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**ROTEL**

**Model RX-400A**

AM/FM Stereo

Solid State Receiver

**Technical Manual**

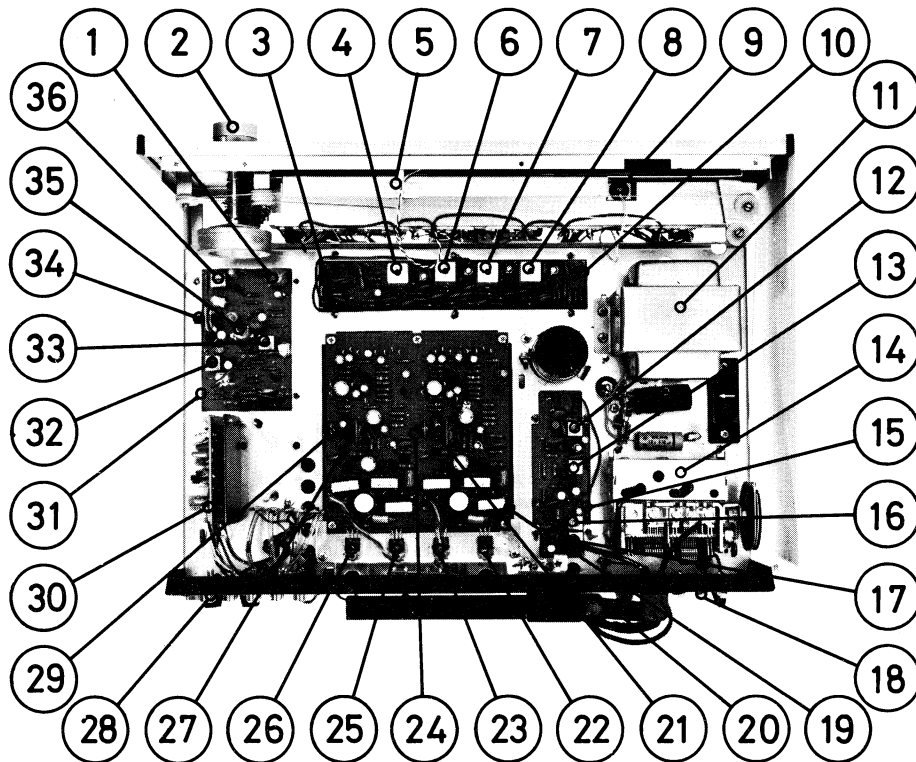
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**ROTEL**

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# CHASSIS LAYOUT

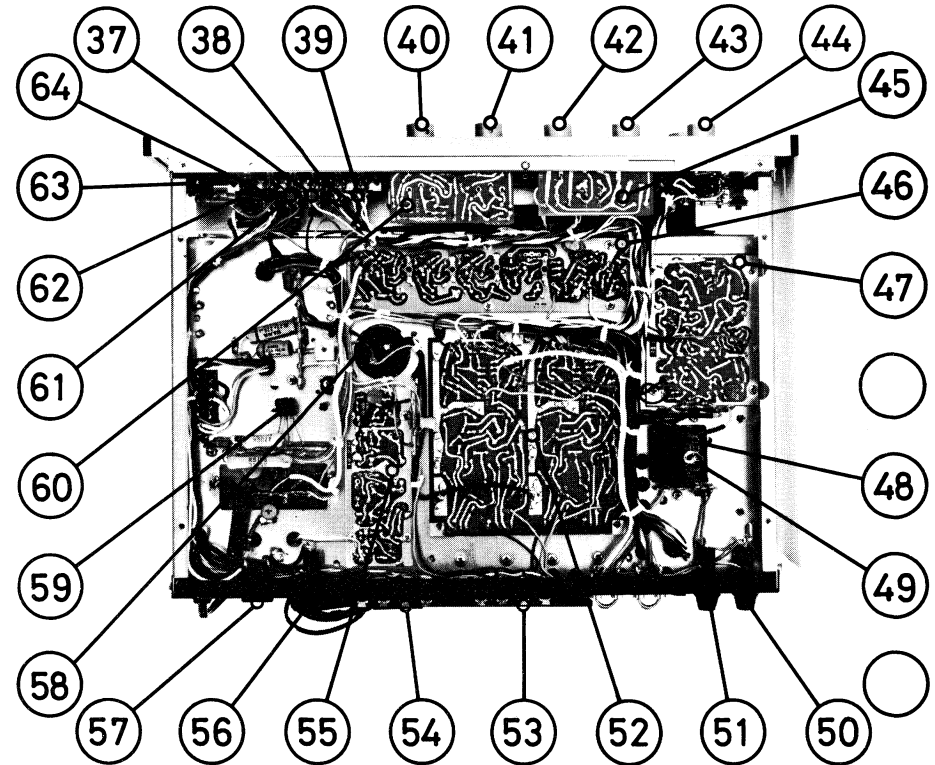
Top View



1. L303, SCA Trap, 72KHz
2. Tuning
3. VR102, FM Mono-Stereo Switching Level Adj.
4. T104, FM IFT, Ratio
5. Dial Pointer
6. T103, FM IFT, 4th
7. T102, FM IFT, 3rd
8. T101, FM IFT, 2nd
9. FM-Stereo Indicator
10. FM IF Amp. PCB
11. T901, Power Transformer
12. T203, AM IFT, 3rd
13. T202, AM IFT, 2nd
14. AM/FM Front end
15. AM Conv. and IF Amp. PCB
16. T201, AM IFT, 1st
17. L201, AM OSC Coil
18. Antenna Terminal
19. Pre, Main Amp. PCB
20. L901, AM Antenna Coil
21. VR601, DC Balance Adj., R-ch.

22. Tr610, Power Amp., R-ch.
23. Tr609, Power Amp., R-ch.
24. VR602, Idling Current Adj., R-ch.
25. Tr510, Power Amp., L-ch.
26. Tr509, Power Amp., L-ch.
27. VR501, DC Balance Adj., L-ch.
28. Input Terminal
29. VR502, Idling Current Adj., L-ch.
30. Equalizer Amp. PCB
31. FM-Stereo (MPX) PCB
32. T302, MPX Trans., 38KHz
33. T301, MPX Trans., 19KHz
34. VR301, Separation Adj.
35. L302, SCA Trap, 67KHz
36. L301, MPX Coil, 19KHz
37. Mode switch
38. Tape Monitor switch
39. Loudness switch
40. VR702, Bass control
41. VR701, Treble control
42. VR801, Balance control
43. VR802, Volume control

Bottom View



44. Func. Selector switch
45. Volume control PCB
46. FM IF Amp. PCB
47. FM-Stereo (MPX) PCB
48. C908
49. C909
50. F902, Speaker Fuse, R-ch.
51. F901, Speaker Fuse, L-ch.
52. Pre, Main amp. PCB
53. Output Terminal, R-ch.
54. Output Terminal, L-ch.
55. AM Conv. and IF Amp. PCB
56. F903, AC Fuse
57. AC Outlet
58. C907
59. D902, Rectifier
60. Tone control PCB
61. Speaker-2 switch
62. Power switch
63. Phone Jack
64. Speaker-1 switch

## PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacement for output and driver transistors, if necessary, must be made from the same data group as the original type.
4. If one output transistor burns out (open or short) always remove all output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohm-meter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, ..... for they may cause transistor failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

## PREDRIVER/DRIVER ADJUSTMENT

1. Set Balance, Bass and Treble controls to mid-position.
2. Set Mode switch to "STEREO", Speaker switch to "ON", and Func. Selector switch to "AUX" position.
3. Connect 8-ohm, 50-watts resistor across Left channel speaker terminals. In parallel with the load resistor, connect the vertical input leads of the oscilloscope.
4. Connect an audio generator, set for 1,000Hz (sine wave), to Left channel AUX input.
5. Connect AC power cord and rotate volume control to clockwise position (full volume). Increase generator output until sine wave on scope just starts clipping. Adjust DC Balance potentiometer VR501 (on Pre, Main Amp. PCB) for equal clipping on the positive and negative half cycles of the signal. See Fig. 1.
6. Adjust idling current using a DC milli-volt meter, DC milli-volt meter across R531 resistor (on Pre, Main Amp PCB), rotate VR502 (on Pre, Main Amp PCB) to obtain a 7.5mV reading on DC milli-volt meter (no signal input). See Fig. 2.
7. Repeat the steps 3 thru 6 as above for Right channel. (Use VR601, 602 and R613).

