FD-40A

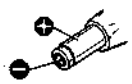
SERVICE MANUAL

US Model

SPECIFICATIONS

TV standard	American TV standards
TV channel coverage	
	VHF channel 2–13
	UHF channels 14–69
Antenna	VHF/UHF telescopic antenna
Picture tube	10-cm (4-inch) picture measured diagonally
Speaker	Approx. 5 cm (2 inches) dia.
Input	A/V IN jack (AV jack)
	Video input: 1 V p-p, 75 ohm unbalanced, sync negative
	Audio input: −5 dBs (436 mVrms), 30 kilohms
Output	Earphone/headphones jack (minijack) load impedance 8–300 ohms
Battery life	Watching TV at a normal sound level and normal temperatures, you can expect the following batteries to last for: Sony Eveready AM2 alkaline batteries or Eveready No.E93 alkaline batteries, approx. 4 hours.
Power requirements	6 V dc:
	Batteries
	four size C alkaline batteries (IEC designation LR14)
	BP-16H rechargeable battery pack (optional)
	DC IN 6 V jack accepts:
	AC-40A AC power adaptor (optional) for use on 120 V ac, 60 Hz
Dimensions	Approx. 127.5×215.5×65.5 mm (w/h/d) (5 1/8 × 8 1/2 × 2 5/8 inches) incl. projecting parts and controls
	Approx. 120×210×65 mm (w/h/d) (4 3/4 × 8 3/8 × 2 5/8 inches) not incl. projecting parts and controls
Weight	Approx. 1.2 kg (2 lb 11 oz) incl. batteries
	Approx. 0.93 kg (2 lb 1 oz) not incl. batteries

Note: Use only an ac power adaptor or car battery cord manufactured by Sony. Polarity of the plug of other manufacturers may be different.



Polarity of Sony plug

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND 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.

MICROFILM

FLAT BLACK AND WHITE TV

SONY®

B&W

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.

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 microampers). 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)

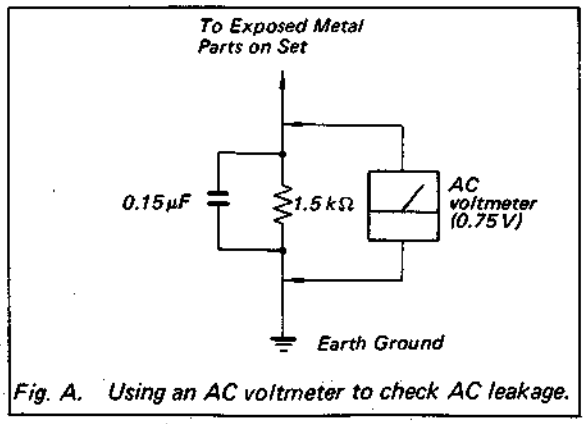


Fig. A. Using an AC voltmeter to check AC leakage.

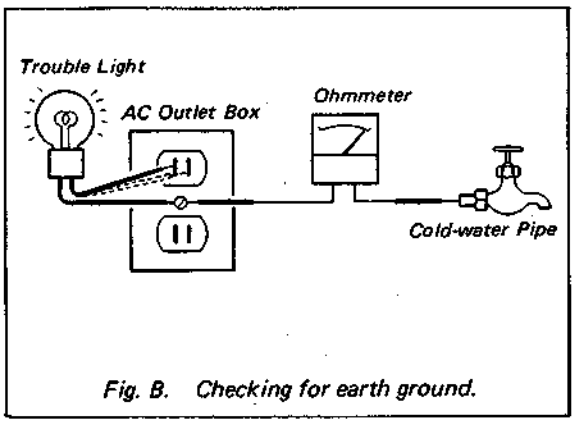
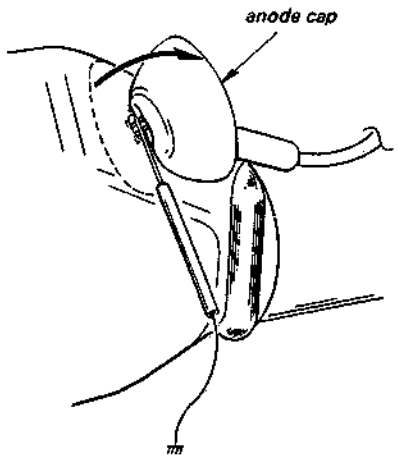


Fig. B. Checking for earth ground.

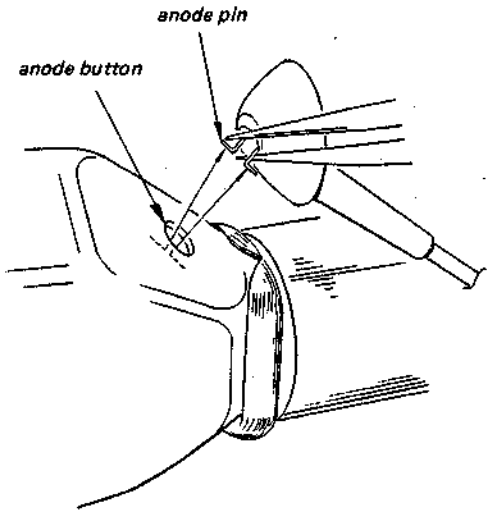
NOTE ON THE ANODE CAP REMOVAL

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.

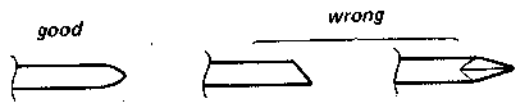


Caution on Reinstallation :
Confirm that the anode button is inserted into the anode cap securely.

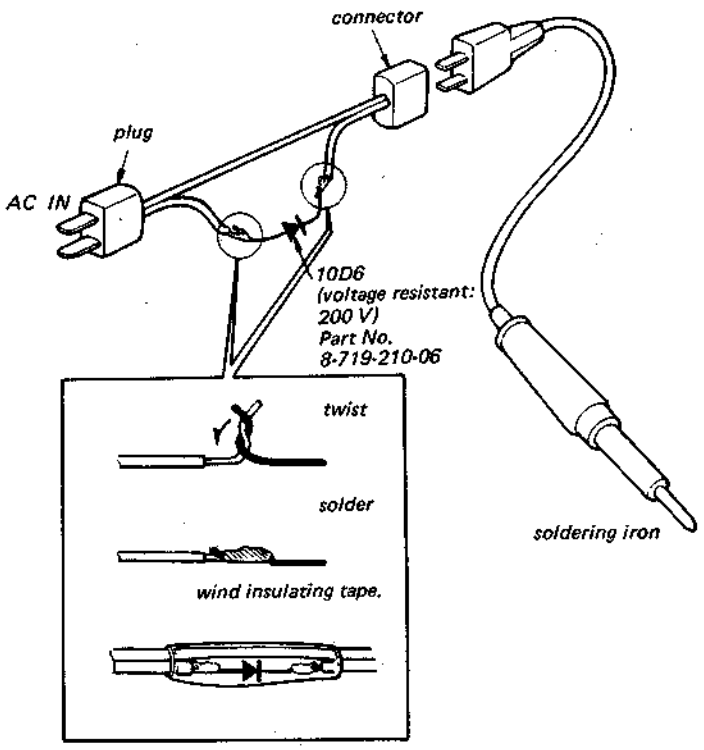
Flexible Circuit Board Repairing

1. Keep the temperature of the soldering iron at 270° ± 10°C during repairing.
   You can maintain the temperature of the soldering iron around 270°C by using the thermal controller as illustrated on the right.
2. Do not touch the soldering iron more than 4 seconds or 4 times on the same conductor of the circuit board.
3. Do not apply force on the conductor when soldering or unsoldering.

Tip of soldering iron



To make thermal controller of soldering iron



SERVICING NOTE

Replacing chip components

All chip components should be connected and disconnected, using a tapered soldering iron [temperature of the iron tip: less than 280°C (536°F)], a pair of tweezers and braided wire.

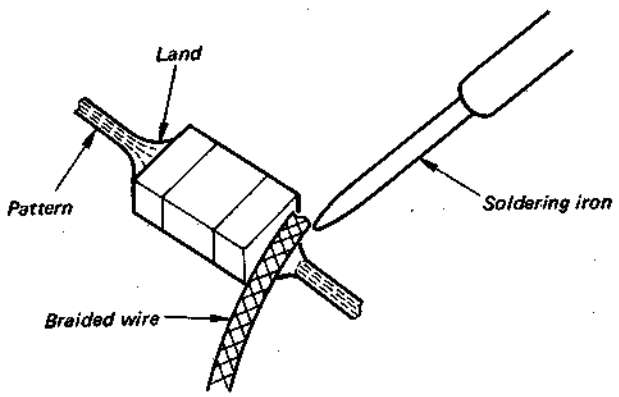
Precautions for replacement

1. **Do not disconnect the chip component forcefully. Otherwise, the pattern may peel off.**
2. **Never re-use a disconnected chip component. Dispose of all old chip components.**
3. **To protect the chip component, heating time for attaching the component should be within 3 seconds.**

○ **Removing chip components**

(1) Removing solder at electrode

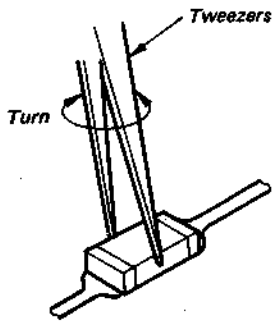
Remove the solder at the electrode, using a thin braided wire. Do not remove the solder of the part (chip component) attached adjacent to the electrode.



