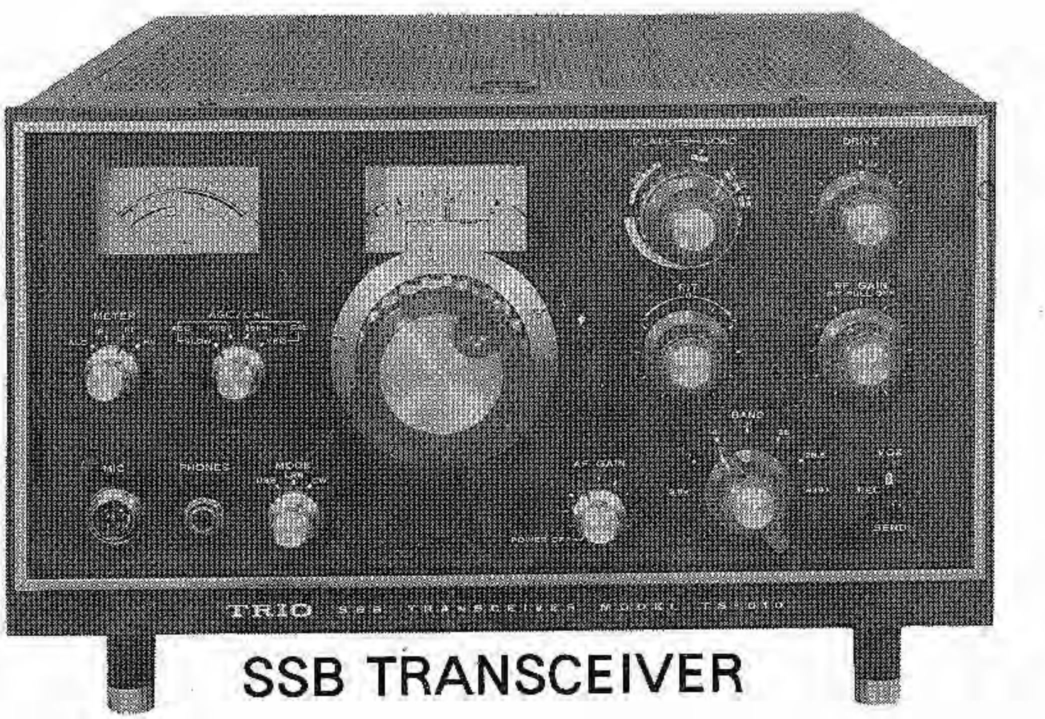
TRIO

SERVICE MANUAL

TS-510
(PS-510)



SSB TRANSCEIVER

PARTS DESCRIPTION LIST

■ MAIN CHASSIS (LB-6J) SECTION

Symbol No.	Description				Part No.	Remarks
PRINTED CIRCUIT						
—	DIODE S.W. BLOCK	(UC1209J)				
—	COIL PACK D BLOCK	(UC1111J)				
—	COIL PACK C BLOCK	(UC1110J)				
—	COIL PACK B BLOCK	(UC1109J)				
—	COIL PACK A BLOCK	(UC1108J)				
—	FINAL UNIT BLOCK	(UC1404J)				
—	IF UNIT BLOCK	(UC1204J)				
—	RF UNIT BLOCK	(UC1112J)				
—	VFO BLOCK	(UC0116J1)				
—	BM UNIT BLOCK	(UC1501J)				
—	CARRIER BLOCK	(UC1405J)				
—	MARKER UNIT BLOCK	(UC1502J)				
—	AF UNIT BLOCK	(UC1304J)				
CAPACITORS						
C1	Ceramic	0.01μF	+100%,	−0%		
C3	Ceramic	0.001μF	+100%,	−0%		
C4	Ceramic	0.01μF	+100%,	−0%		
C5~8	Ceramic	500PF	+100%,	−0%		
C9	Ceramic	0.01μF	+100%,	−0%		
C10	Mica	800PF	±10%			
C11	Mica	150PF	±10%			
C12,13	Ceramic	0.01μF	+100%,	−0%		
C14,15	Ceramic	0.001μF	+100%,	−0%		
C16	Mica	250PF	±5%			
C17	Ceramic	0.01μF	+100%,	−0%		
C18	Ceramic	0.01μF	±20%			
C20~23	Ceramic	0.01μF	+100%,	−0%		
C24	Oil Impregnated Paper	0.01μF	±20%			
C25	Ceramic	0.01μF	+100%,	−0%		
C26	Electrolytic Tubular	47μF	25WV			
RESISTORS						
R5	Metallic Oxide Film Composition	4.7kΩ	±5%	7W		
R6	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R7,8	Carbon Composition	1MΩ	±5%	1W		
R9	Carbon Composition	10kΩ	±5%	1W		
R10	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R11	Fixed Carbon Composition	1MΩ	±10%	1/2W		
R12	Fixed Carbon Composition	2.2kΩ	±10%	1/2W		
R13	Metallic Oxide Film Composition	15kΩ	±5%	3W		
R14	Fixed Carbon Composition	100kΩ	±10%	1/2W		
POTENTIOMETERS						
VR1	500kΩ	(B)	VOX GAIN		R01-0422	
VR2	1MΩ	(B)	MIC GAIN		R01-0423	
VR3	10kΩ	(C)	RF GAIN (with S.W.)		R01-1123	
VR4	500kΩ	(A)	AF GAIN (with S.W.)		R01-1124	
VR5	3MΩ	(B)	TIME CONST.		R01-0424	
VR6	5kΩ	(B)	BIAS		R01-0420	
VR7	5kΩ	(B)	S. ZERO ADJ.		R01-0420	
VR8	5kΩ	(B)	RIT		R01-0425	
VR9	500kΩ	(B)	ANTI.		R01-0422	
VR10	10kΩ	(B)	RF METER ADJ.		R01-0421	
COILS/TRANSFORMER						
L1	Output Coil (A)				L13-136	
L2	Output Coil (B)				L13-147	
L3	Choke Coil				L20-102G	
L4,5	Parasitic Filter				L18-26	

PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Remarks
L6	IF Trap	L13-135	
L7,8	Ferrite Inductor (1 mH)		
T1	Output Transformer (5kΩ: 8Ω)	T02-63	
	SWITCHES		
Sa	ANT Slide S.W.	S10-22D	
Sb	LOAD/BAND Rotary S.W.	S03-676	
Sc	AGC/CAL Rotary S.W.	S07-149	
Sf	MODE Rotary S.W.	S07-150	
SM1	METER Rotary S.W.	S04-140	
-	VOX Siemens S.W.	S-4139	
	VARIABLE CAPACITORS		
VC1	PLATE V.C. (300PF)	D01-161	
VC2	LOAD V.C. (400PF)	D01-118	
TC1	NEUTRALIZING V.C.	D01-07	
	DIODES		
D1	1N60		
D2	SW-05S		
	MISCELLANEOUS		
–	Case	A01-LB6J	
–	Chassis	A03-LB6J	
–	Panel	A05-LB6J	
	Sub Panel	A06-LB6J	
–	Sole Plate	A08-LB6J	
–	Shield Board x 2	A13-LB6J	
–	P.L. Metal Fittings	A44-38	
–	Spring	A62-12	
–	Dual Shaft	A64-36	
–	Drive Shaft	A64-37	
–	Band S.W. Shaft	A64-38	
–	Patch	A90-LA215	
–	Final Box	A90-LB6J	
–	Final Cover (L Type)	A91-LB6J	
–	Decorative Plate	A94-LA01	
–	Load Holder x 16	A4880	
–	Shaft Shield Fittings x 3	A4947	
	Angle (for load S.W.)	A5034	
–	Side Angle x 2	A5035	
–	Coil Pack Holder x 2	A5036	
–	Meter Holder	A5037	
–	Relay Holder x 2	A5038	
–	Angle (for Bobbin) x 2	A5039	
–	Angle (for VOX)	A5040	
–	Coil Pack Cover	A5045	
–	Panel Framework (AA03-LB6J)		
–	Name Plate	B08-31	
–	Address	B59-0001-00	
–	Pulley x 4	D04-29	
–	Mold Socket (9p MT)	E01-19A	
–	US Socket	E01-38A	
–	PL Holder	E03-02F	
–	Lug x 3	E04-101	
–	Lug x 4	E04-101B	
–	Lug x 2	E04-202B	
–	M Type Receptacle	E07-11P	
–	4P Plug Socket (Jack)	E07-14C	
–	Square Plug Socket (with 12P)	E07-212B	
J	1P Jack	E08-11C	
–	M Type Receptacle (Plug)	E09-11P	
–	4P Plug Socket (Plug)	E09-14C	
–	1P Pin Plug	E09-410	

PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Remarks
–	Shielded Wire 5m	W11-016K	
–	Reticular Wire 0.15m	W14-01	
–	Vinyl Tube (Layflat Width, Black) 0.7m	W17-17	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 2m	W62-509	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 2.5m	W62-519	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 2m	W62-529	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 3.5m	W62-539	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 2m	W62-549	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 3m	W62-559	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 2m	W62-569	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 3m	W62-579	
–	P.V.C. Insulated Wire (Spiral) 0.5φ 3m	W62-589	
–	Screw (M6 x 18-F)		
–	Nut (N6-F)		
–	Washer (W6 x 13 x 1-F) x 2		
–	Spring Washer (SW6-P)		
–	Hexagon Nut (N9-F)		
–	Flat Head Washer (W3-F) x 13		
	Flat Head Washer (W4-F) x 4		
–	Pan Head Washer (⊕P3 x 4-F) x 14		
–	Pan Head Washer (⊕P3 x 6-F) x 14		
–	Pan Head Washer (⊕P3 x 8-F) x 14		
–	Pan Head Washer (⊕P4 x 8-F) x 5		
–	Flat Head Screw (⊕S2.6 x 4-F) x 2		
–	Flat Head Screw (⊕S3 x 8-F) x 6		
–	Nut (N3-F) x 18		

■ UC1209J

Symbol No.	Description	Part No.	Remarks
	CAPACITOR		
C501～510	Ceramic 0.01μF +100%, –0%		
	RESISTORS		
R501	Fixed Carbon Composition 15kΩ ±10%, 1/2W		
R502～505	Fixed Carbon Composition 6.8kΩ ±10%, 1/2W		
R506,507	Fixed Carbon Composition 15kΩ ±10%, 1/2W		
	COIL		
L501～504	Ferri-Inductor 150μH		
	MISCELLANEOUS		
–	Printed Circuit Board	S23-284	
	Shielding Board	A13-UC1209J	
–	Terminal (for P.C.B) x 10	N4086	

■ UC1111J

Symbol No.	Description	Part No.	Remarks
	CRYSTALS		
X801	HC18U 12.395 MHz	T13-88	
X802	HC18U 15.895 MHz	T13-89	
X803	HC18U 22.895 MHz	T13-90	
X804	HC18U 29.895 MHz	T13-91	
X805	HC18U 36.895 MHz	T13-92	
X806	HC18U 37.395 MHz	T13-93	
X807	HC13U 37.995 MHz	T13-94	
	MISCELLANEOUS		
	Printed Circuit Board	S23-281	
–	Terminal (for P.C.B) x 3	N4085	
–	Wafer	S4141	
–	P.V.C Insulated Wire (0.5φ Black) 0.12m	W02 50	

PARTS DESCRIPTION LIST

■ UC1110J

Symbol No.	Description	Part No.	Remarks
	CAPACITORS		
C851	Mica 22PF ±5%		
C852	Mica 47PF ±5%		
C853	Mica 100PF ±5%		
C854,855	Ceramic 0.01μF +100%, −0%		
	RESISTOR		
R851	Fixed Carbon Composition 4.7kΩ ±10% 1/2W		
	COILS		
L851	OSC Coil 28MHz (A)	L11-82	
L852,853	OSC Coil 14MHz, 21MHz	L11-81	
L854	OSC Coil 7MHz	L11-80	
L855	OSC Coil 3.5MHz	L11-79	
L856	OSC Coil 28MHz (B)	L11-83	
	MISCELLANEOUS		
–	Printed Circuit Board	S23-289	
–	Terminal (for P.C.B) x 2	N4085	
–	Wafer	S4141	

■ UC1109J

Symbol No.	Description	Part No.	Remarks
	CAPACITORS		
C901	Mica 680PF ±5%		
C902	Mica 36PF ±5%		
C903	Mica 150PF ±5%		
C904	Mica 27PF ±5%		
C905~907	Ceramic 0.01μF +100%, −0%		
C908	Mica 12PF ±5%		
	RESISTOR		
R901	Fixed Carbon Composition 1kΩ ±10% 1/2W		
	COILS		
L901	Tune Coil 3.5MHz	L13-142	
L902	Tune Coil 7MHz	L13-138	
L903	Tune Coil 14MHz	L13-139	
L904	Tune Coil 21MHz	L13-140	
L905	Tune Coil 28MHz	L13-141	
	MISCELLANEOUS		
–	Printed Circuit Board	S23-280	
–	Terminal (for P.C.B) x 4	N4086	
–	Wafer	S4140	
–	P.V.C Insulated Wire (0.8φ white) 0.2m	W02-89	

■ UC1108J

Symbol No.	Description	Part No.	Remarks
	CAPACITORS		
C2	Mica 100PF ±10%		
C951	Mica 680PF ±5 %		
C952	Mica 36PF ±5%		
C953	Mica 150PF ±5%		
C954	Ceramic 0.01μF +100%, −0%		
C955	Mica 27PF ±5%		
C956,957	Ceramic 0.01μF +100%, −0%		
	RESISTOR		
R4	Fixed Carbon Composition 100Ω ±10% 1/2W		

PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Remarks
	COILS		
L951	Tune Coil 3.5MHz	L13-137	
L952	Tune Coil 7MHz	L13-138	
L953	Tune Coil 14MHz	L13-139	
L954	Tune Coil 21MHz	L13-140	
L955	Tune Coil 28MHz	L13-141	
L956	Ferri-Inductor 100μH		
	MISCELLANEOUS		
–	Printed Circuit Board	S23-279	
–	Terminal (for P.C.B) x 7	N4086	
–	Wafer	S4140	
–	P.V.C Insulated Wire (0.8φ White) 0.2m	W02-89	

■ UC1404J

Symbol No.	Description	Part No.	Remarks
	CAPACITORS		
C101	Ceramic 0.01μF +100%, –0%		
C102~107	Ceramic 0.04μF +100%, –0%		
C108,109	Ceramic 0.01μF +100%, –0%		
C110	Metalized Paper 0.2μF ±20%		
C111	Polyester 0.22μF ±10%		
C112,113	Ceramic 0.01μF +100%, –0%		
C114,115	Ceramic 0.04μF +100%, –0%		
	RESISTORS		
R101,102	Fixed Carbon Composition 10Ω ±10% 1/2W		
R103	Fixed Carbon Composition 4.7kΩ ±10% 1/2W		
R104	Fixed Carbon Composition 8.2kΩ ±10% 1/2W		
R105	Fixed Carbon Composition 100Ω ±10% 1/2W		
R106	Fixed Carbon Composition 10kΩ ±10% 1/2W		
R107	Fixed Carbon Composition 22kΩ ±10% 1/2W		
R108	Fixed Carbon Composition 12kΩ ±10% 1/2W		
R109	Fixed Carbon Composition 10kΩ ±10% 1/2W		
R110	Fixed Carbon Composition 2.2MΩ ±10% 1/2W		
R111	Fixed Carbon Composition 10kΩ ±10% 1/2W		
	COILS		
L101	Ferri-Inductor 150μH		
L102	Parasitic Filter	L18-31	
	TUBE		
V101,102	S2001		
	TRANSISTOR/DIODE		
Q101	2SC856		
D101	1N60		
	MISCELLANEOUS		
–	Final Chassis	AD3-UC1404J	
–	US Socket x 2	E01-38A	
–	Lug	E04-101B	
–	Lug x 4	E04-202B	
–	P.V.C Insulated Wire (0.5φ Black) 0.2m	W02-50	
–	P.V.C Insulated Wire (0.5φ Yellow) 0.4m	W02-54	
–	P.V.C Insulated Wire (0.5φ White) 0.3m	W02-59	
–	P.V.C Insulated Wire (0.8φ Red) 0.4m	W02-82	
–	P.V.C Insulated Wire (0.8φ Yellow) 0.5m	W02-84	
–	P.V.C Insulated Wire (0.8φ Blue) 0.2m	W02-86	
–	Tinned Wire (1.2φ) 0.4m	W03-12	
–	P.V.C Insulated Wire (0.5φ Green) 0.6m	W62-559	
–	P.V.C Insulated Wire (0.5φ Blue) 0.1m	W62-569	
–	P.V.C Insulated Wire (0.5φ Purple) 0.1m	W62-579	
–	P.V.C Insulated Wire (0.5φ Gray) 0.3m	W62-589	
–	Screw (⊕P3 x 4-F) x 9		

