

FD-525

SERVICE MANUAL

US Model



MEGA watchman

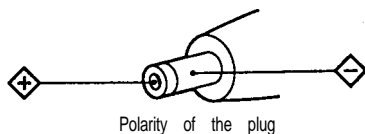
SPECIFICATIONS

TV standard	American TV standard
Channel coverage	VHF channels 2-13 UHF channels 14-69
Radio frequency range	FM 87.6-108 MHz AM 530-1,710 kHz
Antenna	VHF/UHF/FM: telescopic antenna AM: Built-in ferrite bar antenna
Picture tube	4.5-inch picture measured diagonally
Input	EXT ANT: minijack, 75 ohms
output	EAR: minijack, impedance 8-300 ohms
Speaker	Full range 05 cm (02 inches)
Power requirements	12 V DC
Battery life	See page 4 for "Power sources."
Power consumption	10.8 W
Dimensions	Approx. 176.2 x 177 x 175.5 mm (w/h/d) (7 x 7 x 7 inches) incl. projecting pans and controls
Mass	Approx. 2.8 kg (6 lb 3 oz) incl. batteries
Supplied accessory	AC power adaptor (1)

Design and specifications are subject to change without notice.

Note



Use only recommended AC power adaptor. Do not use any other AC power adaptor.



FEATURES

- 4.5-inch black and white 90° deflection picture tube.
- The voltage synthesizer tuning system allows easy tuning.
- AM/FM tuner is combined.
- Built-in 2-inch dia. speaker with powerful output and good sound suitable for garden and kitchen use.
- Carrying handle for easy carrying.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

BLACK AND WHITE
TV-AM/FM TUNER

SONY®

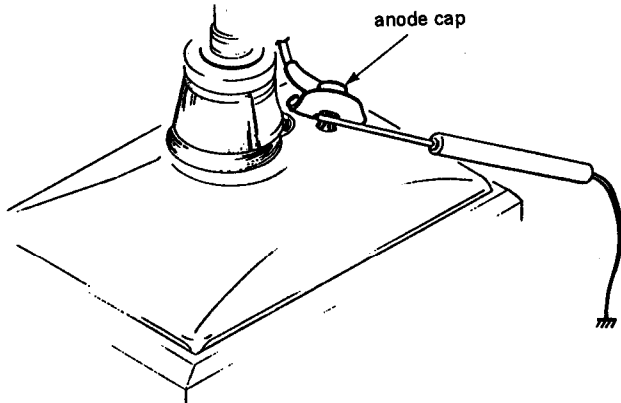


NOTE ON THE ANODE CAP REMOVAL

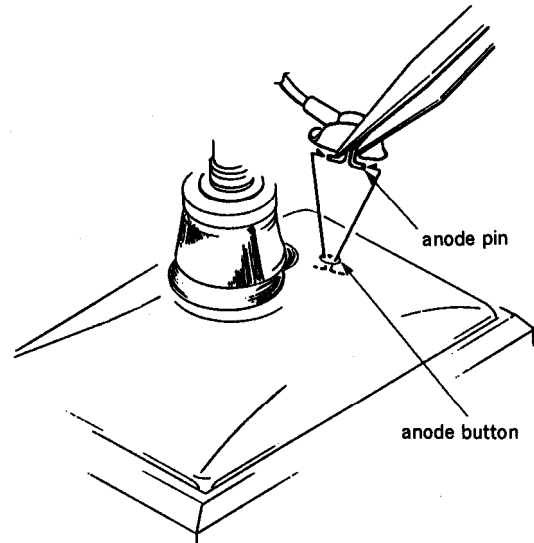
Even when the power switch is off, the voltage at the anode cap is still high.

Remove the anode cap as follows.

1. Discharge the anode pin to the ground.



2. Pinch and remove the anode pin with a pair of tweezers. At this time, be careful not to scratch the anode button.



Caution on Reinstallation :

Confirm that the anode button is inserted into the anode cap securely.

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the **monopole** antenna (if any).
Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

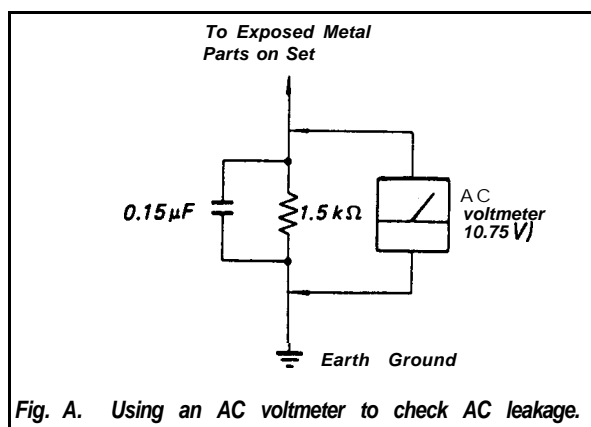


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed **0.5 mA (500 microamperes)**. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA **WT-540A**. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is **0.75 V**, so analog meters must have an accurate **low-voltage** scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a **cold-water** pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60-100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

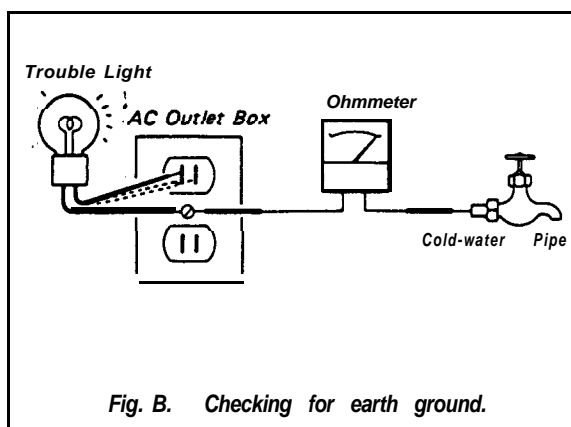
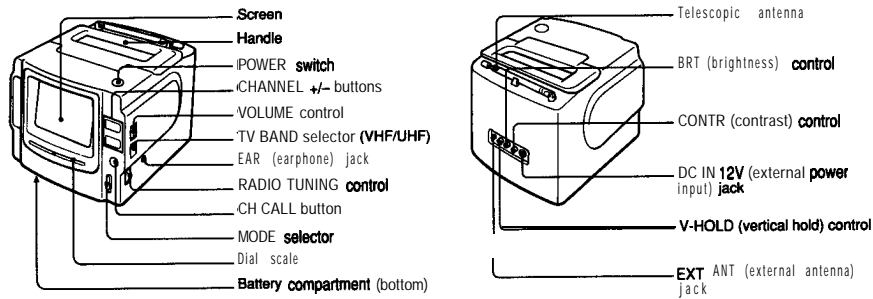


Fig. B. Checking for earth ground.

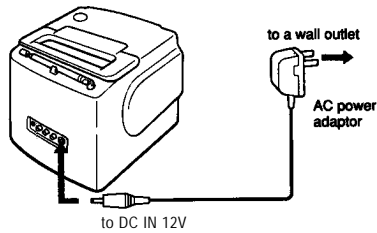
Location of Controls



Power Sources

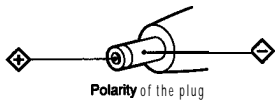
Using House Current (120V AC)

Using the supplied AC power adaptor

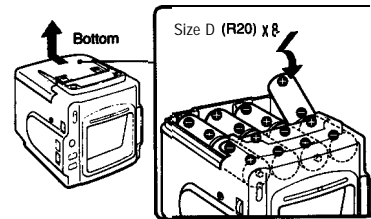


Note

Use only recommended AC power adaptor. Do not use any other AC power adaptor.



Batteries



When to replace batteries

When the picture becomes small, replace all the batteries with new ones.

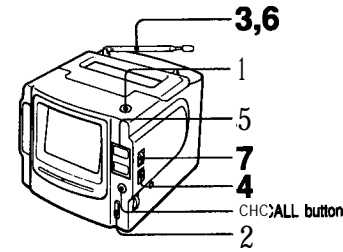
Battery life

Batteries	N	RADIO AM PM	
Sony SUM-I (NS)	1.5	25	25
Sony alkaline AM1 (N)	5	70	70

Note

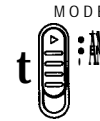
When the unit is not to be used for a long period of time, remove the batteries to avoid unit damage caused by battery leakage and corrosion.

Watching the TV



1 Press the POWER switch

2 Set the MODE selector to TV. The unit starts tuning automatically.



3 Pull out the antenna fully

4 Select the band. VHF or UHF.



5 Tune in the desired channel.



6 Adjust the antenna length and its direction

7 Adjust the volume.



To turn off the TV

Press the Power switch and fold the antenna.

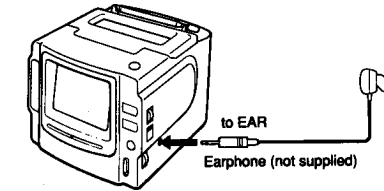
If the channel changes

If the power is momentarily lost because of a mechanical shock, or if the unit has passed through a tunnel, the channel may change. If this happens, tune in the desired channel again with CHANNEL +/-.

To indicate the current channel

Press the CH CALL button. The line appears at the position of the current channel

To Listen Using the Earphone

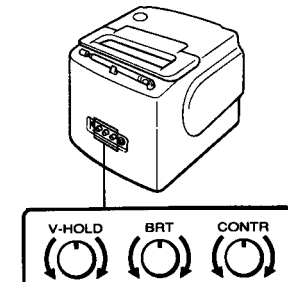


For your safety, do not watch the TV nor operate the controls while driving.

Note

Be sure to turn off the TV after use, especially when listening with earphone. This prevents unnecessary battery wear.

Picture Adjustment



V-HOLD control

Turn the control when the picture rolls vertically

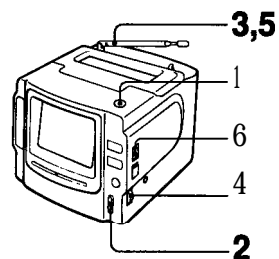
BRT control

Turn the control counterclockwise for more brightness and clockwise for less brightness.

CONTR control

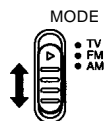
The picture contrast becomes stronger by turning the control counterclockwise, and is reduced by turning it clockwise.

Listening to the Radio



1 Press the POWER switch.

2 Set the MODE selector to FM or AM.



3 Pull out the antenna fully for FM reception

4 Tune in the desired station



5 For FM reception, adjust the length and direction of the antenna.
For AM reception, rotate the unit.

6 Adjust the volume.



To turn off the radio

Press the POWER switch and fold the antenna.

