

TECHNICAL MANUAL



ROTEL[®]

RT-850

AM/FM STEREO TUNER

RT-850L

LW/MW/FM STEREO TUNER

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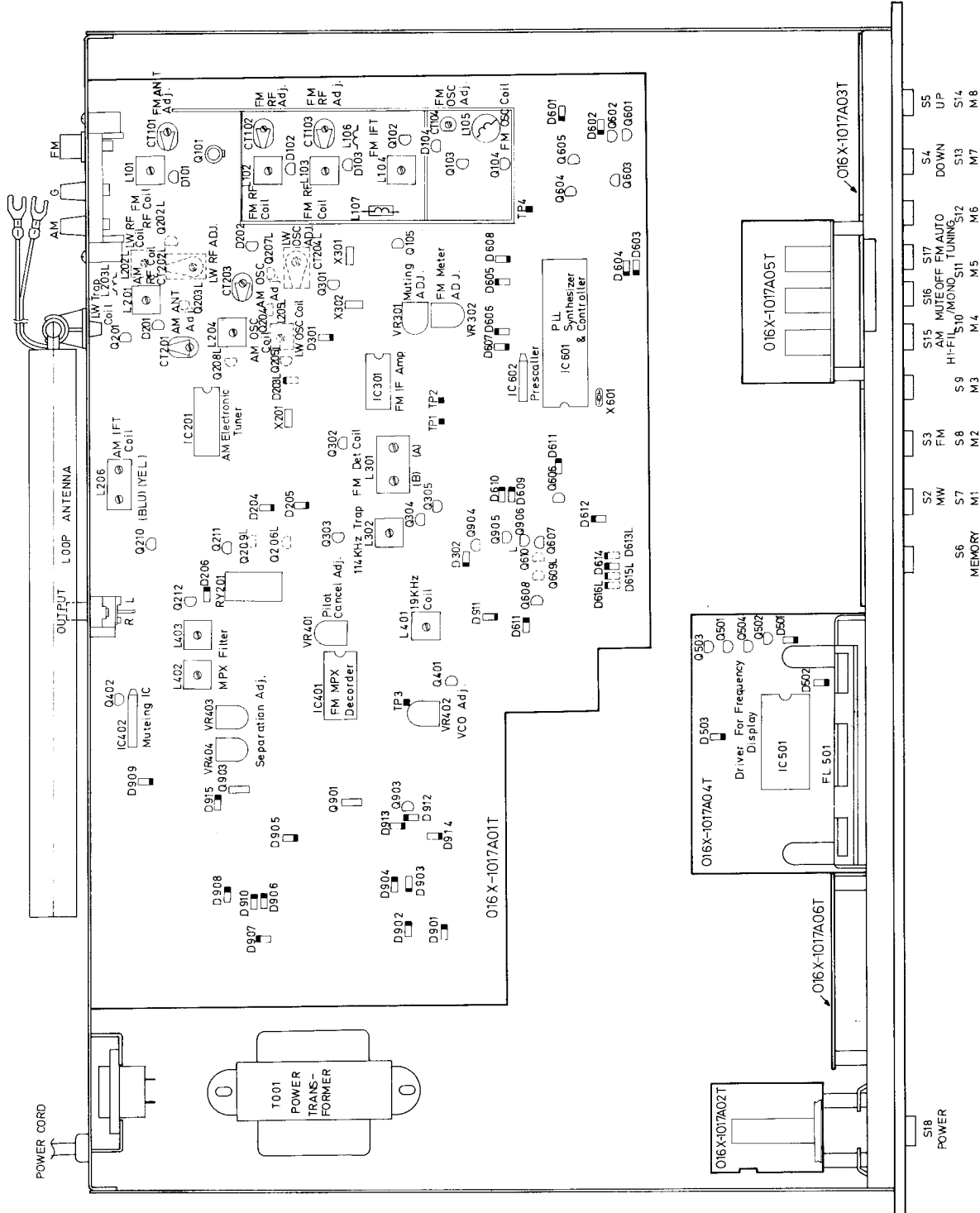
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THE ROTEL CO., LTD.
ROTEL ELECTRONICS CO., LTD.

1-36-8 OHOKAYAMA, MEGURO-KU, TOKYO 152, JAPAN
ROTEL BLDG., 3F. NO. 35, FUSING N. ROAD, TAIPEI,
TAIWAN, REPUBLIC OF CHINA

MN20001196

Chassis Layout



FM IF and RF Alignment

Instruments : FM Signal Generator, (400Hz, 100% Modulated) T.H.D. analyzer, Oscilloscope, AC VTVM, DC Voltmeter, Tuning Meter

Terminated : DC Voltmeter...Between TP4 and Earth On X-1017AOIT P.C.B.
Tuning Meter...Between TP1 and TP2 On X-1017AOIT P.C.B.

