

SANYO

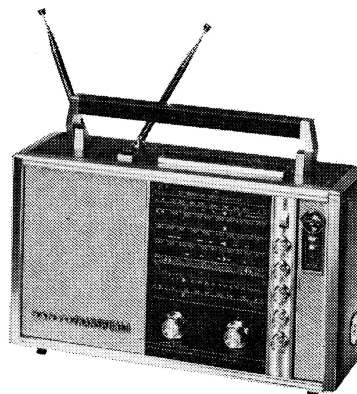
**17-transistor, 6-band
Portable Radio**

MODEL 17H-815

SERVICE MANUAL

SANYO ELECTRIC CO., LTD.

INTERNATIONAL DIVISION: SANYO ELECTRIC TRADING CO., LTD.
OSAKA, JAPAN



SPECIFICATIONS

Frequency range.....	FM 87 - 108 MC	(16) 2SB405	Power amplifier.
SW 1 2.3 - 7.3 MC	(17) 2SB405	Power amplifier.	
SW 2 8.0 - 22.0 MC	(1) 1S553	A.F.C	
49m 5.95- 7.3 MC	(2) 1S188	FM A.G.C	
MW 520 - 1,605 KC	(3) 1S188	FM limiter	
LW 150 - 350 KC	(4) 1S188	Discriminator	
Transistors.....	(5) 1S188	Discriminator	
(1) 2SC668D	(6) SIA-3	AM bias stabilizer	
(2) 2SC545	(7) 1S188	AM detector	
(3) 2SC668	(8) SIA-3	FM oscillator stabilizer.	
(4) 2SC545			
(5) 2SC537	Power output.....	(1) Maximum 3,000 mW	
(6) 2SC537	(2) Undistorted 2,000 mW		
(7) 2SA222	Current Drain.....	(1) No signal 30 mA	
(8) 2SC537	(2) Maximum 600 mA		
(9) 2SC537	Power supply	(1) 9 volt, 6 x UM-1 (size "D" flashlight battery) or D9-815 AC adaptor.	
(10) 2SC537	Loudspeaker	5" x 7" oval type permanent dynamic speaker, Voice coil impedance 8 ohms.	
(11) 2SD187	Cabinet dimensions.....	390mm(w) x 240mm(h) x 120mm(d)	
(12) 2SB303	Net weight	approx. 4.6 kg	
(13) 2SB186A			
(14) 2SB186A			
(15) 2SA202C			

ALIGNMENT PROCEDURES

AM ALIGNMENT

Sequence of Alignment	Wave Range	Dial Pointer	Signal Generator		Connection high side of Signal Generator	Coil Adjust-ment	Dial Pointer	Signal Generator		Trimmer Adjust-ment	Indication
			Fre-quency	Modula-tion				Fre-quency	Modula-tion		
I.F.T. T15	MW	1600KC	455KC	AM 30%	Thru. Loop Antenna						Max. Output
I.F.T. T14	MW	1600KC	455KC	AM 30%	"						"
I.F.T. T13	MW	1600KC	455KC	AM 30%	"						"
Oscillator LW	LW	160KC	160KC	AM 30%	"	T- 8	320KC	320KC	AM 30%	Ct 12	"
Antenna LW	LW	160KC	160KC	AM 30%	"	L-16	320KC	320KC	AM 30%	Ct 7	"
Oscillator MW	MW	600KC	600KC	AM 30%	"	T- 9	1400KC	1400KC	AM 30%	Ct 11	"
Antenna MW	MW	600KC	600KC	AM 30%	"	L-14	1400KC	1400KC	AM 30%	Ct 6	"
Oscillator SW1	SW 1	2.5MC	2.5MC	AM 30%	"	T-10	6.5MC	6.5MC	AM 30%	Ct 10	"
Antenna SW1	SW 1	2.5MC	2.5MC	AM 30%	"	L-13	6.5MC	6.5MC	AM 30%	Ct 5	"
Oscillator SW2	SW 2	9.0MC	9.0MC	AM 30%	"	T-11	20MC	20MC	AM 30%	Ct 9	"
Antenna SW2	SW 2	9.0MC	9.0MC	AM 30%	"	L-11	20MC	20MC	AM 30%	Ct 4	"
Oscillator 49m	49m	6.0MC	6.0MC	AM 30%	"	T-12	6.2MC	6.2MC	AM 30%	Ct 8	"
Antenna 49m	49m	6.0MC	6.0MC	AM 30%	"	L- 9	6.2MC	6.2MC	AM 30%	Ct 3	"

