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Craig L131 and L231 Service Manual

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L 131
L 231

SERVICE MANUAL

CRAIG®

L131 L231

40 CHANNEL MOBILE SSB/AM CB TRANSCEIVER



L 131

40 CHANNEL BASE STATION SSB/AM CB TRANSCEIVER



L 231

SPECIFICATIONS

GENERAL:

Channels: 40
 Frequency Range: 26.965 to 27.405 MHz
 Frequency Tolerance: ... $\pm 0.005\%$ from -30C
 to +50C
 Frequency Stability: ... $\pm 0.001\%$
 Microphone: Dynamic with Press-to-talk
 switch and coiled cord.
 Power Source: 13.8V DC Pos. or Neg. Ground
 Current Drain: Receive:
 1.0A @ Maximum audio output
 0.7A Standby (No Signal)
 Transmit:
 AM full mode, 2.0A
 SSB 12 W PEP, 2.4A
 Meter: Illuminated. Indicates
 relative power output,
 received signal strength
 and SWR.

TRANSMITTER:

RF Power Output: AM: 4.0W
 SSB: 12W Peak Envelope Power
 Modulation Capability: 100%
 Spurious Attenuation: .. 60dB
 Output Impedance: 50 Ohms
 Filter Circuit: Crystal lattice 7.8MHz filter
 Carrier Suppression: ... 50dB
 Unwanted Sideband Suppression: 60dB

RECEIVER:

Sensitivity: AM: Better than 0.5uV
 for 10dB (S+N)/N
 SSB: Better than 0.18uV
 for 10dB (S+N)/N
 Bandwidth: 2KHz @ -6dB
 AGC: Change in Audio Output less
 than 12dB from 10uV to 0.5V
 Squelch: Adjustable. Threshold less
 than 0.5uV. Tight, more
 than 250uV.
 Power Output: 3.5W at 10% THD
 Image Rejection: Better than 60dB.
 IF Frequency: AM: 7.8 MHz
 SSB: 7.8 MHz
 Adjacent Channel Rejection: Better than 60dB.
 Clarifier Range: AM: ± 800 Hz
 SSB: ± 800 Hz
 Noise Blanker: RF parallel gate type.

P.A. SYSTEM:

Power Output: 3.5 Watts

NOTE: 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 6/10/78)

WARNING

Replacement or substitution of IC's, crystals, transistors, regulator diodes, or any other part of a specialized nature with parts other than those recommended by Craig may cause the operator to be in violation of the Type Acceptance requirements of Part 2 of the Rules.

FCC Rules require that ALL transmitter section adjustments, other than those supplied by Craig as front-panel operating controls, be made by or under the immediate supervision of the holder of an FCC First or Second Class Radio-Telephone Operator's License.

A PRODUCT OF CRAIG CORPORATION

REF. NO.	CRAIG KEY NO.	DESCRIPTION	RET. PRICE	REF. NO.	CRAIG KEY NO.	DESCRIPTION	RET. PRICE
L131				CABINET & CHASSIS			
L231				L231			
1	L131291	Plate Spr, Mtg Bkt	1.10	1	L101028	Control Knob	1.20
2	LA21	Slide Mtg Bkt	13.98	2	L231061	Control Panel	8.35
3	L131707	Insulator, Ext. SP Jack	.25	3	L131431	Rubber Wsh, Control Knob	.25
4	L101369	Coupler, Coaxial ANT. Conn.	2.95	4	L231026	Ass'y Knob, Channel Selector	3.50
5	4101034	Jack, EXT. SP (J1,J2)	1.45	5	L231027	Lens, Channel Selector	.90
6	4102015	PCB, Power Supply Conn.	3.45	6	L231028	Inner Knob, Channel Selector	.80
7	L131396	Bkt, Power SupPly PCB Mtg	.90	7	L101291	Plate Spr, Channel Selector	.25
8	XFU004	Fuse, 4A	.40	8	L231030	Outer Knob, " "	1.00
9	L101800	Fuse Holder	.70	9	L231031	Cap, " "	.25
10	L101052	Slide Rail	.95	10	L231070	Clear Panel, Meter	5.45
11	L131231	Spacer, Slide Rail	.80	11	L231062	Speaker Grille	5.45
12	L131052	Cabinet, Top	6.30	12	L231032	Knob, TIMER SET	1.20
13	NSP	Main PCB	####	13	L231033	Knob, TIME SET	1.20
14	-----	Plastic Pin	.25	14	L231034	Knob, Power SW.	2.05
15	L101621	15P, Digital Display Conn.	2.85	15	L231415	Clock Unit, (GH2-1824)	32.80
16	2SC1014	Transistor (Q801)	1.65	16	L231010	Front Escutcheon	14.00
17	NSP	Rubber Grommet	####	17	L231071	Clear Window, Clock	.95
18	L131517	PCB only, PLL	1.60	18	4101020	5P Fem. Conn., MIC.	4.15
19	L131051	Cover, PLL Cabinet	1.15	19	L231395	Bkt, MIC. Conn. Mtg	.85
20	L131050	Cabinet, PLL PCB	1.90	20	L231607	Headphone Jack	3.75
21	L131430	Rubber Grommet	.25	21	L231570	VR 10k, VOLUME (R501)	1.70
24	-----	Washer, Transistor	.25	22	L131571	VR 10k, CALIBRATE (R131)	1.40
25	2SC1969	Transistor (Q101)	8.70	23	L131571	VR 10k, SQUELCH (R316)	1.40
26	NSP	Heat Sink	####	24	L231571	VR 5k, RF GAIN (R307)	1.80
27	L131620	Antenna Conn.	3.95	25	L231530	Rotary Sw.,METER (S4)	5.00
28	L131201	Chassis, Rear	9.35	26	L231530	Rotary Sw.,ANTENNA (S6)	5.00
29	L131397	Bkt, Ground Conn.	2.75	27	L101531	Rotary Sw.,OFF/ANL/NB (S3)	2.70
30	4102014	6P socket, Power (J3)	2.95	28	L231531	Rotary Sw.,MODE (S1)	5.80