Step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	No use.		87.5 MHz	L105	3V reading on DC Voltmeter
2			108 MHz	CT104	22V reading on DC Voltmeter
3	Repeat steps 1 and 2 unit no further improvement is noticed.				
4	Antenna terminal	90 MHz	90 MHz	L101,L102 L103	Maximum reading on AC VTVM.
5				L104	Adjusting balance of wave form
6		105 MHz	105 MHz	CT101, CT102 CT103	Maximum reading on AC VTVM.
7	Repeat steps 4.5 and 6 unit on further improvement is noticed (Muting OFF)				
8	Antenna terminal 1mV input	90 MHz	90 MHz	L301(A)	Adjust center on Tuning Meter
9				L301(B)	Minimum reading on T.H.D. Analyzer
10	Repeat steps 8 and 9 unit no further improvement is noticed (Muting OFF)				
11	Antenna terminal 15 μ V input	90 MHz	90 MHz	VR 301	Muting Level (Muting ON)
12	Antenna terminal 5 μ V input	90 MHz	90 MHz	VR 302	Signal Indicator Level (Muting OFF)

FM MPX Alignment

Instruments : FM Stereo Generator, AC VTVM, Oscilloscope, Frequency Counter and THD Analyzer

Step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	No use		98 MHz	VR 402	VCO 75.9 kHz \pm 100Hz (Muting ON) TP3 Thru 68 kohms resistor
2	Antenna terminal 1mV input	98 MHz Pilot.....10% 1 KHz.....90% Mod.	98 MHz	L401	Stereo indicator light up (Muting ON) L or R Max. reading on AC VTVM.
3				VR403,VR404	Best separation
4	Antenna terminal 1mV input	98 MHz Pilot.....10% 1 KHz.....90% Mod.	98 MHz	VR401 L104	Pilot Cancel 19 KHz Minimum Dist.
5	Repeat steps 2 to 4 unit no further improvement is noticed. Check the stereo indicator can be operated normally when pilot signal is reduce from 10% to 5%				

MW IF and RF Alignment

Instruments : AM signal Generator (400Hz 30% Modulated), AC VTVM, Oscilloscope, DC Voltmeter
Terminated : DC Voltmeter "Between TP4 and Earth ON X-1017A01T P.C.B.

