

Service Manual

FM-MW-SW1~6
8-Band Receiver

Radio
RF-B10
(Black)
(Silver)



This is the Service Manual for the following areas.

☒ ...For Asia, Latin America, Middle East and Africa areas.

☐ ...For Australia.

☒ ...For Saudi Arabia.

■ SPECIFICATIONS

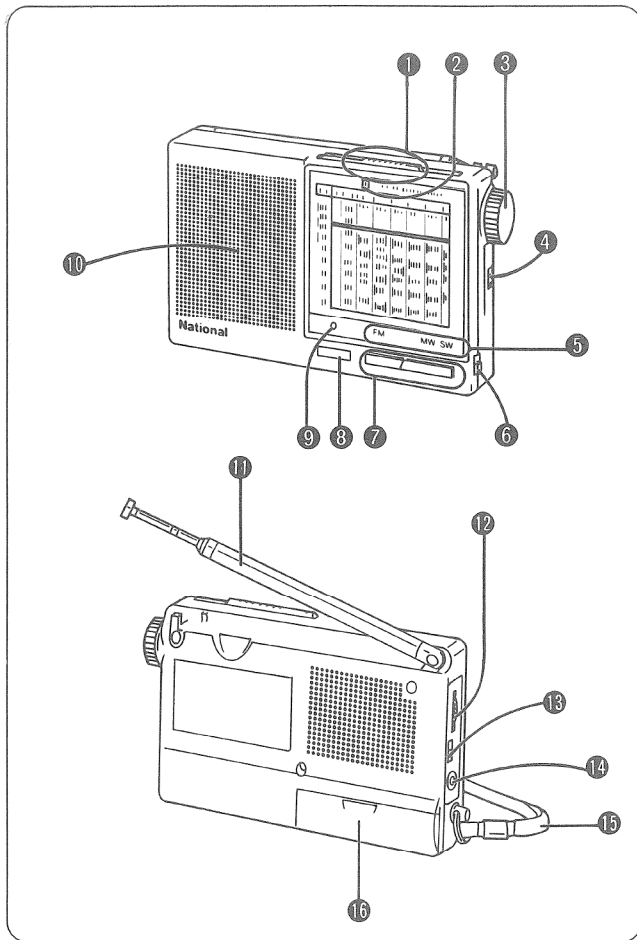
Frequency Range:	FM; 88~108 MHz	Power Source:	DC 3 V (Two UM-3, "AA" size Penlight Batteries)
	MW; 530~1605 kHz (566~187 m)		200 mW...RMS (Max.)
	SW1; 5.95~6.2 MHz (50.4~48.3 m)		Power Output:
	SW2; 7.1~7.3 MHz (42.2~41 m)		Speaker:
	SW3; 9.5~9.9 MHz (31.5~30.3 m)		Output:
	SW4; 11.65~12.05 MHz (25.8~24.9 m)		Earphone; 8Ω, Ø3.5
Intermediate Frequency:	SW5; 15.1~15.6 MHz (19.8~19.2 m)	Dimensions:	110(W)×70(H)×23(D) mm
	SW6; 17.55~17.9 MHz (17.1~16.7 m)		Weight:
	FM; 10.7 MHz		145 g without batteries
	AM (MW, SW); 450 kHz		
	Sensitivity:		
	FM; 3 μV(−3 dB Limit Sens)		
Sensitivity:	MW; 100 μV/m/50 mW output		
	SW1; 4 μV/50 mW output		
	SW2; 4 μV/50 mW output		
	SW3; 4 μV/50 mW output		
	SW4; 4 μV/50 mW output		
	SW5; 4 μV/50 mW output		
	SW6; 4 μV/50 mW output		

Design and specifications are subject to change without notice.



Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS



- ① MW-SW Band Selector (MW-SW BAND SELECTOR)
- ② MW-SW Band Indicators (MW-SW BAND INDICATOR)
- ③ Tuning Control (TUNE)
- ④ DX-LOCAL Sensitivity Selector (SENS)
- ⑤ FM/MW-SW Band Indicators (FM/MW-SW)
- ⑥ Hold Switch (HOLD)
- ⑦ FM/MW-SW Band Select Buttons
 - These buttons also have the function as a power on button.
- ⑧ Power Off Button (OFF POWER)
- ⑨ Tuning Indicator (TUNING)
- ⑩ Speaker/5 cm, 4Ω
- ⑪ Telescopic Antenna
- ⑫ Volume Control (VOLUME)
- ⑬ Tone Switch (TONE)
- ⑭ Earphone Jack (C) / 8Ω, Ø3.5
- ⑮ Carrying Strap
- ⑯ Battery Compartment

■ Hold Switch

- If you slide the switch to the direction of the arrow after the set has been turned off by pressing the Power Off Button, the set will not be turned on even if the Band Select Buttons are pressed by mistake. This prevents the batteries from being wasted. It is useful when carrying the set. Especially before putting the set into the carrying case, be sure to slide the switch to the direction of the arrow.
- When listening to the radio, if you slide the switch to the direction of the arrow, the other Band Select Buttons and the Power Off Button do not operate. So you can avoid changing the received band or turning the set off by mistake.

