ROTEL®

SERVICE MANUAL

RX-400 AM/FM Stereo Receiver

— Roland Electronics Co., Ltd. —

ALIGNMENT PROCEDURE

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 beta 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 their position.
2. Set MODE switch to "STEREO", SPEAKER switch to "ON" and SELEC TOR switch to "AUX" position.
3. Connect 8 ohm 50watts resistor across L speaker terminals. In paralle with the load resistor; connect the vertical input leads of the oscillo scope.
4. Connect an audio generator, set for 1,000Hz (sine wave), to L char AUX input.
5. Connect AC power cord and rotate volume control to clockwise positior ——full volume. Increase generator output until sine wave on scope jus starts clipping. Adjust DC balance VR505 for equal clipping on the pos tive and negative half cycles of the signal. (Fig. 1)
6. Rotate volume control to counter-clockwise position to get 0.9 volt RMS 8 ohm (0.1watts) output. Adjust crossover distortion, adjust VR5C until the crossover is extinguished. Or adjust idling current using a DCm meter, DCmV meter across R902 resistor on Rear Chassis; rotate VR50 to obtain a 7.5mV reading on DCmV meter (no signal input).
7. Repeat preceding steps for right channel.

Fig. 1 DC balance adjustment

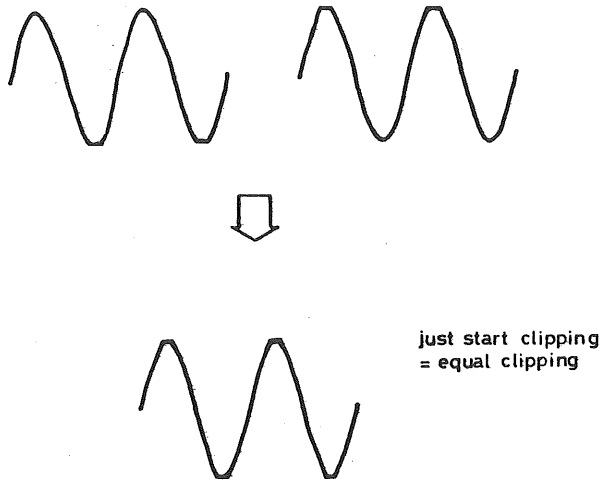


Fig. 2 crossover distortion adjustment

Fig. 2-1

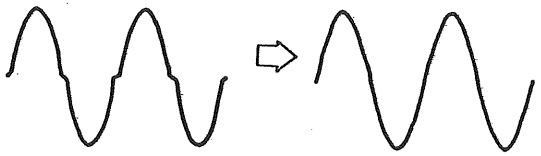
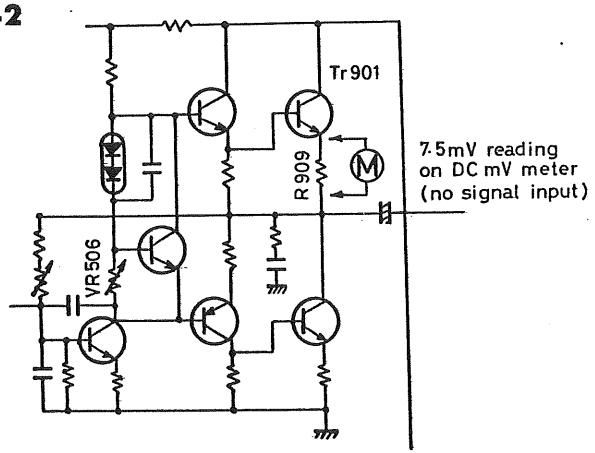
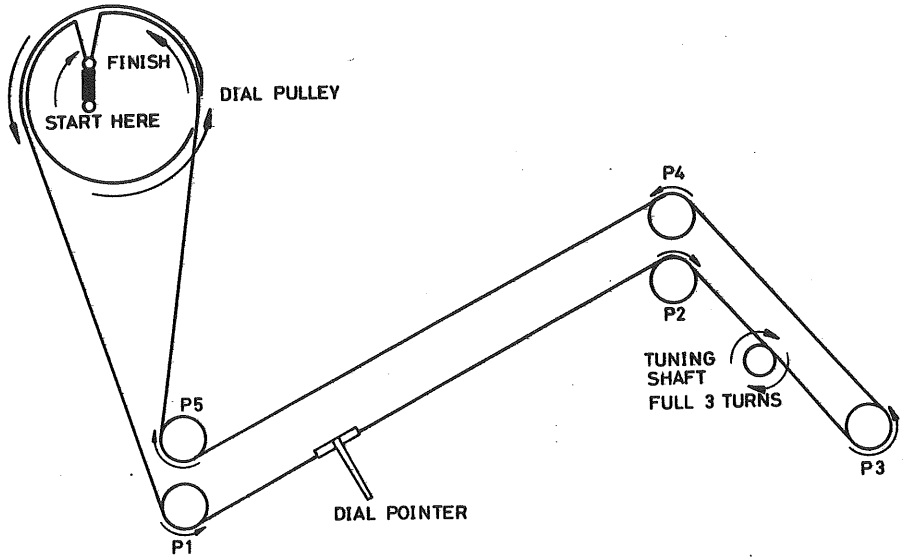


Fig. 2-2



DIAL STRINGING



AM ALIGNMENT

Instruments: AM Signal Generator, AC VTVM and Oscilloscope.
NOTE: Set Selector switch to "AM" position.
Input signal must be kept as low as possible to avoid AVC action.

Step	Signal Generator		Tuning Dial Setting	Output Indicator	Adjust	Adjust for
	Coupling	Frequency		Connect to		
1	Tr201 Bass through a 0.01uF capacitor	455KHz (400 Hz 30%)	Any non-interfering setting	VTVM and Oscilloscope L or R chan. TAPE OUT terminal	T203, 202 and 201	Maximum Deflection
2	Connect to short loop of wire. radiate signal into ferrite loopstick antenna.	600KHz (400 Hz 40%)	600KHz		L201 & L901 Ring of loopstick ANT	
3		1400KHz (400 Hz 30%)	1400KHz		CT5 (OSC) CT4 (ANT) (AM FM Front end)	
4	Repeat steps 2 and 3 until no further improvement is possible.					

FM ALIGNMENT

Instruments: FM Signal Generator, VTVM, Oscilloscope and Distortion meter.
Set Selector switch to "FM"

Step	Signal Generator		Tuning Dial Setting	Output Indicator	Adjust	Adjust for
	Connect to	Frequency		Connect to		
1	Junction of C909 & C910	10.7MHz (unmodulated)	Quiet point on band	VTVM across R126	T104 Bottom	Maximum
2				(set to center zero) junction of R127, C121	T104 Top	ZERO voltage
3	Repeat steps 1 and 2 as necessary to obtain a balanced "S" curve.					
4	FM antenna terminal	98MHz (400MHz 100% modulation)	Tuning for maxmum output point	Oscilloscope	T103, T102 T101 & T2 (FM Front end) Top & Bottom	Maximum
				Tape out		
5				Distortion meter junction of R127 & C126	T104 Top & Bottom fine Adjust	Minimum Distortion
5		90MHz	90MHz	VTVM	L2, L1 & T1 (FM Front end)	Maximum
				Tape out		
7		106MHz	106MHz		CT3, CT2 CT1 (FM Front end)	
8	Repeat steps 6 and 7 until no further improvement is possible.					

