Service Manual

NATIONAL
RADIO
PANASONIC

AM 2-BAND PORTABLE RADIO

MODEL R-238W/R-238R

■ SPECIFICATIONS

Frequency Range:	MW 525～1605 kHz (571～187 m) SW 3.9～12.0 MHz (76.9～25 m)...W 4.75～18.0 MHz (63.2～16.7 m)...R
Intermediate Frequency:	455 kHz
Sensitivity:	MW 50μV/m for 50 mW Output SW 7μV for 50 mW Output
Power Output:	700 mW Maximum
Batteries:	4.5V (Three "D" Size Flashlight Batteries) (NATIONAL UM-1 or equivalent)
Speaker:	8 cm (3") PM Dynamic Speaker
Dimensions:	203(Wide)×132(High)×45(Deep) mm (8"×5⅛"×1⅘")
Weight:	700 g. (1 lb. 8.7 oz.)
Impedance:	Speaker .....8Ω Earphone Jack 8Ω

■ SERVICING PROCEDURES
(Printed resistor circuit)

1. When repairing the chassis, connect DC power source (4.5V) to EXT power jack and speaker to earphone jack too.
2. This is a high reliability printed resistor board.
   Special care should be exercised when using this resistor board to assure that the values of the resistors are adequate, and will not be damaged when used in the circuit.
   A) Operation notes:
      1. Don't flex the printed board excessively.
      2. Be careful not to damage the printed resistors (black), conductive paint or feed-through eyelets.
      3. Avoid applying unnecessary amounts of heat to the printed resistors, conductive paint or especially to the feed-through eyelets.
   B) How to check the resistance values of the printed resistors:
      Cut the printed conductor of the reverse side of the printed resistor required to be checked so that the resistor will be completely isolated.
      Then, check the resistance value in the normal manner.
   C) How to replace a printed resistor:
      When a printed resistor becomes faulty, cut out that resistor portion and solder a normal resistor to the printed conductor on the back of the circuit.

■ TO REMOVE CHASSIS

1. Remove a tuning control knob from cabinet.
2. Remove a cabinet back cover screw.
3. Remove a red chassis screw as illustrated in fig. 1.
4. To remove chassis completely, unsolder two leadwires to the printed circuit board.
5. To reassemble, reverse the above procedure.

Note:
When removing the chassis, keep to push the part of Ⓐ direction of the arrow mark and pull out the part of Ⓑ direction of the arrow mark. (Fig. 2 & Fig. 3)