FM IF ALIGNMENT

Sequence of Alignment		Wave Range	Alignment Frequency	Testing Equipment Connection	Adjustment	Curve
1	T-6 (I.F.T.)	FM	10.7 MC	Connect sweep generator to test point TP-1 and oscilloscope to test point TP-2.	Detune T7 and T6 tune for max. gain and symmetry of response curve.	
2	T-5 (I.F.T.)	FM	10.7 MC	Same as above connection.	T-5 tune for max. gain and symmetry of response curve.	
3	T-4 (I.F.T.)	FM	10.7 MC	Same as above connection.	T-4 tune for max gain and symmetry of response curve.	
4	T-7 (I.F.T.)	FM	10.7 MC	Connect sweep generator to test point to TP-1 and oscilloscope to test point TP-3.	T-7 tune symmetry and max.gain of response curve.	

FM RF ALIGNMENT

Sequence of Alignment	Wave Range	Dial Pointer	Signal generator		Connect high side of Generator to	Coil Adjust-ment	Dial Pointer	Signal Generator		Trimmer Adjust-ment	Indicator
			Fre-quency	Modula-tion				Fre-quency	Modula-tion		
Oscillator	FM	87.0 MC	87.0 MC	22.5 KC	Signal generator to TP-1	T-3	104.0 MC	104.0 MC	22.5 KC	Ct-2	Max output
Antenna	FM	87.0 MC	87.0 MC	22.5 KC	Signal generator to TP-1	T-2	104.0 MC	104.0 MC	22.5 KC	Ct-1	Max output

PARTS LIST

Stock No.	Description	Q'ty
CHASSIS		
R-241016	Pulley shaft (For FM)	2
R-32685	Double pulley	1
R-241158	Pulley Shaft	1
R-44291	Holder (for Pilot)	2
R-112477	Fixing metal (for Pilot switch)	1
R-31853	Holder (Fixing for terminal)	1
R-112700	Fixing metal (band switch)	2
R-241157	Guide shaft	1
R-S81197	Knob, complete	1
R-32576	Knob	
R-261337	Telltale plate	
R-S81202	Knob, complete	1
R-32576	Knob	
R-261342	Telltale plate	
R-S81198	Knob, complete	1
R-32576	Knob	
R-261338	Telltale plate	
R-S81199	Knob, complete	1
R-32576	Knob	
R-261339	Telltale plate	
R-S81200	Knob, complete	1
R-32576	Knob	
R-261340	Telltale plate	
R-S81203	Knob, complete	1
R-32576	Knob	
R-261341	Telltale plate	
R-S81364	Knob, complete	1
R-32686	Knob	
R-261545	Telltale plate	1
R-112945	Fixture (Metal)	1
R-35297	Base	2
R-261608	Holder (for Antenna core)	1
R-44065	Cushion (for Variable condenser)	2
R-39188	Drum	2
R-1513a	Coil spring	4
R-15096a	Coil spring	2
R-27065	Pulley	4
R-241263	Pulley shaft	2
R-39310	Double pulley	1
R-241158	Pulley shaft	1
R-S7069	Special nut	2
RR-24123	Cap nut	4
R-44045	Cushion	1
R-44240	Cushion	1
R-	Dial string (600mm)	1
R-	Dial string (850mm)	1
R-	Dial string (700mm)	1
R-	Dial string (750mm)	1
R-	Washer 4.3 ϕ × 10 ϕ × 1t)	2