Fig. 1 DC Balance Adjustment (wave form)

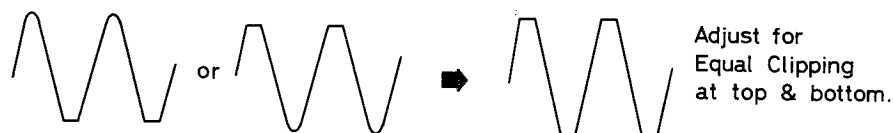
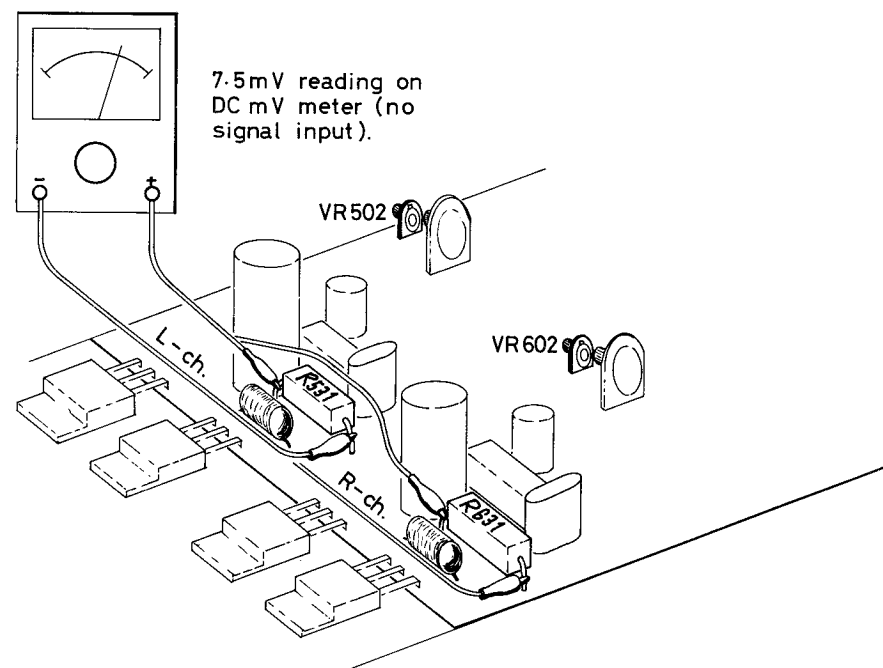


Fig. 2 Idling Current Adjustment Hook-up



## AM ALIGNMENT PROCEDURE

Instruments: AM Signal Generator and AC VTVM.

Set Selector switch to AM.

NOTE: Input signal must be kept as low as possible to avoid AVC action.

Step	Generator		Tuning Dial Setting	Output Indicator Connected to	Adjust	Adjust for
	Coupling	Frequency				
1	Tr201 Base (Pin #2 on AM IF board) through a 0.01mfd capacitor.	455 KHz (400 Hz 30% mod.)	Non-interfering at low end of scale.	AC VTVM to TAPE OUT jack.	T204, 203, 202 & 201 (on AM IF board)	Maximum reading on VTVM.
2	Connect to short loop of wire. Radiate signal into ferrite loopstick antenna.	600 KHz (400 Hz 30% mod.)	600 KHz		L201 (OSC) coil (on AM IF board ) and L901 ANT. Ring.	
3		1400 KHz (400 Hz 30% mod.)	1400 KHz		CT5 (OSC) and CT4 (ANT) Trim. (on Front-end)	
4	Repeat the steps 2 and 3 until no further improvement is noticed.					

## FM ALIGNMENT PROCEDURE

Instruments: FM Sweep Generator, FM Signal Generator, AC VTVM and Oscilloscope.

Set Selector switch to FM.

Step	Generator		Tuning Dial Setting	Output Indicator Connected to	Adjust	Adjust for
	Connected to	Freq.				
1	FM Sweep Generator to junction of C901 and C902, (FM IF input, pin #1 on FM IF Board).	10.7 MHz	Quiet point on band.	Oscilloscope to junction of R132 and C125 (on FM IF board)	T104, 103, 102 & 101 (on FM IF board) Top and Bottom	Maximum and Balanced S curve on scope.
2	Disconnect FM Sweep Generator and connect FM Signal Generator to FM antenna terminals.					
3	FM Signal Generator to FM antenna terminals.	98MHz (400Hz 100% mod.)	Tune for maximum output point.	Oscilloscope and AC VTVM. to TAPE OUT jack.	T2, top & Bottom (on Front end) Touch up T101, 102, 103 & 104 if necessary.	Maximum and undistorted amplitude on scope.
4	* To align the steps 4 and 5, input signal level must be kept	90MHz (400HZ 100% mod.)	90MHz		L2 (OSC), L1 (RF) & T1 (ANT) (on Front end)	Maximum reading on VTVM.
5	—3db of limiter saturation.	106MHz (400Hz 100% mod.)	106MHz		CT(OSC), CT2 (RF)& CT1 (ANT) (on Front end).	
6	Repeat the steps 4 and 5 until no further improvement is noticed.					

## FM—STEREO ALIGNMENT PROCEDURE

NOTE: The FM IF Alignment must be completed before attempting this FM-Stereo Alignment. Poor IF alignment will result in poor FM-Stereo Alignment.

Set selector switch to FM STEREO.

### 1. Alignment of SCA Trap

Step	Audio Generator		Output Indicator Connected to	Adjust	Adjust for
	Connected to	Frequency			
1	To MPX Input (pin No.1 on MPX board)	67 KHz	VTVM to TP1	L302	Minimum reading on VTVM.
2		72 KHz		L303	

### 2. Alignment of FM-Stereo

Connect FM Stereo Generator to FM antenna terminals.

Set Separation Adj. VR301 (on MPX Board) to mid-position before starting this procedure.

Step	Stereo Generator		Output Indicator Connected to	Adjust	Adjust for
	Modulation	RF Deviation			
1	19 KHz Pilot only	1 – 2%	VTVM & Oscillo- scope to TP2	L301, T301, T302.	Maximum reading on VTVM.
2	Composite 1 KHz sig- nal to Left channel only.	Pilot 10% Signal 70%	VTVM & Oscillo- scope to Left channel OUTPUT jack.	T301	Maximum and un- distorted sine wave on scope.
3	Composite 1 KHz sig- nal to Right channel only.			VR301	Minimum reading on VTVM.
	Same as in  Step 2			VTVM & Oscillo- scepe to Right channel OUTPUT jack.	
5	Repeat steps 3 and 4 until on further improvement is noticed.				

## FM MONO – STEREO AUTOMATIC SWITCHING LEVEL ADJUSTMENT PROCEDURE

1. Connect a VTVM and Oscilloscope to the OUTPUT jack (Left or Right channel).

2. Feed the FM signal whose MPX has been varied into the antenna terminals.

MPX variation	Pilot	10%
	Modulation Frequency	1 KHz (Left or Right channel).
	RF deviation	±45KHz

3. Set the frequency at 98 MHz (when there are disrupting signal, choose another setting).

4. Set the Function switch to FM STEREO.

5. Turn CCW the MONO—STEREO Auto-switching Level Control VR101 (on FM IF circuit board): This is a condition in which Auto-switching does not function.

6. Adjust the FM-Stereo so that the distortion and separation will be best.

7. Adjust the VR101 so that when the antenna input level is 30uV or more, Stereo will switch in and when the input is below the 30uV level, Mono will switch in.

8. After adjustment, check to make sure that, indeed, when the antenna input level exceeds 30uV, Stereo will switch in.

## ENTIRE UNIT INOPERATIVE

I. If the pilot lamp does not light,

A. Check to see if the AC Power Supply Cord is properly connected to the Power source, or

B. Check to see if there is adequate voltage from the power source, or

C. If A & B are OK, check to see if the AC fuse F903 is not blown.

1. If the AC fuse is OK,

a. AC Power Supply Cord is cut, or

b. Primary Winding in the Power Transformer is cut, or

c. Power switch connection is faulty.

2. If the AC fuse is blown,

a. Primary Winding in the Power Transformer is shorted out, or

b. Secondary Winding in the Power Transformer is shorted out, or

c. Rectifier D902 is shorted out.

II. If the pilot lamp does light,

A. Check to see if the DC fuse F901 or 902 is not blown.

1. If the DC fuse is blown,

a. Output circuits (including the speakers) are shorted out, or

b. +B circuits are shorted out, due to faulty C907 or faulty Transistors Tr506, 508, 510, 606, 608, 509, 609 or 610, or

- c. Faulty C571 or 617.
- 2. If the DC fuse is OK,
  - a. And if the B voltage is not OK,
    - (1). Rectifier D902 is open, or
    - (2). Secondary winding in the Power Transformer (center tap, black lead) is cut, or
    - (3). Faulty DC fuse connection.
  - b. And if the B voltage is OK,
    - (1). And if there is signal output at the TAPE OUT jacks,
      - (a). Tape Monitor switch connection is faulty, or
      - (b). Transistors Tr503, 504, 505, 603, 604 or 605 are faulty, or
      - (c). C502, C506, 507, 508, 510, 602, 606, 607, 608 or 610 are faulty.
    - (2). And if there is no signal output at the TAPE OUT jacks,
      - (a). Transistors Tr501, 502, 601 or 602 are shorted out or open, or
      - (b). C501, 503, 504, 601, 603 or 604 are open, or
      - (c). Wires from the Function switch are cut.

## ONLY PHONO SECTION INOPERATIVE

- I. If there is on fault in the wires to the Equalizer Amp board,
  - A. Transistors Tr401, 402, 403 or 404 are shorted out or open, or
  - B. C401, 405, 408, 409, 414 or 417 are faulty, or
  - C. Function switch connection is faulty.

## TONE CONTROLS INEFFECTIVE

- I. C701, 702, 703, 704, 705, 706, 707 or 708 are faulty

## LOUDNESS CONTROL INEFFECTIVE

- I. C801 or 802 is faulty, or
- II. Loudness switch connection is faulty.

## RADIO SECTION INOPERATIVE

- I. If both AM and FM are inoperative,
  - A. Measure voltage at B6 (refer to circuit diagram),
    - 1. If there is no voltage at B6,
      - a. Zener diode D903 is shorted out, or
      - b. C902 is faulty.
    - 2. If there is proper voltage at B6,
      - a. Function switch connection is faulty, or
      - b. Wire to the Function switch is cut.