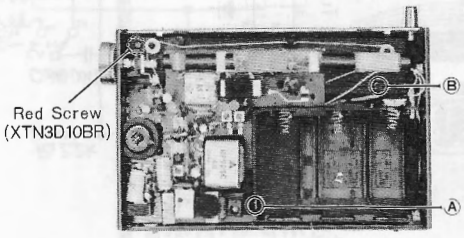


Fig. 1

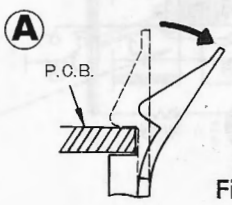


Fig. 2

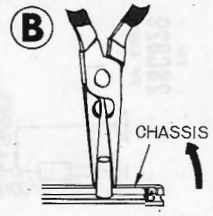
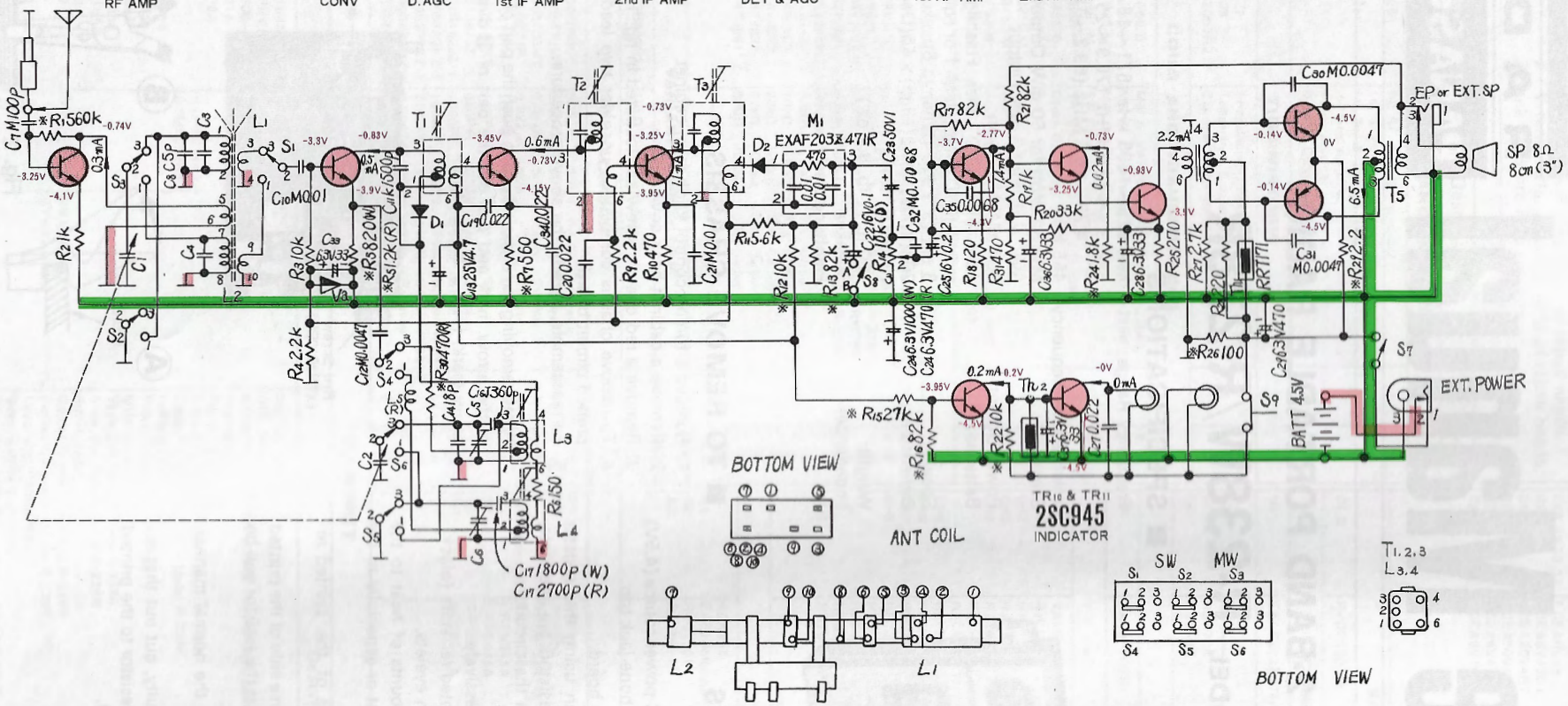


Fig. 3

MATSUSHITA ELECTRIC
MATSUSHITA ELECTRIC TRADING CO., LTD.
P. O. Box 288, Central Osaka, Japan