AM ALIGNMENT

Instruments: AM Signal Generator, AC VTVM and Oscilloscope.
NOTE: Set Selector switch to "AM" position.
Input signal must be kept as low as possible to avoid AVC action.

Step	Signal Generator		Tuning Dial Setting	Output Indicator	Adjust	Adjust for
	Coupling	Frequency		Connect to		
1	Tr201 Bass through a 0.01uF capacitor	455KHz (400 Hz 30%)	Any non-interfering setting	VTVM and Oscilloscope L or R chan. TAPE OUT terminal	T203, 202 and 201	Maximum Deflection
2	Connect to short loop of wire. radiate signal into ferrite loopstick antenna.	600KHz (400 Hz 40%)	600KHz		L201 & L901 Ring of loopstick ANT	
3		1400KHz (400 Hz 30%)	1400KHz		CT5 (OSC) CT4 (ANT) (AM FM Front end)	
4	Repeat steps 2 and 3 until no further improvement is possible.					

FM ALIGNMENT

Instruments: FM Signal Generator, VTVM, Oscilloscope and Distortion meter.
Set Selector switch to "FM"

Step	Signal Generator		Tuning Dial Setting	Output Indicator	Adjust	Adjust for
	Connect to	Frequency		Connect to		
1	Junction of C909 & C910	10.7MHz (unmodulated)	Quiet point on band	VTVM across R126	T104 Bottom	Maximum
2				(set to center zero) junction of R127, C121	T104 Top	ZERO voltage
3	Repeat steps 1 and 2 as necessary to obtain a balanced "S" curve.					
4	FM antenna terminal	98MHz (400MHz 100% modulation)	Tuning for maxmum output point	Oscilloscope	T103, T102 T101 & T2 (FM Front end) Top & Bottom	Maximum
				Tape out		
5				Distortion meter junction of R127 & C126	T104 Top & Bottom fine Adjust	Minimum Distortion
5		90MHz	90MHz	VTVM	L2, L1 & T1 (FM Front end)	Maximum
				Tape out		
7		106MHz	106MHz		CT3, CT2 CT1 (FM Front end)	
8	Repeat steps 6 and 7 until no further improvement is possible.					

MPX ALIGNMENT

Instruments: FM Stereo Generator, VTVM and Oscilloscope.
Set Selector switch to FM STEREO.
NOTE: Check the alignment of the FM IF amplifier before aligning the MPX decoder. Poor IF alignment can make proper multiplex adjustment impossible.
Set VR301 (located on MPX board "MX-G") to center position before starting this procedure. Connect Stereo Generator to FM antenna terminals.
Stereo Generator output level must be kept to 1-2mV during all adjustment.

Step	Stereo Generator		Output Indicator	Adjust	Adjust for
	Modulation	RE. Deviation	Connect to		
1	19KHz Pilot only	1 – 2%	VTVM & Oscilloscope test point TP2	"MX-G" T301 T302 T302	Maximum
2	Composite 1KHz L channel only	Pilot 10% Signal 70%	VTVM & Oscilloscope L chan. Tape out	"MX-G" T302	Maximum Clean sine wave on scope.
3	Composite 1KHz R channel only			"MX-G" VR301	Minimum
4	Same as step 2		VTVM & Oscilloscope R chan. Tape out		
5	Repeat steps 3 and 4 until no further improvement is possible.				

FM MONO-STEREO AUTOMATIC SWITCHING LEVEL ADJUSTMENT PROCEDURE

1. Connect a VTVM and Oscilloscope to the TAPE OUT jack (Left or Right).
2. Feed the FM signal whose MPX has been varied into the ANT terminal.
   MPX variation Pilot 10%
   L. or R. modulation frequency 1KHz
   RF deviation ±45KHz
3. Set the frequency at 98 MHz (when there is disrupting signal, choose another setting).
4. Set the MODE switch to STEREO and FUNCTION switch to FM STEREO

=ADJUSTMENT=

1. Turn CCW the MONO—STEREO Auto Switching Level Control (VR101): this is a condition in which Auto Switching does not function.
2. Adjust the FM MPX so that the distortion and separation will be best.
3. Adjust the VR101 so that when the antenna input level is 30μV or more, Stereo will switch in and when the input is below the 30μV level, Mono will switch in.
4. After adjustment, check to make sure that, indeed, when the antenna input level exceeds 30μV, 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 (D901) 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 C905 or faulty Transistors Tr901, 902, 903, 904, 506, 508, 606 or 608, or
c. Faulty C901 or 902.
2. If the DC fuse is OK,
a. And if the B voltage is not OK,
(1). Rectifier (D901) is open, or
(2). Secondary Winding in the Power Transformer (center tap, black lead) is cut, or
(3). Faulty grounding of Black Lead Wire, or
(4). 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, 506, 508, 603, 604, 605, 606 or 608 are faulty.
(c). C510, 511, 512, 514, 610, 611, 612 or 614 are faulty.
(2). And if there is no signal output at TAPE OUT jacks,
(a). Transistors Tr501, 502, 601 or 602 are shorted out or open, or
(b). C501, 502, 601 or 602 are open, or
(c). Wires from the Function Switch are out, or
(d). Wires to the Tape Monitor Switch are out.

ONLY PHONO SECTION INOPERATIVE

I. If there is no fault in the wires to the Pre-amplifier 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 INEFECTIVE

I. C504, 505, 506, 507, 604, 605, 606 or 607 are faulty.

LOUDNESS CONTROL INEFFECTIVE

I. C508 or 608 is faulty, or
II. Loudness Switch connection is faulty.

RADIO SECTION INOPERATIVE

I. If both AM and FM are inoperative,
A. Measure voltage at B7 (refer to circuit diagram),
1. If there is no voltage at B7,
(a). Resistor R918 is faulty, or
(b). Capacitor C903 is faulty, or
2. If there is proper voltage at B7,
(a). Function Switch connection is faulty, or
(b). Wire to the Function Switch is cut.

