SANYO

13-Transistor Portable
Stereo Radio Phonograph

MODEL G-2232

SERVICE MANUAL

SANYO ELECTRIC CO., LTD.

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

SPECIFICATIONS

Circuit·····2-band, 13-transistor superheterodyne 2-speed, FM. AM. radio-stereo phonograph

Frequency range·····AM 530-1605 KC
FM 87-108 MC

Intermediate frequency ·····AM 455 KC
FM 10.7 MC

Output power·····Maximum FM 900 mW×2
AM 900 mW×2
Phono 650 mW×2
Undistorted FM 600 mW×2
AM 500 mW×2
Phono 450 mW×2

Speakers ·····Two 4″ permanent dynamic speaker
Voice coil impedance 8 ohms

Transistors·····2SA440×2 FM RF amplifier & FM Converter
2SA321×3 FM IF amplifier & AM Converter & FM/AM IF amplifier
2SB186×4 AF amplifier
2SB22×4 Power amplifier

Diodes ·····1S188×5 FM AGC, FM Limiter, FM detector & AM detector & AGC

Power requirement···6×1½V size "D" (UM-1) flashlight batteries

Current drain·····No Signal FM 40 mA
AM 38 mA
Phono 80 mA
Maximum FM 360 mA
AM 360 mA
Phono 400 mA

Sensitivity ·····FM 16μV/m for 50 mW output at S/N 30 dB
AM 150μV/m for 50 mW output

Turn table ·····5 11/16″ Width × 9 9/16″ height × 4 5/16″ depth (270×217×108.5)

Wieght·····4.8 lbs. 2.2 Kg

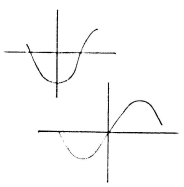
Accessary·····Earphone

ALIGNMENT PROCEDURES

AM ALIGNMENT

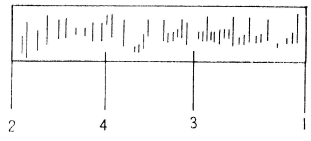
Sequence of Alignment	Wave Range	Signal generator Frequency	Signal generator Modulation	Dial Pointer	Connection high side of signal generator to	Coil Adjustment	Signal Generator Frequency	Signal Generator Modulation	Dial Pointer	Trimmer Adjustment	Indication
I.F.T. T-8	M.W	455 Kc	A.M 30%	Lower end	Thru loop antenna						Max. output
I.F.T. T-7	M.W	455 Kc	A.M 30%	Lower end	Thru loop antenna						Max. output
I.F.T. T-6	M.W	455 Kc	A.M 30%	Lower end	Thru loop antenna						Max. output
Oscillator M.W	M.W	600 Kc	A.M 30%	600 Kc	Thru loop antenna	L-6	1400 Kc	A.M 30%	1400 Kc	Ct-4	Max. output
Ferrite ant. M.W	M.W	600 Kc	A.M 30%	600 Kc	Thru loop antenna	L-5	1400 Kc	A.M 30%	1400 Kc	Ct-3	Max. output

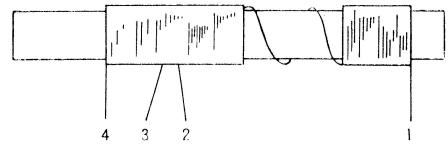
FM IF ALIGNMENTS

Sequence of Alignment		Wave Range	Alignment Frequency	Test equipments connections	Adjustment	Curve
1	I.F.T T-3	F.M	10.7 Mc	Connect sweep generator to test point Rod antenna, Tp-1 and oscilloscope to test point Tp-3	Detune T-5 and T-3 tune for max. gain and symmetry of response curve.	
2	I.F.T T-2	F.M	10.7 Mc	Same as above connection	T-2 tune for max. gain and symmetry of response curve.	
3	I.F.T T-1	F.M	10.7 Mc	Same as above connection	T-1 tune for max. gain and symmetry of response curve.	
4	I.F.T T-4, 5	F.M	10.7 Mc	Connect sweep generator to test point Rod antenna, Tp-1 and oscilloscope to test point Tp-4, 5	T-4 and T-5 tune symmetry and max. gain of response curve.	

