Craig 4351, 4352 Service Manual

4351
4352

SERVICE MANUAL

CRAIG®

4351
4352

PORTABLE 4 CHANNEL SCANNER MONITOR

4351 Hi/Lo VHF

4352 UHF

SPECIFICATIONS

FREQUENCY RANGE.....Low VHF: 30 - 50 MHz
High VHF: 150 - 174 MHz
RF BAND WIDTH.....Lo VHF: 6MHz(Supplied 37 to 43 MHz)
Hi VHF: 8MHz(Supllied 152 to 160MHz)
SENSITIVITY.....0.6 uV for 20 dB quieting (center band)
IMAGE REJECTION.....40 dB
SQUELCH SENSITIVITY.....0.6 uV minimum
MODULATION ACCEPTANCE.....5 kHz
POWER OUTPUT.....350 mW into 8 Ohms
SCAN MODES.....Automatic & manual
CONTROLS.....Vol, SQ, bypass, scan mode, power
SPEAKER IMPEDANCE.....8 Ohms
POWER SOURCE.....4 "AA" size cells or 6V 130mA DC

CRYSTAL DATA

CRYSTAL HOLDER TYPE.....HC-25U
MODE OF OSCILLATION.....Third overtone
RESONANCE.....Parallel
FREQUENCY TOLERANCE.....± 0.001%(+25°C)
LOAD CAPACITY.....20pF
MAXIMUM DRIVE.....2 mW
MAXIMUM SERIES RESISTANCE....35 Ohms
CRYSTAL FREQ(third overtone)
CALCULATION.....Lo VHF: CH Freq. +10.7MHz
Hi VHF (CH Freq. -10.7MHz)/3

FREQUNCY RANGE.....UHF: 450 - 512 MHz
RF BAND WIDTH.....UHF: 10 MHz(supplied 455 to 465 MHz
SENSITIVITY.....2.5 uV for 20 dB quieting (center-band)
IMAGE REJECTION.....40 dB
SQUELCH SENSITIVITY.....25 uV minimum
MODULATION ACCEPTANCE.....5 kHz
POWER OUTPUT.....250 mW into 8 Ohms
SCAN MODES.....Automatic and manual
CONTROLS.....Vol, SQ, bypass, scan mode, power
POWER SOURCE.....4 "AA" size cells or 6V, 150mA DC

CRYSTAL DATA

CRYSTAL HOLDER TYPE.....HC-25U
MODE OF OSCILLATION.....Third overtone
RESONANCE.....Parallel
FREQUENCY TOLERANCE.....± 0.001%(+25°C)
LOAD CAPACITY.....20 pF
MAXIMUM DRIVE.....2 mW
MAXIMUM SERIES RESISTANCE.....35 Ohms
CRYSTAL FREQ.(third overtone)
CALCULATION.....UHF: (Channel Frequency —10.7 MHz)/9

A PRODUCT OF CRAIG CORPORATION

ALIGNMENT PROCEDURES

Alignment is performed at factory with laboratory test equipment. Therefore, before alignment is attempted the unit should be thoroughly checked for circuit troubles.

EQUIPMENT REQUIERED

1.) FM SIGNAL GENERATOR - 30 to 190 MHz (VHF Band)
2.) FM SIGNAL GENERATOR - 450 to 512 MHz (UHF Band)
3.) SWEEP GENERATOR - 30 to 170 MHz
4.) OSCILLOSCOPE
5.) POWER SUPPLY - 6V DC 200 mA
6.) CRYSTALS - 156 MHz, 450 MHz, 470 MHz & 480 MHz
7.) DUMMY LOAD - 8 Ohms
8.) V.T.V.M.

4351

Turn volume and squelch control fully counterclockwise. Set unit to MANUAL scanning and activate CH-4, plug ONE pin only of a crystal type HC-25U (any frequency can be used) into CH-4 crystal socket on the HIGH Band side to activate the RF and mixer circuits.

FUNCTION	BAND	SIGNAL INPUT	FREQ'CY	OUTPUT	ADJUSTMENT	ADJ. FOR
RF	Hi VHF (4351 only)	Connect sweep generator to TP1 & TP2 (SIGNAL LEVEL MEDIUM)	158 MHz	Connect oscilloscope to R103 & ground to R302	L101,L102, L103,L104	Wave form on Fig. 4

Remove crystal from High Band side and plug ONE pin only of the same crystal on CH-4 crystal socket on Low Band side

RF	Lo VHF	Connect sweep generator to TP1 & TP2 (SIGNAL LEVEL MEDIUM)	40 MHz	Connect oscilloscope to R110 & Gnd to R302	L105,L106, L107,L108	Wave form on Fig. 4

ALIGNMENT FOR MINIMIZING SPURIOUS

Set unit to MANUAL scanning and activate CH-4, plug a 156 MHz crystal into CH-4 crystal socket on High Band side.

MINIMIZING SPURIOUS	VHF (4351 only)	Connect FM signal generator to TP1 & TP2 (SIGNAL LEVEL APROX. 1mV)	183.03 MHz	Connect oscilloscope, V.T.V.M. to 8 Ohm dummy load across EXT. speaker jack.	L109	minimum spurious output level

4352

Turn power on and squelch control fully counterclockwise. Plug the 450 MHz crystal (type HC-25U) in CH-3 crystal socket, set unit to manual scanning and activate CH-3.

