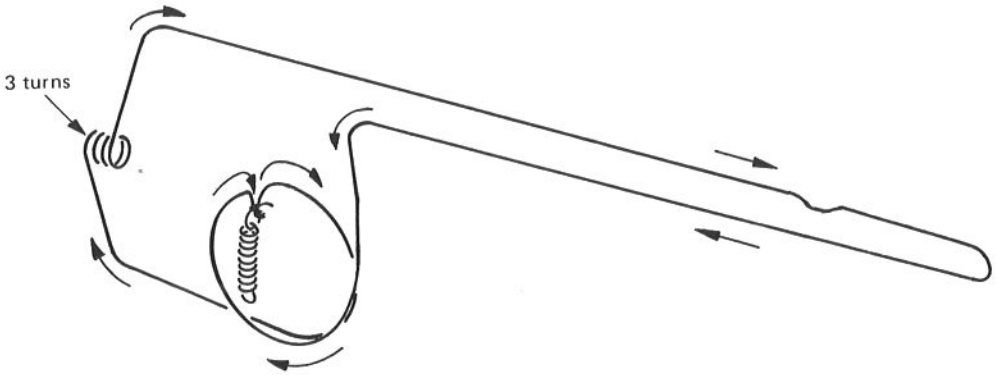


Fig. 9

5. CIRCUIT DESCRIPTION

5.1 TUNER SECTION

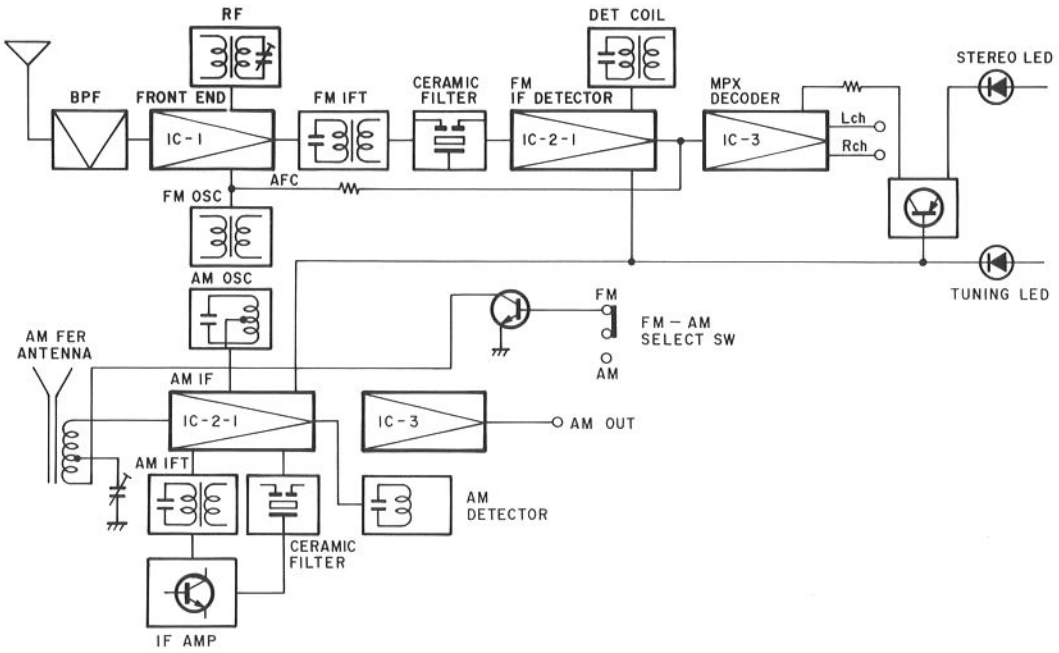


Fig. 10

• Front end

FM Front end consists of an IC (TA7335P) which contains RF Amp, Mixer and Oscillation stages and AFC diode.

• IF Detection circuit

Consists of 2 elements Ceramic Filter and IC (TA7640AP) which contains IF amplifier, limitter and quadrature detector.

• FM Stereo demodulation circuit

Employs PLL MPX IC (TA7343P).

• AM Tuner

Consists of IF IC (TA7640AP), a gang of 2 condensers and Ceramic filter.

5.2 AMPLIFIER AND MOTOR CONTROLLER

• Pre circuit

IC401 (TA7658P) contains 2 Pre amplifiers, buffer amp ALC driver circuit. Playback and Record circuits are in this IC.

• Power circuit

IC402 (LA4190) contains 2 power amplifiers.

• Loudness control circuit

When volume level lowered C218 (C318) enhances treble and C219 (C319) suppresses mid range so that the frequency response is raised in high and low ranges. With small speakers which have 5 cm diameter, the control is less effective but it functions good when using headphones.

• Muting circuit

During record mode a certain potential is applied to the base of transistor Q407 (Q408) to mute input to Power amplifier from condenser microphone.

• Motor control circuit

During FF, REW, CUE or REVIEW mode, a sensitive resistor detects a rise of electric current to motor at tape-end, and turns Q405 off. A potential rise across R409, turns Q403 on and Q404 off. Then the voltage at the base of Q405 rises and turns current to the motor off. Q406 turns on and it lowers base voltage of Q404. It remains as is until the power supply is turned off. To resume operation must turn power supply on again.

When the motor stops at the tape-end in REVIEW mode, first push STOP button and then resume play operation.

5.3 BLOCK & LEVEL DIAGRAM

- **Playback**

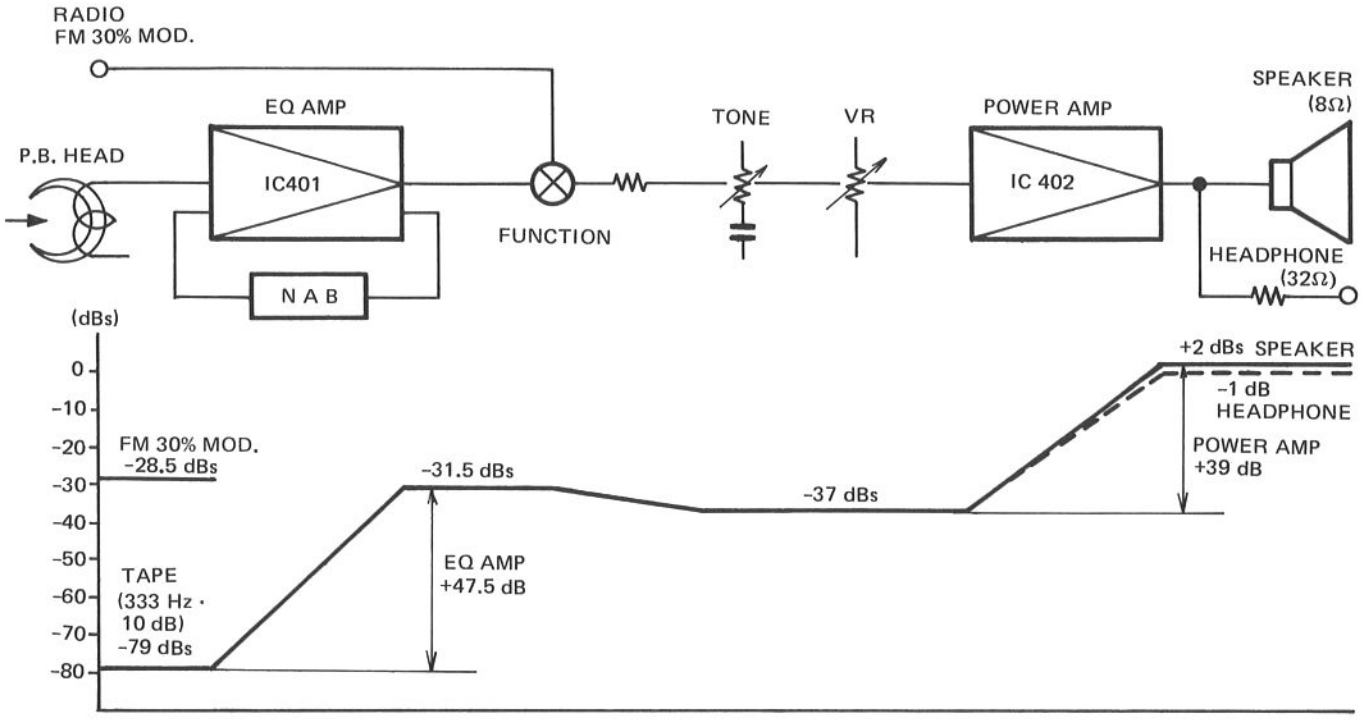


Fig. 11

- **Recording**

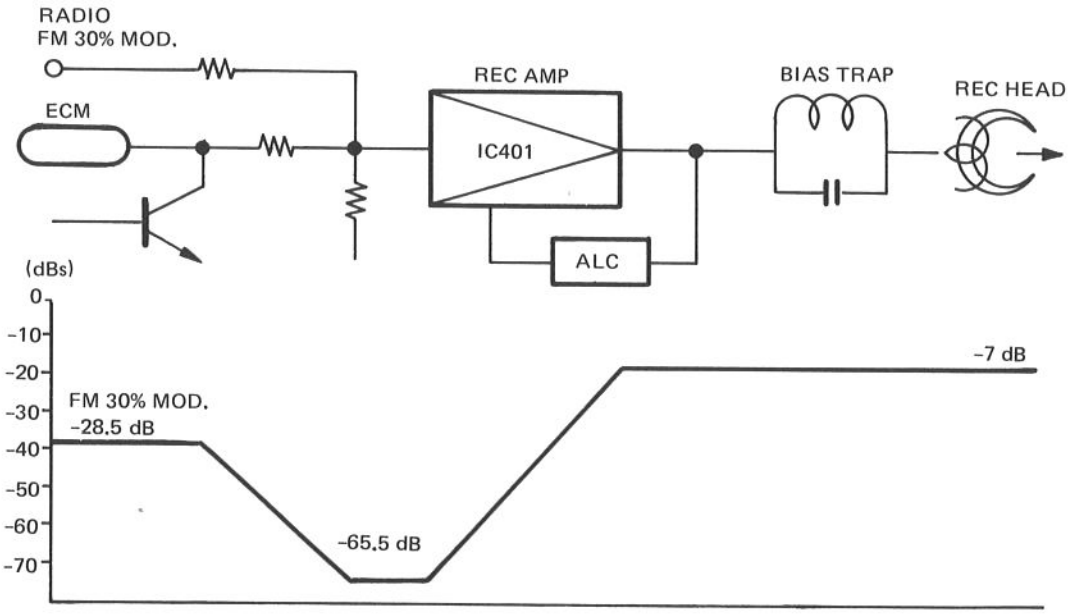
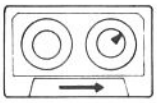
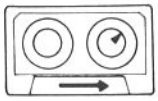
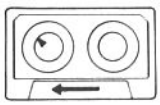
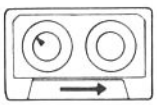
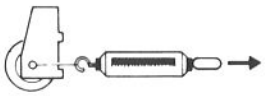


