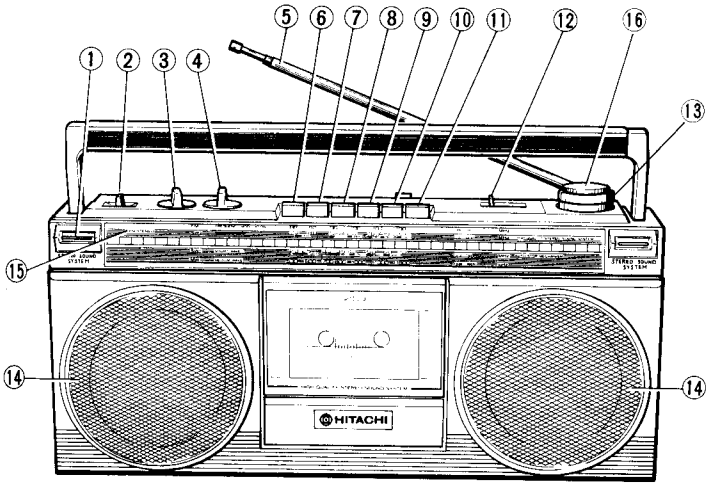
HITACHI
SERVICE MANUAL

TY | No. 476 E

TRK-610
H, HC, E, E(BS), W, AU

TN-21VC-177 Chassis (For E, E (BS) W, AU)
TN-21VC-177-1 Chassis (For H, HC)



CONTENTS

KEY TO ILLUSTRATIONS

① INNER MICROPHONE (MONAURAL)
② FUNCTION SELECTOR
③ TONE CONTROL
④ VOLUME CONTROL
⑤ ROD ANTENNA (AERIAL)
⑥ PAUSE BUTTON
⑦ STOP/EJECT BUTTON
⑧ FAST FORWARD BUTTON
⑨ REWIND BUTTON
⑩ PLAYBACK BUTTON
⑪ RECORD BUTTON
⑫ BAND SELECTOR
⑬ TUNNING CONTROL
⑭ SPEAKERS
⑮ FM STEREO INDICATOR
⑯ FINE TUNING CONTROL (W, AU ONLY)

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

RADIO CASSETTE TAPE RECORDER

November 1985 TOYOKAWA WORKS

SAFETY PRECAUTION

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 makers. Critical parts are marked with ⚠ in the circuit diagram and printed wiring board.
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.

SPECIFICATIONS

General Section

Semiconductors
ICs: 4
Transistors: 11 [For E]
10 [For E (BS), W, AU]
9 [For H, HC]
Diodes: 14 [For W]
13 [For E (BS), (AU)]
9 [For H, HC]
LEDs: 1

Power supply
AC: 220V, 50Hz [For E]
AC: 240V, 50Hz [For E (BS), AU]
AC: 110–127V/200–220V 230–250V, 50/60Hz [For W]
AC: 120V 60Hz [For H, HC]
DC: 9V ("D" CELL or IEC R20 × 6 or equivalent)

Power Consumption 8W
Power Output 5W P.M.P. (AC operation)
1.1W/CH (T.H.D. 10% DC)
Speakers 10cm, 8 ohms × 2
Dimensions 420 (W) × 201 (H) × 118 (D)
Weight 2.9kg (with batteries)

Radio Section

Circuit System
FM/SW/MW/LW 4-band [For E, E (BS)]
FM/SW2/SW1/MW 4-band [For W, AU]
FM/AM 2-band [for H, HC]
Super heterodyne

Tuning Range
FM: 87.5 to 108 MHz
SW: 6.0 to 18.0 MHz
MW: 530 to 1,605 kHz
LW: 150 to 285 kHz
[For E, E (BS)]

FM: 88 to 108 MHz
SW2: 7.0 to 22.0 MHz
SW1: 2.3 to 7.0 MHz
MW: 530 to 1,605 kHz
[For W, AU]

FM: 88 to 108 MHz
AM: 530 to 1,605 kHz
[For H, HC]

Intermediate Frequency
FM: 10.7 MHz
AM: 465 kHz [For E,E(BS)]
AM: 455 kHz [For W,AU,H,HC]

Sensitivity
FM: 12 dB (pra.), 5 dB (max.)
SW: 30 dB (pra.), 22 dB (max.)
MW: 50 dB (pra.), 40 dB (max.)
LW: 55 dB (pra.), 48 dB (max.)
[For E, E (BS)]

FM: 12 dB (pra.), 5 dB (max.)
SW2: 30 dB (pra.), 27 dB (max.)
SW1: 47 dB (pra.), 38 dB (max.)
MW: 50 dB (pra.), 40 dB (max.)
[For W, AU]

FM: 12 dB (pra.), 5 dB (max.)
AM: 50 dB (pra.), 40 dB (max.)
[For H, HC]

Antennas (Aerials)
FM/SW: Rod antenna
MW/LW: Built-in ferrite core antenna
[For E, E (BS)]

FM/SW2: Rod antenna
SW1/MW: Built-in ferrite core antenna
[For W, AU]

FM: Rod antenna
AM: Built-in ferrite core
[For H, HC]

Tape Recorder Section

Tape Cassette tape (C-30, 60, 90)
Track System 4 track 2 channel stereo
Recording System AC bias, 52 kHz [For E, E (BS),W,AU]
DC Bias [For H, HC]
Erasing System Magnet
Frequency Response Normal: 60 to 10000 Hz
Signal to Noise Ratio 40 dB [For E. E(BS),W,AU]
35 dB [For H,HC]
Wow and Flutter 0.25% (WRMS)
Cross Talk Between tracks: 65 dB
Between channels: 40 dB
Input Sensitivity and Impedance Mic: 0.6mV, 2.2kohms
Output Load Impedance Line-out 500mV/(Variable), 220 ohms
Distortion 5%
Erasing Ratio 60 dB [For E, E(BS),W,AU]
50 dB [For H, HC]
Fast Forwarding or Rewinding time 170sec (using C-60)
Motor DC motor
Heads Permalloy

DISASSEMBLY

1. **Removing cassette compartment lid (Fig. 1)**
   Open the cassette compartment lid, and pull out it to the front while applying a force in the direction fo the arrow.

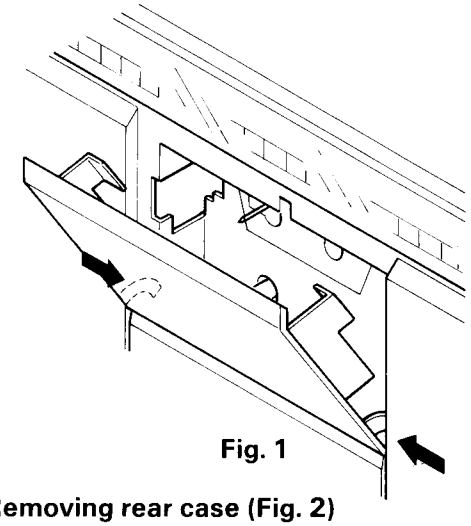


Fig. 1

2. **Removing rear case (Fig. 2)**
   (1) Remove the battery compartment lid.
   (2) Remove 7 screws Ⓐ and remove the rear case.

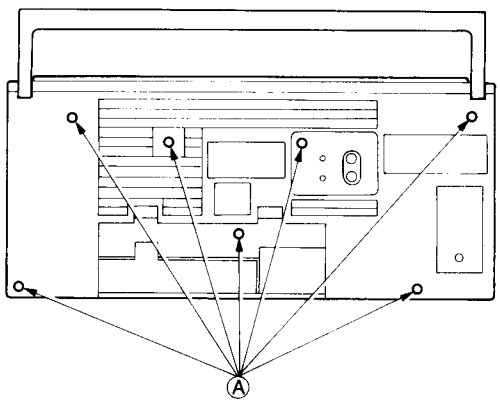


Fig. 2

3. **Removing main P.W.B. (Fig. 3)**
   (1) Remove VOLUME and TONE control knobs.
   (2) Remove the FUNCTION and BAND SELECTOR knobs, then remove the main PWB.

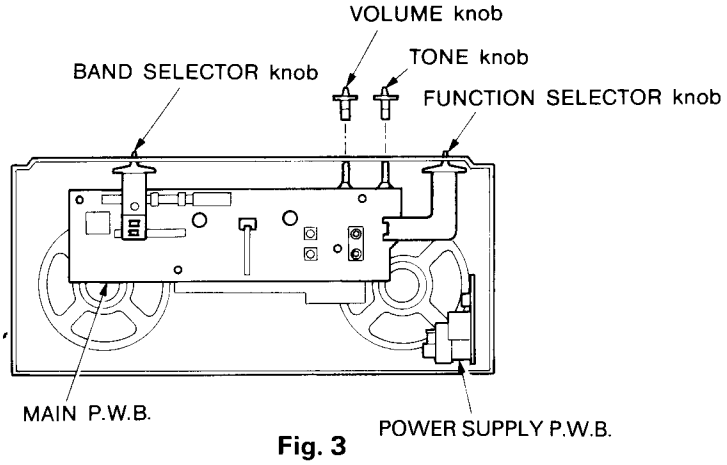


Fig. 3

4. **Removing power supply P.W.B. (Fig. 3)**
   Pull out the power supply PWB.

5. **Removing the cassette deck mechanism (Fig. 4)**
   Disengage 3 claws Ⓑ and remove the cassette deck mechanism.

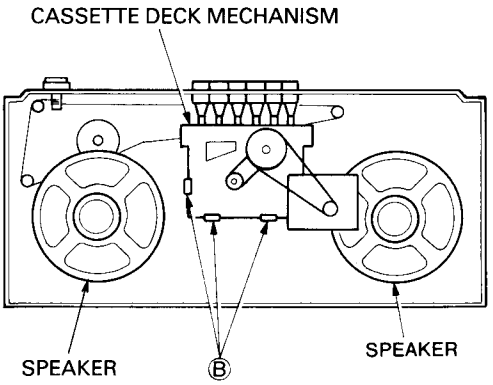


Fig. 4

6. **Removing speakers**
   Remove the rear case, then remove the speakers.

ADJUSTMENT

1. Radio Section

FM Section

*( ) For W. Germany

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	Turn T202 fully counterclockwise.						
	(2)	S-Curve	● Genescope (10.7 MHz)	L104	C301⊖	10.7 MHz	Highest	T101	Note 1
								T202	Note 2
2	(1)	FM OSC (Covering)	● FM signal generator (400 Hz, 30% dev.) ● Oscilloscope ● VTVM	TP101 (thru FM dummy antenna) (Note 3)	C301⊖	87 MHz *(87.5 MHz)	Lowest	L102	Max.
	(2)					109 MHz *(108 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	Connect a 10μF 25V electrolytic capacitor between the No. 2 pin of IC301 and the ground	C301⊖	—	—	RT301	19 kHz ±20 Hz (Note 4)

AM Section

	Step		Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
				Measuring Instrument	Input Terminal	Output Terminal				
For E/E (BS)	1	(1)	AM IF	● Genescope (465 kHz)	Ferrite-core antenna (Note 5)	C301⊖	465 kHz	Highest	T201 T203	Note 6
		(2)					Repeat step (1)			
	2	(1)	LW OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	Ferrite-core antenna (Note 5)	C301⊖	145 kHz	Lowest	L156	Max.
		(2)					290 kHz	Highest	CT157	
		(3)					Repeat steps (1) and (2)			
	3	(1)	LW ANT. (Tracking)				160 kHz	160 kHz	L153	Max.
		(2)					270 kHz	270 kHz	CT153	
		(3)					Repeat steps (1) and (2)			
	4	(1)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	Ferrite-core antenna (Note 5)	C301⊖	515 kHz	Lowest	L155	Max.
		(2)					1650 kHz	Highest	CT155	
		(3)					Repeat steps (1) and (2)			
	5	(1)	MW ANT. (Tracking)				600 kHz	600 kHz	L152	Max.
		(2)					1400 kHz	1400 kHz	CT152	
		(3)					Repeat steps (1) and (2)			
	6	(1)	SW OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	TP101 (thru SW. dummy antenna) (Note 7)	C301⊖	5.8 MHz	Lowest	L154	Max.
		(2)					18.5 MHz	Highest	CT154	
		(3)					Repeat steps (1) and (2)			
	7	(1)	SW ANT. (Tracking)				6.5 MHz	6.5 MHz	L151	Max.
		(2)					16 MHz	16 MHz	CT151	
		(3)					Repeat steps (1) and (2)			

	Step		Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
				Measuring Instrument	Input Terminal	Output Terminal				
For W/AU	8	(1)	AM IF	● Genescope (455 kHz)	Ferrite-core antenna (Note 5)	C301⊖	455 kHz	Highest	T201 T203	Note 6
		(2)					Repeat step (1)			
	9	(1)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	Ferrite-core antenna (Note 5)	C301⊖	515 kHz	Lowest	L156	Max.
		(2)					1650 kHz	Highest	CT156	
		(3)					Repeat steps (1) and (2)			
	10	(1)	MW ANT. (Tracking)				600 kHz	600 kHz	L152	Max.
		(2)					1400 kHz	1400 kHz	CT153	
		(3)					Repeat steps (1) and (2)			
	11	(1)	SW1 OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	Ferrite-core antenna (Note 5)	C301⊖	2.2 MHz	Lowest	L155	Max.
		(2)					7.3 MHz	Highest	CT155	
		(3)					Repeat steps (1) and (2)			
	12	(1)	SW1 ANT. (Tracking)				2.7 MHz	2.7 MHz	L153	Max.
		(2)					6.3 MHz	6.3 MHz	CT152	
		(3)					Repeat steps (1) and (2)			
	13	(1)	SW2 OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	TP101 (thru SW. dummy antenna) (Note 7)	C301⊖	6.7 MHz	Lowest	L154	Max.
		(2)					23 MHz	Highest	CT154	
		(3)					Repeat steps (1) and (2)			
	14	(1)	SW2 ANT. (Tracking)				8 MHz	8 MHz	L151	Max.
		(2)					20 MHz	20 MHz	CT151	
		(3)					Repeat steps (1) and (2)			
For H/HC	15	(1)	AM IF	● Genescope (455 kHz)	Ferrite-core antenna (Note 5)	C301⊖	455 kHz	Highest	T201 T203	Note 6
		(2)					Repeat step (1)			
	16	(1)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % mod.) ● VTVM ● Oscilloscope	Ferrite-core antenna (Note 5)	C301⊖	515 kHz	Lowest	L152	Max.
		(2)					1650 kHz	Highest	CT152	
		(3)					Repeat steps (1) and (2)			
	17	(1)	MW ANT. (Tracking)				600 kHz	600 kHz	L151	Max.
		(2)					1400 kHz	1400 kHz	CT151	
		(3)					Repeat steps (1) and (2)			

Note:

1. Feed in a weak signal to L104 from the genescope. Adjust T101 for maximum gain and the waveform indicated in Fig. 5. If the center of the waveform cannot be lined up on the marker, adjust the right/left balance.
2. Use the T202 core to form the S-curve shown in Fig. 6. Adjust the symmetry of A and B about point C for linearity.

