

Service Manual

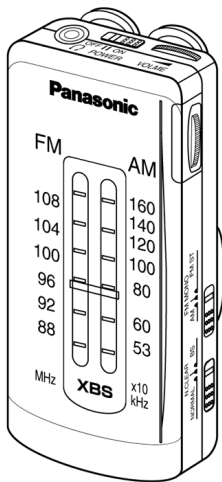
FM-AM 2-Band Receiver

RF-NA06REG

Colour

(S).....Silver Type

(A).....Blue Type



Specification

■ RADIO

Frequency range:

FM; 87.50-108.00 MHz

AM; 520-1610 kHz

Intermediate Frequency:

FM; 10.7 MHz

AM; 459 kHz

Sensitivity:

FM; 11 dB /0.1 mW output (-3dB Limit,Sens)

AM; 46 dB /0.1 mW output (MAX,Sens)

■ General

Power Requirement:

Battery;

DC 1.5 V One (R03/LR03)/AAA battery

Output Jack:

PHONES;32Ω

Power output:

1.8 mW + 1.8mW (RMS...Max.)

■Dimensions (W x H x D):

38.7 mmx 85 mm x 23.1 mm

■Mass:

50g (Without batteries)

■Playing time

(Approximate operating time at 25°C, on flat, stable surface.)

Panasonic alkaline dry cell battery

FM;

About 50 hours

AM;

About 78 hours

Note:

Specifications are subject to change without notice.

Mass and dimensions are approximate.

The play time may be less depending on the operating conditions.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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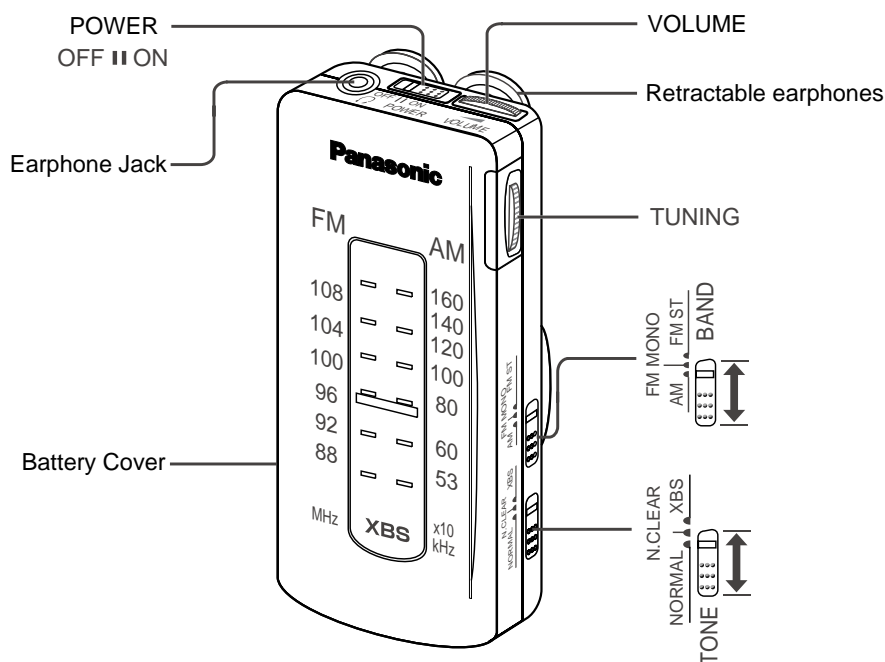
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Panasonic

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1 Location of Controls



2 Operation Checks and Component Replacement Procedures

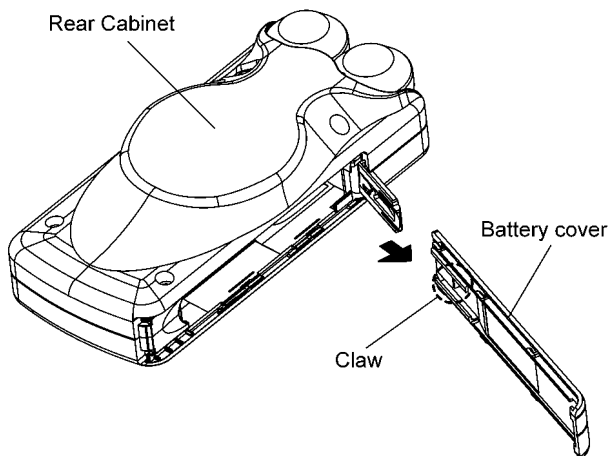
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures special ressembly procedures are described only when required.
3. Select item from the following index when checks or replacement are required.

Contents

1. Checking for the circuit board ass'y.
2. Replacement for the reel unit.
3. Replacement for the VC gear and dial pointer.

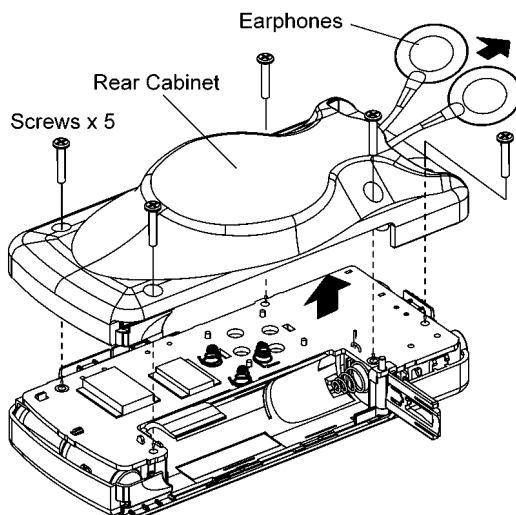
2.1. Removal of the battery cover

1. Open the battery cover.
2. Release the claw.
3. Remove the battery cover in the direction of arrow.



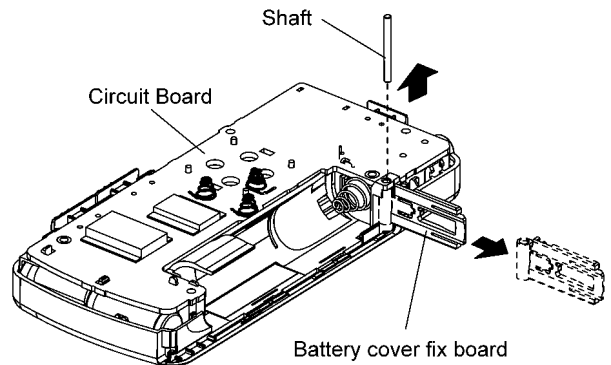
2.2. Removal of the rear cabinet

1. Remove the earphones in the direction of arrow.
2. Remove the screws x 5.
3. Remove the rear cabinet in the direction of arrow.



