

Purchase of Parts

Parts can be purchased from any Hy-Gain Service Center or from the factory Warranty Service Department. When ordering, please supply the following information:

1. unit model number
2. unit serial number
3. part description
4. part number

Specifications

General

Frequency	Phase Locked Loop Synthesizer (PLL)
Channels	40 channels
Mode of operation	AM, LSB and USB
Power source voltage	12 VDC, nominal
Speaker	Built-in, 3" dynamic type
Microphone	Dynamic type with PTT bar

Receiver

System	SSB: Single conversion superheterodyne AM: Dual conversion superheterodyne
Sensitivity	SSB: 0.25 uV for 10 dB S/N ratio AM: 1 uV for 10 dB S/N ratio
Selectivity	SSB: 2.4 kHz at 6 dB down AM: 6 kHz at 6 dB down
Clarifier	± 600Hz
Audio output	3 watts to 8 ohms
Squelch range	SSB: 0.7 uV to 20 uV AM: 1 uV to 500 uV
IF	SSB: 10.695 MHz AM: 1st-10.695 MHz 2nd-455 kHz

Transmitter SSB

Generation	Double balanced modulator with crystal lattice filter
RF output power	12 watts, (PEP FCC max.), at 13.8 VDC
Carrier suppression	40 dB down
Unwanted sideband suppression	60 dB down
Harmonic suppression	60 dB down

Transmitter AM

Modulation	High level class B, power IC
RF output power	4 watts (FCC max.), at 13.8 VDC
Harmonic suppression	60 dB

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.

ALIGNMENT

General

These procedures must be followed to align the Hy-Gain V transceiver (Model 2705). Alignment should not be undertaken unless the technician has adequate test equipment and a full understanding of the circuitry of the transceiver.

IMPORTANT: Tuning adjustment of this transceiver "shall be made by or under the immediate supervision and responsibility of a person holding a first or second-class commercial radio operator's license", as stipulated in Part 95.97 (b) of the FCC Rules and Regulations.

The procedures are divided into two main sections: Transmitter Alignment and Receiver Alignment. See *Equipment* below for a complete list of recommended equipment.

These procedures assume that proper voltages are present at all points in the unit, if not, troubleshoot before continuing.

NOTE: The ferrite cores in the tuned coils are easily chipped or broken. Always use care when inserting an alignment tool in the coil: insert it straight into the core.

Recommended Tools and Equipment

The following equipment is recommended for use in aligning the Hy-Gain V transceiver.

- Audio Signal Generator, 20Hz to 20 kHz
- AC VTVM, 1 mV measurable
- DC Ampere Meter, 2A
- Variable Regulated Power Supply, 8-15 VDC, 2A
- Frequency Counter, 0 to 40 MHz, high input impedance type
- VTVM with RF probe
- Oscilloscope, 30 MHz, high input impedance
- Low capacitance RF probe, capacitance not to exceed 7 pF.
- RF wattmeter and 50 ohm, 5W dummy load
- Standard RF signal generator, 27 MHz CB band
- Speaker dummy resistor, 8 ohm, 5W
- VOM 20k ohm/V
- All test equipment should be properly calibrated.

NOTE: Test voltage is 13.8 VDC unless otherwise specified.

Transmitter Alignment Procedure

Equipment Set-up

Refer to figure 3-1 for the test equipment set-up. Refer to figure 3-6 for location of components to be adjusted for transmitter alignment.

Pre-Alignment Frequency Check

Before alignment, use the frequency counter through a 1000 pF coupling capacitor connected in series with the counter input probe to check the operating frequencies at the following points.

1. Place the Mode switch, S2, in the USB position; the Channel Selector to channel 19. Connect the frequency counter to TP2 and adjust the Trimmer Capacitor, CT3, for a reading of 10.24000 MHz.
2. Connect both an RF VTVM with an RF probe and the frequency counter to TP3. Adjust the core of T3 for a maximum indication on the RF VTVM. Adjust Trimmer Capacitor, CT1, for a reading of 20.105 MHz $\pm$ 40Hz.

Hy-Gain 2705(Hy-Gain V)

- Return the Mode Switch, S2, to the USB position. Connect the frequency counter to TP5 and adjust CT5 for a reading of $10.695 \text{ MHz} \pm 50 \text{ Hz}$. Place the Mode Switch, S2, in the LSB position and adjust CT4 to read $10.692 \text{ MHz} \pm 50 \text{ Hz}$.

Connect all test equipment as shown below:

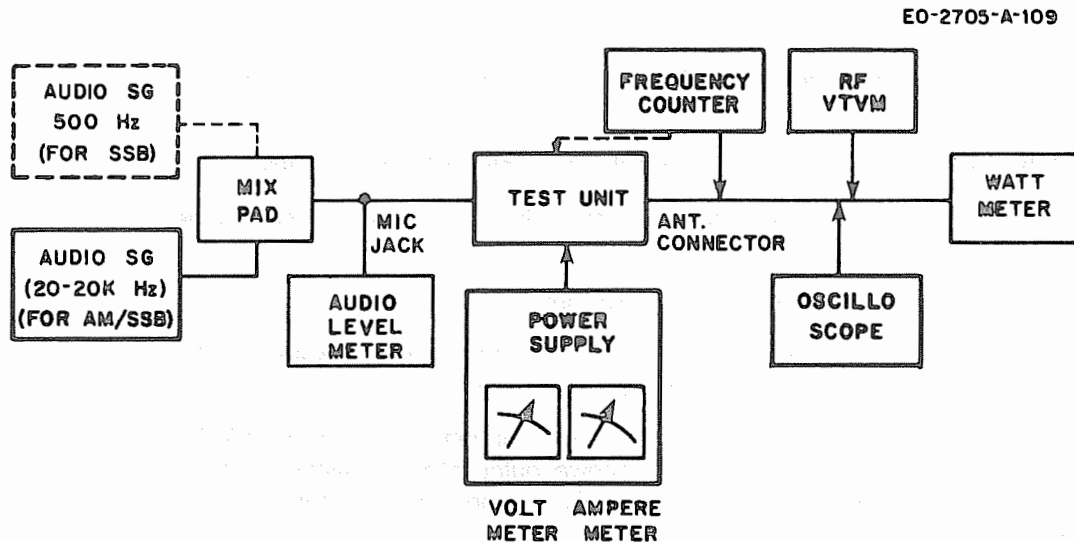


Figure 3-1. Equipment Set-up, Transmitter Alignment

VCO Circuit Alignment

- Place the Channel Selector in the channel 1 position.
- Connect the VOM (12 VDC range) between ground and TP4.
- Adjust the core provided in the VCO Block to obtain a reading of $3.6 \text{ V} \pm 0.1 \text{ V}$, starting from top to bottom when turning the core.
- Place the Channel Selector to the channel 40 position. The reading should be within 1.4 to 2.3V.

Driver Stage Alignment

- Apply a 2.4 kHz, 2.5 mV audio signal to the MIC input.
- Place the Channel Selector in the channel 40 position and the Mode Switch, S2, in the USB position.
- Connect an oscilloscope and 50 ohm dummy load across the ANT connector.
- Adjust T1 for maximum amplitude on the oscilloscope display.
- Place the Channel Selector in the channel 1 position and adjust T2 for maximum amplitude.
- Connect an ampere meter between the emitter of Q10 and chassis ground. Adjust RV1 to obtain a bias current of $35 \text{ mA} \pm 10 \text{ mA}$.
- Place the Channel Selector in the channel 40 position and adjust T4 for maximum amplitude.

8. Place the Channel Selector in the channel 1 position and adjust T5 for maximum amplitude.

SSB RF Power Amplifier Stage Alignment

1. Place the Channel Selector in the channel 19 position and the Mode switch in the USB position.

2. Feed a 2.4 kHz, 25 mV audio signal to the microphone input.

3. Connect an oscilloscope to the emitter of Q7 and adjust T11 for a maximum amplitude display on the oscilloscope.

4. Turn T6 core fully upward, then adjust RV11 to obtain a reading of 150 mV (peak to peak) on the oscilloscope.

5. Connect the oscilloscope to the ANT connector in parallel with the wattmeter.

6. Temporarily adjust RV2 fully counterclockwise and adjust the core of L13 so that the core top is flush with the top of the coil bobbin.

7. Adjust T6; T11, L7 and L11 for maximum power output.

8. Decrease the audio signal to the microphone input to zero and adjust RV4 and RV5 for minimum amplitude of carrier leakage on the oscilloscope display.

9. Feed two signals, 500Hz to 2400Hz, of 25 mV to the microphone input and adjust RV2 to obtain 10 watts of PEP power. Make sure the PEP power output at each channel is within 9 to 11 watts. The waveshape displayed on the oscilloscope should conform to the waveshape shown in figure 3-2.

10. Place the Mode switch in the LSB position. Check to see that the AM/USB alignments are not affected, and that similar results are obtained in this mode of operation.

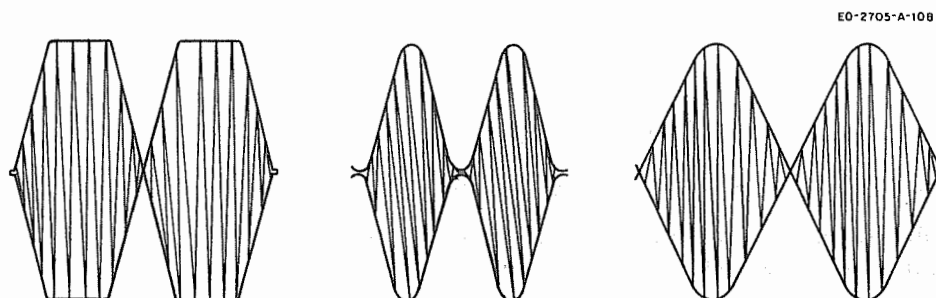


Figure 3-2. Waveforms

AM RF Power Stage Alignment

1. Place the Mode switch in the AM position and the Channel Selector in channel 19 position.

2. Adjust VR5 for an RF power output of 3.7 watts as indicated on the wattmeter.

AM Modulation Alignment

1. Apply a 2.5 kHz, 25 mV audio input signal to the MIC circuit.

2. Adjust RV12 so that the modulation depth is 80% to 95%.

3. Decrease the signal input to 2.5 mV and check that the modulation depth is 30% or higher.

NOTE: To figure modulation percentage use the formula in figure 3-3.

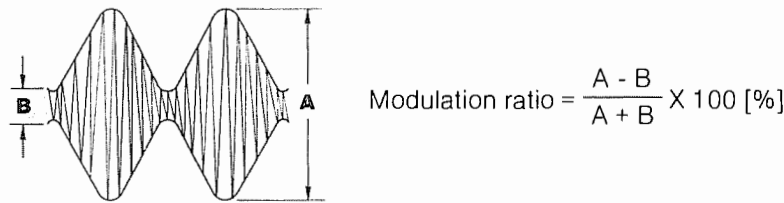


Figure 3-3. Modulation Waveform

RF Power Meter Alignment

Adjust RV3 so that the P-RF meter provided on the front panel of the equipment indicates the same wattage as the wattmeter.

Lock-Out Circuit Check

Place the Channel Selector in the open channel (detent) position. Check the voltage at the base of Q1 using a VOM. The voltage should be within 0.05 to 0.4V.

Transmit Frequency Check

1. Place the transceiver into transmit AM mode with no modulation.
2. Connect the frequency counter to the antenna connector as shown in figure 3-4. Read the frequency at each channel. The frequency should be within $\pm 800\text{Hz}$ from each center channel frequency as tabulated in the frequency table.

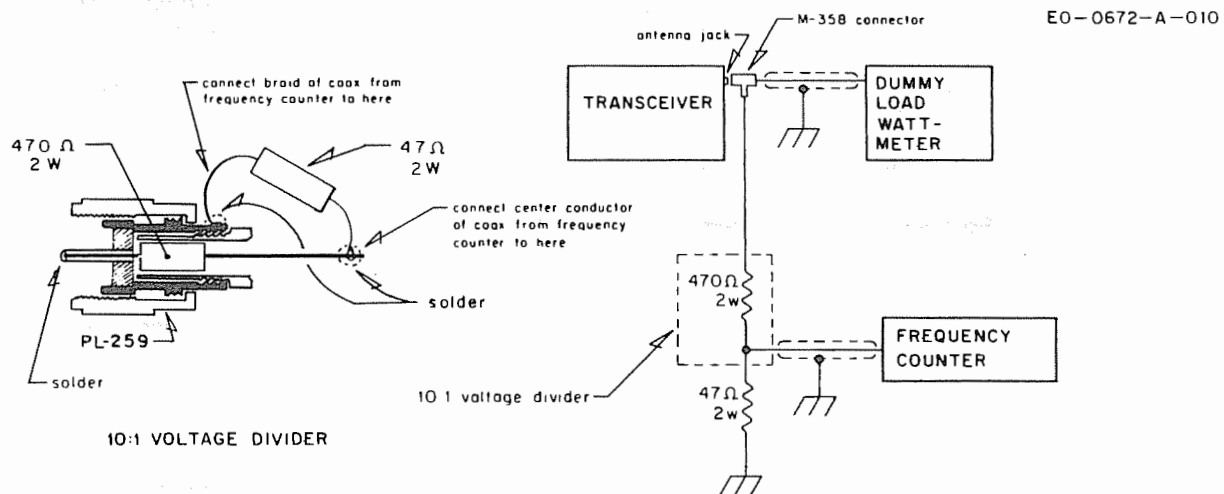


Figure 3-4. Connection of Frequency Counter and Dummy Load

CHANNEL FREQUENCY

Channel	MHz	Channel	MHz	Channel	MHz	Channel	MHz
1	26.965	11	27.085	21	27.215	31	27.315
2	26.975	12	27.105	22	27.225	32	27.325
3	26.985	13	27.115	23	27.255	33	27.335
4	27.005	14	27.125	24	27.235	34	27.345
5	27.015	15	27.135	25	27.245	35	27.355
6	27.025	16	27.155	26	27.265	36	27.365
7	27.035	17	27.165	27	27.275	37	27.375
8	27.055	18	27.175	28	27.285	38	27.385
9	27.065	19	27.185	29	27.295	39	27.395
10	27.075	20	27.205	30	27.305	40	27.405

Receiver Alignment

Equipment Set-up

Refer to figure 3-5 for the test equipment set-up. Refer to figure 3-7 for the location of components to be adjusted for transmitter alignment.

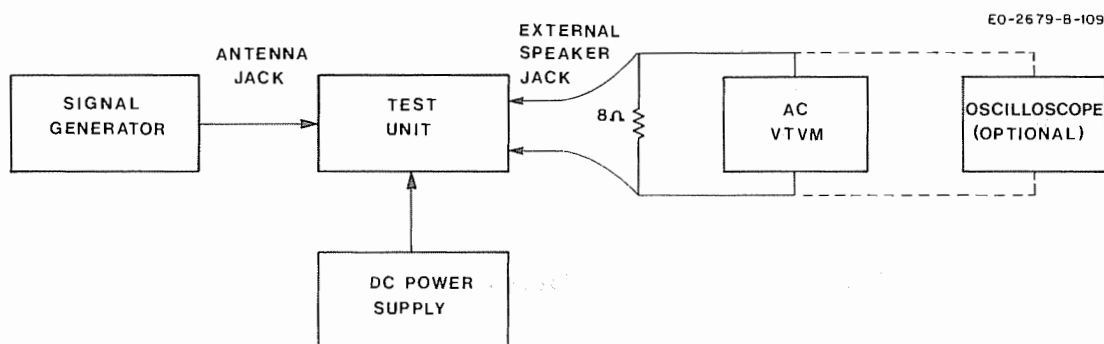


Figure 3-5. Test Equipment Set-Up, Receiver Alignment

AGC Alignment

1. Connect the VOM to terminal number 15 on the main p.c. board and chassis ground.
2. Place the Mode switch in the AM position.
3. Adjust RV8 to obtain a reading of 2V.

Receiver Sensitivity Alignment

To put the transceiver into the receive mode, short pins 3 and 5 of the MIC jack on the front panel together.

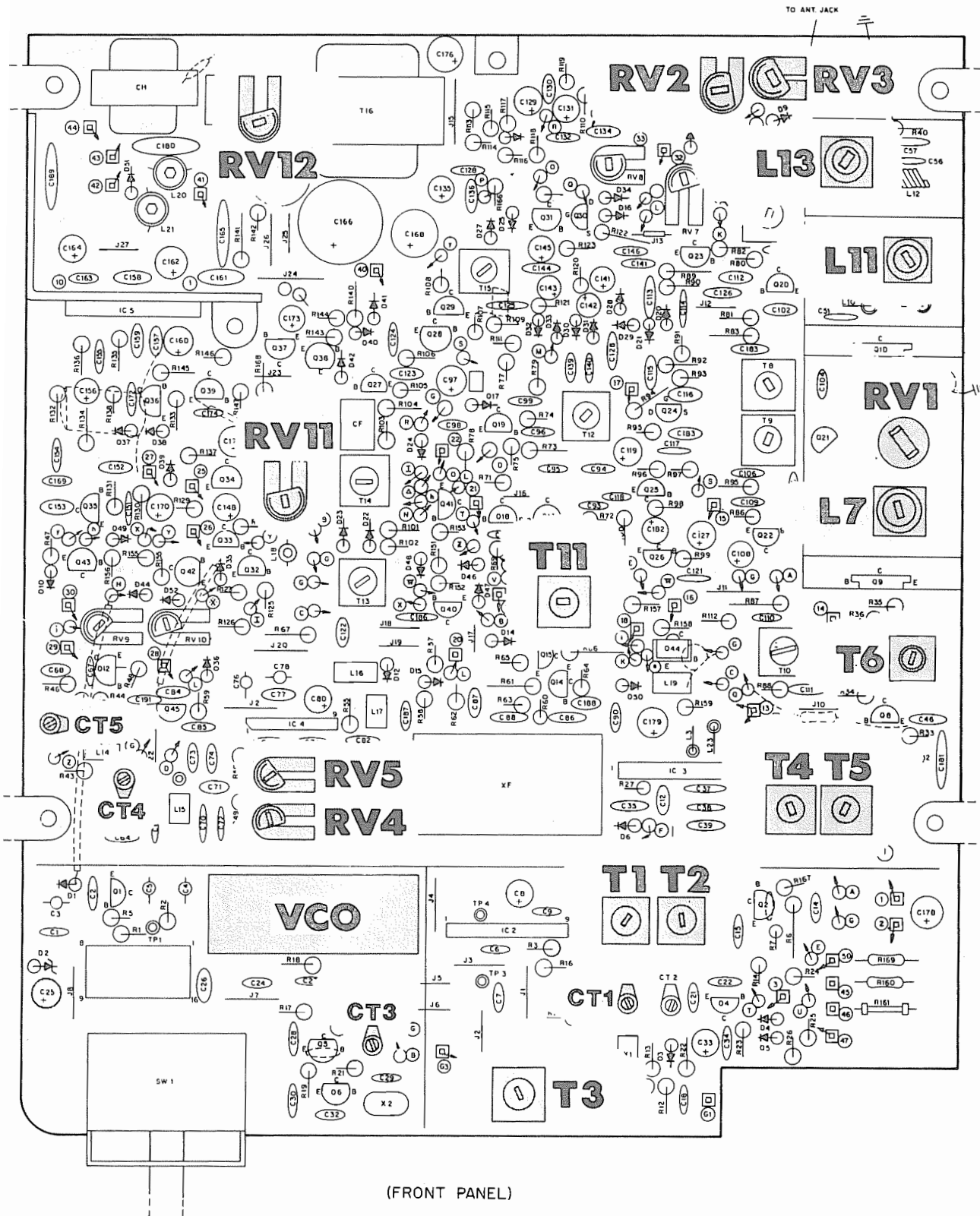
1. Set the signal generator to 27.185 MHz, 1 kHz, 30% modulation and set the transceiver to channel 19. **NOTE:** This alignment should be performed with an extremely small signal input from the signal generator to avoid inaccurate alignment due to AGC action.
2. Adjust T7, T8, T9, T10, T13, T14 and T15 for maximum audio output as indicated on the AC VTVM (or oscilloscope, if used).
3. Turn the core of T7 one turn clockwise.

Squelch Circuit Alignment

1. Place the Mode switch in the AM position.
2. Set the signal generator to provide an RF input signal of 50 μ V, 1 kHz, 30% modulation.
3. Rotate the squelch control fully clockwise.
4. Adjust RV9 so that the squelch just breaks with the 50 μ V signal input.
5. Place the Mode switch in the USB position and adjust RV10 so that the squelch just breaks with the 50 μ V signal input.

S-Meter Adjustment

1. Set the signal generator to provide a 30 μ V signal input and place the Mode switch in the USB position.
2. Adjust RV7 so that the S-meter indicates "9".
3. Place the Mode switch in the AM position and retune the signal generator slightly to obtain maximum audio output.
4. Adjust RV6 so that the S-meter indicates "9".



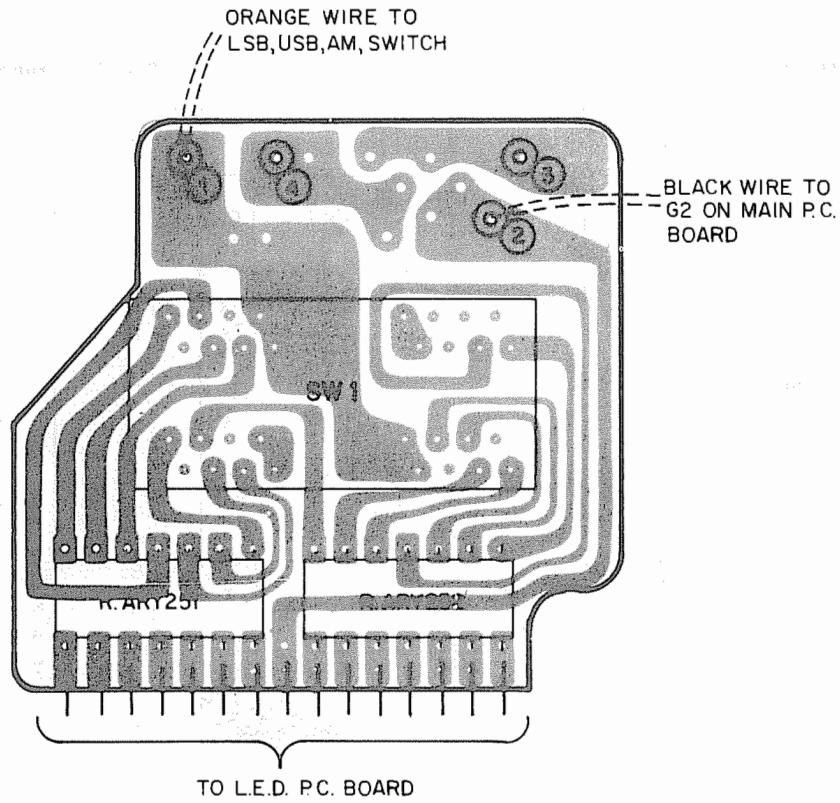
Components Adjusted for Transmitter Alignment

Regulated Power Supply (AVR)

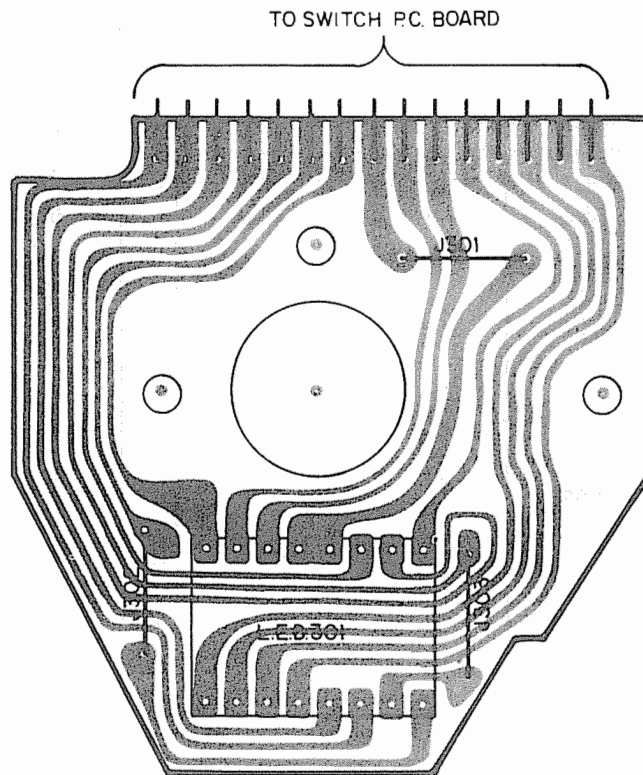
The Automatic Voltage Regulator circuit consists of Q44 and D50. D50 is a zener diode and will break down when any voltage spikes occur. This circuit supplies the regulated voltage through switching transistors Q40, Q41, Q42 and Q43. The various switching transistors operate depending on the mode of operation selected by S2.

N CODE — FREQUENCY CORRELATION CHART

CHANNEL NO.	CHANNEL FREQ. (MHz)	"N" CODES	VCO FREQUENCY		CHANNEL SWITCH OUTPUT (PLL Inputs)					
			AM/USB	LSB	P0	P1	P2	P3	P4	P5
1	26.965	255	17.555	17.5535	1	1	1	1	1	1
2	26.975	254	17.575	17.5735	0	1	1	1	1	1
3	26.985	253	17.575	15.5735	1	0	1	1	1	1
4	27.005	251	17.595	17.5935	1	1	0	1	1	1
5	27.015	250	17.605	17.6035	0	1	0	1	1	1
6	27.025	249	17.615	17.6135	1	0	0	1	1	1
7	27.035	248	17.625	17.6235	0	0	0	1	1	1
8	27.055	246	17.645	17.6435	0	1	1	0	1	1
9	27.065	245	17.655	17.6535	1	0	1	0	1	1
10	27.075	244	17.665	17.6635	0	0	1	0	1	1
11	27.085	243	17.675	17.6735	1	1	0	0	1	1
12	27.105	241	17.695	17.6935	1	0	0	0	1	1
13	27.115	240	17.705	17.7035	0	0	0	0	1	1
14	27.125	239	17.715	17.7135	1	1	1	1	0	1
15	27.135	238	17.725	17.7235	0	1	1	1	0	1
16	27.155	236	17.745	17.7435	0	0	1	1	0	1
17	27.165	235	17.755	17.7535	1	1	0	1	0	1
18	27.175	234	17.765	17.7635	0	1	0	1	0	1
19	27.185	233	17.775	17.7735	1	0	0	1	0	1
20	27.205	231	17.795	17.7935	1	1	1	0	0	1
21	27.215	230	17.805	17.8035	0	1	1	0	0	1
22	27.225	229	17.815	17.8135	1	0	1	0	0	1
23	27.255	226	17.845	17.8435	0	1	0	0	0	1
24	27.235	228	17.825	17.8235	0	0	1	0	0	1
25	27.245	227	17.835	17.8335	1	1	0	0	0	1
26	27.265	225	17.855	17.8535	1	0	0	0	0	1
27	27.275	224	17.865	17.8635	0	0	0	0	0	1
28	27.285	223	17.875	17.8735	1	1	1	1	1	0
29	27.295	222	17.885	17.8835	0	1	1	1	1	0
30	27.305	221	17.895	17.8935	1	0	1	1	1	0
31	27.315	220	17.905	17.9035	0	0	1	1	1	0
32	27.325	219	17.915	17.9135	1	1	0	1	1	0
33	27.335	218	17.925	17.9235	0	1	0	1	1	0
34	27.345	217	17.935	17.9335	1	0	0	1	1	0
35	27.355	216	17.945	17.9435	0	0	0	1	1	0
36	27.365	215	17.955	17.9535	1	1	1	0	1	0
37	27.375	214	17.965	17.9635	0	1	1	0	1	0
38	27.385	213	17.975	17.9735	1	0	1	0	1	0
39	27.395	212	17.995	17.9935	0	0	1	0	1	0
40	27.405	211	17.995	17.9935	1	1	0	0	1	0



Component Outline LED P.C. Board.