Fig. 12

6. ADJUSTMENT

6.1 CHECK POINTS OF CASSETTE MECHANISM

Confirm the following items when replacing parts of the cassette mechanism.	■ Tape speed deviation: 3,000 Hz +90 Hz, −60 Hz (4.76 cm/sec +3%, −2%) Using an STD-301, measure the speed at the start and end of winding and take the maximum value. Measuring time shall be 5 ~ 6 seconds.	■ Wow and flutter (play): Less than 0.35% Using an STD-301, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5 ~ 6 seconds.
■ Fast forward and rewinding time: Less than 150 seconds Using a C-60 cassette tape, set to fast forward and rewind, and measure the time with a stop watch.	■ Winding torque: 35 ~ 65 g-cm  Using a cassette type torque meter (120 g-cm), measure the minimum value while in the play mode. Measuring time shall be 5 ~ 6 seconds.	■ F.F. torque: 70 ~ 160 g-cm  Using a cassette type torque meter (120 g-cm), measure the value when the tape stops in the F.F. mode. Measuring time shall be 5 ~ 6 seconds.
■ REW torque: 70 ~ 160 g-cm  Using a cassette type torque meter (120 g-cm), measure the value when the tape stops in the REW mode. Measuring time shall be 5 ~ 6 seconds.	■ Back tension torque: 2 ~ 4.5 g-cm  After setting in the REW mode without loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.	■ Pinch roller pressure: 240 ~ 330 g  Measure the pressure with a tension meter (1 kg) at the point where the rotor stops rotating at the center of the pinch roller.

6.2 HEAD AZIMUTH ADJUSTMENT

- **To Adjust**

1. Detach cassette holder. Insert STD-341A (10 kHz) to set the unit to playback mode. Adjust azimuth screw with a screw driver.
2. Turn the screw so that both L and R channel show maximum on mV meter.
3. See to it that meter read about the same on reversed side of the tape.
4. It much difference between 2 and 3 observed, readjust to balance it.
5. After the adjustment apply screw lock.

6.3 RECORDING BIAS ADJUSTMENT

- **Connection Diagram**

Switch position

BFC switch 1
TAPE selector switch ..... Normal

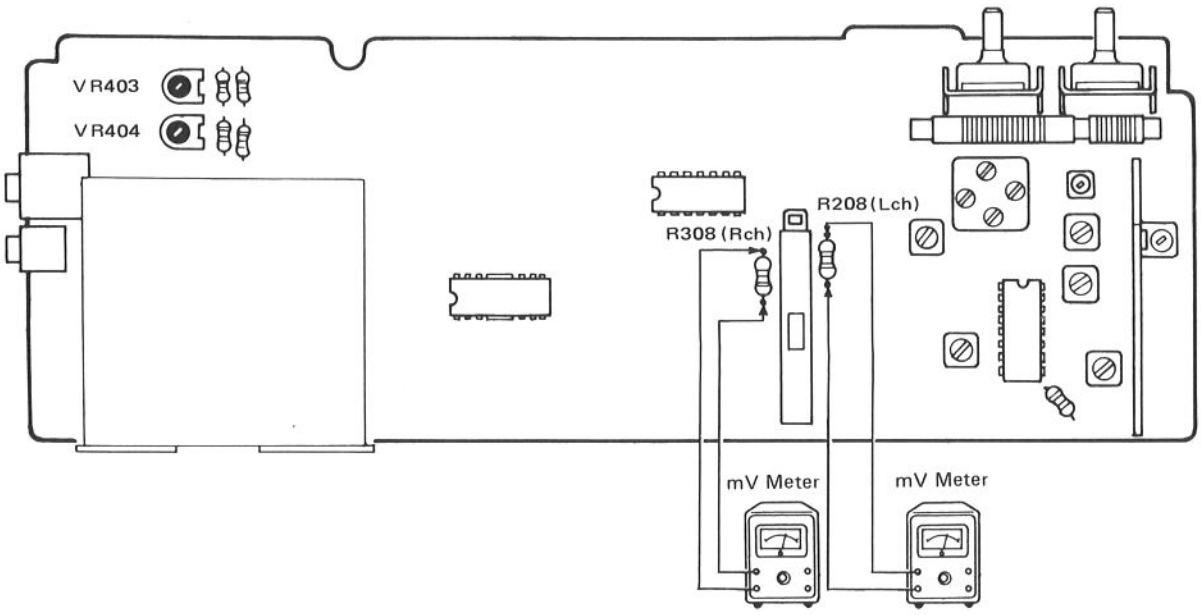


Fig. 13

- **To Adjust**

1. Set the unit to record mode.
2. Adjust VR403 (Lch, Rch. Balance) and VR404 (Bias) so that the mV meter reads 5.0 mV.

6.4 AM ADJUSTMENT

- **Connection Diagram**

Generator scope

Sweep center frequency ..... 455 kHz

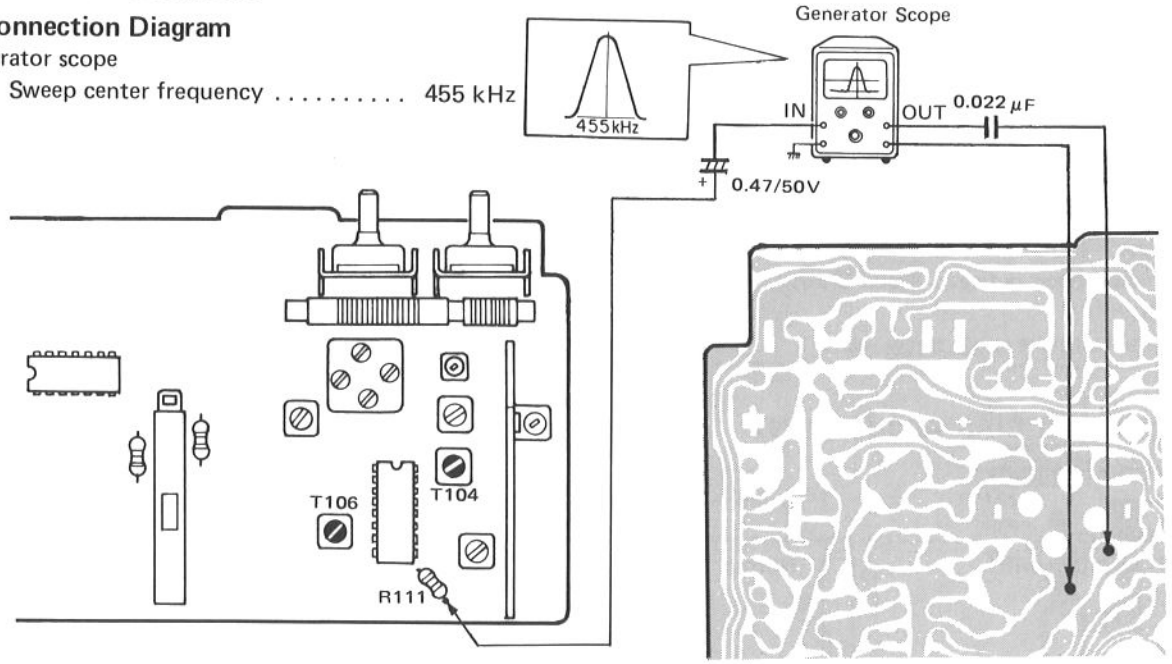


Fig. 14

- **To Adjust**

1. Set the BAND switch to AM mode, and FUNCTION switch to TUNER mode.
2. Apply minimum output signal required to check generator scope U curve and adjust T104 so that curve amplitude is at maximum point.
3. Adjust T106 for optimum symmetry.

6.5 AM TRACKING ADJUSTMENT

- **Connection Diagram**

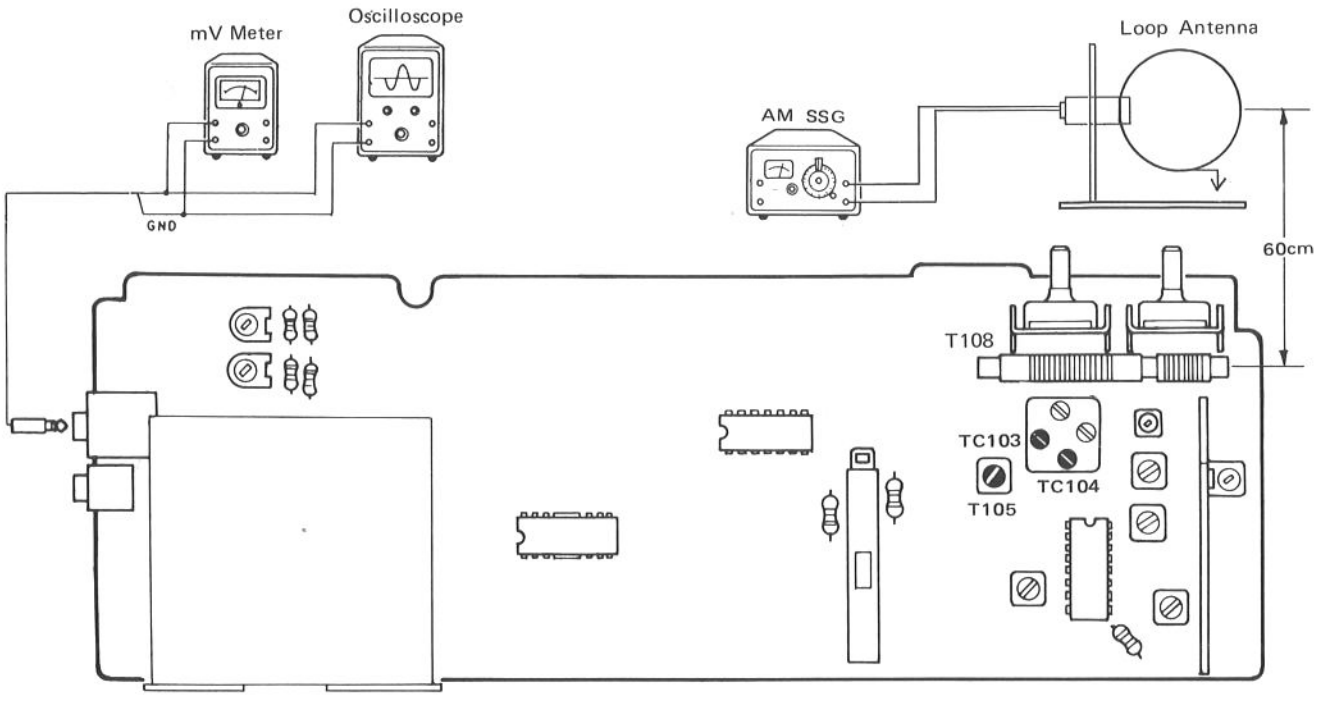


Fig. 15

- **Preparation**

Emit radio waves from an AM SSG using loop antenna or coil antenna as shown in illustration.

