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Craig L103 Service Manual

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SERVICE MANUAL

CRAIG®

L103

40-CHANNEL MOBILE CB TRANSCEIVER



SPECIFICATIONS

RECEIVER

SENSITIVITY	0.4 uV for 10 dB (S+N)/N
BANDWIDTH	7 KHz @ -6.0 dB
AGC	Charge in audio output less than 10 dB from 10 uV to 1.0 V
SQUELCH	Adjustable; Threshold, less than 0.5 uV. Tight, more than 250 uV
POWER OUTPUT	4.0 W at 10 % THD
IMAGE REJECTION	Better than 90 dB
IF REJECTION	Better than 60 dB
ADJACENT CHANNEL REJECTION	Better than 60 dB
IF FREQUENCY	10.695 MHz

TRANSMITTER

RF POWER OUTPUT	4.0 W
SPURIOUS ATTENUATION	60 dB minimum
OUTPUT IMPEDANCE	50 ohm

GENERAL

CHANNELS	40 AM
FREQUENCY RANGE	26.965 to 27.405 MHz
FREQUENCY TOLERANCE	0.005 % from -30°C to 50°C
FREQUENCY STABILITY	+0.001% Dynamic
MICROPHONE	
POWER SOURCE	13.8 Vdc, pos. or neg. ground
CURRENT DRAIN; RECEIVE:	0.7 A at max. audio output
	0.3 A at standby
TRANSMIT	1.5 A

P.A. SYSTEM

POWER OUTPUT	4.0 W
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NOTE: ALL DATA SUBJECT TO CHANGE WITHOUT NOTICE

PARTS PRICE LIST

★★★★★★★★★★ ★★★★★★★★★★

REF. No.	CRAIG KEY No.	DESCRIPTION	MFR's SUGG RET. PRICE
PACKAGING			
	L103001	Individual Carton	\$ 3.00
	L103002	Styrofoam, FRONT	1.85
	L103003	Styrofoam, REAR	1.85
	L103507	Microphone (Complete)	22.40
	L150396	Bracket, Mic Mounting	.75
	XFU002	Spare Fuse, 2A	1.00
	L103395	Mounting Bracket (Unit)	1.25
	L103212	Mounting Screw (Unit)	.40
	L103004	Mounting Hardware Kit	1.15
	4101033	D.C. Power Plug	3.50
CABINET & CHASSIS			
1	NSP	Chassis	----
2	L103050	Cabinet Top	4.80
3	L103100	Wool Tack	.25

SUBJECT TO CHANGE WITHOUT NOTICE. USE ALL AVAILABLE NUMBERS AND COMPLETE DESCRIPTION WHEN ORDERING, INCLUDING MODEL NUMBER
THESE PRICES HAVE BEEN REVISED AS OF 1/20/80

REF. No.	CRAIG KEY No.	DESCRIPTION	MFR's SUGG RET. PRICE
CABINET & CHASSIS (CONTINUED)			
4	L103051	Cabinet Bottom	\$ 5.15
5	L103061	Assy. FRONT PANEL	8.35
5A	L103062	Front Panel	7.40
6	L103070	Window, Front Display	3.20
7	L103071	Optical Filter (Ch. Display)	.55
8	L103395	Bracket, Mounting (Unit)	1.25
9	L103231	Rubber Washer (Mtg. Brkt.)	.25
10	L103212	Mounting Screw (Unit)	.40
11	L103026	Knob, CHANNEL SELECT	1.40
12	L103027	Knob, SQUELCH;VOL;ON/OFF	.90
13	L103291	Spring Plate, Ch. Sel. Knob	.25
14	L103028	Pushbutton, PA/CB;ANL SW	.65
15	NSP	FCC Plate	----
16	L103232	Rubber Washer (Speaker Mtg.)	.25
17	----	PH Scr. M3x6	.25
18	----	PH Scr. M3x8	.25