V.V.C.	UHF			Connect Voltmeter between R101 & Gnd	L106	Reading of 0.4V on Voltmeter
Remove the 450 MHz crystal and plug the 470 MHz crystal in the same socket.						
A.F.C.	UHF			Connect Voltmeter between TP2 & ground	VR2	Reading of 3.0V on Voltmeter
SENSITIVITY		Connect signal generator to EXT. ANT. jack. Attenuator of SG aprox. 1 mV NOTE: Decrease output level of SG gradually while adjusting.	470 MHz	Connect Oscilloscope, V.T.V.M. to 8 Ohm dummy load across EXT. speaker jack	L104,C116, C105,C101	Best signal to noise ratio (repeat adj)
Remove 470 MHz crystal and plug the 480 MHz crystal in the same socket. Turn the squelch control fully clockwise.						
SQUELCH	UHF	Set attenuator of signal generator to 10 uV		Connect oscilloscope, V.T.V.M. to 8 Ohm dummy load across EXT. speaker jack	VR1	open SQ with 10uV signal input

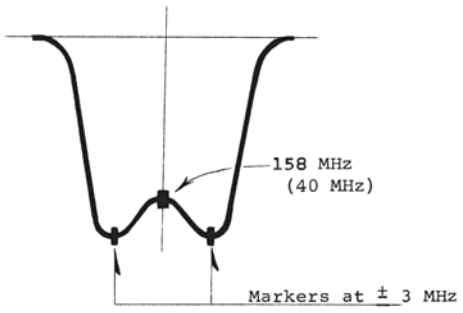
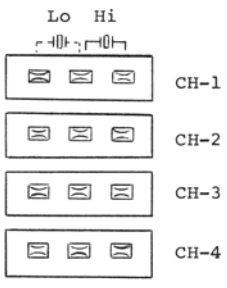


Fig. 4



4352 CRYSTAL SOCKET

PARTS PRICE LIST

SUBJECT TO CHANGE WITHOUT NOTICE. USE ALL AVAILABLE NUMBERS AND COMPLETE DESCRIPTION WHEN ORDERING, INCLUDING MODEL NUMBER

* * * "THESE PRICES HAVE BEEN REVISED AS OF 5-11-76" * * *

PACKAGING

Ref. No.	CRAIG KEY NO. MODEL 4351	MODEL 4352	Description	Mfr's Sugg Ret. Price
	4351001	4352001	Individual Carton	2.50
	4351002	4352002	Carton Sleeve	1.20
	4351003	4351003	Cushion, Unit Pad	1.70
	4351004	4352003	Plastic Base	1.20
	4351005	4351005	Leather Carrying Case	6.35
46	4351006	4351006	Telescopic Antenna	3.70
	4351007	4351007	Extension Antenna Wire	.90
47	4351008	4351008	Scr, Telescopic Ant Mtg	1.05
48	4351009	4351009	Bushing, Telescopic Antenna	.40
	2603123	2603123	Earphone	.60

CABINET EXPLODED VIEW

Ref. No.	CRAIG KEY NO. MODEL 4351	MODEL 4352	Description	Mfr's Sugg Ret. Price
1	4351056	4351056	Front Cabinet	4.90
2	4351057	4352021	Plate, Decoration	.65
3	4351058	4351058	Net, Speaker Grille	.35
4	4351059	4351059	Back Cabinet	4.90
5	4351060	4351060	Plate, Decoration	.65
6	4351061	4352022	Craig Model Bedge	.75
7	4351017	4351017	Lid, Crystal Access	.70
8	4351018	4352012	Label, Crystal Layout	.25
9	4351019	4351019	Top Panel	4.40
10	4351020	4351020	Face Plate, Top Panel	.70
11	4351021	4351021	Plastic Bkt, LED & Cont Mtg	.85
12	4351022	4351022	Dust Cover, Switch	.25
13	4351023	4351023	Bkt (L), Main PCB Mtg	.40
14	4351024	4351024	Bkt (R), Main PCB Mtg	.40
15	4351025	4351025	Bkt, Slide Sw Mtg	.30
16	4351026	4351026	Knob, Select Sw	.95
17	4351027	4351027	Battery Case	3.90
18	4351028	4351028	Ass'y, Batt Terminal	.75
19	4351029	4351029	Knob, Vol Cont	.95
20	4351030	4351030	Knob, Squelch Cont	.95
21	4351031	4351031	Felt Cushion, Speaker Mtg	.25
22	4351032	4351032	Spr, Ant. Extension Jack	.25
23	*******	*******	Main P.C.B.	****
28	SLP123B	SLP123B	L.E.D. (D519~D522)	1.35
29	4351038	4351038	Var Res 10k, Vol W/Sw	2.35
30	4351039	4351039	Var Res 10k, Squelch	2.05
31	4351040	4351040	Speaker, 8 Ohms	3.25
32	4351041	4351041	AUTO/MANU/CH-SEL Switch	2.60
33	4351042	4351042	BYPASS Switch	1.50
34	9109025	9109025	Jack, Antenna Extension	.40
35	4351043	4351043	Jack Ass'y, Ext. SP & Power	1.50
36			Scr, PH M2x4	.25
37			Scr, FH M2.6x6	.25
38			Scr, FH M2x4	.25
39			Scr, PH M2.6x6	.25
40			Toothed Lock Washer, M2	.25
41	N/A	NSP	Shield Plate(A), PCB	**
42	N/A	NSP	Shield Plate(B), PCB	**
43	N/A	4352014	Shield Plate	.35
44	N/A	4351015	Insulator	.35
45	4351044	4351044	Coution Label	.25
24	4351034	4351034	LED PCB W/O Comp	.75
25	4351035	4351035	PCB, CH Select Sw	.75
26	4351036	4351036	Shield Plate	.35
27	4351037	4351037	Fiber Insulator	.35
	4351062	4352023	Crystal Socket	1.65

CHOKES, COILS, FILTERS & CRYSTALS

Ref. No.	4351 Craig Key No.	Description	Mfr's Sugg Ret. Price
L103	4351045	RF Coil	1.50
L101,102,	4351046	" "	1.50
L104	4351046	" "	1.50
L109	4351047	" "	1.50
L105,106,	4351048	" "	1.50
L107,108	4351048	RF Coil	1.50
L502,503,	4351049	RF Choke, 25 uH	.75
L504,505	4351049	" " " "	.75
L501	4351050	RF Choke, 8.2 mH	1.05
L110	4351051	VHF Coil	.30
HF301	4351052	Crystal Filter (10M15A)	8.95
HF302	4351053	Ceramic Filter (CFU455D)	4.95
HF303	4351054	Ceramic Discriminator	3.95
X1	4351055	Crystal, 10.245 MHz(HC-18U)	7.70