## II. If only AM is inoperative,

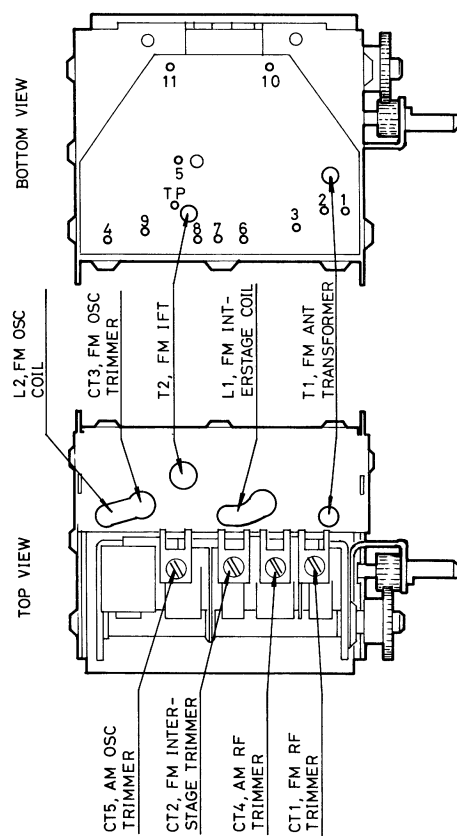
- A. Measure voltage of AM PCB (6),
  - 1. If there is no voltage,
    - a. Function switch connection is faulty, or
    - b. Wire from Function switch is cut, or
    - c. C213, 214 or 215 are faulty.
  - 2. If there is proper voltage,
    - a. C202, 209 or 210 are faulty, or
    - b. Transistors Tr201, 202 or 203 are faulty, or
    - c. Coils L201 or 901 is faulty, or
    - d. AM IFT T201, 202 or 203 are faulty.

## III. If only FM is inoperative, check to see if MPX working properly.

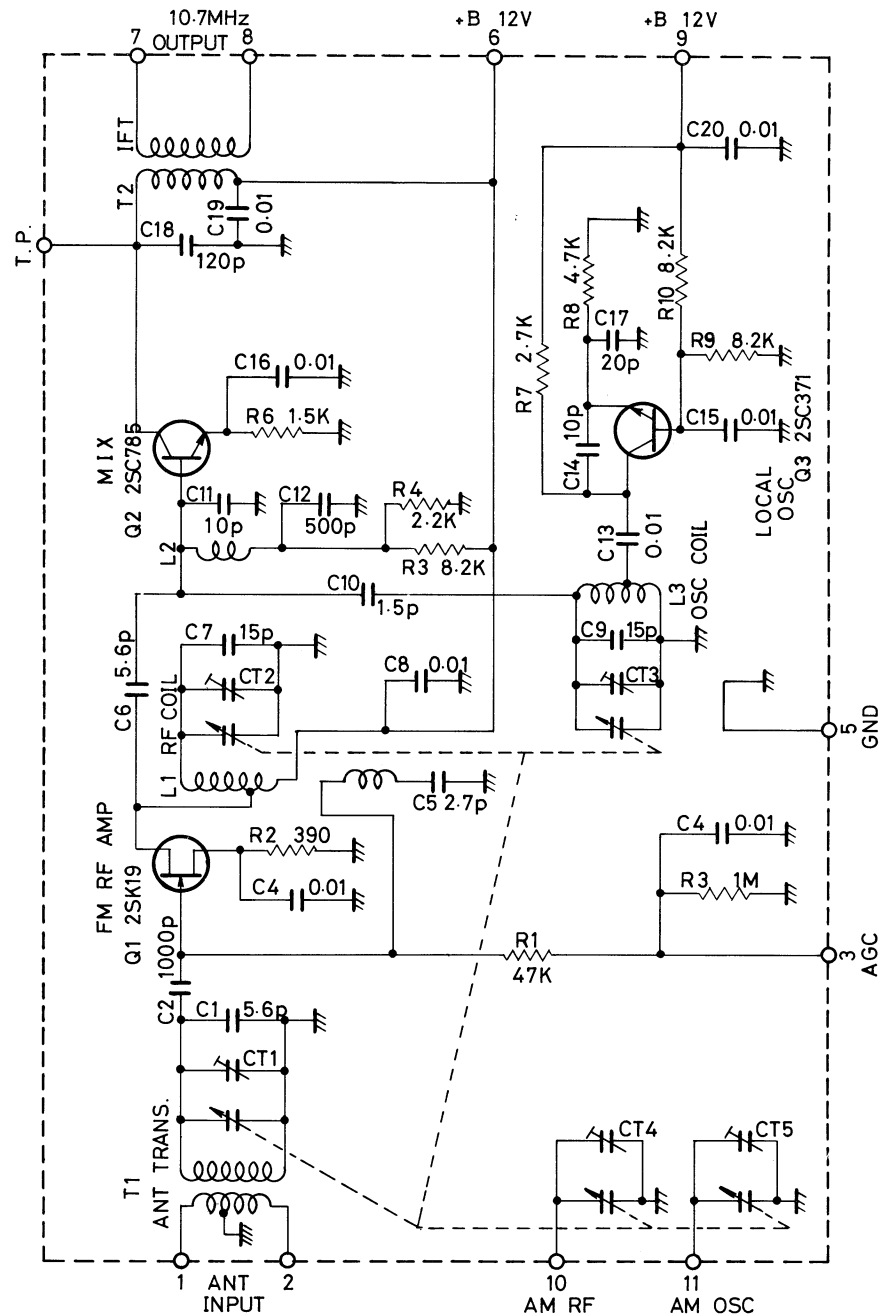
- A. If MPX is faulty, measure voltage at B2 and B3.
  - 1. If there is no voltage at B2,
    - a. C319, 908 or 909 are faulty, or
    - b. R915 is faulty.
  - 2. If there is no voltage at B3,
    - a. R920 is faulty, or
    - b. C911 is faulty.
  - 3. If there is proper voltage at B3,
    - a. And if there is no signal with Function switch set at FM,
      - (1). C301 is faulty.
    - b. If there is no signal with Function switch set at FM STEREO,
      - (1). Transistors Tr301, 302 or 303 are faulty.
    - c. If there is proper voltage at B4 but Stereo Lamp does not light,
      - (1). Check for audibility of stereo signal.
        - (a). If no stereo signal is heard from speakers, then, check the above mentioned transistors.
        - (b). If stereo signal is heard, then stereo lamp or transistor Tr304 is faulty.
    - d. If stereo lamp stays on when signal changes from stereo to mono,
      - (1). Transistor Tr304 is faulty.
- B. If MPX is OK, check FM IF circuit.
  - 1. If FM IF is not OK,
    - a. Measure voltage of FM IF PCB (2),
      - (1). If there is no voltage,
        - (a). Function switch connection is faulty, or
        - (b). Wire from Function switch is cut, or
        - (c). C102, 109, 115 or 118 are faulty.
      - (2). If there is proper voltage,
        - (a). Transistors Tr101, 102, 103 or 104 are faulty, or
        - (b). C103, 110, 114 or 119 are faulty.
  - 2. If FM IF is OK,

- a. And if FM Front end is faulty,
  - (1). Transistors Tr1, 2 or 3 are faulty, or
  - (2). C8, 19 or 20 are faulty.
- b. If FM Front end is OK,
  - (1). Input circuit is grounded, or
  - (2). FM antenna improperly connected.

FRONT END LAYOUT



FRONT END SCHEMATIC DIAGRAM



# FM FRONT END

(32SN2F1-359)