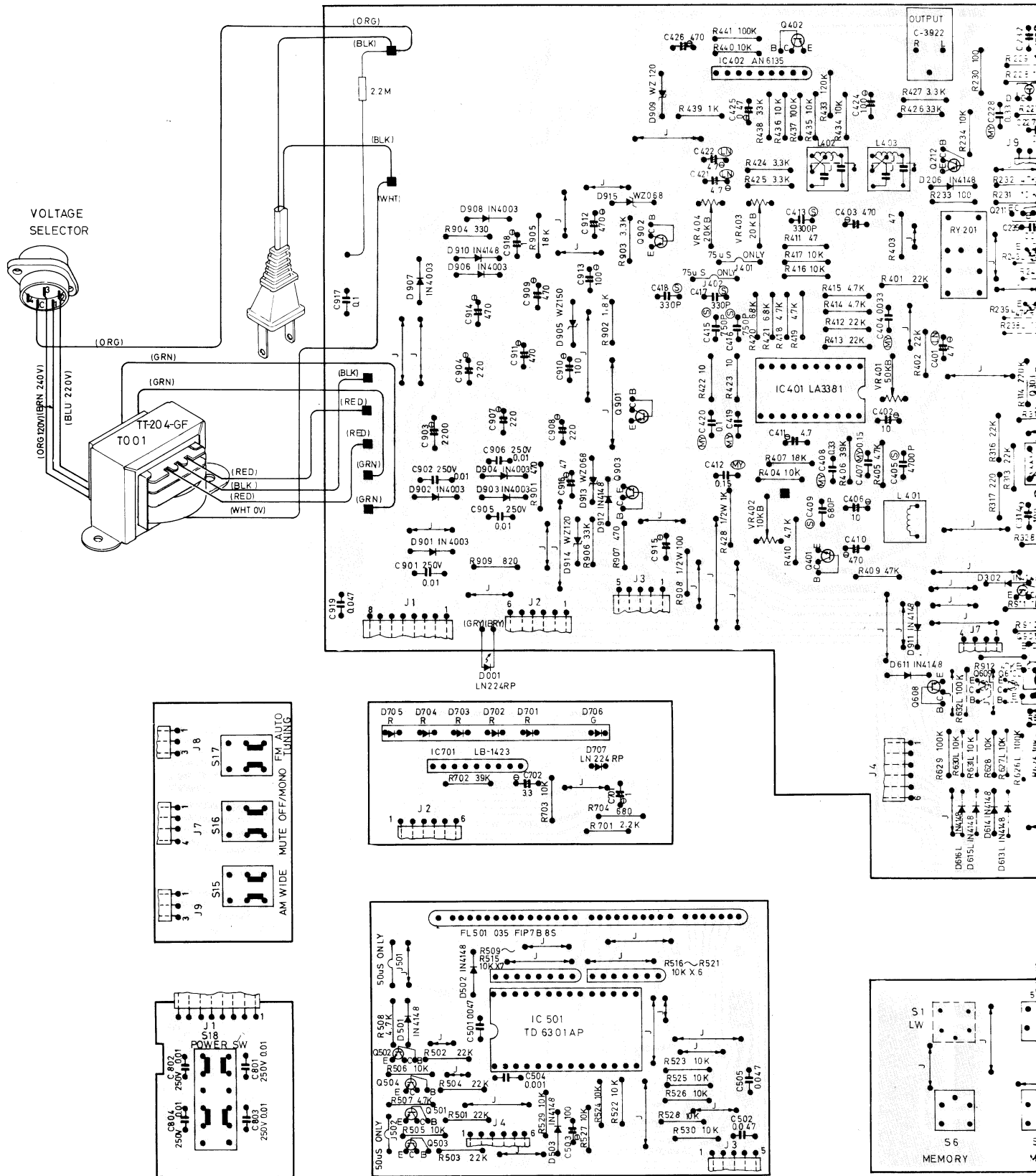
Step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	No use.		530 KHz (531 KHz) Europe	L204	About 1.2V \pm 0.1V on DC Volt meter
2			1600 KHz (1602 KHz) Europe	CT203	About 9V \pm 0.2V on DC Volt meter
3	Repeat steps 1 and 2 unit no further improvement is noticed.				
4	Test Loop Radiate signal into loop antenna	450 KHz	530 KHz	L206	Maximum reading on AC VTVM.
5		600 KHz	600 KHz	L201, L206	
6		1400 KHz	1400 KHz	CT201	
7	Repeat steps 5 and 6 unit no further improvement is noticed.				

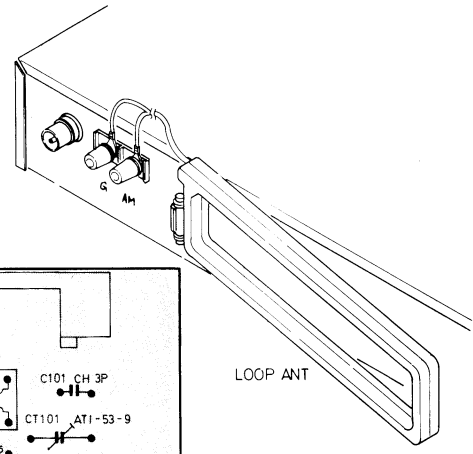
LW RF Alignment

Instruments : AM signal Generator (400Hz 30% Modulated), AC VTVM, Oscilloscope, DC Voltmeter.
Terminated : DC Voltmeter "Between TP4 and Earth ON X-1017A01T P.C.B.