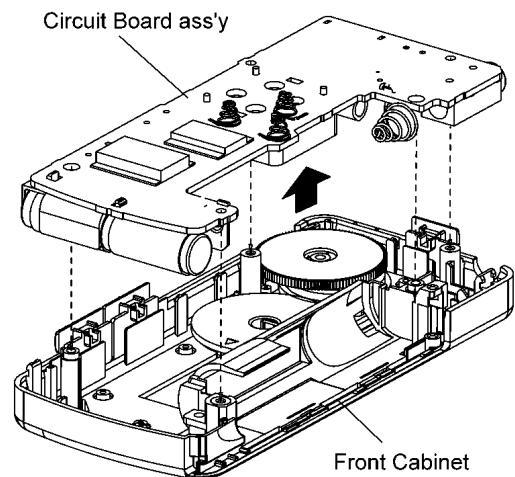
2.3. Removal of the battery cover fix board

1. Remove the shaft in the direction of arrow.
2. Remove the battery cover fix board in the direction of arrow.



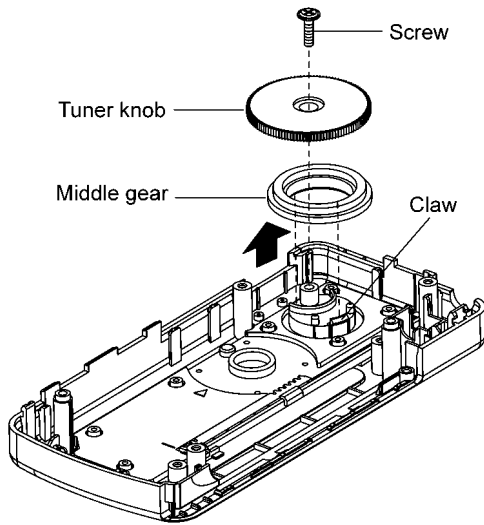
2.4. Removal of the circuit board ass'y

1. Remove the circuit board ass'y in the direction of arrow.



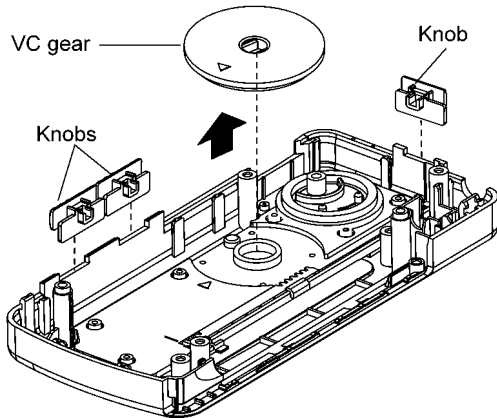
2.5. Remov of the tuner knob and middle gear

- 1.Remove the screw x 1.
- 2.Remove the tuner knob.
- 3.Release the claw and then remove the middle gear.



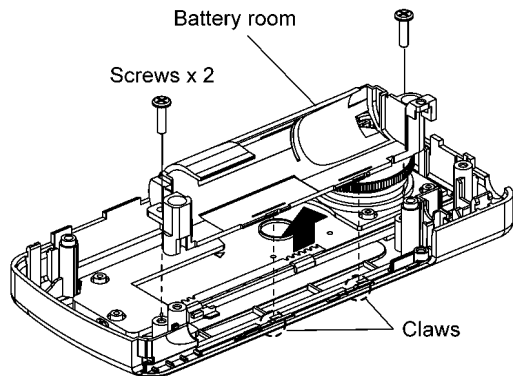
2.6. Removal of the VC gear and knob

- 1.Remove the VC gear.
- 2.Remove the knob x 3.



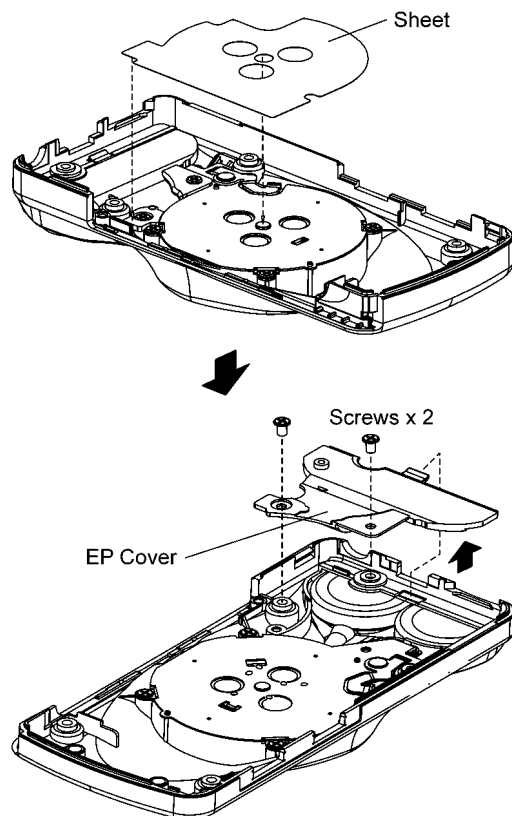
2.7. Remove of the battery room

- 1.Remove the screws x 2.
- 2.Release the claws.
- 3.Remove the battery room in the direction of arrow.



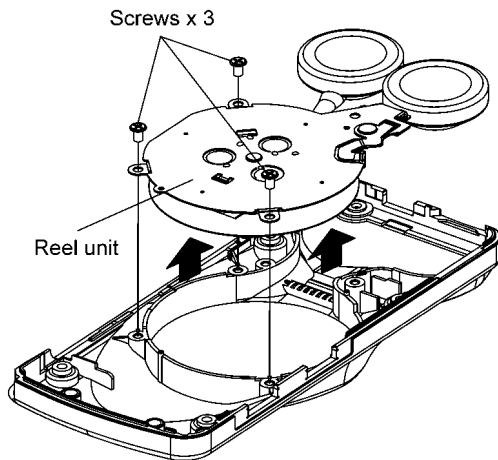
2.8. Removal of the EP cover

- 1.Remove the sheet.
- 2.Release the screws x 2.
- 2.Remove the EP cover in the direction of arrow.



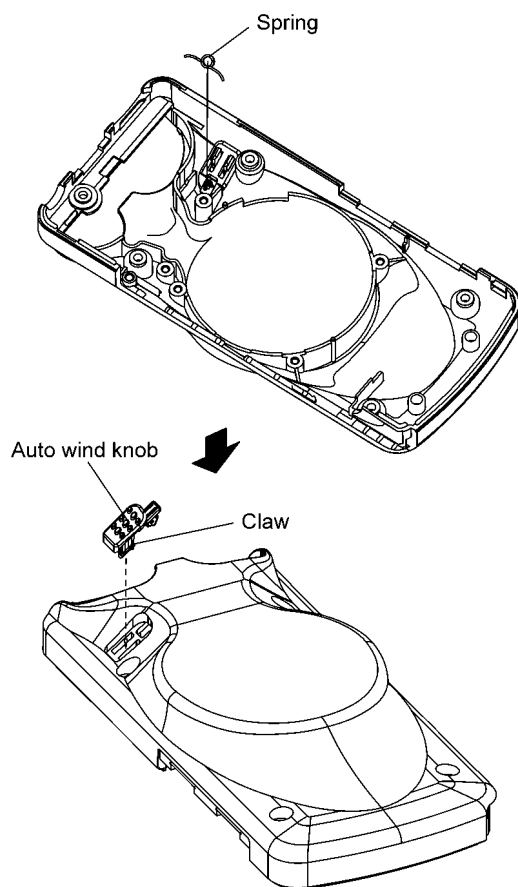
2.9. Removal of the reel unit

- 1.Remove the screws x 3.
- 2.Remove the reel unit in the direction of arrow.