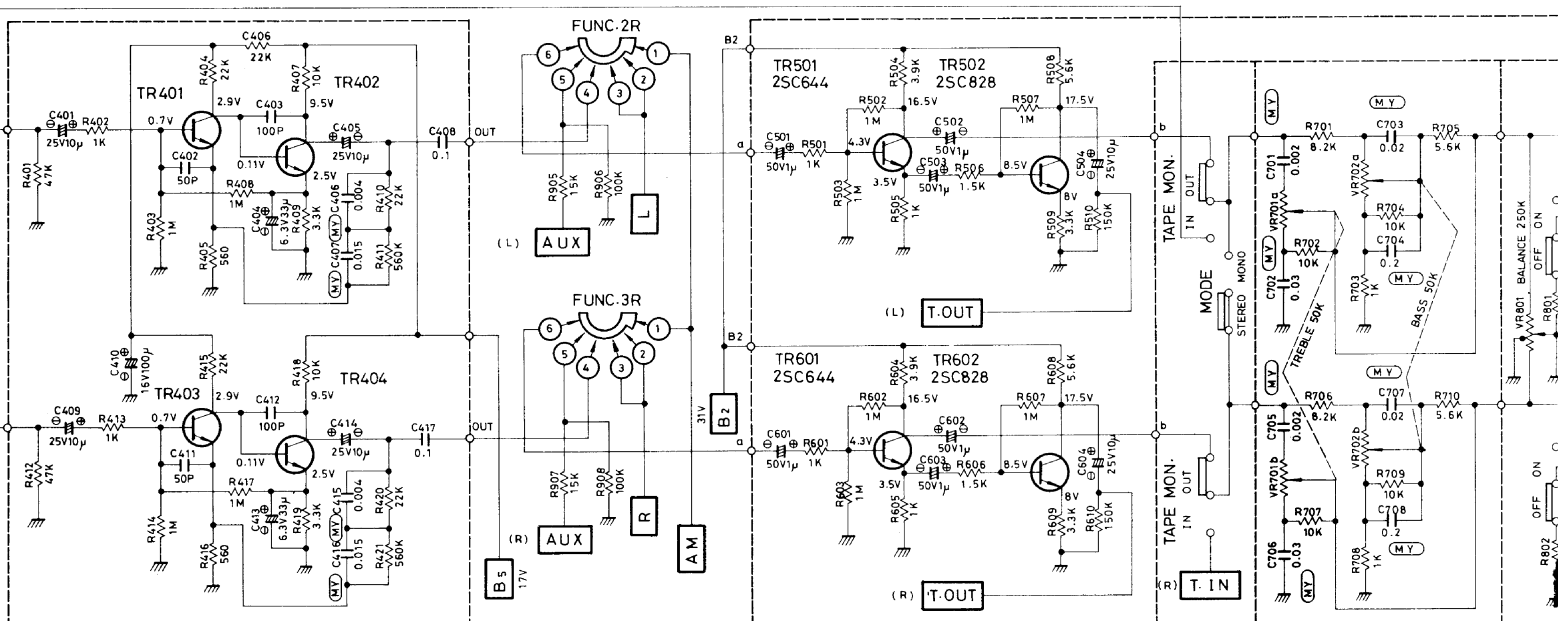
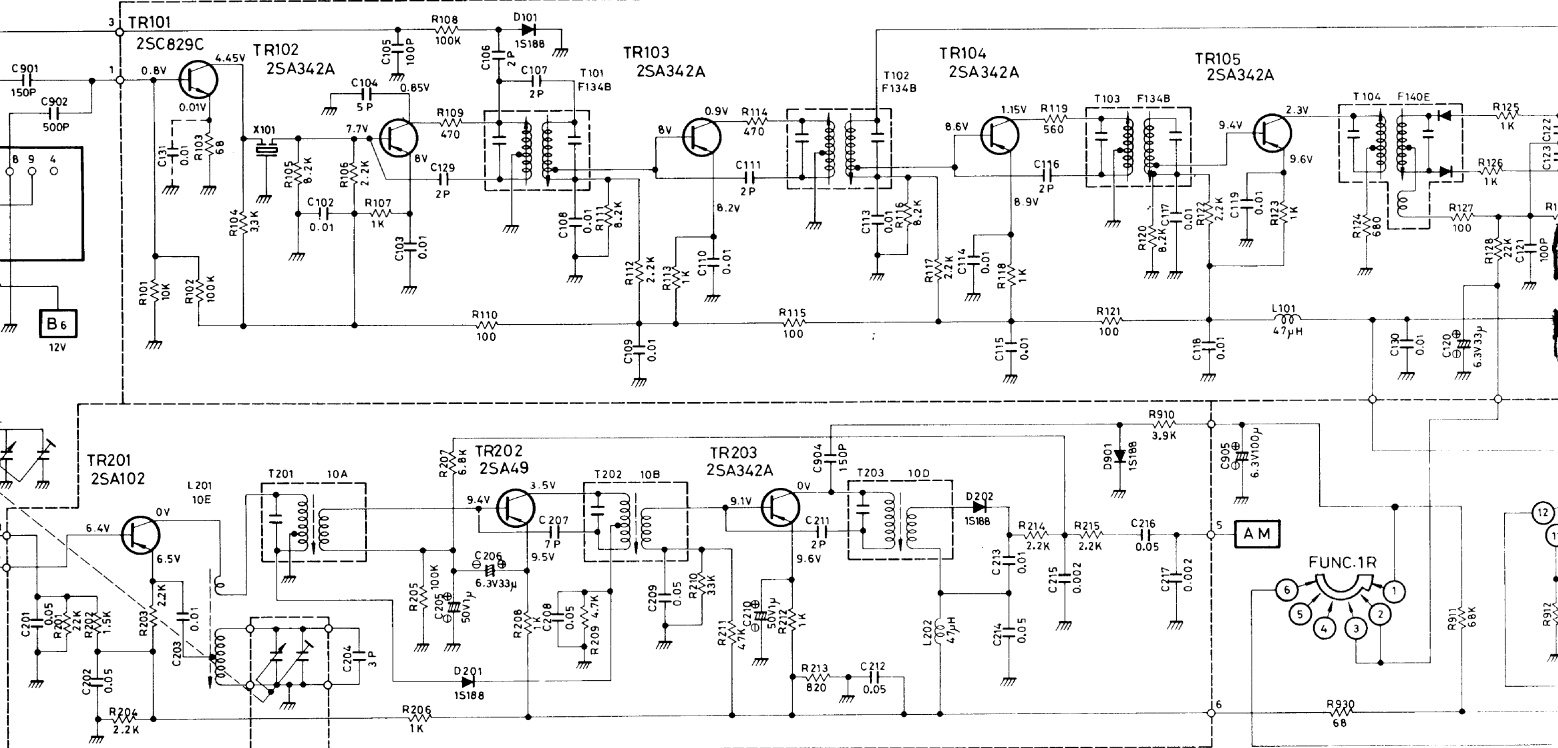
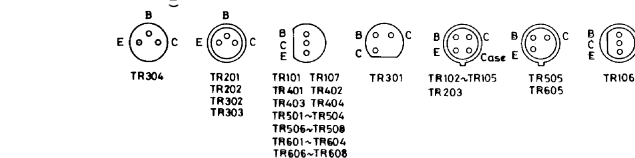
F M  
300Ω  
A M

LEFT

MAG  
AUX  
T.IN  
T.OUT  
T.OUT

RIGHT

MAG  
AUX  
T.IN  
T.OUT  
T.OUT



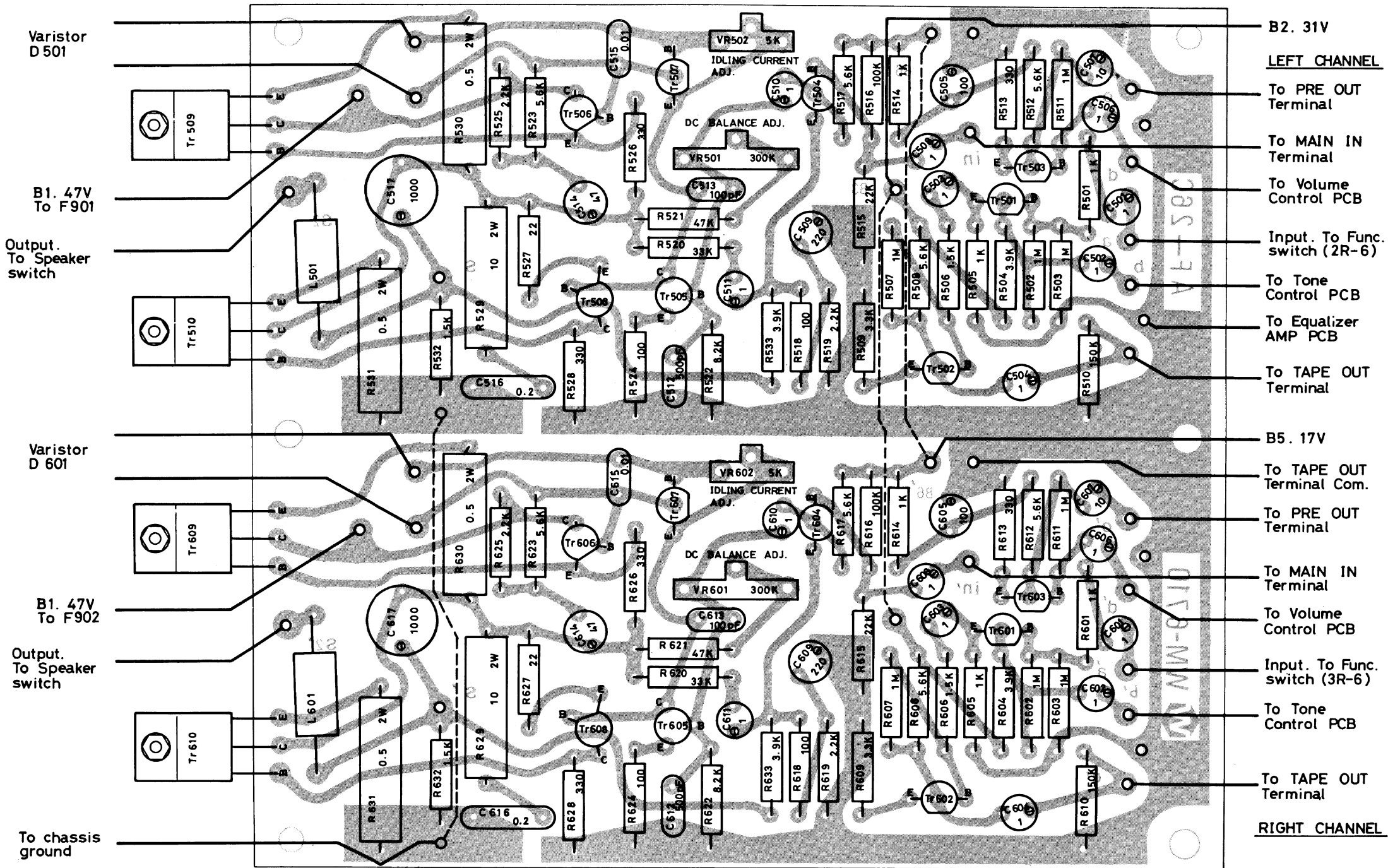
## NOTES.

