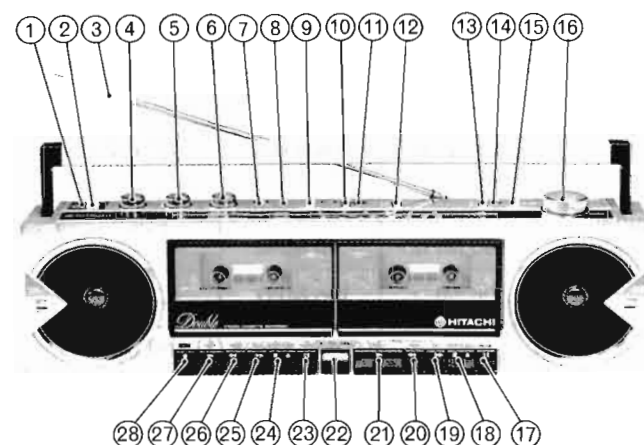


HITACHI

SERVICE MANUAL

RECEIVED JUN 3 0 1984



TK No. 2107E

TRK-W4H/HC/W

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

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KEY TO ILLUSTRATIONS

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

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 Δ 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

TRK-W4H/HC/W

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 :	100mm, 4 ohms × 2 20mm, 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 (A).

* 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.

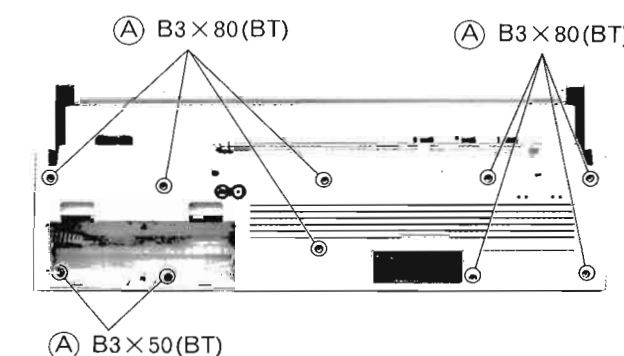


Fig. 1

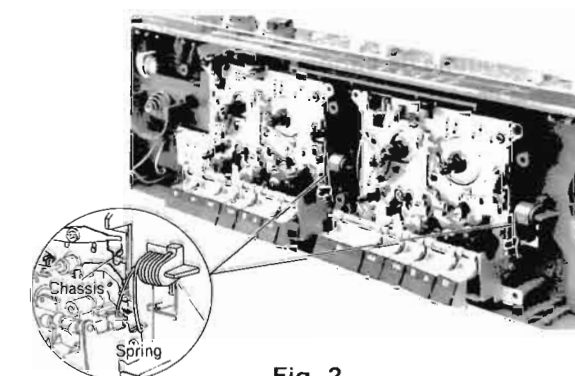
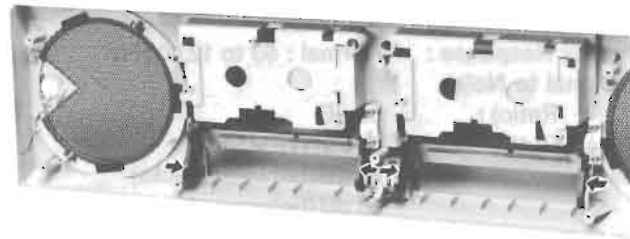


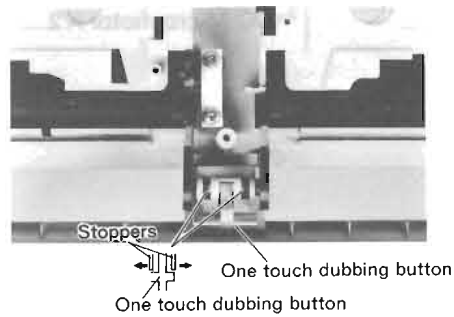
Fig. 2

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**

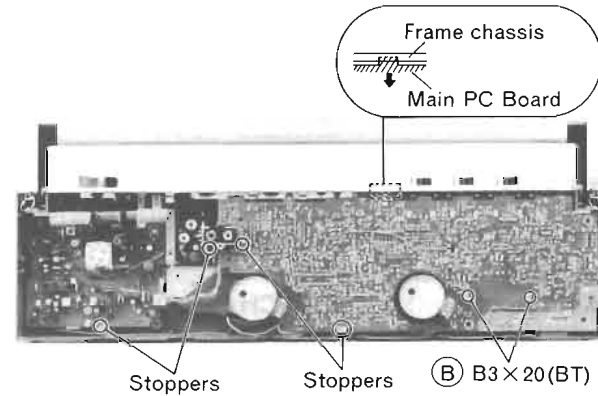
Insert a flat-tip screwdriver into the position shown in Fig. 5 to release the lock.

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.

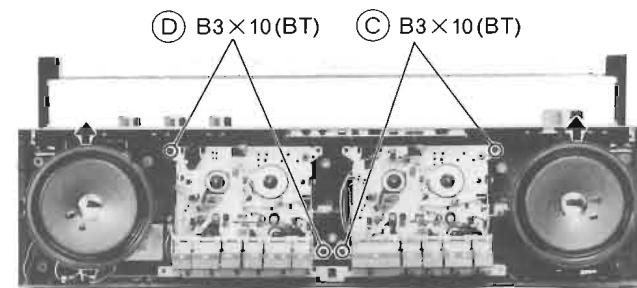
**Fig. 5****7. Cassette chassis**

Tape 1 : Remove 2 fixing screws (C).

Tape 2 : Remove 2 fixing screws (D).

8. Speaker

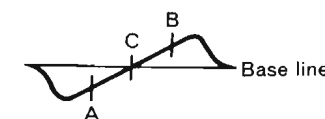
Push the speaker to remove it in the direction of the arrow.

**Fig. 6****ADJUSTMENT****1. Radio Section**

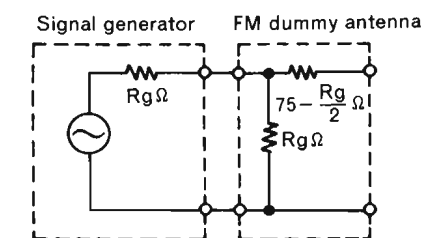
Step		Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading			
			Measuring Instrument	Input Terminal	Output Terminal							
1	(1)	FM IF	• Genescope (10.7 MHz) 108 MHz	TP103	TP301	10.7 MHz	Highest	T101	Note 1			
						108 MHz						
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)				TP101, 102 (thru FM dummy antenna) (Note 2)	Speaker terminal (4ohm load)	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)				• AM Signal generator (400 Hz, 30% mod.) • VTVM	Ferrite-core antenna (Note 4)	Speaker terminal (4ohm load)	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
	(2)		1650 kHz	Highest	CT152							
	(3)		Repeat steps (1) and (2)									
9	(1)	AM ANT. (Tracking)	• AM signal generator (400 Hz, 30% mod.) • VTVM	Ferrite-core antenna (Note 4)	Speaker terminal (4ohm load)							600 kHz
	(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.

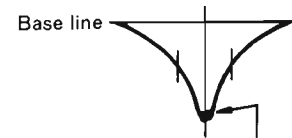


Rg : SG's output impedance

Fig. 8

3. Connect the frequency counter to 2 pin of IC301, via a resistor of 100 k Ω .
4. Connect AM signal generator to loop antenna, bring near to ferrite antenna.