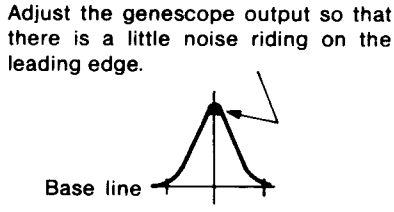


Fig. 5

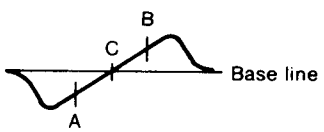
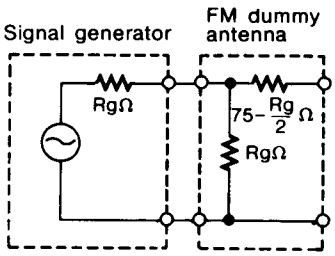


Fig. 6

3. FM dummy antenna is shown in Fig. 7.



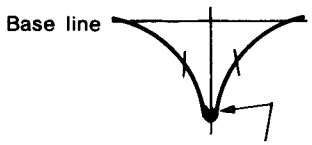
Rg : SG's output impedance

Fig. 7

4. Connect the frequency counter to C301⊖ and connect a 100 kΩ resistor series with the frequency counter.

5. Connect the output of AM signal generator to the loop antenna, and put it near to the ferrite antenna.

6. Feed in a weak signal from the genescope. Adjust T201, T203 for maximum gain and the waveform of Fig. 8.



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

Fig. 8

7. SW. dummy antenna is shown in Fig. 9

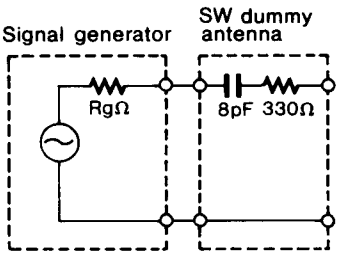


Fig. 9

ADJUSTMENT PARTS LOCATION

● **TUNER SECTION**

★: in case of 4 band set
☆: in case of 2 band set

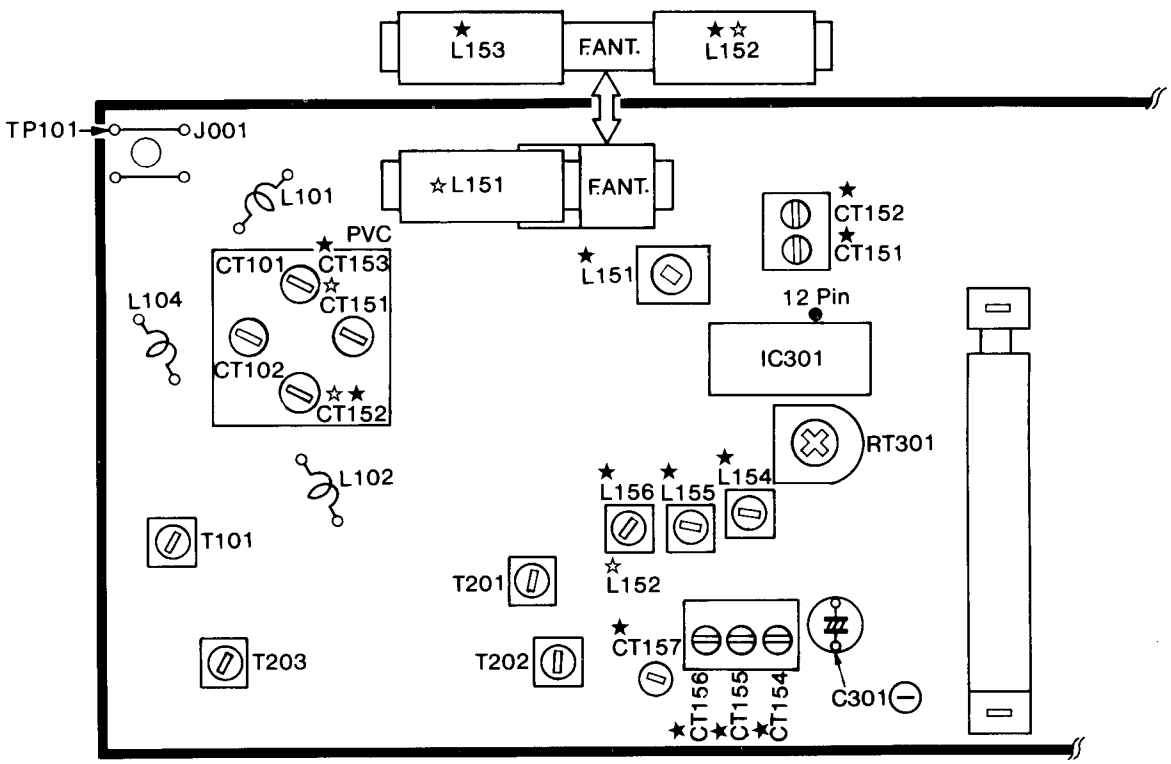


Fig. 10

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	● Frequency counter	—	Speaker terminal	Tape speed adjustment tape (3 kHz)	Playback	Semivariable resistor in the motor (Fig. 11)	3 kHz ± 20 Hz	Note 1
2	Head azimuth	● VTVM	—	Speaker terminal	Head azimuth adjustment tape (10 kHz)	Playback	Azimuth adjusting screw	Output max.	Note 2

Note:

1. Adjsut within 30 sec. after heat-running for more than 20 minutes.
2. 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.

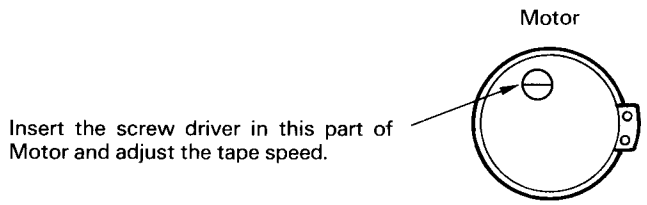


Fig. 11

INSPECTION OF MECHANISM

Item	Checking item		Reference value	Remarks
1	Pressure of pressure roller		300 – 500g	Note
2	Take-up torque		35 – 65 g·cm	
3	Fast forward/Rewind torque		60 – 140 g·cm	
4	Auto-Stop sensor operation force		40 – 75 g	
5	Brake torque		15 g·cm or more	Measured in stop mode
6	Back tension torque	Take-up	1 – 6 g·cm	
		Supply	2 – 6 g·cm	
7	Flywheel thrust gap		0.05 – 0.5 mm	
8	Button operation force	Play button	1.7 kg or less	
		FF button	1.0 kg or less	
		Rewind button	1.0 kg or less	
		Eject button	1.0 kg or less	
		Record button	1.0 kg or less	
		Pause button	1.5 kg or less	

ted ue	Remarks
20 Hz	Note 1
max.	Note 2

Note:
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 form the capstan.

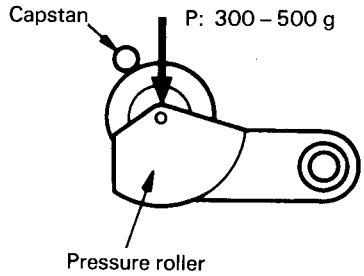


Fig. 12

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)

DIAL CORD STRINGING

Stringing method

- String the dial cord to each rollers according to the order from ① to ⑧ after turned the pulley to the end of clockwise direction.

harks
stop mode

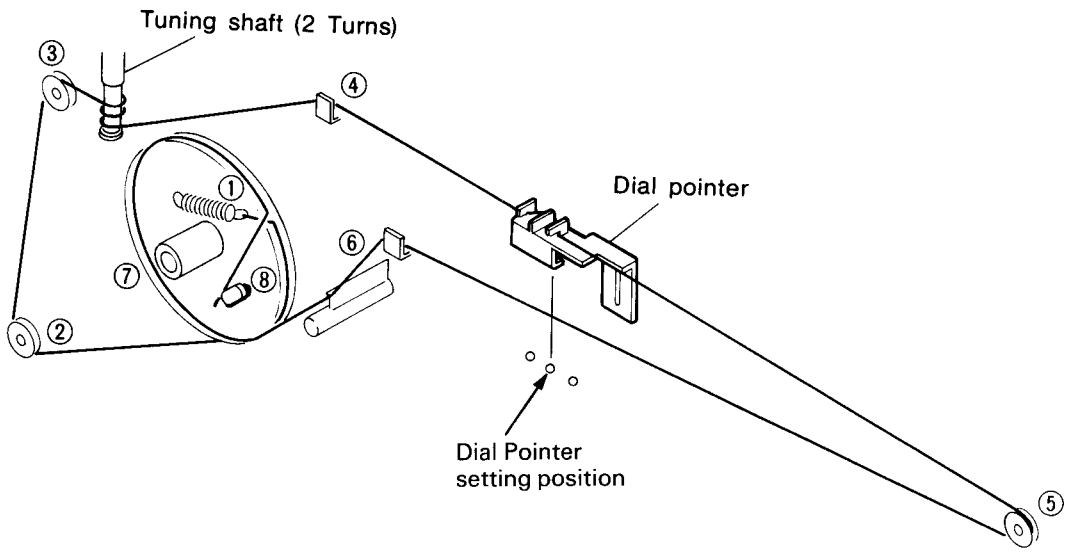
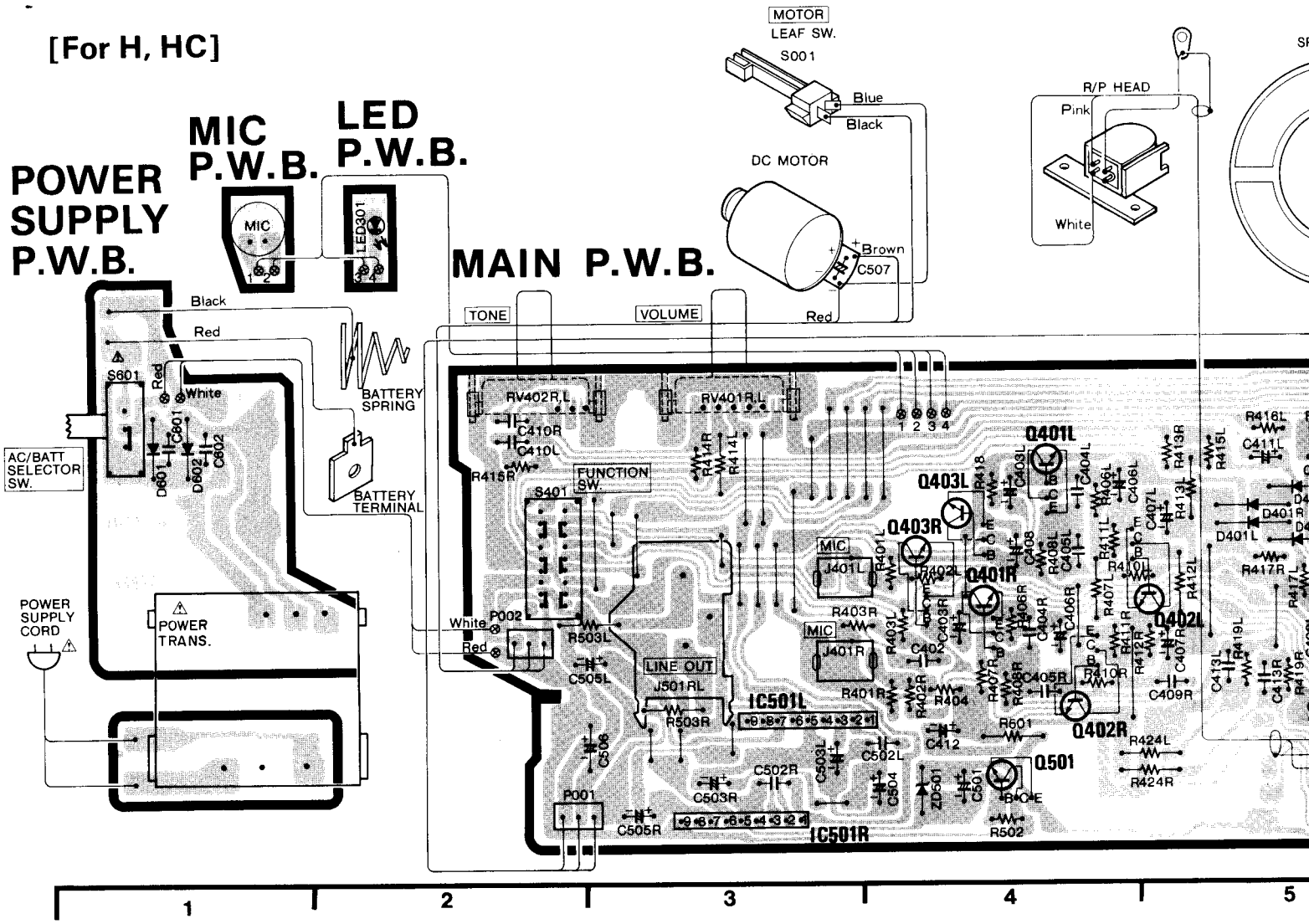
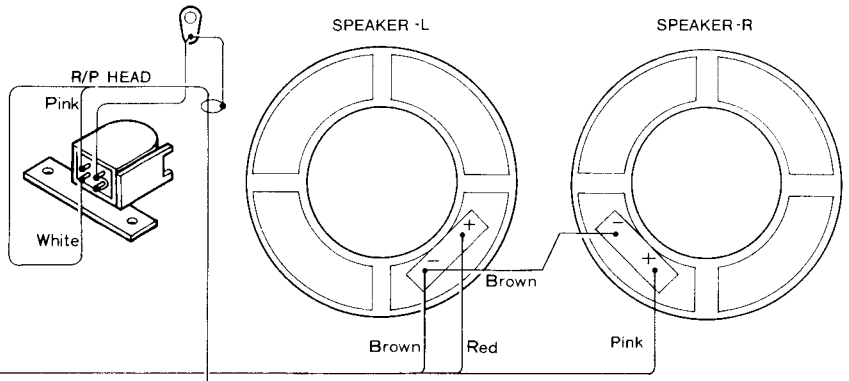


Fig. 13

PRINTED WIRING BOARD

[For H, HC]





( ) VOLTAGE : AM

IC201			
1	0.5V (1.6V)	9	1.4V
2	0.5V (1.6V)	10	4.5V
3	(2.3V)	11	4.5V
4	(2.3V)	12	1.4V
5	(0.9V)	13	1.4V
6	(0.9V)	14	1.4V
7	—	15	1.4V
8	0V	16	4.5V

IC301			
1	4.5V	9	0.5V (1.6V)
2	1.5V	10	1.3V
3	1.4V	11	1.3V
4	2.2V	12	1.1V
5	2.1V	13	1.3V
6	2.9V	14	1.3V
7	0V	15	1.3V
8	0V	16	1.8V