DISASSEMBLY INSTRUCTIONS

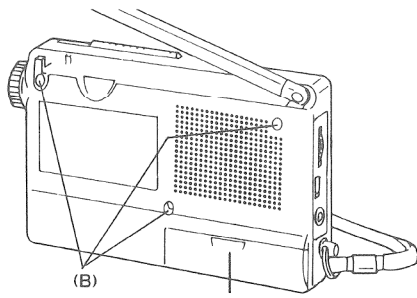


Fig. 1

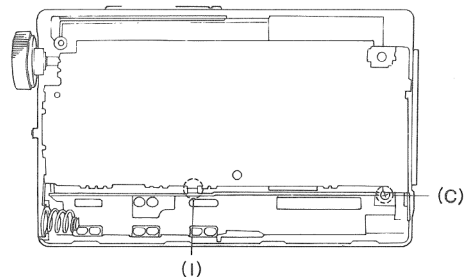


Fig. 2

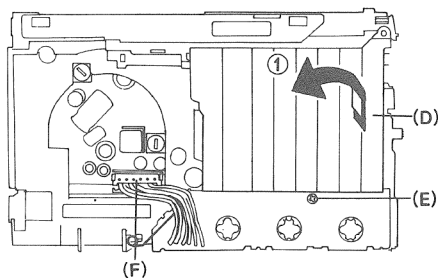
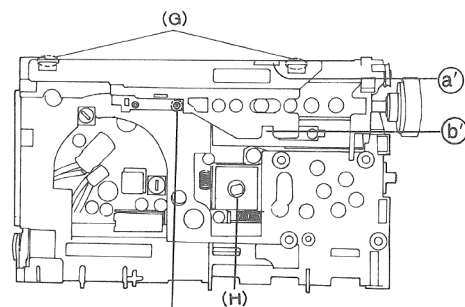


Fig. 3



* (Note)

Fig. 4

MEASUREMENTS AND ADJUSTMENT

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT			
1. Set volume control to maximum.	6. Set sens switch to DX.		
2. Set tone switch to high.	7. Set power source voltage to 3 V DC.		
3. Set band switch to FM, MW, SW.	8. Output of signal generator should be no higher than necessary to obtain an output reading.		
4. Set MW-SW band switch to MW, SW1 ~ SW6.			
5. Set hold switch to OFF.			

■ MW, LW and SW1 ~ 6 ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIOIAL SETTING	INDICATOR (ELECTRONICS VOLT-METER or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
(1)	MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	450 kHz 30% Mod. at 400 Hz	AM-IF ALIGNMENT		
				Point of non-interference. (on/ about 600 kHz)	Output meter across voice coil.	T2 (AM IFT)
				MW-RF ALIGNMENT		
(2)	MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	511 kHz	Tuning capacitor fully closed.	Output meter across voice coil.	L14 (MW OSC Coil) Adjust for maximum output.
(3)	MW	"	1,650 kHz	Tuning capacitor fully open.	"	CT4 (MW OSC Trimmer) Adjust for maximum output. Adjust L4 by moving coil bobbin along ferrite core.
(4)	MW	"	550 kHz	Tune to signal.	"	(* 1) L4 (MW ANT Coil) Adjust for maximum output. Repeat steps (2)~(5).
(5)	MW	"	1,500 kHz	"	"	CT1 (MW ANT Trimmer)

(*1) Cement antenna bobbin with wax after completing alignment.

■ SW1-RF ALIGNMENT

(6) SW1	Connect to test point ∇ through ceramic capacitor (5 pF). Negative side to test point ∇ .	6.086 MHz	6.086 MHz (Refer to Fig. 4)	Output meter across voice coil	L15 (SW1 OSC Coil) L5 (SW1 ANT Coil)	Adjust for maximum output.
SW2-RF ALIGNMENT						
(7) SW2	"	7.212 MHz	7.212 MHz (Refer to Fig. 4)	Output meter across voice coil	L16 (SW2 OSC Coil) L6 (SW2 ANT Coil)	Adjust for maximum output.
SW3-RF ALIGNMENT						
(8) SW3	"	9.72 MHz	9.72 MHz (Refer to Fig. 4)	Output meter across voice coil	L17 (SW3 OSC Coil) L7 (SW3 ANT Coil)	Adjust for maximum output.
SW4-RF ALIGNMENT						
(9) SW4	Connect to test point ∇ through ceramic capacitor (5 pF). Negative side to test point ∇ .	11.872 MHz	11.872 MHz (Refer to Fig. 4)	Output meter across voice coil	L18 (SW4 OSC Coil) L8 (SW4 ANT Coil)	Adjust for maximum output.
SW5-RF ALIGNMENT						
(10) SW5	"	15.375 MHz	15.375 MHz (Refer to Fig. 4)	Output meter across voice coil	L19 (SW5 OSC Coil) L9 (SW5 ANT Coil)	Adjust for maximum output.
SW6-RF ALIGNMENT						
(11) SW6	"	17.755 MHz	17.755 MHz (Refer to Fig. 4)	Output meter across voice coil	L20 (SW6 OSC Coil) L10 (SW6 ANT Coil)	Adjust for maximum output.