To listen using the earphone

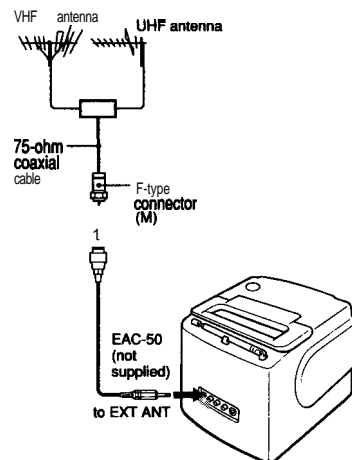
See "Watching the TV".

Note

Be sure to turn off the radio after use, especially when listening with earphone. This prevents unnecessary battery wear.

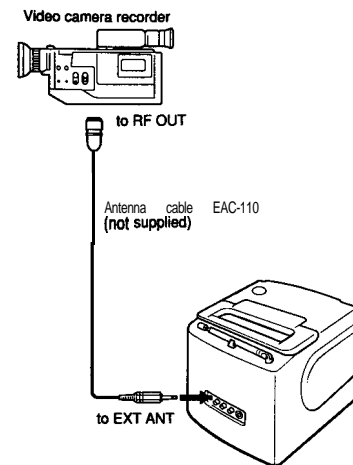
External Antenna Connection

Outdoor antenna



Monitoring the video camera recorder

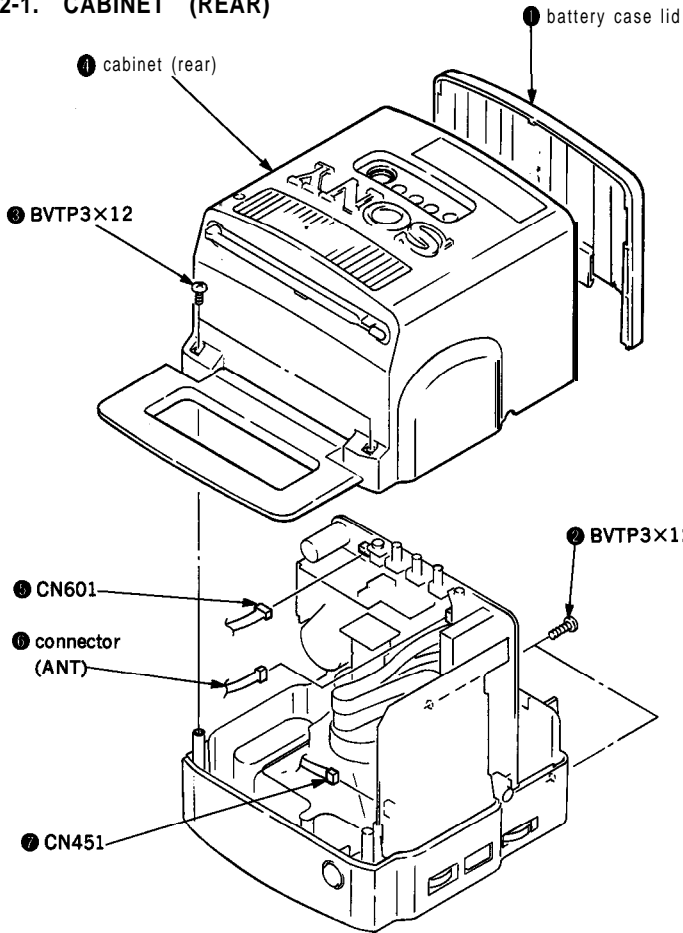
After connecting as illustrated, turn on the power of the equipment and tune in the channel 3 or 4.



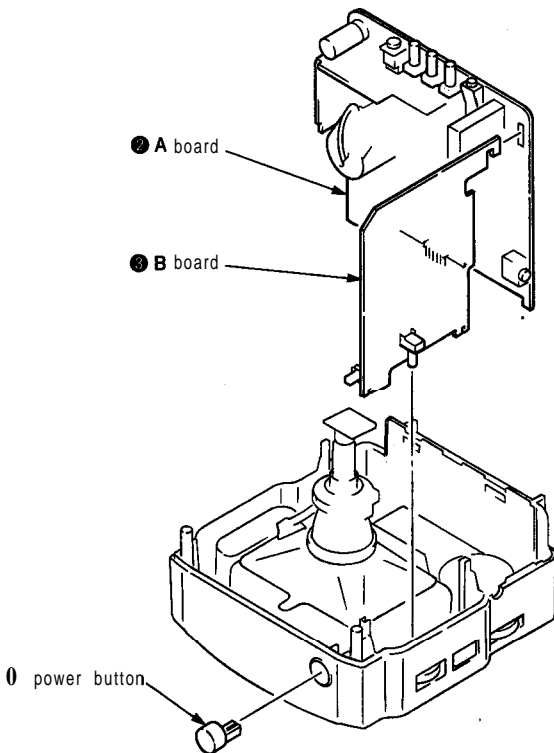
SECTION 2 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

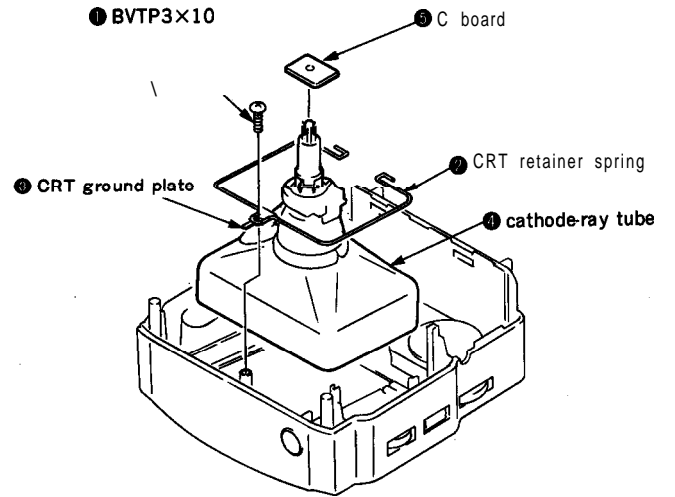
2-1. CABINET (REAR)



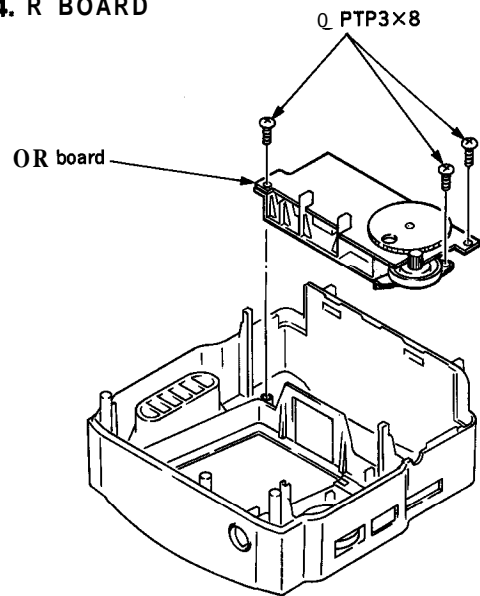
2-2. A BOARD



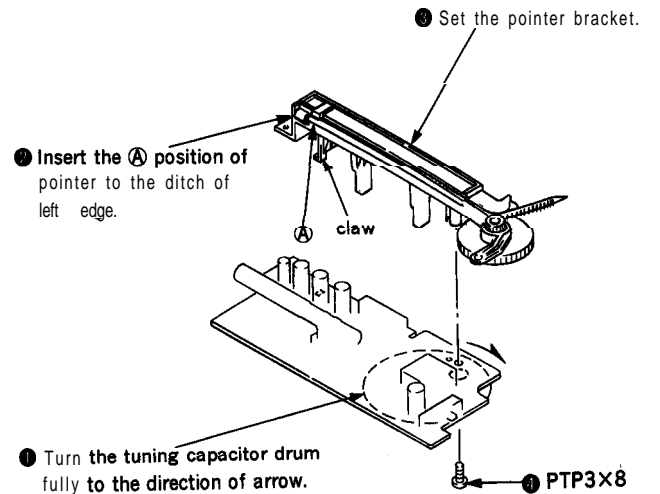
2-3. CATHODE-RAY TUBE



2-4. R BOARD



2-5. POINTER SETTING



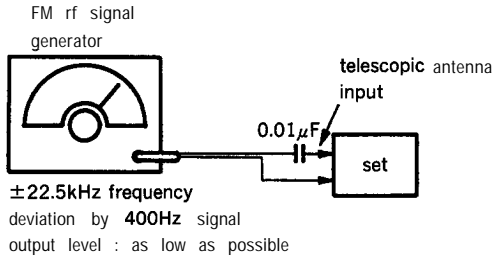
SECTION 3 ELECTRICAL ADJUSTMENTS

3-1. TUNER SECTION

• FM Section

Setting :

MODE switch : FM



FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L3	CT3
86.5MHz	109.5MHz

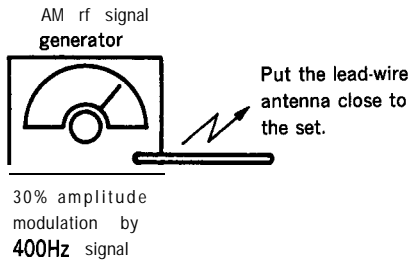
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L2-1, L2-2	CT2
86.5MHz	109.5MHz

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L4	CT4
520kHz	1,750kHz

• AM Section

Setting :

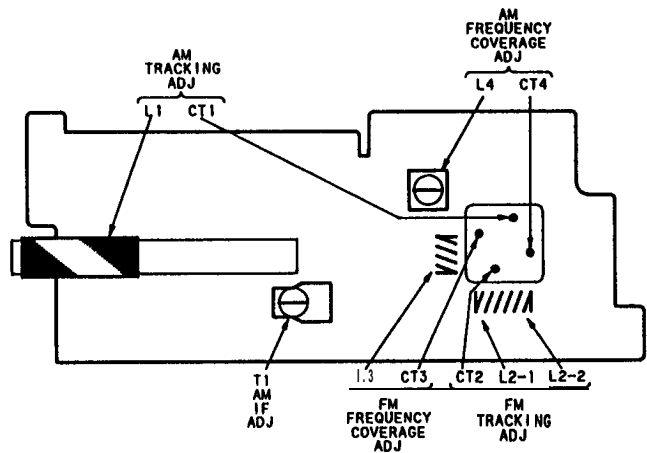
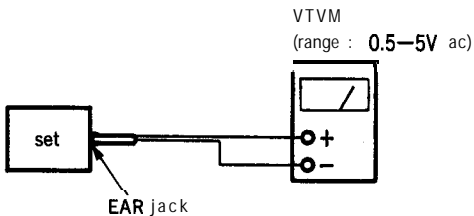
MODE switch : AM



AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L1	CT1
620kHz	1,400kHz

AM IF ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
T1	
450kHz	

Adjustment Location : R board (component side)



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Remove telescopic antenna in FM section adjustments.