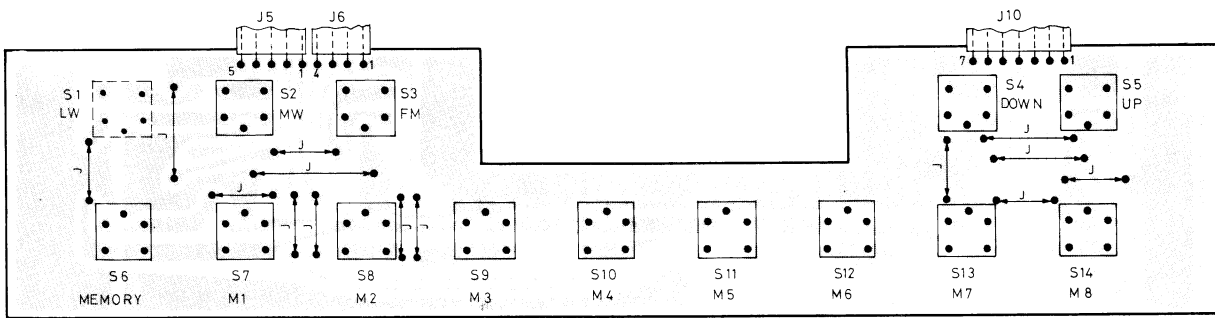
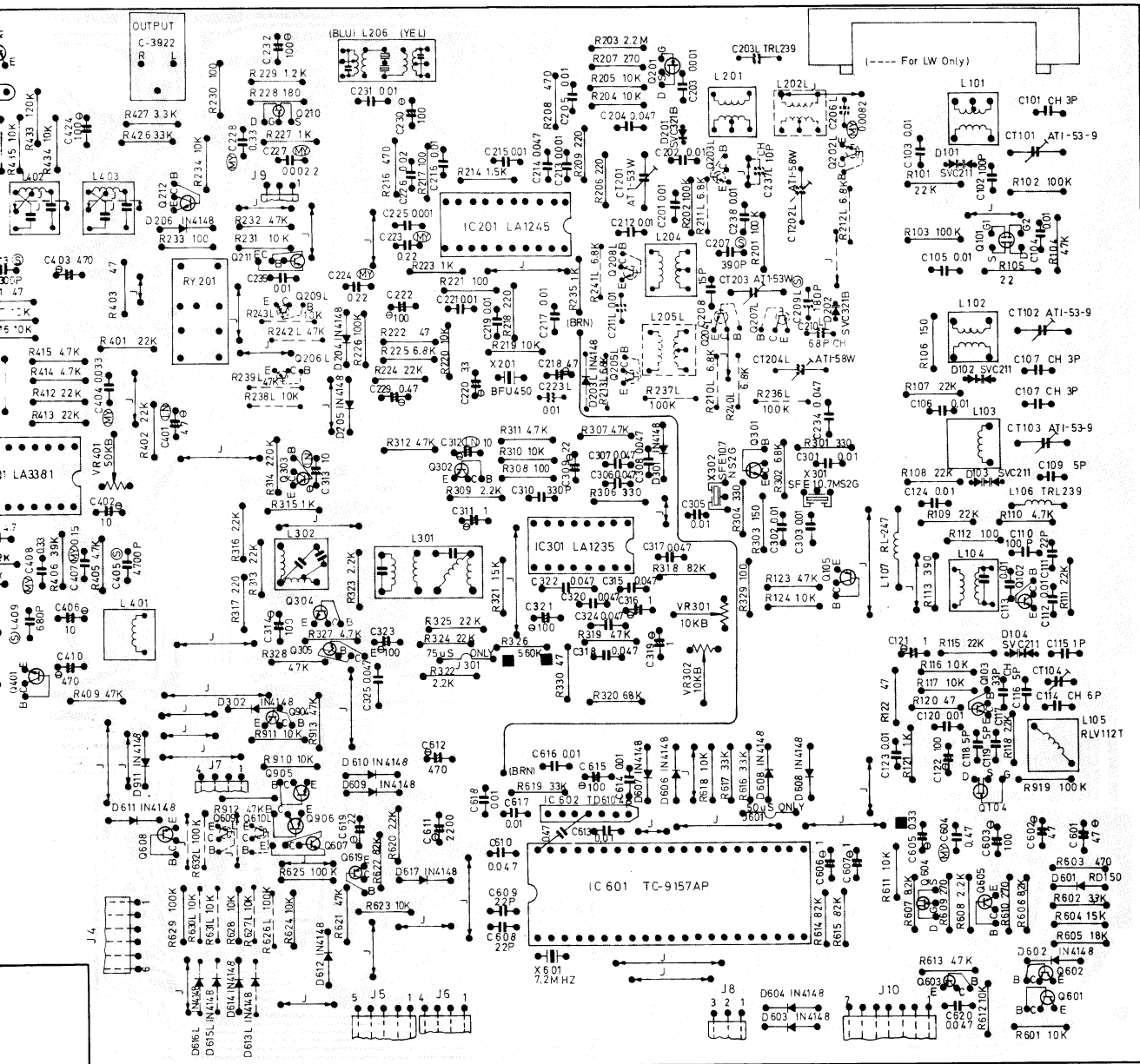
Step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	No use.		153 KHz	L205	About 2.5 \pm 0.1V on DC Volt meter
2			281 KHz	CT204	About 7.5V \pm 0.2V on DC Volt meter
3	Repeat steps 1 and 2 unit no further improvement is noticed.				
4	Test Loop Radiate signal into loop antenna	160 KHz	160 KHz	L202	Maximum reading on AC VTVM.
5		250 KHz	250 KHz	CT202	
6	Repeat steps 4 and 5 unit no further improvement is noticed.				