Component Outline Switch P.C. Board

VOLTAGE MEASUREMENT CHARTS

(AM Receive-Transmit)

Ref. Desig.		E	B	C
Q1	Rx	3.8	.25	5.6
	Tx	3.8	.25	5.6
Q2	Rx	1	1.5	9.3
	Tx	0	0	9.3
Q3	Rx	1.08	1.5	9.2
	Tx	1.08	1.5	9.2
Q4	Rx	0	0	0
	Tx	0	0	0
Q5	Rx	.5	.82	5.6
	Tx	.5	.82	5.6
Q6	Rx	0	.6	.82
	Tx	0	.6	.82
Q7	Rx	0	.7	0
	Tx	1.5	.7	7.2
Q8	Rx	0	0	13.8
	Tx	.76	1.55	13
Q9	Rx	0	0	13.8
	Tx	0	.7	5.6
Q10	Rx	0	0	13.8
	Tx	0	.6	5.4
Q11	Rx	0	0	0
	Tx	0	0	0
Q12	Rx	2.8	3.2	9.4
	Tx	2.5	3.0	8.0
Q13	Rx	0	0	0
	Tx	0	0	0
Q14	Rx	0	0	9.4
	Tx	1.05	0	3.2
Q15	Rx	0	0	9.4
	Tx	1.05	1.63	3.2
Q16	Rx	0	0	0
	Tx	0	0	0

AM Receive-Transmit

Ref. Desig.		E	B	C
Q17	Rx	0	0	0
	Tx	0	0	0
Q18	Rx	0	0	0
	Tx	0	.75	0
Q19	Rx	0	0	0
	Tx	0	0	0
Q20	Rx	1.45	1.85	10.8
	Tx	.4	.45	10.8
Q21	Rx	0	0	0
	Tx	0	.75	0
Q22	Rx	1.5	1.75	12.2
	Tx	.2	.4	13
Q23	Rx	0	4.7	13
	Tx	0	4.7	13
Q24	Rx	0	.65	7.8
	Tx	0	0	0
Q25	Rx	8.6	7.6	3.4
	Tx	0	0	0
Q26	Rx	0	0	0
	Tx	0	0	0
Q27	Rx	.6	.87	8
	Tx	0	0	13
Q28	Rx	0	.65	2
	Tx	0	0	.25
Q29	Rx	1.35	2	11
	Tx	0	.25	13
Q30	Rx	0	0	0
	Tx	0	0	0
Q31	Rx	0	0	0
	Tx	0	0	0
Q32 Squelched	Rx	1.7	1.7	0
	Tx	.9	.2	.7

Hy-Gain 2705(Hy-Gain V)

AM Receive-Transmit

Ref. Desig.		E	B	C
Q32 Unsquelled	Rx	2.7	1.8	.7
	Tx	1.6	.5	.7
Q33 Unsquelled	Rx	0	.7	0
	Tx	0	.7	0
Q33 Squelched	Rx	0	0	.7
	Tx	0	.7	0
Q34 Unsquelled	Rx	0	0	3.3
	Tx	0	0	3.3
Q34 Squelched	Rx	0	.65	0
	Tx	0	0	3.3
Q35	Rx	0	0	0
	Tx	0	0	0
Q36	Rx	0	.7	0
	Tx	0	.7	0
Q37	Rx	1.5	4.4	0
	Tx	1.5	4.3	0
Q38	Rx	1.5	6.9	0
	Tx	1.5	6.6	0
Q39	Rx	0	0	7.6
	Tx	0	0	7.3
Q40	Rx	0	0	0
	Tx	0	0	0
Q41	Rx	0	0	0
	Tx	0	0	0
Q42	Rx	9.2	9.1	0
	Tx	9.1	8.4	9
Q43	Rx	8.6	9.2	9.4
	Tx	.35	.8	9.3

USB Receive-Transmit

Ref. Desig.		E	B	C
Q2	Rx	1	1.5	9.3
	Tx	0	0	9.3
Q3	Rx	1.08	1.5	9.2
	Tx	1.08	1.5	9.2
Q4	Rx	0	0	0
	Tx	0	0	0
Q5	Rx	.5	.82	5.6
	Tx	.5	.82	5.6
Q6	Rx	0	.6	.82
	Tx	0	.6	.82
Q7	Rx	0	.7	0
	Tx	1.65	.7	7.2
Q8	Rx	0	0	13.8
	Tx	.76	1.7	13.5
Q9	Rx	0	0	13.8
	Tx	0	.7	13.8
Q10	Rx	0	0	13.8
	Tx	0	.6	13.8
Q11	Rx	0	0	0
	Tx	0	0	0
Q12	Rx	2.5	3	8
	Tx	2.5	3	8
Q13	Rx	0	0	0
	Tx	4	4.7	6.8
Q14	Rx	.97	.83	8.2
	Tx	.6	1.1	8.6
Q15	Rx	.97	0	8.2
	Tx	.6	0	8.6
Q16	Rx	0	.7	1.9
	Tx	0	0	0
Q17	Rx	1.1	1.9	6
	Tx	0	0	.2
Q18	Rx	0	0	1.9
	Tx	0	.75	0

USB Receive-Transmit

Ref. Desig.		E	B	C
Q1	Rx	3.8	.25	5.6
	Tx	3.8	.25	5.6

USB Receive-Transmit

Reg. Desig.		E	B	C
Q19	Rx	0	.5	5.6
	Tx	0	0	0
Q20	Rx	1.25	1.85	13.2
	Tx	.5	.45	13.2
Q21	Rx	0	0	0
	Tx	0	.75	0
Q22	Rx	1.3	1.75	12.8
	Tx	.2	.45	13.5
Q23	Rx	0	4.9	13.5
	Tx	0	4.9	13.5
Q24	Rx	0	.65	7.8
	Tx	0	0	0
Q25	Rx	8.6	7.6	3.4
	Tx	0	0	0
Q26	Rx	0	0	0
	Tx	0	0	0
Q27	Rx	0	0	13.5
	Tx	0	0	13.5
Q28	Rx	0	0	0
	Tx	0	0	0
Q29	Rx	0	0	13.5
	Tx	0	0	13.5
Q30	Tx	1.5	2.2	7.7
	Tx	0	0	0
Q31	Rx	.1	1.5	2.05
	Tx	0	0	0
Q32 Unsquelled	Rx	2.7	1.8	.7
	Tx	1.6	.5	.7
Q32 Squelched	Rx	1.7	1.7	0
	Tx	.9	.2	.7
Q33 Unsquelled	Rx	0	.7	0
	Tx	0	.7	0
Q33 Squelched	Rx	0	0	.7
	Tx	0	.7	0

USB Receive-Transmit

Ref. Desig.		E	B	C
Q34 Unsquelled	Rx	0	0	3.3
	Tx	0	0	3.3
Q34 Squelched	Rx	0	.65	0
	Tx	0	0	3.3
Q35	Rx	0	0	0
	Tx	0	0	0
Q36	Rx	0	.7	0
	Tx	0	0	0
Q37	Rx	1.5	4.4	0
	Tx	1.5	4.4	0
Q38	Rx	1.5	6.9	0
	Tx	1.5	1.5	0
Q39	Rx	0	0	7.6
	Tx	0	.75	0
Q40	Rx	8.4	8.2	0
	Tx	8.2	7.4	8
Q41	Rx	7.5	8.1	8.4
	Tx	.2	.7	8.2
Q42	Rx	0	0	0
	Tx	0	0	0
Q43	Rx	0	0	0
	Tx	0	0	0

LSB Receive-Transmit

Ref. Desig.		E	B	C
Q1	Rx	3.8	.25	5.6
	Tx	3.8	.25	5.6
Q2	Rx	1	1.5	9.3
	Tx	0	0	9.3
Q3	Rx	1.08	1.5	9.2
	Tx	1.08	1.5	9.2
Q4	Rx	0	.77	0
	Tx	0	.77	0

Hy-Gain 2705(Hy-Gain V)

LSB Receive-Transmit

Ref. Desig		E	B	C
Q5	Rx	.5	.82	5.6
	Tx	.5	.82	5.6
Q6	Rx	0	.6	.82
	Tx	0	.6	.82
Q7	Rx	0	.7	0
	Tx	1.65	.7	7.2
Q8	Rx	0	0	13.8
	Tx	.76	1.7	13.5
Q9	Rx	0	0	13.8
	Tx	0	.7	13.8
Q10	Rx	0	0	13.8
	Tx	0	.6	13.8
Q11	Rx	0	.7	0
	Tx	0	.7	0
Q12	Rx	2.5	3	8
	Tx	2.5	3	8
Q13	Rx	0	0	0
	Tx	4	4.7	6.8
Q14	Rx	.97	.95	8.2
	Tx	.6	1.1	8.2
Q15	Rx	.97	0	8.2
	Tx	.6	0	8.2
Q16	Rx	0	.7	1.9
	Tx	0	0	0
Q17	Tx	1.1	1.9	6
	Tx	0	0	.2
Q18	Rx	0	0	1.9
	Tx	0	.75	0
Q19	Rx	0	.5	5.6
	Tx	0	0	0
Q20	Rx	1.25	1.85	13.2
	Tx	.5	.45	13.2
Q21	Rx	0	0	0
	Tx	0	.75	0

LSB Receive-Transmit

Ref. Desig.		E	B	C
Q22	Rx	1.3	1.75	12.8
	Tx	.2	.45	13.5
Q23	Rx	0	4.9	13.5
	Tx	0	4.9	13.5
Q24	Rx	0	.65	7.8
	Tx	0	0	0
Q25	Rx	8.6	7.6	3.4
	Tx	0	0	0
Q26	Rx	0	0	0
	Tx	0	0	0
Q27	Rx	0	0	13.5
	Tx	0	0	13.5
Q28	Rx	0	0	0
	Tx	0	0	0
Q29	Rx	0	0	13.5
	Tx	0	0	13.5
Q30	Rx	1.5	2.2	7.7
	Tx	0	0	0
Q31	Rx	.1	1.5	2.05
	Tx	0	0	0
Q32 Unsquelled	Rx	2.7	1.8	.7
	Tx	1.6	.5	.7
Q32 Squelched	Rx	1.7	1.7	0
	Tx	.9	.2	.7
Q33 Unsquelled	Rx	0	.7	0
	Tx	0	.7	0
Q33 Squelched	Rx	0	0	.7
	Tx	0	.7	0
Q34 Unsquelled	Rx	0	0	3.3
	Tx	0	0	3.3
Q34 Squelched	Rx	0	.65	0
	Tx	0	0	3.3
Q35	Rx	0	0	0
	Tx	0	0	0

LSB Receive-Transmit

Ref. Desig.		E	B	C
Q36	Rx	0	.7	0
	Tx	0	0	0
Q37	Rx	1.5	4.4	0
	Tx	1.5	4.4	0
Q38	Rx	1.5	6.9	0
	Tx	1.5	1.5	0
Q39	Rx	0	0	7.6
	Tx	0	.75	0
Q40	Rx	8.4	8.2	0
	Tx	8.2	7.4	8
Q41	Rx	7.5	8.1	8.4
	Tx	.2	.7	8.2
Q42	Rx	0	0	0
	Tx	0	0	0
Q43	Rx	0	0	0
	Tx	0	0	0

IC 1 (P.L.L. 02)

Pin No.	Voltage	Channels Selected
1	5.6	N/A
2	1.8	N/A
3	.15	N/A
4	5.3	N/A
5	No Pin	
6	1.5 - 3.5	40 - 1
7	0	N/A
8	5.6	N/A
9	5.6	N/A
10	5.6	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,19,20,21,22,23,24,25, 26,27
11	5.6	1,2,3,4,5,6,7,8,9,10,11,12,13,25, 29,30,31,32,33,34,35,36,37,38,39,40
12	5.6	1,2,3,4,5,6,7,14,15,16,17,18,19,28, 29,30,31,32,33,34,35
13	5.6	1,2,3,8,9,10,14,15,16,20,21,22, 24,28,29,30,31,36,37,38,39
14	5.6	1,2,4,5,8,11,14,15,17,18,20,21,23, 25,28,29,32,33,36,37,40
15	5.6	1,3,4,6,9,11,12,14,17,19,20,22,25, 26,28,30,32,34,36,38,40
16	0	N/A

NOTE: All voltage readings are taken with the power source set at exactly 13.8 VDC.

Hy-Gain 2705(Hy-Gain V)

IC 2

Pin No.		1	2	3	4	5	6	7	8	9
Voltage	Rx	2.5	2	1.3	2.3	0	8.4	2.1	4.4	5.5
	Tx	2.5	2	1.3	2.3	0	8.4	2.1	4.4	5.5

IC 3

Pin No.		1	2	3	4	5	6	7	8	9
Voltage	Rx	0	0	0	0	0	0	0	0	0
	Tx	2.6	2	1.3	2.7	0	7.2	2	7.3	6.8

IC 4

Pin No.		1	2	3	4	5	6	7
Voltage	Rx	0	0	0	0	0	0	0
	Tx	3.1	3.4	3.5	0	6.3	8.3	4.7

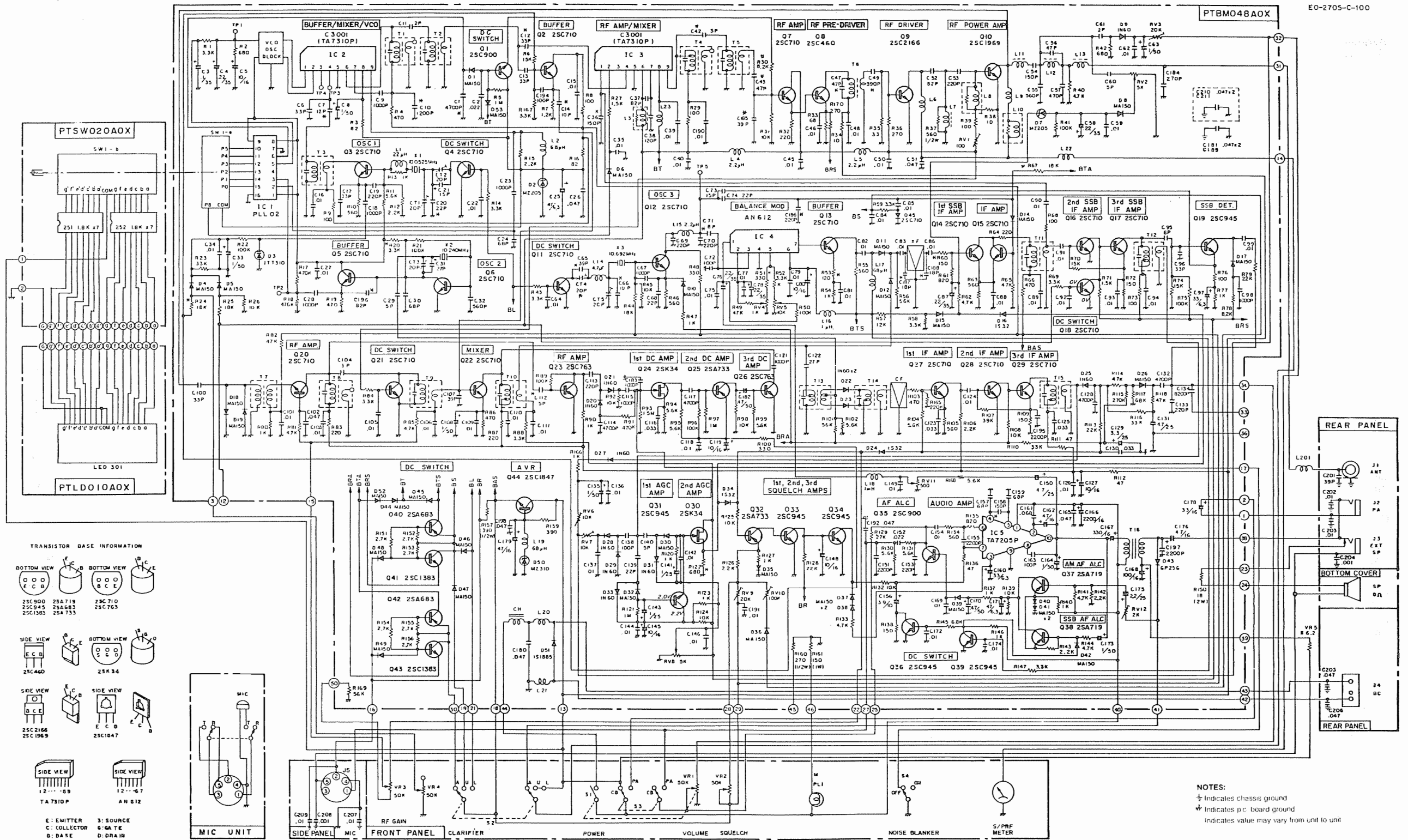
IC 5

Pin No.		1	2	3	4	5	6	7	8	9	10
Voltage squelched		13.8	12.5	2.5	12	.4	1.6	1.5	0	0	11
Voltage unsquelched		13.8	12.5	4	8.4	1.3	3.8	3.5	1.3	0	7.1

NOTE: All voltage measurements are taken with the power supply set at exactly 13.8 VDC.

MAIN P.C. BOARD

Reference Designator	Description	Part No.
	main p.c. board, complete	AP-TBM048CA
	main p.c. board, plate and drilled	PT-BM048AOX
C1	4700pF, 50V, mylar	CQ-MB472KCH
C2	.022uF, 50V, mylar	CQ-MB223KCH
C3	.1uF, 35V, tantalum	CS-SF0R1MLC
C4	.22uF, 35V, tantalum	CS-SFR22MLC
C5	10uF, 16V, tantalum	CS-SD100MLC
C6	33pF, 50V, ceramic	CC-CB330KPM
C7	12pF, 50V, ceramic	CC-CB120KPM
C8	1uF, 50V, electrolytic	CE-EG010ALN
C9	1000pF, 50V, mylar	CQ-MB102KCH
C10	1200F, 50V, mylar	CQ-MB122KCH
C11	2pF, 50V, ceramic	CC-CB020CPM
C12	33pF, 50V, ceramic	CC-CB330KPM
C13	33pF, 50V, ceramic	CC-CB330KPM
C14	10pF, 50V, ceramic	CC-CB100DPM
C15	.01uF, 50V, mylar	CQ-MB103KCH
C16	.01uF, 50V, mylar	CQ-MB103KCH
C17	33pF, 50V, ceramic	CC-CB330KPM
C18	1000pF, 50V, mylar	CQ-MB102KCH
C19	220pF, 50V, ceramic	CC-CB221KPM
C20	22pF, 50V, ceramic	CC-CB220KCM
C21	15pF, 50V, ceramic	CC-CB150KCM
C22	.01uF, 50V, mylar	CQ-MB103KCH
C23	1000pF, 50V, mylar	CQ-MB102KCH
C24	68pF, 50V, ceramic	CC-CB680KPM
C25	47uF, 6.3V, electrolytic	CE-EB470ALN
C26	.047uF, 50V, mylar	CQ-MB473KCH
C27	.01uF, 50V, mylar	CQ-MB103KCH
C28	1000pF, 50V, mylar	CQ-MB102KCH
C29	5pF, 50V, mylar	CC-CB050DPM
C30	68pF, 50V, mylar	CC-CB680KPM
C31	27pF, 50V, mylar	CC-CB270KCM
C32	560pF, 50V, mylar	CC-CB561KOM
C33	1uF, 50V, electrolytic	CE-EG010ALN
C34	.01uF, 50V, mylar	CQ-MB103KCH
C35	.01uF, 50V, mylar	CQ-MB103KCH
C36	150pF, 50V, ceramic	CC-CB151KPM
C37	82pF, 50V, ceramic	CC-CB820KPM
C38	120pF, 50V, ceramic	CC-CB121KPM
C39	.01uF, 50V, mylar	CQ-MB103KCH
C40	.01uF, 50V, mylar	CQ-MB103KCH
C41	(not used)	
C42	3pF, 50V, ceramic	CC-CB030CPM
C43	47pF, 50V, ceramic	CC-CB470KPM
C44	(not used)	
C45	.01uF, 50V, mylar	CQ-MB103KCH
C46	.01uF, 50V, mylar	CQ-MB103KCH
C47	47pF, 50V, ceramic	CC-CB470KPM
C48	.01uF, 50V, mylar	CQ-MB103KCH
C49	330pF, 50V, ceramic	CC-CB331KOK
C50	.01uF, 50V, mylar	CQ-MB103KCH
C51	.047uF, 50V, mylar	CQ-MB473KCH
C52	82pF, 50V, ceramic	CC-CB820KPM
C53	180pF, 50V, ceramic	CC-CB181KPM
C54	150pF, 50V, ceramic	CC-CB151KPM
C55	560pF, 50V, ceramic	CC-CB561KOK
C56	47pF, 50V, ceramic	CC-CB470KPM
C57	470pF, 50V, ceramic	CC-CB471KOK
C58	.22uF, 35V, tantalum	CS-SFR22MLC
C59	.01uF, 50V, mylar	CQ-MB103KCH
C60	5pF, 50V, ceramic	CC-CB050DPM



Hy-Gain 2705(Hy-Gain V)

Reference Designator	Description	Part No.
C61	2pF, 50V, ceramic	CC-CB020KPM
C62	.01uF, 50V, mylar	CQ-MB103KCH
C63	1uF, 50V, electrolytic	CE-EG010ALN
C64	.01uF, 50V, mylar	CQ-MB103KCH
C65	47pF, 50V, ceramic	CC-CB470KCM
C66	10pF, 50V, ceramic	CC-CB100DCM
C67	1000pF, 50V, mylar	CQ-MB102KCH
C68	22pF, 50V, ceramic	CC-CB220KPM
C69	220pF, 50V, ceramic	CC-CB221KPM
C70	220pF, 50V, ceramic	CC-CB221KPM
C71	8pF, 50V, ceramic	CC-CB080DPM
C72	100pF, 50V, ceramic	CC-CB101KPM
C73	15pF, 50V, ceramic	CC-CB150KPM
C74	22pF, 50V, ceramic	CC-CB220KPM
C75	.01uF, 50V, mylar	CQ-MB103KCH
C76	4.7uF, 25V, electrolytic	CE-EE4R7ALN
C77	.01uF, 50V, mylar	CQ-MB103KCH
C78	10uF, 16V, electrolytic	CE-ED100ALN
C79	.01uF, 50V, mylar	CQ-MB103KCH
C80	10uF, 16V, electrolytic	CE-ED100ALN
C81	.01uF, 50V, mylar	CQ-MB103KCH
C82	.01uF, 50V, mylar	CQ-MB103KCH
C83	.01uF, 50V, mylar	CQ-MB103KCH
C84	.01uF, 50V, mylar	CQ-MB103KCH
C85	.01uF, 50V, mylar	CQ-MB103KCH
C86	.01uF, 50V, mylar	CQ-MB103KCH
C87	22uF, 35V, tantalum	CS-SFR22MLC
C88	.01uF, 50V, mylar	CQ-MB103KCH
C89	.01uF, 50V, mylar	CQ-MB103KCH
C90	.01uF, 50V, mylar	CQ-MB103KCH
C91	.01uF, 50V, mylar	CQ-MB103KCH
C92	.01uF, 50V, mylar	CQ-MB103KCH
C93	.01uF, 50V, mylar	CQ-MB103KCH
C94	.01uF, 50V, mylar	CQ-MB103KCH
C95	.01uF, 50V, ceramic	CC-CB030CPM
C96	33pF, 50V, ceramic	CC-CB330KPM
C97	33uF, 6.3V, electrolytic	CE-EB330ALN
C98	1000pF, 50V, mylar	CQ-MB102KCH
C99	.01uF, 50V, mylar	CQ-MB103KCH
C100	33pF, 50V, ceramic	CC-CB330KPM
C101	.01uF, 50V, mylar	CQ-MB103KCH
C102	.01uF, 50V, mylar	CQ-MB103KCH
C103	.01uF, 50V, mylar	CQ-MB103KCH
C104	3pF, 50V, ceramic	CC-CB030CPM
C105	.01uF, 50V, mylar	CQ-MB103KCH
C106	.01uF, 50V, mylar	CQ-MB103KCH
C107	39pF, 50V, ceramic	CC-CB390KPM
C108	1uF, 50V, electrolytic	CE-EG010ALN
C109	.01uF, 50V, mylar	CQ-MB103KCH
C110	.01uF, 50V, mylar	CQ-MB103KCH
C111	.01uF, 50V, mylar	CQ-MB103KCH
C112	5pF, 50V, ceramic	CC-CB050DPM
C113	220pF, 50V, ceramic	CC-CB221KPM
C114	4700pF, 50V, mylar	CQ-MB472KCH
C115	1000pF, 50V, mylar	CQ-MB102KCH
C116	.033uF, 50V, mylar	CQ-MB333KCH
C117	4700pF, 50V, mylar	CQ-MB472KCH
C118	.01uF, 50V, mylar	CQ-MB103KCH
C119	10uF, 16V, electrolytic	CE-ED100ALN
C120	(not used)	
C121	1000F, 50V, mylar	CQ-MB102KCH
C122	27pF, 50V, ceramic	CC-CB270KPM
C123	.033uF, 50V, mylar	CQ-MB333KCH
C124	.01uF, 50V, mylar	CQ-MB103KCH
C125	.033uF, 50V, mylar	CQ-MB333KCH

Reference Designator	Description	Part No.
C126	.01uF, 50V, mylar	CQ-MB103KCH
C127	10uF, 10V, electrolytic	CE-ED100ALN
C128	4700pF, 50V, mylar	CQ-MB472KCH
C129	3.3uF, 25V, electrolytic	CE-EE3R3ALN
C130	.033uF, 50V, mylar	CQ-MB333KCH
C131	4.7uF, 25V, electrolytic	CE-EE4R7ALN
C132	4700pF, 50V, mylar	CQ-MB472KCH
C133	220pF, 50V, ceramic	CC-CB221KOM
C134	8200pF, 50V, mylar	CQ-MB822KCH
C135	1uF, 50V, electrolytic	CE-EG010ALN
C136	.01uF, 50V, mylar	CQ-MB103KCH
C137	.01uF, 50V, mylar	CQ-MB103KCH
C138	100pF, 50V, ceramic	CC-CB101KPM
C139	22pF, 50V, ceramic	CC-CB220KPM
C140	5pF, 50V, ceramic	CC-CB050DPM
C141	1uF, 25V, tantalum	CS-SE010MLC
C142	.01uF, 50V, mylar	CQ-MB103KCH
C143	1uF, 25V, tantalum	CS-SE010MLC
C144	.01uF, 50V, mylar	CQ-MB103KCH
C145	10uF, 16V, electrolytic	CE-ED100ALN
C146	.01uF, 50V, mylar	CQ-MB103KCH
C147	(not used)	
C148	10uF, 16V, electrolytic	CE-ED100ALN
C149	.01uF, 50V, mylar	CQ-MB103KCH
C150	4.7uF, 25V, electrolytic	CE-EE4R7ALN
C151	2200pF, 50V, mylar	CQ-MB222KCH
C152	.022uF, 50V, mylar	CQ-MB223KCH
C153	220pF, 50V, ceramic	CC-CB221KOM
C154	.01uF, 50V, mylar	CQ-MB103KCH
C155	2200pF, 50V, mylar	CQ-MB222KCH
C156	3.9uF, 10V, tantalum	CS-SC3R9LMC
C157	68pF, 50V, ceramic	CC-CB680KOM
C158	150pF, 50V, ceramic	CC-CB151KOM
C159	68pF, 50V, ceramic	CC-CB680KOM
C160	33uF, 6.3V, electrolytic	CE-EB330ALN
C161	.068uF, 50V, mylar	CQ-MB683KCH
C162	47uF, 16V, electrolytic	CE-ED470ALN
C163	100pF, 50V, ceramic	CC-CB101KOM
C164	1uF, 50V, electrolytic	CE-EG010ALN
C165	.047uF, 50V, ceramic	CK-CB473ZFM
C166	2200uF, 16V, electrolytic	CE-ED222AUN
C167	330uF, 16V, electrolytic	CE-ED331ALN
C168	100uF, 16V, electrolytic	CE-ED101ALN
C169	.01uF, 50V, mylar	CQ-MB103KCH
C170	10uF, 16V, electrolytic	CE-ED100ALN
C171	47uF, 6.3V, electrolytic	CE-EB470ALN
C172	.01uF, 50V, mylar	CQ-MB103KCH
C173	1uF, 50V, electrolytic	CE-EG010ALN
C174	.01uF, 50V, mylar	CQ-MB103KCH
C175	2.2uF, 25V, electrolytic	CE-EE2R2ALN
C176	47uF, 16V, electrolytic	CE-ED470ALN
C177	(not used)	
C178	33uF, 16V, electrolytic	CE-ED330ALN
C179	47uF, 16V, electrolytic	CE-ED470ALN
C180	.047uF, 50V, ceramic	CK-CB473ZFM
C181	.047uF, 50V, ceramic	CK-CB473ZFM
C182	.47uF, 50V, electrolytic	CE-EGR47ALN
C183	1000pF, 50V, mylar	CQ-MB102KCH
C184	270pF, 50V, ceramic	CC-CB271KOK
C185	39pF, 50V, ceramic	CC-CB390KPM
C186	220pF, 50V, ceramic	CC-CB221KPM
C187	18pF, 50V, ceramic	CC-CB180KPM
C188	18pF, 50V, ceramic	CC-CB180KPM
C189	.047uF, 50V, ceramic	CK-CB473ZFM
C190	.01uF, 50V, mylar	CQ-MB103KCH