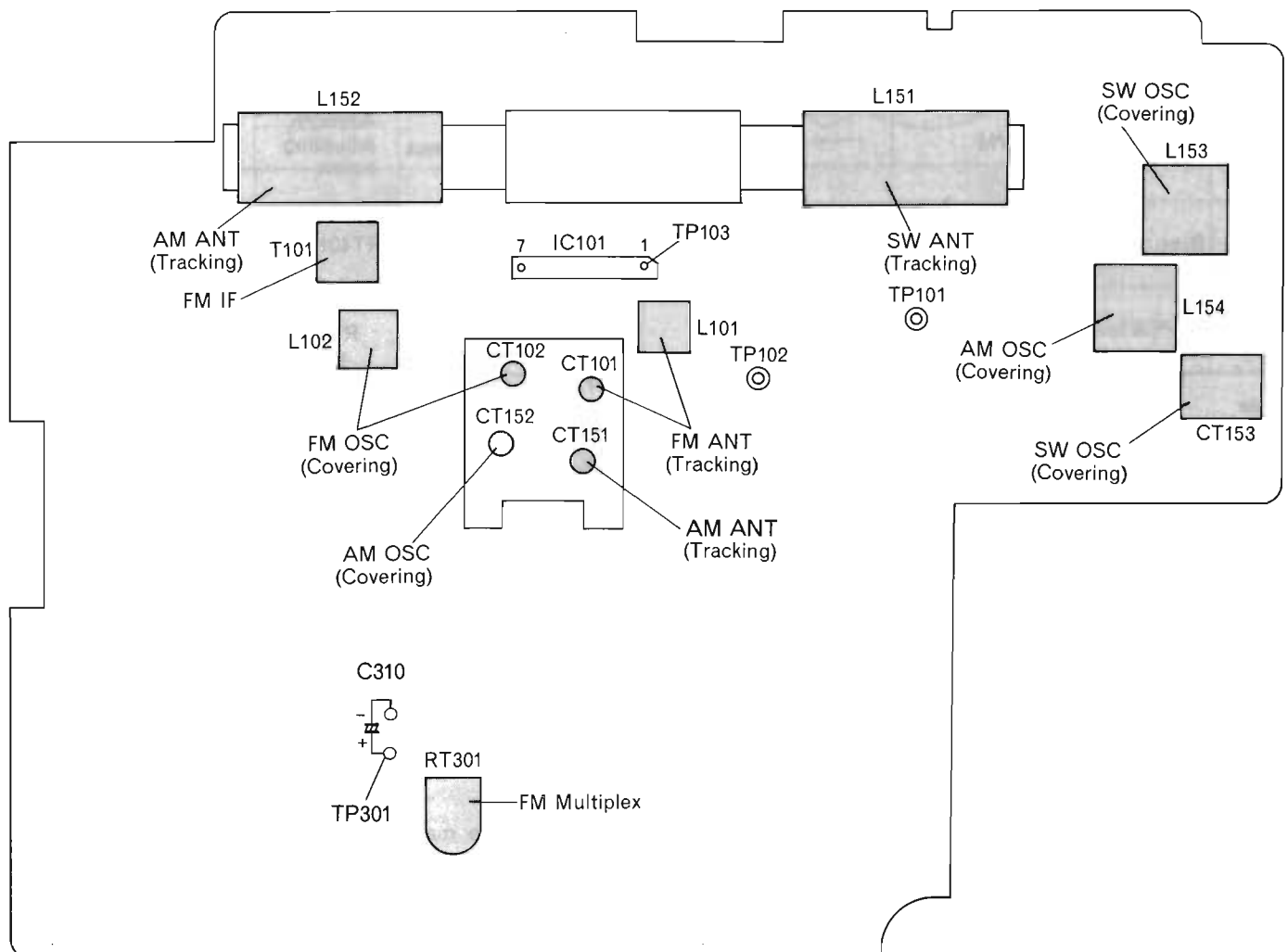
5. Feed in a weak signal from the genescope and confirm that the waveform is obtained shown in Figure 9.



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)	$6\text{kHz} \pm 20\text{Hz}$	Note 1
							RT804 (TAPE 2)		
2	Tape speed (Normal)	• Frequency counter	—	Speaker terminal (4 ohm load)	Tape speed adjustment tape (3 kHz)	Playback	RT801 (TAPE 1)	$3\text{kHz} \pm 10\text{Hz}$	Note 2
							RT803 (TAPE 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	$400 \pm 50\mu\text{A}$	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 (A) and (B).
- 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 $\pm 20\text{ Hz}$.
- 7) Release the short-circuit between patterns (A) and (B).

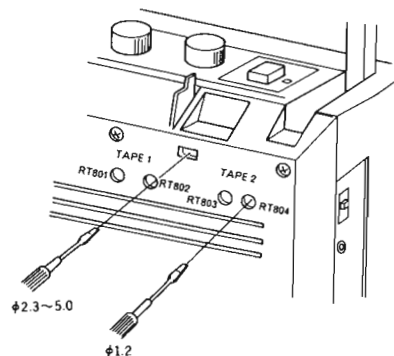
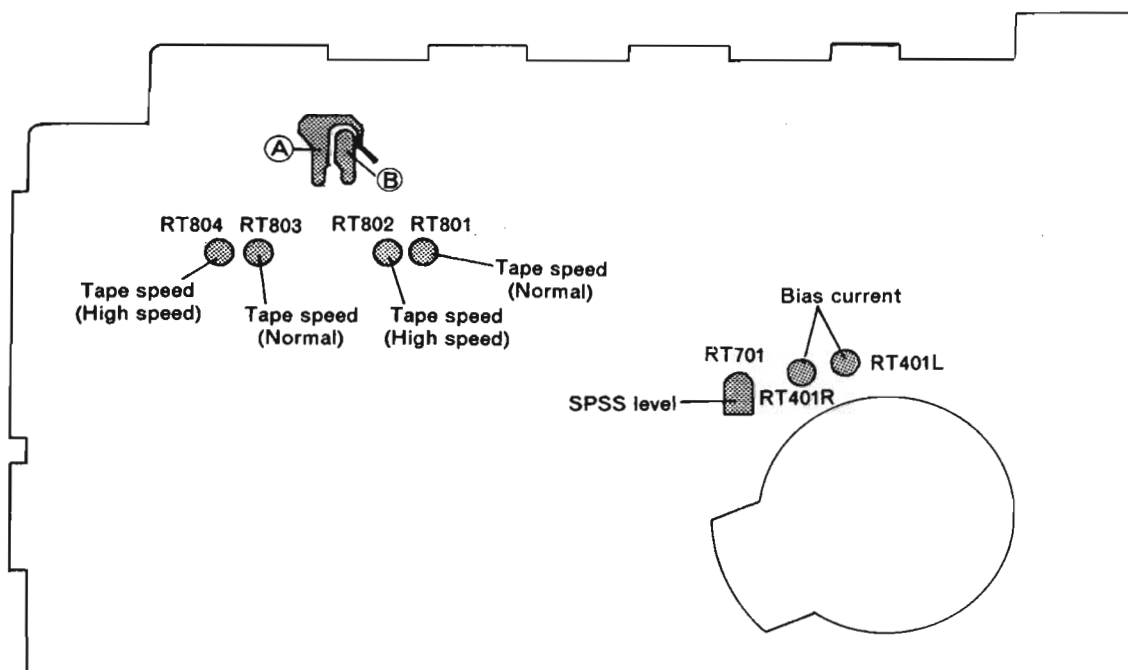


Fig. 10

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 $\pm 10\text{ Hz}$.

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 $400 \pm 50\mu\text{A}$.
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.

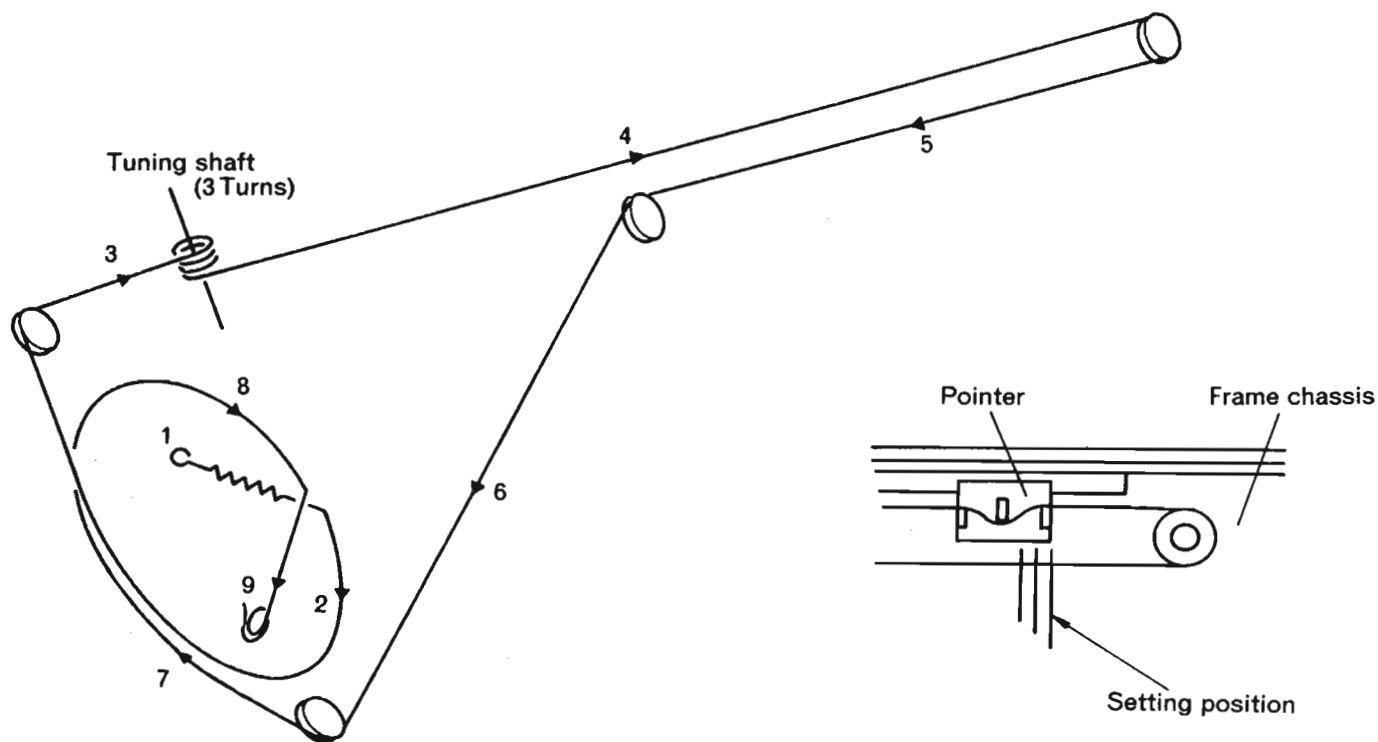


Fig. 11

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.

