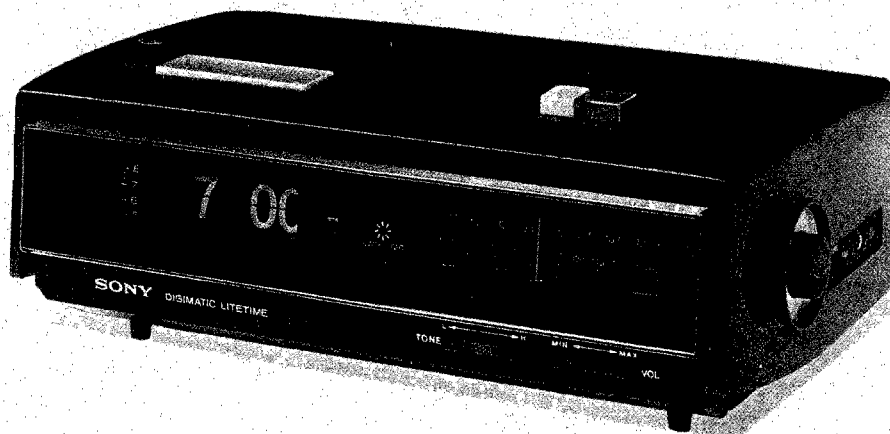


# TFM-C650WL

AEP Model



## FM/MW/LW DIGITAL CLOCK RADIO

### SPECIFICATIONS

<b>Circuit:</b>	Superheterodyne	<b>Signal-to-Noise Ratio:</b>	FM 55 dB at 54 dB, 98 MHz input MW 32 dB at 60 dB/m, 1 MHz input LW 18 dB at 60 dB/m, 220 kHz input
<b>Frequency Range:</b>	FM 87.5 ~ 108 MHz (3.43 ~ 2.78 m) MW 530 kHz ~ 1605 kHz (566 ~ 187 m) LW 150 kHz ~ 285 kHz (2000 ~ 1052 m)	<b>Output Power:</b>	1.4W (undistorted) 1.6W (maximum)
<b>Intermediate Frequency:</b>	FM 10.7 MHz MW, LW 455 kHz	<b>Power Consumption:</b>	AC 9W (maximum)
<b>Antennas:</b>	FM external antenna terminals (75 $\Omega$ ) MW, LW built-in ferrite bar (10 mm dia x 160 mm, 3/8 inch dia x 6 5/16 inches)	<b>Power Requirement:</b>	AC 110, 127, 220, 240V 50 Hz
<b>Sensitivity at 50 mW Output:</b>	FM 2.2 $\mu$ V (7 dB), S/N = 14 dB 4.5 $\mu$ V (13 dB), S/N = 30 dB MW 80 $\mu$ V/m (38 dB/m), S/N = 6 dB LW 240 $\mu$ V/m (48 dB/m), S/N = 6 dB	<b>Speaker:</b>	100 mm dia, 4 inch dia 8 $\Omega$
<b>Selectivity:</b>	30 dB at $\pm$ 10 kHz off-resonance at 1400 kHz	<b>Semiconductors:</b>	13 transistors (incl. 2 transistors for AUX circuits), 8 diodes
		<b>Clock:</b>	digital (leaf) type, synchronous motor, black light
		<b>Jack:</b>	EARPHONE, EXT ANT
		<b>Dimensions:</b>	340 (w) x 116 (h) x 190 (d) mm, 13 1/2 (w) x 4 9/16 (h) x 7 1/2 (d) inches
		<b>Weight:</b>	2.3 kg, 5 lb 2 oz
		<b>Supplied Accessory:</b>	Earphone

**SONY**<sup>®</sup>  
**SERVICE MANUAL**

153

**TABLE OF CONTENTS**

<u>Section</u>	<u>Title</u>	<u>Page</u>
	Specifications .....	1
<b>1.</b>	<b>OUTLINE</b>	
1-1.	Snooze Circuit Operation .....	3
1-2.	Block Diagram .....	4
1-3.	External View .....	5
1-4.	Internal View .....	5
<b>2.</b>	<b>DISASSEMBLY</b>	
2-1.	Case Removal .....	6
2-2.	Chassis Removal .....	7
2-3.	Digital Clock Removal .....	7
2-4.	BL Circuit Board Removal .....	7
2-5.	Snooze Button Removal .....	8
2-6.	Control Circuit Board Removal .....	8
2-7.	Switch Circuit Board Removal .....	8
2-8.	Antenna Circuit Board Removal .....	8
2-9.	Main Circuit Board Removal .....	9
2-10.	Dial Cord Stringing .....	9
<b>3.</b>	<b>ADJUSTMENTS</b> .....	11
<b>4.</b>	<b>DIAGRAMS</b>	
4-1.	Mounting Diagram	
	– Component Side – .....	14
4-2.	Schematic Diagram .....	16
4-3.	Mounting Diagram	
	– Conductor Side – .....	19
<b>5.</b>	<b>EXPLODED VIEW AND PACKING</b>	
5-1.	Exploded View .....	21
5-2.	Packing .....	23
<b>6.</b>	<b>ELECTRICAL PARTS LIST</b> .....	24

*When ordering replacement parts, use PART NUMBERS listed in Parts Lists or shown in EXPLODED VIEWS.*

*Parts List reference numbers should not be used.*

*In West Germany the FM frequency coverage should be within the range between 87.5 MHz and 108 MHz.*

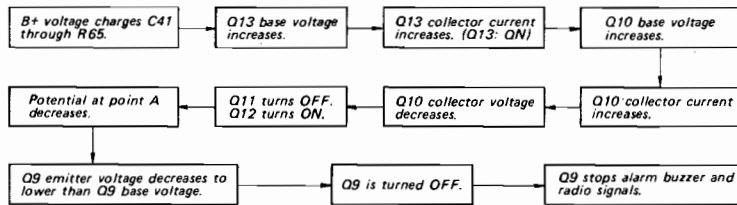
*Adjust the frequency coverage by osc coil and osc trimmer  
(See FM Frequency Coverage Adjustment on page 14.)*

## SECTION 1 OUTLINE

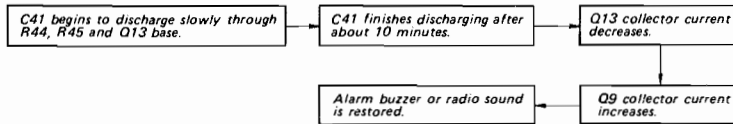
### 1-1. SNOOZE CIRCUIT OPERATION

This circuit stops the alarm buzzer or radio sound for about 10 minutes. The schematic (Fig. 1-1) indicates the condition of alarm switch (S6) ON and alarm buzzer sounding. The circuit operates as follows.

1) With snooze switch (S7) depressed at this condition:



2) With snooze switch (S7) released:



3) With alarm switch (S6) turned OFF:

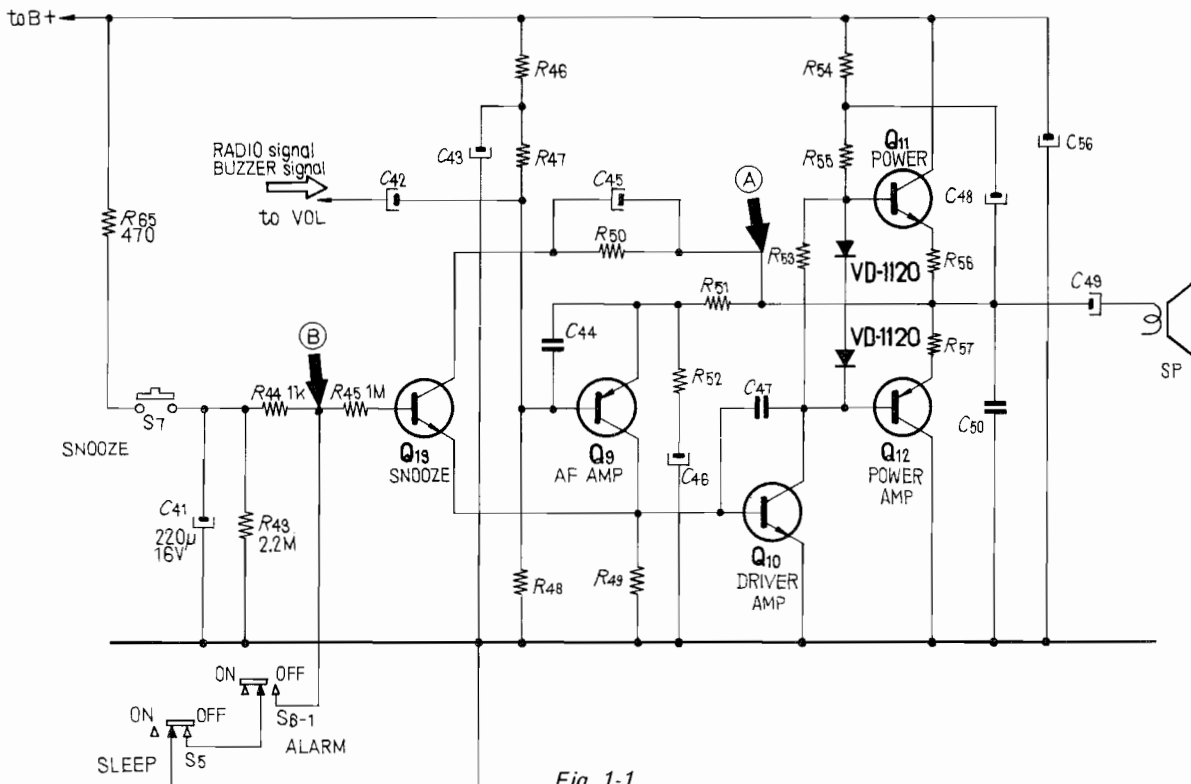
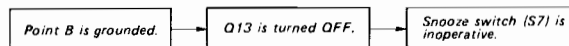
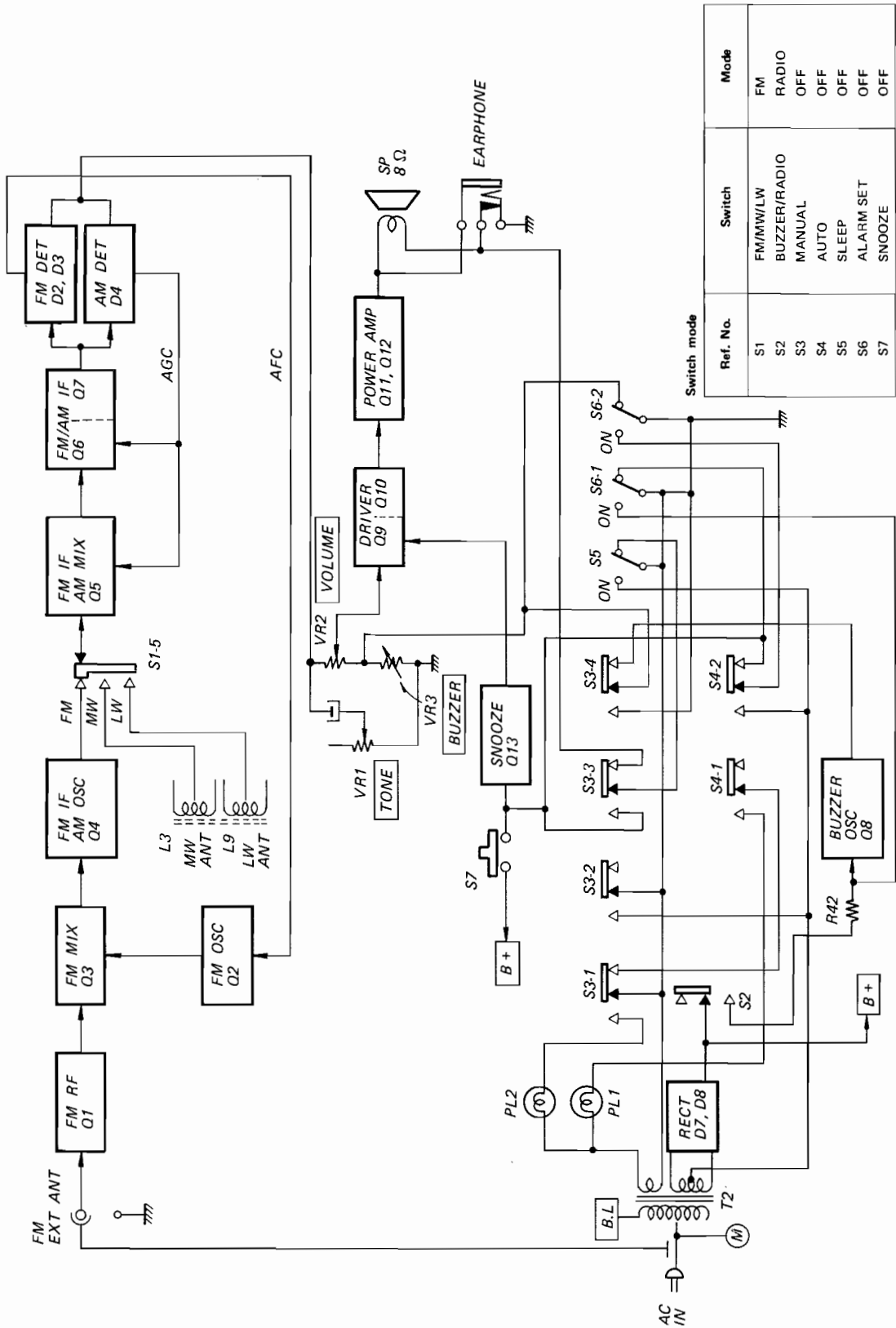