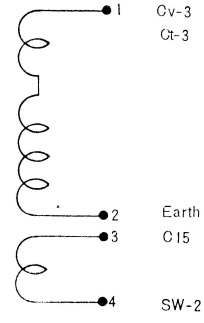
FM RF ALIGNMENTS

Sequence of Alignment	Wave Range	Signal Generator Frequency	Signal Generator Modulation	Dial Pointer	Connection high side of signal generator to	Coil Adjustment	Signal Generator Frequency	Signal Generator Modulation	Dial Pointer	Trimmer Adjustment	Indication
Oscillator	F.M	90.0 Mc	F.M 22.5 Kc	90.0 Mc	Signal generator to Rod ANT.	L-4	108.0 Mc	F.M 22.5 Kc	104.0 Mc	Ct-2	Max. output
Antenna	F.M	90.0 Mc	F.M 22.5 Kc	90.0 Mc	Signal generator to Rod ANT.	L-2	108.0 Mc	F.M 22.5 Kc	104.0 Mc	Ct-1	Max. output

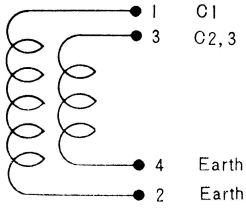




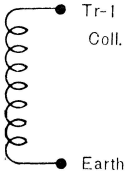
AM antenna coil (L-5)



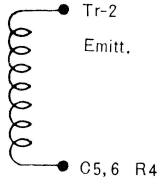
FM antenna coil (L-1)



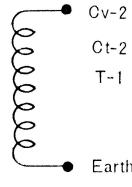
VHF coil (L-2)



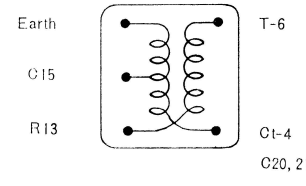
Choke coil (L-3)



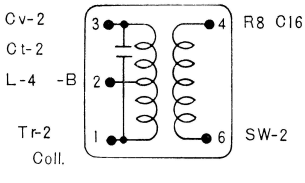
VHF coil (L-4)



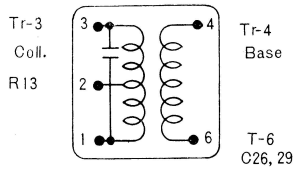
AM OSC coil (L-6)



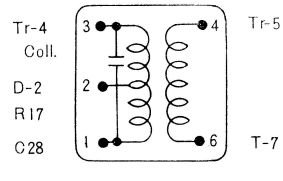
TFT (T-1)



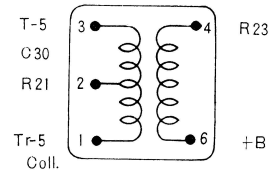
IFT (T-2)



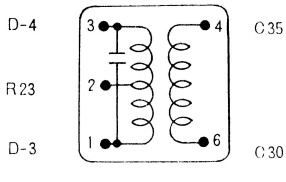
IFT (T-3)



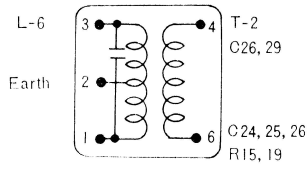
IFT (T-4)



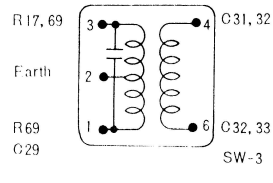
IFT (T-5)



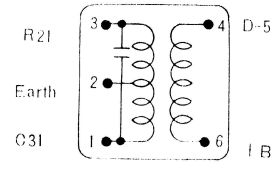
IFT (T-6)



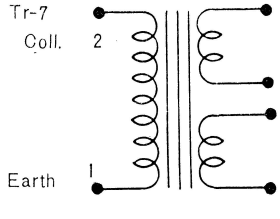
IFT (T-7)



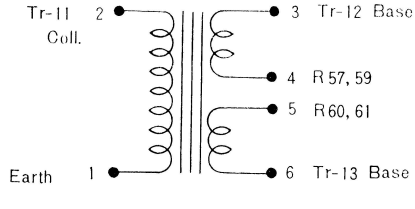
IFT (T-8)