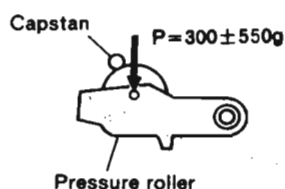


Fig. 12

LUBRICATION

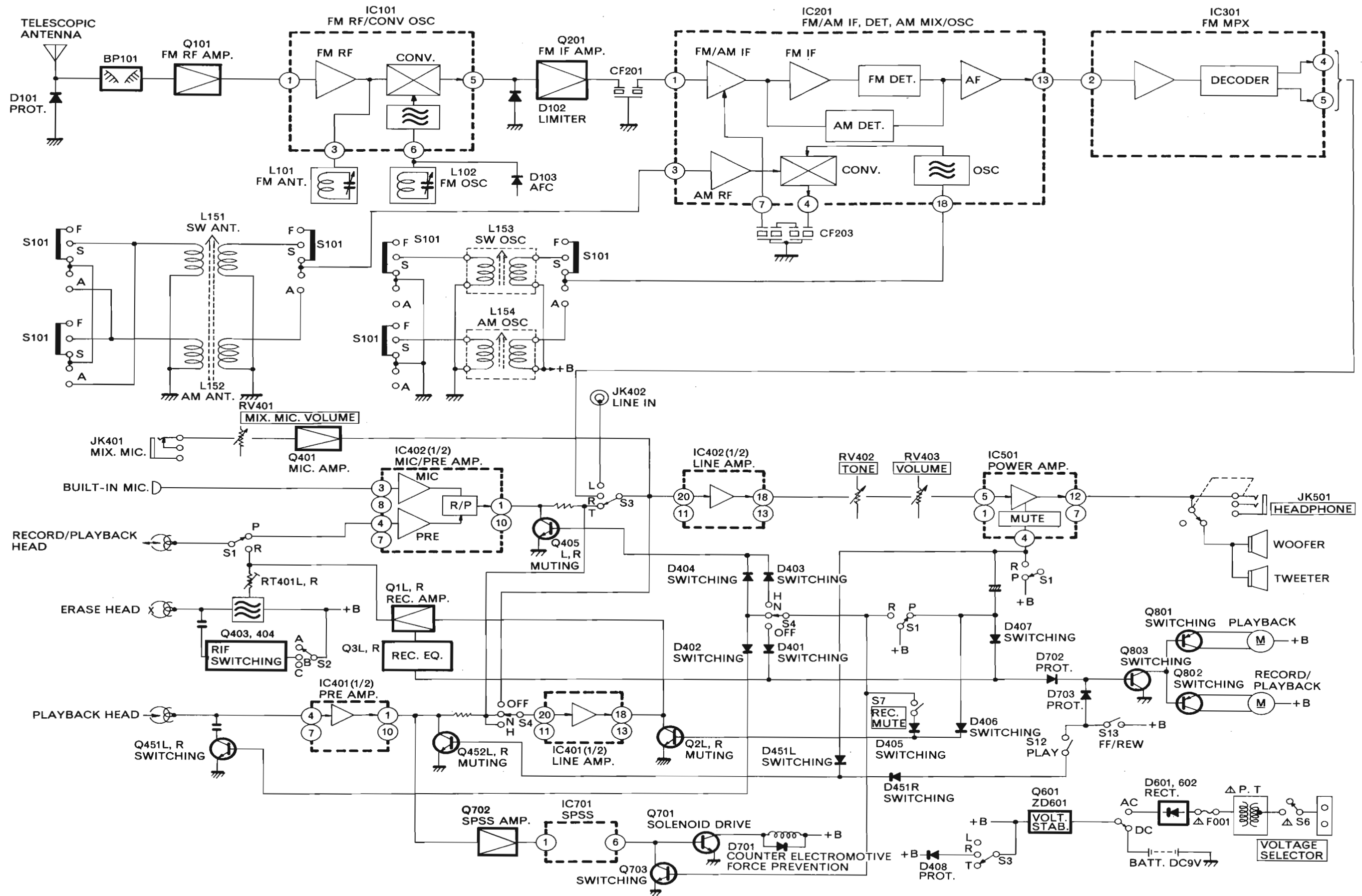
Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point.

Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use.

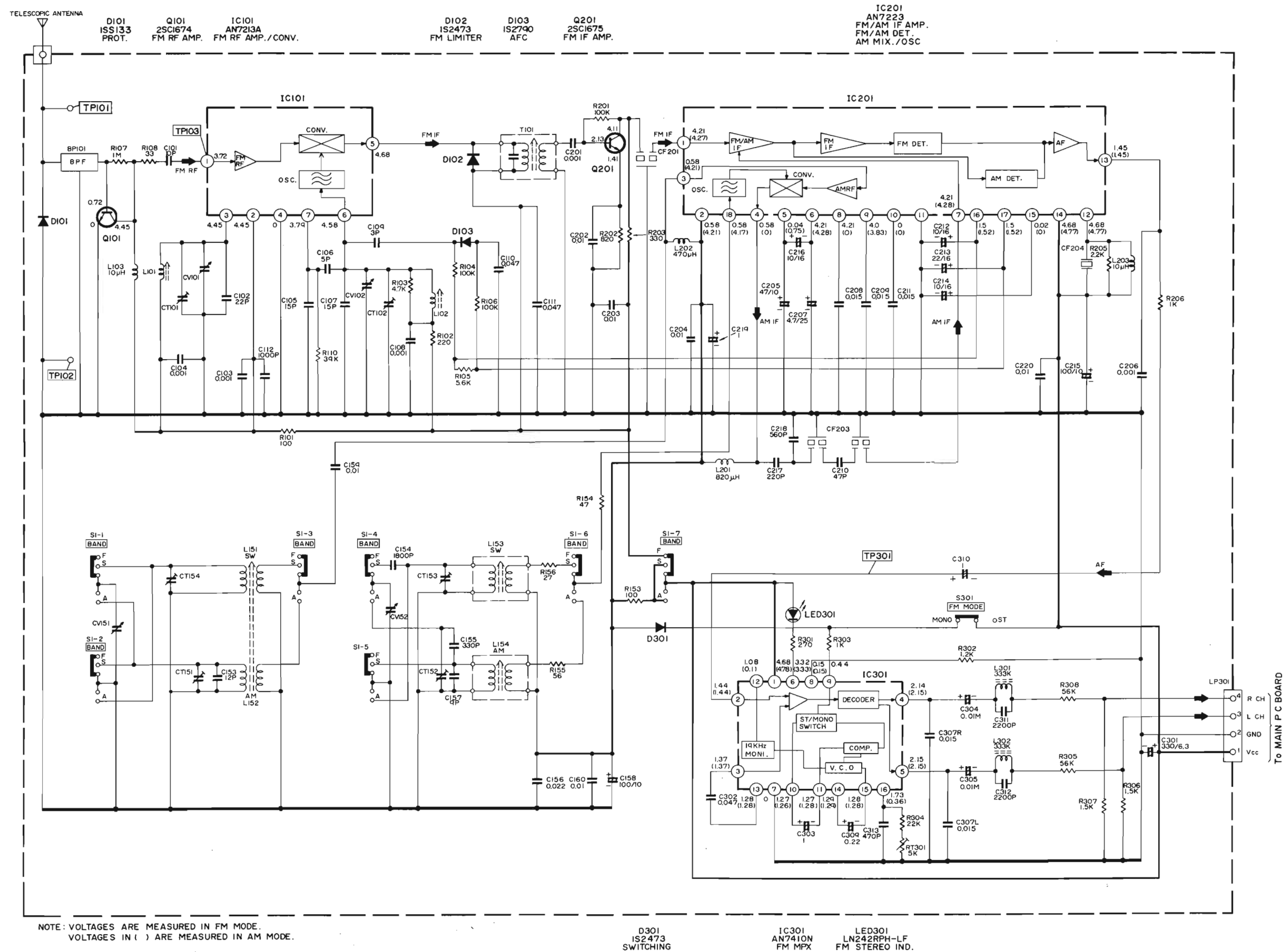
Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