IC501 LR	
1	0V
2	3.0V
3	0.6V
4	0.6V
5	0V
6	0V
7	3.9V
8	—
9	9V

Q101	
B	1.6V
C	4.4V
E	0.9V

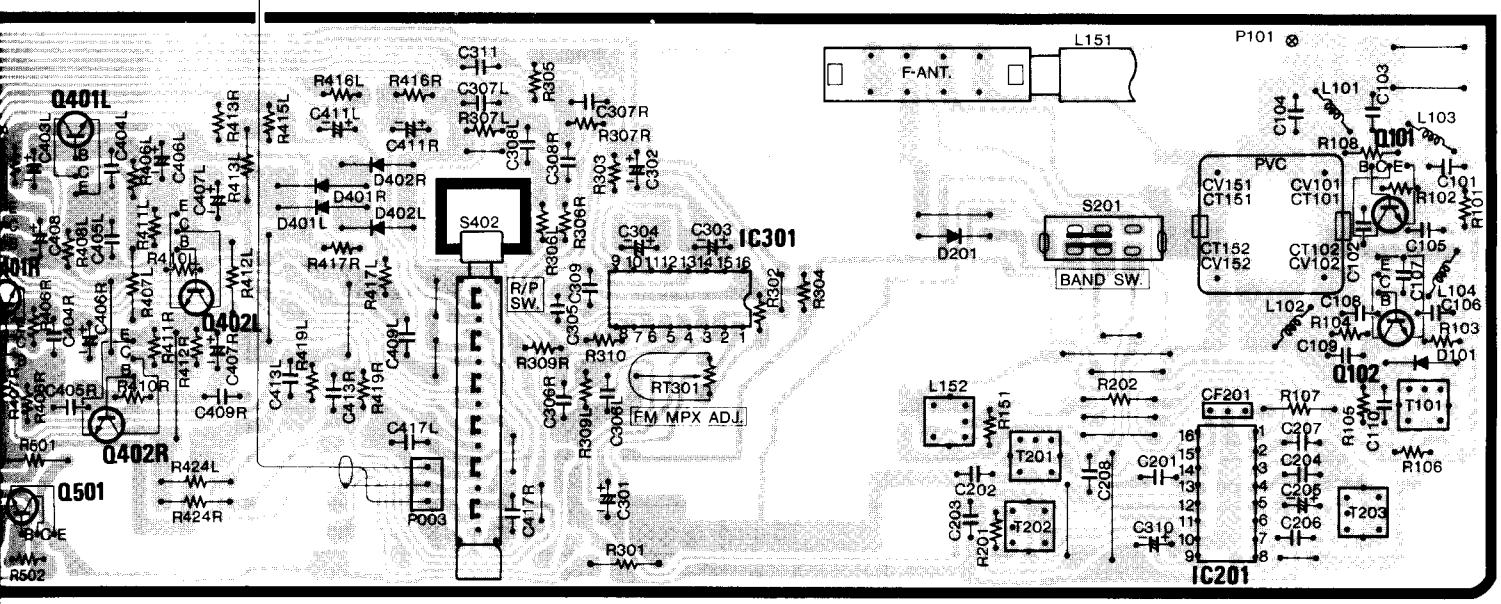
Q102	
B	1.5V
C	4.4V
E	0.8V

Q401 LR	
B	0.6V
C	1.6V
E	0V

Q402 LR	
B	0.6V
C	2.1V
E	0V

Q403 LR	
B	0V
C	0V
E	0V

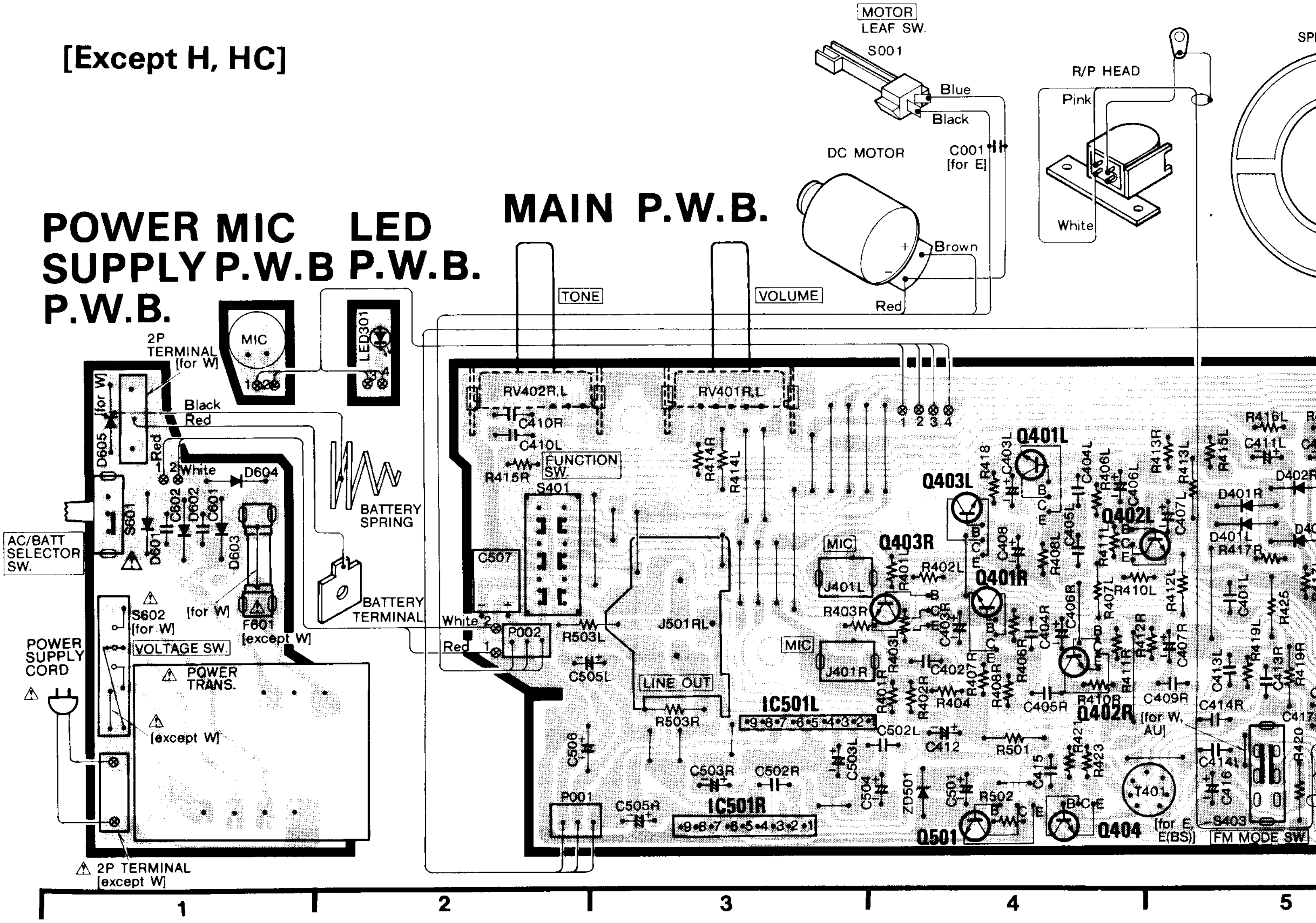
Q501 LR	
B	5.9V
C	9V
E	5.2V

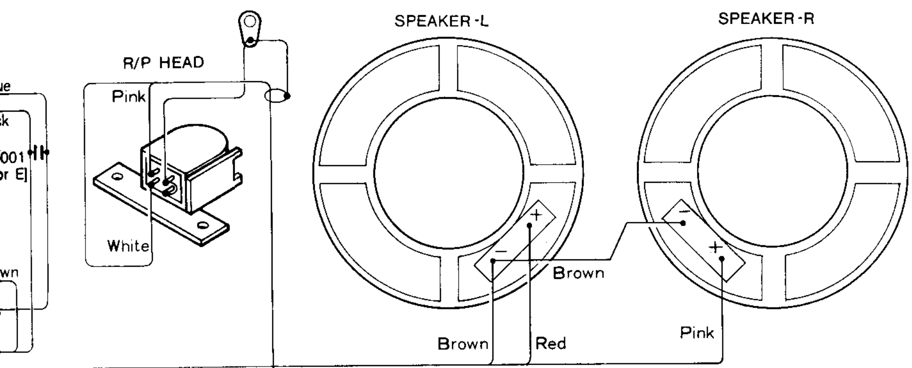


4 5 6 7 8

A B C

[Except H, HC]


POWER SUPPLY P.W.B.
MIC P.W.B
LED P.W.B.
MAIN P.W.B.
MOTOR LEAF SW.
S001
Blue
Black
DC MOTOR
C001 [for E]
Brown
Red
R/P HEAD
Pink
White
TONE
VOLUME
2P TERMINAL [for W]
MIC
LED301
Black
Red
White
D604
D605
AC/BATT SELECTOR SW.
S601
D601
D602
C601
C602
D603
BATTERY SPRING
BATTERY TERMINAL
S602 [for W]
[for W]
F601 [except W]
VOLTAGE SW.
POWER SUPPLY CORD
POWER TRANS.
[except W]
2P TERMINAL [except W]
RV402R,L
RV401R,L
C410R
C410L
FUNCTION SW.
R415R
S401
R414R
R414L
C507
White
Red
P002
R503L
C505L
J501RL
LINE OUT
R503R
C506
P001
C505R
IC501L
IC501R
C503R
C502R
MIC
J401L
J401R
R403R
Q403R
Q403L
Q401L
Q401R
Q402L
Q402R
R418
C403L
C404L
R406L
C406L
R413R
R413L
R415L
R416L
C411L
D401R
D401L
D402R
R417R
R402L
R401L
C408
R408L
C405L
R411L
C407L
R410L
R412L
C401L
R425
C402R
R401R
R402R
R404
R407R
R408R
R406R
C404R
C406R
R407L
R412R
R411R
C407R
R410R
C405R
C409R
[for W, AU]
C414R
C413L
R419L
C413R
R419R
C417
C502L
C412
C503L
C504
ZD501
C501
R501
R502
Q501
C415
R421
R423
T401
Q404
[for E, E(BS)]
C414L
C416
R420
S403
FM MODE SW
1
2
3
4
5



( ) VOLTAGE : AM

IC201			
1	0V (1.6V)	9	1.4V
2	0V (1.6V)	10	4.5V
3	(2.3V)	11	4.5V
4	(2.3V)	13	1.4V
5	(0.9V)	12	1.4V
6	(0.9V)	14	1.4V
7	—	15	1.4V
8	0V	16	4.5V

IC301			
1	4.5V	9	0V (1.6V)
2	1.5V	10	1.3V
3	1.4V	11	1.3V
4	2.2V	12	1.1V
5	2.1V	13	1.3V
6	2.9V	14	1.3V
7	0V	15	1.3V
8	0V	16	1.8V

IC501 LR	
1	0V
2	3.0V
3	0.6V
4	0.6V
5	0V
6	0V
7	3.9V
8	—
9	9V

	Q101
B	1.6V
C	4.4V
E	0.9V

	Q102
B	1.5V
C	4.4V
E	0.8V

	Q151
B	(1.1V)
C	(4.6V)
E	(0.4V)