- **To Adjust**

Frequency of AM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 520 kHz (400 Hz, 30% modulation) output level 60 dB (μV)	Maximum (turn the tuning knob counterclockwise until low end.)	T105	520 kHz can be received.
2. 1,670 kHz (400 Hz, 30% modulation) output level 60 dB (μV)	Minimum (turn the tuning knob clockwise until high end.)	TC103	1,670 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 520 ~ 1,670 kHz are covered.			
4. 600 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB (μV)	Tuned to 600 kHz.	T108 (Coil of bar antenna	Maximum output.
5. 1,400 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB (μV)	Tuned to 1,400 kHz.	TC104	Maximum output.
6. Repeat (4) and (5) alternately and confirm that tuning pointer indication is correct.			

Note: After adjusting T108 (Coil of bar antenna), melt electro wax with soldering iron and fix it in position.

6.6 FM IF ADJUSTMENT

- **Connection Diagram**

Generator scope

Sweep center frequency ..... 10.7 MHz

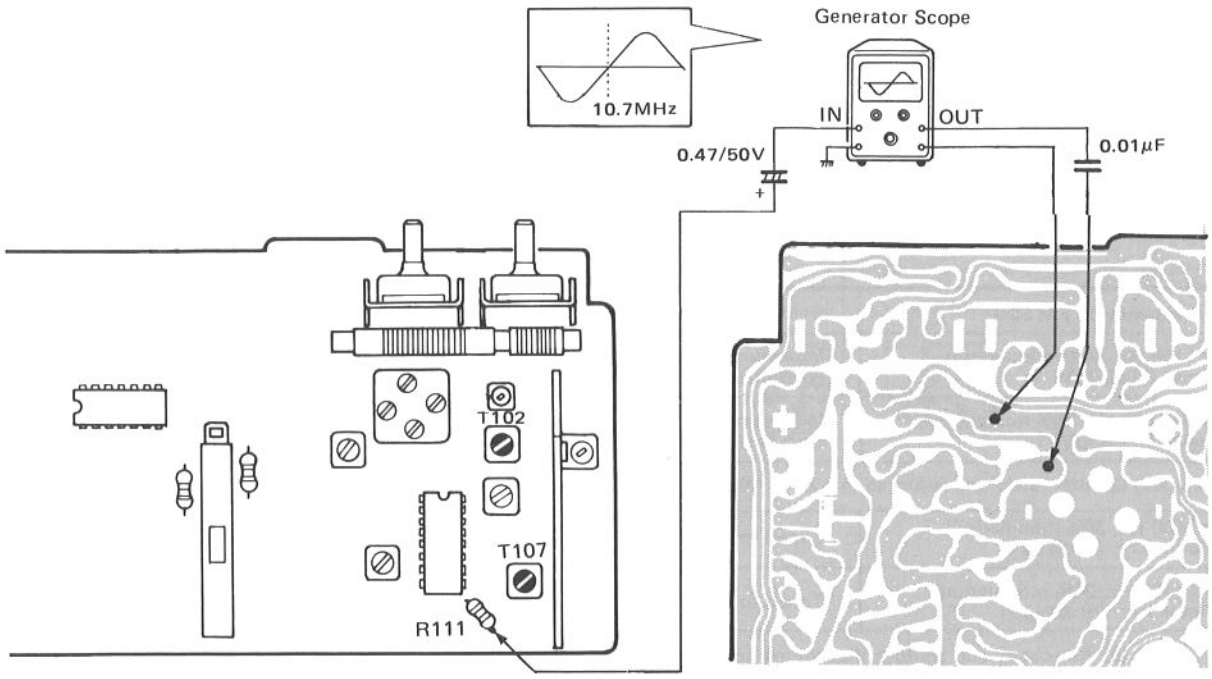


Fig. 16

- **To Adjust**

1. Set the BAND switch to FM mode.
2. Adjust T107 to symmetric S curve.
3. Adjust T102 for best linearity.

6.7 FM TRACKING ADJUSTMENT

- **Connection Diagram**

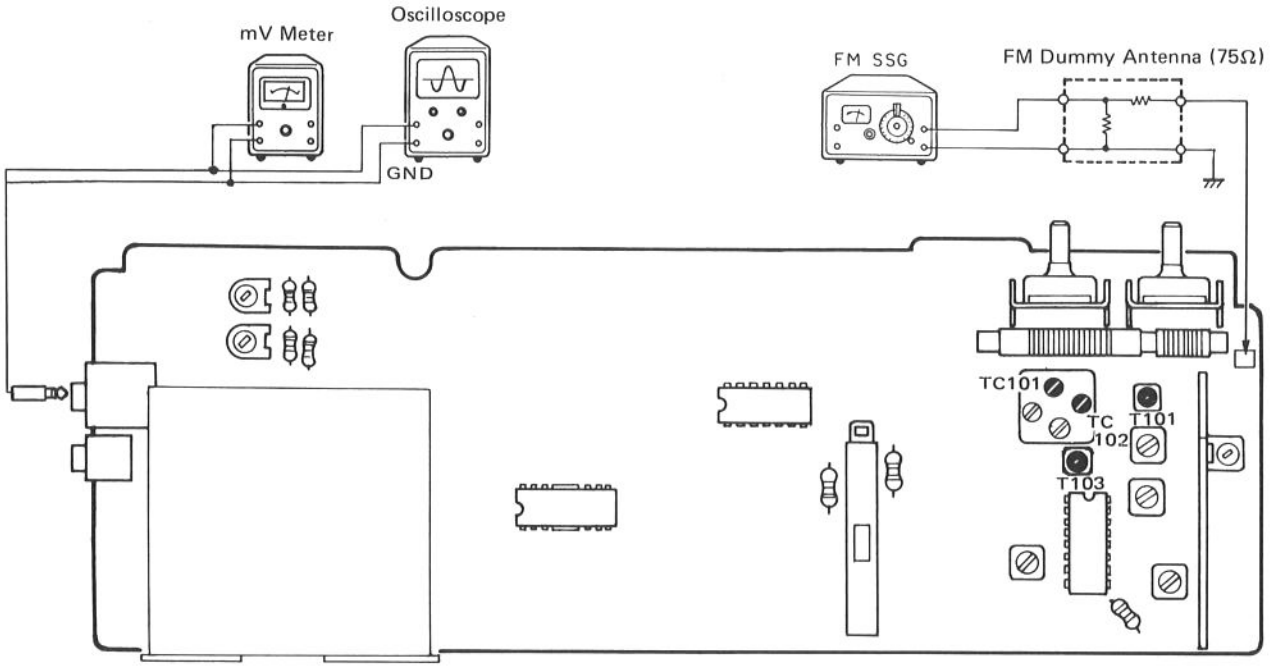


Fig. 17

- **To Adjust**

Frequency of FM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 87 MHz (400 Hz, 30% modulation) output level 30 dB (μV)	Maximum (turn the tuning knob counterclockwise until low end.)	T103	87 MHz can be received.
2. 109.5 MHz (400 Hz, 30% modulation) output level 30 dB (μV)	Minimum (turn the tuning knob clockwise until high end.)	TC102	109.5 MHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 87 ~ 109.5 MHz are covered.			
4. 88 MHz (400 Hz, 30% modulation) output level 10 ~ 20 dB (μV)	Tuned to 88 MHz.	T101	Maximum output.
5. 108 MHz (400 Hz, 30% modulation) output level 10 ~ 20 dB (μV)	Tuned to 108 MHz.	TC101	Maximum output.
6. Repeat (4) and (5) alternately and confirm that tuning pointer indication is correct.			

6.8 FM MPX ADJUSTMENT

- **Connection Diagram**

Stereo Modulator

Modulation frequency ..... 1 kHz
Modulation rate 100%
Pilot ..... 7.5 kHz
Main ..... 67.5 kHz