1. RESISTANCE IS SHOWN IN OHMS.  
K=1.000 M=1.000.000
2. UNLESS OTHERWISE NOTED IN THE SCHEMATIC, ALL CAPACITOR VALUES ARE EXPRESSED IN MFD (MICROFARAD).
3. VOLTAGE READING WITH VTVM FROM THE POINT SHOWN TO THE CHASSIS GROUND (LINE VOLTAGE 120 VOLTS).  
VOLTAGE IN    INDICATED VALUE DURING THE CIRCUITS OPERATION.
4. VOLTAGE READING MAY VARY  $\pm 20\%$ .
5. VOLTAGES IN BOX OBTAINED WHEN RECEIVING
6. SELECTOR SWITCH IS IN.  
(1) - (7) A M  
(2) - (8) F M  
(3) - (9) F M STEREO  
(4) - (10) PHONO  
(5) - (11) A U X

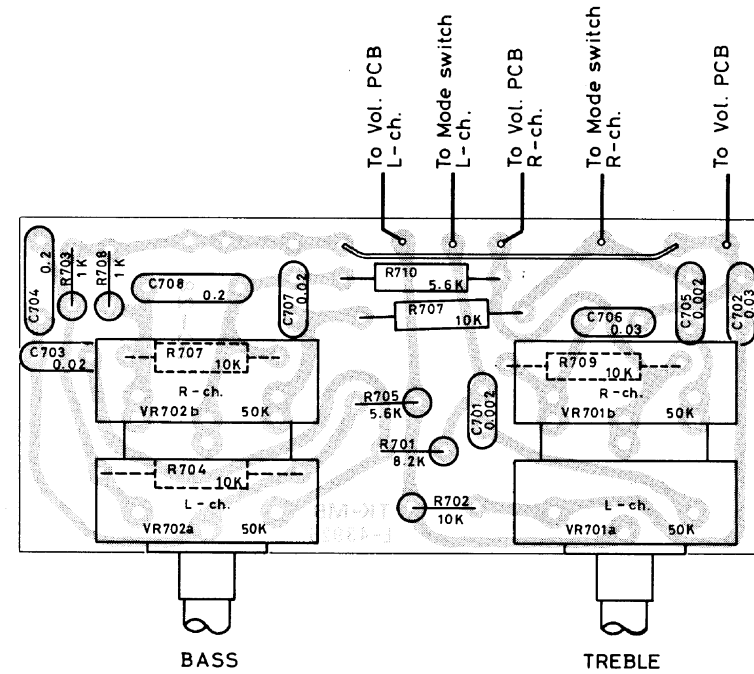




# PRE, MAIN AMP CIRCUIT BOARD DIAGRAM



### TONE CONTROL CIRCUIT BOARD DIAGRAM



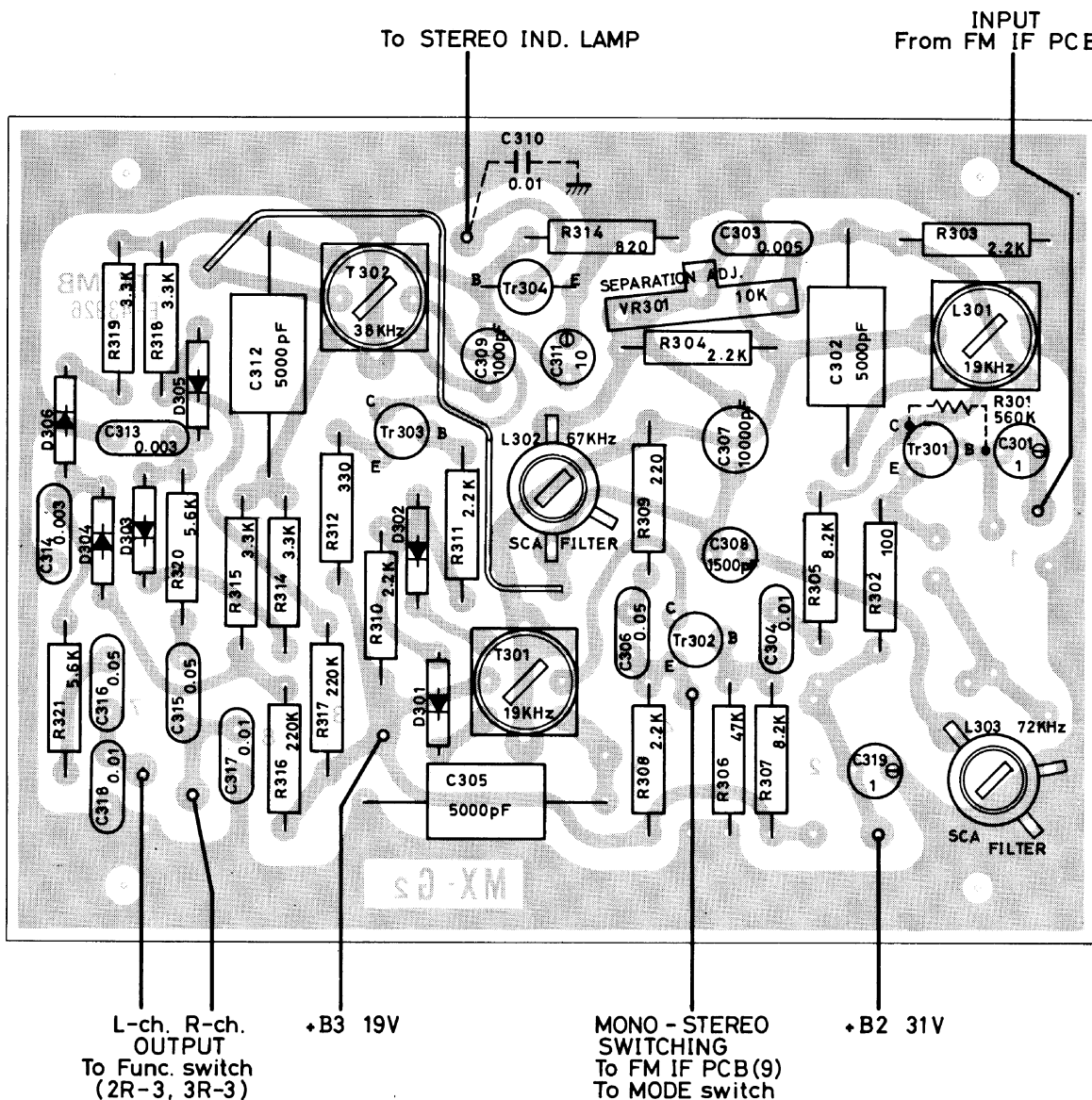
To MPX PCB (4)  
 METER OUTPUT  
 To Func. switch (1R-9)  
 AGC  
 From Front end (3)  
 INPUT 10.7MHz  
 From Front end (7)

D102  
 R134 470  
 Tr107  
 C128 0.01  
 C129 100pF  
 Tr106  
 D103  
 VR102 250K  
 SWITCHING LEVEL  
 ADJ.  
 R130 10K  
 R131 10K  
 VR101 100K  
 METER "ZERO" ADJ.  
 R128 22K  
 C120 33  
 R125 1K  
 R127 100  
 R126 1K  
 T104  
 FM RATIO  
 R124 560  
 Tr105  
 C119 0.01  
 L101 47µH  
 R123 680  
 R122 2.2K  
 C118 0.01  
 R121 100  
 T103  
 FM 4TH IFT  
 R120 8.2K  
 C117 0.01  
 C115 0.01  
 R117 2.2K  
 C116 0.01  
 R118 1K  
 C109 0.01  
 R115 100  
 T102  
 FM 3RD IFT  
 R114 470  
 Tr103  
 C111 2pF  
 C110 0.01  
 R116 8.2K  
 R113 1K  
 R112 2.2K  
 R110 100  
 T101  
 FM 2ND IFT  
 R108 100K  
 C107 2pF  
 C105 100pF  
 D101  
 R109 470  
 C106 2pF  
 Tr102  
 C104 5pF  
 R104 3.3K  
 Tr101  
 R105 8.2K  
 R106 2.2K  
 R107 1K  
 R102 100K  
 R103 68  
 R101 10K  
 C103 0.01  
 C102 0.01  
 C125 100pF  
 C124 1  
 C126 5pF  
 C127 200pF  
 C123 200pF  
 C122 200pF  
 C121 100pF

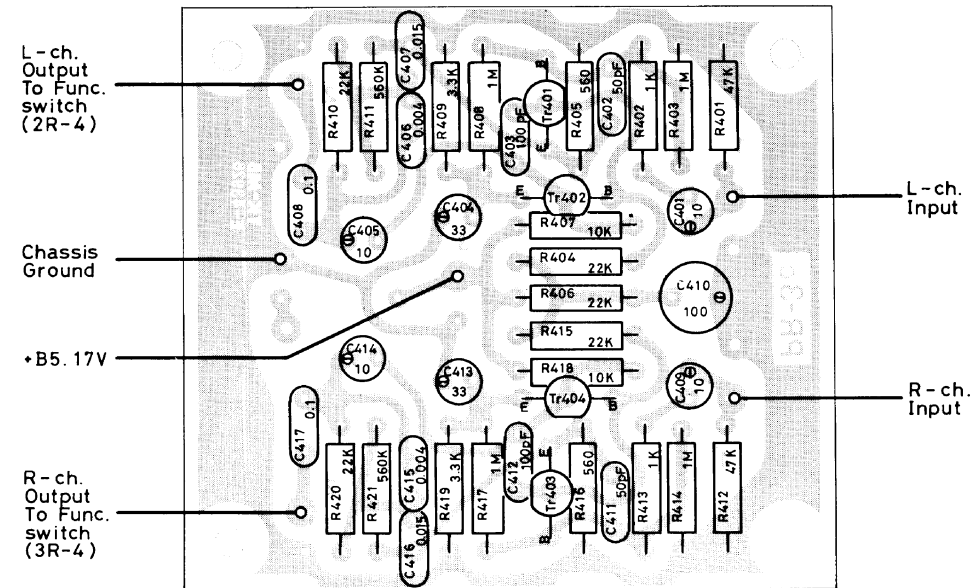
+B 12V  
 To Func. switch (2R-9)

OUTPUT  
 To MPX PCB (1)