(2) Disconnecting chip components

Turn the tweezers with the soldering iron alternately applied to both electrodes, and the chip component will be disconnected. Take careful precautions while disconnecting, because if the chip component is forcefully removed the land may peel off.

Never re-use a disconnected chip component.



(3) Smoothing the soldered surface

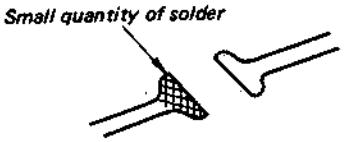
After disconnecting the chip component, remove the solder by using a braided wire to smooth the land surface.

○ **Connecting chip components**

The value of chip components is not displayed on the main body. Take due precautions to avoid mixing new chip components with other ones.

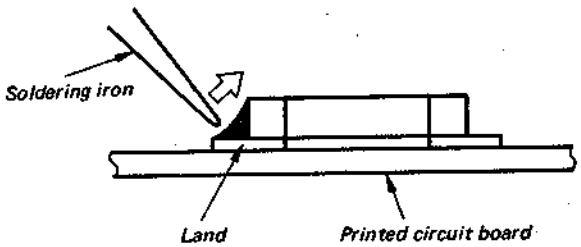
(1) Applying solder to land on one side

Apply a thin layer of solder to the land on one side where the chip component is to be connected. Too much solder may cause bridging.



(2) Speedy soldering

Hold the chip component at the desired position, using tweezers, and apply the soldering iron in the arrow-marked direction. To protect the chip component, heating time should be within 3 seconds.

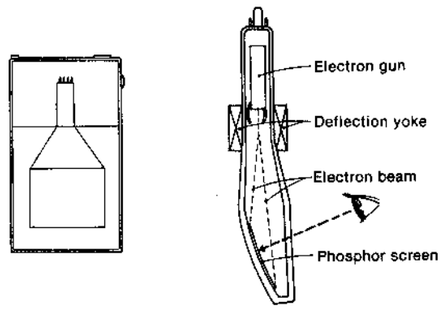


(3) Speedy soldering of electrode on the other side

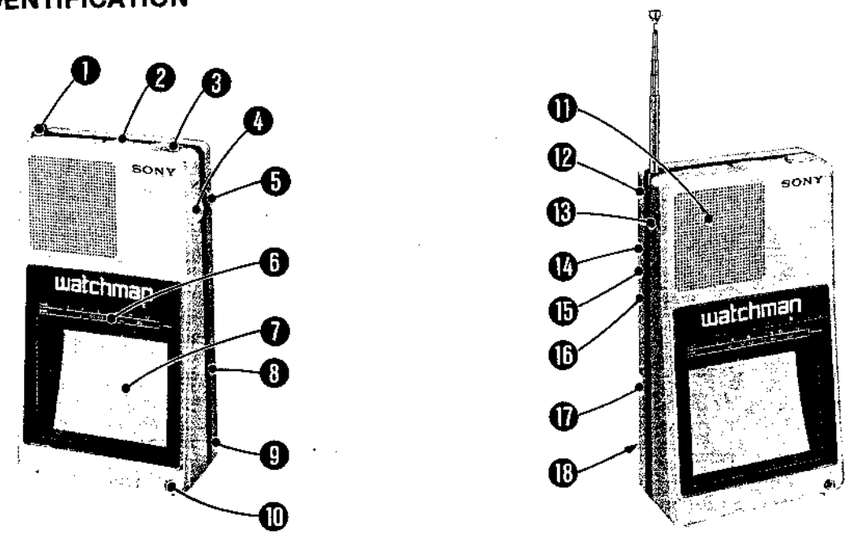
Solder the electrode on the other side in the same way as in (2) above.

FEATURES

- Miniature B/W TV for portable or desktop use
- Newly designed 4" flat display picture tube
- Stand-up design with screen at bottom
- Recessed tilted screen for comfortable viewing
- New combined audio-video input for easy hookup
- External antenna jack for home and car use
- Built-in 2" speaker for better sound
- 3-way power supply capability



PARTS IDENTIFICATION



❶ Telescopic antenna
❷ BAND SELECT switch
❸ POWER switch
❹ TUNING knob
❺ VOL (volume) control
❻ Dial scale
❼ Screen
❽ DC IN 6 V (external power input) jack
❾ Loop for hand strap
❿ EARPHONE jack
⓫ Speaker
⓬ Loop for hand strap
⓭ EXT ANT (external antenna) jack
⓮ CONTR (contrast) control
⓯ BRT (brightness) control
⓰ V (vertical) HOLD control
⓱ A/V IN (audio/video input) jack
⓲ Battery compartment (rear)

SECTION 1
SAFETY RELATED CHECK

Operation Check on Hold Down Circuit

When replacing the following components marked ⧓ on schematic diagram, check the operation on the hold down circuit.

- Components marked ⧓
  C804, C817, D606, D801, D802, R604, R605, R628, R803, R804, RV601

Procedure:

1. Unsolder Ⓐ, Ⓑ and Ⓒ in the Fig. 1, and remove the one leads (power source side) of R804, R803 and R628.
   Note: Be careful not to short the removed lead of each resistor to the pattern before checking step 2 and later.
2. Supply 6 V dc to DC IN 6 V jack.
3. Connect the regulated dc power supply to R804 as shown in the Fig. 2.
   1) When supplying 9.3 V dc to R804, confirm that the raster does not appear.
   2) When supplying 7.7 V dc to R804, confirm that the raster appears.
4. Connect the regulated dc power supply to R803 as shown in the Fig. 2.
   1) When supplying 7.05 V dc to R803, confirm that the raster does not appear.
   2) When supplying 6.2 V dc to R803, confirm that the raster appears.
5. Connect the regulated dc power supply to R628 as shown in the Fig. 2. When supplying 6.1 V dc, confirm that the raster does not appear.
6. After the check, reconnect the one leads of R804, R803 and R628.