3-2. TV SECTION

Setting :

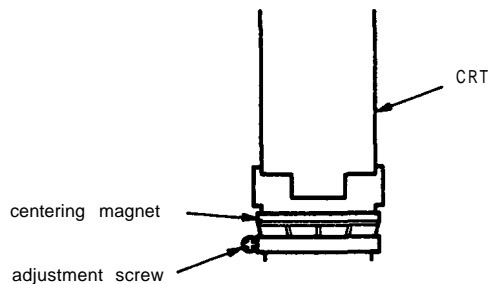
MODE switch : TV
TV BAND switch : VHF or UHF

Centering Adjustment

Procedures :

1. Tune in off-the-air signal.
2. Adjust the centering magnet so that the picture is in the center.
3. After the adjustment, look the magnets with suitable locking compound.

Adjustment Location :



B+(8.8V) Adjustment

Procedure :

Adjust RV601 for 8.8V reading on collector voltage of Q601.

Horizontal Frequency (H-HOLD) Adjustment

Procedures :

1. Connect between IC201 pin ⑥ and pin ⑳ with 1kΩ resistor.
2. Connect the frequency counter to IC201 pin ⑰.
3. Adjust RV501 for a 15.734kHz±60Hz reading on frequency counter.
4. After the adjustment, remove the resistor in item 1.

Vertical Amplitude (V-SIZE) Adjustment

Procedures :

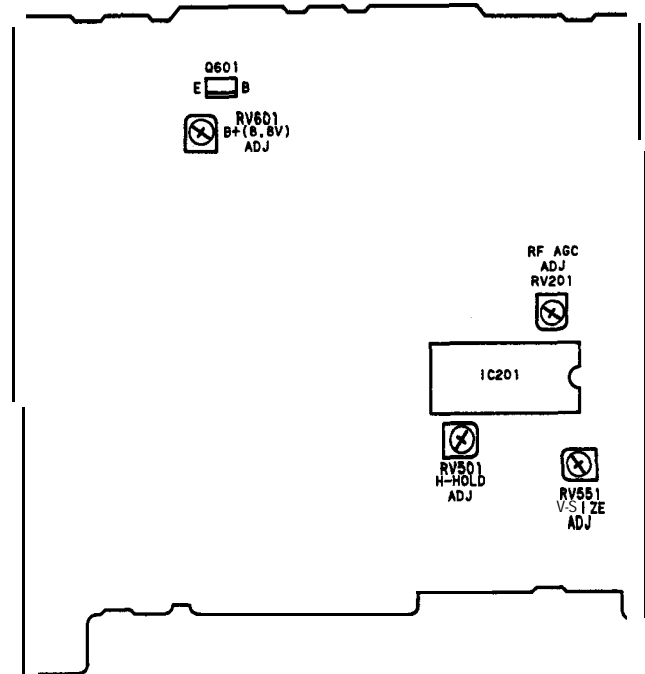
1. Tune in an off-the-air signal.
2. Adjust RV551 for the best vertical amplitude.

RF AGC Adjustment

Procedures :

1. Tune in an off-the-air signal.
2. Adjust RV201 so that snow noise disappears from the picture.

Adjustment Location : A board (component side)



Tuning Adjustment

Procedures :

1. Short S104 (CH CALL).
(State where the display bar is shown on the screen.)
2. Set S151 (TV BAND) to the VHF side.
3. Receive the broadcast of 2CH by pushing S102 (CHANNEL-) or S103 (CHANNEL+).
4. Adjust RV103 so that the display bar is corresponded to the position of 2CH.
5. Receive the broadcast of 13CH, and adjust RV101 so that the display bar is corresponded to the 13CH.

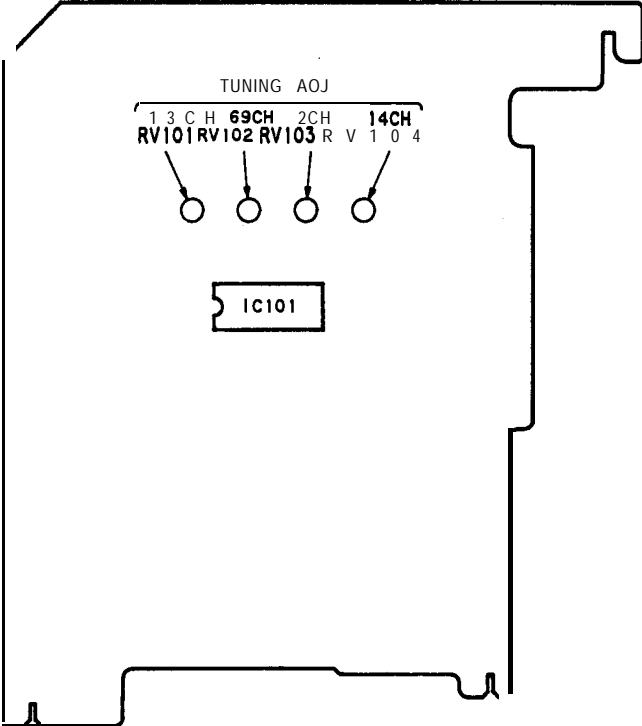
Note : Since the items 4 and 5 will interfere each other, the adjustment is necessary for 2 to 3 times.

6. Receive the broadcasts of 2 to 13CH, and check if the display bar is corresponded to each channel.
7. Set S151 (TV BAND) to the UHF side.
8. Receive the broadcast of 14CH, and adjust RV104 so that the display bar is corresponded to the position of 14CH.
9. Receive the broadcast of 69CH, and adjust RV102 so that the display bar is corresponded to the position of 69CH.

Note : Since the items of 8 and 9 will interfere each other, the adjustment is necessary for 2 to 3 times.

10. Receive the broadcasts of 14CH to 69CH, and check if the display bar is corresponded to the position of each channel.
11. Disconnect the S104 shorted in the above item 1.

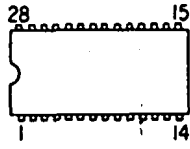
Adjustment Location : B board (conductor side)



SECTION 4 DIAGRAMS

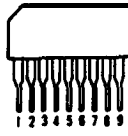
4-1. SEMICONDUCTOR LEAD LAYOUTS

AN5151N



(Top view)

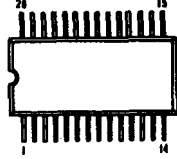
NJM386BS



**2SB1094-LK
2SD1159**



AN5707NS

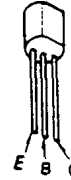


(TOP VIEW)

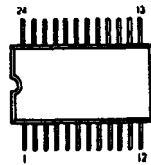
RC78L05A



2SC2786-K



CX20111-T6

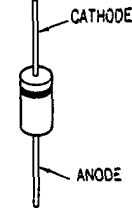


(TOP VIEW)

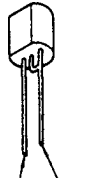
**DTC114YS
2SC2785-FEK**



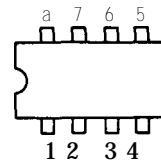
**GP10G5020
RL202-M11
10E2**



L5630



NJM3404AD



(Top view)

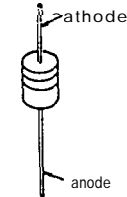
DTC144ES
letter ride



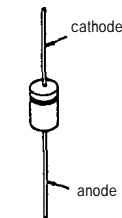
**2SA952
2SA1175-FEK
2SC2001TP-K1K2
2SC2909**