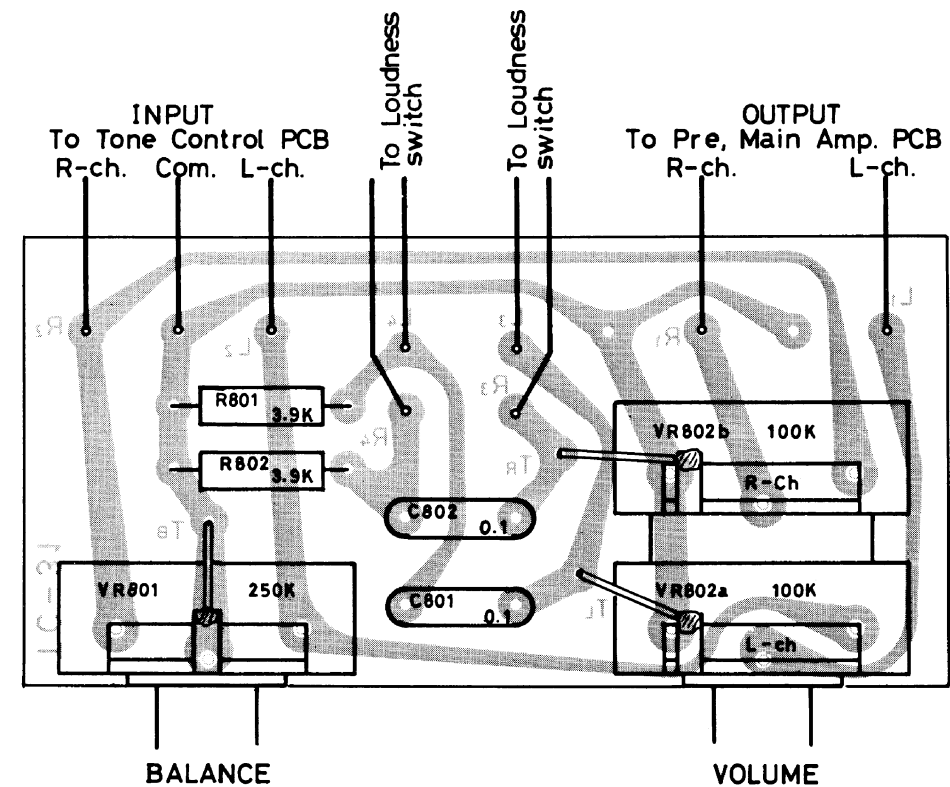
# FM STEREO CIRCUIT BOARD DIAGRAM



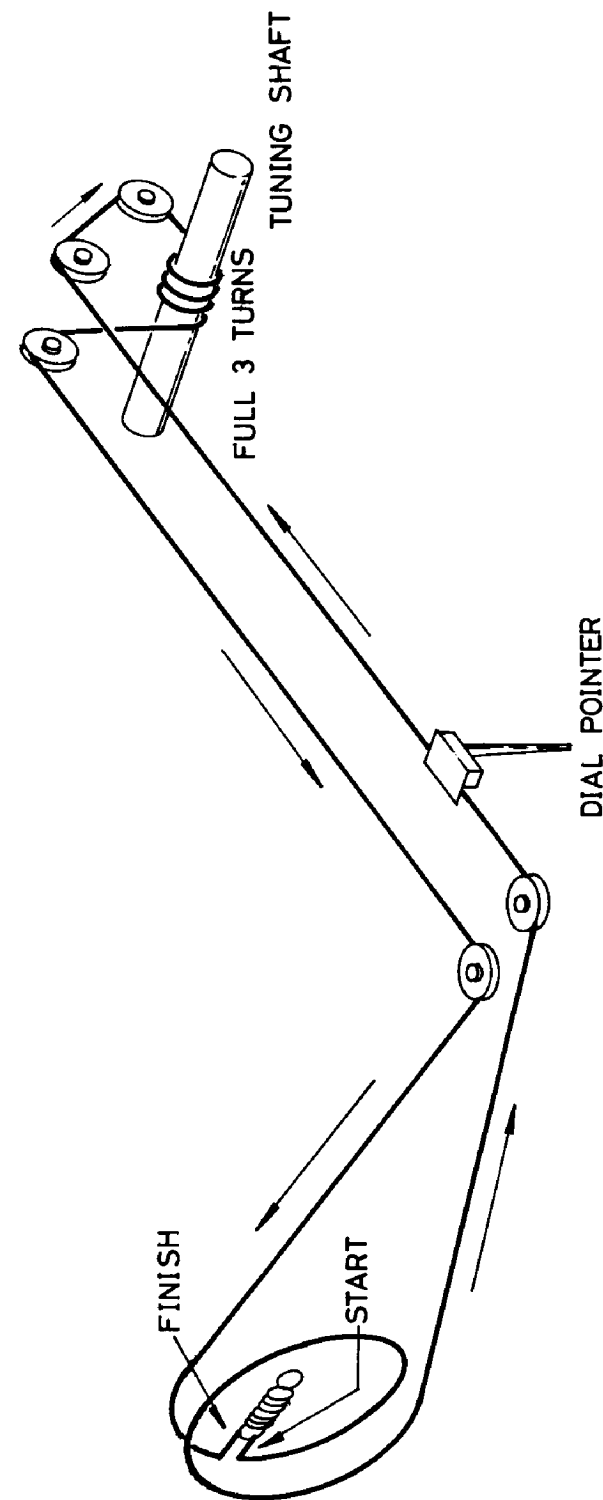
# EQUALIZER AMP CIRCUIT BOARD DIAGRAM



# VOLUME CONTROL CIRCUIT BOARD DIAGRAM



# DIAL STRINGING DIAGRAM



# Model RX-400A Parts List

## CABINET AND CHASSIS

SYMBOL	DESCRIPTION	PART NO.
	Cabinet	131011228
	Front Panel Assembly	111911229
	Knob, Tuning	116310054
	Knob, Vol., Bal. and Func.	116310055
	Knob, Bass and Treble (Left channel)	116310056
	Knob, Bass and Treble (Right channel)	116310057
	Button, Push switch	116210007
	Chassis	121011269
	Dial Board	112011236
	Front end	321304359
	Front chassis	122011269
	Dial Pointer w/Illumination Lamp	151691117
	Dial Pulley	655311010
	Dial Spring	658601113
	Switch, Function selector	610111365
	Switch, Push 6 keys	614061205
	Switch, Speaker Matrix	613000021
	Jack, Headphone	626007702
	Shaft, Tuning w/Flywheel	654911282
	Meter, Tuning	231310018
	Bracket, Dial Lamp	640011112
	Lamp, Dial Illumination, 6.3V 0.28A	352063028
	Lamp, Stereo Indicator, 14V 80mA	351140008
	Lamp, Function Indicator, 8V 0.15A	351080015
	Rear chassis	123011269
	Terminal strip, 4P	641200104
	Pin jack, 4P	624100104
	Terminal strip, 3P	641200103
	Fuse Bracket	640253334
	Pin jack, 10P	624100210
F901	Fuse, 1.5A	341220015
F902	Fuse, 1.5A	341220015
F903	Fuse, 2A	341220020
	AC Outlet	620101114
	Screw, GND Terminal	761911113
R901	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223
R902	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223
R903	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223
R904	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223
R905	Resistor, Carbon Film, 15K $\pm 10\%$ , 1/4W	552015323
R906	Resistor, Carbon Film, 100K $\pm 10\%$ , 1/4W	552010423
R907	Resistor, Carbon Film, 15K $\pm 10\%$ , 1/4W	552015323
R908	Resistor, Carbon Film, 100K $\pm 10\%$ , 1/4W	552010423
R909	Resistor, Carbon Film, 100 $\pm 10\%$ , 1/4W	552010123
R910	Resistor, Carbon Film, 3.9K $\pm 10\%$ , 1/4W	552039223
R911	Resistor, Carbon Film, 68K $\pm 10\%$ , 1/4W	552068323
R912	Resistor, Carbon Film, 820 $\pm 10\%$ , 1/4W	552082123
R913	Resistor, Composition, 680 $\pm 10\%$ , 1/2W	551068133
R914	Resistor, Composition, 2.2K $\pm 10\%$ , 1/2W	551022533
R915	Resistor, Composition, 820 $\pm 10\%$ , 1/2W	551082133
R916	Resistor, Metal Oxide, 330 $\pm 10\%$ , 5W	553133173
R917	Resistor, Composition, 2.2K $\pm 10\%$ , 1/2W	551022233
R918	Resistor, Metal Oxide, 470 $\pm 10\%$ , 1/3W	553147163
R919	Resistor, Composition, 2.2K $\pm 10\%$ , 1/2W	551022233
R920	Resistor, Composition, 2.2K $\pm 10\%$ , 1/2W	551022233