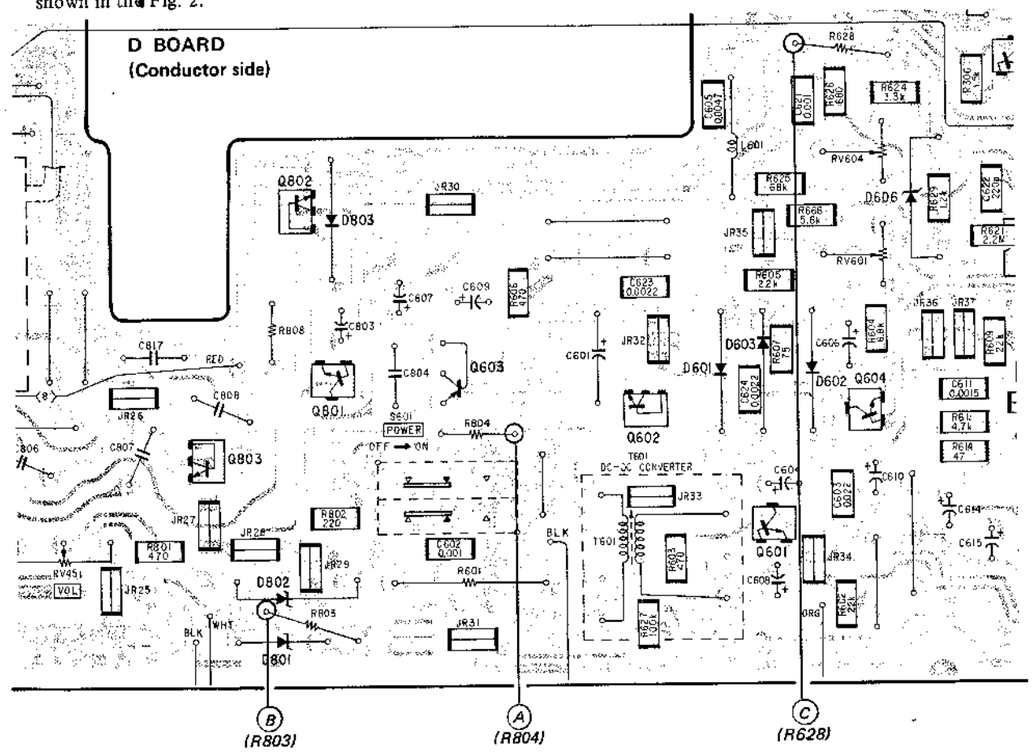


Fig. 1 Unsoldering Location

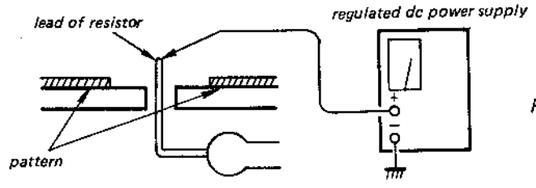
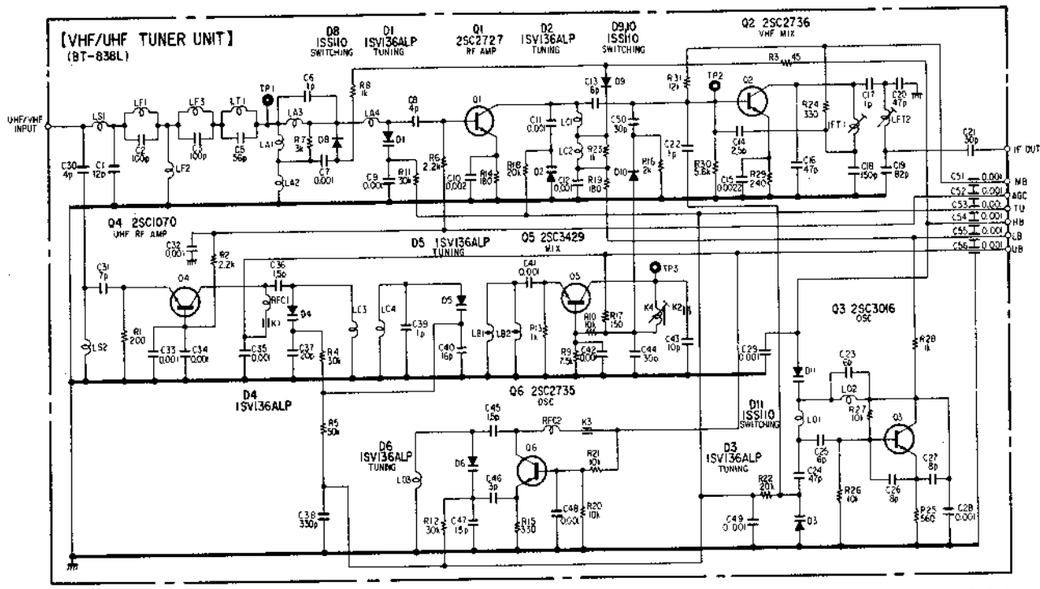


Fig. 2 Regulated dc Power Supply Connection (The unsoldering side of R804, R803 and R628.)

MEMO

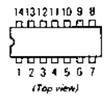
2-1. TUNER SCHEMATIC DIAGRAM
VHF/UHF TUNER –BT838L



Note: Tuner reference numbers are not included in the Electrical Parts List.

● **Semiconductor Lead Layouts.**

M51364P

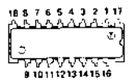


M51378L

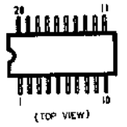
μPC574J

NJM386D

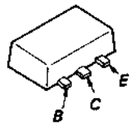
HA11441



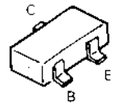
CX22011



2SB798
2SD1005
2SD1615A-GP

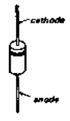


2SA812
2SA1162
2SC1623-L7
2SC1654
DTC114YK

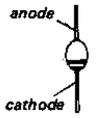


2SB962
2SC3073-Y
2SD1083L

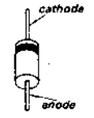
ERA81-004
ESJA57-04



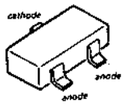
V19E



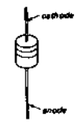
1S2076A
RD3.3EB1
RD4.3EN1
RD5.6EN2
RD7.5EN1
RD13EB1



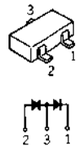
1S2837



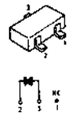
1SS119



DA204K



1SS222



• See page 8 for Semiconductor Lead Layouts.

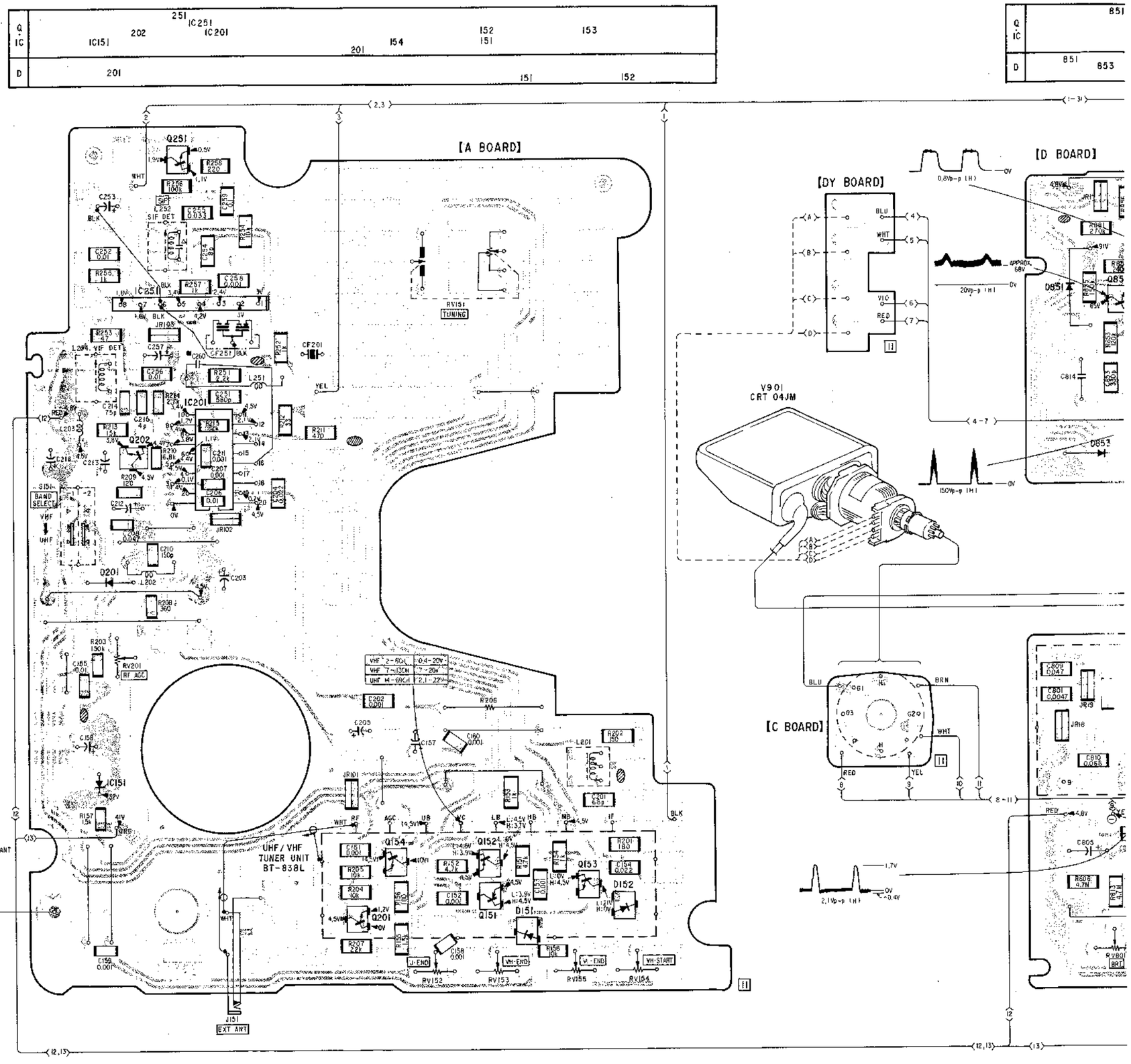
Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/8 W unless otherwise noted. kΩ: 1000 Ω, MΩ: 1000 kΩ
- ⇨ : signal path.
- ▭ : adjustment for repair.
- ▬ : B+ bus.
- Power voltage is 6V and fed with regulated dc power supply from DC IN 6V (external power input) jack.
  no mark: VHF
  L: VHF low channel (2 – 6 CH)
  H: VHF high channel (7 – 13 CH)
  ( ): UHF
- Voltages are dc with respect to ground in detuned mode. Voltage variations may be noted due to normal production tolerances.
- Total current is measured at detuned mode with VOL knob turned downwards (MIN).
- Waveforms are taken to ground in detuned mode by using oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Switch