UC1204J

Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C301	Ceramic	50PF	±10%			
C302~305	Ceramic	0.01 μF	+100%,	−0%		
C306	Ceramic	3PF	±0.5PF			
C307	Ceramic	50PF	±10%			
C308	Ceramic	0.01 μF	+100%,	−0%		
C309	Ceramic	30PF	±10%			
C310~318	Ceramic	0.01 μF	+100%,	−0%		
C319	Ceramic	0.002μF	+100%,	−0%		
C320~322	Ceramic	0.01 μF	+100%,	−0%		
C323	Ceramic	0.04μF	+100%,	−0%		
C324~326	Ceramic	0.01 μF	+100%,	−0%		
C327	Ceramic	0.04μF	+100%,	−0%		
C328	Ceramic	10PF	±0.5PF			
C329	Ceramic	0.01 μF	+100%,	−0%		
C330	Ceramic	200PF	±10%			
C331	Ceramic	0.04μF	+100%,	−0%		
C332	Polyester	0.33μF	±5%			
C333	Ceramic	0.01μF	+100%,	−0%		
C334,335	Ceramic	0.04μF	+100%,	−0%		
C337	Ceramic	0.01μF	+100%,	−0%		
C338	Electrolytic Tubular	10μF	16WV			
TC301	Ceramic Trimmer	50PF				
	RESISTORS					
R302	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R303	Fixed Carbon Composition	100Ω	±10%	1/2W		
R304	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R305,306	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R307	Fixed Carbon Composition	68kΩ	±10%	1/2W		
R308	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R309	Fixed Carbon Composition	3.9kΩ	±10%	1/2W		
R310	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R311	Fixed Carbon Composition	3.9kΩ	±10%	1/2W		
R312	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R313	Fixed Carbon Composition	560Ω	±10%	1/2W		
R314	Fixed Carbon Composition	2.2kΩ	±10%	1/2W		
R315	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R316	Fixed Carbon Composition	10kΩ	±10%	1/2W		
R317	Fixed Carbon Composition	82kΩ	±10%	1/2W		
R319	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R320	Fixed Carbon Composition	560kΩ	±10%	1/2W		
R321	Fixed Carbon Composition	22kΩ	±10%	1/2W		
R322	Fixed Carbon Composition	220kΩ	±10%	1/2W		
R323	Fixed Carbon Composition	4.7kΩ	±10%	1/2W		
R324	Fixed Carbon Composition	100Ω	±10%	1/2W		
R325	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R326	Fixed Carbon Composition	100Ω	±10%	1/2W		
R327	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R328	Fixed Carbon Composition	330kΩ	±10%	1/2W		
R329	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R330	Fixed Carbon Composition	47kΩ	±10%	1/2W		
R331	Fixed Carbon Composition	15kΩ	±10%	1/2W		
R332	Fixed Carbon Composition	22kΩ	±10%	1/2W		
R333	Fixed Carbon Composition	3.3MΩ	±10%	1/2W		
R334	Fixed Carbon Composition	10kΩ	±10%	1/2W		
R335	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R336	Fixed Carbon Composition	2.2MΩ	±10%	1/2W		
R337	Fixed Carbon Composition	10kΩ	±10%	1/2W		

PARTS DESCRIPTION LIST

POTENTIOMETERS

Symbol No.	Description	Part No.	Remarks
VR301	2kΩ (B)	R10-113	
VR302	20kΩ (B)	R10-104	

COILS/TRANSFORMER

Symbol No.	Description	Part No.	Remarks
L301	IFT (3.395MHz)	L01-83	
L302	Ferri-Inductor 1mH		
L303	IFT (3.395MHz)	L01-84	
L304	Trap (3.395MHz)	L13-146	
L305	B.P.F. (A)	L13-143	
L306	B.P.F. (B)	L13-144	
L307	B.P.F. (C)	L13-145	
L308	IFT (3.395MHz)	L01-83	
L309	IFT (3.395MHz)	L01-85	
L310	Ferri-Inductor 3.3μH		
L311	Ferri-Inductor 1mH		
T301	AF Transformer	L11-85	

TUBES

Symbol No.	Description	Part No.	Remarks
V301	6BA6		
V302	6GH8A		
V303	6CB6		
V304	6BA6		

TRANSISTORS/DIODES

Symbol No.	Description	Part No.	Remarks
Q301,302	2SC373		
Q303	2SA562Y		
D302,303	1S73A		
D304	0A95		
D305	SZ-200-07		
D306	0A95		

X'TAL FILTERS

Symbol No.	Description	Part No.	Remarks
XF1,2	X'tal Filter	L4013	

MISCELLANEOUS

Symbol No.	Description	Part No.	Remarks
–	Printed Circuit Board	S23-283	
–	9pMT Shield Case	E24-01	
–	7pMT Shield Case × 3	E24-06	
–	7pMT Molded Socket (for P.C.B) × 3	E51-17A	
–	9pMT Molded Socket (for P.C.B)	E51-19C	
–	Terminal (for P.C.B) × 41	N4085	
–	P.V.C Insulated Wire (0.5φ Yellow) 0.07m	W02-54	
–	P.V.C Insulated Wire (0.8φ Blue) 0.225m	W02-86	
–	P.V.C Insulated Wire (0.8φ White) 0.09m	W02-89	
–	P.V.C Insulated Wire (0.5φ Spiral) 0.275m	W62-529	
–	P.V.C Insulated Wire (0.5φ Spiral) 0.15m	W62-579	

■ UC1112J

CAPACITORS

Symbol No.	Description	Part No.	Remarks
C201	Ceramic 20PF ±10%		
C202	Ceramic 5PF ±0.5PF		
C203	Ceramic 0.005μF +100%, −0%		
C204,205	Ceramic 0.01μF +100%, 0%		
C206	Ceramic 50PF ±10%		
C207	Ceramic 0.005μF +100%, −0%		
C208~213	Ceramic 0.01μF +100%, −0%		
C214	Ceramic 30PF ±10%		
C215	Ceramic 10PF ±0.5PF		
C216~219	Ceramic 0.01μF +100%, −0%		
C220	Ceramic 50PF ±10%		
C221	Ceramic 0.01μF +100%, −0%		
C222~227	Ceramic 0.04μF +100%, −0%		
C228	Ceramic 5PF ±0.5PF		

PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Remarks
	RESISTORS		
R201	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R202	Fixed Carbon Composition 330Ω ±10% 1/2W		
R204	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R205	Fixed Carbon Composition 150Ω ±10% 1/2W		
R207,209	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R210	Fixed Carbon Composition 33kΩ ±10% 1/2W		
R211	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R212	Fixed Carbon Composition 470Ω ±10% 1/2W		
R213	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R214	Fixed Carbon Composition 47kΩ ±10% 1/2W		
R215	Fixed Carbon Composition 100Ω ±10% 1/2W		
R216	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R217	Fixed Carbon Composition 1.5kΩ ±10% 1/2W		
R218	Fixed Carbon Composition 10Ω ±10% 1/2W		
R219	Fixed Carbon Composition 4.7kΩ ±10% 1/2W		
R220	Fixed Carbon Composition 68kΩ ±10% 1/2W		
R221	Fixed Carbon Composition 100kΩ ±10% 1/2W		
	COILS		
L201	Ferri-Inductor 1mH		
L202	Ferri-Inductor 15μH		
L203	Ferri-Inductor 1mH		
L204	Choke Coil 0.22μH	L22-01	
	TUBES		
V201	6AW8A		
V202	12BY7A		
V203	6CB6		
V204	6BZ6		
	TRANSISTOR/DIODES		
Q201	2SC373		
D201,202	SM-150-01		
	MISCELLANEOUS		
–	Printed Circuit Board	S23-282	
VC201,202	Variable Capacitor	D01-162	
–	Pulley x 2	D04-29	
–	9PMT Shield Case x 2	E24-01	
–	7PMT Shield Case x 2	E24-06	
–	7PMT Molded Socket (for P.C.B) x 2	E51-17A	
–	9PMT Molded Socket (for P.C.B) x 2	E51-19C	
–	Terminal (for P.C.B) x 16	N4085	
–	P.V.C Insulated Wire (0.5ϕ Black) 0.07m	W02-50	
–	P.V.C Insulated Wire (0.8ϕ Blue) 0.26m	W02-86	
–	P.V.C Insulated Wire (0.8ϕ White) 0.23m	W02-89	
–	P.V.C Insulated Wire (0.5ϕ Spiral) 0.24m	W62-529	

■ UC0116J1

Symbol No.	Description	Part No.	Remarks
	CAPACITORS		
C1	Temperature Compensating Ceramic 47PF ±5%		
C2,3	Temperature Compensating Ceramic 150PF ±5%		
C4	Temperature Compensating Ceramic 70PF ±5%		
C5	Temperature Compensating Ceramic 470PF ±5%		
C6	Temperature Compensating Ceramic 220PF ±5%		
C7,8	Super Mica 1500PF		
C9	Hi Q Mica 3PF ±0.5PF		
C10	Ceramic 0.02μF +80%, −20%		
C11,12	Ceramic 0.04μF +80%, −20%		
C13	Ceramic 0.02μF +80%, −20%		
C14	Ceramic 33PF ±0.5%		
C15	Ceramic 5PF ±0.5PF		

PARTS DESCRIPTION LIST

Symbol No.	Description				Part No.	Remarks
C16	Ceramic	10PF	±0.5PF			
C17	Ceramic	5PF	±0.5PF			
C18	Ceramic	0.01μF	+80%,	−20%		
C19	Ceramic	0.04μF	+80%,	−20%		
C20	Temperature Compensating Ceramic	(CC94CG1H100J)				
	RESISTORS					
R1	Fixed Carbon Composition	270kΩ	±5%	1/4W		
R2	Fixed Carbon Composition	100Ω	±5%	1/4W		
R3,4	Fixed Carbon Composition	1MΩ	±5%	1/4W		
R5	Fixed Carbon Composition	330Ω	±5%	1/4W		
R6	Fixed Carbon Composition	33kΩ	±5%	1/4W		
R7	Fixed Carbon Composition	47kΩ	±5%	1/4W		
R8	Fixed Carbon Composition	1kΩ	±5%	1/4W		
R9	Fixed Carbon Composition	100Ω	±5%	1/4W		
	COILS					
L2~4	Ferrite Inductor	(FL5H-102K)				
L5	Ferrite Inductor	(FL5H-220K)				
L6~7	Ferrite Inductor	(FL5H-102K)				
L	OSC Coil				L11-78	
	TRANSISTORS/DIODES					
Q1	3SK22 (Y)					
Q2	2SK19 (Y)					
Q3,4	2SC460 (B)					
D1	SD111					
D2,3	1N60					
	MISCELLANEOUS					
—	Printed Circuit Board				J25-0019-04	
—	Dial Scale				A07-UC0110J	
—	Name Plate				B42-0010-04	
V.C.	Variable Capacitor				C01-0001-05	
V.C.	Midget Capacitor				C03-0001-05	
—	Trimmer (ECV-1ZW 10P12)				C4036	
—	Dial				D03-18	
—	V.F.O. Box (A)				F11-0004-13	
—	V.F.O. Box (B)				F11-0005-04	
—	V.F.O. Box (C)				F11-0006-03	
—	V.F.O. Box (D)				F11-0007-04	
—	V.F.O. Box (E)				F11-0008-04	
—	V.F.O. Box (F)				F11-0013-04	
—	V.F.O. Box (G)				F11-0010-04	
—	V.F.O. Box (H)				F11-0011-04	
—	V.F.O. Box (I)				F11-0012-04	
—	Lug				E04-101B	
—	Acme Terminal				E4071	
—	Terminal x 5				N4085	
—	Earth Lug				N28-0.32	
—	Shaft Coupling				S4082	
—	P.V.C. Insulated Wire	0.5/s.	0.3m		W02-50	
—	P.V.C. Insulated Wire		0.2m		W02-52	
—	P.V.C. Insulated Wire		0.3m		W02-54	
—	P.V.C. Insulated Wire		0.2m		W02-56	
—	Tinned Wire	0.8/s.	TCW 0.2m		W03-08	
—	Pan Head Screw	(⊕P2 x 4-F)	x 3			
—	Pan Head Screw	(⊕P3 x 6-F)	x 38			
—	Flat Head Washer	(W3-F)	x 4			
—	Pan Head Screw	(⊕P3 x 4-F)				

PARTS DESCRIPTION LIST

■ UC1501J

Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C601,602	Mica	100PF	±5%			
C603,604	Ceramic	0.005μF	+100%,	−0%		
C605	Electrolytic Tubular	10μF	16WV			
C606	Metalized Paper	0.05μF	±20%			
C607	Ceramic	0.01μF	+100%,	−0%		
C608	Polyester	0.47μF	±5%			
C609,610	Ceramic	0.001μF	+100%,	−0%		
C611	Mica	50PF	±5%			
C612,613	Ceramic	0.01μF	+100%,	−0%		
C614	Ceramic	30PF	±10%			
C615~617	Ceramic	0.01μF	+100%,	−0%		
C618	Electrolytic Tubular	10μF	160WV			
C619	Ceramic	0.01μF	+100%,	−0%		
C620	Polyester	0.47μF	±5%			
C621	Electrolytic Tubular	10μF	16WV			
C622	Metalized Paper	0.05μF	±20%			
C623	Polyester	0.1μF	±5%			
C624~628	Ceramic	0.01μF	+100%,	−0%		
C629,630	Ceramic	0.001μF	+100%,	−0%		
C631	Ceramic	0.01μF	+100%,	−0%		
C632,633	Ceramic	0.04μF	+100%,	−0%		
	RESISTORS					
R601	Fixed Carbon Composition	470kΩ	±10%	1/2W		
R602	Fixed Carbon Composition	47kΩ	±10%	1/2W		
R603	Fixed Carbon Composition	3.3kΩ	±10%	1/2W		
R604	Fixed Carbon Composition	820kΩ	±10%	1/2W		
R605	Fixed Carbon Composition	270kΩ	±10%	1/2W		
R606	Fixed Carbon Composition	470kΩ	±10%	1/2W		
R607	Fixed Carbon Composition	47kΩ	±10%	1/2W		
R608	Fixed Carbon Composition	4.7kΩ	±10%	1/2W		
R609	Fixed Carbon Composition	82Ω	±10%	1/2W		
R610	Fixed Carbon Composition	6.8kΩ	±10%	1/2W		
R611,612	Fixed Carbon Composition	220Ω	±10%	1/2W		
R613	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R614	Fixed Carbon Composition	2.2kΩ	±10%	1/2W		
R615	Fixed Carbon Composition	4.7kΩ	±10%	1/2W		
R616	Fixed Carbon Composition	10kΩ	±10%	1/2W		
R617	Fixed Carbon Composition	470kΩ	±10%	1/2W		
R618	Fixed Carbon Composition	1MΩ	±10%	1/2W		
R619	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R620	Fixed Carbon Composition	150kΩ	±10%	1/2W		
R621	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R622	Fixed Carbon Composition	220kΩ	±10%	1/2W		
R623	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R624	Fixed Carbon Composition	680Ω	±10%	1/2W		
R625,626	Fixed Carbon Composition	470Ω	±10%	1/2W		
	POTENTIOMETERS					
VR601	50kΩ (B)				R10-56	
VR602	300Ω (B)				R10-112	
VR603	500kΩ (B)				R10-105	
VR604	5kΩ (B)				R10-53	
	COILS/TRANSFORMER					
L601~604	Ferri-Inductor 1mH					
L605	IFT (for B.M)				L01-87	
	TUBES					
V601	6GH8A					
V602	6BA6					
V603	6GH8A					

PARTS DESCRIPTION LIST

Symbol No.	Description				Part No.	Remarks
	DIODES					
D601~604	1N60					
D605	SM-150-01					
D606~609	1N60					
	MISCELLANEOUS					
—	Printed Circuit Board				S23-287	
TC601,602	Ceramic Trimmer	40PF			C4047	
—	Shielding Case	(9 pin MT)	x 2		E24-01	
—	Shielding Case	(7 pin MT)	x 2		E24-06	
—	Molded Socket	(7 pin MT)			E51-17A	
—	Molded Socket	(9 pin MT)	x 2		E51-19C	
—	Terminal (for P.C.B)	x 29				
Ne601	Neon Tube	(NE-2)				
—	P.V.C Insulated Wire	(0.8φ Blue)	0.2m		W02-86	
—	Vinyl Tube		0.05m		W07-014	
—	P.V.C Insulated Wire	(0.5φ Spiral)	0.1m		W62-529	

■ UC1405J

Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C001	Mica	18PF	±10%			
C002	Mica	82PF	±10%			
C003	Ceramic	0.01μF	+100%,	−0%		
C004,005	Ceramic	0.001μF	+100%,	−0%		
C006	Ceramic	0.01μF	+80%,	−20%		
C007	Mica	82PF	±10%			
C008	Ceramic	0.01μF	+100%,	−20%		
C009~011	Mica	18PF	±10%			
	RESISTORS					
R001	Fixed Carbon Composition	47kΩ	±10%	1/4W		
R002	Fixed Carbon Composition	10kΩ	±10%	1/4W		
R003	Fixed Carbon Composition	47kΩ	±10%	1/4W		
R004,005	Fixed Carbon Composition	1kΩ	±10%	1/4W		
R006	Fixed Carbon Composition	47kΩ	±10%	1/4W		
R007	Fixed Carbon Composition	10kΩ	±10%	1/4W		
R008	Fixed Carbon Composition	47kΩ	±10%	1/4W		
R009	Metallic Oxide Film	10kΩ	±10%	2W		
R010	Fixed Carbon Composition	47kΩ	±10%	1/4W		
R011	Fixed Carbon Composition	33kΩ	±10%	1/4W		
	CRYSTALS					
X001	3393.5kHz				T13-95	
X002	3394.3kHz				T13-96	
X003	3396.5kHz				T13-97	
	TRANSISTORS/DIODES					
Q001,002	2SC373					
D001,002	1N60					
D003	SZ-200-18					
	TRANSFORMER					
Tool	IFT				L01-86	
	MISCELLANEOUS					
—	Printed Circuit Board				S23-286	
—	Crystal Holder	x 2			A4896	
TC001 004	Ceramic Trimmer	40PF			C4047	
—	Crystal Socket	x 2			E4058	
—	Terminal (for P.C.B)	x 16			N4086	
—	Screw	(⊕P3 x 12-F)	x 2			
—	Nut	(N3-F)	x 2			