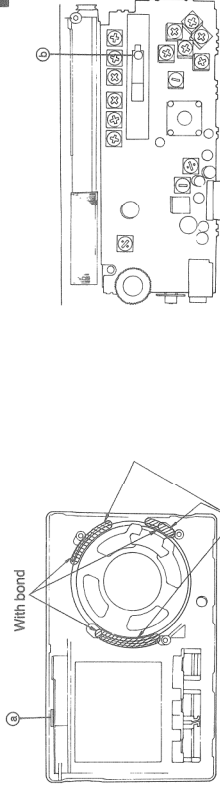


Fig. 5

Ref. No.	Shown in Fig.---	To remove---	Remove---
1	1	Rear Cabinet	Battery compartment cover (A)×1
2	1		Screw (2×8) mm (B)×3
3	2	Front Cabinet (*1)	Screw (2×5) mm (C)×1
4	3	Dial Plate (*2)	Remove the dial point and then remove the dial plate in the direction of arrow (D) (D)×1
5	3	Switch P.B.	Screw (2×5) mm (E)×1
6	3		Socket (F)×1
7	4	Indication Plate (*3)	Rib (G)×2 (* There is a steel ball and spring underneath the indication plate, so be sure not to lose them when removing the plate.)
8	4	Dial Drum	Screw (1.7×2) mm (H)×1 (Refer to the dial threading when attaching the dial rope.)
9	2	Main P.B.	Rib (I)×1
10	5	Speaker (*4)	Use the cutter knife to remove the bond from around the speaker and the welds from the front cabinet. (J)×3

(*1) When attaching the front cabinet, make sure part (A) of the band select knob and boss (G) of the switch (S2) mesh. (See Figs. 4 and 5.)

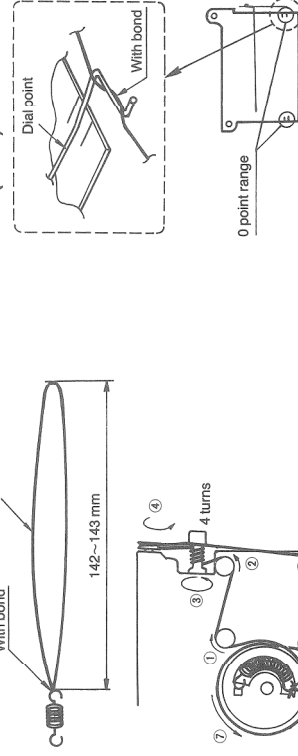
(*2) The dial plate is attached with double-sided tape which can be used repeatedly. However, if double-sided tape should not adhere properly, replace it.

(*3) When attaching the indication plate, mesh boss (G) of the band select switch with part (E) of the indication plate. (See Figs. 4 and 6.)

(*4) When attaching the speaker, weld parts of the edge on the front cabinet and also apply bond. (See Fig. 5.)

