



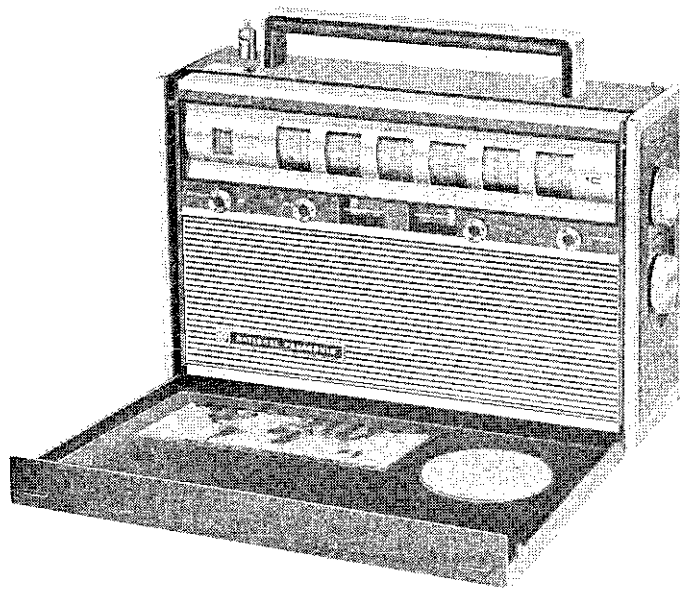
NATIONAL PANASONIC

Service Manual

ORDER NO. RD-483

FM/AM 6-BAND 30 SOLID STATE DEVICES INCORPORATING ICs (INTEGRATED CIRCUITS)

MODEL RF-3000



SPECIFICATIONS

Frequency Range	FM 87 ~ 108 Mc/s LW 150 ~ 400 kc/s 3000 ~ 7500m AM 520 ~ 1610 kc/s 577 ~ 1860m MB 1.6 ~ 4.5 Mc/s 187 ~ 30.7 m SW ₁ 4.8 ~ 12 Mc/s 68.7 ~ 35 m SW ₂ 12 ~ 22 Mc/s 25 ~ 12.6 m	Band	60 ~ 100 FM (SEL) 100 ~ 150 FM (4B) 500 ~ 800 AM 6.4 ~ 10.9 FM Detector 18.2 ~ 21.1 Operation Compensator 18.2 ~ 22.1 18.2 ~ 22.1 Operation Compensator 18.2 ~ 22.1 6.4 ~ 10.9 AM D. AGC
Intermediate Frequency	FM 10.7 Mc/s AM 455 kc/s	Sensitivity	FM 0.6µV for 50mW Output LW 150µV/m for 50mW Output AM 80µV/m for 50mW Output MB 30µV/m for 50mW Output SW ₁ 30µV/m for 50mW Output SW ₂ 30µV/m for 50mW Output
Integrated Circuit	EXM 0515XA AM IF Amplifier EXM 0515XB AM Detector & AGC	Power Output	1.2W Undistorted 2W Maximum
Transistors	2SC429 FM RF Amplifier 2SC469 FM Mixer 2SC185 FM Oscillator 2SC469 FM 1st IF Amplifier 2SC489 FM 2nd IF Amplifier 2SC489 FM 3rd IF Amplifier 2SC489 FM 4th IF Amplifier 2SC185 AM RF Amplifier 2SC185 AM Converter 2SC183 Regulator Amplifier 2SB176 Regulator 2SB173 1st AF Amplifier 2SB173 2nd AF Amplifier 2SB171 3rd AF Amplifier 2SB176 4th AF Amplifier 2SB324 2SB324	Power Source	6V (Six "D" Size Flashlight Batteries, NATIONAL UM-1 or equivalent)
		Speakers	12cm (5") plus 10cm (4") PM Dynamic Speaker
		Cabinet Dimensions	370(Wide) x 254(High) x 129(Deep)mm 14 1/2" x 10" x 5 1/4"
		Weight	5.6 kg. (12 lb. 6 oz.)

(EXPORT DIVISION)

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

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
RADIO DIVISION

To Remove Dial Scale (Refer to Fig. 4)

1. Remove the chassis from the case (Refer to Figs. 2 & 3).
2. Remove two (2) dial drum mounting screws.
3. Remove four (4) dial scale bracket mounting screws, Nos. 1~4, as illustrated in Fig. 4.
4. To reassemble, reverse the above procedure paying attention to the following:
Mount dial drum at an angle of 45° and start dial cord stringing after setting starting point of the dial scale as illustrated in Fig. 5.

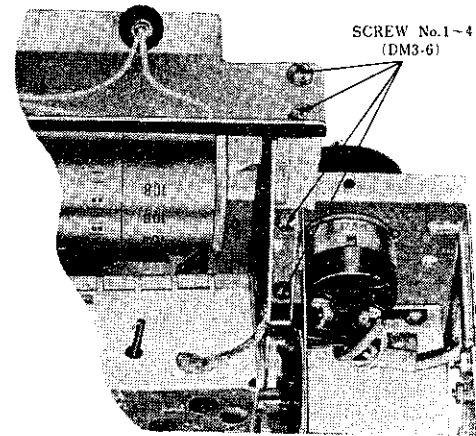


Fig. 4

To Mount Fine Tuning Knob

1. Set the slot of fine tuning control horizontally.
2. Set the protuberance of the fine tuning knob to white making of the cabinet.
3. Insert fine tuning knob to its shaft.

Tone Indicator Cord Stringing Guide (Refer to Fig. 8)

1. Dial cord length is 60cm (23 5/8").
2. Set tone control fully clockwise.
3. Fasten one end of the dial cord to the spring and attach the other end of the tension spring to the chassis hole. Then start stringing in numerical order.
4. Cement dial cord ends.

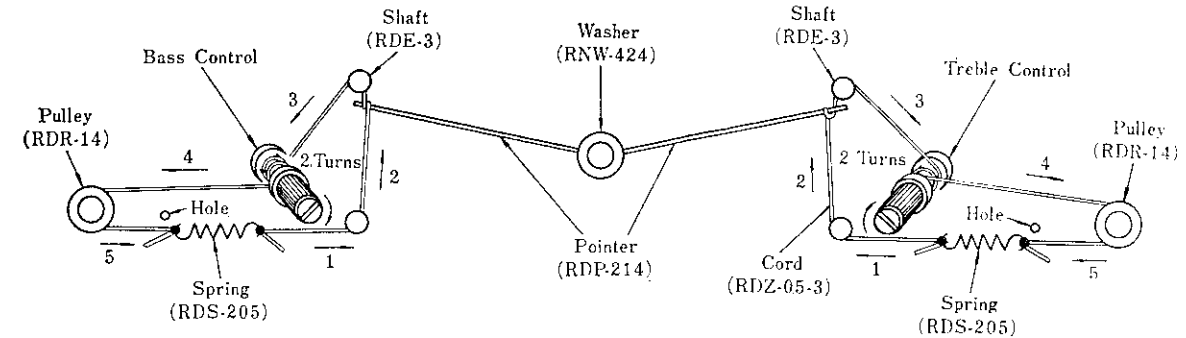


Fig. 8

CORD STRINGING GUIDE

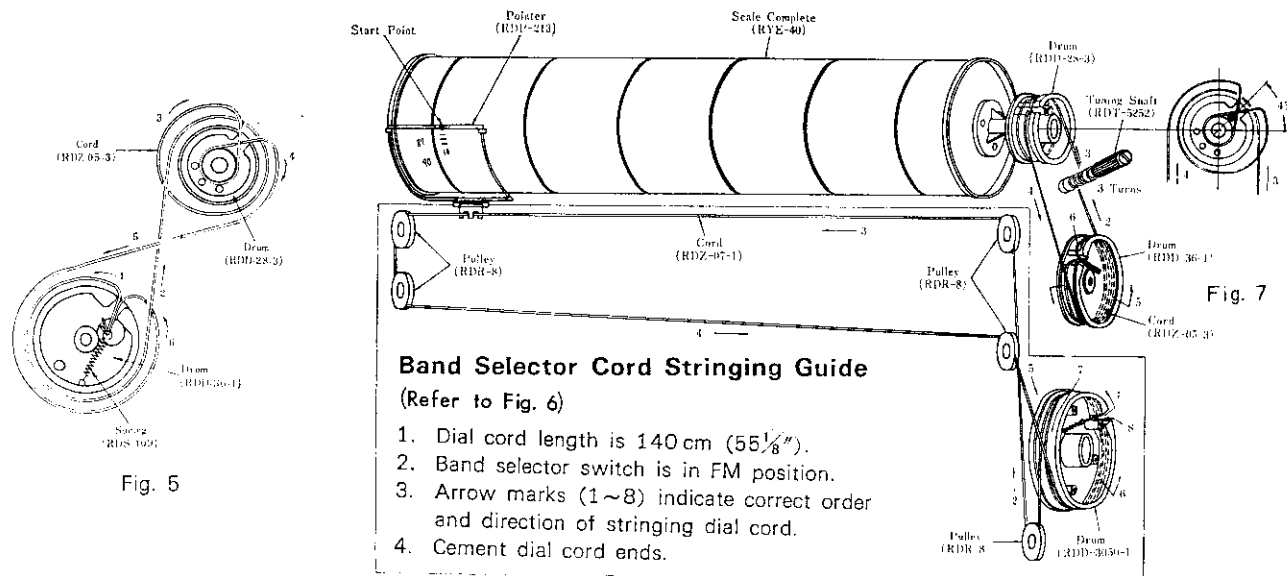


Fig. 6

FM Dial Cord Stringing Guide

(Refer to Fig. 5)

1. Dial cord length is 65cm (25 5/8").
2. Tuning gang is positioned at maximum capacity.
3. Dial scale is positioned at start point.
4. Arrow marks (1~6) indicate correct order and direction of stringing dial cord.
5. Cement dial cord ends.