A PRODUCT OF CRAIG CORPORATION

REF. No.	CRAIG KEY No.	DESCRIPTION	MFR's SUGG RET. PRICE
CABINET & CHASSIS (CONTINUED)			
19	----	PH Tapp Scr. M3x6	\$.25
20	----	PH Tapp Scr. M3x6	.25
21	----	PH Tapp Scr. M3x6	.25
22	----	FH Tapp Scr. M3x6	.25
23	----	Flange Nut M3	.25
24	NSP	Rivet	----
25	NSP	Heat Sink	----
26	L103213	Plastic PH Scr. M3x6	.25
27	----	PH Scr. M3x10	.25
28	NSP	Ground Lug	----
29	L103004	Hardware Mounting Kit	1.15
29A	L150496	Bracket, Mic Mounting	.75
30	----	Lock Washer M3.5	.25
31	----	RH Tapp Scr. M3.5x8	.25
32	----	Star Washer M5	.25
33	----	RH Tapp Scr. M5x10	.25
D15	UR202	LED, CHANNEL Indicator	9.15
D16	TLR124	LED, TX Indicator	.85
FC1	L103800	7 Lead Flexible Cable	.35
FC2	L103800	7 Lead Flexible Cable	.35
IC1	UPC1182H	I.C. (Amp)	5.70
J1	L103609	Coaxial Antenna Connector	1.80
J2	L103608	Socket, Mic Connector	2.15
J3	4101027	D.C. Power Conn. Socket	1.75
J4	L103609	Jack, PA Speaker	.75
J5	L103609	Jack, External Speaker	.75
M1	L103604	Meter, SIGNAL/TX Power	9.05
PC2/7	L103517	PCB w/Comp., LED Ch. Ind.	10.35
PC3/7	L103518	PCB w/Comp., VOL;PWR ON/OFF	3.25
PC4/7	L103519	PCB w/Comp., SQUELCH Cont.	2.10
PC7/7	L103520	PCB w/Comp., LED TX Ind.	1.45
PC594	NSP	PCB w/Comp., MAIN	----
PC639	L103521	PCB w/Comp., MIC JACK	2.70
PC640	L103522	PCB w/Comp., ANL;PA/CB SW	5.95
PL1	L103550	Pilot Lamp, SIG/TX Meter	1.05
SL1	L103570	Switch, POWER On/Off	2.70
VR4	VR4	VR 50K Ohm (VOLUME Cont.)	8.90
S5	L103531	SW, Rotary (Ch. Select)	9.90
SP1	L103702	Speaker	6.40
SW124	L103532	Assy, Push Switch	8.90
S2	L103533	Push SW, ANL On/Off	3.30
S3	L103533	Push SW, CB/PA Select	3.30
PC640	NSP	PCB Only, ANL;CB/PA SW	----
TR13	2SC2028	Transistor	1.65
TR14	2SC2029	Transistor	2.90
TR15	2SC2028	Transistor	1.65
VR4	L103570	VOL Cont., PWR On/Off SW	2.70
VR5	L103571	VR 50K Ohm (SQUELCH Cont.)	1.55
YD042	NSP	Mica Insulator	----

COILS, TRIMMERS & XFORMERS			
FL1	L103670	Ceramic Filter (FL048)	1.40
FL2	L103671	Ceramic Filter (FL066)	6.45
L1	L103672	Coil (LA279)	.80
L2	L103673	Coil (LA308)	.90
L3	L103674	Coil (LA309)	.90
L4	L103675	Coil (LA181)	.90
L5	L103676	Inductor 10mH (LZ.002)	.50
L6	L103677	Coil (LA281)	.80
L7	L103678	Coil (LA204)	.85
L8	L103679	Coil (LA207)	.85
L9	L103680	Coil (LA307)	.90
L10	L103681	Coil (LA283)	.90
L11	L103682	Inductor 4.7uH (LZ0.02)	.50
L12	L103683	Coil (LA208)	.90
L13	L103684	Coil (LC072)	.80
L15	L103685	Coil (LD033)	.40
L16	L103686	Coil (LC073)	.75
L17	L103687	Coil (LE093)	.25
L18	L103687	Coil (LE093)	.25
T1	L103641	Transformer, Output (TF177)	3.55
T2	L103642	Coil, AF Choke (TF083)	1.05