Hy-Gain 2705(Hy-Gain V)

Reference Designator	Description	Part No.
C191	.01uF, 50V, mylar	CQ-MB103KCH
C192	.047uF, 50V, mylar	CQ-MB473KCH
C193	(not used)	
C194	47pF, 50V, ceramic	CC-CB470KPM
CF	ceramic filter 455 kHz	FB-R455A13M
CH	choke coil	LJ-119H004W
CT1	20pF, trimmer	CT-Z7200H01
CT2	20pF, trimmer	CT-Z7200H01
CT3	20pF, trimmer	CT-Z7200H01
CT4	20pF, trimmer	CT-Z7200H01
CT5	20pF, trimmer	CT-Z7200H01
D1	MA150, silicon	QD-SMA150XN
D2	MZ205, zener	QD-ZMZ205XE
D3	ITT310, silicon	QD-CTT310XQ
D4	MA150, silicon	QD-SMA150XN
D5	MA150, silicon	QD-SMA150XN
D6	MA150, silicon	QD-SMA150XN
D7	MZ205, zener	QD-ZMZ205XE
D8	MA150, silicon	QD-SMA150XN
D9	1N60, germanium	QD-G1N20XXT
D10	MA150, silicon	QD-SMA150XN
D11	MA150, silicon	QD-SMA150XN
D12 through D13	(not used)	
D14	MA150, silicon	QD-SMA150XN
D15	MA150, silicon	QD-SMA150XN
D16	MA150, silicon	QD-SMA150XN
D17	MA150, silicon	QD-SMA150XN
D18	MA150, silicon	QD-SMA150XN
D19	MA150, silicon	QD-SMA150XN
D20	1N60, germanium	QD-G1N60XXT
D21	MA150, silicon	QD-SMA150XN
D22	MA150, silicon	QD-SMA150XN
D23	MA150, silicon	QD-SMA150XN
D24	1S32, germanium	QD-G1S32XXT
D25	1N60, germanium	QD-G1N60XXT
D26	MA150, silicon	QD-SMA150XN
D27	1N60, germanium	QD-G1N60XXT
D28	1N60, germanium	QD-G1N60XXT
D29	1N60, germanium	QD-G1N60XXT
D30	MA150, silicon	QD-SMA150XN
D31	1N60, germanium	QD-G1N60XXT
D32	MA150, silicon	QD-SMA150XN
D33	1N60, germanium	QD-G1N60XXT
D34	1S32, germanium	QD-G1S32XXT
D35	MA150, silicon	QD-SMA150XN
D36	MA150, silicon	QD-SMA150XN
D37	MA150, silicon	QD-SMA150XN
D38	MA150, silicon	QD-SMA150XN
D39	MA150, silicon	QD-SMA150XN
D40	MA150, silicon	QD-SMA150XN
D41	MA150, silicon	QD-SMA150XN
D42	MA150, silicon	QD-SMA150XN
D43	GP25G, germanium	QD-SGP25GAG
D44	MA150, silicon	QD-SMA150XN
D45	MA150, silicon	QD-SMA150XN
D46	MA150, silicon	QD-SMA150XN
D47	MA150, silicon	QD-SMA150XN
D48	MA150, silicon	QD-SMA150XN

Reference Designator	Description	Part No.
D49	MA150, silicon	QD-SMA150XN
D50	ITT310, silicon	QD-CTT310XQ
D51	1S1885, silicon	QD-SS1885XT
D52	MA150, silicon	QD-SMA150XN
IC1	PLL02A	QQ-OPLL02AN
IC2	C3001A (TA731OP)	QQ-MC3001AT
IC3	C3001A (TA731OP)	QQ-MC3001AT
IC4	AN612	QQ-MAN612AN
IC5	TA7205P	QQ-MO7205AT
L1	rf coil	LF-2RKD01N
L2	rf coil	LF-680KD01N
L3	rf coil	LD-ADA3538G
L4	rf coil	LF-2R2KD01N
L5	rf coil	LF-2R2KD01N
L6	rf coil	LD-ADA3038J
L7	rf coil	TR-10CZ003S
L8	rf coil	LD-ADB3524M
L9	rf coil	LD-ADB4024B
L10	rf coil	LD-ADB3524M
L11	rf coil	TR-10CZ005S
L12	rf coil	LA-1JG1004A
L13	rf coil	TR-10CZ004S
L14	rf coil	LF-4R7KD01N
L15	rf coil	LF-2R2KD01N
L16	rf coil	LF-1R0KD01N
L17	rf coil	LF-680KD01N
L18	rf coil	LF-102KB01S
L19	rf coil	LF-680KD01N
L20	rf coil	LB-BJE1008A
L21	rf coil	LB-BJE1008A
L22	rf coil	LD-ADB4024B
L23	rf coil	LD-ADB4024B
MXF	metal crystal filter 10.6935 MHz	FF-10R7S01G
Q1	2SC900 (F)	QT-C0900XBA
Q2	2SC710C	QT-C0710XAE
Q3	2SC710D	QT-C0710XBE
Q4	2SC710D	QT-C0710XBE
Q5	2SC710D	QT-C0710XBE
Q6	2SC710D	QT-C0710XBE
Q7	2SC710D	QT-C0710XBE
Q8	2SC460 (A)	QT-C0460XBB
Q9	2SC2166	QT-C2166XAE
Q10	2SC1969	QT-C1969XAE
Q11	2SC710D	QT-C0710XBE
Q12	2SC710D	QT-C0710XBE
Q13	2SC710C	QT-C0710XAE
Q14	2SC710C	QT-C0710XAE
Q15	2SC710C	QT-C0710XAE
Q16	2SC710C	QT-C0710XAW
Q17	2SC710C	QT-C0710XAE
Q18	2SC710D	QT-C0710XBE
Q19	2SC945 (A-Q)	QT-C0945ABA
Q20	2SC710C	QT-C0710XAE
Q21	2SC710D	QT-C0710XBE
Q22	2SC710C	QT-C0710XAE
Q23	2SC763D	QT-C0763XAE
Q24	2SK34 (C) or (D)	QT-K0034XAE
Q25	2SA733 (Q)	QT-A0733XAA

Hy-Gain 2705(Hy-Gain V)

Reference Designator	Description	Part No.
Q26	2SC763D	QT-C0763XAE
Q27	2SC710C	QT-C0710XAE
Q28	2SC710C	QT-C0710XAE
Q29	2SC710D	QT-C0710XBE
Q30	2SK34	QT-K0034XBE
Q31	2SC945 (A-Q)	QT-C0945ABA
Q32	2SA733	QT-A0733XAA
Q33	2SC945 (A-Q)	QT-C0945ABA
Q34	2SC945 (A-Q)	QT-C0945ABA
Q35	2SC900U	QT-C0900XCA
Q36	2SC945 (A-Q)	QT-C0945ABA
Q37	2SA719Q	QT-A0719XAN
Q38	2SA719Q	QT-A0719XAN
Q39	2SC945 (A-Q)	QT-C0945ABA
Q40	2SA683 (R)	QT-A0683XBN
Q41	2SC1383 (R)	QT-C1383ZDN
Q42	2SA683 (R)	QT-A0683XBN
Q43	2SC1383 (R)	QT-C1383XDN
Q44	2SC1847 (Q)	QT-C1847XAN
R1	3.3k, 1/4W, carbon	RD-25VJ332N
R2	680, 1/4W, carbon	RD-25VJ681N
R3	82, 1/4W, carbon	RD-25VJ820N
R4	470, 1/4W, carbon	RD-25VJ471N
R5	1M, 1/4W, carbon	RD-25VJ104N
R6	15k, 1/4W, carbon	RD-25VJ153N
R7	1.2k, 1/4W, carbon	RD-25VJ122N
R8	100, 1/4W, carbon	RD-25VJ101N
R9	100, 1/4W, carbon	RD-25VJ101N
R10	560, 1/4W, carbon	RD-25VJ561N
R11	5.6k, 1/4W, carbon	RD-25VJ562N
R12	2.2k, 1/4W, carbon	RD-25VJ222N
R13	1k, 1/4W, carbon	RD-25VJ102N
R14	3.3k, 1/4W, carbon	RD-25VJ332N
R15	2.2k, 1/4W, carbon	RD-25VJ222N
R16	82, 1/4W, carbon	RD-25VJ820N
R17	470k, 1/4W, carbon	RD-25VJ474N
R18	470k, 1/4W, carbon	RD-25VJ474N
R19	470, 1/4W, carbon	RD-25VJ471N
R20	3.3k, 1/4W, carbon	RD-25VJ332N
R21	100k, 1/4W, carbon	RD-25VJ104N
R22	100k, 1/4W, carbon	RD-25VJ104N
R23	33k, 1/4W, carbon	RD-25VJ333N
R24	18k, 1/4W, carbon	RD-25VJ183N
R25	18k, 1/4W, carbon	RD-25VJ183N
R26	10k, 1/4W, carbon	RD-25VJ103N
R27	1.5k, 1/4W, carbon	RD-25VJ152N
R28	(not used)	
R29	100, 1/4W, carbon	RD-25VJ101N
R30	8.2k, 1/4W, carbon	RD-25VJ822N
R31	10k, 1/4W, carbon	RD-25VJ103N
R32	220, 1/4W, carbon	RD-25VJ221N
R33	68, 1/4W, carbon	RD-25VJ680N
R34	10, 1/4W, carbon	RD-25VJ100N
R35	33, 1/4W, carbon	RD-25VJ330N
R36	270, 1/4W, carbon	RD-25VJ271N
R37	560, 1/2 metal oxide film	RG-HANJ561N
R38	10, 1/4W, carbon	RD-25VJ100N
R39	100, 1/4W, carbon	RD-25VJ101N
R40	4.7k, 1/4W, carbon	RD-25VJ472N
R41	100k, 1/4W, carbon	RD-25VJ104N
R42	1.5k, 1/4W, carbon	RD-25VJ152N
R43	3.3k, 1/4W, carbon	RD-25VJ332N

**Reference
Designator**
Description
Part No.

R44	18k, ¼W, carbon	RD-25VJ183N
R45	10k, ¼W, carbon	RD-25VJ103N
R46	560, ¼W, carbon	RD-25VJ561N
R47	1k, ¼W, carbon	RD-25VJ102N
R48	330, ¼W, carbon	RD-25VJ331N
R49	47k, ¼W, carbon	RD-25VJ473N
R50	100k, ¼W, carbon	RD-25VJ104N
R51	330, ¼W, carbon	RD-25VJ331N
R52	3.3k, ¼W, carbon	RD-25VJ332N
R53	120, ¼W, carbon	RD-25VJ121N
R54	1k, ¼W, carbon	RD-25VJ102N
R55	560, ¼W, carbon	RD-25VJ561N
R56	5.6k, ¼W, carbon	RD-25VJ562N
R57	12k, ¼W, carbon	RD-25VJ123N
R58	3.3k, ¼W, carbon	RD-25VJ332N
R59	3.3k, ¼W, carbon	RD-25VJ332N
R60	150, ¼W, carbon	RD-25VJ151N
R61	820, ¼W, carbon	RD-25VJ821N
R62	4.7k, ¼W, carbon	RD-25VJ472N
R63	560, ¼W, carbon	RD-25RJ561N
R64	220, ¼W, carbon	RD-25VJ221N
R65	4.7k, ¼W, carbon	RD-25VJ472N
R66	470, ¼W, carbon	RD-25VJ471N
R67	18k, ¼W, carbon	RD-25VJ183N
R68	100, ¼W, carbon	RD-25VJ101N
R69	3.3k, ¼W, carbon	RD-25VJ332N
R70	15k, ¼W, carbon	RD-25VJ153N
R71	1.5k, ¼W, carbon	RD-25VJ152N
R72	150, ¼W, carbon	RD-25VJ151N
R73	100, ¼W, carbon	RD-25VJ101N
R74	15k, ¼W, carbon	RD-25VJ153N
R75	100k, ¼W, carbon	RD-25VJ104N
R76	100, ¼W, carbon	RD-25VJ101N
R77	1k, ¼W, carbon	RD-25VJ102N
R78	4.7k, ¼W, carbon	RD-25VJ472N
R79	(not used)	
R80	1k, ¼W, carbon	RD-25VJ102N
R81	4.7k, ¼W, carbon	RD-25VJ472N
R82	47k, ¼W, carbon	RD-25VJ473N
R83	220, ¼W, carbon	RD-25VJ221N
R84	3.3k, ¼W, carbon	RD-25VJ332N
R85	4.7k, ¼W, carbon	RD-25VJ472N
R86	470, ¼W, carbon	RD-25VJ471N
R87	220, ¼W, carbon	RD-25VJ221N
R88	3.3k, ¼W, carbon	RD-25VJ332N
R89	100k, ¼W, carbon	RD-25VJ104N
R90	1k, ¼W, carbon	RD-25VJ102N
R91	470k, ¼W, carbon	RD-25VJ474N
R92	10k, ¼W, carbon	RD-25VJ103N
R93	1.5M, ¼W, carbon	RD-25VJ155N
R94	5.6k, ¼W, carbon	RD-25VJ562N
R95	5.6k, ¼W, carbon	RD-25VJ562N
R96	100k, ¼W, carbon	RD-25VJ104N
R97	1M, ¼W, carbon	RD-25VJ105N
R98	10k, ¼W, carbon	RD-25VJ103N
R99	5.6k, ¼W, carbon	RD-25VJ562N
R100	330, ¼W, carbon	RD-25VJ331N
R101	56k, ¼W, carbon	RD-25VJ563N
R102	5.6k, ¼W, carbon	RD-25VJ562N
R103	1k, ¼W, carbon	RD-25VJ102N
R104	47k, ¼W, carbon	RD-25VJ473N
R105	390, ¼W, carbon	RD-25VJ391N
R106	3.3k, ¼W, carbon	RD-25VJ332N
R107	39k, ¼W, carbon	RD-25VJ393N

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Reference Designator	Description	Part No.
R108	10k, ¼W, carbon	RD-25VJ103N
R109	150, ¼W, carbon	RD-25VJ151N
R110	33k, ¼W, carbon	RD-25VJ333N
R111	47, ¼W, carbon	RD-25VJ470N
R112	47, ¼W, carbon	RD-25VJ470N
R113	22k, ¼W, carbon	RD-25VJ223N
R114	47k, ¼W, carbon	RD-25VJ473N
R115	270k, ¼W, carbon	RD-25VJ274N
R116	33k, ¼W, carbon	RD-25VJ333N
R117	68k, ¼W, carbon	RD-25VJ683N
R118	47k, ¼W, carbon	RD-25VJ473N
R119	(not used)	
R120	1k, ¼W, carbon	RD-25VJ102N
R121	1M, ¼W, carbon	RD-25VJ105N
R122	680, ¼W, carbon	RD-25VJ681N
R123	1k, ¼W, carbon	RD-25VJ102N
R124	10k, ¼W, carbon	RD-25VJ103N
R125	10k, ¼W, carbon	RD-25VJ103N
R126	2.2k, ¼W, carbon	RD-25VJ222N
R127	1k, ¼W, carbon	RD-25VJ102N
R128	22k, ¼W, carbon	RD-25VJ223N
R129	27k, ¼W, carbon	RD-25VJ273N
R130	5.6k, ¼W, carbon	RD-25VJ562N
R131	5.6k, ¼W, carbon	RD-25VJ562N
R132	10k, ¼W, carbon	RD-25VJ103N
R133	4.7k, ¼W, carbon	RD-25VJ472N
R134	560, ¼W, carbon	RD-25VJ561N
R135	820, ¼W, carbon	RD-25VJ821N
R136	47, ¼W, carbon	RD-25VJ470N
R137	1k, ¼W, carbon	RD-25VJ102N
R138	150, ¼W, carbon	RD-25VJ151N
R139	10k, ¼W, carbon	RD-25VJ103N
R140	1k, ¼W, carbon	RD-25VJ102N
R141	4.7k, ¼W, carbon	RD-25VJ472N
R142	2.2k, ¼W, carbon	RD-25VJ222N
R143	2.2k, ¼W, carbon	RD-25VJ222N
R144	4.7k, ¼W, carbon	RD-25VJ472N
R145	3.3k, ¼W, carbon	RD-25VJ332N
R146	1k, ¼W, carbon	RD-25VJ102N
R147	3.3k, ¼W, carbon	RD-25VJ332N
R148	(not used)	
R149	(not used)	
R150	18 ¼W metal oxide film	RX-2ANJ180B
R151	2.7k, ¼W, carbon	RD-25VJ272N
R152	2.7k, ¼W, carbon	RD-25VJ272N
R153	2.7k, ¼W, carbon	RD-25VJ272N
R154	2.7k, ¼W, carbon	RD-25VJ272N
R155	2.7k, ¼W, carbon	RD-25VJ272N
R156	2.7k, ¼W, carbon	RD-25VJ272N
R157	390 ½W metal oxide film	RG-HANJ391B
R158	10 2W metal oxide film	RX-2ANJ100B
R159	470 ¼W carbon	RD-25VJ471N
R160	270 ½W metal oxide film	RG-HANJ271N
R161	150 1W metal oxide film	RG-1ANJ151B
R162	270 ½W metal oxide film	RG-HANJ271B
R165	220k ¼W carbon	RD-25VJ224N
R166	1k, ¼W, carbon	RD-25VJ102N
R167	3.3k, ¼W, carbon	RD-25VJ332N
R168	5.6k, ¼W, carbon	RD-25VJ562N
R169	56K, ¼W, carbon	RD-25TJ563N
RV1	100, semi-fixed	RP-GNB10101

Reference Designator	Description	Part No.
RV2	.5k, semi-fixed	RP-GNB50201
RV3	20k, semi-fixed	RP-GNB20301
RV4	1k, semi-fixed	RP-GNB10201
RV5	10k, semi-fixed	RP-GNB10301
RV6	10k, semi-fixed	RP-GNB10301
RV7	10k, semi-fixed	RP-GNB10301
RV8	5k, semi-fixed	RP-GNB50201
RV9	20k, semi-fixed	RP-GNB20301
RV10	100k, semi-fixed	RP-GNB10401
RV11	500, semi-fixed	RP-GNB50101
RV12	2k, semi-fixed	RP-GNB20201

SW	rotary switch	SR-2040302
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T1	rf transformer	TR-10MB003T
T2	rf transformer	TR-10MB005S
T3	if transformer	TR-10B002S
T4	rf transformer	TR-10CA006T
T5	rf transformer	TR-10CB003T
T6	rf transformer	TR-10CP006S
T7	rf transformer	TR-10MP003T
T8	rf transformer	TR-10CA006T
T9	rf transformer	TR-10CB001S
T10	if transformer	TR-10MA013S
T11	if transformer	TR-10MA015S
T12	if transformer	TR-10MA015S
T13	if transformer	TR-10MA014S
T14	if transformer	TR-10LA021S
T15	if transformer	TR-10LA022S
T16	audio transformer	TB-G28A004W

VCO	vco oscillator block	ZZ-Z0000017
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X1	crystal oscillator, 10.0525	XA-S1C1001T
X2	crystal oscillator, 10.24	XA-S1B9001T
X3	crystal oscillator, 10.692	XA-Z1A8001T

Part No	Description	Qty
ML-565AD001	heat sink, TA7205P	1
MS-327AD004	heat sink, TA7205P	1
MQ-531AD001	heat sink, 2SC2166	1
MX-653AD001	heat sink, 2SC1969	1
BS-PB3006NN	screw, bind head, M3x6	6
BS-PP3006NT	screw, pan head, M3x6	3

LED P.C. Board

Reference Designator	Description	Part No.
LED	LED p.c. board, complete	AP-TLD010AA
	LED p.c. board, drilled and plated	PT-LD010COX
	SL122	QL-#SL1222C

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SW P.C. Board

Reference Designator	Description	Part No.
	SW p.c. board, complete.....	AP-TSW020AA
	SW p.c. board, drilled and plated	PT-SW020COX
	1.8k, ¼w. x7. resistor array.....	ra-C182M07N

CHASSIS—MOUNTED COMPONENTS

Reference Designator	Description	Part No.
C201	39pF, 50V, ceramic	CC-DB390KPM
C202	.01uF, 50V, ceramic	CK-DB103PEM
C203	.01uF, 50V, ceramic	CK-DB103PEM
C204	.001uF, 50V, ceramic	CK-DB102PEM
C205	.0047uF, 50V, ceramic	CK-EB473ZFM
C206	.0047uF, 50V, ceramic	CK-EB473ZFM
C207	.01uF, 50V, ceramic	CK-DB103PEM
C208	.001uF, 50V, ceramic.....	CK-DB102OPEM
C209	.01uF, 50V, ceramic.....	CK-DB103PEM
C210	.0047uF, 50V, ceramic	CK-EB473ZFM
C211	.0047uF, 50V, ceramic	CK-EB473ZFM
J1	jack, 2 pin, antenna	YJ-C02S009Z
J2	jack, 3 pin, pa	YJ-T03S003Z
J3	jack, 3 pin, external speaker	YJ-T03S003Z
J4	jack, 2 pin, dc	YJ-B02S001U
J5	jack, 5 pin din	YJ-D05S002Z
L201	rf coil	LA-2TG1503A
M/PL1	meter 500uA	ZM-J2030N04
SP	speaker	ZO-A0770802
S2	switch, rotary, function	SR-0303102E
S3	switch, toggle, cb pa	ST-020201AM
S4	switch, toggle, nb	ST-020201AM
VR1/S1	potentiometer, 50k (volume control w/power switch	RV-NB503A05
VR2	potentiometer, 50k, squelch	RV-NA503B08
VR3	potentiometer, 50k, rf gain	RV-NA503B08
VR4	potentiometer, 50k, clarifier	RV-NA503A06
VR5	control, 10, 10W, wire wound.....	RW-VA100B01

MECHANICAL PARTS

Part No.	Description	Qty
AC-DC035GEA	dc cord, power	1
MB-762SZ051	panel, front	1
MU-242SZ005	bracket, meter mount	1
ML-681SZ013	panel, right side	1
ML-332SZ008	bracket, power control	1
ML-681SZ012	panel, left side	1

MECHANICAL PARTS

Part No.	Description	Qty
MS-767SZ004	panel, rear	1
ML-122SZ004	bracket, L shaped, main p.c. board mount	1
AM-2705#01	escutcheon	1
VN-176SB007	knob, channel selector	1
VN-276SM001	knob	5
MU-874SM013	case, top	1
MU-874SM014	case, bottom	1
ML-121SZ007	bracket, speaker	1
BS-PB2608NB	screw, bind head, case M2.6x8	2
BS-PL3006NB	screw, bind head, case M3x6	4

ACCESSORY PARTS

Part No.	Description	Qty
ZG-AAZ50111	microphone	1
MU-576SM003	bracket, unit mount	1
MZ-331SZ002	hanger, mike	1
MF-284SN001	thumb screw, unit mount	2
BT-PT5013AZ	screw, self-tapping M5x13	4
BW-G50A06SW	washer, outside tooth M5	4
BT-PP4010BN	screw, self-tapping M4x10	2
BW-U40855SW	washer, inside tooth M4	2
BT-PW3008BZ	screw, self-tapping, mike hanger	2

General Construction.

1. Three-pin polarized jack for DC power.
2. Four-pin screw connector for microphone.
3. No mechanical relays. All switching is solid state using diodes and transistors for high reliability.
4. Transmitter output stage is protected from mismatch, no-load or short-circuit conditions.
5. Input power is suitably filtered and bypassed to prevent alternator "whine" on transmit or receive.

Electrical Specifications.

General.

Voltage 13.8 V, Positive/
Negative Ground
Operating Range:
10 V to 16 V.
Frequency Stability $\pm 0.05\%$
Temperature Range -30° to $+50^{\circ}$ C
(Per FCC Part 15).
Humidity 5-90%.
Vibration EIA Standard RS-424.
Shock EIA Standard RS-424.

Receiver (AM):

Sensitivity.—
Less than 0.7 μ v for 10 dB SN + N to N.
Automatic Gain Control Figure of Merit.—
70 dB.
Audio Squelch Sensitivity.—
Threshold: Less than 10 dB SN + N to N.
Tight: 100 μ v minimum, 500 μ v maximum.

Adjacent Channel Selectivity and Desensitization.—

50 dB (Two-generator method).
Spurious Response Attenuation.—
50 dB.

Audio Power Output.—

4 W @ 10% distortion (load impedance
8 ohms resistive).

Audio Frequency Response (1 KHz, 0 dB reference).—

300 Hz @ -6 dB.
1000 Hz @ 0 dB.
2000 Hz @ -6 dB.

Hum and Noise, Squelched.—

-45 dB.

Noise Limiting.—

Provided with Full-time ANL.

S Meter Sensitivity at "S9".

100 μ v.

Antenna Input Impedance.—

50 ohms, unbalanced.

Transmitter (AM):

Carrier Power, No Modulation.—

4 W maximum, 3.6 minimum.

Conducted Spurious Emissions.—

-65 dB.

Radiated Spurious Emissions.—

(Complies with FCC Part 95).

Audio Frequency Harmonic Distortion.—

10% maximum @ 80% modulation.

Audio Frequency Response (1 KHz, 0 dB reference).—

300 Hz @ -6 dB.
1000 Hz @ 0 dB.
3000 Hz @ -6 dB.
6 dB/octave falling above 3000 Hz.

Hum and Noise.—

-40 dB.

Output Impedance.—

50 ohms, unbalanced.

Output Protection.—

Withstands for 5 minutes all VSWR
around Smith Chart at 20:1 without
damage or failure.

Output Stability.—

Does not exceed FCC Spurious Emission
requirements when operated into a mismatch
load with 5:1 VSWR at any point on the Smith Chart.

Transceiver Features/Controls:

- Integrated Off/IAF (Audio Frequency) Gain (volume) Control.
- Variable Squelch Control.
- CB/PA Switch.
- Analog S/R/PWR Meter, Illuminated.
- Green color Numerical LED Channel Indicator.
- Rotary Analog-Numerical Channel Selector.
- Screw-type 4-Pin Microphone Connector.

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.

ALIGNMENT EQUIPMENT FOR CB TRANSCEIVER

1. Test Voltage

DC 13.8V $\pm$ 5%, unless otherwise specified.

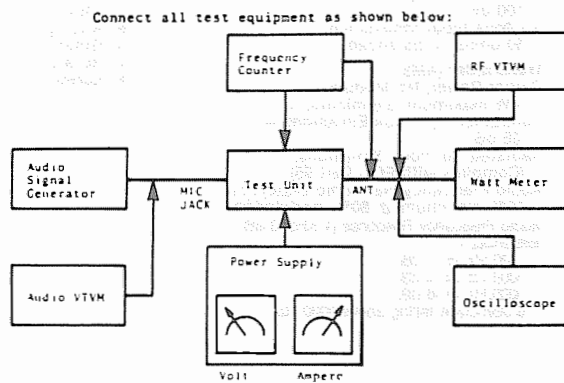
2. Test Equipment

All test equipment should be properly calibrated.

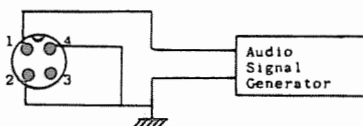
1. Audio Signal generator, 10Hz-20KHz.
2. VTVM 1mV measurable
3. DC ampere meter, 2A
4. Regulated power supply, DC 0-20V, 2A or higher
5. Frequency counter, 0-40MHz, high input impedance type
6. RF VTVM probe type
7. Oscilloscope, 30MHz, high input impedance
8. RF watt meter, thermo-couple type, 50 ohm, 5w
9. Standard signal generator, 100KHz-50MHz, -10-100dB, 50ohm unbalanced.
10. Speaker dummy resistor, 8 ohm, 5w
11. Circuit tester, DC, 20Kohm/V

3. Alignment of Transmitter Circuitry

3.1 Test Setup



- 3.2 To set the transceiver into transmit mode without the microphone, insert the plug wired as shown below into the MIC jack on the transceiver. When applying the audio modulation signal to the microphone input circuit, also use the same plug.



3.3 PLL Circuit Alignment

3.3.1 10.24MHz

Connect a frequency counter to the pin 12 and check to see 10.24000MHz $\pm$ 100Hz. When a defective crystal is replaced, and if the frequency is higher than by 100Hz, the C302 should be increased. If the frequency is lower, the C302 should be reduced in capacitance. With a factory supplied crystal, C302 value of 39 pfd should be sufficient. But on some sets minor value selection may be necessary.