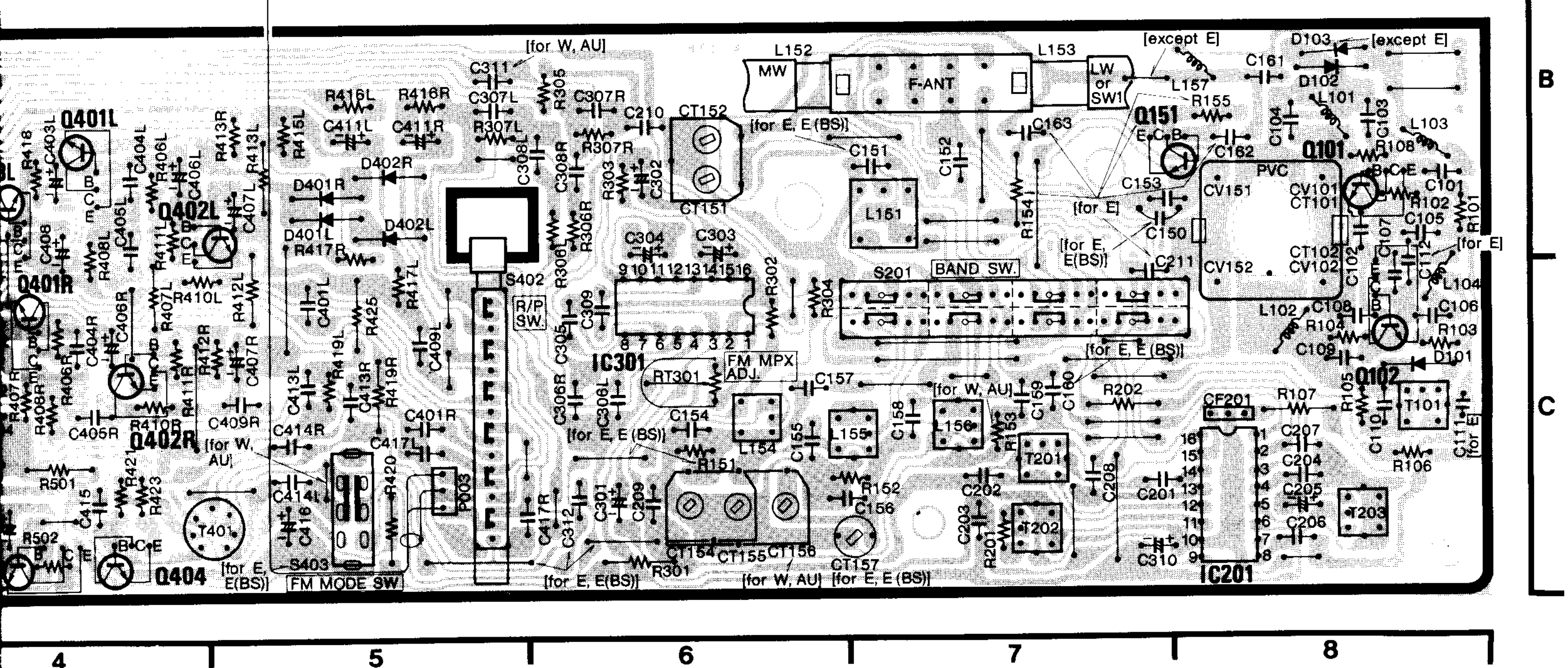
	Q401 LR
B	0.6V
C	1.6V
E	0V

	Q402 LR
B	0.6V
C	2.1V
E	0V

	Q403 LR
B	0V
C	0V
E	0V

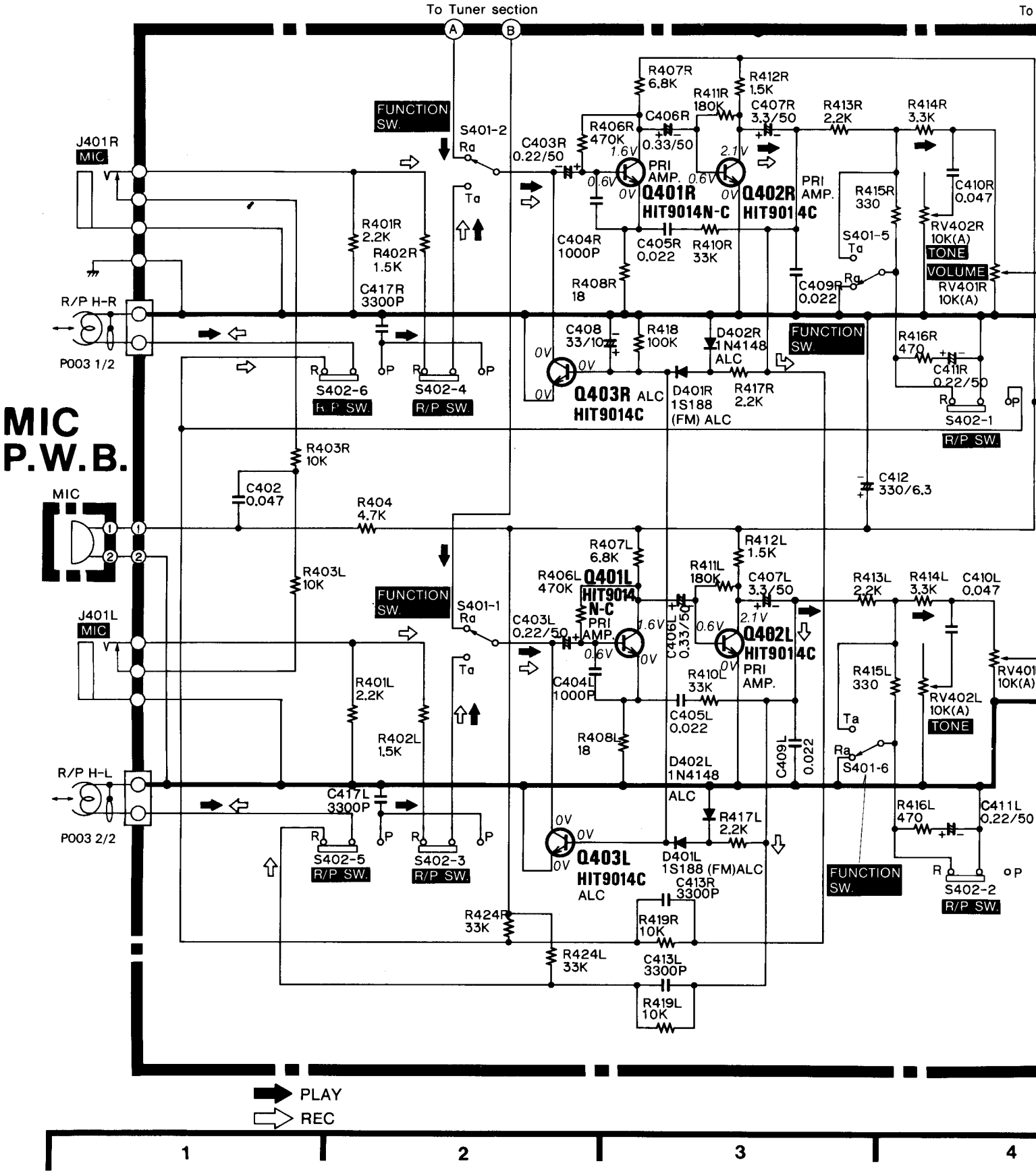
Q404 REC	
B	(0.8V)
C	(4.5V)
E	(0.2V)

	Q501
B	5.9V
C	9V
E	5.2V



CIRCUIT DIAGRAM

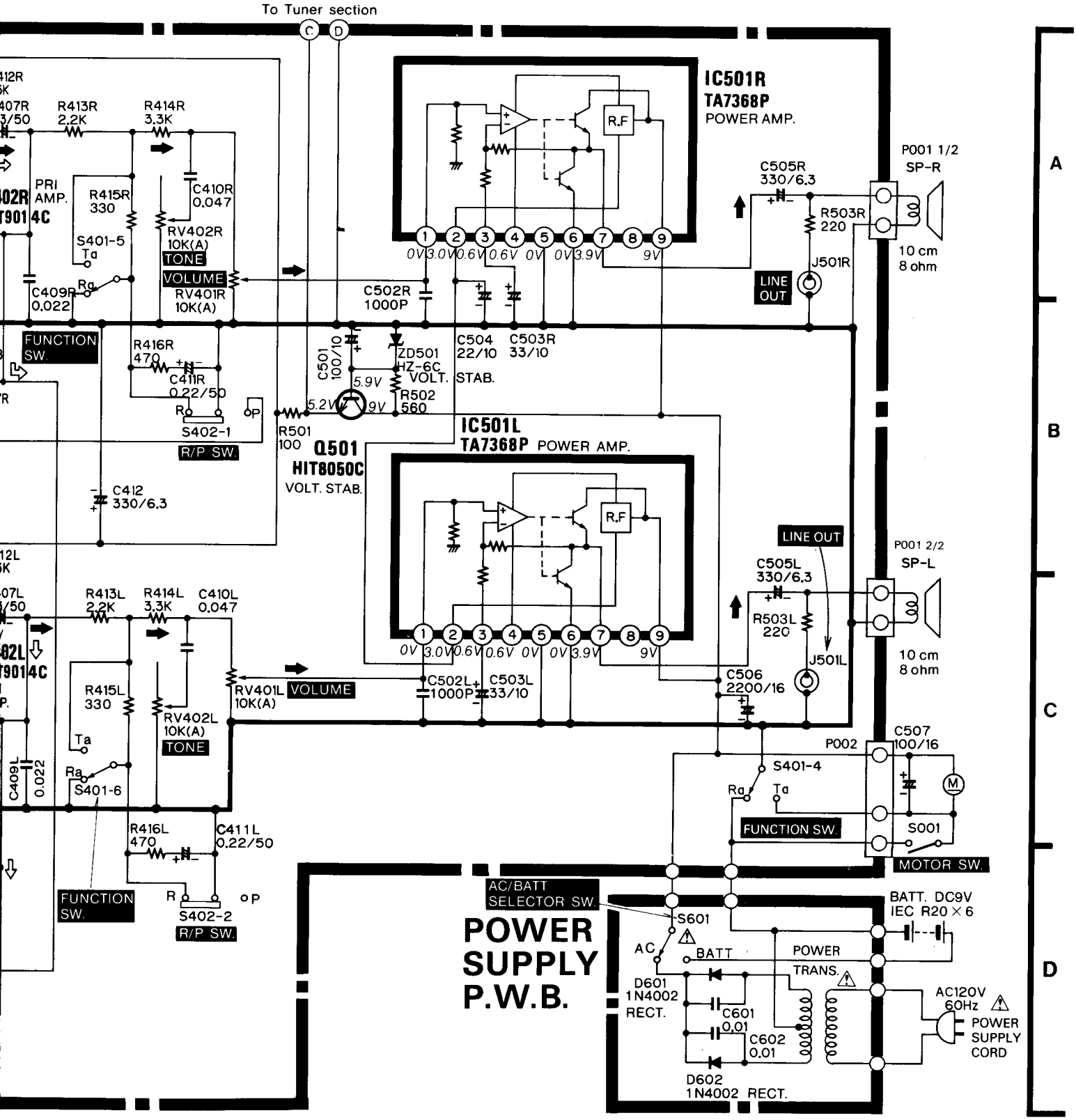
MAIN P.W.B. (Tape recorder/Audio section) [For H, HC]



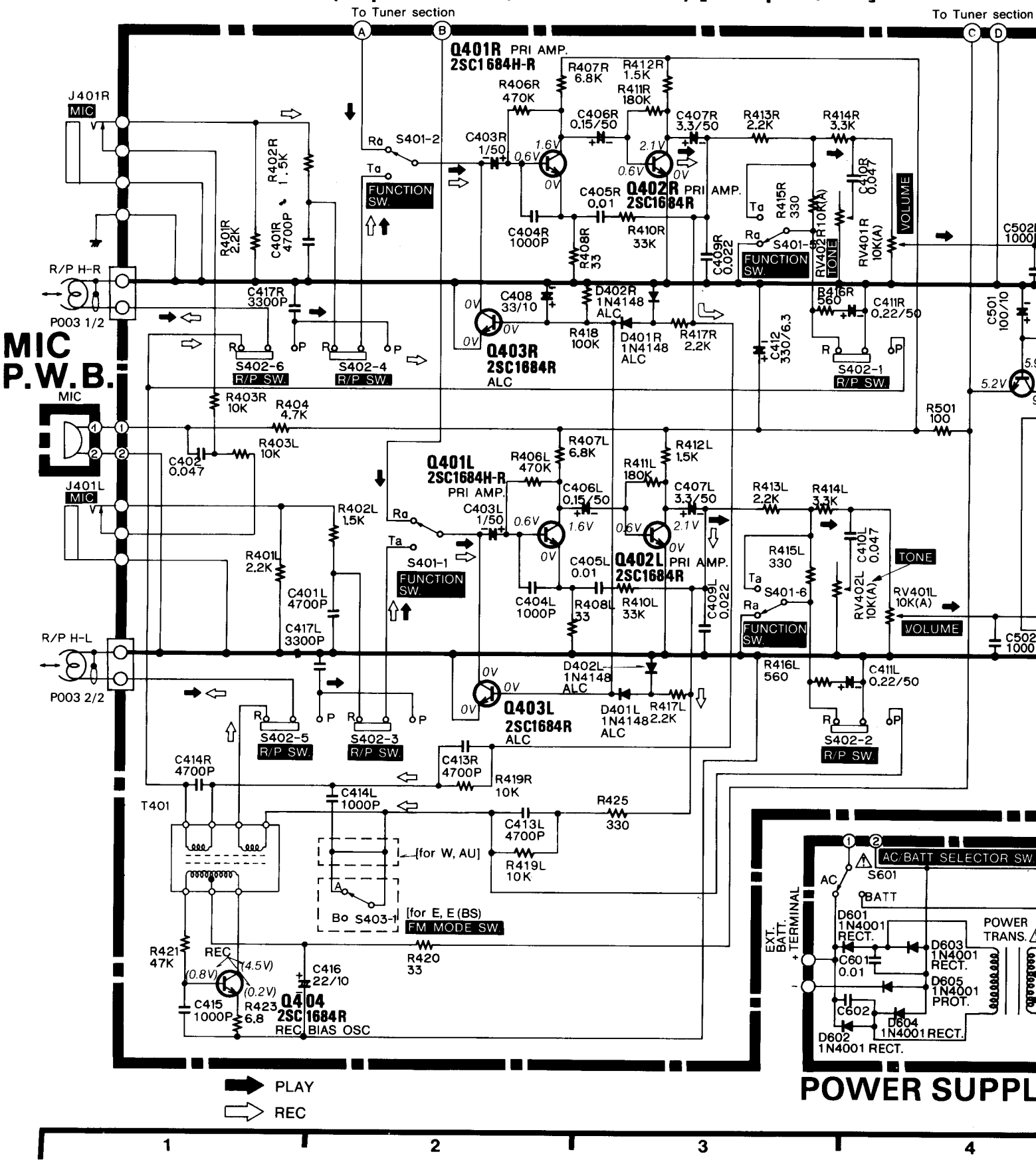
CAUTION

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmϕ.

r H, HC]



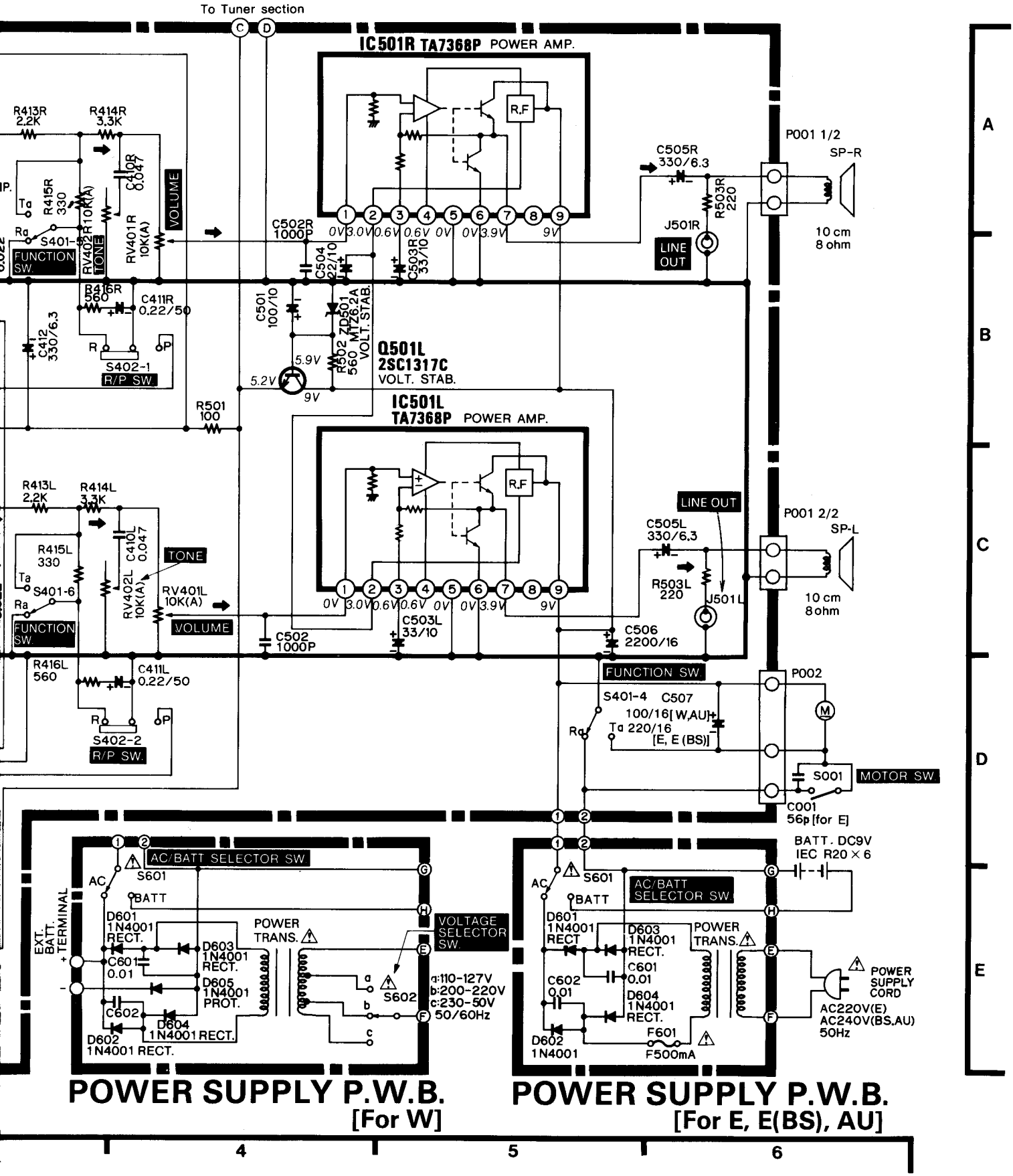
MAIN P.W.B. (Tape recorder/Audio section) [Except H, HC]