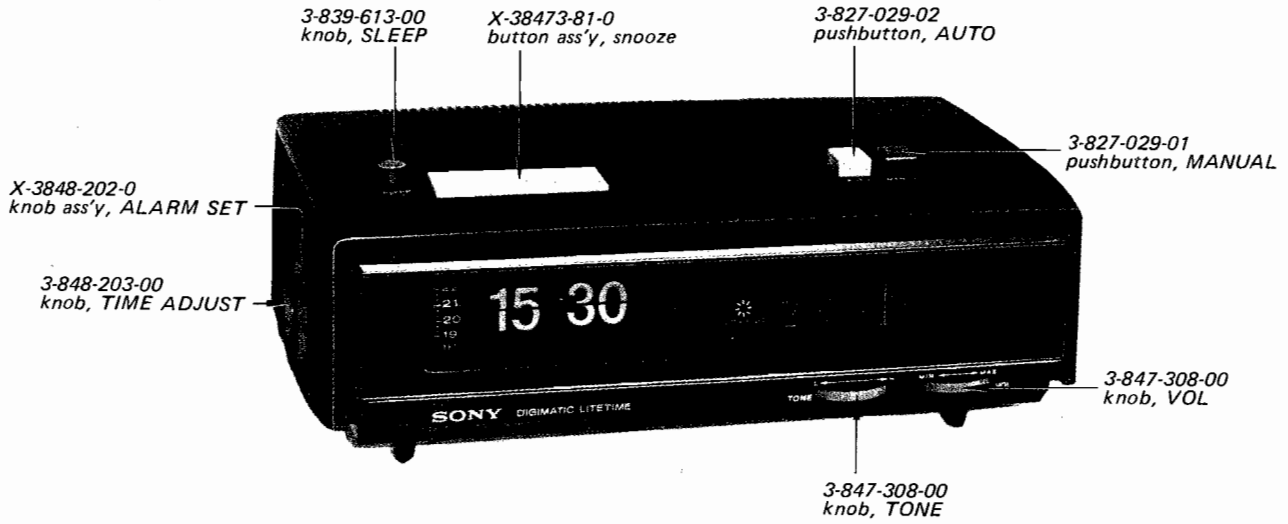
Fig. 1-1.

# TFM-C650WL

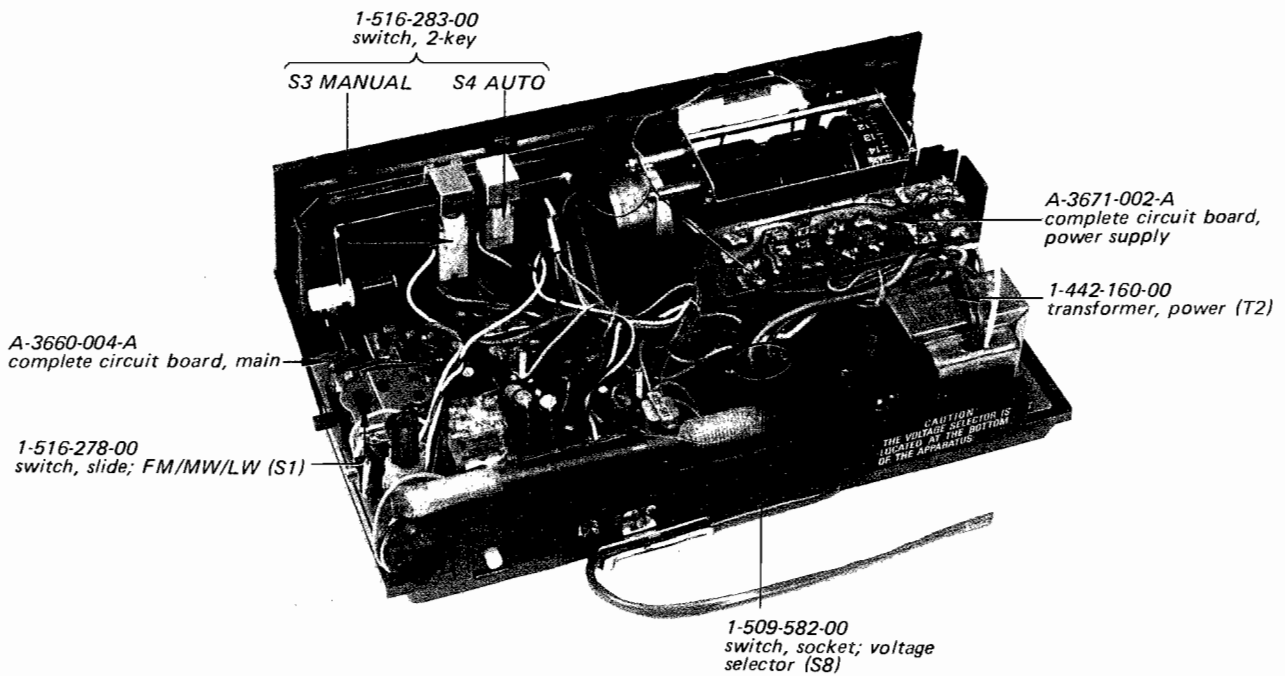
## 1-2. BLOCK DIAGRAM



**1-3. EXTERNAL VIEW**



**1-4. INTERNAL VIEW**



## SECTION 2 DISASSEMBLY

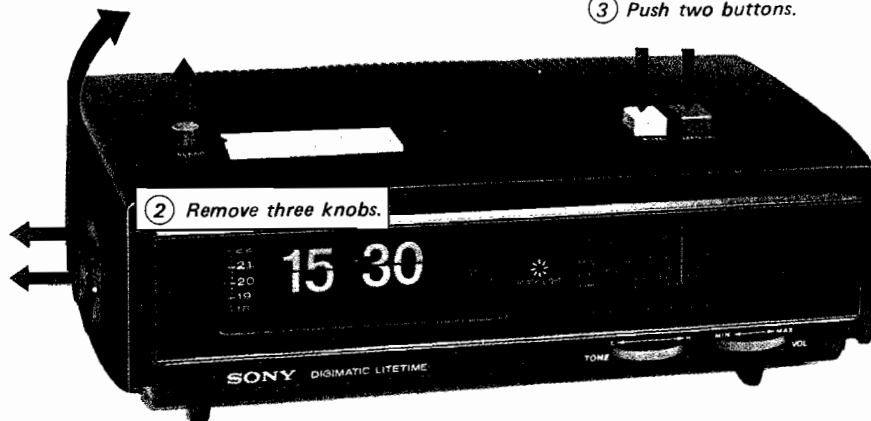
### 2-1. CASE REMOVAL

- ① Remove five screws and tuning knob.

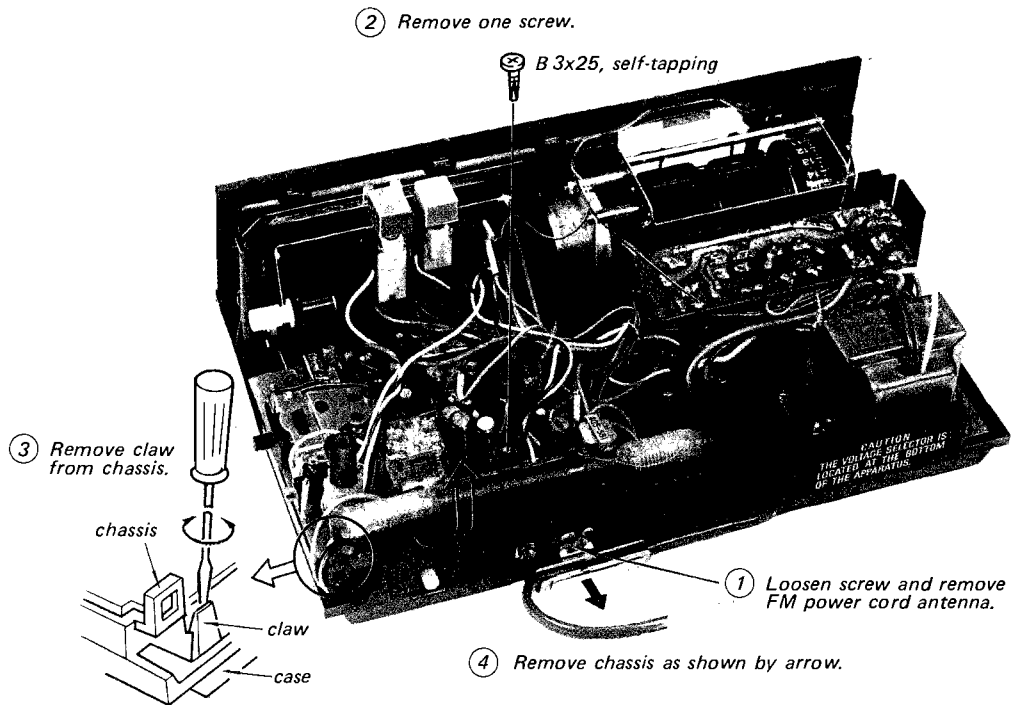


- ④ Lift upper case up.

