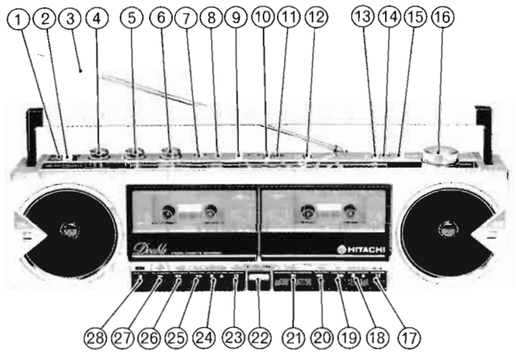
HITACHI

SERVICE MANUAL



TK **No. 2107E**

TRK-W4H/HC/W

HTO-50FSB chassis [Tape 1]
HTO-50FB chassis [Tape 2]

CONTENTS

KEY TO ILLUSTRATIONS

① POWER (MAINS) INDICATOR
② POWER (MAINS) SWITCH
③ TELESCOPIC ANTENNA
④ TONE CONTROL
⑤ VOLUME CONTROL
⑥ MIXING MIC. VOLUME CONTROL
⑦ MIXING MICROPHONE JACK
⑧ BUILT-IN MICROPHONE
⑨ RECORDING MUTE BUTTON
⑩ DUBBING SWITCH
⑪ DUBBING INDICATOR
⑫ FUNCTION SELECTOR
⑬ BAND SELECTOR
⑭ FM STEREO INDICATOR
⑮ FM MODE SELECTOR
⑯ TUNING CONTROL
⑰ PAUSE BUTTON
⑱ STOP/EJECT BUTTON
⑲ FAST FORWARD BUTTON
⑳ REWIND BUTTON
㉑ PLAYBACK BUTTON — TAPE 1
㉒ ONE TOUCH DUBBING BUTTON
㉓ PAUSE BUTTON
㉔ STOP/EJECT BUTTON
㉕ FAST FORWARD BUTTON
㉖ REWIND BUTTON
㉗ PLAYBACK BUTTON
㉘ RECORD BUTTON — TAPE 2

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes.
   Critical parts are marked with ⚠ in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.
3. Before returning a repaired unit to the customer, the service technician must measure the leakage-current or resistance to determine that the exposed parts are acceptably insulated from the power circuit.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

CASSETTE TAPE RECORDER WITH FM/SW/AM RADIO

April 1984 **TOKAI WORKS**

SPECIFICATIONS

GENERAL SECTION

Semiconductors :	IC's : 6 Transistors : 23 Diodes : 18 LED's : 3 Varicap : 1
Power Supply :	AC : 120V/230V, 50/60 Hz DC : 9V ["C" Cell (IEC R14) × 6 or equivalent]
Power Consumption :	10W
Power Output :	2.5W/CH (T.H.D. 10%)
Speakers :	100 mm, 4 ohms × 2 20 mm, 2k ohms × 2
Dimensions :	500(W) × 148.5(H) × 135(D) mm
Weight :	3.7 kg (with batteries)

RADIO SECTION

Circuit System :	FM/SW/AM 3-band superheterodyne
Tuning Range :	FM : 88 to 108 MHz SW : 3.2 to 12 MHz AM : 530 to 1605 kHz
Sensitivity :	FM : 18 dB (pra.), 10 dB (max.) SW : 33 dB (pra.), 23 dB (max.) AM : 56 dB (pra.), 48 dB (max.)
Intermediate Frequency :	FM : 10.7 MHz SW/AM : 455 kHz
Antennas (Aerials) :	FM/SW : Telescopic antenna AM : Built-in ferrite core antenna

TAPE RECORDER SECTION

Track System :	4 track 2 channel stereo
Tape :	Cassette tape
Tape Speed :	4.75 cm/s
Recording System :	AC bias, 55 kHz
Erasing System :	AC erase
Frequency Response :	Normal : 60 to 12,000 Hz
S/N (Signal to Noise Ratio) :	50 dB
Wow and Flutter :	0.15% (WRMS)
Crosstalk :	60 dB (between tracks) 30 dB (between channels)
Erase Ratio :	50 dB
Input Sensitivity and Impedance :	Microphone : 20mV, 10k ohms Line in : 400mV, 100k ohms
Output Level and Impedance :	Headphone : 8 ohms to 2k ohms
Fast Forwarding or Rewinding Time :	120 sec. (Using C-60)
Distortion :	5%
Motor :	DC Micro motor × 2

DISASSEMBLY

1. Front case and rear case

Open the cassette lids of TAPE 1 and TAPE 2, and remove 10 fixing screws Ⓐ.

* To install the front case, press the door spring in the direction of the arrow shown in Fig. 2 to hook it onto the cassette chassis and install the front case, then press the EJECT button firmly 2—3 times. the door spring is released from the cassette chassis and hooked to the cassette lid arm.

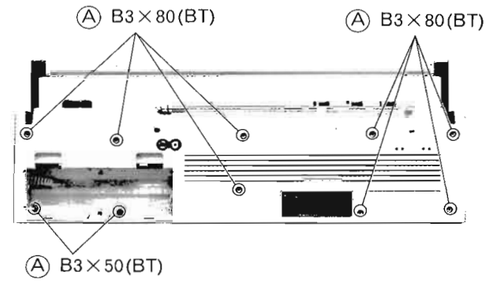


Fig. 1

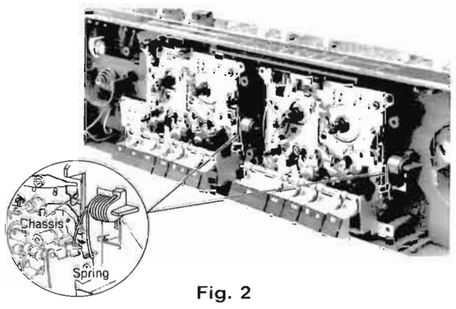


Fig. 2

2. Cassette lid

Push the cassette lid arm in the direction of arrow.

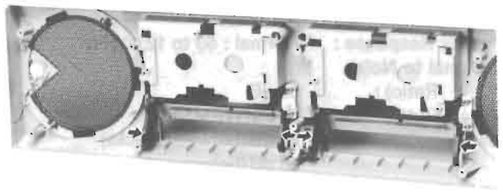


Fig. 3

3. One touch dubbing button

Press the stopper of the front case using a fine flat-tip screwdriver in the direction of the arrow to remove it.

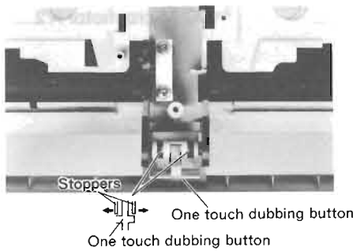


Fig. 4

4. Handle

Insert a flat-tip screwdriver into the position shown in Fig. 5 to release the lock.

5. Radio PC Board

Press 2 stoppers outside the board to release them.

6. Main PC Board

1) Remove 3 knobs (Tone, Volume, Mic volume) and 2 fixing screws (B).
2) Pull the LINE IN jack board toward the front to remove it.
3) Remove 2 stoppers and pull the board toward the front while lifting its bottom to remove the board from the frame chassis.

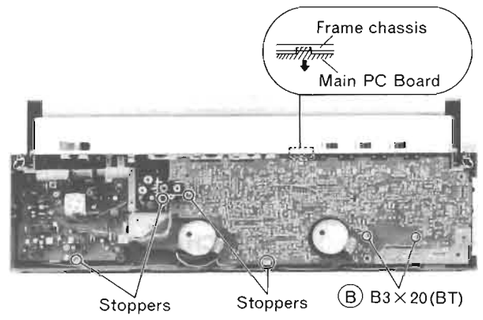


Fig. 5

7. Cassette chassis

Tape 1 : Remove 2 fixing screws (C).
Tape 2 : Remove 2 fixing screws (D).

8. Speaker

Push the speaker to remove it in the direction of the arrow.

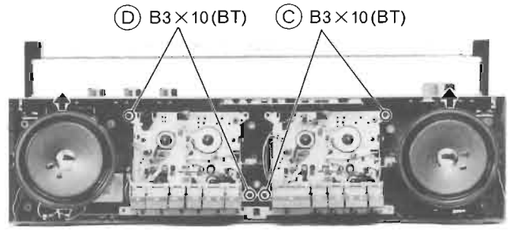


Fig. 6

ADJUSTMENT

1. Radio Section

Step		Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
			Measuring Instrument	Input Terminal	Output Terminal				
1	(1)	FM IF	· Genescope (10.7 MHz / 108 MHz)	TP103	TP301	10.7 MHz 108 MHz	Highest	T101	Note 1
2	(1)	FM OSC. (Covering)	· FM signal generator (400 Hz, 30% mod.) · Oscilloscope · VTVM	TP101, 102 (thru FM dummy antenna) (Note 2)	Speaker terminal (4ohm load)	87 MHz	Lowest	L102	Max.
	(2)					109 MHz	Highest	CT102	
	(3)					Repeat steps (1) and (2)			
3	(1)	FM ANT. (Tracking)				90 MHz	90 MHz	L101	Max.
	(2)					106 MHz	106 MHz	CT101	
	(3)					Repeat steps (1) and (2)			
4	(1)	FM MPX (Multiplex)	· Frequency counter	——	Note 3	——	——	RT301	19 kHz ±100 Hz
5	(1)	AM IF	· Genescope (455 kHz)	Ferrite-core antenna (Note 4)	TP301	455 kHz	Highest	——	Note 5
6	(1)	SW OSC. (Covering)	· AM Signal generator (400 Hz, 30% mod.) · VTVM	Ferrite-core antenna (Note 4)	Speaker terminal (4ohm load)	3.1 MHz	Lowest	L153	Max.
	(2)					12.5 MHz	Highest	CT153	
	(3)					Repeat steps (1) and (2)			
7	(1)	SW ANT. (Tracking)				4 MHz	4 MHz	L151	Max.
	(2)					Repeat steps (1) and (2)			
8	(1)	AM OSC. (Covering)	· AM signal generator (400 Hz, 30% mod.) · VTVM	Ferrite-core antenna (Note 4)	Speaker terminal (4ohm load)	515 kHz	Lowest	L154	Max.
	(2)					1650 kHz	Highest	CT152	
	(3)					Repeat steps (1) and (2)			
9	(1)	AM ANT. (Tracking)				600 kHz	600 kHz	L152	Max.
	(2)					1400 kHz	1400 kHz	CT151	
	(3)					Repeat steps (1) and (2)			

Note

1. S-curve adjustment is not required but confirm that the waveform is as shown in Fig. 7. Adjust T101 so that the noise at the center of the S-curve is minimum and the noise at the base line is maximum.