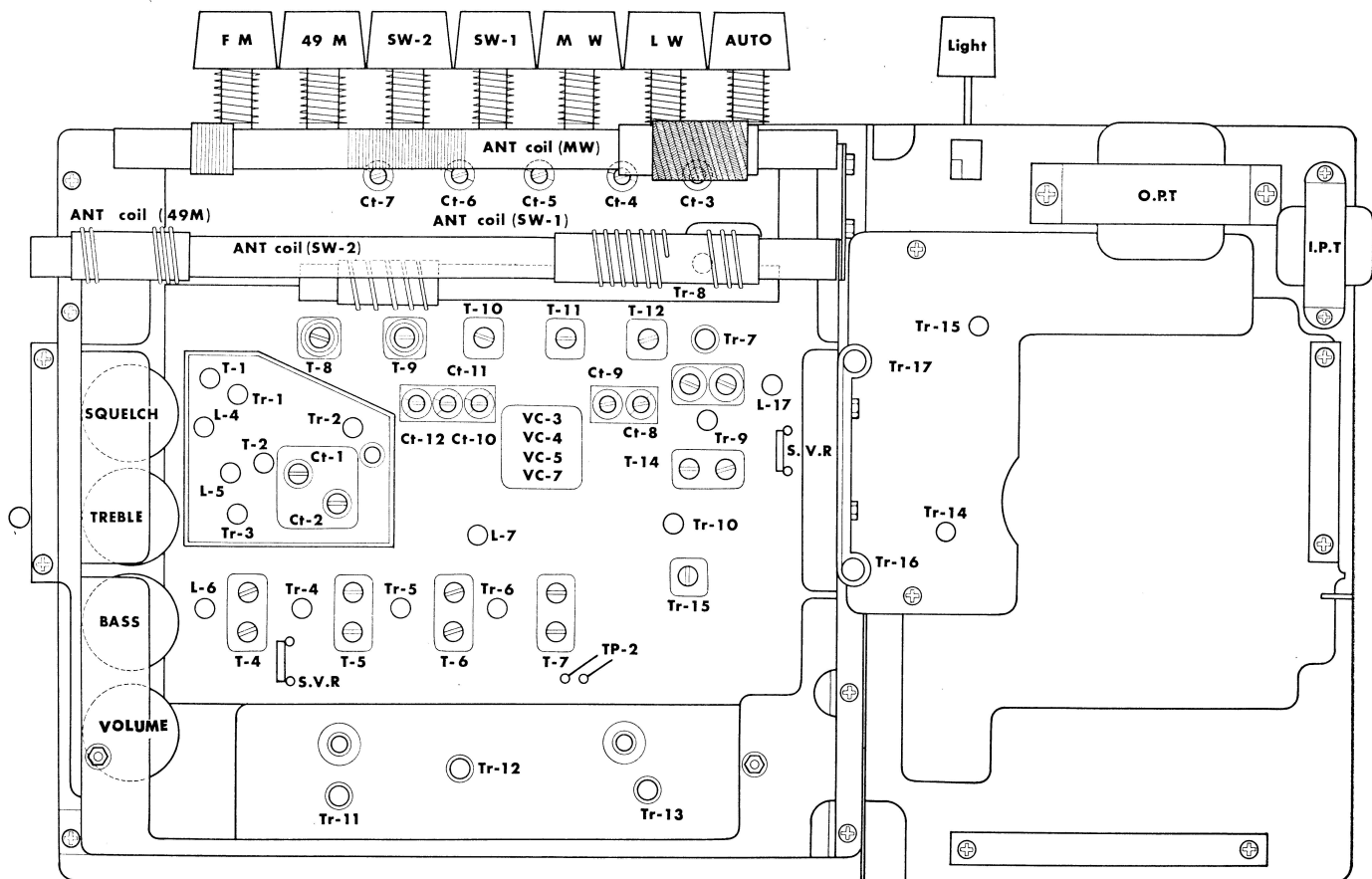
Symbol No.	Description	Q'ty
RESISTOR		
R1	Carbon 220 ohm $\pm 5\%$ $\frac{1}{4}W$	1
R2	" 330 K " " "	1
R3	" 27 K " " "	1
R4, 8, 85	" 2.2 K " " "	3
R5	" 3.3 K " " "	1
R6	" 6.8 K " " "	1
R7, 28, 33, 60	" 100 K " $\pm 10\%$ "	4
R-19	" 6.8 K " $\pm 5\%$ "	1
R10	" 3.3 K " " "	1
R11, 68, 88	" 100 " $\pm 10\%$ "	3
R13, 74	" 2.2 K " " "	2
R14, 43	" 2 K " $\pm 5\%$ "	2
R15,29,36,44,52	" 3.3 K " $\pm 10\%$ "	5
R16, 19, 76	" 22 K " " "	3
R17, 20, 32, 51	" 10 K " " "	4
R18, 21, 40	" 1 K " $\pm 5\%$ "	3
R22	" 6.8 K " $\pm 10\%$ "	1
R23, 93	" 270 " " "	2
R24, 25	" 1 K " " "	2
R26, 27	" 5.6 K " $\pm 5\%$ "	2
R30, 31	" 33 K " $\pm 10\%$ "	2
R34, 75, 87	" 56 " " "	3
R35	" 27 " " "	1
R37, 39	" 18 K " " "	2
R38	" 27 K " " "	1
R41	" 39 K " " "	1
R45	" 1.5 K " $\pm 5\%$ "	1
R46, 50, 66	" 5.6 K " $\pm 10\%$ "	3
R47, 90	" 1.2 K " " "	2
R48, 72	" 560 " " "	2
R49, 92	" 220 " " "	2
R53	" 80 K " $\pm 5\%$ "	1
R61	" 10 K " $\pm 10\%$ "	1
R62	" 82 " " "	1
R64	" 3.9 K " $\pm 5\%$ "	1
R67	" 82 K " $\pm 10\%$ "	1
R69	" 470 " " "	1