3.32VCO Alignment

1. Set the radio to channel 40 and in transmit mode. (make certain 50ohm dummy load or wattmeter is connected to antenna terminal)
2. Connect circuit tester between TP1 and ground
3. Adjust L203 to obtain 5.0V DC.
4. Set the radio to channel 1 and in receive mode.
5. Check to see the TP1 DC voltage dropping to a level between 0.3 to 1.0 volt DC.

As long as the DC level stays between 5.0V DC for transmit at channel 40 and 0.3 to 1.0V DC for receive at channel 1, the VCO is set properly. The magnitude of the TP1 voltage swing is determined by C304 at factory. The optimum value of C304 was found to be around 60pfd. C304 with value larger than 60 pfd will reduce the voltage swing magnitude and vice versa for smaller value. If the lower value drops only to 1.5V DC, then the C304 of 60pfd should be reduced to increase the range. But this shouldn't be necessary when factory supplied parts are used for D201 (varactor diode) and L203 (VCO tuning coil).

3.4 RF Driver Stage Alignment

1. Select channel 19
2. Connect an oscilloscope to the base of Q301 and ground.
3. Adjust L204, L301 and L302 for maximum amplitude of scope display (27.185MHz signal)
4. Connect the scope to Q302 collector.
5. Adjust L303 for maximum amplitude of scope display.

3.5 RF Power Amplifier Alignment

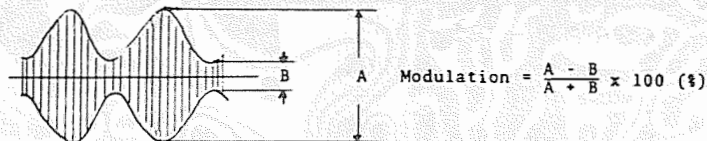
1. Set power supply voltage to 13.8V and set the radio into channel 19 position.
2. Connect a watt meter to the antenna connector.
3. Adjust L304, L305 and L306 for maximum power indication. Also again touch up L303, L302 and L301 to peak power.
4. When all coils are peaked, the power meter should indicate above 4.0watt.
5. Turn L306 counterclockwise until the power reading of 3.8 watt is obtained.

3.6 Transmit Frequency Check

1. Set the radio into transmit mode with no modulation.
2. Connect the frequency counter to the antenna load or to the tab provided at the wattmeter. The frequency should be within +800Hz from each channel center frequency as tabulated in the frequency table attached.

3.7 Modulation Sensitivity Alignment

1. Set the unit into transmit mode and apply 20mV, 1KHz signal to the Mic input circuit.
2. RV201 should be adjusted to obtain 85% modulation at this condition.



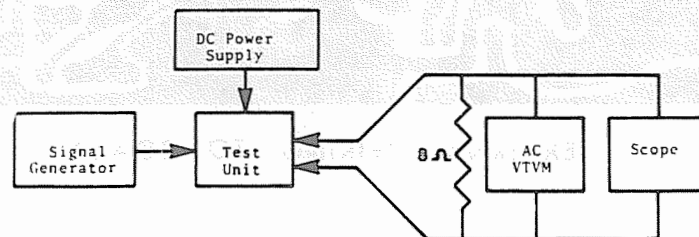
3. Next, decrease signal input to 6mV and observe that the modulation ratio is keeping the value higher than 60%.

3.8 RF Meter Alignment

Adjust RV202 so that the meter pointer should indicate the same wattage as the reading obtained on the watt meter. Refer to "3.5" in this alignment procedure.

4.0 Alignment of Receiver Circuitry

4.1 Test Set-up



4.2 Receiver Sensitivity Alignment

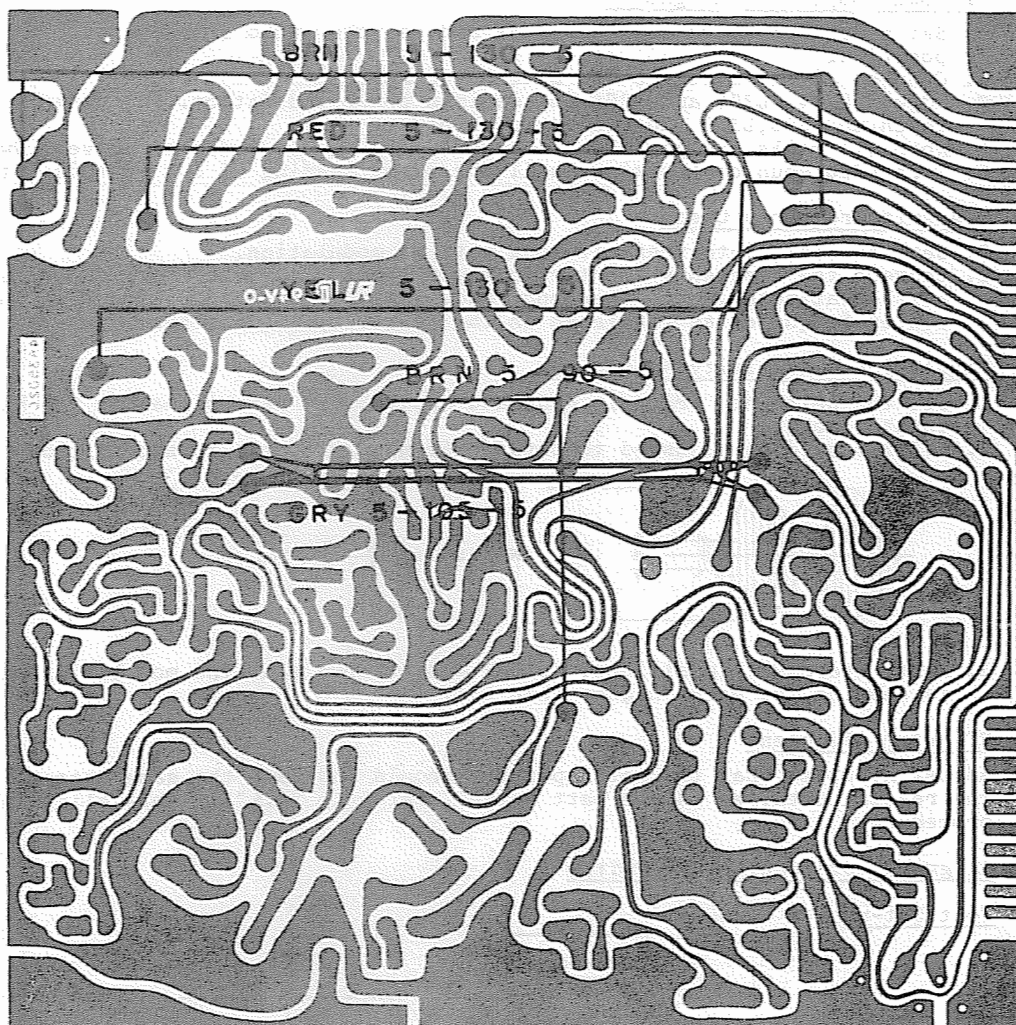
1. Set the signal generator at 27.185MHz, 1KHz and 30% modulation. Also set the radio at channel 19 position.
2. Adjust L204, L101, L102, L103, L104, L105, L106 and L107 for maximum audio output across the 8 ohm dummy load resistor. This alignment should be performed by gradually decreasing the signal generator output signal to a minimum level required for tuning to avoid inaccurate alignment due to AGC action.

4.3 Squelch Circuit Alignment

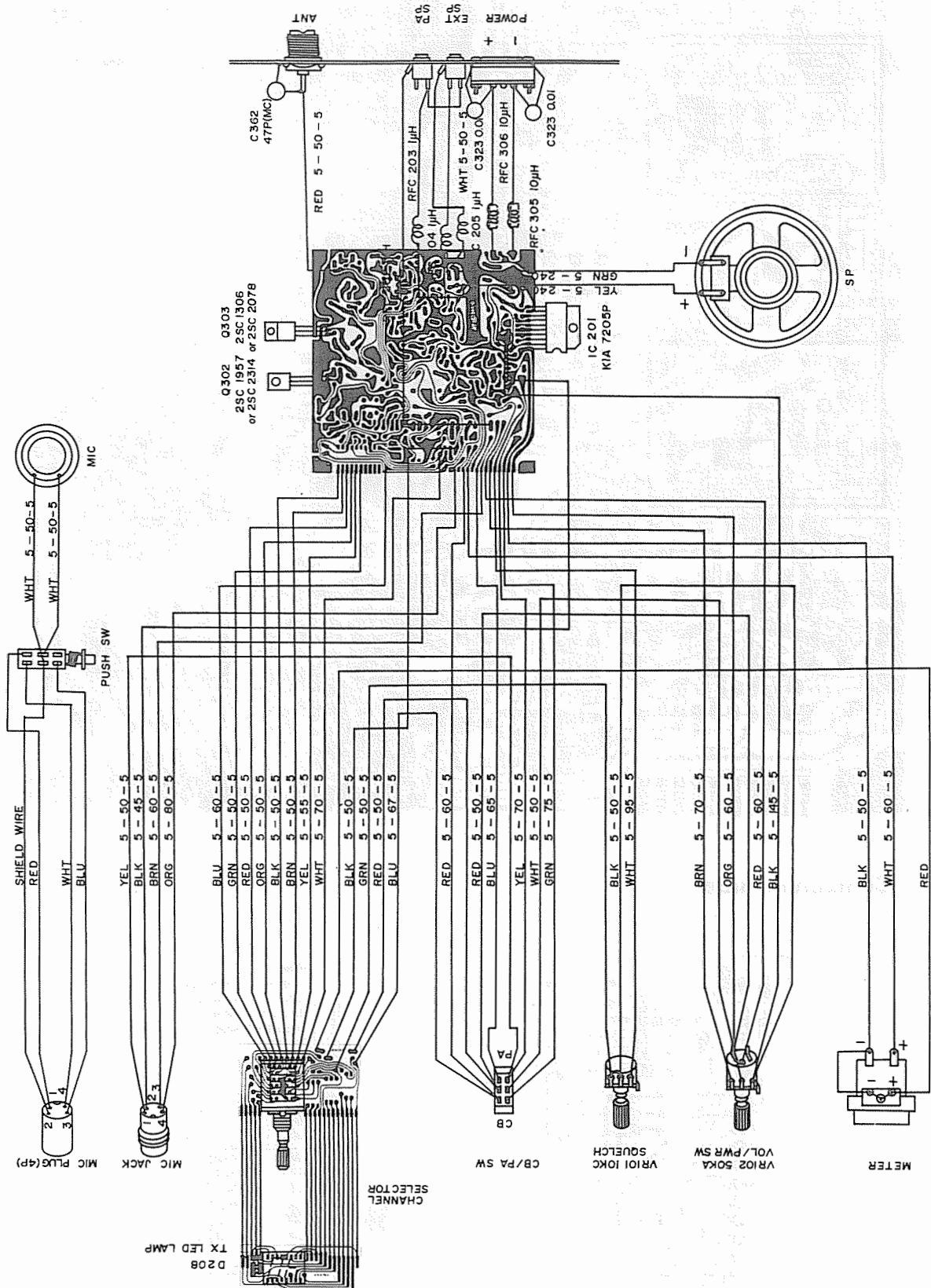
1. Set the signal generator to provide RF input signal of 50db (1KHz 30% modulation)
2. Rotate the squelch control in full clockwise direction.
3. Temporarily adjust RV101 for maximum audio output, and note the audio output level. Then, adjust RV101 so that the audio output level decreases by 6dB.

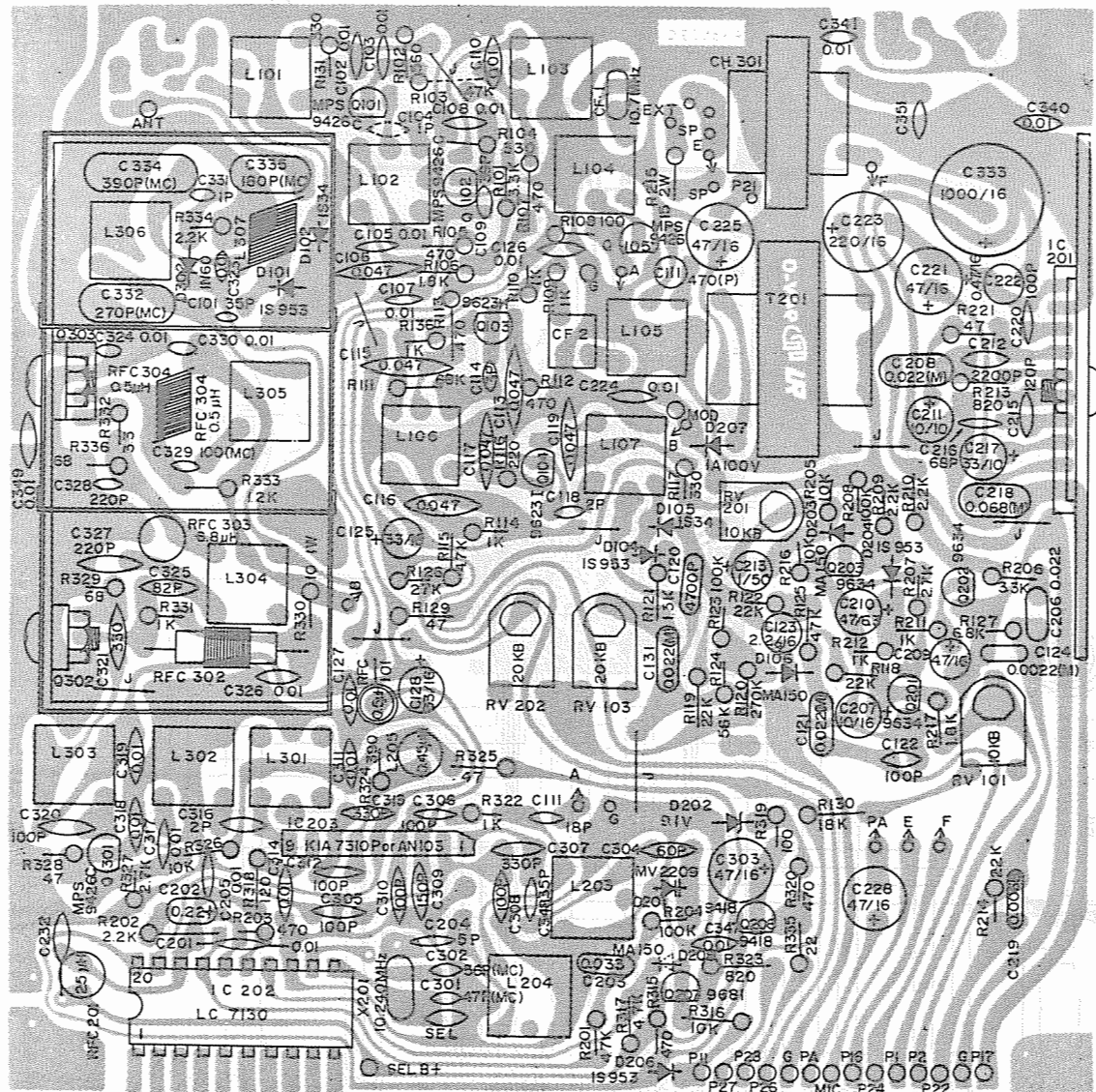
4.4 S-Meter Adjustment

1. Set the signal generator to provide 40dB signal output.
2. Adjust RV103 so that the S-Meter reads S"9" on the meter provided on the front panel.

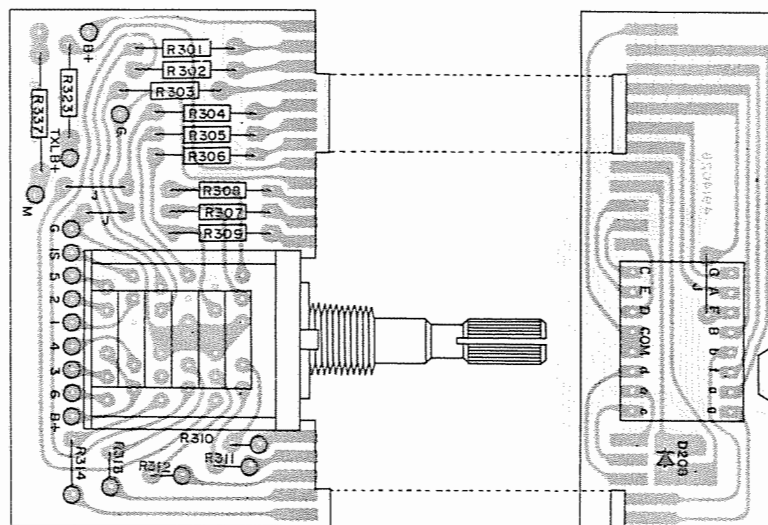


EXTERNAL WIRING TO BOARD





Component side.

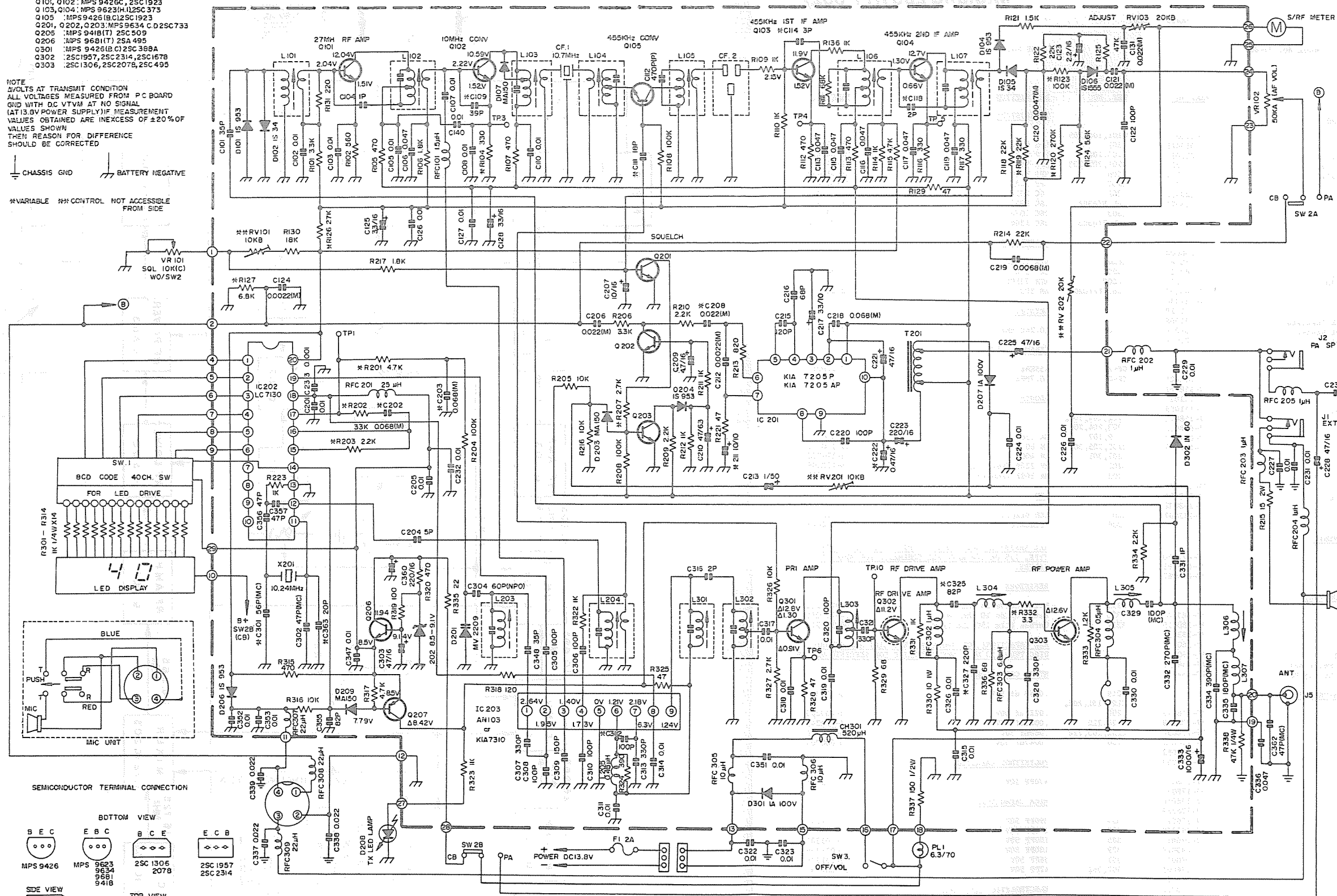


Q101, Q102: MPS 9426C, 2SC1923
 Q103, Q104: MPS 9623 (H12SC373)
 Q105: MPS 9426B (C12SC1923)
 Q201, Q202, Q203: MPS 9634 C, 2SC733
 Q205: MPS 9418 (T) 2SC509
 Q206: MPS 9618 (T) 2SA495
 Q301: MPS 9426B (C) 2SC388A
 Q302: 2SC1957, 2SC2314, 2SC1678
 Q303: 2SC1306, 2SC2078, 2SC495

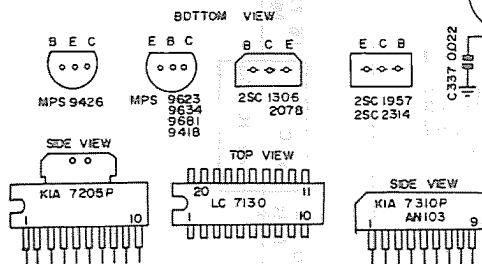
NOTE
 VOLTAGE MEASUREMENTS AT TRANSMIT CONDITION
 ALL VOLTAGES MEASURED FROM P.C. BOARD
 GND WITH DC VTM AT NO SIGNAL
 (AT 13.0V POWER SUPPLY) IF MEASUREMENT
 VALUES OBTAINED ARE IN EXCESS OF $\pm 20\%$ OF
 VALUES SHOWN
 THEN REASON FOR DIFFERENCE
 SHOULD BE CORRECTED

CHASSIS GND BATTERY NEGATIVE

*VARIABLE **CONTROL NOT ACCESSIBLE FROM SIDE



SEMICONDUCTOR TERMINAL CONNECTION

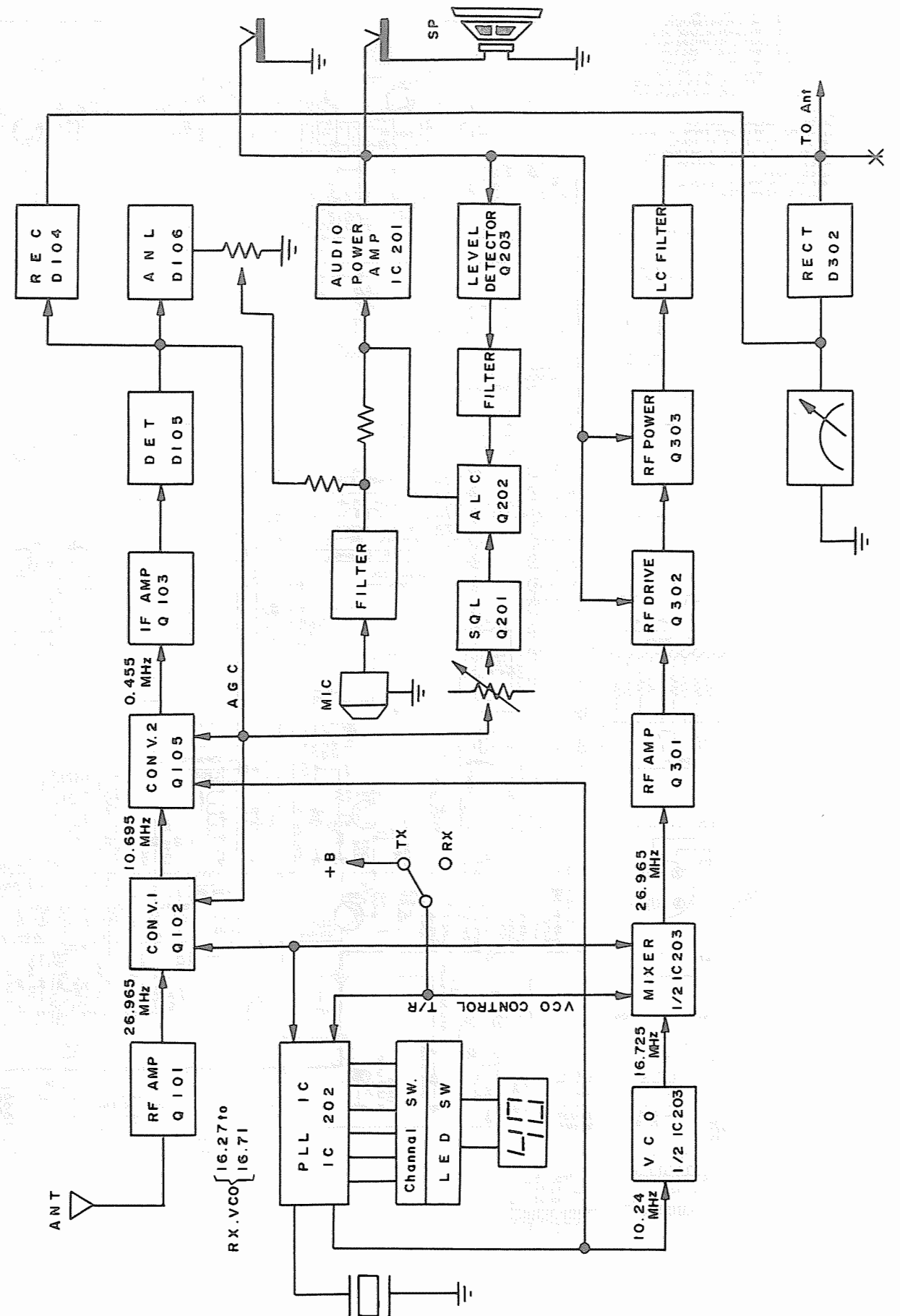


Midland 2001(77-002)