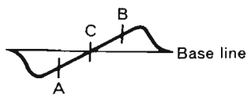
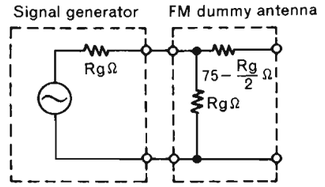


Fig. 7

2. FM dummy antenna shows Figure 8.



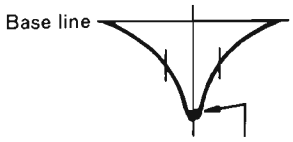
Rg : SG's output impedance

Fig. 8

3. Connect the frequency counter to 2 pin of IC301, via a resistor of 100 kΩ.

4. Connect AM signal generator to loop antenna, bring near to ferrite antenna.

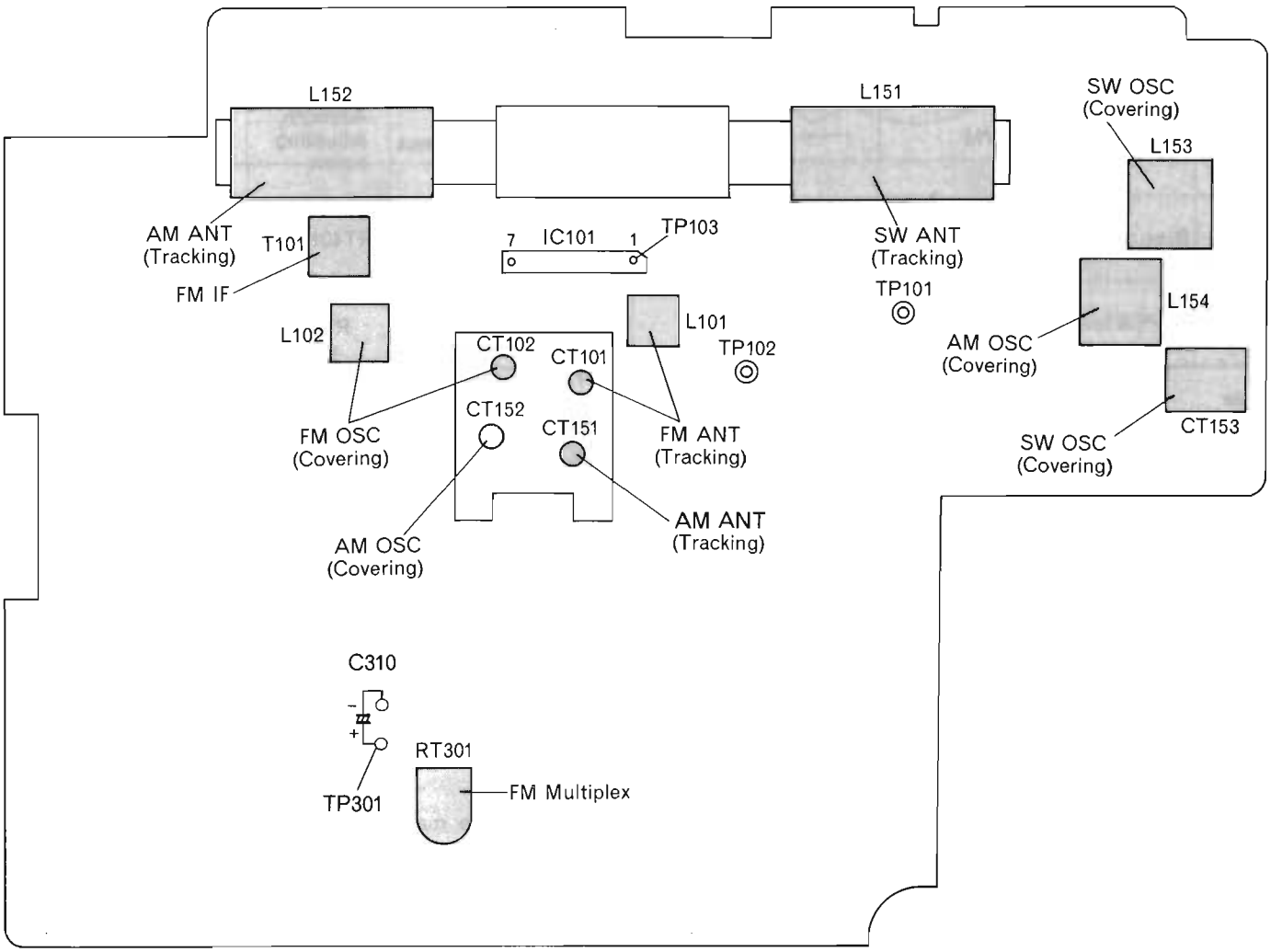
5. Feed in a weak signal from the genescope and confirm that the waveform is obtained shown in Figure 9.



Confirm that the genescope output so that there is a little noise riding on the leading edge.

Fig. 9

ADJUSTMENT PARTS LOCATION (Radio section)



2. Tape Recorder Section

Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moistened in alcohol.

Step	Adjustment Item	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Tape speed (High speed)	· Frequency counter	——	Speaker terminal (4 ohm load)	Tape speed adjustment tape (3 kHz)	Playback	RT802 (TAPE 1) RT804 (TAPE 2)	6kHz±20Hz	Note 1
2	Tape speed (Normal)	· Frequency counter	——	Speaker terminal (4 ohm load)	Tape speed adjustment tape (3 kHz)	Playback	RT801 (TAPE 1) RT803 (TAPE 2)	3kHz±10Hz	Note 2
3	Head azimuth	· VTVM	——	Speaker terminal (4 ohm load)	Head azimuth adjustment tape (10kHz)	Playback	Azimuth adjusting screw	Output max.	Note 3
4	Bias current	· VTVM	——	Both ends of 10 ohm resistor	——	Record	RT401L, R	400±50μA	Note 4
5	SPSS level	——	——	——	DRPS test tape (TMT-6261)	SPSS	RT701	——	Note 5

Note

1. 1) Connect a frequency counter to the speaker terminal.
   2) Heat-run the unit for 20 minutes or more and then adjust at the middle of the tape.
   3) Short-circuit copper foil patterns Ⓐ and Ⓑ.
   4) Playback the test tape in TAPE 1 and adjust RT802 to obtain the adjustment value.
   5) Playback the test tape in TAPE 2 and adjust RT804 to obtain the adjustment value.
   6) The difference between the adjustment values of TAPE 1 and TAPE 2 should be within ±20 Hz.
   7) Release the short-circuit between patterns Ⓐ and Ⓑ.

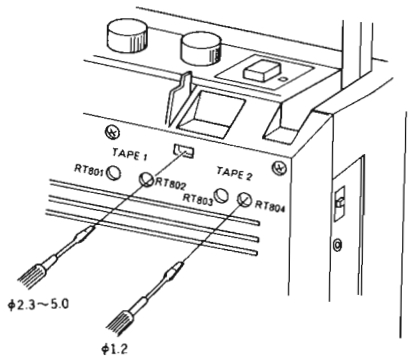
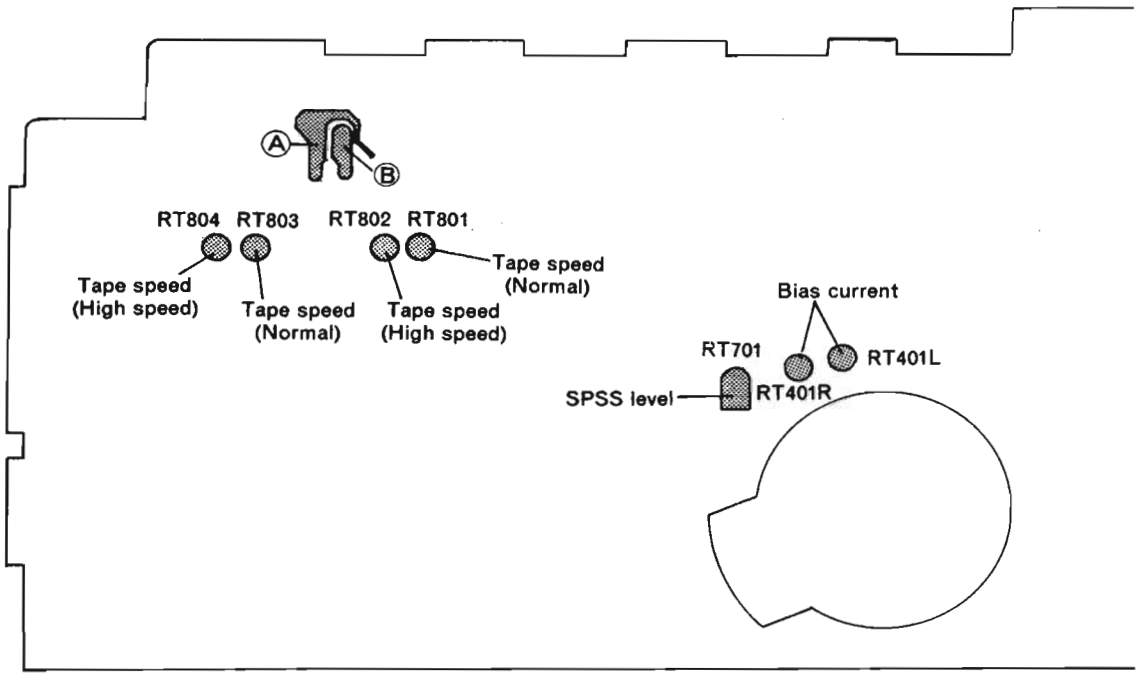


Fig. 10

2. 1) Connect a frequency counter to the speaker terminal.
   2) Heat-run the unit for 20 minutes or more and then adjust at the middle of the tape.
   3) Playback the test tape in TAPE 1 and adjust RT801 to obtain the adjustment value.
   4) Playback the test tape in TAPE 2 and adjust RT803 to obtain the adjustment value.
   5) The difference between the adjustment values of TAPE 1 and TAPE 2 should be within ±10 Hz.

3. When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.
4. Connect a 10Ω resistor between the ground side of the record/playback head and ground. Connect the VTVM to both ends of this resistor and adjust RT401L, R becomes 400 ±50μA.
5. Playback the DRPS test tape (TMT-6261) in the SPSS QUE/REVIEW modes and adjust RT701 so that the unit enters the play mode when the recording level of the tape changes to −40 dB from −35 dB.