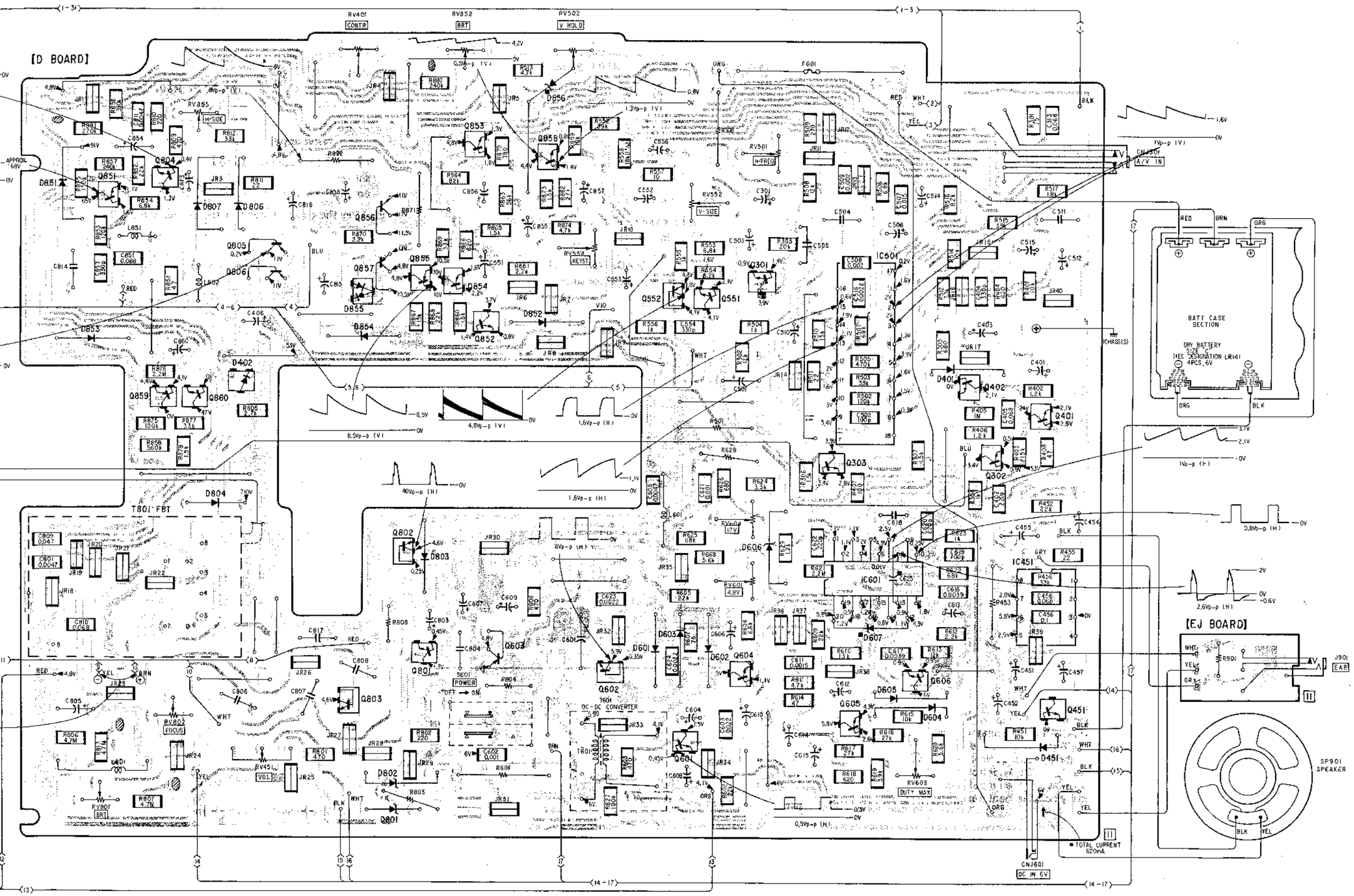
Ref. No.	Switch	Position
S151	BAND SELECT	VHF
S601	POWER	OFF

Note on Mounting Diagram:

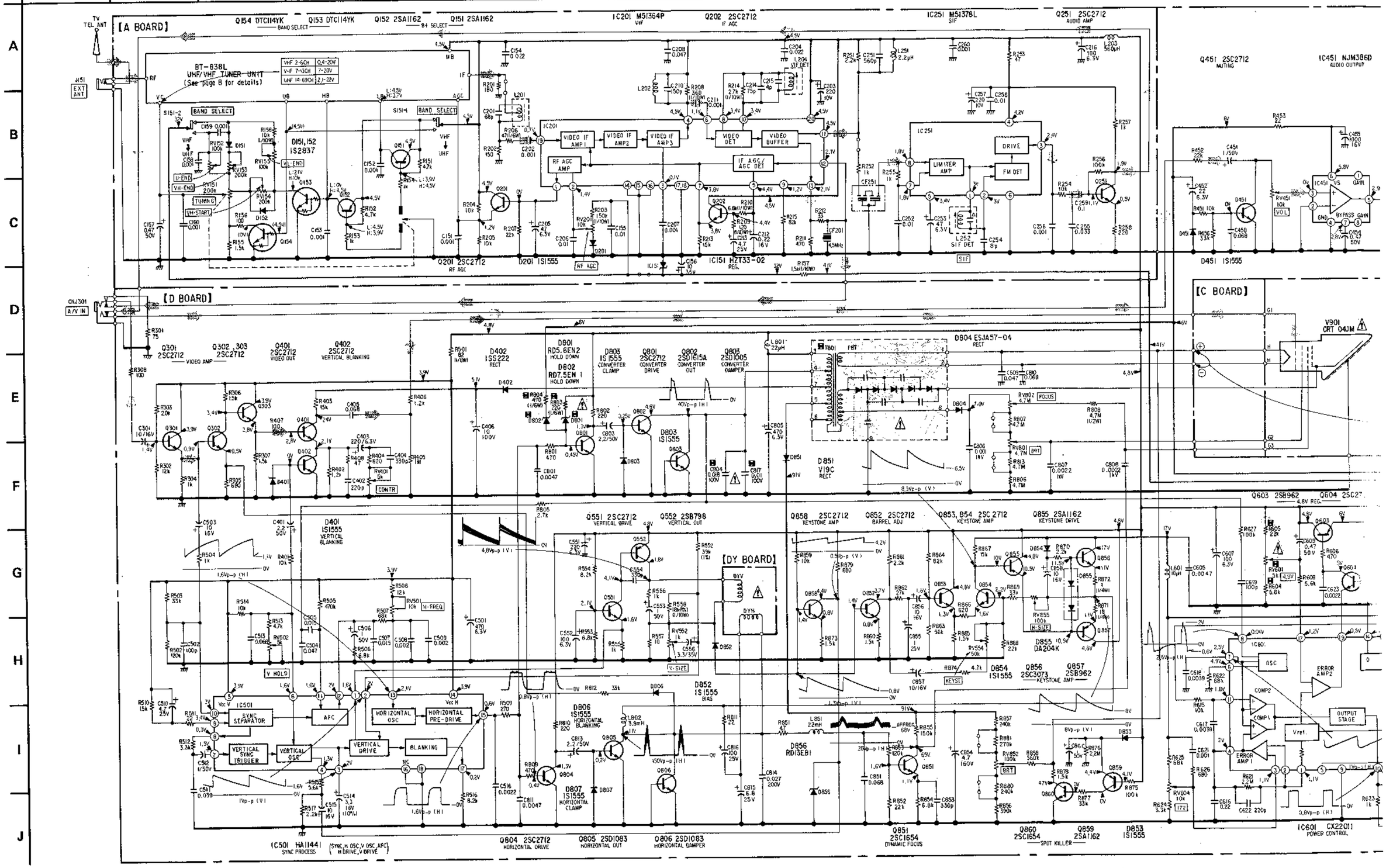
- ■ : part mounted on the conductor side.
- ▒ : B + pattern



	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Q IC	851	804 859, 860	805 806	856 857 803	855 802	854 853 852	858	552	551	301 604	303	IC501 IC601 605	606	402	302	401 451	A
D	851 853	807 804	806 402	855 857 854	802 801	803	856 852	601	603	602	606	607	605 604	401	451		



2-3. SCHEMATIC DIAGRAM • See page 9 for notes.



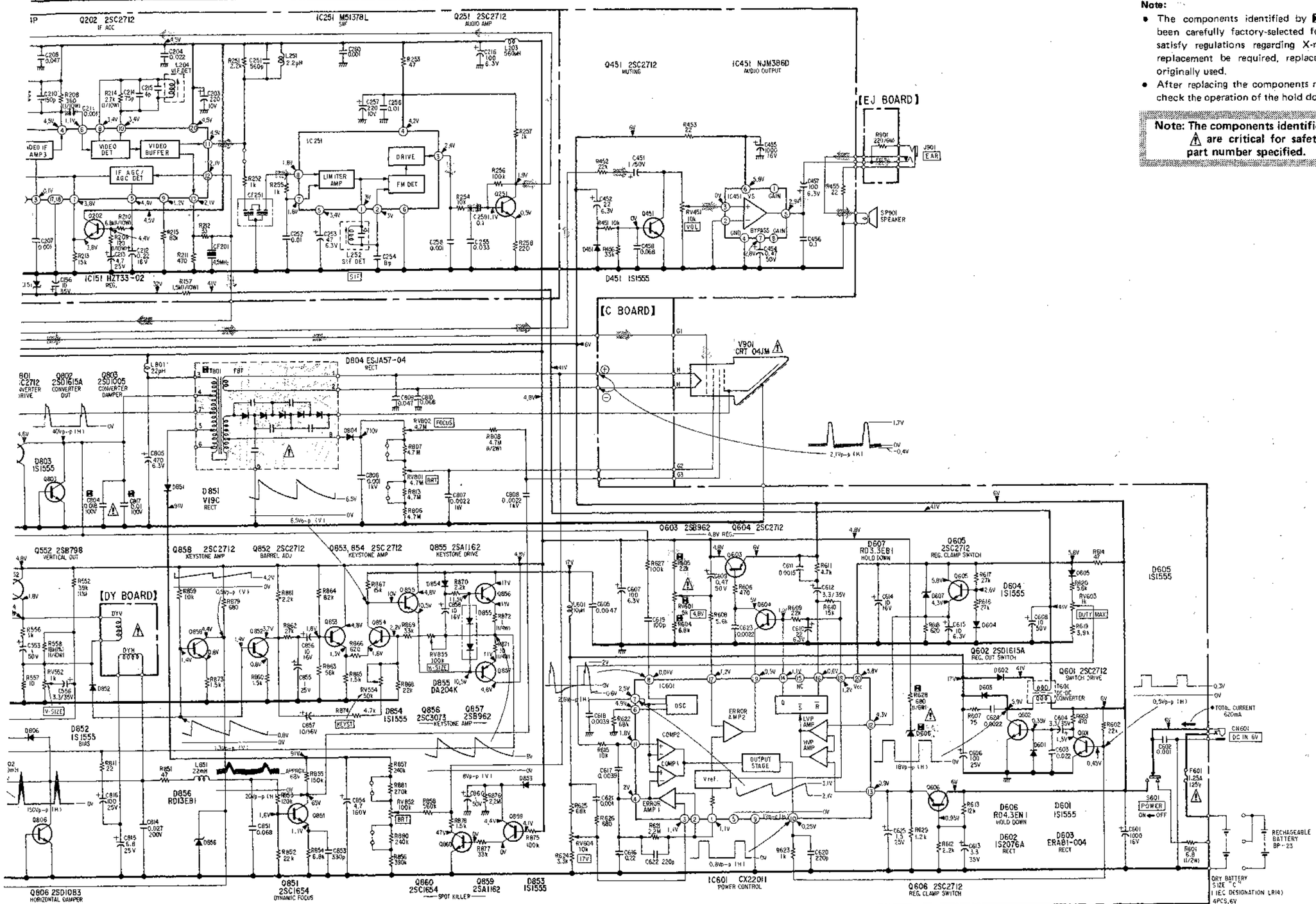
8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J