Wiring Diagram



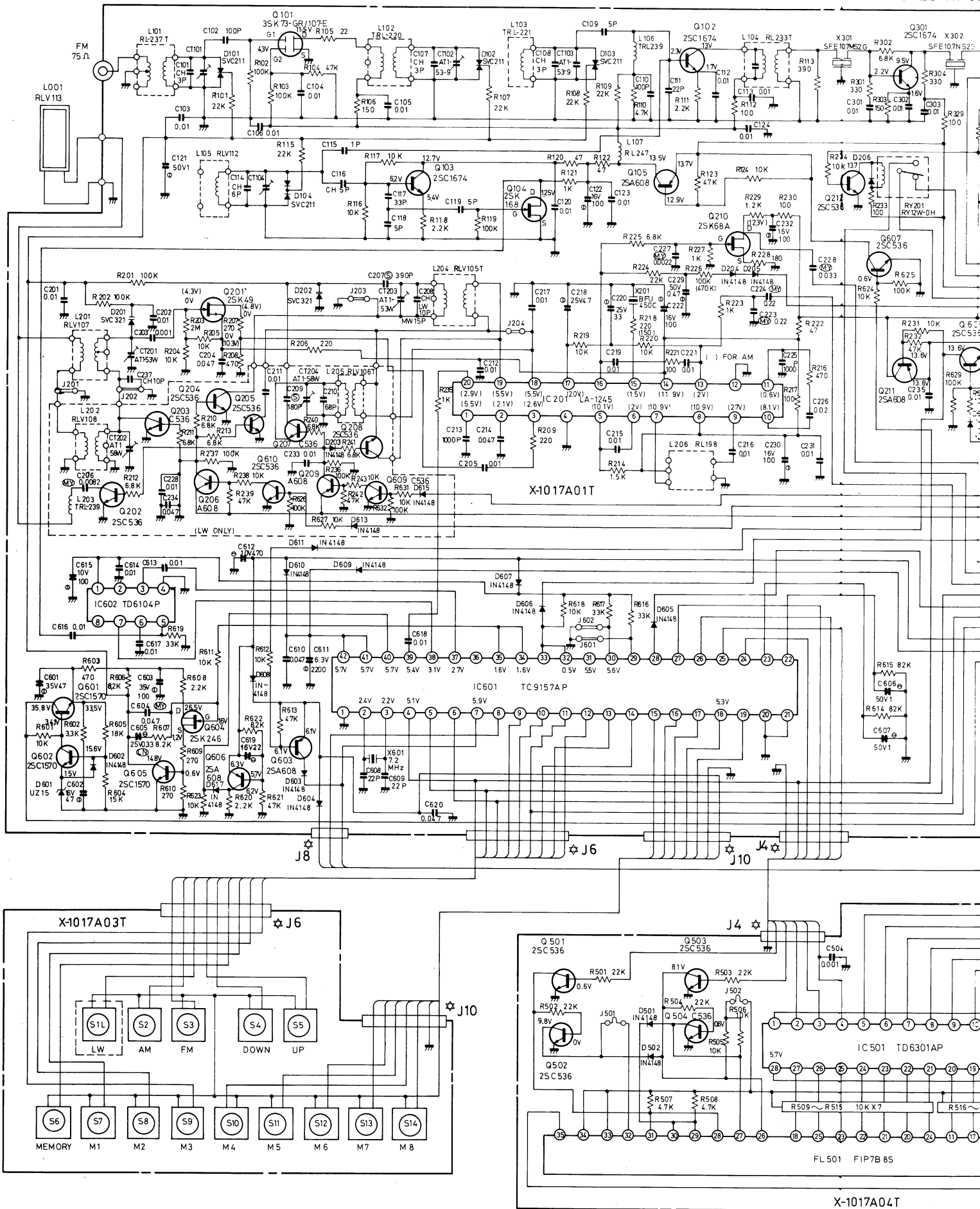


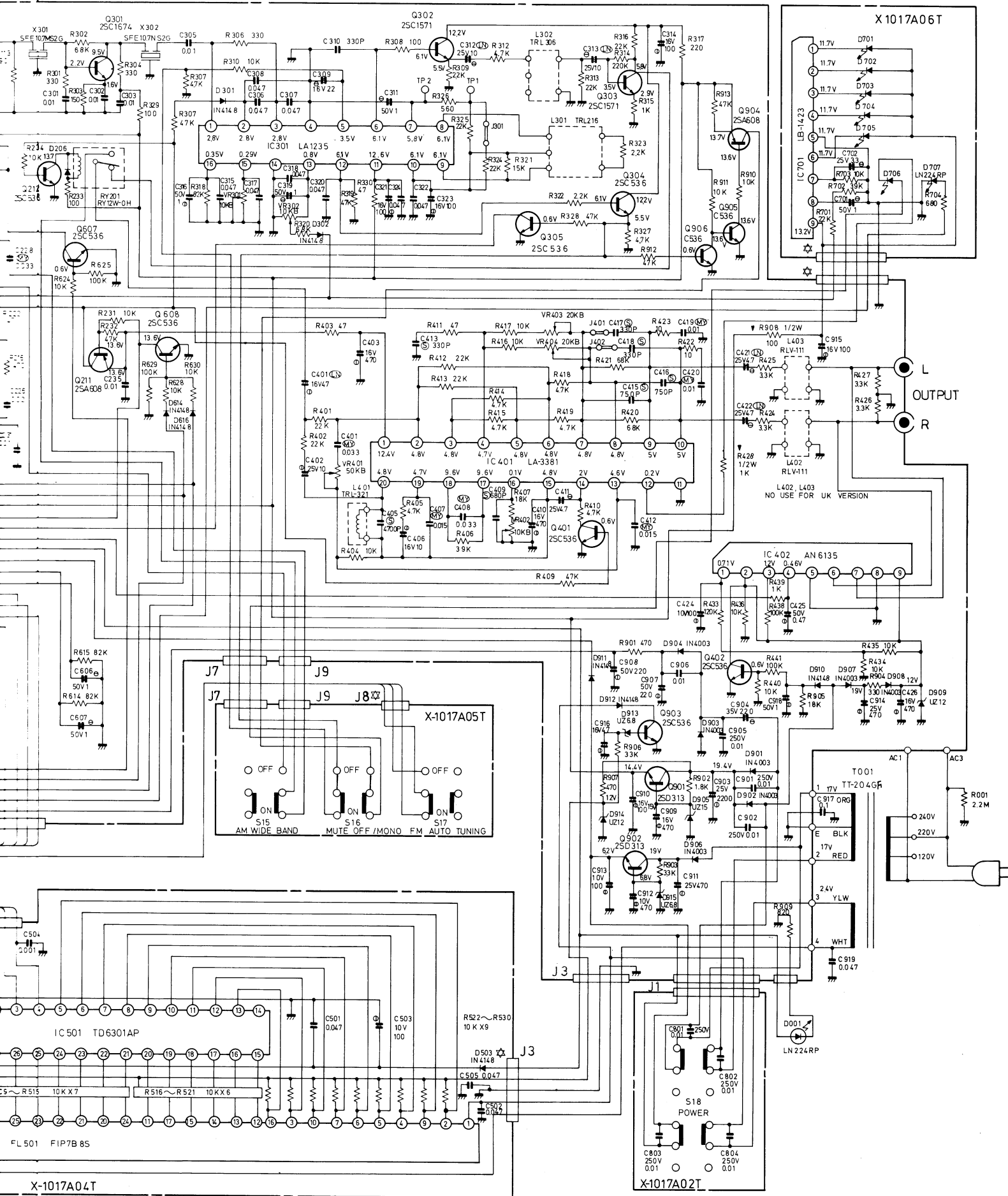
LOOP ANT

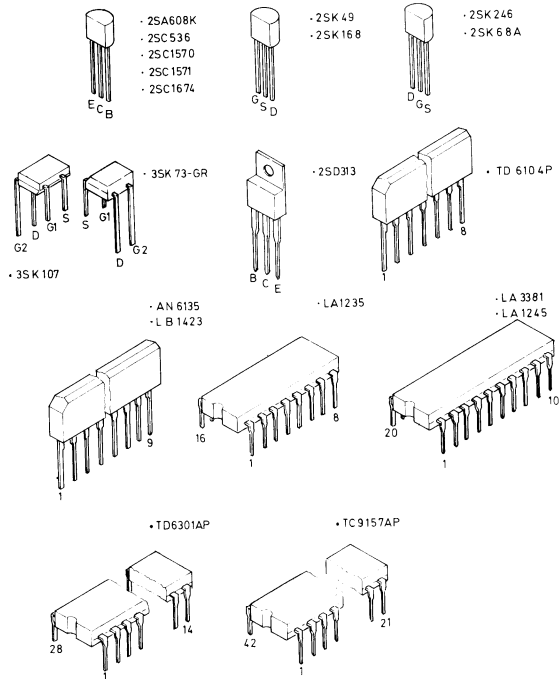


Schematic Diagram

SCHEMATIC DIAGRAM MODEL RT-85







RESISTORS

5% TOLERANCE UNLESS OTHERWISE NOTED
 K..... KILO OHM
 M..... MEGA OHM
 ▽..... NONFLAMMABLE CARBON FILM RESISTORS 1/2 WATT
 NON MARK..... LOW NOISE TYPE CARBON RESISTORS 1/4 WATT