DIAL THREADING

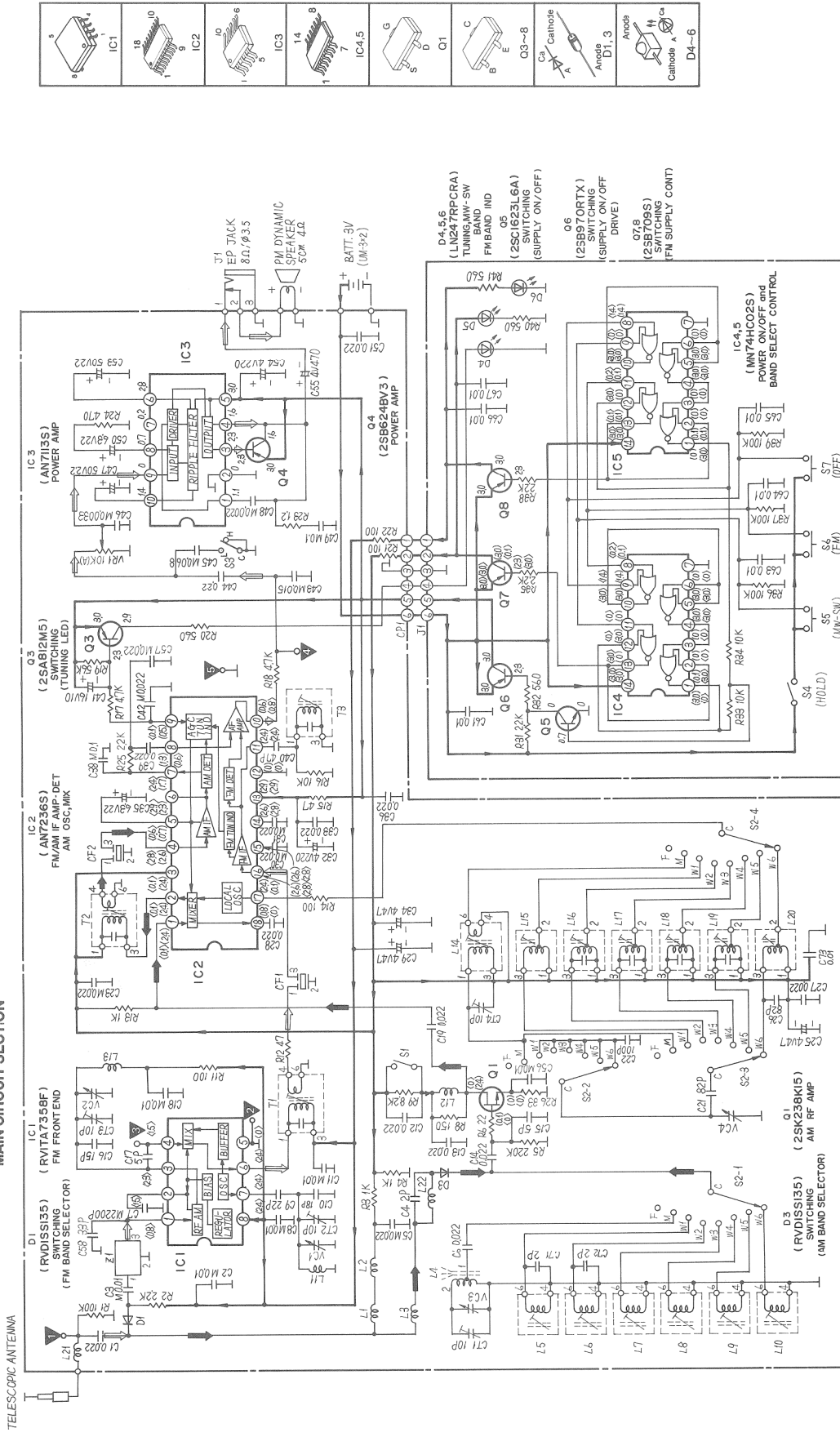
■ 0 (ZERO) POINT ADJUSTMENT



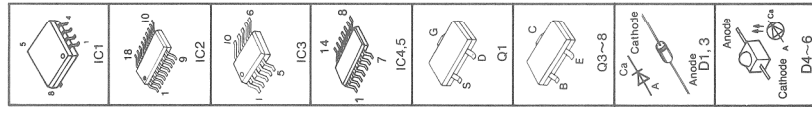
Steps:

1. Attach the dial point above the 0 point, move it to the 0 point and lock it in place with bond.
2. Confirm that the dial point enters the 0 point range.