Note:

- The components identified by ⋈ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- After replacing the components marked ⋈ , be sure to check the operation of the hold down circuit on page 6.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



SECTION 3
EXPLODED VIEWS

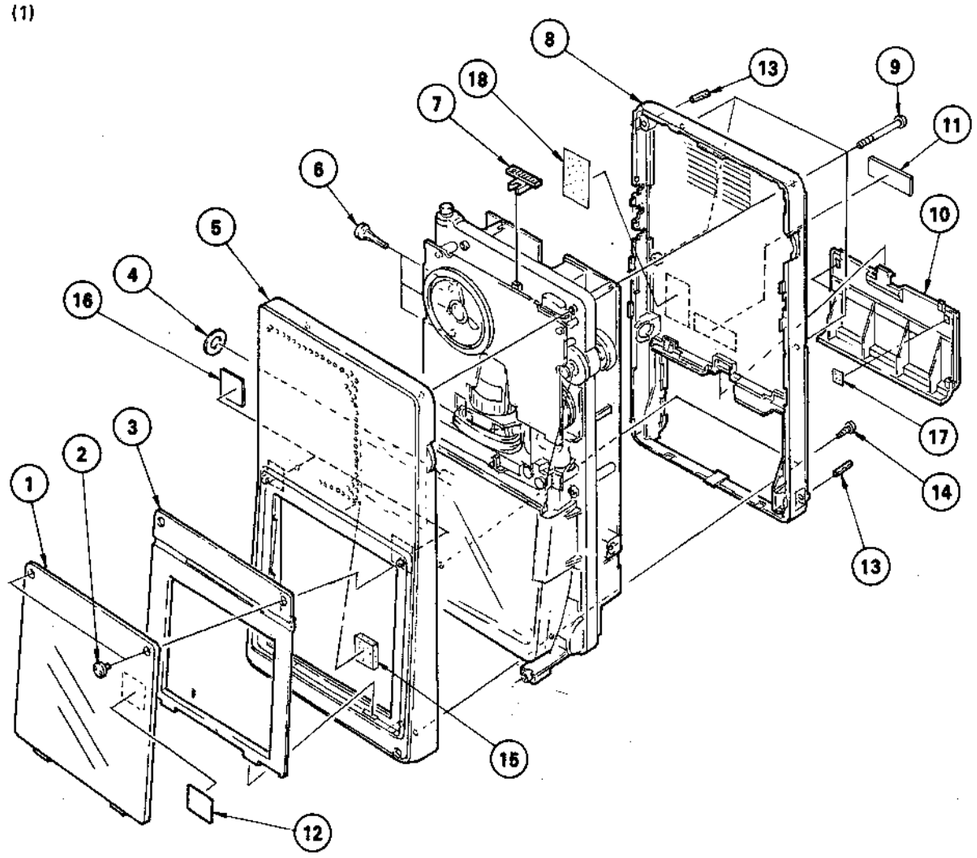
NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

· Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

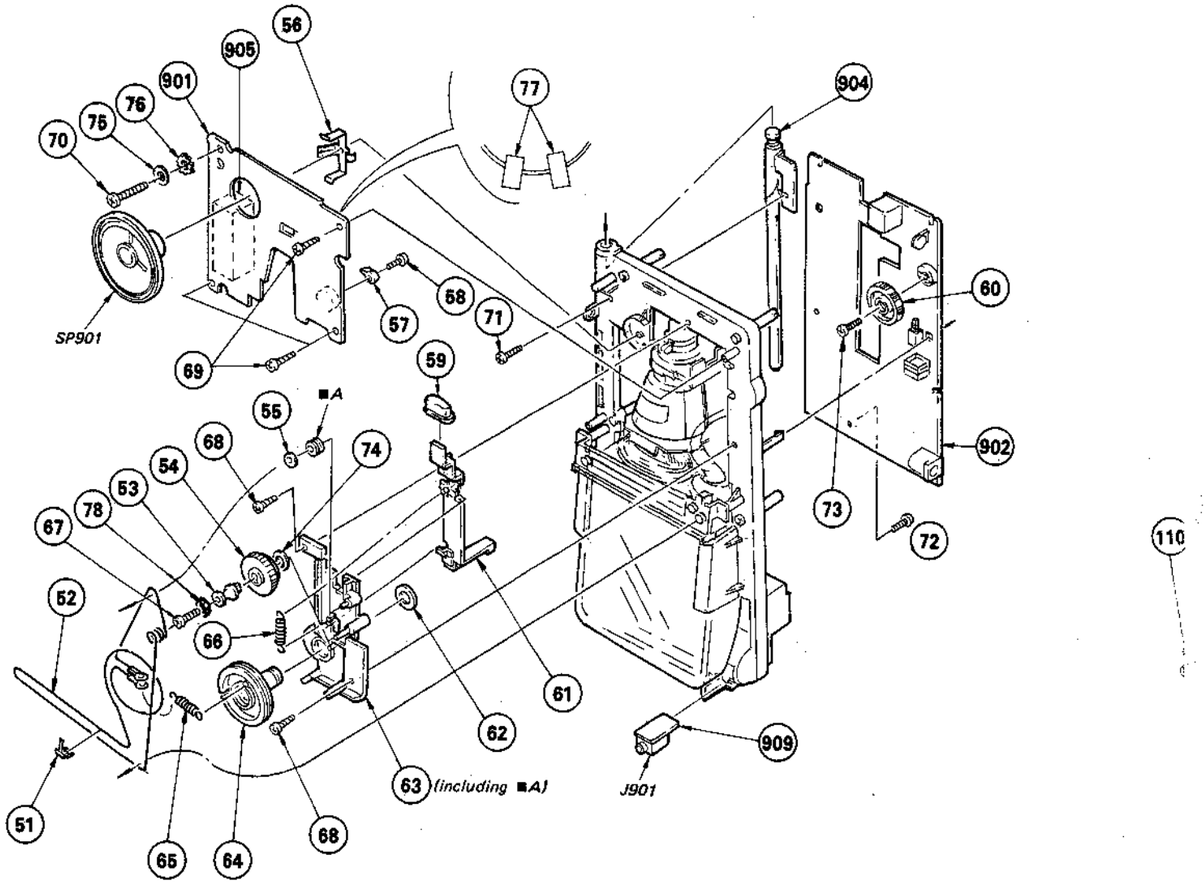
· The construction parts of an assembled part are indicated with a collation number in the remark column.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(1)



(2)



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No.	Part No.	Description	REMARKS
1	3-323-917-01	FILTER	
2	3-314-055-00	SCREW (M1.4), PIN-FACE	
3	3-323-918-01	FRAME, DISPLAY	
4	*3-323-915-01	PLATE, BLIND, AV	
5	A-3040-508-A	CABINET ASSY, FRONT	
6	3-323-922-01	KNOB, ADJUSTMENT	
7	3-323-904-01	KNOB, SELECTION, BAND	
8	3-323-924-01	CABINET, REAR	
9	3-323-901-01	SCREW (2X36), CABINET	
10	3-323-916-01	LID, BATTERY CASE	
11	3-701-999-00	LABEL, SERIAL NUMBER	
12	3-703-710-01	STICKER, SONY SYMBOL (12)	
13	7-626-301-31	SPRING PIN 2X10	
14	7-685-105-14	TPG +P 2X8, TYPE 2, NON-SLIT	
15	9-911-840-XX	CUSHION, RUBBER	
16	*3-892-163-00	SPACER, FRONT	
17	3-831-441-XX	CUSHION	
18	*3-703-044-18	LABEL, CAUTION	