- ③ Push two buttons.

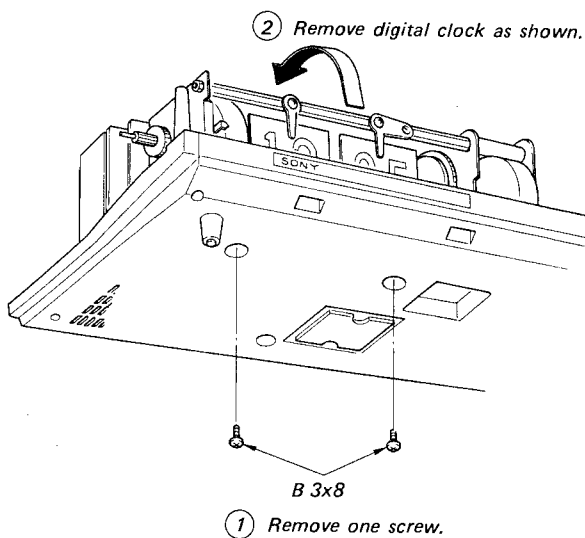


**2-2. CHASSIS REMOVAL**



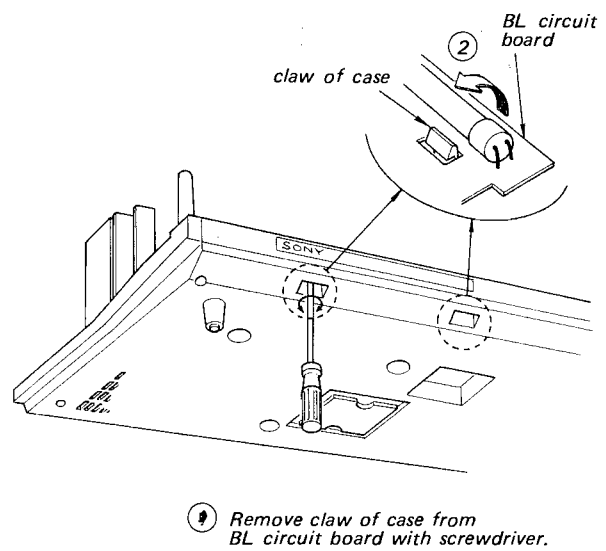
**2-3. DIGITAL CLOCK REMOVAL**

*Do this removal after case removal.*



**2-4. BL CIRCUIT BOARD REMOVAL**

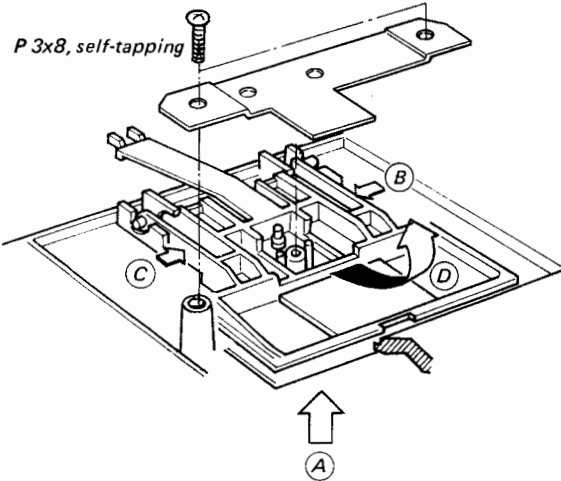
*Do this removal after digital clock removal.*



## 2-5. SNOOZE BUTTON REMOVAL

Do this removal after case removal.

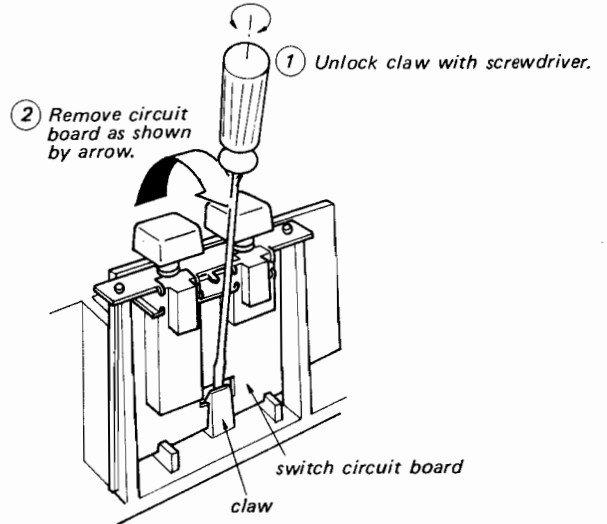
- 1 Remove switch contact bracket.



- 2 Push (A), (B), (C), at the same time and remove snooze button as shown by arrow (D).

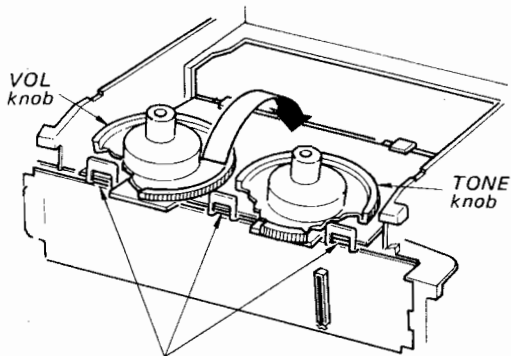
## 2-7. SWITCH CIRCUIT BOARD REMOVAL

Do this removal after case removal.



## 2-6. CONTROL CIRCUIT BOARD REMOVAL

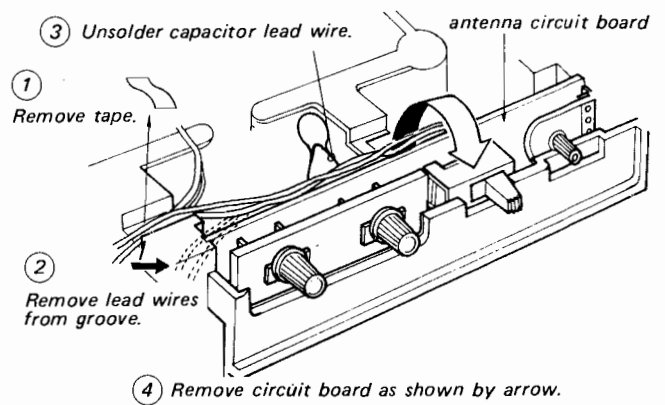
Do this removal after case removal.



Remove three claws from circuit board.

## 2-8. ANTENNA CIRCUIT BOARD REMOVAL

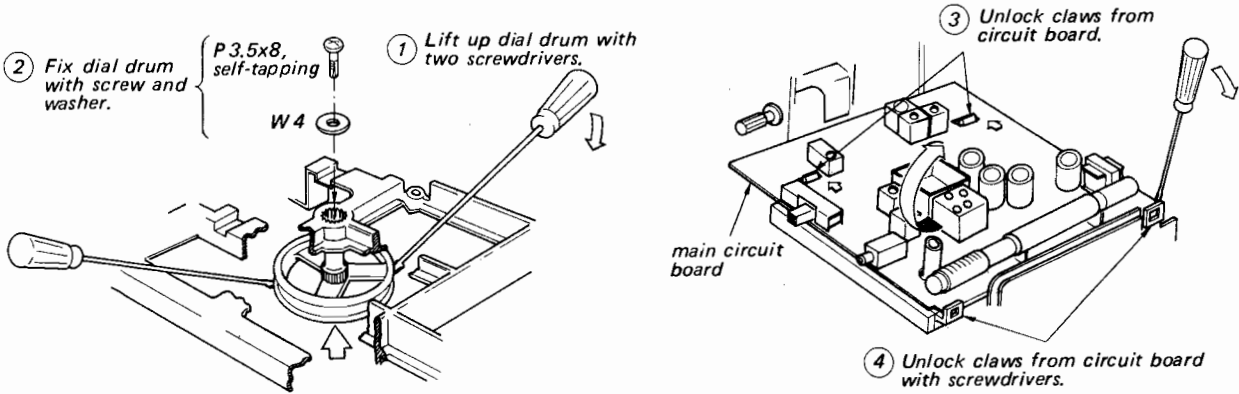
Do this removal after chassis removal.





**2-9. MAIN CIRCUIT BOARD REMOVAL**

*Do this removal after chassis removal.*



**2-10. DIAL CORD STRINGING**

**Note:** Do dial cord stringing after removing chassis, TONE and VOL knob, cord clamp (Fig. (a)), main circuit board and control circuit board.

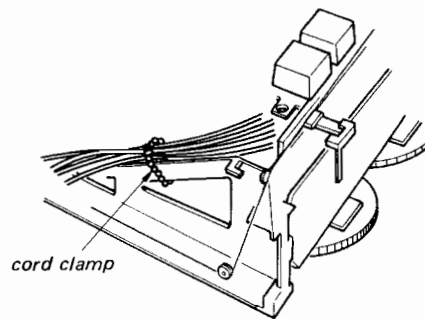


Fig. (a)

1) Make dial cord assembly as shown in Fig. (b).