UC1502J

Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C701	Ceramic	0.01μF	+80%,	−20%		
C702	Mica	100PF	±10%			
C703	Mica	220PF	±10%			
C704	Mica	47PF	±10%			
C705	Mica	390PF	±10%			
C706	Mica	330PF	±10%			
C707	Ceramic	200PF	±10%			
C708	Ceramic	0.04μF	+80%,	−20%		
C709	Ceramic	5PF	±0.5PF			
C710	Electrolytic Tubular	1μF	50WV			
	RESISTORS					
R701	Fixed Carbon Composition	10kΩ	±10%	1/4W		
R702	Fixed Carbon Composition	100kΩ	±10%	1/4W		
R703	Fixed Carbon Composition	470Ω	±10%	1/4W		
R704	Fixed Carbon Composition	10kΩ	±10%	1/4W		
R705,706	Fixed Carbon Composition	150kΩ	±10%	1/4W		
R707,708	Fixed Carbon Composition	10kΩ	±10%	1/4W		
R709	Fixed Carbon Composition	4.7kΩ	±10%	1/4W		
R710,711	Fixed Carbon Composition	47kΩ	±10%	1/2W		
	POTENTIOMETER					
VR701	50kΩ (B)				R10-56	
	COIL					
L701	Ferri-Inductor	12mH				
	TRANSISTORS					
Q701∼704	2SC373					
	MISCELLANEOUS					
—	Printed Circuit Board				S23-288	
—	Crystal Holder				A4853	
TC701	Ceramic Trimmer	40PF			C4047	
—	Crystal Socket				E4058	
—	Terminal (for P.C.B)	x 3			N4086	
—	Screw (⊕P3 x 12-F)					
—	Nut (N3-F)					

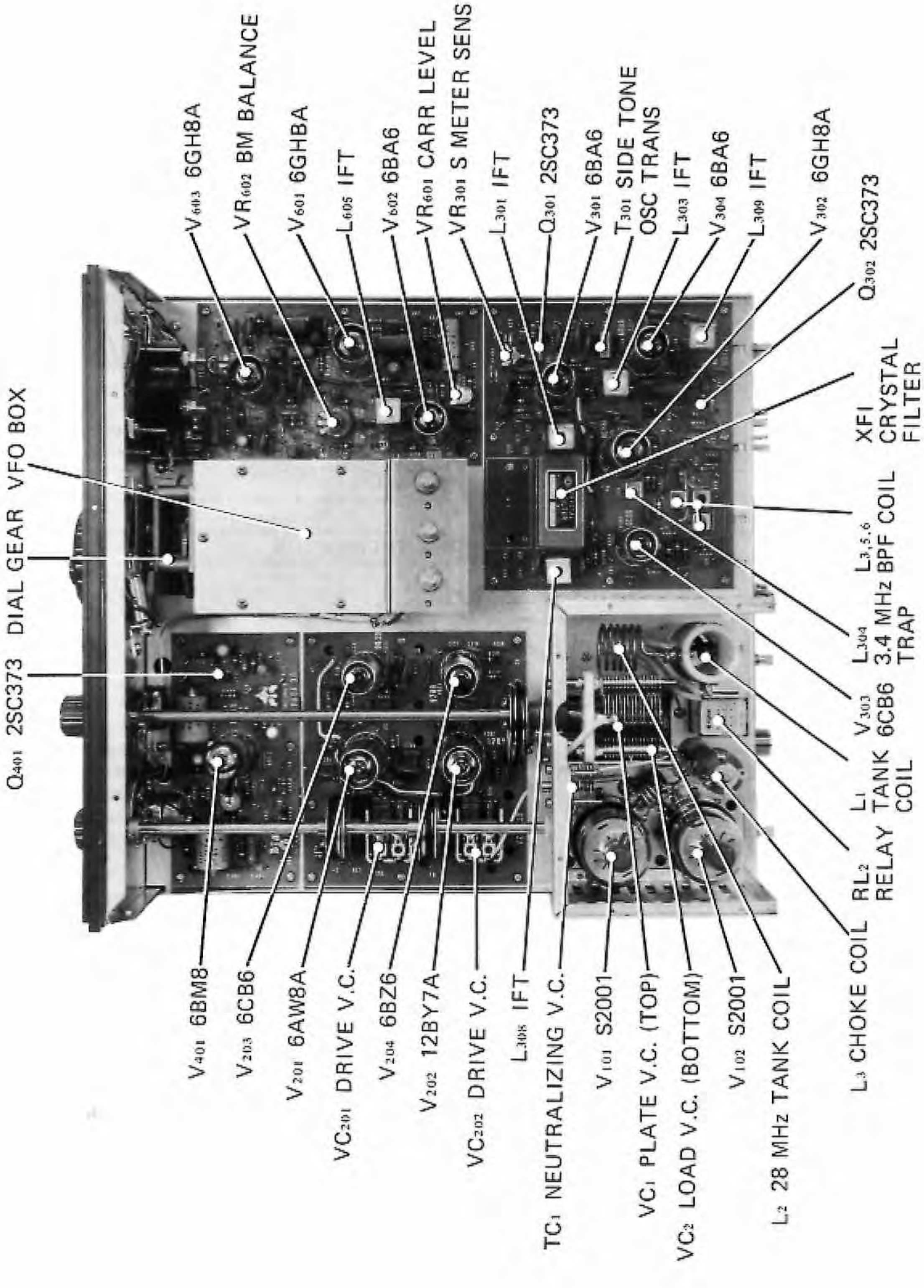
UC1304J

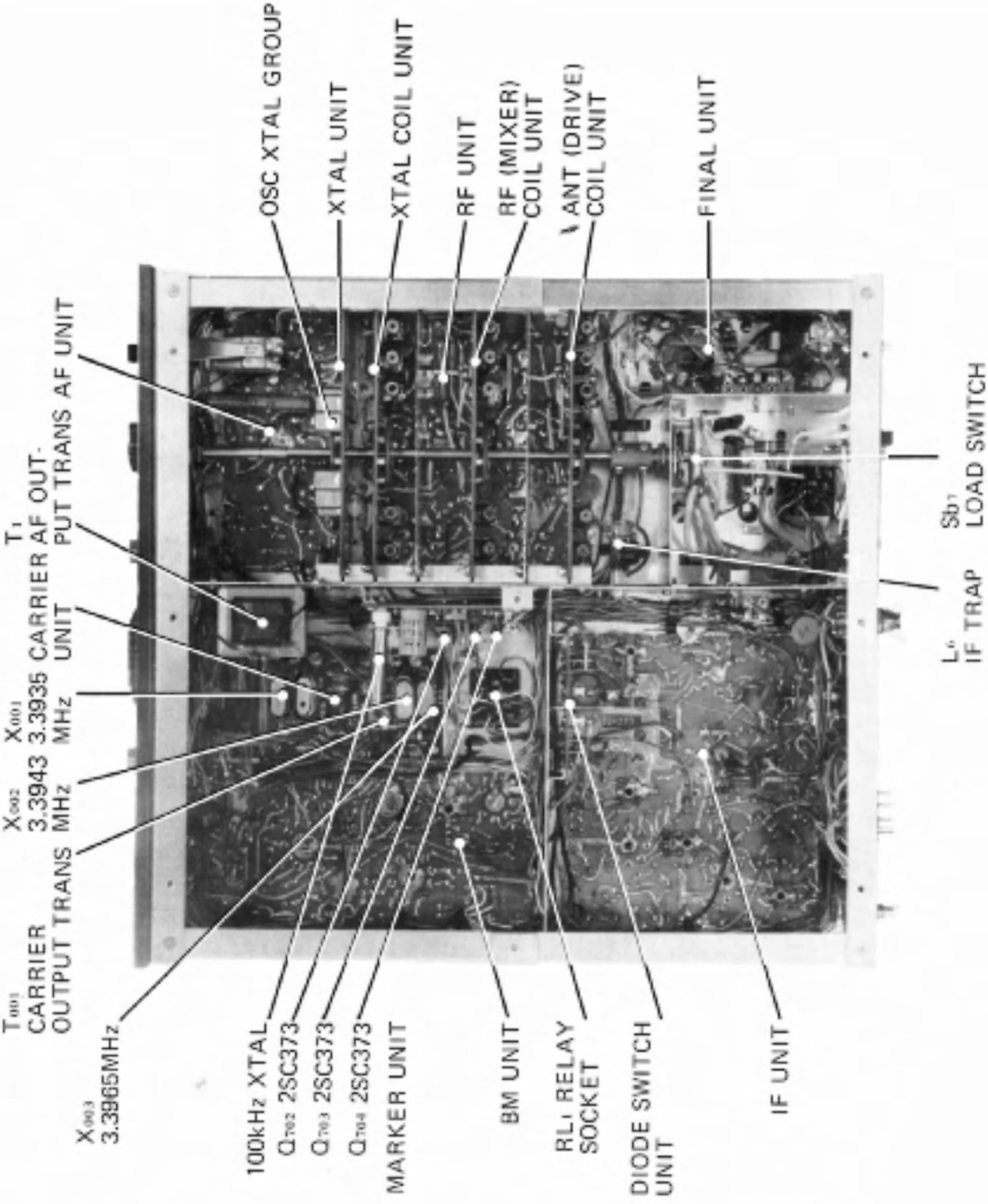
Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C401	Ceramic	100PF	±10%			
C403	Ceramic	0.01μF	±100%,	−0%		
C404	Ceramic	200PF	±10%			
C405	Metalized Paper	0.2μF	±20%			
C406	Electrolytic Tubular	10μF	16WV			
C407	Electrolytic Tubular	10μF	250WV			
C408	Ceramic	0.01μF	+100%,	−0%		
C409	Electrolytic Tubular	10μF	25WV			
C410	Electrolytic Tubular	10μF	250WV			
C411	Ceramic	0.005μF	+100%,	−0%		
C412	Electrolytic Tubular	1μF	25WV			
C413	Electrolytic Tubular	10μF	25WV			
C414	Ceramic	0.002μF	±20%			
C416	Mica	330PF	±10%			
C417	Electrolytic Tubular	33μF	16WV			
	RESISTORS					
R401	Fixed Carbon Composition	1MΩ	±10%	1/2W		
R402	Fixed Carbon Composition	470kΩ	±10%	1/2W		
R403	Fixed Carbon Composition	2.2kΩ	±10%	1/2W		

PARTS DESCRIPTION LIST

Symbol No.	Description				Part No.	Remarks
R404	Fixed Carbon Composition	100kΩ	±10%	1/2W		
R405	Fixed Carbon Composition	10kΩ	±10%	1/2W		
R406	Fixed Carbon Composition	470kΩ	±10%	1/2W		
R407	Fixed Carbon Composition	220Ω	±10%	1/2W		
R408	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R409,410	Fixed Carbon Composition	470kΩ	±10%	1/2W		
R411	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R412	Fixed Carbon Composition	3.3kΩ	±10%	1/2W		
R413	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R414	Fixed Carbon Composition	22kΩ	±10%	1/2W		
R415	Fixed Carbon Composition	150kΩ	±10%	1/2W		
R416	Fixed Carbon Composition	5.6kΩ	±10%	1/2W		
R417	Fixed Carbon Composition	47kΩ	±10%	1/2W		
R418	Fixed Carbon Composition	1kΩ	±10%	1/2W		
R419	Fixed Carbon Composition	5.6kΩ	±10%	1/2W		
R420,421	Fixed Carbon Composition	100Ω	±10%	1/2W		
R422	Fixed Carbon Composition	3.3kΩ	±10%	1/2W		
R423	Fixed Carbon Composition	47Ω	±10%	1/2W		
R424	Fixed Carbon Composition	100kΩ	±10%	1/2W		
	POTENTIOMETERS					
VR401	50kΩ	(B)			R10-56	
VR402	10kΩ	(B)			R10-54	
	TUBE					
V401	6BM8					
	TRANSISTOR/DIODES/THERMISTOR					
Q401	2SC373					
D401,402	1N60					
D403	RD9AM					
D404	1N60					
D405	RD9AM					
TH401	5T-31					
	MISCELLANEOUS					
–	Printed Circuit Board				S23-285	
–	Molded Socket	(9 pin MT)			E51-19B	
–	Terminal (for P.C.B)	x 2			N4085	
–	Terminal (for P.C.B)	x 14			N4086	
–	Insulating Sleeve	0.05m			W06-154	

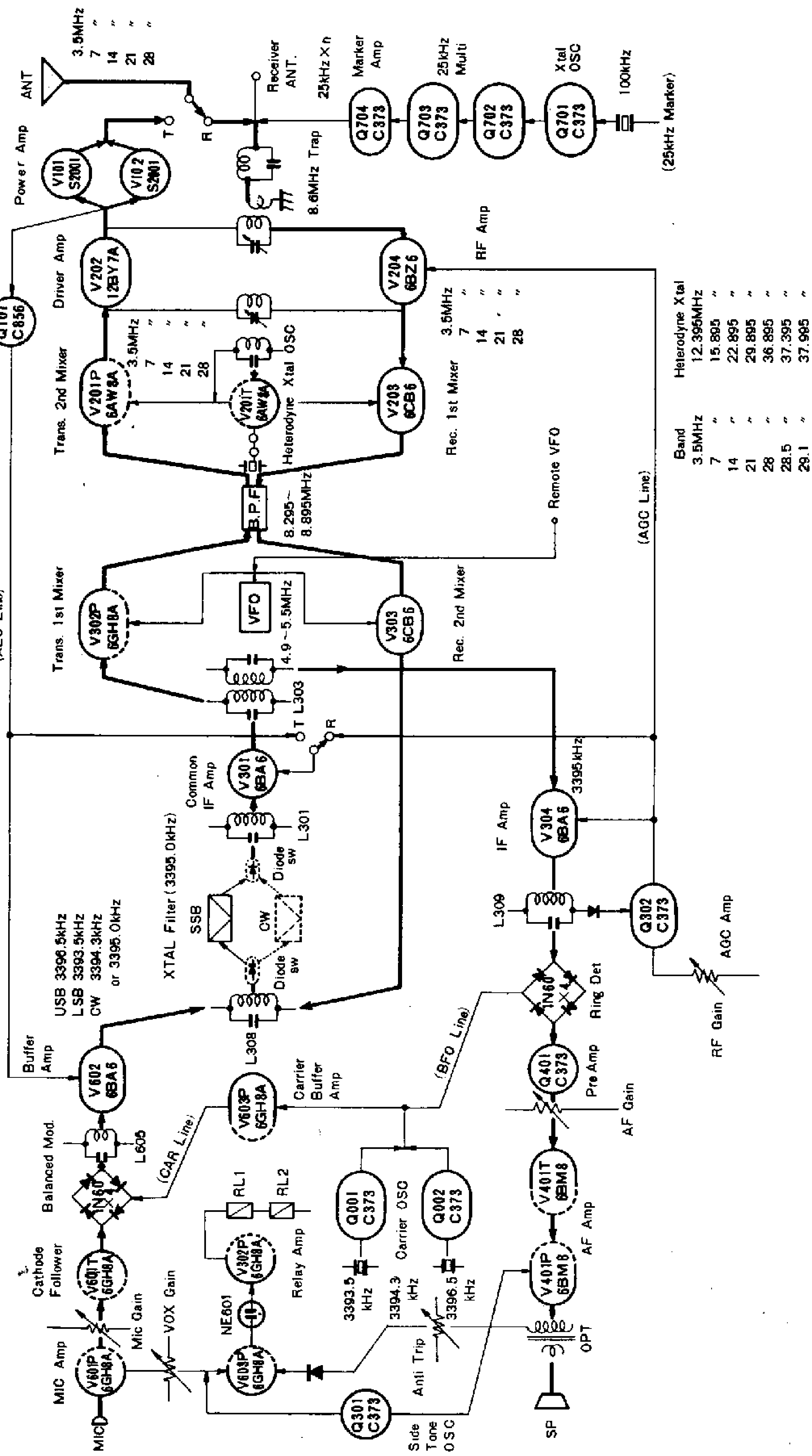
CHASSIS TOP VIEW





OSC XTAL GROUP
XTAL UNIT
XTAL COIL UNIT
RF UNIT
RF (MIXER) COIL UNIT
ANT (DRIVE) COIL UNIT
FINAL UNIT
AF UNIT
T_1 CARRIER AF OUT-PUT TRANS
CARRIER UNIT
X_{001} 3.3935 MHz
X_{002} 3.3943 MHz
T_{001} CARRIER OUTPUT TRANS
X_{003} 3.3965MHz
100kHz XTAL
Q_{702} 2SC373
Q_{703} 2SC373
Q_{704} 2SC373
MARKER UNIT
BM UNIT
RL_1 RELAY SOCKET
DIODE SWITCH UNIT
IF UNIT
L_6 IF TRAP
Sb_7 LOAD SWITCH