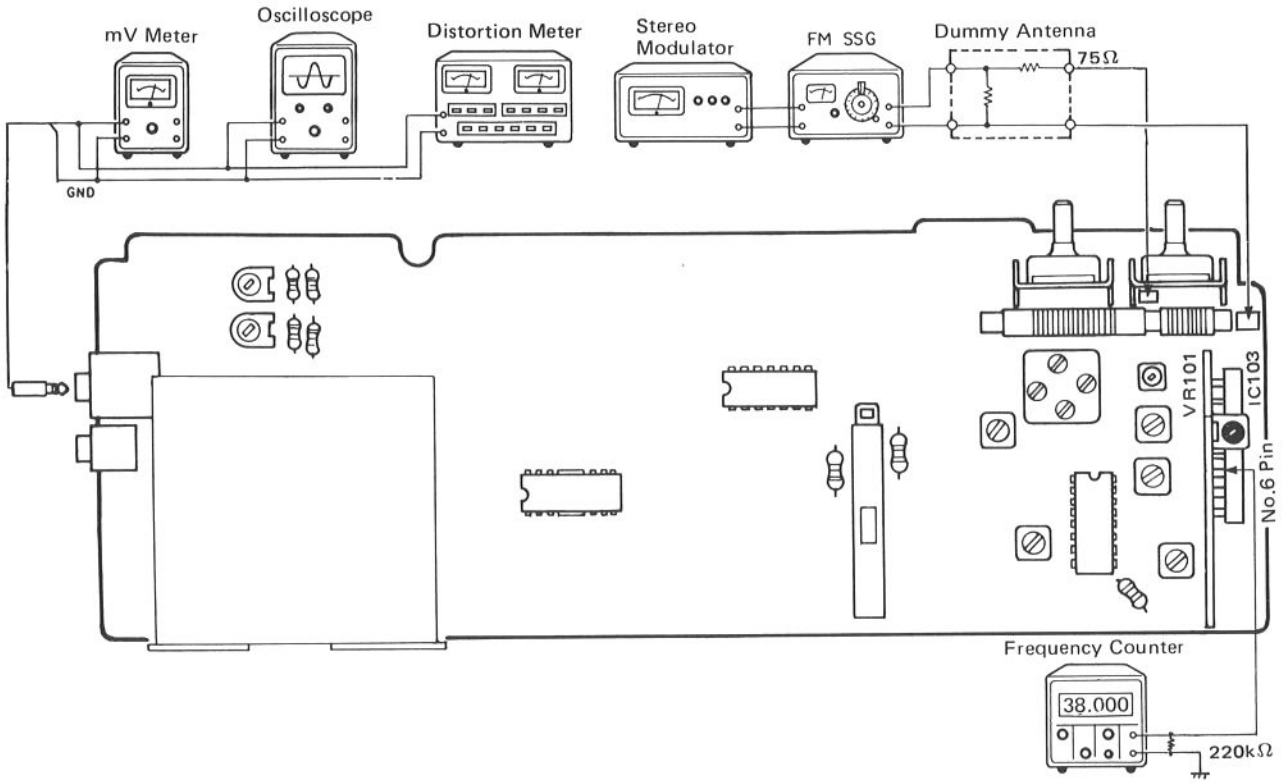


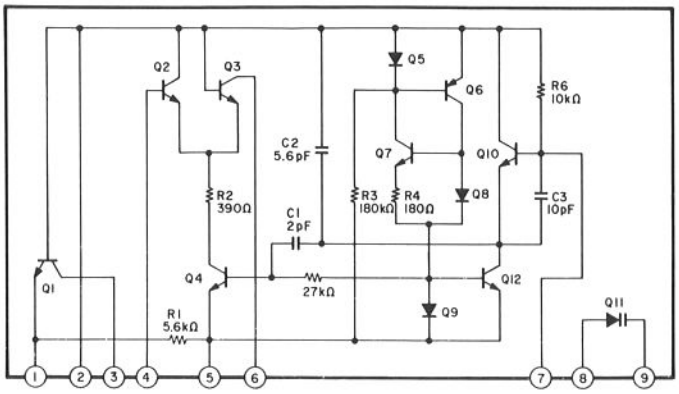
Fig. 18

- **To Adjust**

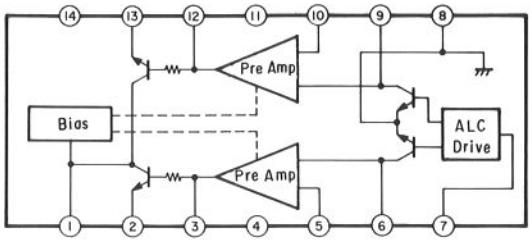
1. Apply 98 MHz, 60 dB signal, and tune the unit to it.
2. Connect No.6 terminal of IC103 to Frequency Counter.
3. Turn Modulation off.
4. Adjust VR101 so that Frequency Counter indicates 38 kHz ± 100 Hz.

- **IC's and Transistors**

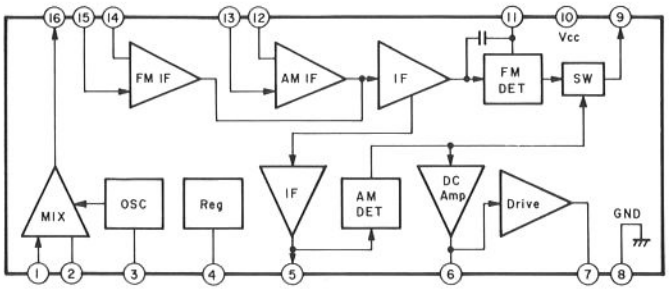
IC 1 : TA7335P



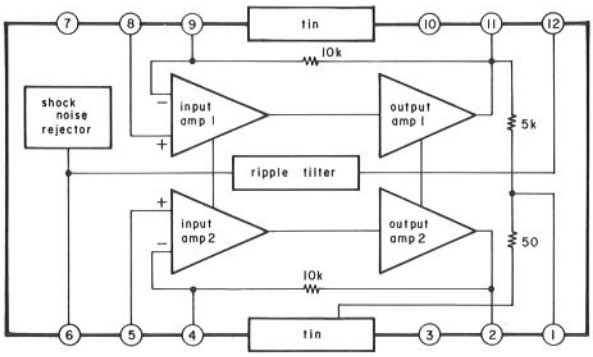
IC401 : TA7658P



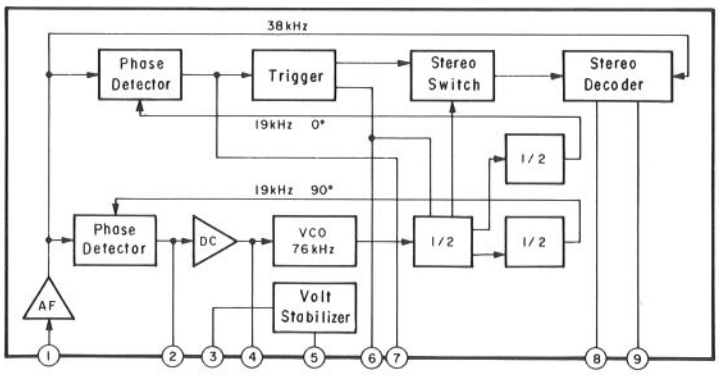
IC 2 : TA7640AP



IC402 : LA4190

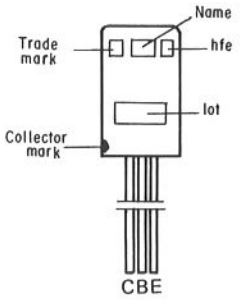


IC 3 : TA7343P

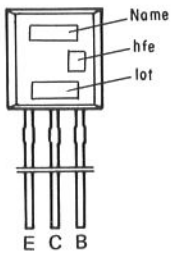


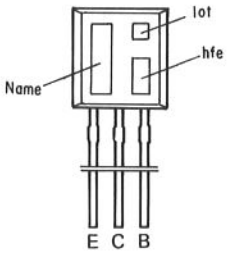
Q101 : 2SC1815-BL
Q102 : 2SA1015-GR
Q201,301,407,408 : 2SC2878-B
Q402,403,404,406 : 2SC1815-GR
Q405 : 2SA950-O

Q401: 2SD352-E

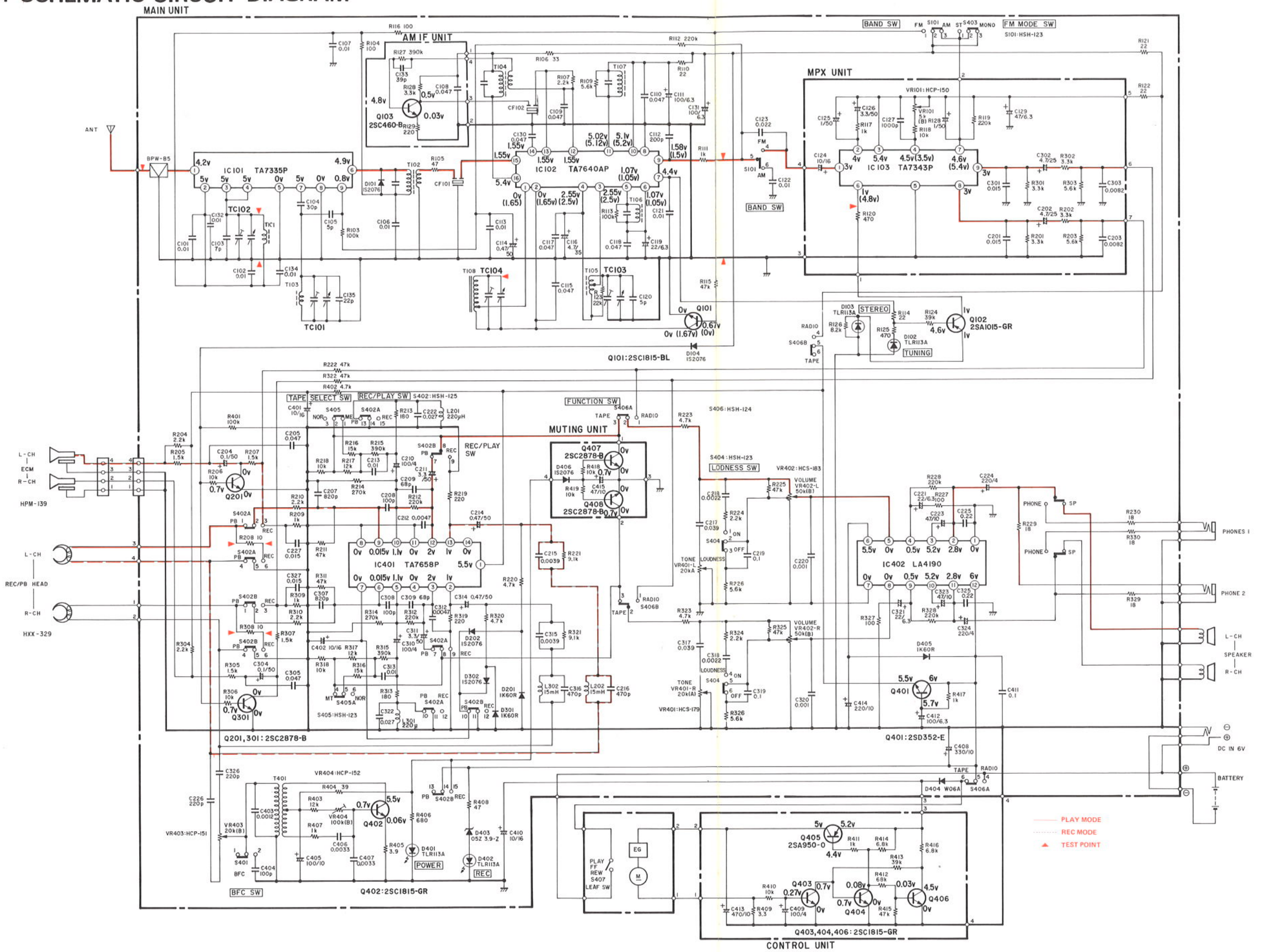


Q103 : 2SC460-B





7. SCHEMATIC CIRCUIT DIAGRAM



S101 BAND SWITCH: AM–FM
S401 BFC SWITCH: I–2
S402 REC/PLAY SWITCH: REC–PLAY
S403 FM MODE SWITCH: STEREO–MONO
S404 LOUDNESS SWITCH: ON–OFF
S405 TAPE SELECT SWITCH: METAL–NORMAL
S406 FUNCTION SWITCH: TAPE–TUNER
S407 LEAF SWITCH: ON–OFF

The under lined indicates the switch position.