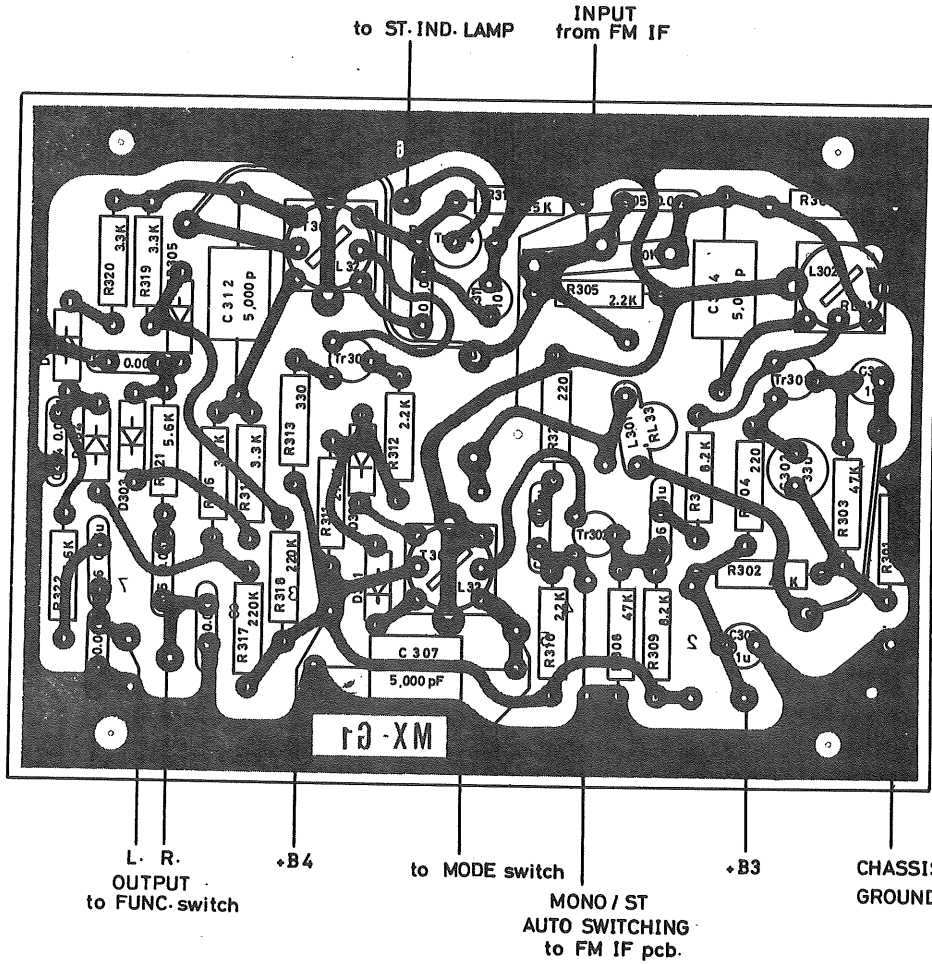
II. If only AM is inoperative.
A. Measure voltage of AM IF PCB (6).
1. If there is no voltage,
(a). Function Switch connection is faulty, or
(b). Wire from Function Switch is cut, or
(c). C202, 210, 213 or 215 are faulty.
2. If there is proper voltage.
(a). C211 is faulty, or
(b). Transistors Tr201, 202 or 203 are faulty, or
(c). Coils L201 or 901 are faulty, or
(d), AM IFT T201, 202 or 203 are faulty.

III. If only FM is inoperative, check to see if MPX is working pr
A. If MPX is faulty, measure voltage at B3 and B4.
1. If there is no voltage at B3,
a. C303 or 904 are faulty, or
b. R919 is faulty.

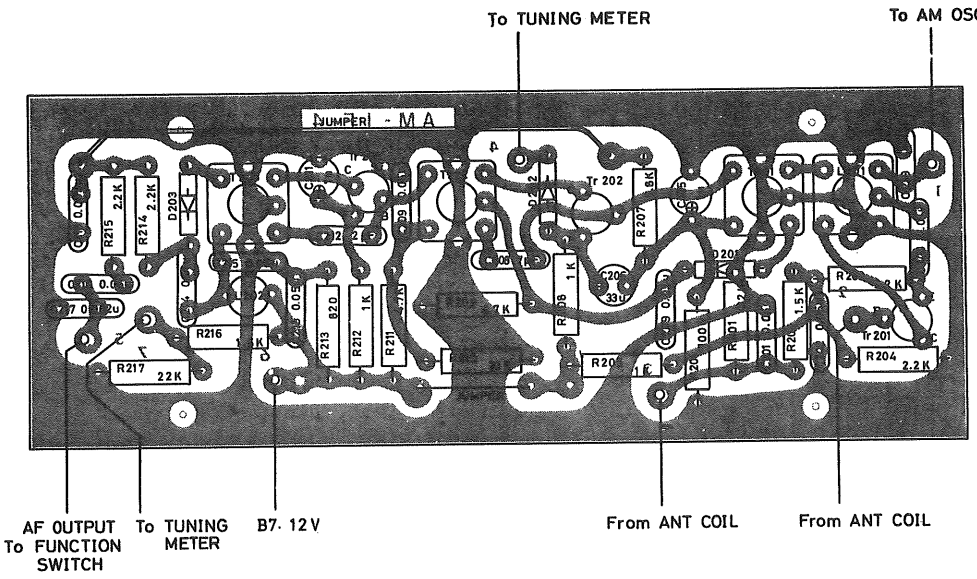
2. If there is no voltage at B4,
   a. R924 is faulty, or
   b. C908 is faulty.
3. If there is proper voltage,
   a. And if there is no signal with Function Switch set at FM,
      (1). C301 is faulty.
   b. If there is no signal with Function Switch set at FM STEREO,
      (1). Transistors Tr301, 302 or 303 are faulty.
   c. If there is proper voltage at B5 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 at B7,
      (1). If there is no voltage at B7,
         (a). Function Switch connection is faulty, or
         (b). Wire from Function Switch is cut, or
         (c). C102, 106, 113 or 116 are faulty.
      (2). If there is proper voltage at B7,
         (a). Transistors Tr101, 102, 103 or 104 are faulty, or
         (b). C105, 109, 112 or 117 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). C21 or 13 are faulty.
   b. If FM Front-end is OK,
      (1). Input circuit is grounded, or
      (2). FM antenna improperly connected.