AM Dial Cord Stringing Guide

(Refer to Fig. 7)

1. Dial cord length is 65cm (25 5/8").
2. Tuning gang is positioned at maximum capacity.
3. Band selector switch is in FM position.
4. Dial scale is positioned at start point.
5. Arrow marks (1~6) indicate correct order and direction of stringing dial cord.
6. Cement dial cord ends.

ALIGNMENT INSTRUCTIONS

VOLTAGE ADJUSTMENT

1. Radio Receiver Setting
 - Set tuning gang to non-interference point (on/about 550 kc/s).
 - Set band selector switch to AM.
2. Circuit Tester Connection
 - Set a circuit tester to 10 volts and connect the positive side to the test point "TP4", and the negative side to chassis.

3. Voltage Indication

- Adjust the 1KΩ potentiometer (R65) so that the circuit tester indicates 5V.

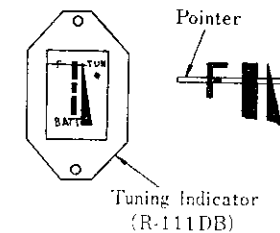


Fig. 9

TUNING INDICATOR ADJUSTMENT

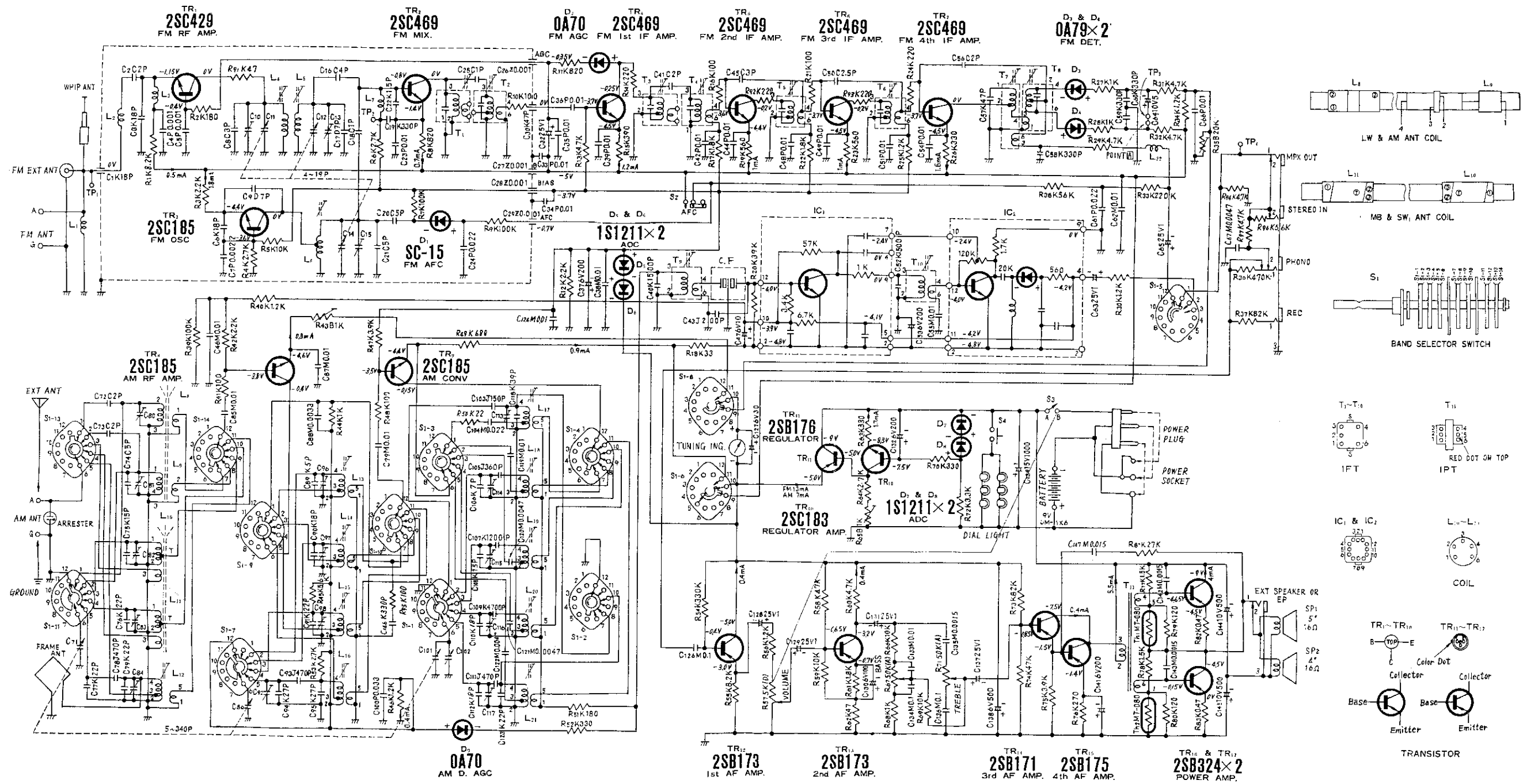
1. Radio Receiver Setting
 - Set band selector switch to AM or FM
 - Set tuning gang to non-interference point (on/about 550 kc/s).
2. Remarks
 - Adjust 1KΩ potentiometer (R43) & 20KΩ potentiometer (R35) so that the pointer of the tuning indicator stays as shown in Fig. 9.

Notes:

1. Refer to Figs. 15 and 16 for alignment points.
2. Stand the frame antenna on top of the cabinet when aligning SW1~SW2 bands. Because the frame antenna is attached to the cabinet, do not pull out its plug.

AM IF ALIGNMENT

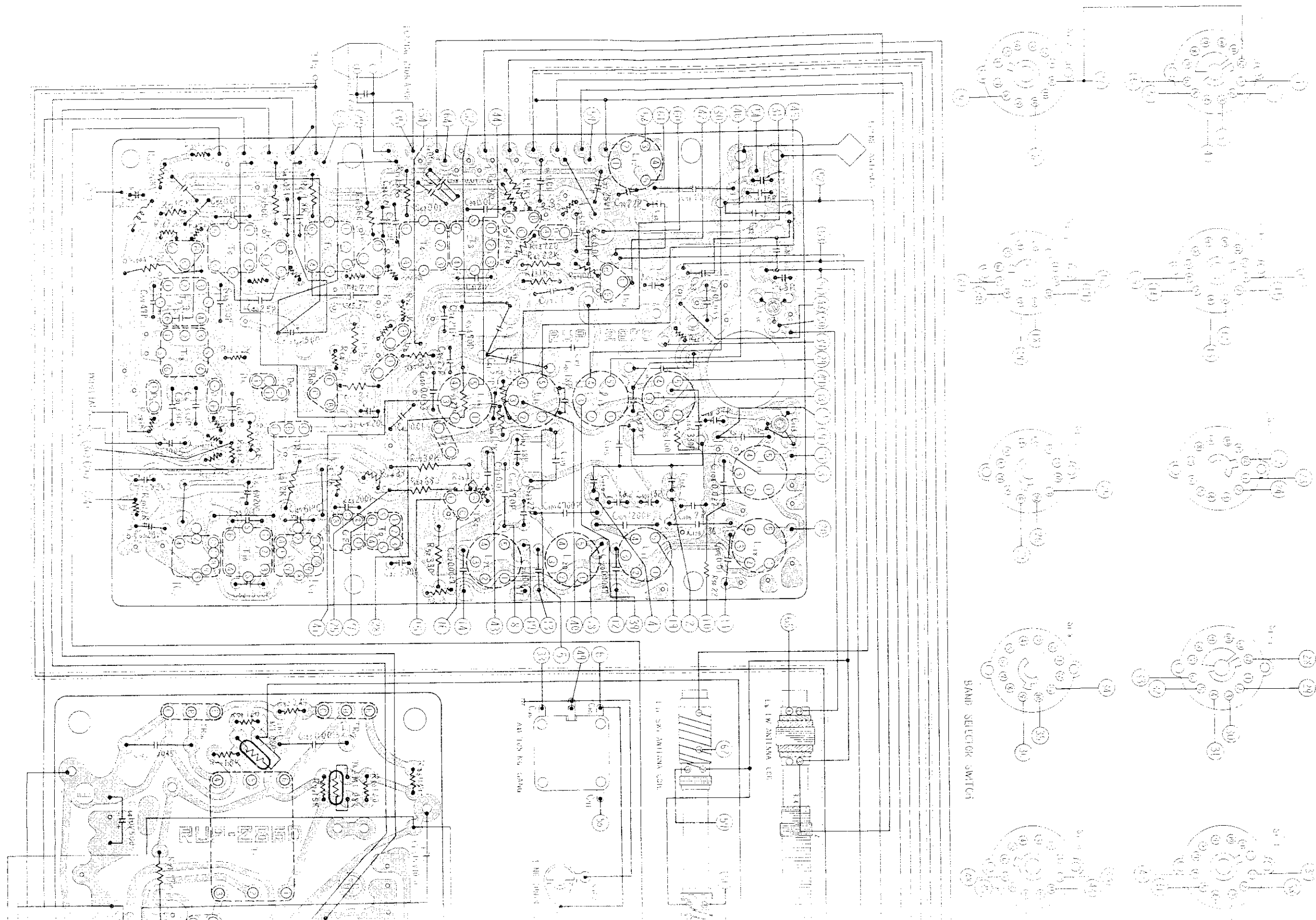
Output of signal generator should be no higher than necessary to obtain an output reading. Set volume control to minimum. Set bass control to fully clockwise. Set power source voltage to 9 volts DC. Set treble control to fully clockwise. Set fine tuning control to center.						
Band Switch Position	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1 AM	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kc/s (400~ Mod.)	Point of non-interference (on/about 550 kc/s)	Output meter across voice coil	T9 (1st IFT) T20 (2nd IFT)	Adjust for maximum output.

