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# Craig L201 Service Manual

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# SERVICE MANUAL



**L201** 



#### 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.

#### **SPECIFICATIONS**

#### **GENERAL**

CHANNELS
FREQUENCY RANGE
FREQUENCY STABILITY
MICROPHONE
POWER SOURCE
CURRENT DRAIN:Receive; 0.95 A at maximum audio output
Transmit;

40 AM
FREQUENCY STABILITY
Dynamic type
Oynamic type
O

#### TRANSMITTER

RF POWER OUTPUT
FREQUENCY TOLERANC
SPURIOUS ATTENTUATION
OUTPUT IMPEDANCE

4.0 W
+0.003 % from -30 C to +50 C
60 dB minimum
50 Ohm

NOTE: ALL DATA SUBJECT TO CHANGE WITHOUT NOTICE

#### RECEIVER

SENSITIVITY Better than 0.5 uV for 10 dB (S+N)/N 6 KHz @ -6.0 dB AGC Change in audio output less than 10 dB from 10 uV to 1.0 V SQUELCH Adjuststable, threshold less than 0.5 uV Tight, more than 250 uV 3.0 W at 10 % THD IMAGE REJECTION Better than 70 dB IF REJECTION Better than 60 dB ADJACENT CHANNEL REJECTION Better than 55 dB IF FREQUENCY 10.695 MHz h1250 Hz NOISE BLANKER RF parallel gate type

#### P.A. SYSTEM

POWER OUTPUT 3.0 W

#### PARTS PRICE LIST

REF.			MFR's SUGG RET. PRICE				
PAG	PACKAGING						
	L201001 L201002 L103507 L201003 L150396  XFU002 4101033	Styrofoam Set (L & R) Microphone (Complete) TMIC Mounting Kit Bracket, Mic Mounting RH Tapp Screw M3.5x8 Star Washer M3.5	5.50 3.50 22.40 1.20 .75 .25 .25 1.00 3.50				
CAI	CABINET & CHASSIS						
1 2	NSP L103100	Cabinet Top 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 6/20/80

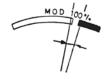
REF. CRAIG No. KEY No.		s SUGG PRICE						
CABINET &	CABINET & CHASSIS (continued)							
3 L201010 4 NSP 5 NSP 7 L201070 8 L201070 8 NSP 10 L201800 11 L201801 12 13 NSP 14 NSP 15 NSP 16 NSP	Plate, TX/RX/CH 9 Plate, Sw Control Index Plate, Control Board Index Optical Filter (Clk & CH Display) Speaker Dust Cloth Cabinet Bottom	24.15  4.15 .25 .25 .25 .25						

## A PRODUCT OF CRAIG CORPORATION

# **ALIGNMENT PROCEDURES**



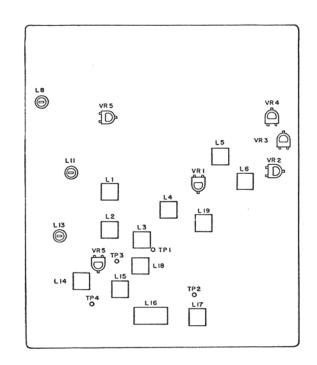






Test Equipment Required

- a) OSCILLOSCOPE
  b) D.C.VOLT METER
  c) VTVM
  d) RF WATTAGE METER
  e) FREQUENCY COUNTER
  f) 50 Ohm DUMMY ANTENNA LOAD
  g) SIGNAL GENERATOR