Ref. No.	4352 Craig Key No.	Description	Mfr's Sugg Ret. Price
L101,102,	4352016	RF Coil	1.50
L105	4352016	RF Coil	1.50
L104	4352018	RF Coil	1.50
L106	4351048	RF Coil	1.50
L505	4351050	RF Choke, 8.2 mH	1.05
L501,502,	4351049	RF Choke 25 mH	.75
L503,504	4351049	RF Choke 25 mH	.75
L301	4352019	Choke Coil, 3.9 uH	1.05
HF301	4351052	Crystal Filter (10M15A)	8.95
HF302	4351053	Ceramic Filter (CFU455D)	4.95
HF303	4351054	Ceramic Discriminator	3.95
X1	4351055	Crystal, 10.245MHz (HC-18U)	7.70
L103	4352017	VHF Coil	.45

4351 SEMICONDUCTORS

Ref. No.	Craig Key No.	Description	Mfr's Sugg Ret. Price
Q101,102,103	2SC1674	Transistor	1.35
Q104,105	"	"	"
Q106,107	2SA733	"	.95
Q301	2SK49	"	1.65
Q302,303,304	2SC930	"	1.50
Q305,306,307	"	"	"
Q308	"	"	"
Q501,502,503	2SC536	"	2.30
Q505,506,507	"	"	"
Q508,509,510	2SC945	"	1.50
Q504,702,701	"	"	"
Q703	2SD227	Transistor	1.55
Q704	2SA642	Transistor	1.20
IC501	TC4011P	I.C.	5.00
D301,302,501	1S188	Diode	.60
D502,503,504,	"	"	"
D505,506,507,	"	"	"
D508,509,510,	"	"	"
D511,512,513,	"	"	"
D514	"	"	"
D515,516,517,	1S1587	"	1.15
D518	"	"	"
D519,520,521,	SLP123B	L.E.D.	1.60
D522	SLP123B	L.E.D.	1.60

4352 SEMICONDUCTORS

Ref. No.	Craig Key No.	Description	Mfr's Sugg Ret. Price
Q101	2SC1070	Transistor	1.95
Q102	2SC787	"	1.95
Q103,301,302,	2SC930	"	1.50
Q303,304,305,	"	"	"
Q306,307,308	"	"	"
Q104	2SC387	"	1.95
Q105	2N4258	"	1.85
Q501	2SK44D	"	1.50
Q503,504,505,	2SC536	"	2.30
Q506,507,508,	"	"	"
Q702	"	"	"
Q509,510,511,	2SC945	"	1.50
Q512,701	2SC945	"	"
Q703	2SD227	"	1.55
Q704	2SA642	"	1.20
IC101	LM703	I.C.	3.95
IC501	TC4011P	I.C.	5.00
D101,102,106	MV2101	Variable Capacitance Diode	1.85
D103,104,105	MV201	" " "	1.85
D109	"	" " "	"
D107	RD51	Zener Diode	1.05
D108	VD1121	Varistor	.95
D301,302,501	1S188	Diode	.60
D502,522	"	"	"
D503 513	"	"	"
D514,515,516,	1S1587	Diode	.95
D517	"	"	"
D518,519,520,	SLP123B	L.E.D.	1.60
D521	"	"	"
D701	VD1220	Varistor	.85
D702	F14A	Diode	.95

N/A: Not Applicable
NSP: Non Serviceable Part

Ref. No.	Description	Mfr's Sugg Ret. Price

4351 CAPACITORS

C102,107	Ceramic, 1pF/50V	.45
C110	" 2pF/50V	.45
C304	" 3pF/50V	.45
C113,118	" 6pF/50V	.45
C101,103,106,108, 126	" 8pF/50V " "	.45 "
C121	" 15pF/50V	.45
C104,112,114,117, 119	" 30pF/50V " " "	.45 "
C124	" 40pF/50V	.45
C306	" 70pF/50V	.45
C109,115,123,301, 317,519,520	" 100pF/50V " " "	.45 "
C305,517,518,521, 120,309,313,522	" 200pF/50V " " "	.45 "
C303,308,310,311, 312,314	" 500pF/50V " " "	.45 "
C105,111,122,515	Ceramic, 0.001uF/50V ± 20%	.45
C116,125	" 0.005uF/50V "	.45
C127,128,129,302, 501,709	" 0.01uF/50V " " "	.45 "
C316	Mylar, 0.0022uF/50V "	.45
C504	Mylar, 0.0033uF/50V "	.45
C502,503,706	" 0.0047uF/50V "	.45
C707	" 0.0082uF/50V "	.45
C701	" 0.01uF/50V "	.45
C506,507,705	" 0.047uF/50V "	.50
C315,508	" 0.1uF/50V "	.55
C704,708,710	Electrolytic, 100uF/6.3V	.65
C512	" 10uF/10V	.60
C505	" 1uF/10V	.65
C513,514	" 0.022uF/10V	.55
C702	" 0.1uF/10V	.55
C307,309,510,703	" 3.3uF/10V	.75
C511,318	" 0.47uF/35V	1.20

4352 CAPACITORS

C114	Ceramic, 2pF/50V ±0.25pF	.45
C302	" 3pF/50V ±10%	.45
C106,128,313,520, 521,305,309	" 100pF/50V " "	.45 "
C103,312,516,517, 518,519	" 200pF/50V " "	.45 "
C301,303,304,306, 307,308	" 500pF/50V " "	.45 "
C107	" 0.5pF/50V "	.45
C120	" 18pF/50V "	.45
C113	" 25pF/50V "	.45
C102,104,109,110, 111,115,117,119, 122,126,127,504, 505,506	" 0.001uF/50V " " " " "	.45 " " "
C124	" 0.01uF/50V "	.45
C123,314,502	" 0.02uF/50V "	"
C108	Ceramic, 8pF/50V ±10%	.45
C121,125,310	" 0.002uF/50V ±10%	.45
C112,501,523	" 0.0033uF/50V "	"
C129,128	" 0.04uF/50V "	.45
C704	Mylar, 0.0047uF/50V ±20%	.45
C705	" 0.0082uF/50V "	.45
C515	" 1000pF/50V "	.45
C311,508,706,710	" 0.01uF/50V "	.45
C315	" 0.047uF/50V "	.45
C703,707	Electrolytic, 100uF/6.3V	.45
C513,514	" 0.22uF/10V	.55
C701	" 0.1uF/10V	.55
C708,711	" 330uF/10V	1.85
C118,709,316	" 3.3uF/10V	.75
C509,522	" 0.47uF/35V	1.50
C507,510,511	" 1uF/25V	.65
C512,503	" 10uF/10V	.60