Symbol No.	Description	Q'ty
RESISTOR		
R70	" 3.9 K " " "	1
R79	" 4.7 K " " "	1
R80	" 220 K " $\pm 5\%$ "	1
R86	" 15 K " $\pm 10\%$ "	1
R89	" 100 " $\pm 5\%$ "	1
R91	" 1 " " "	1

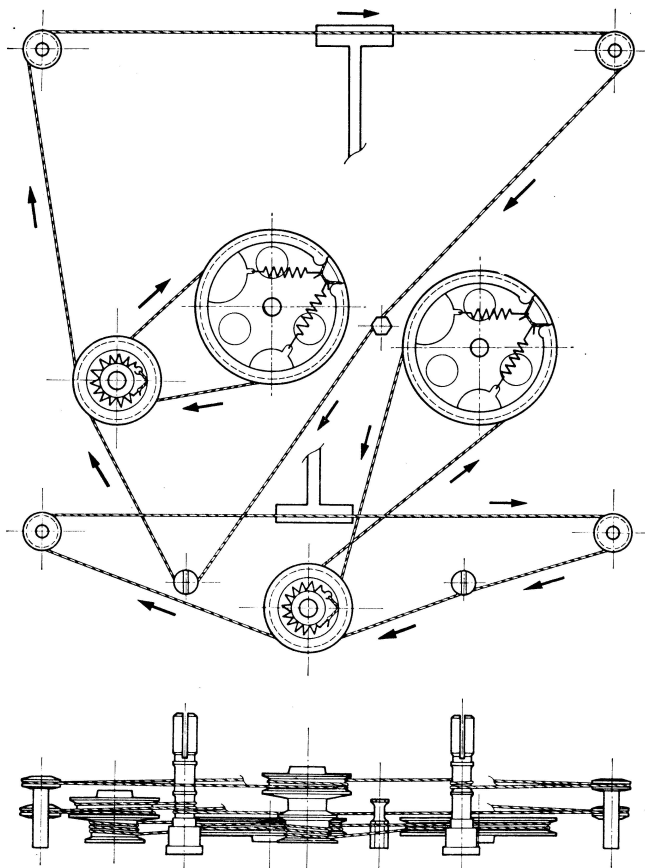
CAPACITOR					
C1, 2	Ceramic	13pF	$\pm 10\%$	25WV	2
C3	"	80pF	"	50WV	1
C4	"	15pF	"	25WV	1
C5	"	500pF	$\pm 20\%$	25WV	1
C6, 11, 15	"	0.001 μ F	+80,-20%	25WV	3
C7	"	12pF	$\pm 10\%$	25WV	1
C8, 30	"	4pF	$\pm 0.5pF$	25WV	2
C9, 92	"	20.0pF	$\pm 10\%$	25WV	2
C10,17,20,21,24	"	0.01 μ F	+80,-20%	50WV	7
C27, 43					
C12, 38, 126	"	3pF	$\pm 0.25pF$	25WV	3
C13	"	5pF	$\pm 0.5pF$	25WV	1
C14,16,22,25,28,39,40,42,119,122,123,124,127,129,					
131,138,142	"	0.04 μ F	+80,-20%	50WV	17
C18, 23	"	1.5pF	$\pm 0.25pF$	25WV	2
C26, 130	"	2pF	"	25WV	2
C31,115,134,136	Mylar	0.005 μ F	$\pm 20\%$	50WV	4
C32, 108	Styrol	310pF	$\pm 10\%$	125WV	2
C36, 37	Mylar	0.001 μ F	$\pm 20\%$	50WV	2
C41	Ceramic	30pF	$\pm 10\%$	25 or 50WV	1
C76,104,105,114	Mylar	0.01 μ F	$\pm 20\%$	50WV	4
C77	"	0.004 μ F	"	50WV	1
C88, 89	"	0.03 μ F	"	50WV	2
C101, 102	Ceramic	16pF	$\pm 10\%$	25WV	2
C103, 111	"	100pF	"	50WV	2
C106, 121, 139	Mylar	0.02 μ F	$\pm 20\%$	50WV	3
C107	Styrol	165pF	$\pm 10\%$	125WV	1
C109	"	1200pF	"	35WV	1
C110	"	4300pF	"	35WV	1
C112	Ceramic	75PF	$\pm 5\%$	50WV	1