STEP	SET TO	CONNECTIONS	ADJUST	ADJUST FOR
P.L	L. CIRCUIT			
1	Channel 40. No Modulation. TX Mode.	D.C. Volt Meter To Pin #7 Of IC1 (TP1).	L17	Reading Of Approx. 3.5 V On D.C. Volt Meter.
2	Channel 1. No Modulation. TX Mode.	Oscilloscope To Secondary Of L18 (TP3).	L18	Maximum Indication On Oscilloscope.
TR	ANSMITTER			
1	Channel 19. No Modulation. TX Mode.	RF Wattage Meter To Antenna Jack (J301). VTVM To TP4.	L15, L16	Maximum Indication On VTVM.
2	Same As Step 1	RF Wattage Meter To Antenna Jack (J301).	L11, L13, L14	Maximum Indication On RF Wattage Meter.
3	Same As Step 1	Same As Step 2.	L11	Nominal 3.8 W On RF Wattage Meter.
4	Repeat Steps 1,2	& 3 To Insure That Adjustments Made Are Correct.		
5	Channel 19. TX Mode. 1KHz (100 mV) Applied Through Mic Input.	Signal Generator To Microphone Jack (J451). Oscilloscope To Antenna Jack (J301) Through 50 Ohm Load And Attenuator.	VR6	95 % Modulation.
6	Same As Step 1	RF Wattage Meter To Antenna Jack (J301).	VR4	"RF" Mark Reading On Meter (M201).
7	Same As Step 1	Frequency Counter To Antenna Jack (J301) Through 50 Ohm Load And Attenuator.	L19	27.185 MHz On Frequency Counter.
	NOTE; Under Same	Set-Up, Check All Channels For Correct Frequency O	peration.	
8	Same As Step 5	Same As Step 5.	VR5	95 % Modulation.
RE	CEIVER			Şβ
1	Volume;MAX. Squelch;MIN. ANL;OFF	Signal Generator To Antenna Jack (J301) At Channel 19 Frequency (27.185 MHz). VTVM To EXT. SPKR. Jack (J402)	L1,L2,L3 L4,5,6	Maximum Audio Output:
2	Same As Step 1	Same As Step 1.	VR1	2 V Output With S/G Output Level Of .4uV.
3	Volume; MAX. Squelch; MAX. ANL; OFF	Same As Step 1.	VR3 (Sque1ch)	2 V Output With S/G Output Level Of 250uV.
4	Same As Step 1	Same As Step 1.	VR2	Reading Of 9 On Signal Meter (M302) With S/G Output Level Of 100uV.