FM: MONO
( ) VOLTAGE AT AM POSITION

Fig. 19

8. CONNECTION DIAGRAM

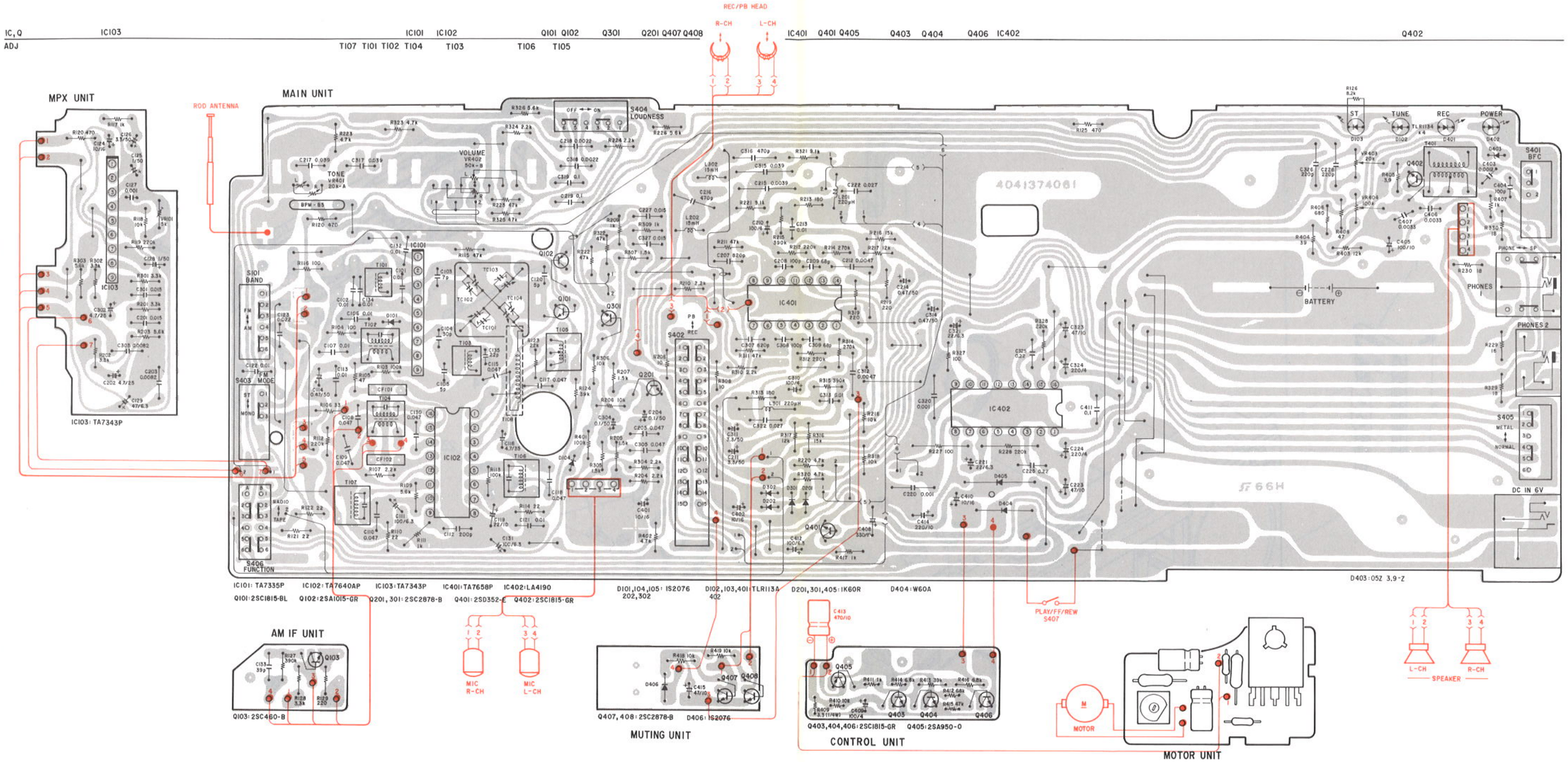


Fig. 20

8. CONNECTION DIAGRAM

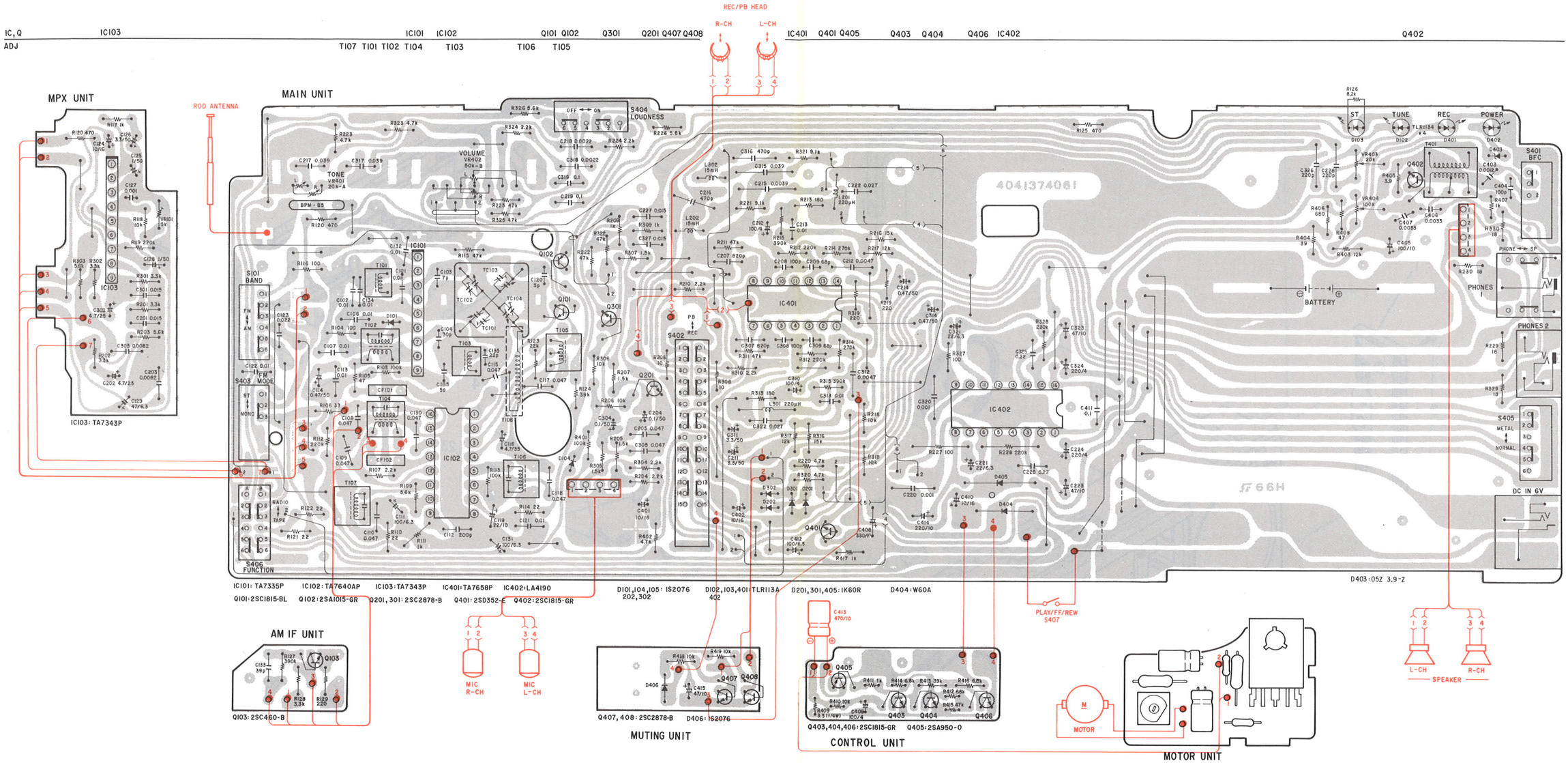


Fig. 20

9. EXPLODED VIEW

9.1 CABINET (1)

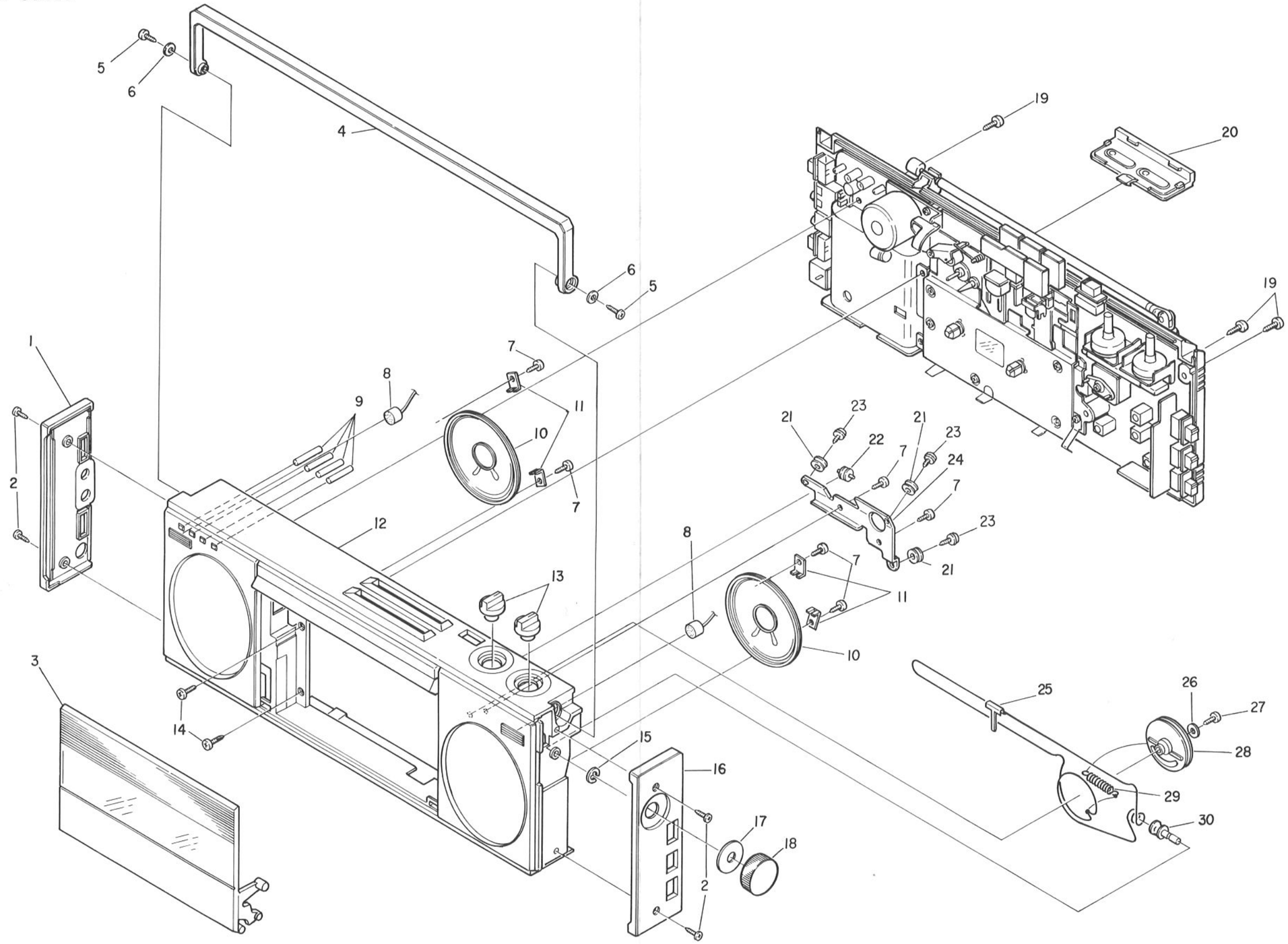


Fig. 21

• Cabinet (1) Parts List

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Mark	No.	Part No.	Description
	1.	HNS-666	Side Panel (L)
	2.	PBK20P080FCR	Screw
	*3.		Cassette Lid Assy
	*4.		Handle
	5.	iBK20P060FZN	Screw
	6.	WC20FZN	Washer
	7.	PBK20P060FZN	Screw
★	8.	HPM-139	Microphone Assy
	9.	HNS-669	LED Lens
★★	10.	HDV-121	Speaker
	11.	HNC-757	Speaker Lock Metal
	*12.		Front Cabinet Assy
★	13.	HAA-232	Volume Knob (Volume, Tone)
	14.	PMK20P040FBW	Screw
	15.	YE30FZN	E-Ring
	16.	HNS-667	Side Panel (R)
	17.	HNM-400	Knob Collar
★	18.	HAA-231	Tuning Knob
	19.	PBK26P100FNN	Screw
	20.	HXB-126	Battery Lid Assy
	21.	HNV-621	Pulley
	22.	HNV-623	Pulley
	23.	iMK20P050FZN	Screw
	24.	HNC-756	Dial Bracket
	25.	HAF-123	Dial Pointer
	26.	WC26FZN	Washer
	27.	iBK26P050FZN	Screw
	28.	HNV-620	Dial Drum
	29.	HBH-443	Dial Spring
	30.	HLA-414	Tuning Shaft