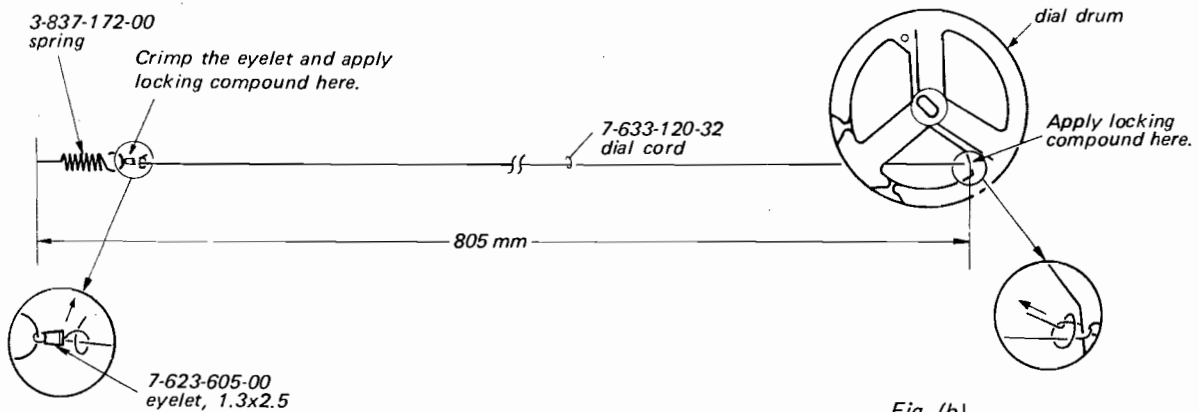
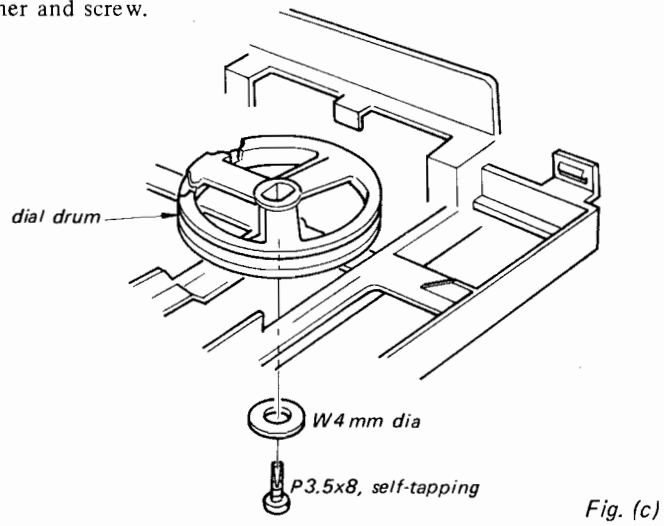
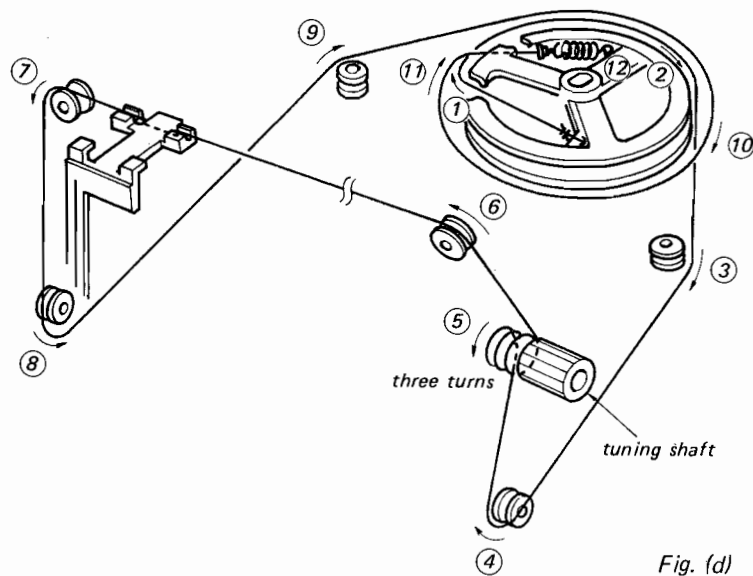


Fig. (b)

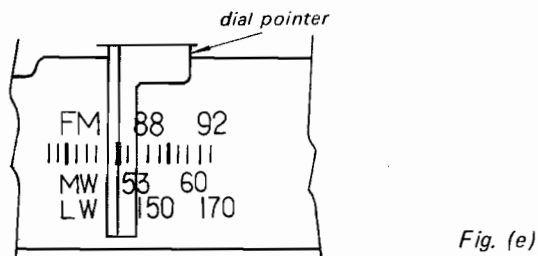
- 2) Fix dial drum with washer and screw.



- 3) String dial cord in numerical order.



- 4) Turn tuning capacitor shaft on main circuit board fully counterclockwise.
- 5) Install main and control circuit boards on chassis. When installing main circuit board, watch to meet tuning capacitor shaft and dial drum hole.
- 6) Remove screw and washer fixed in Fig.(c) and push dial drum to tuning capacitor shaft.
- 7) Turn tuning shaft fully counterclockwise and set dial pointer as shown in Fig.(e).



- 8) Put cord clamp as shown Fig. (a) on page 9.

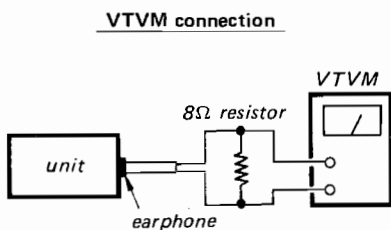
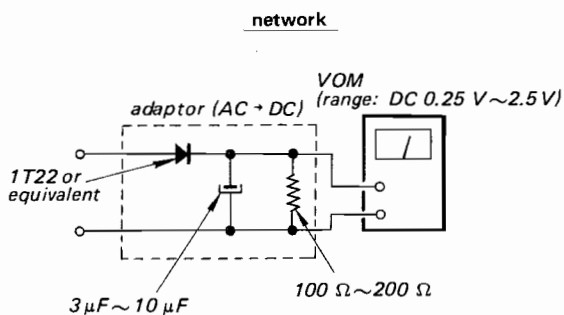
## SECTION 3 ADJUSTMENTS

### Test Equipment/Tools Required

- AM rf signal generator
- FM rf signal generator
- VOM (volt-ohm meter)

**Note:** 1. Modulation

- AM: 30% amplitude modulation by 400 Hz signal.
  - FM:  $\pm 22.5$  kHz frequency deviation by 400 Hz signal.
2. AM, FM rf signal generator output level should be as low as possible for following adjustments.
3. When your volt-ohm meter does not have 0.5 ~ 5 V AC range, use the DC range with rectifying network or use VTVM, as shown below.

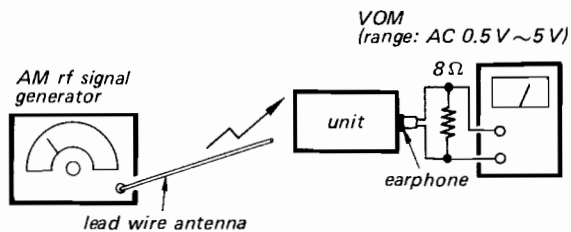


### 1. AM I-f Alignment

**Settings:**

- FM/MW/LW switch: MW
- VOL control: MAX

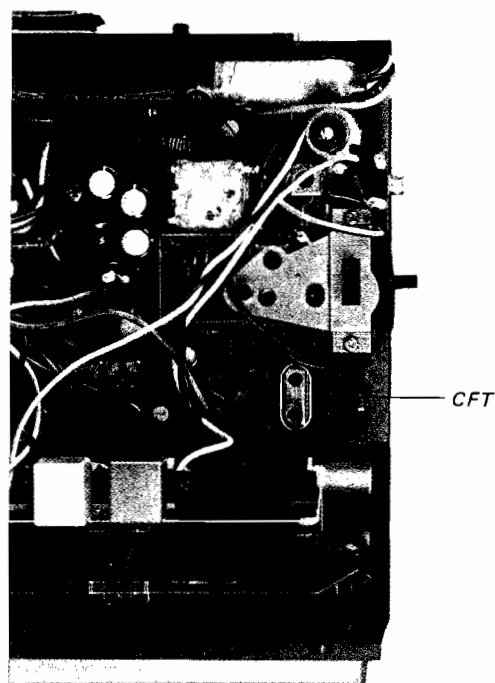
**Procedure:**



Step	AM rf signal generator frequency	Tuning knob	Adjust	VOM reading
1	455 kHz	Detune broadcasting signals.	CFT	maximum
2	455 kHz	Detune broadcasting signals.	AM rf signal generator tuning knob	maximum

**Note:** Repeat above steps two or three times ending Step 1.

**Adjustment Location:**

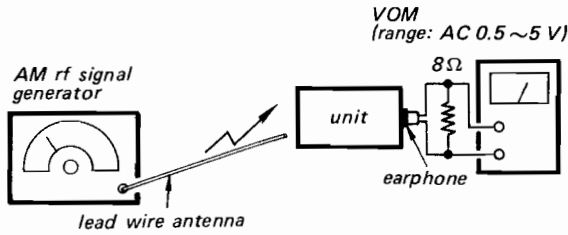


## 2. MW Frequency Coverage and Tracking Adjustments

### Settings:

FM/MW/LW switch: MW  
VOL control: MAX

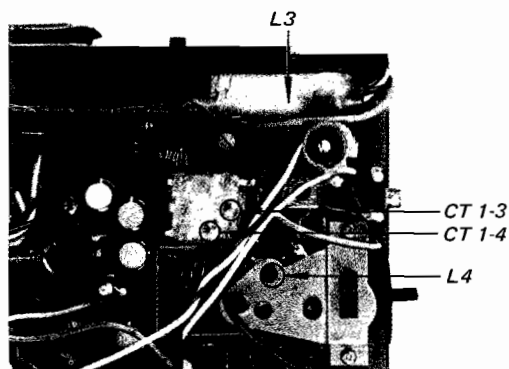
### Procedure:



Adjustment	Step	AM rf signal generator frequency	Tuning knob	Adjust	VOM reading
Frequency coverage	1	520 kHz	fully counter-clockwise	L4	maximum
	2	1680 kHz	fully clockwise	CT 1-4	maximum
Tracking	1	620 kHz	Tune to 620 kHz	L3	maximum
	2	1400 kHz	Tune to 1400 kHz	CT 1-3	maximum

- Note:**
- Repeat above steps two or three times ending Step 2.
  - After this adjustment, fix the ferrite bar antenna coil (L3) with wax.
  - After this adjustment, perform LW Frequency Coverage and Tracking Adjustment.

### Adjustment Location:

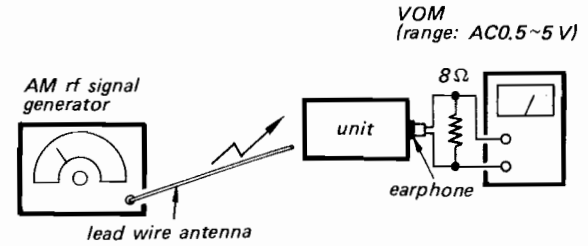


## 3. LW Frequency Coverage and Tracking Adjustment

### Settings:

FM/MW/LW switch: LW  
VOL control: MAX

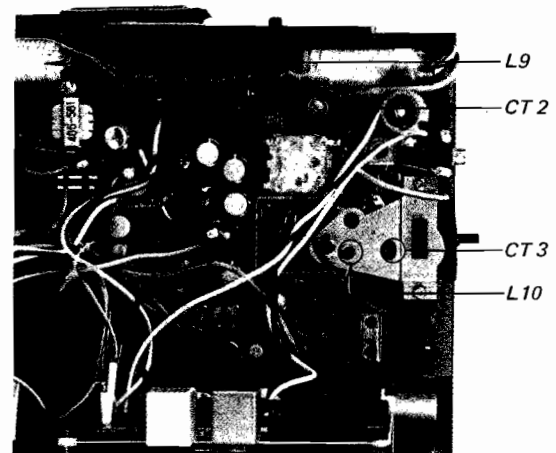
### Procedure:



Adjustment	Step	AM rf signal generator frequency	Tuning knob	Adjust	VOM reading
Frequency coverage	1	145 kHz	fully counter-clockwise	L10	maximum
	2	300 kHz	fully clockwise	CT 3	maximum
Tracking	1	160 kHz	Tune to 160 kHz	L9	maximum
	2	280 kHz	Tune to 280 kHz	CT 2	maximum

- Note:**
- Repeat above steps two or three times ending Step 2.
  - After this adjustment, fix the ferrite bar antenna coil (L9) with wax.