SYMBOL		DESCRIPTION	PART NO.						
R921	Resistor, Composition, 680 ±10%, 1/2W	551068133	C210	Capacitor, Electrolytic, 1mfd, 50V	402100749	R132	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223	
R922	Resistor, Composition, 270 ±10%, 1/2W	551027133	C211	Capacitor, Ceramic, 2pF ±0.5pF, 250V	440201388	R133	Resistor, Carbon Film, 1M ±10%, 1/4W	552010523	
R923	Resistor, Composition, 3.3K ±10%, 1/2W	551033233	C212	Capacitor, Ceramic, 0.05mfd, 50V	440500935	R134	Resistor, Carbon Film, 470 ±10%, 1/4W	552047123	
R924	Resistor, Composition, 3.3K ±10%, 1/2W	551033233	C213	Capacitor, Ceramic, 0.01mfd, 250V	440100985	VR101	Variable Resistor, Meter Zero Adj., 100K	510502120	
R925	Resistor, Composition, 330 ±10%, 1/2W	551033133	C214	Capacitor, Ceramic, 0.05mfd, 50V	440500935		VR102	Variable Resistor, Auto-switching Level Adj., 250K	510502116
R926	Resistor, Composition, 330 ±10%, 1/2W	551033133	C215	Capacitor, Ceramic, 0.002mfd ±10%, 250V	442201083				
R927	Resistor, Bath-tub, 2 ±10%, 2W	554020853	C216	Capacitor, Ceramic, 0.05mfd 50V	440500935				
R928	Resistor, Bath-tub, 2 ±10%, 2W	554020853	C217	Capacitor, Ceramic, 0.002m fd ±10%, 250V	442201983	C101	Non used		
R929	Resistor, Carbon Film, 100K ±10%, 1/4W	552010423	Tr201	Transistor, 2SA102	301001124	C102	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
R930	Resistor, Carbon Film, 68 ±10%, 1/4W	552068023	Tr202	Transistor, 2SA49	301001111	C103	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
C901	Capacitor, Ceramic, 150pF ±10%, 250V	440151183	Tr203	Transistor, 2SA342	301001122	C104	Capacitor, Ceramic, 5pF ±0.5pF, 250V	440501388	
	Capacitor, Ceramic, 500pF ±10%, 250V	440501183	D201	Diode, 1S188	300111008	C105	Capacitor, Ceramic, 100pF ±10%, 250V	440101183	
	Capacitor, Ceramic, 0.1mfd, 50V	440100835		Diode, 1S188	300111008	C106	Capacitor, Ceramic, 2pF ±0.5pF, 250V	440201388	
	Capacitor, Ceramic, 150pF ±10%, 250V	440151183	L201	Coil, AM Local Oscillator	223301121	C107	Capacitor, Ceramic, 2pF ±0.5pF, 250V	440201388	
	Capacitor, Electrolytic, 100fmd, 6.3V	402100509		Coil, RF Choke, 47 micro-Henry	220001122	C108	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
	Capacitor, Electrolytic, 470mfd, 16V	401470519	L202			C109	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
	Capacitor, Electrolytic, 2200mfd, 50V	400220449	T201	Transformer, 455KHz 1st IF	225301121	C110	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
	Capacitor, Electrolytic, 1000mfd, 35V	402100439		Transformer, 455KHz 2nd IF	225301122	C111	Capacitor, Ceramic, 2pF ±0.5pF, 250V	440201388	
	Capacitor, Electrolytic, 1000mfd, 35V	402100439	T202	Transformer, 455KHz 3rd IF	225301124	C112	Non used		
	Capacitor, Electrolytic, 47mfd, 35V	401470639	T203			C113	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
	Capacitor, Electrolytic, 220mfd, 25V	401220592	Printed Circuit Board		140100121	C114	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
	Capacitor, Electrolytic, 1000mfd, 35V	402100439			141110127	C115	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
L901	AM ANT Assembly	222391118				C116	Capacitor, Ceramic, 2pF ±0.5pF, 250V	440201388	
L902	Coil, RF Choke, 47 micro-Henry	220001122				C117	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
T901	Transformer, Power Supply	205001317				C118	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
D901	Diode, 1S188	300111008				C119	Capacitor, Ceramic, 0.01mfd, 250V	440100985	
D902	Diode, 1S1850	300919005				C120	Capacitor, Electrolytic, 33mfd, 6.3V	402330609	
D903	Diode, BZ-120	300313004				C121	Capacitor, Ceramic, 100pF ±10%, 250V	440101183	
				FM IF CIRCUIT BOARD					
				SYMBOL	DESCRIPTION	PART NO.			
				R101	Resistor, Carbon Film, 10K ±10%, 1/4W	552010323	C122	Capacitor, Ceramic, 200pF ±10%, 250V	
				R102	Resistor, Carbon Film, 100K ±10%, 1/4W	552010423	C123	Capacitor, Ceramic, 200pF ±10%, 250V	
				R103	Resistor, Carbon Film, 68 ±10%, 1/4W	552068023	C124	Capacitor, Electrolytic, 1mfd, 50V	
				R104	Resistor, Carbon Film, 3.3K ±10%, 1/4W	552033223	C125	Capacitor, Ceramic, 100pF ±10%, 250V	
				R105	Resistor, Carbon Film, 8.2K ±10%, 1/4W	552082223	C126	Capacitor, Ceramic, 5pF ±0.5pF, 250V	
				R106	Resistor, Carbon Film, 2.2K ±10%, 1/4W	552022223	C127	Capacitor, Ceramic, 100pF ±10%, 250V	
				R107	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223	C128	Capacitor, Ceramic, 0.01mfd, 250V	
				R108	Resistor, Carbon Film, 100K ±10%, 1/4W	552010423	C129	Capacitor, Ceramic, 2pF ±0.5pF, 250V	
				R109	Resistor, Carbon Film, 470 ±10%, 1/4W	552047123	C130	Capacitor, Ceramic, 0.01mfd, 250V	
				R110	Resistor, Carbon Film, 100 ±10%, 1/4W	552010123	C131	Capacitor, Ceramic, 0.01mfd, 250V	
				R111	Resistor, Carbon Film, 8.2K ±10%, 1/4W	552082223	Tr101	Transistor, 2SC829C	
				R112	Resistor, Carbon Film, 2.2K ±10%, 1/4W	552022223		301201117	
				R113	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223	Tr102	Transistor, 2SA342	
				R114	Resistor, Carbon Film, 470 ±10%, 1/4W	552047123	Tr103	Transistor, 2SA342	
				R115	Resistor, Carbon Film, 100 ±10%, 1/4W	552010123	Tr104	Transistor, 2SA342	
				R116	Resistor, Carbon Film, 8.2K ±10%, 1/4W	552082223	Tr105	Transistor, 2SA342	
				R117	Resistor, Carbon Film, 2.2K ±10%, 1/4W	552022223	Tr106	Transistor, 2SC536G	
				R118	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223	Tr107	Transistor, 2SA564	
				R119	Resistor, Carbon Film, 560 ±10%, 1/4W	552056123	D101	Diode, 1S118	
				R120	Resistor, Carbon Film, 8.2K ±10%, 1/4W	552082223		300111008	
				R121	Resistor, Carbon Film, 100 ±10%, 1/4W	552010123		300111008	
				R122	Resistor, Carbon Film, 2.2K ±10%, 1/4W	552022223	D102	Diode, 1S188	
				R123	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223		300111008	
				R124	Resistor, Carbon Film, 680 ±10%, 1/4W	552068123			
				R125	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223	L101	Coil, RF choke, 47 micro-Henry	
				R126	Resistor, Carbon Film, 1K ±10%, 1/4W	552010223	T101	Transformer, 10.7MHz 1st IF	
				R127	Resistor, Carbon Film, 100 ±10%, 1/4W	552010123	T102	Transformer, 10.7MHz 2nd IF	
				R128	Resistor, Carbon Film, 22K ±10%, 1/4W	552022323	T103	Transformer, 10.7MHz 3rd IF	
				R129	Non used		T104	Transformer, 10.7MHz Ratio Det.	
				R130	Resistor, Carbon Film, 10K ±10%, 1/4W	552010323	X101	Ceramic Filter, 10.7MHz	
				R131	Resistor, Carbon Film, 10K ±10%, 1/4W	552010323	Printed Circuit Board		
				FM IF Circuit Board Assembly					
C201	Capacitor, Ceramic, 0.05mfd, 50V	440500935							
C202	Capacitor, Ceramic, 0.05mfd, 50V	440500935							
C203	Capacitor, Ceramic, 0.05mfd, 50V	440500935							
C204	Capacitor, Ceramic, 3pF (N5.6), 50V	441301336							
C205	Capacitor, Electrolytic, 1mfd, 50V	402100749							
C206	Capacitor, Electrolytic, 33mfd, 6.3V	402330609							
C207	Capacitor, Ceramic, 7pF ±0.5%, 250V	440701388							
C208	Capacitor, Ceramic, 0.05mfd, 50V	440500935							
C209	Capacitor, Ceramic, 0.05mfd, 50V	440500935							