REF. No.	CRAIG KEY No.	DESCRIPTION	MFR's SUGG RET. PRICE
MISCELLANEOUS ELECTRICAL			
F1	XFU002	Fuse, 2A	\$ 1.00
FC1	L103800	7 Lead Flexible Cable	.35
FC2	L103800	7 Lead Flexible Cable	.35
J1	L103607	Coaxial Antenna Connector	1.80
J2	L103608	Socket, Mic Connector	2.15
J3	4101027	Socket, D.C. Power Conn.	1.75
J4	L103609	Jack, PA Speaker	.75
J5	L133609	Jack, External Speaker	.75
MK1	L103507	Microphone (Complete)	22.40
M1	L103604	Meter, SIGNAL/TX Power	9.05
P1	4101033	D.C. Power Plug w/Cord	3.50
PC2/7	L103517	PCB w/Comp., LED Ch. Ind.	10.35
PC3/7	L103518	PCB w/Comp., VOL;PWR On/Off	3.25
PC4/7	L103519	PCB w/Comp., SQUELCH Cont.	2.10
PC7/7	L103520	PCB w/Comp., LED TX Ind.	1.45
PC594	NSP	PCB w/Comp., MAIN	----
PC639	L103521	PCB w/Comp., MIC JACK	2.70
PC640	L103522	PCB w/Comp., ANL;PA/CB SW	5.95
PL1	L103550	Pilot Lamp, SIG/TX Meter	1.05
SL1	L103570	SW, Power On/Off	2.70
VR4	VR4	VR 50K Ohm (VOLUME Cont.)	8.90
SW124	L103532	Assy, Push Switch	8.90
S2	L103533	Push SW, ANL On/Off	3.30
S3	L103533	Push SW, CB/PA Select	3.30
S5	L103531	Rotary SW, Channel Select	9.90
SP1	L103702	Speaker	6.40
VR1	L600593	Semi-Fixed Resistor 50K Ohm	.70
VR2	L600593	Semi-Fixed Resistor 50K Ohm	.70
VR3	L600593	Semi-Fixed Resistor 50K Ohm	.70
VR4	L103570	VR 50K (VOL Cont), PWR On SW	2.70
VR5	L103571	VR 50K (SQUELCH Cont.)	1.55
X1	L103722	Crystal (10.24 MHz)	4.55