No.	Part No.	Description	REMARKS
51	3-314-008-00	POINTER	
52	9-911-825-32	STRING, DIAL 0.3DIA	
53	3-323-914-01	PULLEY, DIAL	
54	X-3323-902-1	KNOB ASSY, TUNING	
55	3-489-108-00	WASHER, NYLON	
56	3-323-913-01	STOPPER, SP	
57	3-314-006-00	JOINT, TUNING	
58	3-888-156-00	SCREW (1.7X4)	
59	3-323-903-01	BUTTON, POWER	
60	3-323-902-01	KNOB, CONTROL	
61	3-323-919-01	LEVER (A), SWITCH	
62	3-323-929-01	RING, STOPPER	
63	X-3233-905-1	CHASSIS ASSY, DIAL CORD	
64	3-323-907-01	DRUM, DIAL	
65	3-564-949-01	SPRING, TENSION	
66	4-858-478-00	SPRING, TENSION	
67	7-627-552-37	SCREW, PRECISION +P 1.7X3	
68	7-685-134-14	SCREW +P 2.6X8 TYPE2 NON-SLIT	
69	7-685-104-14	SCREW +P 2X6 TYPE2 NON-SLIT	
70	7-621-772-88	SCREW +B 2X16	
71	7-621-255-25	SCREW +P 2X4	
72	7-685-851-01	SCREW +BVTT 2X4 (S)	
73	7-627-552-47	SCREW, PRECISION +P 1.7X4	
74	3-701-439-00	WASHER, PLASTIC	
75	7-623-205-22	SW 2, TYPE 2	
76	7-623-420-07	LW 2, TYPE B	
77	3-831-441-XX	CUSHION	
78	3-323-937-01	RETAINER, PULLEY	
901	*A-3015-308-A	PC BOARD ASSY, A	
902	*A-3015-311-A	PC BOARD ASSY, D	
904	1-501-330-11	ANTENNA, TLESCOPIC	
905	1-463-538-11	TUNER UNIT (UHF/VHF)(BT-838L)	
909	*1-613-770-11	PC BOARD, EJ	

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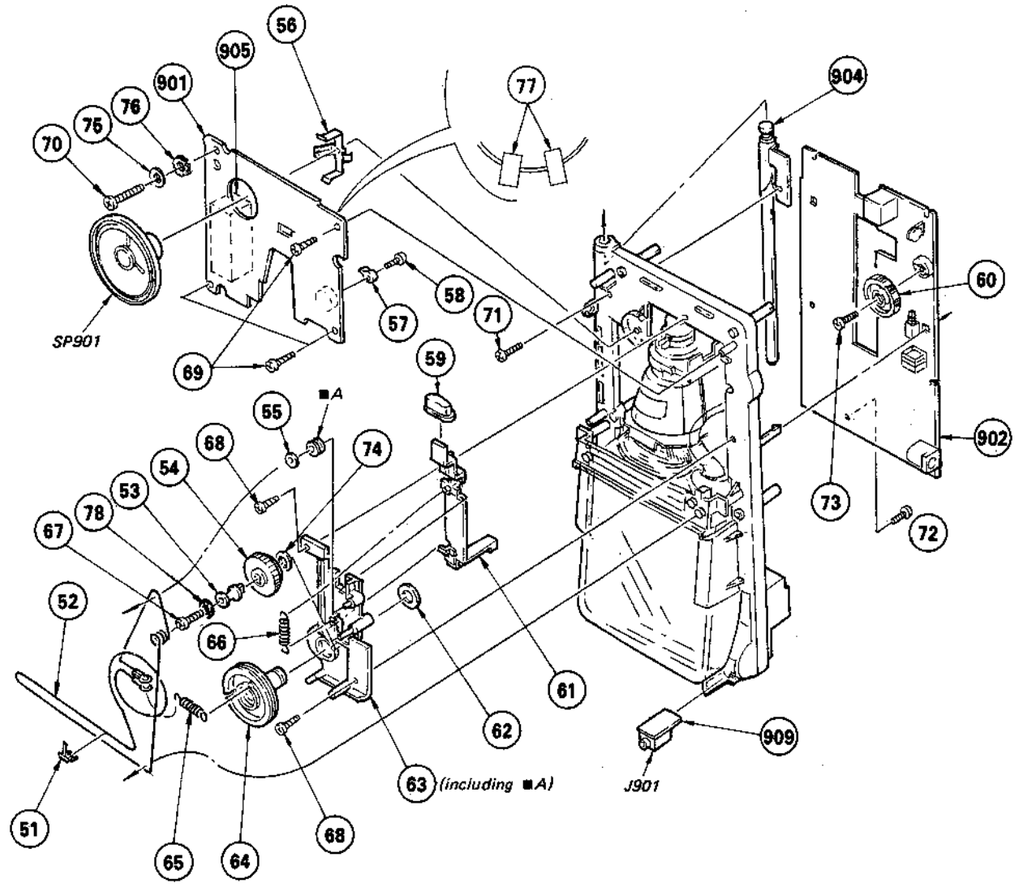

No.	Part No.	Description	REMARKS
51	3-314-008-00	POINTER	
52	9-911-825-32	STRING, DIAL 0.3DIA	
53	3-323-914-01	PULLEY, DIAL	
54	X-3323-902-1	KNOB ASSY, TUNING	
55	3-489-108-00	WASHER, NYLON	
56	3-323-913-01	STOPPER, SP	
57	3-314-006-00	JOINT, TUNING	
58	3-888-166-00	SCREW (1.7X4)	
59	3-323-903-01	BUTTON, POWER	
60	3-323-902-01	KNOB, CONTROL	
61	3-323-919-01	LEVER (A), SWITCH	
62	3-323-929-01	RING, STOPPER	
63	X-3233-905-1	CHASSIS ASSY, DIAL CORD	
64	3-323-907-01	DRUM, DIAL	
65	3-564-949-01	SPRING, TENSION	
66	4-858-478-00	SPRING, TENSION	
67	7-627-552-37	SCREW, PRECISION +P 1.7X3	
68	7-685-134-14	SCREW +P 2.6X8 TYPE2 NON-SLIT	
69	7-685-104-14	SCREW +P 2X6 TYPE2 NON-SLIT	
70	7-621-772-88	SCREW +B 2X16	
71	7-621-255-25	SCREW +P 2X4	
72	7-685-851-01	SCREW +BVTT 2X4 (S)	
73	7-627-552-47	SCREW, PRECISION +P 1.7X4	
74	3-701-439-00	WASHER, PLASTIC	
75	7-623-205-22	SW 2, TYPE 2	
76	7-623-420-07	LW 2, TYPE B	
77	3-831-441-XX	CUSHION	
78	3-323-937-01	RETAINER, PULLEY	
901	*A-3015-308-A	PC BOARD ASSY, A	
902	*A-3015-311-A	PC BOARD ASSY, D	
904	1-501-330-11	ANTENNA, TLESCOPIC	
905	1-463-538-11	TUNER UNIT (UHF/VHF)(BT-838L)	
909	*1-613-770-11	PC BOARD, EJ	

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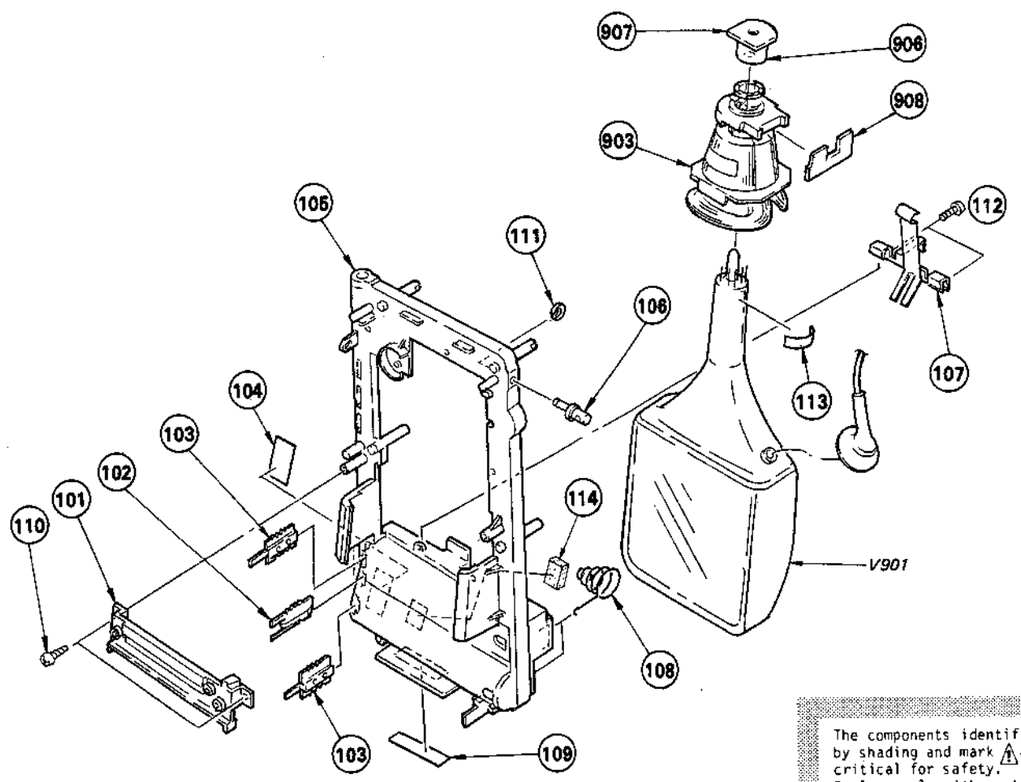