CAUTION

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmϕ.

xcept H, HC]



POWER SUPPLY P.W.B. [For W]

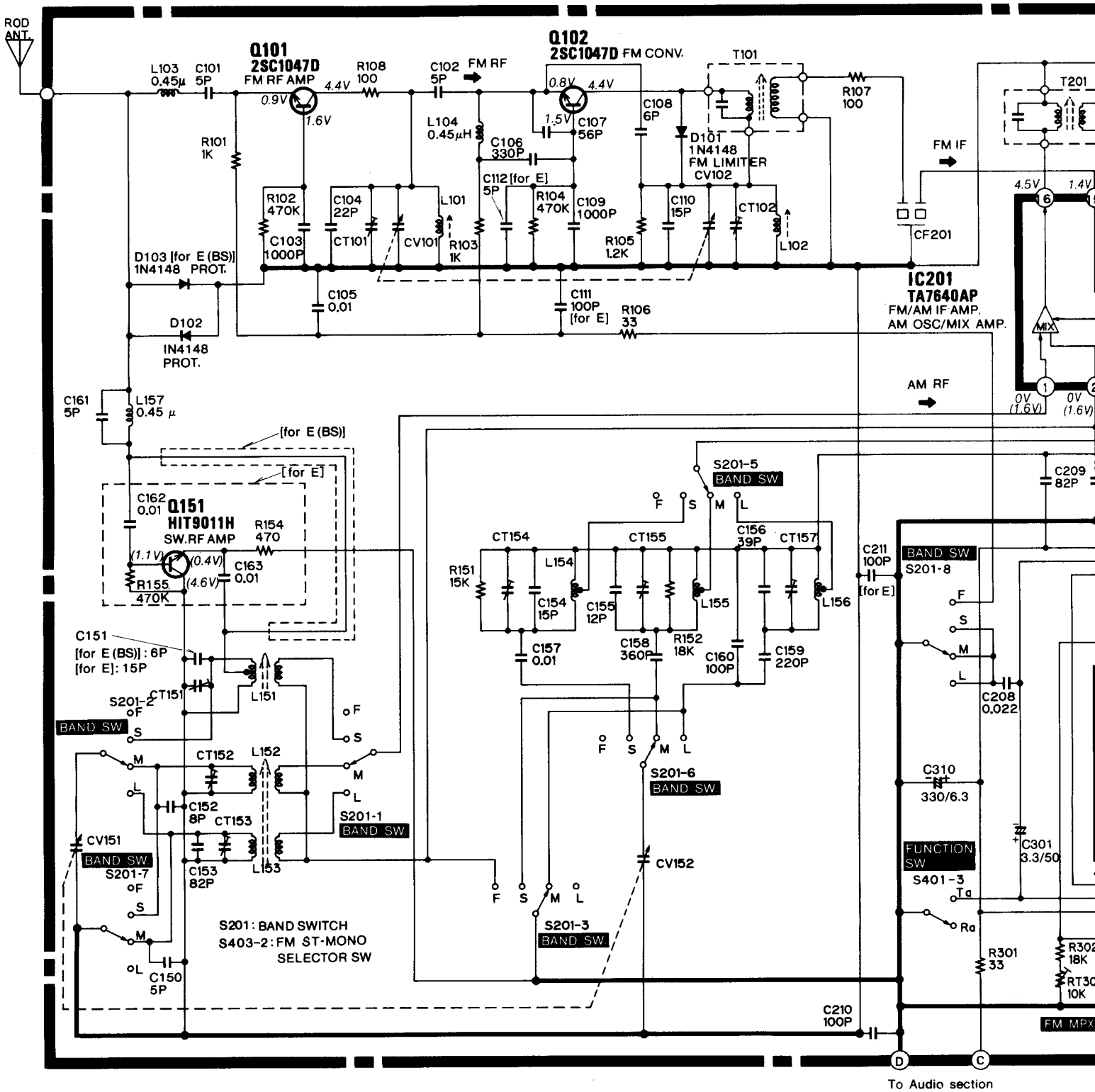
POWER SUPPLY P.W.B. [For E, E(BS), AU]

RCUIT DIAGRAM

CAUTION
Use the ele
the diamete

MAIN P.W.B. (Tuner section) [For E, E(BS)]

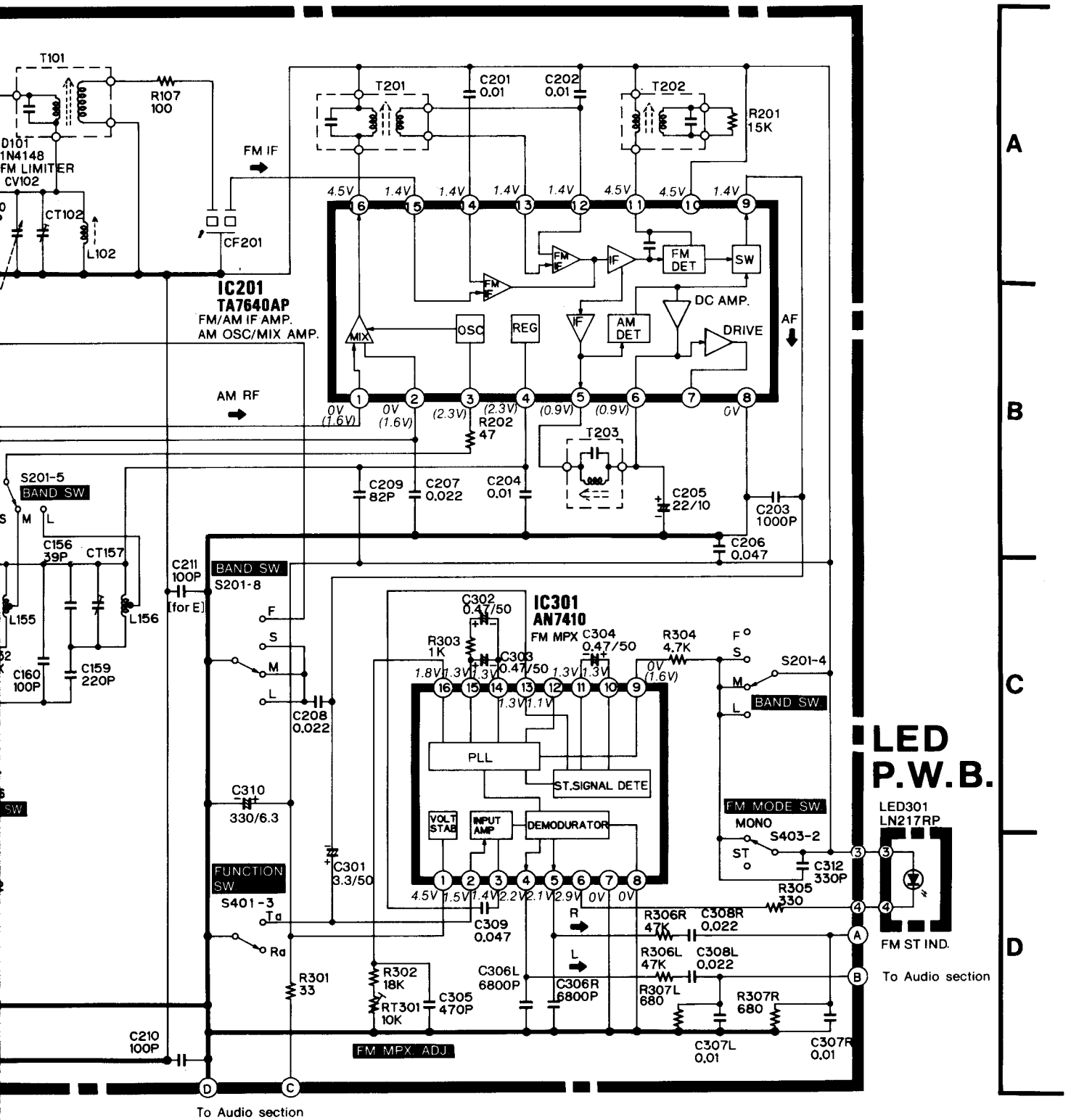
( ) VOLTAGE : AM



CAUTION

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmϕ.

( ) VOLTAGE : AM

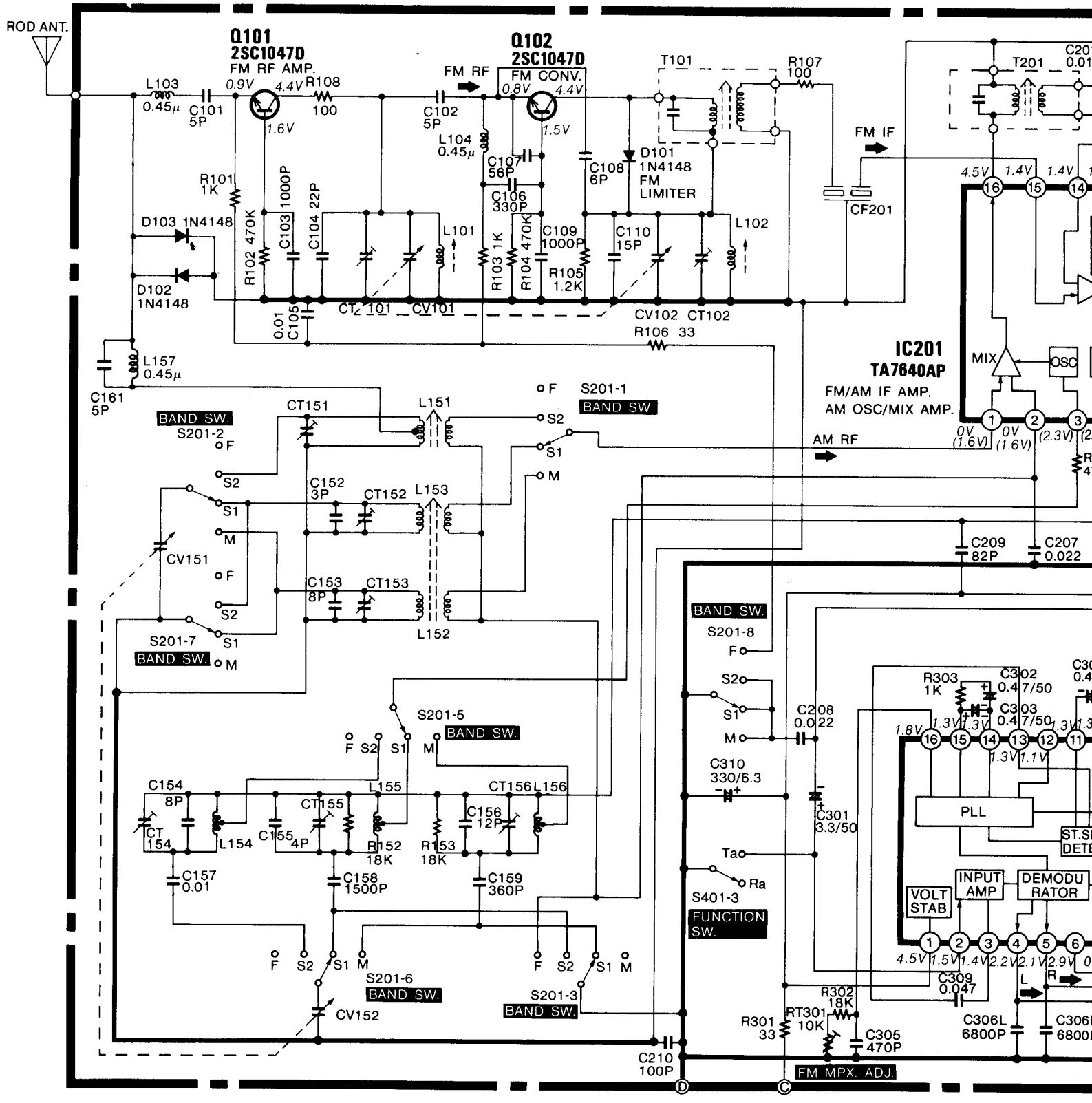


CAUTION

Use the electro
the diameter of

MAIN P.W.B. (Tuner section) [For W, AU]

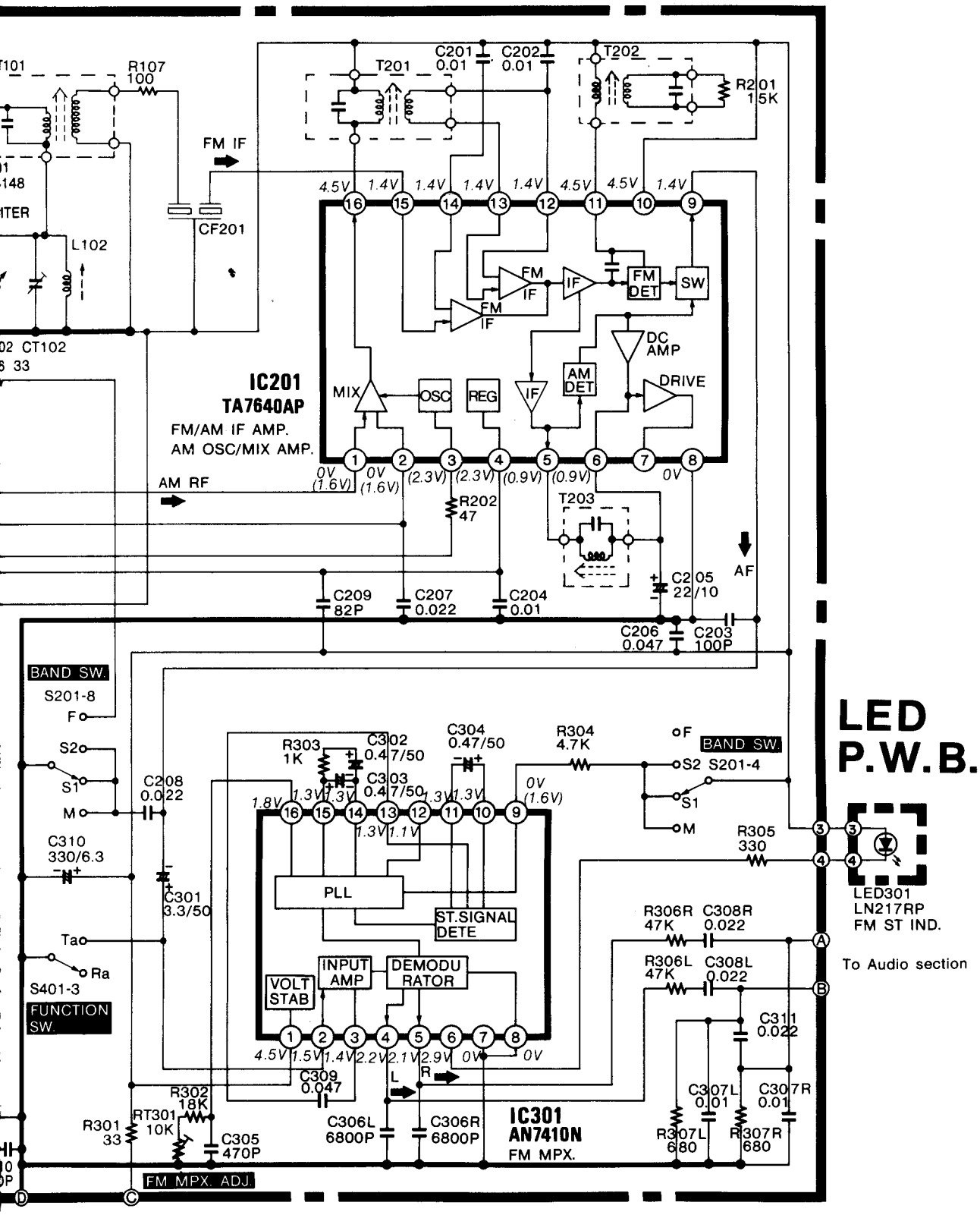
( ) VOLTAGE : AM



CAUTION

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmϕ.