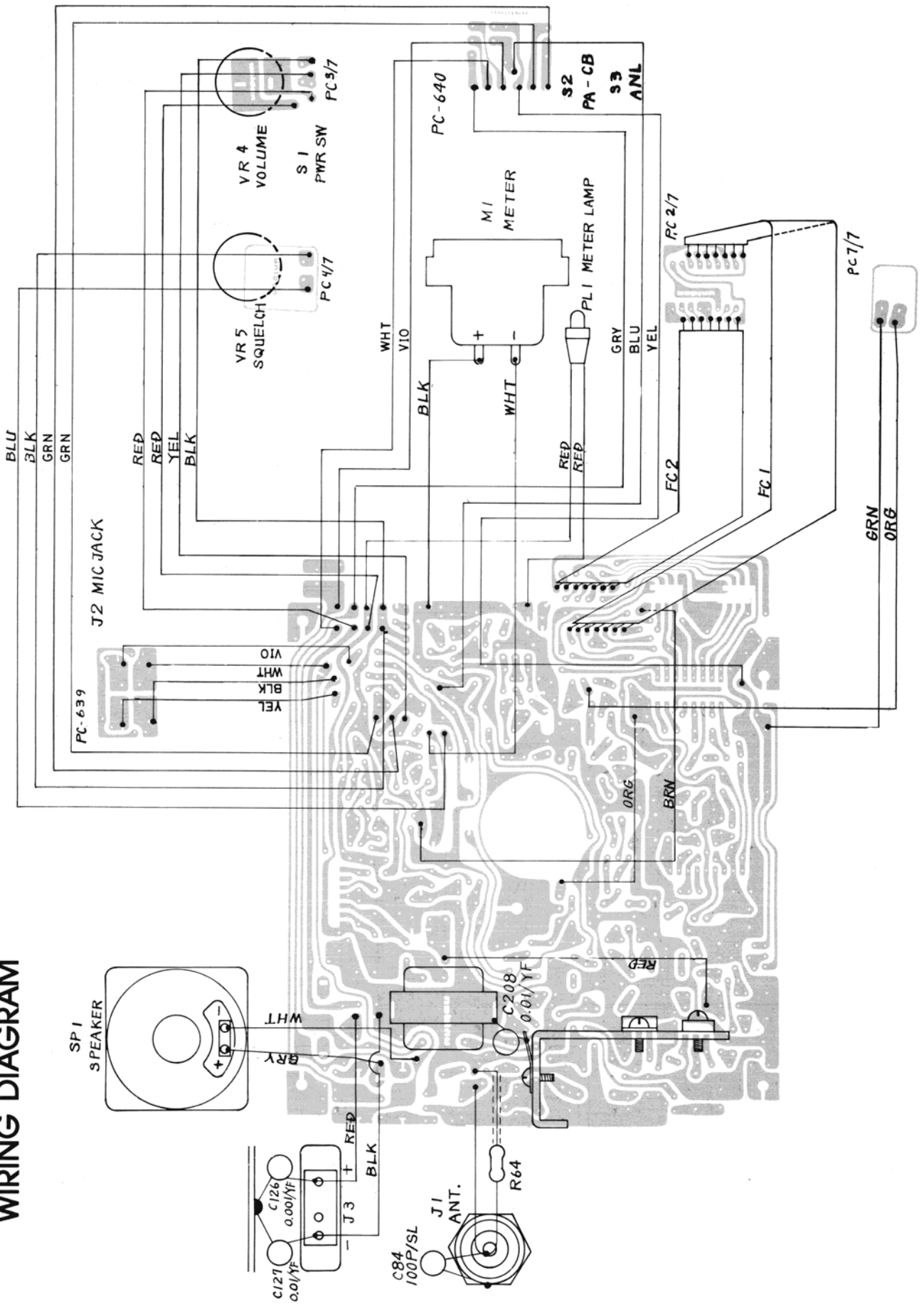
SEMICONDUCTORS			
D1	1S2075	Diode	.35
D2	1S2075	Diode	.35
D3	1S2075	Diode	.35
D4	1N60	Diode	.95
D5	1N60	Diode	.95
D6	1S2076A	Diode	.25
D7	1S2075	Diode	.35
D8	1S2075	Diode	.35
D9	1S2688	Vari-Cap Diode	1.25
D10	1N4003	Diode	.65
D11	1S2075	Diode	.35
D12	RD8.2EB1	Zener Diode	.40
D13	RD8.2EB1	Zener Diode	.40
D14	1N4003	Diode	.65
D15	UR202	LED, Channel Indicator	9.15
D16	TLR124	LED, TX Indicator	.85
D17	1S2075	Diode	.35
IC1	UPC1182H	I.C. (A.F. POWER)	5.70
IC2	TA7310P	I.C. (VCO/MULTIPLEXER)	1.75
IC3	TC9109P	I.C. (P.L.L.)	10.60
TR1	2SC1342	Transistor	1.95
TR2	2SC1342	Transistor	1.95
TR3	2SC1675	Transistor	1.30
TR4	2SC1675	Transistor	1.30
TR5	2SC1675	Transistor	1.30
TR6	2SC711	Transistor	.95
TR7	2SC711	Transistor	.95
TR8	2SC711	Transistor	.95
TR9	2SC1675	Transistor	1.30
TR10	2SA733	Transistor	.95
TR11	2SC711	Transistor	.95
TR12	2SC710	Transistor	1.15
TR13	2SC2028	Transistor	1.65
TR14	2SC2029	Transistor	2.90
TR15	2SC2028	Transistor	1.65
TR16	2SC711	Transistor	.95
TR17	2SC711	Transistor	.95
TR18	2SA733	Transistor	.95