TRIMMERS & VARIABLE RESISTORS

Ref. No.	Craig Key No.	Description	Mfr's Sugg Ret. Price
VR1	4351038	Var Res 10k,Vol Cont W/Sw	2.35
VR2 (4351 ONLY)	4351039	Var Res 10k, Squelch	2.05
VR1,2	4352009	Semi-Varible Res, 10k	.75
VR4 (4352 ONLY)	4351038	Vol Cont W/Sw	2.35
VR5 (4352 ONLY)	4351039	Squelch Cont	2.05
C101,105	4352007	Trimmer Cap	1.50
C116	4352007	Trimmer Cap	1.50

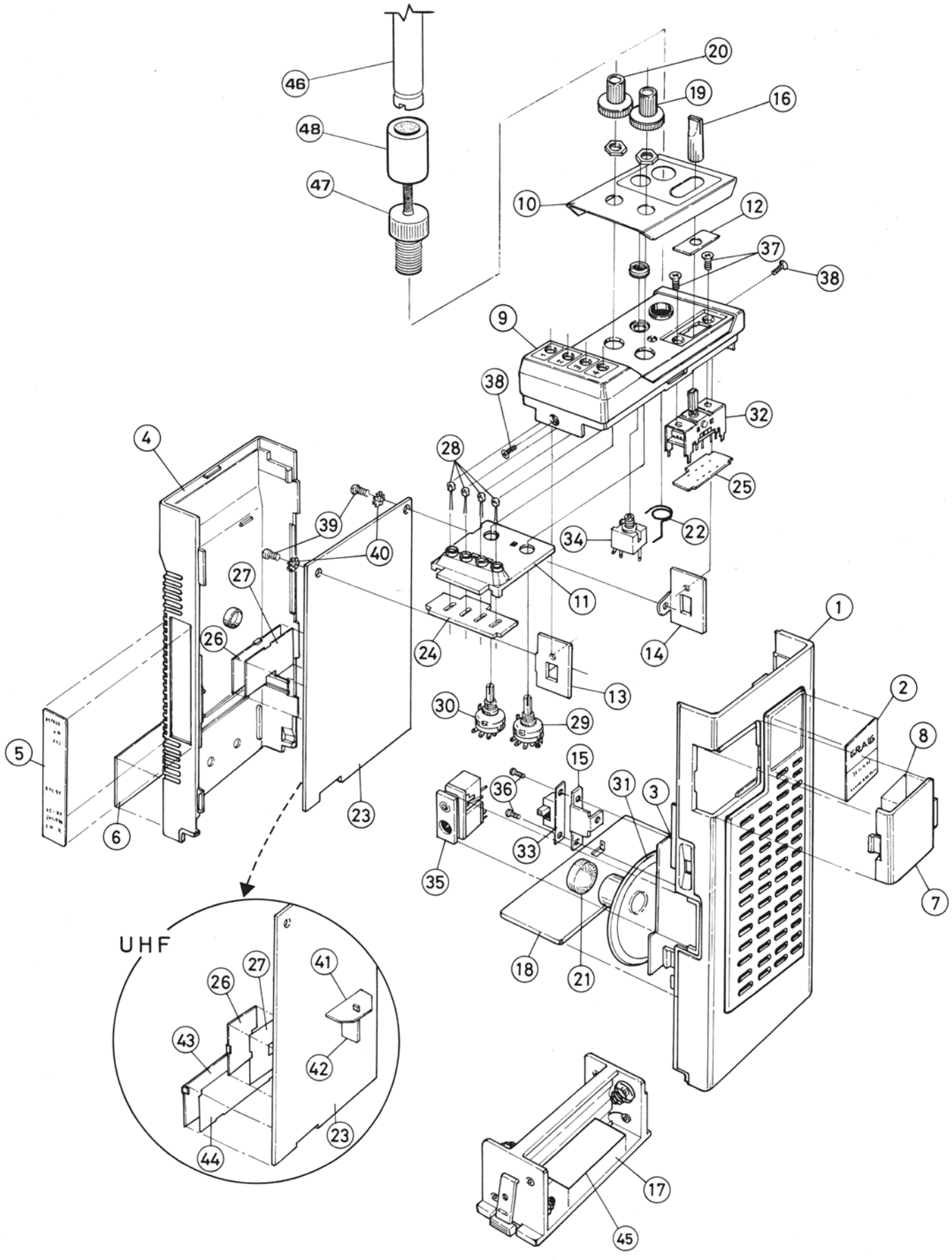
4351 RESISTORS, CARBON, OHMS, ± 10%, ¼W, 0.25¢ OR NOTED

Ref. No.	Description
R303	33 Ohms, ¼ Watt
R114,309, 506,705	100 " " "
R102,105, 107	470 " " "
R708	15 " " "
R113,528, 703	330 " " "
R312,314, 316,318, 501,503	1k " " "
R306	1.5k " " "
R310	2.7k " " "
R104,108, 109,111, 301,304, 308,320, 505,509, 704	3.3k Ohms, ¼W " " " " " " " " " "
R321,322	5.6k " "
R115,116, 511,514	6.8k " "
R507,508, 701	10k " "
R510	33k " "
R112,524, 525,526, 527	56k Ohms, ¼W " " "
R302,516, 517,522, 523	100k " " " " " "
R307	180k " "
R101,103, 106,110, 319	330k " " " " " "
R512,513	390k " "
R305,502	470k " "
R504,515, 702	470k Ohms, ¼W " " "
R311,313, 315,317	820k " " " " "
R518,519, 520,521	560k " " " " "
R529,530, 531,532, 533,534, 535,536	15k " 1/8W " " " " " " " " "
R707	270k " ¼W
R706	820 " "