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

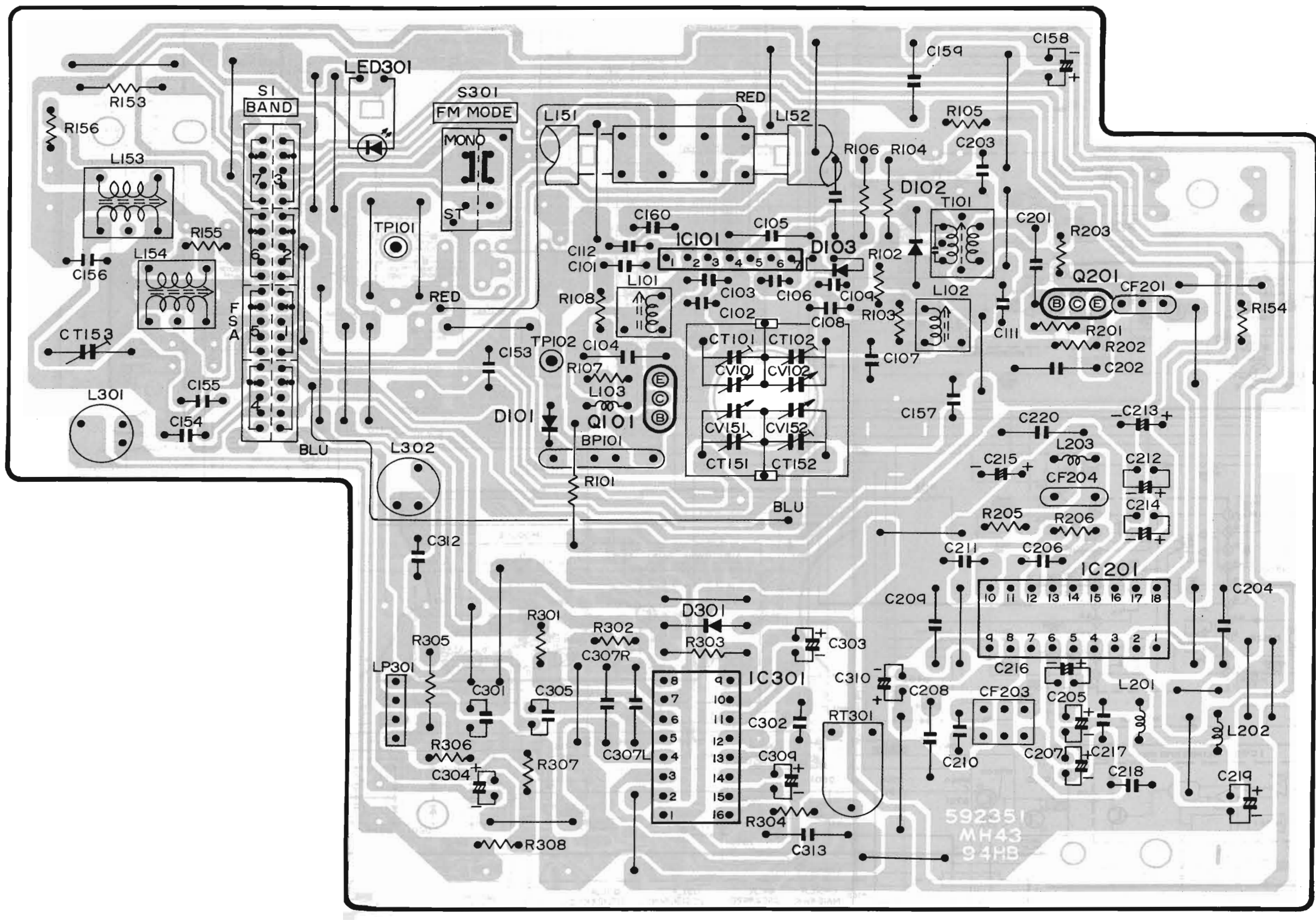
1. Voltage measured at base of chassis with minimum volume control and no signal.
2. Nomenclature of Resistors and Capacitors.

Circuit No.	
Value	No indicated Ω (Ohm) M : 1000 k Ω
Tolerance	No indicated $\pm 5\%$ K : $\pm 10\%$ M : $\pm 20\%$
Wattage	No indicated $\frac{1}{4}W$
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 $\pm 10\%$ J : $\pm 5\%$ M : $\pm 20\%$ Z : $\pm 80\%$ - 20% D : $\pm 0.5pF$ C : $\pm 0.25pF$
Sort	Ceramic Electrolytic Mylar Polyester 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