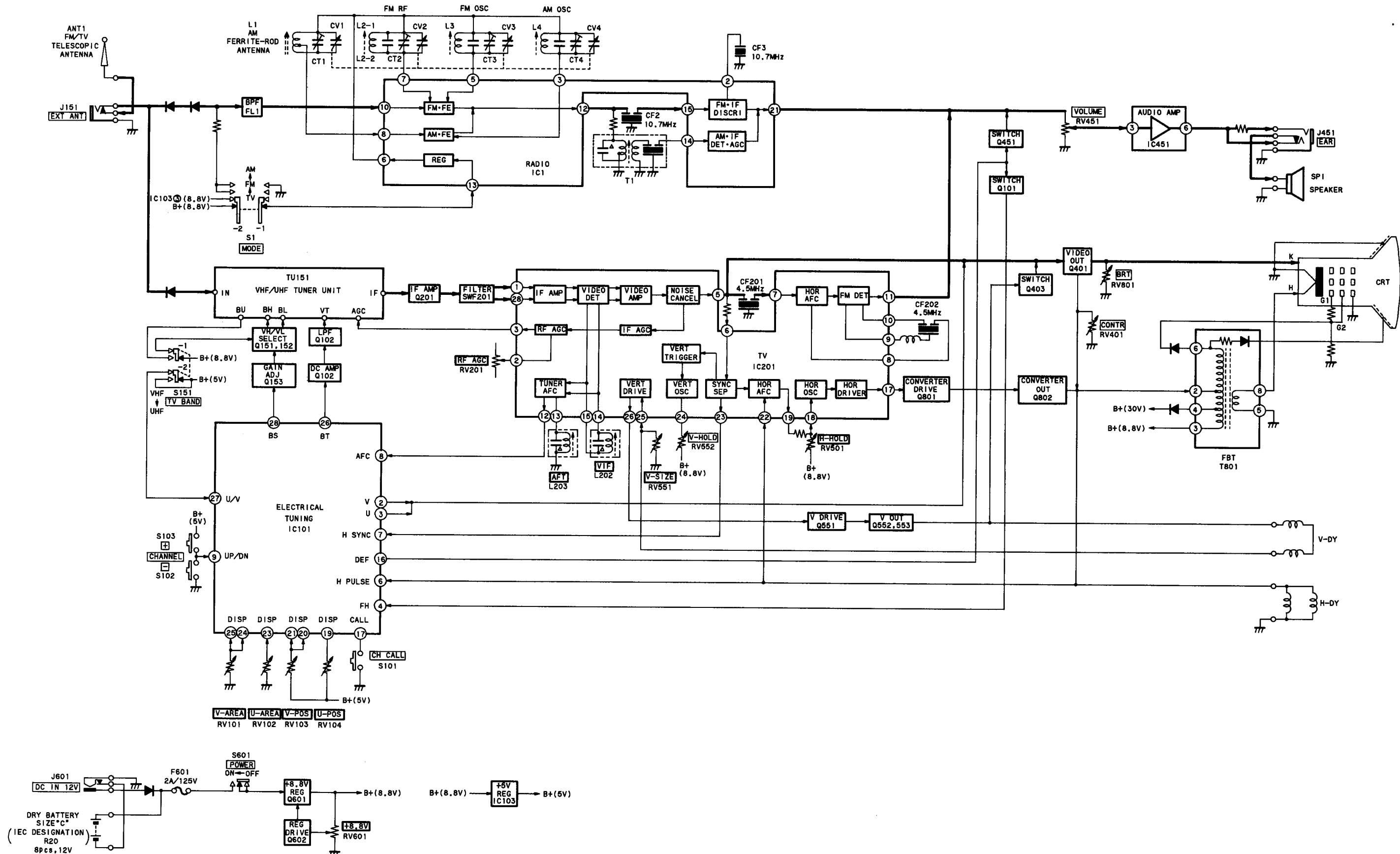
**RD6.2ES-B2
RD7.5ES-B2
1SS119
1SS168**



RU-3AM



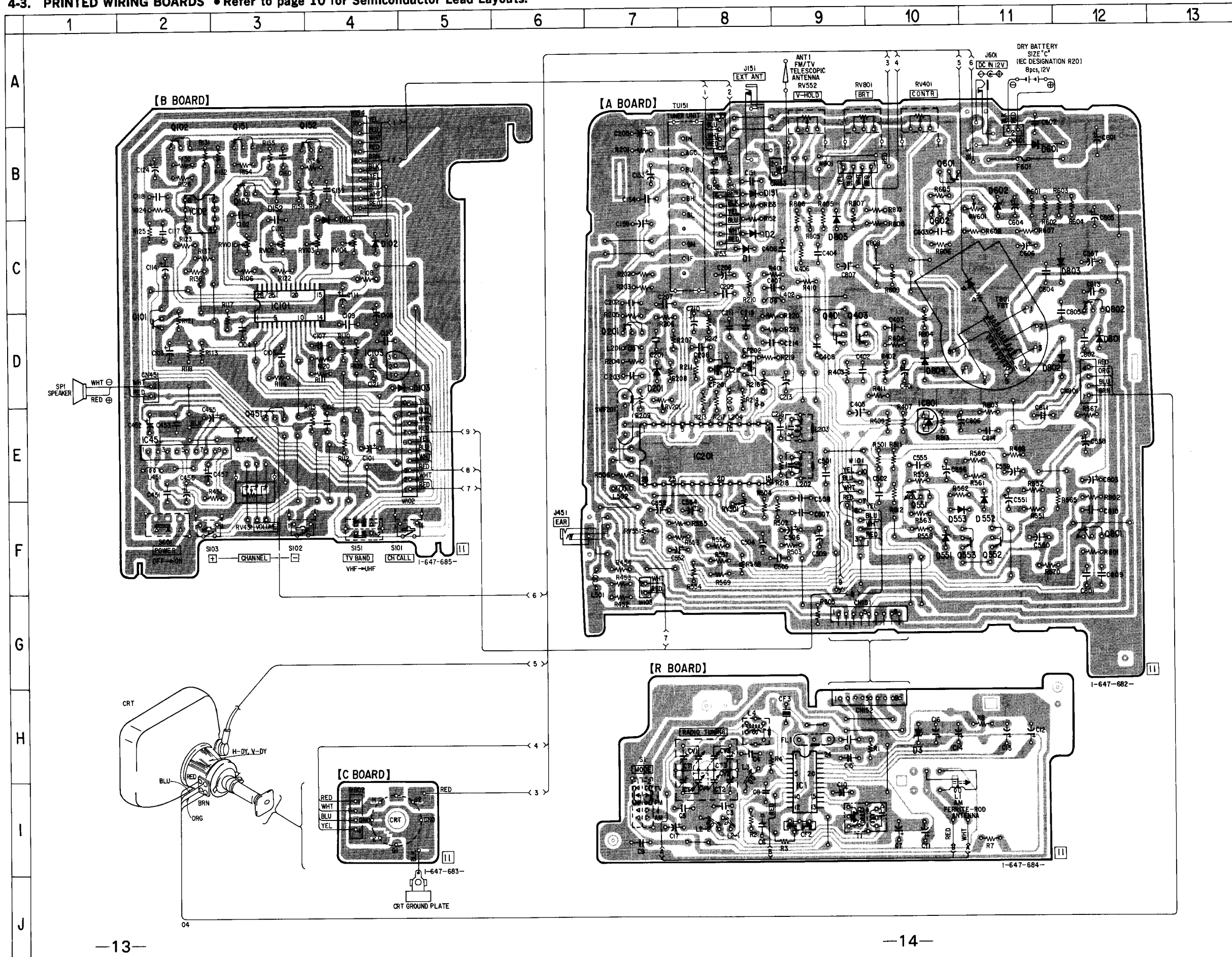
4-2. BLOCK DIAGRAM

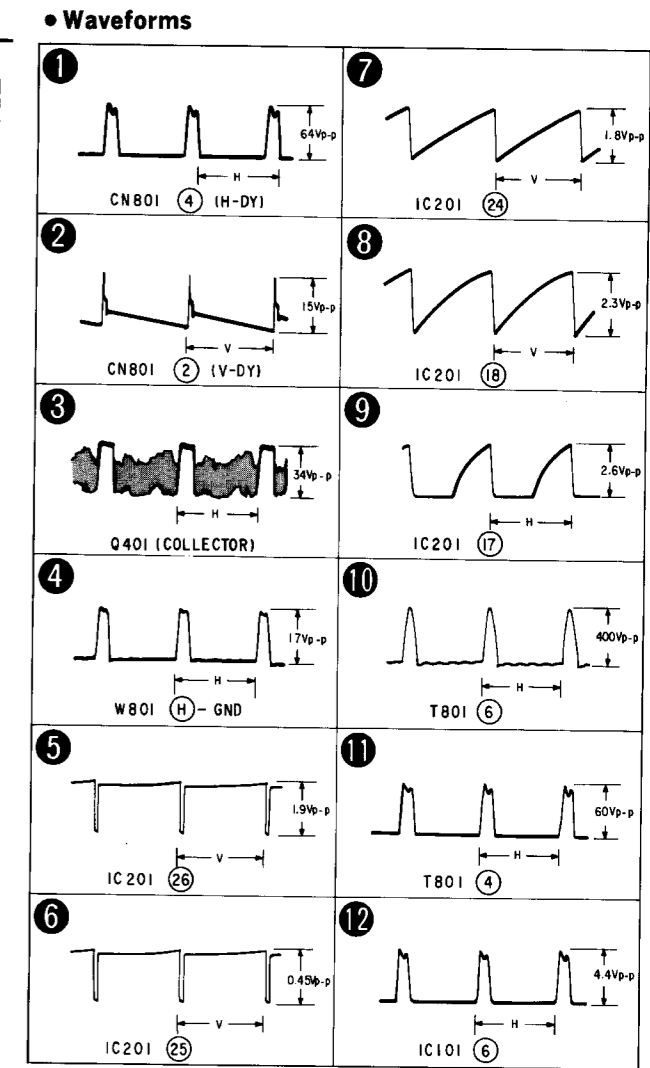
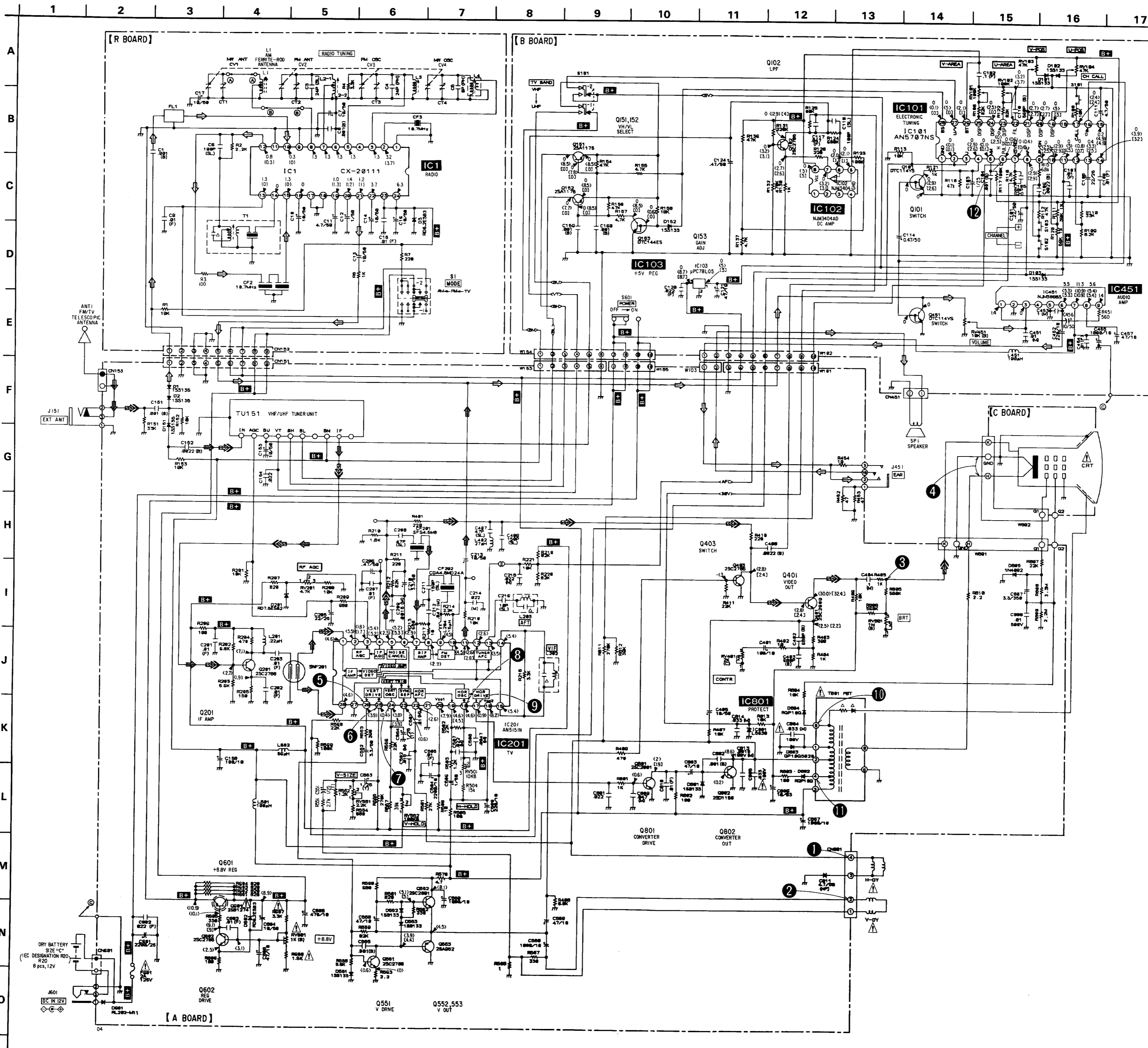


● Semiconductor Location 4-3. PRINTED WIRING BOARDS ● Refer to page 10 for Semiconductor Lead Layouts.

Ref. No.	Location
D1	C-8
D2	C-8
D3	H-10
D101	C-4
D102	C-4
D103	D-5
D151	B-8
D152	B-3
D201	D-7
D551	F-10
D552	F-11
D553	F-10
D601	B-11
D602	B-11
D801	D-12
D802	D-12
D803	C-12
D804	D-10
D805	C-9
IC1	I-9
IC101	C-3
IC102	B-2
IC103	D-4
IC201	E-8
IC451	E-2
IC801	E-10
Q101	D-2
Q102	B-2
Q151	B-3
Q152	B-4
Q153	B-3
Q201	D-7
Q401	D-9
Q403	D-9
Q451	E-3
Q551	F-10
Q552	F-11
Q553	F-11
Q601	B-10
Q602	C-10
Q801	F-12
Q802	D-12

Note:
 ● — : parts extracted from the component side.
 ● [] indicates side identified with part number.