( ) VOLTAGE : AM



LED P.W.B.

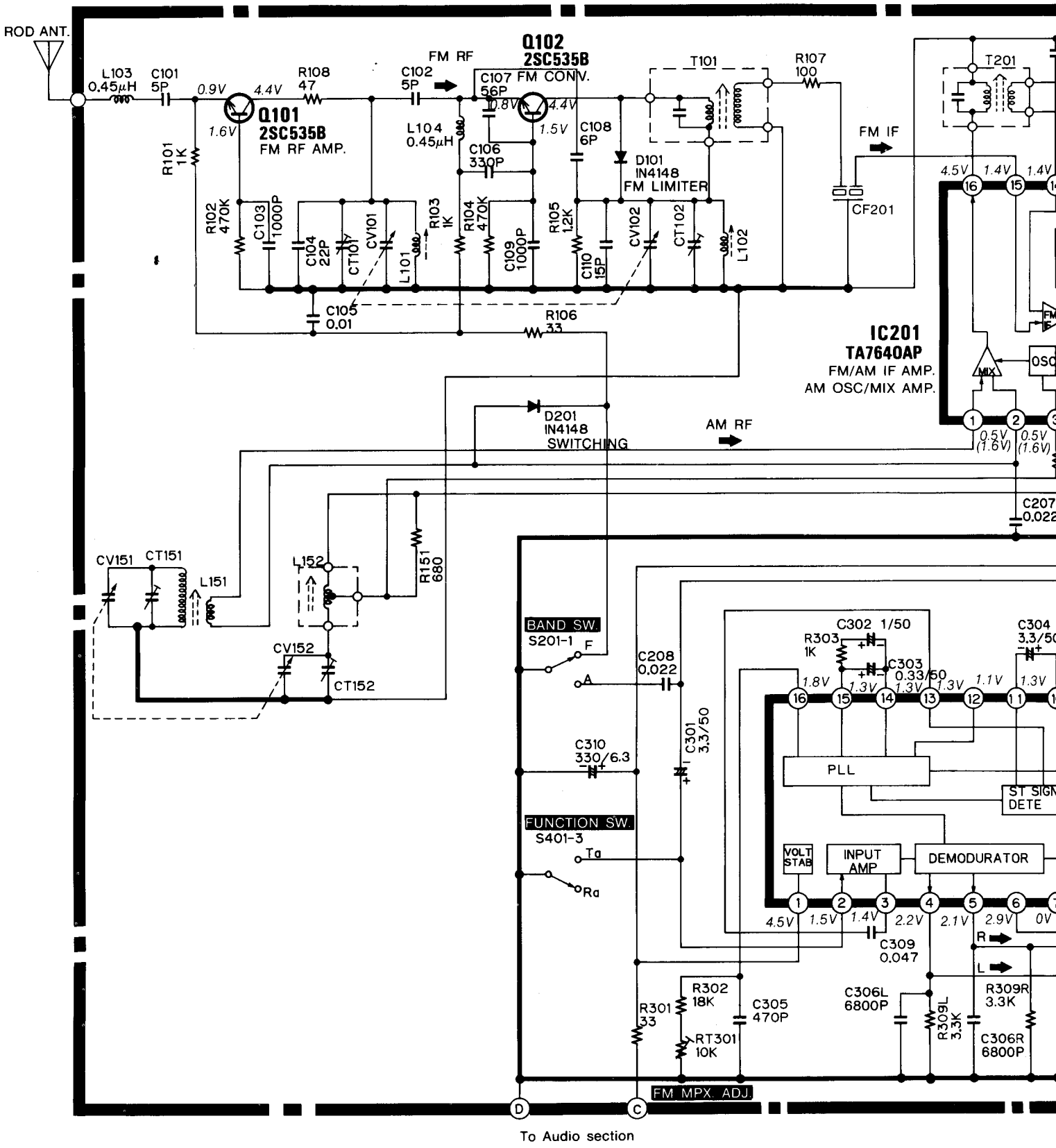
A B C D E

3 4 5 6

CAUTION-
Use the elect
the diameter

MAIN P.W.B. (Tuner section) [For H, HC]

( ) VOLTAGE : AM



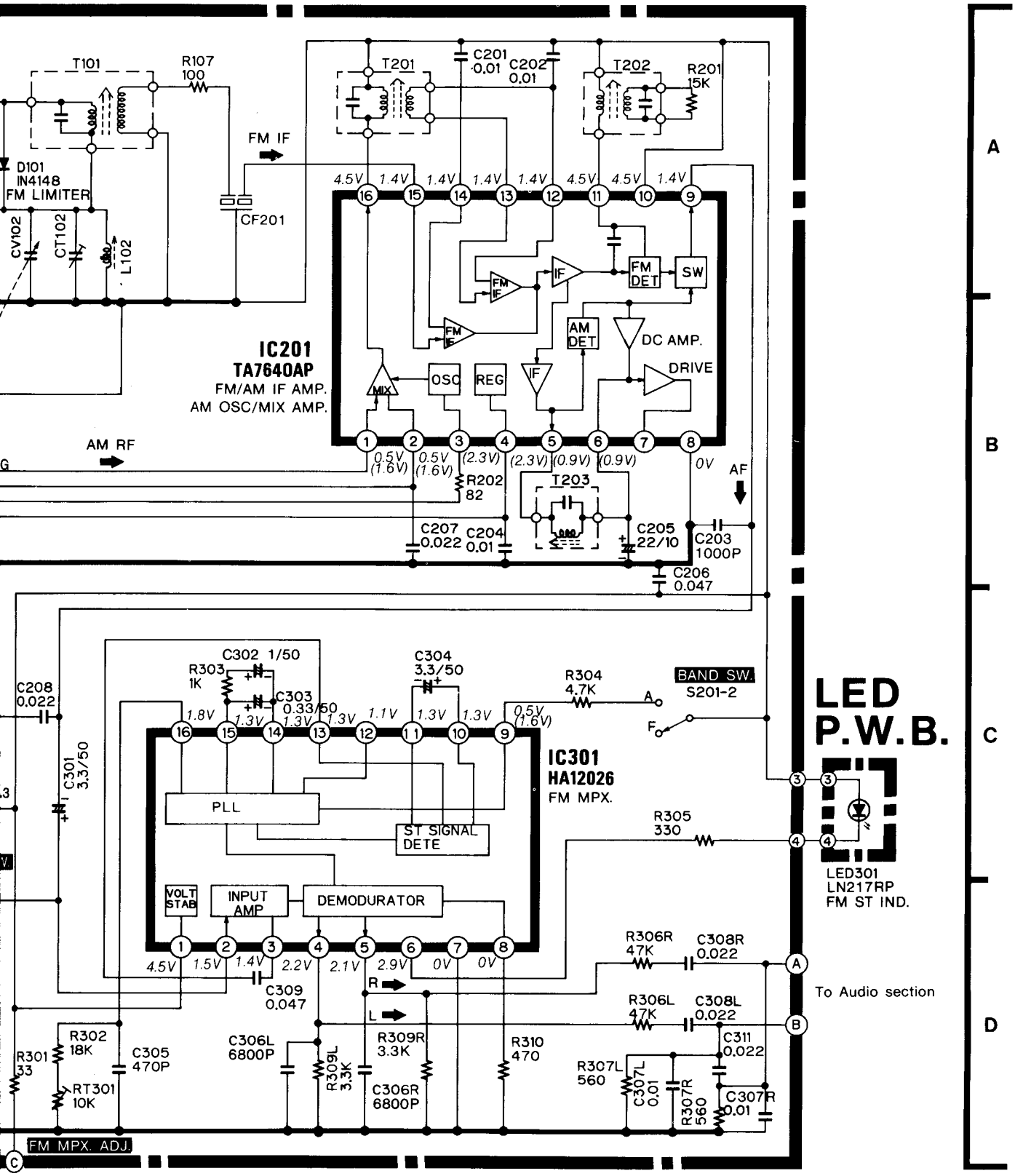
To Audio section

1 2 3

CAUTION

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmϕ.