RADIO

IC101	
	FM
1	3.72V
2	4.45V
3	4.45V
4	0V
5	4.68V
6	4.58V
7	3.79V

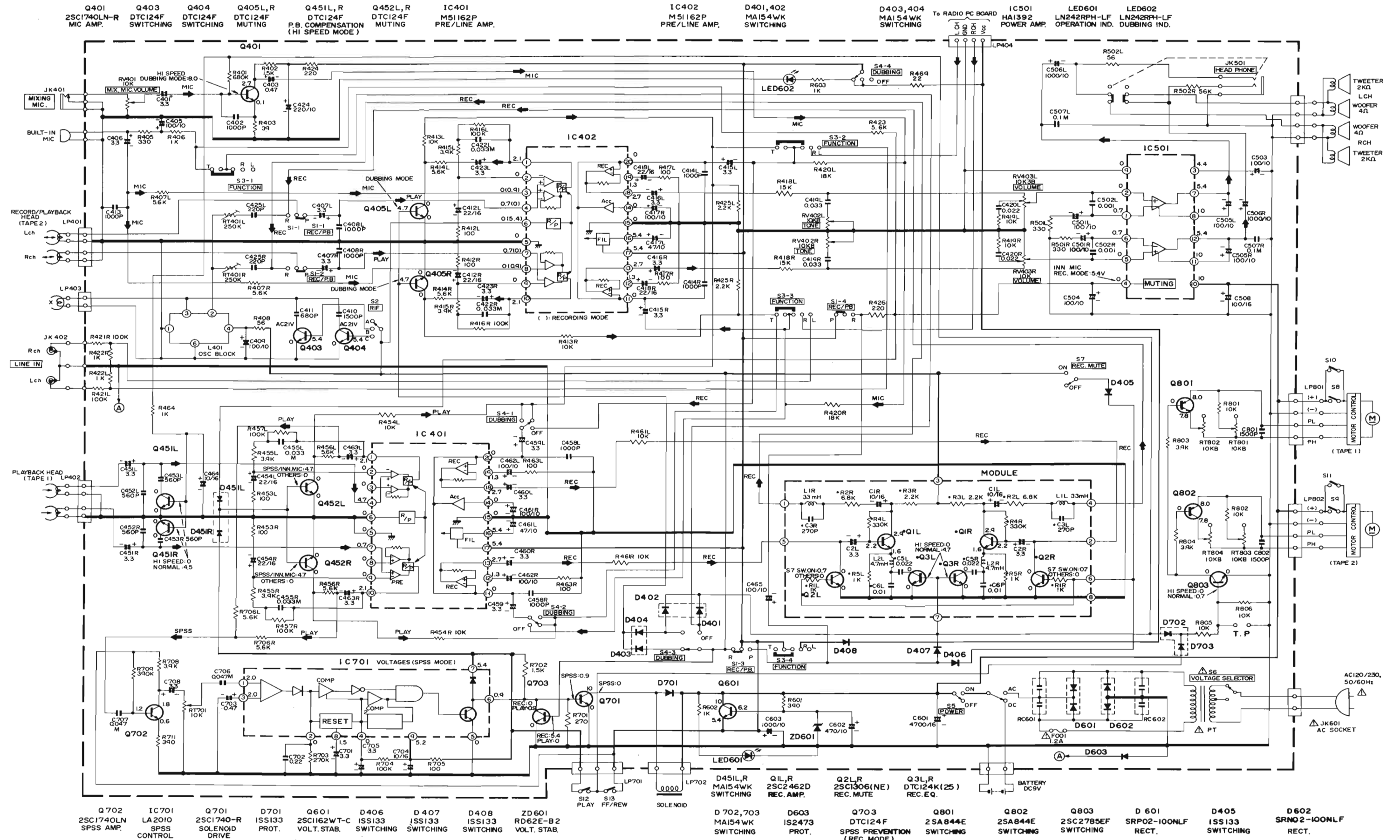
Q101	
	FM
B	0.72V
C	4.45V
E	0V

Q201	
	FM
B	2.13V
C	4.11V
E	1.41V

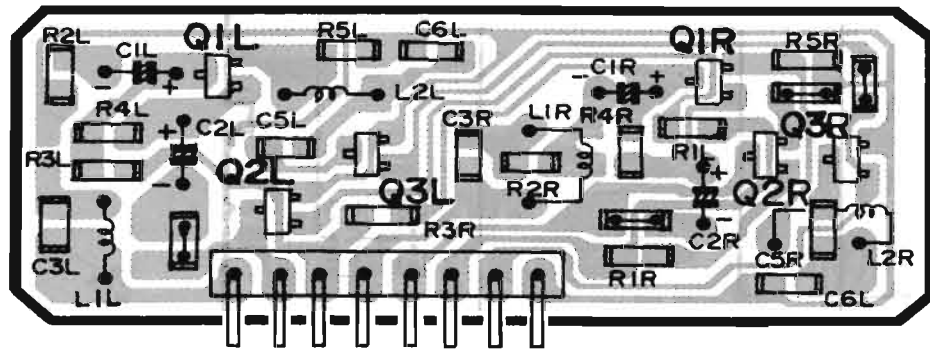
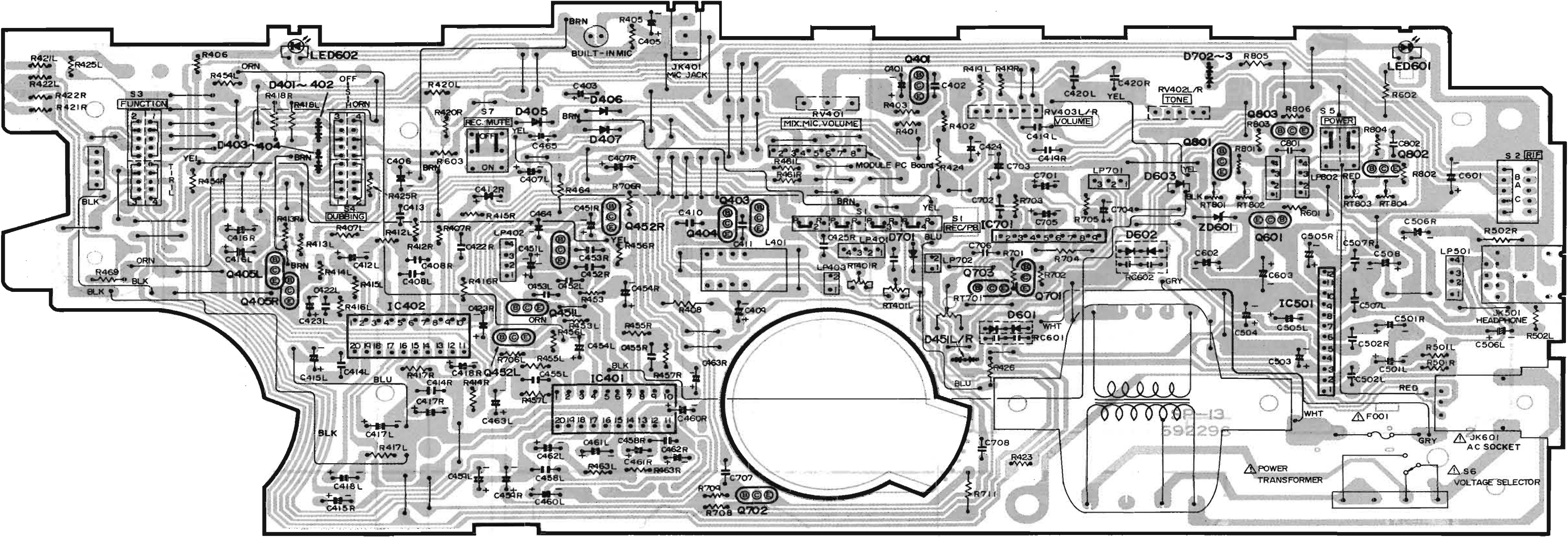
IC201		
	FM	AM
1	4.21V	4.27V
2	0.58V	4.21V
3	0.58V	4.21V
4	0.58V	0V
5	0V	1.0V
6	0.04V	0.75V
7	4.21V	4.28V
8	4.21V	4.28V
9	4.21V	0V
10	4.0V	3.83V
11	0V	0V
12	4.68V	4.77V
13	1.45V	1.45V
14	4.68V	4.77V
15	0.02V	0V
16	1.5V	1.52V
17	1.5V	1.52V
18	0.58V	4.19V

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

SCHEMATIC DIAGRAM



CIRCUIT BOARD DIAGRAM



SHOWS JUMPER CHIP
MODULE

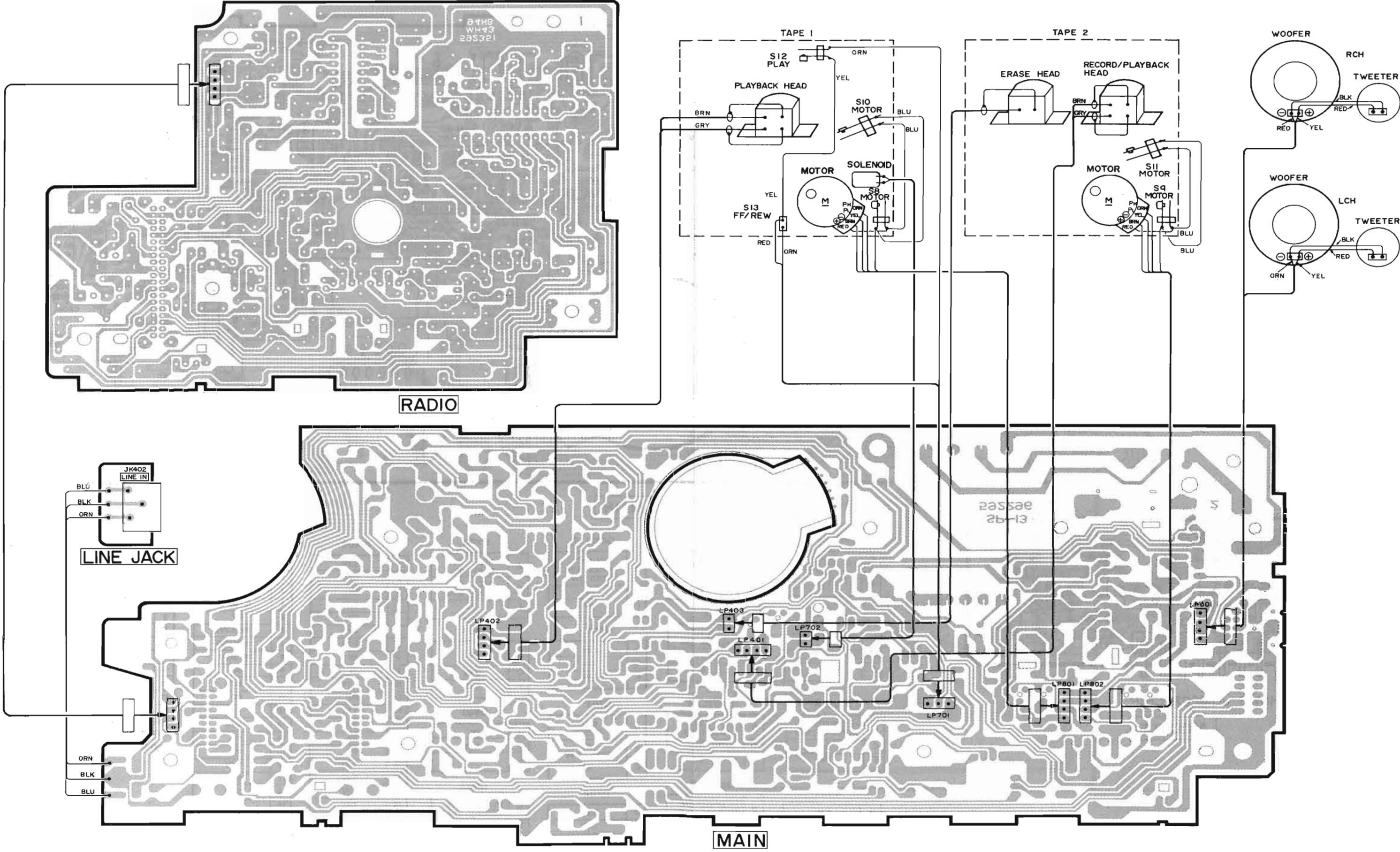
MAIN

Q1L, R		Q403		Q452L, R		Q703		IC401		IC402		IC501		IC701	
B	2.2V	B	5.4V	B	INN. MIC/ SPSS : 4.7V OTHERS : 0V	B	REC : 5.4V PLAY : 0V	1	2.1V	1	2.1V	1	0.7V	1	2.0V
C	2.9V	C	AC21V	C	0V	C	REC : 0V PLAY : 0.9V	2	0V	2	0V	2	0V	2	0V
E	1.6V	E	0V	E	0V	E	0V	3	0V	3	0V (0.9V)	3	4.4V	3	2.0V
								4	4.7V	4	0.7V (0V)	4	0V	4	0V
								5	0V	5	0V	5	0V	5	0V
								6	0V	6	0V (5.4V)	6	0.7V	6	0.9V
								7	0.7V	7	0.7V (0V)	7	5.4V	7	5.4V
								8	0V	8	0V (0.9V)	8	10V	8	1.5V
								9	0V	9	0V	9	0V	9	5.2V
								10	2.1V	10	2.1V	10	10V	SPSS MODE	
								11	0V	11	0V	11	10V		
								12	1.3V	12	1.3V	12	5.4V		
								13	2.7V	13	2.7V	PIN ④			
								14	0V	14	0V	INN MIC/REC : 5.4V			
								15	0V	15	0V				
								16	5.4V	16	5.4V				
								17	5.4V	17	5.4V				
								18	2.7V	18	2.7V				
								19	1.3V	19	1.3V				
								20	0V	20	0V				