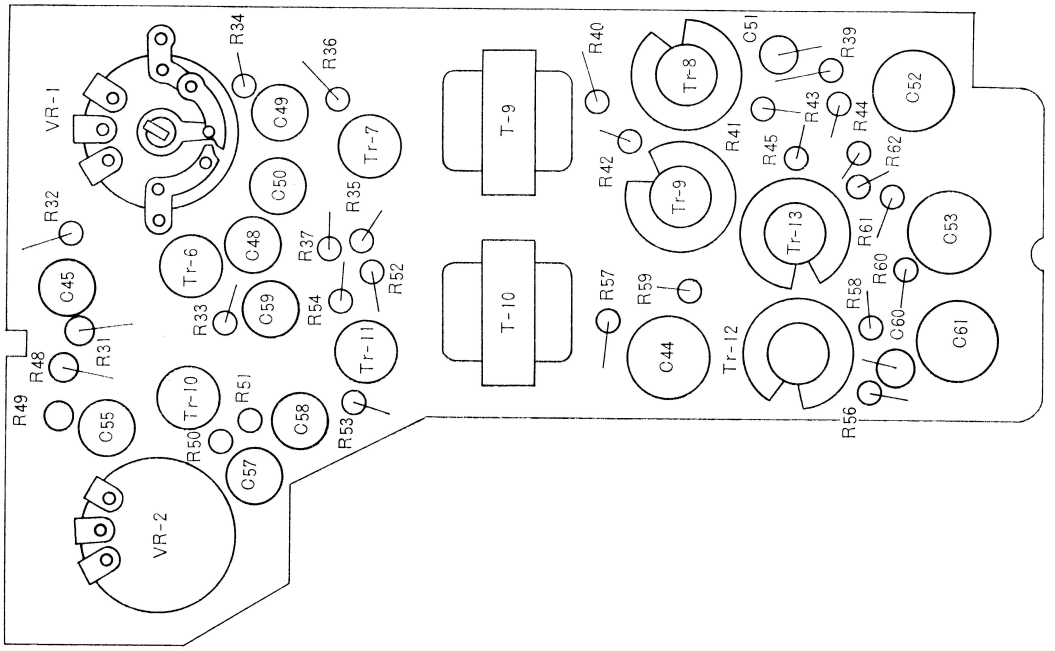
IPT (T-9)