C113	"	20pF	$\pm 10\%$	25 or 50WV	1
C116, 118	Mylar	0.002 μ F	$\pm 20\%$	50WV	2
C117	Ceramic	500pF	$\pm 10\%$	50WV	1
C140	"	8pF	"	25WV	1
C141	"	50pF	"	50WV	1

Stock No.	Description	Q'ty
ELECTRIC PARTS		
R-S4335a	Push-button switch (for BAND selector)	1
R-S4208	Slide switch (for Batt. Econo. TA/TB)	3
R-4303	Slide switch (for AFC)	1
R-S1288	Plug (7 pin)	1
R-S3186	Terminal plate	2
R-S1266b	Telescopic rod antenna	2
R-S2802	Socket (5 pin DIN type)	1
R-S2155	Socket (for AUTO antenna)	1
R-261526	Radiator (for 2SB405)	1
R-23781	Shield	1
R-S3018	Eyelet (2.0 ϕ)	62
R-S1155	Tip	12
R-S2139	Socket (for External speaker)	2
R-S81214f	Battery case, complete	1
R-424099	Battery case	
R-S81215e	Battery case, complete	1
R-112708d	Fixing metal	
R-34161	Insulation plate	
R-23056	Fixing metal	
R-23101	Battery terminal	
R-25953	Coil spring	
R-	Round head rivet	
R-	Eyelet	
R-S81216d	Battery terminal, complete	
R-112709b	Battery terminal	
R-25053	Coil spring	
R-471042	Battery instruction sheet	1
R-25239a	Spring	1
R-S3008	Lug	6
R-25154b	Lug	2
R-25154b	Lug	1
R-S1155	Tip	2
R-S4381	Push-button switch (for Pilot lamp)	1
R-25160a	Socket (for AC-DC switch)	1
R-S1289	Plug (for AC-DC switch)	1
R-S8535a	External antenna tip, complete	1
R-S1154a	Plug	
R-23165	Lug	
R-44016	Cushion	
R-24106	Knob	