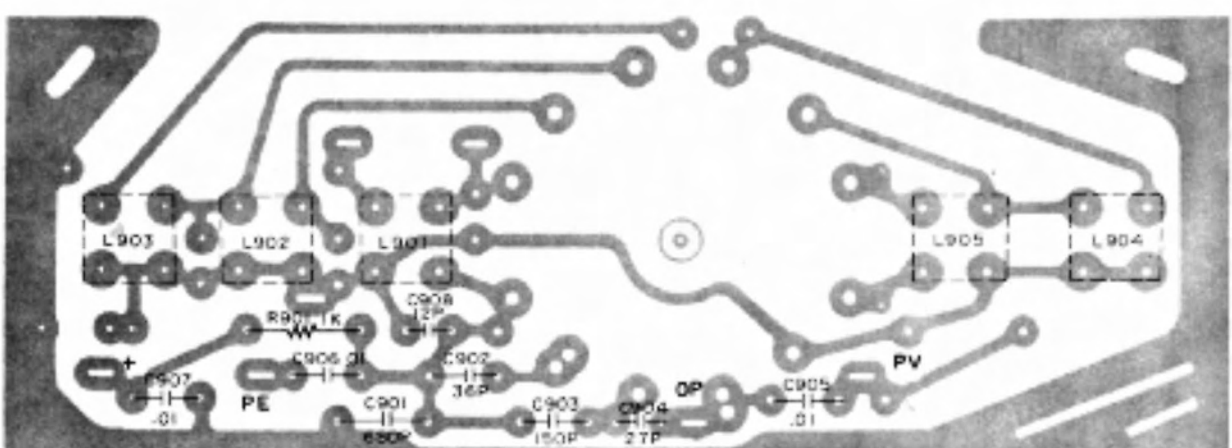
BLOCK DIAGRAM



-PHANTOM VIEWS

UC1110J

UC1109J



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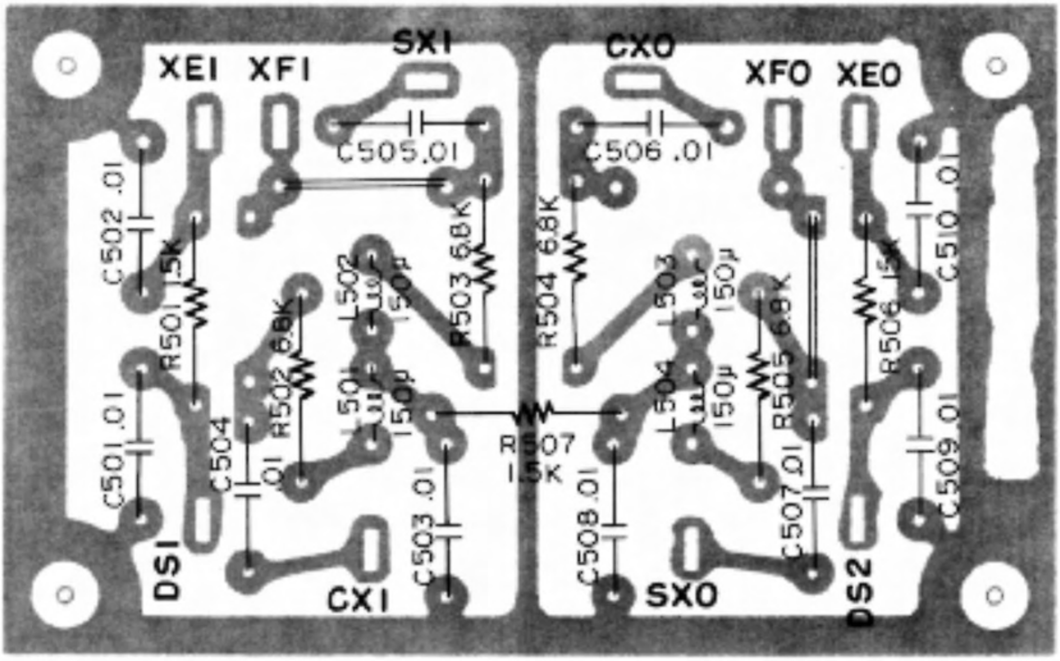
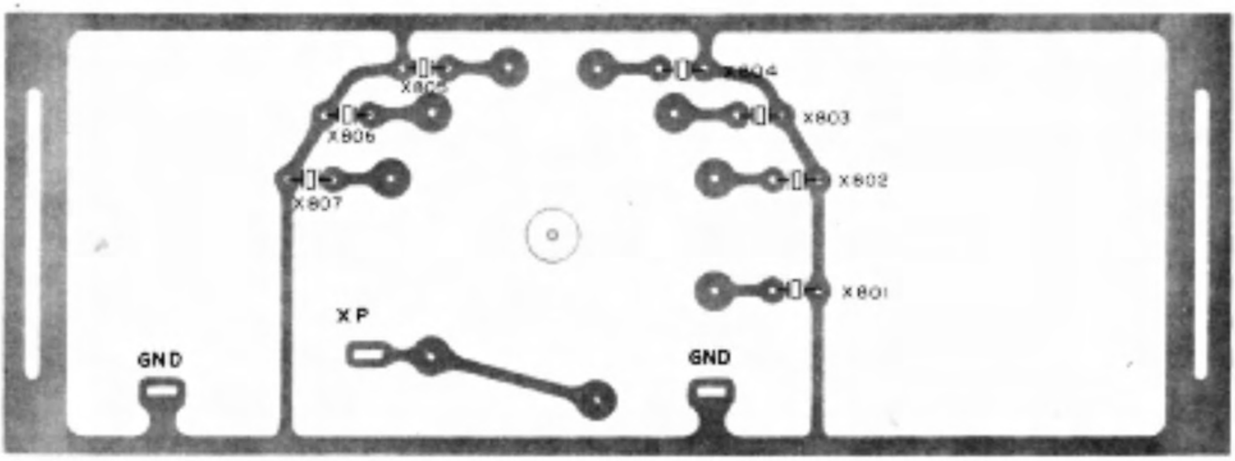
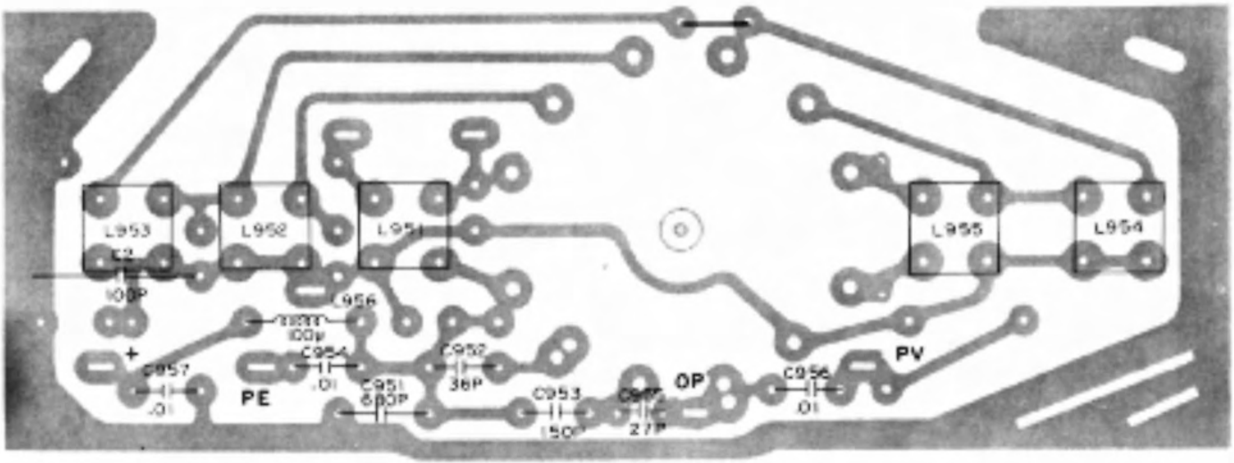


UC1111J



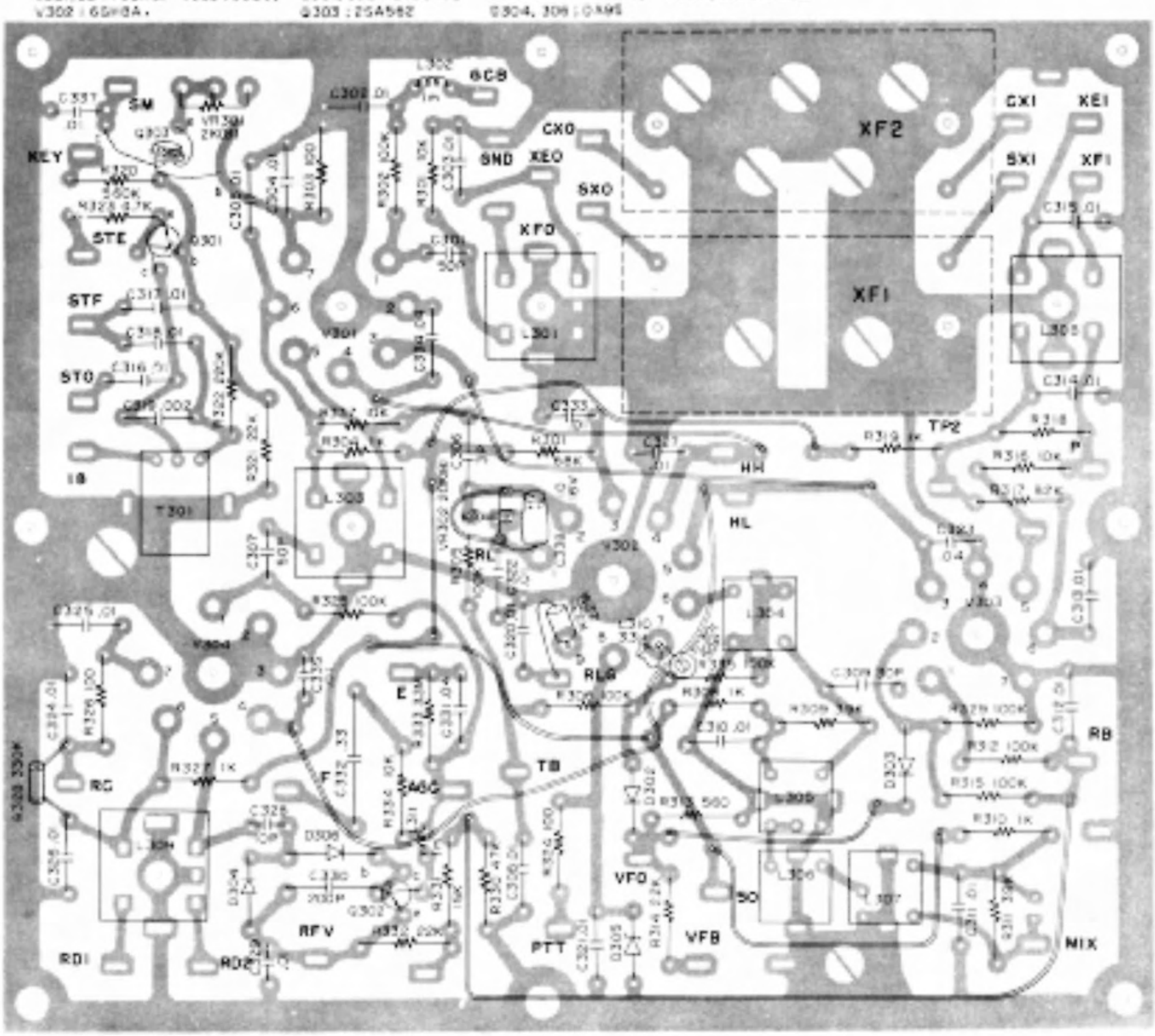
SEALED CIRCUIT ASSEMBLIES - PHANTOM VIEWS

UC1108J



UC1204J

V301, 304 : 6BA6, V303 : 6CB6, Q301, 302 : 2SC373, D305 : SZ-200-07, D302, 303 : 1S73A
V302 : 6GH8A, Q303 : 2SA562, D304, 306 : OA95