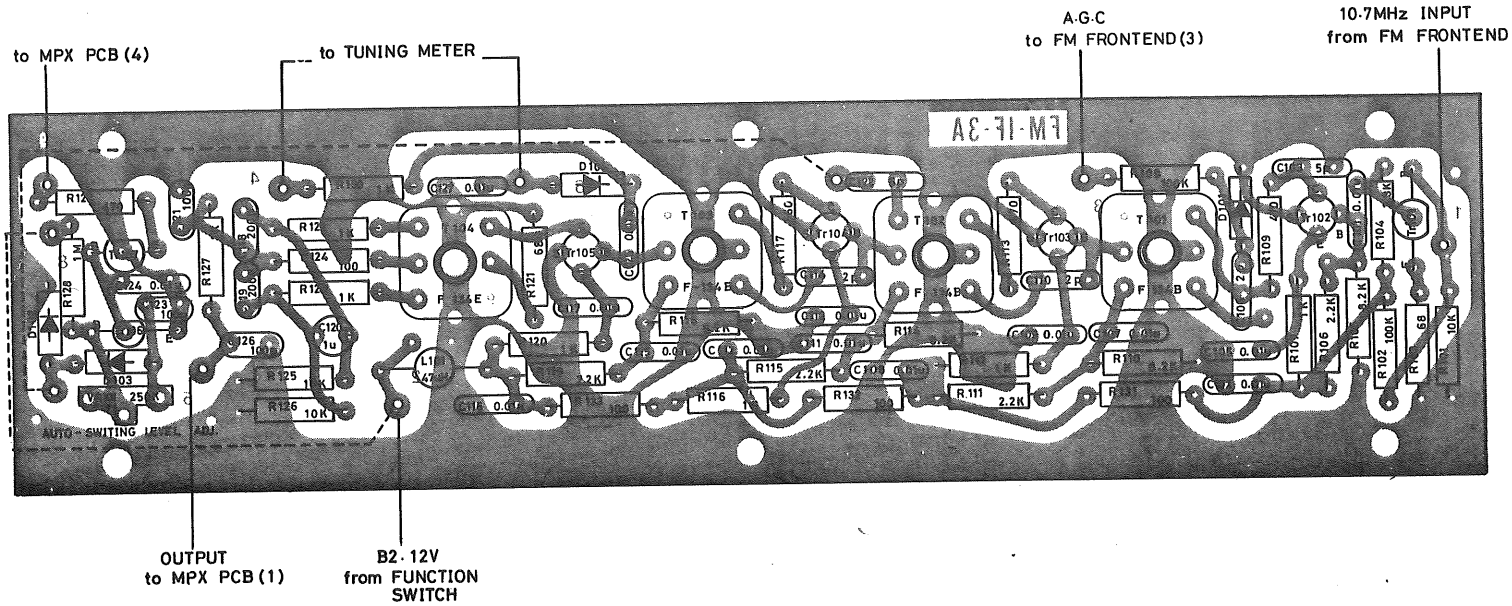
MPX PCB "MX-G1"