## TONE CONTROL CIRCUIT BOARD

SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION	PART NO.
R301	Resistor, Carbon Film, 560K $\pm 10\%$ , 1/4W	552056423	T301	Transformer, 19KHz Tune	225601126	R701	Resistor, Carbon Film, 8.2K $\pm 10\%$ , 1/4W	552082223
R302	Resistor, Carbon Film, 100 $\pm 10\%$ , 1/4W	552010123	T302	Transformer, 38KHz Tune	225601126	R702	Resistor, Carbon Film, 10K $\pm 10\%$ , 1/4W	552010323
R303	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223				R703	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223
R304	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223		Printed Circuit Board	140400438	R704	Resistor, Carbon Film, 10K $\pm 10\%$ , 1/4W	552010323
R305	Resistor, Carbon Film, 8.2K $\pm 10\%$ , 1/4W	552082223		FM-Stereo Circuit Board Assembly	141411419	R705	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223
R306	Resistor, Carbon Film, 47K $\pm 10\%$ , 1/4W	552047323				R706	Resistor, Carbon Film, 8.2K $\pm 10\%$ , 1/4W	552082223
R307	Resistor, Carbon Film, 8.2K $\pm 10\%$ , 1/4W	552082223				R707	Resistor, Carbon Film, 10K $\pm 10\%$ , 1/4W	552010323
R308	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223				R708	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223
R309	Resistor, Carbon Film, 220 $\pm 10\%$ , 1/4W	552022123				R709	Resistor, Carbon Film, 10K $\pm 10\%$ , 1/4W	552010323
R310	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223				R710	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223
R311	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223						
R312	Resistor, Carbon Film, 330 $\pm 10\%$ , 1/4W	552033123				C701	Capacitor, Mylar Film, 0.002mfd $\pm 10\%$ , 50V	450201033
R313	Resistor, Carbon Film, 820 $\pm 10\%$ , 1/4W	552082123	R401	Resistor, Carbon Film, 47K $\pm 10\%$ , 1/4W	552047323	C702	Capacitor, Mylar Film, 0.03mfd $\pm 10\%$ , 50V	450300933
R314	Resistor, Carbon Film, 3.3K $\pm 10\%$ , 1/4W	552033223	R402	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223	C703	Capacitor, Mylar Film, 0.02mfd $\pm 10\%$ , 50V	450200933
R315	Resistor, Carbon Film, 3.3K $\pm 10\%$ , 1/4W	552033223	R403	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523	C704	Capacitor, Mylar Film, 0.2mfd $\pm 10\%$ , 50V	450200833
R316	Resistor, Carbon Film, 220K $\pm 10\%$ , 1/4W	552022423	R404	Resistor, Carbon Film, 22K $\pm 10\%$ , 1/4W	552022323	C705	Capacitor, Mylar Film, 0.002mfd $\pm 10\%$ , 50V	450201033
R317	Resistor, Carbon Film, 220K $\pm 10\%$ , 1/4W	552022423	R405	Resistor, Carbon Film, 560 $\pm 10\%$ , 1/4W	552056123	C706	Capacitor, Mylar Film, 0.03mfd $\pm 10\%$ , 50V	450300933
R318	Resistor, Carbon Film, 3.3K $\pm 10\%$ , 1/4W	552033223	R406	Resistor, Carbon Film, 22K $\pm 10\%$ , 1/4W	552022323	C707	Capacitor, Mylar Film, 0.02mfd $\pm 10\%$ , 1/4W	450200933
R319	Resistor, Carbon Film, 3.3K $\pm 10\%$ , 1/4W	552033223	R407	Resistor, Carbon Film, 10K $\pm 10\%$ , 1/4W	552010323	C708	Capacitor, Mylar Film, 0.2mfd $\pm 10\%$ , 1/4W	450200833
R320	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223	R408	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523			
R321	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223	R409	Resistor, Carbon Film, 3.3K $\pm 10\%$ , 1/4W	552033223	VR701	Variable Resistor, Treble Control, 50KA	525101115
			R410	Resistor, Carbon Film, 22K $\pm 10\%$ , 1/4W	552022323	VR702	Variable Resistor, Bass Control, 50KA	525101115
VR301	Variable Resistor, Separation Adj. 10K	510502102	R411	Resistor, Carbon Film, 560K $\pm 10\%$ , 1/4W	552056423			
			R412	Resistor, Carbon Film, 47K $\pm 10\%$ , 1/4W	552047323		Printed Circuit Board	140700727
C301	Capacitor, Electrolytic, 1mfd, 50V	402100749	R413	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223		Tone Control Circuit Board Assembly	141710216
C302	Capacitor, Polystyrene Film, 5000pF $\pm 10\%$	453501033	R414	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523			
C303	Capacitor, Ceramic, 0.005mfd $\pm 10\%$ , 250V	442501083	R415	Resistor, Carbon Film, 22K $\pm 10\%$ , 1/4W	552022323			
C304	Capacitor, Mylar Film, 0.01mfd, $\pm 10\%$ , 50V	450100933	R416	Resistor, Carbon Film, 560 $\pm 10\%$ , 1/4W	552056123			
C305	Capacitor, Polystyrene Film, 5000pF $\pm 10\%$	453501033	R417	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523			
C306	Capacitor, Mylar Film, 0.05mfd, $\pm 10\%$ , 50V	450500933	R418	Resistor, Carbon Film, 10K $\pm 10\%$ , 1/4W	552010323			

## PRE, MAIN AMP CIRCUIT BOARD

SYMBOL	DESCRIPTION	PART NO.			
R501 R601	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223	C515 C615	Capacitor, Ceramic, 0.01mfd, 250V	440100985
R502 R602	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523	C516 C616	Capacitor, Mylar Film, 0.2mfd $\pm 10\%$ , 50V	450200833
R503 R603	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523	C517 C617	Capacitor, Electrolytic, 1000mfd, 35V	402100439
R504 R604	Resistor, Carbon Film, 3.9K $\pm 10\%$ , 1/4W	552039223			
R505 R605	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223	Tr501 Tr601	Transistor, 2SC644	301201114
R506 R606	Resistor, Carbon Film, 1.5K $\pm 10\%$ , 1/4W	552015223	Tr502 Tr602	Transistor, 2SC828	301201115
R507 R607	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523	Tr503 Tr603	Transistor, 2SC644	301201114
R508 R608	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223	Tr504 Tr604	Transistor, 2SC828	301201115
R509 R609	Resistor, Carbon Film, 3.3K $\pm 10\%$ , 1/4W	552033223	Tr505 Tr605	Transistor, 2SC538A	301201113
R510 R610	Resistor, Carbon Film, 150K $\pm 10\%$ , 1/4W	552015423	Tr506 Tr606	Transistor, 2SC1384	301201132
R511 R611	Resistor, Carbon Film, 1M $\pm 10\%$ , 1/4W	552010523	Tr507 Tr607	Transistor, 2SC1384	301201132
R512 R612	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223	Tr508 Tr608	Transistor, 2SA684	301001123
R513 R613	Resistor, Carbon Film, 330 $\pm 10\%$ , 1/4W	552033123	Tr509 Tr609	Transistor, 2SD317 or 2SC1107 (301201133)	301301122
R514 R614	Resistor, Carbon Film, 1K $\pm 10\%$ , 1/4W	552010223	Tr510 Tr610	Transistor, 2SD317 or 2SC1107 (301201133)	301301122
R515 R615	Resistor, Carbon Film, 22K $\pm 10\%$ , 1/4W	552022323	D501 D601	Diode, Varistor, KB-265	300212002
R516 R616	Resistor, Carbon Film, 100K $\pm 10\%$ , 1/4W	552010423			
R517 R617	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223	L501 L601	Coil, Anti-parasitic	220401120
R518 R618	Resistor, Carbon Film, 100 $\pm 10\%$ , 1/4W	552010123			
R519 R619	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223	VR501 VR601	Resistor, Variable, DC Bal. Adj., 300K	510502122
R520 R620	Resistor, Carbon Film, 33K $\pm 10\%$ , 1/4W	552033323	VR502 VR602	Resistor, Variable, Idling Current Adj., 5K	510502121
R521 R621	Resistor, Carbon Film, 47K $\pm 10\%$ , 1/4W	552047323			
R522 R622	Resistor, Carbon Film, 8.2K $\pm 10\%$ , 1/4W	552082223		Heat Sink, for Power Transistor,	127012096
R523 R623	Resistor, Carbon Film, 5.6K $\pm 10\%$ , 1/4W	552056223		Printed Circuit Board	140600646
R524 R624	Resistor, Carbon Film, 22 $\pm 10\%$ , 1/4W	552022023		Pre, Main Amp Circuit Board Assembly	141610219
R525 R625	Resistor, Carbon Film, 2.2K $\pm 10\%$ , 1/4W	552022223			
R526 R626	Resistor, Composition, 330 $\pm 10\%$ , 1/2W	551033133			
R527 R627	Resistor, Composition, 22 $\pm 10\%$ , 1/2W	551022033			
R528 R628	Resistor, Composition, 330 $\pm 10\%$ , 1/2W	551033133			
R529 R629	Resistor, Bath-tub, 10 $\pm 10\%$ , 2W	554010053			
R530 R630	Resistor, Bath-tub, 0.5 $\pm 10\%$ , 2W	554050953			
R531 R631	Resistor, Bath-tub, 0.5 $\pm 10\%$ , 2W	554050953			
R532 R632	Resistor, Composition, 1.5K $\pm 10\%$ , 1/2W	551015233			
R533 R633	Resistor, Carbon Film, 3.9K $\pm 10\%$ , 1/4W	552039223			
C501 C601	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C502 C602	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C503 C603	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C504 C604	Capacitor, Electrolytic, 10mfd, 25V	402100629			
C505 C605	Capacitor, Electrolytic, 100mfd, 16V	402100519			
C506 C606	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C507 C607	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C508 C608	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C509 C609	Capacitor, Electrolytic, 220mfd, 6.3V	402220509			
C510 C610	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C511 C611	Capacitor, Electrolytic, 1mfd, 50V	402100749			
C512 C612	Capacitor, Ceramic, 500pF $\pm 10\%$ , 250V	440501183			
C513 C613	Capacitor, Ceramic, 100pF $\pm 10\%$ , 250V	440101183			
C514 C614	Capacitor, Electrolytic, 47mfd, 35V	402470639			

## VOLUME CONTROL CIRCUIT BOARD

SYMBOL	DESCRIPTION	PART NO.
R801	Resistor, Carbon Film, 3.9K $\pm 10\%$ , 1/4W	552039223
R802	Resistor, Carbon Film, 3.9K $\pm 10\%$ , 1/4W	552039223
VR801	Variable Resistor, Balance Control, 250K	515121114
VR802	Variable Resistor, Volume Control, 100K	525121114
C801	Capacitor, Mylar Film, 0.1mfd $\pm 10\%$ , 50V	450100833
C802	Capacitor, Mylar Film, 0.1mfd $\pm 10\%$ , 50V	450100833
	Printed Circuit Board	140800133
	Volume Control Circuit Board	141810118

# ROTEL<sup>®</sup>

## RX-400A

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