ORDER NO. RD-890

Schematic Diagram – Model R-238W/R-238R



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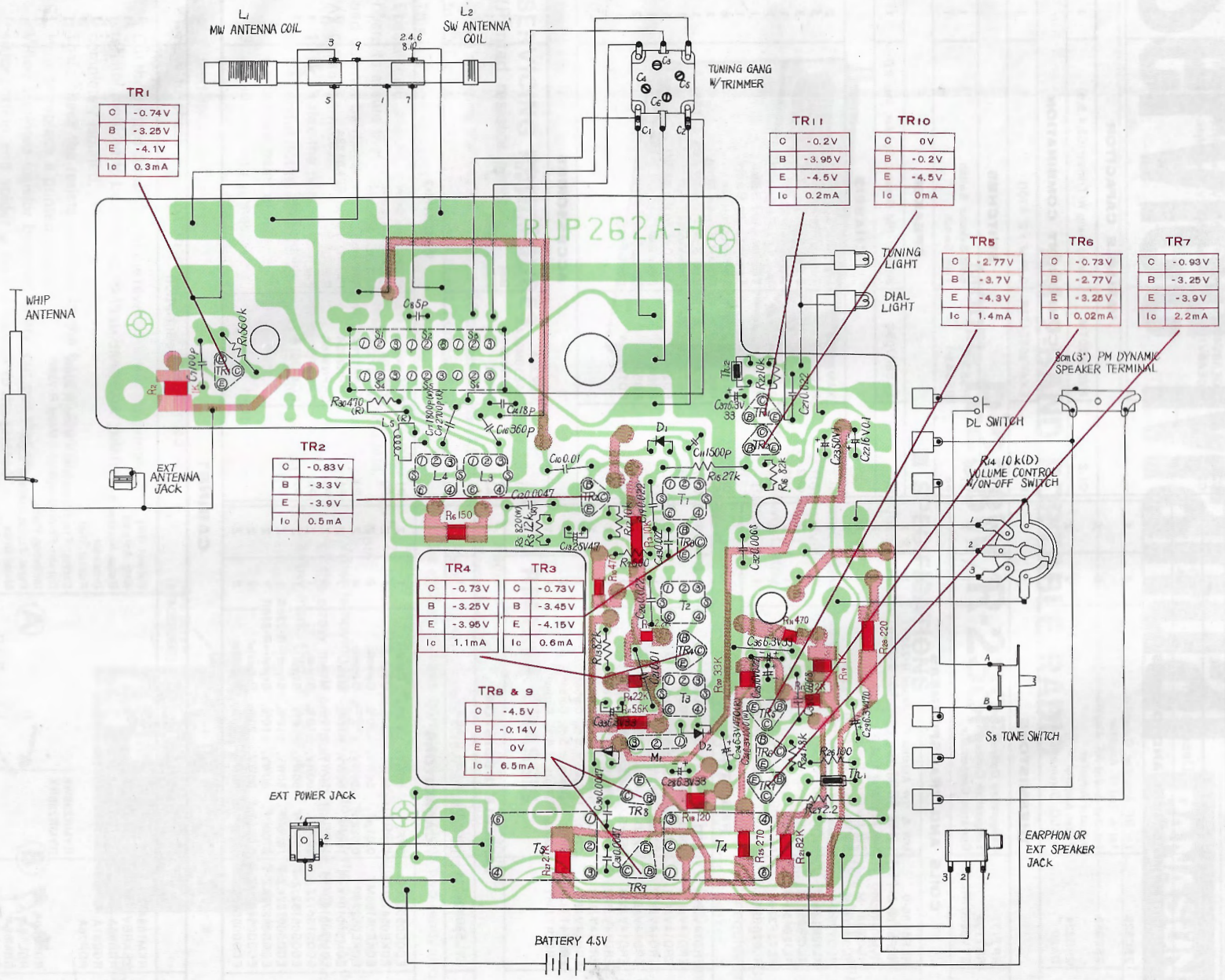
Circuit Board Wiring View – Model R-238W/R-238R

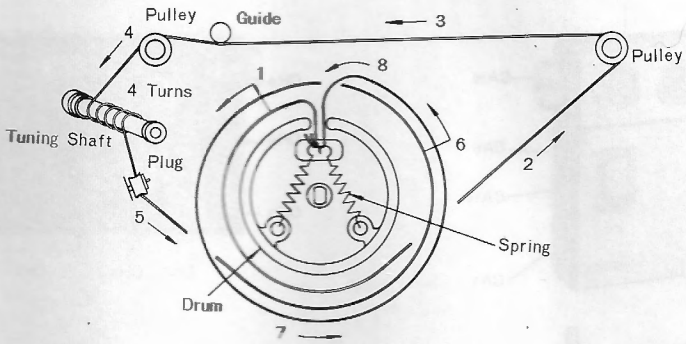


TR & D	TR1														TR2	TR8	TR9	D1	TR3	TR4	D2	TR11	TR12	TR5	TR6	TR7
T & L		L1						L5	L2	L4	L3		T5					T1	T2	T3	T4					

Printed Resistor Conductive Paint Printed Conductor

■ DIAL CORD INSTALLATION GUIDE

1. Dial cord length is 100 cm (39⅜").
2. Turn dial drum to left fully.
3. Arrows (1~8) indicate correct order and direction of installation dial cord.
4. Cement dial cord ends.
5. Turn dial tuning gang to right fully.
6. Insert the drum to the dial tuning gang.



