FUJI HEAVY INDUSTRIES GENUINE RADIO

SERVICE MANUAL

MODEL RF-1301-04

CLARION SHOJI. CO., LTD.
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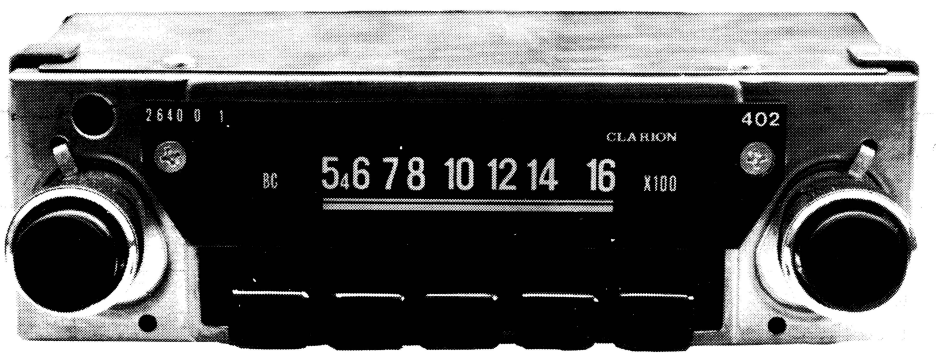


* SPECIFICATIONS:

Circuit system	Superhetrodyne
Tuning system	μ-tuning, 5 push-buttons
Receiving range	530 ~ 1605KHz
Intermediate frequency	262.5KHz
Maximum sensitivity	Less than 20dB (at 0.5W output)
Normal sensitivity	Less than 30dB (at 20dB S/N ratio)
Selectivity	Better than 20dB (at ±10kHz frequency separation)
Image ratio	Better than 54dB
Fiedlity	100Hz High −2±3dB (−1±3dB) Low +2±3dB (+3±3dB) 400Hz 0dB 4000Hz High −13±5dB Low −28±5dB
Load impedance	8Ω (or 4Ω)
Power output	More than 2.5W. (More than 3.0W) (at less than 10% distortion)
Maximum output	More than 3.5W (more than 5.0W)
Power requirements	13.2V DC (standard voltage), ⊖ ground only
Current consumption	Less than 0.5A (0.8A)
Weight	0.8Kg
Dimensions	160W x 50H x 80D m/m

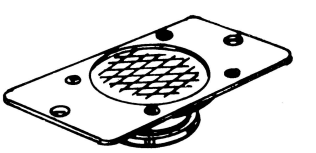
NOTE: Figures within ( ) are for 4Ω load.

Semiconductors	TRansistors − 7, diodes − 2	
	RF amplifier	2SA355 x 1
	Frequency converter	2SA354 x 1
	IF amplifier	2SA353 x 1
	Demodulator	1N34A x 1
	AF amplifier	2SC458 x 1
	AF amplifier	2SB77 x 1
	Power amplifier	2SB367 x 2
	A G C	1N34A x 1

* CONPONENT VIEW:

Main unit 1 Set

SPA-487-301 Speaker Ass'y ×1



925-0058-00 Parts Kit x1

380-3430-00
Knob ×2

380-3431-00
Knob ×2

Printed in Japan 298-173I-00

RF-130I

722-0231-00 ×2 Special nut

745-0430-01 ×2 Special washer

* FEATURES:

- Ultra-small car radio.
  Compact, solid-state car radio.
- SEPP-OTL system provides beautiful tone.
  Since an SEPP-OTL system is employed in the power amplifier, beautiful tone and ample volume are provided.
- Use of a highly sensitive AGC circuit ensures stable reception unaffected by variation in field strength even when the car is driven between high buildings or in mountainous districts.
- Silicon transistors increase stability
  Since silicon transistors amply resistant to heat and cold are employed in the audio amplifier, stable operation is always displayed over a wide temperature range.