ADJUSTMENT PARTS LOCATION (Tape Recorder section)



DIAL CORD STRINGING

STRINGING METHOD

1. Turn the pulley fully clockwise.
2. String the dial cord in the direction of the arrow (No. 1 ~ 9).
3. Set the dial pointer to setting position.

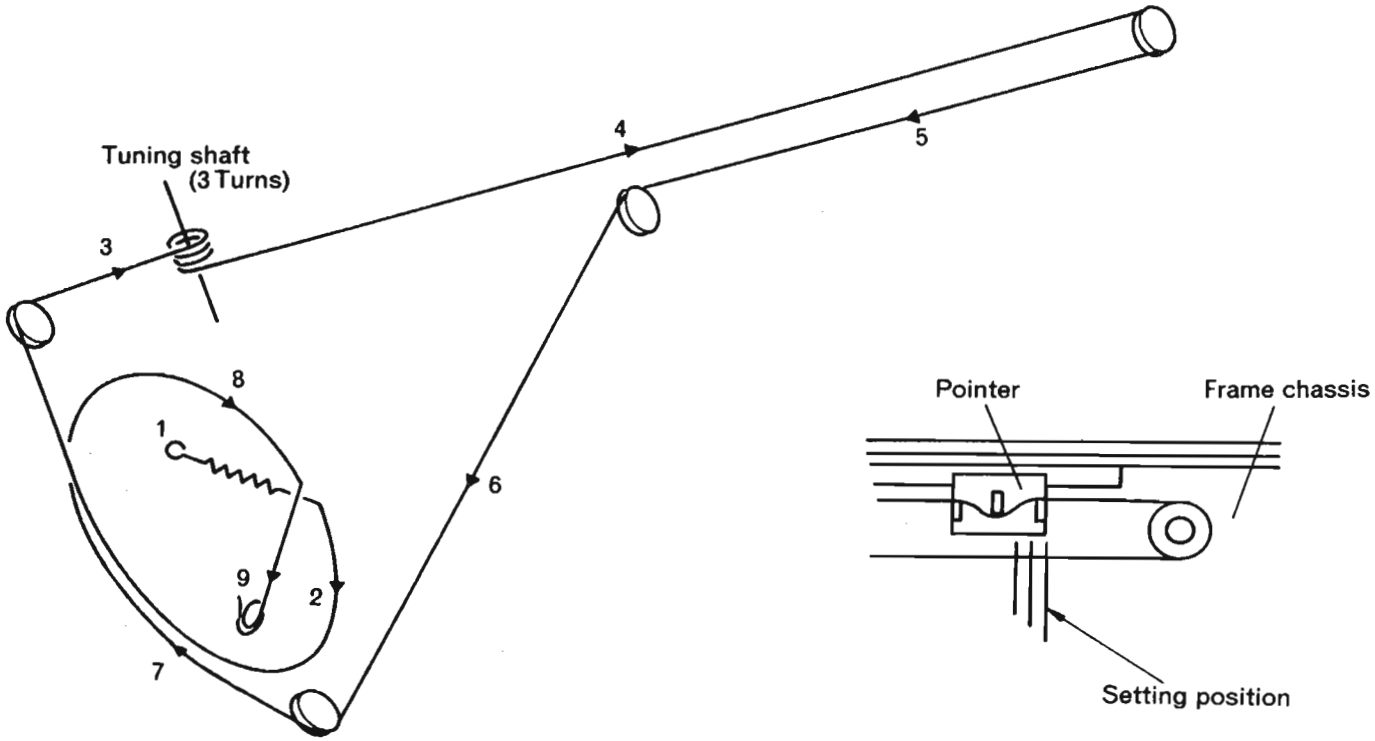


Fig. 11

INSPECTION OF MECHANISM

Item No.	Checking item		Reference value	Remarks
1	Pressure of pressure roller		300—550g	Note 1
2	Take-up torque		35—75g·cm	
3	Fast forward/Rewind torque		70—160g·cm	TAPE 2
			90—150g·cm	TAPE 1
4	Auto stop sensor pressing force		40—75g	
5	Brake force		15g·cm	Stop mode
6	Back tension torque	Take-up	2—6.5g·cm	TAPE 2
			1—6.0g·cm	TAPE 1
		Supply	1—6.0g·cm	
7	Flywheel thrust gap		0.05—0.3mm	
8	Button operation force	PLAY	0.4kg or less	
		FF	0.5kg or less	
		REW	0.6kg or less	
		EJECT	0.4kg or less	
		REC	0.45kg or less	TAPE 2
		PAUSE	0.65kg or less	

Note :

1. Set this unit in the playback mode and press the pressure roller in the direction of the arrow using a fan type tension gauge, and measure the pressure when the pressure roller is released from the capstan.