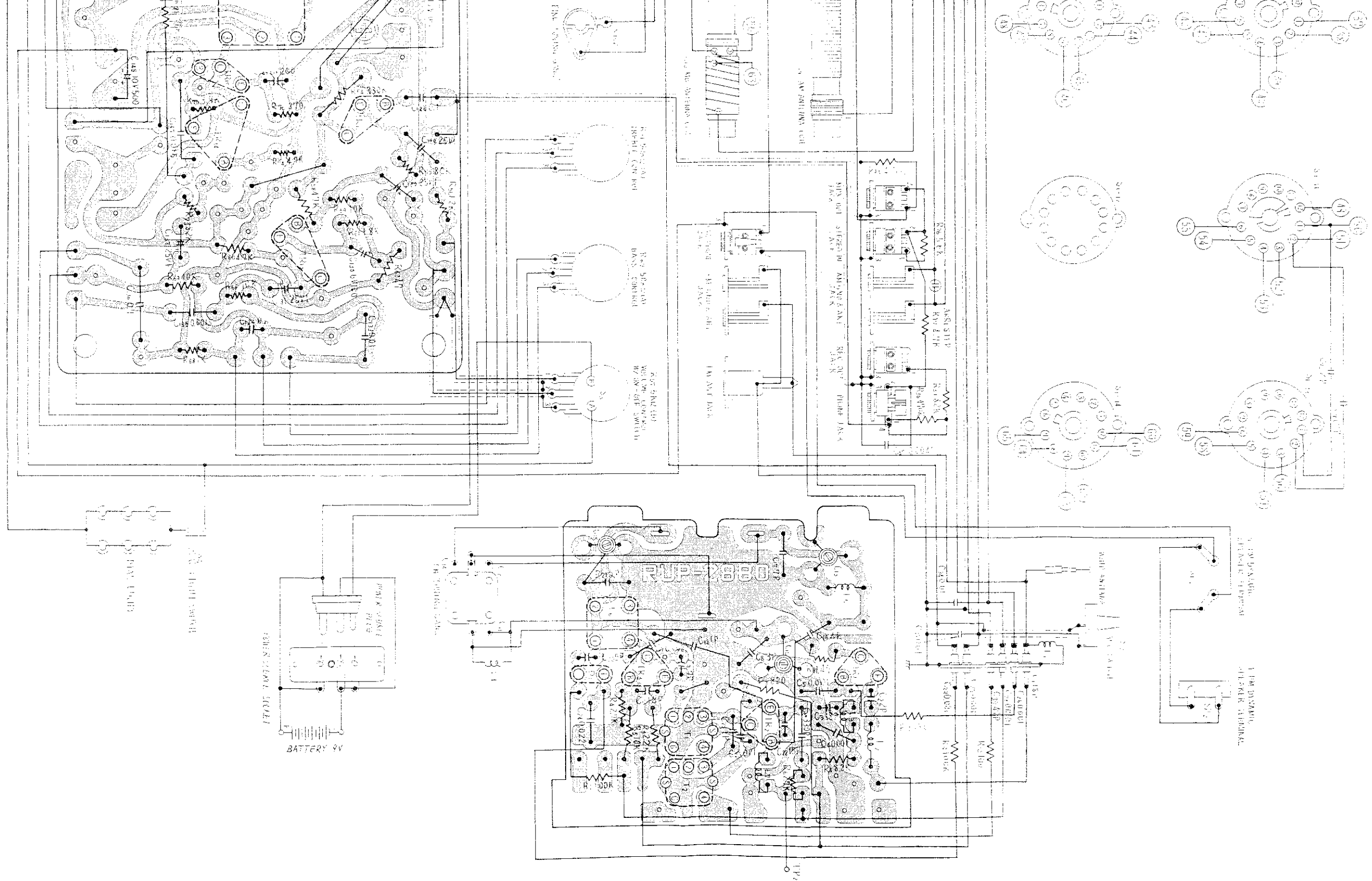


Notes:

1. S1-1~S1-14: Band selector switch in "FM" position.
2. S2 : AFC switch in "ON" position.
3. S3 : Power source switch in "OFF" position.
4. S4 : Dial light switch in "OFF" position.
5. DC Voltage measurements are taken with circuit tester 10K Ω /volt from chassis ground.
TR₁~TR₇.....Band selector switch in FM position.
TR₈, TR₉.....Band selector switch in AM position.
6. Capital letters (J,K,M,P,C,D) in the circuit diagram show allowable tolerances of resistors and capacitors as follows:
J=±5% K=±10% M=±20% P=+100%
C=±0.25PF D=±0.5PF - 0%
7. PF=pico farad=mmf
μF=micro farad=MF
8. All resistor values in ohms (K=1000 Ω).
9. All capacitor values in micro farads (P=μF).

Fig. 10 Schematic Diagram.





- Notes:**
1. All resistor values in ohms (K=1000Ω).
 2. All capacitor values in micro farads (P=μF).

Fig. 11 Circuit Board Wiring View (Conductor Side).

AM RF ALIGNMENT

FM IF & DETECTOR ALIGNMENT WITH OSCILLOSCOPE

Output of signal generator should be no higher than necessary to obtain an output reading.
 Set volume control to maximum. Set fine tuning control to center.
 Set bass control to fully clockwise. Set power source voltage to 9 volts DC.
 Set treble control to fully clockwise.

Band Switch Position	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1 LW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	150 kc/s (400~ Mod.)	150 kc/s	Output meter across voice coil.	L17 (OSC Coil) L8 (ANT Coil)	Adjust for maximum output by sliding coil (L8) along ferrite core.
	"	400 kc/s (400~ Mod.)	400 kc/s	"	C113 (OSC Trimmer) C80 (ANT Trimmer)	Adjust for maximum output. Repeat steps (1) and (2).
3 AM	"	550 kc/s (400~ Mod.)	550 kc/s	"	L18 (OSC Coil) L9 (ANT Coil) L13 (DET Coil)	Adjust for maximum output by sliding coil (L9) along ferrite core.
	"	1500 kc/s (400~ Mod.)	1500 kc/s	"	C114 (OSC Trimmer) C81 (ANT Trimmer) C96 (DET Trimmer)	Adjust for maximum output. Repeat steps (3) and (4).
5 MB	"	1.6 Mc/s (400~ Mod.)	1.6 Mc/s	"	L19 (OSC Coil) L10 (ANT Coil) L14 (DET Coil)	Adjust for maximum output by sliding coil (L10) along ferrite core.
	"	4.5 Mc/s (400~ Mod.)	4.5 Mc/s	"	C115 (OSC Trimmer) C97 (ANT Trimmer) C82 (DET Trimmer)	Adjust for maximum output. Repeat steps (5) and (6).
7 SW1	"	4.5 Mc/s (400~ Mod.)	4.5 Mc/s	"	L20 (OSC Coil) L11 (ANT Coil) L15 (DET Coil)	Adjust for maximum output by sliding coil (L11) along ferrite core.
	"	12 Mc/s (400~ Mod.)	12 Mc/s	"	C116 (OSC Trimmer) C83 (ANT Trimmer) C98 (DET Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).
9 SW2	Stand frame antenna and radiate signal a to frame antenna.	12 Mc/s (400~ Mod.)	12 Mc/s	"	L21 (OSC Coil) L12 (ANT Coil) L16 (DET Coil)	Adjust for maximum output.
	"	22 Mc/s (400~ Mod.)	22 Mc/s	"	C117 (OSC Trimmer) C84 (ANT Trimmer) C92 (DET Trimmer)	Adjust for maximum output. Repeat steps (9) and (10).

OSCILLOSCOPE
 Set sweep selector of oscilloscope to "External Sweep". Apply 60~ sweep signal from sweep generator to horizontal input terminals of oscilloscope.

EQUIPMENT REQUIRED
 Signal generator that provides 10.7 Mc/s marker.
 Sweep generator that provides 10.7 Mc/s center frequency and 400 kc/s sweep width.
 Set band selector switch to FM.
 Set volume control to minimum.
 Set power source voltage to 9 volts DC.
 Set bass control to fully clockwise.
 Set treble control to fully clockwise.
 Set fine tuning control to center.

SWEEP GENERATOR COUPLING	SIGNAL GENERATOR COUPLING	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
High side thru. .001μF to point TP2. Common to chassis.	High side thru. .001μF to point TP2. Common to chassis.	Point of non-interference (on/about 100 Mc/s)	Connect vert. Amp. of scope to point TP3. Common to chassis.	T1 (FM 1st IFT) (P) T2 (FM 1st IFT) (S) T3 (FM 2nd IFT) (P) T4 (FM 2nd IFT) (S) T5 (FM 3rd IFT) T6 (FM 4th IFT)	Adjust for maximum amplitude and symmetrical curve. (Refer to Fig.12)
"	"	"	Connect vert. Amp. of scope to point TP4. Common to chassis.	T6 (FM 5th IFT) (Primary) T8 (FM 5th IFT) (Secondary)	Adjust T7 for maximum amplitude & proper linearity between ±100 kc/s markers. Adjust T8 so that 10.7Mc/s marker appears at the center. (Refer to Fig. 13)

Note: When aligning the Ratio Detector circuit, the wave form may appear as in Fig. 12 & 13 or upside-down.