### Adjustment Location:

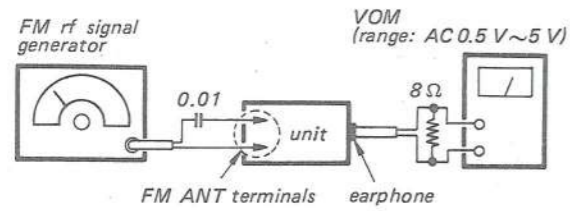


4. FM I-f Alignment

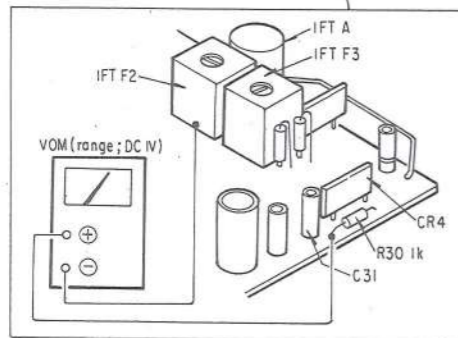
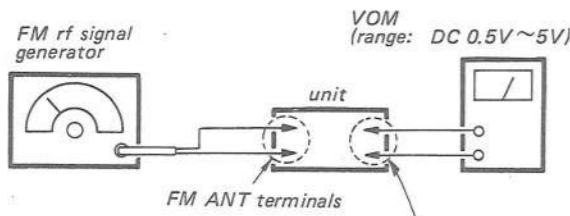
Settings:

FM/MW/LW switch: FM  
VOL control: MAX

Procedure:

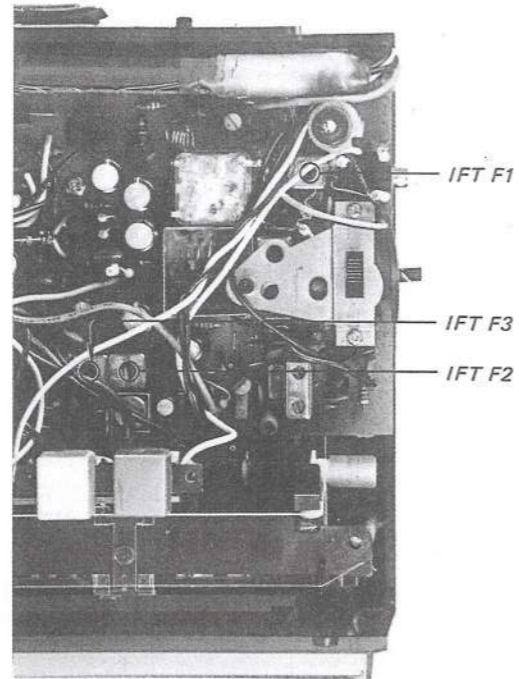


Step	FM rf signal generator frequency	Tuning knob	Adjust	VOM reading
1	10.7 MHz	Detune broadcasting signals.	FM rf signal generator knob	maximum
2	10.7 MHz	Detune broadcasting signals.	IFT F1, F2, F3	maximum
3	Repeat above steps two or three times.			



Step	FM rf signal generator frequency	Tuning knob	Adjust	VOM reading
4	10.7 MHz (no modulation)	Detune broadcasting signals.	IFT F3	0V DC

Adjustment Location:

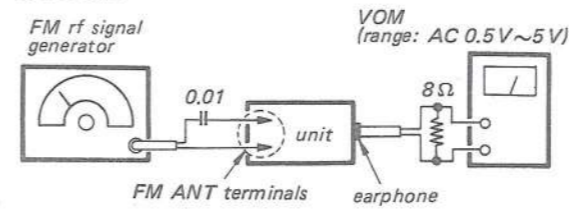


5. FM Frequency Coverage and Tracking Adjustment

Settings:

FM/MW/LW switch: FM  
VOL control: MAX

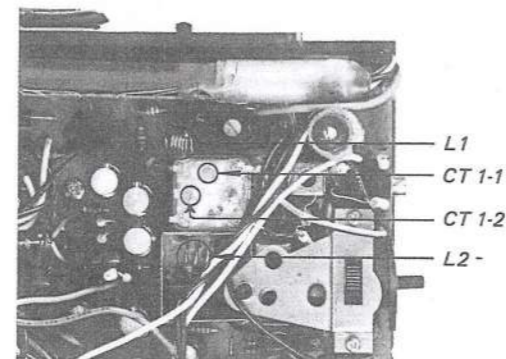
Procedure:



Adjustment	Step	AM rf signal generator frequency	Tuning knob	Adjust	VOM reading
Frequency coverage	1	87.5 MHz	fully counter-clockwise	L2	maximum
	2	108 MHz	fully clockwise	CT 1-2	maximum
Tracking	1	87.5 MHz	fully counter-clockwise	L1	maximum
	2	108 MHz	fully clockwise	CT 1-1	maximum

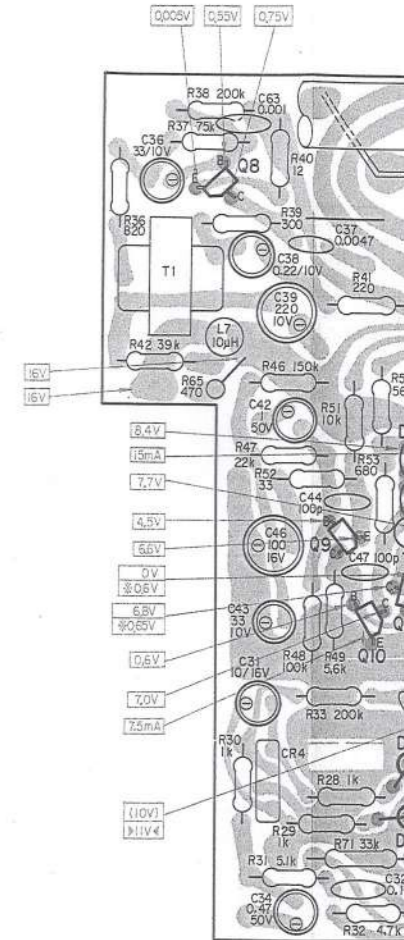
- Note: 1. Repeat above steps two or three times ending step 2.  
2. After this adjustment, fix the FM osc coil (L2) with wax.  
3. Adjust the pitch of coils L1 and L2.

Adjustment Location:



4-1. MOUNTING DIAGRAM

- Component Side -



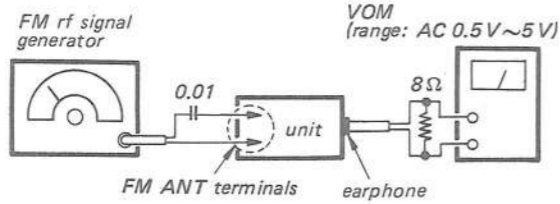
SECTION 4  
DIAGRAMS

5. FM Frequency Coverage and Tracking Adjustment

Settings:

FM/MW/LW switch: FM  
VOL control: MAX

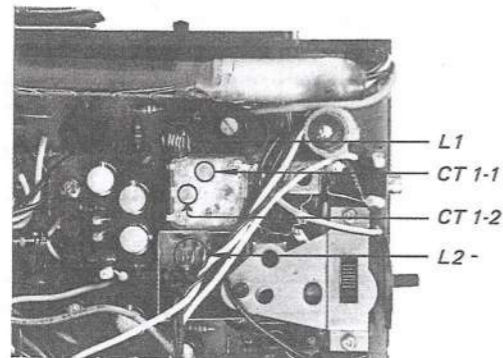
Procedure:



Adjustment	Step	AM rf signal generator frequency	Tuning knob	Adjust	VOM reading
Frequency coverage	1	87.5 MHz	fully counter-clockwise	L2	maximum
	2	108 MHz	fully clockwise	CT 1-2	maximum
Tracking	1	87.5 MHz	fully counter-clockwise	L1	maximum
	2	108 MHz	fully clockwise	CT 1-1	maximum

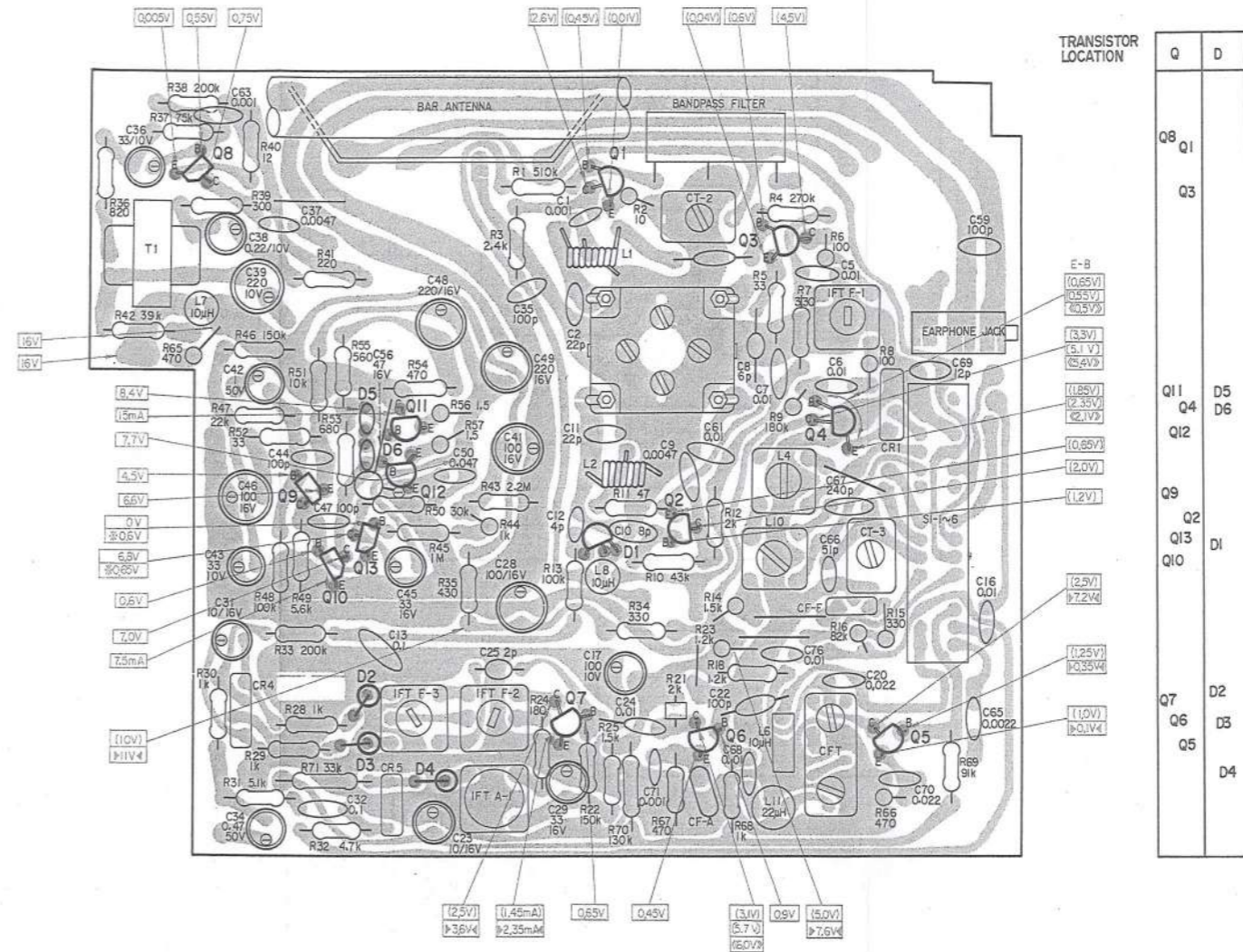
- Note: 1. Repeat above steps two or three times ending step 2.  
2. After this adjustment, fix the FM osc coil (L2) with wax.  
3. Adjust the pitch of coils L1 and L2.