31	2SC1061	Transistor (AM MOD.)	3.60	29	L131570	VR 10k, CLARIFIER (R705)	1.85
32	2SC1014	Transistor (LED Reg.)	1.65	30	L231800	Rubber foot	.40
33	NSP	Heat Sink	####	31	NSP	Chassis, Bottom	####
34	L131706	Insulator, IC	.80	32	L131531	Rotary Sw., CH. Selector(S5)	9.60
35	HAL339A	IC501	6.75	33	NSP	Front Chassis	####
36	NSP	Heat Sink	####	34	L101380	Bkt, Mod. Lamp Holder	.95
37	2SC1449	Transistor (Q103)	1.50	35	L101430	Cushion, CH. Display	.25
38	NSP	Heat Sink	####	36	L231396	Bkt, Digital Display Mtg	.60
39	2SC2146	Transistor (Q102)	3.20	37	L231397	Bkt, Meter Mtg	1.05
40	L131200	Chassis, Front	6.45	38	L231516	PCB only, Digital Display	.75
41	L101552	Meter Lamp,14V85mA(DS701-702)	1.20	39	L231552	LED Indicator (DS803-806)	.85
42	L131570	VR 10k, CLARIFIER (R705)	1.65	40	L231553	Ass'y, Digital CH. Display	26.40
43	L131571	VR 10k, SQUELCH (R316)	1.40	41	L231604	Meter, S/RFO (M2)	8.90
44	L131572	VR 10k, VOLUME (R501)(S7)	2.30	42	L231605	Meter, SWR/CAL (M1)	8.90
45	L131573	VR 10k, CALIBRATE (R131)	4.75	43	L231702	Speaker	4.80
46	L101531	Rotary Sw.,OFF/ANL/NB (S3)	2.30	44	L231550	Meter Lamp, 14V 85mA	1.05
47	L131531	Rotary Sw.,S/RFO CAL/SWR (S4)	2.30	45	L231300	Holder, Meter Lamp	.30
48	L131530	Rotary Sw.,LSB/AM/USB (S1)	4.15	46	L231430	Cushion, Meter	.25
49	L131518	Rotary Sw.,CB/DIM/PA (S2)	4.15	47	NSP	Heat Sink	####
50	L131053	Rotary Sw., CH. Select (S5)	9.60	48	2SD180	Transistor (Q802)	5.00
51	L131518	PCB only, Channel Selector	1.05	49	-----	Washer, Transistor	.25
52	L131801	Cabinet, Bottom	6.75	50	L231517	PCB only, Channel Selector	1.25
53	L131702	Speaker screen	.40	51	NSP	Chassis, Right side	####
54	L101550	Speaker	4.50	52	NSP	Heat Sink	####
55	L101380	Mod. Lamp, 6V60mA(DS801,802)	1.50	53	NSP	Heat Sink	####
56	L101551	Bkt, Mod. Lamp Mtg	.95	54	2SC1449	Transistor (Q103)	1.50
57	L131604	Ass'y, Digital CH. Display	16.95	55	NSP	Heat Sink	####
58	L131709	Meter, S/CAL/SWR (M1)	8.50	56	HAL339A	IC501	6.75
59	L131395	Insulator, Digital Display	.25	57	2SC1014	Transistor (LED REG)	1.65
60	L131431	Bkt, Digital Display Mtg	1.10	58	L131519	PCB only, MIC. AMP.	.55
61	L101430	Rubber Wsh, Control Sw.	.25	59	NSP	Sealing Flate	####
62	L131708	Cushion, Mod. Meter	.30	60	L231630	Terminal Strip, 3L3	.81
63	L131432	Insulator, MIC. Conn.	.25	61	L231398	Bkt, Front Panel Mtg	2.65
64	L131010	Rubber Cushion	.30	62	L231399	Bkt, Clock Mtg	.60
65	L101086	Front Escutcheon	7.35	63	4350078	AC Power Receptacle	1.60
66	L131070	Gray Filter, Digital Display	.30	64	NSP	Chassis, Power Supply	####
67	L131061	Clear Window, Meter	1.60	65	L231551	Clock Lamp, 14V (DS812,813)	1.60
68	L131061	Decoration Panel	3.35	66	L231400	Bkt, Lamp Mtg	.55
69	L101026	Cap, CH. Selector Knob		67	L231508	Transformer, Power Supply	29.00
70	L101026	Outer Knob, CH. Selector		68	L231518	PCB only, Power Supply	1.25
71	L101026	Plate Spring, " "	-2.30	69	KBLO2	Bridge Diode (CR805)	5.20
72	L101026	Inner Knob, " "		70	NSP	Heat Sink	####
73	L101026	Lens, " "		71	L231608	DC Terminal (Red)	2.35
74	L131026	Calibrate Knob	1.60	72	L231609	DC Terminal (Black)	2.35
75	L101028	Control Knob	.95	73	4350017	Coaxial ANT. Socket	3.95
76	-----	Scr, M4x6	.25	74	L231401	Bkt, Ground Conn.	1.05
77	-----	Spr Wsh, M4	.25	75	2SC1061	Transistor (AM MOD.)	3.60
78	-----	Tap tight, M3x6	.25	76	2SC1969	Transistor (Q101)	8.70
79	-----	Tap Scr, M3x6	.25	77	2SC2146	Transistor (Q102)	3.20
80	-----	Tap Scr, M3x6 Black	.25	78	NSP	Heat Sink	####
81	-----	Self Tap Scr, M3x8	.25	79	L231610	Rear Chassis	####
82	-----	Washer, M3	.25	80	NSP	Ext SP & EP Jack	.65
83	-----	Self Tap Scr, M3x8	.25	81	NSP	Heat Sink	####
84	-----	Scr, M3x6	.25	82	-----	Wsh, Ext SP Jack	.25
85	-----	Nut, M3	.25	83	L231381	Fuse Holder	2.10
86	-----	Self Tap Scr, M3x6	.25	84	L231631	Terminal Strip, 2L2	.60
87	-----	Scr, M3x6	.25	85	L231601	Capacitor, Power Supply(C803)	3.10
88	-----	Tripple, M3x6	.25	86	L131051	Cover, PLL Cabinet	1.15
89	-----			87	L131517	PCB only, PLL	1.60
90	-----			88	L131050	PLL Cabinet	1.90
91	-----			89	L131430	Rubber Grommet	.25
92	-----			90	NSP	Rubber Grommet	####
93	-----			91	NSP	Bkt, Main PCB Mtg	####
94	-----			92	NSP	Main PCB	####
95	-----			93	L231382	Cap, Wood Panel	.40
96	-----			94	L231063	Wood Panel, Right Side	9.40
97	-----	Twist Nut	.25	95	L231064	Wood Panel, Left Side	9.40
98	-----	Scr, M3x10	.25	96	L101550	Mod. Lamp, 6V 60mA	1.50
99	-----	Scr, M3x20 (Black)	.25	97	L231050	Upper Cabinet	11.45