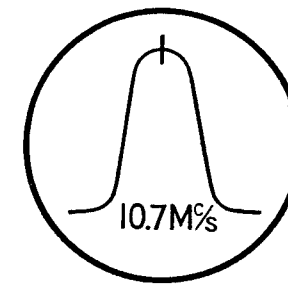


Fig. 12

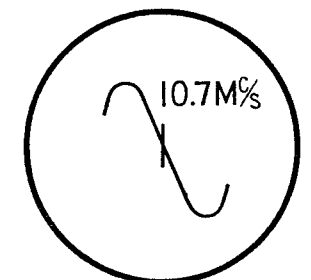


Fig. 13

FM RF ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading.
 Set volume control to maximum. Set bass control to fully clockwise.
 Set band selector switch to FM. Set treble control to fully clockwise.
 Set power source voltage to 9 volts DC. Set fine tuning control to center.

SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
Connect to Point TP1 through FM Dummy antenna. Common to chassis. (Refer to Fig. 14)	90 Mc/s (400~ Mod.)	90 Mc/s	Output meter across voice coil.	L6 (FM OSC Coil) L5 (FM DET Coil) L4 (FM Collector Coil)	Adjust for maximum output.
"	106 Mc/s (400~ Mod.)	106 Mc/s	"	C15 (FM OSC Trimmer) C13 (FM DET Trimmer) C10 (FM Collector Trimmer)	Adjust for maximum output. Repeat steps (3) and (4).

Note: As three output responses will be present, proper tuning is the center frequency.

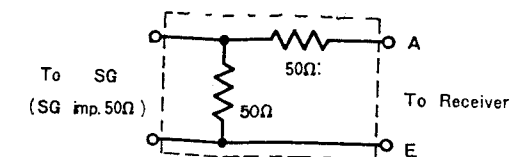


Fig. 14 FM Dummy Antenna

Note: Cement antenna bobbin with wax after completing alignment.

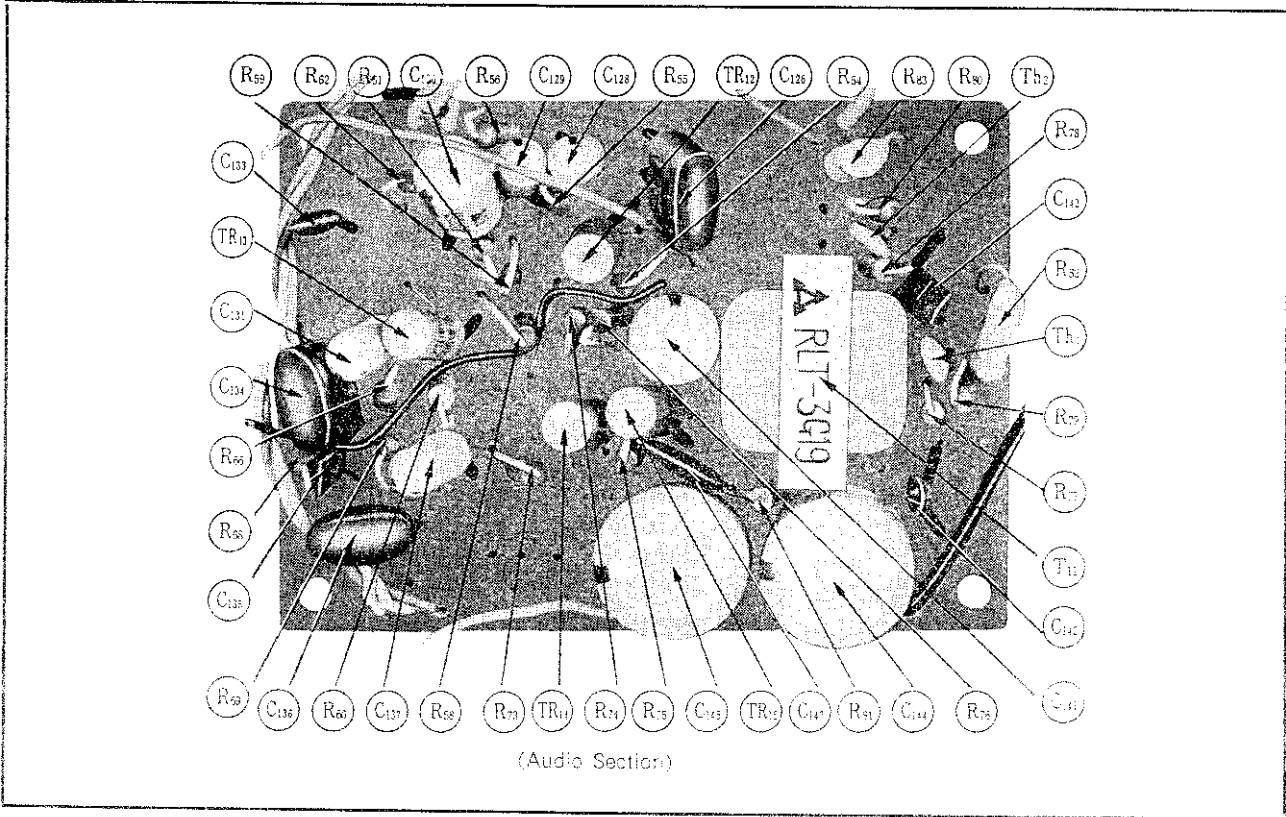


Fig. 19 Component View - Parts Identification.

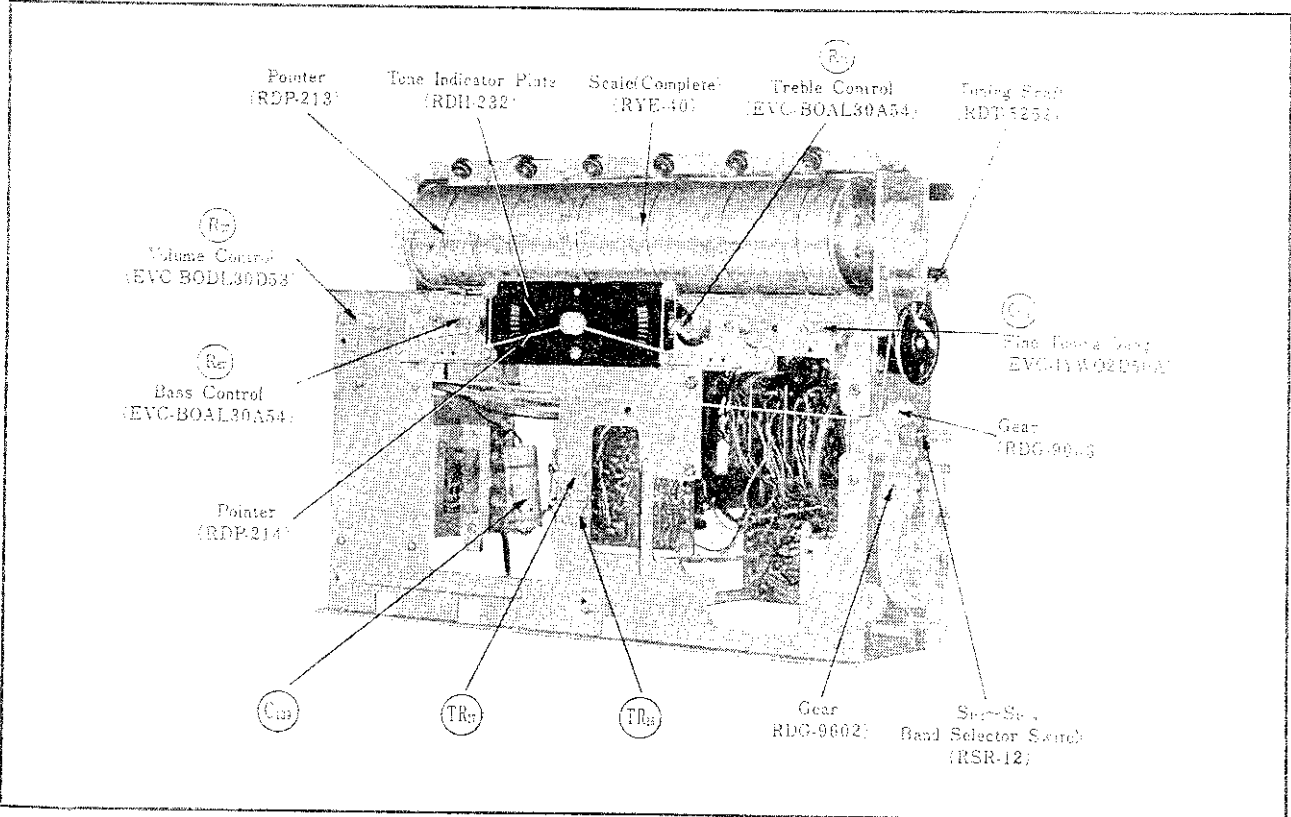


Fig. 20 Component View - Parts Identification.