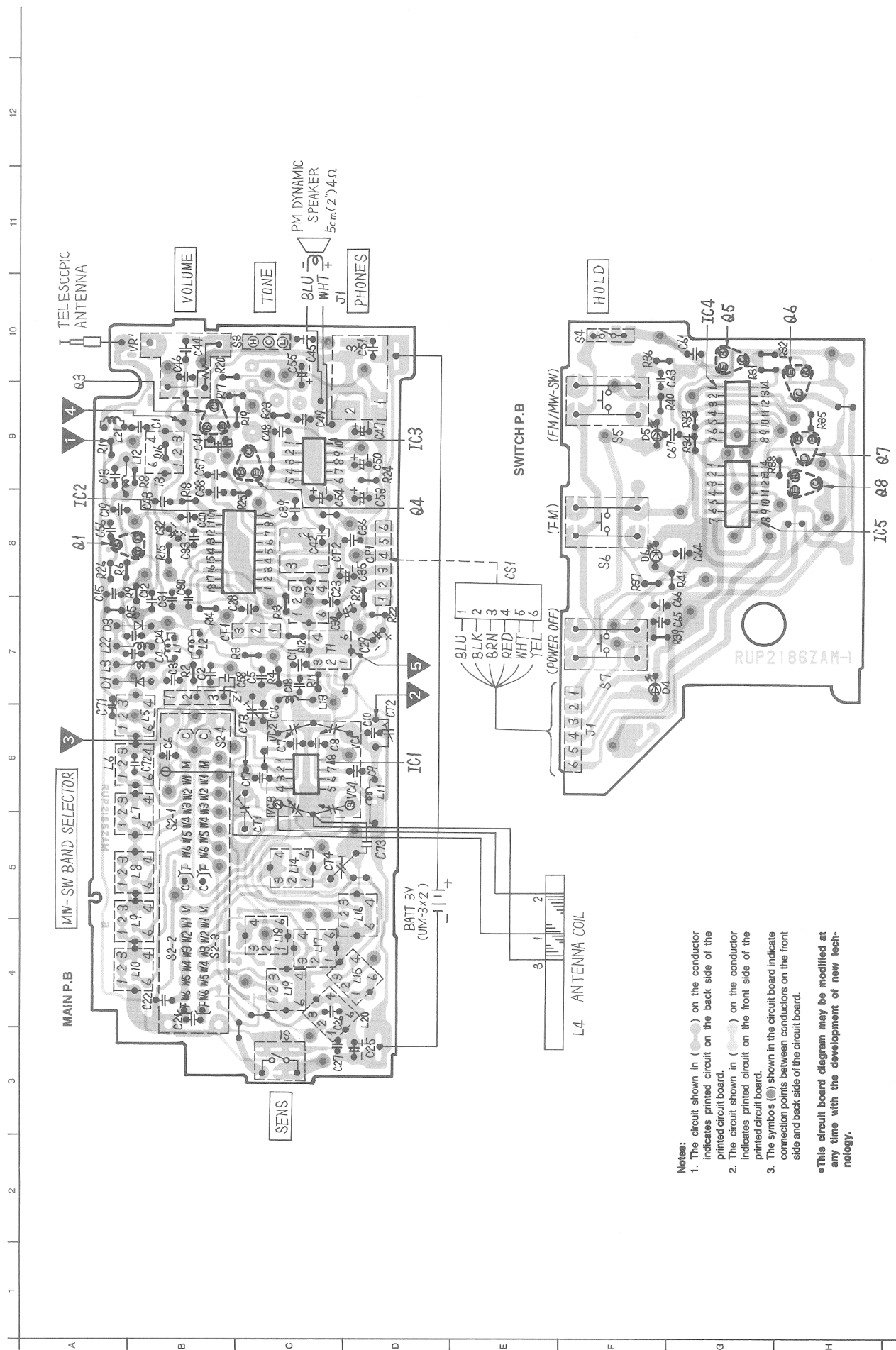
SCHEMATIC DIAGRAM



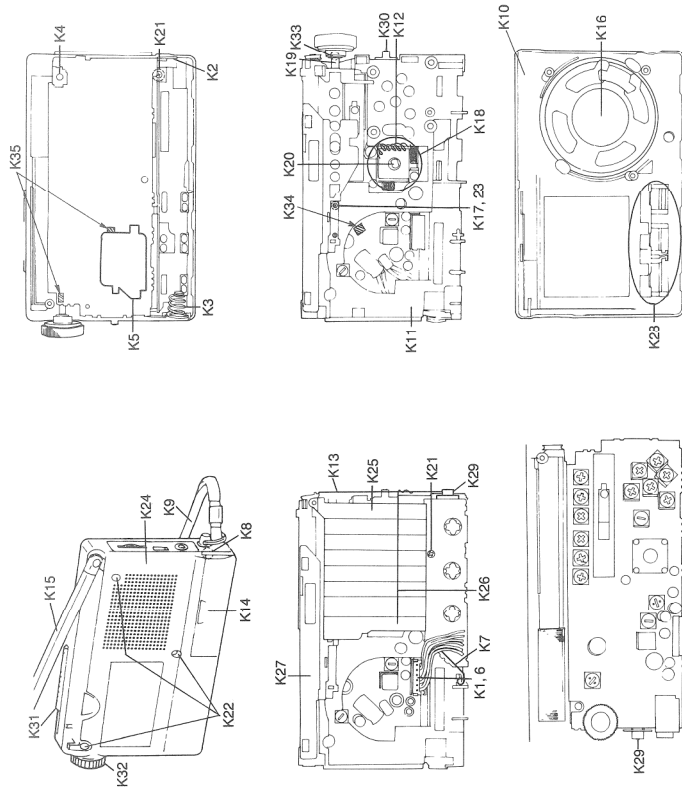
(2SC2412) ← Supply parts number



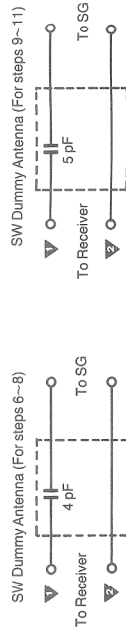
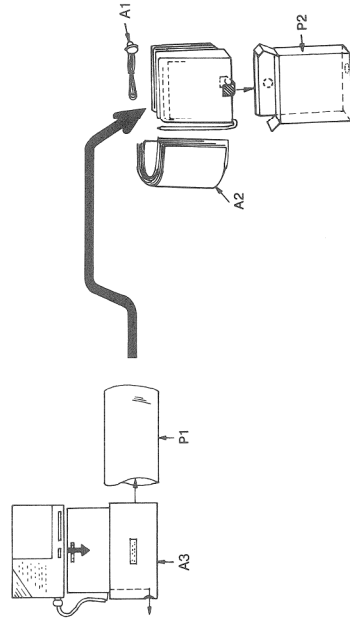
CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



CABINET PARTS LOCATION



ACCESSORY AND PACKING MATERIALS



FM ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTIONS	FREQUENCY	RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
FM-IF ALIGNMENT						
FM	Connect to test point of non-interference (on/ side to test point)	10.7 MHz (SWP.)		Connect vert. ant. side to test point	T1 (FM 1st IFT)	Adjust for maximum amplitude (Refer to fig. 2.)
FM				Negative side to test point	T3 (FM 2nd IFT)	Adjust for maximum amplitude (Refer to fig. 3.)
FM-RF ALIGNMENT						
FM	Variable capacitor fully closed.	86.2 MHz		Output meter across voice coil.	L11 (FM OSC Coil)	(+2) Adjust for maximum output.
FM	Connect to test point through FM dummy antenna. Negative side to test point	109.2 MHz		Variable capacitor fully open.	CT2 (FM OSC Trimmer)	"
FM		90 MHz		Tune to signal.	L13 (FM ANT Coil)	"
FM		108 MHz		Tune to signal.	CT3 (FM ANT Trimmer)	(+2) Adjust for maximum output. Repeat steps (14)-(17).