NOTE: NSP/Non-Serviceable Part

REF. NO.	CRAIG KEY NO.	DESCRIPTION	RET. PRICE	REF. NO.	CRAIG KEY NO.	DESCRIPTION	RET. PRICE
L131				MISCELLANEOUS ELECTRICAL			
L231				L231			
DS701	L101621	15P, Digital Display Conn.	2.85	Y1	4350080	AC Cord	3.00
DS702	XFU004	Fuse, 4A	.40	Y401	L231722	Crystal, 10.000MHz	7.90
DS801	L101552	Meter Lamp, 14V 60mA	1.20	L131723	L131723	Crystal, 7.8015MHz	7.90
DS802	L101550	Mod. Lamp, 6V 60mA	1.50	L131670	L131670	Crystal Filter	43.20
J3	4102014	6P, Power Supply Conn.	2.95	XFU231	XFU231	Fuse w/Lead, 1A	1.25
J601	4101020	5P, Microphone Conn.	4.15	XFU004	XFU004	Fuse, 4A	.40
J1,J2	4101034	Earphone Jack, Ext. SP	1.45	L101020	L101020	5P Female Conn., MIC.	4.15
S1,S2	L131530	Rotary Sw., LSB/AM,CB/DIM	4.15	L231607	L231607	Headphone Jack	3.75
S3,S4	L101531	Rotary Sw., OFF/ANL,S/RFO	2.30	L231610	L231610	Earphone Jack, Ext. SP	.65
S5	L131531	Rotary Sw., Channel Select	9.60	DS801	]-L101550	Mod. Lamp, 6V 60mA	1.50
M1	L131604	Meter, S/CAL/SWR	8.50	DS802			1.50
DS1,DS2	L101551	Ass'y, DIGITAL DISPLAY	8.50	DS807			1.05
Y1	L131722	Crystal, 10.000MHz	7.90	DS808	]-L231550	Meter Lamp, 14V 85mA	1.05
Y401	L131723	Crystal, 7.8015MHz	7.90	DS809			1.05
FL201	L131670	Crystal Filter	43.20	DS810			1.60
R131,S6	L131573	VR 10k, CALIBRATE&LOC/DX	4.75	DS812	]-L231551	Clock Lamp, 14V	1.60
R316	L131571	VR 10k, SQUELCH	1.40	DS813			1.60
R501,S7	L131572	VR 10k, VOLUME& Power	2.30	R501	L231570	VR 10k, VOLUME	1.70
R705	L131570	VR 10k, CLARIFIER	1.65	R131	]-L131571	VR 10k, CAL. or SQUELCH	1.40
L701	L131688	RELAY (K1-K4) (-02-NE)	8.80	R316			1.40
	4101100	5P Mic. Plug	4.95	R307		VR 5k, RF GAIN	1.80
TRANSFORMERS (L131 & L231)				S1	L231571	Rotary Sw., MODE	5.80
T1,104	L131641	Transformer (Z177ZT)	1.50	S3	L101531	Rotary Sw., OFF/ANL/NB	2.70
T103	L131642	" (C181ZT)	1.50	S5	L131531	Rotary Sw., CH. Selector	9.60
T102	L131643	" (C182ZT)	1.50	S4	]-L231530	Rotary Sw., METER or ANT.	5.00
T203,204,205	L131644	" (S183AT)	1.50	S6			5.00
T202	L131645	" (S187AT)	1.50	M1	L231605	Meter, SWR/CAL	8.90
T206	L131646	" (S190AT)	1.50	M2	L231604	Meter, S/RFO	8.90
T201	L131647	" (C365ZT)	1.50	DS803	]-L231552	LED, LSB/AM/USB/PA Ind.	.85
T101	L131648	" (CO42DD)	1.00	DS804			.85
T302,303	L131649	" (C196AT)	1.60	DS805			.85
T301	L131650	" (C1931T)	1.50	DS806			.85
T501	L131651	AF ODT (L75)	4.90	DS1,DS2	L231553	Ass'y, DIGITAL DISPLAY	26.40
T701	L131652	AF Choke (K18)	1.80	R705	L131570	VR 10k, CLARIFIER	1.85
T800	L231508	Transformer, Power	29.00	L701	L131688	RELAY (K1-K4) (-02-NE)	8.80
I.C. (L131 & L231)				L115	L231670	RELAY, Antenna Select	5.25
IC1	78L62AWC	I.C., PLL	2.80	S7	L231532	Switch, Power Supply	1.50
IC2	NDC40013	I.C., PLL	23.75	COILS & FILTERS (L131 & L231)			
IC51	MC3340	I.C., Mic.	5.35	C803	L231601	Cap, Power Supply	3.10
IC301	UA703	I.C.	3.50	L1	L101671	Choke Coil, 100uH	.60
IC401	SL1640C	I.C.	7.05	L2,405	L131685	" " 150uH	.50
IC501	HA1339A	I.C.	6.75	L3	L131671	RF Coil (Z368NG)	1.10
IC601	TA7063P	I.C.	4.20	L4	L101673	RF Coil (C354NZ)	1.45
DIODES (L131 & L231)				L5	L131672	RF Coil (Y369N)	1.45
CR51,105,110,204,207,208,209,210,211,212,302,303,307,311,801,802	1N60	Diode	.45	L6	L131674	RF Coil (Y370NT)	1.50
CR213,304	1N34A	Diode	.60	L101	L131682	HF Choke, 0.85uH	.50
CR4	1S2688	"	1.25	L102,107	L131680	HF Choke, 0.22uH	.50
CR101,102	1N60P	"	.50	L103,104	L131683	HF Choke, 22uH	.65
CR201,202	1S1007S	"	1.00	L105	L131679	RF Coil (C997ND)	.40
CR106,107,108	1S990S	"	.45	L106	L101675	RF Coil (CO43NG)	1.10
CR1	1S990A	"	.45	L108	L131684	Choke Coil, 1.2uH	.60
CR702,703,704	MV201	"	1.40	L109	L131678	RF Coil (C996NM)	1.20
CR803*,804*	BB142	"	1.40	L110,112	L131681	HF Choke, 0.65uH	.50
CR103,104	BZ090	"	1.50	L111	L131677	RF Coil (C979NT)	.40
CR203	1N4739A	"	1.50	L113	L131676	RF Coil (Z838N)	1.40
CR701	BZ075	"	1.45	L114	L131675	RF Coil (Z392N)	1.50
CR805*	10D4	"	.60	L115*	L231670	Relay, Antenna Select	5.25
CR2,3,109,111,112,205,214,215,308,309,310,405,406,407,501,602,603,604,605,606,607,705,706,707,708,709,710,711,712	1N4448	Diode	.50	L201,401,403,404	L101674	Choke Coil, 22uH	.50
TRANSISTORS (L131 & L231)				L301,303	L131686	Choke Coil, 470uH	.50
Q1,2,3,5,7,8,9,10,106,201,204,205,206,207,208,209,210,211,401,402,403,404	2SC710	Transistor (NPN)	1.15	L302	L131687	AF Choke (K-69)	1.60
Q701,801	2SC1014	Transistor (NPN)	1.65	L404	L131673	RF Coil (Y372NT)	1.50
Q503,803*	2SC1061	" (")	3.60	L701	L131688	Relay (K1-K4)	8.80
Q103	2SC1449	" (")	1.50	FL201	L131670	CRYSTAL FILTER	43.20
Q104	JSP7001	" (")	1.85	C415,101	L131689	Trimmer, 10pF	1.00
Q101	2SC1969	" (")	8.70	RA1,RA2	L231590	Array Res, 220 Ohm	1.25
Q304,501,502	2SC1307	" (")	.80	TRANSISTORS (L131 & L231)			
Q102	2SC1740	" (")	3.20	Q1,2,3,5,7,8,9,10,106,201,204,205,206,207,208,209,210,211,401,402,403,404	2SC710	Transistor (NPN)	1.15
Q202,804*	2SC2146	" (")	6.90	Q701,801	2SC1014	Transistor (NPN)	1.65
Q802*	2SC1306	" (")	5.00	Q503,803*	2SC1061	" (")	3.60
Q4,305	2SK19Y	" (FET)	1.05	Q103	2SC1449	" (")	1.50
Q303	2SD180	" (NPN)	1.70	Q104	JSP7001	" (")	1.85
Q6,105,203	2SA844C	" (PNP)	1.75	Q101	2SC1969	" (")	8.70
Q301,302	2SK34E	" (FET)	3.00	Q304,501,502	2SC1307	" (")	.80
Q51	3SK41	" (")	1.60	Q102	2SC1740	" (")	3.20
	3SK45B	" (")	3.00	Q202,804*	2SC2146	" (")	6.90
	2SK55D	" (")	1.60	Q802*	2SC1306	" (")	5.00
	2SK40C	" (")	1.50	Q4,305	2SK19Y	" (FET)	1.05

REF. NO.	DESCRIPTION	REF. NO.	DESCRIPTION
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RESISTORS (L131 & L231)

R901,902,903,904 R712,713,714,715, 716,717 718.	Carbon, 22 Ohm, 1/8w	R221,225,231,236, 406,502.	Carbon, 15k Ohm, 1/2w
R113,606	Carbon, 56 " "	R26,33,409,509	" 22k " "
R103,612	" 470 " "	R243,246,319,407.	" 33k " "
R101A,101B	" 1k " "	R253,607	" 39k " "
R118	" 3.3k " "	R14,31,123,212	" 47k " "
R216	" 10 " 1/2w	R20,318,417	" 56k " "
R206	" 22 " "	R18,21,22,38,126, 202,205,311,609	" 100k " "
R1,119,124	" 33 " "	R303,402	" 220k " "
R110	" 47 " "	R314	" 470k " "
R17,23,28,209,51 222,228,317.	" 100 " "	R204,304,306,602	" 1M " "
R214	" 200 " "	R115	Solid, 2.2 Ohm, 1/2w
R6	" 22 " "	R116	" 3.3 " "
R307,512	" 270 " "	R515	" 10 " "
R9,27,227,403, 710	" 330 " "	R109	" 22 " "
R223,413	" 390 " "	R113	" 47 " "
R12,13,120,122, 203,207,211,215, 219,224,238,405, 606.	Carbon, 470 Ohm, 1/2w	R513,514	" 56 " "
R8,15,16,24,29,32 34,37,105,119, 129,208,117,213, 234,245,251,305, 312,320,408,504, 506,507.	Carbon, 1k Ohm, 1/2w	R112	" 330 " "
R11 232,611,614	Carbon, 1.5k " "	R114,405	" 470 " "
R513	" 1.8k " "	R804	" 1M " "
R250,329,604	" 2.2k " "	R309,605	Semi-fixed, 5k Ohm, 50¢
R121,226,306,404	" 2.7k " "	R315	" 10k " 50¢
R2,10,210,218, 220,230,233,237, 310 411,412,515, 610,615,704	Carbon, 3.3k " "	R229	" 20k " 50¢
R5,12,25,132,235, 401,503,510,511	" 4.7k " "	R106,240,414	" 100k " 50¢
R36	" 5.6k " "	R711	" 500 " 50¢
R30,35,242,707	" 6.8k " "	R130,401,706	" 10k " 60¢
R7,19,125,127,201 241 244,247,248, 249,252,254,410, 416,603,608,802.	Carbon, 10k Ohm, 1/2w	R107	Oxide Film, 150 Ohm, 2w
		R702**,708**	" 330 " 1w
		R702*,708*	" 33 " 2w
		R108,111	" 200 " 2w
		R701,703	" 56 " 2w
		R709	Wire Wound, 150 Ohm, 2w 60¢
		RA1,RA2	Array Res, 220 " \$1.25
		R3	Solid, 10k " 1/8w
		R4	" 47k " "
		R405	" 470 " 1/2w
		R116	" 3.3 " "
		R110	" 4.7 " "
		R254	" 10 " "
		R38,415	" 100k " "
		R131	VR 10k, CALIBRATE (see MISC)
		P316	VR 10k, SQUELCH (")
		R307**	VR 5k, RF GAIN (")
		R501	VR 10k, VOLUME (")

CAPACITORS (L131 & L231)