REF.	CRAIG KEY No.		SUGG			RAIG Y No.	DESC	MFR' RIPTION RET.	
	INET &	CHASSIS (continued)						SSIS (continued)	
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	NSP NSP NSP L201395 NSP NSP NSP L201212 L103026 L103027 L103028 L201396 NSP L201430 L201430	Escutcheon Mounting Bracket (R) Escutcheon Mounting Bracket (L) Holder, Sw Assy Holder, Sw Assy 'Square Nut M3 Knob, CHANNEL SELECT Knob, VOL Cont; SQUELCH Cont; etc. Pushbutton, POWER/CLOCK SET Sw Holding Bracket, CH Select Sw Model No./FCC/Serial No. Plate	.25		TR9 2S TR201 2S VR301 L2 VR302 L2 VR305 L2 VR306 L2 VR306 L2 VR302 33	c1096 01570 01571 01572 01571 01573 01574 01575 07099 NSP 01331 01332	Tran Tran VR VR 50 VR 50 VR 50 VR VR 20 VR A.C. Clam Bush Bush		
33 34 35	L201491 1'L20'1'43'2 L103291	Dust Cloth, CH 9/PA/ANL/NB Sw ເປັນຮະ ປີເວປກ, Mແນ/SWR Sw	.25		KEF.	T U	RATG	I 'MFR'	
36 37	NSP	Rivet Hex Nut M3	.25		COILS		RIM	MERS & XFORMERS	
33444445678901234567892030330334444444444555555555555555555555	L201232 L2012330 L201232 L201232 L201330 NSP NSP NSP NSP NSP NSP TLR124 TLR124A TLR124A	PCB Mtg Stud Plastic PH Screw M3x6 PH Screw M3x6 PH Screw M2.4 PH Screw M2.6x4 PH Screw M4.6x4 PH Screw M4.6x4 PH Screw M4.6 PH Screw M4.10 PH Screw M5x8 PH Tapp Screw M3x8 PH Tapp Screw M3x8 PH Tapp Screw M3x6 PH Tapp Screw M3x8 PH Tapp Scr	.350 .405 .255 .255 .255 .255 .255 .255 .255 .2		FL1 FL2 L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L16 L17 L16 L17 L16 L17 L17 L16 L17 L11 L11 L11 L11 L11 L11 L11 L11 L11	L10	03670 03671 04671 03675 03675 03675 03676 03684 03687 03688 03688 03688 03688 03687 03688 03687 03688 03687 03688 03687 036888 036888 036888 036888 03688 03	Ceramic Filter (FL048)   Ceramic Filter (FL066)   Trimmer (LA029)   Trimmer (LA181)   Trimmer (LA181)   Trimmer (LA204)   Trimmer (LA204)   Trimmer (LA207)   Coil (LD113)   Trimmer (LC072)   Coil (LE096)   Coil (LE093)   Trimmer (LC073)   Coil (LE093)   Trimmer (LC073)   Coil (LC073)   Trimmer (LA088)   Trimmer (LA088)   Trimmer (LA165)   Trimmer (LA165)   Trimmer (LA201)   Trimmer (LA218)   Coil (LD077)   Output Transformer (TF177)	1
D501 D701	UR202 TLR2077	LED, DIGITAL CH DISPLAY LED. DIGITAL CLOCK DISPLAY	9.15					EOUS ELECTRICAL	1'