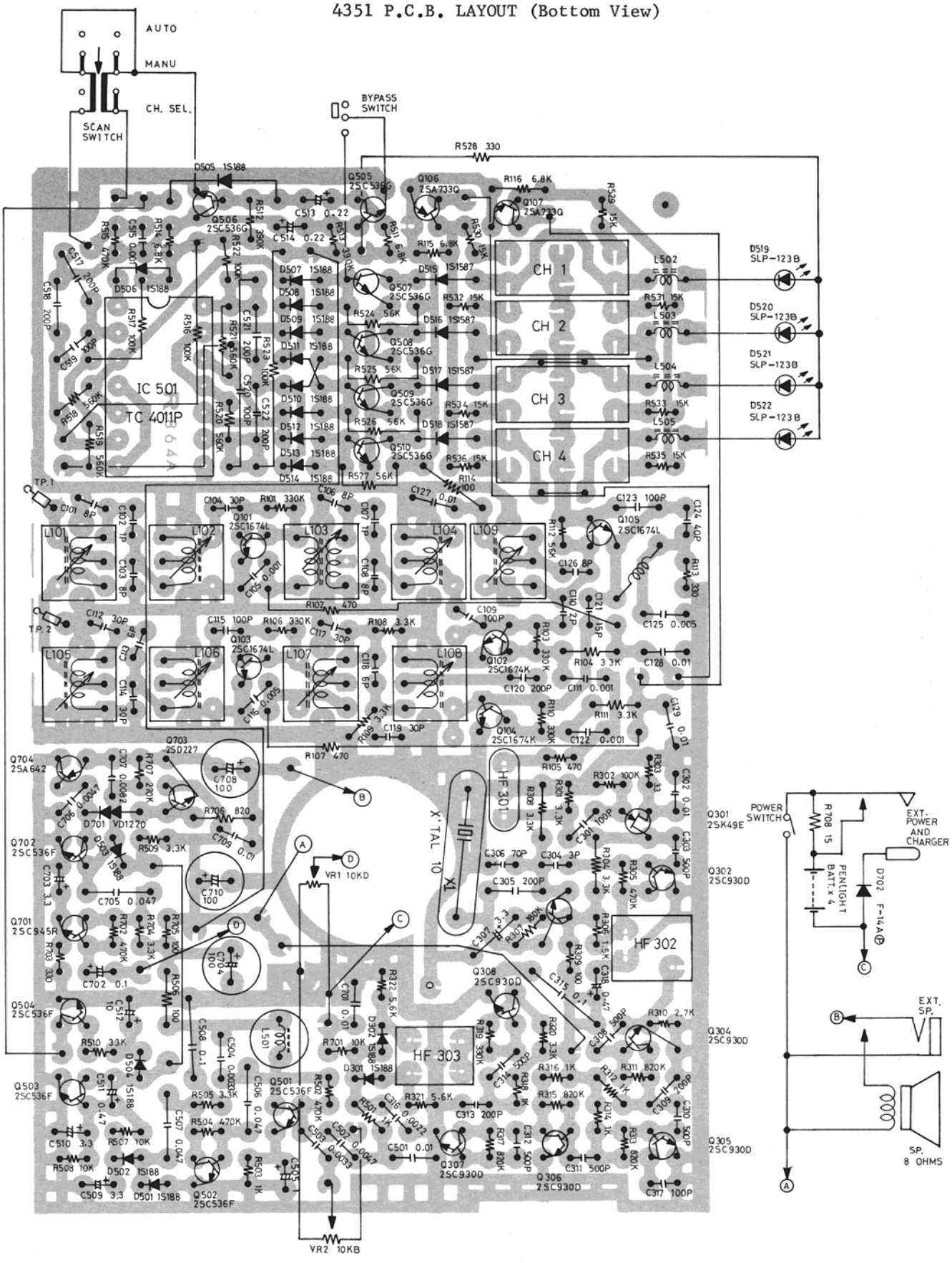
4352 RESISTORS

R112,307, 704	100 Ohms, ¼W " "	R114,128, 511,512	10k Ohms, ¼W " "
R528,707	330 " "	R101,104, 107,110, 111,115, 513	33k " " " " " " " " "
R701	15 " "	R529,530, 531,532	56k " " " "
R508	1k " "	R108	82k " "
R302,308, 310,312, 314,510	2.7k " " " " "	R520,521, 524,525	100k " " " "
R106,316, 514,703	3.3k " " " "	R102	150k " "
R317,318	5.6k " "	R306,315	330k " "
R125,127, 515,518	6.8k " " " "	R303,313, 516,517	390k Ohms, ¼W " " " "
		R105,301, 309,311, 519,702	470k " " " " " "
		R507,509, 522,523, 526,527	560k " " " " " "
		R123,304, 324	1.8k " " " "
		R117	2.2k " "
		R126	3.9k " "
		R321	220k " "
		R706	270k Ohms, ¼W
		R130,320	220 " "
		R122	270 " "
		R705	820 " "
		R118,124, 319,322	22k " " " "
		R502	47k " "
		R113	68k " "
		R103,121, 501	56 " " " "
		R116,120, 129	82 " "