C240	Mica, 1pF/50V	C25,28,29,33,201, 218,219,238,251, 256,259,309,314, 406,601,603,610, 617,619,711,712, 713,714,715,806.	Ceramic, 0.001uF/50V
C21,301	" 1.5pF/50V	C3,4,10,13,26,27, 30,35,36,52,53, 102,103,105,106, 109,111,116,117, 121,123,126,127, 128,129,130,133, 134,137,144,146, 147,204,207,209, 211,212,225,243, 249,255,257,302, 303,311,312,314, 317,402,403,404, 413,417,418,504, 507,511,515,518, 519,526,602,606, 608,706,707,710, 809,810,811,812, 813,814,815.	Ceramic, 0.01uF/50V
C9,108	" 2pF/50V	C716,807,808,255	Ceramic, 0.047uF/50V
C205,206,208	" 3pF/50V	C804,805	" 0.0022uF/150V, 50¢
C233,236	" 4.7pF/50V, 50¢	C701	Feed Thru, 1000pF/500V, 50¢
C17,26	" 5pF/50V	C51	Mylar, 0.01uF/50V
C210	" 8pF/50V	C55	" 0.01uF/50V
C114,408,409	" 10pF/50V	C55	" 0.02uF/50V
C11,136,307,407	" 15pF/50V, 50¢	C514	" 0.03uF/50V
C140,216,224,305	" 20pF/50V	C1,15,22,147,220, 217,220,222,223, 226,227,228,229, 230,231,232,234, 235,239,244,245, 246,253,260,261, 262,411,414,419, 508,520,708,817, 818.	Mylar, 0.04uF/50V
C125,138,202	" 30pF/50V	C243,313,506,516	Mylar, 0.1uF/50V
C145,213	" 47pF/50V, 55¢	C507	" 0.005uF/50V
C6,12,150,308	" 56pF/50V	C110,139,159,221, 241,247,250,253, 254,258,310,315, 401,502,605,612, 613,615,616.	Electrolytic, 1uF/50V
C120,143	" 60pF/50V	C803**	Electrolytic, 3300uF/35V Power Supply \$3.10
C104	" 65pF/50V		
C153	" 85pF/50V		
C7,23,24,113,135 151,152,242	" 100pF/50V		
C512	" 120pF/50V, 60¢		
C32,107,124	" 150pF/50V		
C119,141	" 170pF/50V		
C410	" 180pF/50V		
C131	" 220pF/50V, 75¢		
C270	" 270pF/50V, 30¢		
C510	" 300pF/50V, 30¢		
C31	" 330pF/50V, 30¢		
C112,412	" 550pF/50V, 35¢		
C143	CX Condenser, 62pF		
C416	Ceramic, 5pF/50V		
C34	" 22pF/50V		
C14	" 30pF/50V		
C8	" 47pF/50V		
C203,252,316,607	Electrolytic, 4.7uF/25V		
C5,148,248,515, 609,618,801,816	" 10uF/16V		
C56,316	" 2.2uF/25V		
C118,214	" 22uF/16V		
C57,509,521,611	" 47uF/16V		
C122,503	" 100uF/16V,\$1.0		
C2,513,517,703, 704,705	" 220uF/16V, 40¢		
C523,709,802	" 470uF/16V, 70¢		
C702*	" 2200uF/16V,\$2.0		
C16	Aluminium, 0.22uF/16V, 40¢		
C18,501	Tantalum, 0.22uF/35V, 40¢		
C19	" 1uF/25V, 40¢		
C604,615	" 10uF/10V, 90¢		
C101,415	Trimmer,10pF (see CHOKE)		
C132	Gimic, 1pF/50V \$1.00		

L231 - CABINET & CHASSIS

PACKAGING

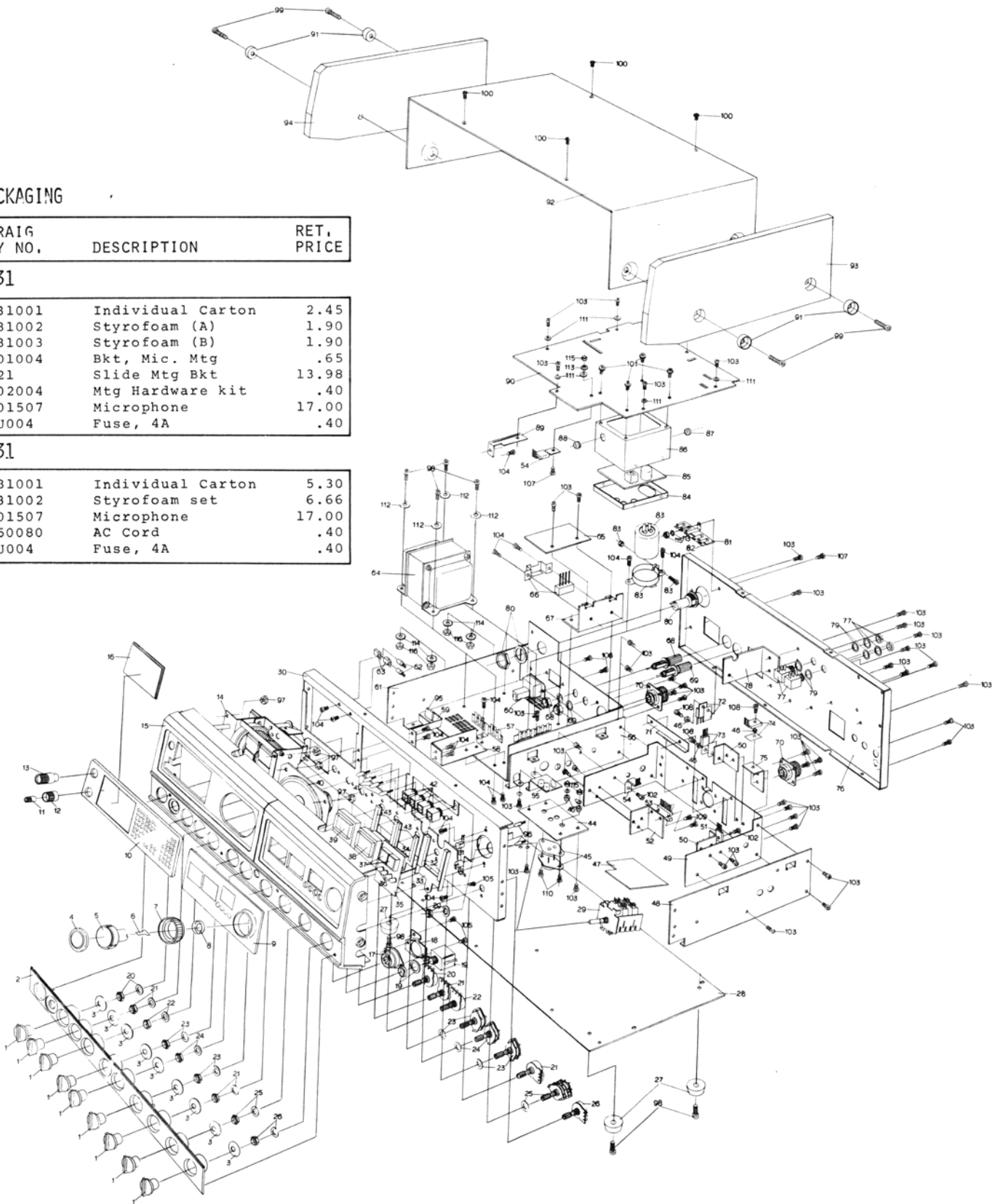
CRAIG KEY NO.	DESCRIPTION	RET. PRICE
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L131