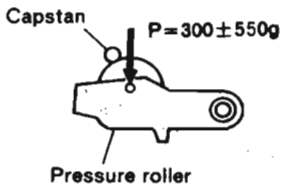


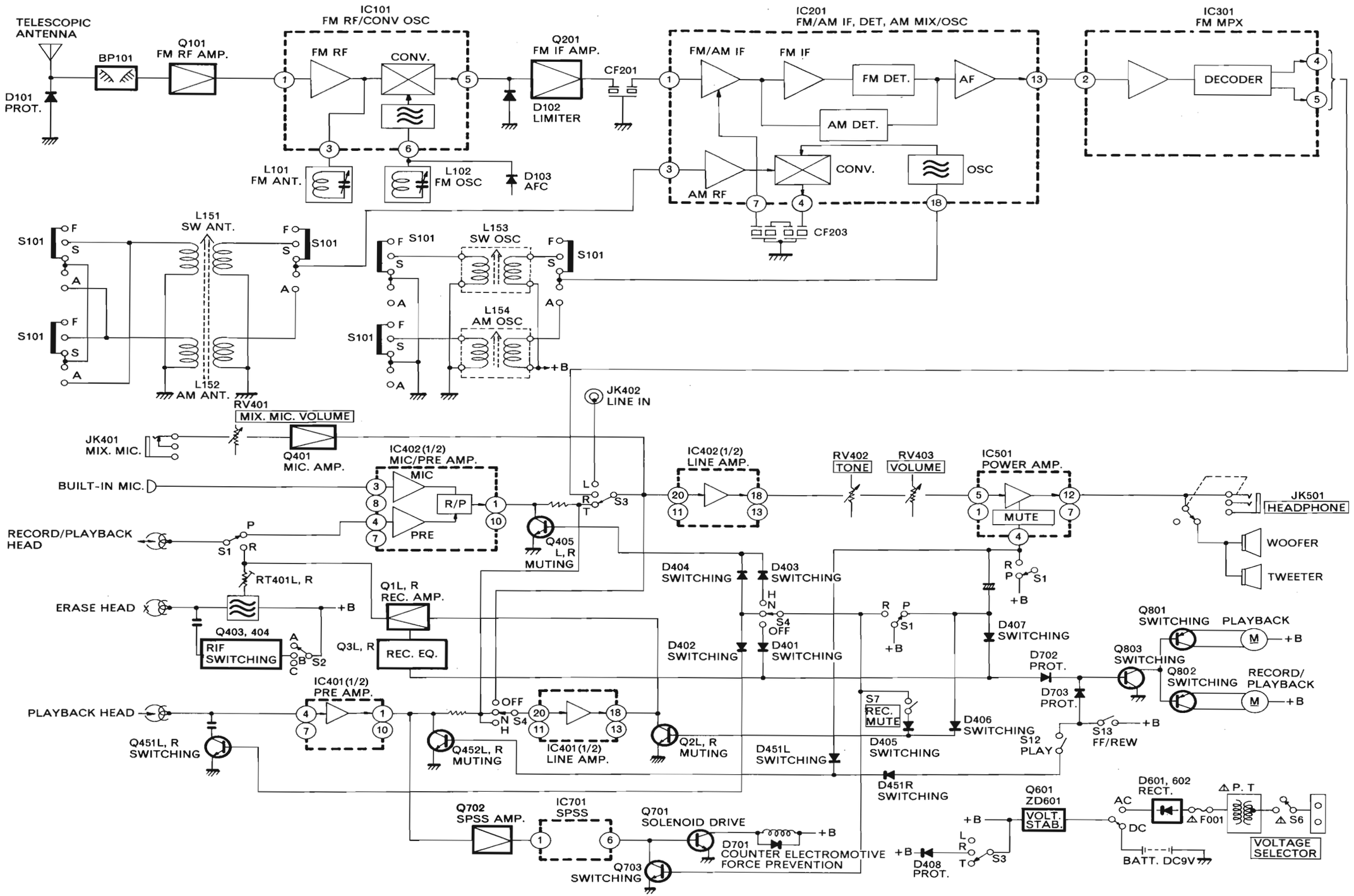
Fig. 12

LUBRICATION

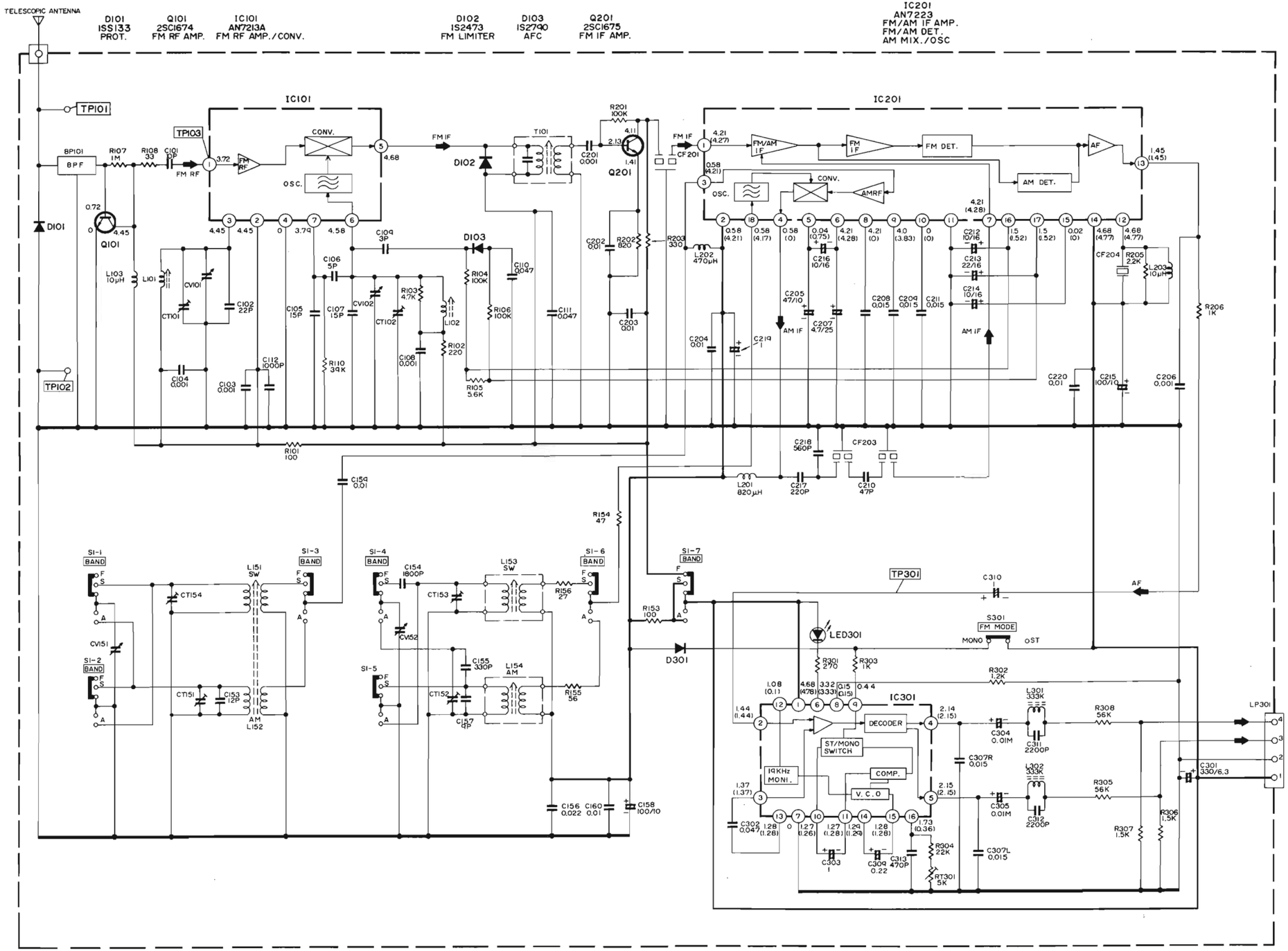
Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point.
Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use.
Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

Lubrication point		Oil or Grease
Rotary section	Metal and metal	Pan motor oil (10W-40)
	Mold and metal	Sonic slider oil (#1600)
Sliding section	Metal and metal	Hitasol (MO-138)
	Mold and mold Mold and metal	White grease (FL-LUBE-A)
Spring resonance prevention		Floil (GB-TS-1)

BLOCK DIAGRAM



SCHEMATIC DIAGRAM



NOTE: VOLTAGES ARE MEASURED IN FM MODE.
VOLTAGES IN ( ) ARE MEASURED IN AM MODE.

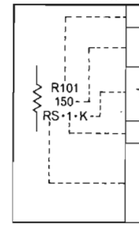
D301 IS2473 SWITCHING

IC301 AN7410N FM MPX

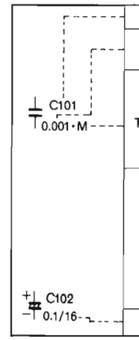
LED301 LN242RPH-LF FM STEREO IND.

Note

1. Voltage measured at base of chassis with minimum volume control and no signal.
2. Nomenclature of Resistors and Capacitors.



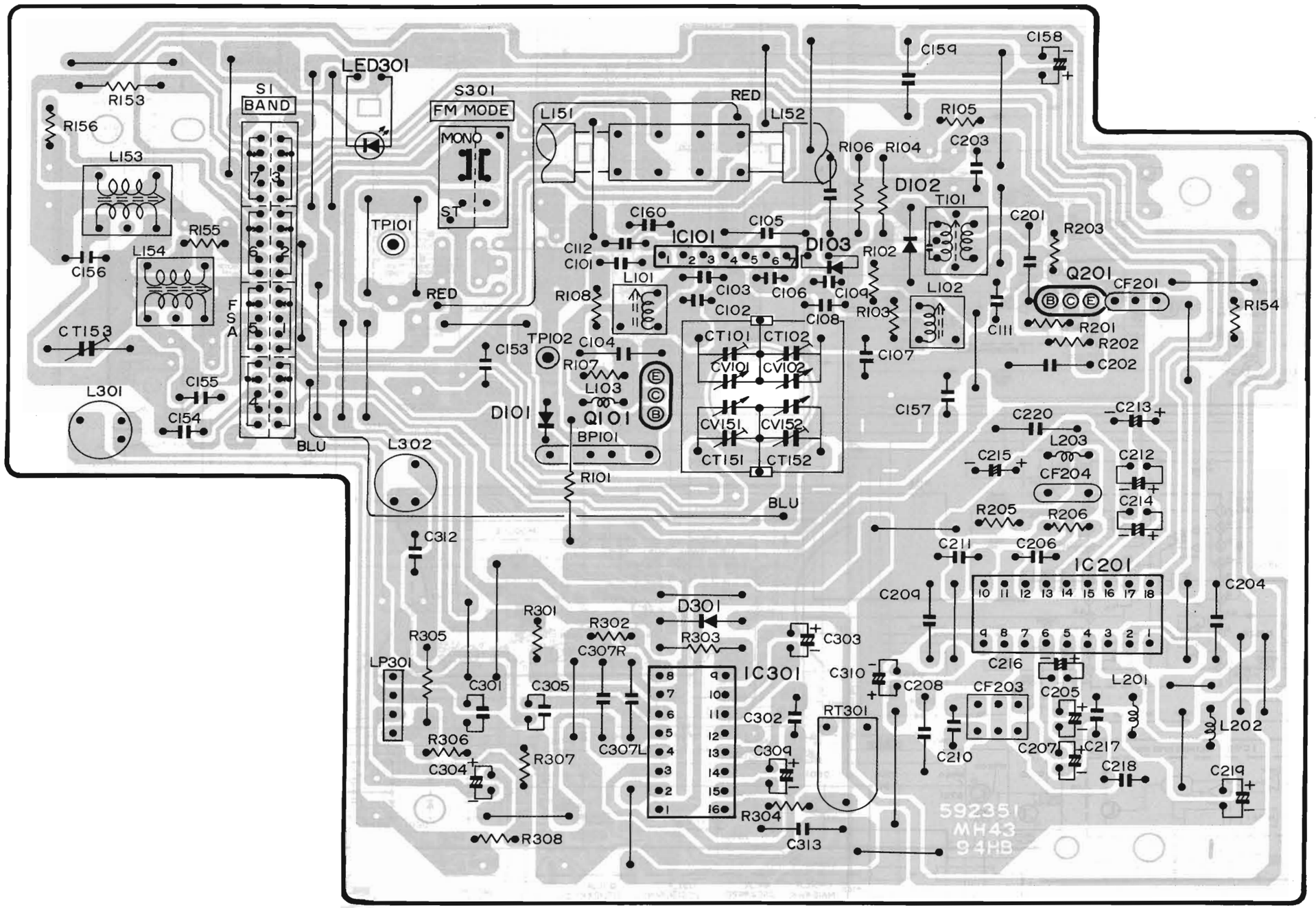
Circuit No.	
Value	No indicated Ω(Ohm) M : 1000kΩ
Tolerance	No indicated ±5% K : ±10% M : ±20%
Wattage	No indicated ¼W
Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film



Circuit No.		
Value	No indicated μF P : PF	
Tolerance	No indicated ±10% J : ± 5% M : ±20% Z : +80%, −20% D : ±0.5pF C : ±0.25pF	
Sort		Ceramic
		Electrolitic
	M	Mylar
	P	Polyester
	S	Styrol
Voltage	No indicated 50WV	

3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked with ※, use specified ones stated on parts list since required temperature characteristics.