Adjustment Location:



4-1. MOUNTING DIAGRAM

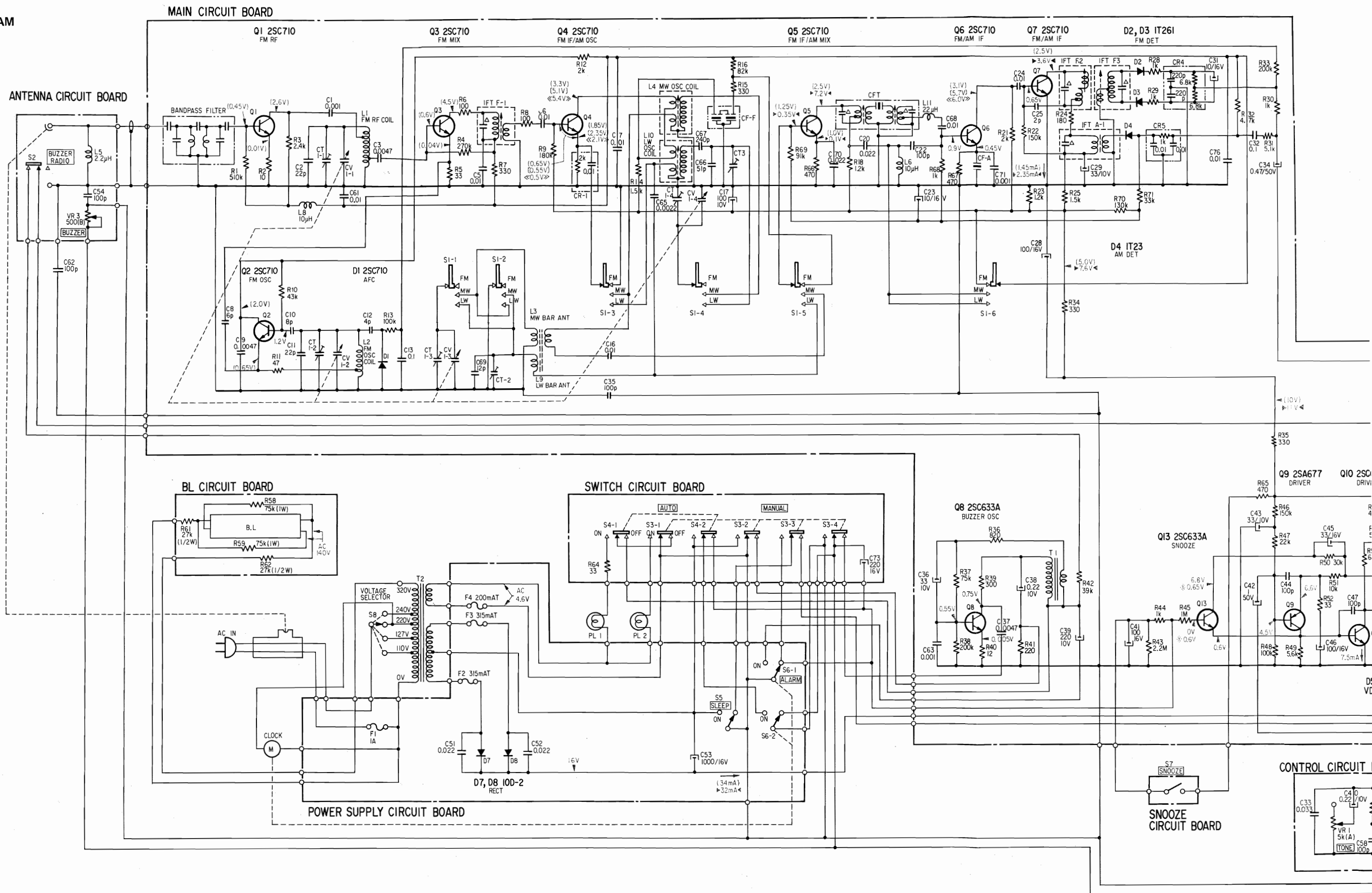
— Component Side —

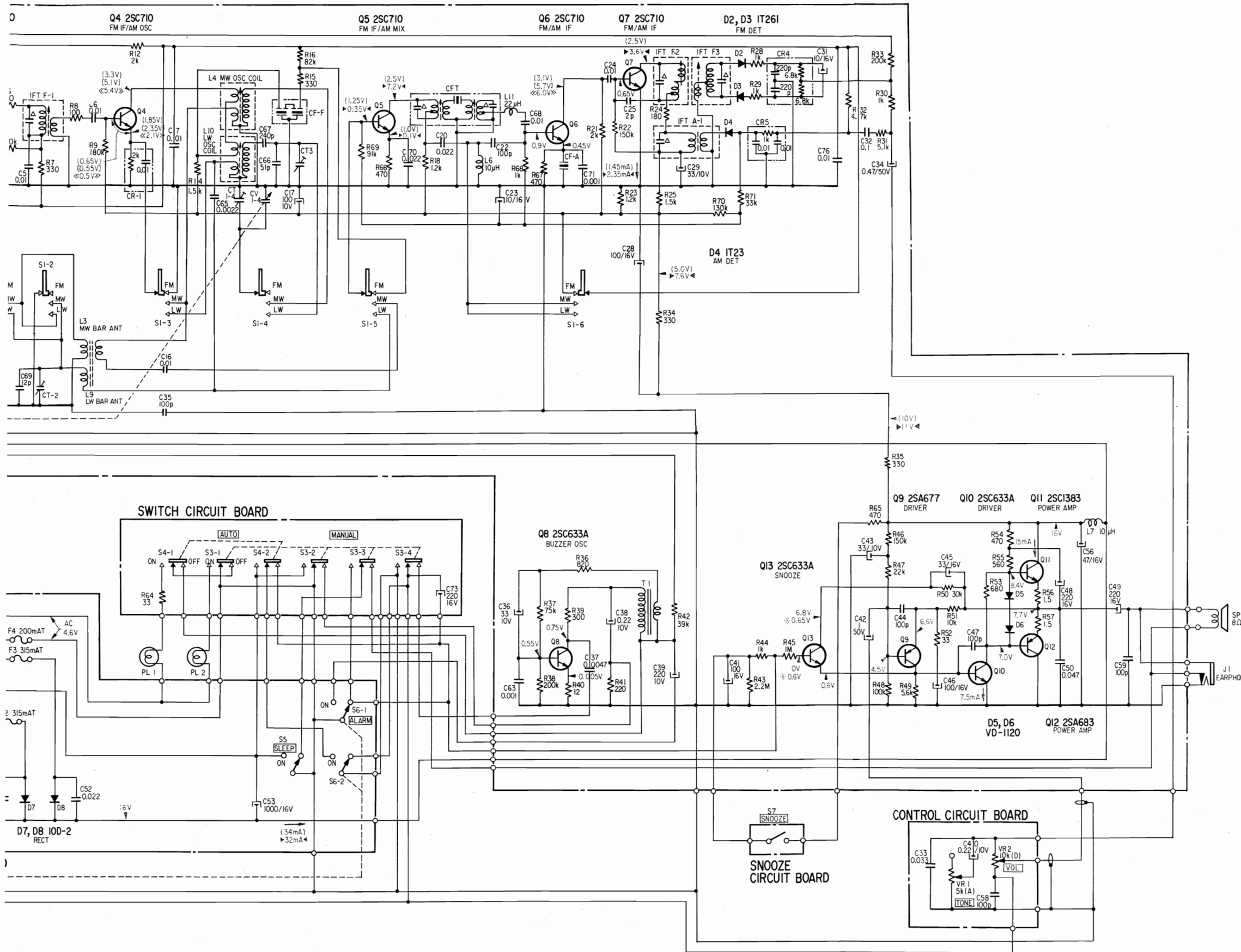


Note:

- All resistors and capacitors are in Ω and μF, unless otherwise specified.
- Voltage values shown are measured with a voltmeter (DC 20kΩ/V, AC 8kΩ/V) with MANUAL button depressed. Variations may be noted due to normal production tolerances.  
( ) : FM mode [ ] : MW mode  
No mark : common  
< > : LW mode ▶ ◀ : MW and LW mode
- Transistor is used for D1 instead of diode.
- It is normal if voltage at point \* drops to about 0.8V when depressing snooze button in alarm mode.

4-2. SCHEMATIC DIAGRAM





- Note:**
- All resistors and capacitors are in  $\Omega$  and  $\mu F$ , unless otherwise specified.
  - Letter in ( ) suffixed to variable resistor value indicates characteristics.
  - Voltage values shown are measured with a voltmeter (DC 20  $k\Omega/V$ , AC 8  $k\Omega/V$ ) with MANUAL button depressed. Variations may be noted due to normal production tolerances.
  - ( ) : FM mode [ ] : MW mode  
No mark : common
  - ◀ ▶ : LW mode ▶ ◀ : MW and LW mode

- Capacitors marked  $\Delta$  are included in i-f transformers.
- Transistor is used for D1 instead of diode.
- **Switch Mode:**

Ref. No.	Description	Mode
S1	FM/MW/LW	FM
S2	BUZZER/RADIO	BUZZER
S3	MANUAL	OFF
S4	AUTO	OFF
S5	SLEEP	OFF
S6	ALARM SET	OFF
S7	SNOOZE	OFF
S8	VOLTAGE SELECTOR	220V

- It is normal if voltage at point \* drops to about 0.8V when depressing snooze button in alarm mode.
- Place IFT F-2, so that the marking side comes as shown.