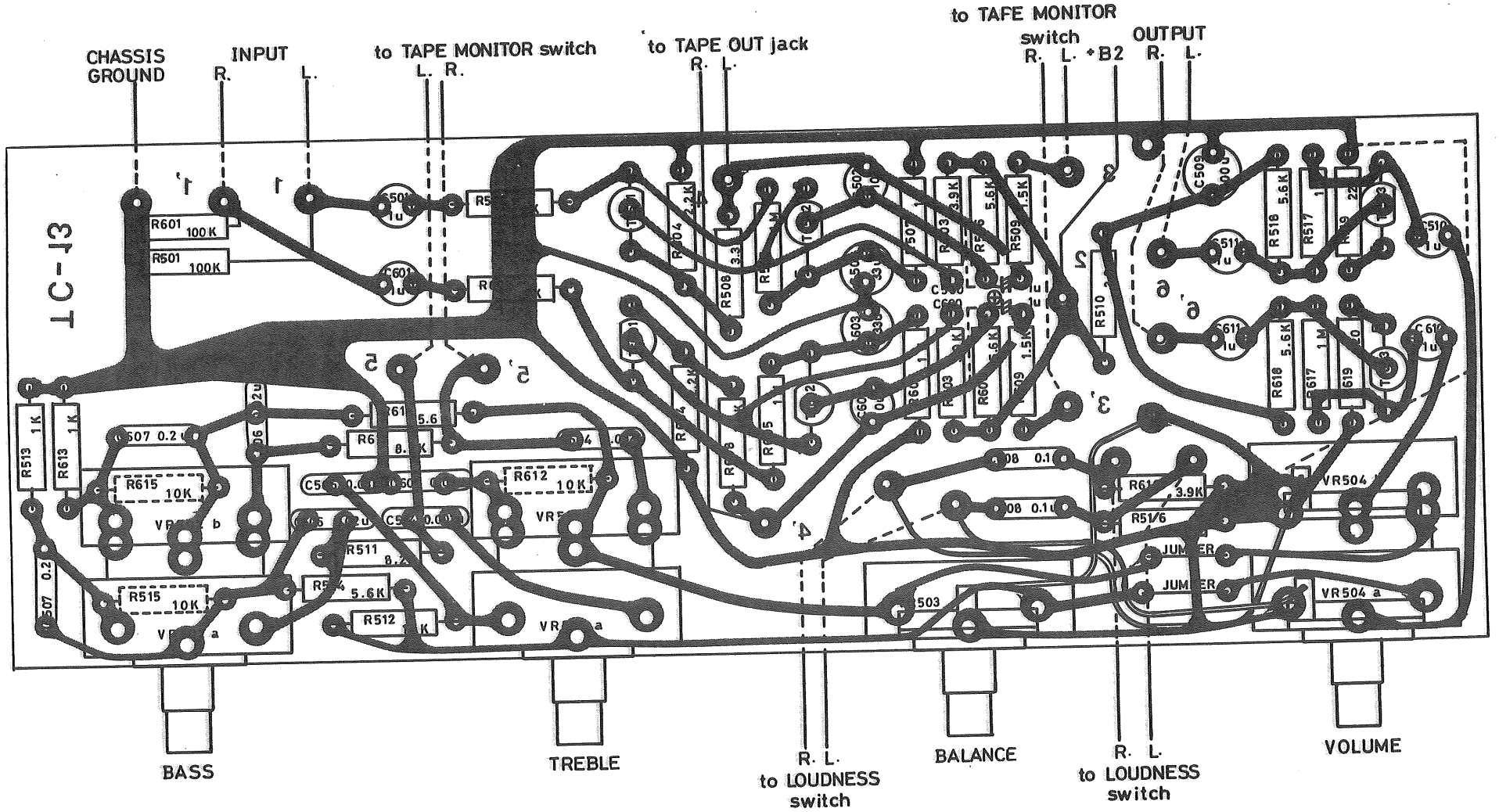
AM IF AMP CIRCUIT BOARD



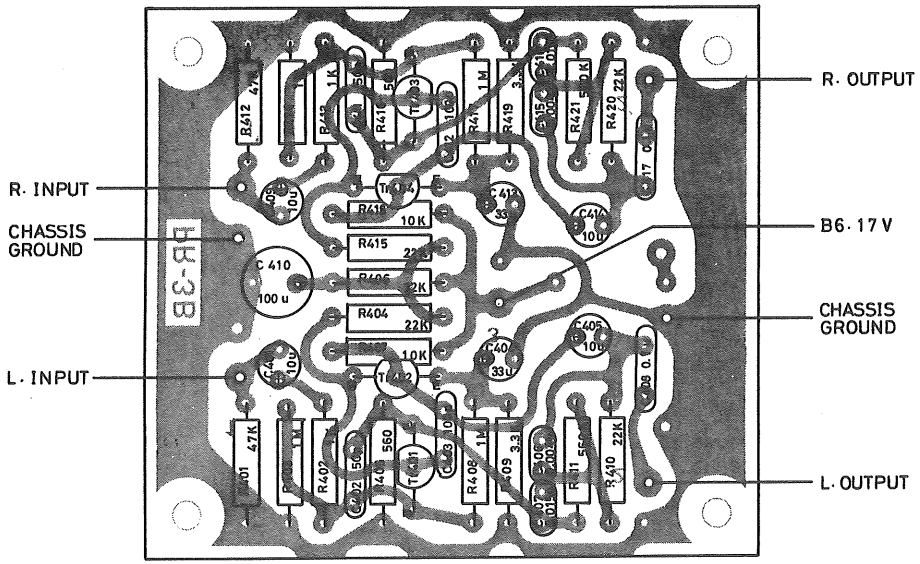
FM IF CIRCUIT BOARD DIAGRAM



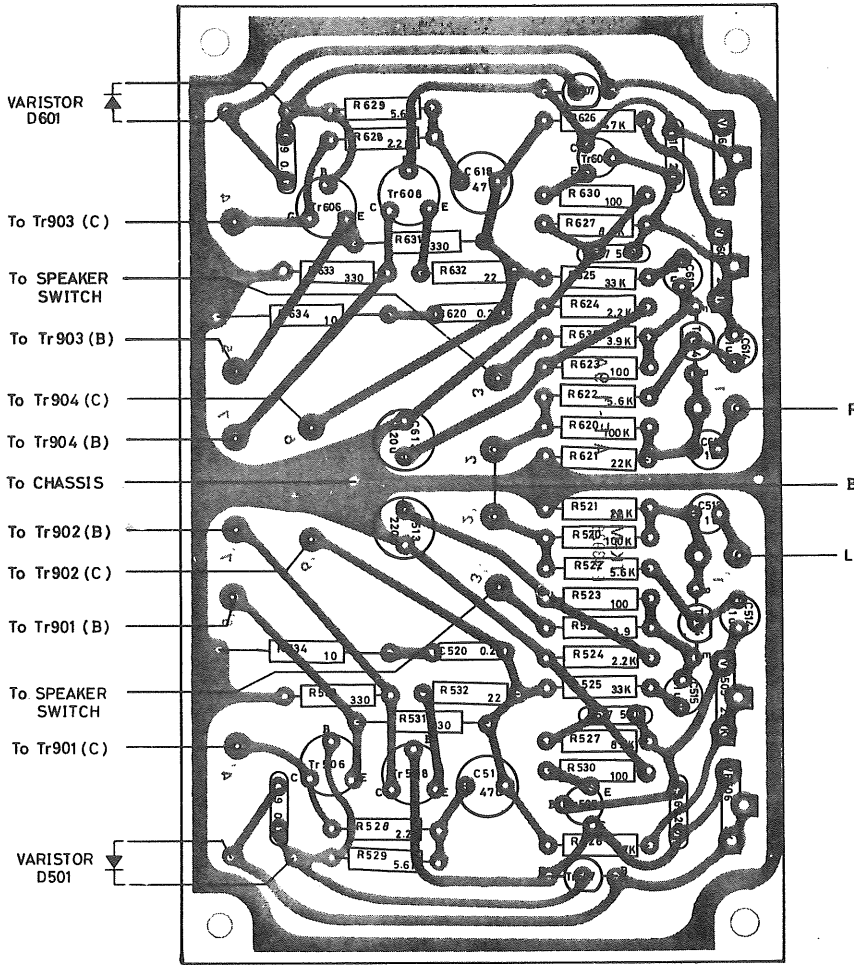
TONE CONTROL PCB "TC 13"



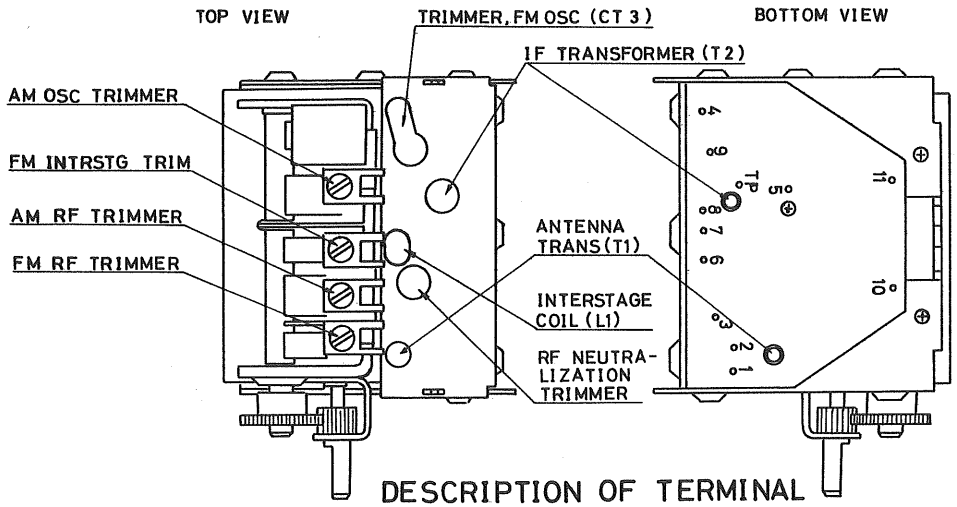
PRE-AMP CIRCUIT BOARD "PR-3B"



PRE-DRIVER/DRIVER CIRCUIT BOARD AF-19A



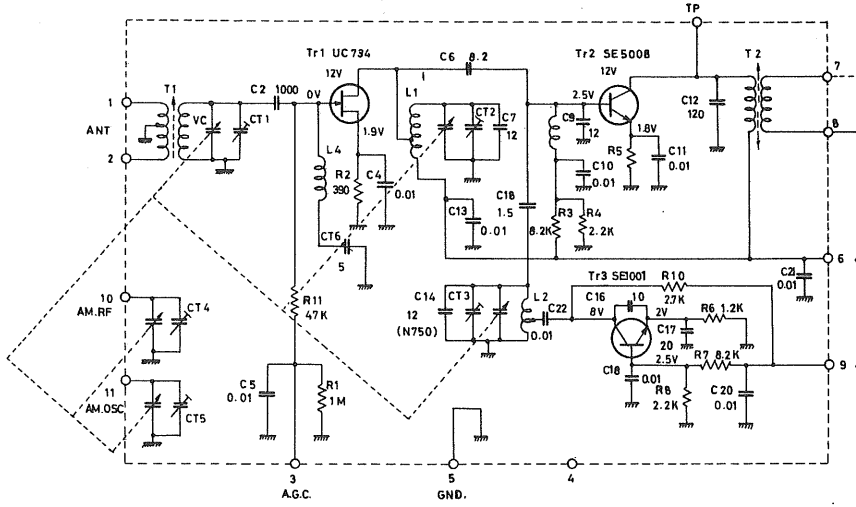
AM/FM FRONT END (32SN2F1-351)