FH0002 1C301 J3012 J4012 J4012 J4012 J4011 M3002 PC318 PC4435 PC4445 PC5444 PC5444 PC54601 PC56601 PC56601 PC53002	L201380 TA7222P L103607 4101027 4101034 L103608 L201607 L201606 L201516 L201517 L201518 L201519 L201520 L201521 L201520 L201525	I.C. (AF POWER AMP) Connector, Coaxial Antenna Socket, D.C. Pwr Connector Socket, PA Spkr Jack Socket, Ext. Spkr Jack Socket, Ext. Spkr Jack Socket, Headphone Jack Meter, SWR/MOD Meter, RF PWR/SIG PCB w/Comp, HEADPHONE JACK PCB w/Comp, EXT. SPKR JACK PCB w/Comp, POWER SUPPLY PCB w/Comp, CLOCK VOLTAGE REG. PCB w/Comp, CH SELECT SW PCB Only, CLOCK PUSH SW ASSY PCB w/Comp, SLIDE SW ASSY PCB w/Comp, LED CLOCK LOGIC PCB w/Comp, MIC JACK PCB w/Comp, MIC JACK PCB w/Comp, TX/RX/CH 9 LED Ind PCB w/Comp, TX/RX/CH 9 LED Ind PCB w/Comp, MAIN PIIOT Lamp, RF PWR/SIG METER PIIOT Lamp, SWR/MOD METER Slide Sw, CH 9(AUTO)/CB Select	1.45 1.45 2.15 2.15 2.100 8.00 3.85 12.70 9.65 9.30 1.50 9.35 21.00 3.35 3.00		F301 F302 J301 J302 J401 J402 J451 J601 M301 M302 M1C1 P302 PC311 PC398 PC410 PC433 PC433 PC435 PC544 PC546	XFI XFI L10 410 410 410 L20 L20 L20 L20 L20 L20 L20 L20 L20 L2	J002 J002 J002 J002 J002 J002 J003 J01034 J01034 J01034 J01034 J01034 J01034 J0103 J	Fuse, 2A Fuse, 2A Connector, Coaxial Antenna Socket, D.C. Power Conn. Socket, PA Spkr Jack Socket, Ext Spkr Jack Socket, 4P Mic Connector	2
\$302 \$303 \$304 \$305 \$306 \$501 \$W181 \$702- \$703- \$704- \$706- \$705- \$707- \$707- \$707- \$707-	L201530 L201530 L201531 L201531 L201532 L103531 L2015334 L201534 L103532 L103532 L103532 L201536 L201536 L201536 L201536	Slide Sw, CB/PA Select Slide Sw, NNB On/Off Slide Sw, NB On/Off Slide Sw, MB On/Off Slide Sw, MOD/CAL/SWR Select Slide Sw, AC/DC Select Rotary Sw, CHANNEL Select -Push Sw Assy, (S701~S707) -Push Sw, MANUAL POWER -Push Sw, AUTO POWER -Push Sw, AUTO POWER -Push Sw, AUTO POWER -Push Sw, CLOCK SET -Push Sw, FAST SCAN -Push Sw, FAST SCAN -Push Sw, HOLD -Speaker, 16 Ohm/3W	1.90 1.90 2.15 2.15 9.99 11.95 2.60 3.30 3.00 7.70 15.70	:	PC566 PL301 PL302 S301 S302 S303 S304 S305 S306 S501 SW181 S701 S702 S703 S704 S705 S705 S705 S707	L20 L20 L20 L20 L20 L20 L20 L20 L20 L20	NSP 01550 01550 01530 01530 01530 01530 01531 01532 03531 01534 01535 01535 01535 01536	PCB w/Comp, MAIN Pilot Lamp, RF PWR/SIG Meter Pilot Lamp, SWR/MOD Meter Slide Sw, CH 9(AUTO)/CB Select Slide Sw, ANL On/Off Slide Sw, NB On/Off Slide Sw, MOD/CAL/SWR Select Slide Sw, MOD/CAL/SWR Select Slide Sw, CHANNEL SELECT Push Sw Assy, CLOCK CONTROL Push Sw, MANUAL POWER Push Sw, AUTO SELECT Push Sw, SLOW SCAN Push Sw, SLOW SCAN Push Sw, SLOW SCAN Push Sw, SLOW SCAN Push Sw, HOLD	