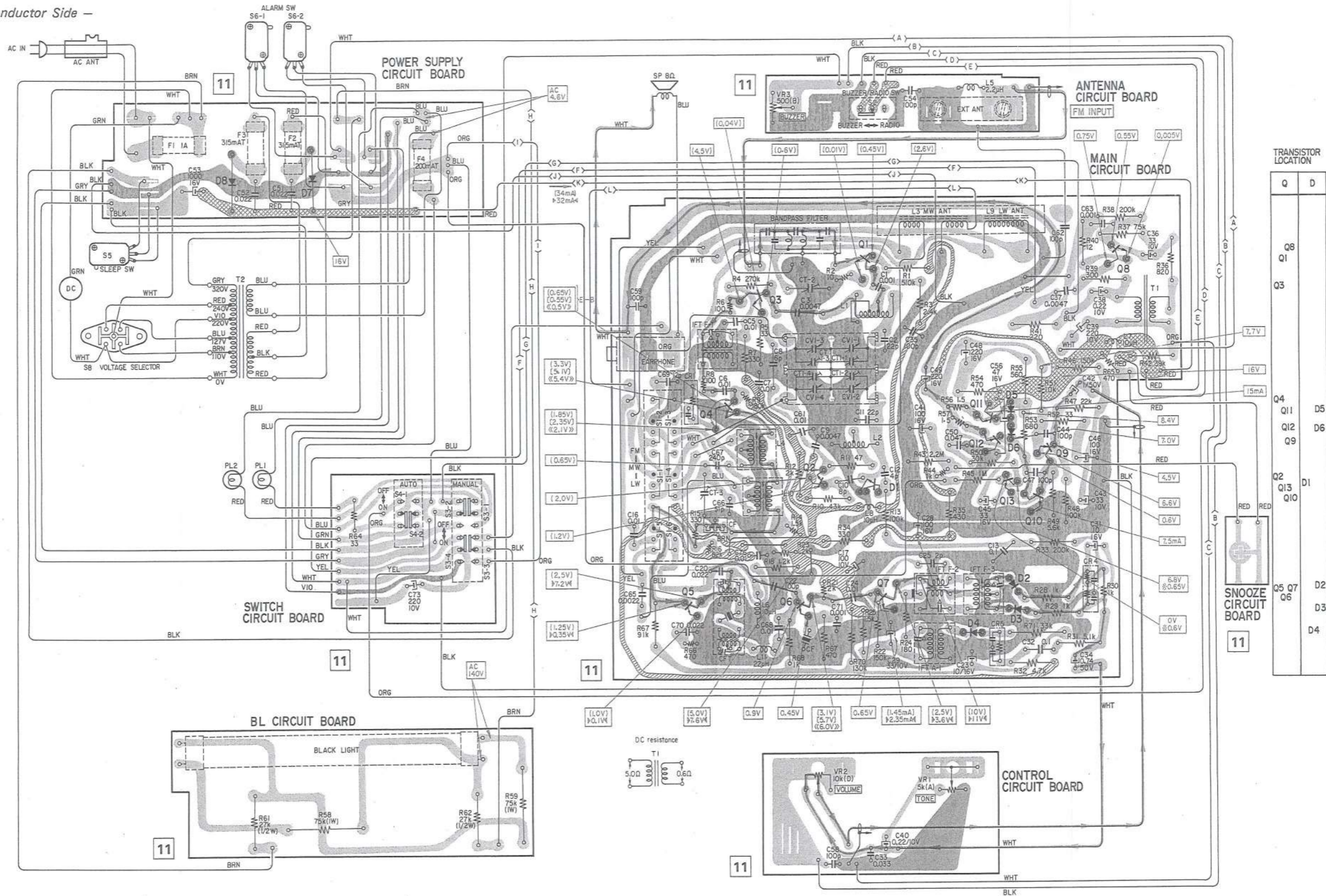


- When replacing ceramic filter (CF-F), use one whose identification color is the same as the used one.
- | Part No.     | Identification color |
|--------------|----------------------|
| 1-527-184-11 | red                  |
| 1-527-184-12 | blue                 |
| 1-527-184-13 | orange               |
| 1-527-184-14 | black                |
| 1-527-184-15 | white                |



4-3. MOUNTING DIAGRAM

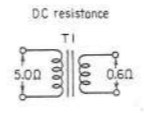
— Conductor Side —



TRANSISTOR LOCATION

Q	D
Q8	
Q1	
Q3	
Q4	D5
Q11	D6
Q12	D9
Q2	D1
Q13	D1
Q10	
Q5	D2
Q7	D2
Q6	D3
D4	

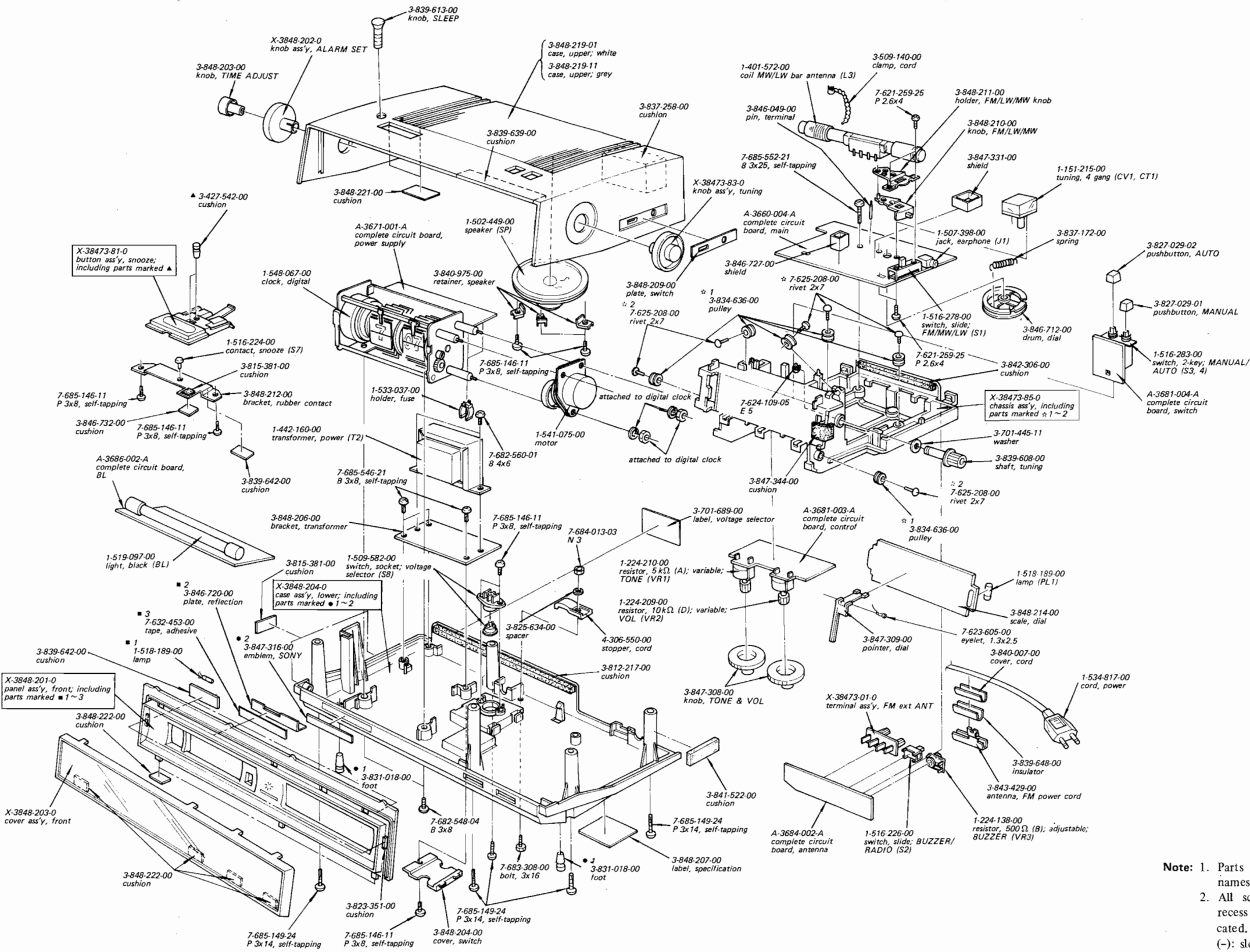
- Q1 ~ 7 : 2SC710
- D1 :
- Q8, 10, 13 : 2SC633A
- Q9 : 2SA677
- Q11 : 2SC1383
- Q12 : 2SA683
- D2, 3 : 1T261
- D4 : 1T23
- D5, 6 : VD1120
- D7, 8 : 10D2



— : signal path    ■ : Ground pattern    ▨ : 11V ~ 16V pattern    ▩ : 2V ~ 7.6V pattern

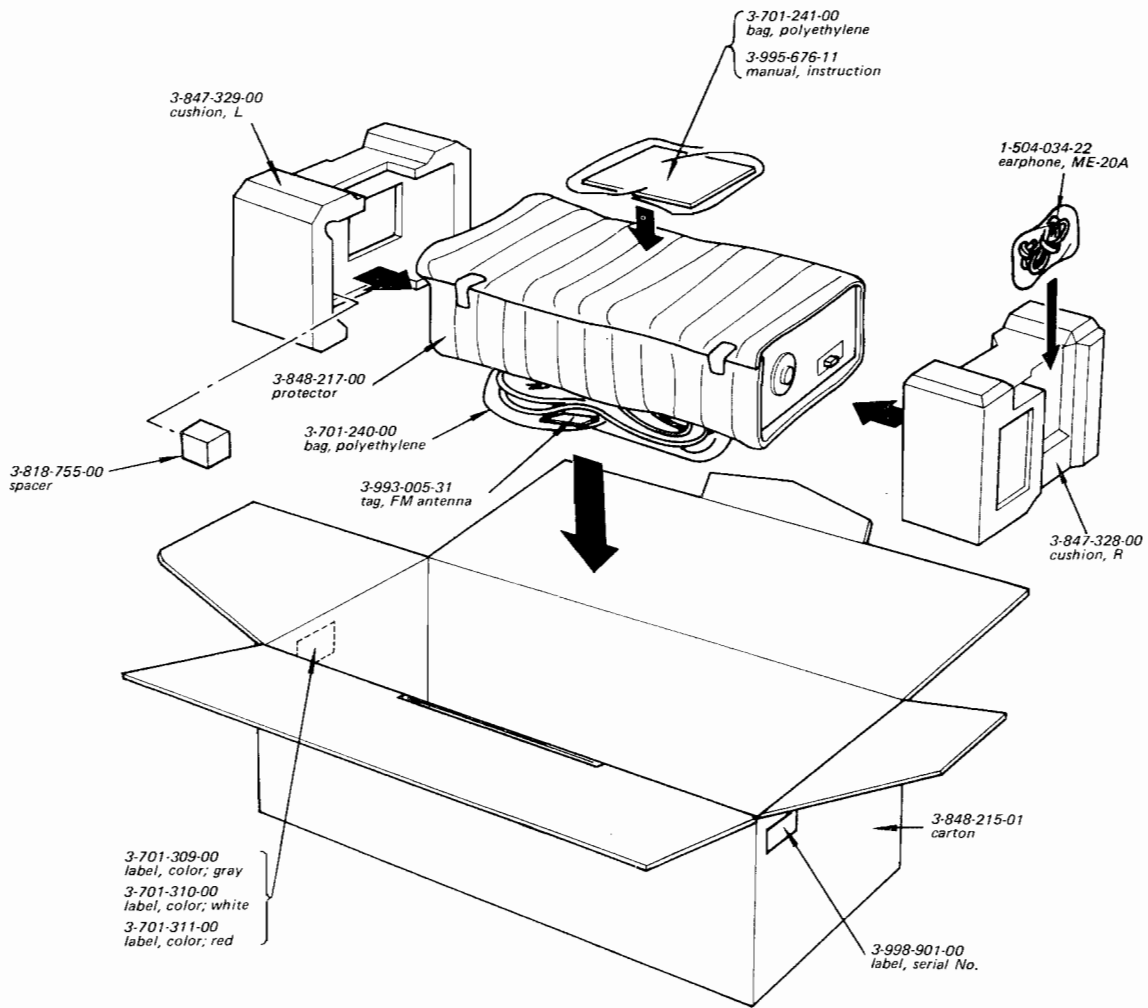
**SECTION 5**  
**EXPLODED VIEW AND PACKING**

**5-1. EXPLODED VIEW**



**Note:** 1. Parts without part numbers and names are not available.  
 2. All screws are Phillips type (cross recess type) unless otherwise indicated.  
 (-): slotted head.