WARNING

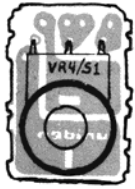
Replacement or substitution of IC's, crystals, transistors, regulator diodes, or any other part of a specialized nature with parts other than those recommended by Craig may cause the operator to be in violation of the Type Acceptance requirements of Part 2 of the Rules.

FCC Rules require that ALL transmitter section adjustments, other than those supplied by Craig as 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.

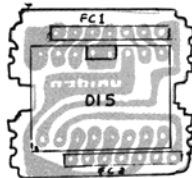
WIRING DIAGRAM



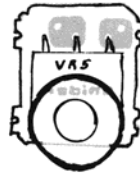
POWER
ON/OFF
VOLUME PCB



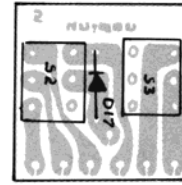
LED CH.
IND. PCB



SQUELCH
CONT. PCB



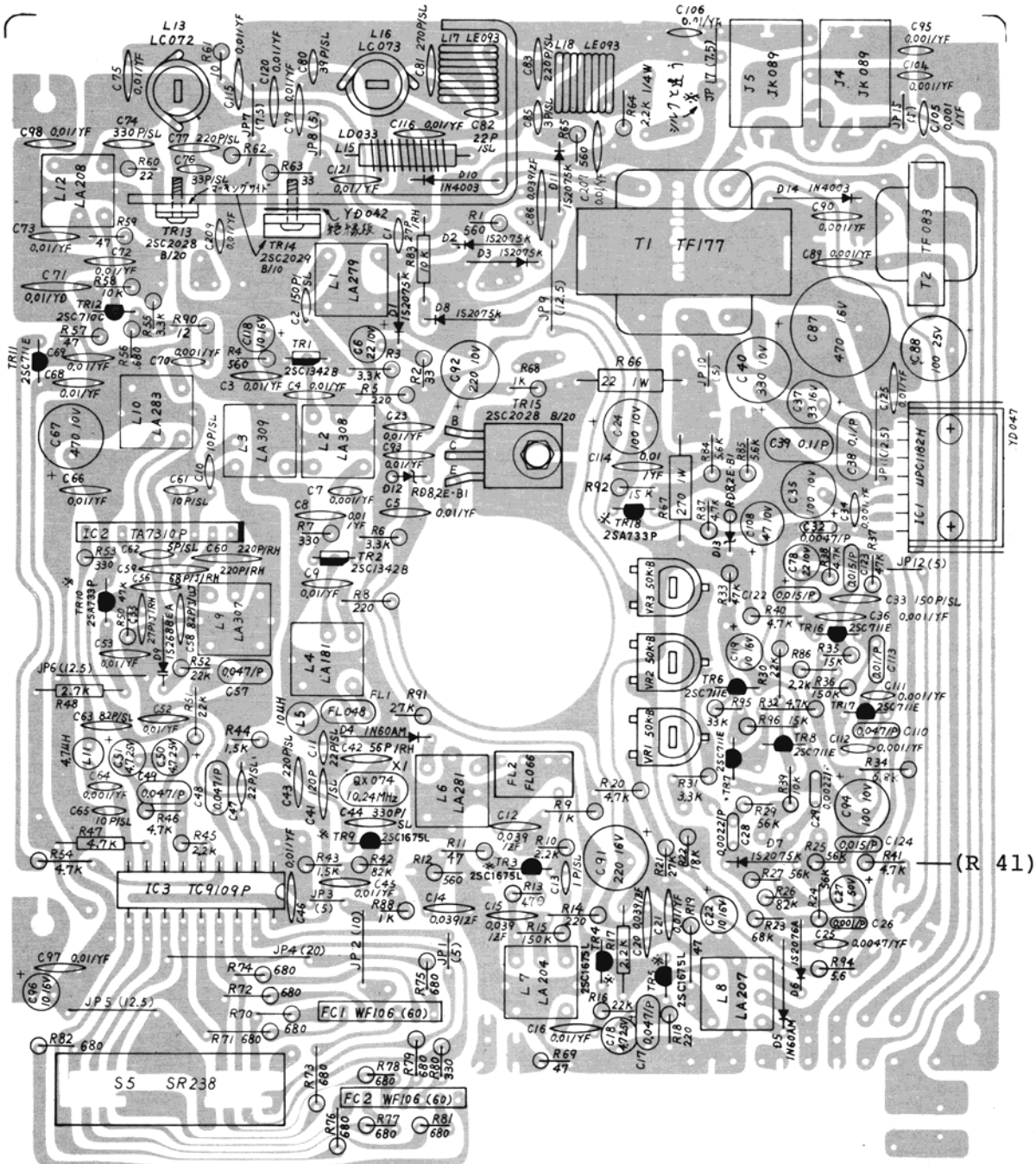
ANL/PA CB
SWITCH PCB



MIC
JACK PCB



MAIN PCB

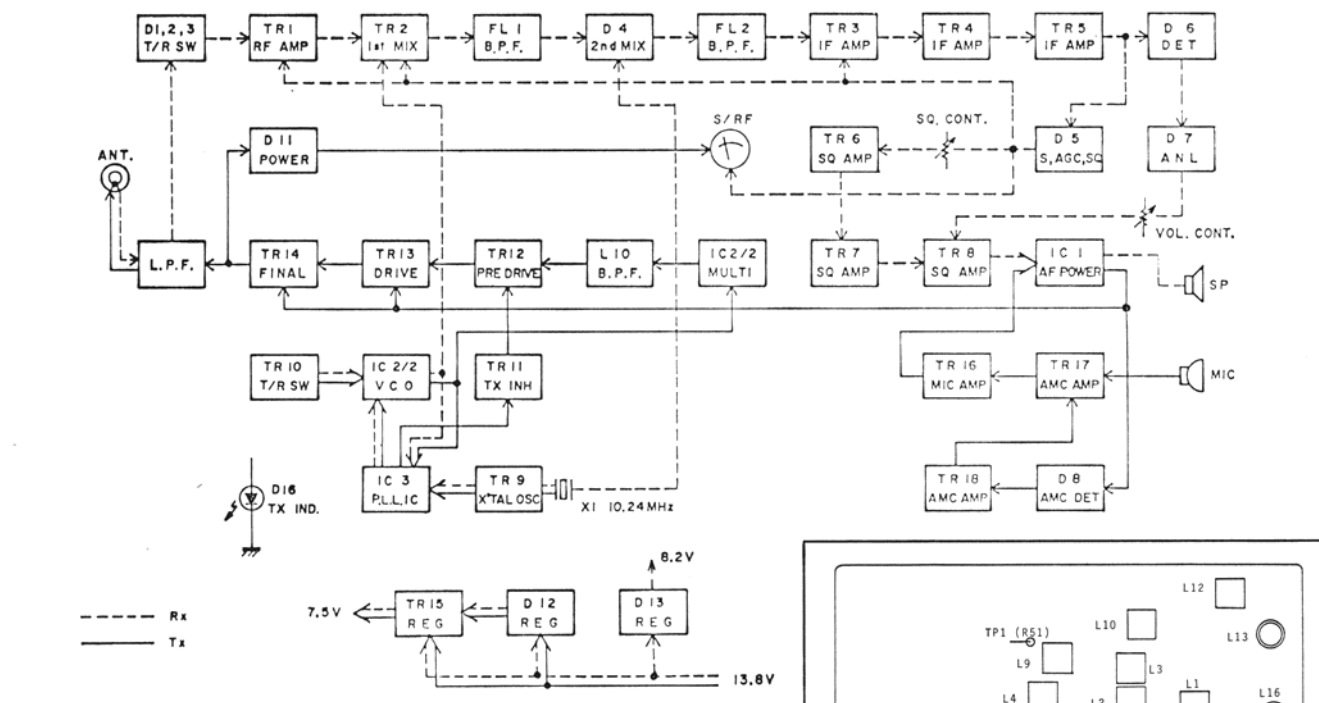