2.10. Removal of the auto wind knob

- 1.Remove the spring.
- 2.Remove the claw and then remove the auto wind knob.



2.11. How to replace the VC gear and dial pointer

- 1.Insert the VC gear to the pointer chassis.
(Align A point to A' point).
- 2.Align dial pointer (B point to B' point). (as Fig.1.)
- 3.Turn variable capacitor counter-clockwise to the end.
- 4.Install the variable capacitor shaft to VC gear center hole.
(as Fig.2)

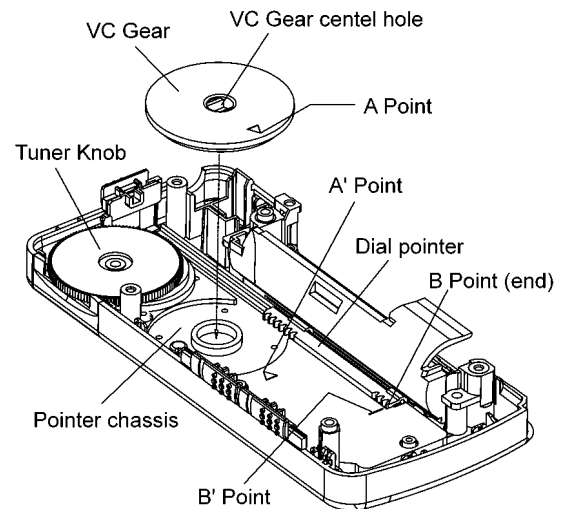


Fig.1

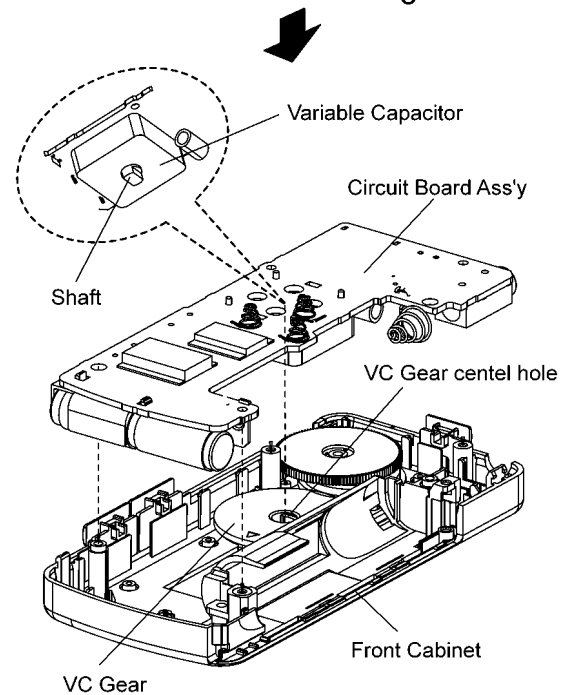
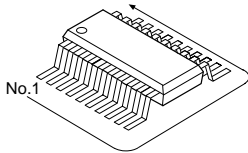
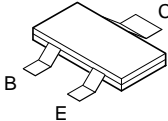
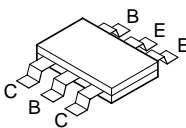
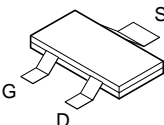


Fig.2.

3 Type Illustration of ICs, Transistors

 <table border="1" data-bbox="154 564 483 645"><tr><td>AN7504SB-E1</td><td>28 PIN</td></tr><tr><td>C1BB00000562</td><td>30 PIN</td></tr></table>	AN7504SB-E1	28 PIN	C1BB00000562	30 PIN	 <p data-bbox="601 553 809 649">B1A3CF00020 2SA1577QT106 B1ADMB000003</p>	 <p data-bbox="928 582 1048 609">UM1XNTN</p>	 <p data-bbox="1216 582 1356 609">2SK242-T4</p>
AN7504SB-E1	28 PIN						
C1BB00000562	30 PIN						

4 Schematic Diagram Notes

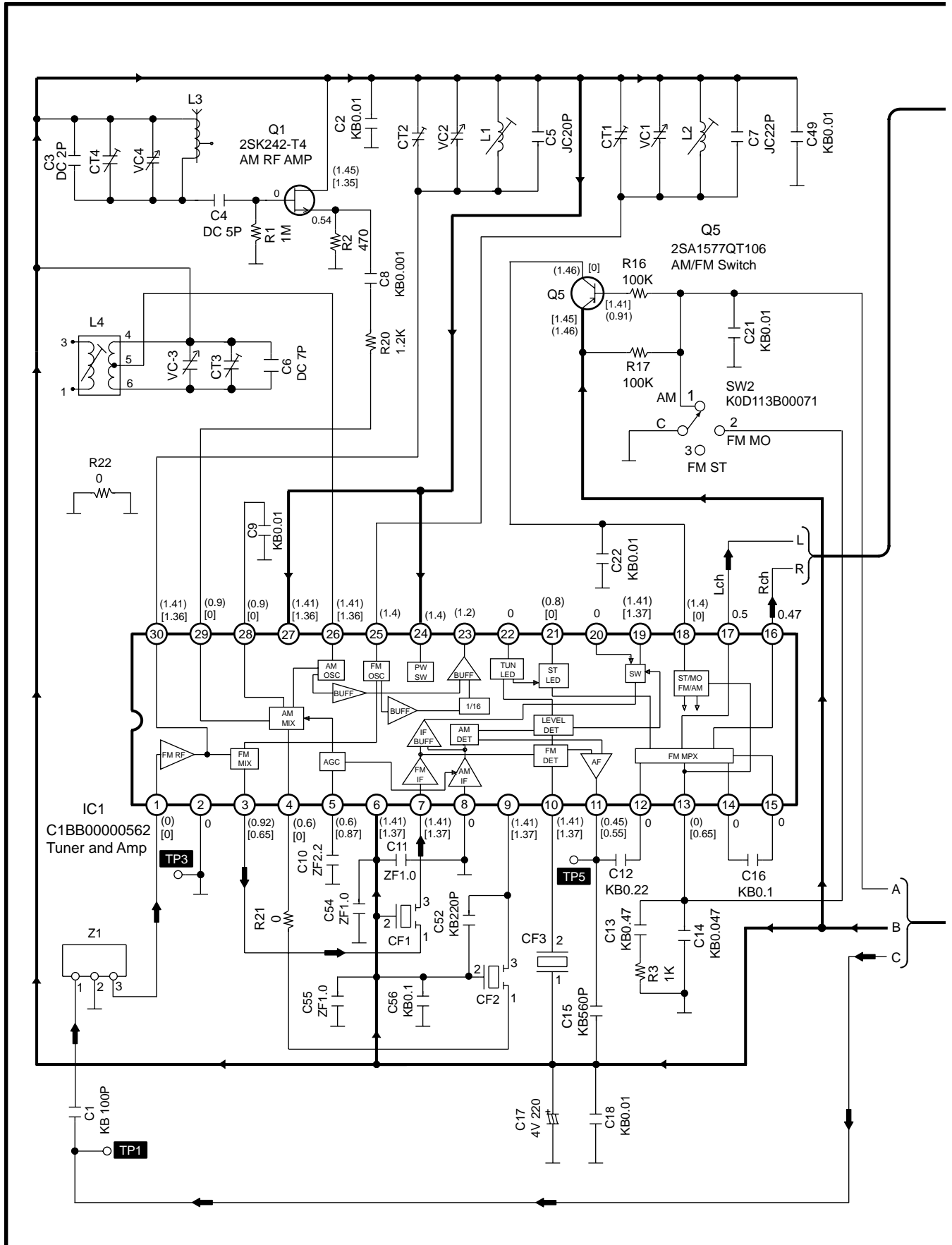
Notes:

- 1.SW1: Power switch in "ON" position.
- 2.SW2: Band switch in "AM" position.
(1...AM, 2...FM MO. 3...FM ST).
- 3.SW3: XBS switch in "XBS" position
(1...XBS, 2...NOR, 3...NC).
- 4.VR1-1: Volume control VR (L-ch).
VR1-2: Volume control VR (R-ch).
- 5.The mark (■) shows test point e.g. ■1 = test point 1.
- 6.DC voltage measurement are taken with electronics.
- 7.Voltmeter from negative terminal of battery.
[]...FM position, ()...AM position,
No mark...FM & AM position.
- 8.Battery current: Volume minimum output (FM).....15 mA.
Volume maximum output (FM).....21.5 mA.
Volume minimum output (AM).....8.6 mA.
Volume maximum output (AM).....18.2 mA
(Radio, 74dB 30% Modulation.)
9. ➡ +B Voltage Line, ➡ FM Signal.

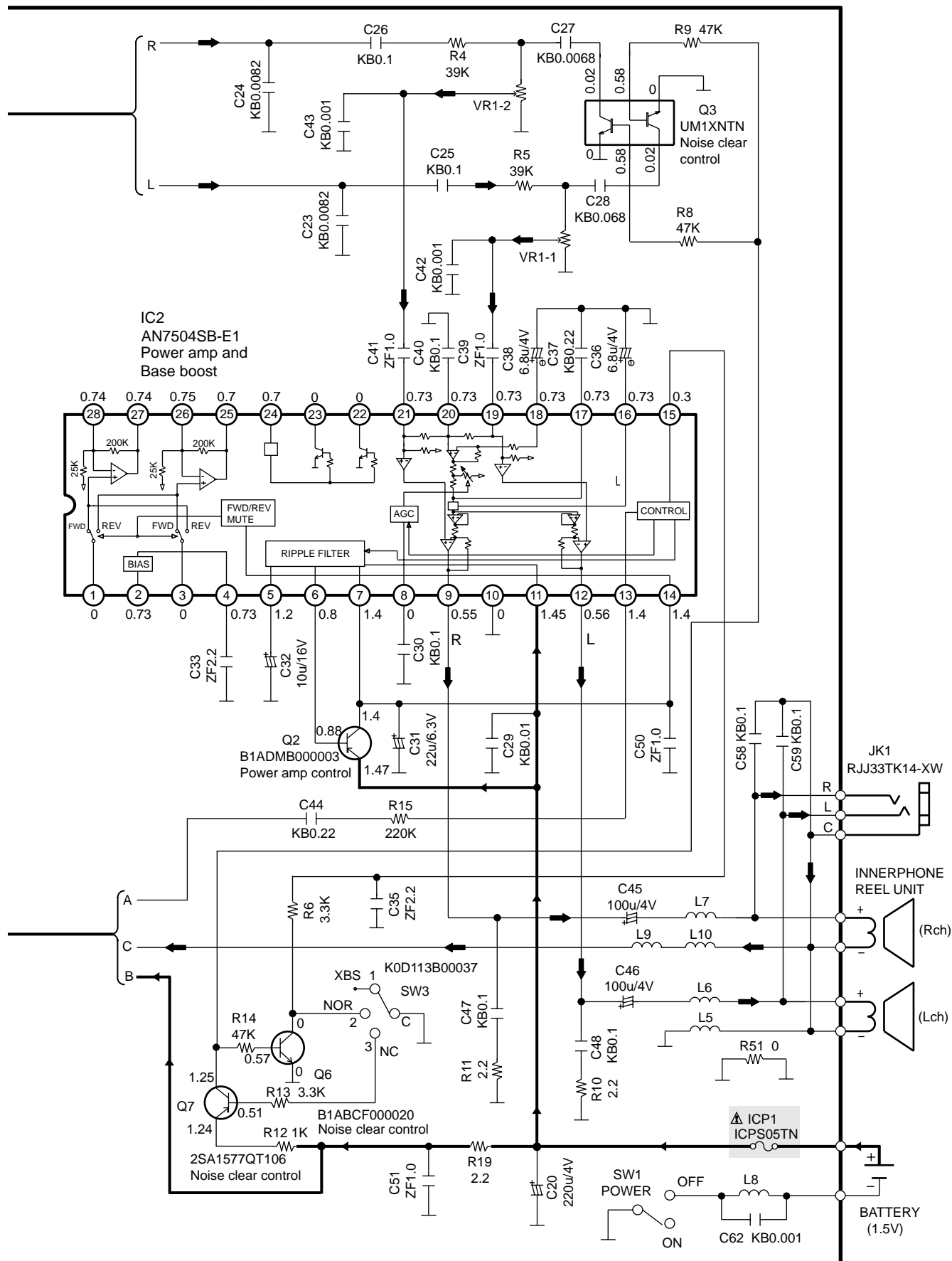
● **This schematic diagram may be modified at any time with the development of new technology.**