LOCATION OF MAIN PARTS



DIAL STRING

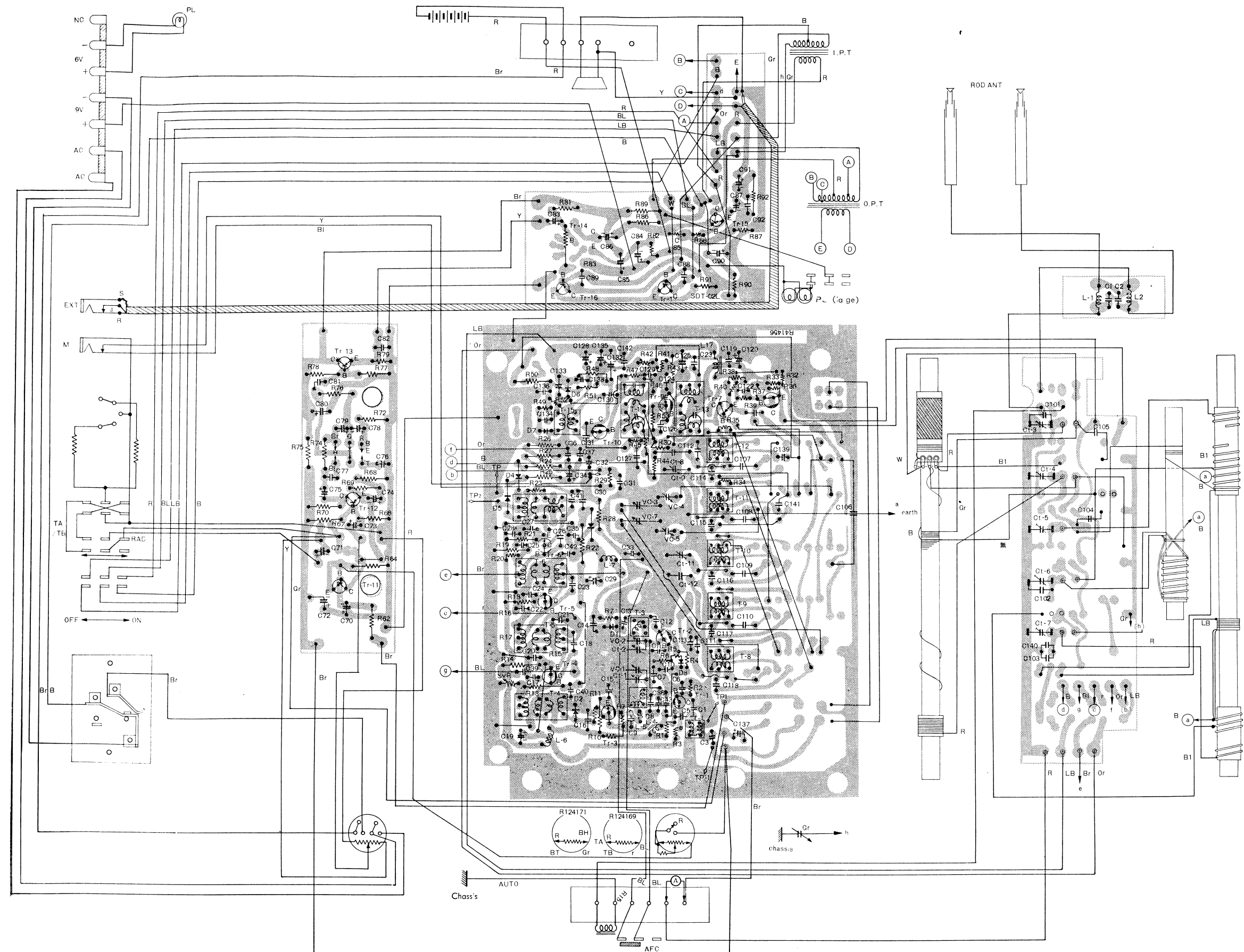


PARTS LIST

Symbol No.	Description	Q'ty
TRANSISTORS & DIODES		
Tr-1	2SC668D	1
Tr-2	2SC2SC545	1
Tr-3	2SC668	1
Tr-4	2SC545	1
Tr-5	2SC537	1
Tr-6	2SC537	1
Tr-7	2SC537	1
Tr-8	2SA222	1
Tr-9	2SC537	1
Tr-10	2SC537	1
Tr-11	2SD187	1
Tr-12	2SB303	1
Tr-13	2SB186A	1
Tr-14	2SB186A	1
Tr-15	2SA202c	1
Tr-16	2SB405	1
Tr-17	2SB405	1
D-	1S188 (for Discriminator)	2
D-	1S188 (for FM circuit)	4
D-	1S553 (for AFC)	1
D-	SIA3	1
Stock No.	Description	Q'ty
COILS		
R-S81362	Antenna coil, complete (for MW, LW)	1
R-W2284	Antenna coil	1
R-35077b	Holder	1
R-S81363	Antenna coil, complete (for SW1, SW3)	1
R-W2285	Antenna coil	1
R-35077b	Holder	1
R-W2283	Antenna coil (for FM)	1
R-W4034	RF coil	1
R-W8218	Oscillator coil (for FM)	1
R-W8219	Oscillator coil (for LW)	1
R-W8220	Oscillator coil (for BC)	1
R-W8221	Oscillator coil (for SW-1)	1
R-W8222	Oscillator coil (for SW-2)	1
R-W8223	Oscillator coil (for SW-3)	1
R-W1058	Chock coil (4.5 ϕ)	1