MFR's SUGG RET. PRICE

2.90 1.65 3.80 3.40 1.50 1.50 1.50 1.50 1.50 1.50 1.50

MFR's 30GG RET. PRICE

1.40 6.45 .90 .90 .90 .95 .85 .25 .75 .40 .90 .90 .95 .95 .95 .25 .75 .90 .90 .95 .95 .95 .95

1.00 1.00 1.80 1.75 1.45 2.15 2.15 8.00 22.40 3.50 3.85 1.75 12.70 9.65

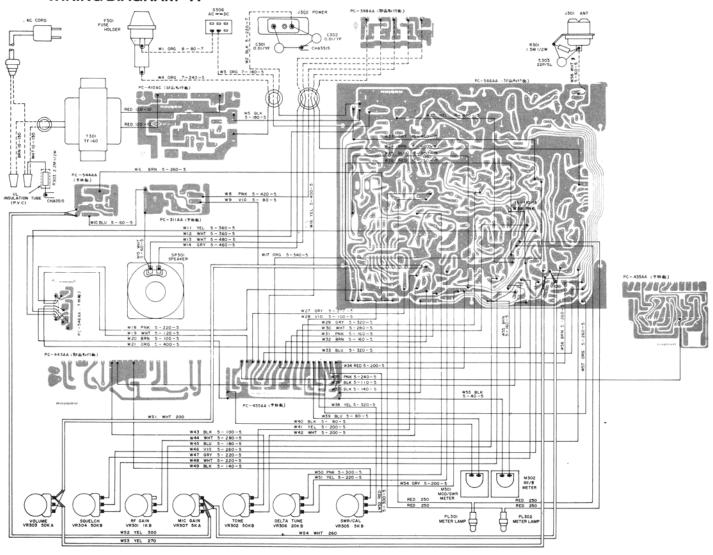
5.00 9.30 1.50 9.35 21.00 3.35

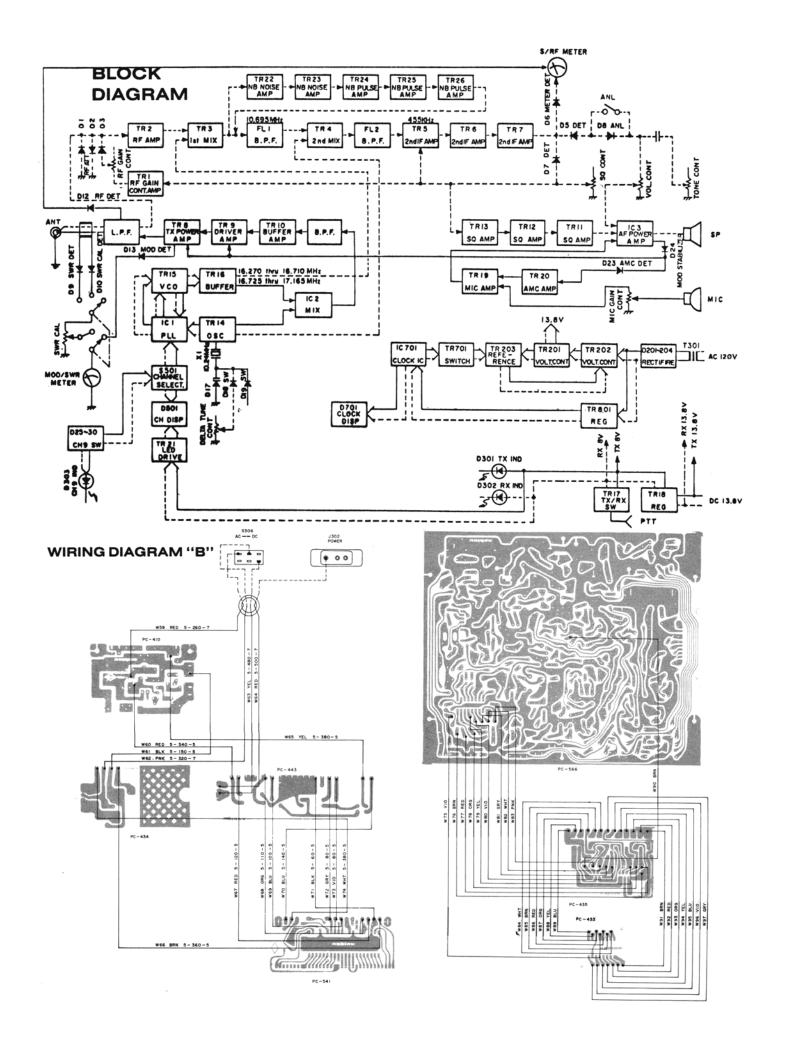
3.00 ----1.60 1.90 1.90 1.90 2.15 9.90 2.15 9.90 3.30 3.30 3.00 3.00

REF. No.	CRAIG KEY No.		R's SUGG
MISCELL	ANEOUS	ELECTRICAL (continued	1)
SP301 SW181 VR1 VR2 VR3 VR4 VR5 VR6 VR201 VR301 VR302 VR303 VR304 VR305 VR306 VR307 X1	L201702 L201533 L104590 L600593 L600593 L201590 L600593 S609590 L104590 L201571 L201571 L201572 L201571 L201573 L201574 L201574 L201575 L20157	Speaker 16 Ohm/3W Push Sw Assy, (S701 S707) Semi-Fixed Res. 500 Ohm Semi-Fixed Res. 50K Ohm Semi-Fixed Res. 50K Ohm Semi-Fixed Res. 30K Ohm Semi-Fixed Res. 50K Ohm Semi-Fixed Res. 50K Ohm Semi-Fixed Res. 50O Ohm VR 1K, RF GAIN Cont. VR 50K, TONE Cont. VR 50K, VOLUME Cont. VR 50K, SWELCH Cont. VR 50K, SWELCH Cont. VR 5K, SWR/CAL Cont. VR 20K, DELTA TUNE Cont. VR 20K, MIC GAIN Cont. Crystal, 10.240MHz	7.70 11.95 .65 .70 .70 .70 .65 1.50 1.50 1.50 1.50 1.50 4.55
SEMIC	ONDUC	CTORS	
D1,2,3,7, 8,13,14, 15,18,19, 20,22,23, 25,26,27, 28,29,30, 33,34,702	1 S20 75 K 1 S20 76 A	Diode Diode	.35
D6,9,10, 12,32 D16,17	1 N60AM 1 S2688EA	Diode Diode Vari-Cap Diode	.25 .35 1.05