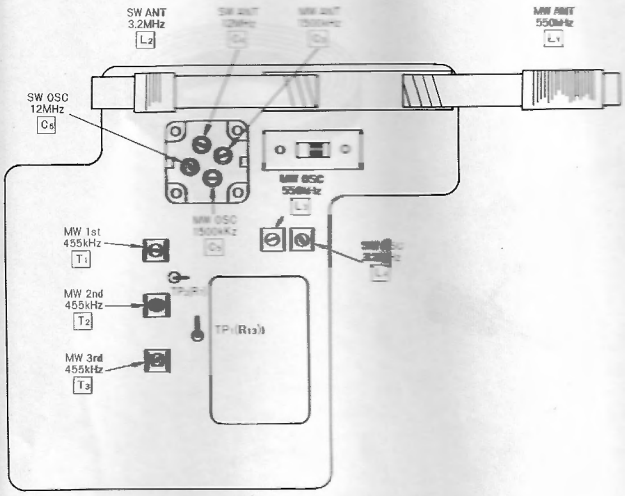
■ TO MOUNT DIAL POINTER

1. Turn dial drum to right fully.
2. Set dial pointer to start mark of the dial board.
3. Attach dial cord to dial pointer.

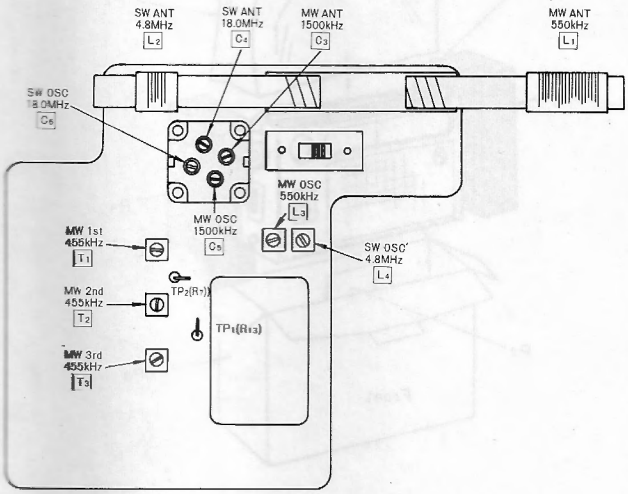
■ ALIGNMENT INSTRUCTIONS

Notes:

1. Set volume control to maximum.
2. Set tone switch to high.
3. Set band selector switch to MW or SW.
4. Set power source voltage to 4.5 volts DC.
5. Output of signal generator should be no higher than necessary to obtain an output reading.



MODEL R-238W



MODEL R-238R

■ TO REMOVE THE SPEAKER

1. Remove the chassis from the cabinet.
2. Remove the tone switch.
3. Then remove the speaker.

■ CAUTION

Do not push down the terminals, because bad connections will be happen. (Fig. 4)

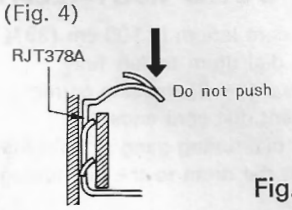
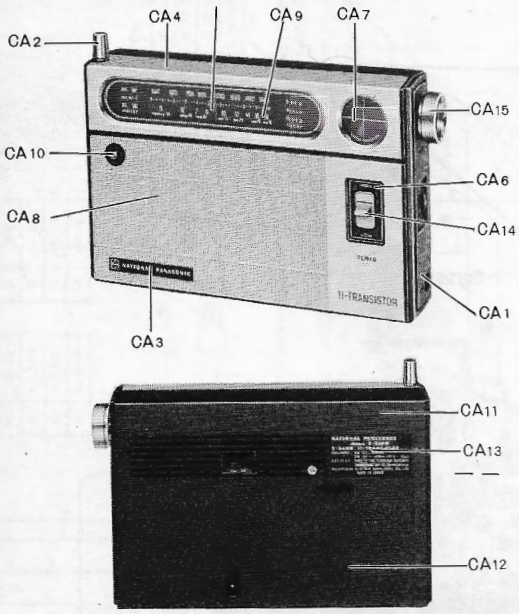
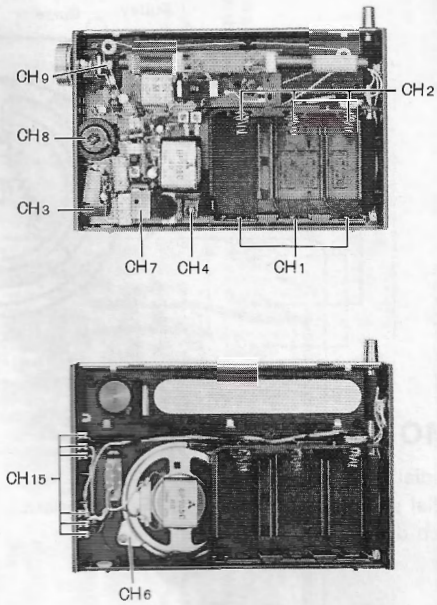