MODEL NO. 77-002

PAGE NO. 1

REF. NO.	DESCRIPTION	PART NO.	REF. NO.	DESCRIPTION	PART NO.
CABINET MATERIALS					
	Top Case	77-010050			
	Bottom Case	77-013021			
	Escutcheon Ass'y.	77-011020			
	Control Knob Ass'y.	77-115027			
	Channel Knob Ass'y.	77-115031			
	Front Chassis	77-015005			
	LED Lens	77-020062			
	FCC Plate	77-023022			
MISCELLANEOUS					
	Speaker	77-060002			
	Meter	77-200008			
	Mic Jack Brkt.	77-158080			
	Heatsink (IC201)	77-089022			
	Heatsink (Q302, 303)	77-089023			
	Case Shield	77-089037			
	Plate Shield	77-089036			
	FCC Plate Rivet	77-151019			
	PA/Ext. Sp. Jack Insulator	77-151008			
	PA/Ext. Sp. Jack Washer	77-151010			
	CB/PA Switch Felt	77-020034			
ACCESSORIES					
	DC Cord	77-034025			
	Mounting Bracket	77-158081			
	Thumbscrew	77-151027			
	Set Mount Washer	77-151009			
	Microphone Hanger	77-158071			
	Mic Cartridge	77-038012			
	Mic Cord	77-034013			
	Microphone	77-038019			
JACKS					
	Mic Jack	77-153004			
	PA/Ext. Sp. Jack	77-153001			
	DC Jack	77-153002			
	Antenna Jack	77-153007			
BOARDS W/COMPONENTS					
	LED PCB	77-075060			
	CH Switch PCB	77-075061			
	Main PCB	77-075062			
SWITCHES AND CONTROLS					
	MIC P/T Switch	77-183007			
	CH Switch	77-180015			
	CB/PA Switch	77-183018			
	Volume Control	77-160011			
	Squelch Control	77-160016			
	Sens. Control (Meter Adj.)	77-164018			
	Sens. Control (Sq.Adj.Mod)	77-164019			
COILS AND TRANSFORMERS					
	CH 301	77-178048			
	RFC 201, 307	77-178049			
	RFC 308, 309	77-178050			
	RFC 305, 306	77-178051			
	RFC 303	77-178052			
	RFC 101	77-178053			
	RFC 202, 203, 204, 205, 302	77-178054			
	RFC 304	77-178055			
	L 205	77-178056			
	L 101	77-176069			
	L 102	77-176071			
	L 103, 104, 204	77-090032			
	L 105	77-090017			
	L 106	77-090018			
	L 107	77-090019			
	L 301	77-176065			
	L 302	77-090021			
	L 303	77-090022			
	L 304	77-090023			
	L 307	77-176051			
	L 305	77-176052			
	L 306	77-176053			
	L 203	77-176055			
	T 201	77-096007			
TRANSISTORS					
	Q101, 102, 105	301	MPS 9426	01-349426	
	Q103, 104	301	MPS 9623	01-349623	
	Q201, 202, 203	301	MPS 9634	01-349634	
	Q206	301	MPS 9418	01-349418	
	Q207	301	MPS 9681	01-349861	
	Q302	301	2SC 2314	01-032314	
	Sub F/Q302	301	2SC 1957	01-031957	
	Q303	301	2SC 2078	01-032078	
	Sub F/Q303	301	2SC 1306	01-031306	
INTEGRATED CIRCUITS					
	IC201	IC201	KIA 7205P	02-437205	
	IC202	IC202	LC 7130	02-507130	
	IC203	IC203	KIA 7310P	02-437310	
	Sub. F/IC203	IC203	AN 103	02-010103	
CRYSTAL					
	X 201	X 201	10.240 MHz	77-128005	
CERAMIC FILTERS					
	CF-1	CF-1	455KHz	77-179012	
	CF-2	CF-2	10.7MHz	77-179013	
DIODES					
	D101, 104, 106, 203, 204, 206, 209, 107	D101, 104, 106, 203, 204, 206, 209, 107	MA 150	05-330150	
	D102, 105, 302	D102, 105, 302	IN 60	05-170060	
	D207, 301	D207, 301	IN 4002	05-174002	
	D201	D201	MV 2209 (Vari Cap)	05-472209	
	D202	D202	MA 1091 (Zener)	05-331091	
LED					
	LED	LED	LED Display	77-202025	
	D208	D208	Transmit LED	77-202026	
RESISTORS					
	R215	R215	Metal Oxide 15 ohm 2W	04-020151	
	R330	R330	Metal Oxide 10 ohm 1W	04-010085	
	R337	R337	Carbon Film 150 ohm 1/2W	04-991510	
ALL RESISTORS NOT SHOWN ON THIS LIST ARE CARBON TYPE, 1/8 OR 1/4 WATT SEE SCHEMATIC FOR SPECIFIC VALUES.					
ALL CAPACITORS NOT SHOWN ON THIS LIST ARE CERAMIC DISC TYPE, 50 WV. SEE SCHEMATIC FOR SPECIFIC VALUES.					
MYLAR CAPACITORS					
	C219	C219	.0068 uf 50V	03-000360	
	C121, 131, 206, 208	C121, 131, 206, 208	.022 uf 50V	03-000240	
	C124, 212	C124, 212	.0022uf 50V	03-000245	
	C202, 203, 218	C202, 203, 218	.068uf 50V	03-000356	
	C120	C120	.0047uf 50V	03-000305	
POLYSTYROL CAPACITOR					
	C112	C112	470PF 50V	03-009065	
MICA CAPACITORS					
	C334	C334	390PF 50V	03-001247	
	C332	C332	270PF 50V	03-001226	
	C335	C335	180PF 50V	03-001207	
	C329	C329	100PF 50V	03-001206	
	C301	C301	56PF 50V	03-001276	
	C302, 362	C302, 362	47PF 50V	03-001266	
ELECTROLYTIC CAPACITORS					
	C333	C333	1000uf 16V	00-132210	
	C223, 360	C223, 360	220uf 16V	00-132380	
	C221, 225, 228, 303	C221, 225, 228, 303	47uf 16V	00-132630	
	C128	C128	33uf 16V	00-132510	
	C207	C207	10uf 16V	00-132115	
	C209	C209	4.7uf 16V	00-132595	
	C125	C125	3.3uf 16V	00-132460	
	C123	C123	2.2uf 16V	00-132265	
	C222	C222	.47uf 16V	00-132565	
	C211	C211	10uf 10V	00-132100	
	C217	C217	33uf 10V	00-132505	
	C210	C210	.47uf 6.3V	00-132620	
	C213	C213	1uf 50V	00-132055	



RECEIVER SPECIFICATIONS

Description	Nominal	Limit
Intermediate frequency		
1st IF	10.695 MHz	
2nd IF	455 kHz	
Sensitivity for 500 mW output	0.3 μ V	0.5 μ V
Sensitivity at 10 dB S + N/N	0.5 μ V	1.4 μ V
Adjacent Channel Rejection	80 dB (at 10 kHz), 100 dB (at 20 kHz)	> 60 dB
Image Rejection (5.7 MHz)	50 dB	> 40 dB
Bandwidth (—6 dB) at 10 dB S + N/N	7.6 kHz	5 — 9 kHz
Signal-to-Noise ratio		
at 1000 μ V input	40 dB	35 dB
Distortion at 1 mV input, 500 mW output	2.0%	< 4.0%
AGC Figure of merit	100 dB	> 90 dB
Power output at 5000 μ V input		
Undistorted (10% THD)	4.5 W	> 3.5 W
Maximum	5.0 W	> 4.0 W
Electrical fidelity compared to 1000 Hz		
450 Hz	—6 dB	—6 $\pm$ 3 dB
2500 Hz	—6 dB	—6 $\pm$ 3 dB
Cross Modulation	At least 50 dB	> 46 dB
Squelch	Adjustable from 0.5 μ V to 1000 μ V	

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.
(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.

OTHER ITEMS

Fuse	2 Amp. (1 Amp. for Australian models)
General power requirement	AC 120 V, 60 Hz, (240 V, 50 Hz for Australian models)
Dimensions	(H)4-3/4" (121 mm) $\times$ (W)11-13/16" (300 mm) $\times$ (D)9-3/4" (247 mm)
Weight	7 Lbs. 1 oz. (3.2 kg)

NOTE: Nominal Specs represent the design specs; all units should be able to approximate these — some will exceed and some may drop slightly below these specs. Limit Specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

ALIGNMENT INSTRUCTIONS

A. PLL SECTION

1. Test Equipment Required

- Frequency Counter
- RF V.T.V.M.
- DC Volt Meter (above 100 K Ω /V)

NOTE: Figure 21 provides test point and alignment location information.

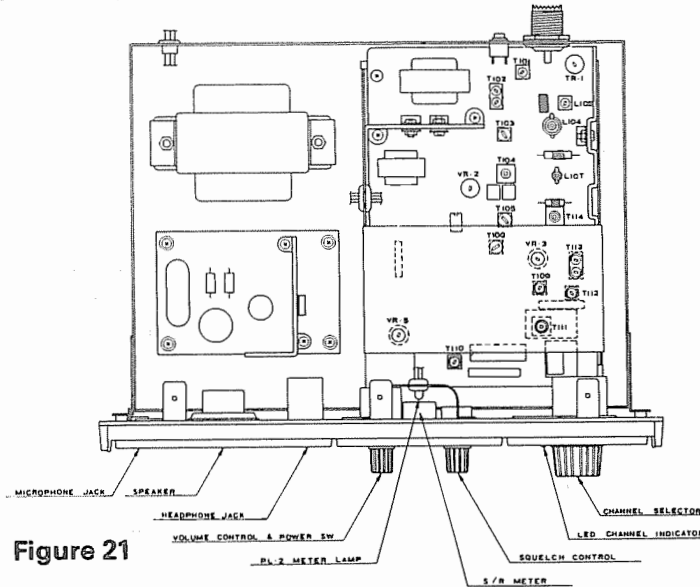


Figure 21

2. Alignment Procedure

STEP	CONTROL SETTING	OUTPUT INDICATOR CONNECTION	ADJUST.	ADJUST FOR
1	MIC: Receive POWER: "on" VOLUME: Optional SQUELCH: Optional Channel Selector: Optional	Connect Frequency Counter to CF-4/R174 (Figure 22)	CT-1	Alignment of REF OSC Adjust for 10.240 MHz $\pm$ 50 Hz indication on Frequency Counter.
2	MIC: Transmit POWER: "on" VOLUME: Optional SQUELCH: Optional Channel Selector: Channel 40 (*Channel 18)	Connect DC Volt Meter to R177/R179. Connect Frequency Counter to Drain of Q109. (Figure 23)	T111	Alignment of VCO Adjust for 6.5 Volt indication on DC Volt Meter.
3	MIC: Receive POWER: "on" VOLUME: Optional SQUELCH: Optional Channel Selector: Channel 1	Same as step 2		Check for indication on DC Volt Meter (must be 3.2—3.7 Volt or *3.5—3.9 Volt). If DC Volt Meter does not indicate 3.2—3.7 (*3.5—3.9 Volt) Volt, readjust T111; then return to step 2.
4	Same as step 1.	Connect RF V.T.V.M. to pin 22 of IC-1. (Figure 24)	T11C	Alignment of Tripler Coil Adjust for maximum indication on RF V.T.V.M.

*For Australian models

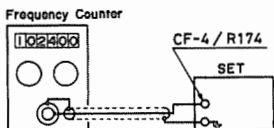


Figure 22

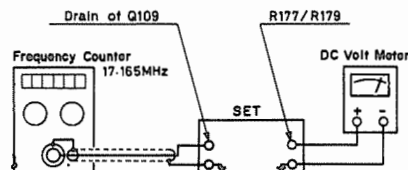


Figure 23

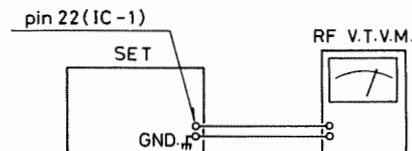


Figure 24

RECEIVER SECTION

NOTE: Figure 21 provides alignment location information.

1. Test Equipment Required

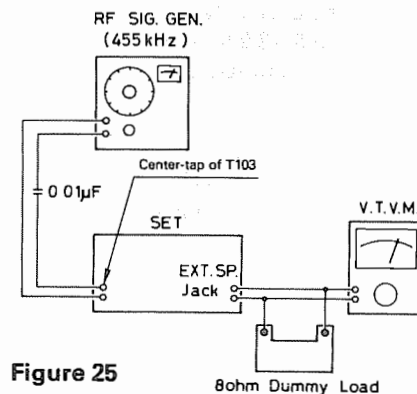
- RF Signal Generator
- V.T.V.M.
- Oscilloscope
- RF V.T.V.M.
- Distortion Meter

2. General Alignment Conditions

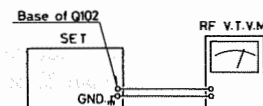
- Signal input must be kept as low as possible, to avoid overload and clipping.
(Use highest possible sensitivity of output indicator.)
- Standard modulation is 1000 Hz at 30% amplitude.
- A non-metalic alignment tool must be used for all adjustments.

3. Alignment Procedure

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	SET SIGNAL	ADJUST	ADJUST FOR
1	Set Channel Selector to Channel 19 (#Channel 9).				
2	Turn VR-6 (SQUELCH) fully counterclockwise.				
3	Turn VR-4 (VOLUME) fully clockwise.				
4	Connect RF Signal Gen. to center-tap of T103 through 0.01 μ F Capacitor.	Connect V.T.V.M. across EXT. Speaker Jack with 8 Ω load. (Figure 25)	455 kHz 1 kHz 30 % Modulation. Adjust output of RF Signal Generator to a minimum level to avoid saturation of IF circuit.	T104	Alignment of 2nd IF
5				T105	Set VR-2 to center. Adjust for maximum output.
6				T106	
7	Set Channel Selector to Channel 20 (#Channel 9).				
8		Connect RF V.T.V.M. to base of Q102 (Figure 26)		T109,	Alignment of 1st Local OSC Adjust for maximum output. (reference 40 mV)



*For Australian models



Realistic TRC-441/-441-18
(21-1545/9441)

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	SET SIGNAL	ADJUST	ADJUST FOR
9	Connect RF Signal Generator to Antenna Connector.	Connect V.T.V.M. and Distortion Meter across EXT. Speaker Jack with 8 Ω load. (Figure 27)	27.205 MHz (#27.115 MHz) 1 kHz, 30 % Mod.	T101	Overall Alignment
10				T102	Adjust for maximum indication on V.T.V.M. Also, reduce output of RF SG to maintain audio output of 500 mW (2 V).
11				T103	
12				T104	
13				T105	
Repeat steps 9 to 13 as necessary to obtain maximum output.					
15	Same as step 9	Same as step 9	27.205 MHz, (#27.115 MHz) 1 kHz, 30 % Mod. Set Output of RF SG to 1 mV.	T106	Alignment of T106 Adjust for minimum indication on Distortion Meter.
16	Same as step 9	Same as step 9	27.205 MHz (#27.115 MHz) 1 kHz, 30 % Mod. Set output of RF SG to 0.3 μ V.	VR2	Adjustment of IF Gain Adjust for 2V indication on V.T.V.M.
17	Same as step 9	Same as step 9	27.205 MHz (#27.115 MHz) 1 kHz, 30% Mod. Set Output of RF SG to 500 μ V.	VR5	Adjustment of SQUELCH Turn VR6 (SQUELCH) fully-clockwise. Adjust VR-5 so squelch just opens/closes with 500 μ V input.
18	Same as step 9	Same as step 9	27.205 MHz (#27.115 MHz) 1 kHz, 30 % Mod. Set Output of RF SG to 100 μ V.	VR3	Adjustment of S-Meter Adjust for S-9 indication on S/RF Meter.

*For Australian models

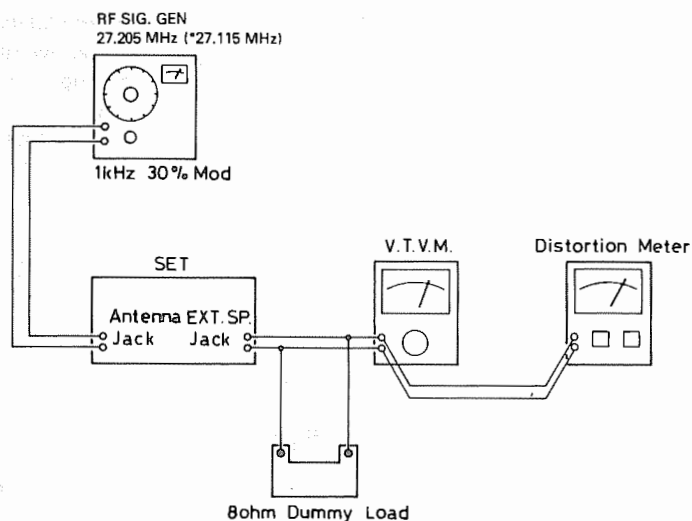


Figure 27

TRANSMITTER SECTION

1. Test Equipment Required

- RF Output Power Meter
- 50 Ohm Load (non-inductive)
- RF Attenuator
- Oscilloscope
- Audio Generator
- Field Strength Meter (or Spectrum Analyzer)
- Frequency Counter
- Coupler

NOTE: Figure 21 provides test point and alignment location information.

2. Alignment Procedure

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
1	Set Channel Selector to Channel 18 (*Channel 9).			
2	Disconnect R200 (or short base of Q117 to ground with 0.01 μ F). (Figure 28)			
3		Connect RF V.T.V.M. to T113/C173 (Figure 29)	T112	Alignment of Pre-driver Stages
4			T113	Adjust for maximum indication on RF V.T.V.M.
5	Make sure that the differential level of Channel 1 and Channel 40 (*18) is below 20 mV on RF V.T.V.M. If the differential level is above 20 mV, repeat Steps 3 and 4 as necessary to obtain maximum output.			
6	Re-connect R200 (or remove shorting capacitor). (Figure 28)			
7		Connect Dummy Load and Frequency Counter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT. Jack on Set. (Figure 30)	T114	Alignment of Driver and Final Stages
8			L107	Adjust for maximum indication on RF Power Meter.
9			L104	
10	Repeat steps 7 through 9 as necessary to obtain maximum output.			
11		Connect Dummy Load and Frequency Counter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT. Jack on Set. (Figure 30)	Check that RF output power is 3.6 to 4.4 W on all channels with no modulation. If it is not within the above range, go back to steps 7 through 9 and readjust. If still improper, change R200 value (1-8.2 ohms).	

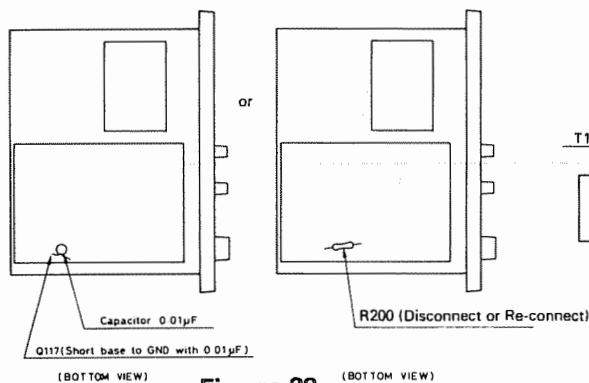


Figure 28

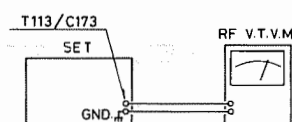


Figure 29

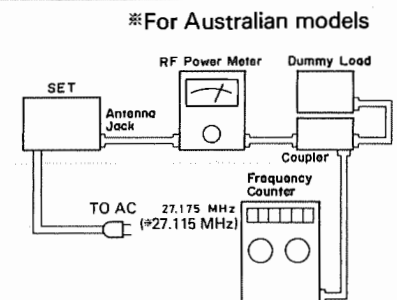


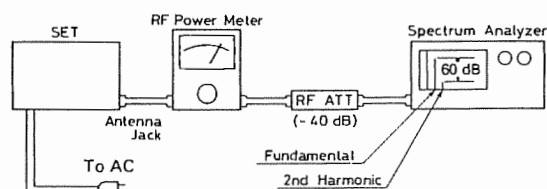
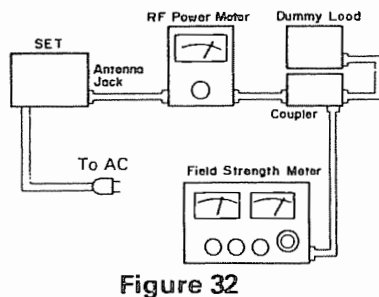
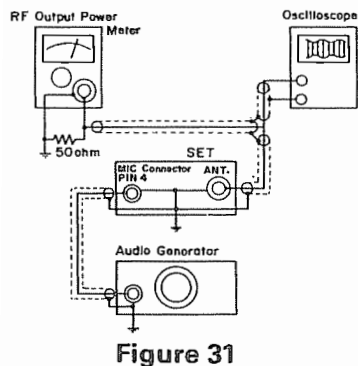
Figure 30

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
12	Audio Generator (1 kHz) across C147 or to Microphone Connector, pin 4. (Figure 31) Adjust audio signal level to obtain 80-100% modulation level.	Connect Dummy Load and Oscilloscope through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on Set. (Figure 31)		Check scope pattern for proper modulation
*13		Connect Dummy Load and Field Strength Meter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on set. (Figure 32) Tune to 2nd harmonic frequency (54.35 MHz or *54.23 MHz) on Field Strength Meter.	L102	Alignment of 2nd harmonic frequency Adjust for min. (54.35 MHz or *54.23 MHz) indication on Field Strength Meter.
14	Check level of fundamental and 2nd harmonic frequency (54.35 MHz or *54.23 MHz).			
15	Check suppression of 2nd harmonic frequency (54.35 MHz or *54.23 MHz) compared to fundamental (must be better than -60 dB).			
16	Check all Channels and if necessary, repeat steps 13 through 15 to obtain more than -60 dB on all channels with no modulation.			
17	(Return to Channel 19.*9)	Same as step 11.		Alignment of transmitter Frequency Make sure that the transmitter frequency is 27.185 MHz(*27.115 MHz) $\pm$ 100 Hz (on Frequency Counter). If the transmitter frequency is not 27.185 MHz (*27.115 MHz) $\pm$ 100 Hz, readjust CT.
18		Same as step 11.	VR1	Adjustment of RF Meter Adjust for 4 W Indication on RF Meter.

* : If you have a Spectrum Analyzer, you can obtain more precise readings with it.

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
A		Connect Spectrum Analyzer and RF Attenuator through RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on Set. (Figure 33)	L102	Adjust for min (54.35 MHz or *54.23 MHz) indication on Spectrum Analyzer.
B	Go to step 14			

*For Australian models



FREQUENCIES GENERATED AND MIXED TO OBTAIN EACH CHANNEL

RECEIVE

$$\bullet \text{VCO FREQUENCY} = [(N/2048 + 1.5)] \times [\text{REFERENCE FREQUENCY (10.240 MHz)}]$$

TRANSMIT

$$\bullet \text{VCO FREQUENCY} = [(N/2048 + 1.5)] \times [\text{REFERENCE FREQUENCY (10.240 MHz)}]$$

$$\bullet \text{TRANSMIT FREQUENCY}$$

$$= (\text{VCO FREQUENCY}) + [\text{REFERENCE FREQUENCY (10.240 MHz)}]$$

For USA & Canadian models

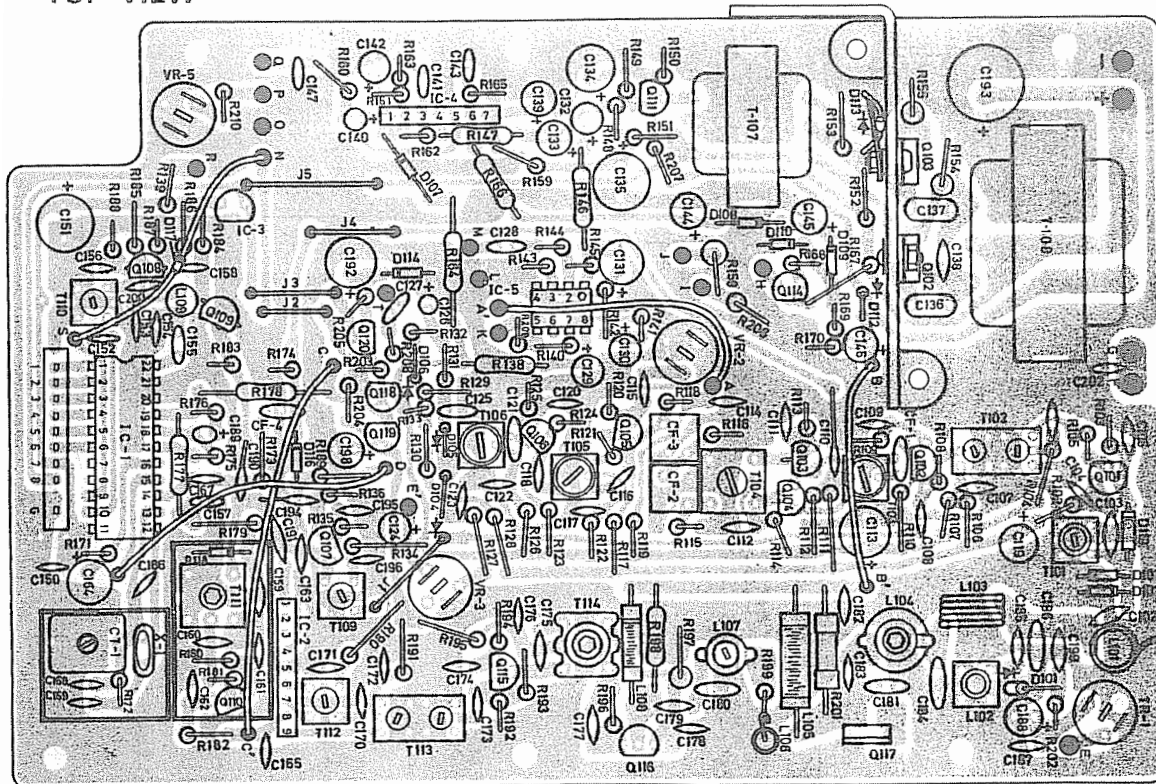
CHANNEL NUMBERS	BCD INPUT TO IC-1		RECEIVE		TRANSMIT		
	IC-1 PIN NUMBERS		N	VCO FREQUENCY (MHz)	N	VCO FREQUENCY (MHz)	TRANSMIT FREQUENCY (MHz)
	8 7 6 5	4 3 2 1					
1	0000	0001	182	16.270	273	16.725	26.965
2	0000	0010	184	16.280	275	16.735	26.975
3	0000	0011	186	16.290	277	16.745	26.985
4	0000	0100	190	16.310	281	16.765	27.005
5	0000	0101	192	16.320	283	16.775	27.015
6	0000	0110	194	16.330	285	16.785	27.025
7	0000	0111	196	16.340	287	16.795	27.035
8	0000	1000	200	16.360	291	16.815	27.055
9	0000	1001	202	16.370	293	16.825	27.065
10	0001	0000	204	16.380	295	16.835	27.075
11	0001	0001	206	16.390	297	16.845	27.085
12	0001	0010	210	16.410	301	16.865	27.105
13	0001	0011	212	16.420	303	16.875	27.115
14	0001	0100	214	16.430	305	16.885	27.125
15	0001	0101	216	16.440	307	16.895	27.135
16	0001	0110	220	16.460	311	16.915	27.155
17	0001	0111	222	16.470	313	16.925	27.165
18	0001	1000	224	16.480	315	16.935	27.175
19	0001	1001	226	16.490	317	16.945	27.185
20	0010	0000	230	16.510	321	16.965	27.205
21	0010	0001	232	16.520	323	16.975	27.215
22	0010	0010	234	16.530	325	16.985	27.225
23	0010	0011	240	16.560	331	17.015	27.255
24	0010	0100	236	16.540	327	16.995	27.235
25	0010	0101	238	16.550	329	17.005	27.245
26	0010	0110	242	16.570	333	17.025	27.265
27	0010	0111	244	16.580	335	17.035	27.275
28	0010	1000	246	16.590	337	17.045	27.285
29	0010	1001	248	16.600	339	17.055	27.295
30	0011	0000	250	16.610	341	17.065	27.305
31	0011	0001	252	16.620	343	17.075	27.315
32	0011	0010	254	16.630	345	17.085	27.325
33	0011	0011	256	16.640	347	17.095	27.335
34	0011	0100	258	16.650	349	17.105	27.345
35	0011	0101	260	16.660	351	17.115	27.355
36	0011	0110	262	16.670	353	17.125	27.365
37	0011	0111	264	16.680	355	17.135	27.375
38	0011	1000	266	16.690	357	17.145	27.385
39	0011	1001	268	16.700	359	17.155	27.395
40	0000	0000	270	16.710	361	17.165	27.405

For Australian models

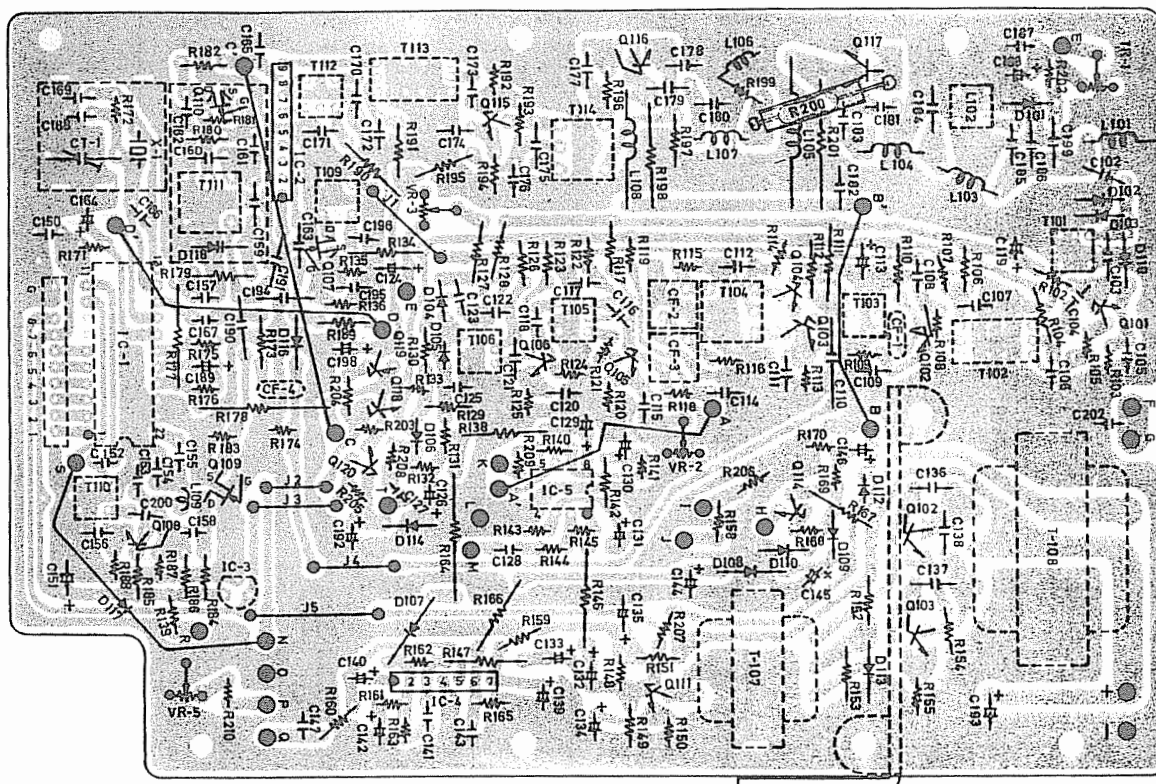
CHANNEL NUMBERS	BCD INPUT TO IC-1		RECEIVE		TRANSMIT		
	IC-1 PIN NUMBERS		N	VCO FREQUENCY (MHz)	N	VCO FREQUENCY (MHz)	TRANSMIT FREQUENCY (MHz)
	8 7 6 5	4 3 2 1					
1	0000	0001	192	16.320	283	16.775	27.015
2	0000	0010	194	16.330	285	16.785	27.025
3	0000	0011	196	16.340	287	16.795	27.035
4	0000	0100	200	16.360	291	16.815	27.055
5	0000	0101	202	16.370	293	16.825	27.065
6	0000	0110	206	16.390	297	16.845	27.085
7	0000	0111	208	16.400	299	16.855	27.095
8	0000	1000	210	16.410	301	16.865	27.105
9	0000	1001	212	16.420	303	16.875	27.115
10	0001	0000	214	16.430	305	16.885	27.125
11	0001	0001	216	16.440	307	16.895	27.135
12	0001	0010	220	16.460	311	16.915	27.155
13	0001	0011	222	16.470	313	16.925	27.165
14	0001	0100	224	16.480	315	16.935	27.175
15	0001	0101	226	16.490	317	16.945	27.185
16	0001	0110	228	16.500	319	16.955	27.195
17	0001	0111	230	16.510	321	16.965	27.205
18	0001	1000	234	16.530	325	16.985	27.225