REF. No.	CRAIG KEY No.		's SUGG . PRICE				
SEMICONDUCTORS (continued)							
D21 D24,31 D201,202,	RD10EB1 1N4003	Zener Diode Diode	.40 .65				
203,204 D205 D206 D301,303 D302 D501 D701 D801 IC1 IC2 IC3 IC701 TR1,11,12,	GM-3Y RD16FB RD7.5EB2 TLR124 TLG124A UR202 TLR2077 CZ092 TC9106P TA7310P TA7222P TM4801P	Diode Zener Diode Zener Diode LED, TX/CH 9 Indicator LED, RX Indicator LED, CHANNEL Indicator LED, CLOCK DIGITAL DISPLAY Zener Diode I.C. (PLL) I.C. (TX MIX) I.C. (AF POWER AMP) I.C. (CLOCK LOGIC)	1.50 1.05 .40 .85 1.35 9.15 13.30 1.00 10.60 1.75 5.65 11.70				
13,203, 701 TR2 TR3 TR4,5,6,7,	2SC711 2SC1674 2SK19	Transistor Transistor FET	.95 1.50 4.40				
TR4,5,6,7, 10,16,22, 23,24,26 TR8 TR9 TR14,15,19 TR17,20,25 TR18,21 TR201 TR202,801	2SC710 2SC2029 2SC2028 2SC458 2SA628 2SA628 2SD355 2SD586 2SC1096	Transistor Transistor Transistor Transistor Transistor Transistor Transistor Transistor Transistor	1.15 2.90 1.65 1.85 1.50 3.80 3.40				

#### **WIRING DIAGRAM "A"**





## TRANSISTOR VOLTAGE CHART

	_	(RX)		_	(TX)	_			(RX)			(TX)	
	E	В	С	E	В	С		E	В	С	E	В	С
TR1 (SQ) (UNSQ)	0	.63	.11	0	.54	1.20	TR15	3.00	3.60	6.34	2.98	3.60	6.31
	1 20	F.4	0.20				TR16	0	.61	2.36	0	.25	2.35
TR2 (SQ) (UNSQ)	1.29	.63	9.38 9.36	. 42	0	.24	TR17	8.70	9.26	.06	8.66	7.85	8.54
TR3	2.44 (SOURCE)	O (GATE)	7.39 (DRAIN)	2.44 (SOURCE)	O (GATE)	7.34 (DRAIN)	TR18	8.79	9.40	13.45	8.74	9.39	12.78
TR4 (SQ) (UNSQ)	.89	1.26	7.41 7.29	.02	.39	.12	TR19	9.47	1.69	8.46	.84	1.49	5.66
				.02		.12	TR20	0	0	0	0	0	0
TR5 (SQ) (UNSQ)	.65	1.21	8.92 8.85	0	.42	.24	TR21	6.59	7.22	12.20	6.54	7.17	12.05
TR6	0	.68	1.59	0	0	.24	TR22	0	0	0	0	0	0
TR7	.91	1.59	13.54	0	.24	13.76	TR23	0	0	0	0	0	0
TR8	0	0	13.51	0	0	13.48	TR24	0	0	0	0	0	0
TR9	0	0	13.32	0	01	13.30	TR25	0	0	0	0	0	0
TR10	9.49	2.35	13.78	.85	1.20	12.95	TR26	0	0	0	0	0	0
TR11(SQ) (UNSQ)	0	.64	0	0	.64	0	TR201	13.84	14.50	0	13.85	14.51	0
		<u> </u>			.04	0	TR202	14.50	15.05	0	14.51	15.07	0
TR12(SQ) (UNSQ)	0	.65	4.73 0	0	.24	4.70	TR203	7.24	7.83	15.05	7.24	7.83	15.07
TR13(SQ)	0	.61	.04	_			TR701	0	.66	0	0	.66	0
(UNSQ)	0	.57	.65	0	.22	.24	TR801	8.57	9.17	0	8.55	9.15	0
TR14	2.11	2.61	7.51	2.09	2.59	7.46							