Fig.4

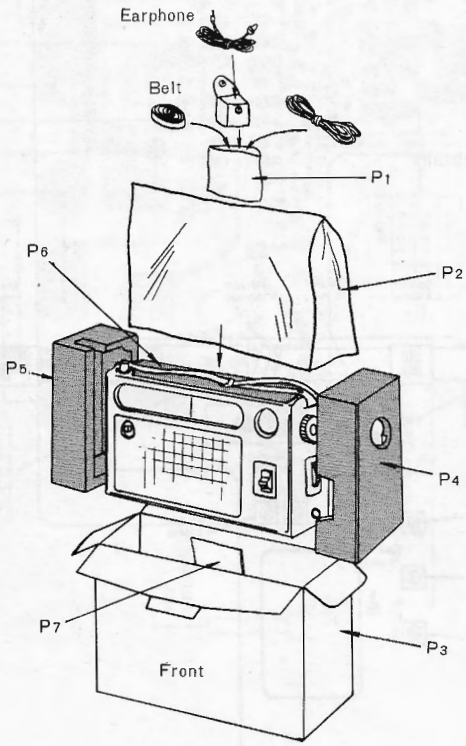
■ CABINET PARTS LOCATIONS



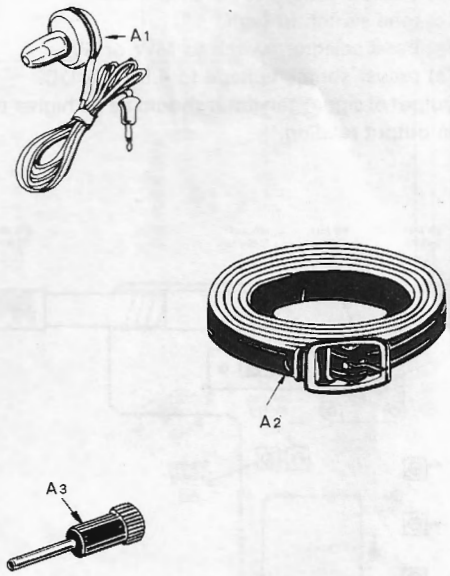
■ CHASSIS PARTS LOCATIONS



■ PACKING PARTS LOCATIONS



■ ACCESSORY



■REPLACEMENT PARTS LIST

NOTES: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. Ⓝindicates the New Parts.
3. **X−Z** rank: **X** rank parts will cover 80% of repair needs.
X+Y rank parts will cover 95% of repair needs.
Z rank parts are less necessary.