**5-2. PACKING**



**Note:** Parts without part numbers and names are not available.

## SECTION 6 ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
<b>COMPLETE CIRCUIT BOARDS</b>					
	A-3660-004-A	main	T2	1-442-160-00	transformer, power
	A-3671-002-A	power supply	IFT A-1	1-403-900-00	IFT, AM single tuned
	A-3681-003-A	control	IFT F-1	1-403-899-00	IFT, FM single tuned
	A-3681-004-A	switch	IFT F-2	1-403-903-00	transformer, FM discriminator
	A-3684-002-A	antenna	IFT F-3	1-403-902-00	transformer, FM discriminator
	A-3686-002-A	BL			
<b>SEMICONDUCTORS</b>			<b>CAPACITORS</b>		
			All capacitors are in $\mu\text{F}$ unless otherwise indicated. p = $\mu\mu$ elect = electrolytic		
Q1		transistor 2SC710	C1	1-101-918-11	0.001 25V ceramic
Q2		transistor 2SC710	C2	1-102-959-11	22p 50V ceramic
Q3		transistor 2SC710	C3	1-101-922-11	0.0047 25V ceramic
Q4		transistor 2SC710	C4		-----
Q5		transistor 2SC710	C5	1-101-923-11	0.01 25V ceramic
Q6		transistor 2SC710	C6	1-101-923-11	0.01 25V ceramic
Q7		transistor 2SC710	C7	1-101-923-11	0.01 25V ceramic
Q8		transistor 2SC633A	C8	1-101-943-11	6p 50V ceramic
Q9		transistor 2SA677	C9	1-102-125-11	0.0047 50V ceramic
Q10		transistor 2SC633A	C10	1-102-945-11	8p 50V ceramic
Q11		transistor 2SC1383	C11	1-102-514-11	22p 50V ceramic
Q12		transistor 2SA683	C12	1-102-941-11	4p 50V ceramic
Q13		transistor 2SC633A	C13	1-101-797-11	0.1 12V ceramic
D1		transistor 2SC710	C14		-----
D2		diode 1T261	C15		-----
D3		diode 1T261	C16	1-101-923-11	0.01 25V ceramic
D4		diode 1T23	C17	1-121-414-11	100 10V elect
D5		diode VD-11 20	C18		-----
D6		diode VD-11 20	C19		-----
D7		diode 10D-2	C20	1-101-924-11	0.022 25V ceramic
D8		diode 10D-2	C21		-----
<b>COILS &amp; TRANSFORMERS</b>			C22	1-102-975-11	100p 50V ceramic
L1	1-425-798-00	coil, FM rf	C23	1-121-651-11	10 16V elect
L2	1-405-604-00	coil, FM osc	C24	1-101-923-11	0.01 25V ceramic
L3	1-401-572-00	coil, MW/LW bar antenna	C25	1-102-935-11	2p 50V ceramic
L4	1-405-625-00	coil, MW osc	C26		-----
L5	1-407-612-00	microinductor, 2.2 $\mu\text{H}$	C27		-----
L6	1-407-693-00	microinductor, 10 $\mu\text{H}$	C28	1-121-415-11	100 16V elect
L7	1-407-738-00	microinductor, 10 $\mu\text{H}$	C29	1-121-402-11	33 10V elect
L8	1-407-157-00	microinductor, 10 $\mu\text{H}$	C30		-----
L9	1-407-157-00	microinductor, 10 $\mu\text{H}$	C31	1-121-651-11	10 16V elect
L9		included in bar antenna coil (L3)	C32	1-101-797-11	0.1 12V ceramic
L10	1-405-636-00	coil, LW osc	C33	1-105-839-12	0.033 50V mylar
L11	1-407-161-00	microinductor, 22 $\mu\text{H}$	C34	1-121-726-11	0.47 50V elect
T1	1-405-581-00	transformer, buzzer osc	C35	1-102-975-11	100p 50V ceramic
			C36	1-102-402-11	33 10V elect
			C37	1-101-922-11	0.0047 25V ceramic
			C38	1-127-020-11	0.22 10V solid aluminum
			C39	1-121-420-11	220 10V elect

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
C40	1-127-020-11	0.22 10V solid aluminum	R6	1-240-449-11	100 carbon
C41	1-121-415-11	100 16V elect	R7	1-202-371-31	330
C42	1-121-391-11	1 50V elect	R8	1-202-359-31	100
C43	1-121-402-11	33 10V elect	R9	1-202-437-31	180k
C44	1-102-975-11	100p 50V ceramic	R10	1-202-422-31	43k
C45	1-121-403-11	33 16V elect	R11	1-202-341-31	47
C46	1-121-415-11	100 16V elect	R12	1-202-390-31	2k
C47	1-107-131-11	100p 50V silvered mica	R13	1-202-431-31	100k
C48	1-121-421-11	220 16V elect	R14	1-202-387-31	1.5k
C49	1-121-421-11	220 16V elect	R15	1-202-371-31	330
C50	1-105-841-12	0.047 50V mylar	R16	1-202-429-31	82k
C51	1-105-877-12	0.022 100V mylar	R17	-----	
C52	1-105-877-12	0.022 100V mylar	R18	1-202-385-31	1.2k
C53	1-121-245-11	1000 16V elect	R19	-----	
C54	1-102-975-11	100p 50V ceramic	R20	-----	
C55	-----	-----	R21	1-202-390-31	2k
C56	1-121-409-11	47 16V elect	R22	1-202-435-31	150k
C57	-----	-----	R23	1-202-385-31	1.2k
C58	1-102-975-11	100p 50V ceramic	R24	1-202-365-31	180
C59	1-102-975-11	100p 50V ceramic	R25	1-202-387-31	1.5k
C60	-----	-----	R26	-----	
C61	1-101-923-11	0.01 25V ceramic	R27	-----	
C62	1-102-975-11	100p 50V ceramic	R28	1-202-383-31	1k
C63	1-101-918-11	0.001 25V ceramic	R29	1-202-383-31	1k
C64	-----	-----	R30	1-202-383-31	1k
C65	1-101-919-11	0.0022 50V ceramic	R31	1-202-400-31	5.1k
C66	1-101-882-11	51p 50V ceramic	R32	1-202-399-31	4.7k
C67	1-107-094-11	240p 50V silvered mica	R33	1-202-438-31	200k
C68	1-101-923-11	0.01 25V ceramic	R34	1-202-371-31	330
C69	1-102-949-11	12p 50V ceramic	R35	1-202-374-31	430
C70	1-101-924-11	0.022 50V ceramic	R36	1-202-381-31	820
C71	1-101-918-11	0.001 50V ceramic	R37	1-202-428-31	75k
C72	-----	-----	R38	1-202-438-31	200k
C73	1-121-421-11	220 16V elect	R39	1-202-370-31	300
C74	-----	-----	R40	1-202-327-31	12
C75	-----	-----	R41	1-202-367-31	220
C76	1-101-923-11	0.01 25V ceramic	R42	1-202-421-31	39k
CV,CT1	1-151-215-00	tuning, 4 gang	R43	1-202-463-31	2.2M
CT2,3	1-141-097-00	trimmer	R44	1-240-473-11	1k carbon
			R45	1-202-455-31	1M
			R46	1-202-435-31	150k
			R47	1-202-415-31	22k
			R48	1-202-431-31	100k
			R49	1-202-401-31	5.6k
			R50	1-202-418-31	30k
			R51	1-202-407-31	10k
			R52	1-202-337-31	33
			R53	1-202-379-31	680
			R54	1-202-375-31	470
			R55	1-202-377-31	560
			R56	1-240-405-11	1.5 carbon
			R57	1-240-405-11	1.5 carbon

## RESISTORS

All resistors are in  $\Omega$ , composition type and  $\frac{1}{4}$  W unless otherwise indicated. k = 1000 M = 1000k

R1	1-202-448-31	510k
R2	1-202-325-31	10
R3	1-202-392-31	2.4k
R4	1-202-441-31	270k
R5	1-202-337-31	33

# TFM-C650WL

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
R58	1-204-139-21	75k 1W carbon	CFT	1-403-144-00	ceramic filter
R59	1-204-139-21	75k 1W carbon	S1	1-516-278-00	switch, slide; FM/MW/LW
R60	-----		S2	1-516-226-00	switch, slide; BUZZER/RADIO
R61	1-244-907-11	27k 1/2W carbon	S3	1-516-283-00	switch, 2-key; MANUAL
R62	1-244-907-11	27k 1/2W carbon	S4	1-516-283-00	switch, 2-key; AUTO
R63	-----		S5	1-514-423-00	switch, micro; SLEEP
R64	1-202-337-31	33	S6	1-514-423-00	switch, micro; ALARM SET
R65	1-202-565-31	470 1/2W	S7	1-516-224-00	contact, snooze
R66	1-202-375-31	470	S8	1-509-582-00	switch, socket; voltage selector
R67	1-202-375-31	470	F1	1-532-063-00	fuse 1A
R68	1-202-383-31	1k	F2	1-532-235-00	fuse 315 mA
R69	1-202-430-31	91k	F3	1-532-235-00	fuse 315 mA
R70	1-244-724-11	130k carbon	F4	1-532-205-00	fuse 200 mA
R71	1-244-709-11	33k carbon	J1	1-507-398-00	jack, earphone
VR1	1-224-210-00	5k (A), variable; TONE	BL	1-519-097-00	light, black
VR2	1-224-209-00	10k (D), variable; VOL		1-533-037-00	holder, fuse
VR3	1-224-138-00	500 (B), adjustable; BUZZER		8-846-049-00	pin, terminal

### MISCELLANEOUS

CF-A	1-403-154-00	ceramic filter
CF-F	1-527-184-11	(red)
	1-527-184-12	(blue)
	1-527-184-13	(orange)
	1-527-184-14	(black)
	1-527-184-15	(white)

\* Note: When replacing ceramic filter (CF-F), use one whose identification color is the same as the used one.

### — Hardware Nomenclature —

<b>P</b> — Pan Head Screw . . . . .	<b>SC</b> — Set Screw . . . . .
<b>PS</b> — Pan Head Screw with Spring Washer . . . . .	<b>E</b> — Retaining Ring (E Washer) . . . . .
<b>K</b> — Flat Countersunk Head Screw . . . . .	W — Washer
<b>B</b> — Binding Head Screw . . . . .	SW — Spring Washer
<b>RK</b> — Oval Countersunk Head Screw . . . . .	LW — Lock Washer
<b>T</b> — Truss Head Screw . . . . .	N — Nut
<b>R</b> — Round Head Screw . . . . .	
<b>F</b> — Flat Fillister Head Screw . . . . .	
<b>— Example —</b>	

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