*** Parts have specific parts number according to respective models.**

No.	Description	SK-Q10RD	SK-Q10SV	SK-Q10BU	SK-Q10BK
3.	Cassette Lid Assy	HXB-127	HXB-147	HXB-145	HXB-146
4.	Handle	HNS-665	HNS-665	HNS-670	HNS-665
12.	Cabinet Front Assy	HXB-129	HXB-222	HXB-220	HXB-221

9.2 CABINET (2) PARTS LIST

Mark	No.	Part No.	Description
	1.	HNV-619	Battery Holder
	2.	PYC20P060FZN	Screw
	3.	PBK20P020FZN	Screw
	4.	HAH-185	Reflector
	5.	HAH-184	Cover
*	6.	HAC-350	Slide Knob
**	7.	HSH-123	Slide Switch
	8.	HKN-159	Headphone Jack
	9.	HKN-160	Headphone Jack
**	10.	HSH-123	Slide Switch
	11.	HKN-158	DC Jack
*	12.	TLR-113A	LED
	13.	HNM-405	LED Cover
	14.		Battery P.C.B. Assy
	15.	HKF-112	Battery Terminal (–)
	16.	HKF-111	Battery Terminal (+)
*	17.	HAC-346	Knob (PLAY)
*	18.	HAC-348	Knob (STOP/EJECT)
*	19.	HAC-349	Knob (FF)
*	20.	HAC-349	Knob (REW)
*	21.	HAC-347	Knob (REC)
	22.	HXB-125	Cassette Mechanism Assy
	23.	BPK20P060FZN	Screw
	24.	HNM-414	Insulator
	25.	PMK20P050FZN	Screw
	26.		Not used
	27.	HNM-404	Switch Cover
	28.		Not used
**	29.	HCS-183	Volume(VOLUME)
	30.	HTX-152	AM BAR Antenna
	31.	HCL-120	Variable Capacitor
	32.	HNV-618	Dial Drum (B)
	33.	PMK17P050FZN	Screw
	34.		MPX P.C.B. Assy
**	35.	HCS-179	Volume(TONE)
	36.		P.C.B. Bracket
	37.		Muting P.C.B. Assy
	38.	HDX-113	Rod Antenna
	39.	PMK20P060FNN	Screw
	40.	CMK30P050FNN	Screw
	41.	HNS-664	Cabinet, Back
	42.	HXB-124	Main P.C.B. Assy
**	43.	HSH-124	Slide Switch
	44.	PMK20P040FZN	Screw

- Cabinet (2)