PRINTED CIRCUIT BOARD (TOP & BOTTOM VIEW)

TOP VIEW

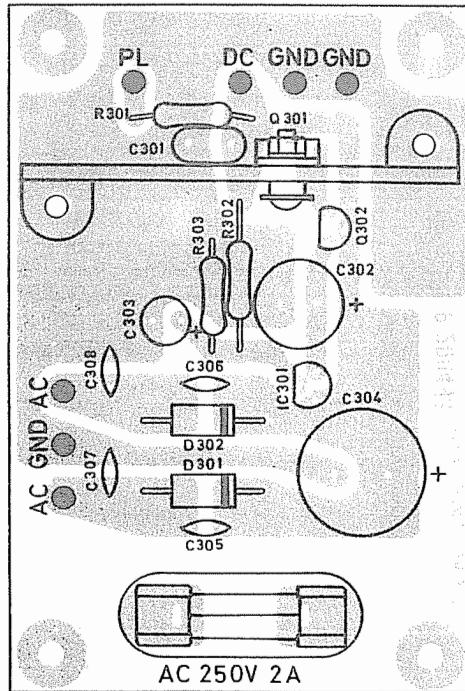


BOTTOM VIEW

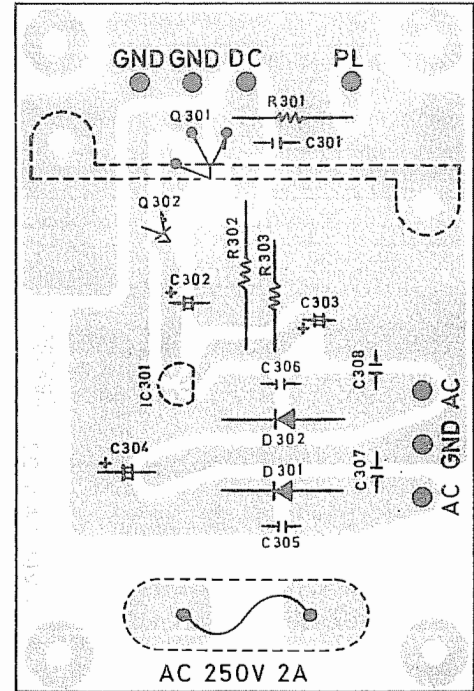


POWER SUPPLY P.C.B. (TOP & BOTTOM VIEW)

TOP VIEW

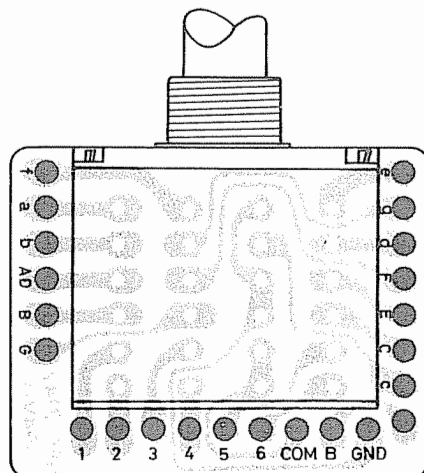


BOTTOM VIEW

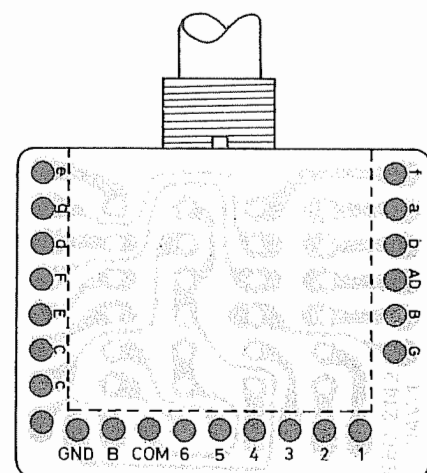


CHANNEL SELECTOR SWITCH P.C.B. (TOP & BOTTOM VIEW)

TOP VIEW

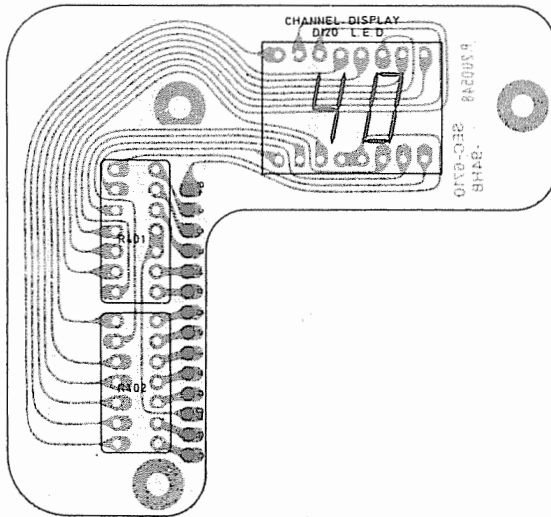


BOTTOM VIEW

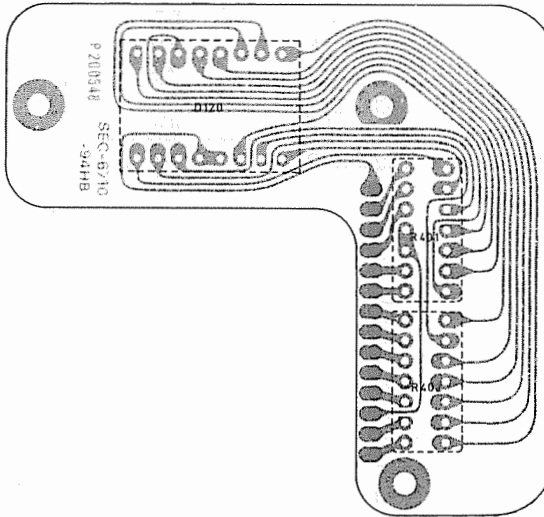


CHANNEL DISPLAY P.C.B. (TOP & BOTTOM VIEW)

TOP VIEW

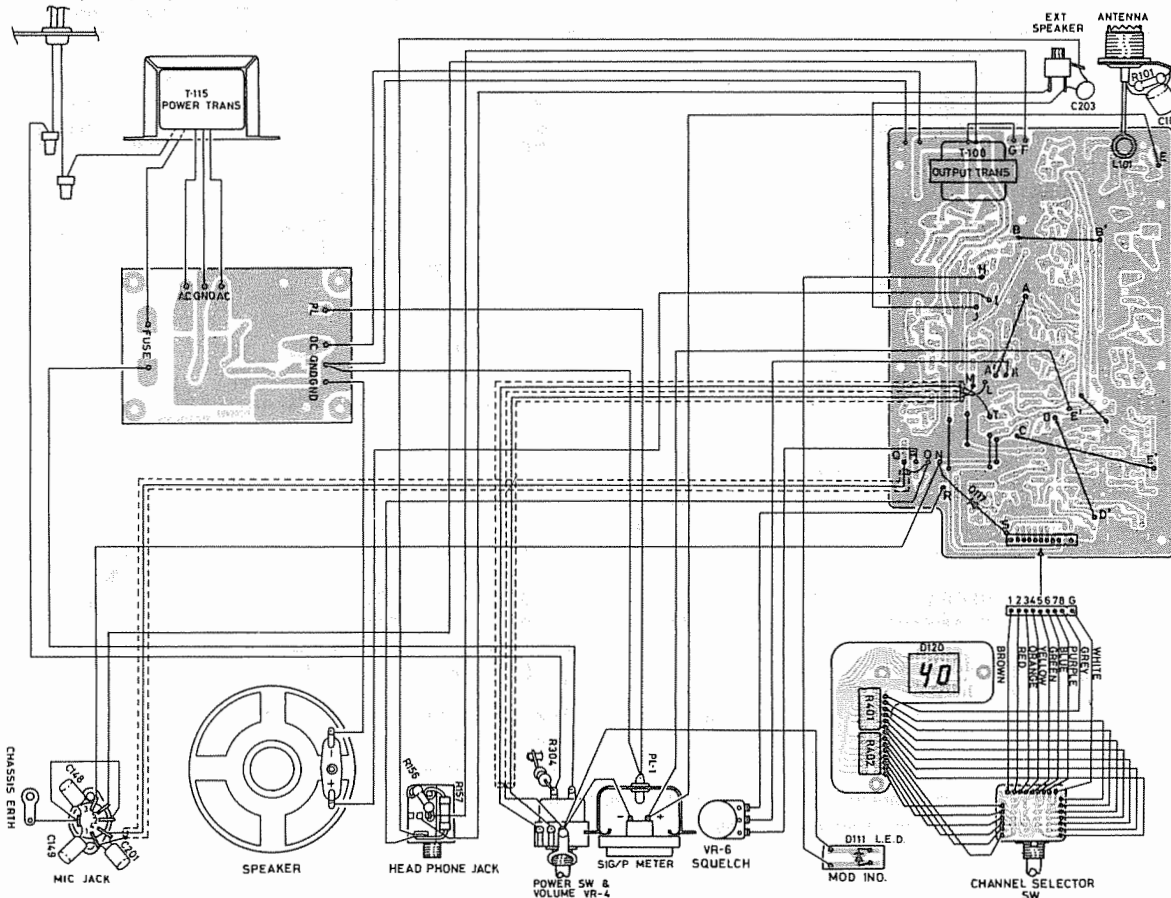


BOTTOM VIEW



WIRING DIAGRAM

AC 120V, 60Hz (240V, 50Hz for Australian models only)



TRANSISTOR AND IC VOLTAGE CHART

TRANSISTOR VOLTAGE CHART

TRANSISTOR NUMBER	RECEIVE			TRANSMIT		
	EMITTER (SOURCE)	COLLECTOR (DRAIN)	BASE (GATE)	EMITTER (SOURCE)	COLLECTOR (DRAIN)	BASE (GATE)
Q101	0.3	6.7	0.9	0.4	0	-0.9
Q102	0.4	6.7	1.1	0	0	-0.1
Q103	0.8	7.0	1.4	0	0	-0.1
Q104	0.8	7.0	1.3	0	0	-0.1
Q105	0.8	6.6	1.6	0	0	-0.1
Q106	0.8	6.6	1.5	0	0	-0.1
Q107	0.5	7.1	0	0	0	0
Q108	0.7	3.4	1.3	0.7	3.4	1.3
Q109	0.8	1.7	0	0.8	1.7	0
Q110	0.4	7.8	0	0.4	7.8	0
Q111	1.3	11.1	1.9	1.2	11.0	1.8
Q112	0	13.6	0.6	0	13.3	0.6
Q113	0	13.6	0.6	0	13.3	0.6
Q114	0.3	13.6	0	0	13.4	0.1
Q115	0	1.0	0.3	0.8	7.8	0.9
Q116	0	13.3	0	3.6	12.4	-0.4
Q117	0	13.3	0	0	12.4	-0.2
Q118	7.4	8.1	8.1	0	8.1	0
Q119	8.1	1.0	8.1	8.1	8.0	7.4
Q120	8.1	13.6	8.8	8.1	13.4	8.8
Q301	13.6	19.7	14.2	13.4	17.5	14.2
Q302	14.2	19.7	14.9	14.2	17.5	14.8

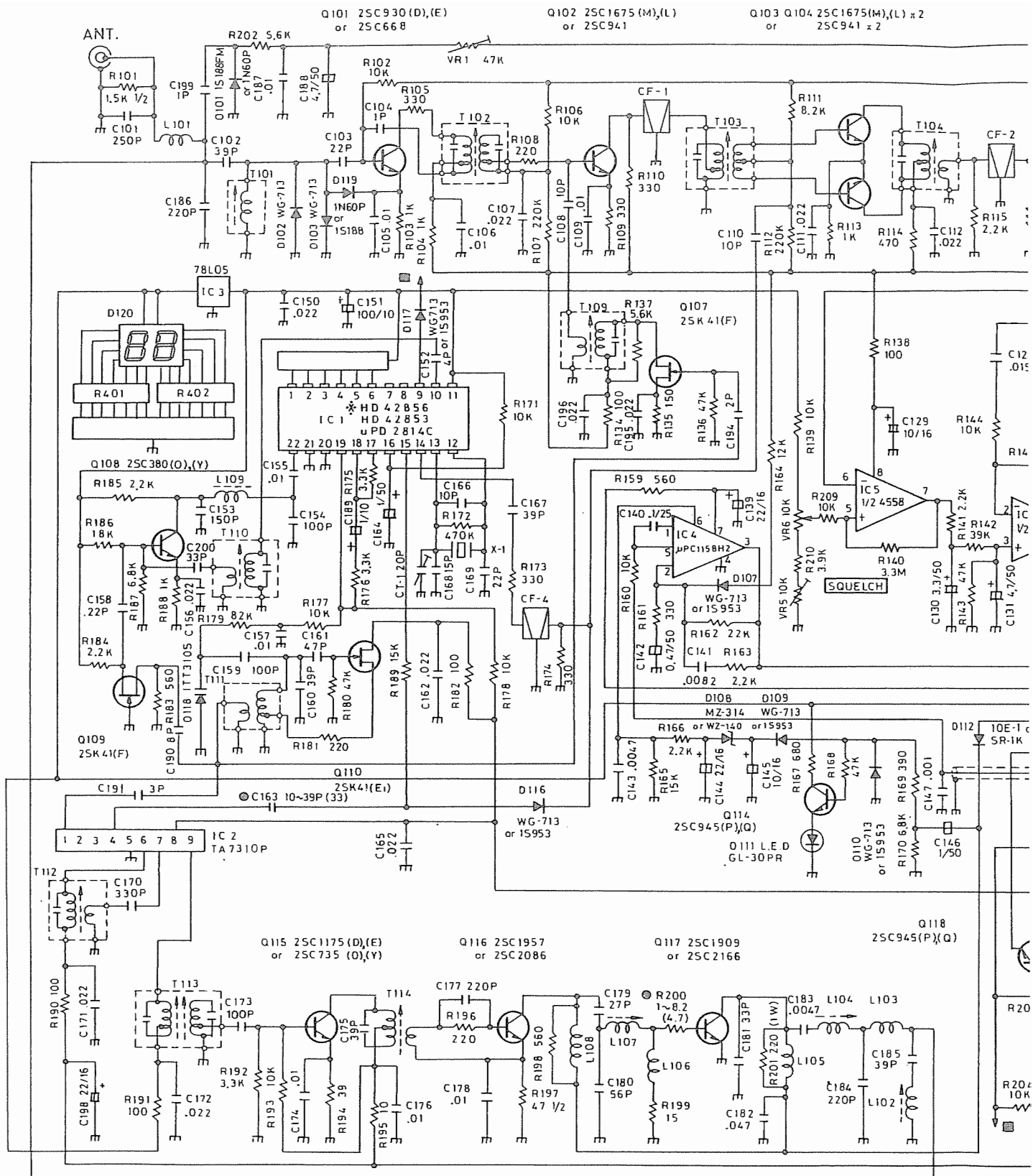
NOTE: All voltage values are indicated in volts with no signal, measured with V.T.V.M.

IC VOLTAGE CHART

#For Australian models

IC-1 HD42853 ($\equiv$ HD42856)	PIN NO.	1	2	3	4	5	6	7	8	9	10	11
	RECEIVE	5.0	0	0	5.0	5.0 ($\equiv$ 0)	0	—	—	5.0	0.6 ($\equiv$ 0.8)	5.0
	TRANSMIT	5.0	0	0	5.0	5.0 ($\equiv$ 0)	0	—	—	0.4	0.6 ($\equiv$ 0.8)	5.0
	PIN NO.	12	13	14	15	16	17	18	19	20	21	22
IC-2 TA7310P	RECEIVE	2.4 ($\equiv$ 2.2)	2.4	1.4 ($\equiv$ 1.1)	4.9	4.9	1.7 ($\equiv$ 1.5)	1.7 ($\equiv$ 1.5)	3.7 ($\equiv$ 4.0)	0	0	2.4 ($\equiv$ 2.3)
	TRANSMIT	2.4 ($\equiv$ 2.2)	2.4	1.4 ($\equiv$ 1.1)	4.9	4.9	1.4 ($\equiv$ 1.3)	1.4 ($\equiv$ 1.3)	5.4 ($\equiv$ 6.0)	0	0	2.4 ($\equiv$ 2.3)
	PIN NO.	1	2	3	4	5	6	7	8	9		
	RECEIVE	2.6	—	—	1.5	0	1.0	2.0	8.1	13.0		
IC-3 NJM78L05	TRANSMIT	2.6	—	—	2.4	0	7.6	2.0	8.1	13.0		
	PIN NO.	1	2	3								
	RECEIVE	5.0	0	13.6								
	TRANSMIT	5.0	0	13.4								
IC-4 μ PC1158H2	PIN NO.	1	2	3	4	5	6	7				
	RECEIVE	1.4	2.5	0.3	0	0	0.3	12.3				
	TRANSMIT	1.4	1.0	4.9	0	0	4.9	10.8				
	PIN NO.	1	2	3	4	5	6	7	8			
IC-5 NJM4558D SQUELCH ON/OFF	RECEIVE	1.3/3.5	1.3/3.5	0.7/3.5	0/0	1.6/3.0	1.8/1.8	1.3/6.5	7.1/7.2			
	TRANSMIT	0.2	0.3	0.1	0	3.0	—0.1	0	0			

NOTE: All voltage values are indicated in volts with no signal, measured with V.T.V.M.
Channel is 19 (9 for Australian models).



ELECTRICAL PARTS LIST

Realistic TRC-441/-441-18
(21-1545/9441)

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
CAPACITORS SL: 350 — 1000 ppm/°C			
C101	Mica 250 pF ± 10% 50 WV		
C102	Mica 39 pF ± 5% 50 WV		
C103	Mica 22 pF ± 5% 50 WV		
C104	Ceramic 1 pF ± 0.3 pF 50 WV (SL)		
C105	Ceramic Barrier 0.01 μF 25 WV		
C106	Ceramic Barrier 0.01 μF 25 WV		
C107	Ceramic Barrier 0.022 μF 25 WV		
C108	Ceramic 10 pF ± 0.5 pF 50 WV (SL)		
C109	Ceramic Barrier 0.01 μF 25 WV		
C110	Ceramic 10 pF ± 0.5 pF 50 WV (SL)		
C111	Ceramic Barrier 0.022 μF 25 WV		
C112	Ceramic Barrier 0.022 μF 25 WV		
C113	Electrolytic 33 μF/25 V		
C114	Ceramic Barrier 0.022 μF 25 WV		
C115	Ceramic Barrier 0.022 μF 25 WV		
C116	Ceramic 1 pF ± 0.3 pF 50 WV (SL)		
C117	Ceramic Barrier 0.022 μF 25 WV		
C118	Ceramic Barrier 0.022 μF 25 WV		
C119	Electrolytic 4.7 μF/50 V		
C120	Ceramic Barrier 0.022 μF 25 WV		
C121	Mylar 0.047 μF ± 10% 50 WV		
C122	Ceramic Barrier 0.022 μF 25 WV		
C123	Ceramic Barrier 0.01 μF 25 WV		
C124	Electrolytic 10 μF/16 V		
C125	Mylar 0.001 μF ± 10% 50 WV		
C126	Alsicon 0.22 μF/25 V		
C127	Mylar 0.0047 μF ± 10% 50 WV		
C128	Mylar 0.015 μF ± 10% 50 WV		
C129	Electrolytic 10 μF/16 V		
C130	Electrolytic 3.3 μF/50 V		
C131	Electrolytic 4.7 μF/50 V		
C132	Electrolytic 0.47 μF/50 V		
C133	Tantalum 0.33 μF/10 V		
C134	Electrolytic 100 μF/10 V		
C135	Electrolytic 220 μF/16 V		
C136	Mylar 0.047 μF ± 10% 50 WV		
C137	Mylar 0.047 μF ± 10% 50 WV		
C138	Ceramic 0.047 μF 50 WV		
C139	Electrolytic 22 μF/16 V		
C140	Alsicon 0.1 μF/25 V		
C141	Mylar 0.0082 μF ± 10% 50 WV		
C142	Electrolytic 0.47 μF/50 V		
C143	Mylar 0.0047 μF ± 10% 50 WV		
C144	Electrolytic 22 μF/16 V		
C145	Electrolytic 10 μF/16 V		
C146	Electrolytic 1 μF/50 V		

REF. NO.	DESCRIPTION			RS PART NO.	MFR'S PART NO.
C147	Mylar	0.001 μ F $\pm$ 10%	50 WV		
C148	Mylar	0.0033 μ F $\pm$ 10%	50 WV		
C149	Mylar	0.0033 μ F $\pm$ 10%	50 WV		
C150	Ceramic Barrier	0.022 μ F	25 WV		
C151	Electrolytic	100 μ F/10 V			
C152	Ceramic	4 pF $\pm$ 0.3 pF	50 WV (SL)		
C153	Ceramic	150 pF $\pm$ 5%	50 WV		
C154	Ceramic	100 pF $\pm$ 5%	50 WV		
C155	Mylar	0.01 μ F $\pm$ 10%	50 WV		
C156	Ceramic Barrier	0.022 μ F	25 WV		
C157	Mylar	0.01 μ F $\pm$ 10%	50 WV		
C158	Mica	22 pF $\pm$ 5%	50 WV		
C159	Ceramic	100 pF $\pm$ 5%	50 WV		
C160	Ceramic	39 pF $\pm$ 5%	50 WV		
C161	Ceramic	47 pF $\pm$ 5%	50 WV		
C162	Ceramic Barrier	0.022 μ F	25 WV		
C163	Ceramic	33 pF $\pm$ 5%	50 WV (SL)		
C164	Electrolytic	1 μ F/50 V			
C165	Mylar	0.022 μ F $\pm$ 10%	50 WV		
C166	Ceramic	10 pF $\pm$ 0.5 pF	50 WV		
C167	Mica	39 pF $\pm$ 5%	50 WV		
C168	Mica	15 pF $\pm$ 5%	50 WV		
C169	Mica	22 pF $\pm$ 10%	50 WV		
C170	Ceramic	330 pF $\pm$ 5%	50 WV		
C171	Ceramic Barrier	0.022 μ F	25 WV		
C172	Ceramic Barrier	0.022 μ F	25 WV		
C173	Ceramic	100 pF $\pm$ 5%	50 WV		
C174	Ceramic Barrier	0.01 μ F	25 WV		
C175	Mica	39 pF $\pm$ 5%	50 WV		
C176	Ceramic Barrier	0.01 μ F	25 WV		
C177	Ceramic	220 pF $\pm$ 5%	50 WV		
C178	Ceramic Barrier	0.01 μ F	25 WV		
C179	Mica	27 pF $\pm$ 5%	50 WV		
C180	Mica	56 pF $\pm$ 5%	50 WV		
C181	Mica	33 pF $\pm$ 5%	50 WV		
C182	Ceramic	0.047 μ F	50 WV		
C183	Ceramic	0.0047 μ F	50 WV		
C184	Mica	220 pF $\pm$ 5%	50 WV		
C185	Mica	39 pF $\pm$ 5%	50 WV		
C186	Mica	220 pF $\pm$ 5%	50 WV		
C187	Ceramic Barrier	0.01 μ F	25 WV		
C188	Electrolytic	4.7 μ F/50 V			
C189	Tantalum	1 μ F/10 V			
C190	Ceramic	8 pF $\pm$ 0.5 pF	50 WV (SL)		
C191	Ceramic	3 pF $\pm$ 0.5 pF	50 WV (SL)		
C192	Electrolytic	47 μ F/10 V			
C193	Electrolytic	470 pF/16 V			
C194	Ceramic	2 pF $\pm$ 0.3 pF	50 WV (SL)		

Realistic TRC-441/-441-18
(21-1545/9441)

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C195	Ceramic Barrier 0.022 μ F 25 WV		
C196	Ceramic Barrier 0.022 μ F 25 WV		
C197	Not used		
C198	Electrolytic 22 μ F/16 V		
C199	Ceramic 1 pF $\pm$ 0.3 pF 50 WV (SL)		
C200	Ceramic 33 pF $\pm$ 5% 50 WV (SL)		
C201	Mylar 0.0047 μ F $\pm$ 10% 50 WV		
C202	Ceramic Barrier 0.01 μ F 25 WV		
C203	Ceramic Barrier 0.01 μ F 25 WV		
C301	Mylar 0.047 μ F 50 WV		
C302	Electrolytic 470 μ F/16 V		
C303	Electrolytic 10 μ F/16 V		
C304	Electrolytic 2200 μ F/25 V		
C305	Ceramic 0.01 μ F 50 WV		
C306	Ceramic 0.01 μ F 50 WV		
C307	Ceramic 0.01 μ F 50 WV		
C308	Ceramic 0.01 μ F 50 WV		
CERAMIC FILTERS			
CF-1	Ceramic Filter SFE 10.7 MJ-Z	C-0913	P-130056
CF-2	Ceramic Filter CFU 455 kHz	C-0754	P-130050
CF-3	Ceramic Filter CFU 455 kHz	C-0754	P-130050
CF-4	Ceramic Filter 10.240 MA	C-0914	P-130053
TRIMMER			
CT-1	Trimmer	C-0751	P-160010
DIODES			
D101	Germanium Diode 1S188FM-1 or 1N60P	DX-0162	
D102	Silicon Diode WG-713 or 1S953	DX-0543	
D103	Silicon Diode WG-713 or 1S953	DX-0543	
D104	Germanium Diode 1S188FM-1 or 1N60P	DX-0162	
D105	Germanium Diode 1S188FM-1 or 1N60P	DX-0162	
D106	Silicon Diode WG-713 or 1S953	DX-0543	
D107	Silicon Diode WG-713 or 1S953	DX-0543	

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
D108	Zener Diode WZ140 or MZ314B	DX-0713	
D109	Silicon Diode WG-713 or 1S953	DX-0543	
D110	Silicon Diode WG-713 or 1S953	DX-0543	
D111	Light Emitting Diode GL-30PR	L-0899	
D112	Silicon Diode 10E-1	DX-1039	
D113	Silicon Diode WG-713 or 1S953	DX-0543	
D114	Zener Diode WZ090 or RD9.1EB or MZ309B	DX-0533	
D115	Not used		
D116	Silicon Diode WG-713 or 1S953	DX-0543	
D117	Silicon Diode WG-713 or 1S953	DX-0543	
D118	Silicon Diode ITT-310S	DX-1080	
D119	Germanium Diode 1S188FM-1 or 1N60P	DX-0162	
D120	Light Emitting Diode SL1221 or TLR321	L-0898	
D301	Silicon Diode S3V-20 or 3BZ61 or 30D-1	DX-0990	
D302	Silicon Diode S3V-20 or 3BZ61 or 30D-1	DX-0990	
INTEGRATED CIRCUITS			
IC-1	HD42853 or μ PD2814C, *HD42856	MX-3540	
IC-2	TA7310P-YELLOW	MX-3256	
IC-3	NJM78L05 or μ PC78L05	MX-3541	
IC-4	μ PC1158H2	MX-3542	
IC-5	NJM4558D	MX-3438	
IC-301	NJM78L12 or μ PC78L12	MX-3543	
FUSE			
F1	Fuse (Tube Type) 250 V 2A	HF-0043	P-250079
*F1	Fuse 5.2 ϕ $\times$ 20, 250 V 1A		P-250089
JACKS			
J1	Antenna Connector	J-0843	P-190111
J2	5P DIN Jack	J-6572	P-190131
J3	Headphone Jack	J-0956	P-190134
J4	EXT. SP. Jack	J-0683	P-190047