MODEL RF-3000

REPLACEMENT PARTS LIST

Ref No.	Part No.	Description
TRANSISTORS AND DIODES		
TR ₁	2SC429	FM RF Amplifier
TR ₂	2SC469	FM Mixer
TR ₃	2SC185	FM Oscillator
TR ₄	2SC469	FM 1st IF Amplifier
TR ₅	2SC469	FM 2nd IF Amplifier
TR ₆	2SC469	FM 3rd IF Amplifier
TR ₇	2SC469	FM 4th IF Amplifier
TR ₈	2SC185	AM RF Amplifier
TR ₉	2SC185	AM Converter
TR ₁₀	2SC183	Regulator Amplifier
TR ₁₁	2SB176	Regulator
TR ₁₂	2SB173	1st AF Amplifier
TR ₁₃	2SB173	2nd AF Amplifier
TR ₁₄	2SB171	3rd AF Amplifier
TR ₁₅	2SB175	4th AF Amplifier
TR ₁₆	2SB324	Power Amplifier (push- pull)
TR ₁₇	2SB324	
D ₁	SC-15	FM AFC
D ₂	OA70	FM AGC
D ₃	OA79	FM Detector
D ₄	OA79	
D ₅	1S1211	Operation Compensator
D ₆	1S1211	
D ₇	1S1211	Operation Compensator
D ₈	1S1211	
D ₉	OA70	AM D. AGC
INTEGRATED CIRCUITS		
IC ₁	EXM-0515XA	AM IF Amplifier
IC ₂	EXM-0515XB	AM Detector & AGC
THERMISTORS		
Th ₁	MT-080	Operation Compensator
Th ₂	MT-080	Operation Compensator
CAPACITORS		
C ₁	ECC-L5180K	18PF, ±10%, Ceramic
C ₂	ECC-D05020C	2PF, ±0.25PF, Ceramic
C ₃	ECC-D05180K	18PF, ±10%, Ceramic
C ₄	ECK-D5102P	0.001μF, 500WV, +100%, Ceramic Disc
C ₅	ECK-D5102P	0.001μF, 500WV, +100%, Ceramic Disc
C ₆	ECC-D05180K	18PF, ±10%, Ceramic
C ₇	ECK-D05222P	0.0022μF, 50 WV, +100%, Ceramic Disc
C ₈	ECC-D05030C	3PF, ±0.25PF, Ceramic
C ₉	ECC-D05070D	7PF, ±0.5PF, Ceramic
C ₁₀	ECV-1ZW10P12	Trimmer, FM Collector
C _{11, 12, 14}	PVC-3D20	Tuning Gang, FM
C ₁₃	ECV-1ZW10P12	Trimmer, FM Detector
C ₁₅	ECV-1ZW10P12	Trimmer, FM Oscillator
C ₁₆	ECC-D05040C	4PF, ±0.25PF, Ceramic
C ₁₇	ECC-D05070D	7PF, ±0.5PF, Ceramic
C ₁₈	ECC-D05010C	1PF, ±0.25PF, Ceramic
C ₁₉	ECC-U05331K	330PF, ±10%, Ceramic
C ₂₀	ECC-D05050C	5PF, ±0.25PF, Ceramic
C ₂₁	ECC-D05050C	5PF, ±0.25PF, Ceramic
C ₂₂	ECC-D05150K	15PF, ±10%, Ceramic
C ₂₃	ECK-D05103P	0.01μF, 50WV, +100%, Ceramic Disc
C ₂₄	ECK-D05223P	0.022μF, 50WV, +100%, Ceramic Disc
C ₂₅	ECC-D05010C	1PF, ±0.25PF, Ceramic
C ₂₆	ECK-L5102Z	0.001μF, 500WV, +80% Ceramic -20% (Cylinder Type)
C ₂₇	ECK-L5102Z	0.001μF, 500WV, +80% Ceramic -20% (Cylinder Type)
C ₂₈	ECK-L5102Z	0.001μF, 500WV, +80% Ceramic -20% (Cylinder Type)

MODEL RF-3000

Ref No.	Part No.	Description
CAPACITORS		
C29	ECK-L5102Z	0.001 μ F, 500WV, +80% Ceramic -20% (Cylinder Type)
C30	ECC-L5470K	47PF, \pm 10%, Ceramic
C32	ECE-A25V1	1 μ F, 25WV, Electrolytic
C33	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C34	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C35	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C36	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C37	ECE-A6V200	200 μ F, 6 WV, Electrolytic
C38	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C39	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C40	ECQ-S02152KZ	1500PF, \pm 10%, Styrol
C41	ECC-D05020C	2PF, \pm 0.25PF, Ceramic
C42	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C43	ECQ-S1201JZ	200PF, \pm 5%, Styrol
C44	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C45	ECC-D05030C	3PF, \pm 0.25PF, Ceramic
C46	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C47	ECE-A6V10	10 μ F, 6 WV, Electrolytic
C48	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C49	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C50	ECC-D052R5C	2.5PF, \pm 0.25PF, Ceramic
C51	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C52	ECQ-S02152KZ	1500PF, \pm 10%, Styrol
C53	ECE-A6V200	200 μ F, 6WV, Electrolytic
C54	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C55	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C56	ECC-D05020C	2PF, \pm 0.25PF, Ceramic
C57	ECC-D05470K	47PF, \pm 10%, Ceramic
C58	ECC-U05331K	330PF, \pm 10%, Ceramic
C59	ECC-U05331K	330PF, \pm 10%, Ceramic
C60	ECC-U05331K	330PF, \pm 10%, Ceramic
C61	ECK-D05223P	0.022 μ F, 50WV, +100%, Ceramic Disc - 0%
C62	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C63	ECE-A25V1	1 μ F, 25WV, Electrolytic
C64	ECE-B10V5	5 μ F, 10WV, Electrolytic
C65	ECE-A25V1	1 μ F, 25WV, Electrolytic
C66	ECK-D05103P	0.01 μ F, 50WV, +100%, Ceramic Disc - 0%
C67	ECK-D05472M-Y	0.0047 μ F, 50WV, \pm 20%, Ceramic Disc
C71, 86, 101	PVC-3RA	Tuning Gang, AM
C72	ECC-D05020C	2PF, \pm 0.25PF, Ceramic
C73	ECC-D05020C	2PF, \pm 0.25PF, Ceramic
C74	ECC-D05050C	5PF, \pm 0.25PF, Ceramic
C75	ECC-D05150K	15PF, \pm 10%, Ceramic
C76	ECC-D05220K	22PF, \pm 10%, Ceramic
C77	ECC-D05220K	22PF, \pm 10%, Ceramic
C78	ECQ-S1471J	470PF, \pm 5 %, Styrol
C79	ECC-D05220K	22PF, \pm 10%, Ceramic
C80	ECV-12W20P12	Trimmer, LW Antenna
C81~84	ECV-4RW12W13	Trimmer, AM, MB, SW ₁ & SW ₂ Antenna
C85	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C87	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C88	ECK-D05332M-Y	0.0033 μ F, 50WV, \pm 20%, Ceramic Disc
C89	ECC-D05050C	5PF, \pm 0.25PF, Ceramic
C90	ECC-D05180K	18PF, \pm 10%, Ceramic
C91	ECC-D05220K	22PF, \pm 10%, Ceramic
C92, 96~98	ECV-4RW12W13	Trimmer, AM, MB, SW ₁ & SW ₂ Detector
C93	ECQ-S1471J	470PF, \pm 5%, Styrol
C94	ECC-D05270K	27PF, \pm 10%, Ceramic
C95	ECC-D05270K	27PF, \pm 10%, Ceramic
C99	ECK-D05103M-Y	0.01 μ F, 50WV, \pm 20%, Ceramic Disc
C100	ECK-D05333P	0.033 μ F, 50WV, +100%, Ceramic Disc - 0%