5 Schematic Diagram

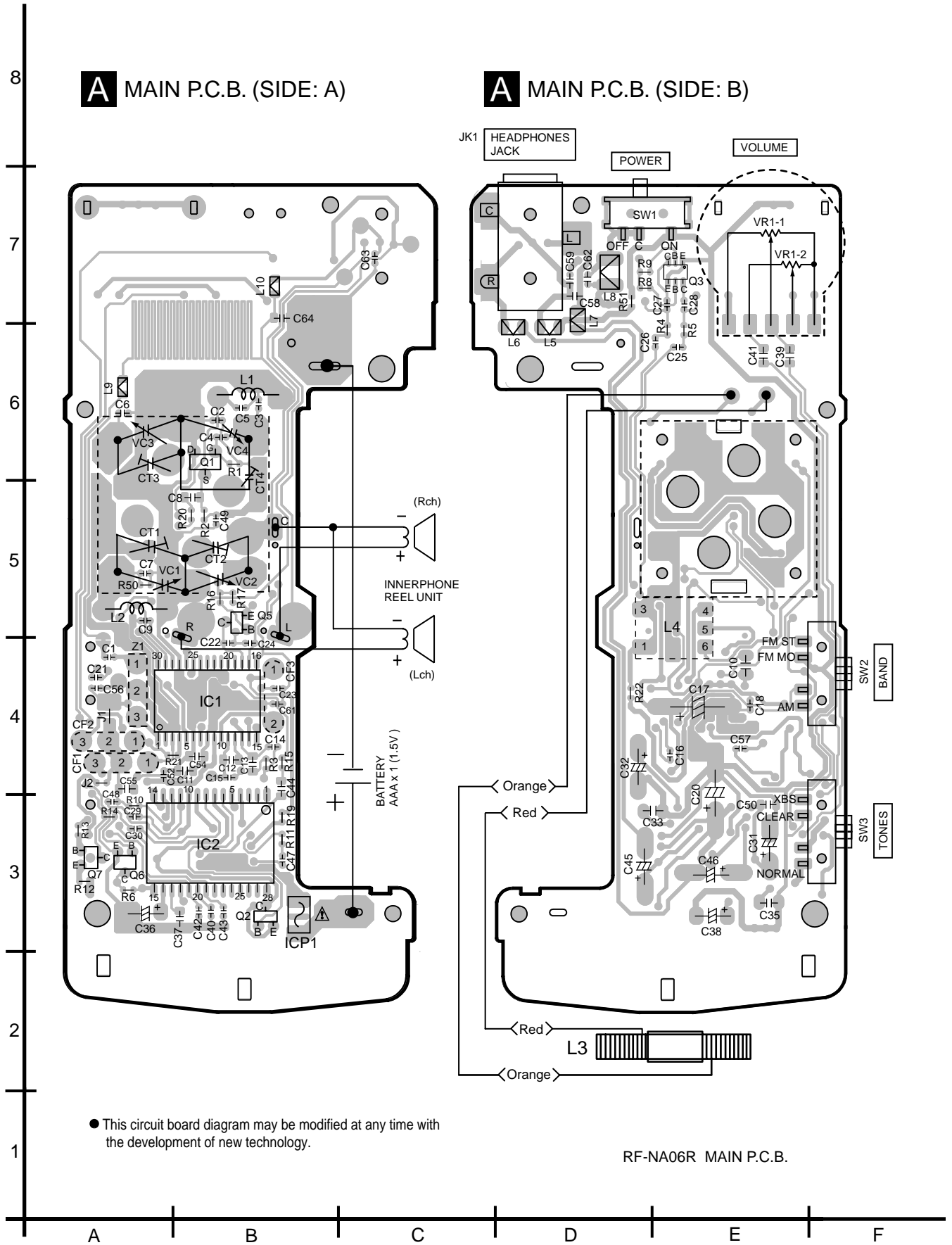
■ Schematic Diagram-1



Schematic Diagram-2



6 Printed Circuit Board Diagram



7 Measurements and Adjustments

7.1. Adjustment Instructions

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set the power switch to ON position..
2. Set volume control to maximum.
3. Set band selector switch to AM or FM.
4. Set power source voltage to 1.5 V DC.
5. Output of signal generator should be no higher than necessary to obtain an output reading.

• AM-RF ALIGNMENT

Signal Generator or Sweep Generator		Radio Dial Setting	Indicator (Electronic Voltmeter or oscilloscope)	Adjustment(Shown in Fig.1 and Fig.2)	Remarks
Connections	Frequency				
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	515 kHz	Tuning capacitor fully closed.	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	L4 (AM OSC Coil) (Fig. 2)	Adjust for maximum output.
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	1640 kHz	Tuning capacitor fully closed.	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	CT3 (AM OSC Trimmer) (Fig. 1)	Adjust for maximum output.
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	600 kHz	Tuning capacitor fully closed.	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	L3 (AM ANT Coil) (Fig. 2)	Adjust for maximum output.
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	1500 kHz	Tuning capacitor fully closed.	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	CT4 (AM ANT Terminal) (Fig. 1)	Adjust for maximum output.

• FM-RF ALIGNMENT

Signal Generator or Sweep Generator		Radio Dial Setting	Indicator (Electronic Voltmeter or oscilloscope)	Adjustment(Shown in Fig.1 and Fig.2)	Remarks
Connections	Frequency				
Connect to test point TP1 through FM dummy antenna. Negative side to test point TP3.	86.2 MHz	Tune to signal	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	L2 (FM OSC Coil) (Fig. 2)	Adjust for maximum output.
Connect to test point TP1 through FM dummy antenna. Negative side to test point TP3.	109.2 MHz	Tune to signal	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	CT1 (FM OSC Trimmer) (Fig. 1)	Adjust for maximum output.
Connect to test point TP1 through FM dummy antenna. Negative side to test point TP3.	90 MHz	Tune to signal	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	L1 (FM ANT Coil) (Fig. 2)	Adjust for maximum output.
Connect to test point TP1 through FM dummy antenna. Negative side to test point TP3.	106 MHz	Tune to signal	Headphone Jack (32Ω) Fabricate the plug as shown in Fig. 3 and then connect the lead wires of the plug to the measuring instrument.	CT2 (FM ANT Trimmer) (Fig. 1)	Adjust for maximum output.

7.2. Adjustment points

- Please refer to Circuit Board and Wiring Connection Diagram to locate test points.