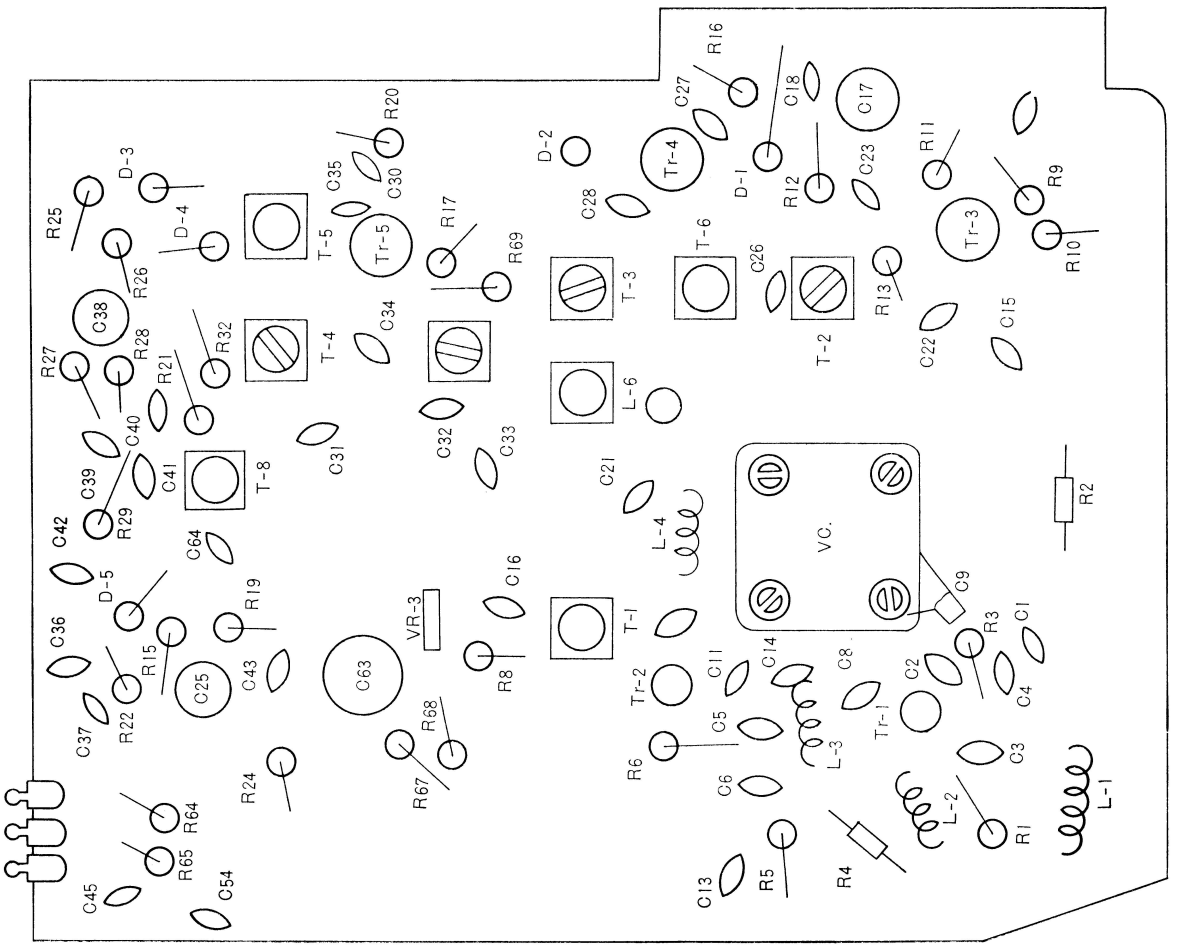


IPT (T-10)