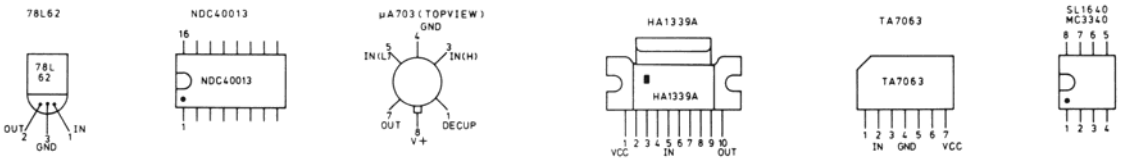
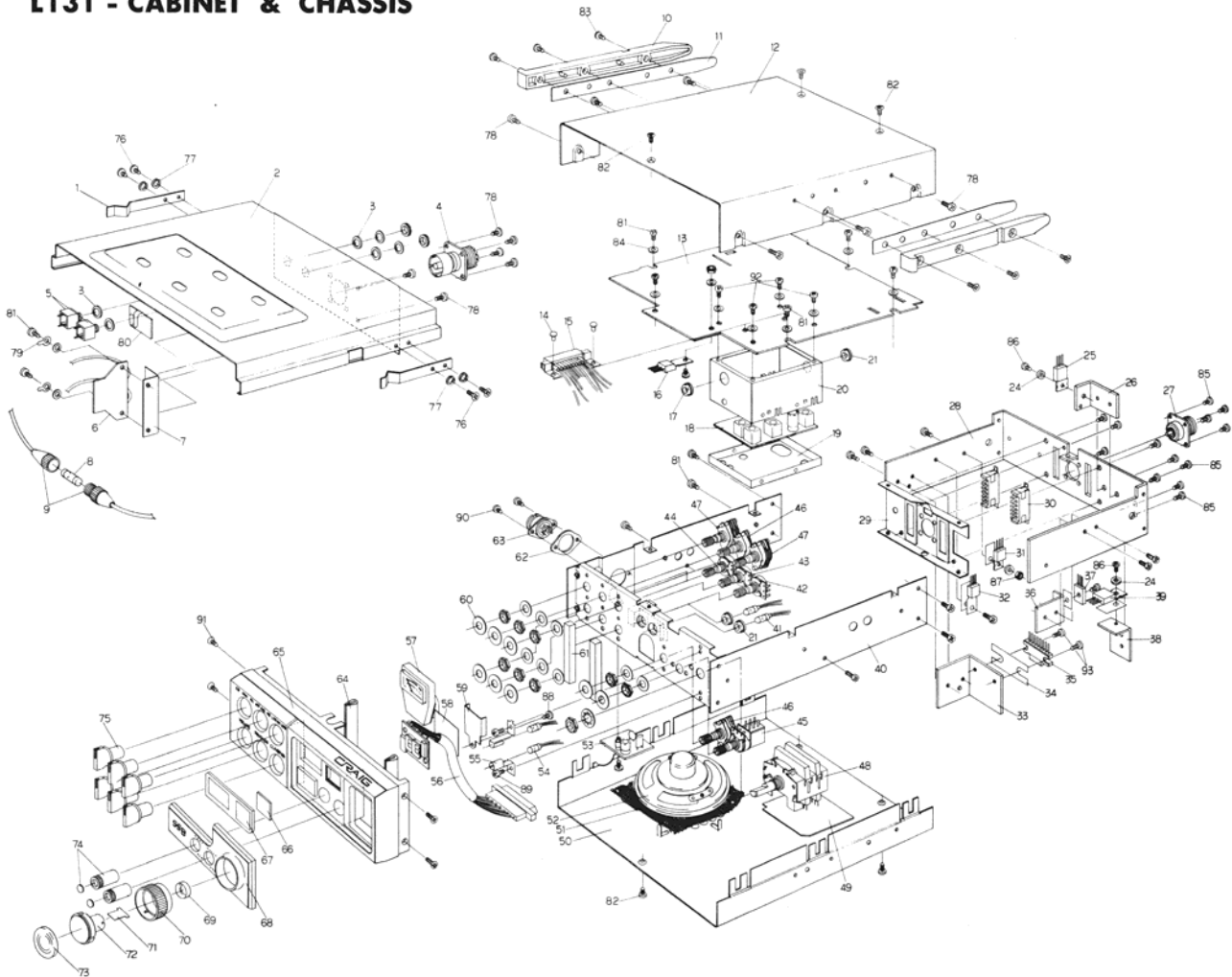
L131001	Individual Carton	2.45
L131002	Styrofoam (A)	1.90
L131003	Styrofoam (B)	1.90
4101004	Bkt, Mic. Mtg	.65
LA21	Slide Mtg Bkt	13.98
L102004	Mtg Hardware kit	.40
L101507	Microphone	17.00
XFU004	Fuse, 4A	.40

L231

L231001	Individual Carton	5.30
L231002	Styrofoam set	6.66
L101507	Microphone	17.00
4350080	AC Cord	.40
XFU004	Fuse, 4A	.40

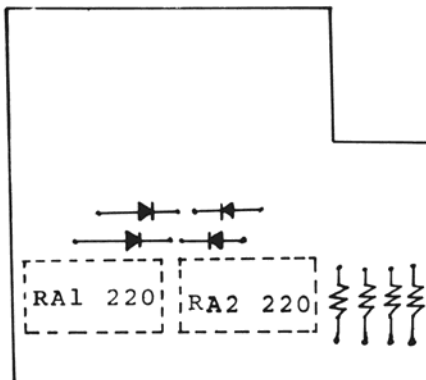


L131 - CABINET & CHASSIS

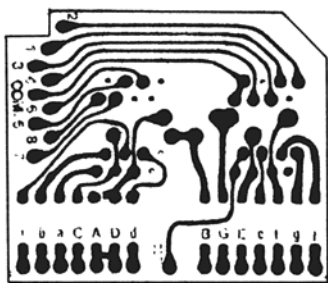


L231 - CH. SELECTOR PCB

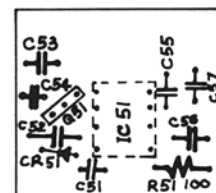
CR705-708 1N4448



L131 - CH. SELECTOR PCB



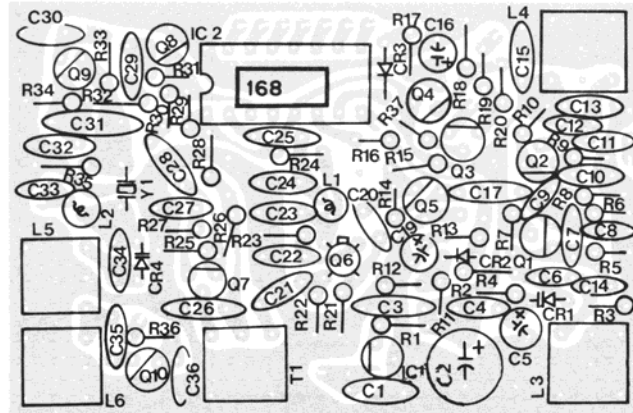
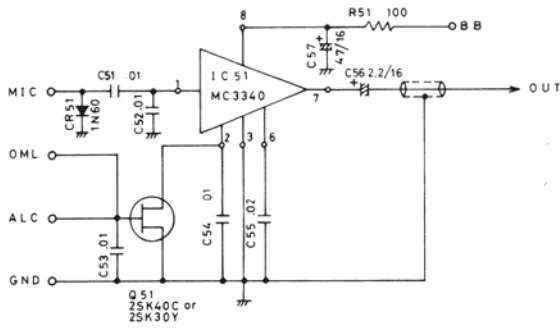
MIC. AMP. PCB