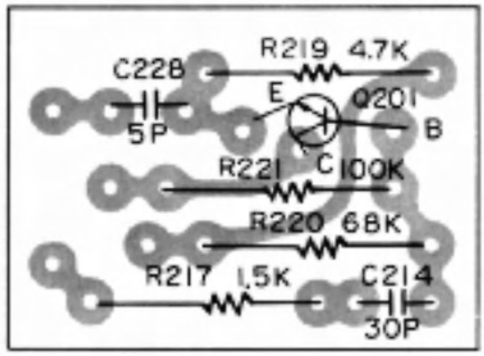
BOTTOM VIEW OF TRANSISTOR

2SC373 2SA562

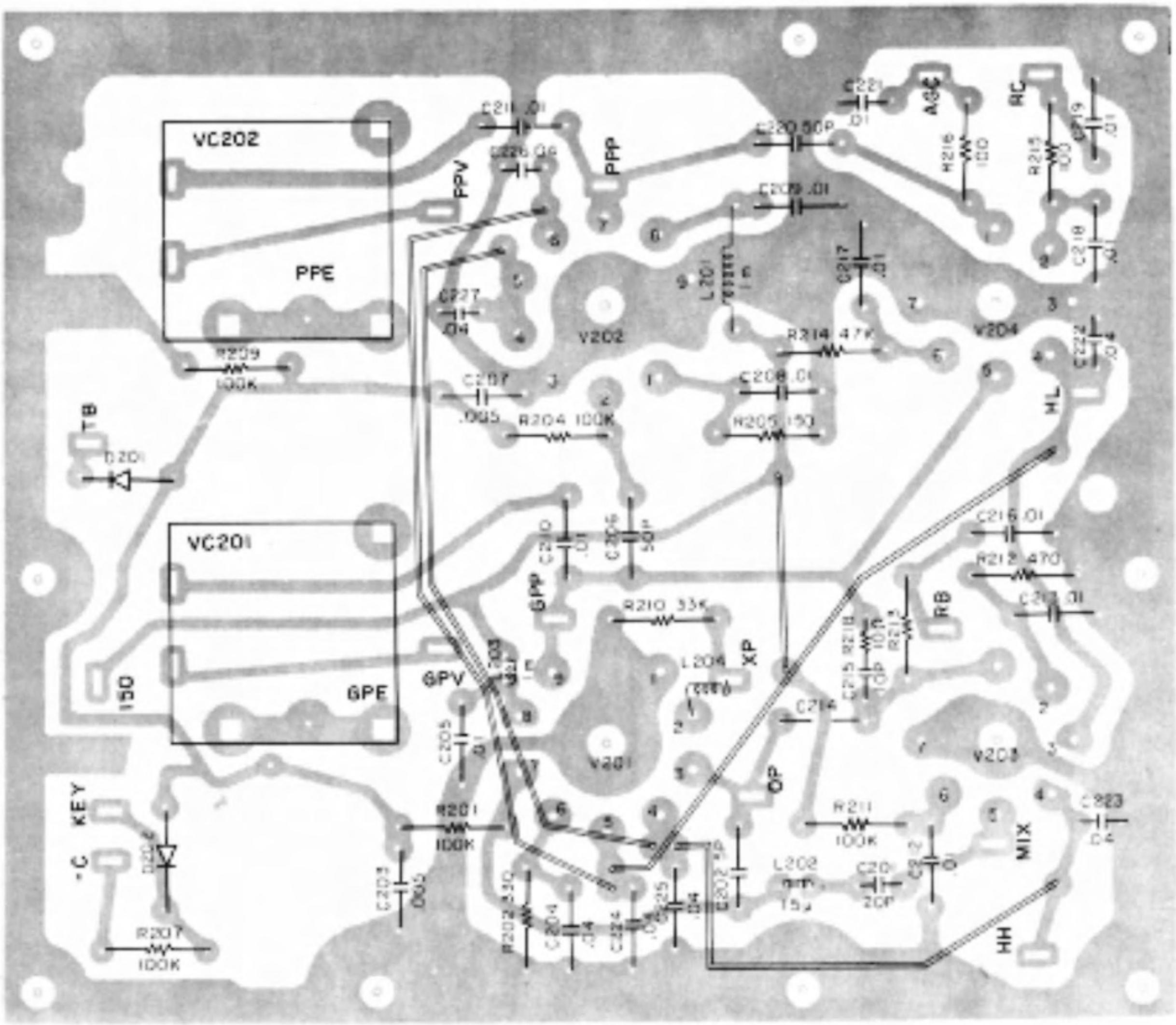
UC1112J

BOTTOM VIEW OF TRANSISTOR

2SC373

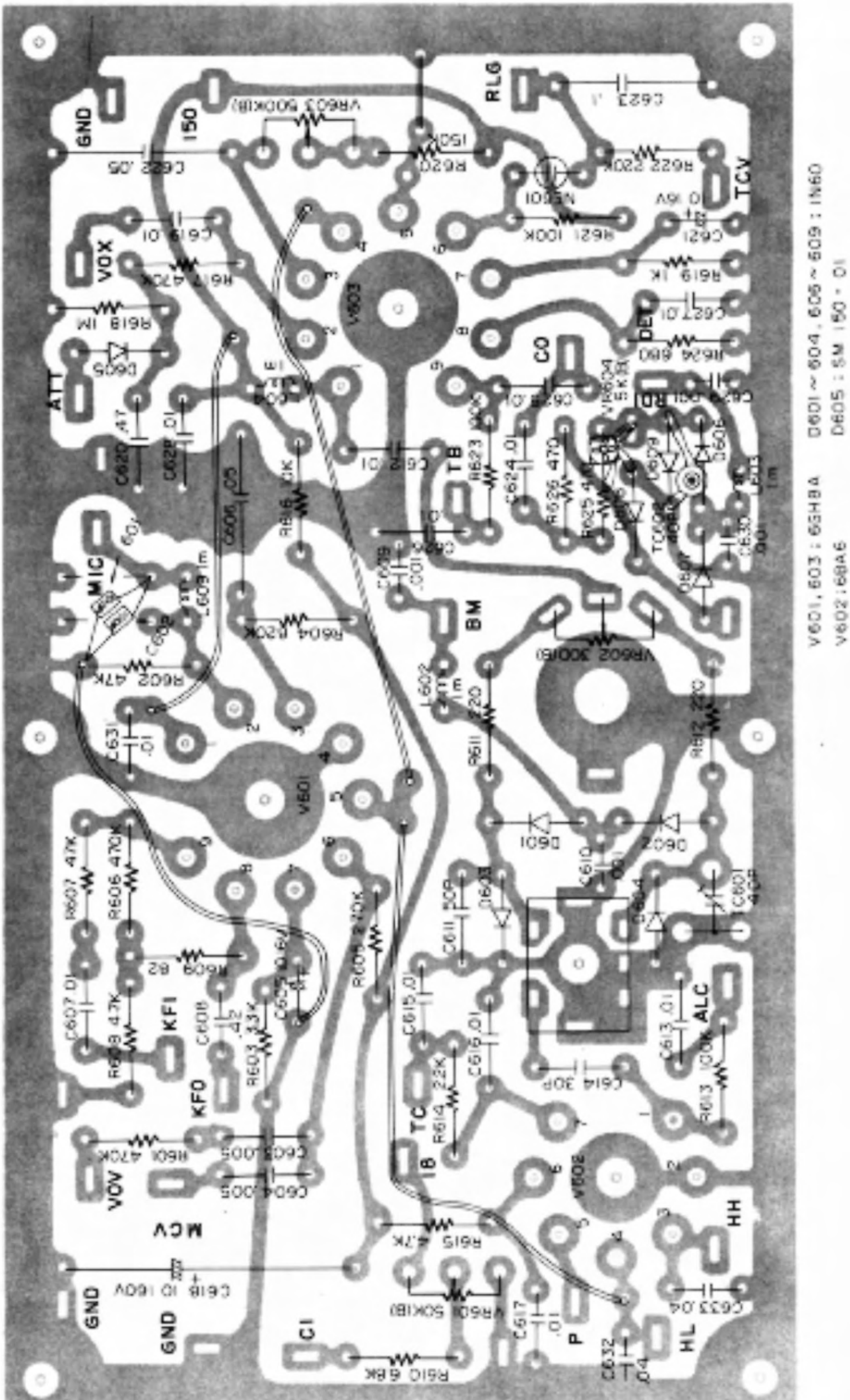


Q201 2SC373



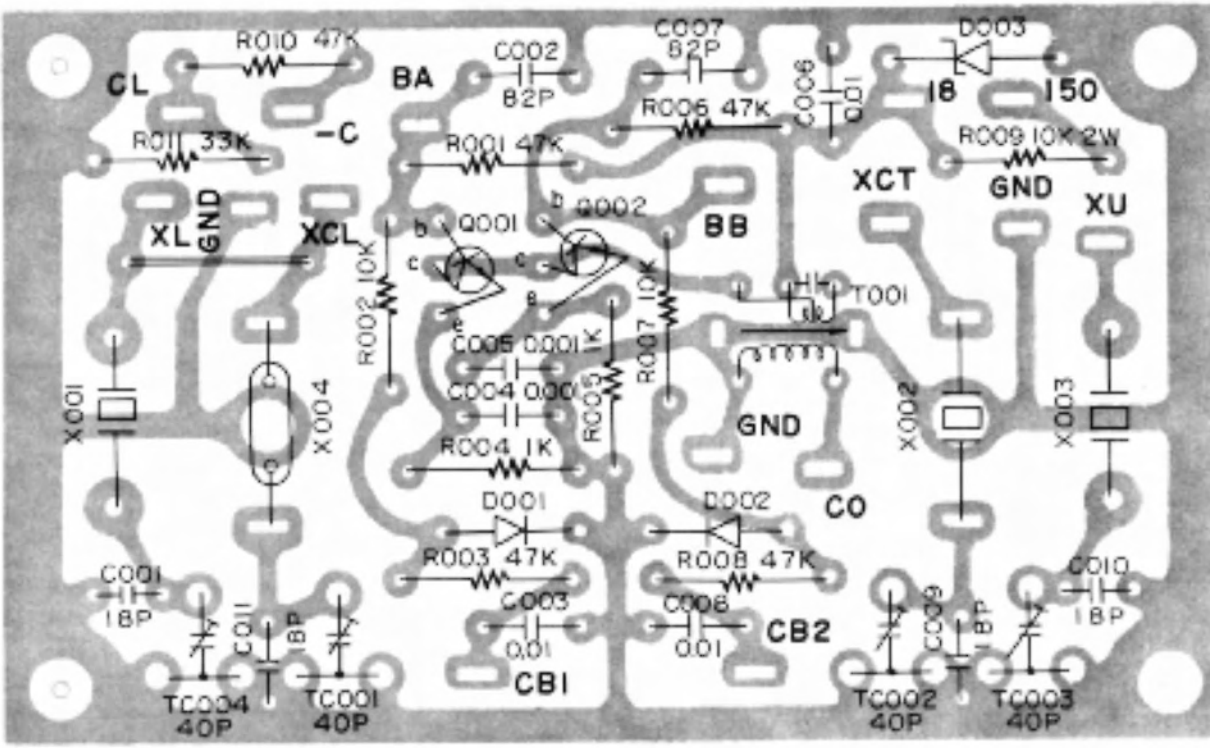
SEALED CIRCUIT ASSEMBLIES - PHANTOM VIEWS

UC1501J



SEALED CIRCUIT ASSEMBLIES - PHANTOM VIEWS

UA1405J

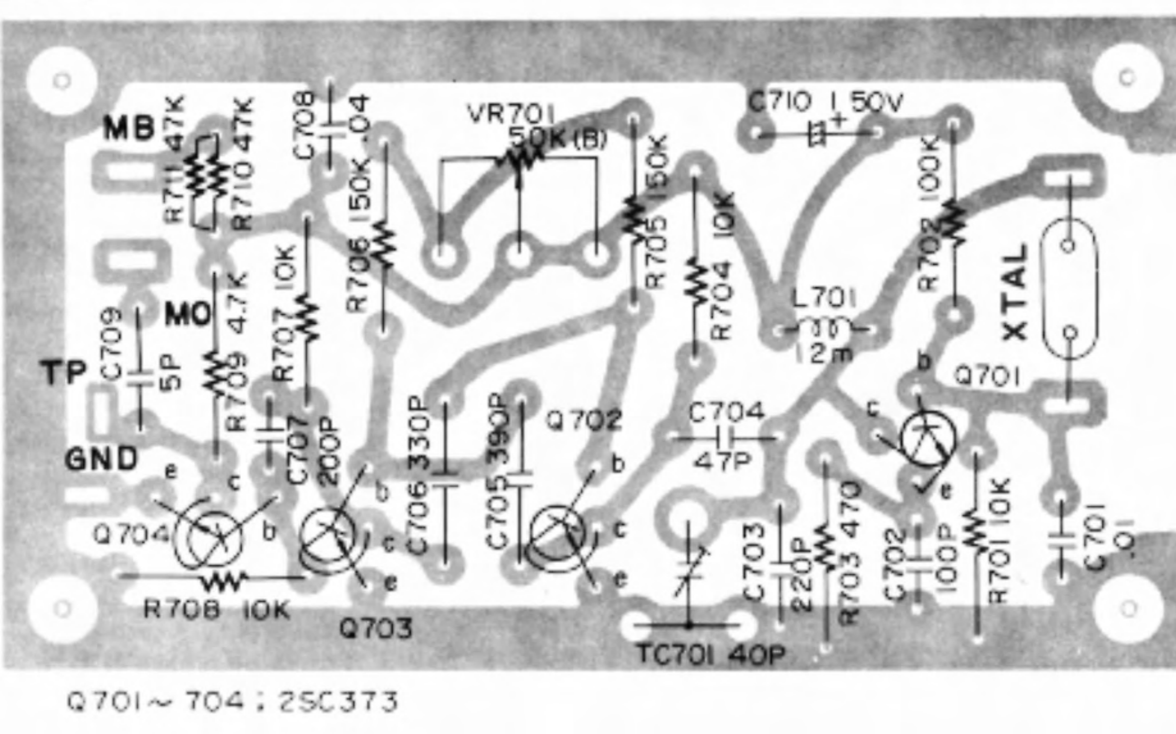


Q001, 002 ; 2SC373　　D001, 002 ; 1N60　　D003 ; SZ-200-18

2SC373

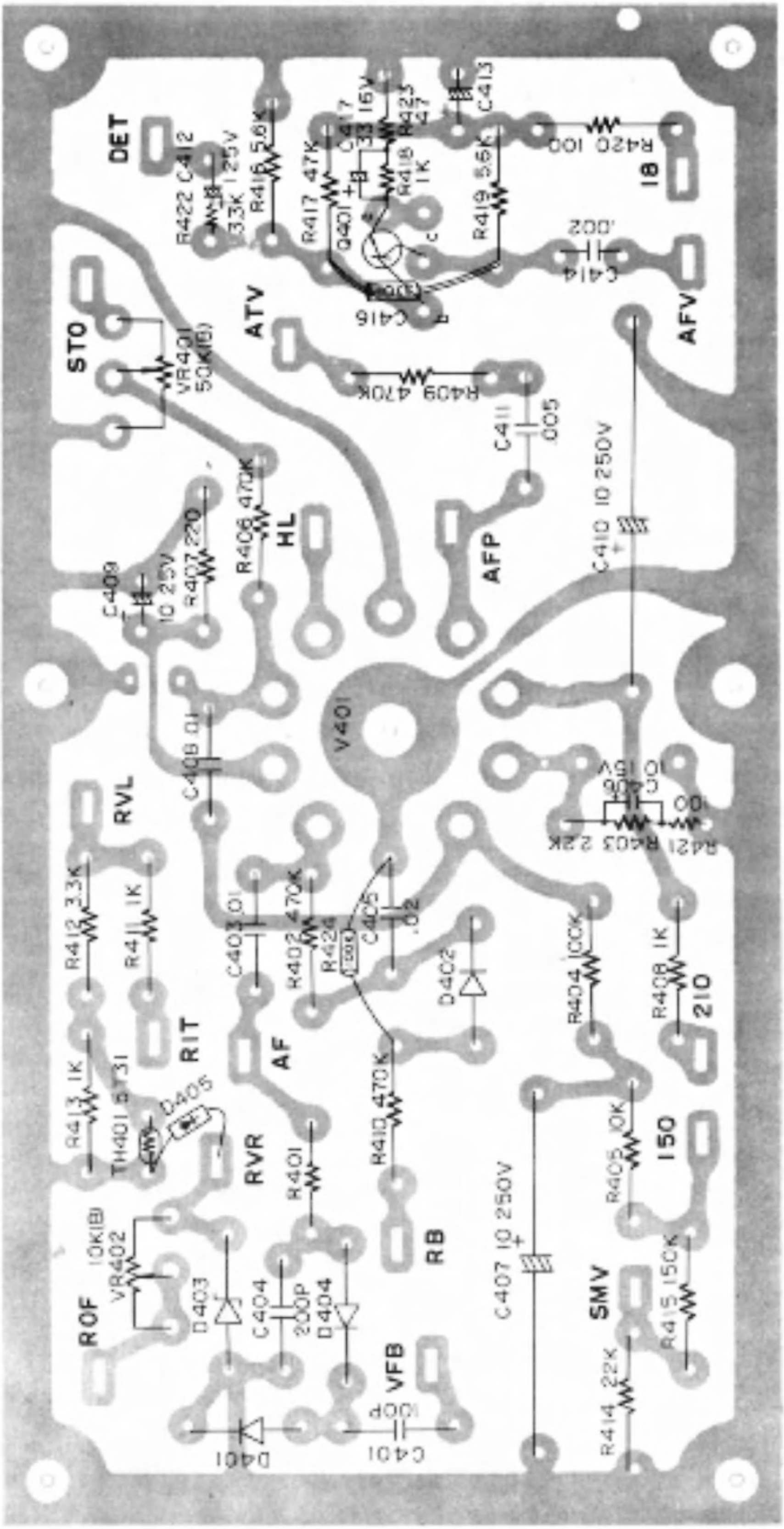
BOTTOM VIEW OF TRANSISTOR

UC1502J



Q701 ~ 704 ; 2SC373

UC1304J



BOTTOM VIEW OF TRANSISTOR

V401 : 6BM8
Q401 : 2SC373
D401, 402, 403 : 1N60
D403, 405 : RD9AM

I. General Description

This manual describes the adjusting sequence and procedures of the transmitter, receiver and accessory circuits of the Model TS-510 SSB transceiver.

II. Preliminary Operations

1. Checking the parts
   1) Check the crystals and vacuum tubes.
   2) Plug of VFO remote terminal
   3) Connect a 8Ω (3W) dummy resistor to the PHONES terminal.

2. Setting the variable resistors and others
   1) Final bias VR (VR6) Fully clockwise position
   2) UC-1204J S meter SENSE VR (VR301) Fully clockwise position
   3) UC-1501J CAR. LEVEL VR (VR601) Fully counter-clockwise position
   4) RF GAIN VR (VR3) Fully clockwise position
   5) UC-1405J T001 core Fully clockwise position
   6) Set the antenna switch to REC.

3. Checking the voltages (receiving condition)
   Use a DC vacuum tube voltmeter to measure the DC voltages.
   Use a moving iron type meter higher than Class 2.5 to measure the AC voltages.

   1) DC (+)
      (1) Power connector terminal No. 4 +150V
      (2) Power connector terminal No. 7 +210V±10V
      (3) Power connector terminal No. 10 +300V±10V

   2) DC (–)
      (1) Power connector terminal No. 1 –90V±10V
      (2) RB relay (RL_1) pin 1 0V
      (3) TB relay (RL_1) pin 5 Approx. –40V
      (4) Final bias S2001 1st grid (pin 5) Approx. - 70V
      (Note) When connecting the measuring terminal to the first grid, be sure not to short it to another circuit.

   3) AC (heater voltage)
      (1) Power connector terminal No. 5 12.5V±1V
      (2) Power connector terminal No. 8 12.5V±1V
      (3) HL terminal located on UC-1204J 6.3V±0.5V

4. Others
   1) In principle, the STAND BY switch should be placed at REC during the receiver adjustment and preliminary stages.
   2) When Ip more than 150mA is flowing, the final stage should always be kept completely tuned.

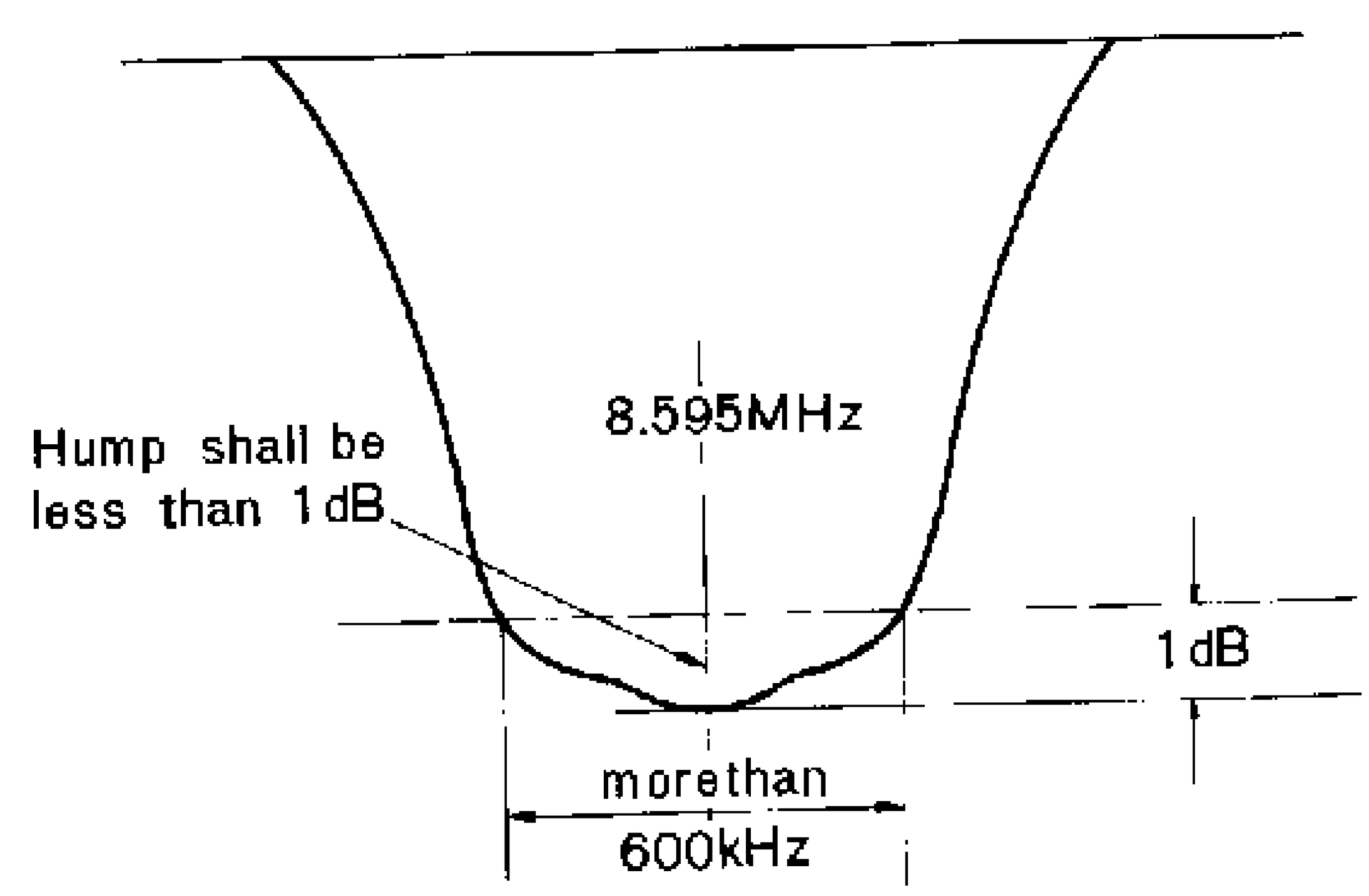
III. Receiver Adjustment

1. Heterodyne crystal oscillator
   1) Purpose
      To set heterodyne crystal in oscillation.
   2) Measuring instrument
      RF vacuum tube voltmeter
   3) Adjusting procedures
      (1) Connect the RF vacuum tube voltmeter to the GPP terminal of the UC-1112J with a 0.01μF (titanium variable condenser 500WV) in between.
      (2) Set the band switch to:

3.5MHz	and adjust the cores	L855	located in the
7 MHz		L854	
14 MHz		L853	
21 MHz		L852	
28 MHz		L851	

      UC-1110J of the coil pack to a point 10% lower than when maximum oscillation is obtained.
      (3) Check that oscillation is obtained in the 28.5MHz and 29.1MHz bands as well.
      (4) Disconnect the 0.01μF condenser.