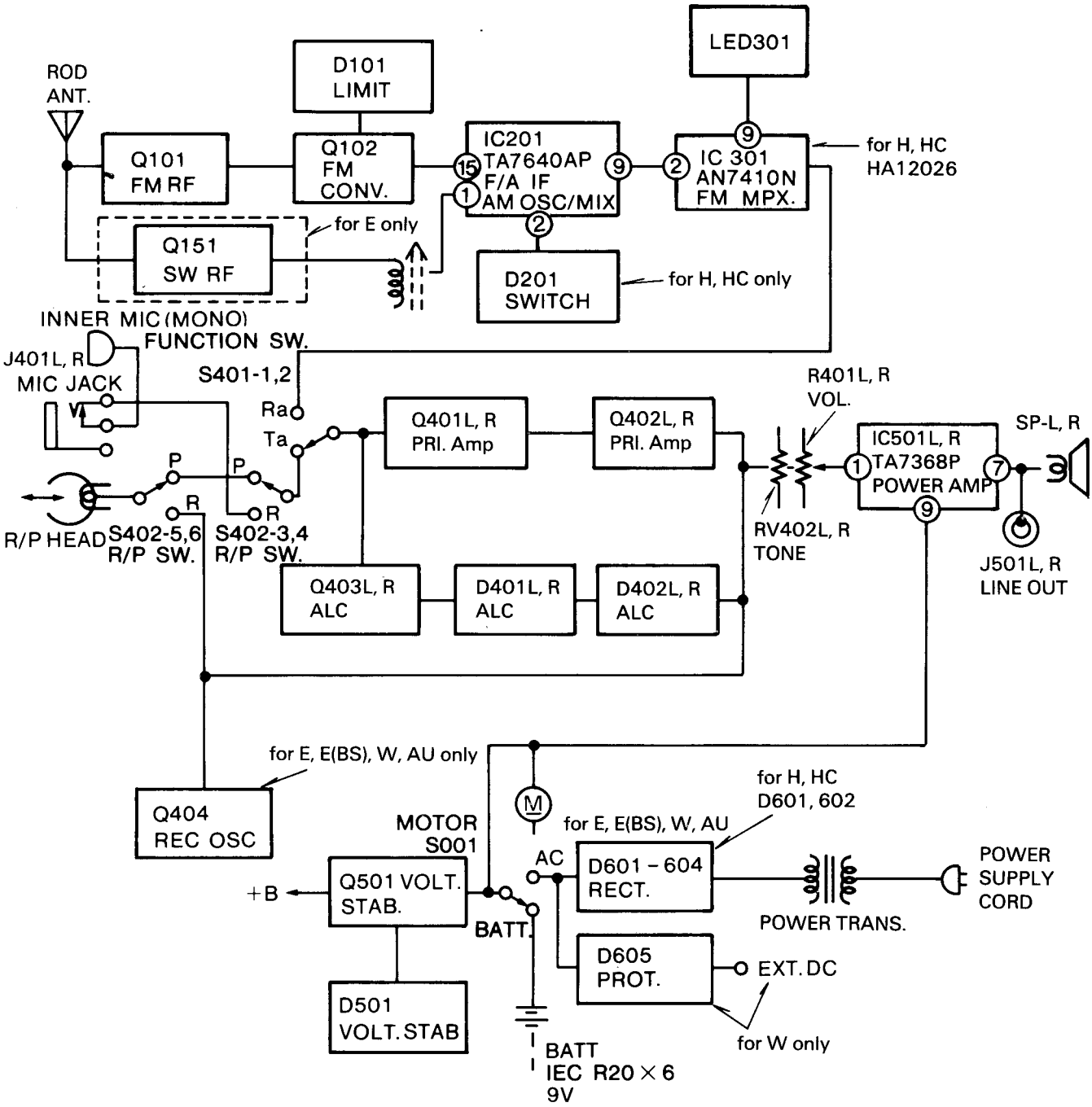
( ) VOLTAGE : AM



A B C D

3 4

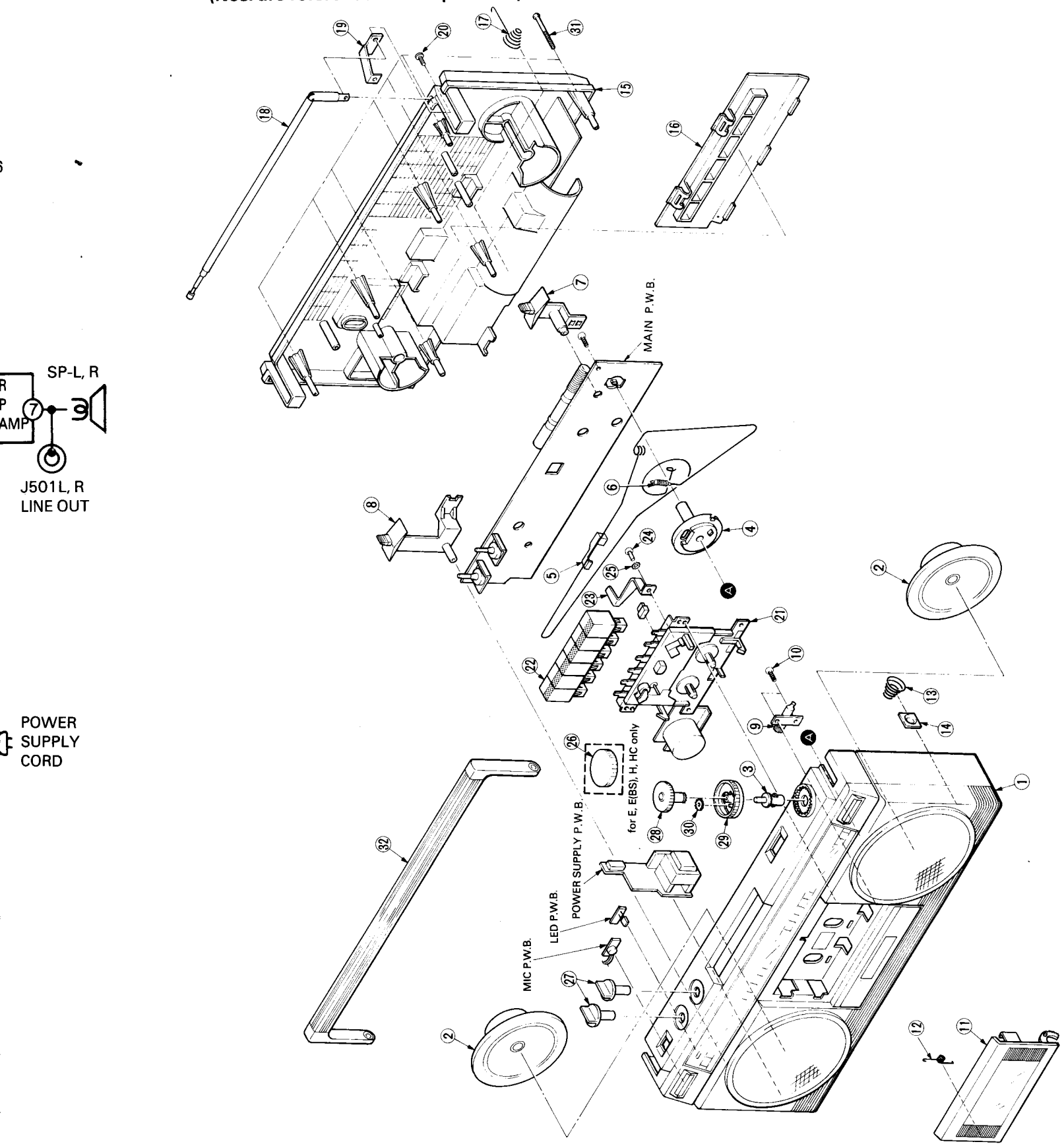
BROCK DIAGRAM



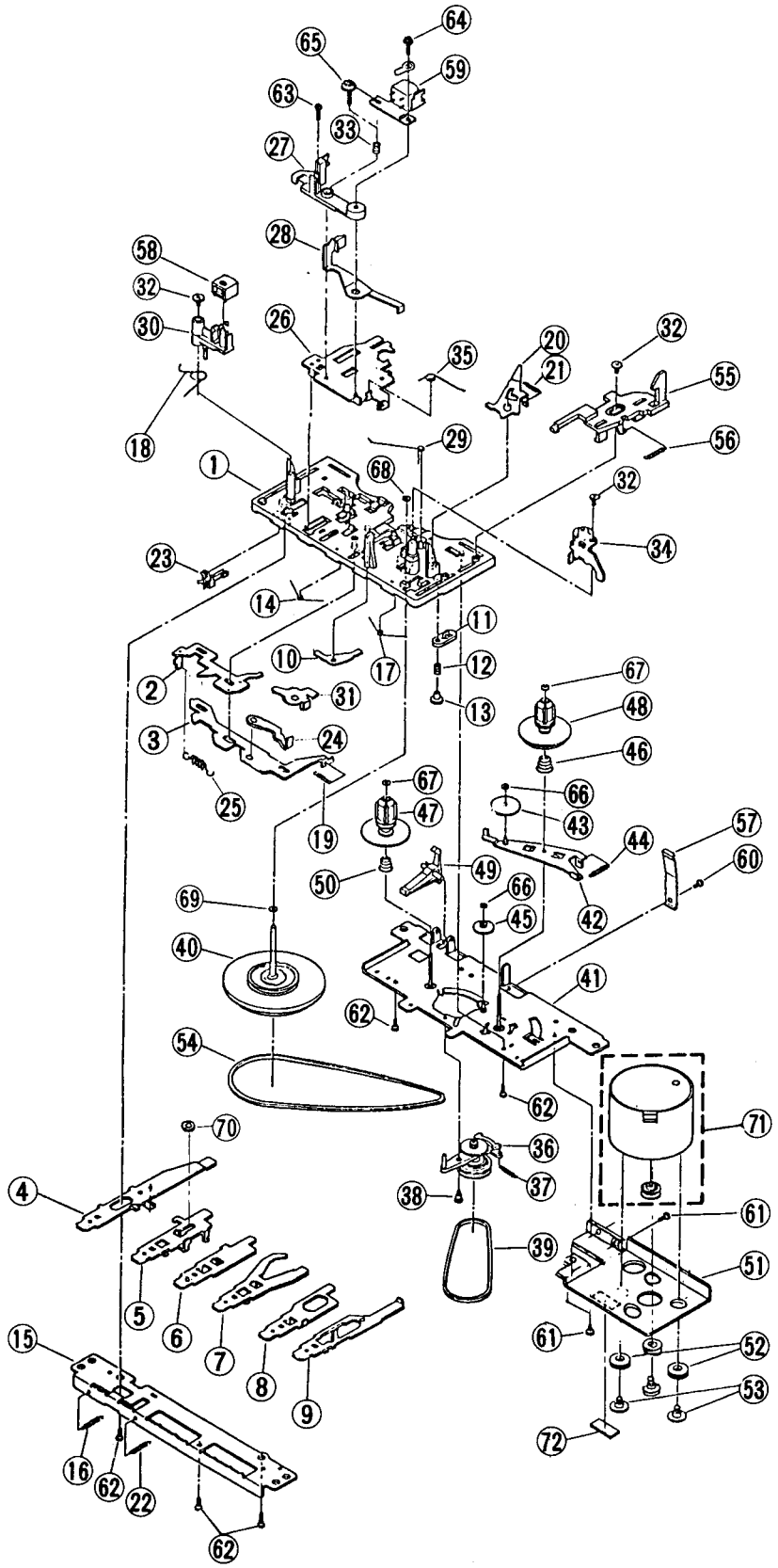
EXPLODED VIEW

● CABINET

(Nos. are reference Nos. of parts list)



- **Cassette chassis TN-21VC-177 chassis [For E, E(BS), W, AU]**
- **Cassette chassis TN-21VC-177-1 chassis [For H, HC]**



REPLACE

Cabinet

SYMBOL NO.	PART NO.	
	for FRONT C	
1	4027981	F
		[f
	4027982	F
		[f
	4028251	F
		[f
2	2402952	S
3	3976261	S
	3976262	S
	3976263	S
4	3976251	P
	3976252	P
5	3388241	P
	3388242	P
6	3340321	S
7	3305651	L
	3305652	L
8	3305641	L
		[e
	3305642	L
9	3970221	G
10	8691410	S
11	3976211	C
	3976212	C

Cassette chassis (

SYMBOL NO.	PART NO.	
	TN-2	
1	4818991	M
2	4818992	S
3	4820211	P
4	4820212	L
5	4820213	L
6	4818996	L
7	4818997	L
8	4818998	L
9	4818999	P
10	4818990	L
11	4819131	L
12	4819132	S
13	4819133	S
14	4820214	S
15	4820215	S
16	4819007	S
17	4819100	S
18	4820216	S
19	4819008	S
20	4819009	L
21	4819000	S
22	4820217	S
23	2789801	S
24	4819568	L

REPLACEMENT PARTS LIST

Cabinet

SYMBOL NO.	PART NO.	DESCRIPTION
for FRONT CASE ASSEMBLY		
1	4027981	Front case assembly [for E, E (BS)]
	4027982	Front case assembly [for W, AU]
	4028251	Front case assembly [for H, HC]
2	2402952	Speaker 10cm
3	3976261	Shaft, Tuning [for E, E (BS)]
	3976262	Shaft, Tuning [for W, AU]
	3976263	Shaft, Tuning [for H, HC]
4	3976251	Pulley 80 [except H, HC]
	3976252	Pulley 80 [for H, HC]
5	3388241	Pointer [except H, HC]
	3388242	Pointer [for H, HC]
6	3340321	Spring
7	3305651	Lever, Band [except H, HC]
	3305652	Lever, Band [for H, HC]
8	3305641	Lever, Function [except H, HC]
	3305642	Lever, Function [for H, HC]
9	3970221	Gear damper assembly
10	8691410	Screw, 3 x 10 BT bind head
11	3976211	Cassette lid [except H, HC]
	3976212	Cassette lid [for H, HC]
12	3368263	Spring
13	3367142	Spring A
14	4436666	Terminal
for REAR CASE ASSEMBLY		
15	4028001	Rear case assembly [for E]
	4028002	Rear case assembly [for E (BS)]
	4028003	Rear case assembly [for W]
	4028004	Rear case assembly [for AU]
	4028271	Rear case assembly [for H]
	4028272	Rear case assembly [for HC]
16	3976221	Battery lid [except H, HC]
	3976222	Battery lid [for H, HC]
17	3369941	Spring
18	2758231	Rod antenna [except H, HC]
	2758141	Rod antenna [for H, HC]
19	4463331	Bracket, Antenna
20	8744412	Screw bind head 3 x 12
for TN MECHA ASSEMBLY		
21	2588561	TN-21 Deck mecha assembly [except H, HC]
	2588562	TN-21 Deck mecha assembly [for H, HC]
22	3305631	Button, Cassette [except H, HC]
	3305633	Button, Cassette [for H, HC]
23	4463322	Plate, Rec
24	4578281	2.6 x 4 Screw
25	8815113	2.6 Lock washer
for FAINAL ASSEMBLY		
26	3303181	Knob 38 [for E, E (BS)]
	3303183	Knob 38 [for H, HC]
27	3303177	Knob, Selection [except H, HC]
	3303178	Knob, Selection [for H, HC]
28	3303091	Knob, Fine [for W, AU]
29	3303331	Knob, Tuning [for W, AU]
30	3348611	OG gear 2 [for W, AU]
31	4577819	Screw, 3 x 35 BT
32	4028151	Handle assembly

Cassette chassis (TN-21VC-177 chassis, TN-21VC-177-1 chassis)

SYMBOL NO.	PART NO.	DESCRIPTION
TN-21VC-177		
1	4818991	Main base assy
2	4818992	Switch Plate
3	4820211	Push button actuator
4	4820212	Lever, REC button
5	4820213	Lever, PLAY button
6	4818996	Lever, RWD button
7	4818997	Lever, FF button
8	4818998	Lever, STOP button
9	4818999	PAUSE button lever ass'y
10	4818990	Lever, RWD
11	4819131	Lever, PAUSE
12	4819132	Spring, PAUSE lever
13	4819133	Stopper, PAUSE
14	4820214	Spring, Button lever
15	4820215	Sub chassis
16	4819007	Spring, Button lever
17	4819100	Spring, Button lever
18	4820216	Spring, MG arm
19	4819008	Spring, Actuator
20	4819009	Lever, AUTO
21	4819000	Spring, AUTO lever
22	4820217	Spring, PLAY button lever
23	2789801	Switch, LEAF (S001)
24	4819568	Lever, E kick
25	4820218	Spring, Switch actuator
26	4820219	Head panel
27	4819014	Head base
28	4819015	Sensing plate ass'y
29	4820221	Spring, Head panel
30	4819018	MG arm
31	4819006	PR stopper
32	4819045	Screw
33	4819017	Spring
34	4820222	Pressure roller arm ass'y
35	4820223	Spring, Pressure roller arm
36	4820224	RF pulley arm ass'y
37	4820225	Spring, RF pulley arm
38	4820226	Screw, RF arm coller
39	4820227	Belt
40	4820231	Flywheel ass'y
41	4820232	Reel base ass'y
42	4820233	Take-up gear plate ass'y
43	4819029	Gear, Take-up, roller
44	4819020	Spring, TG plate
45	4819112	FF gear
46	4819037	Spring
47	4819033	Supply reel ass'y
48	4819034	Take-up reel ass'y
49	4819035	Record safety lever
50	4819032	Spring
51	4820234	Bracket, motor
52	4819039	Motor rubber
53	4819533	Screw, motor coller
54	4820235	Main belt
55	4819043	Level, Eject slide
56	4819044	Spring, Eject Slide lever
57	4820242	Pack spring
58	2557321	Erase head
59	4817061	R/P head [for E,W,AU]
	2557491	R/P head [for H,HC]
60	4819063	Screw, Tapping 2 x 3
61	4819068	Screw, Tapping 2 x 4
62	4819607	Screw, Bind tapping 2 x 5
63	4819069	Screw, 2 x 6
64	4819060	Screw, 2 x 7
65	4819600	Screw, Azimath
66	4819180	Washer, 1.2
67	4819077	Washer, 1.2
68	4819078	Washer, 1.55
69	4819614	Washer, 2.05
70	4820243	Washer, 2.1
71	4820361	Motor assembly [for E,W,AU]
	4820362	Motor assembly [for H,HC]
72	4820241	Mat

REPLACEMENT PARTS LIST

CD.....Ceramic discal EL..... Electrolytic ST..... Styrol ME..... Metal CO..... Composition
CC..... Cylindrical ceramic MF ..... Mylar, film CF ..... Carbon film MO..... Metal, oxide FR ..... Fuse resistor