CAPACITORS

⊙..... POLYSTYRENE FILM CAPACITORS
 ①..... TANTALUM CAPACITORS
 ⊗..... MYLAR FILM CAPACITORS
 ⊕..... ELECTROLYTIC CAPACITORS
 ⊖..... LOW NOISE ELECTROLYTIC CAPACITORS
 NON MARK..... CERAMIC CAPACITORS

J602	J601	DESTINATION
OPEN	CLOSE	EUROPE
OPEN	OPEN	USA 10 KHz
CLOSE	CLOSE	S AFRICA

	RT 850	RT850	RT 850L
X201	No Color Mark	BLACK	BLACK
R218	220	150	150
R226	100K	390K	470K
D204	IN478	JUMPER	JUMPER

DE-EMPHASIS	CLOSE	OPEN
75 uS	J401, J402, J301	J501, J502
50 uS	J501, J502	J401, J402, J301

J201~J204	2 BAND	CLOSE
	3 BAND	OPEN

Repair Parts List

Schematic Location	Computer No.	Description
TRANSISTORS, DIODES AND IC'S		
Q101	TR5000140	032 3SK73-GR/107F, FM RF Amp.
Q102	TR30000133	2SC1674, FM MIX.
Q103	TR30000133	2SC1674, FM OSC.
Q104	TR50000139	032 2SK168-F, Buffer AMP.
Q105	TR10000129	2SA608K(F,G), For Switching
Q201	TR50000097	2SK49(F,H), AM RF AMP.
Q202L, Q203L	TR30000327	2SC536G, For Switching
Q204L	TR30000327	2SC536G For Switching
Q205L	TR30000327	2SC536G, For Switching
Q206L	TR10000126	2SA608K (F, G) For Switching
Q207L	TR30000327	2SC536G, For Switching
Q208L	TR30000327	2SC536G, For Switching
Q209L	TR10000126	2SA608K (F, G) For Switching
Q210	TR50000061	032 2SK68A-KIM, AM Audio AMP.
Q211	TR10000126	2SA608K(F,G), For Switching
Q301	TR30000133	2SC1674, FM IF AMP.
Q302	TR30000108	2SC1571(E,F), Buffer AMP.
Q303	TR30000108	2SC1571(E,F), FM Audio AMP.
Q304	TR30000327	2SC536G, For Switching
Q305	TR30000327	2SC536G, For Auto Stop.
Q401	TR30000327	2SC536G, For Switching VCO Stop Control
Q402	TR30000327	2SC536G, For Switching
Q501,Q502	TR30000327	2SC536G, For Switching
Q503,Q504	TR30000327	2SC536G, For Switching
Q601	TR30000108	2SC1570(E,F), Stabilizer
Q602	TR30000108	2SC1570(E,F), Stabilizer
Q603	TR10000126	2SA608K(F,G), For Switching
Q604	TR50000127	032 2SK246-YGR, Low Pass Filter.
Q605	TR30000108	2SC1570, Low Pass Filter
Q606	TR10000126	2SA608K(F,G), For Switching
Q607	TR30000327	2SC536G, For Switching
Q608	TR30000327	2SC536G, For Switching
Q609	TR30000327	2SC536G, For Switching
Q901	TR30000029	2SD313, Stabilizer
Q902	TR30000029	2SD313, Stabilizer
Q903	TR30000327	2SC536G, For Switching
Q904	TR10000126	2SA608K(F,G) For Switching
Q905	TR30000327	2SC536G, For Switching
Q906	TR30000327	2SC536G, For Switching
D101	DD50000055	SVC211, Vari-Cap FM Tuning
D102	DD50000055	SVC211, Vari-Cap FM Tuning
D103	DD50000055	SVC211, Vari-Cap FM Tuning
D104	DD50000055	SVC211, Vari-Cap FM Tuning
D201	DD50000031	SVC321B, Vari-Cap AM Tuning
D202	DD50000031	SVC321B, Vari-Cap AM Tuning
D203L	DD10000100	1N4148, Reverse Prevention
D204	DD10000100	1N4148, AM Meter Rectifier
D205	DD10000100	1N4148, AM Meter Rectifier
D301	DD10000100	1N4148, Reverse Prevention
D302	DD10000100	1N4148, FM Meter Rectifier
D501~D503	DD10000100	1N4148, Diode
D601	DD20000193	UZ-15B, Zener Regulator
D602~D614	DD10000100	1N4148, Diode
D701~D705	DD40000691	034 C-3949, Signal Level IND.
D706	DD40000691	034 C-3949, Stereo IND.
D707	DD40000095	034 LN224RP, Memory IND.
D901~D904	DD10000068	1N4003, Rectifier
D905	DD20000193	UZ-15B, Zener Regulator
D906~D908	DD10000068	1N4003, Rectifier
D909	DD20000016	UZ-12B, Zener Regulator
D910	DD10000100	1N4148, Diode
D913,D915	DD20000065	UZ-6.8B, Zener Regulator
D914	DD20000016	UZ-12B, Zener Regulator
D001	DD40000095	034 LN224RP, Power IND.
X201	LF00000221	BFU450C, 405KHz Ceramic Resonator
X301,X302	LF00000166	SFE10.7MSZGA, 10.7MHz Ceramic Resonator