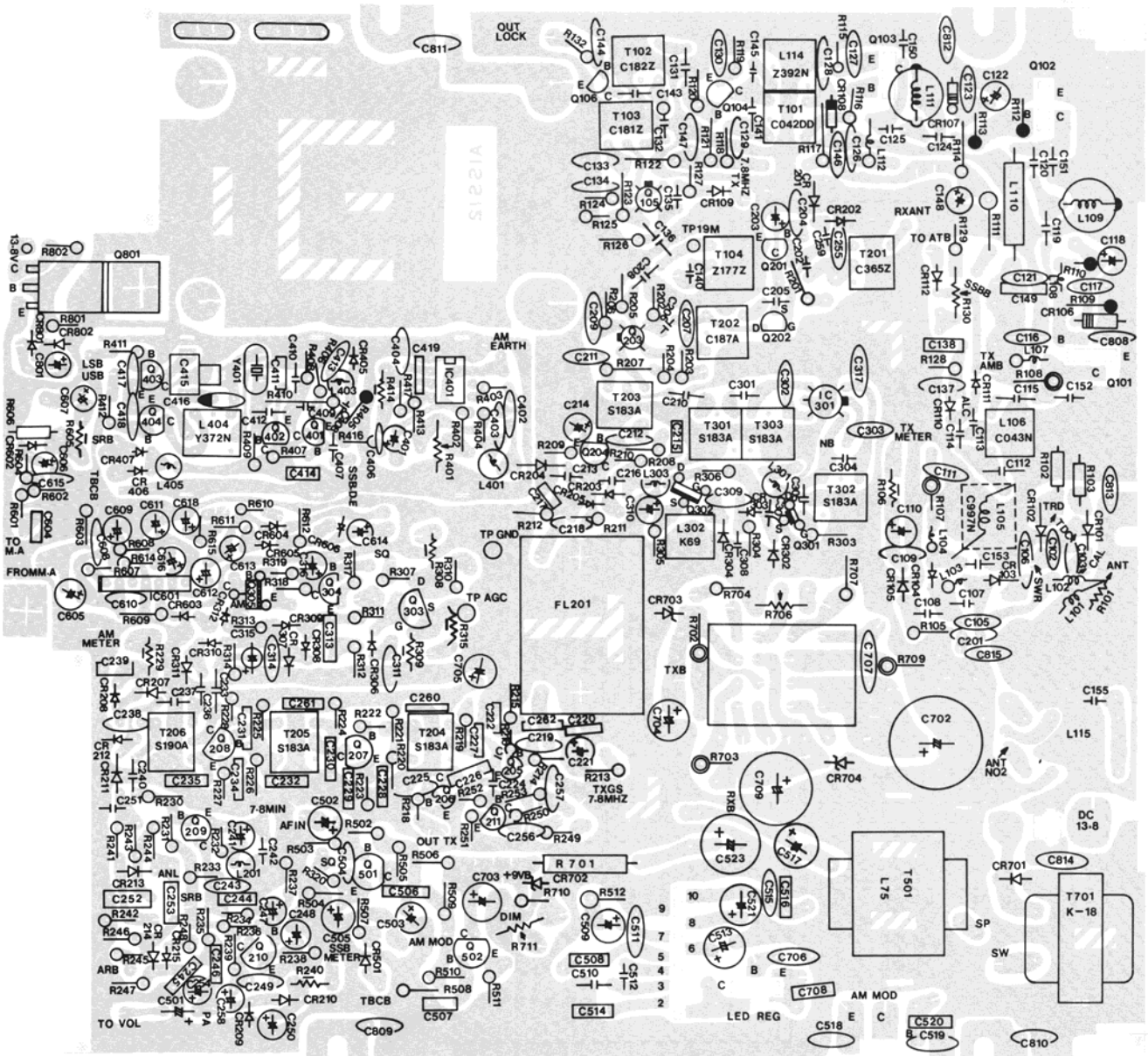
R901-904 220

PLL PCB LAYOUT

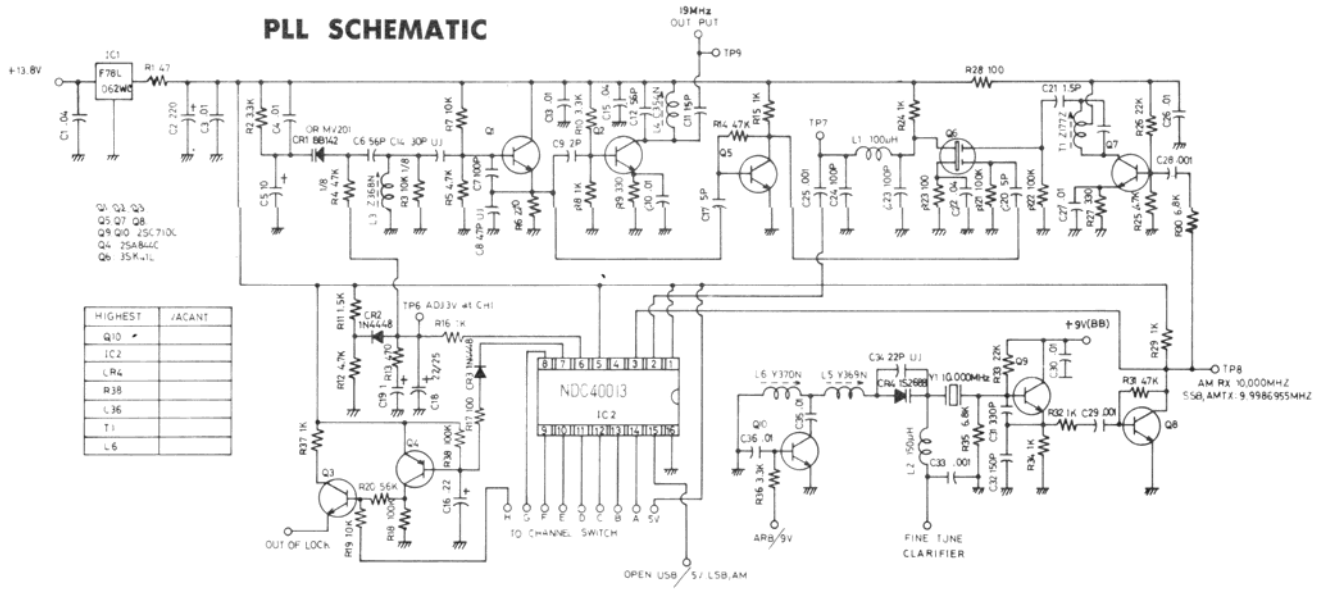
MIC. AMP. SCHEMATIC



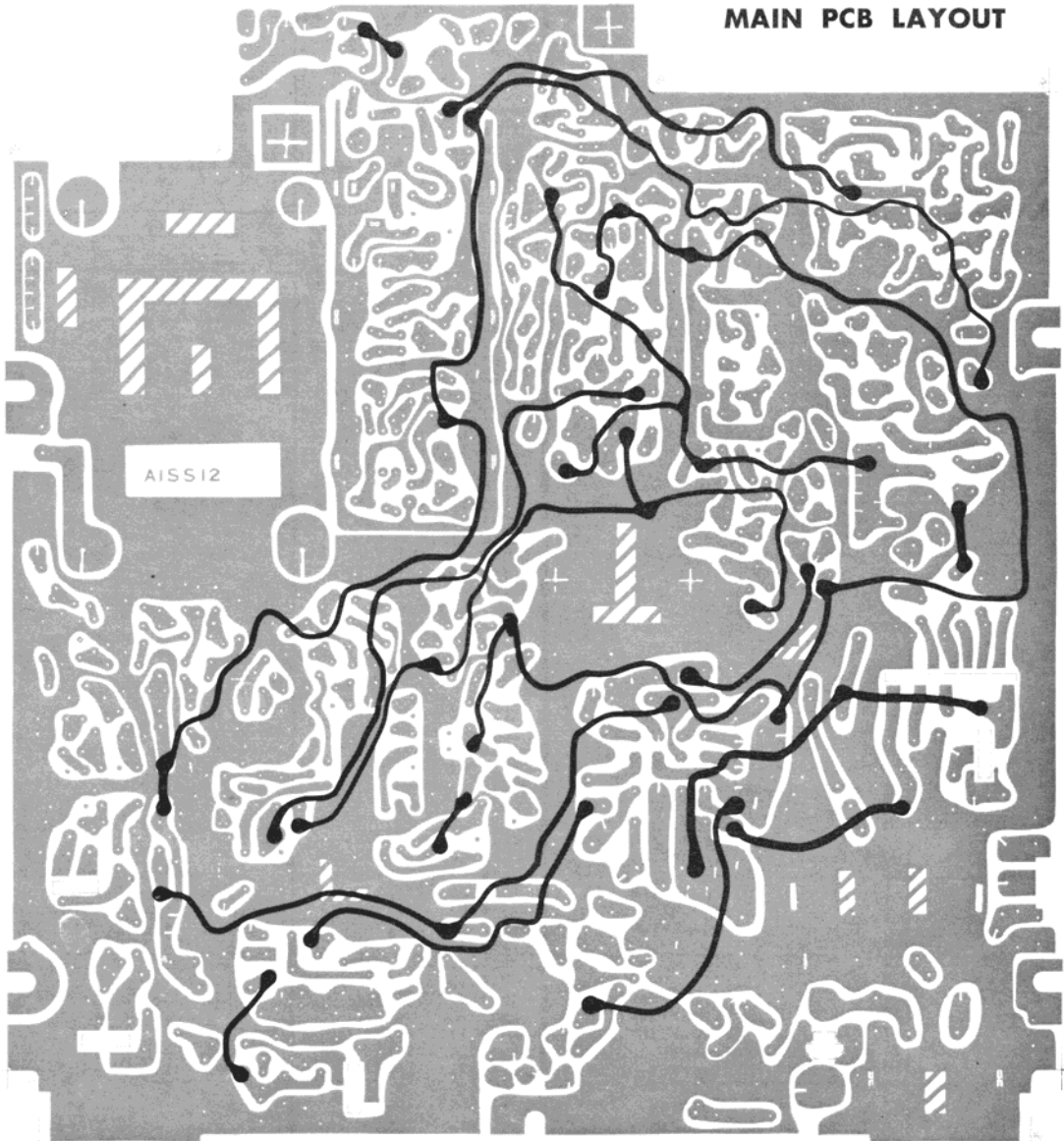
MAIN PCB LAYOUT



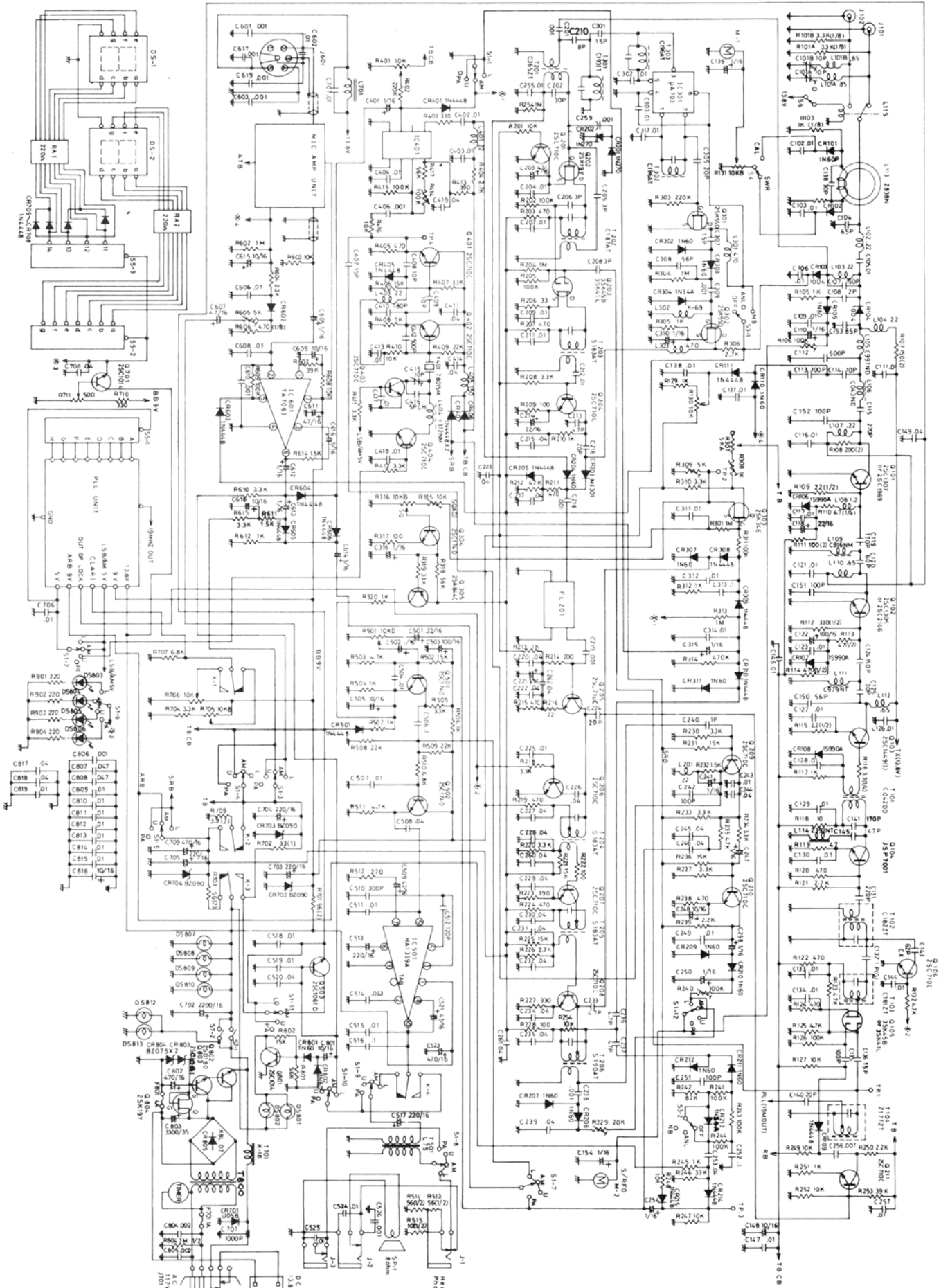
PLL SCHEMATIC

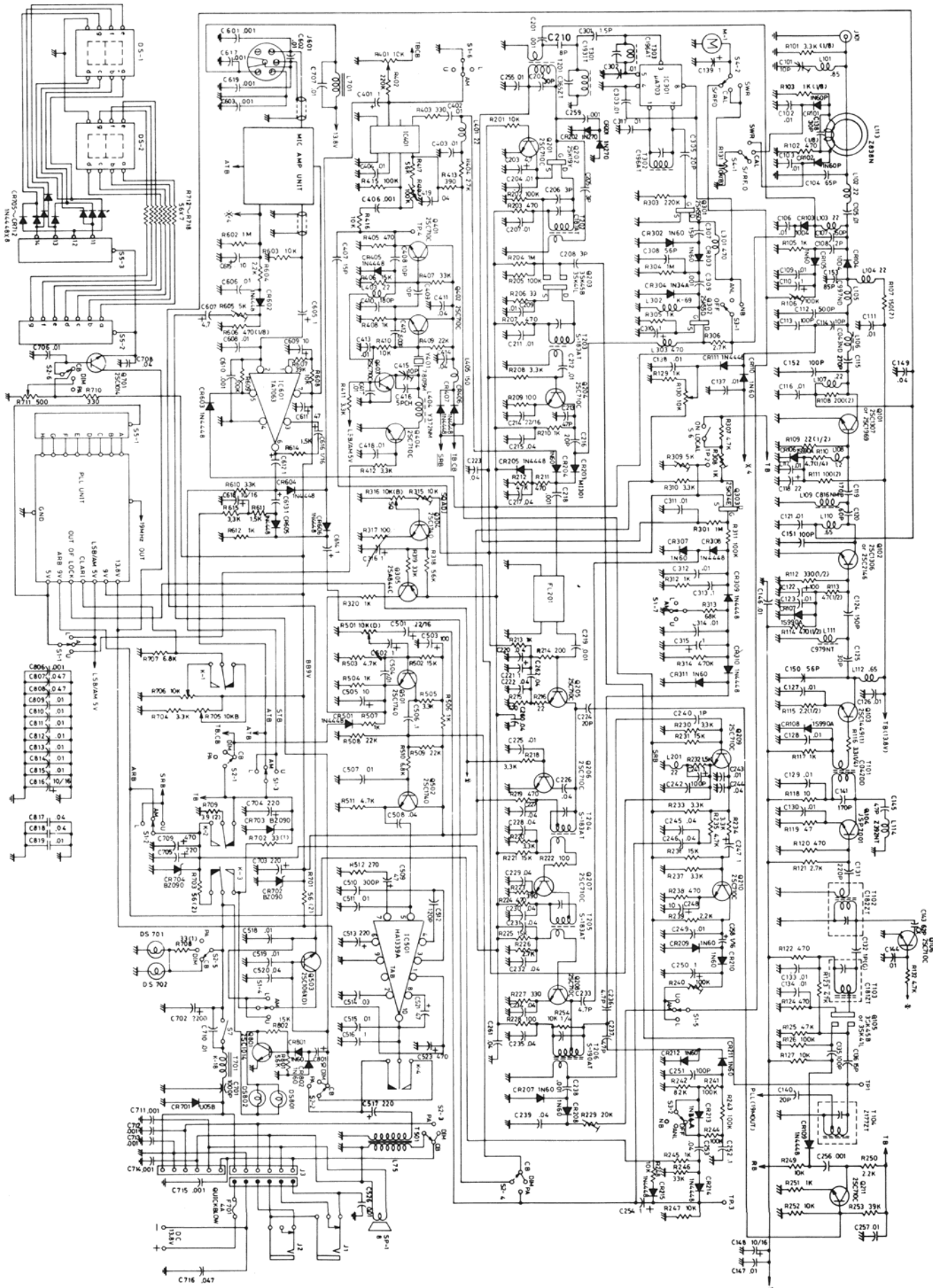


MAIN PCB LAYOUT



1231 - SCHEMATIC DIAGRAM





L131 - SCHEMATIC DIAGRAM

VOLTAGE CHART

I.C

NOTES: 1) CHANNEL: 19
 2) MODE: AM
 3) RF GAIN: Fully Clockwise

4) OFF/ANL/NB: OFF
 5) SQUELCH: NO Squelch
 6) PLL: RECEIVE Mode Only.

SYMBOL	PIN#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC1 (PLL)		14	6.3	0													
IC2 (PLL)		5.2	2.2	2	1.1	5.2	2.7	5.2	0	5.2	5.2	5.2	5.2	0	5.2	5.2	0
IC301	RX	0	0	0	0	0	0	0	0	0	0						
IC401	TX	0	2.14	2.18	4.8	3.88	4.7	0	0								
	RX	0	0	0	0	0	0.06	0	0								
IC501		14	1.27	8.3	1.35	3.3	3.9	3.3	13	0	6.9						
IC601	TX	1.2	.5	.05	0	.66	6.8	9.4									
	RX	.4	1	.35	0	8.66	8.5	9.4									
MC3340 (Mic.)		1.35	.33	0	0	0	5.6	4.9	8.75								