PIN ④
INN MIC/REC : 5.4V

() : REC. MODE

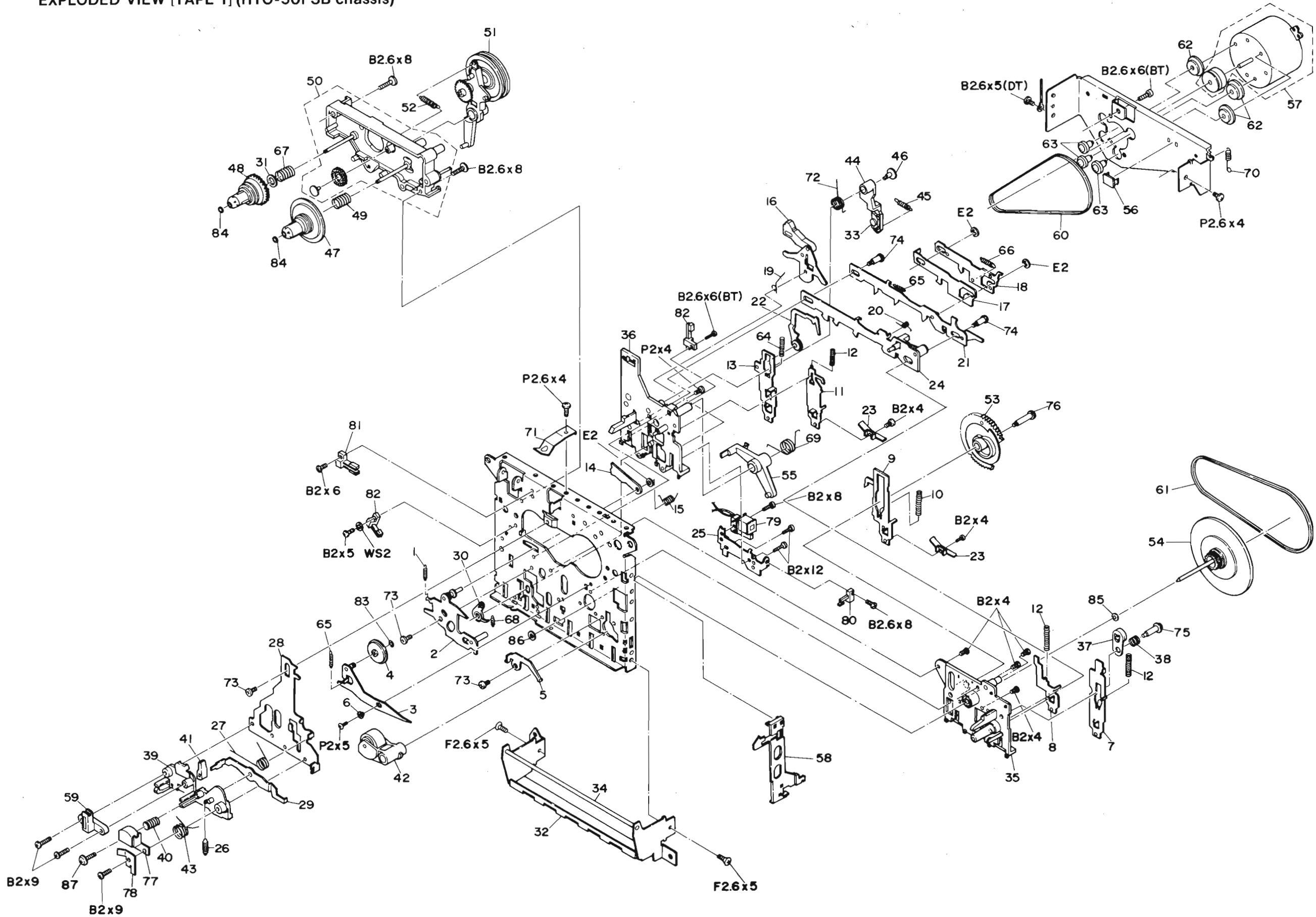
WIRING DIAGRAM



REPLACEMENT PARTS LIST

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

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
HTO-50FSB chassis [TAPE 1]					
1	6544361	SPRING	44	6777871	SOLENOID ARM
2	7359271	SHIFT ARM ASSEMBLY	45	6544281	SOLENOID ARM SPRING
3	7359211	IDLER ARM ASSEMBLY	46	6778051	BUSH
4	6778041	PLAY IDLER	47	6414951	TAKE-UP REEL ASSEMBLY
5	7359111	PAUSE ARM	48	6414961	SUPPLY REEL ASSEMBLY
6	7570841	COLLER	49	6521642	BACK TENTION SPRING
7	7359121	PAUSE LEVER ASSEMBLY	50	6777941	REEL BASE ASSEMBLY
8	7359141	STOP LEVER	51	6779561	CLUTCH ARM ASSEMBLY
9	7362801	F.F. LEVER	52	6544291	CLUTCH ARM SPRING
10	6521671	FF LEVER SPRING	53	6433451	GEAR
11	7362791	REWIND LEVER	54	6374741	FLYWHEEL ASSEMBLY
12	6521661	REWIND LEVER SPRING	55	6779391	ROCK ARM
13	7362771	PLAY LEVER ASSEMBLY	56	6777821	CAPSTAN SPACER
14	7359221	REC LEVER (B)	57	5577914	DC MOTOR ASSEMBLY
15	6549431	REC LEVER SPRING	58	6777811	EJECT LEVER
16	7362731	REVIEW/CUE ARM ASSEMBLY	59	6777801	TAPE GUIDE
17	7359231	LOCK CAM (S)	60	6356031	BELT
18	7359241	LOCK CAM (R)	61	6356131	FLYWHEEL BELT
19	6549801	SPRING	62	6587211	MOTOR CUSHION
20	6549491	AUTO ARM SPRING	63	7775221	SCREW
21	7359051	LOCK CAM (H) ASSEMBLY	64	6521651	LEVER SPRING
22	7359071	TRIGGER ARM	65	6544171	CAM SPRING
23	7360441	SWITCH LEVER (FR)	66	6544172	S CAM SPRING
24	7359091	LOCK CAM (C) ASSEMBLY	67	6521891	BACK TENTION SPRING
25	7358941	SOLENOID BRACKET	68	6549851	SPRING
26	6544351	SPRING	69	6544381	SPRING
27	6549791	SPRING	70	6544371	SPRING
28	7362821	HEAD PLATE	71	6537241	CASSETTE HOLDER SPRING
29	7359041	AUTO STOP ARM	72	6549441	TRIGGER ARM SPRING
30	7358951	REVIEW/CUE LOCK ARM (N) ASSEMBLY	73	7783501	SCREW
31	7789071	WASHER	74	7783511	SCREW
32	7362851	BUTTON HOLDER	75	7783521	SCREW
33	7559981	CHIP SHAFT	76	7783531	SCREW
34	4500021	BUTTON SHAFT	77	5447641	PLAYBACK HEAD
35	6777641	LEVER HOLDER (A) ASSEMBLY	78	7351741	EARTH PLATE
36	6778011	LEVER HOLDER (B)	79	5644271	SOLENOID
37	6777991	PAUSE CAM	80	5603781	LEAF SWITCH (S13)
38	6521681	PAUSE CAM SPRING	81	5603791	LEAF SWITCH (S12)
39	6777981	HEAD BASE	82	5603801	LEAF SWITCH (S10)
40	6521682	HEAD SPRING	83	7787695	POLY SLIDER WASHER
41	6777861	SENSOR CAP	84	7787711	POLY SLIDER WASHER
42	6344701	PRESSURE ROLLER ASSEMBLY	85	7787692	POLY SLIDER WASHER
43	6549841	SPRING	86	7768234	POLY SLIDER WASHER
			87	7780555	FLAT SCREW-2MMDX9MM

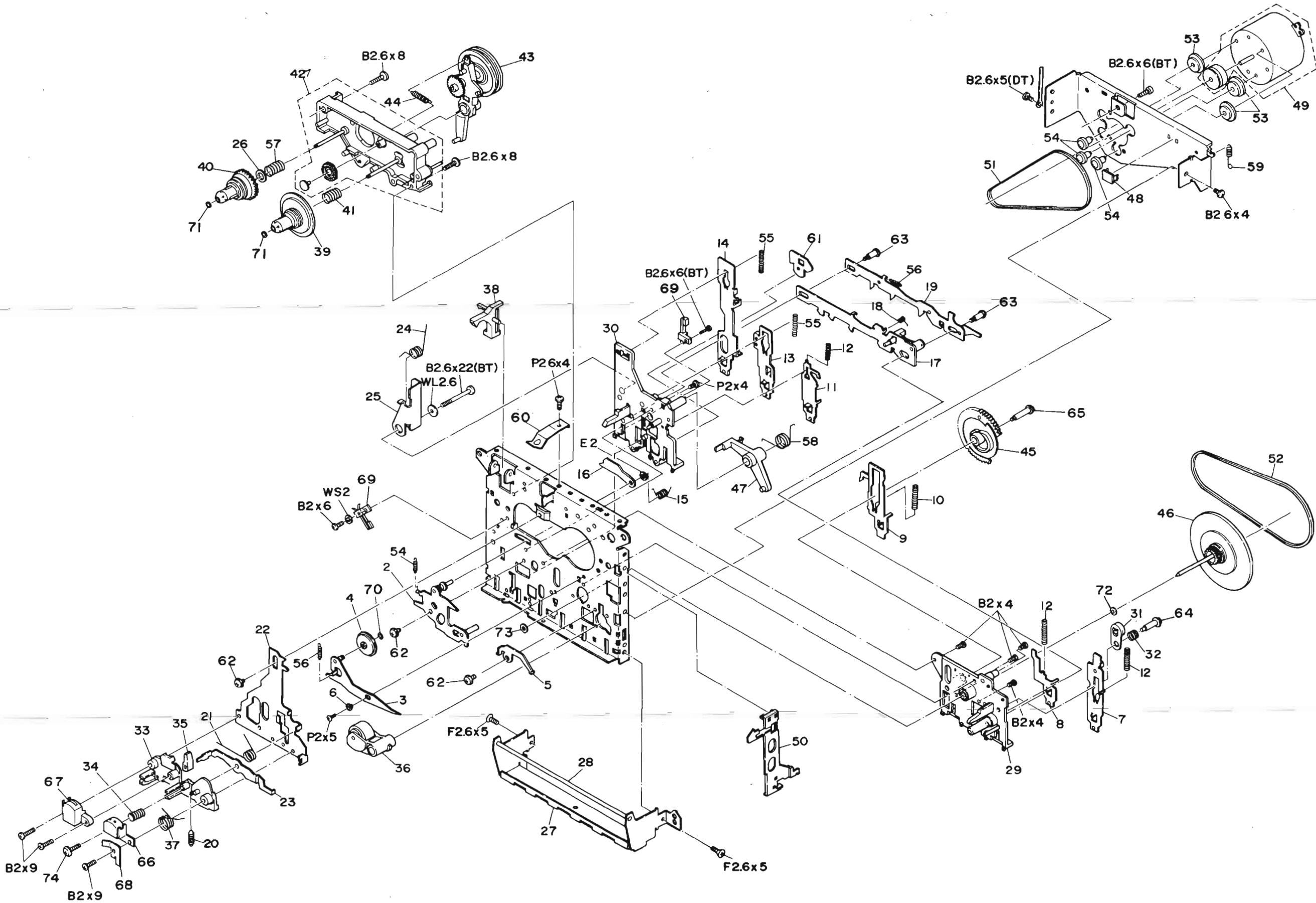


Note : Components marked without numbers in this drawing are not specified as replacement parts.