*For Australian Models Only

Realistic TRC-441/-441-18
(21-1545/9441)

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
COILS			
L101	Filter Coil	CA-3548	P-380043
L102	Trap Coil	CA-3908	P-380132
L103	Filter Coil	CA-3547	P-380044
L104	Filter Coil	CA-3909	P-380133
L105	Choke Coil	CB-2284	P-380048
L106	Choke Coil	CB-2318	P-380098
L107	Filter Coil	CA-3910	P-380134
L108	Choke Coil	CB-2283	P-380047
L109	Choke Coil	CB-2319	P-360026
LAMP			
L1		L-0900	P-240095
TRANSISTORS			
Q101	2SC930(D), (E) or 2SC668		
Q102	2SC1675(M), (L) or 2SC941		
Q103	2SC1675(M), (L) or 2SC941		
Q104	2SC1675(M), (L) or 2SC941		
Q105	2SC930(D), (E) or 2SC373		
Q106	2SC930(D), (E) or 2SC373		
Q107	2SK41(F)		
Q108	2SC380(O) or (Y)		
Q109	2SK41(F)		
Q110	2SK41(E1)		
Q111	2SC1175(D), (E) or 2SC735(O), (Y)		
Q112	2SD325(D), (E)		
Q113	2SD325(D), (E)		
Q114	2SC945(P), (Q)		
Q115	2SC1175(D), (E) or 2SC735(O), (Y)		
Q116	2SC1957 or 2SC2086		
Q117	2SC1909 or 2SC2166		
Q118	2SC945(P), (Q)		
Q119	2SA733(P), (Q)		
Q120	2SC1175(D), (E) or 2SC735		
Q301	2SD234(O), (Y) or 2SD235(O), (Y)		
Q302	2SC735 or 2SC1175(D), (E)		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
RESISTORS (): Typical Value, UY: Radial Type, PY: Axial Type			
R101	Carbon PY 1.5 K Ω 1/2W	NFE-0206	
R102	Carbon UY 10 K Ω 1/4W	NFE-0281	
R103	Carbon UY 1 K Ω 1/4W		
R104	Carbon UY 1 K Ω 1/4W		
R105	Carbon UY 330 Ω 1/4W		
R106	Carbon UY 10 K Ω 1/4W	NFE-0281	
R107	Carbon UY 220 K Ω 1/4W	NFE-0396	
R108	Carbon UY 220 Ω 1/4W	NFE-0149	
R109	Carbon UY 330 Ω 1/4W	NFE-0159	
R110	Carbon UY 330 Ω 1/4W	NFE-0159	
R111	Carbon UY 8.2 K Ω 1/4W	NFE-0271	
R112	Carbon UY 220 K Ω 1/4W	NFE-0396	
R113	Carbon UY 1 K Ω 1/4W	NFE-0196	
R114	Carbon UY 470 Ω 1/4W	NFE-0169	
R115	Carbon UY 2.2 K Ω 1/4W	NFE-0216	
R116	Carbon UY 2.2 K Ω 1/4W	NFE-0216	
R117	Carbon UY 10 K Ω 1/4W	NFE-0281	
R118	Carbon UY 6.8 K Ω 1/4W	NFE-0262	
R119	Carbon UY 180 K Ω 1/4W	NFE-0402	
R120	Carbon UY 1 K Ω 1/4W	NFE-0196	
R121	Carbon UY 470 Ω 1/4W	NFE-0169	
R122	Carbon UY 470 Ω 1/4W	NFE-0169	
R123	Carbon UY 33 K Ω 1/4W	NFE-0324	
R124	Carbon UY 10 K Ω 1/4W	NFE-0281	
R125	Carbon UY 470 Ω 1/4W	NFE-0169	
R126	Carbon UY 470 Ω 1/4W	NFE-0169	
R127	Carbon UY 10 K Ω 1/4W	NFE-0281	
R128	Carbon UY 39 K Ω 1/4W	NFE-0303	
R129	Carbon UY 68 K Ω 1/4W	NFE-0354	
R130	Carbon UY 100 K Ω 1/4W	NFE-0354	
R131	Carbon UY 68 K Ω 1/4W	NFE-0354	
R132	Carbon UY 68 K Ω 1/4W	NFE-0354	
R133	Carbon UY 1.2 M Ω 1/4W	NFE-0447	
R134	Carbon UY 100 Ω 1/4W	NFE-0132	
R135	Carbon UY 150 Ω 1/4W	NFE-0142	
R136	Carbon UY 47 K Ω 1/4W	NFE-0340	
R137	Carbon UY 5.6 K Ω 1/4W	NFE-0257	
R138	Carbon PY 100 Ω 1/4W	NFE-0132	
R139	Carbon UY 10 K Ω 1/4W	NFE-0281	
R140	Carbon UY 3.3 M Ω 1/4W	NFE-0458	
R141	Carbon UY 2.2 K Ω 1/4W	NFE-0216	
R142	Carbon UY 39 K Ω 1/4W	NFE-0330	
R143	Carbon UY 47 K Ω 1/4W	NFE-0340	
R144	Carbon UY 10 K Ω 1/4W	NFE-0281	
R145	Carbon UY 470 K Ω 1/4W	NFE-0423	
R146	Carbon PY 470 Ω 1/4W	NFE-0169	
R147	Carbon PY 560 Ω 1/4W	NFE-0176	

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R148	Carbon UY 33 K Ω 1/4W	NFE-0324	
R149	Carbon UY 6.8 K Ω 1/4W	NFE-0262	
R150	Carbon UY 100 Ω 1/4W	NFE-0132	
R151	Carbon UY 220 Ω 1/4W	NFE-0149	
R152	Carbon PY 1.8 K Ω 1/2W	NFE-0210	
R153	Carbon PY 82 Ω 1/2W	NFE-0122	
R154	Metal Oxide 0.22 Ω 1W		
R155	Metal Oxide 0.22 Ω 1W		
R156	Carbon PY 390 Ω 1/2W	NFE-0162	
R157	Metal Oxide 56 Ω 1W		
R158	Metal Oxide 5.6 Ω 2W		
R159	Carbon UY 560 Ω 1/4W	NFE-0176	
R160	Carbon UY 10 K Ω 1/4W	NFE-0281	
R161	Carbon UY 330 Ω 1/4W	NFE-0159	
R162	Carbon UY 22 K Ω 1/4W	NFE-0311	
R163	Carbon UY 2.2 K Ω 1/4W	NFE-0216	
R164	Carbon PY 12 K Ω 1/4W	NFE-0288	
R165	Carbon UY 15 K Ω 1/4W	NFE-0297	
R166	Carbon PY 2.2 K Ω 1/4W	NFE-0216	
R167	Carbon UY 680 Ω 1/4W	NFE-0183	
R168	Carbon UY 47 K Ω 1/4W	NFE-0340	
R169	Carbon UY 390 Ω 1/4W	NFE-0162	
R170	Carbon UY 6.8 K Ω 1/4W	NFE-0262	
R171	Carbon UY 10 K Ω 1/4W	NFE-0281	
R172	Carbon UY 470 K Ω 1/4W	NFE-0423	
R173	Carbon UY 330 Ω 1/4W	NFE-0159	
R174	Carbon UY 330 Ω 1/4W	NFE-0159	
R175	Carbon UY 3.3 K Ω 1/4W	NFE-0230	
R176	Carbon UY 3.3 K Ω 1/4W	NFE-0230	
R177	Carbon PY 10 K Ω 1/4W	NFE-0281	
R178	Carbon PY 10 K Ω 1/4W	NFE-0281	
R179	Carbon UY 82 K Ω 1/4W	NFE-0360	
R180	Carbon UY 47 K Ω 1/4W	NFE-0340	
R181	Carbon UY 220 Ω 1/4W	NFE-0149	
R182	Carbon UY 100 Ω 1/4W	NFE-0132	
R183	Carbon UY 560 Ω 1/4W	NFE-0176	
R184	Carbon UY 2.2 K Ω 1/4W	NFE-0216	
R185	Carbon UY 2.2 K Ω 1/4W	NFE-0216	
R186	Carbon UY 18 K Ω 1/4W	NFE-0303	
R187	Carbon UY 6.8 K Ω 1/4W	NFE-0262	
R188	Carbon UY 1 K Ω 1/4W	NFE-0196	
R189	Carbon UY 15 K Ω 1/4W	NFE-0297	
R190	Carbon UY 100 Ω 1/4W	NFE-0132	
R191	Carbon UY 100 Ω 1/4W	NFE-0132	
R192	Carbon UY 3.3 K Ω 1/4W	NFE-0236	
R193	Carbon UY 10 K Ω 1/4W	NFE-0281	
R194	Carbon UY 39 Ω 1/4W	NFE-0132	

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R195	Carbon UY 10 Ω 1/4W	NFE-0132	
R196	Carbon UY 220 Ω 1/4W	NFE-0149	
R197	Carbon PY 47 Ω 1/2W		
R198	Carbon PY 560 Ω 1/4W	NFE-0176	
R199	Carbon PY 15 Ω 1/4W	NFE-0074	
R200	Carbon PY 1—8.2 (4.7) 1/2W	NFE-0047	
R201	Metal Oxide 220 Ω 1W		
R202	Carbon UY 5.6 K Ω 1/4W	NFE-0257	
R203	Carbon UY 1.2 K Ω 1/4W	NFE-0199	
R204	Carbon UY 10 K Ω 1/4W	NFE-0281	
R205	Carbon UY 1 K Ω 1/4W	NFE-0196	
R206	Metal Oxide 10 Ω 1W		
R207	Carbon UY 330 K Ω 1/4W	NFE-0423	
R208	Carbon UY 68 K Ω 1/4W	NFE-0371	
R209	Carbon UY 10 K Ω 1/4W	NFE-0281	
R210	Carbon UY 3.9 K Ω 1/4W		
R301	Carbon PY 15 Ω 1/2W	NFE-0074	
R302	Carbon PY 1.2 K Ω 1/2W	NFE-0199	
R303	Carbon PY 150—220 (220) Ω 1/2W		
R304	Carbon PY 2.2 M Ω 1/2W	NFE-0454	
R304*	Not used		
R401	Resistor Array 2.2K Ω $\times$ 7	RX-0068	P-210006
R402	Resistor Array 2.2K Ω $\times$ 7	RX-0068	P-210006

*For Australian Models Only

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
SWITCHES			
S1	Power Switch (with VR-4)	P-1757	P-170258
S2	Channel Selector Switch	S-1306	P-180294
S2*	Channel Selector Switch		P-180364
TRANSFORMERS			
T101	Antenna Coil	CA-3543	P-380038
T102	RF Coil	CA-4938	P-380135
T103	IFT Coil	CA-7602	P-140031
T104	IFT Coil	CA-7603	P-130033
T105	IFT Coil	CA-7513	P-130026
T106	IFT Coil	CA-7514	P-130027
T107	Input Transformer	TN-0100	P-100346
T108	Output/Modulation Transformer	TD-0139	P-100347
T109	RF Coil	CA-4939	P-380136
T110	RF Coil	CA-4939	P-380136
T111	VCO Coil	CA-3911	P-380137
T112	Tuning Coil	CA-3912	P-380138
T113	Tuning Coil	CA-3913	P-380139
T114	Pre Driver Coil	CA-3788	P-380115
T115	Power Transformer	TA-0670	P-100510
T115*	Power Transformer		P-100561

*For Australian Models Only

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
VARIABLE RESISTORS			
VR-1	Semi Fixed Resistor 47K Ω	P-6492	P-170307
VR-2	Semi Fixed Resistor 1K Ω	P-6493	P-170297
VR-3	Semi Fixed Resistor 47K Ω	P-6492	P-170307
VR-4	VOLUME 5K Ω 10A (with S1)	P-1757	P-170258
VR-4*	VOLUME 5K Ω 10A (with S1)		P-170344
VR-4**	VOLUME 5K Ω 10A (with S1)		P-170340
VR-5	Semi Fixed Resistor 10K Ω	P-6494	P-170303
VR-6	SQUELCH 10K Ω C	P-1750	P-170240
CRYSTAL			
X1	Crystal HC-18/U 10.240 MHz or Crystal HC-18/U 10.240 MHz	MX-2295	P-390047 P-390049

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EXPLODED VIEW PARTS LIST

Realistic TRC-441/-441-18
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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	FCC Plate	HB-7852	P-730218
*	DOC Plate		P-730226
※	Standard Plate		P-730257
	Panel, Back	Z-3483	P-630062
*	Panel, Back		P-630100
※	Panel Back		P-630102
	Net	HB-7576	P-690225
	Cabinet	Z-4034	P-600122
	Microphone Hanger (with Microphone)	M-2222	P-270062 or P-270063
	Rubber Foot	F-0237	P-680168
	Transformer Bracket	HB-3669	P-410027
	Power Transformer (T115)	TA-0670	P-100510
※	Power Transformer (T115)		P-100561
	Clamp Connector	H-3305	P-320006
	Heat Sink "A"	HH-0270	P-411314
	Insulator, Fiber	HB-6132	P-690207
	Heat Sink "B"	HH-0204	P-411053
	Main P.C.B.		P-200492
	Chassis		P-400173
*	Chassis		P-400173A
※	Chassis		P-400231
	AC Line Cord		P-310093
*	AC Line Cord		P-310079
※	AC Line Cord		P-310041
	Strain Relief	HB-0598	P-480010
*	Strain Relief		P-480165
※	Strain Relief		P-480037
	Antenna Connector	J-0843	P-190111
	EXT. SP. Jack	J-0683	P-190047
	Rubber Bushing (B)	HB-6124	P-680150
	Shield Plate "A"	HB-7574	P-411529
	Bracket for Panel (Right)	HB-6137	P-411123
	Bracket for Panel (Left)	HB-6138	P-411124
	Heat Sink "C"	HH-0272	P-411315
	Fuse 250V 2A	HF-0043	P-250079
※	Fuse 250V 1A		P-250089
	Power P.C.B.		P-200493
※	Power P.C.B.		P-200647
	LED P.C.B. (Channel Display)	X-7715	P-200548
	Switch P.C.B.	X-7716	P-200518
	Channel Selector Switch	S-1306	P-180294
※	Channel Selector Switch		P-180364
	Cabinet Holder	HB-7580	P-411341
	LED P.C.B. (MOD)		P-200517
	LED (Modulation)	L-0902	
	Cabinet Holder	HB-6136	P-411126
	SQUELCH Control (VR-6)	P-1750	P-170240

*For Canadian Models Only

*For Australian Models Only

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	Signal Meter	M-0338	P-230058
	Shield Plate "B"	HB-7575	P-411530
	Lamp for Meter	L-0900	P-240095
	Lamp Rubber Bushing	HB-6130	P-680148A
	Lamp Holder	HB-7570	P-411337
	Meter Holder	HB-6131	P-440110
	VOLUME Control (VR-4/S1)	P-1757	P-170258
*	VOLUME Control (VR-4/S1)		P-170344
※	VOLUME Control (VR-4/S1)		P-170340
	Lug		P-411172
	Bracket for Speaker	HB-6071	P-410278
	Speaker	S-4676	P-270058 or P-270051
	Cabinet Holder	HB-6136	P-411126
	Bracket for Headphone Jack	HB-6128	P-411127
	Headphone Jack	J-0906	P-190134
	Mic Connector, 5P DIN	J-6572	P-190131
	Bracket for Mic Connector	HB-6127	P-411125
	Side Trim Panel, Left	HB-6141	P-710109
	Front Panel	Z-4033	P-600121
	Side Trim Panel, Right	HB-6141	P-710109
	Dress Plate for LED	HB-7579	P-730217
	Dress Plate for Meter	HB-7578	P-730216
※	Dress Plate for Meter		P-700369
	Channel Selector Knob	K-2892	P-650264
	VOLUME & SQUELCH Knob	K-2554	P-650230A
	Trim Panel with Name Plate	HB-7577	P-700254
※	Trim Panel with Name Plate		P-700368
	Fuse Holder		P-260017
※	Fuse Holder		P-260008
※	Block Terminal		P-320223
※	Bracket for Block Terminal		P-411745
	Blind Rivet YB-320		
	Tapping Screw (Tap Tight) 3 ϕ $\times$ 12		
	Screw (Black) 3 ϕ $\times$ 6P		
	Tapping Screw (Poly Wave) 3 ϕ $\times$ 8PTII		
	Nut 4N		
	Spring Washer 4SW		
	Screw 3 ϕ $\times$ 10P		
	Washer 3W		
	Spring Washer 3SW		
	Nut 3N		
	Triple Screw 3 ϕ $\times$ 6P		
	Triple Screw 3 ϕ $\times$ 8PTII		
	Fiber Washer 6.2 ϕ $\times$ 10 ϕ $\times$ 1t		
	Triple Screw 4 ϕ $\times$ 10P		
	Triple Screw 3 ϕ $\times$ 8P		
	Lug 3 ϕ		P-411172
	Nylon Washer 3.5 ϕ $\times$ 8 ϕ $\times$ 0.5t		
	Blind Rivet YB-420		
※	Tooth Lock Washer 3 ϕ		
※	Screw 3 ϕ $\times$ 20B		
	Tapping Screw 3 ϕ $\times$ 8PTII		

*For Canadian models Only ※For Australian Models Only

SPECIFICATIONS

TRANSMITTER SECTION

RF power output, AM 4 Watts maximum
 SSB 12 Watts P.E.P. (Peak envelope power) maximum

Frequency range 27MHz Citizens Band

Channels 40 channels P.L.L. (Phase Locked Loop) circuit synthesizer
 AM 40 channels and SSB 80 channels (USB 40 channels and LSB 40 channels).
 (USB :Upper Side Band)
 (LSB :Lower Side Band)

Type of crystal HC-18/U

frequency	tolerance	stage
10,240MHz	±0.003%	P.L.L.
18,2575MHz	±0.003%	P.L.L.
7,7975MHz	±0.003%	Transmitter, OSC. (USB)
7,8025MHz	±0.003%	Transmitter, OSC. (LSB)

Transmitter modulation 100% (maximum) AM

Modulation limiter AM; Yields high average modulation at average voice levels.

Power output limiter SSB; ALC let's the SSB transmission be free from excessive output and distortion.

Antenna matching 50 ohms, Un-balanced

Carrier deviation Not greater than ±800Hz nominal on (exceeds F.C.C., requirements)

Harmonic suppression Exceeds 60dB

Carrier suppression 40dB (SSB)

Unwanted sideband suppression 40dB (SSB)

RECEIVER SECTION

Audio power output 3.5 Watts maximum

Circuit type Single conversion superheterodyne, Phase Locked Loop (P.L.L.) frequency synthesizer provides 40 transmit and receive channels. Clarifier of ±0.8kHz on each channels at USB and LSB

Sensitivity AM 0.5μV for 10dB S + N to N ratio at 1,000Hz, 30% modulation
 SSB 0.15μV for 10dB S + N to N ratio at 1,000Hz beat

Channels 40 channels P.L.L. (Phase Locked Loop) circuit synthesizer (AM, USB and LSB)

Type of crystal HC-18/U

frequency	tolerance	stage
10,240MHz	±0.003%	P.L.L.
18,2575MHz	±0.003%	P.L.L.
7,7975MHz	±0.003%	B.F.O. (USB)
7,8025MHz	±0.003%	B.F.O. (LSB)

Selectivity 6dB down at ±2kHz
 60dB down at ± 5kHz

Intermediate frequency 7.8MHz
 (USB 7.7975MHz)
 (LSB 7.8025MHz)
 (AM 7.7989MHz)

Clarifier ±800Hz nominal

Auxiliary circuits Variable squelch control
 Variable RF Gain control
 N.B. (Noise Blanker)
 P.A. (Public Address) system
 Automatic noise limiter (built-in)

GENERAL

Power source DC 12.0 Volts Nominal (Test voltage is DC 13.8 Volts)
 negative or positive ground

Antenna 50 ohms external antenna

Channels 40 (AM, USB and LSB)

Frequency range 26,965MHz ~ 27,405MHz

Speaker 3-1/8" round, P.D.S. 8 ohms impedance

Microphone Low impedance, Press-to-talk dynamic microphone (500 ohms)

Semiconductors 4-IC (1 C-MOS LSI)
 2-FET (Field Effect Transistor)
 42-Transistor
 1-LED (Light Emitting Diode) Display

Dimensions Width 7-15/16"
 Height 2-3/4"
 Depth 9-5/8"

Weight 5.3 lbs (without microphone)

Cabinet Metal body with plastic front

Accessories Microphone hanger
 Mobile mounting bracket
 Mounting screws
 Microphone with plug and cord
 Power supply cord with fuse holder and socket
 Spare fuse (4A)

Specifications are subject to change without prior notice, within FCC rules and regulations.

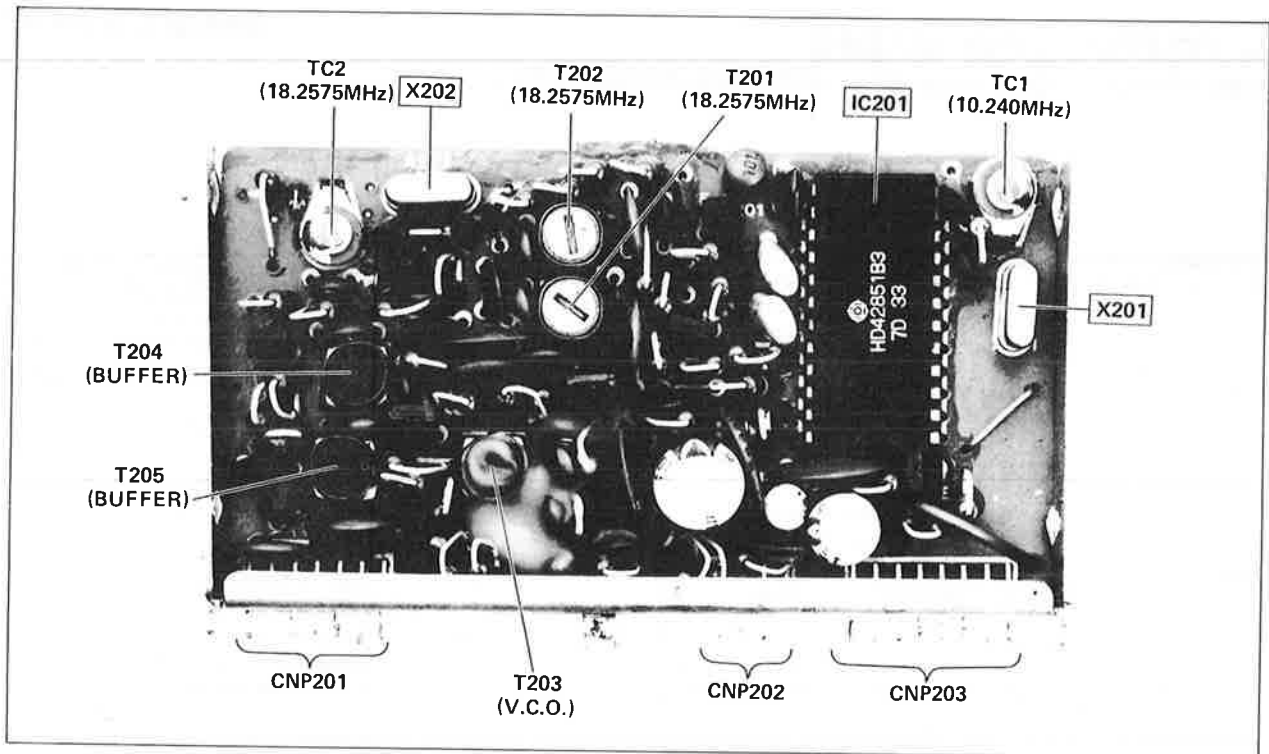


Figure 22-1 ALIGNMENT POINTS OF P.L.L. CIRCUIT

ALIGNMENT

EQUIPMENT REQUIRED

- | | | | |
|----------------------------|---|--|---|
| 1) Frequency Counter: | 0 to 40 MHz (High Sensitivity) | 8) RF Voltmeter: | 0 to 3 V, 0 to 50 MHz |
| 2) Synchroscope: | 0 to 50 MHz | 9) AC V.T.V.M.: | 0 to 20 V |
| 3) Signal Generator: | 10 MHz to 30 MHz with
1,000 Hz AM mod. | 10) DC V.T.V.M.: | 0 to 20 V |
| 4) Audio Signal Generator: | 1,000 Hz (sine wave) | 11) DC Milliammeter: | 0 to 100 mA with Low-pass
Filter (see Figure 27-4) |
| 5) 2-tone Generator: | 500 Hz and 2,400 Hz (sine
wave) | 12) Dummy Load 8 ohms and
50 ohms: | Non-inductive |
| 6) Audio Attenuator: | 0 to 100 dB | 13) Spectrum Analyzer or
Field Strength Meter | |
| 7) RF Output Power Meter: | 0 to 25 W [mean power and
P.E.P. (peak envelope power)
at 27 MHz] | 14) C.M. Coupler: | 0 to 500 MHz |
| | | 15) DC Power Supply: | 13.8 V, 3.5 A |

[NOTE]

- 1- Keep supply voltage to 13.8 V always during the alignment.
- 2- The tools to be used for the alignment should be non-metallic ones.
- 3- Be sure to keep 50 ohms dummy load connectable with the antenna terminal all the way during the transmitter alignment.
- 4- As to the alignment of the modulation circuit, be sure to use the microphone plug shown in Figure 22-2 to be connected to it.

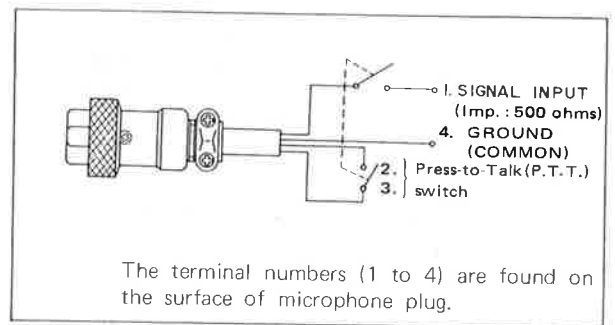


Figure 22-2 CONNECTION OF MICROPHONE PLUG

PHASE LOCKED LOOP (P.L.L.) CIRCUIT ALIGNMENT

STEP	CONNECTION OF MEASURING INSTRUMENT	ADJUSTMENT	PROCEDURE (under reception mode)
1 (18,2575MHz)	Connect a frequency counter, through 5pF capacitor, to the test point TP201 .	TC2	(1) Set the channel selector to "20" channel. (2) Set the mode switch to "USB" position. (3) Set the clarifier control to the "Center" (click's point). (4) Adjust so that the frequency counter reads within 18,2575MHz $\pm 100\text{Hz}$.
	Connect an RF voltmeter to the test point TP201 .	T201 T202	(5) Adjust so that the RF voltmeter reads the maximum.
2 (10,240MHz)	Connect a frequency counter, through 5pF capacitor, to the test point TP202 . (the terminal No. 9 of IC201)	TC1	Adjust so that the frequency counter reads within 5,120MHz $\pm 50\text{Hz}$.
3 (V.C.O.)	Connect a DC VTVM to the test points TP203 and TP205 .	T203	Confirming that the voltage at the test point TP205 is more than 4.5V, adjust so that the VTVM reads within 2.2V $\pm 0.05\text{V}$
4 (Buffer)	Connect an RF voltmeter to the test point TP204 . (the secondary of the transformer T205)	T204 T205	(1) Set the channel selector to "20" channel. (2) Adjust so that the RF voltmeter reads the maximum. (3) Switching over the channel selector from "1", "20" to "40" channel, adjust so that the RF voltmeter reads the maximum and that the level difference is within 1 dB. [Note] The central value of P.L.L. output signal voltage is to be 0.85V (r.m.s.) at TP204.
5 (TX Frequency)	Connect a DC VTVM to the test point TP206 .	R342	(1) Make the set be ready for transmission. (2) Adjust so that DC voltage at the test point TP206 becomes 2.20 $\pm 0.05\text{V}$.
	Connect a frequency counter, through 5pF capacitor, to the test point TP204 .	—	(1) Set the mode switch to "USB" position and make the set be ready for reception. (2) Check that the frequency counter reads within 19,1675MHz $\pm 110\text{Hz}$ for "1" channel. (3) Check that the frequency counter reads within 19,6075MHz $\pm 110\text{Hz}$ for "40" channel. (4) When the mode switch is changed to "LSB" from "USB" position, check that the frequency indication is 5kHz lower than that available at "USB" position. (5) When the mode switch is changed to "AM" from "USB" position, check that the frequency indication is about 1,4kHz lower than available at "USB" position. (6) For USB or LSB mode if the clarifier control is shifted to the "Max." (clockwise) or to the "Min." (counter-clockwise) from the "Center" (click's point), check that the frequency indication is varied by more than 600Hz in either case.