No.	Part No.	Description	REMARKS
101	A-3039-031-A	RAIL ASSY,SUSPENDER, DIAL CORD	
102	3-323-908-01	PLATE, CONTACT	
103	3-501-056-11	TERMINAL, POSITIVE	
104	3-314-050-00	LABEL, CAUTION, POWER	
105	3-323-925-01	CHASSIS	
106	3-323-926-01	BRACKET, STRAP	
107	*X-3323-903-1	BRACKET ASSY, CRT	
108	3-701-835-00	SPRING	
109	3-314-062-00	LABEL, CAUTION, SERVICE	
110	7-685-104-14	SCREW +P 2X6 TYPE2 NON-SLIT	
111	7-624-104-04	STOP RING 2.0, TYPE -E	
112	7-685-853-01	SCREW +BVTT 2X6	
113	7-632-201-41	TAPE, MASKING (9MMX50M) #214	
114	9-911-815-02	CUSHION	
903	⚠1-451-257-11	DEFLECTION YOKE	
906	1-526-736-00	SOCKET, CRT	
907	*1-613-766-11	PC BOARD, C	
908	*1-613-767-11	PC BOARD, DY	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 4
ELECTRICAL PARTS LIST

NOTE:
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*A-3015-308-A	PC BOARD ASSY, A			
902	*A-3015-311-A	PC BOARD ASSY, D			
903 ⚠	1-451-257-11	DEFLECTION YOKE			
904	1-501-330-11	ANTENNA, TLESCOPIC			
905	1-463-538-11	TUNER UNIT (UHF/VHF) (BT-838L)			
906	1-526-736-00	SOCKET, CRT			
907	*1-613-766-11	PC BOARD, C			
908	*1-613-767-11	PC BOARD, OY			
909	*1-613-770-11	PC BOARD, EJ			
C151	1-163-205-00	CERAMIC CHIP	0.001MF	5%	50V
C152	1-163-205-00	CERAMIC CHIP	0.001MF	5%	50V
C153	1-163-205-00	CERAMIC CHIP	0.001MF	5%	50V
C154	1-163-073-00	CERAMIC CHIP	0.022MF		50V
C155	1-163-031-00	CERAMIC CHIP	0.01MF		50V
C156	1-123-620-00	ELECT	10MF	20%	35V
C157	1-123-610-00	ELECT	0.47MF	20%	50V
C158	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C159	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C160	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C201	1-163-177-00	CERAMIC CHIP	68PF	5%	50V
C202	1-163-205-00	CERAMIC CHIP	0.001MF	5%	50V
C203	1-124-444-00	ELECT	220MF	20%	10V
C204	1-163-073-00	CERAMIC CHIP	0.022MF		50V
C205	1-123-647-00	ELECT	47MF	20%	6.3V
C206	1-163-031-00	CERAMIC CHIP	0.01MF		50V
C207	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C208	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C210	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C211	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C212	1-131-453-00	TANTALUM	0.22MF	20%	16V
C213	1-123-616-00	ELECT	4.7MF	20%	25V
C214	1-163-114-00	CERAMIC CHIP	75PF	5%	50V
C215	1-163-087-00	CERAMIC CHIP	4PF	0.25PF	50V
C216	1-123-661-00	ELECT	100MF	20%	6.3V
C251	1-163-199-00	CERAMIC CHIP	560PF	5%	50V
C252	1-163-059-00	CERAMIC CHIP	0.01MF	10%	50V
C253	1-124-224-00	ELECT	47MF	20%	6.3V
C254	1-163-155-00	CERAMIC CHIP	8PF	0.25PF	50V
C255	1-163-074-00	CERAMIC CHIP	0.033MF	10%	25V
C256	1-163-059-00	CERAMIC CHIP	0.01MF	10%	50V
C257	1-123-308-00	ELECT	220MF	20%	10V
C258	1-163-205-00	CERAMIC CHIP	0.001MF	5%	50V
C259	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C260	1-101-001-00	CERAMIC	0.001MF		50V
C301	1-123-617-00	ELECT	10MF	20%	16V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C401	1-124-257-00	ELECT	2.2MF	20%	50V
C402	1-163-189-00	CERAMIC CHIP	220PF	10%	50V
C403	1-123-308-00	ELECT	220MF	20%	6.3V
C404	1-163-193-00	CERAMIC CHIP	330PF	5%	50V
C405	1-163-076-00	CERAMIC CHIP	0.068MF		50V
C406	1-123-384-00	ELECT	10MF	20%	100V
C451	1-123-611-00	ELECT	1MF	20%	50V
C452	1-123-618-00	ELECT	22MF	20%	6.3V
C454	1-124-253-00	ELECT	0.47MF	20%	50V
C455	1-124-555-00	ELECT	1000MF	20%	16V
C456	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C457	1-123-661-00	ELECT	100MF	20%	6.3V
C458	1-163-076-00	CERAMIC CHIP	0.068MF		50V
C501	1-124-470-11	ELECT	470MF	20%	6.3V
C502	1-163-181-00	CERAMIC CHIP	100PF	5%	50V
C503	1-123-617-00	ELECT	10MF	20%	16V
C504	1-130-491-00	MYLAR	0.047MF	5%	50V
C505	1-130-485-00	MYLAR	0.015MF	5%	50V
C506	1-123-611-00	ELECT	1MF	20%	50V
C507	1-163-061-00	CERAMIC CHIP	0.015MF	10%	50V
C508	1-163-212-00	CERAMIC CHIP	0.002MF	5%	50V
C509	1-163-212-00	CERAMIC CHIP	0.002MF	5%	50V
C510	1-123-616-00	ELECT	4.7MF	20%	25V
C511	1-136-160-00	MYLAR	0.039MF	5%	50V
C512	1-124-255-00	ELECT	1MF	20%	50V
C513	1-163-076-00	CERAMIC CHIP	0.068MF		50V
C514	1-131-368-00	TANTALUM	3.3MF	10%	16V
C515	1-123-617-00	ELECT	10MF	20%	16V
C516	1-163-213-00	CERAMIC CHIP	0.0022MF	10%	50V
C551	1-123-308-00	ELECT	220MF	20%	6.3V
C552	1-123-661-00	ELECT	100MF	20%	6.3V
C553	1-123-611-00	ELECT	1MF	20%	50V
C554	1-163-193-00	CERAMIC CHIP	330PF	5%	50V
C556	1-123-613-00	ELECT	3.3MF	20%	35V
C601	1-123-839-00	ELECT	1000MF	20%	16V
C602	1-163-205-00	CERAMIC CHIP	0.001MF	5%	50V
C603	1-163-073-00	CERAMIC CHIP	0.022MF		50V
C604	1-123-613-00	ELECT	3.3MF	20%	35V
C605	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C606	1-123-333-00	ELECT	100MF	20%	25V
C607	1-123-661-00	ELECT	100MF	20%	6.3V
C608	1-123-816-00	ELECT	10MF	20%	50V
C609	1-123-610-00	ELECT	0.47MF	20%	50V
C610	1-123-618-00	ELECT	22MF	20%	6.3V
C611	1-163-209-00	CERAMIC CHIP	0.0015MF	10%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
JR17	1-216-296-00	METAL CHIP	0	5%	1/8W
JR18	1-216-296-00	METAL CHIP	0	5%	1/8W
JR19	1-216-296-00	METAL CHIP	0	5%	1/8W
JR20	1-216-296-00	METAL CHIP	0	5%	1/8W
JR21	1-216-296-00	METAL CHIP	0	5%	1/8W
JR22	1-216-296-00	METAL CHIP	0	5%	1/8W
JR23	1-216-296-00	METAL CHIP	0	5%	1/8W
JR24	1-216-296-00	METAL CHIP	0	5%	1/8W
JR25	1-216-296-00	METAL CHIP	0	5%	1/8W
JR26	1-216-296-00	METAL CHIP	0	5%	1/8W
JR27	1-216-296-00	METAL CHIP	0	5%	1/8W
JR28	1-216-296-00	METAL CHIP	0	5%	1/8W
JR29	1-216-296-00	METAL CHIP	0	5%	1/8W
JR30	1-216-296-00	METAL CHIP	0	5%	1/8W
JR31	1-216-296-00	METAL CHIP	0	5%	1/8W
JR32	1-216-296-00	METAL CHIP	0	5%	1/8W
JR33	1-216-296-00	METAL CHIP	0	5%	1/8W
JR34	1-216-296-00	METAL CHIP	0	5%	1/8W
JR35	1-216-296-00	METAL CHIP	0	5%	1/8W
JR36	1-216-296-00	METAL CHIP	0	5%	1/8W
JR37	1-216-296-00	METAL CHIP	0	5%	1/8W
JR38	1-216-296-00	METAL CHIP	0	5%	1/8W
JR39	1-216-296-00	METAL CHIP	0	5%	1/8W
JR40	1-216-296-00	METAL CHIP	0	5%	1/8W
JR101	1-216-296-00	METAL CHIP	0	5%	1/8W
JR102	1-216-296-00	METAL CHIP	0	5%	1/8W
JR103	1-216-296-00	METAL CHIP	0	5%	1/8W
L201	1-459-530-11	COIL (WITH CORE)			
L202	*1-422-109-00	COIL, AIR-CORE			
L203	1-408-098-00	MICRO INDUCTOR 560UH			
L204	1-404-446-00	COIL, VIF DETECTOR			
L251	1-408-109-00	MICRO INDUCTOR 2.2UH			
L252	1-404-387-00	COIL, FM DETECTOR			
L601	1-408-117-00	MICRO INDUCTOR 10UH			
L801	1-408-121-00	MICRO INDUCTOR 22UH			
L802	1-407-499-00	MICRO INDUCTOR 3.9MMH			
L851	1-407-508-00	MICRO INDUCTOR 22MMH			
Q151	8-729-100-76	TRANSISTOR 2SA812			
Q152	8-729-100-76	TRANSISTOR 2SA812			
Q153	8-729-900-52	TRANSISTOR DTC114YK			
Q154	8-729-900-52	TRANSISTOR DTC114YK			
Q201	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q202	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q251	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q301	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q302	8-729-100-67	TRANSISTOR 2SC1623-L7			