REPLACEMENT PARTS LIST

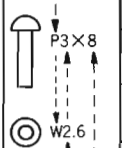
SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
HTO-50FB chassis [TAPE 2]			37	6549841	SPRING
1	6544361	SPRING	38	6777971	REC SENSOR
2	7359271	SHIFT ARM ASSEMBLY	39	6414951	TAKE-UP REEL ASSEMBLY
3	7359211	IDLER ARM ASSEMBLY	40	6414961	SUPPLY REEL ASSEMBLY
4	6778041	PLAY IDLER	41	6521642	BACK TENTION SPRING
5	7359111	PAUSE ARM	42	6777941	REEL BASE ASSEMBLY
6	7570841	COLLER	43	6779561	CLUTCH ARM ASSEMBLY
7	7359121	PAUSE LEVER ASSEMBLY	44	6544291	CLUTCH ARM SPRING
8	7359141	STOP LEVER	45	6433451	GEAR
9	7362801	F.F LEVER	46	6374741	FLYWHEEL ASSEMBLY
10	6521671	FF LEVER SPRING	47	6779391	ROCK ARM
11	7362791	REWIND LEVER	48	6777821	CAPSTAN SPACER
12	6521661	REWIND LEVER SPRING	49	5577914	DC MOTOR ASSEMBLY
13	7362781	PLAY LEVER	50	6777811	EJECT LEVER
14	7359251	REC LEVER	51	6356031	BELT
15	6549431	REC LEVER SPKING	52	6356131	FLYWHEEL BELT
16	7362751	RECORD LEVER	53	6587211	MOTOR CUSHION
17	7362741	LOCK CAM ASSEMBLY	54	7775221	SCREW
18	6549491	AUTO ARM SPRING	55	6521651	LEVER SPRING
19	7359061	LOCK CAM (B) ASSEMBLY	56	6544171	CAM SPRING
20	6544351	SPRING	57	6521891	BACK TENTION SPRING
21	6549791	SPRING	58	6544381	SPRING
22	7362821	HEAD PLATE	59	6544371	SPRING
23	7359041	AUTO STOP ARM	60	6537241	CASSETTE HOLDER SPRING
24	6549811	SPRING	61	7360351	INTER LOCK ARM
25	7362711	RECORD ARM	62	7783501	SCREW
26	7789071	WASHER	63	7783511	SCREW
27	7362841	BUTTON HOLDER	64	7783521	SCREW
28	4500021	BUTTON SHAFT	65	7783531	SCREW
29	6777841	LEVER HOLDER (A) ASSEMBLY	66	5449351	RECORD/PLAYBACK HEAD
30	6778011	LEVER HOLDER (B)	67	5445531	ERASE HEAD
31	6777991	PAUSE CAM	68	7351741	EARTH PLATE
32	6521681	PAUSE CAM SPRING	69	5603801	LEAF SWITCH (S9, S11)
33	6777981	HEAD BASE	70	7787695	POLY SLIDER WASHER
34	6521682	HEAD SPRING	71	7787711	POLY SLIDER WASHER
35	6777861	SENSOR CAP	72	7787692	POLY SLIDER WASHER
36	6344701	PRESSURE ROLLER ASSEMBLY	73	7768234	POLY SLIDER WASHER
			74	7780555	FLAT SCREW-2MMDX9MM

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



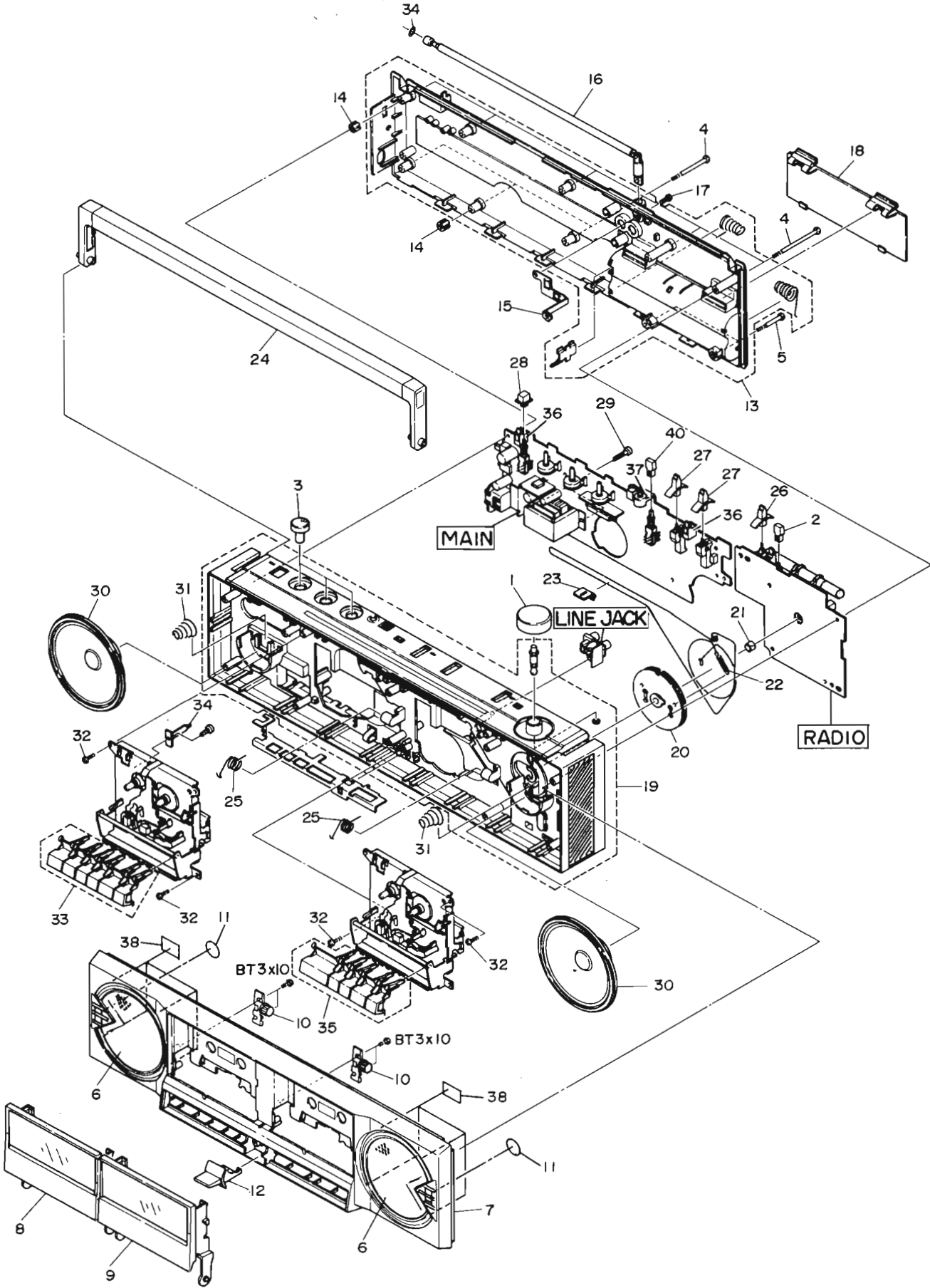
Note : Components marked without numbers in this drawing are not specified as replacement parts.