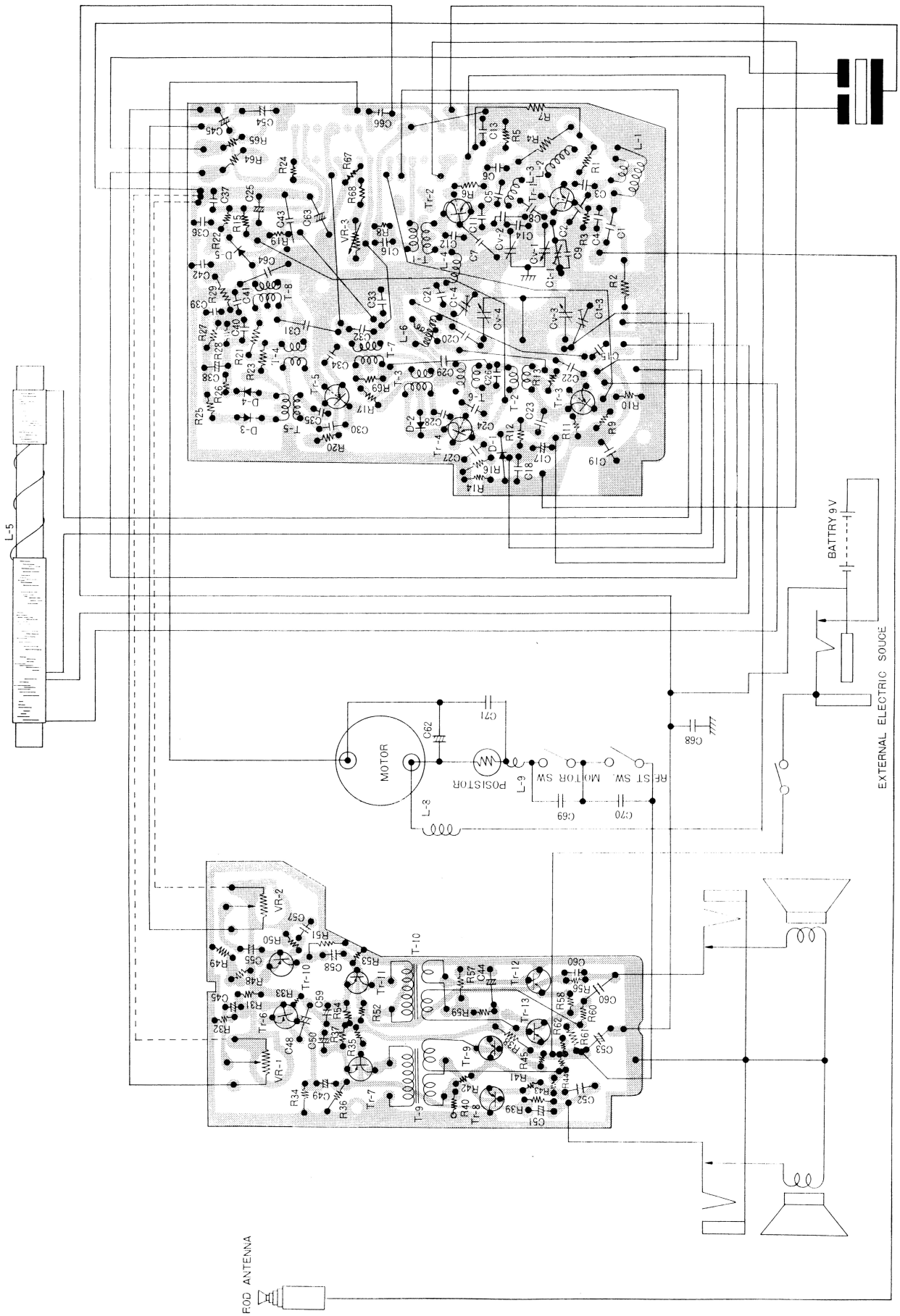


PARTS LOCATION

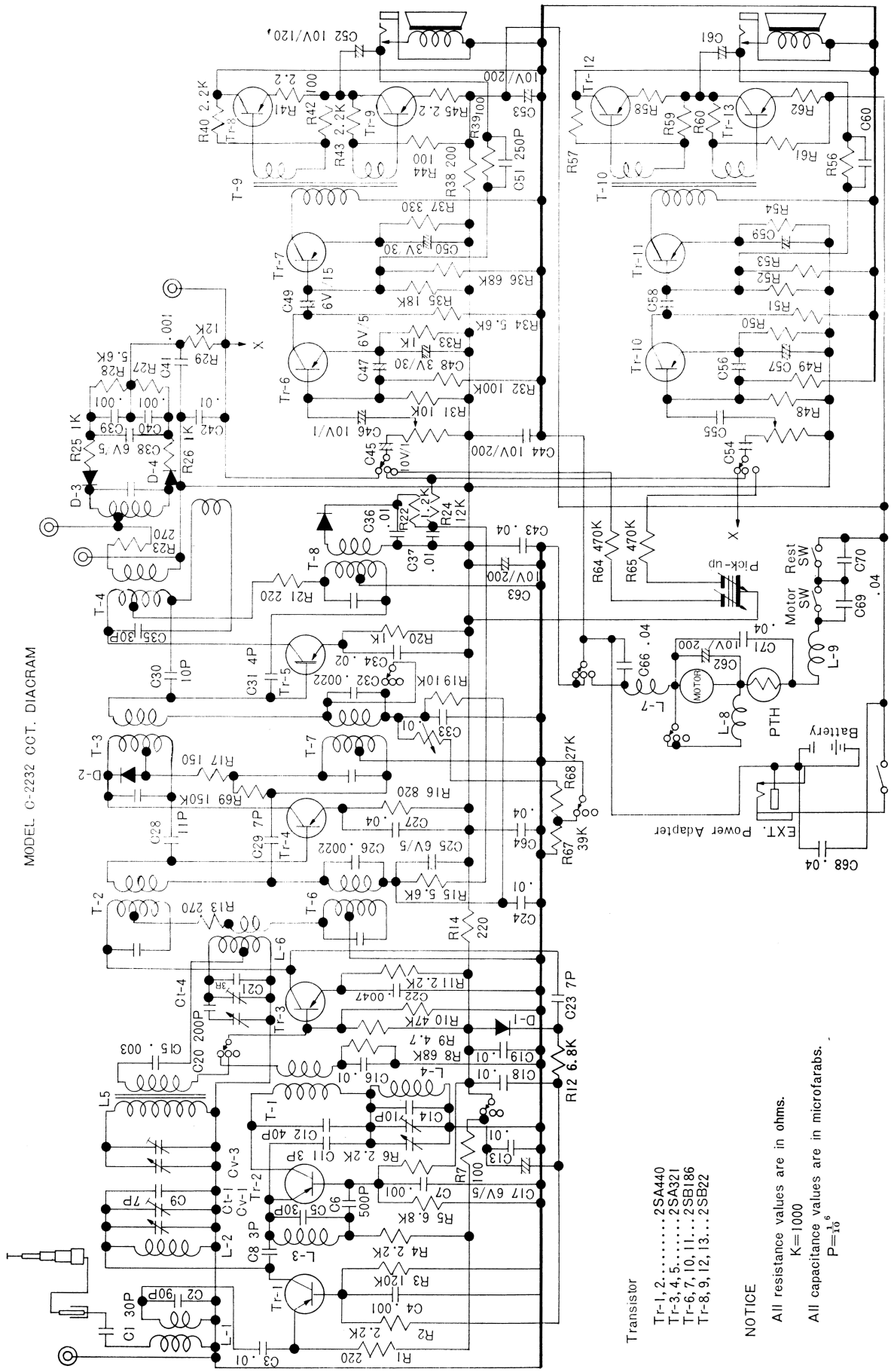




INNER-PARTS WIRING ILLUSTRATION



CIRCUIT DIAGRAM



Stock No.	Description	Q'ty
Cabinet		
R-A7029	Cabinet complete	
R-315175b	—Cabinet	1
R-275010	—Insert nut	2
R-A7030	—Dial complete	
R-395144	—Dial	1
R-267017	—Volume express panel	2
R-267032	—Select express panel	1
R-267018	—Front decoration metal	1
R-265515	—Express panel of extra power & earphone	1 1
R-S85198	—Handle complete	1
R-115340	—Handle fix metal	
R-395145	—Handle	1
	—Countersunk (2×6)	3
	—Bolt nut washer (2)	3
	—Hexagon nut (2)	3
R-355127	—Clip of pickup	1
R-355128	—Arm holder of pickup	1
R-325195	—Pickup clip fix parts	1
R-355129	—Clip of adaptor	1
R-245272	—Handle fix metal	1
R-A7031	Bottom cover complete	
R-395119b	—Bottom cover	1
R-265516	—Express metal of bottom cover	1
R-267019	—Specification panel	1
R-395124	—Battery compartment cover	1
R-12080	—Special nut	2
R-235072a	—Battery terminal (+)	2
R-155041	—Battery terminal (−)	2
R-A7014	Speaker box complete (left)	
R-395120b	—Back lid of speaker	1
R-395142	—Front lid of speaker	1
R-365067	—Speaker cover of vinylon	1
R-A7015	Speaker box complete (right)	
R-395121b	—Back lid of speaker	1
R-395141	—Front lid of speaker	1
R-365067	—Speaker cover of vinylon	1
R-135014	Board spring	1
R-395129	Plastic pipe of pickup tail	1