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
Q303	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q401	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q402	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q451	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q551	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q552	8-729-101-07	TRANSISTOR 2SB798			
Q601	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q602	8-729-106-68	TRANSISTOR 2SD1615A-GP			
Q603	8-729-102-78	TRANSISTOR 2SB962			
Q604	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q605	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q606	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q801	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q802	8-729-106-68	TRANSISTOR 2SD1615A-GP			
Q803	8-729-103-72	TRANSISTOR 2SD1005			
Q804	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q805	8-729-301-87	TRANSISTOR 2SD1083L			
Q806	8-729-301-87	TRANSISTOR 2SD1083L			
Q851	8-729-103-52	TRANSISTOR 2SC1654			
Q852	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q853	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q854	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q855	8-729-216-22	TRANSISTOR 2SA1162			
Q856	8-729-204-19	TRANSISTOR 2SC3073-Y			
Q857	8-729-102-78	TRANSISTOR 2SB962			
Q858	8-729-100-67	TRANSISTOR 2SC1623-L7			
Q859	8-729-216-22	TRANSISTOR 2SA1162			
Q860	8-729-103-52	TRANSISTOR 2SC1654			
R151	1-216-214-00	METAL CHIP	4.7K	5%	1/8W
R152	1-216-214-00	METAL CHIP	4.7K	5%	1/8W
R153	1-216-198-00	METAL CHIP	1K	5%	1/8W
R154	1-216-198-00	METAL CHIP	1K	5%	1/8W
R155	1-216-202-00	METAL CHIP	1.5K	5%	1/8W
R156	1-216-174-00	METAL CHIP	100	5%	1/8W
R157	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R158	1-216-073-00	METAL CHIP	10K	5%	1/10W
R201	1-216-180-00	METAL CHIP	180	5%	1/8W
R202	1-216-178-00	METAL CHIP	150	5%	1/8W
R203	1-216-101-00	METAL CHIP	150K	5%	1/10W
R204	1-216-222-00	METAL CHIP	10K	5%	1/8W
R205	1-216-222-00	METAL CHIP	10K	5%	1/8W
R206	1-247-799-00	CARBON	47	5%	1/6W
R207	1-216-230-00	METAL CHIP	22K	5%	1/8W
R208	1-216-038-00	METAL CHIP	360	5%	1/10W
R209	1-216-027-00	METAL CHIP	120	5%	1/10W
R210	1-216-069-00	METAL CHIP	6.8K	5%	1/10W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R804 ⚠	1-247-823-00	CARBON	470	5%	1/6W
R805	1-216-208-00	METAL CHIP	2.7K	5%	1/8W
R806	1-216-286-00	METAL CHIP	4.7M	5%	1/8W
R807	1-216-286-00	METAL CHIP	4.7M	5%	1/8W
R808	1-202-727-00	SOLID	4.7M	10%	1/2W
R809	1-216-190-00	METAL CHIP	470	5%	1/8W
R810	1-216-182-00	METAL CHIP	220	5%	1/8W
R811	1-216-158-00	METAL CHIP	22	5%	1/8W
R812	1-216-234-00	METAL CHIP	33K	5%	1/8W
R813	1-216-286-00	METAL CHIP	4.7M	5%	1/8W
R851	1-216-166-00	METAL CHIP	47	5%	1/8W
R852	1-216-230-00	METAL CHIP	22K	5%	1/8W
R853	1-216-248-00	METAL CHIP	120K	5%	1/8W
R854	1-216-218-00	METAL CHIP	6.8K	5%	1/8W
R855	1-216-250-00	METAL CHIP	150K	5%	1/8W
R856	1-216-260-00	METAL CHIP	390K	5%	1/8W
R857	1-216-255-00	METAL CHIP	240K	5%	1/8W
R858	1-216-264-00	METAL CHIP	560K	5%	1/8W
R859	1-216-222-00	METAL CHIP	10K	5%	1/8W
R860	1-216-202-00	METAL CHIP	1.5K	5%	1/8W
R861	1-216-206-00	METAL CHIP	2.2K	5%	1/8W
R862	1-216-232-00	METAL CHIP	27K	5%	1/8W
R863	1-216-240-00	METAL CHIP	56K	5%	1/8W
R864	1-216-244-00	METAL CHIP	82K	5%	1/8W
R865	1-216-202-00	METAL CHIP	1.5K	5%	1/8W
R866	1-216-193-00	METAL CHIP	620	5%	1/8W
R867	1-216-226-00	METAL CHIP	15K	5%	1/8W
R868	1-216-230-00	METAL CHIP	22K	5%	1/8W
R869	1-216-234-00	METAL CHIP	33K	5%	1/8W
R870	1-216-206-00	METAL CHIP	2.2K	5%	1/8W
R871	1-247-083-00	CARBON	10	5%	1/4W
R872	1-247-071-00	CARBON	1	5%	1/4W
R873	1-216-202-00	METAL CHIP	1.5K	5%	1/8W
R874	1-216-214-00	METAL CHIP	4.7K	5%	1/8W
R875	1-216-246-00	METAL CHIP	100K	5%	1/8W
R876	1-216-278-00	METAL CHIP	2.2M	5%	1/8W
R877	1-216-234-00	METAL CHIP	33K	5%	1/8W
R878	1-216-202-00	METAL CHIP	1.5K	5%	1/8W
R879	1-216-194-00	METAL CHIP	680	5%	1/8W
R880	1-216-255-00	METAL CHIP	240K	5%	1/8W
R881	1-216-256-00	METAL CHIP	270K	5%	1/8W
R901	1-247-791-00	CARBON	22	5%	1/6W
RV151	1-230-397-11	RES, VAR, CARBON(WITH SW) 200K, TUNING			
RV152	1-230-611-11	RES, ADJ, CARBON 100K			
RV153	1-230-612-11	RES, ADJ, CARBON 200K			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
RV154	1-230-612-11	RES, ADJ, CARBON 200K
RV155	1-230-611-11	RES, ADJ, CARBON 100K
RV201	1-230-510-11	RES, ADJ, CARBON 10K
RV401	1-226-430-00	RES, ADJ, CARBON 5K
RV451	1-228-572-00	RES, VAR, CARBON 10K, VOL
RV501	1-230-503-11	RES, ADJ, CARBON 10K
RV502	1-226-430-00	RES, ADJ, CARBON 5K
RV552	1-230-653-11	RES, ADJ, CARBON 1K
RV554	1-230-601-11	RES, ADJ, CARBON 50K
RV601 ⚠	1-230-599-11	RES, ADJ, CARBON 5K
RV603	1-230-653-11	RES, ADJ, CARBON 1K
RV604	1-230-503-11	RES, ADJ, CARBON 10K
RV801	1-230-241-00	RES, ADJ, CARBON 4.7M
RV802	1-230-241-00	RES, ADJ, CARBON 4.7M
RV852	1-226-434-00	RES, ADJ, CARBON 100K
RV855	1-230-611-11	RES, ADJ, CARBON 100K
S151	1-554-222-00	SWITCH, SLIDE, BAND SELECT
S601	1-554-358-00	SWITCH, PUSH, POWER
SP901	1-503-408-11	SPEAKER
T601	1-447-984-11	TRANSFORMER, DC-DC CONVERTER
T801 ⚠	1-439-360-11	TRANSFORMER ASSY, FLYBACK
V901 ⚠	8-736-851-05	CRT 040N

ACCESSORY & PACKING MATERIAL

Part No.	Description
1-528-100-00	BATTERY, ALKALINE MANGANESE
3-323-930-01	STRAP
3-323-931-01	CASE, CARRYING
3-323-933-01	INDIVIDUAL CARTON
3-323-935-01	CUSHION (LEFT)
3-323-936-01	CUSHION (RIGHT)
*3-546-434-00	BAG, POLYETHYLENE
3-701-622-00	BAG, POLYETHYLENE
3-760-128-21	MANUAL, INSTRUCTION
3-795-748-21	SAFETY INSTRUCTIONS, HEADPHONE
4-491-213-22	INSTRUCTION

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.