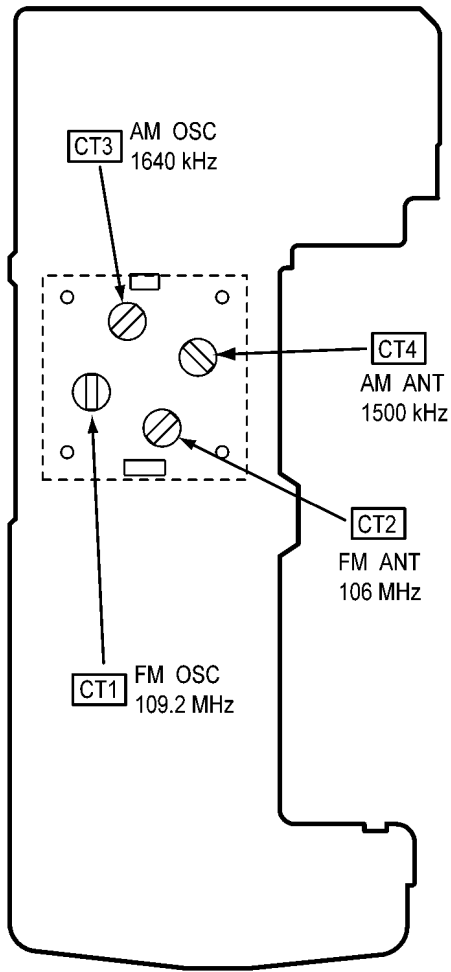


Fig.1

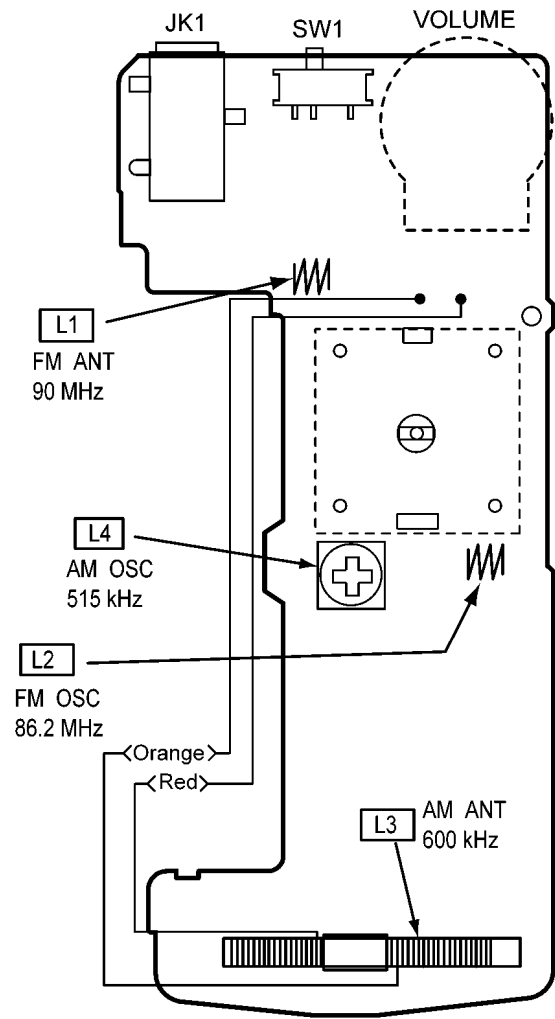


Fig.2

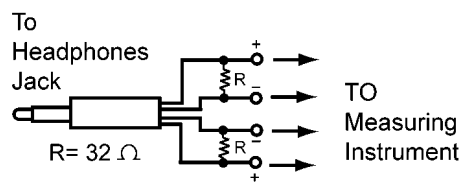
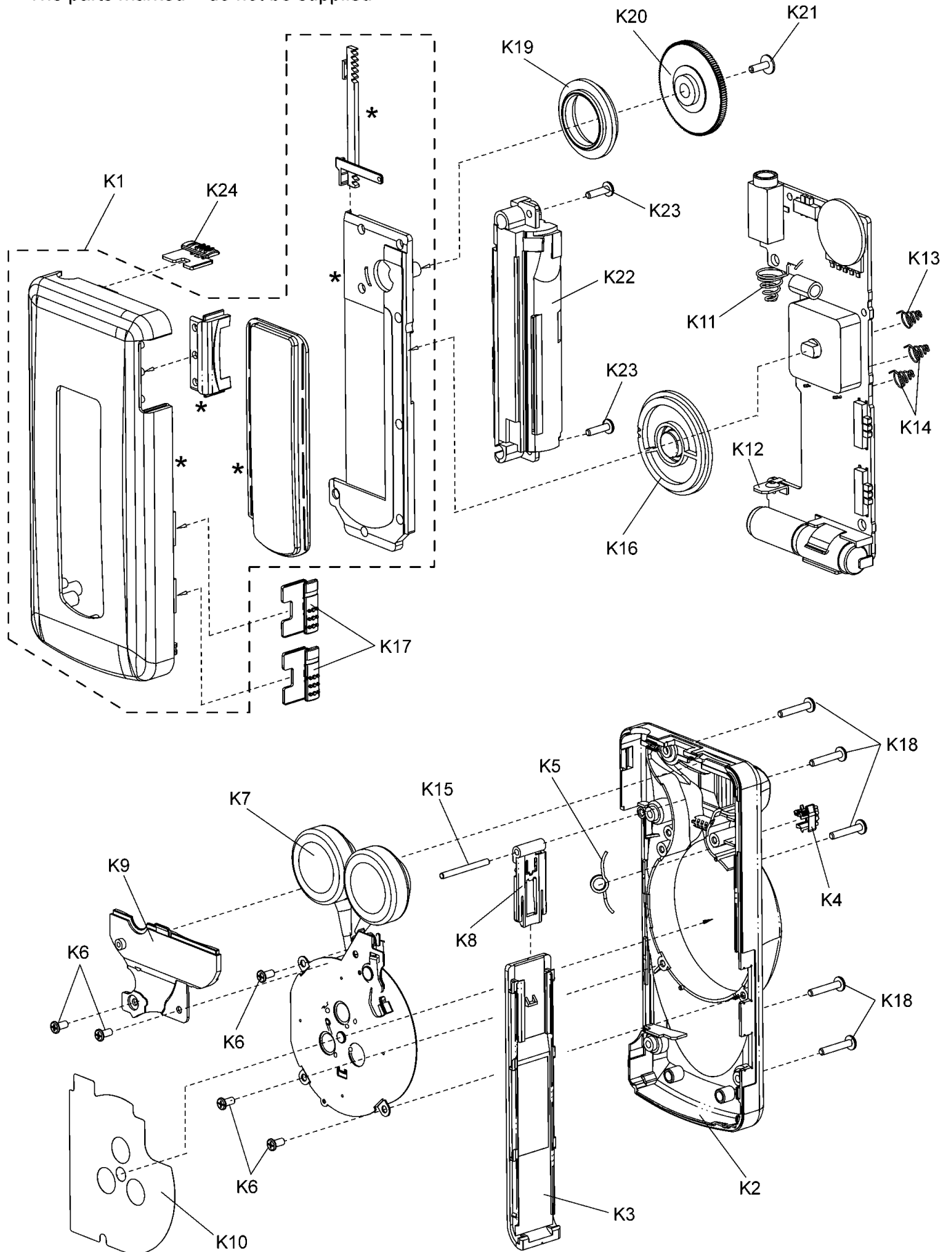


Fig.3

8 Cabinet Parts Location

Note:

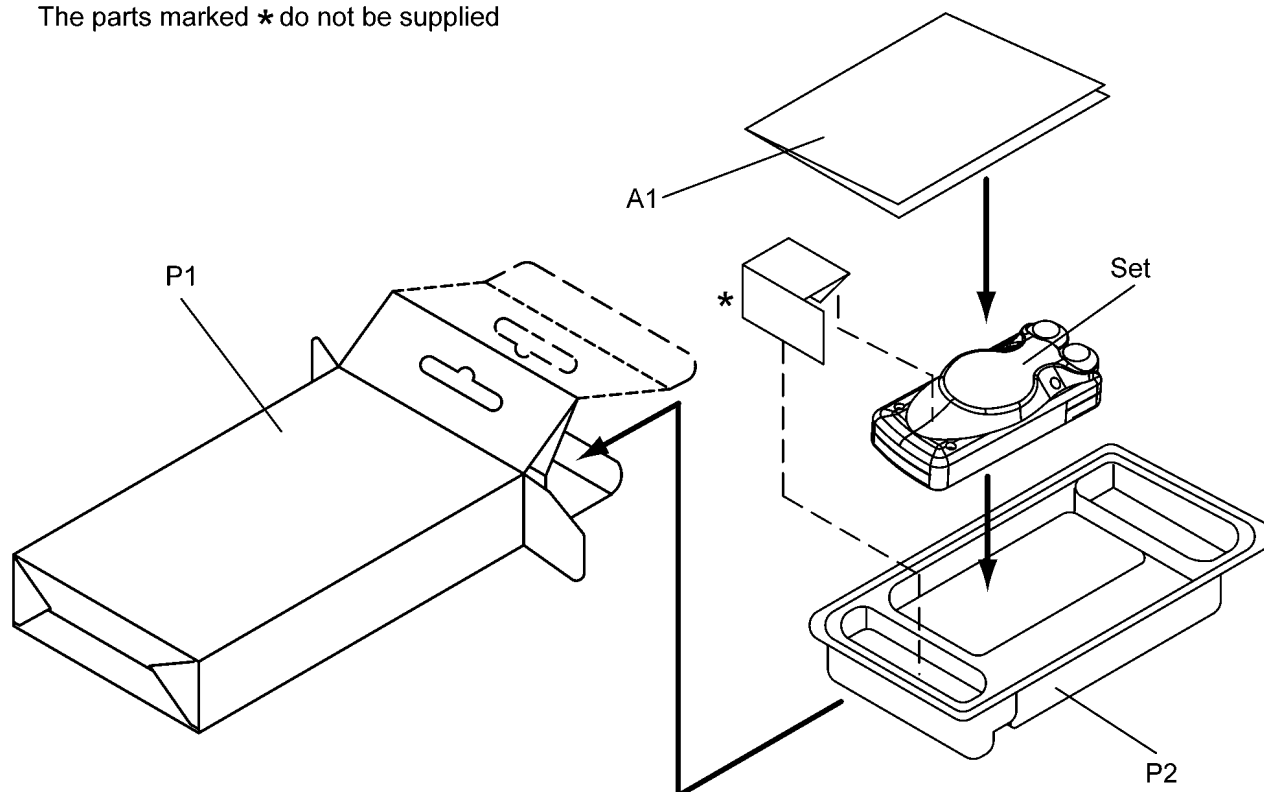
The parts marked * do not be supplied



9 Packaging

Note:

The parts marked * do not be supplied



10 Replacement Parts List

Notes:

- 1.(T) Indicates parts that are supplied **TAMACO**
- 2.The reference number SA represent the grease tool usea for unit.
- 3.The marking (RTL) indicates that Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

Ref. No.	Part No.	Part Name & Description	Remarks
CABINET PARTS			
K1	RFKKFNA06RGS	FRONT CAB. PREPARE (Silver)	(T)
K1	RFKKFNA06RGA	FRONT CAB. PREPARE (Blue)	(T)
K2	RKST0101B-H	REAR CABINET	(T)
K3	RKKT0057-S	BATTERY COVER (Silver)	(T)
K3	RKKT0057-A	BATTERY COVER (Blue)	(T)
K4	RGVT0091-H	AUTO WIND KNOB	(T)
K5	RJRT0017	GUIDE SPRING	(T)
K6	RHQT0017	SCREW	(T)
K7	LOBAANA06R	REEL UNIT	(T)
K8	RMAT0120-H	BATT COVER FIX BOARD	(T)
K9	RKQT0038-H	EP COVER	(T)
K10	RMZT0063-K	PCB INSULATION SHEET	(T)
K11	RJCT70036	BATTERY TERMINAL	(T)
K12	RJCT30038	BATTERY TERMINAL	(T)
K13	RJRT0015	I/P TOUCH SPRING(A)	(T)
K14	RJRT0016	I/P TOUCH SPRING(B)	(T)

Ref. No.	Part No.	Part Name & Description	Remarks
K15	RMST0034	BATT COVER SHAFT	(T)
K16	RDGT0028-H	VC.GEAR	(T)
K17	RGVT0090-H	SW KNOB	(T)
K18	RHDT14062	CAB SCREW	(T)
K19	RDGT0027	MID. GEAR	(T)
K20	RGWT0049-H	T. KNOB	(T)
K21	RHDT14042	SCREW	(T)
K22	RKQT0039-K	BATT ROOM	(T)
K23	XTNR14+45CFZ	SCREW	(T)
K24	RGVT0089-R	POWER BUTTON	(T)
ACCESSORIES			
A1	RQTT0717-E	INSTRUCTION BOOK	(T)
PACKING MATERIALS			
P1	RPKT0853	DECORATION BOX (Blue)	(T)
P1	RPKT0852	DECORATION BOX (Silver)	(T)
P2	RPNT0515	CLAM SHEEL(FRONT)	
P.C.B			
PCB1	PBNA06REG	P.C.B ASS'Y *	(T)
INTEGRATED CIRCUITS TRANSISTORS AND DIODES			
IC1	C1BB00000562	I.C (D30P) TUNER	(T)
IC2	AN7504SB-E1	I.C. (D28P)	(T)
Q1	2SK242-T4	TRANSISTOR	(T)
Q2	B1ADMB000003	TRANSISTOR	(T)
Q3	UMX1NTN	TRANSISTOR (DIGITAL)	(T)
Q5	2SA1577QT106	TRANSISTOR	(T)
Q6	B1ABCF000020	TRANSISTOR	(T)
Q7	2SA1577QT106	TRANSISTOR	(T)
COILS AND TRANSFORMERS			
L1	RLO4Y19-4	OSC.COIL(FM)	(T)
L2	RLO4Y19-4	OSC.COIL(FM)	(T)
L3	REKT0052	BAR ANT. ASSEMBLY	(T)
L4	613AN-A034AH	AM OSC COIL	(T)
L5	J0JBC0000019	CHIP COIL	(T)