CIRCUIT BOARD DIAGRAM



IC101

	FM
1	3.72V
2	4.45V
3	4.45V
4	0V
5	4.68V
6	4.58V
7	3.79V

Q101

	FM
B	0.72V
C	4.45V
E	0V

Q201

	FM
B	2.13V
C	4.11V
E	1.41V

IC201

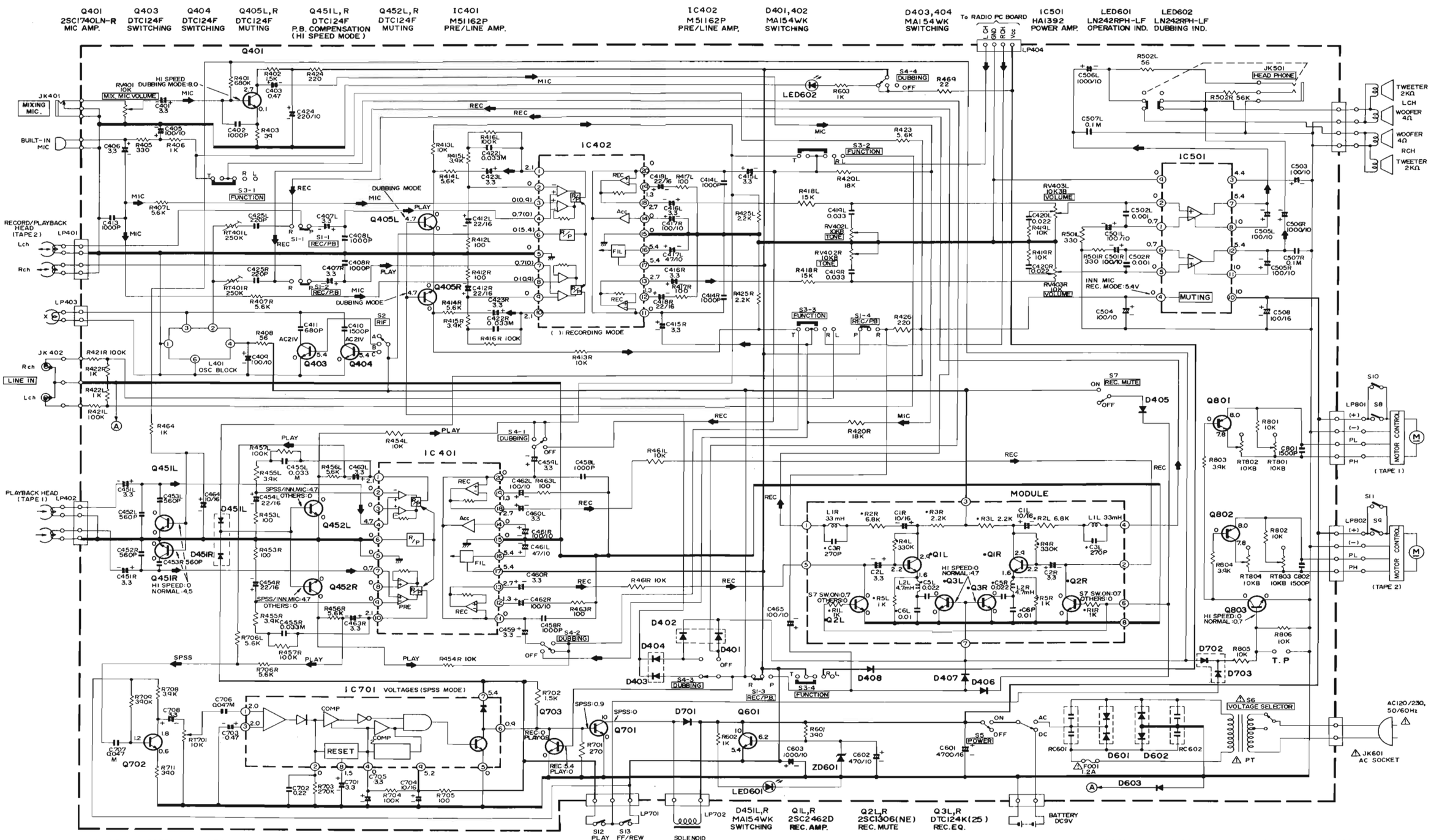
	FM	AM
1	4.21V	4.27V
2	0.58V	4.21V
3	0.58V	4.21V
4	0.58V	0V
5	0V	1.0V
6	0.04V	0.75V
7	4.21V	4.28V
8	4.21V	4.28V
9	4.21V	0V
10	4.0V	3.83V
11	0V	0V
12	4.68V	4.77V
13	1.45V	1.45V
14	4.68V	4.77V
15	0.02V	0V
16	1.5V	1.52V
17	1.5V	1.52V
18	0.58V	4.19V

IC301

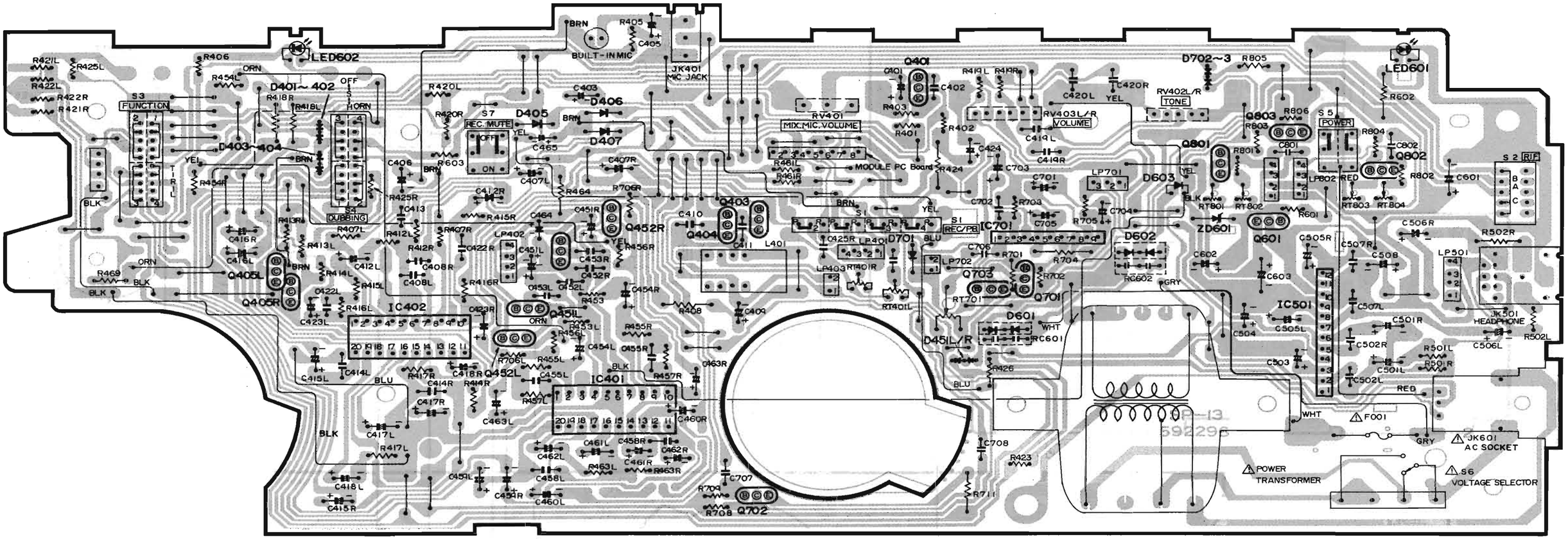
	FM	AM
1	4.68V	4.78V
2	1.44V	1.44V
3	1.37V	1.37V
4	2.14V	2.15V
5	2.15V	2.15V
6	3.32V	3.33V
7	0V	0V
8	0.15V	0.15V
9	0.44V	2.99V
10	1.27V	1.26V
11	1.27V	1.28V
12	1.08V	0.1V
13	1.28V	1.28V
14	1.29V	1.29V
15	1.28V	1.28V
16	1.73V	0.36V

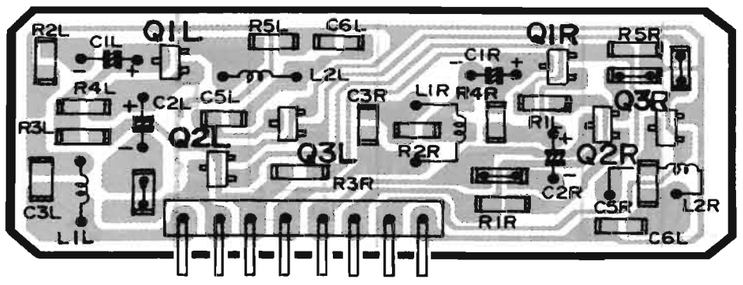
RADIO

SCHEMATIC DIAGRAM



CIRCUIT BOARD DIAGRAM





SHOWS JUMPER CHIP

MODULE

MAIN

Q1L, R

B	2.2V
C	2.9V
E	1.6V

Q2L, R

B	S7 SW ON : 0.7V OTHERS : 0V
C	0V
E	0V

Q3L, R

B	HI SPEED : 0V NORMAL : 4.7V
C	0V
E	0V

Q401

B	0.8V
C	2.7V
E	0.1V

Q403

B	5.4V
C	AC21V
E	0V

Q404

B	5.4V (S2 SW ON)
C	AC21V
E	0V

Q405L, R

B	4.7V (DUBBING)
C	0V
E	0V

Q451L, R

B	HI SPEED : 0V NORMAL : 4.5V
C	0V
E	0V

Q452L, R

B	INN. MIC/ SPSS : 4.7V OTHERS : 0V
C	0V
E	0V

Q601

B	6.2V
C	10V
E	5.4V

Q701

B	0.9V (SPSS)
C	10V SPSS : 0.9V
E	0V

Q702

B	1.2V
C	1.8V
E	0 6V

Q703

B	REC : 5.4V PLAY : 0V
C	REC : 0V PLAY : 0 9V
E	0V

Q801

B	0V
C	7.8V
E	8.0V

Q802

B	0V
C	7.8V
E	8.0V

Q803

B	HI SPEED : 0V NORMAL : 0.7V
C	0V
E	0V

IC401

1	2.1V
2	0V
3	0V
4	4.7V
5	0V
6	0V
7	0.7V
8	0V
9	0V
10	2.1V
11	0V
12	1.3V
13	2.7V
14	0V
15	0V
16	5.4V
17	5.4V
18	2.7V
19	1.3V
20	0V

IC402

1	2.1V
2	0V
3	0V (0.9V)
4	0.7V (0V)
5	0V
6	0V (5.4V)
7	0.7V (0V)
8	0V (0.9V)
9	0V
10	2.1V
11	0V
12	1.3V
13	2.7V
14	0V
15	0V
16	5.4V
17	5.4V
18	2.7V
19	1.3V
20	0V