MODEL RF-3000

Ref. No.	Part No.	Description
CAPACITORS		
C102	ECV-1YW02D50A	Fine Tuning Gang
C103	ECQ-S1151J	150PF, ±5%, Styrol
C104	ECQ-M05223MZ	0.022µF, 50WV, ±20%, Polyester
C105	ECQ-S1361J	360PF, ±5%, Styrol
C106	ECC-D05070K	7PF, ±10%, Ceramic
C107	ECQ-S02122K	1200PF, ±10%, Styrol
C108	ECC-D05150K	15PF, ±10%, Ceramic
C109	ECQ-S02472K	4700PF, ±10%, Styrol
C110	ECC-D05180K	18PF, ±10%, Ceramic
C111	ECQ-S1471J	470PF, ±5%, Styrol
C112	ECC-D05180K	18PF, ±10% Ceramic
C113	ECV-1ZW20P12	Trimmer, LW Oscillator
C114~117	ECV-4RW12W13	Trimmer, AM, MB, SW ₁ & SW ₂ Oscillator
C118	ECC-D05390K	39PF, ±10%, Ceramic
C119	ECK-D05103M-Y	0.01µF, 50WV, ±20%, Ceramic Disc
C120	ECK-D05472M-Y	0.0047µF, 50WV, ±20%, Ceramic Disc
C121	ECK-D05472M-Y	0.0047µF, 50WV, ±20%, Ceramic Disc
C122	ECK-D05472M-Y	0.0047µF, 50WV, ±20%, Ceramic Disc
C123	ECC-D05220K	22PF, ±10%, Ceramic
C124	ECK-D05103M-Y	0.01µF, 50WV, ±20%, Ceramic Disc
C126	ECQ-M05104MZ	0.1µF, 50WV, ±20%, Polyester
C127	ECE-A6V30	30µF, 6 WV, Electrolytic
C128	ECE-A25V1	1µF, 25WV, Electrolytic
C129	ECE-A25V1	1µF, 25WV, Electrolytic
C130	ECE-A6V100	100µF, 6 WV, Electrolytic
C131	ECE-A25V1	1µF, 25WV, Electrolytic
C132	ECE-A6V200	200µF, 6 WV, Electrolytic
C133	ECQ-M05103MZ	0.01µF, 50WV, ±20%, Polyester
C134	ECQ-M05104MZ	0.1µF, 50WV, ±20%, Polyester
C135	ECQ-M05152MZ	0.0015µF, 50WV, ±20%, Polyester
C136	ECQ-M05104MZ	0.1µF, 50WV, ±20%, Polyester
C137	ECE-A25V1	1µF, 25WV, Electrolytic
C138	ECE-A6V500	500µF, 6 WV, Electrolytic
C139	ECE-B15V1000	1000µF, 15WV, Electrolytic
C141	ECE-A6V200	200µF, 6 WV, Electrolytic
C142	ECQ-M05152MZ	0.0015µF, 50WV, ±20%, Polyester
C143	ECQ-M05152MZ	0.0015µF, 50WV, ±20%, Polyester
C144	ECE-A10V500	500µF, 10WV, Electrolytic
C145	ECE-A10V500	500µF, 10WV, Electrolytic
C146	ECC-U05331K	330PF, ±10%, Ceramic
C147	ECQ-M05153MZ	0.015µF, 50WV, ±20%, Polyester
RESISTORS		
R1	ERD-14VK822	8.2KΩ, ¼Watt, ±10%, Carbon
R2	ERD-14VK181	180Ω, ¼Watt, ±10%, Carbon
R3	ERD-14VK222	2.2KΩ, ¼Watt, ±10%, Carbon
R4	ERD-14VK272	2.7KΩ, ¼Watt, ±10%, Carbon
R5	ERD-14VK103	10KΩ, ¼Watt, ±10%, Carbon
R6	ERD-14VK272	2.7KΩ, ¼Watt, ±10%, Carbon
R7	ERD-14TK104	100KΩ, ¼Watt, ±10%, Carbon
R8	ERD-14TK821	820Ω, ¼Watt, ±10%, Carbon
R9	ERD-14VK104	100KΩ, ¼Watt, ±10%, Carbon
R10	ERD-14TK101	100Ω, ¼Watt, ±10%, Carbon
R11	ERD-14VK821	820Ω, ¼Watt, ±10%, Carbon
R12	ERD-14VK222	2.2KΩ, ¼Watt, ±10%, Carbon
R13	ERD-14VK472	4.7KΩ, ¼Watt, ±10%, Carbon
R14	ERD-14VK221	220Ω, ¼Watt, ±10%, Carbon
R15	ERD-14VK391	390Ω, ¼Watt, ±10%, Carbon
R16	ERD-14VK101	100Ω, ¼Watt, ±10%, Carbon
R17	ERD-14VK182	1.8KΩ, ¼Watt, ±10%, Carbon
R18	ERD-14VK330	33Ω, ¼Watt, ±10%, Carbon
R19	ERD-14VK561	560Ω, ¼Watt, ±10%, Carbon
R20	ERD-14VK393	39KΩ, ¼Watt, ±10%, Carbon
R21	ERD-14VK101	100Ω, ¼Watt, ±10%, Carbon
R22	ERD-14VK182	1.8KΩ, ¼Watt, ±10%, Carbon
R23	ERD-14VK561	560Ω, ¼Watt, ±10%, Carbon
R24	ERD-14VK221	220Ω, ¼Watt, ±10%, Carbon
R25	ERD-14VK122	1.2KΩ, ¼Watt, ±10%, Carbon
R26	ERD-14VK331	330Ω, ¼Watt, ±10%, Carbon
R27	ERD-14VK102	1KΩ, ¼Watt, ±10%, Carbon
R28	ERD-14VK102	1KΩ, ¼Watt, ±10%, Carbon
R29	ERD-14TK472	4.7KΩ, ¼Watt, ±10%, Carbon
R30	ERD-14VK122	1.2KΩ, ¼Watt, ±10%, Carbon
R31	ERD-14VK472	4.7KΩ, ¼Watt, ±10%, Carbon
R32	ERD-14VK472	4.7KΩ, ¼Watt, ±10%, Carbon

Ref. No.	Part No.	Description
RESISTORS		
R33	ERD-14VK224	220K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R34	ERD-14VK122	1.2K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R35	EVL-TOAAO0B24	20K Ω (B), Indicator Control (FM)
R36	ERD-14VK474	470K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R37	ERD-14TK823	82K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R38	ERD-14VK563	56K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R39	ERD-14VK104	100K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R40	ERD-14VK122	1.2K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R41	ERD-14VK101	100 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R42	ERD-14VK222	2.2K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R43	EVL-TOAAO0B13	1K Ω (B), Indicator Control (AM)
R44	ERD-14VK102	1K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R45	ERD-14VK562	5.6K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R46	ERD-14VK122	1.2K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R47	ERD-14TK392	3.9K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R48	ERD-14VK101	100 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R49	ERD-14TK681	680 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R50	ERD-14VK220	22 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R51	ERD-14VK181	180 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R52	ERD-14VK331	330 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R53	ERD-14TK272	2.7K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R54	ERD-14VK334	330K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R55	ERD-14VK822	8.2K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R56	ERD-14VK122	1.2K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R57	EVC-BODL30D53	5K Ω (D), Volume Control W/ON-OFF Switch (S ₃)
R58	ERD-14VK473	47K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R59	ERD-14VK103	10K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R60	ERD-14VK472	4.7K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R61	ERD-14VK182	1.8K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R62	ERD-14VK470	47 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R63	ERD-14VK331	330 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R64	ERD-14VK272	2.7K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R65	EVL-TOAAO0B13	1K Ω (B), Bias Voltage Control
R66	ERD-14VK103	10K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R67	EVC-BOAL30A54	50K Ω (A), Bass Control
R68	ERD-14VK102	1K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R69	ERD-14VK103	10K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R70	ERD-14VK331	330 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R71	EVC-BOAL30A45	50K Ω (A), Treble Control
R72	ERD-14VK332	3.3K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R73	ERD-14VK823	82K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R74	ERD-14VK473	47K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R75	ERD-14VK392	3.9K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R76	ERD-14VK271	270 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R77	ERD-14VK152	1.5K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R78	ERD-14VK152	1.5K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R79	ERD-14VK121	120 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R80	ERD-14VK121	120 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R81	ERD-14TK273	27K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R82	ERW-12LKR47	0.47 Ω , 1/2 Watt, $\pm 10\%$, Wire
R83	ERW-12LKR47	0.47 Ω , 1/2 Watt, $\pm 10\%$, Wire
R91	ERD-14VK470	47 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R92	ERD-14VK221	220 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R93	ERD-14VK221	220 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R94	ERD-14TK472	4.7K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R95	ERD-14TK101	100 Ω , 1/4 Watt, $\pm 10\%$, Carbon
R96	ERD-14VK562	5.6K Ω , 1/4 Watt, $\pm 10\%$, Carbon
R97	ERD-14TK472	4.7K Ω , 1/4 Watt, $\pm 10\%$, Carbon
COILS AND TRANSFORMERS		
L1	RLQ-Y25S-2	FM Choke Coil
L2	RLQ-Y11G-1	FM Choke Coil
L3	RLQ-Y25S-2	FM Antenna Coil
L4	RLD-4N7	FM Detector Coil
L5	RLD-4N4	FM Detector Coil
L6	RLD-4010	FM Oscillator Coil
L7	RLQ-Y72S-1	FM Coupling Choke Coil
L8, L9	RLF-6H3	LW, AM Antenna Coil
L10, L11	RLF-3H1	MB, SW ₁ Antenna Coil
L12	RLA-3P24	SW ₂ Antenna Coil
L13	RLD-2P2	AM Detector Coil
L14	RLD-3P5	MB Detector Coil
L15	RLD-3P6	SW ₁ Detector Coil
L16	RLD-3P7	SW ₂ Detector Coil
L17	RLO-1P14	LW Oscillator Coil
L18	RLO-2P54	AM Oscillator Coil
L19	RLO-3P83	MB Oscillator Coil