Ref. No.	Part No.	Part Name & Description	Remarks
L6	J0JBC0000019	CHIP COIL	(T)
L7	J0JBC0000019	CHIP COIL	(T)
L8	RLQQ330KT1-D	CHIP COIL	(T)
L9	RLQPR33KT-Y	COIL	(T)
L10	G1CR22KA0009	COIL	(T)
VARIABLE RESISTORS			
VR1	D2BGC54A0001	VARIABLE RESISTOR(VOLUME)	(T)
COMPONENT COMINATION			
Z1	RCRBMT004-H	BAND PASS FILTER	(T)
SWITCHES			
SW1	K0D112B00071	SLIDE SWITCH	(T)
SW2	K0D113B00071	SLIDE SWITCH	(T)
SW3	K0D113B00071	SLIDE SWITCH	(T)
JACK			
JK1	RJJ33TK14-W	M3.5 JACK	(T)
CERAMIC FILTERS			
CF1	J0B1075A0081	CERAMIC FILTER	(T)
CF2	RLFPFW459J	CERAMIC FILTER (AM)	(T)
CF3	RLFDFT03AL	CERAMIC FILTER	(T)
VARIABLE CAPACITOR			
PVC	F6D4CCBB0002	POLY VARIABLE CAP.(20PF)	(T)
IC PROCTECTOR			
ICP1	B1ZBZ0000005	IC PROCTECTOR Δ	(T)
RESISTORS			
R1	D0GA105JA020	CHIP RESISTOR	(T)
R2	D0GA471JA020	CHIP RESISTOR	(T)
R3	D0GA102JA020	CHIP RESISTOR	(T)
R4	D0GA393JA020	CHIP RESISTOR	(T)
R5	D0GA393JA020	CHIP RESISTOR	(T)
R6	D0GA332JA020	CHIP RESISTOR	(T)
R8	D0GA473JA020	CHIP RESISTOR	(T)
R9	D0GA473JA020	CHIP RESISTOR	(T)
R10	D0GA2R2JA020	CHIP RESISTOR	(T)
R11	D0GA2R2JA020	CHIP RESISTOR	(T)
R12	D0GA102JA020	CHIP RESISTOR	(T)
R13	D0GA332JA020	CHIP RESISTOR	(T)
R14	D0GA473JA020	CHIP RESISTOR	(T)
R15	D0GA224JA020	CHIP RESISTOR	(T)
R16	D0GA104JA020	CHIP RESISTOR	(T)
R17	D0GA104JA020	CHIP RESISTOR	(T)
R19	D0GA2R2JA020	CHIP RESISTOR	(T)
R20	D0GA122JA020	CHIP RESISTOR	(T)
R21	D0GAR00JA020	CHIP RESISTOR	(T)
R22	D0GAR00JA020	CHIP RESISTOR	(T)
R50	D0GA472JA020	CHIP RESISTOR	(T)
R51	D0GAR00JA020	CHIP RESISTOR	(T)
CHIP JUMPERS			
J1	D0GBR00JA008	CHIP RESISTOR	(T)
J2	D0GAR00JA020	CHIP RESISTOR	(T)
CAPACITORS			
C1	ECUE1H101KBQ	CHIP CAPACITOR	(T)
C2	F1G1C103A004	CHIP CAPACITOR	(T)
C3	ECUE1H020CCQ	CHIP CAPACITOR	(T)
C4	ECUE1H050DCQ	CHIP CAPACITOR	(T)
C5	ECUE1H200JCQ	CHIP CAPACITOR	(T)
C6	ECUE1H070DCQ	CHIP CAPACITOR	(T)
C7	ECUE1H220JCQ	CHIP CAPACITOR	(T)
C8	F1H1H102A013	CHIP CAPACITOR	(T)
C9	F1G1C103A004	CHIP CAPACITOR	(T)
C10	F1J1C225A063	CHIP CAPACITOR	(T)
C11	ECUVNA105ZFV	CHIP CAPACITOR	(T)
C12	ECUVNA224KBV	CHIP CAPACITOR	(T)
C13	ECUV1C474ZFV	CHIP CAPACITOR	(T)
C14	ECUENA473KBQ	CHIP CAPACITOR	(T)
C15	ECUE1H561KBQ	CHIP CAPACITOR	(T)
C16	ECUENA104KBQ	CHIP CAPACITOR	(T)
C17	ECEV0GA221SP	REFLOW ELECTROLYTIC CAP.	(T)
C18	F1G1C103A004	CHIP CAPACITOR	(T)
C20	ECEV0GA221SP	REFLOW ELECTROLYTIC CAP.	(T)
C21	F1G1C103A004	CHIP CAPACITOR	(T)
C22	F1G1C103A004	CHIP CAPACITOR	(T)
C23	ECUE1E822KBQ	CHIP CAPACITOR	(T)
C24	ECUE1E822KBQ	CHIP CAPACITOR	(T)
C25	ECUENA104KBQ	CHIP CAPACITOR	(T)

Ref. No.	Part No.	Part Name & Description	Remarks
C26	ECUENA104KBQ	CHIP CAPACITOR	(T)
C27	F1G1E682A057	CHIP CAPACITOR	(T)
C28	F1G1E682A057	CHIP CAPACITOR	(T)
C29	F1G1C103A004	CHIP CAPACITOR	(T)
C30	ECUENA104KBQ	CHIP CAPACITOR	(T)
C31	ECEV0JS220WR	REFLOW ELECTROLYTIC CAP.	(T)
C32	ECEV1CS100SR	REFLOW ELECTROLYTIC CAP.	(T)
C33	F1J1C225A063	CHIP CAPACITOR	(T)
C35	F1J1C225A063	CHIP CAPACITOR	(T)
C36	F3F0G685A012	TANTALUM CAP.	(T)
C37	ECUVNA224KBV	CHIP CAPACITOR	(T)
C38	F3F0G685A012	TANTALUM CAP.	(T)
C39	ECUVNA105ZFV	CHIP CAPACITOR	(T)
C40	ECUENA104KBQ	CHIP CAPACITOR	(T)
C41	ECUVNA105ZFV	CHIP CAPACITOR	(T)
C42	ECUE1H102KBQ	CHIP CAPACITOR	(T)
C43	ECUE1H102KBQ	CHIP CAPACITOR	(T)
C44	ECUVNA224KBV	CHIP CAPACITOR	(T)
C45	ECEV0GA101SR	REFLOW ELECTROLYTIC CAP.	(T)
C46	ECEV0GA101SR	REFLOW ELECTROLYTIC CAP.	(T)
C47	ECUENA104KBQ	CHIP CAPACITOR	(T)
C48	ECUENA104KBQ	CHIP CAPACITOR	(T)
C49	F1G1C103A004	CHIP CAPACITOR	(T)
C50	ECUVNA105ZFV	CHIP CAPACITOR	(T)
C52	ECUE1E221JCQ	CHIP CAPACITOR	(T)
C54	ECUVNA105ZFV	CHIP CAPACITOR	(T)
C55	ECUVNA105ZFV	CHIP CAPACITOR	(T)
C56	ECUENA104KBQ	CHIP CAPACITOR	(T)
C58	ECUVNA104KBQ	CHIP CAPACITOR	(T)
C59	ECUVNA104KBQ	CHIP CAPACITOR	(T)
C62	ECUE1H102KBQ	CHIP CAPACITOR	(T)