(+2) Three output responses will be present; proper tuning is the center frequency.

ALIGNMENT POINTS

Please refer to Circuit Board and Wiring Connection Diagram which is located test point.

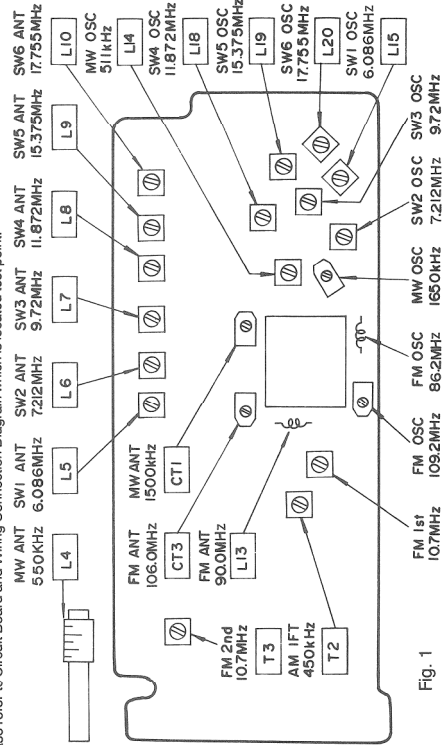


Fig. 1

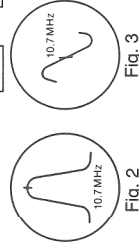


Fig. 2

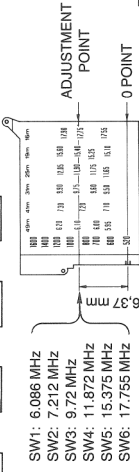


Fig. 3

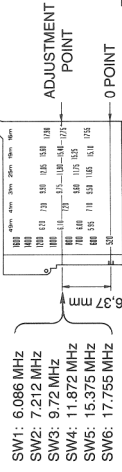


Fig. 4

■ REPLACEMENT PARTS LIST

NOTES:

- The letter in the square bracket after the part name indicates the color of the product.
[K]...Black Type, [S]...Silver Type
- The letter in circles in the Ref. No. column indicates the color of the part.
Ⓚ...Black, Ⓢ...Silver, Ⓜ...Gray, Ⓟ...Blue

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
INTEGRATED CIRCUITS				L17	RL03A15-T		COIL, SW3 OSC
IC1	RV1TA7358F		IC	L18	RL03A16-T		COIL, SW4 OSC
IC2	AN7236S		IC	L19	RL03A17-T		COIL, SW5 OSC
IC3	AN7113S		IC	L20	RL03A10-T		COIL, SW6 OSC
IC4, IC5	MN74HC02S		IC	L21	ELJFBR33MT-D		COIL, CHOKE
TRANSISTORS				L22	RLQZB1R0K		COIL, CHOKE
Q1	2SK238K15		TRANSISTOR	TRANSFORMERS			
Q3	2SA812M5		TRANSISTOR	T1	RL14A4		I.F. TRANSFORMER, 1ST
Q4	2SB624BV3		TRANSISTOR	T2	RL12A8		I.F. TRANSFORMER, AM
Q5	2SC1623L6A		TRANSISTOR	T3	RL14A4		I.F. TRANSFORMER, 2ND
Q6	2SB970RTX		TRANSISTOR	VARIABLE CAPACITORS			
Q7, Q8	2SB709S		TRANSISTOR	VC1	RCV4LC9Q1Q-M		VARIABLE CAPACITOR, VC2-4
DIODES				TRIMMER CAPACITORS			
D1, D3	RVD1SS135		DIODE	CT1	RCV10AF1		TRIMMER CAPACITOR
D4, D5	LN247RPCRA		DIODE	CT2, CT3	RCVCTZ3510		TRIMMER CAPACITOR
D6	LN247RPCRA		DIODE	CT4	RCV10AF1		TRIMMER CAPACITOR
COILS				VARIABLE RESISTORS			
L1, L2	RLQZP101K		COIL, CHOKE	VR1	EVLF1AA00A14		VR/WITH KNOB
L3	RLQZP3R3K		COIL, CHOKE	FILTERS			
L4	RLF2Y51-0		BAR ANTENNA, AM ANT	CF1	RVF107WAZ		CERAMIC FILTER, 10.7MHZ
L5	RLA3A22-T		COIL, SW1 ANT	CF2	RVFCFUM450H		CERAMIC FILTER, 450KHZ
L6	RLA3A23-T		COIL, SW2 ANT	COMPONENTS COMBINATION			
L7	RLA3A24-T		COIL, SW3 ANT	Z1	RXABPW8		COMPONENT COMBINATION
L8	RLA3A25-T		COIL, SW4 ANT	SWITCHES			
L9	RLA3A26-T		COIL, SW5 ANT	S1	RSS2B40Z		SLIDE SWITCH, DX/LOCAL
L10	RLA3A27-T		COIL, SW6 ANT	S2	RSS7D02ZA-H		SLIDE SWITCH, MW-SW
L11	RL04Y88		COIL, FM OSC	S3, S4	RSS2A38Z		SWITCH, TONE/HOLD
L12	RLQZP221KL-Y		COIL, CHOKE	S5, S6	RSH1A48Y		PUSH SWITCH, FM/MW, FM
L13	RL04Y136-0		COIL, FM ANT	S7	RSH1A48Y		PUSH SWITCH, POWER OFF
L14	RL02A3		COIL, AM OSC	JACKS			
L15	RL03A13-T		COIL, SW1 OSC	J1	RJJD3M3Z		JACK, EARPHONE
L16	RL03A14-T		COIL, SW2 OSC				