( ) : REC. MODE

IC501

1	0.7V
2	0V
3	4.4V
4	0V
5	0V
6	0.7V
7	5.4V
8	10V
9	0V
10	10V
11	10V
12	5.4V

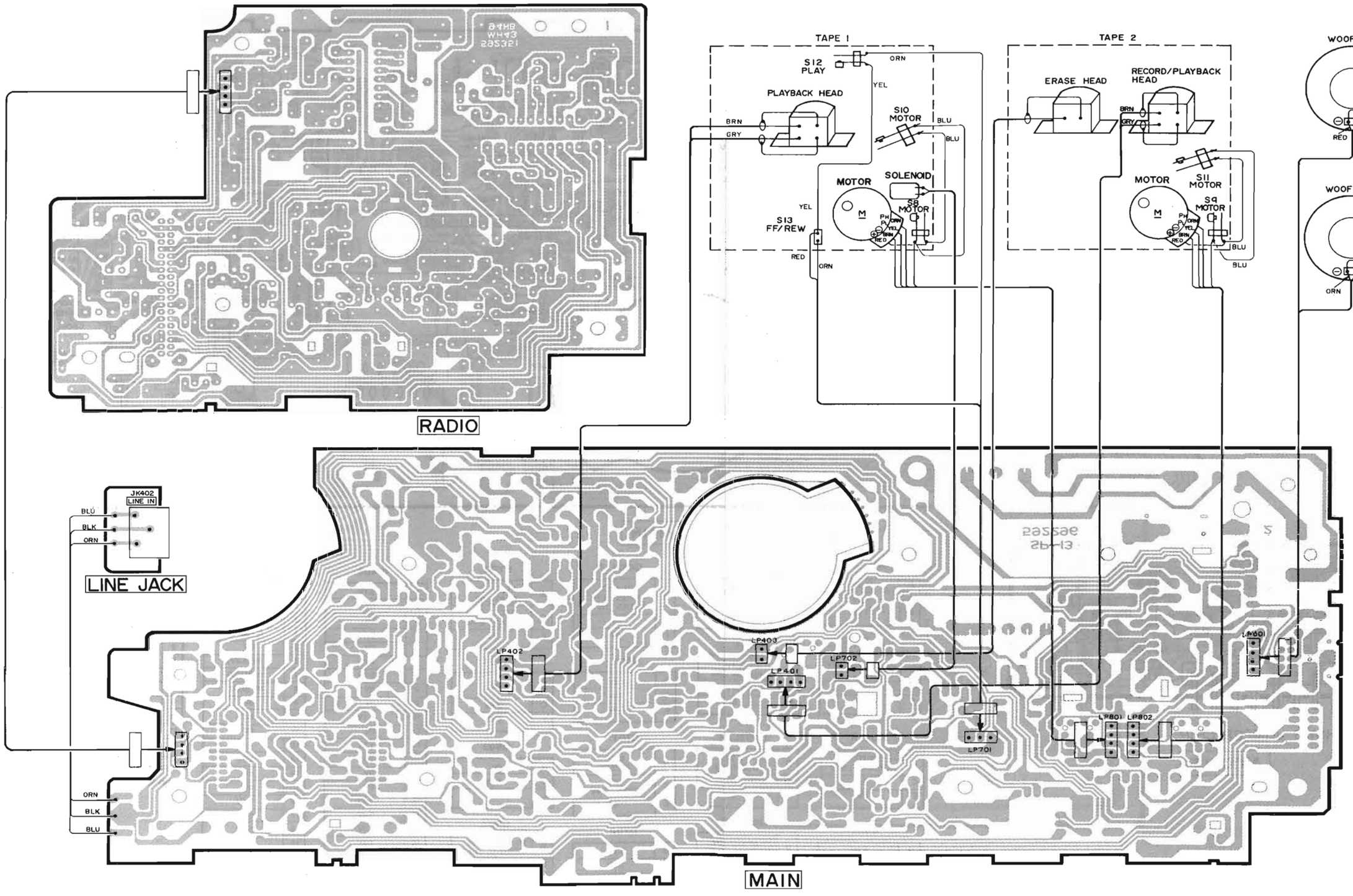
PIN ④
INN MIC/REC : 5.4V

IC701

1	2.0V
2	0V
3	2.0V
4	0V
5	0V
6	0.9V
7	5.4V
8	1.5V
9	5.2V

SPSS MODE

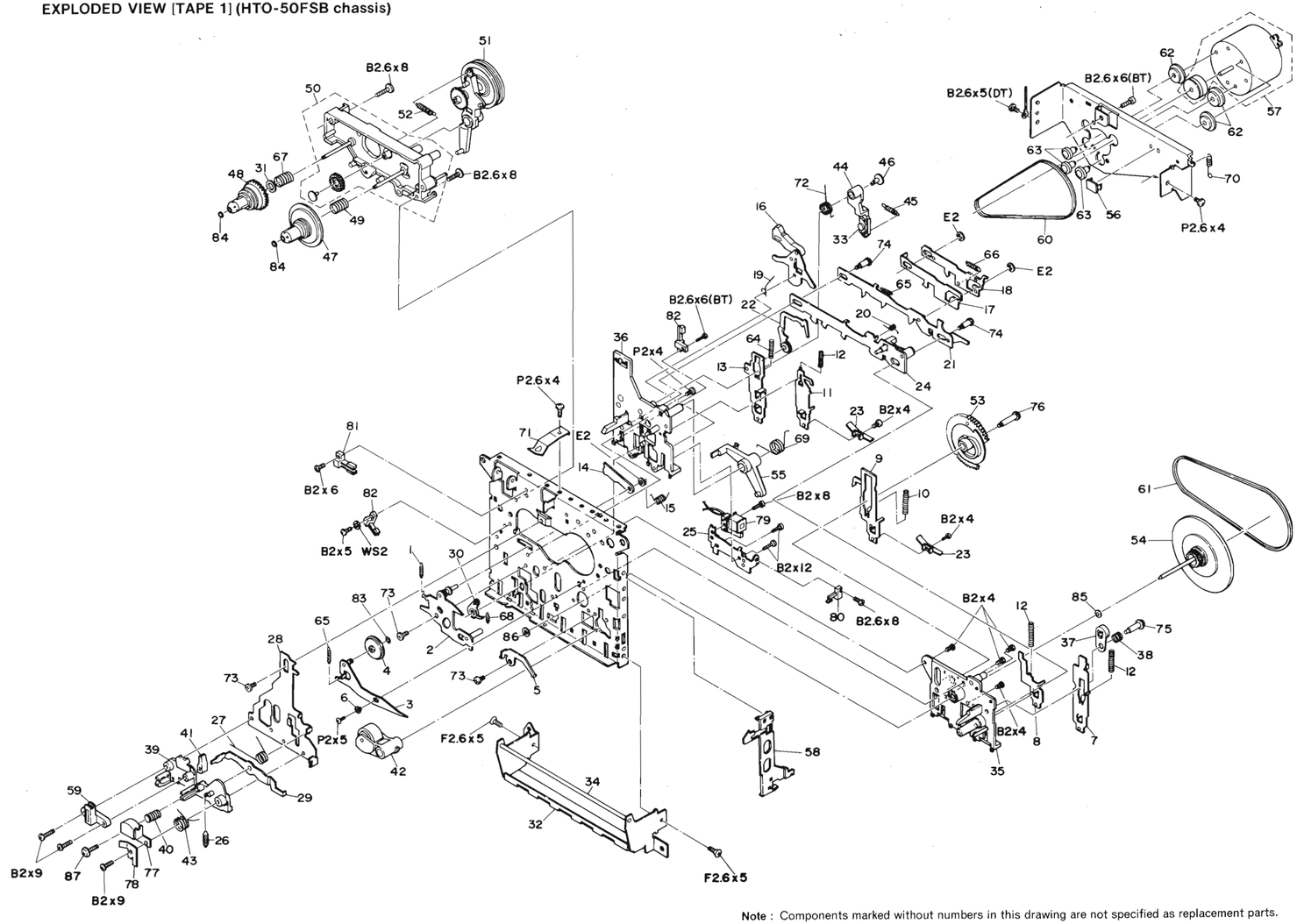
WIRING DIAGRAM



REPLACEMENT PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		HTO-50FSB chassis [TAPE 1]
1	6544361	SPRING
2	7359271	SHIFT ARM ASSEMBLY
3	7359211	IDLER ARM ASSEMBLY
4	6778041	PLAY IDLER
5	7359111	PAUSE ARM
6	7570841	COLLER
7	7359121	PAUSE LEVER ASSEMBLY
8	7359141	STOP LEVER
9	7362801	F.F LEVER
10	6521671	FF LEVER SPRING
11	7362791	REWIND LEVER
12	6521661	REWIND LEVER SPRING
13	7362771	PLAY LEVER ASSEMBLY
14	7359221	REC LEVER (B)
15	6549431	REC LEVER SPRING
16	7362731	REVIEW/CUE ARM ASSEMBLY
17	7359231	LOCK CAM (S)
18	7359241	LOCK CAM (R)
19	6549801	SPRING
20	6549491	AUTO ARM SPRING
21	7359051	LOCK CAM (B) ASSEMBLY
22	7359071	TRIGGER ARM
23	7360441	SWITCH LEVER (FR)
24	7359091	LOCK CAM (C) ASSEMBLY
25	7358941	SOLENOID BRACKET
26	6544351	SPRING
27	6549791	SPRING
28	7362821	HEAD PLATE
29	7359041	AUTO STOP ARM
30	7358951	REVIEW/CUE LOCK ARM (N) ASSEMBLY
31	7789071	WASHER
32	7362851	BUTTON HOLDER
33	7559981	CHIP SHAFT
34	4500021	BUTTON SHAFT
35	6778841	LEVER HOLDER (A) ASSEMBLY
36	6778011	LEVER HOLDER (B)
37	6777991	PAUSE CAM
38	6521681	PAUSE CAM SPRING
39	6777981	HEAD BASE
40	6521682	HEAD SPRING
41	6777861	SENSOR CAP
42	6344701	PRESSURE ROLLER ASSEMBLY
43	6549841	SPRING
44	6777871	SOLENOID ARM
45	6544281	SOLENOID ARM SPRING
46	6778051	BUSH
47	6414951	TAKE-UP REEL ASSEMBLY
48	6414961	SUPPLY REEL ASSEMBLY
49	6521642	BACK TENTION SPRING
50	6777941	REEL BASE ASSEMBLY
51	6779561	CLUTCH ARM ASSEMBLY
52	6544291	CLUTCH ARM SPRING
53	6433451	GEAR
54	6374741	FLYWHEEL ASSEMBLY
55	6779391	ROCK ARM
56	6777821	CAPSTAN SPACER
57	5577914	DC MOTOR ASSEMBLY
58	6777811	EJECT LEVER
59	6777801	TAPE GUIDE
60	6356031	BELT
61	6356131	FLYWHEEL BELT
62	6587211	MOTOR CUSHION
63	7775221	SCREW
64	6521651	LEVER SPRING
65	6544171	CAM SPRING
66	6544172	S CAM SPRING
67	6521891	BACK TENTION SPRING
68	6549851	SPRING
69	6544381	SPRING
70	6544371	SPRING
71	6537241	CASSETTE HOLDER SPRING
72	6549441	TRIGGER ARM SPRING
73	7783501	SCREW
74	7783511	SCREW
75	7783521	SCREW
76	7783531	SCREW
77	5447641	PLAYBACK HEAD
78	7351741	EARTH PLATE
79	5644271	SOLENOID
80	5603781	LEAF SWITCH (S13)
81	5603791	LEAF SWITCH (S12)
82	5603801	LEAF SWITCH (S10)
83	7787695	POLY SLIDER WASHER
84	7787711	POLY SLIDER WASHER
85	7787692	POLY SLIDER WASHER
86	7768234	POLY SLIDER WASHER
87	7780555	FLAT SCREW-2MMD×9MM

EXPLODED VIEW [TAPE 1] (HTO-50FSB chassis)