Note:

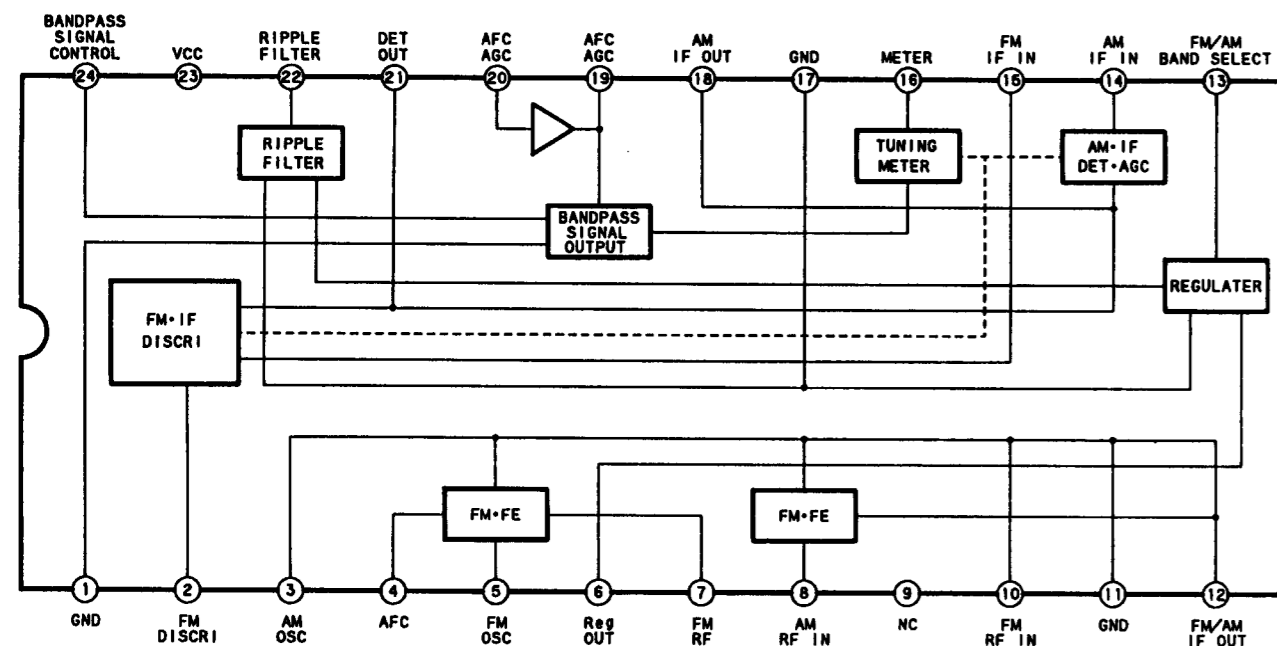
- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{2}\text{W}$ or less unless otherwise specified.
- Δ : internal component.

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

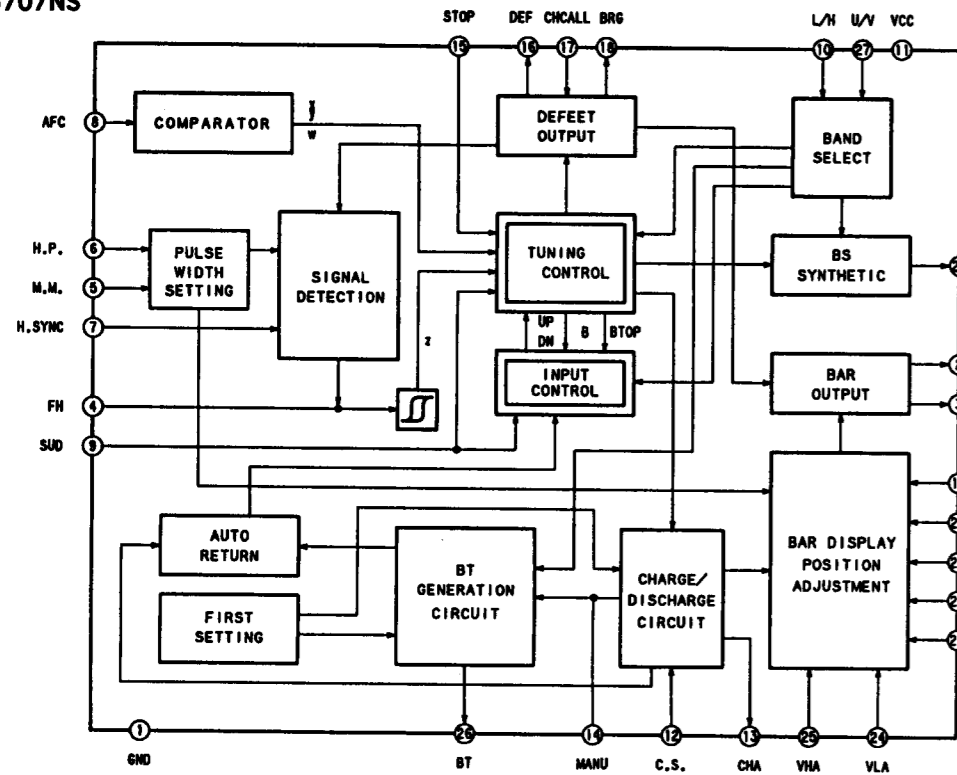
- \square : adjustment for repair.
- Power voltage is dc 12V and fed with regulated dc power supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
- (): AM
- < >: VHF
- []: UHF

- Volts are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path:
 - \rightarrow : FM
 - \rightarrow : TV (SOUND)
 - \rightarrow : TV (PICTURE)

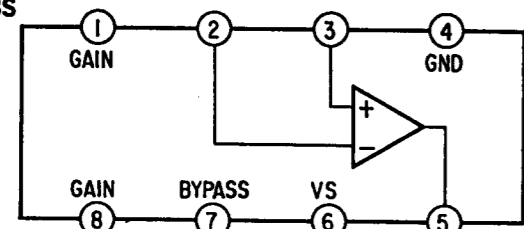
• IC Block Diagrams
IC1 CX20111-T6



IC101 AN5707NS



IC451 NJM386BS



SECTION 5
EXPLODED VIEWS

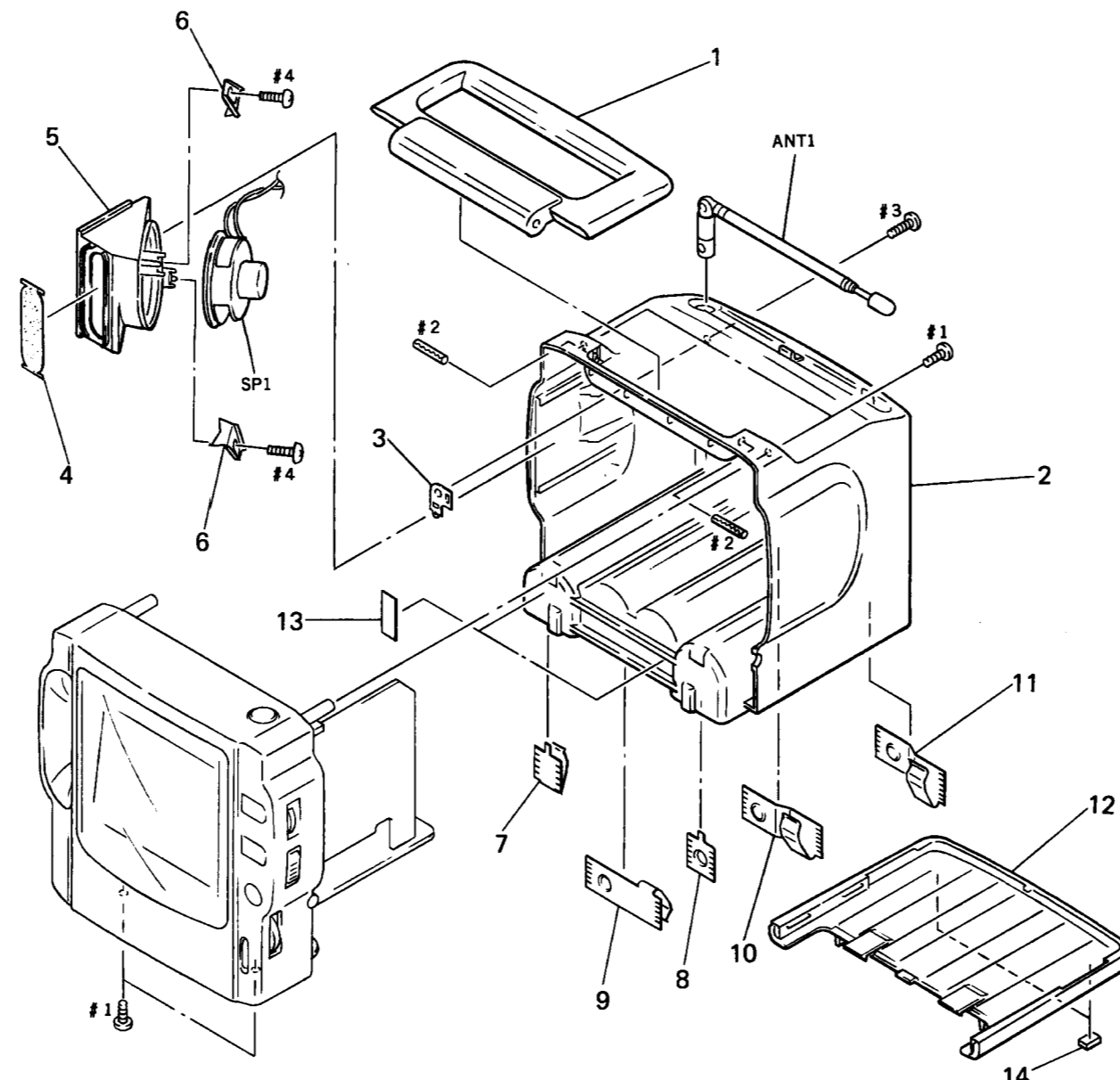
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
Example :
KNOB, BALANCE (WHITE)... (RED)
↑
Parts Color Cabinet's Color

- Hardware (# mark) list is given in the last of this parts list.
- The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