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
CABINET PARTS				K21	XTNR2+5CFZ		TAPPING SCREW
K1	RJP6G20Z		PLUG, 6P(CP 1)	K22	XTNR2+8CFN		TAPPING SCREW (S)
K2	RKC30012ZA		BATTERY TERMINAL < + >	K22	XTNR2+8CFZ		TAPPING SCREW (K)
K3	RJC70016ZA		BATTERY TERMINAL < - >	K23	RHM156Z		STEEL BALL
K4	RJT1077ZA		TERMINAL, ANTENNA	K24	Ⓚ KF871YA		REAR CABINET (K)
K5	RMC1108ZA		SHIELD PLATE	K24	Ⓢ KF871YA7		REAR CABINET (S)
K6	RJS6L16Z		SOCKET, 6P(CS 1)	K25	Ⓚ RKD717YA		SCALE
K7	RJT1081ZA		TERMINAL, EARTH	K26	Ⓢ RDP331ZA		POINTER, DIAL
K8	XUC2FT		RETAINING RING, φ2	K27	Ⓜ RGK1295ZA		ORNAMENT PLATE, AM
K9	Ⓚ RKH96W		CARRING STRAP (K)	K28	RBC1046ZA		BUTTON, BAND/OFF
K9	Ⓢ RKH96WA-7		CARRING STRAP (S)	K29	Ⓚ RBD286Z1		KNOB, HOLD, TONE
K10	Ⓚ RYMFB10X		FRONT CABINET ASS'Y (K)	K30	Ⓚ RBD374Z		KNOB, DX-LOCAL
K10	Ⓢ RYMFB10X8		FRONT CABINET ASS'Y (S)	K31	Ⓚ RBD443ZA		KNOB, MW-SW (K)
K11	Ⓚ RZAFB10J		CHASSIS ASS'Y (K)	K31	Ⓢ RBD443ZA1		KNOB, MW-SW (S)
K11	Ⓢ RZAFB10J1		CHASSIS ASS'Y (S)	K32	Ⓚ RBN756Z		KNOB, TUNING
K12	RDS2052Z		COIL SPRING, DIAL DRUM	K33	XUC12FT		RETAINING RING, φ1.2
K13	RDZ03Y		DIAL CORD	K34	RHG1171ZA		RUBBER, CUSHION-A
K14	Ⓚ RKC320ZA		BATTERY COVER (K)	K35	RHG1172ZA		RUBBER, CUSHION-B
K14	Ⓢ RKC320ZA7		BATTERY COVER (S)	ACCESSORIES			
K15	Ⓚ XEARK85HA-Y		TELESCOPIC ANTENNA (K)	A1	XEH1A1P		EARPHONE
K15	Ⓢ XEARK85HB-Y		TELESCOPIC ANTENNA (S)	A2	RQX4910ZA		OPERATING INSTRUCTIONS
K16	RASSP12ZA-F		SPEAKER	A3	Ⓚ RQD243YA		CARRYING CASE
K17	RUD78ZA		SPRING, IND. PLATE	PACKINGS			
K18	RDD212ZA		DRUM, DIAL	P1	RPH548ZA		POLYETHYLENE COVER
K19	RDX372Y		ROLLER, TUNING SHAFT	P2	RPK2408ZA		GIFT BOX
K20	XSHR17+2FZ		SCREW				

RESISTORS & CAPACITORS

Numbering System of Resistor

Example:

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value (100Ω)
ERJ	6G	C	J	2R2
Type	Wattage	Shape	Tolerance	Value (2.2Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage	Value (1000pF)	Tolerance	Peculiarity
ECEA	50	M	R47	
Type	Voltage	Peculiarity	Value (0.47 μF)	

Resistor Type	Wattage	Tolerance
ERD: Carbon Resistor	10 : $\frac{1}{8}$ W	F : $\pm 1\%$
ERC: Solid Resistor	25 : $\frac{1}{4}$ W	G : $\pm 2\%$
ERF: Incombustible Box-Shaped Wire-Wound Resistor	50 : $\frac{1}{2}$ W	J : $\pm 5\%$
	18 : $\frac{1}{8}$ W	K : $\pm 10\%$
	14 : $\frac{1}{8}$ W	H : $\pm 20\%$
	12 : $\frac{1}{2}$ W	
ERG: Metal Oxide-Film Resistor	1 : 1W	
	2 : 2W	
ERM: Wire-Wound Resistor	3 : 3W	
	S1 : $\frac{1}{2}$ W	
ERO: Superstable Metal Film Resistor	S2 : $\frac{1}{4}$ W	
	6G : $\frac{1}{10}$ W	
	8G : $\frac{1}{8}$ W	
ERX: Metal-Film Resistor		
RRJ: Chip Resistor		
ERJ: Chip Resistor		

※ Capacity are in microfarads (μF) unless specified otherwise, P=Pico-farads.