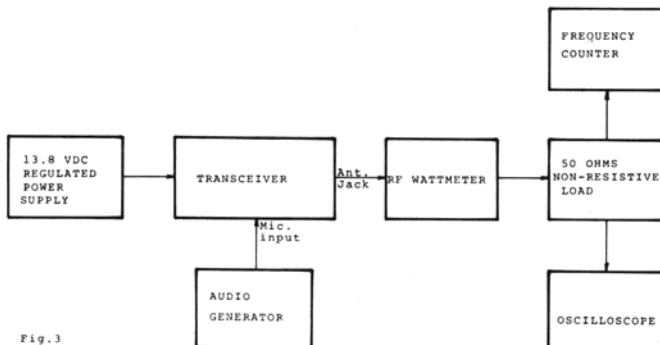
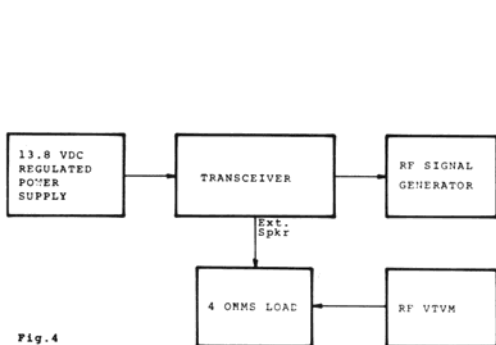
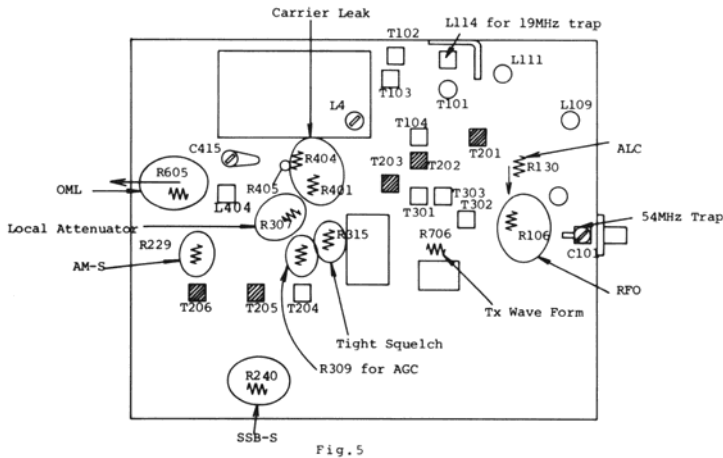
F.E.T

SYMBOL	TRANSMIT			RECEIVE		
	G	D	S	G	D	S
Q6 (PLL)	∅	∅	∅	1.0/2.0 2.5/.24	0	0
Q51 (MIC.)	.2	.25	0	0	.33	0
Q105	6.15/.25	1	0	0 / 0	0	0
Q202	.4	.42	0	.16	8.1	.12
Q203	.01/.13	.02	0	.26	.83	0
Q301	.65	.09	.05	0	0	0
Q302	.06	.2	.02	0	6.37	.95
Q303	.23	5.36	1.58	0	2.3	1.48
Q804	15.4	18.8	15.4	∅	∅	∅

TRANSISTORS

SYMBOL	TRANSMIT			RECEIVE		
	B	C	E	B	C	E
Q1	∅	∅	∅	1.4	5.2	.9
Q2	∅	∅	∅	1.15	5.2	.5
Q3	∅	∅	∅	0	5.2	.4
Q4	∅	∅	∅	5	0	5.2
Q5	∅	∅	∅	.66	1.9	0
Q7	∅	∅	∅	.85	4.65	.35
Q8	∅	∅	∅	0	2	.36
Q9	∅	∅	∅	2.15	9.4	1.8
Q10	∅	∅	∅	.7	0	0
Q101	2.25	6*	0	0	0	0
Q102	0	6*	0	0	0	0
Q103	.74	13.75*	.15	0	0	0
Q201	.22	0	0	.68	.13	0
Q204	.6	.06	0	1.3	2.98	.6
Q205	1.56	8.5	1	1.45	8.68	.79
Q206	0	0	0	0	0	0
Q207	-.02	.25	0	1.59	8.2	.91
Q208	0	.25	0	1.36	9.11	.68
Q209	0	0	0	0	0	0
Q210	0	0	0	0	0	0
Q211	1.79	6.8	1.45	0	0	0
Q304	0	2.3	0	0	9.28	0
Q305	3.58	4.15	.25	9.25	1.2	9.3
Q401	2.35	8.65	1.85	0	0	0
Q402	0	8.6	2.46	0	0	0
Q403	.65	0	0	.7	0	0
Q404	0	0	0	0	0	0
Q501	2	8.95	4.25	1.8	3.7	1.22
Q502	4.74	9.4	4.15	4.75	9.45	4.18
Q503	7	13.9	6.23	.25	.03	.03
Q801	5.4	13.96	4.73	5.34	14.16	4.66
Q802	-	-	-	14.87	18.8	14.21
Q803	-	-	-	15.4	14.8	14.87

NOTE: (∅): PLL in RECEIVE only.
 (*): Measure OFF side RF Choke.



ALIGNMENT PROCEDURES

EQUIPMENT REQUIRED:

- 1) 12.0 VDC Regulated
- 2) R.F. WATTMETER
- 3) V.T.V.M.
- 4) R.F. SIGNAL GENERATOR
- 5) FREQUENCY COUNTER
- 6) OSCILLOSCOPE
- 7) A.F. SIGNAL GENERATOR
- 8) 50 Ohms DUMMY LOAD

NOTES:

- 1) WARM UP THE UNIT AND TEST EQUIPMENT AT LEAST 15 MINUTES BEFORE STARTING ALIGNMENT.
- 2) NON-METALIC TOOLS SHOULD BE USED FOR ALL ADJUSTMENT
- 3) COUPLING TO FREQUENCY COUNTER SHOULD BE AS LOOSE AS POSSIBLE.

STEP	CIRCUIT	INPUT SIGNAL	OUTPUT INDICATOR	CHANNEL SELECTOR	ADJUST	ADJUST FOR	SET MODE SWITCH TO	REM.
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PLL

1	20MHz Doubler	NO SIGNAL RX CONDITION see Fig.2	Connect Scope to TP7.	19	T-1	MAXIMUM	AM	
2	VCO BIAS		Connect VTVM to TP6.	1	L-3	3.0 VDC		
3	FREQUENCY		Connect Frequency-Counter to TP9.	18	L-5	19.37510 MHz		
4					L-6	19.37260 MHz	LSB	
5					NO ADJUST	Check for 19.37760 MHz	USB	

TRANSMITTER

1	CARRIER FREQUENCY	NO SIGNAL RX CONDITION	Connect Frequency-Counter to R405.		C415	7.80240 MHz	LSB	
2					L404	7.79740 MHz	USB	
3	TRANSMITTER POWER OUTPUT.	Connect A.F. Generator to Mic. input set at 2500Hz. Set A.F.Lever for Max. output w/o saturating.	Connect R.F.Watt-Meter to Antenna connector. as shown in Fig.3	20	L4,106 L109 L111 T101 T102 T103 T104 T204	MAXIMUM POWER OUTPUT	LSB	Turn R130 & R605 toward as shown in Fig.5
3A						T101 L106,109 L111	MAXIMUM POWER OUTPUT & READJUST for 12W		AM	This step is repeat of step 3
4	TRANSMIT FREQUENCY	Adjust Audio signal to Mic., at 2500Hz for 50% Mod. as shown in Fig.1 Increase Mic. input by 16dB.	As above & Connect Frequency Counter to R.F. Output.	1	R706	27.2050 MHz	AM	
5	AM OUTPUT POWER				L109 Clockwise	3.80 Watts R.F.Output		
6					R605	85% Modulation		
7	R.F.O METER	No Modulation			R106	"RFO-4" on RFO-METER		

RECEIVER

1	RF/IF	R.F Signal Gen. to ANT. input at 27.175MHz with 1kHz 30% Mod.	as shown in Fig.4	18	T201,202 203,205 206.	MAXIMUM Indication on A.F. VTVM	AM	
2	SQUELCH	Reduce R.F Signal Gen. input to 250uV (54dB)			R315	Adjust for point that sonarity is begun to be heard.		
3	S-METER	Reduce R.F Signal Gen. input to 100uV (46dB)	S-METER		R240	"S-9" on S-METER		
4	NOISE BLANKER	R.F.Signal Gen. to 25MHz with 1kHz 30% Mod.	Connect A.F VTVM to CR303		T302,303	MAX. on VTVM		
				17	T203	MAX. on S-METER		SQUELCH to fully Counter-Clockwise.

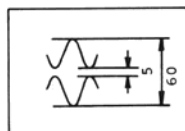


Fig.1

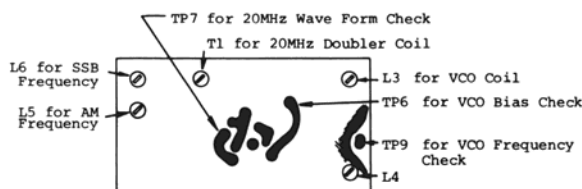


Fig.2