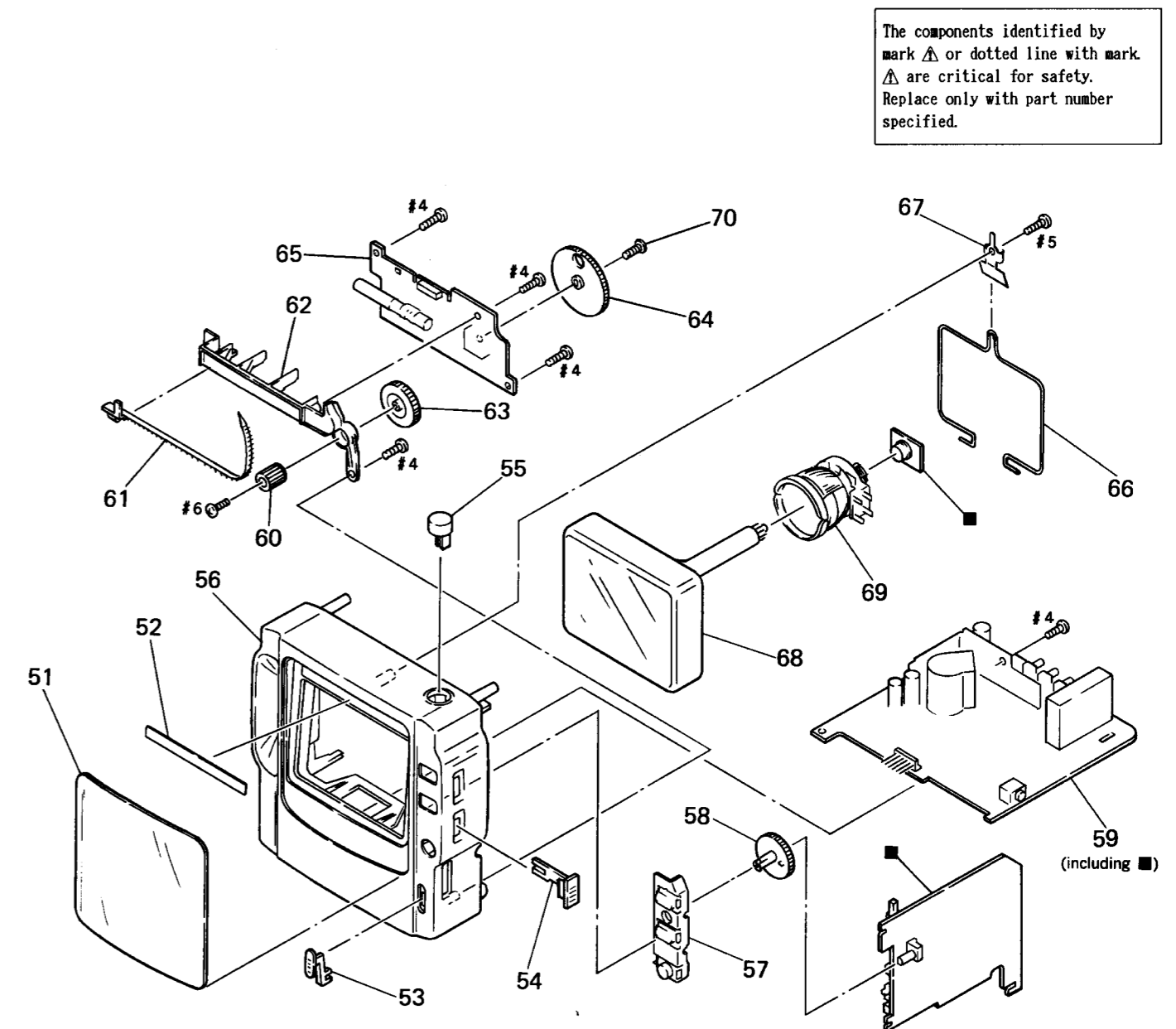
5-1. REAR CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	4-039-698-01	HANDLE (BLACK)---(BLACK)	
1	4-039-698-11	HANDLE (WHITE)---(WHITE)	
2	4-039-703-01	CABINET (REAR) (BLACK)---(BLACK)	
2	4-039-703-11	CABINET (REAR) (WHITE)---(WHITE)	
3	4-039-686-01	BRACKET, ANTENNA	
4	4-039-683-01	NET, SPEAKER	
• 5	4-039-699-01	BRACKET, SPEAKER	
6	3-840-975-00	CLAW, SPEAKER	
7	4-040-195-01	TERMINAL BOARD (-)	
8	4-040-194-01	TERMINAL BOARD (+)	

Ref. No.	Part No.	Description	Remark
9	3-345-508-01	TERMINAL BOARD (A), BATTERY	
10	4-039-685-01	TERMINAL BOARD (B), BATTERY	
11	4-039-684-01	TERMINAL BOARD (A), BATTERY	
12	4-039-697-01	LID, BATTERY CASE (BLACK)---(BLACK)	
12	4-039-697-11	LID, BATTERY CASE (WHITE)---(WHITE)	
13	3-831-441-11	CUSHION (B)	
14	9-911-845-XX	SPACER (B)	
ANT1	1-501-596-11	ANTENNA, TELESCOPIC (BLACK)---(BLACK)	
ANT1	1-501-596-21	ANTENNA, TELESCOPIC (WHITE)---(WHITE)	
SP1	1-504-247-11	SPEAKER (SCM)	

5-2. FRONT CABINET SECTION



Ref. No.	Part No.	Description	Remark
51	4-039-696-01	FILTER (BLACK)---(BLACK)	
51	4-039-696-11	FILTER (WHITE)---(WHITE)	
• 52	4-039-692-01	PLATE, INDICATION, CH (BLACK)---(BLACK)	
• 52	4-039-692-11	PLATE, INDICATION, CH (WHITE)---(WHITE)	
53	4-039-689-01	KNOB, MODE (BLACK)---(BLACK)	
53	4-039-689-11	KNOB, MODE (WHITE)---(WHITE)	
54	4-039-688-01	KNOB, TV BAND (BLACK)---(BLACK)	
54	4-039-688-11	KNOB, TV BAND (WHITE)---(WHITE)	
55	4-039-687-01	BUTTON, POWER	
56	4-039-702-01	CABINET (FRONT) (BLACK)---(BLACK)	
56	4-039-702-11	CABINET (FRONT) (WHITE)---(WHITE)	
57	4-039-700-01	BUTTON (CHANNEL +/-, CH CALL) (BLACK)---(BLACK)	
57	4-039-700-11	BUTTON (CHANNEL +/-, CH CALL) (WHITE)---(WHITE)	

Ref. No.	Part No.	Description	Remark
58	4-039-690-01	KNOB, VOLUME (BLACK)---(BLACK)	
58	4-039-690-11	KNOB, VOLUME (WHITE)---(WHITE)	
• 59	A-3016-359-A	A BOARD, COMPLETE	
60	4-039-681-01	GEAR, TUNING	
61	4-039-693-01	POINTER	
62	4-039-701-01	BRACKET, POINTER	
63	4-039-691-01	KNOB, RADIO TUNING (BLACK)---(BLACK)	
63	4-039-691-11	KNOB, RADIO TUNING (WHITE)---(WHITE)	
64	4-039-694-01	DRUM, TUNING CAPACITOR	
• 65	A-3016-362-A	R BOARD, COMPLETE	
• 66	4-039-682-01	SPRING, CRT RETAINER	
• 67	3-345-577-01	PLATE, GROUND, CRT	
Δ 68	1-546-075-11	CATHODE-RAY TUBE, B/W (E2282)	
Δ 69	1-451-365-21	DEFLECTION YOKE	
70	3-714-118-01	SCREW (1.7X4)	

SECTION 6 ELECTRICAL PARTS LIST



NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u; μ , for example:
uA .: μ A. . uPA.: μ PA. .
uPB.: μ PB. . uPC.: μ PC. . uPD.: μ PD. .
- CAPACITORS
uF: μ F
- COILS
uH: μ H

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark
*	A-3016-359-A	A BOARD, COMPLETE (INCLUDING B, C BOARD) *****	
*	1-526-736-00	SOCKET, CRT	
	7-685-646-79	SCREW +P 3X8 TYPE2 NON-SLIT	
		< CAPACITOR >	
	C101	1-124-464-11 ELECT	0. 22uF 20% 50v
	C102	1-162-851-11 CERAMIC	0. 1uF 16V
	C103	1-131-498-00 TANTALUM	1uF 10% 25V
	C104	1-102-074-00 CERAMIC	0. 00uF 10% 50v
	C105	1-102-525-11 CERAMIC	68PF 5 % 50v
	C106	1-102-121-00 CERAMIC	2200PF 10% 50v
	C107	1-101-004-00 CERAMIC	0. 01uF 50v
	C108	1-124-916-11 ELECT	22uF 20% 63V
	C109	1-101-004-00 CERAMIC	0. 01uF 50v
	C110	1-102-115-00 CERAMIC	560PF 10% 50v
	C111	1-124-927-11 ELECT	4. 7uF 20% 100V
	C114	1-124-902-00 ELECT	0. 47uF 20% 50v
	C117	1-101-006-00 CERAMIC	0. 047uF 50v
	C118	1-102-973-00 CERAMIC	100PF 5 % 50v
	C120	1-101-005-00 CERAMIC	22000PF 50v
	C121	1-124-477-11 ELECT	47uF 20% 25V
	C124	1-124-902-00 ELECT	0. 47uF 20% 50v
	C151	1-102-074-00 CERAMIC	0. 00uF 10% 50v
	C152	1-102-121-00 CERAMIC	2200PF 10% 50v
	C153	1-124-907-11 ELECT	10uF 20% 50v
	C154	1-101-005-00 CERAMIC	22000PF 50v
	C158	1-124-443-00 ELECT	100uF 20% 10V
	C159	1-102-074-00 CERAMIC	0. 00uF 10% 50v
	C160	1-102-074-00 CERAMIC	0. 00uF 10% 50v
	C201	1-101-004-00 CERAMIC	0. 01uF 50v
	C202	1-101-004-00 CERAMIC	0. 01uF 50v
	C203	1-101-004-00 CERAMIC	0. 01uF 50v
	C205	1-124-916-11 ELECT	22uF 20% 63V
	C206	1-124-902-00 ELECT	0. 47uF 20% 50v
	C207	1-101-004-00 CERAMIC	0. 01uF 50v
	C208	1-101-880-00 CERAMIC	47PF 5 % 50v
	C209	1-130-473-00 MYLAR	0. 0015uF 5 % 50v
	C210	1-123-382-00 ELECT	3. 3uF 20% 100V