DESCRIPTION OF TERMINAL

NO. 1, 2	ANTENNA	NO. 7	IF HOT
3	A G C	8	IF COLD
4	NC	9	B+OSC
5	PW GND	10	AM RF
6	B+RF MIX	11	AM OSC

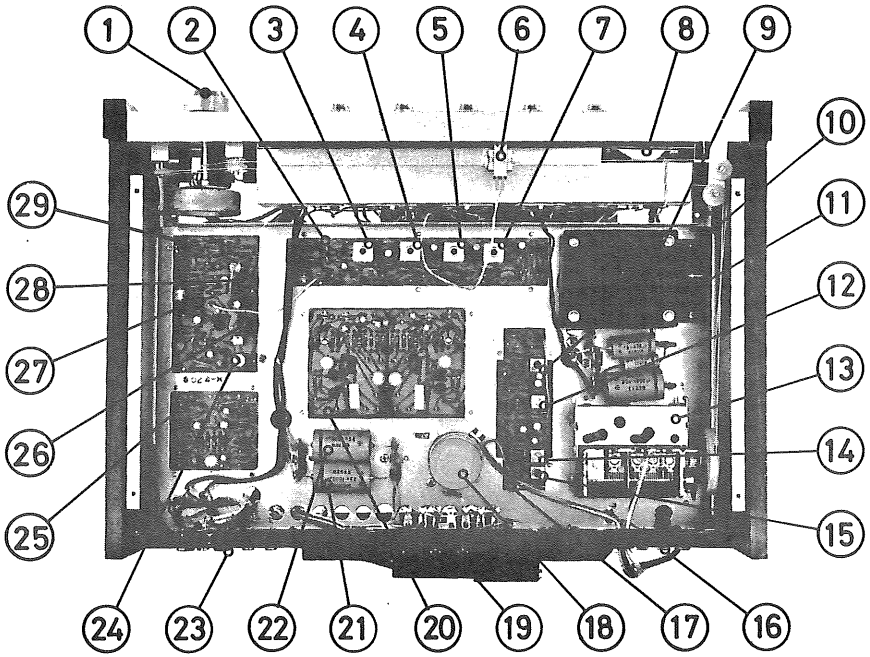
AM/FM FRONT END (32SN2F1-351) SCHEMATIC DIAGRAM



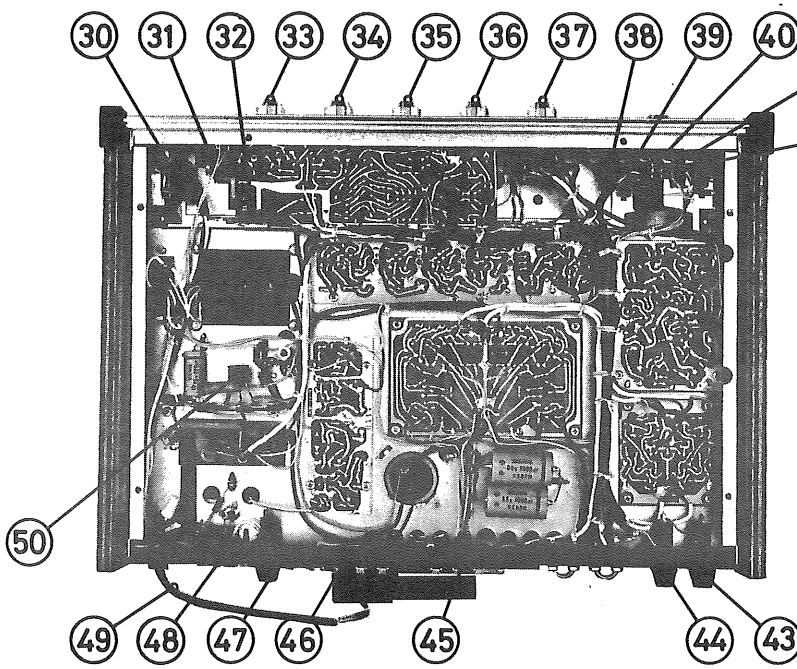
1. ALL CAPACITY VALUES IN μμF, EXCEPT DECIMAL VALUES IN μF.
2. ALL RESISTANCE VALUES IN OHMS.