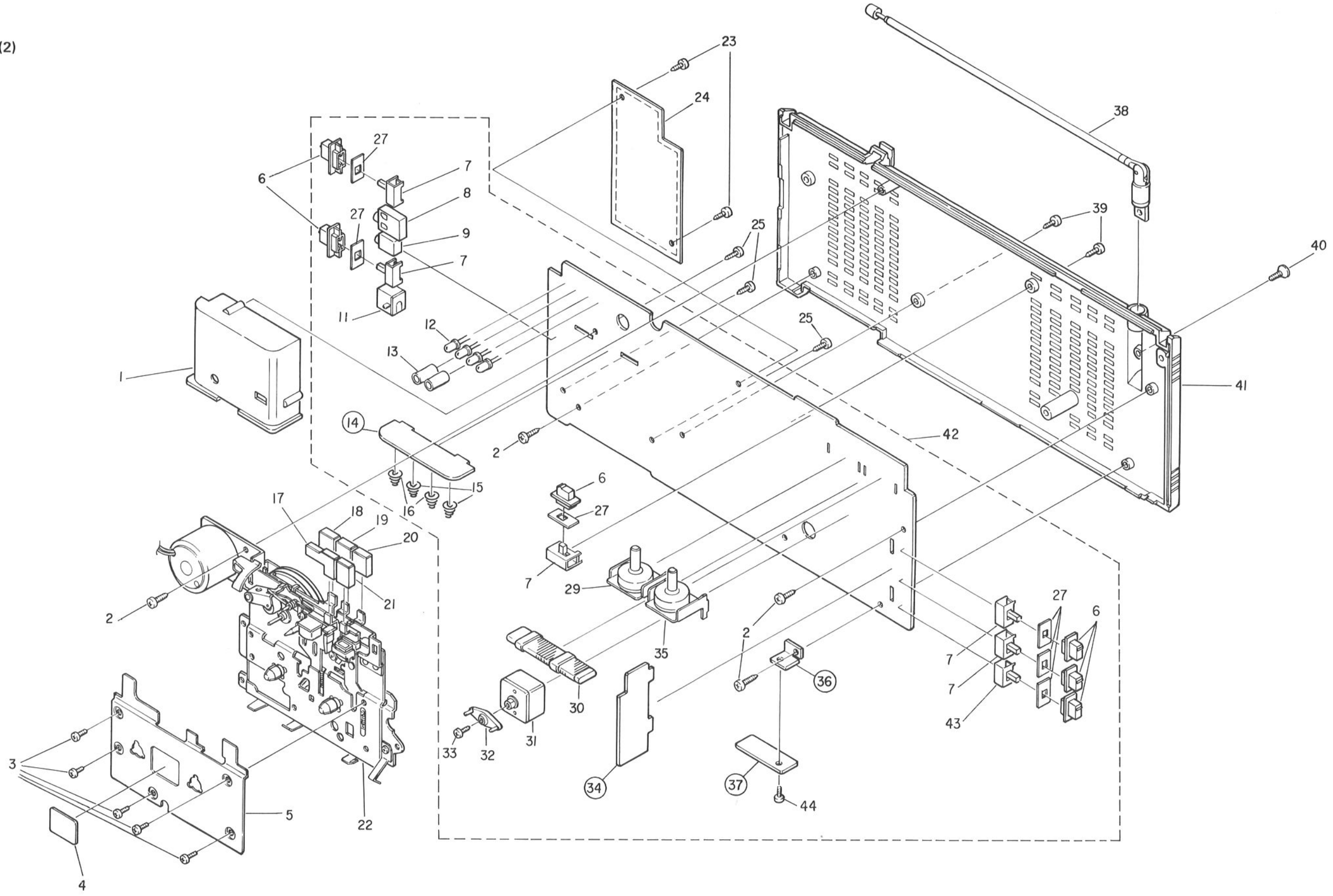


Fig. 22

9.3 MECHANISM (UPPER)

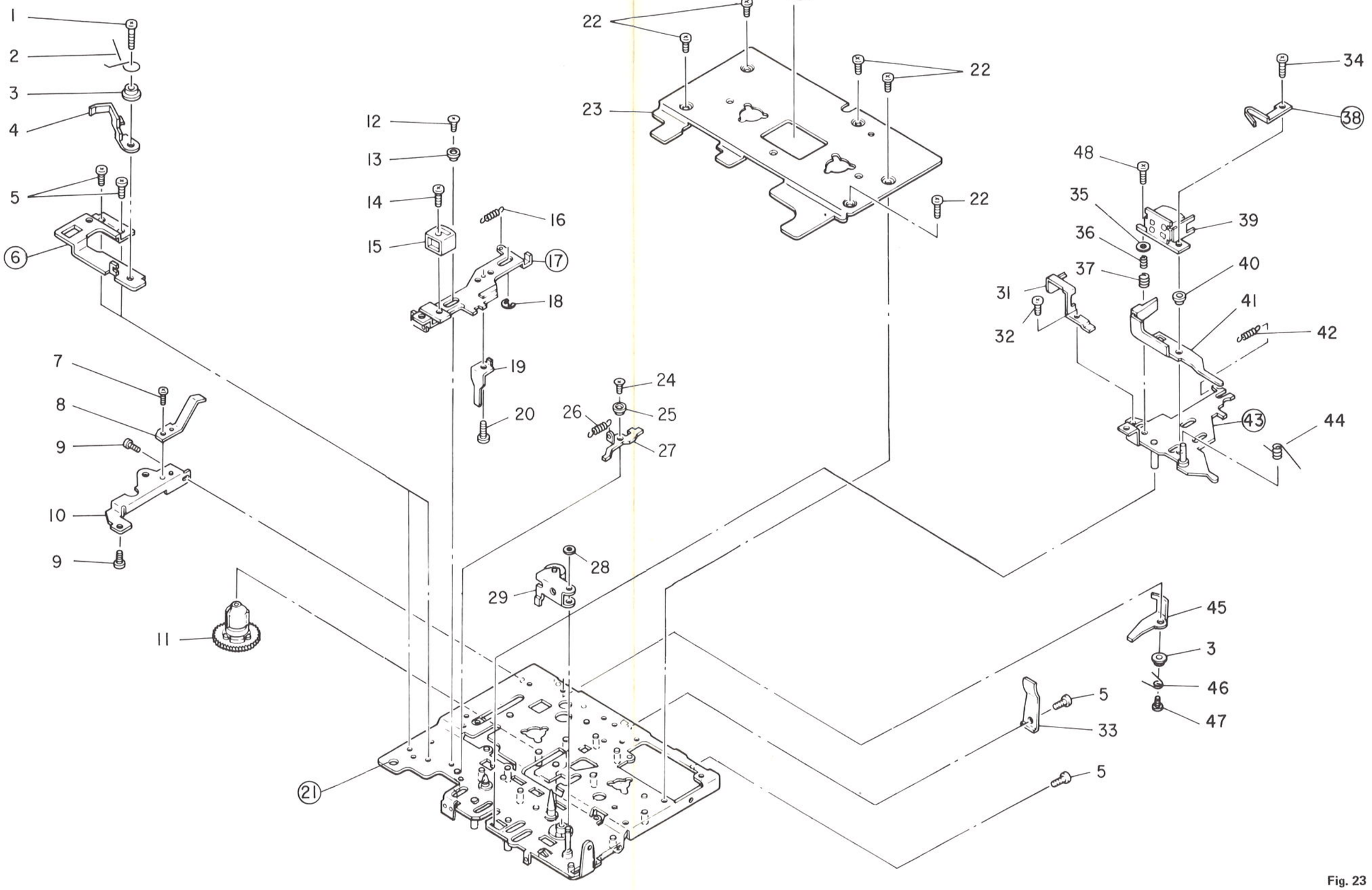


Fig. 23

• Mechanism (upper) Parts List

Mark	No.	Part No.	Description
	1.	HBA-236	Screw
	2.	HXX-381	Spring
	3.	HXX-384	Collar
	4.	HXX-380	Lever
	5.	HBA-238	Screw
	6.		Bracket
	7.	PMK20P030FZN	Screw
	8.	HBL-189	Spring
	9.	PMK20P030FZN	Screw
	10.	HNC-754	Bracket
**	11.	HXX-398	Reel Unit
	12.	HBA-240	Screw
	13.	HXX-376	Collar
	14.	PMZ020Y070FNi	Screw
**	15.	HXX-374	Head (Erase)
	16.	HXX-375	Spring
	17.		Lever (Record)
	18.	YE15SWAD	E-Ring
	19.	HBL-197	Plate
	20.	HBA-241	Screw
	21.		Chassis Assy
	22.	PBK20P020FC	Screw
	23.	HAH-184	Cover
	24.	HBA-240	Screw
	25.	HXX-378	Collar
	26.	HXX-379	Spring
	27.	HXX-377	Lever
	28.	WA21D050D040	Washer
**	29.	HXX-393	Pinch Roller Unit
	30.	HAH-185	Reflector
	31.	HXX-392	Guide
	32.	HBA-239	Screw
	33.	HXX-382	Plate Spring
	34.	PMZ020Y038FNi	
	35.	WA21F050W040	Washer
	36.	HXX-389	Spring (B)
	37.	HXX-390	Spring (A)
	38.		Clamp
**	39.	HXX-395	Head (REC/PLAY)
	40.	HXX-391	Collar
	41.	HXX-396	Plate Assy
	42.	HXX-387	Spring
	43.		Base
	44.	HXX-394	Spring
	45.	HXX-383	Lever
	46.	HXX-385	Spring
	47.	HBA-236	Screw
	48.	PMZ020Y040FNi	Screw

9.4 MECHANISM (LOWER-1) PARTS LIST

Mark	No.	Part No.	Description
	1.	HXX-350	Lever
	2.	HXX-351	Spring
	3.	YE15SWAD	E-Ring
	4.	HXX-352	Lever
	5.	HXX-353	Spring
	6.	HXX-360	Lever
	7.	YE25SWAD	E-Ring
	8.	HXX-371	Microphone Assy
	9.	HXX-372	Collar
	10.	HXX-370	Lever
	11.	HXX-388	Spring
	12.		Lever
	13.	HXX-358	Spring
	14.	HXX-357	Spring
	15.	HXX-356	Slide Plate Actuator
	16.	HXX-359	Spring
	17.		Slide Plate Actuator
	18.		Lever Assy
	19.	HXX-368	Spring
	20.	HXX-369	Spring
	21.	HXX-404	Gear (A)
	22.	HXX-405	Gear (FF)
	23.	WA12D030D025	Washer
	24.	HXX-403	Spring
	25.		Arm
	26.	HNM-413	Washer
**	27.	HXX-373	Switch
	28.	HBA-235	Screw
	29.	HXX-399	Roller
	30.	HXX-397	Reel Unit
	31.	HXX-341	Spring
	32.	HXX-406	Lever
	33.	HXX-402	Plate
	34.	HXX-400	Collar
	35.	HXX-401	Spring
	36.	HBA-236	Screw

- Mechanism (lower-1)