2. BPF filter
   1) Purpose
      To obtain a required bandwidth by adjusting the bandpass filter (BPF).
   2) Measuring instruments
      Sweep generator
      Detector
      Oscilloscope
   3) Adjusting procedures
      (1) Connect the output of the sweep generator through a 0.01μF condenser to the first grid (pin 1) of the 6BC6 of the UC-1112J.
      (2) Set the band switch to 28MHz.
      (3) Disconnect the VFO remote terminal.
      (4) Connect the terminals P and TP2 located in the UC-1204J.
      (5) Connect the detector to the terminal TP1 located in the UC-1204J.
      (6) Adjust the L305 (yellow), L306 (green) and



L307 (blue) so that a characteristic curve such as shown below can be obtained.

(Note) One dB corresponds to approx. 1/10 of the total amplitude.
The center frequency is 8.595MHz as shown.

(7) After obtaining the required characteristic, lock the L305, L306 and L307 by the use of wax material.

(8) Remove the 0.01μF condenser and detector, disconnect jumper wire from the P and TP2, connect the P and TP1 with a lead, and solder the joints.

(9) Put the connector in the VFO remote terminal.

. IFT and crystal filter

1) Purpose
To adjust the IFT to 3.395MHz and shape the waveform of the crystal filter.

2) Measuring instrument
Slow sweep generator
Detector
Afterglow type oscilloscope

3) Adjusting procedures

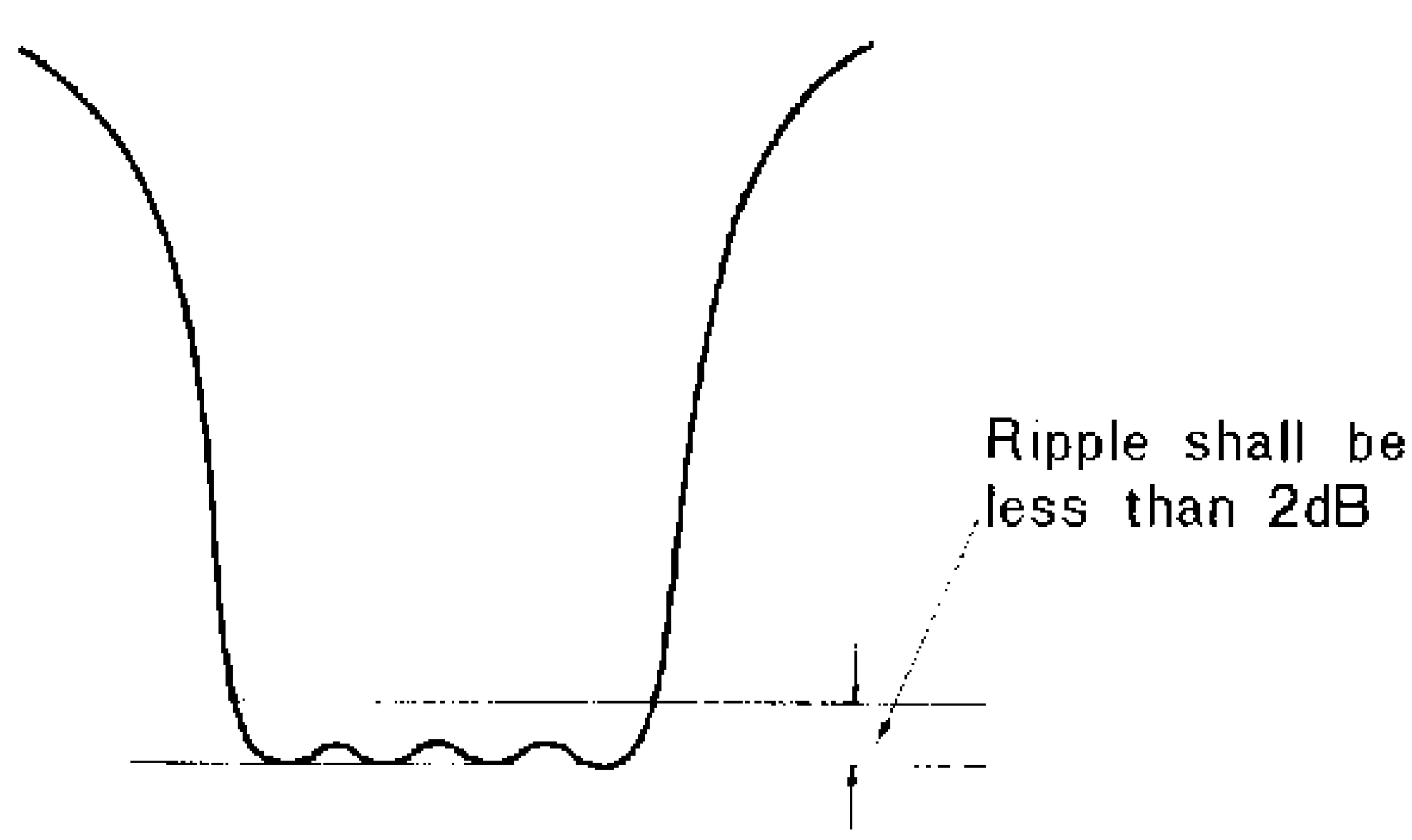
(1) Connect the sweep output through a 0.01μF condenser to the first grid (pin 1) of the 6CB6 of the UC-1204J. (Output approx. 0.1V)

(2) Connect the AGC terminal to GND.

(3) Connect the detector to the plate (pin 5) of the IF final-stage 6BA6 (V306).

(4) Increase the sweep speed (to approx. 10m/m sec/cm), plot the characteristic of the IF stage on the oscilloscope, and adjust the L303 and L309. Since the L303 is a double tuning IFT, adjust both the upper and lower cores.

(5) Next, reduce the sweep speed (to approx. 0.5 sec/cm), get the waveform of the crystal filter plotted, and adjust the L301 and L308 to adjust the waveform of the crystal filter as shown below.



(6) Reduce the ripple to a minimum by adjusting the 3.4MHz trap of the L304 (white).

If the L304 has practically no effects on the waveform, place the core in the innermost position.

(7) Disconnect the 0.01μF condenser and detector, and disconnect the AGC from GND.

(8) While keeping watch on the S meter, retune the L309 so that S will reach a maximum.

4. Zero adjustment of S meter

1) Purpose
To adjust the base point of the S meter to the position 0 of the meter.

2) Measuring instrument
None required

3) Adjusting procedures

(1) Connect the AGC terminal of the UC-1204J to GND.

(2) Adjust the pointer of the meter to the zero point of Ip (not the zero point of S) by the ZERO ADJ VR (VR7) located in the rear of the chassis.

(Note) The pointer hardly swings toward the negative direction because of a diode. So care must be taken to adjust the pointer precisely to 0.

(3) Disconnect the AGC terminal from GND.

(4) Change over the MODE switch to each position and check to ensure that the pointer of the meter remains stationary in each position.

(5) Rotate the RF GAIN VR (VR3 on the front panel) fully counter-clockwise and chack that the pointer of the S meter swings full scale. Thereafter, rotate the VR back to fully closkwise position.

5. Carrier oscillator

1) Purpose
To adjust the carrier oscillator and oscillation frequency.

2) Measuring instruments
RF vacuum tube voltmeter (the same as in III, 1)
Frequency counter

3) Adjusting procedures

(1) Remove the connector from the VFO remote terminal.

(2) Connect the RF vacuum tube voltmeter to the terminal CO of the UC-1405J through a 10pF condenser (titanium condenser 250WV for example), and adjust the T001 so that the USB, LSB and CW crystal units will provide a maximum oscillation strength as read on the vacuum tube voltmeter.

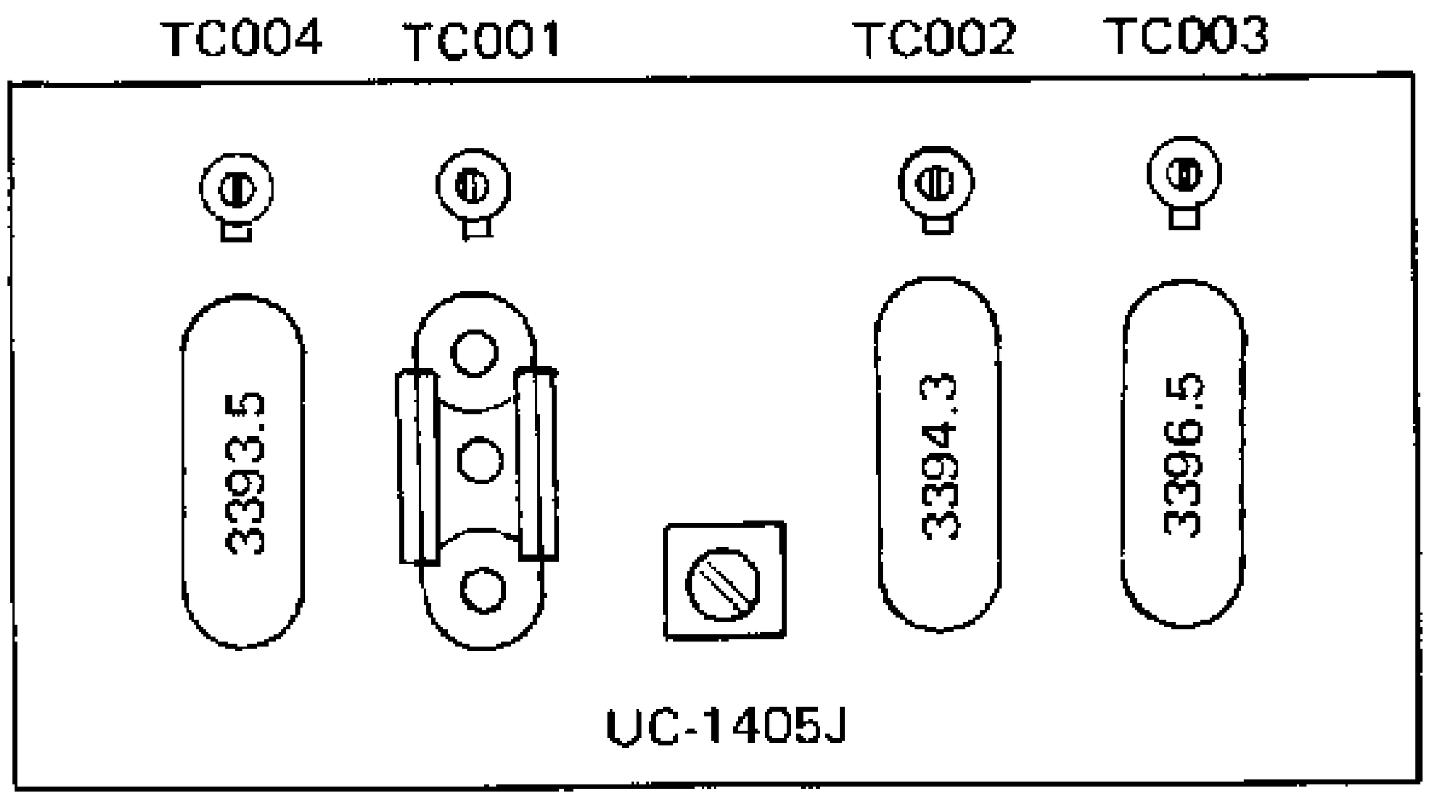
(3) Connect the counter to the terminal CO through a 10pF condenser and adjust the trimmers so that the specified frequency in each mode can be obtained.

USB 3396.5kHz (±10Hz) TC003
LSB CW 3393.5kHz (±10Hz) TC004

(4) Set the STAND BY switch to SEND and adjust the CW transmitting frequency.
CW 3394.3kHz (±10Hz) TC002

(5) Set the STAND BY switch to REC.

(6) Set the TC001 to the same blade (of the trimmer) position as the TC002.



6. Coil pack
   1) Purpose
      To achieve the antenna RF tuning of the coil pack.
   2) Measuring instruments
      SSG
      Oscilloscope
      AF vacuum tube voltmeter
   3) Adjusting procedures
      (1) Connect the SSG output to the BEC ANT terminal and set the ATT to 40dB. (Non-modulation signal)
      (2) Connect the oscilloscope AF vacuum tube voltmeter to the 8Ω dummy resistor of the PHONES terminal so that observation can be made.
      (3) Set the DRIVE knob of the front panel to the 12 o'clock position. In this case, make sure that the DRIVE knob has no divisional differences at both sides.
      (4) Set the BAND switch to 3.5MHz, 28.5MHz, 21 MHz, 14 MHz and 7 MHz
      adjust SSG frequencies and VFO frequencies to
      3.750MHz
      28.800MHz
      21.225MHz to produce approx. 1,000Hz beat.
      14.175MHz
      7.150MHz
      Next, adjust the coil cores L901, L951; L905, L955; L904, L954; L903, L953; L902, L952
      of coil packs UC1109J and UC-1108J
      so that maximum S meter indication and beat note can be obtained.
      (Note 1) If you fail to observe the correct band adjusting sequence, proper adjustment will become impossible. Tune the 3.5MHz L951 (UC-1108J) core on the innermost side and the other cores on the outermost side.
      (Note 2) Be careful not to damage the cores, If there is any core that fails to rotate smoothly, inject white powder (acro wax) and make sure that it rotates smoothly before adjusting it.

7. 8.6MHz trap
   1) Purpose
      To improve IF rejection by adjusting 8.6MHz trap.
   2) Measuring instruments
      SSG
      AF vacuum tube voltmeter
      Oscilloscope
   3) Adjusting procedures
      (1) Connect the 8Ω load, AF vacuum tube voltmeter and oscilloscope to the PHONES terminal.
      (2) Adjust the SSG frequency to 8.595MHz and supply 100dB input signal to the REC ANT terminal.
      (3) Set the BAND switch to 14MHz and adjust the DRIVE knob to the 12 o'clock position.
      (4) Adjust the VFO dial to 300 or thereabouts and obtain beat output. Adjust the 8.6MHz trap (L6) so that the output will be reduced to a minimum.

8. S meter sensitivity
   1) Purpose
      Adjust the pointer of the S meter to S9 with specified input.
   2) Measuring instrument
      SSG
   3) Adjusting procedures
      (1) Check that the RF GAIN VR (VR3) is set to fully clockwise position.
      (2) Set the BAND to 14MHz, supply 14.2MHz 40dB SSG signal from the REC ANT, and tune the DRIVE and VFO. (Signal: Non-modulation signal)
      (3) Adjust the SENSE VR (VR-301) of the S meter located on the UC-1204J so that the S meter will point to S9.
      (Note) After the above adjustment, check for "carrier leak".
      Carrier leak sometimes occurs, depending on the carrier position or the waveform unbalance of the filter (XF-1). Check for

carrier leak by the following procedures.

(1) After the 8-3)-(3) adjustment, rotate the RF GAIN VR gently counter-clockwise and hold it at a point just before the S meter indication increases from S9.

(2) Next, turn off the SSG output and check that the S meter gives an indication of more than S7.

(3) Place the RF GAIN VR in fully clockwise position.

25kHz multivibrator

1) Purpose

To adjust the frequency of the 25kHz multivibrator.

2) Measuring instrument

Frequency counter

3) Adjusting procedures

(1) Connect the counter to the TP terminal of the UC-1502J through a 10PF/condenser (titanium condenser 250WV for example).

(2) Insert the 100kHz crystal.

(3) Set the AGC/CAL switch to 25kHz, operate the multivibrator, and adjust the Multi Adj VR701 so that a reading of approx. 25kHz can be taken from the counter.

(4) Next, adjust the TC701 so that a reading of exactly 25kHz (±2Hz or less) can be taken from the counter.