※ Resistance are in ohms (Ω), unless specified otherwise, 1K=1,000Ω, 1M=1,000KΩ

Capacitor Type	Voltage	Tolerance
ECCD: Ceramic Capacitor (Chitacon)	(ECCD, ECKD Type) 1H : 500V DC 2H : 500V DC	K : $\pm 10\%$ M : $\pm 20\%$
ECKD: Ceramic Capacitor (Chitabari)	(ECFD Type) C : 12V DC D : 25V DC	Z : $+80\%$ J : -20%
ECFD: Semiconductor Ceramic Capacitor (ECQ Type)	E : 50V DC	G : $\pm 5\%$ F : $\pm 2\%$
ECE□: Electrolytic Capacitor	05 : 50WV DC 1 : 100WV DC	C : $\pm 1\%$
ECS□: Tantalum Fixed Electrolytic Capacitor	(ECE, ECS Type) 0G : 4V 0J : 6.3V	D : ± 0.25 pF F : ± 1 pF
ECQ□: Polystyrene Film Capacitor	1A : 10V 1C : 16V	
ECQS: Polystyrene Film Capacitor	1E : 25V 1V : 35V	
ECQS: Polypropylene Film Capacitor	1H : 50V 1J : 63V	
ECQV: T.F. Capacitor	2A : 100V	
ECU□: Chip Capacitor		
ECB□: Chip Capacitor		
ECBT: Cylindrical Ceramic Capacitor		

Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
CAPACITORS			C35	ECEA0JKS220		R5	RRJ6GCJ224TE	
C1	RCUV1E223ZF		C36	RCUV1E223MD		R6	RRJ6GCJ220TE	
C2, C3	RCUV1E103MD		C38	ECUV1E104MD		R8	RRJ6GCJ151TE	
C4	RCUV1H020CC		C39	ECUV1H223MD		R9	RRJ6GCJ822	
C5	RCUV1E223MD		C40	RCUV1H470KC		R11	RRJ6GCJ101TE	
C6	RCUV1E223ZF		C41	ECEA1CKS100		R12	RRJ6GCJ470TE	
C7	RCUV1H222MD		C42	RCUV1E223MD		R13	RRJ6GCJ102TE	
C8	RCUV1E103MD		C43	RCUV1E153MD		R14	RRJ6GCJ101TE	
C9	RCUV1H220KC		C44	ECUV1E224ZF		R15	RRJ6GCJ470TE	
C10	RCUV1H180KC		C45	ECUV1E683MD		R16	RRJ6GCJ103TE	
C11	RCUV1E103MD		C46	RCUV1H332MD		R17, R18	RRJ6GCJ472TE	
C12, C13	RCUV1E223ZF		C47	ECEA1HKS2R2		R19	RRJ6GCJ563TE	
C14	RCUV1E223ZF		C48	RCUV1H222MD		R20	RRJGCJ561TE	
C15	RCUV1H050DC		C49	ECUV1E104MD		R21, R22	RRJ6GCJ101TE	
C16	RCUV1H150KC		C50	ECEA0JKS220		R23	RRJ6GCK1R2	
C17	RCUV1H050DC		C51	RCUV1E223ZF		R24	RRJ6GCJ471TE	
C18	RCUV1E103MD		C53	ECEA1HKS2R2		R25	RRJ6GCJ222TE	
C19	RCUV1E223ZF		C54	ECEA0GKS221		R26	RRJ6GCJ330	
C21	RCUV1H820GU		C55	ECEA0GU471		R31	RRJ6GCJ222TE	
C22	RCUV1H101GU		C57	RCUV1E223MD		R32	RRJGCJ561TE	
C23	RCUV1E223MD		C58	RCBS1H3R3KC		R33, R34	RRJ6GCJ103TE	
C25	ECEA0GKS470		C61, C63	RCUV1H103ZF		R35	RRJ6GCJ222TE	
C26	RCUV1H820JS		C64, C65	RCUV1H103ZF		R36, R37	RRJ6GCJ104TE	
C27, C28	RCUV1E223ZF		C66, C67	RCUV1H103ZF		R38	RRJ6GCJ222TE	
C29	ECEA0GKS470		C71	RCUV1H030CC		R39	RRJ6GCJ104TE	
C30, C31	RCUV1E223MD		RESISTORS			R40, R41	RRJGCJ561TE	
C32	ECEA0GKS221		R1	RRJ6GCJ104TE		RJ1, RJ2	RRJ6GCJ000TE	
C33	RCUV1E223MD		R2	RRJ6GCJ222TE		RJ3, RJ4	RRJ6GCJ000TE	
C34	ECEA0GKS470		R3, R4	RRJ6GCJ102TE		RJ5, RJ10	RRJ6GCJ000TE	
						RJ11	RRJ6GCJ000TE	

GAD

H.M.



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