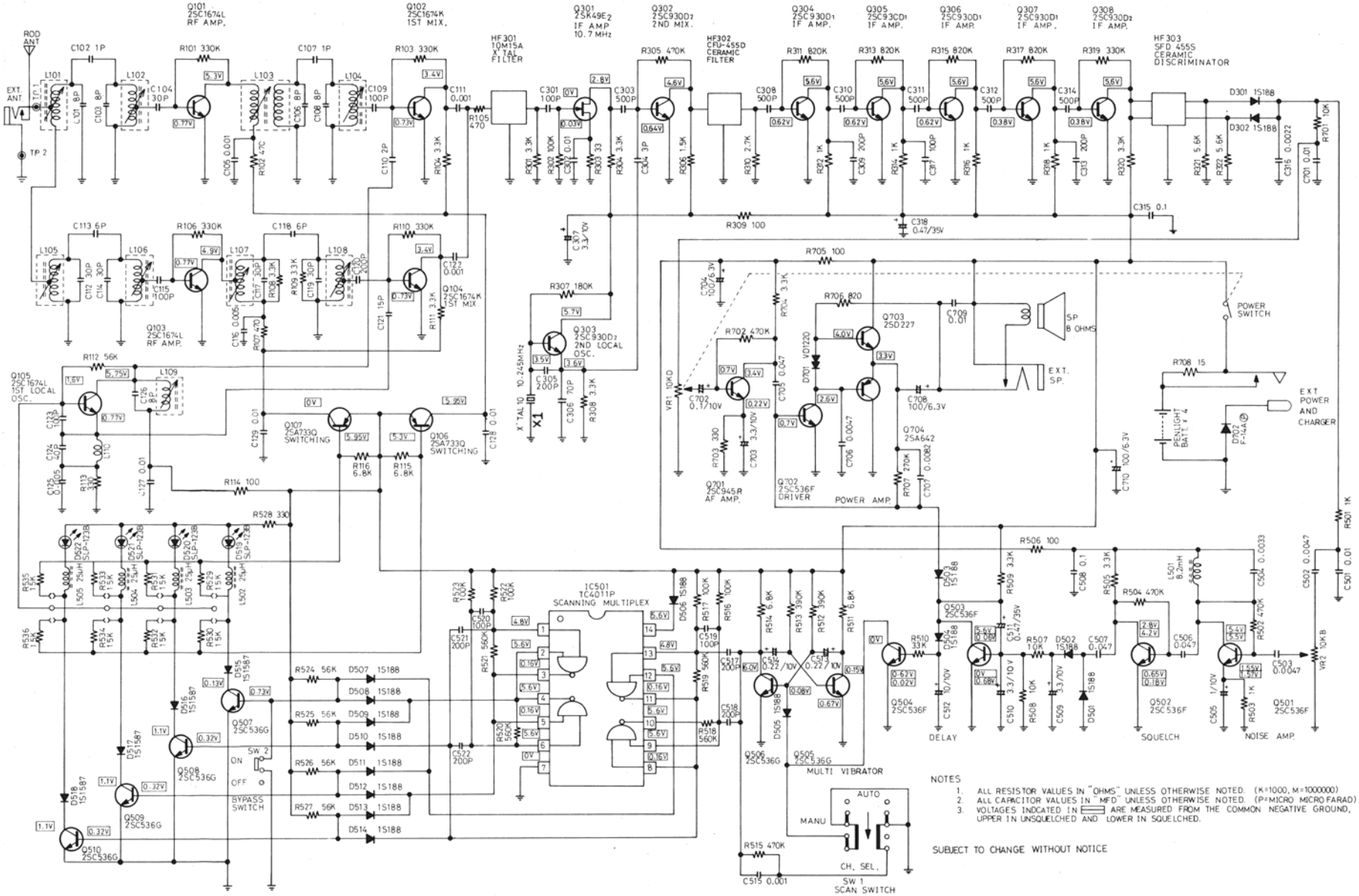
CABINET AND CHASSIS



4351 P.C.B. LAYOUT (Bottom View)



4351 SCHEMATIC DRAWING

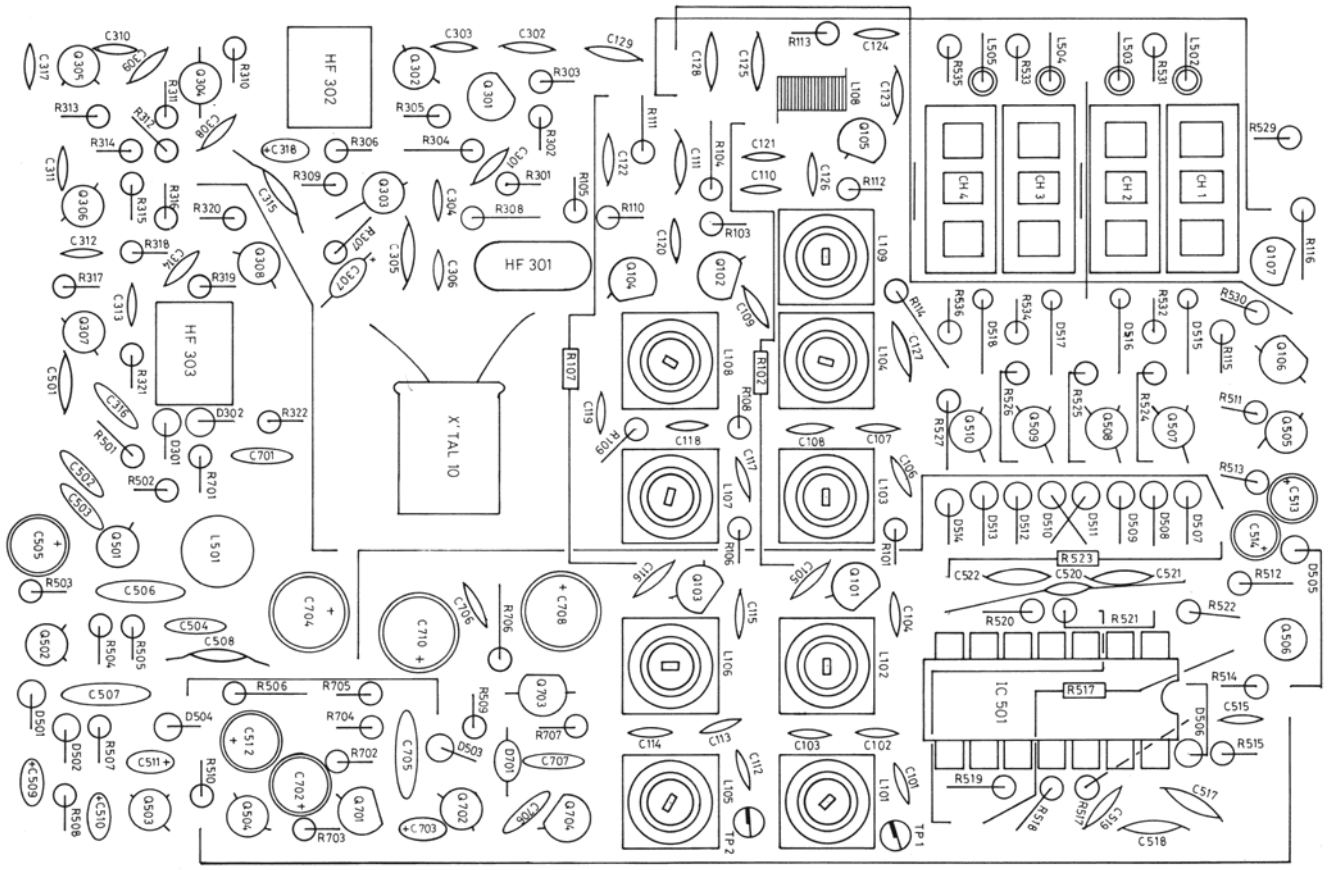


NOTES

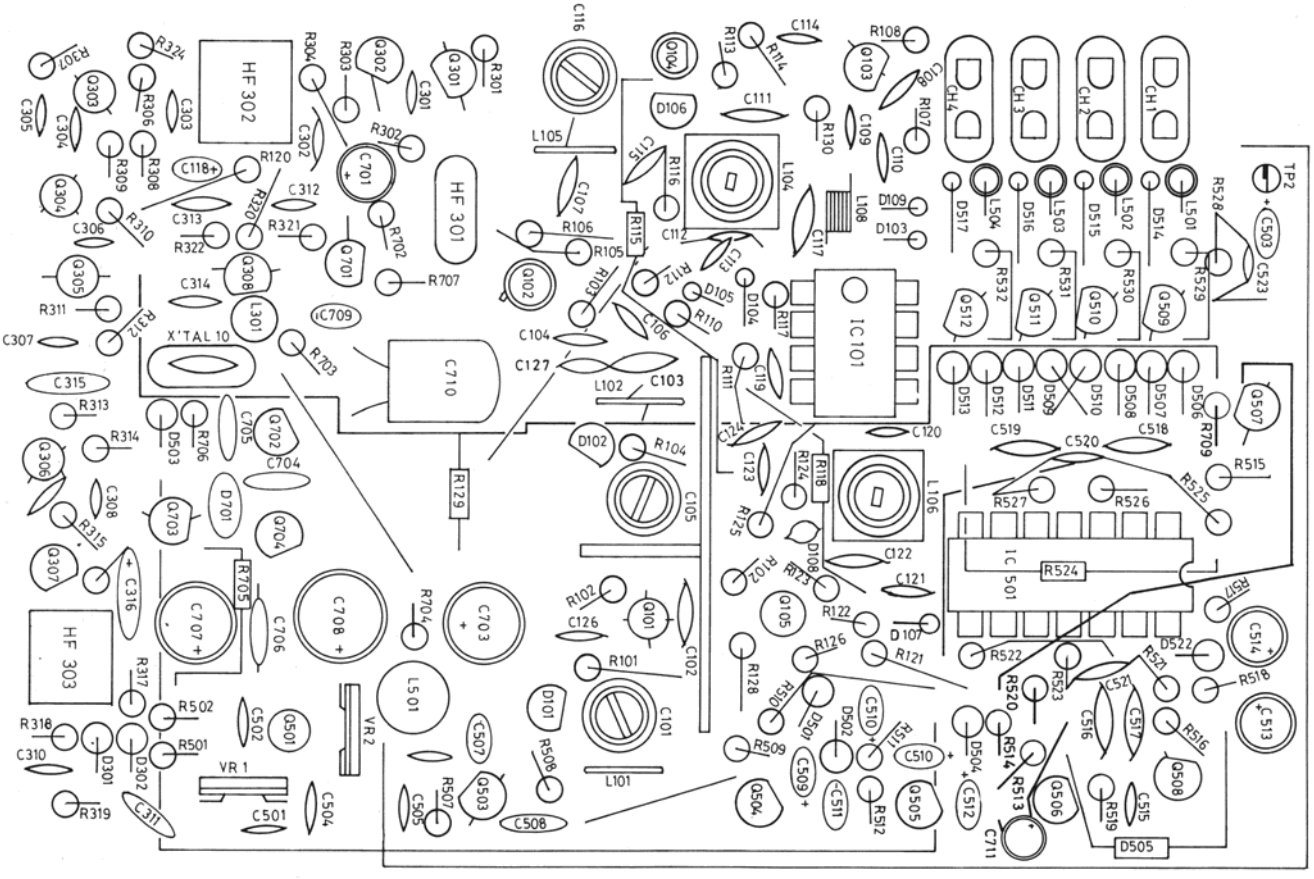
1. ALL RESISTOR VALUES IN "OHMS" UNLESS OTHERWISE NOTED. (K=1000, M=1000000)
2. ALL CAPACITOR VALUES IN "MFD" UNLESS OTHERWISE NOTED. (P=MICRO MICROFARAD)
3. VOLTAGES INDICATED IN ▭ ARE MEASURED FROM THE COMMON NEGATIVE GROUND, UPPER IN UNSQUELCHED AND LOWER IN SQUELCHED.