R-115315	Rod antenna fix metal	1
R-395161	Coard fixing parts	2
R-245129	Stud nut	2
	Washer (Handle fixing metal)	2
R-325176	Extra power socket fix parts	1
R-115248d	Pickup lever	1
R-A7016	Turn-table cover complete	
R-445066a	—Turn-table cover	1
R-265523	—Decoration metal of turn-table cover	1
R-395132	Adaptor	1
R-355130	Cap of motor shaft	1
R-365070	Slide lock	2
R-235010	Lug board	1
	Fixing gum of battery lead	2
	Battery pull out ribbon	1
R-355147	Washer (3.1φ×8φ×0.3t)	2
(***Chassis***)		
R-395131a	Chassis	1
R-415206	Printed in circuit board	1
R-415207	〃 〃	1
R-265520	Back plate	1
R-115316	Rail	1
R-395162	Tuning knob	1
R-275012	Bearing	1
R-275013	Tuning shaft	1
R-345012	Select lever	1
R-345013	〃 〃	1
R-345014	〃 〃	1
R-275014	Special screw	2
R-275015	〃 〃	1
R-275016	〃 〃	1
R-39188	Drum	1

Stock No.	Description	Q'ty
(***Chassis***)		
R-S4560	Select switch	1
R-395146a	Select knob	1
R-395147	Volume knob	1
R-S85191	Pointer complete	1
R-235127	—Slide of pointer	1
R-235054	—Pointer	1
R-13061	"C" washer (Select lever)	5
R-135003	"C" washer (Tuning shaft)	1
R-245240	Pulley	2
R-275034	Pulley shaft	2
R-155026	Coil spring	2
	Tuning rope (0.3φ 650 mm)	1
R-115365	Fix metal of slide switch	1
R-245284	Tuning knob fix metal	1
R-155034	Rope guide	1
R-445073	Cushion	1
R-245299	Special screw (VC & Drum)	1
R-355147	Washer (3.1φ×8φ×0.3t)	4