SYMBOL NO.	PART NO.	DESCRIPTION
		CAPACITORS
C101	0208635	CD 5pF 0.25pF 50V
C102	0208635	CD 5pF 0.25pF 50V
C103	0209161	CD 1000pF $^{+80}_{-20}$% 50V
C104	0208668	CD 22pF ±5% 50V
C105	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
C106	0209721	CD 330pF ±10% 50V
C107	0208678	CD 56pF ±5% 50V
C108	0208016	CD 6pF ±0.5pF 50V
C109	0209161	CD 1000pF $^{+80}_{-20}$% 50V
C110	0208034	CD 15pF ±5% 50V
C111	0248684	CD 100pF ±5% 50V [for E]
C112	0248635	CD 5pF ±0.25pF 50V [for E]
C150	0248645	CD 5pF ±0.5pF 50V [for E, E(BS)]
C151	0248646	CD 6pF ±0.5pF 50V [for E (BS)]
C151	0248664	CD 15pF ±5% 50V [for E]
C152	0208648	CD 8pF ±0.5pF 50V [for E, E (BS)]
C152	0208633	CD 3pF ±0.25pF 50V [for W, AU]
C153	0208682	CD 82pF ±5% 50V [for E, E (BS)]
C153	0208648	CD 8pF ±0.5pF 50V [for W, AU]
C154	0208664	CD 15pF ±5% 50V [for E, E (BS)]
C154	0208648	CD 8pF ±0.5pF 50V [for W, AU]
C155	0208662	CD 12pF ±5% 50V [for E, E (BS)]
C155	0208634	CD 4pF ±0.25pF 50V [for W, AU]
C156	0208674	CD 39pF ±5% 50V [for E, E (BS)]
C156	0208662	CD 12pF ±5% 50V [for W, AU]
C157	0209737	CD 0.01μF ±10% 50V [except H, HC]
C158	0221339	ST 1500pF ±5% 50V [for W, AU]
C158	0221324	ST 360pF ±5% 50V [for E, E (BS)]
C159	0221324	ST 360pF ±5% 50V [for W, AU]
C159	0221319	ST 220pF ±5% 50V [for E, E (BS)]
C160	0208684	CD 100pF ±5% 50V [for E, E (BS)]
C161	0208635	CD 5pF ±0.25pF 50V [except H, HC]
C162	0244171	CD 0.01μF $^{+80}_{-20}$% 50V [for E]
C163	0244171	CD 0.01μF $^{+80}_{-20}$% 50V [for E]
C201	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
C202	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
C203	0209161	CD 1000pF $^{+80}_{-20}$% 50V [except H, HC]
C203	0244161	CD 1000pF $^{+80}_{-20}$% 50V [for H, HC]
C204	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
C205	0252322	EL 22μF 10V
C206	0209175	CD 0.047μF $^{+80}_{-20}$% 50V [except H, HC]
C206	0244175	CD 0.047μF $^{+80}_{-20}$% 50V [for H, HC]
C207	0244173	CD 0.022μF $^{+80}_{-20}$% 50V
C208	0244173	CD 0.022μF $^{+80}_{-20}$% 50V
C209	0208682	CD 82pF ±5% 50V [except H, HC]
C210	0248684	CD 100pF ±5% 50V [except H, HC]
C211	0248684	CD 100pF ±5% 50V [for E]
C301	0252813	EL 3.3μF 50V
C302	0252805	EL 0.47μF 50V [except H, HC]
C302	0252811	EL 1.0μF 50V [for H, HC]
C303	0252805	EL 0.47μF 50V [except H, HC]
C303	0252803	EL 0.33μF 50V [for H, HC]
C304	0252805	EL 0.47μF 50V [except H, HC]
C304	0252813	EL 3.3μF 50V [for H, HC]
C305	0221327	ST 470pF ±5% 50V [except H, HC]
C305	0268444	PP 470P ±5% 100V [for H, HC]
C306L,R	0209736	CD 6800pF ±10% 50V
C307L,R	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
C308L,R	0244173	CD 0.022μF ±5% 50V
C309	0209175	CD 0.047μF $^{+80}_{-20}$% 50V
C310	0252233	EL 330μF 0.3V
C311	0244173	CD 0.022μF ±5% 50V [except E, E (BS)]
C312	0208696	CD 330pF ±5% [for E, E (BS)]
C401L,R	0209165	CD 4700pF $^{+80}_{-20}$% 50V [except H, HC]
C402	0209175	CD 0.047μF $^{+80}_{-20}$% 50V
C403L,R	0252811	EL 1μF 50V [except H, HC]
C403L,R	0252802	EL 0.22μF 50V [for H, HC]
C404L,R	0209161	CD 1000pF $^{+80}_{-20}$% 50V
C405L,R	0244171	CD 0.01μF ±5% 50V
C406L,R	0252804	EL 0.15μF 50V [except H, HC]
C406L,R	0252803	EL 0.33μF 50V [for H, HC]
C407L,R	0252813	EL 3.3μF 50V
C408	0252323	EL 33μF 10V
C409L,R	0244173	CD 0.022μF $^{+80}_{-20}$% 50V
C410L,R	0209175	CD 0.047μF $^{+80}_{-20}$% 50V
C411L,R	0252802	EL 0.22μF 50V
C412	0252233	EL 330μF 6.3V
C413L,R	0209735	CD 4700pF ±10% 50V [except H, HC]
C413L,R	0209734	CD 3300pF ±10% 50V [for H, HC]
C414L	0209731	CD 1000pF ±10% 50V [except H, HC]
C414R	0274015	MF 4700pF ±10% 50V [except H, HC]
C415	0209161	CD 1000pF $^{+80}_{-20}$% 50V [except H, HC]
C416	0252322	EL 22μF 10V [except H, HC]
C417L,R	0209734	CD 3300pF ±10% 50V [except H, HC]
C417L	0209734	CD 3300pF ±10% 50V [for H, HC]
C417R	0244107	CD 3300pF ±10% 50V [for H, HC]
C501	0252331	EL 100μF 10V
C502L,R	0209161	CD 1000pF $^{+80}_{-20}$% 50V
C503L,R	0252323	EL 33μF 10V
C504	0252322	EL 22μF 10V
C505L,R	0252233	EL 330μF 6.3V
C506	0252542	EL 2200μF 16V
C507	0252532	EL 220μF 16V [for E, E (BS)]
C507	0252531	EL 100μF 16V [for W, AU]
C601	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
C602	0244171	CD 0.01μF $^{+80}_{-20}$% 50V
		RESISTORS
R101	0113615	CF 1kΩ ±5% SRD 1/8P
R102	0113679	CF 470kΩ ±5% SRD 1/8P
R103	0113615	CF 1kΩ ±5% SRD 1/8P
R104	0113679	CF 470kΩ ±5% SRD 1/8P
R105	0113617	CF 1.2kΩ ±5% SRD 1/8P
R106	0113579	CF 33Ω ±5% SRD 1/8P
R107	0113591	CF 100Ω ±5% SRD 1/8P
R108	0113591	CF 100Ω ±5% SRD 1/8P [except H, HC]
R108	0113583	CF 47Ω ±5% SRD 1/8P [for H, HC]
R151	0113643	CF 15kΩ ±5% SRD 1/8P [for E, E (BS)]
R151	0113611	CF 680Ω ±5% SRD 1/8P [for H, HC]
R152	0113645	CF 18kΩ ±5% SRD 1/8P [except H, HC]
R153	0113645	CF 18kΩ ±5% SRD 1/8P [for W, AU]
R154	1129577	CF 470Ω ±5% SRD 1/8P [for E]
R155	0170384	CF 470kΩ ±5% SRD 1/8P [for E]

SYMBOL NO.	PART NO.	DESCRIPTION
R201	0113643	CF 15kΩ ±5% SRD 1/8P
R202	0113583	CF 47Ω ±5% SRD 1/8P [except H, HC]
R202	0113589	CF 82Ω ±5% SRD 1/8P [for H, HC]
R301	0129543	CF 33Ω ±5% SRD 1/4P
R302	0113645	CF 18kΩ ±5% SRD 1/8P
R303	0113615	CF 1kΩ ±5% SRD 1/8P
R304	0113631	CF 4.7kΩ ±5% SRD 1/8P
R305	0113603	CF 330Ω ±5% SRD 1/8P
R306L,R	0113655	CF 47kΩ ±5% SRD 1/8P
R307L,R	0113611	CF 680Ω ±5% SRD 1/8P [except H, HC]
R307L,R	0113609	CF 560Ω ±5% SRD 1/8P [for H, HC]
R309L,R	0113627	CF 3.3kΩ ±5% SRD 1/8P [for H, HC]
R310	0113607	CF 470Ω ±5% SRD 1/8P [for H, HC]
R401L,R	0113623	CF 2.2kΩ ±5% SRD 1/8P
R402L,R	0113619	CF 1.5kΩ ±5% SRD 1/8P
R403L,R	0113639	CF 10kΩ ±5% SRD 1/8P
R404	0113631	CF 4.7kΩ ±5% SRD 1/8P
R406L,R	0113679	CF 470kΩ ±5% SRD 1/8P
R407L,R	0113635	CF 6.8kΩ ±5% SRD 1/8P
R408L,R	0113579	CF 33Ω ±5% SRD 1/8P [except H, HC]
R408L,R	0113573	CF 18Ω ±5% SRD 1/8P [for H, HC]
R410L,R	0113651	CF 33kΩ ±5% SRD 1/8P
R411L,R	0113669	CF 180kΩ ±5% SRD 1/8P
R412L,R	0113619	CF 1.5kΩ ±5% SRD 1/8P
R413L,R	0113623	CF 2.2kΩ ±5% SRD 1/8P
R414L,R	0113627	CF 3.3kΩ ±5% SRD 1/8P
R415L,R	0113603	CF 330Ω ±5% SRD 1/8P
R416L,R	0113609	CF 560Ω ±5% SRD 1/8P [except H, HC]
R416L,R	0113607	CF 470Ω ±5% SRD 1/8P [for H, HC]
R417L,R	0113623	CF 2.2kΩ ±5% SRD 1/8P
R418	0113663	CF 100kΩ ±5% SRD 1/8P
R419L,R	0113639	CF 10kΩ ±5% SRD 1/8P
R420	0129543	CF 33Ω ±5% SRD 1/4P [except H, HC]
R421	0113655	CF 47kΩ ±5% SRD 1/8P [except H, HC]
R423	0113563	CF 6.8Ω ±5% SRD 1/8P [except H, HC]
R424L,R	0113651	CF 33kΩ ±5% SRD 1/8P [for H, HC]
R425	0113603	CF 330Ω ±5% SRD 1/8P [except H, HC]
R501	0113591	CF 100Ω ±5% SRD 1/8P
R502	0113609	CF 560Ω ±5% SRD 1/8P
R503L,R	0113599	CF 220Ω ±5% SRD 1/8P

ICS & TRANSISTORS

IC201	2389511	TA7640AP
IC301	2369631	AN7410N [except H, HC]
IC301	2389501	HA12026 [for H, HC]
IC501L,R	2300031	TA7368P
Q101	2317991	2SC1047D [except H, HC]
Q101	2329332	2SC535B [for H, HC]
Q102	2317991	2SC1047D [except H, HC]
Q102	2329332	2SC535B [for H, HC]
Q151	2319081	HIT9011H [for E]
Q401L,R	2318001	2SC1684H-R [except H, HC]
Q401L,R	2319091	HIT9014N-C [for H, HC]
Q402L,R	2319101	2SC1684R [except H, HC]
Q402L,R	2319161	HIT9014C [for H, HC]
Q403L,R	2319101	2SC1684R [except H, HC]
Q403L,R	2319161	HIT9014C [for H, HC]
Q404	2319101	2SC1684R [except H, HC]
Q501	2318011	2SC1317C [except H, HC]
Q501	2319052	HIT8050C [for H, HC]

DIODES

D101	2398081	1N4148
D102	2398081	1N4148 [except H, HC]
D103	2398081	1N4148 [for E (BS), W, AU]
D201	2398081	1N4148 [for H, HC]
D401L,R	2398081	1N4148 [except H, HC]
D401L,R	2398132	1S188 (FM) [for H, HC]
D402L,R	2398081	1N4148
ZD501	2397261	MTZ 6.2A [except H, HC]
ZD501	2338003	HZ-6C [for H, HC]
D601	2398062	1N4001 [except H, HC]
D601	2398061	1N4002 [for H, HC]
D602	2398062	1N4001 [except H, HC]
D602	2398061	1N4002 [for H, HC]
D603	2398062	1N4001 [except H, HC]
D604	2398062	1N4001 [except H, HC]
D605	2398062	1N4001 [for W]
LED301	2397753	LN217RP

VARIABLE RESISTORS

RT301	0199331	10kΩ [except H, HC] (FM MPX ADJ)
RT301	0151808	10kΩ [for H, HC] (FM MPX ADJ)
RV401L,R	0166942	10kΩ-(A) (VOLUME)
RV402L,R	0166931	10kΩ-(A) (TONE)

COILS & TRANSFORMERS

L101	2137683	FM RF coil
L102	2137682	FM OSC coil
L103	2137684	Choke coil
L104	2137684	Choke coil
L151	2137662	SW ANT coil [for E]
L151	2758221	Ferrite antenna [for H, HC]
L151	2137661	SW ANT coil [for E (BS)]
L151	2137667	SW ANT coil [for W, Au]
L152	2137634	MW OSC coil [for H, HC]
L154	2137671	SW OSC coil [for E, (BS)]
L154	2137672	SW2 OSC coil [for W, Au]
L155	2137631	MW OSC coil [for E, E (BS)]
L155	2137633	SW1 OSC coil [for W, Au]
L156	2137632	LW OSC coil [for E, E (BS)]
L156	2137631	MW OSC coil [for W, Au]
L157	2137684	Choke coil [except H, HC]
T101	2154962	FM IF transformer
T201	2154952	AM IF transformer
T202	2154964	FM IF transformer
T203	2154951	AM IF transformer
T401	2136891	REC OSC transformer [except H, HC]

MISCELLANEOUS

CT151	0283557	Semi variable capacitor [except H, HC]
CT152	0283557	Semi variable capacitor [except H, HC]
CT154	0283557	Semi variable capacitor [for E, E (BS)]
CT155	0283557	Semi variable capacitor [for E, E (BS)]
CT154	0283130	Semi variable capacitor [for W, Au]
CT155	0283130	Semi variable capacitor [for W, Au]
CT156	0283130	Semi variable capacitor [for W, Au]
CT157	0282148	Semi variable capacitor [for E, E (BS)]
S201	2629411	Slide switch (2-2) [for H, HC] (BAND)
S201	2629282	Slide switch [except H, HC] (BAND)
S401	2628372	Slide switch (6-2) (FUNCTION)
S402	2628361	Slide switch (6-2) (R/P)
S403	2629331	Slide switch (2-2) (FM MODE) [for E, E (BS)]
S601	2628351	Slide switch (1-2) [except H, HC] (AC/BATT)
S602	2618471	Rotary switch (1-3) [for W] (VOLTAGE SELECTOR)
S601	2629381	Slide switch (1-2) [for H, HC] (AC/BATT)
CF201	2135321	Ceramic filter
⚠ F601	2727723	Fuse F500mA [except W, H, HC]
	2737102	Microphone [except H, HC]
	2737441	Microphone [for H, HC]
	0282120	PVC (VARIABLE CAPACITOR) [except H, HC]
	0282282	PVC (VARIABLE CAPACITOR) [for H, HC]
	2757994	Ferrite antenna [for E, E (BS)]
	2757982	Ferrite antenna [for W, Au]
⚠	2707709	Power supply cord [for E]
⚠	2717902	Power supply cord [for E (BS)]
⚠	2706584	Power supply cord [for W]
⚠	2706251	Power supply cord [for Au]
⚠	2706593	Power supply cord [for H, HC]
⚠	2249016	Power transformer [for E]
⚠	2249017	Power transformer [for E (BS), Au]
⚠	2249013	Power transformer [for W]
⚠	2249014	Power transformer [for H]
⚠	2249015	Power transformer [for HC]

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