R-W1059	Chock coil (6.0 ϕ)	1
R-W1060	Chock coil (500 μ H)	1
R-W5021	VHF coil (3.5t)	2
R-W2300	Antenna coil (for SW-2)	1
TRANSFORMERS		
R-W5W022	IFT (for AM, yellow)	1
R-W5W023	IFT (for AM, white)	1
R-W5T241	IFT (for AM, black)	1
R-W5W024	IFT (for FM, brown)	1
R-W5W025	IFT (for FM, green)	1
R-W5W026	IFT (for FM, blue)	1
R-W5W027	IFT (for FM, red)	1
R-W6325	I.P.T (Input Transformer)	1
R-W6326	O.P.T (Output Transformer)	1
CONTROLS		
R-R124168	Variable resistor (50k)	1
R-R124169	Variable resistor (50k B)	1
R-R124170	Variable resistor (500 B)	1
R-11011	Variable resistor (100 k)	1
R-C1116	Variable capacitor (4F-20G)	1
R-C1098	Variable capacitor (2F-20GT)	1
R-C1128	Variable capacitor (for Fine tuning)	1
R-C0050	Trimmer (for AM ant.)	5
R-R124171	Variable resistor (50k A)	1
R-C0058	Trimmer (for AM oscillator)	4
R-C5700	Trimmer (for AM oscillator)	1
LOUDSPEAKER		
R-S6418	Loudspeaker (5"×7", 8 ohms)	1
ELECTROLYTIC CAPACITORS		
R-C9127	500 μ F 15 v	2
R-C9146	200 μ F 10 v	2
R-C9525	50 μ F 10 v	4