LAYOUT

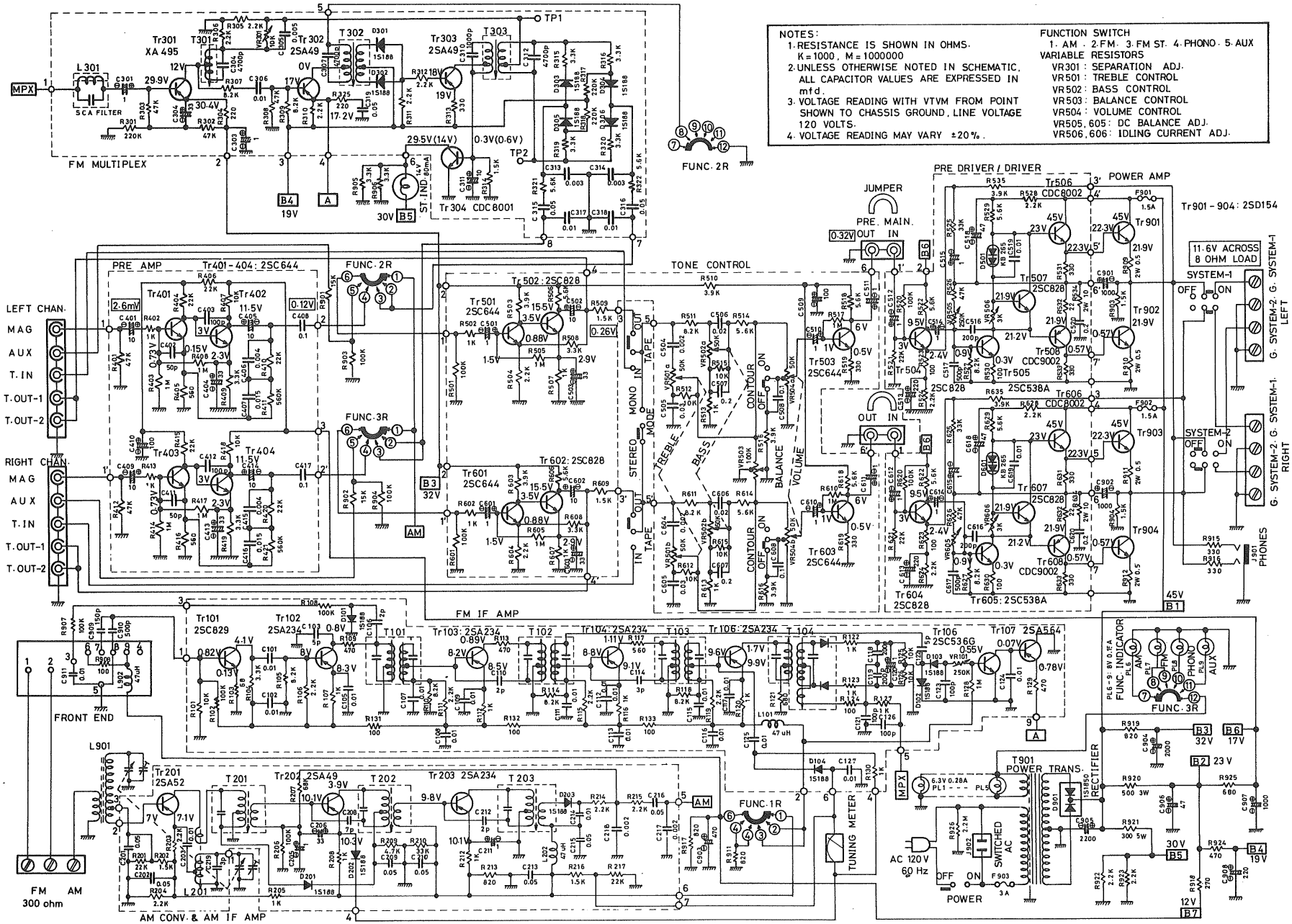
TOP VIEW



BOTTOM VIEW



1. Tuning Knob
2. FM IF amp PBC
3. T104 (ratio)
4. T103 (3rd)
5. T102 (2nd)
6. Dial Pointer
7. T101 (1st)
8. Stereo Lamp
9. Power Transformer
10. T203 (AM Dec)
11. Voltage Selector
12. T202 (2nd)
13. AM/FM Front end
14. T201 (1st)
15. L201 AM OSC
16. ANT Terminal
17. AM Conv & IF amp PCB
18. Ripple Filter Capacitor
19. L901 AM ANT Coil
20. Pre-Driver/Driver PCB
21. C902 Output Capacitor R-ch
22. C901 Output Capacitor L-ch
23. Input Terminal
24. L302 (19KHz)
25. Pre-amp PCB
26. VR301 Separation Adj.
27. T301 (38KHz)
28. T302 (38KHz)
29. Multiplex PCB
30. Power Switch
31. Headphone Jack
32. Tone Control PCB
33. Bass Control
34. Treble Control
35. Balance Control
36. Volume Control
37. Function Switch
38. Loudness Switch
39. Tape Monitor Switch
40. Mode Switch
41. Speaker Switch System-
42. Speaker Switch System-
43. DC Fuse (Right)
44. DC Fuse (Left)
45. Output Terminal (Right)
46. Output Terminal (Left)
47. AC Fuse
48. AC Outlet
49. AC Supply Cord
50. D901 Rectifier


NOTES:
1. RESISTANCE IS SHOWN IN OHMS. K=1000, M=1000000
2. UNLESS OTHERWISE NOTED IN SCHEMATIC, ALL CAPACITOR VALUES ARE EXPRESSED IN mfd.
3. VOLTAGE READING WITH VTVM FROM POINT SHOWN TO CHASSIS GROUND, LINE VOLTAGE 120 VOLTS.
4. VOLTAGE READING MAY VARY ±20%.
FUNCTION SWITCH
1. AM · 2. FM · 3. FM ST. 4. PHONO · 5. AUX
VARIABLE RESISTORS
VR301 : SEPARATION ADJ.
VR501 : TREBLE CONTROL
VR502 : BASS CONTROL
VR503 : BALANCE CONTROL
VR504 : VOLUME CONTROL
VR505, 605 : DC BALANCE ADJ.
VR506, 606 : IDLING CURRENT ADJ.
FM MULTIPLEX
SCA FILTER
PRE AMP
Tr401 - 404 : 2SC644
TONE CONTROL
PRE DRIVER / DRIVER
POWER AMP
Tr901 - 904 : 2SD154
11.6V ACROSS 8 OHM LOAD
SYSTEM-1
SYSTEM-2
LEFT CHAN.
RIGHT CHAN.
MAG
AUX
T. IN
T. OUT-1
T. OUT-2
FUNC. 2R
FUNC. 3R
FUNC. 1R
JUMPER
PRE. MAIN.
TAPE
MONO
STEREO
MODE
TREBLE
BASS
BALANCE
VOLUME
CONTOUR
FM IF AMP
FRONT END
AM CONV. & AM IF AMP
FM AM
300 ohm
TUNING METER
FUNC. INDICATOR
PHONES
POWER TRANS.
RECTIFIER
SWITCHED AC
AC 120 V
60 Hz
POWER

PARTS LIST FOR MODEL RX-400

Roland part No.	Symbol No.	Descriptions
502068123	R103	Carbon Resistor 68 ohm(K)1/4w
502100123	R124, 131, 132, 133, 532, 623, 530, 630	〃 100 ohm(K)1/4w
502220123	R325, 304	〃 220 ohm(K)1/4w
502330123	R519, 619, 313	〃 330 ohm(K)1/4w
502470123	R109, 113, 129	〃 470 ohm(K)1/4w
502560123	R117, 405, 416	〃 560 ohm(K)1/4w
502680123	R121	〃 680 ohm(K)1/4w
502820123	R213	〃 820 ohm(K)1/4w
502010223	R107, 112, 116, 120, 122, 123, 127, 205, 208, 212, 402, 413, 502, 507, 513, 602, 607, 613	〃 1Kohm(K)1/4w
502015223	R202, 216, 314, 509, 609	〃 1.5Kohm(K)1/4w
502022223	R106, 111, 115, 119, 203, 130, 204, 214, 215, 305, 306, 310, 311, 312, 504, 524, 528, 604, 624, 628	〃 2.2Kohm(K)1/4w
502033223	R104, 315, 316, 319, 320, 409, 419, 508, 608	〃 3.3Kohm(K)1/4w
502039223	R503, 519, 535, 510, 603, 619, 635	〃 3.9Kohm(K)1/4w
502047223	R209, 211	〃 4.7Kohm(K)1/4w
502056223	R321, 322, 506, 606, 514, 614, 518, 618, 522, 622, 529, 629	〃 5.6Kohm(K)1/4w
502068223	R207	〃 6.8Kohm(K)1/4w
502082223	R105, 110, 114, 118	〃 8.2Kohm(K)1/4w
	307, 309, 511, 611, 527, 627	
502010323	R101, 125, 126, 407, 418, 512, 612, 515, 615	Carbon Resister 10Kohm(K)1/4w
502015323	R901, 902	〃 15Kohm(K)1/4w
502022323	R201, 217, 404, 406, 410, 415, 420, 521, 621	〃 22Kohm(K)1/4w
502033323	R210, 525, 625	〃 33Kohm(K)1/4w
502047323	R302, 303, 308, 401, 412, 526, 626,	〃 47Kohm(K)1/4w
502010423	R102, 108, 206, 501, , 601, 520, 620, 903, 904, 907	〃 100Kohm(K)1/4w
502022423	R301, 317, 318	〃 220Kohm(K)1/4w
502056423	R411, 421	〃 560Kohm(K)1/4w
502010523	R128, 403, 408, 414, 417, 505, 605, 517, 617	〃 1Mohm(K)1/4w
501022133	R532, 632	〃 22 ohm(K)1/2w
501100133	R908	〃 100 ohm(K)1/2w
501270133	R918	〃 270 ohm(K)1/2w
501330133	R531, 533, 631, 633, 915, 916	〃 330 ohm(K)1/2w
501470133	R924	〃 470 ohm(K)1/2w
501560133	R925	〃 560 ohm(K)1/2w
501820133	R911, 917, 919	〃 820 ohm(K)1/2w
501015233	R913, 914	〃 1.5Kohm(K)1/2w
501022233	R922, 923	〃 2.2Kohm(K)1/2w
501033233	R905, 906	〃 3.3Kohm(K)1/2w
501022533	R926	〃 2.2Mohm(K)1/2w
503300173	R921	Metal Oxide Resistor 300 ohm(K)5w
503500163	R920	〃 500 ohm(K)3w
504005053	R909, 910, 911, 912,	Bath-tub Resistor 0.5 ohm(K)2w
504010153	R534, 634	〃 10 ohm(K)2w
525101111	VR501, 502	Bass & Treble Cont. 50Kohm A
525121112	VR504	Volume Cont. 50Kohm B
515121112	VR503	Balance Cont. 100Kohm W
521025032	VR101, 505, 605	250Kohm
521005022	VR506, 606	Idling Current Adj. 5Kohm
523001032	VR301	Separation Adj. 10Kohm
400220439	C905	Electrolytic Capacitor 2,200mfd 50V(L)
401100439	C901, 902, 904, 907	〃 1,000mfd 35V(ST)
401470519	C903	〃 470mfd 16V(ST)
401220529	C908	〃 220mfd 25V(ST)
401470639	C906	〃 47mfd 35V(ST)
402220509	C513, 613	〃 220mfd6.3V(SU)
402100519	C410, 509	〃 100mfd 16V(SU)
402470639	C518, 618	〃 47mfd 35V(SU)
402330609	C206, 302, 404, 413 503, 603	〃 33mfd6.3V(SU)
402100619	C311, 401, 405, 409, 414, 502, 602, 511, 611	〃 10mfd 16V(SU)
402100739	C120, 205, 211, 301, 303, 500, 501, 510, 512, 514, 515, 600, 601, 610, 612, 614, 615	〃 1mfd 50V(SU)
451471033	C304, 307, 312	Polystren Film Capacitor 4,700pF 50V