Symbol No.	Stock No.	Description	Q'ty
(***Electric***)			
VR-1	R-116538	Variable resistor	1
VR-2	R-116539	Variable resistor	1
VC-1, 2, 3, 4	R-1120	Variable capacitor	1
AM	R-S85179	Antenna coil assembly	1
	R-W2592	—Antenna coil	1
	R-355074	—Antenna holder	2
	R-W9018	Choke coil	1
AM	R-W8198	OSC. coil	1
T-1	R-W5T565	IF. trans.	1
T-2	R-W5T174	IF. trans.	1
T-3	R-W5T168	IF. trans.	1
T-4	R-W5T169	IF. trans.	1
T-5	R-W5T170	IF. trans.	1
T-6	R-W5T214	IF. trans.	1
T-7	R-W5T213	IF. trans.	1
T-8	R-W5T165	IF. trans.	1
	R-W6577	Input trans.	2
	R-S6601	Speaker	2
	R-S6560	Earphone assembly	1
	R-R11011	Semi-fixed resistor	1
	R-S6602	Pickup assembly	1
	R-S6603	—Pickup arm	1
	R-S6604	—Cartridge	1
FM ANT.	R-W2222	Antenna coil	1
FM OSC.	R-W9515	VHF. coil	1
FM RF	R-W9516	VHF. coil	1
	R-S5617	Motor assembly	1
	R-S5618	—Motor unit	1
	R-S5619	—Turn table	1
	R-C9115	Electrolytic capacitor (1μ/10V)	4
	R-C9556	〃 〃 (5μ/6V)	7
	R-C9080	〃 〃 (30μ/3V)	4
	R-C9091	〃 〃 (120μ/10V)	2
	R-C9557	〃 〃 (200μ/10V)	4
	R-W1508	Choke coil	3
	R-S1560a	Rod antenna	1
	R-S4561	Slide switch	1
	R-25239a	Spring	1
	R-12004	Lug board	3
	R-S2530	Ext power socket	1
	R-S2040	Socket	1
	R-S4550	Rest switch	1
	R-235128	Eyelet	4
	2SA440	Transistor	1
	2SA440	〃	1
	2SA321	〃	1
	2SA321	〃	1
	2SA321	〃	1
	2SB186	〃	4
	2SB22S	〃	4
	1S188	Diode	5
	R-S1573	Posistor	1

PARTS LIST

Symbol No.	Description				Q'ty
(*Resistor & Capacitor*)					
Resistor					
R1	220 ohms	±5%	1/8W	Carbon	1
R2, 4, 6, 11	2.2 K ohms	〃	〃	〃	4
R9	4.7 K ohms	〃	〃	〃	1
R5, 12	6.8 K ohms	〃	〃	〃	2
R7	100 ohms	±10%	〃	〃	1
R17	150 ohms	〃	〃	〃	1
R23	270 ohms	〃	〃	〃	1
R13	330 ohms	〃	〃	〃	1
R15	5.6 K ohms	〃	〃	〃	1
R24	12 K ohms	〃	〃	〃	1
R10	47 K ohms	〃	〃	〃	1
R3	120 K ohms	〃	〃	〃	1
R41, 45, 58, 62	2.2 K ohms	±5%	¼W	Carbon or Solid	4
R42, 44, 59, 61	100 ohms	±10%	〃	〃	4
R38	200 ohms	〃	〃	〃	1
R14, 21	220 ohms	〃	〃	〃	2
R37, 54	330 ohms	〃	〃	〃	2
R16	820 ohms	〃	〃	〃	1
R20, 25, 26, 33, 50	1 K ohms	〃	〃	〃	5
R22	1.2 K ohms	〃	〃	〃	1
R40, 43, 57, 60	2.2 K ohms	〃	〃	〃	4
R71	4.7 K ohms	〃	〃	〃	1
R27, 28, 30, 34, 47, 51	5.6 K ohms	〃	〃	〃	6
R19, 31, 48	10 K ohms	〃	〃	〃	3
R29	12 K ohms	〃	〃	〃	1
R35, 52	18 K ohms	〃	〃	〃	2
R68	27 K ohms	〃	〃	〃	1
R67	39 K ohms	〃	〃	〃	1
R8, 36, 53	68 K ohms	〃	〃	〃	3
R32, 39, 49, 56	100 K ohms	〃	〃	〃	4
R69	150 K ohms	〃	〃	〃	1
R64, 65	470 K ohms	〃	〃	〃	2
Ceramic					
C8, 11, 21	3 P	±0.25P	50V		3
C31	4 P	〃	〃		1
C9, 23, 29	7 P	±0.5P	〃		3
C28	11 P	±P1	〃		1
C1, 5, 35	30 P	±5%	〃		3
C12	40 P	〃	〃		1
C2	90 P	〃	〃		1
C6	500 P	±20%	〃		1
C4, 7, 40, 39, 41	.001 μF	+100% −0%	〃		5
C3, 13, 16, 18, 19, 33, 24	.01 μF	〃	〃		7
C34	.02 μF	〃	〃		1
C14, 30	10 P	±1P	〃		2
C27, 43, 64, 66, 68, 69, 70, 71	.04 μF	+80% −0%	〃		8
Mylar					
C15	.0033 μF	+30% −20%	35-50V		1
C22	.0047 μF	〃	〃		1
C26, 32	.0022 μF	〃	〃		2
C36, 37, 42	.01 μF	〃	〃		3
C72, 73	.001 μF	〃	〃		2
Styrol					
C20	200 P	±5%	50-125V		1
C51, 60	250 P	±10%	〃		2