(5) Remove the 100kHz crystal.

(Note) Do not forget to remove the 100kHz crystal.

). ANTI TRIP VR

1) Purpose

To adjust the ANTI TRIP VR.

2) Measuring instruments

AF generator

DC vacuum tube voltmeter

AF vacuum tube voltmeter

Oscilloscope

3) Adjusting procedures

(1) Inject 1,000Hz AF signal into the middle point of the AF GAIN VR (front panel) and adjust the input so that 100mW output will be available from the PHONES terminal.

(2) Adjust the ANTI TRIP VR (VR9) so that the DC voltage at the D605 located in the UC-1501J will become 0.5V.

1. PIT

1) Purpose

To adjust to transmitting frequency with the PIT knob at 0 position.

2) Measuring instruments

AF generator

Oscilloscope

3) Adjusting procedures

(Adjust on the basis of Lissajous figure.)

(1) Set the SWEEP RANGE of the oscilloscope to EXT HORIZONTAL and supply AF generator output (1,000Hz 1V) to the H terminal.

(2) Adjust the RIT knob (front panel VR8) to exactly 0 and push the RF GAIN VR switch (front panel VR3) in.

(3) Supply 14.2MHz 40dB (non-modulated) SSG input signal to the REC ANT terminal and obtain approx. 1,000Hz beat note. In this case, adjust the knob of each stage so that the signal can be received with a maximum sensitivity.

(4) Supply the received output to the V terminal of the oscilloscope and adjust the VFO dial minutely until the Lissajous figure stops. In this case, the figure should be a circle.

(5) Pull the RF GAIN VR knob toward you, set the RIT to OFF, and adjust the RIT "0" ADJ VR (VR402) located on the UC-1304J so that the Lissajous figure of the oscilloscope will become a circle again.

(Note) The adjustment of Item (5) must be finished in less than a minute. If it cannot be finished in less than a minute, go over again from the adjustment of Item (4).

(6) Remove the SSG, AF generator and oscilloscope.

IV. Transmitter Adjustment

1. Final bias

1) Purpose

To set the final base current.

2) Measuring instrument

None required

3) Adjusting procedures

(1) Remove the connector from the VFO remote terminal and set the DRIVE knob to the 9 o'clock position.

(2) Set the MODE switch to LSB, the BAND switch to 14MHz, and the STAND BY switch to SEND.

(3) Set the METER switch to Ip and adjust the BIAS VR (VR6) so that Ip will become 60mA.

(4) At this point, rotate the FINAL VC and check that Ip remains unchanged.

(5) Return the STAND BY switch to REC and connect the VFO connector.

2. BM stage IFT and carrier level and RF meter sensitivity

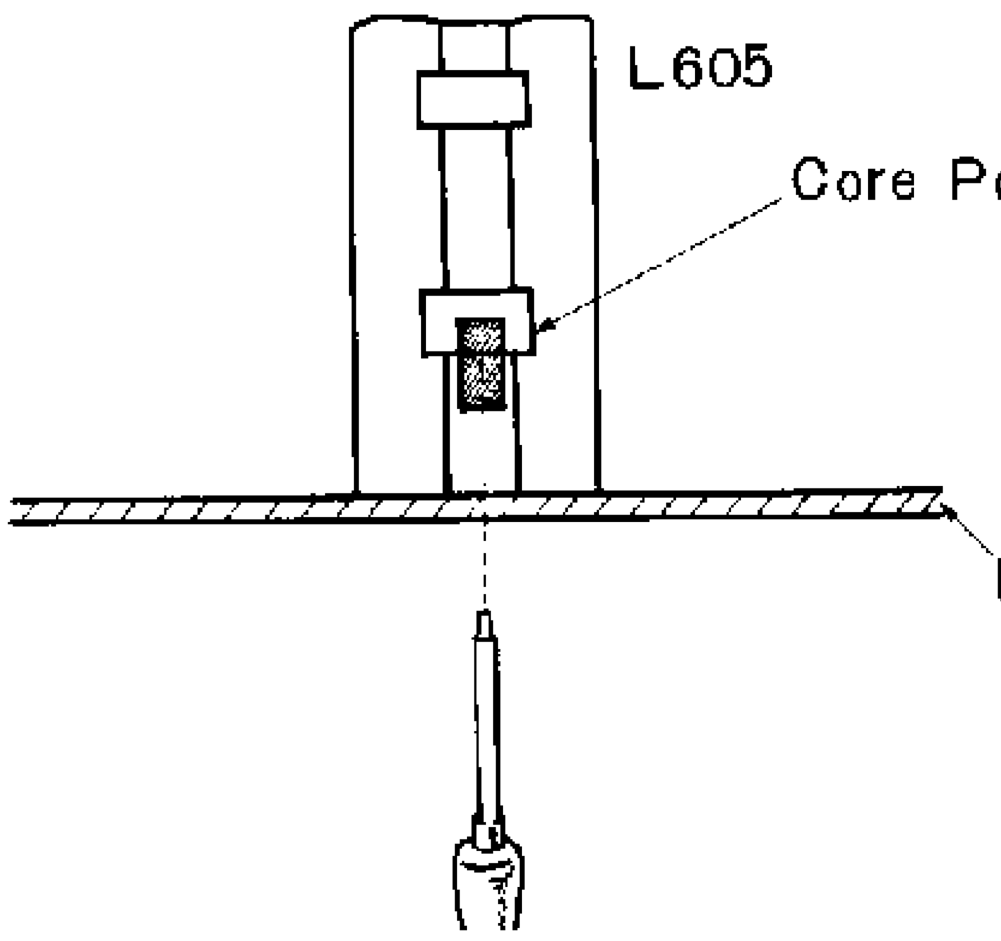
1) Purpose

To adjust the 3.395MHz IFT of the BM stage and to set the CW carrier level and RF meter sensitivity.

2) Measuring instrument

75Ω dummy or power meter (100W or more)

3) Adjusting procedures
(1) Connect the 75Ω dummy to the ANT terminal.
(2) Set the BAND to 14MHz, the VFO to 14.175MHz, the DRIVE knob to the 12 o'clock position, and the FINAL variable condenser to the 14MHz position (division).
(3) Set the MODE switch to CW.
(4) Set the STAND BY switch to SEND, make Ip dip adjustment quickly, and adjust the DRIVE, FINAL and LOAD knobs so that the power will reach a maximum.
(5) Next, set the meter changeover switch to ALC and adjust the L605 of the UC-1501J from behind the chassis so that ALC will reach a maximum. The core has two tuning positions. Make the adjustment at the position shown below.



(6) In this condition, return the STAND BY switch to REC.
(7) Approx. 1 minute thereafter set the switch again to SEND and adjust all the knobs so that the power will reach a maximum.
(8) Set the meter switch to ALC and reduce carrier injection until the ALC deflection comes to the 150mA position on the Ip scale.
(9) Retune each section and check that the specified value of ALC deflection is obtained.
(10) In this condition, adjust the deflection of the RF meter (VR10) located in the rear of the chassis to the 200mA position.
(11) Return the STAND BY switch to REC.
(12) Set the switch to SEND, adjust each knob, and check that more than 80W 3.530MHz power is available.
(13) Similarly, check that more than 80W 7.050MHz and 21.2MHz powers are available.
(14) Similarly, check that more than 50W 28.3MHz, 28.8MHz and 29.4MHz powers are available.

(Note) a. If the final stage is out of tuning, there is danger of damage to the S2001. So be sure to tune the final stage completely and quickly.

b. When Ip more than 15mA is used for adjustment, it is desirable to turn it on for one minute and off for 20 seconds for example.

3. 14.13MHz trap
1) Purpose
To reduce spurious radiation near 14.13MHz.
2) Measuring instruments
75Ω dummy (power meter)
Synchroscope
3) Adjusting procedures
(1) Connect the 75Ω dummy to the ANT terminal.
(2) Turn the ATT of the synchroscope to the minimum position and connect the probe to the ANT terminal. Set the SWEEP RANGE of the synchroscope to approx. 2cm/sec.
(3) Set the BAND switch and VFO to 14.13MHz and adjust each knob so that a maximum power can be obtained.
(4) Adjust the ATT of the synchroscope to obtain a proper amplitude and adjust the VFO so that the number of envelope ripples will be 4 to 5.
(5) Next, reduce the ripples to a minimum by adjusting the trimmer (TC301) of the 14.13MHz trap inserted in the cathode of the V302 6GH8A of the UC-1204J.
(6) Set the STAND BY switch to REC.
(Note) Limit the time ratio of transmission to reception to 3 : 1. (Transmission 3 : 1 Reception)

4. Neutralization adjustment
1) Purpose
To stabilize operation by the RF neutralization of the S2001.
2) Measuring instruments
75Ω dummy (power meter)
RF vacuum tube voltmeter
3) Adjusting procedures
(1) Connect the 75Ω dummy to the ANT terminal.
(2) Obtain maximum output at 21.225MHz (CW).
(3) Set the STAND BY switch to REC and cut off the plate screen voltage of the S2001.
(Note) When the circuit is cut off directly, care must be taken to prevent electrical shock.
(4) Connect the RF vacuum tube voltmeter to the ANT terminal, set the STAND BY switch to SEND, and adjust the neutralizing variable condenser (VC) located in the final shield box so that the RF vacuum tube voltmeter will give a minimum deflection.
(5) Return the STAND BY switch to REC, remove the RF vacuum tube voltmeter, and return the plate screen circuit to the original state.
(6) Set the switch to SEND again and check that the power is available as before.

(7) Return the switch to REC.

(Note) 1. Pay special heed to electrical shock.

2. Turn off the final-stage tube at a ratio of 3 : 1 against the transmission time.

5. BM and carrier position

1) Purpose

To adjust the carrier position by balancing the balanced mixer.

2) Measuring instruments

AF generator
AF vacuum tube voltmeter
75Ω dummy (power meter)
RF vacuum tube voltmeter

3) Adjusting procedures

(1) Connect the 75Ω dummy and RF vacuum tube voltmeter to the ANT terminal.

(2) Set the MODE switch to CW, adjust the frequency to 14.2MHz, and adjust each knob so that a maximum power can be obtained.

(3) Next, set the MODE switch to LSB and adjust the balancing VR (VR602) and trimmer (TC601) of the UC-1501J so that the RF vacuum tube voltmeter will give a minimum indication.

(4) Set the RANGE of the RF vacuum tube voltmeter to a position where a maximum voltage can be obtained, supply 7mV 1,500Hz AF signal to the microphone terminal, and adjust the output to 50W by adjusting the MIC GAIN VR (VR2).

(5) Next, change over the frequency of AF signal to 400Hz and 2,600Hz and make fine adjustment of the trimmer TC005 located in the UC-1405J (carrier unit) so that the output difference between 400Hz and 2,600Hz will be reduced to less than 5W.

(6) Set the MODE switch to USB and make fine adjustment of the trimmer TC003 so that the output diffrernce between AF signal 400Hz and 2,600Hz will be reduced to less than 5W as in Item (5).

(7) Disconnect the AF generator from the MIC terminal and rotate the MIC GAIN VR fully counter-clockwise.

(8) Set the MODE switch to LSB again and adjust the trimmer of the balancing VR of the UC-1501J so that RF vacuum tube voltmeter will give a minimum indication. (The same procedures as in Item (3))

(9) Set the MODE switch to USB. If the RF vacuum tube voltmeter gives a larger indication, adjust the VR and trimmer to points where the RF vacuum tube voltmeter at USB and LSB give the same minimum indication, and let the reading of the RF vacuum tube voltmeter at the time be A.

(When the MODE switch is changed over from LSB to USB, if the RF vacuum tube voltmeter gives a lower indication, do not readjust the VR and trimmer but let the reading at LSB be A.)

(10) Turn the ATT of the RF vacuum tube voltmeter to the maximum position.

(11) Supply 7mV 1,500Hz AF signal to the MIC terminal of the UC-1501J and check that more than 80W power is available. Let the reading of the RF vacuum tube voltmeter be B.

(12) Check that the difference between the RF vacuum tube voltmeter readings A and B is more than 40dB.

(Note) Limit the time ratio of transmission to reception to 3 : 1.

6. MIC GAIN

1) Purpose

To set the MIC GAIN VR.

2) Measuring instruments

AF generator
AF vacuum tube voltmeter

3) Adjusting procedures

(1) Disconnect the connector from the VFO remote terminal.

(2) Set the MODE switch to USB.

(3) Supply 7mV 1,500Hz AF signal to the MIC terminal located in the UC-1501J.

(4) Set the STAND BY switch to SEND and adjust the MIC GAIN VR (VR2) located in the rear of the chassis so that AF voltage 400mV will be available at the BM terminal of the UC-1501J.

(5) Return the STAND BY switch to REC and put the connector in the VFO remote terminal.

7. VOX operation

1) Purpose

To set the gain and time constant of the VOX circuit.

2) Measuring instruments

AF generator
AF vacuum tube voltmeter
Watch (stop watch or wrist watch with second hand)

3) Adjusting procedures

(1) Disconnect the connector from the VFO remote terminal.

(2) Set the STAND BY switch to VOX and adjust the VOX SENSE VR (VR603) of the UC-1501J to a point just before the neon tube makes discharge.
In this case, do not supply input signal to the MIC terminal.

(3) Next, supply 7mV 1,500Hz AF signal to the MIC terminal of the UC-1501J and increase the VOX gain by the VOX GAIN VR (VR1) until the relay starts operation.

(4) If the relay starts operation, cut off the AF input signal, and adjust the TIME CONST VR (VR5) so that the relay will be reset in approx. 1 second after that instant.
(5) Return the STAND BY switch to REC and put the VFO connector in the original position.

8. SIDE TONE
1) Purpose
To set the output level of side tone and to check semi-break-in operation.
2) Measuring instruments
75Ω dummy (power meter)
Key, AF vacuum tube voltmeter
Oscilloscope
3) Adjusting procedures
(1) Connect the dummy to the ANT terminal and connect the AF vacuum tube voltmeter and oscilloscope to the PHONES terminal.
(2) Set the STAND BY switch to SEND, set the MODE switch to CW, and adjust each knob so that a maximum power will be available at 14.2MHz.
(3) Check that when the key is inserted into the key jack, RF output is reduced to zero.
(4) Check that when the key is pushed, the power is available as before. Thereafter, adjust the side tone VR (VR401) located in the UC-1304J so that side tone AF output 50mW (0.63V/8Ω) will be available.
(5) Set the STAND BY switch to VOX and check that when the key is pushed, the semi-break-in keying can be done.

V. Instrument Specifications

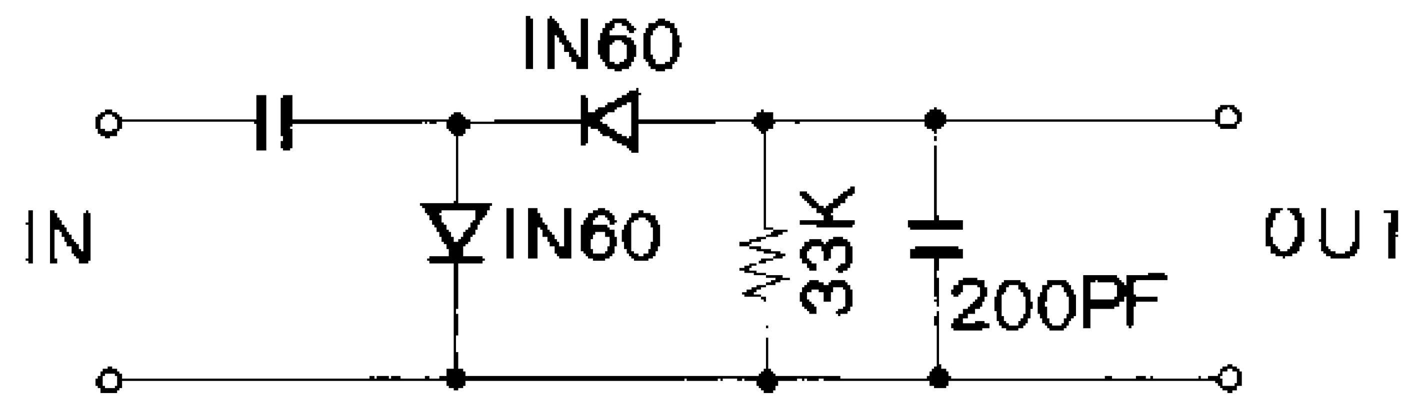
DC vacuum tube voltmeter
* Input resistance More than 1MΩ
* Range 1.5V to 500 F.S.

AC voltmeter
* Precision class AC voltmeter or Class 2.5 or higher precision moving iron type voltmeter

RF vacuum tube voltmeter
* Input impedance More than 1MΩ Less than 20pF
* Range 10mV to 300V F.S. ATT usable

Sweep generator
* Center frequency 8.6MHz
* Frequency deviation Max. ±500kHz or more
* Output voltage Approx. 0.1V
* Sweep speed 50Hz
* Marker Preferably obtainable at three points, 8.3MHz, 8.6MHz and 8.9 MHz

Detector



Oscilloscope

Slow sweep generator
* Center frequency 3.395kHz
* Frequency deviation Max. ±5kHz
* Output voltage More than 0.1V
* Sweep speed Minimum 0.5 sec/cm

Afterglow oscilloscope
* Has afterglow characteristic. More than 1 sec
* Both vertical and horizontal amplifiers are DC amplifiers.