Ref. No.	Part No.	Description	Remark
	C211	1-101-361-00 CERAMIC	150PF 5% 50V
	C212	1-136-161-00 MYLAR	0. 047uF 10% 50V
	C213	1-124-907-11 ELECT	10uF 20% 50V
	C214	1-136-157-00 MYLAR	0. 022uF 10% 50V
	C215	1-136-157-00 MYLAR	0. 022uF 10% 50V
	C216	1-102-947-00 CERAMIC	10PF 5 % 50v
	C401	1-124-443-00 ELECT	100uF 20% 10V
	C402	1-102-116-00 CERAMIC	680PF 10% 50v
	C403	1-102-116-00 CERAMIC	680PF 10% 50v
	C404	1-136-165-00 MYLAR	0. 1uF 10% 50v
	C405	1-124-907-11 ELECT	10uF 20% 50v
	C406	1-101-361-00 CERAMIC	150PF 5 % 50v
	C407	1-101-880-00 CERAMIC	47PF 5 % 50v
	C408	1-102-121-00 CERAMIC	2200PF 10% 50v
	C451	1-136-153-00 FILM	0. 01uF 5 % 50v
	C452	1-124-120-11 ELECT	220uF 20% 25V
	C453	1-136-165-00 MYLAR	0. 1uF 10% 50v
	C454	1-101-004-00 CERAMIC	0. 01uF 50v
	C455	1-124-360-00 ELECT	1000uF 20% 16V
	C456	1-124-907-11 ELECT	10uF 20% 50v
	C457	1-124-477-11 ELECT	47uF 20% 25V
	C501	1-136-153-00 FILM	0. 01uF 5 % 50v
	C502	1-130-485-00 MYLAR	0. 015uF 5 % 50v
	C504	1-124-893-11 ELECT	2200uF 20% 10V
	C505	1-101-004-00 CERAMIC	0. 01uF 50v
	C506	1-124-903-11 ELECT	1uF 20% 50v
	C507	1-136-157-00 MYLAR	0. 022uF 10% 50v
	C508	1-130-479-00 MYLAR	0. 0047uF 5 % 50v
	C509	1-126-176-11 ELECT	220uF 20% 10V
	C551	1-131-347-00 TANTALUM	1uF 10% 35v
	C552	1-323-382-00 ELECT	3. 3uF 20% 100V
	C553	1-131-347-00 TANTALUM	1uF 10% 35v
	C554	1-131-347-00 TANTALUM	1uF 10% 35v
	C555	1-102-074-00 CERAMIC	0. 00uF 10% 50v
	C556	1-124-126-00 ELECT	47uF 20% 10V
	C557	1-124-473-11 ELECT	1000uF 20% 10V
	C558	1-124-360-00 ELECT	1000uF 20% 16V
	C559	1-124-126-00 ELECT	47uF 20% 10V
	C560	1-124-473-11 ELECT	1000uF 20% 10V
	C601	1-124-563-11 ELECT	2200uF 20% 25V

A	B	C
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Ref. No.	Part No.	Description		Remark
C602	1-101-005-00	CERAMIC	22000PF	50v
C603	1-101-004-00	CERAMIC	0.01uF	50v
C604	1-124-907-11	ELECT	10uF	20% 50v
C605	1-124-472-11	ELECT	470uF	20% 10V
C606	1-124-126-00	ELECT	47uF	20% 10V
C801	1-101-005-00	CERAMIC	22000PF	50v
C802	1-102-074-00	CERAMIC	0.001uF	10% 50v
C803	1-124-126-00	ELECT	47uF	20% 10V
△C804	1-106-379-12	MYLAR	0.033uF	5% 200v
△C805	1-106-379-12	MYLAR	0.033uF	5% 200v
C806	1-124-915-11	ELECT	10uF	20% 63V
C807	1-128-119-21	ELECT	3.3uF	20% 350v
C808	1-102-050-00	CERAMIC	0.01uF	99% 500v
C809	1-136-161-00	MYLAR	0.047uF	10% 50v
C810	1-101-004-00	CERAMIC	0.01uF	50v
C811	1-126-515-11	ELECT	4.7uF	10% 50v
C813	1-106-347-00	MYLAR	1500PF	5% 200v
C814	1-136-159-00	MYLAR	0.033uF	10% 50v
< FILTER >				
CF201	1-567-115-00	FILTER, CERAMIC		
CF202	1-577-066-11	FILTER, CERAMIC (DISCRIMINATOR)		
< CONNECTOR >				
* CN151	1-568-454-11	PIN, CONNECTOR (PC BOARD) 9P		
CN153	1-564-777-11	PLUG, CONNECTOR (2.5MM) 2P		
CN451	1-564-777-11	PLUG, CONNECTOR (2.5MM) 2P		
CN601	1-564-777-11	PLUG, CONNECTOR (2.5MM) 2P		
* CN801	1-564-778-11	PLUG, CONNECTOR (2.5MM) 4P		
< DIODE >				
D1	8-719-903-27	DIODE 1SS168		
D2	8-719-903-27	DIODE 1SS168		
D101	8-719-911-19	DIODE 1SS119		
D102	8-719-911-19	DIODE 1SS119		
D103	8-719-911-19	DIODE 1SS119		
D151	8-719-903-27	DIODE 1SS168		
D152	8-719-911-19	DIODE 1SS119		
D201	8-719-110-03	DIODE RD7. 5ES-B2		
D551	8-719-911-19	DIODE 1SS119		
D552	8-719-911-19	DIODE 1SS119		
D553	8-719-911-19	DIODE 1SS119		
D601	8-719-979-32	DIODE RL202-M11		
D602	8-719-109-93	DIODE RD6. 2ES-B2		
D801	8-719-911-19	DIODE 1SS119		
D802	8-719-300-33	DIODE RU-3AM		
D803	1-808-394-11	DIODE GP10G5020		
D804	8-719-300-33	DIODE RU-3AM		
D805	8-719-200-02	DIODE 10E2		

Ref. No.	Part No.	Description		Remark
< FUSE >				
△F601	1-532-591-00	FUSE, GLASS TUBE (2A/125V)		
< IC >				
IC101	8-759-420-88	IC AN5707NS		
IC102	8-759-701-50	I C NJM3404AD		
IC103	8-759-982-21	IC RC78L05A		
IC201	1-808-293-11	IC AN5151N		
IC451	8-759-702-01	IC NJM386BS		
IC801	8-759-802-17	IC 15630		
< JACK >				
5151	1-507-667-00	JACK, MIC (EXT ANT)		
5451	1-695-473-11	JACK (EAR)		
J601	1-580-288-11	JACK, POWER (DC IN 12V)		
< COIL >				
1201	1-410-312-11	INDUCTOR	0.22uH	
1202	1-404-785-11	COIL, VIF DETECTOR		
1203	1-404-785-11	COIL, VIF DETECTOR		
1204	1-410-972-11	INDUCTOR	15uH	
1402	1-414-030-41	INDUCTOR	27uH	
1451	1-408-421-00	INDUCTOR	100uH	
1501	1-408-421-00	INDUCTOR	100uH	
1502	1-408-418-00	INDUCTOR	56uH	
< TRANSISTOR >				
Q101	8-729-904-36	TRANSISTOR DTC114YS		
Q102	8-729-119-79	TRANSISTOR 2SC2785-FEK		
Q151	8-729-119-77	TRANSISTOR 2SA1175-FEK		
Q152	8-729-119-77	TRANSISTOR 2SA1175-FEK		
Q153	8-729-900-89	TRANSISTOR DTC144ES		
Q201	8-729-178-63	TRANSISTOR 2SC2786-K		
Q401	8-729-821-01	TRANSISTOR 2SC2909		
Q403	8-729-119-79	TRANSISTOR 2SC2785-FEK		
Q451	8-729-904-36	TRANSISTOR DTC114YS		
Q551	8-729-119-79	TRANSISTOR 2SC2785-FEK		
Q552	8-729-011-92	TRANSISTOR 2SC2001TP-K1K2		
Q553	8-729-195-23	TRANSISTOR 2SA952		
△Q601	8-729-141-83	TRANSISTOR 2SB1094-LK		
Q602	8-729-119-79	TRANSISTOR 2SC2785-FEK		
Q801	8-729-011-92	TRANSISTOR 2SC2001TP-K1K2		
Q802	8-729-017-78	TRANSISTOR 2SD1159		
< RESISTOR >				
R106	1-249-440-11	CARBON	82K 5%	1/4W
R108	1-249-429-11	CARBON	10K 5%	1/4W

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
R109	1-249-428-11	CARBON	8. 2K 5% 1/4W
R110	1-249-435-11	CARBON	33K 5% 1/4W
R111	1-215-459-00	METAL	39K 1% 1/6W
R112	1-249-437-11	CARBON	47K 5% 1/4W
R113	1-249-429-11	CARBON	10K 5% 1/4W
R115	1-249-426-11	CARBON	5. 6K 5% 1/4W
R116	1-249-425-11	CARBON	4. 7K 5% 1/4W
R117	1-249-441-11	CARBON	100K 5% 1/4W
R118	1-249-437-11	CARBON	47K 5% 1/4W
R120	1-215-463-00	METAL	56K 1% 1/6W
R121	1-249-417-11	CARBON	1K 5% 1/4W
R122	1-249-440-11	CARBON	82K 5% 1/4W
R123	1-249-441-11	CARBON	100K 5% 1/4W
R124	1-247-899-11	CARBON	680K 5% 1/4W
R125	1-249-439-11	CARBON	68K 5% 1/4W
R126	1-249-409-11	CARBON	220 5% 1/4W
R130	1-249-417-11	CARBON	1K 5% 1/4W
R131	1-247-887-00	CARBON	220K 5% 1/4W
R132	1-247-895-00	CARBON	470K 5% 1/4W
R136	1-249-437-11	CARBON	47K 5% 1/4W
R137	1-249-425-11	CARBON	4. 7K 5% 1/4W
R151	1-249-435-11	CARBON	33K 5% 1/4W
R152	1-249-429-11	CARBON	10K 5% 1/4W
R153	1-249-429-11	CARBON	10K 5% 1/4W
R154	1-249-437-11	CARBON	47K 5% 1/4W
R155	1-249-425-11	CARBON	4. 7K 5% 1/4W
R156	1-249-437-11	CARBON	47K 5% 1/4W
R157	1-249-425-11	CARBON	4. 7K 5% 1/4W
R158	1-249-432-11	CARBON	18K 5% 1/4W
R201	1-249-429-11	CARBON	10K 5% 1/4W
R202	1-249-427-11	CARBON	6. 8K 5% 1/4W
R203	1-249-426-11	CARBON	5. 6K 5% 1/4W
R204	1-249-413-11	CARBON	470 5% 1/4W
R205	1-249-407-11	CARBON	150 5% 1/4W
R206	1-249-405-11	CARBON	100 5% 1/4W
R207	1-249-416-11	CARBON	820 5% 1/4W
R208	1-249-429-11	CARBON	10K 5% 1/4W
R209	1-249-415-11	CARBON	680 5% 1/4W
R210	1-249-420-11	CARBON	1. 8K 5% 1/4W
R211	1-249-409-11	CARBON	220 5% 1/4W
R212	1-249-440-11	CARBON	82K 5% 1/4W
R213	1-249-415-11	CARBON	680 5% 1/4W
R214	1-249-421-11	CARBON	2. 2K 5% 1/4W
R216	1-249-429-11	CARBON	10K 5% 1/4W
R217	1-249-393-11	CARBON	10 5% 1/4W
R218	1-249-423-11	CARBON	3. 3K 5% 1/4W
R219	1-249-440-11	CARBON	82K 5% 1/4W
R220	1-249-440-11	CARBON	82K 5% 1/4W
R221	1-249-429-11	CARBON	10K 5% 1/4W