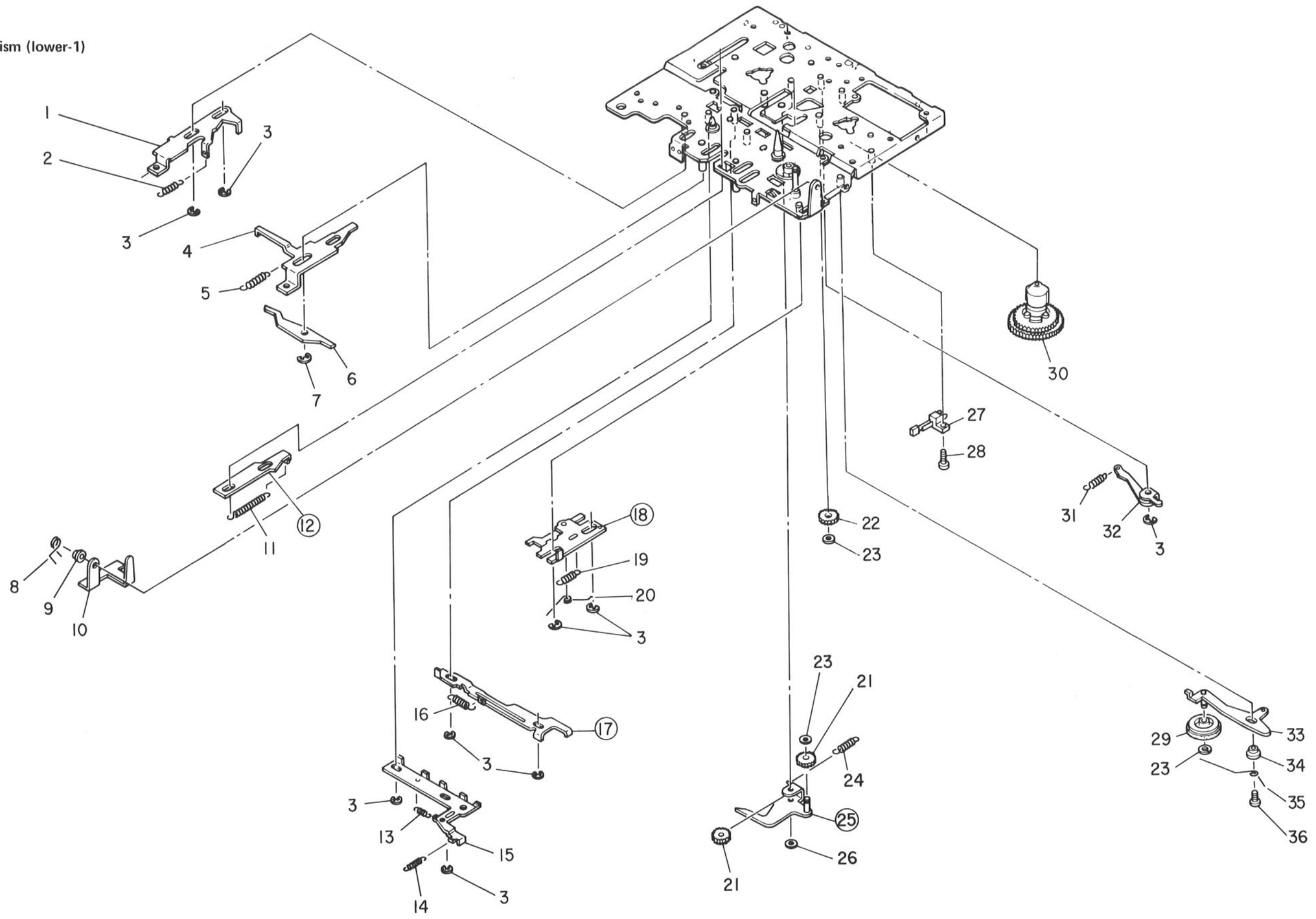


Fig. 24

9.5 MECHANISM (LOWER-2)

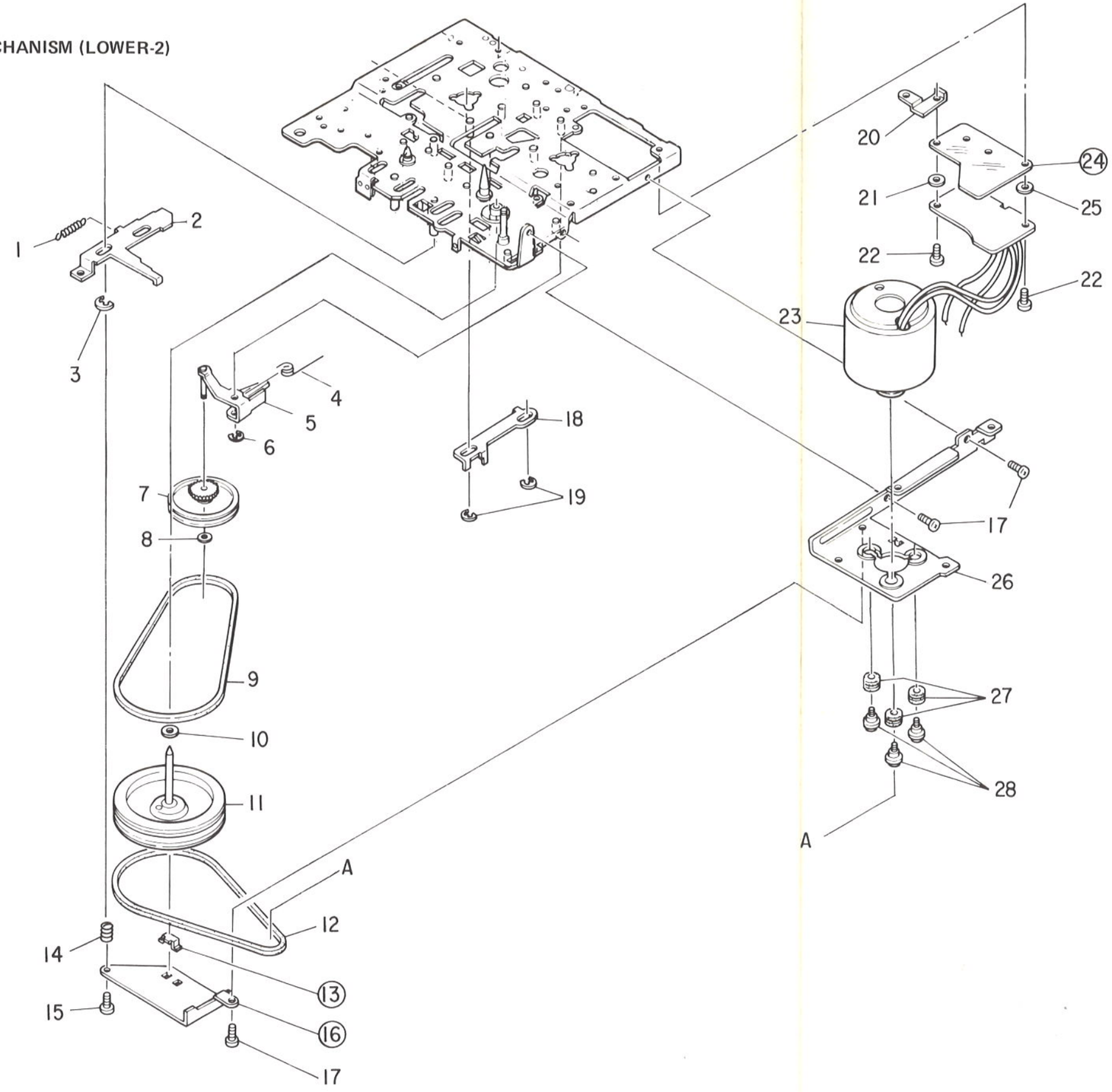


Fig. 25

- **Mechanism (lower-2) Parts List**

Mark	No.	Part No.	Description
	1.	HXX-355	Spring
	2.	HXX-354	Lever
	3.	YE25SWAD	E-Ring
	4.	HXX-346	Spring
	5.	HXX-343	Pulley Arm Unit
	6.	YE15SWAD	E-Ring
	7.	HXX-344	Pulley Unit
	8.	WA12D030D025	Washer
**	9.	HXX-345	Belt (FF, REW)
	10.	WA20N050W020	Washer
	11.	HXX-348	Flywheel
**	12.	HXX-362	Belt
	13.		Capstan Thrust Washer
	14.	HXX-349	Spring
	15.	HBA-237	Screw
	16.		Plate Unit
	17.	PCZ020P030FMC	Screw
	18.	HXX-342	Lever (FF)
	19.	YE15SWAD	E-Ring
	20.	HXX-367	Turnover Lever
	21.	WA20N050W050	Washer
	22.	HBA-236-D	Screw
**	23.	HXX-361	Motor Assy
	24.		Insulator
	25.	HXX-366	Washer
	26.	HXX-363	Bracket
	27.	HXX-364	Rubber
	28.	HXX-365	Collar Screw

10. ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω → 56 x 10^1 → 561 ..... RD1/4PS [5][6][1] J
47kΩ → 47 x 10^3 → 473 ..... RD1/4PS [4][7][3] J
0.5Ω → 0R5 ..... RN2H [0][R][5] K
1Ω → 010 ..... RS1P [0][1][0] K

Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ 562 x 10^1 ..... RN1/4SR [5][6][2][1] F

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Main Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description	
**	TA7335P	IC101	
**	TA7640AP	IC102	
**	TA7658P	IC401	
**	LA4190	IC402	
**	2SC1815-BL	Q101	
**	2SA1015-GR	Q102	
**	2SC460-B	Q103	
**	2SC2872-B	Q201, 301	
**	2SD352-E	Q401	
**	2SC1815-GR	Q402	
*	1S2076	D101, D104, D105, D202, D302	
*	TLR113A	D102, D103, D401, D402	
*	1K60R	D201, D301, D405	
*	05Z3.9-Z	D403	
*	W06A	D404	
	HTC-223	T101	FM RF Coil
	HTE-150	T102	FM IFT
	HTC-186	T103	FM OSC Coil
	HTE-152	T104	AM IFT
	HTB-185	T105	AM OSC Coil
	HTE-153	T106	AM DET
	HTE-151	T107	FM DET
	HTF-146	T401	Bias OSC Coil
	HTF-147	L201, L301	Coil 220μH
	HTF-148	L202, L302	Coil 15mH
	HTF-144	CF101	Ceramic Filter
	HTF-145	CF102	Ceramic Filter

Mark	Part No.	Symbol & Description	
**	HCS-179	VR401	Tone, 20kΩ (A)x2
**	HCS-183	VR402	Volume, 50kΩ (B)x2
**	HCP-151	VR403	Semi Fixed Resistor 20kΩ(B)
**	HCP-152	VR404	Semi Fixed Resistor 100kΩ(B)
**	HSH-123	S101	Switch (AM/FM)
**	HSH-123	S401	Switch (BFC)
**	HSH-123	S403	Switch (ST/MONO)
**	HSH-123	S404	Switch (LOUDNESS)
**	HSH-123	S405	Switch (METAL/NORMAL)
**	HSH-125	S402	Switch (REC/PB)
**	HSH-124	S406	Switch (TAPE/RADIO)
	HCL-154	BPF	Band Pass Filter
	HTX-152		AM Bar Antenna
	HCL-120	TC101–104	Variable Capacitor

RESISTORS

Mark	Part No.	Symbol & Description
	RD1/6PM□□□J	R103–R107, R109–R129, R204–R227, R229, R230, R304–R327, R329, R330, R401, R406, R408, R417
	RD1/6VM□□□J	R407
	RD1/4PM□□□J	R228, R328, R409

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYD103M25	C101–C102, C106, C107, C113, C121, C132, C134
	CCDSL070D50	C103
	CCDSL300K50	C104
	CCDSL050D	C105
	CKDYF473Z50	C108–C110, C115, C117, C118, C130
	CEA101M6.3LS	C111, C131, C412
	CKDYB201K50	C112
	CEAR47M50LS	C114
	CEA4R7M35LS	C116
	CEA220M6.3LS	C119
	CCDSL050D50	C120
	CQMA103J50	C122, C213, C313
	CKDBC223M50	C123
	CKDYD390K50	C133
	CCSTH220K50	C135
	CEAR1M50LS	C204, C304
	CKDBC473M50	C205, C305
	CKDYB821K50	C207, C307
	CCDSL101K50	C208, C308
	CCDSL680K50	C209, C309
	CEA101M4LS	C210, C310
	CEA3R3M50LS	C211, C311
	CKP472K50	C212, C312
	CEAR47M50LS	C214, C314
	CKP392K50	C215, C315
	CKP471K50	C216, C316
	CQMA393K50	C217, C317
	CQMA222K50	*C218, *C318
	CKDBC104M50	*C219, C319, C411
	CKDBC224M50	C225, C325
	CKP102K50	C220, C320
	CEA220M6.3LS	C221, C321
	CQMA273K50	C222, C322
	CEA470M10LS	C223, C323
	CEA221M4LS	C224, C324
	CKP221K50	C226, C326
	CKDBC153M50	C227, C327
	CEA100M16LS	C401, C402, C410
	CQMA122J50	C403
	CCDSL101K50	C404
	CEA101M10LL	C405
	CQMA332K50	C406, C407
	CEA331M10LL	C408
	CEA221M10LL	C414

Control Unit

Mark	Part No.	Symbol & Description
**	2SC1815-GR	Q403, Q404, Q406
**	2SA950-O	Q405
	RD1/6PM□□□J	R409–R416
	CEA101M4LS	C409
	CEA471M10LL	C413
	CEA470M10LS	C415

Muting Unit

Mark	Part No.	Symbol & Description
**	2SC2878-B	Q407, Q408
*	1S2076	D406
	RD1/6PM□□□J	R408, R409
	CEA470M10LS	C415

MPX Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description
**	TA7343P	IC103
**	HCP-150	VR101 Semi-fixed, 5kΩ(B)

RESISTORS

Mark	Part No.	Symbol & Description
	RD1/6PM□□□J	R117, R118, R120, R201–R203, R301–R303
	RD1/6VM□□□J	R119

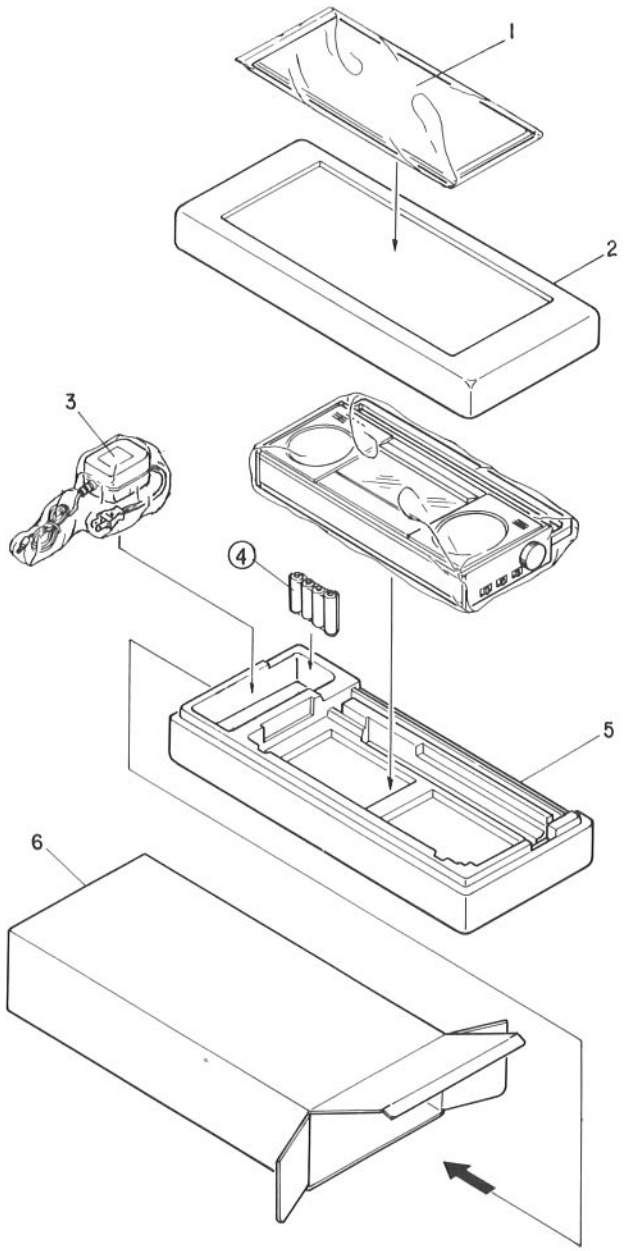
CAPACITORS

Mark	Part No.	Symbol & Description
	CEA100M16LS	C124
	CEA010M50LS	C125, C128
	CEA3R3M50LS	C126
	CQSH102J50	C127
	CEA470M6.3LS	C129
	CQFA153J50	C201, C301
	CEA4R7M25	C202, C302
	CQMA822K50	C203, C303

Miscellaneous Parts List

Mark	Part No.	Symbol & Description
*	HPM-139	Microphone Assy
**	HDV-121	Speaker
	HKN-159	Headphone Jack
	HKN-160	Headphone Jack
	HKN-158	DC Jack
**	HXX-395	Head (REC/PLAY)
**	HXX-374	Head (Erase)
**	HXX-361	Motor Assy

11. PACKING METHOD



Parts List

Mark	No.	Part No.	Description
	1.	HRA-213-0	Owner's Manual (English)
		HRA-214-0	Owner's Manual (Spanish)
	2.	HHA-804	Styrofoam
⚠	3.	HWR-144	AC Adaptor
	4.		Battery
	5.	HHA-805	Styrofoam
	6.	HHA-747	Carton

Fig. 26