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
MISCELLANEOUS			21	6310162	RING SPRING
1	6289652	TUNING KNOB	22	6316232	SPRING M
2	6057852	PUSH BUTTON (FM MODE)	23	6393091	POINTER
3	6284412	KNOB (VOLUME, TONE, MIC. VOLUME)	24	6335251	HANDLE ASSEMBLY (RED)
4	7781303	TAPPING SCREW-3MMDX80MM	24	6335252	HANDLE ASSEMBLY (GRAY)
5	7781148	BT SCREW-3MMDX50MM	24	6335192	HANDLE ASSEMBLY (GOLD)
6	6661351	SPEAKER METAL	25	6549563	LID SPRING
7	6227821	FRONT CASE ASSEMBLY (RED)	26	6276201	LEVER KNOB
7	6227822	FRONT CASE ASSEMBLY (GRAY)	27	6276211	LEVER KNOB
7	6227823	FRONT CASE ASSEMBLY (GOLD)	28	6059631	PUSH BUTTON (POWER)
8	6094945	CASSETTE LID ASSEMBLY (TAPE2)	29	7781146	BT SCREW-3MMDX20MM
9	6094955	CASSETTE LID ASSEMBLY (TAPE1)	30	5405562	SPEAKER-10CM
10	6779551	DAMPER ASSEMBLY	31	6521771	SPRING FOR SPEAKER
11	5419073	SPEAKER-TWEETER	32	8699410	BT BIND HEAD SCREW-3MMDX10MM (BLACK)
12	6060782	BUTTON (DUBBING)	33	6060801	CASSETTE BUTTON (TAPE2)
13	6010431	REAR CASE ASSEMBLY (RED)	34	6537632	RECORD SPRING
13	6010432	REAR CASE ASSEMBLY (GRAY) [W]	35	6060791	CASSETTE BUTTON (TAPE1)
13	6010433	REAR CASE ASSEMBLY (GOLD)	36	6778851	LED HOLDER
13	6010411	REAR CASE ASSEMBLY (RED)	37	6591651	MIC HOLDER
13	6010412	REAR CASE ASSEMBLY (GRAY) [H]	38	7737164	SPACER
13	6010413	REAR CASE ASSEMBLY (GOLD)	39	6591791	RING
13	6010414	REAR CASE ASSEMBLY (RED)	40	6061211	PUSH BUTTON (REC MUTE)
13	6010415	REAR CASE ASSEMBLY (GRAY) [HC]	CAPACITORS		
13	6010416	REAR CASE ASSEMBLY (GOLD)	C3LR	0201036	CERAMIC CHIP 270PF+-5% 50V
14	5687671	CAP TERMINAL	C5LR	0201065	CERAMIC CHIP 0.022UF+-10% 25V
15	7360411	ANTENNA TERMINAL	C6LR	0201007	CERAMIC CHIP 0.01UF+-20% 50V
16	5752742	TELESCOPIC ANTENNA	CT101-102	5052781	VARIABLE CAPACITOR
17	8744410	BINDING SCREW-3MMDX10MM	CT151-152	5052781	VARIABLE CAPACITOR
18	6175016	BATTERY LID (RED)	CT153	5056191	TRIMMER 10PF
18	6175017	BATTERY LID (GRAY)	CV101-102	5052781	VARIABLE CAPACITOR
18	6175012	BATTERY LID (GOLD)	CV151-152	5052781	VARIABLE CAPACITOR
19	6039416	FRAME CHASSIS ASSEMBLY (RED)	C107	0246444	CERAMIC DISC 15PF+-5%
19	6039417	FRAME CHASSIS ASSEMBLY (GRAY,GOLD)	C109	0246413	CERAMIC DISC. 3PF+-0.25PF HP-U
20	6423421	PULLEY			

Type of head					
	P	Pan head screw		BT	Binding head tapping screw
	F	Flat countersunk head screw		BL	Bolt
	B	Binding head screw		W	Washer
	T	Round head tapping screw		E	"E" ring
Length (L mm)					
Diameter (D mm)					

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	SYMBOL-NO	P-NO	DESCRIPTION
CAPACITORS					
C157	0246429	CERAMIC, DISC CAPACITOR 9PF	Q451LR	5323561	TRANSISTOR DTC124F
C158	0256170	ELECTROLYTIC 1000PF, 10V	Q452LR	5323561	TRANSISTOR DTC124F
C208-209	0209027	CERAMIC (RESISTOR SHAPE) 0.015µF ±30%	Q601	5320643	TRANSISTOR 2SC1162WT-C
C220	0209026	CERAMIC DISC (RESISTOR SHAPE) 0.01µF ±30%	Q701	5322213	TRANSISTOR 2SC1741R
C307LR	0209027	CERAMIC (RESISTOR SHAPE) 0.015µF ±30%	Q702	5321293	TRANSISTOR 2SC1740LN-R
C702	0256362	TANTALUM 0.22µF, 25V	Q703	5323561	TRANSISTOR DTC124F
RESISTORS			Q801-802	5321253	TRANSISTOR 2SA844E
R1LR	0103843	CHIP RESISTOR 1KOHM ±5% 0.1W	Q803	5323261	TRANSISTOR 2SC2785EF
R2LR	0103853	CHIP RESISTOR 6.8KOHM ±5% 0.1W	ZD601	5331583	DIODE RD6.2E-B3
R3LR	0103847	CHIP RESISTOR 2.2KOHM ±5% 0.1W	TRANSFORMERS		
R4LR	0103873	CHIP RESISTOR 330KOHM ±5% 0.1W	△PT	5213604	POWER TRANSFORMER
R5LR	0103843	CHIP RESISTOR 1KOHM ±5% 0.1W	T101	5140071	FM IF TRANSFORMER
RC601-602	0186451	CR PACK	COILS		
RT301	5007696	SEMI VARIABLE 5KOHM(U)	L1LR	5150571	CHOKE COIL 33MH
RT401LR	5007439	SEMI VARIABLE 220KOHM	L2LR	5150578	CHOKE COIL
RT701	5007477	SEMI VARIABLE 10KOHM	L101	5126482	FM RF
RT801-804	5007435	SEMI VARIABLE 10KOHM	L102	5126278	FM OSCILLATOR COIL
RV401	5001181	VARIABLE RESISTOR 10KOHM(A)	L103	5152324	CHOKE COIL 10UH ±10%
RV402LR	5001174	VARIABLE RESISTOR 10KOHM(B)	L151-152	5117911	FERRITE ANTENNA
RV403LR	5001201	VARIABLE RESISTOR 10KOHM(3B)	L153	5124261	SW OSCILLATOR COIL
SEMI-CONDUCTORS			L154	5120518	MW OSCILLATOR COIL
D101	5331592	DIODE 1SS133	L201	5152349	CHOKE COIL 820MH
D102	5330574	DIODE 1S2473	L202	5152346	CHOKE COIL 470UH ±10%
D103	5330661	DIODE SILICON 1S2790	L203	5152324	CHOKE COIL 10UH ±10%
D301	5330574	DIODE 1S2473	L301	5150571	CHOKE COIL 33MH
D401-402	5332111	MA154WK	L302	5150571	CHOKE COIL 33MH
D403-404	5332111	MA154WK	L401	5260982	OSCILLATOR BLOCK
D405-407	5331592	DIODE 1SS133	MISCELLANEOUS		
D408	5331592	DIODE 1SS133		5421891	BUILT-IN MICROPHONE
D451LR	5332111	DIODE MA154WK	BP101	5161551	FILTER
D601	5331451	DIODE SRP02-100NLF	CF201	5160303	CERAMIC FILTER 10.7MHZ
D602	5331452	DIODE SRN02-100NLF	CF203	5160061	CERAMIC FILTER 455KHZ
D603	5330574	DIODE 1S2473	CF204	5160383	CERAMIC FILTER 10.7MHZ
D701	5331592	DIODE 1SS133	△F001	5721252	FUSE 1.2A
D702-703	5332111	DIODE MA154WK	JK401	5673382	JACK-3.5MM(D MIC)
IC101	5351902	IC AN7213A	JK402	5676322	2P PIN JACK(LINE IN)
IC201	5355441	IC AN7223	JK501	5673431	HEADPHONE JACK
IC301	5352961	IC AN7410N	△JK601	5652452	AC SOCKET
IC401-402	5363801	IC M51162	S 1	5623492	SLIDE SWITCH(REC/P.B.)
IC501	5352141	IC HA1392	S 2	5624412	SLIDE SWITCH(RIF)
IC701	5364151	IC LA2010	S 3	5604565	LEVER SWITCH(FUNCTION)
LED301	5381621	LED LN242RPH-LF	S 4	5604562	LEVER SWITCH(DUBBING)
LED601-602	5381621	LED LN242RPH-LF	S 5	5634418	PUSH SWITCH(POWER)
Q1LR	5329192	MICRO PACKAGE TRANSISTOR 2SC2462D	△S 6	5612581	ROTARY SWITCH(VOLTAGE SELECTOR)
Q2LR	5329632	MICRO PACKAGE TRANSISTOR 2SD1306(NE)	S 7	5634612	PUSH SWITCH(REC. MUTE)
Q3LR	5329791	MICRO PACKAGE TRANSISTOR DTC124K(25)	S101	5604623	LEVER SWITCH(BAND)
Q101	5321271	TRANSISTOR SILICON 2SC1674L	S301	5633901	PUSH SWITCH(FM MODE)
Q201	5321281	TRANSISTOR SILICON 2SC1675-L	FOR ACCESSORIES		
Q401	5321293	TRANSISTOR 2SC1740LN-R	△	5662301	SIEMENS PLUG(W)
Q403-404	5323561	TRANSISTOR DTC124F	△	5660212	SIEMENS PLUG(H)
Q405LR	5323561	TRANSISTOR DTC124F	△	5747472	POWER CORD(W)
			△	5747262	POWER CORD(H/HC)



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