SUBJECT TO CHANGE WITHOUT NOTICE

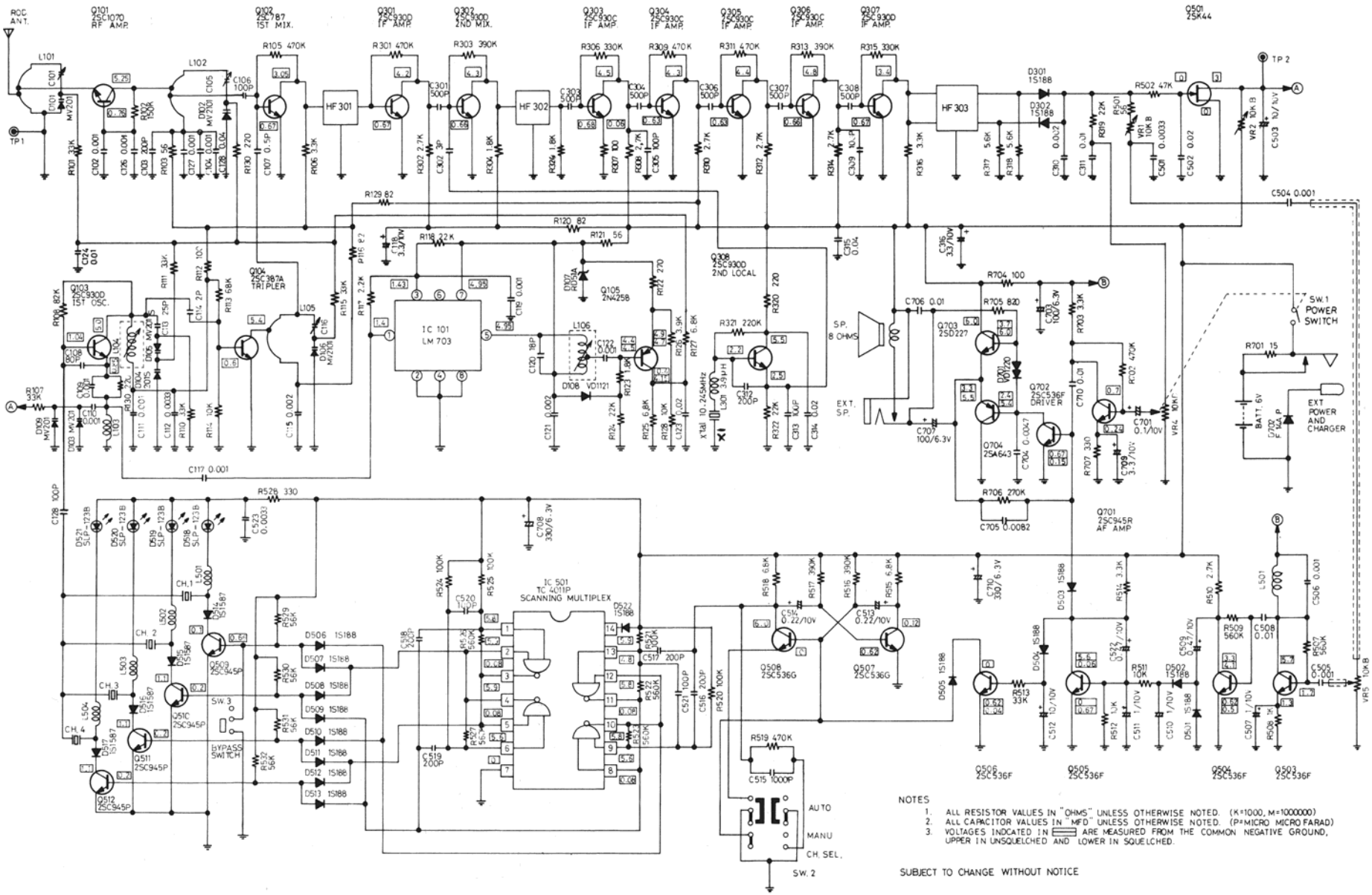
4351 P.C.B. LAYOUT (Top View)



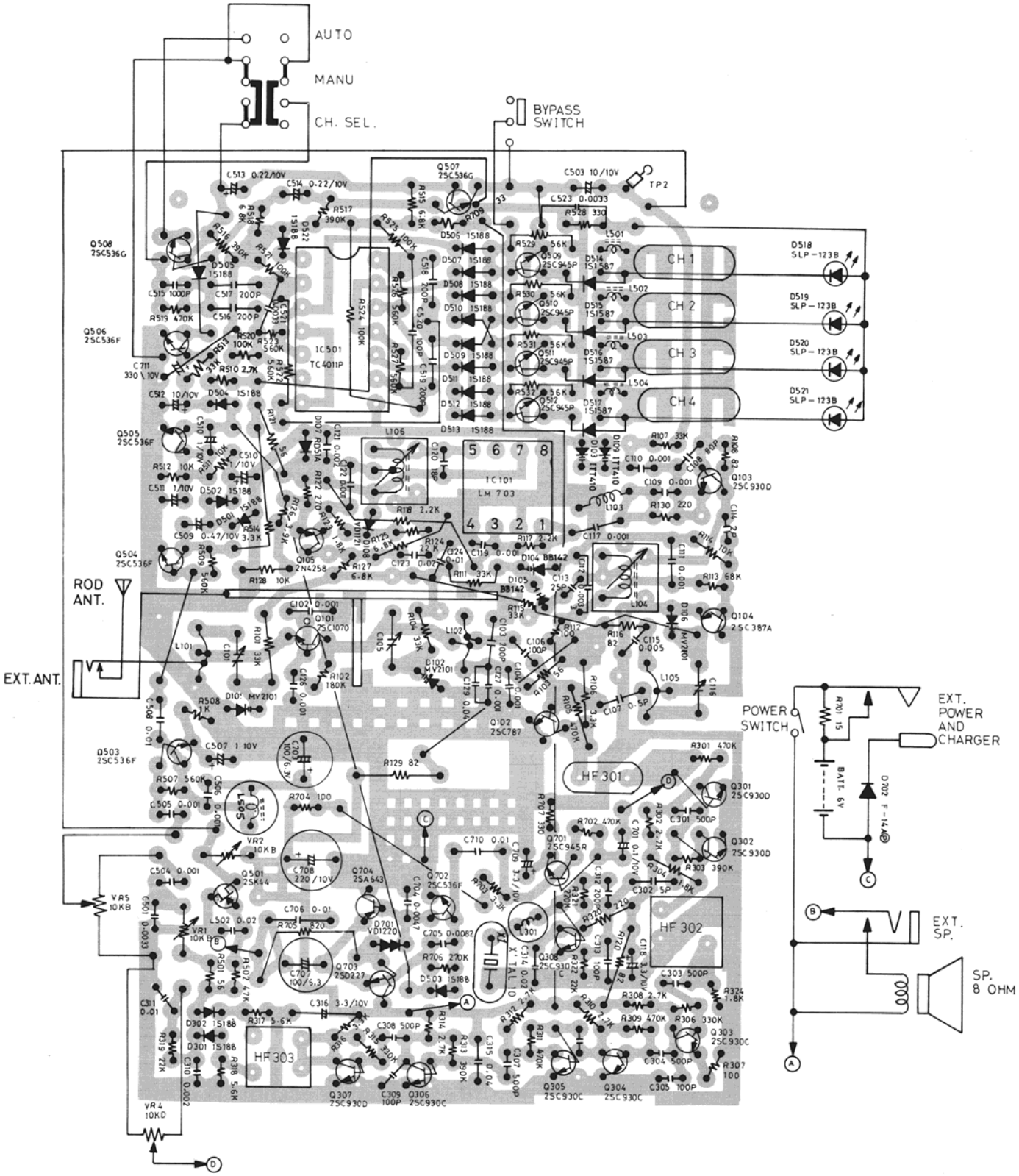
4352 P.C.B. LAYOUT (Top View)



4352 SCHEMATIC DIAGRAM



4352 P.C.B. LAYOUT (Bottom View)



PRODUCT OF CRAIG CORPORATION, COMPTON, CALIFORNIA 90220

0662KJR
Printed in U.S.A.