# **VOLTAGE CHART** (IC701)

	(10701)							
PIN #	Voltages FROM	measured TO	PIN #	Voltages FROM	measured TO			
1	.78	.81	22	.26	.28			
2	.28	.30	23	. 26	.28			
3	.78	.80	24	0	0			
4	.28	.30	25	8.45	8.45			
, 5	.27	. 29	26	.65	.65			
6	.27	.29	27	0	0			
7	.26	.28	28	03	03			
8	.86	.90	29	.39	.39			
9	. 27	.29	30	0	0			
10	.26	.28	31	8.56	8.56			
11	.79	.81	32	8.15	8.15			
12	.27	.29	33	8.13	8.13			
13	.27	.29	34	8.24	8.24			
14	.26	.28	35	8.53	8.53			
15	.26	.28	36	8.52	8.52			
16	.27	.29	37	0	0			
17	.78	.80	38	5.21	5.21			
18	.27	. 29	39	8.51	8.51			
19	.26	.28	40	0	0			
20	0	0	41	. 27	.29			
21	0	0	42	.27	.29			

NOTE; All of the voltages measured on IC701 were made with the clock's readout showing 12:00 P.M. As the readout changes to read 12:01p.m., adjust the CLOCK SET switch for a reading of 12:00 P.M. again.

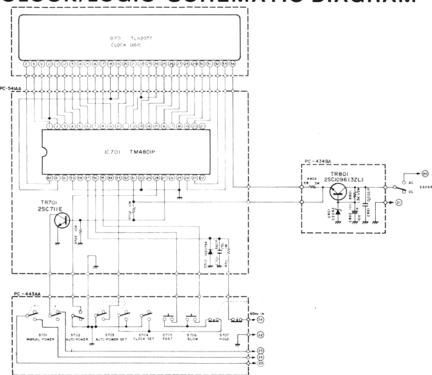
Also note that most voltages measured will vary from ±.02 to ±.04 volts. The voltage chart has been adapted for this.

Example; Pin #1 on the chart reads; "FROM .78 Vdc TO .81 Vdc". This informs you that the voltage measured on this pin of the I.C. will vary between these two voltages.