Ref. No.	Part No.	Description	Remark
R401	1-249-409-11	CARBON	220 5% 1/4W
R402	1-249-393-11	CARBON	10 5% 1/4W
R403	1-249-412-11	CARBON	390 5% 1/4W
R404	1-249-417-11	CARBON	1K 5% 1/4W
R405	1-249-417-11	CARBON	1K 5% 1/4W
R406	1-249-429-11	CARBON	10K 5% 1/4W
R407	1-249-429-11	CARBON	10K 5% 1/4W
R408	1-249-427-11	CARBON	6. 8K 5% 1/4W
R409	1-249-413-11	CARBON	470 5% 1/4W
R410	1-249-409-11	CARBON	220 5% 1/4W
R411	1-249-433-11	CARBON	22K 5% 1/4W
R451	1-249-414-11	CARBON	560 5% 1/4W
R452	1-249-401-11	CARBON	47 5% 1/4W
R453	1-249-401-11	CARBON	47 5% 1/4W
R454	1-249-393-11	CARBON	10 5% 1/4W
R501	1-249-434-11	CARBON	27K 5% 1/4W
R502	1-249-433-11	CARBON	22K 5% 1/4W
R503	1-249-418-11	CARBON	1. 2K 5% 1/4W
R504	1-249-431-11	CARBON	15K 5% 1/4W
R505	1-249-405-11	CARBON	100 5% 1/4W
R506	1-249-393-11	CARBON	10 5% 1/4W
R551	1-249-422-11	CARBON	2. 7K 5% 1/4W
R552	1-249-418-11	CARBON	1. 2K 5% 1/4W
R553	1-249-412-11	CARBON	390 5% 1/4W
R554	1-249-415-11	CARBON	680 5% 1/4W
R555	1-247-889-00	CARBON	270K 5% 1/4W
R556	1-249-433-11	CARBON	22K 5% 1/4W
R557	1-249-436-11	CARBON	39K 5% 1/4W
R558	1-249-426-11	CARBON	5. 6K 5% 1/4W
R559	1-249-440-11	CARBON	82K 5% 1/4W
R560	1-249-415-11	CARBON	680 5% 1/4W
R561	1-249-416-11	CARBON	820 5% 1/4W
R562	1-249-411-11	CARBON	330 5% 1/4W
R563	1-249-385-11	CARBON	2. 2 5% 1/6W
R565	1-249-381-11	CARBON	1 5% 1/4W
R567	1-249-411-11	CARBON	330 5% 1/4W
R568	1-249-433-11	CARBON	22K 5% 1/4W
R569	1-249-441-11	CARBON	100K 5% 1/4W
R570	1-249-389-11	CARBON	4. 7 5% 1/4W
R601	1-249-416-11	CARBON	820 5% 1/4W
R602	1-249-416-11	CARBON	820 5% 1/4W
R603	1-249-416-11	CARBON	820 5% 1/4W
R604	1-249-416-11	CARBON	820 5% 1/4W
R605	1-249-411-11	CARBON	330 5% 1/4W
R606	1-249-405-11	CARBON	100 5% 1/4W
△R607	1-249-423-11	CARBON	3. 3K 5% 1/4W
△R608	1-249-419-11	CARBON	1. 5K 5% 1/4W
R801	1-249-417-11	CARBON	1K 5% 1/4W
R802	1-249-405-11	CARBON	100 5% 1/4W

The components identified by mark △ or dotted line with mark. △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
R803	1-249-405-11	CARBON	100 5% 1/4W
R804	1-249-429-11	CARBON	10K 5% 1/4W
R805	1-247-897-11	CARBON	560K 5% 1/4W
R806	1-247-897-11	CARBON	560K 5% 1/4W
R807	1-249-433-11	CARBON	22K 5% 1/4W
R808	1-259-882-11	CARBON	3.3M 5% 1/4W
R809	1-259-886-11	CARBON	2.2M 5% 1/4W
R810	1-249-385-11	CARBON	2.2 5% 1/6W
R811	1-247-889-00	CARBON	270K 5% 1/4W
R812	1-249-436-11	CARBON	39K 5% 1/4W
R813	1-249-429-11	CARBON	10K 5% 1/4W
< VARIABLE RESISTOR >			
RV101	1-238-020-11	RES, ADJ, CARBON	100K
RV102	1-238-020-11	RES, ADJ, CARBON	100K
RV103	1-238-019-11	RES, ADJ, CARBON	47K
RV104	1-238-019-11	RES, ADJ, CARBON	47K
RV201	1-241-629-11	RES, ADJ, CARBON	4.7K
RV401	1-238-049-21	RES, VAR, CARBON	2K (CONTR)
RV451	1-223-365-21	RES, VAR, CARBON	10K (VOLUME)
RV501	1-241-630-11	RES, ADJ, CARBON	10K
RV551	1-241-628-11	RES, ADJ, CARBON	2.2K
RV552	1-238-050-21	RES, VAR, CARBON	100K (Y-HOLD)
△RV601	1-241-627-11	RES, ADJ, CARBON	1K
RV801	1-238-051-21	RES, VAR, CARBON	1M (BRT)
< SWITCH >			
S101	1-554-088-41	SWITCH, KEY BOARD	(CH CALL)
S102	1-554-088-41	SWITCH, KEY BOARD	(CHANNEL -)
S103	1-554-088-41	SWITCH, KEY BOARD	(CHANNEL +)
S151	1-554-222-00	SWITCH, SLIDE	(TV BAND)
S601	1-570-690-U	SWITCH, PUSH	(POWER)
< FILTER >			
SWF201	1-577-244-11	FILTER CERAMIC	
< TRANSFORMER >			
△T801	1-439-487-21	TRANSFORMER ASSY,	FLYBACK
< TUNER >			
TU151	1-693-196-11	TUNER UNIT	

Ref. No.	Part No.	Description	Remark
*	A-3016-362-A	R BOARD, COMPLETE	

	3-714-118-01	SCREW (1.7X4)	
	4-039-681-01	GEAR, TUNING	
	4-039-691-01	KNOB, RADIO TUNING (BLACK)	
	4-039-691-11	KNOB, RADIO TUNING (WHITE)	
	4-039-693-01	POINTER	
	4-039-694-01	DRUM, TUNING CAPACITOR	
	4-039-701-01	BRACKET, POINTER	
	7-685-646-79	SCREW +P 3X8 TYPE2 NON-SLIT	
< CAPACITOR >			
C1	1-102-074-00	CERAMIC	0.001uF 10% 50v
c3	1-102-960-00	CERAMIC	24PF 5% 50v
c4	1-102-960-00	CERAMIC	24PF 5% 50v
c5	1-102-943-00	CERAMIC	6.0PF 0.5PF 50V
C6	1-102-973-00	CERAMIC	100PF 5% 50v
C7	1-124-907-11	ELECT	10uF 20% 50v
C8	1-102-074-00	CERAMIC	0.001uF 10% 50v
C9	1-101-004-00	CERAMIC	0.01uF 50v
C10	1-124-907-11	ELECT	10uF 20% 50v
C11	1-124-927-11	ELECT	4.7uF 20% 100V
C12	1-124-903-11	ELECT	1uF 20% 50v
C13	1-124-907-11	ELECT	10uF 20% 50v
C14	1-124-907-11	ELECT	10uF 20% 50v
C15	1-101-004-00	CERAMIC	0.01uF 50v
C16	1-124-907-11	ELECT	10uF 20% 50v
C17	1-124-907-11	ELECT	10uF 20% 50v
< FILTER >			
CF2	1-567-097-61	FILTER, CERAMIC	(10.7MHz)
CF3	1-567-097-61	FILTER, CERAMIC	(10.7MHz)
< CONNECTOR >			
*	CN152	1-565-980-11	HOUSING, CONNECTOR(PC BOARD) 9P
< VARIABLE CAPACITOR >			
CT1-4	1-141-458-11	CAP, VAR (RADIO TUNING)	
CV1-4			
< DIODE >			
D3	8-719-109-93	DIODE RD6.2ES-B2	
< FILTER >			
FL1	1-236-022-11	FILTER BAND PASS	

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref. No. Part No. Description Remark

< IC >

IC1 8-752-061-79 I C CX20111-T6

< COIL >

L1 1-402-523-11 ANTENNA, FERRITE-ROD (AM)
L2-1 1-406-042-00 COIL, FM OSC
* L2-2 1-426-074-00 COIL, FM RF (A)
L3 1-422-131-00 COIL, FM OSCILLATION
L4 1-406-087-11 COIL, OSC (AM)

< RESISTOR >

R1 1-249-429-11 CARBON 10K 5% 1/4W
R2 1-249-421-11 CARBON 2.2K 5% 1/4W
R3 1-249-405-11 CARBON 100 5% 1/4W
R4 1-249-423-11 CARBON 3.3K 5% 1/4W
R7 1-249-409-11 CARBON 220 5% 1/4W
R8 1-249-417-11 CARBON 1K 5% 1/4W

< SWITCH >

S1 1-554-061-00 SWITCH, SLIDE (MODE)

< ENCAPSULATED COMPONENT >

T1 1-236-385-11 ENCAPSULATED COMPONENT

MISCELLANEOUS

A68 1-546-075-11 CATHODE-RAY TUBE, B/W (E2282)
A69 1-451-365-21 DEFLECTION YOKE
ANT1 1-501-596-11 ANTENNA, TELESCOPIC (BLACK)...(BLACK)
ANT1 1-501-596-21 ANTENNA, TELESCOPIC (WHITE)...(WHITE)
SP1 1-504-247-11 SPEAKER (5CM)

ACCESSORIES & PACKING MATERIALS

A 1-467-048-11 ADAPTOR, AC (AC-E525)
3-756-602-21 MANUAL, INSTRUCTION (ENGLISH)
* 4-039-803-01 CUSHION (L)
* 4-039-804-01 CUSHION (R)
* 4-039-805-01 INDIVIDUAL CARTON

Ref. No. Part No. Description Remark

HARDWARE L 1 ST

#1 7-685-648-79 SCREW +BVTP 3X12 TYPE2 N-S
#2 7-626-323-31 SPRING PIN 4X14
#3 7-682-548-04 SCREW +B 3X8
#4 7-685-646-79 SCREW +P 3X8 TYPE2 NON-SLIT
#5 7-685-647-79 SCREW, TAPPING, M3X10
#6 7-685-105-11 SCREW +PTP 2X8

The components identified by mark A or dotted line with mark A are critical for safety. Replace only with part number specified.