Stock No.	Description	Q'ty
ELECTROLYTIC CAPACITORS		
R-C9145	10 μ F 10 v	1
R-C9131	5 μ F 6 v	4
R-C9115	1 μ F 10 v	2
R-C9137	30 μ F 6 v	3
R-C9126	0.1 μ F 10 v	2
CABINET		
R-42409e	Cabinet (hardboard with leather.)	1
R-44067	Spacer	4
R-46433	Panel (right side of cabinet)	1
R-46434	Panel (left side of cabinet)	1
R-23865	Decoration metal (R-L side)	2
R-32575	Dial (polystyrol)	1
R-46435a	Panel (for cabinet front)	1
R-46432a	Panel (for cabinet front)	1
R-44250a	Sheet (Black rubber)	1
R-261206	Panel	1
R-261211a	Panel (Aluminium plate)	1
R-	Net (Black Himelon)	1
R-39384	Net (Black Himelon R-7060)	1
R-39263	Decoration (for Knob base)	1
R-32524b	Decoration (polystyrol)	1
R-32483	Cover (Terminal plates)	1
R-	Shaft (for Terminal cover)	1
R-31743	Fixture (for -ditto)	2
R-27046	Badge	1
R-23867	Decoration metal (for Dial)	3
R-261219a	Telltale plate	1
R-47965a	Specification sheet	1
R-32682	Decoration (ABS)	1
R-32683	Decoration (for Pilot switch)	1
R-	Moldplane	2
R-261574	Decoration metal (Aluminium plate)	1
R-31754	Fixture (polystyrol)	2
R-	Pad (Black rubber)	2
R-	Sheet (25 × 25 × 0.03t)	7
R-	Decoration metal	2
	(Decoration for front of cabinet)	2
R-44302	Pad (Black rubber)	2
R-S7076	Hexagonal bolt (Fix. for Dial plate)	2
R-12059	Speed washer (for Badge fixing)	2
R-261765	Decoration metal (Fix. for panel)	1
R-32684a	Knob (for AFC switch)	1
R-S81101	Handle, Complete	1
	R-112476 Handle	
	R-28108 Fixing metal	
R-	Sheet	
R-28109	Fixing metal (for Handle)	2
R-35296	Washer (Ethylene)	2
R-112672	Special washer	2
R-25263	Spring (Fixing for R-28109)	2
R-35081	Washer	1
R-	Cushion (Black rubber)	2
R-S80199	Knob, complete (for TUNING)	2
	R-39262 Knob	
	R-261212 Knob decoration	
R-S81100a	Knob, complete	5
	R-39261a Knob	
	R-261047 Knob decoration	
R-424312	Case (Black pressboard)	1
R-S8113	Pointer, complete	1
	R-23777 Slide	
	R-23805 Pointer	
R-S81189	Pointer complete	1
	R-23777 Slide	
	R-23775 Pointer	
R-	Washer	5
R-	Cover	5
R-	Cushion (Rubber 5.3 ϕ × 1t)	2
R-S6365	Earphone, complete	1
R-S5530	Meter (Indicator, 400 μ A)	1
R-S1202	Pilot lamp (6V 30 mA)	1
R-S1287	Pilot lamp (9V 30 mA)	2
CHASSIS		
R-S81366a	Chassis, complete	1
R-112483a	Chassis	
R-112481b	Chassis	
R-113022	Fixing metal	
R-41456b	Printed circuit board (Main chassis)	1
R-41491b	Printed circuit board (Band switch)	1
R-41561b	Printed circuit board (AF chassis)	1
R-41562a	Printed circuit board (Sub chassis)	1
R-261547b	back plate	1
R-41560	Printed circuit board	1
R-113201	Chassis (for radiator)	1
R-S81102	Dial shaft, complete	2
R-241011	Shaft	
R-241012	Pedestal	
R-	Rivet	

WIRING DIAGRAM



CIRCUIT DIAGRAM