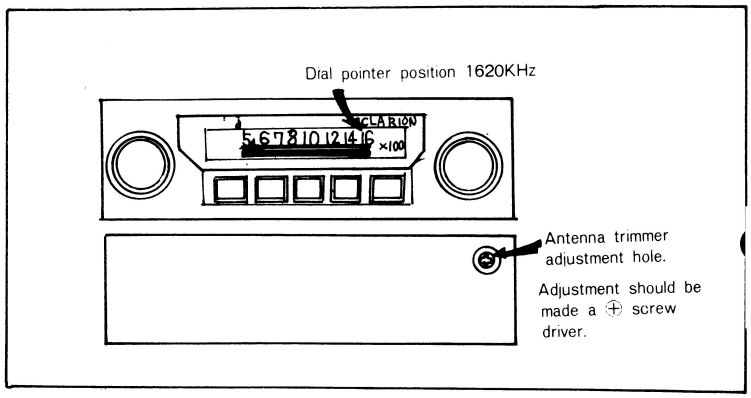
* ADJUSTMENT OF ANTENNA TRIMMER

Antenna trimmer should be adjusted on the following occasions. It affects the sensitivity of receiver.

A. When installing the radio or after repairing it.
B. When antenna or antenna cord is replaced.
C. When car radio sensitivity is bad and noise is prominent

Method of adjustment

Keep volume and tone controls to maximum, set dial pointer to receive a weak broadcast near the right end of dial (1620KHz) and adjust antenna trimmer screw for maximum volume of sound (maximum sensitivity). ((Refer to Fig. 1).



NOTE:
In case there is no broadcast near 1620KHz, adjust for maximum white noise (hissing noise).

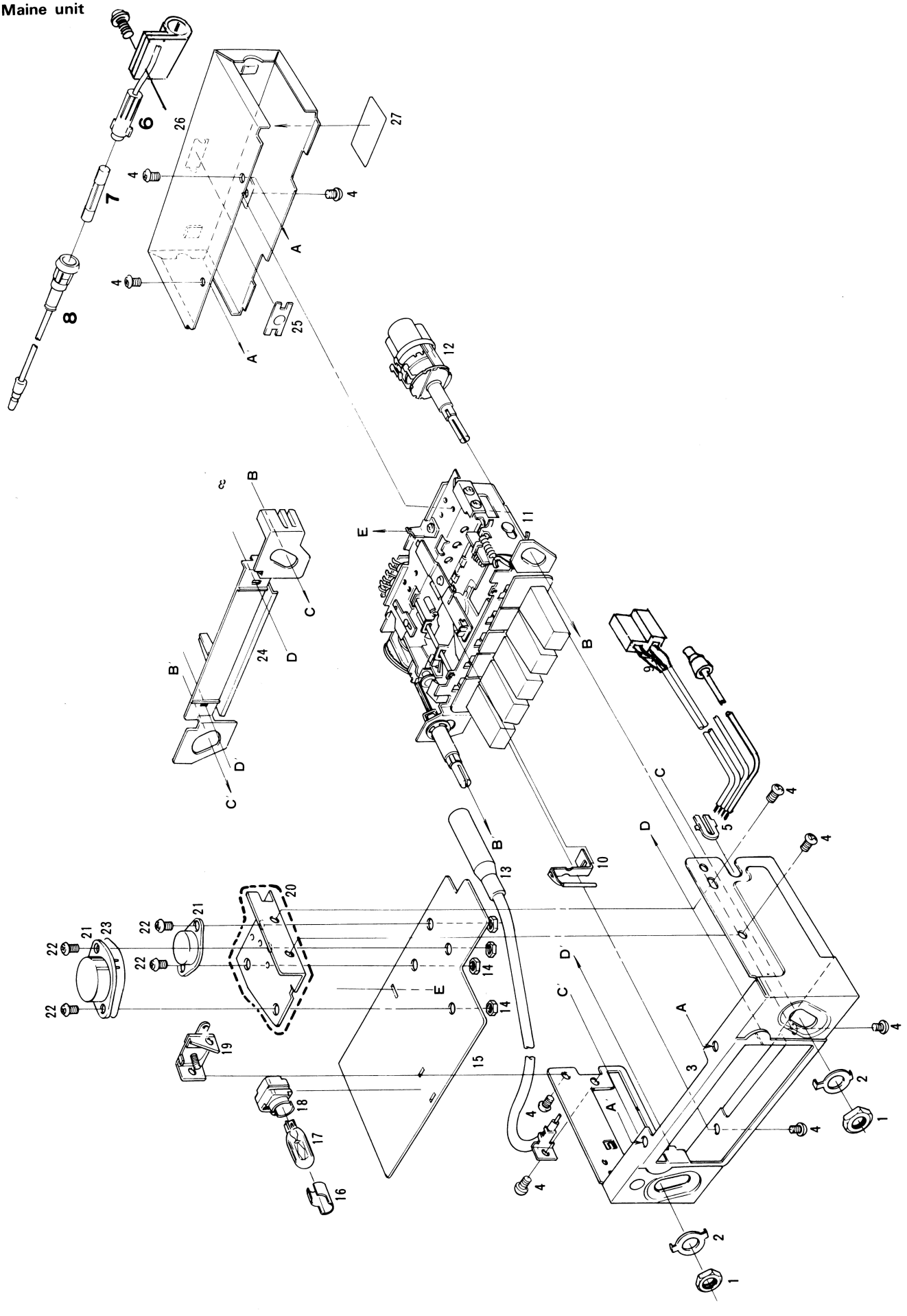
* TROUBLE SHOOTING:

Symptom	Defective circuit	Place and cause of defect	Checking method
Set does not operate at all	Power supply circuit	○ 012-3160-00 (VR) switch contacts defective. or switch construction defective	Check continuity using a multimeter
		○ Choke transformer 009-0530-00 open or leads soldering defective	Check transformer's input and output terminal voltage
		○ C_{17}, C_{20} short	Check continuity
		○ R_{18} open or soldering defective	Check voltage at both ends of R_{18}
		○ C_{23} (by-pass capacitor) short or soldering defective	Check continuity
	Output circuit	○ Speaker voice coil open	Check continuity
		○ Q_6, Q_7 defective (open or short)	Check voltage at transistor terminals
		○ C_{21} short or soldering defective	Check continuity
		○ C_{22} (by-pass capacitor) short or soldering defective	Check continuity
	AF Circuit	○ 006-0740-00 primary side open	Check continuity
		○ Q_4, Q_5 defective	Check transistor's terminal voltage
		○ C_{16} open	Check continuity
		○ 012-3160-00 (VR) contacts defective	Short the signal line. If sound comes, VR defective. (Check the value of resistance between both terminals of VR, keeping detector outout off).
	Detector circuit	○ D_1 1N34A open	Check continuity
		○ 050-0020-00 defective	Check continuity
		○ 005-0670-00 (005-0691-0) IFT secondary side open	Check continuity
	RF and IF circuit	○ Q_1, Q_2, Q_3 defective	Check transistor voltage
		○ 005-0660-00 (005-0690-00) IFT_1, 005-0670-00 (005-0691-00) IFT_2 open	Check continuity
		○ Push-button tuner's coil(s) open	Check continuity