Desdription			Q'ty
(*Scsew, Nut & Washer*)			
Oval countersunk head screw	(3×10)	Special nut	2
Pan head tapping screw	(3×6)	Speaker	8
〃	(3×20)	Speaker box	8
〃	(3×6)	Rest switch-Cabinet	1
〃	(3×6)	Board spring-Cabinet	1
〃	(3×8)	Chassis, Cabinet-P.C. board	3
〃	(3×8)	P.C. board-Cabinet	2
〃	(3×6)	Rod antenna	2
〃	(3×8)	Coard fixing parts	2
〃	(3×10)	Cabinet-Bottom cover	1
〃	(3×6)	Back plate-Chassis	2
〃	(3×6)	Rail-Chassis	2
Bolt nut washer	(3d)	Speaker	8
〃	(3d)	Speaker box	8
〃	(3d)	Cabinet-Bottom cover	1
〃	(3d)	Motor-Cabinet	3
〃	(3d)	Cabinet-Bottom cover	1
〃	(3d)	Battey pull out ribbon-Cabinet	1
〃	(3×10×0.5t)	Antenna holder-Chassis	2
Hexagon nut	(M4)	Handle-Cabinet	2
〃	(M2)	Pickup shaft	1
〃	(M3)	Battery pull out ribbon	1
〃	(M2)	Pulley shaft	2
〃	(M2)	Select lever-Special screw	2
〃	(M2)	Fiv metal of slide switch	1
〃	(M3)	Tuning shaft	1
〃	(M3)	Antenna holder-Chassis	2
〃	(M3)	Chassis-P.C. board	2
〃	(M2)	P.C. board-Special screw	1
Round head screw	(3×8)	Motor-Cabinet	3
〃	(3×6)	Rod Antenna	1
〃	(2×10)	Pickup shaft	1
〃	(2.6×6)	Rickup lever-Pickup shaft	1
〃	(3×8)	Battery pullout ribbon	1
〃	(2×8)	Volume knob	2
〃	(2×8)	Select knob	1
〃	(2×6)	Fix metal of slide switch	2
〃	(2×16)	Fix metal of slide switch	1
〃	(2.6×6)	VC.-P.C. board	2
〃	(3×10)	Antenna holder-Chassis	2
〃	(3×8)	P.C. board-Chassis	2
Spring washer	(2.6d)	Pickup-Lever	1
〃	(3d)	Rod antenna-Fix metal	1
〃	(2d)	Pulley shaft	2
〃	(2d)	Select lever-Special screw	2
〃	(2d)	P.C. board-Special screw	1
〃	(2d)	Volume knob	2
〃	(3d)	Tuning shaft	1
〃	(2d)	Select knob	1
〃	(2.6d)	VC.-Drum	1
Washer	(4d)	Cabinet-Handle	2
Countersunk head screw	(2×6)	Ext. power socket-Fix board	2
Washer	(3.2×10×1t)	Speaker box	8
	(3.2×10×0.5t)	Antenna holder-Chassis	2
Pan head screw	(3×10)	Cabinet-Bottom cover	2