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks
		TRANSISTORS AND DIODES		
TR1,2,3,4	2SC829	1st RF Amplifier, Converter 1st & 2nd IF Amplifier	4	X
TR5,6,7,10,11	2SC945	1st, 2nd & 3rd AF Amplifier Indicator Amplifier	5	X
TR8,9	2SB324	Power Amplifier	2	X
D1,2	0A90	D. AGC, Detector & AGC	2	X
		THERMISTORS		
Th1	RRT171	Temperature Compensator	1	X
Th2	RRT103	Temperature Compensator	1	X
Va	EYV320D1R2J2	Operation Compensator	1	X
		COILS AND TRANSFORMERS		
L1,2	RLF5F56-0	MW & SW Antenna Coil (Model R-238R)	1	Ⓝ X
L1,2	RLF5F58-0	MW & SW Antenna Coil (Model R-238W)	1	Ⓝ X
L3	RL02B86-M	MW Oscillator Coil	1	X
L4	RL03B61-M	SW Oscillator Coil (Model R-238R)	1	Ⓝ X
L4	RL03B66-M	SW Oscillator Coil (Model R-238W)	1	X
L5	RLQY75S-5	Choke Coil (Model R-238R)	1	Y
T1	RLI2B124-M	1st IF Transformer	1	X
T2	RLI2B250-M	2nd IF Transformer	1	X
T3	RLI2B450-M	3rd IF Transformer	1	X
T4	RLT3F33-W	Input Transformer, P=1.4kΩ: S=1.4kΩ	1	X
T5	RLT2F32-W	Output Transformer, P=60Ω: S=8Ω	1	X
		RESISTORS		
R29	ERD14VJ2R2	2.2Ω, ¼Watt, ±5%, Carbon	1	Y
R26	ERD14VJ101	100Ω, ¼Watt, ±5%, Carbon	1	Y
R30	ERD14VJ471	470Ω, ¼Watt, ±5%, Carbon ··· R-238R	1	Y
R5	ERD14VJ122	1.2kΩ, ¼Watt, ±5%, Carbon ··· R-238R	1	Y
R5	ERD14VJ821	820Ω, ¼Watt, ±5%, Carbon ··· R-238W	1	Y
R1	ERD14VJ564	560kΩ, ¼Watt, ±5%, Carbon	1	Y
R24	ERD14VJ182	1.8kΩ, ¼Watt, ±5%, Carbon	1	Y
R12,22	ERD14VJ103	10kΩ, ¼Watt, ±5%, Carbon	2	Y
R15	ERD14VJ273	27kΩ, ¼Watt, ±5%, Carbon	1	Y
R13,16	ERD14TJ823	82kΩ, ¼Watt, ±5%, Carbon	2	Y
R7	ERD14TJ561	560Ω, ¼Watt, ±5%, Carbon	1	Y
		VARIABLE RESISTOR		
R14	EVL53B851D14	10kΩ (D), Volume Control	1	X
		CAPACITORS		
C8	ECCD05050CC	5PF, 50WV, ±0.25μF, Ceramic	1	Z
C12	ECKE05472MY	0.0047μF, 50WV, ±20%, Ceramic	1	Z
C10,21	ECKE05103MY	0.01μF, 50WV, ±20%, Ceramic	2	Z
C19,20,27,34	ECKE05223P	0.022μF, 50WV, $\pm^{100}_{0}$%, Ceramic	4	Z
C7	ECMS05101K-H	100PF, 50WV, ±10%, Mica	1	Z
C14	ECMS05180K-H	18PF, 50WV, ±10%, Mica	1	Z
C16	ECQS1361JZ	360PF, 100WV, ±10%, Styrol	1	Z
C11	ECQS05152JZ-T	1500PF, 50WV, ±10%, Styrol	1	Z
C17	ECQS05182KZ-T	1800PF, 50WV, ±10%, Styrol ··· R-238W	1	Z
C17	ECQS05272KZ-T	2700PF, 50WV, ±10%, Styrol ··· R-238R	1	Z
C30,31	ECQG05472MZ-N	0.0047μF, 50WV, ±20%, Polyester	2	Z
C32,35	ECQG05682MZ-N	0.0068μF, 50WV, ±20%, Polyester	2	Z
C22	ECAG16ER1-Y	0.1μF, 16WV, Electrolytic	1	Y
C25	ECAG16ER22-Y	0.22μF, 16WV, Electrolytic	1	Y
C28,33,36,37	ECEA6V33	33μF, 6.3WV, Electrolytic	4	Y
C29	ECEA6V470	470μF, 6.3WV, Electrolytic	1	Y
C13	ECEA25V4R7	4.7μF, 25WV, Electrolytic	1	Y
C23	ECEA50V1	1μF, 50WV, Electrolytic	1	Y
C24	ECEA6V470	470μF, 6.3WV, Electrolytic ··· R-238R	1	Y
C24	ECEA6V1000	1000μF, 6.3WV, Electrolytic ··· R-238W	1	Y
		VARIABLE CAPACITOR		
C1,2	PVC2K20TM	Tuning Gang, W/Trimmer (C3,4,5,6)	1	X
		COMPONENT COMBINATION		
M1	EXAF203Z471R	0.01μF×2, 470Ω	1	Y
		SWITCHES		
S1~6	RSS70A	Band Selector Switch	1	Ⓝ X
S8	RSS43-1	Tone Switch	1	X
		SPEAKER		
SP	EAS8P70SC	8cm (3") PM Dynamic Speaker, Imp. 8Ω	1	Ⓝ X
		CHASSIS		
	XAM21T50	Light, Dial & Tuning Indicator	2	X
CH1	RJC102-1	Terminal, Battery ⊕ Side	3	Z
CH2	RJC502A	Spring, Battery ⊖ Side	3	Ⓝ Z
CH3	RJJ19A	Jack, Earphone	1	Y
CH4	RJJ49A	Jack, EXT. Power	1	Y
	RJT377A	Terminal, Light Button	1	Ⓝ Y
	RJT305A	Terminal, Light Button	1	Y
CH5	RJT378A	Terminal, Conection	6	Ⓝ Y
CH6	RMS30	Bracket, Speaker M'tg	1	Z
CH7	RMY54-1	Heat Sink, Transistor (TR8 & TR9)	1	Z
CH8	RBT35B	Knob, Volume	1	X
	RDZ05A	Cord, Dial, 100cm (39⅜")	1	Z
	RDD481A	Drum, Dial	1	Ⓝ X
	RDS309	Spring, Dial	2	Y
CH9	RDT9028A	Shaft, Tuning	1	Ⓝ X
		ACCESSORIES		
	RQK34A	Shoulder Case (Complete)	1	Ⓝ X
A1	EAE10M01AA	Earphone, Magnetic, 8Ω	1	X
A2	RQC7101	Belt	1	Y
A3	RJP39	Plug, Antenna	1	Y
		PACKING		
P1	RPF5A	Polyethylene Cover	1	Z
P2	RPP30A	Polyethylene Cover	1	Z
	RPK9133A	Gift Box (Complete)	1	Ⓝ Y
P3	RPK176A	Gift Box } Order RPK9133A	(1)	Ⓝ Z
P4	RPN945A	Pad (R) } Order RPK9133A	(1)	Ⓝ Z
P5	RPN946A	Pad (L) } Order RPK9133A	(1)	Ⓝ Z
P6	RPN957A	Pad	1	Ⓝ Z
P7	RQX5361A	Instruction Book	1	Ⓝ Y