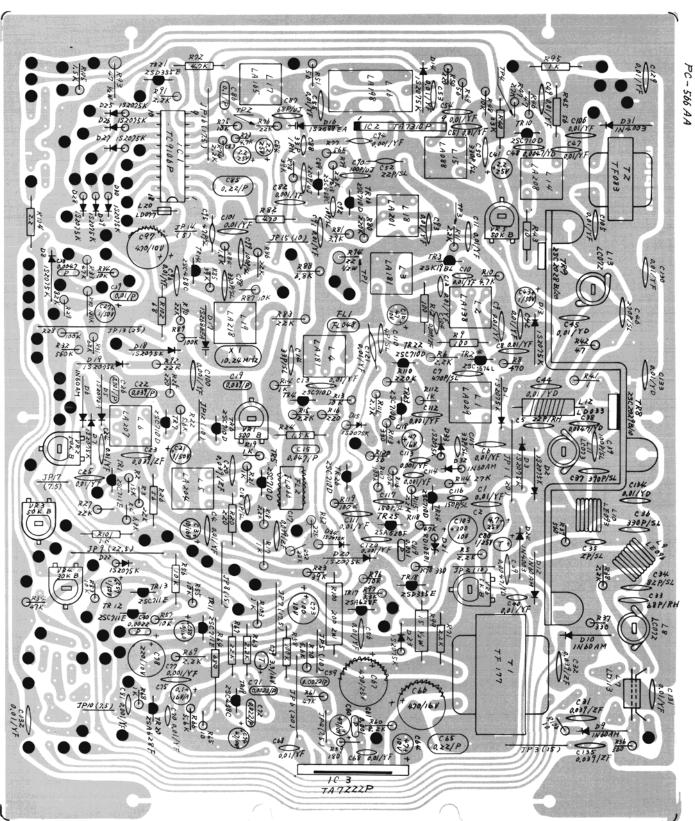
## NOTES;

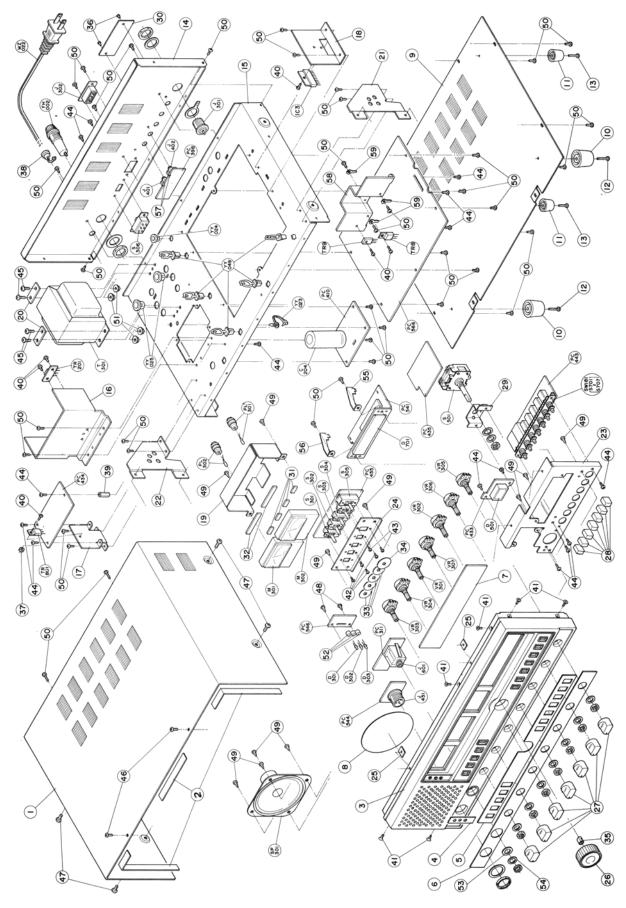
Voltages measured on CHANNEL 9 @ NO MODULATION.							
CONTROL or SWITCH	SET TO:	CONTROL or SWITCH	SET TO:				
RF GAIN (VR301); TONE (VR302); SWR/CAL (VR305); CB/P.A. (S-302); NB On/Off (S-304); AC/DC (S-306); AUTO (POWER) (S-702); CLOCK (SET) (S-704);	MECHANICAL CENTER MINIMUM CB Position OFF Position AC Position OFF Position	DELTA TUNE (VR306); DIAL/CH. 9 (S-301); ANL On/Off (S-303); MOD/CAL/SWR (S-305); MANUAL (POWER) (S-701); AUTO PWR (SET) (S-703)	MECHANICAL CENTER DIAL Position OFF Position CAL Position ON Position				

# CLOCK/LOGIC SCHEMATIC DIAGRAM



# MAIN PCB





A PRODUCT OF CRAIG CORPORATION . COMPTON, CA 90220

7802KDBB Printed in USA