Schematic Location	Computer No.	Description
X601	DD60000040	023 HC187U 7.2MHz, Crystal Resonator
IC201	IC00001322	LA1245, AM Electronic Tuner
IC301	IC00001103	LA1235, FM IF AMP.
IC401	IC00001334	LA3381, FM MPX Decoder
IC402	IC00001310	031 AN6135, Muting
IC501	IC00000573	TD6301AP, Driver for Frequency Display
IC601	IC00001346	TC9157AP, PPL Synthesizer & Controller
IC602	IC00000482	TD6104P, Prescaller
IC701	IC00000883	LB1423, LED Driver
FL501	DD40000125	035FIP7B8S, FL Tube
COILS AND VARIABLE RESISTORS		
L001	LB01130005	021 RLA113A00, Loop ANT.
L101	LC02370009	RL-237T, FM RF Coil
L102	LC22200006	TRL-220, FM RF Coil
L103	LC22210000	TRL-221, FM RF Coil
L104	LC02330000	RL-233T, FM IFT.
L105	LC31120000	RLV-112T, FM OSC Coil
L105	LC23190008	TRL-319, FM OSC Coil (South Africa Only)
L106	LM00000073	TRL-239, FM IF TRAP Coil
L107	LM00000346	RL-247T, Choke Coil
L201	LC31070008	021 RLV107A00, AM RF Coil
L202L	LC31080002	021 RLV108A00, LW, RF Coil
L203L	LM00000073	2.2μH TRL-239, LW Trap Coil
L204	LC31050009	RLV-105T, AM OSC Coil
L205	LC31060003	RLV-106T, LW, OSC Coil
L206	LC01980000	021 RL-198, AM IFT Coil
L301	LC22160008	TRL-216, FM DET Coil
L302	LC23060009	TRL-306, 114 KHz Trap
L401	LM00000360	TRL-312, 19 KHz Coil
L402,L403	LC31110006	021 RLV111A00, MPX Filter
VR301	RV20000193	08-301 10KB, Muting Adj
VR302	RV20000193	08-301 10KB, FM Meter Adj
VR401	RV20000235	08-301 50KB, Pilot Cancel Adj
VR402	RV20000193	08-301 10KB, VCO Adj
VR403,VR404	RV20000223	08-301 20KB, Separation Adj
SWITCHES AND OTHERS		
S1~S14	SH60000070	Key Board SW, LW/MW/FM Band, DOWN, UP, Station 1~8 MEMORY
S15~S17	SH13000176	3 Key Push Switch, AM WIDE, MUTE OFF/MONO, FM AUTO TUNING,
S18	SH11000197	1 Key Push Switch, POWER
T001	PT12850094	TT-204-GF, Power Transformer
CT101	CF00000196	AT1-53-9, FM ANT Adj
CT102	CF00000196	AT1-53-9, FM RF Adj
CT103	CF00000196	AT1-53-9, FM RF Adj
CT104	CF00000184	045 CTZA111, FM OSC Adj
CT201	CF00000160	AT1-53W, AM ANT Adj
CT202L	CF00000214	AT1-58W, LW RF Adj.
CT203	CF00000160	AT1-53W, AM OSC Adj
CT204L	CF00000214	AT1-58W, LW OSC Adj.
	FS30000015	RT-850 Front Panel Assembly
	FS30000027	RT-850L Front Panel Assembly
	KB20000507	012 C-3982#2, Push Button 8x14
	KB20000994	4TR-2010, Push Button 5x5
	KB20000970	4TR-2008#1, Tact Button 19x19
	KB20001100	4TR-2008#2, Tact Button 19x19
	KB20001111	4TR-2008#3, Tact Button 19x19
	KB20001123	4TR-2008#4, Tact Button 19x19
	KB20001135	4TR-2008#5, Tact Button 19x19
	KB20001147	4TR-2008#6, Tact Button 19x19
	KB20001159	4TR-2008#7, Tact Button 19x19
	KB20001160	4TR-2008#8, Tact Button 19x19
	KB20001196	4TR-2008#9, Tact Button 19x19 (MEMORY)
	KB20000933	4TR-1976, Tact Button 4x12 (UP, POWN)
	AU00000464	2TWE-5B#32, Upper Cover