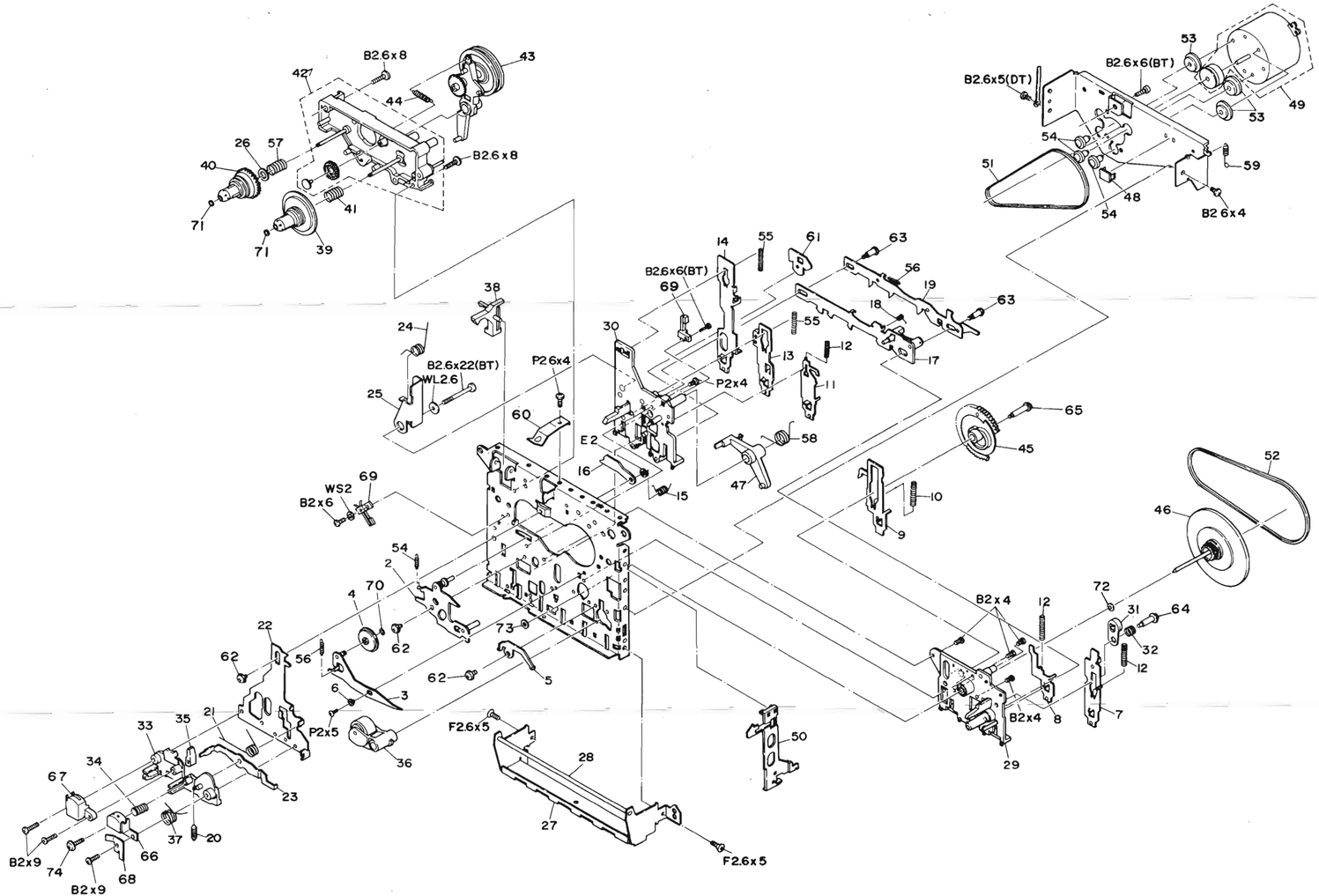


Note : Components marked without numbers in this drawing are not specified as replacement parts.

REPLACEMENT PARTS LIST

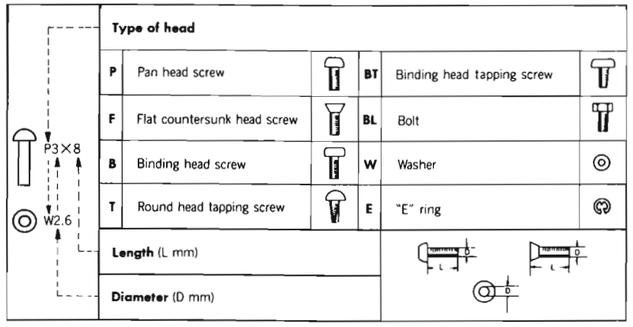
SYMBOL-NO	P-NO	DESCRIPTION
		HTO-50FB chassis (TAPE 2)
1	6544361	SPRING
2	7359271	SHIFT ARM ASSEMBLY
3	7359211	IDLER ARM ASSEMBLY
4	6778041	PLAY IDLER
5	7359111	PAUSE ARM
6	7570841	COLLER
7	7359121	PAUSE LEVER ASSEMBLY
8	7359141	STOP LEVER
9	7362801	F.F LEVER
10	6521671	FF LEVER SPRING
11	7362791	REWIND LEVER
12	6521661	REWIND LEVER SPRING
13	7362781	PLAY LEVER
14	7359251	REC LEVER
15	6549431	REC LEVER SPRING
16	7362751	RECORD LEVER
17	7362741	LOCK CAM ASSEMBLY
18	6549491	AUTO ARM SPRING
19	7359061	LOCK CAM (B) ASSEMBLY
20	6544351	SPRING
21	6549791	SPRING
22	7362821	HEAD PLATE
23	7359041	AUTO STOP ARM
24	6549811	SPRING
25	7362711	RECORD ARM
26	7789071	WASHER
27	7362841	BUTTON HOLDER
28	4500021	BUTTON SHAFT
29	6777841	LEVER HOLDER (A) ASSEMBLY
30	6778011	LEVER HOLDER (B)
31	6777991	PAUSE CAM
32	6521681	PAUSE CAM SPRING
33	6777981	HEAD BASE
34	6521682	HEAD SPRING
35	6777861	SENSOR CAP
36	6344701	PRESSURE ROLLER ASSEMBLY
37	6549841	SPRING
38	6777971	REC SENSOR
39	6414951	TAKE-UP REEL ASSEMBLY
40	6414961	SUPPLY REEL ASSEMBLY
41	6521642	BACK TENTION SPRING
42	6777941	REEL BASE ASSEMBLY
43	6779561	CLUTCH ARM ASSEMBLY
44	6544291	CLUTCH ARM SPRING
45	6433451	GEAR
46	6374741	FLYWHEEL ASSEMBLY
47	6779391	ROCK ARM
48	6777821	CAPSTAN SPACER
49	5577914	DC MOTOR ASSEMBLY
50	6777811	EJECT LEVER
51	6356U31	BELT
52	6356131	FLYWHEEL BELT
53	6587211	MOTOR CUSHION
54	7775221	SCREW
55	6521651	LEVER SPRING
56	6544171	CAM SPRING
57	6521891	BACK TENTION SPRING
58	6544381	SPRING
59	6544371	SPRING
60	6537241	CASSETTE HOLDER SPRING
61	7360351	INTER LOCK ARM
62	7783501	SCREW
63	7783511	SCREW
64	7783521	SCREW
65	7783531	SCREW
66	5449351	RECORD/PLAYBACK HEAD
67	5445531	ERASE HEAD
68	7351741	EARTH PLATE
69	5603801	LEAF SWITCH (S9, S11)
70	7787695	POLY SLIDER WASHER
71	7787711	POLY SLIDER WASHER
72	7787692	POLY SLIDER WASHER
73	7768234	POLY SLIDER WASHER
74	7780555	FLAT SCREW-2MMD×9MM

EXPLODED VIEW [TAPE 2] (HTO-50FB chassis)



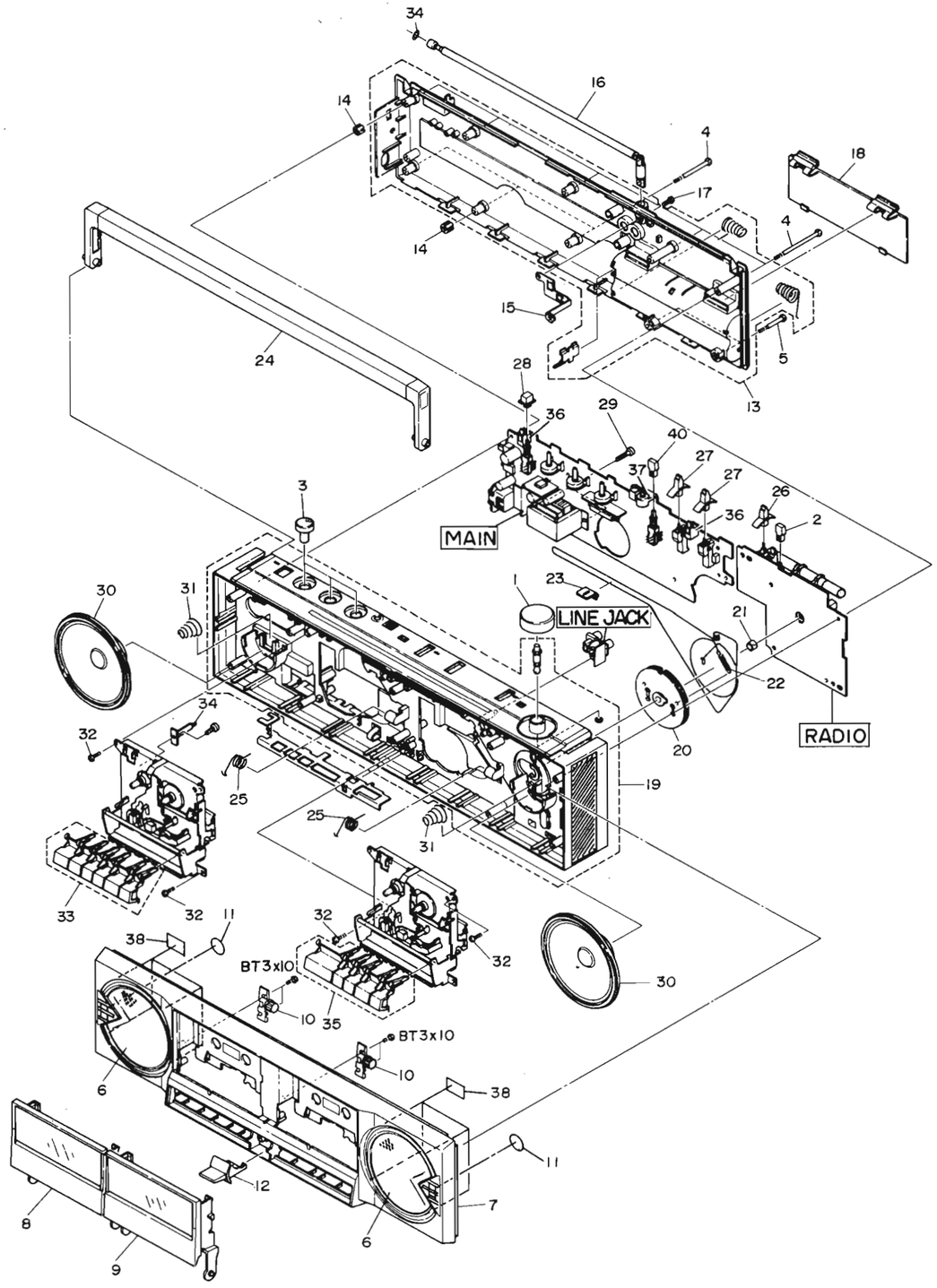
Note : Components marked without numbers in this drawing are not specified as replacement parts.