MODEL RF-3000

Ref. No.	Part No.	Description
COILS AND TRANSFORMERS		
L ₂₀	RLO-3P84	SW ₁ Oscillator Coil
L ₂₁	RLO-3P85	SW ₂ Oscillator Coil
L ₂₂	RLQ-X121-1	Choke Coil
T ₁	RLI-4B113-T	FM 1st IF Transformer, Primary
T ₂	RLI-4B351-T	FM 1st IF Transformer, Secondary
T ₃	RLI-4C204	FM 2nd IF Transformer, Primary
T ₄	RLI-4C204	FM 2nd IF Transformer, Secondary
T ₅	RLI-4C204	FM 3rd IF Transformer,
T ₆	RLI-4C204	FM 4th IF Transformer
T ₇	RLI-4C506	FM 5th IF Transformer, Primary
T ₈	RLI-4C507	FM 5th IF Transformer, Secondary
T ₉	RLI-2B117	AM 1st IF Transformer
T ₁₀	RLI-2C256-M	AM 2nd IF Transformer
T ₁₁	RLT-3G19	Input Transformer
C. F.	EFC-D455K5	Ceramic Filter
SPEAKERS AND EARPHONE		
SP ₁	EAS-12P16SE	12cm (5") PM Dynamic Speaker
SP ₂	EAS-10P70SB	10cm (4") PM Dynamic Speaker
EP	EAE-1TB	Magnetic Earphone
SWITCHES		
S _{1-1~1-14}	RSR-12	Band Selector Switch
S ₂	RSS-91	AFC Switch
S ₄	RSH-6-2	Dial Light Switch
MISCELLANEOUS		
	RVL-408	Neon Lamp, Arrester, 0.3A
	RVL-207	Dial Light, 6V 0.04A (3 Req'd)
	RVL-207-3	Dial Light, 6V 0.04A (3 Req'd)
	RJP-3-1	Plug, Phono & Recorder (2 Req'd)
	RJJ-13-1	Jack, Phono
	RJJ-25	Jack, MPX OUT, Stereo Input Recorder & Earphone
	RJT-318	Terminal, Whip Antenna
	RJF-3407-1	Jack, EXT FM, AM Antenna & Ground
	RJF-3107	Jack, EXT FM Antenna
	RJF-3306	Socket, Battery
	RKE-84	Cover, AC-DC Selector Switch
	RGK-487	Indicating Plate, AC-BATT Mark
	RJP-4-1	Plug, Power Source
	RJC-102	Terminal, Battery (2 Req'd)
	RJC-502	Spring, Battery (2 Req'd)
	RMA-246	Bracket, Core Antenna
	RMS-10	Bracket, Speaker (2 Req'd)
	RMM-19	Bracket, Tuning Indicator (2 Req'd)
	RMY-22	Heat Sink, Transistor (TR ₁₆ & TR ₁₇)
	RMY-1-3	Heat Sink, Transistor (TR ₁₁)
	RDT-5252	Shaft, Tuning
	RDX-804	Shaft, Drum (RDD-3050)
	RDX-602-2	Shaft, Tone Indicator, Large (2 Req'd)
	RDD-3050-1	Drum, Band Selector
	RDD-36-1	Drum, Dial, Black (2 Req'd)
	RDD-28-3	Drum, Dial, White (2 Req'd)
	RDR-8	Pulley, Dial Cord, Large (5 Req'd)
	RDR-14	Pulley, Dial Cord, Small (2 Req'd)
	RDY-2	Shaft, Pulley, Long (6 Req'd)
	RDY-4	Shaft, Pulley, Short (2 Req'd)
	RDG-9003	Gear, Band Selector (with shaft)
	RDG-9602	Gear, Band Selector
	RDE-3	Shaft, Tone Indicator, Small (4 Req'd)
	RDE-41	Shaft, Gear (RDG-9602)
	RDH-232	Plate, Tone Indicator
	RDS-205	Spring, Tone Indicator (2 Req'd)
	RDS-309	Spring, Band Selector
	RDS-409	Spring, Dial (2 Req'd)
	RDZ-05-3	Cord, Tone Indicator & Dial, 190cm (75")
	RDZ-07-1	Cord, Band Selector, 140cm (55 1/8")
	RGK-9010	Indicating Plate, Volume Control
	⊕B3-6V	Screw, Jack (RJF-3407) M'tg. (3 Req'd)
	⊕B3-8V	Screw, Handle M'tg. (2 Req'd)
	⊕B3-8N	Screw, Cabinet Back Cover M'tg. (6 Req'd)
	DSTR3-10R	Red Screw, Chassis M'tg. (6 Req'd)
	L3-5.5	Screw, Dial Drum (RDD-28-3) & Gear (RDG-9003) M'tg. (4 Req'd)

MODEL RF-3000

Ref. No.	Part No.	Description
MISCELLANEOUS		
	RNE-213 RNW-424 RHG-5-1 RHG-202	Screw, Shaft (RDX-602-2) M'tg. (2 Req'd) Washer, Tone Indicator (3 Req'd) Rubber Cushion, FM RF P. C. Board M'tg. (3 Req'd) Rubber Cushion, Dial Light (6 Req'd)
APPEARANCE		
	RYA-2532 RKM-1960 RYF-351 RKF-1551 RYF-361 RKF-1581 RKK-300 RYN-190 RKK-290 RKF-1560 RKF-1570 RJK-1604 RKH-5010 RKT-22 RYE-40 RGE-9001-2 RGE-55 RGP-1930 RGM-1700 RGB-319 RGB-334 RGB-318 RGT-1043 RGX-422 RGX-423 RGX-424 RGX-425 RGX-426 RGX-426 RGK-273 RGK-279 RGK-280 RBN-192 RBS-40 RBT-129 RHG-305-3 RDP-213 RDP-214 RUV-244-1 RMA-194 RMA-195 RSA-26 RANT145-7TA R-111DB	Cabinet (Complete) Cabinet Only, Plastic Cover (Complete), Cabinet Back Cover Only, Cabinet Back Cover (Complete), Cabinet Front Cover Only, Cabinet Front Cover Only, Battery Compartment Cover (Complete), AC Cord Box Cover Only, AC Cord Box Cover Only, Right Side of Cabinet Cover Only, Left Side of Cabinet Case, Battery Handle, Cabinet Bracket, Handle Scale (Complete) Time table World Time Map Panel, Dial Metal Grille Badge, NATIONAL PANASONIC Mark, Cabinet Front Cover Badge, RF-3000 Mark, Cabinet Front Cover Badge, NATIONAL PANASONIC Mark Name Plate Ornament, Lower Side of Metal Grille Ornament, Upper Side of Metal Grille Ornament, Upper Side of Cabinet Ornament, Right Side of Cabinet Ornament, Left Side of Cabinet Ornament, Indicator Mark Indicating Plate, LIGHT & AFC Mark Indicating Plate, MPX, AM ANT, REC OUT & PHONO Mark Indicating Plate, EARPHONE & FM ANT Mark Knob, Volume, Bass, Treble & Fine Tuning Knob, Band Selector Knob, Tuning Stand, Cabinet (4 Req'd) Pointer, Dial Pointer, Tone Indicator (2 Req'd) Box, AC Cord Bracket, Frame Antenna, Small (2 Req'd) Bracket, Frame Antenna, Large (2 Req'd) Frame Antenna Whip Antenna Tuning Indicator

MODEL RF-3000

AC ADAPTOR

MODEL RD-9430

FOR RADIO MODEL RF-3000

SPECIFICATIONS

Input Voltage:	AC 50 or 60c/s 110V/200V/225V 250V
Output Voltage:	DC 9V
Maximum Current:	300mA
Power Consumption:	7W
Dimensions:	60 (Wide) x 70 (High) x 71 (Deep) mm (2 1/8" x 2 3/4" x 2 7/8")
Weight:	700g. (1 1/2 lb.)

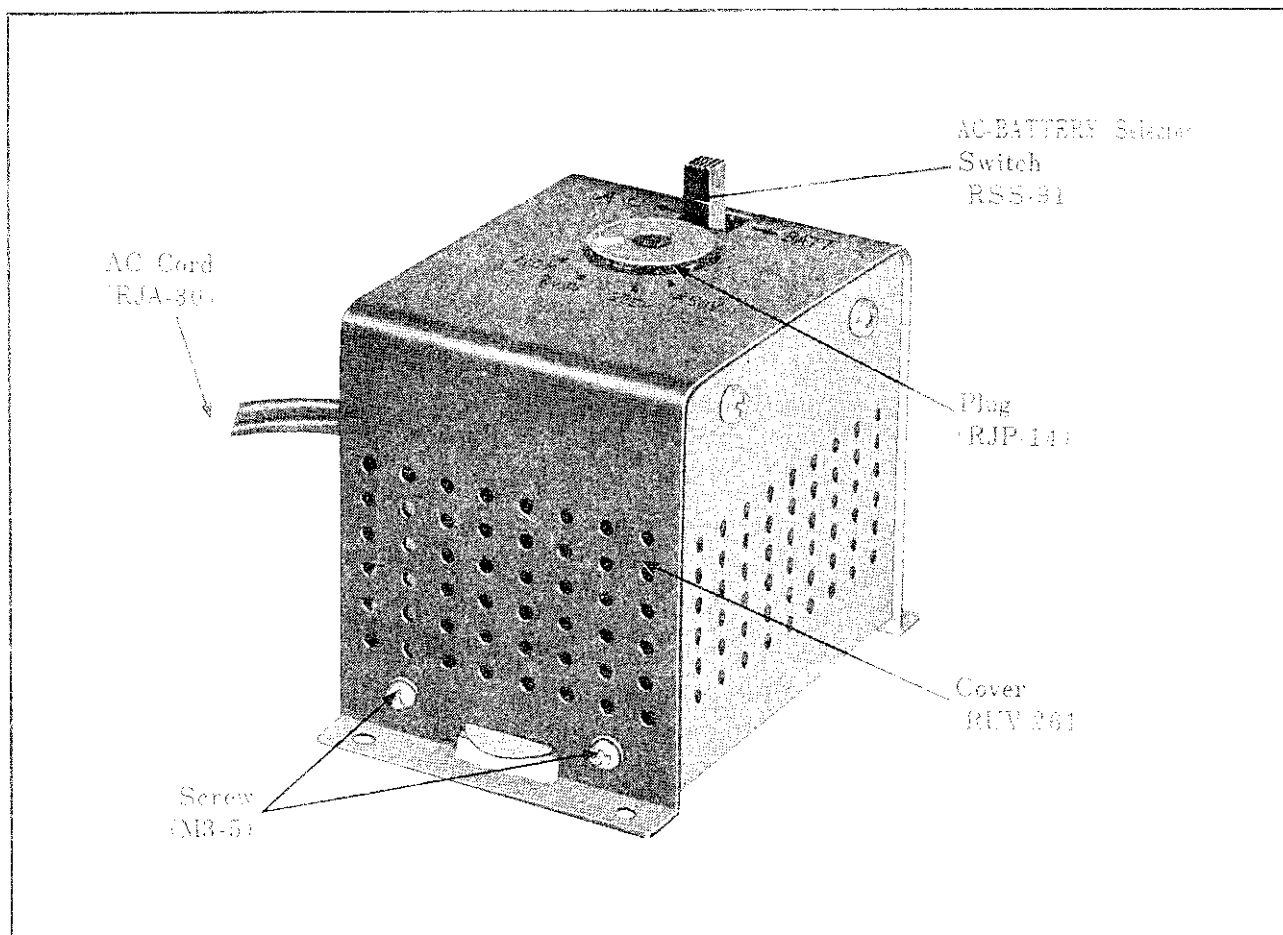


Fig. 21 Appearance - Parts Identification.