Symptom	Defective circuit	Place and cause of defect	Checking method
Insufficient sound or poor sensitivity	AF and output circuit	○ Capacity drop in C_{16}, C_{21}	Check the part (check by adding a new capacitor)
		○ C_{22} open or its capacity dropped	Check the part (check by adding a new capacitor)
		○ Change in resistance value of R_{15}, R_{17}, R_{19}	Check transistor voltage
		○ Q_4, Q_5, Q_6, Q_7 deteriorated	Check the parts
	RF, IF and detector circuit	○ D_1 1N34A deteriorated	Check the value of resistance with a multimeter
		○ R_2, R_3, R_4, R_5, R_9 open or their resistance varues changed	Check voltage
		○ Capacity drop in C_4, C_5, C_{11}, C_{13}	Check the part (check by adding a new capacitor)
		○ C_3, C_6 open or their capacity dropped	Check the part (check by adding a new capacitor)
		○ Capacity change in C_9	Check the part (check by adding a new capacitor)
		○ Adjustment of C_1, C_5, C_{10} defective	Adjust
		○ Dust core of ANT coil and RF coil in push-button tuner damaged	Check the coils visually
		○ Series coil in antenna receptacle 092-0430-01 open or soldering devective	Check continuity
Distorted sound	Output circuit	○ Q_6, Q_7 deteriorated	Check the parts
		○ C_{16}, C_{19} short	Check continuity, check voltage
		○ R_{20}~R_{23} open or their resistance value changed	Check voltage
		○ 006-0740-00 secondary side short or open	Check voltage
	AF circuit	○ R_{13}, R_{14}, R_{16} open or their resistance value changed (because Q_4 and Q_5 are direct-coupled)	Check voltage
	AGC circuit	○ R_2, R_{11} open or their resistance value changed (When the input is excessively large, AGC does oot work and sound is distorted)	Check continuity
		○ C_{14} open or its capacity dropped	
Set oscillates	Power supply circuit	○ Capacity drop in C_{17}, C_{20} (low frequency oscillations)	Check by adding new capacitor
		○ Change in the value of R_{18} (oscillators caused by variations in power source voltage)	Check each voltage
		○ Capacity drop in C_{12} (high frequency feed-back to AGC circuit causes oscillations)	Check by adding a new capacitor
		○ C_{13} open or its capacity dropped	

* EXPLODED VIEW:

⊙Maine unit

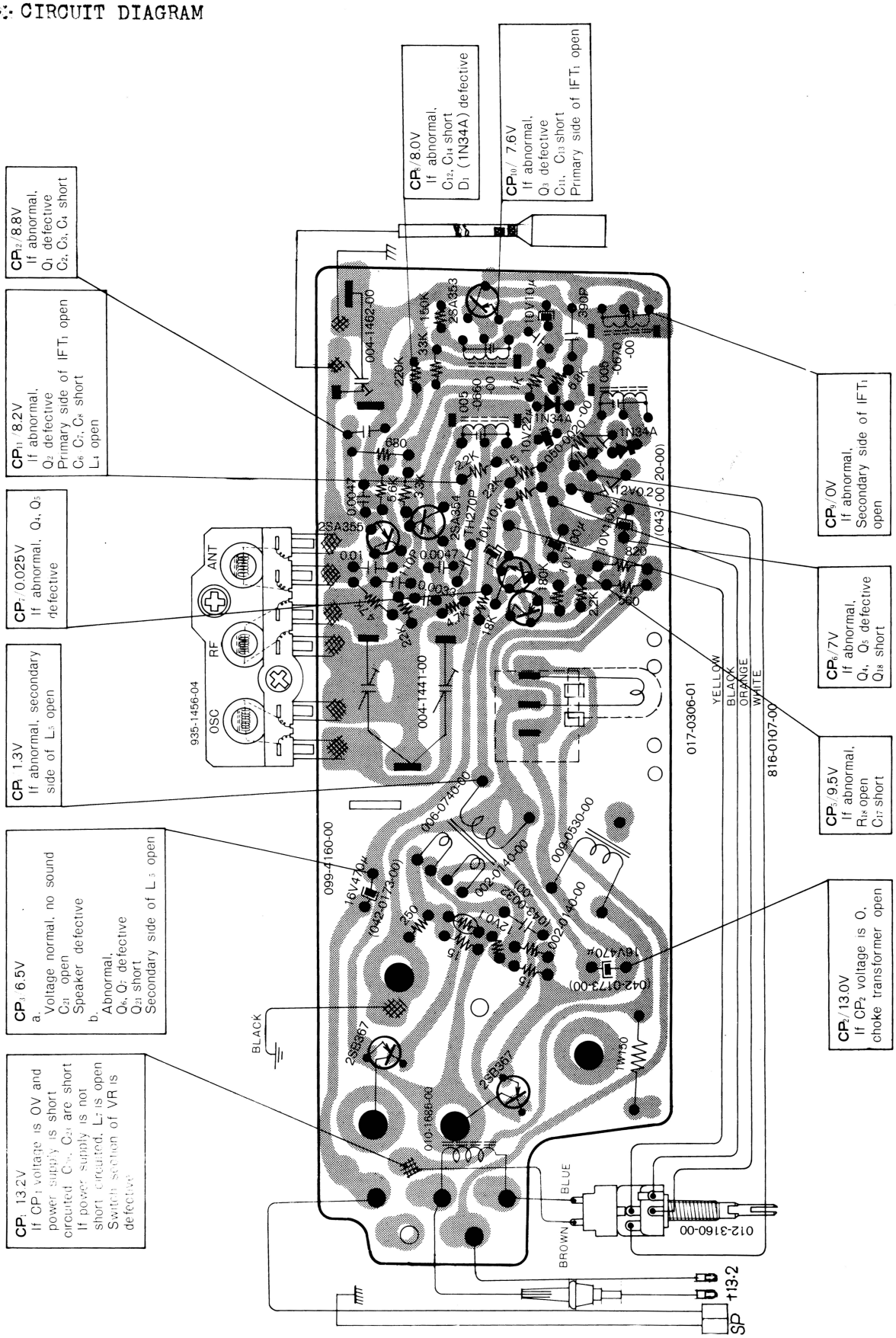


＊PARTS LIST: ⊙Maine unit (Refer to disassembly diagram: Grey portions in the parts list designate assemblies)

REF.NO.	PART NO.		P.C.S
1	722-0231-00	Special nut	2
2	330-4571-00	Pressed part	2
3	308-0742-03	Front cover	1
4	731-3006-80	Tap tight (M3×6)	9
5	335-0580-00	Molded part	1
6	850-1822-00	A-lead	1
7	120-0010-00	Fuse (1A)	1
8	850-1620-02	A-lead	1
9	851-1660-00	Speaker lead	1
10	376-0754-01	Dial pointer	1
11	935-1456-00	3-Coil push button tuner	1
12	012-3160-00	Variable resistor	1
13	092-0431-00	Antenna receptacle	1
14	725-0182-00	Plate nut	4
15	099-4160-00	Printed wiring board	1
16	330-5002-00	Pressed part	1
17	017-0306-01	Pilot lamp	1
18	070-0927-01	Pilot lamp socket	1
19	004-1462-00	Trimmer	1
20	944-0405-01	Filter assembly	1
21	2SB367	Transistor	2
22	716-0243-00	Special screw	4
23	078-0001-00	Insulater sheet	1
24	374-0651-00	Back plate	1
25	725-0161-01	Plate nut	1
26	310-0652-00	Upper case	1
27	286-3678-00	Set plate	1
28	010-1686-00	Coil	1
29	816-0107-00	Special lead	1
30	042-0173-00	Special capacitor	2
31	180-1074-22	Electrolytic capacitor	2
32	180-1064-22	Electrolytic capacitor	2
33	180-2264-22	Electrolytic capacitor	1
34	009-0530-00	Choke coil	1
35	006-0740-00	Input transformer	1
36	004-1441-00	Trimmer	1