SYMBOL-NO	P-NO	DESCRIPTION
		MISCELLANEOUS
1	6289652	TUNING KNOB
2	6057852	PUSH BUTTON (FM MODE)
3	6284412	KNOB (VOLUME, TONE, MIC. VOLUME)
4	7781303	TAPPING SCREW-3MMDX8MM
5	7781148	BT SCREW-3MMDX5MM
6	6661351	SPEAKER METAL
7	6227821	FRONT CASE ASSEMBLY (RED)
7	6227822	FRONT CASE ASSEMBLY (GRAY)
7	6227823	FRONT CASE ASSEMBLY (GOLD)
8	6094945	CASSETTE LID ASSEMBLY (TAPE2)
9	6094955	CASSETTE LID ASSEMBLY (TAPE1)
10	6779551	DAMPER ASSEMBLY
11	5419073	SPEAKER-TWEETER
12	6060782	BUTTON (DUBBING)
13	6010431	REAR CASE ASSEMBLY (RED) [W]
13	6010432	REAR CASE ASSEMBLY (GRAY) [W]
13	6010433	REAR CASE ASSEMBLY (GOLD) [W]
13	6010411	REAR CASE ASSEMBLY (RED) [H]
13	6010412	REAR CASE ASSEMBLY (GRAY) [H]
13	6010413	REAR CASE ASSEMBLY (GOLD) [H]
13	6010414	REAR CASE ASSEMBLY (RED) [HC]
13	6010415	REAR CASE ASSEMBLY (GRAY) [HC]
13	6010416	REAR CASE ASSEMBLY (GOLD) [HC]
14	5687671	CAP TERMINAL
15	7360411	ANTENNA TERMINAL
16	5752742	TELESCOPIC ANTENNA
17	8744410	BINDING SCREW-3MMDX10MM
18	6175016	BATTERY LID (RED)
18	6175017	BATTERY LID (GRAY)
18	6175012	BATTERY LID (GOLD)
19	6039416	FRAME CHASSIS ASSEMBLY (RED)
19	6039417	FRAME CHASSIS ASSEMBLY (GRAY,GOLD)
20	6423421	PULLEY
21	6310162	RING SPRING
22	6316232	SPRING M
23	6393091	POINTER
24	6335251	HANDLE ASSEMBLY (RED)
24	6335252	HANDLE ASSEMBLY (GRAY)
24	6335192	HANDLE ASSEMBLY (GOLD)
25	6549563	LID SPRING
26	6276201	LEVER KNOB
27	6276211	LEVER KNOB
28	6059631	PUSH BUTTON (POWER)
29	7781146	BT SCREW-3MMDX20MM
30	5405562	SPEAKER-10CM
31	6521771	SPRING FOR SPEAKER
32	8699410	BT BIND HEAD SCREW-3MMDX10MM (BLACK)
33	6060801	CASSETTE BUTTON (TAPE2)
34	6537632	RECORD SPRING
35	6060791	CASSETTE BUTTON (TAPE1)
36	6778851	LED HOLDER
37	6591651	MIC HOLDER
38	7737164	SPACER
39	6591791	RING
40	6061211	PUSH BUTTON (REC MUTE)
		CAPACITORS
C3LR	0201036	CERAMIC CHIP 270PF+-5% 50V
C5LR	0201065	CERAMIC CHIP 0.022UF+-10% 25V
C6LR	0201007	CERAMIC CHIP 0.01UF+-20% 50V
CT101-102	5052781	VARIABLE CAPACITOR
CT151-152	5052781	VARIABLE CAPACITOR
CT153	5056191	TRIMMER 10PF
CV101-102	5052781	VARIABLE CAPACITOR
CV151-152	5052781	VARIABLE CAPACITOR
C107	0246444	CERAMIC DISC 15PF+-5%
C109	0246413	CERAMIC DISC, 3PF+-0.25PF HP-U



When ordering hardware excluding stated on these lists, be sure to make your orders with type and size.

EXPLODED VIEW (Cabinet)



Note : Components marked without numbers in this drawing are not specified as replacement parts.

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C157	0246429	CERAMIC, DISC CAPACITOR 9PF
C158	0256170	ELECTROLYTIC 1000μF, 10V
C208-209	0209027	CERAMIC (RESISTOR SHAPE) 0.015μF+-30%
C220	0209026	CERAMIC DISC (RESISTOR SHAPE) 0.01μF+-30%
C307LR	0209027	CERAMIC (RESISTOR SHAPE) 0.015μF+-30%
C702	0256362	TANTALUM 0.22μF,25V
		RESISTORS
R1LR	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2LR	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R3LR	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R4LR	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R5LR	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
RC601-602	0186451	CR PACK
RT301	5007696	SEMI VARIABLE 5KOHM(B)
RT401LR	5007439	SEMI VARIABLE 220KOHM
RT701	5007477	SEMI VARIABLE 10KOHM
RT801-804	5007435	SEMI VARIABLE 10KOHM
RV401	5001181	VARIABLE RESISTOR 10KOHM(A)
RV402LR	5001174	VARIABLE RESISTOR 10KOHM(B)
RV403LR	5001201	VARIABLE RESISTOR 10KOHM(B)
		SEMI-CONDUCTORS
D101	5331592	DIODE 1SS133
D102	5330574	DIODE 1S2473
D103	5330661	DIODE SILICON 1S2790
D301	5330574	DIODE 1S2473
D401-402	5332111	MA154WK
D403-404	5332111	MA154WK
D405-407	5331592	DIODE 1SS133
D408	5331592	DIODE 1SS133
D451LR	5332111	DIODE MA154WK
D601	5331451	DIODE SRP02-100NLF
D602	5331452	DIODE SRN02-100NLF
D603	5330574	DIODE 1S2473
D701	5331592	DIODE 1SS133
D702-703	5332111	DIODE MA154WK
IC101	5351902	IC AN7213A
IC201	5355441	IC AN7223
IC301	5352961	IC AN7410N
IC401-402	5363801	IC M51162
IC501	5352141	IC HA1392
IC701	5364151	IC LA2010
LED301	5381621	LED LN242RPH-LF
LED601-602	5381621	LED LN242RPH-LF
Q1LR	5329192	MICRO PACKAGE TRANSISTOR 2SC2462O
Q2LR	5329632	MICRO PACKAGE TRANSISTOR 2SD1306(NE)
Q3LR	5329791	MICRO PACKAGE TRANSISTOR DTC124K(25)
Q101	5321271	TRANSISTOR SILICON 2SC1674L
Q201	5321281	TRANSISTOR SILICON 2SC1675-L
Q401	5321293	TRANSISTOR 2SC1740LN-R
Q403-404	5323561	TRANSISTOR DTC124F
Q405LR	5323561	TRANSISTOR DTC124F

SYMBOL-NO	P-NO	DESCRIPTION
Q451LR	5323561	TRANSISTOR DTC124F
Q452LR	5323561	TRANSISTOR DTC124F
Q601	5320643	TRANSISTOR 2SC1162WT-C
Q701	5322213	TRANSISTOR 2SC1741R
Q702	5321293	TRANSISTOR 2SC1740LN-R
Q703	5323561	TRANSISTOR DTC124F
Q801-802	5321253	TRANSISTOR 2SA844E
Q803	5323261	TRANSISTOR 2SC2785EF
ZD601	5331583	DIODE RD6.2E-B3
		TRANSFORMERS
⚠PT	5213604	POWER TRANSFORMER
T101	5140071	FM IF TRANSFORMER
		COILS
L1LR	5150571	CHOKE COIL 33MH
L2LR	5150578	CHOKE COIL
L101	5126482	FM RF
L102	5126278	FM OSILLATOR COIL
L103	5152324	CHOKE COIL 100UH+-10%
L151-152	5117911	FERRITE ANTENNA
L153	5124261	SW OSCILLATOR COIL
L154	5120518	MW OSCILLATOR COIL
L201	5152349	CHOKE COIL 820MH
L202	5152346	CHOKE COIL 470UH+-10%
L203	5152324	CHOKE COIL 100UH+-10%
L301	5150571	CHOKE COIL 33MH
L302	5150571	CHOKE COIL 33MH
L401	5260982	OSCILLATOR BLOCK
		MISCELLANEOUS
	5421891	BUILT-IN MICROPHONE
BP101	5161551	FILTER
CF201	5160303	CERAMIC FILTER 10.7MHZ
CF203	5160061	CERAMIC FILTER 455KHZ
CF204	5160383	CERAMIC FILTER 10.7MHZ
⚠F001	5721252	FUSE 1.2A
JK401	5673382	JACK-3.5MMD(MIC)
JK402	5676322	2P PIN JACK(LINE IN)
JK501	5673431	HEADPHONE JACK
⚠JK601	5652452	AC SOCKET
S 1	5623492	SLIDE SWITCH(REC/P.B.)
S 2	5624412	SLIDE SWITCH(RIF)
S 3	5604565	LEVER SWITCH(FUNCTION)
S 4	5604562	LEVER SWITCH(DUBBING)
S 5	5634418	PUSH SWITCH(POWER)
⚠S 6	5612561	ROTARY SWITCH(VOLTAGE SELECTOR)
S 7	5634612	PUSH SWITCH(REC. MUTE)
S101	5604623	LEVER SWITCH(BAND)
S301	5633901	PUSH SWITCH(FM MODE)
		FOR ACCESSARIES
⚠	5662301	SIEMENS PLUG(W)
⚠	5660212	SIEMENS PLUG(H)
⚠	5747472	POWER CORD(W)
⚠	5747262	POWER CORD(H/HC)

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Printed in Japan (H.E.C1)