PARTS LIST FOR MODEL RX-400

Roland part No.	Symbol No.	Descriptions
451101033	C310	Polystyren Film Capacitor 4,700pF 50V
450501033	C305	Mylar Film Capacitor 0.005mfd 50V
450401033	C406, 415	〃 0.004mfd 50V
450301033	C313, 314	〃 0.003mfd 50V
450201033	C504, 604	〃 0.002mfd 50V
450500933	C319	〃 0.05mfd 50V
450300933	C505, 605	〃 0.03mfd 50V
450200933	C506, 606	〃 0.02mfd 50V
450150933	C407, 416	〃 0.015mfd 50V
450100933	C306, 317, 318	〃 0.01mfd 50V
450100833	C508, 608	〃 0.1mfd 50V
450200833	C507, 607, 520, 620	〃 0.2mfd 50V
440201338	C106, 110, 114, 212	Ceramic Capacitor 2pF 50V
440301336-1	C219	〃 3pF N5.6
440501333	C103, 122	〃 5pF
440701333	C208	〃 7pF
440501283	C405, 411	〃 50pF
440101183	C121, 126, 123, 403, 412	〃 100pF 250V
440151183	C909	〃 500pF 250V
440201183	C118. 119, 516, 616	〃 200pF 250V
440501183	C517, 617, 910	〃 500pF 250V
440201085	C217, 218	〃 0.002mfd 250V
440100985	C101, 102, 105, 107, 108, 109, 111, 112, 113, 115, 116, 117, 124, 125, 127, 203, 214, 518, 619, 911	〃 0.01mfd 250V
440500935	C201, 202, 209, 210, 213, 215, 315, 316	〃 0.05mfd 50V

Roland part No.	Symbol No.	Description
440100835	C408, 417	Ceramic Capacitor 0.1mfd 50V
301001111	Tr202, 302, 303	Transistor, 2SA49
301001112	Tr201	〃 2SA52
301001114	Tr102, 103, 104, 105, 203	〃 2SA234
301001117	Tr107	〃 2SA564
301201115	Tr502, 504, 507, 602, 604, 607	〃 2SC828
301201117	Tr101	〃 2SC829
301201114	Tr401, 402, 403, 404, 501, 503, 601, 603	〃 2SC644
301201113	Tr505, 605	〃 2SC538A
301201112	Tr106	〃 2SC536G
301901120	Tr301	〃 XA495
301901112	Tr508, 608	〃CDC9002-1
301901111	Tr506, 606	〃 CDC8002-1
301901117	Tr304	〃 CDC8001-1
301301119	Tr901, 902, 903, 904,	〃 2SD154
300111002	D101, 102, 103, 104, 201, 202, 203, 301, 302, 303, 304, 305, 306	1S188
300919007	D901	Rectifier SB-3
300212002	D501, 601	Varistor KB-265
205001306		Power Transformer
225501114	T101, 102, 103	IFT, FM(1st, 2nd, 3rd)
225501115	T104	IFT, FM (Ratio)
255301121	T201	IFT, AM (1st)
255301122	T202	IFT, AM (2nd)
255301124	T203	IFT, AM (3rd)
223301121	L201	AM OSC Coil
222391115	L901	AM ANT Coil

Roland part No.	Symbol No.	Descriptions
228111125	L302	MPX Coil, 19KHz Tune
228211125	T301, 302	MPX Transformer, 38KHz Tune
228641111	L301	SCA Filter
220001121	L101, 202, 902	RFC
320320510		AM/FM Front-end
231310003		Meter, Tuning
352063028		Lamp, Dial Illumination
351140008		Lamp, Stereo Indicator
351080015		Lamp, Func. Indicator
642100104		Pin Jack, RCA type 4p
642100210		Pin Jack, RCA type 10p
641200103		Terminal, ANT Input
641200104		Terminal, Output
654911282		Tuning Shaft w/Flywheel
610111365		Switch, Func, Selector
614010101		Switch, Power Supply
614051002		Switch, Mode, Speaker etc
626107211		Headphone Jack
620101114		AC Outlet
640253334		Fuse Holder
341240020		Fuse, 2A
341240015		Fuse, 1.5A
796301115		Power Supply Cord
116310016		Knob, Tuning
116310017		Knob, Func, Vol. Bal, Treb, Bass
116110012		Knob, Power Switch
133191253		Side Panel (right)
133291253		Side Panel (left)
112111252		Dial Glass
111911216		Front Panel Ass'y
835201205		Service Manual

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