REF.NO.	PART NO.	DESCRIPTION	P.C.S
37	005-0670-00	IF transformer	1
38	005-0660-00	IF transformer	1
39	002-0140-00	Termistor	2
40	001-0010-00	Diode (1N34A)	2
41	050-0020-00	IF transformer	1
42	2SA355	Transistor	1
43	2SA354	Transistor	1
44	2SB77	Transistor	1
45	2SC458	Transistor	1
46	2SA353	Transistor	1
C_{15}	043-0020-00	Special capacitor (12V0.2μF)	1
C_{19}	043-0039-00	Special capacitor (0.1μF)	1
C_7	141-3323-12	Polyester capacitor (50V0.0033μF)	1
$C_{2,8}$	141-4722-12	Polyester capacitor (50V0.0047μF)	2
$C_{3,11}$	141-1033-12	Polyester capacitor (50V0.01μF)	2
C_4	141-3933-12	Polyester capacitor (50V0.039μF)	1
C_5	144-1112-14	Maica capacitor (50V110PF)	1
C_{14}	144-3912-17	Maica capacitor (50V390PF)	1
C_9	156-2711-50	Ceramic capacitor (270PFTH)	1
$R_{21,23}$	110-2511-41	Solid resistor (½W250Ω±5%)	2
$R_{20,22,15}$	111-1501-32	Film resistor (¼W15Ω±5%)	3
R_{19}	111-5611-32	Film resistor (¼W560Ω±5%)	1
R_4	111-6811-32	Film resistor (¼W680Ω±5%)	1
R_{18}	111-8211-32	Film resistor (¼W820Ω±5%)	1
R_{12}	111-1021-32	Film resistor (¼W1KΩ±5%)	1
$R_{7,17}$	111-2221-32	Film resistor (¼W2.2KΩ±5%)	2
R_6	111-3321-32	Film resistor (¼W3.3KΩ±5%)	1
$R_{1,8}$	111-4721-32	Film resistor (¼W4.7KΩ±5%)	2
R_2	111-5621-32	Film resistor (¼W5.6KΩ±5%)	1
R_{11}	111-6821-32	Film resistor (¼W6.8KΩ±5%)	1
R_{16}	111-1831-32	Film resistor (¼W18KΩ±5%)	1
$R_{5,13}$	111-2231-32	Film resistor (¼W22KΩ±5%)	2
R_{10}	111-3331-32	Film resistor (¼W33KΩ±5%)	1
R_9	111-1541-32	Film resistor (¼W150KΩ±5%)	1
R_{14}	111-1841-32	Film resistor (¼W180KΩ±5%)	1
R_3	111-2241-32	Film resistor (¼W220KΩ±5%)	1