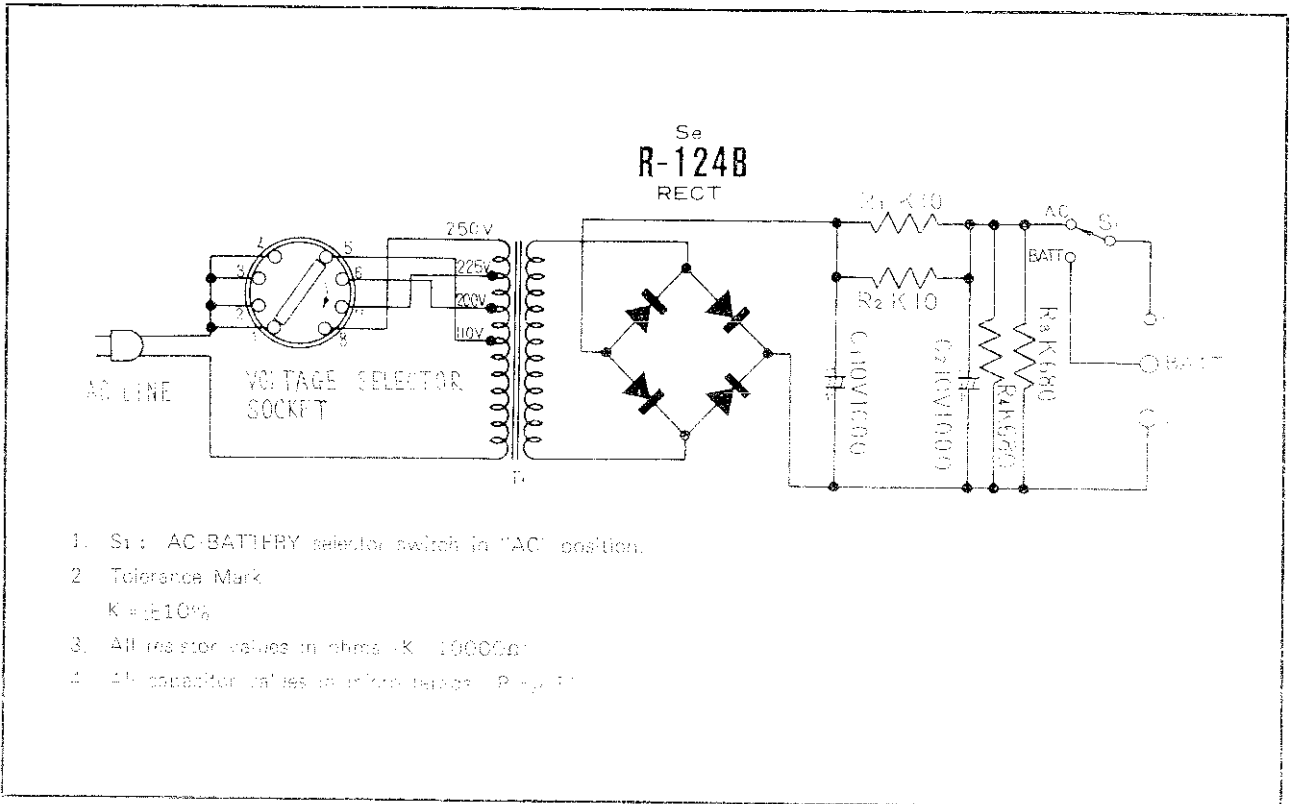


Fig. 22 Schematic Diagram.

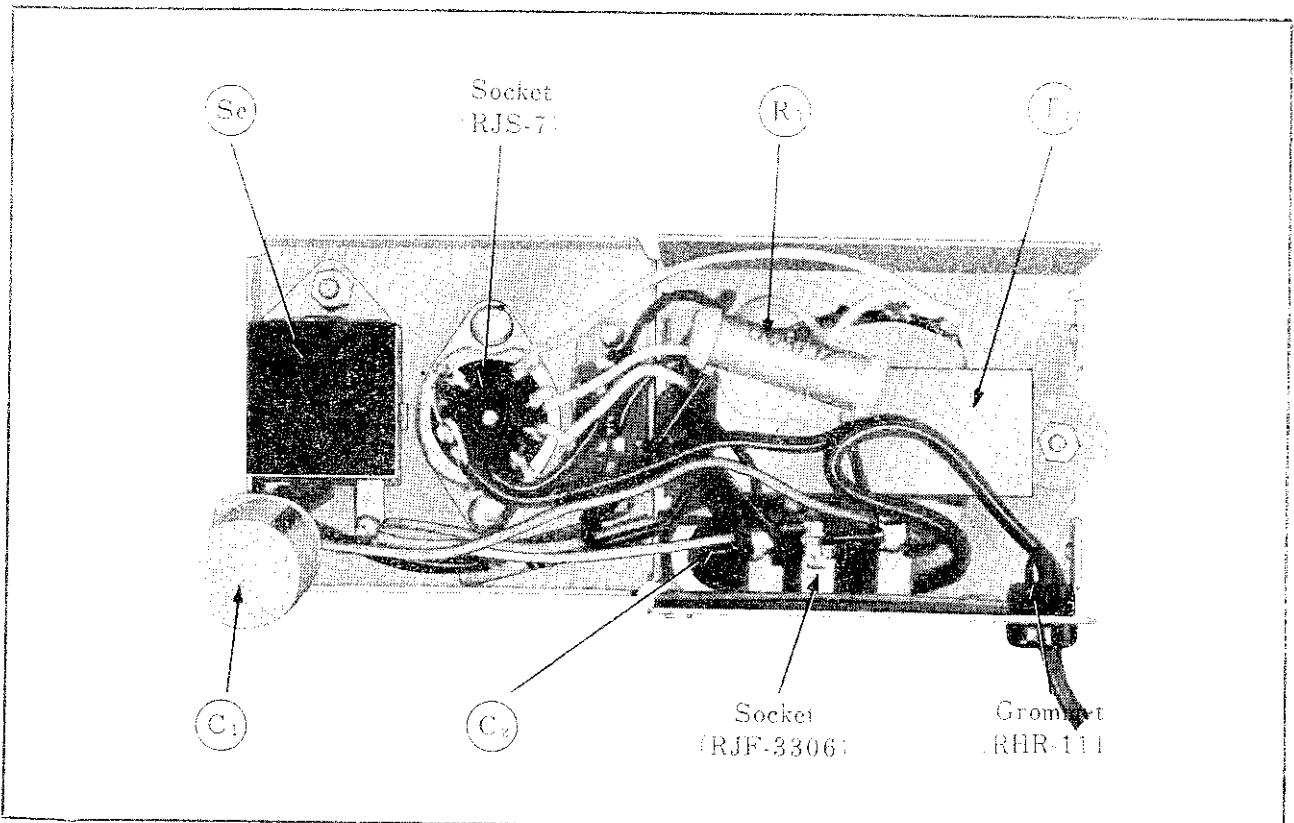


Fig. 23 Component View - Parts Identification.

MODEL RF-3000

REPLACEMENT PARTS LIST

**AC ADAPTOR
FOR
MODEL RD-9430**

Ref. No.	Part No.	Description
SELENIUM		
Se	R-204B	Rectifier
CAPACITORS		
C1, C2	ECE-A10V1000H	1000 μ F, 10WV, Electrolytic
RESISTORS		
R1, R2 R3, R4	ERD-14TK100 ERD-14TK681	10 Ω , $\frac{1}{4}$ Watt, $\pm 10\%$, Carbon 680 Ω , $\frac{1}{4}$ Watt, $\pm 10\%$, Carbon
TRANSFORMER		
T1	RLT-5K11	Power Transformer
SWITCH		
S1	RSS-91	AC-BATTERY Selector Switch
APPEARANCE & MISCELLANEOUS		
	RJP-4-1 RJP-14 RJP-58 or RJP-62 RJP-9014 RUV-15-1 RJS-7 RJA-30 RJF-3306 RUV-261 RHR-111 M3-5	Plug, Power Source Plug, Voltage Selector Plug, AC Cord Plug, EXT Power Source Cover, AC-BATTERY Selector Switch Socket, Voltage Selector AC Cord, Power Source Socket, Power Source Cover, Adaptor Grommet, AC Cord Screw, Cover M'tg. (RUV-261)