SSG
* Frequency 3.0 to 30MHz
* Output 0dB/μV to 120dB/μV
* No modulation and little frequency modulation component

Frequency counter
* Minimum input voltage Less than 50mV
f max. More than 10MHz

AF vacuum tube voltmeter
* Frequency 100 to 10kHz
* Input resistance More than 1MΩ
* Range 10mV to 30V FS

AF generator
* Output impedance Less than 600Ω
* Output voltage Max. 1V
* Frequency 300 to 5kHz
* Distortion factor Less than 0.5% (at 1,500Hz)

75Ω dummy
* Frequency 3.5 to 30MHz
* Power More than 100W
* 50Ω dummay also usable

Synchroscope
* F max. 30MHz
* One which permits easy synchronization.
* Maximum input RF voltage More than 100V

PS510

MAIN CHASSIS (MA5J) SECTION

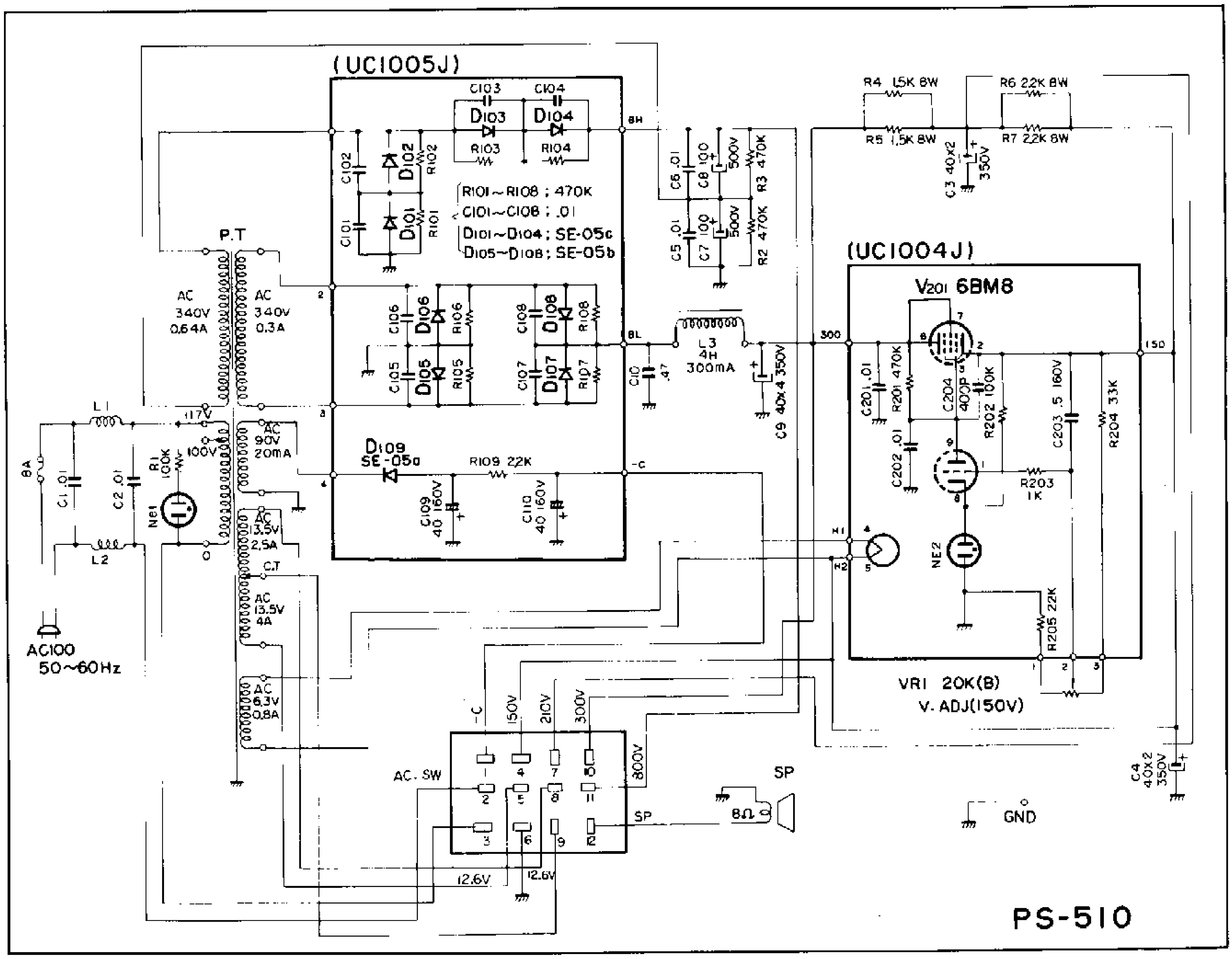
PRINTED CIRCUIT

Constant Voltage Block (UC1004J)
Rectification Block (UC1005J)

Symbol No.	Description	Part No.	Remarks
	CAPACITORS		
C1, 2	Oil Impregnated Paper 0.01μF ±20%		
C3, 4	Electrolytic Block 40μF x 2P x 2 350WV		
C5, 6	Ceramic 0.01μF		
C7, 8	Electrolytic Block 100μF 500WV		
C9	Electrolytic Block 40μF x 4P 350WV		
C10	Oil Impregnated Paper 0.01μF ±20%		
	RESISTORS		
R1	Fixed Carbon Composition 100kΩ ±10% 1/2W		
R2, 3	Fixed Carbon Composition 470kΩ ±10% 1/2W		
R4, 5	Insulated Carbon Film 1.5kΩ ±5% 8W		
R6, 7	Insulated Carbon Film 2.2kΩ ±5% 8W		
	MISCELLANEOUS		
–	Case	A01-MA5J	
–	Chassis	A03-MA5J	
–	Panel	A05-MA5J	
–	Reticular Board	A10-MA31	
–	Lead Holder	A4880	
–	Patch	A5044	
–	Address	B59-0001-00	
–	Bracket (for neon lamp)	E03-16	
–	Lug x 2	E04-101	
–	Lug x 2	E04-202	
–	Square-shaped Concent (Jack)	E07-212C	
–	Square-shaped Concent (Jack)	E07-212B	
–	Square-shaped Concent (Plug)	E09-212C	
–	Leg x 4	G10-02	
–	Leg x 2	G10-08	
–	Cord Bushing	G10-11	
–	Accessory of Corrugated Cardboard Case	H01-MA5JA	
–	Accessory of Corrugated Cardboard Case	H01-MA5JB	
–	Polyethylene Cover	H02-117	
–	Corrugated Cardboard Case	H04-MA5J	
–	Instruction Manual	H05-MA5J	
–	Bag (for Accessory)	H08-043	
–	Instruction Bag	H08-07	
–	Inspection Card	H12-01	
–	Price Card	H18-MA5J	
–	Card	H31-46	
–	Guide	H41-46	
–	AC Filter Choke	L20-150	
–	Decorative Screw x 4	N11-41	
–	Thumb Screw	N4006	
V.R.	Potentiometer 20k (B)	R10-111	
–	Fuse Holder	S15-03B	
F	Fuse (8A)	S17-08	
P.T.	Power Transformer	T01-217A	
–	Filter Choke	T03-13	
–	Speaker	T07-0004-05	
–	P.V.C Insulated Wire (Black, 0.5ϕ) 0.7m	W02-50	
–	P.V.C Insulated Wire (Yellow, 0.5ϕ) 1.6m	W02-54	
–	P.V.C Insulated Wire (Blue, 0.5ϕ) 0.6m	W02-56	

Symbol No.	Description	Part No.	Remarks
–	P.V.C Insulated Wire (White, 0.5ϕ) 1.1m	W02-59	
–	P.V.C Insulated Wire (Black, 0.8ϕ) 0.3m	W02-80	
–	P.V.C Insulated Wire (Red, 0.8ϕ) 1.1m	W02-82	
–	P.V.C Insulated Wire (Yellow, 0.8ϕ) 0.7m	W02-84	
–	P.V.C Insulated Wire (White, 0.8ϕ) 0.6m	W02-89	
–	Tinned Wire (0.8ϕ) 0.2m	W03-08	
–	Tinned Wire (1.2ϕ) 0.3m	W03-12	
–	AC Cord	W09-01	
–	Cord 2m	W12-120	
–	Vinyl Tube (Black, Layflat Width 6.5m/m) 0.2m	W17-17	
–	Decorative Screw (⊕MH3 x 6-F.B) x 2		
–	Screw (⊕2,6 x 6-F) x 2		
–	Screw (⊕P3 x 6-F) x 10		
–	Screw (⊕P4 x 6-F) x 8		
–	Screw (⊕P4 x 8-F) x 4		
–	Screw (⊕P6 x 20-F)		
–	Flat Head Screw (S3 x 6-F) x 4		
–	Flat Head Screw (S3 x 10-F) x 4		
–	Nut (N3-F) x 4		
–	Nut (N6-F)		
–	Flat Head Washer (W4-F) x 12		
–	Washer (Special, W6 x 13 x 1-F) x 2		
–	Spring Washer (SW6-P)		
	CONSTANT VOLTAGE (UC1004J) SECTION		
–	Printed Circuit Board	S23-277	
V201	Tube (6BM8)		
R201	Fixed Carbon Composition 470kΩ ±10% 1/2W		
R202	Fixed Carbon Composition 100k ±10% 1/2W		
R203	Fixed Carbon Composition 1k ±10% 1/2W		
R204	Fixed Carbon Composition 33k ±10% 1/2W		
R205	Fixed Carbon Composition 22k ±10% 1/2W		
C201, 202	Ceramic 0.01μF +100% −0%		
C203	MP 0.5μF ±20%		
C204	Ceramic 400PF ±10%		
–	Neon Tube (NE-2)		
–	Mold Socket (9P, MT Type)	E51-91B	
–	Terminal (for Printed Circuit Board)	N4280	
	RECTIFICATION (UC1005J) SECTION		
–	Printed Circuit Board	S23-278	
D101~4	Silicon Diode SE05c		
D105~8	Silicon Diode SE05b		
D109	Silicon Diode SE05a		
R101~8	Fixed Carbon Composition 470k ±10% 1/2W		
R109	Fixed Carbon Composition 2.2k ±10% 1/2W		
C101~8	Ceramic 0.01μF +100% −0%		
C109, 110	Electrolytic Tubular 40μF 160WV		
	Terminal (for Printed Circuit Board)	N4085	

SCHEMATIC DIAGRAM & SPECIFICATION



SPECIFICATION

○ **Power Unit**

Primary side input: 117 volts, 50/60 Hz

Secondary side output: (When TS-510 is transmitting CW, and output is 90 W)

Terminal	Voltage (V)		Current (mA)		
900 V	880	(970)	196	(14.3)	DC
300 V	285	(295)	36.5	(10.0)	DC
210 V	202	(212)	64	(56.0)	DC
150 V	150		90	(107.0)	DC
−C	−91		11.1	(13.8)	DC
12.6 V	13.6	(14)	1.07 A	(1.09A)	AC
12.6 V	12.7	(13.1)	2.76 A	(2.81A)	AC

The above figures are the values measured at the connector section of the TS-510.

The figures in the parentheses are the values measured when receiving in CW mode.

○ **Power Consumption:** 360 W (Max.)

○ **Speaker:**

Diameter: 6-1/2"

Impedance: 8Ω

Frequency: 150 ~ 5,000 Hz

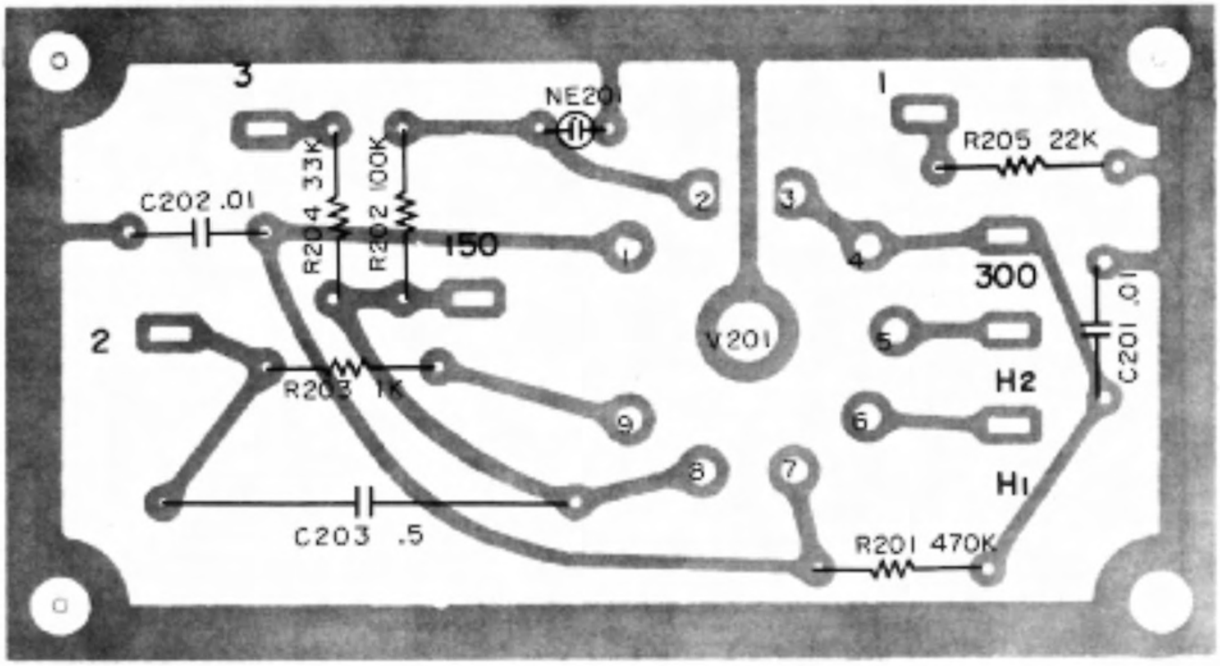
Allowable maximum input: 1.5 W

Dimensions: 200 (w) × 180 (h) × 360 (d) mm (excluding legs)

Weight: 15 kg

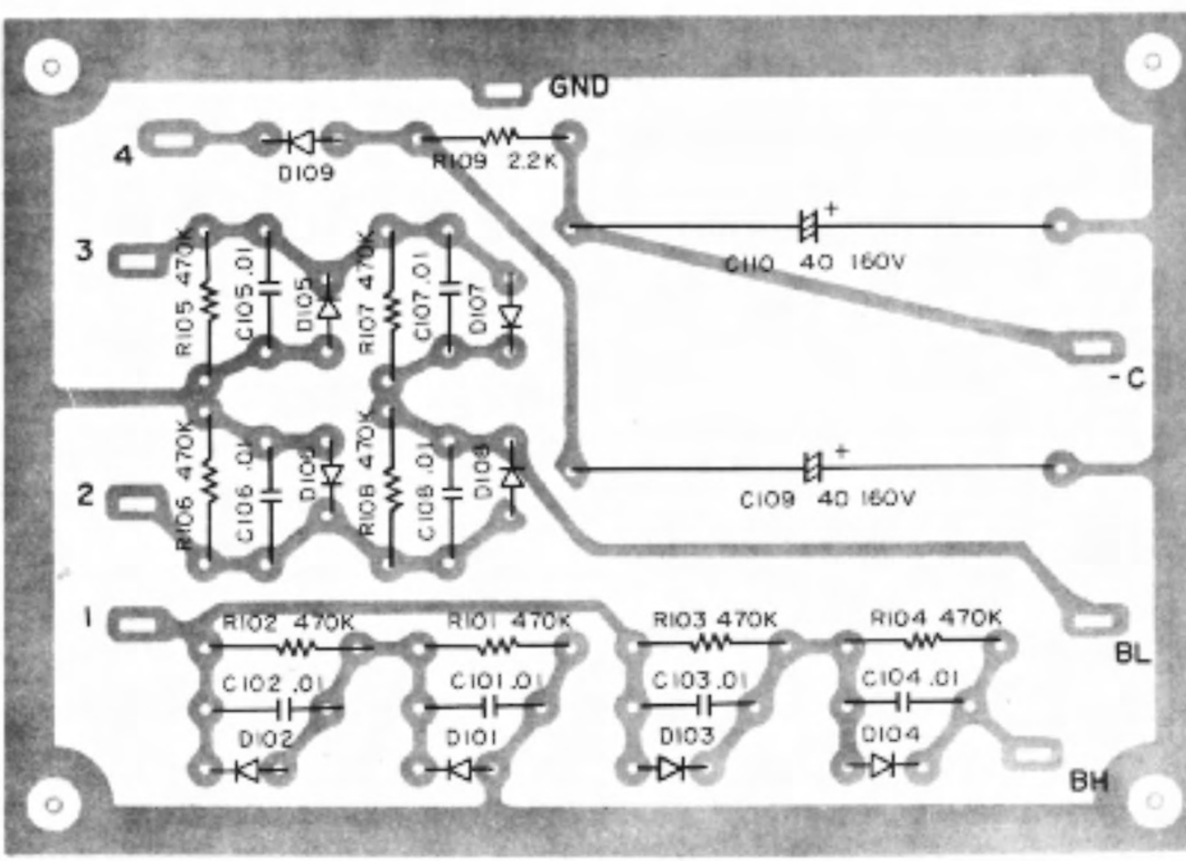
SEALED CIRCUIT ASSEMBLIES - PHANTOM VIEWS

UC1004J



V201 6BM8

UC1005J



D101~104 SE-05c, D105~108 SE 05b
D109 SE-05a