(R 41)

IMPORTANT..

An acoustic feedback is produced when using an external speaker in the P.A. mode. This problem can be corrected by replacing R41 with a 20K Ohm, 1/4W resistor. This will attenuate the signal from the microphone and eliminate the feedback.

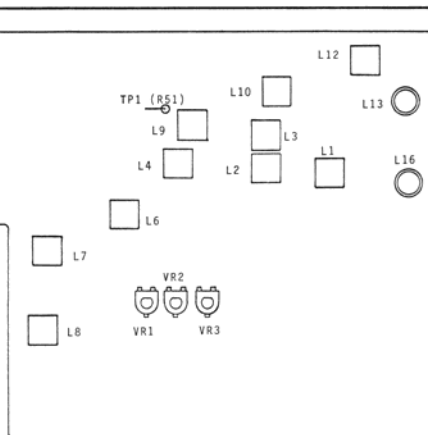
BLOCK DIAGRAM



ALIGNMENT PROCEDURES

Test Equipment Required.

- SIGNAL GENERATOR
- OSCILLISCOPE
- FREQUENCY COUNTER
- D.C. VOLT METER
- RF WATTAGE METER
- VTVM
- 50 Ohm DUMMY ANT. LOAD



STEP	SET TO	CONNECTIONS	ADJUST	ADJUST FOR
P.L.L. CIRCUIT				
1	Channel 40. TX Mode. No Modulation.	D.C. Volt Meter To Pin #7 Of I.C. 3 (TP 1). RF Wattage Meter To Antenna Jack (J1).	L9	Reading Of 3.5 V On D.C. Volt Meter.
TRANSMITTER				
1	Channel 19. TX Mode. No Modulation.	RF Wattage Meter to Antenna Jack (J1).	L10,12, 13 & 16	Maximum Output On RF Wattage Meter.
2	Same As Step 1	Same As Step 1.	L16	Reading Of 3.8 W On RF Wattage Meter.
3	Repeat Steps 1 & 2 To Insure That Adjustments Are Correct.			
4	Same As Step 1	Same As Step 1.	VR3	Reading Of 3 To 4 On Meter (M1).
5	All Channels. TX Mode. No Modulation.	Frequency Counter To Antenna Jack (J1) Through 50 Ohm Dummy Load And Attenuator.		Check All Channels For Correct Fre- quency Operation.
RECEIVER				
1	Volume; MAX. Squelch; MIN.	Signal Generator To Antenna Jack (J1), (27.185 Mhz). VTVM To EXT. SPKR. Jack (J5).	L1,2,3, 4,6,7,8	Maximum Audio Output.
2	Volume; MAX. Squelch; Max.	Same As Step 1.	VR1	2 V Output With S/G Output Level Of 100 uV.
3	Same As Step 1	Same As Step 1.	VR2	Reading Of 9 On Sig. Meter (M1) With S/G Output Level Of 100 uV.