CIRCUIT DIAGRAM

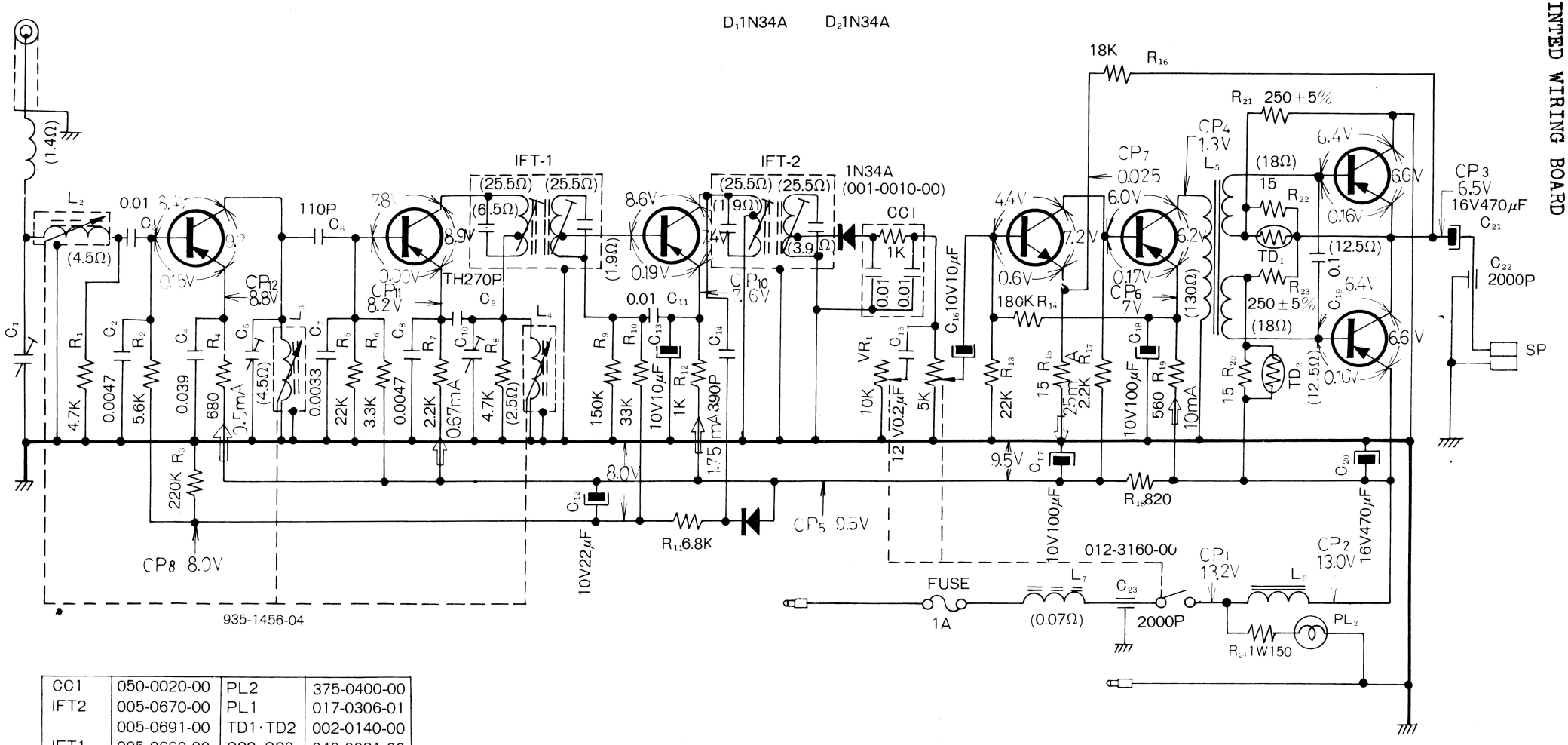


NOTE:
- CP denotes Check Point. (Voltage values are between ground and that point)
- Voltage values may vary by ±10% from set to set. (excluding CP1, CP2)
- An easy method of checking whether the set is operating or not is to touch the printed pattern (especially at base or collector of transistors) ; if click sound is heard from the speaker, the set is operating. Start checking from the audio circuit and proceed on to the RF circuit.

※ PRINTED WIRING BOARD

Q_1:2SA355 Q_2:2SA354 Q_3:2SA353 Q_4:2SC458 Q_5:2SB77 Q_6:2SB367 Q_7:2SB367

$D_1$1N34A $D_2$1N34A



CC1	050-0020-00	PL2	375-0400-00
IFT2	005-0670-00	PL1	017-0306-01
	005-0691-00	TD1·TD2	002-0140-00
IFT1	005-0660-00	C22·C23	040-0081-00
or	005-0690-00	C20·C21	042-0173-00
L7	010-1686-00	C19	043-0039-00
L6	009-0530-00	C15	043-0020-00
L5	006-0740-00	C5·C10	004-1441-00
L1	092-0431-00	C1	004-1462-00
REF.NO	PART.NO	REF.NO	PART.NO

Note) ( ) indicates direct current resistance of L and numerical value is for each parts. Resistance value of thermistor was measured at 25°C, voltage and current value were measured when no signal was made.
Using Tester : Internal Resistance 4KΩ / V

WEAK - DISTORTED AUDIO
Q2 LEAKING

RF-130I