CABINET

Ref.No.	Part No.			Description	Per Set (Pcs.)	Remarks
CA1	RKM168A			Cabinet Only	1	Ⓝ Z
CA2	XEARBV118HBS			Whip Antenna	1	Y
CA3	RGB80A			Badge, National & NATIONAL PANASONIC Mark	1	Z
CA4	RGC31A			Ornament	1	Ⓝ Y
CA5	RDP76A			Pointer, Dial	1	Ⓝ X
		RYMR238WX		Cabinet Front (Complete) ··· Model R-238W	1	Ⓝ X
		RYMR238RX		Cabinet Front (Complete) ··· Model R-238R	1	Ⓝ X
CA6	RGK256A			Indicating Plate	1	Ⓝ Y
CA7	RGL16A			Panel, Tuning Indicator Light	1	Ⓝ Y
CA8	RGM69A			Metal Grille	1	Ⓝ Y
CA9	RKD185A			Scale, Dial Panel ··· Model R-238R	1	Ⓝ X
CA9	RKD185B			Scale, Dial Panel ··· Model R-238W	1	Ⓝ X
CA10	RBC3-1			Button, Light	1	Y
			RYAR238WX	Cabinet (Complete) ··· Model R-238W	1	Ⓝ X
			RYAR238RX	Cabinet (Complete) ··· Model R-238R	1	Ⓝ X
CA11	RKF115A			Cover Only, Cabinet Back	1	Ⓝ Y
CA12	RKK52A			Cover, Battery Compartment	1	Ⓝ Z
		RYFR238WX		Cover (Complete), Cabinet Back ··· Model R-238W	1	Ⓝ Y
		RYER238RX		Cover (Complete), Cabinet Back ··· Model R-238R	1	Ⓝ Y
CA13	RGT276A			Name, Plate ··· Model R-238W Only	1	Ⓝ Y
CA14	RBD38A			Knob, Tone Switch	1	Ⓝ X
CA15	RBN16A			Knob, Tuning	1	X