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.
(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.

RECEIVER ALIGNMENT

- 1- Place the OFF/Volume control of the set to "Max. Volume" position (the extreme clockwise position).
- 2- Place the RF-Gain control of the set to "Max." position (the extreme clockwise position).
- 3- Place the clarifier control of the set to "Center (Click's

- point)" position.
- 4- Place the Squelch control/P.A. switch of the set to "Squelch" position (the extreme counterclockwise position). Never set it to "P.A." position.
- 5- Place the N.B. (noise blanker) to "OFF" position.

STEP	CONNECTION OF MEASURING INSTRUMENT	ADJUSTMENT	PROCEDURE
1		P.L.L. UNIT	The P.L.L. unit must have been adjusted perfectly.
2 (B.F.O.)	(1) Connect a frequency counter, through 5 pF capacitor, to the test point TP701 (the secondary of the transformer T701).	C702	(1) Set the mode switch to "LSB" position. (2) Set the trimmer capacitors C702 and C704 to their "Mechanical Center" position. (3) Adjust so that the frequency counter reads within $7,8025\text{MHz} \pm 10\text{Hz}$.
	(2) Connect an RF voltmeter to the test point TP701	C704	(4) Set the mode switch to "USB" position. (5) Adjust so that the frequency counter reads within $7,7975\text{MHz} \pm 10\text{Hz}$.
		T701	(6) Adjust so that the RF voltmeter reads the maximum. [NOTE] (1) If a core provides two peak values, use it at its "closed" position. (2) The central value of B.F.O. output voltage is to be 430mV (r.m.s.) (TP701).
3	Repeat the step 2 until the best results will be obtained.		
4 (I.F.)	(1) Connect a signal generator to the antenna socket. (2) Connect the 8 ohms dummy load and AC V.T.V.M. to the external speaker terminal. (3) Set the signal generator to $7,800\text{MHz}$, modulation $1,000\text{Hz}$, 30%. [NOTE] Be sure to connect the ground wire of signal generator to the ground of the antenna socket.	T4 T5 T6 T7 T8	(1) Set the mode switch to "AM" position. (2) Set the channel selector to "18" channel. (3) Adjust so that the AC V.T.V.M. reads the maximum.
5 (RF)	(1) The same as in the above step 4 - (1). (2) The same as in the above step 4 - (2). (3) Set the signal generator to $27,175\text{MHz}$ (channel 18), modulation $1,000\text{Hz}$, 30%.	T1 T2 T3	(1) Set the channel selector to "18" channel. (2) Adjust so that the AC V.T.V.M. reads the maximum.
6	The same as in the step 5.	T4 ~ T8	The same as in the step 5.
7	Repeat the steps 4 to 6 until the best results will be obtained.		
8 (Signal meter)	Connect the signal generator to the antenna socket and set the frequency to $27,175\text{MHz}$ ("18" channel) and the modulation to $1,000\text{Hz}$, 30%. Keep the output of signal generator to 40dB ($100\mu\text{V}$).	R62	(1) Set the channel selector to "18" channel. (2) Set the mode switch to "AM" position. (3) Adjust so that the signal/RF power meter indicates "9" on the "SIGNAL" scale.

TRANSMITTER AND MODULATOR ALIGNMENT

- 1- When the set is made ready for the transmitting operation, be sure to always connect the RF output power meter and 50 ohms dummy load (average is 25 watts maximum) to the antenna socket — this should never be forgotten even if it is not noted down specifically. If otherwise, the final transistor Q301 may be damaged.
- 2- When making the connection of measuring instruments,

see Figure 27-1.

- 3- Prior to the adjustments, adjust the P.L.L. circuit and B.F.O. perfectly so that they will be able to operate normally.
- 4- The SWR of transmitting load circuit is to be lower than 1.2.

STEP	CONNECTION OF MEASURING INSTRUMENT	ADJUSTMENT	PROCEDURE
1 (Carrier balance, IF AMP. and Mixer)	(1) Connect a synchroscope to the test point TP304.	C31	(1) Set the channel selector to "18" channel.
	(2) Connect a frequency counter, through 5pF capacitor, to the test point TP303.		(2) Set the mode switch to "AM" position and make the set be ready for transmission.
	(3) Make the microphone's input signal be zero.		(3) Adjust the trimmer capacitor C31 to the maximum.
	(4) Set the V-Gain volume of synchroscope to "Max."	T305	(4) Adjust T305 so that the signal level of Q305 No. 1 gate (TP304) attains the maximum.
		T304 T303 T302 T301	(5) Adjust T304, T303, T302 and T301 in the sequence so that the signal level of Q304 collector (TP303) attains the maximum.
			(6) Repeat again the steps (1) to (5).
			(7) In the step (5), confirm that the frequency of Q304 collector signal is about 27.175MHz.
		R339	(8) While switching over the mode switch from "USB" to "LSB" and vice versa alternately, adjust R339 so that the signal level of Q304 collector reaches the minimum. [NOTE] (1) Never touch T7 since its adjustment has already be finished at the time of reception. (2) If a core provides two peak values, use it at its "closed" position.
2 (Idle current)	(1) The same as in the steps 1 - (3) and - (4) (2) Remove the plug which has been inserted between the drive and final current measuring terminals (bet. A and B, and bet. C and D) of the set. (3) Connect DC milliammeters through RF rejection filter (shown in Fig. 27-4) to the drive and final current measuring terminals (bet. A and B, and bet. C and D). (4) After the adjustments, reinsert the plug (which has been once removed in the step (2)) to their place.	R305 R310	(1) Set the mode switch to "USB" position and make the set be ready for transmission. (2) Adjust R305 so that the idle current between the final terminals (bet. A and B) becomes 7mA. (3) Adjust R310 so that the driver's idle current becomes 40mA (bet. C and D). [NOTE] Prior to the idle current adjustment, be sure to turn R305 and R310 fully counterclockwise (to make the idle current be zero).
3 (Linear amp.)	(1) Connect the RF output power meter (P.E.P., 25W) and synchroscope, through CM coupler, to the antenna socket. (2) Apply signal [1,000Hz, 1V (r.m.s.)] between the test point TP501 and ground.	T305 T304 T303 T302 T301 L309 L306 L303 L302 L301	(1) Prior to adjustments for the transmitting operation, rotate the meter adjusting semi-fixed resistor R301 fully counterclockwise. (2) Set the mode switch to "USB" position and make the set be ready for transmission. (3) Set the channel selector to "18" channel. (4) Adjust the coils repeatedly (more than 3 times) so that the RF output power meter reads the maximum (more than 17 watts). [NOTE] During the adjustment, it is better that the core (H) of L301 is around "Min." the core (H) of L302, around "Nominal" and the core (H) of L303, around "Max."
	(3) Stop the signal application that has been performed in the step (2) above. (4) Set V-Gain volume of synchroscope to "Max."	R339	(5) Readjust R339 so that the output level (carrier's leak) is minimized.
4	Repeat the step 3 until the best results will be obtained.		
5	Repeat the steps 1 to 3 until the best results will be obtained.		
6 (AM power)	(1) Connect the RF output power meter and synchroscope, through CM coupler, to the antenna socket. (2) Make the microphone's input signal be zero.	C31	(1) Set the mode switch to "AM" position and make the set be ready for transmission. (2) Set the channel selector to "18" channel. (3) Adjust so that the RF output power meter reads about 3.4W (output power).

STEP	CONNECTION OF MEASURING INSTRUMENT	ADJUSTMENT	PROCEDURE
7 (AM power)	The same as in the step 6.	T205	(1) Adjust T205 so that output powers for both "1" channel and "40" channel becomes as big as possible and yet that the output difference is minimized as possible.
		T302 T303 T304 T305 C31	(2) Adjust so that all the channels from "1" to "40" becomes as large as possible in their output power and yet that such output power is within 3.4 ± 0.3 watts. (Adjust C31 so that "18" channel will develop 3.4 watts.) The reading then should not exceed 4W. (FCC Rules and Regulations Part 95, Section 95.43).
8	Repeat the steps 6 and 7 until the best results will be obtained.		
9 (AM Modulation)	(1) Connect the RF output power meter, 50 ohms dummy load and synchroscope, through CM coupler, to the antenna socket. (2) Connect an audio signal generator, attenuator and AC V.T.V.M. to the microphone socket. (using the microphone plug shown in Figure 22-2.) (3) Keep the output of audio signal generator to 1,000Hz, 100mV.	R541	(1) Set the mode switch to "AM" position and make the set be ready for transmission. (2) Set the channel selector to "18" channel. (3) Keep R541 be turned fully counterclockwise. (4) Adjust so that the modulation degree becomes about 90% — See Figure 27-2.
10 (SSB ALC)	(1) Connect the RF output power meter (P.E.P., 25W), synchroscope and spectrum analyzer, through CM coupler, to the antenna socket. (2) Connect a 2-tone signal generator (500Hz and 2,400Hz), through attenuator, to the microphone terminal.	R542	(1) Set the channel selector to "18" channel. (2) Set the mode switch to "USB" position and make the set be ready for transmission. (3) Keep ALC semi-fixed resistor R542 be turned fully counterclockwise. (4) Using the attenuator, adjust the output level of 2-tone signal generator so that the RF power output meter reads 10W (P.E.P. output power). (5) Let the output level of 2-tone signal generator be increased by 10dB higher than that available at the step (4) above. (This can be done by using the attenuator.) (6) Adjust R542 so that the RF power output meter reads 11W (P.E.P. output power). [NOTE] For operating the 2-tone signal generator, be sure to keep the two waveforms be crossed at the same point always.
11	The same as in the step 10	—	When SSB output is of 11 watts P.E.P., confirm that the spurious level is superior to -60dB.
12 (RF power meter)	(1) Connect the RF output power meter and 50 ohms dummy load to the antenna socket. (2) Make the microphone terminal's input signal be zero.	R301	(1) Set the channel selector to "18" channel and make the set be ready for transmission (non-modulation, however). (2) Set the mode switch to "AM" position. (3) Adjust R301 so that the reading on the signal/RF power meter (on "Power" scale) is the same as that on the RF output power meter connected with antenna socket.

[NOTE]

- 1- For AM power adjustment in the steps 6 and 7, be sure to carry out an aging operation for more than 2 minutes beforehand.
This aging is not needed when the adjustments are performed from the step 3 to the succeeding steps in sequence.
- 2- For the adjustments in the steps 6 and 7, attach the top cabinet (GCABA3449AFSA) to the set beforehand. (See Figure 26-1).

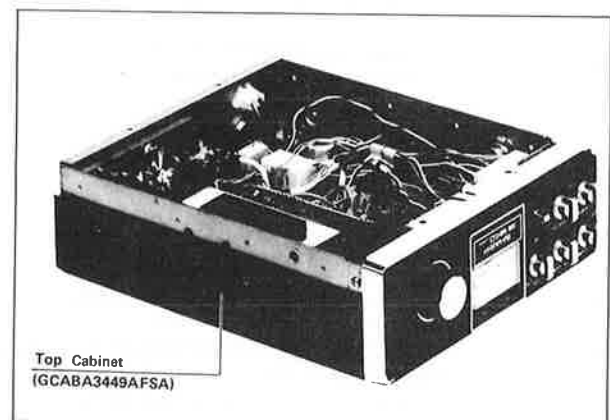
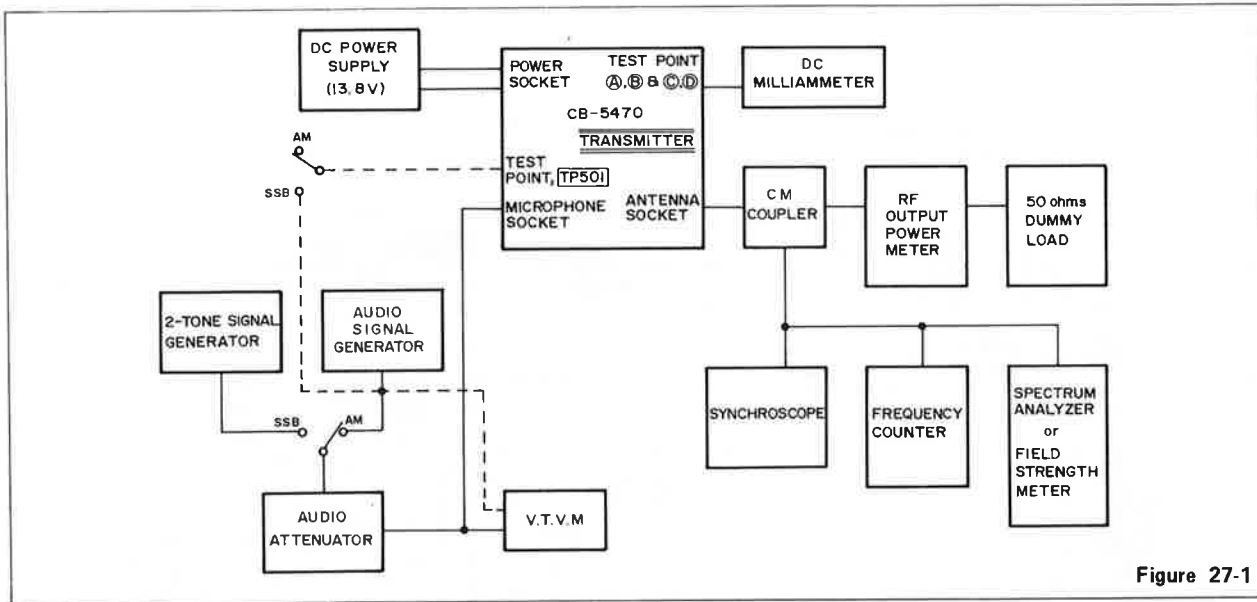


Figure 26-1



<AM modulated waveform>

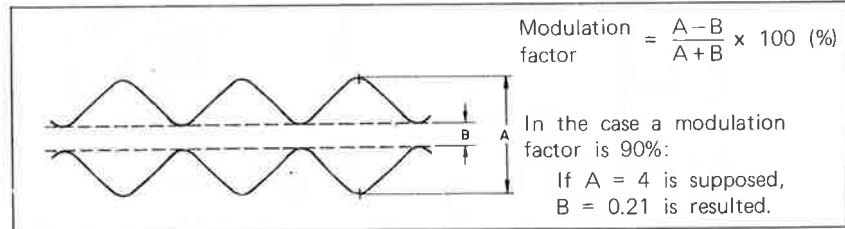


Figure 27-2

<SSB (USB/LSB) modulated waveform>

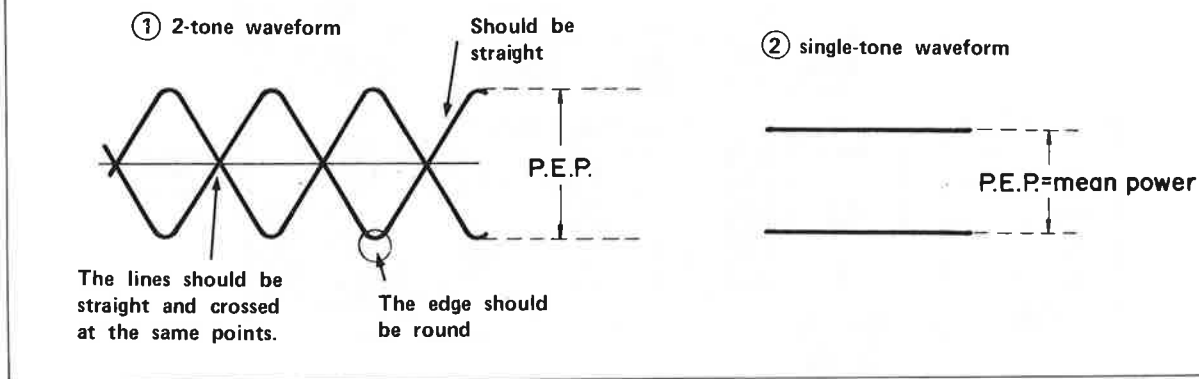


Figure 27-3

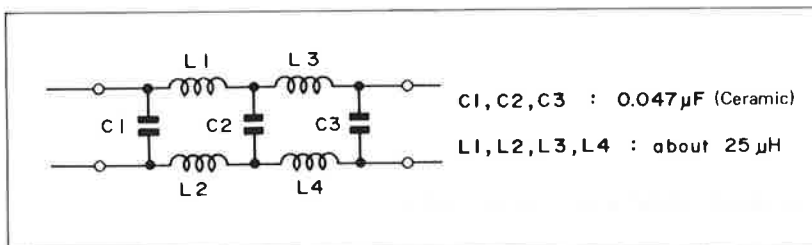


Figure 27-4 RF REJECTION FILTER (LOW-PASS FILTER)

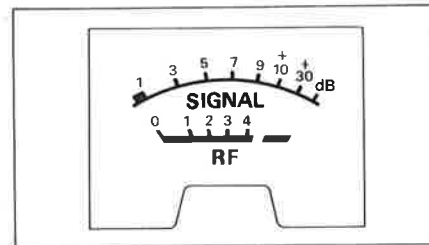
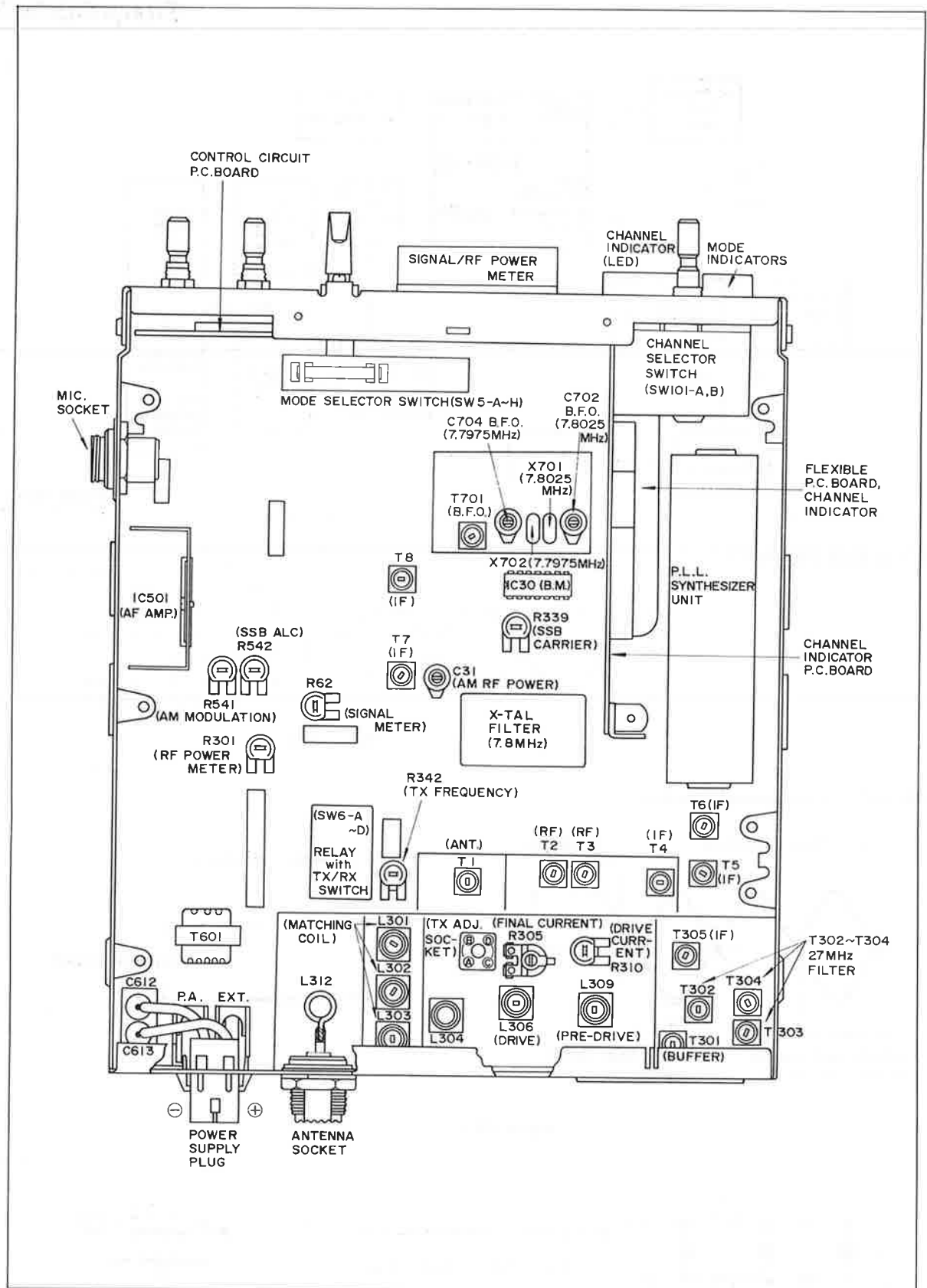


Figure 27-5 SIGNAL/RF POWER METER (ME1)



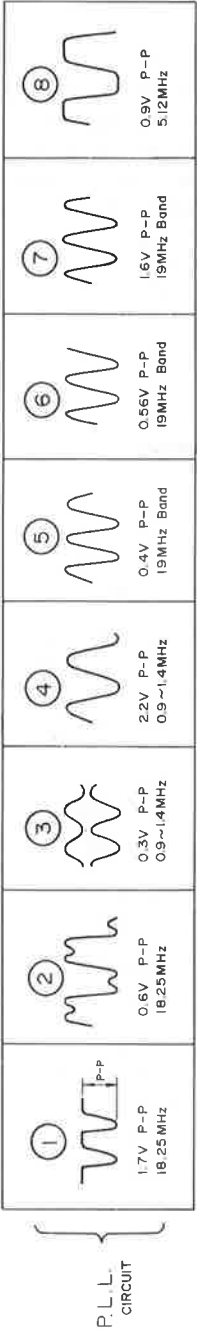
FREQUENCY OF SYNTHESIS CHART

CHANNEL	RECEIVER and TRANSMITTER FREQUENCY f_s (MHz)	CRYSTAL X201 f_1 (MHz)	$f_2 = \frac{f_1}{2048}$ (kHz)	N		f_{3n} (MHz)		f_4 (MHz)		$f_{3n} - f_4$ (MHz)		$f_6 = f_5 - f_{3n}$ (MHz)	
				LSB	USB and AM	LSB	USB and AM (TX)	LSB, USB and AM (TX)	AM* (RX)	LSB	USB and AM	LSB	USB and AM* (RX)
1	26.965	10.240	5	181	182	19.1625	19.1675	18.2575	18.2561	0.905	0.910	7.8025	7.7975
2	26.975	10.240	5	183	184	19.1725	19.1775	18.2575	18.2561	0.915	0.920	7.8025	7.7975
3	26.985	10.240	5	185	186	19.1825	19.1875	18.2575	18.2561	0.925	0.930	7.8025	7.7975
4	27.005	10.240	5	189	190	19.2025	19.2075	18.2575	18.2561	0.945	0.950	7.8025	7.7975
5	27.015	10.240	5	191	192	19.2125	19.2175	18.2575	18.2561	0.955	0.960	7.8025	7.7975
6	27.025	10.240	5	193	194	19.2225	19.2275	18.2575	18.2561	0.965	0.970	7.8025	7.7975
7	27.035	10.240	5	195	196	19.2325	19.2375	18.2575	18.2561	0.975	0.980	7.8025	7.7975
8	27.055	10.240	5	199	200	19.2525	19.2575	18.2575	18.2561	0.995	1.000	7.8025	7.7975
9	27.065	10.240	5	201	202	19.2625	19.2675	18.2575	18.2561	1.005	1.010	7.8025	7.7975
10	27.075	10.240	5	203	204	19.2725	19.2775	18.2575	18.2561	1.015	1.020	7.8025	7.7975
11	27.085	10.240	5	205	206	19.2825	19.2875	18.2575	18.2561	1.025	1.030	7.8025	7.7975
12	27.105	10.240	5	209	210	19.3025	19.3075	18.2575	18.2561	1.045	1.050	7.8025	7.7975
13	27.115	10.240	5	211	212	19.3125	19.3175	18.2575	18.2561	1.055	1.060	7.8025	7.7975
14	27.125	10.240	5	213	214	19.3225	19.3275	18.2575	18.2561	1.065	1.070	7.8025	7.7975
15	27.135	10.240	5	215	216	19.3325	19.3375	18.2575	18.2561	1.075	1.080	7.8025	7.7975
16	27.155	10.240	5	219	220	19.3525	19.3575	18.2575	18.2561	1.095	1.100	7.8025	7.7975
17	27.165	10.240	5	221	222	19.3625	19.3675	18.2575	18.2561	1.105	1.110	7.8025	7.7975
18	27.175	10.240	5	223	224	19.3725	19.3775	18.2575	18.2561	1.115	1.120	7.8025	7.7975
19	27.185	10.240	5	225	226	19.3825	19.3875	18.2575	18.2561	1.125	1.130	7.8025	7.7975
20	27.205	10.240	5	229	230	19.4025	19.4075	18.2575	18.2561	1.145	1.150	7.8025	7.7975
21	27.215	10.240	5	231	232	19.4125	19.4175	18.2575	18.2561	1.155	1.160	7.8025	7.7975
22	27.225	10.240	5	233	234	19.4225	19.4275	18.2575	18.2561	1.165	1.170	7.8025	7.7975
23	27.255	10.240	5	239	240	19.4525	19.4575	18.2575	18.2561	1.195	1.200	7.8025	7.7975
24	27.235	10.240	5	235	236	19.4325	19.4375	18.2575	18.2561	1.175	1.180	7.8025	7.7975
25	27.245	10.240	5	237	238	19.4425	19.4475	18.2575	18.2561	1.185	1.190	7.8025	7.7975
26	27.265	10.240	5	241	242	19.4625	19.4675	18.2575	18.2561	1.205	1.210	7.8025	7.7975
27	27.275	10.240	5	243	244	19.4725	19.4775	18.2575	18.2561	1.215	1.220	7.8025	7.7975
28	27.285	10.240	5	245	246	19.4825	19.4875	18.2575	18.2561	1.225	1.230	7.8025	7.7975
29	27.295	10.240	5	247	248	19.4925	19.4975	18.2575	18.2561	1.235	1.240	7.8025	7.7975
30	27.305	10.240	5	249	250	19.5025	19.5075	18.2575	18.2561	1.245	1.250	7.8025	7.7975
31	27.315	10.240	5	251	252	19.5125	19.5175	18.2575	18.2561	1.255	1.260	7.8025	7.7975
32	27.325	10.240	5	253	254	19.5225	19.5275	18.2575	18.2561	1.265	1.270	7.8025	7.7975
33	27.335	10.240	5	255	256	19.5325	19.5375	18.2575	18.2561	1.275	1.280	7.8025	7.7975
34	27.345	10.240	5	257	258	19.5425	19.5475	18.2575	18.2561	1.285	1.290	7.8025	7.7975
35	27.355	10.240	5	259	260	19.5525	19.5575	18.2575	18.2561	1.295	1.300	7.8025	7.7975
36	27.365	10.240	5	261	262	19.5625	19.5675	18.2575	18.2561	1.305	1.310	7.8025	7.7975
37	27.375	10.240	5	263	264	19.5725	19.5775	18.2575	18.2561	1.315	1.320	7.8025	7.7975
38	27.385	10.240	5	265	266	19.5825	19.5875	18.2575	18.2561	1.325	1.330	7.8025	7.7975
39	27.395	10.240	5	267	268	19.5925	19.5975	18.2575	18.2561	1.335	1.340	7.8025	7.7975
40	27.405	10.240	5	269	270	19.6025	19.6075	18.2575	18.2561	1.345	1.350	7.8025	7.7975

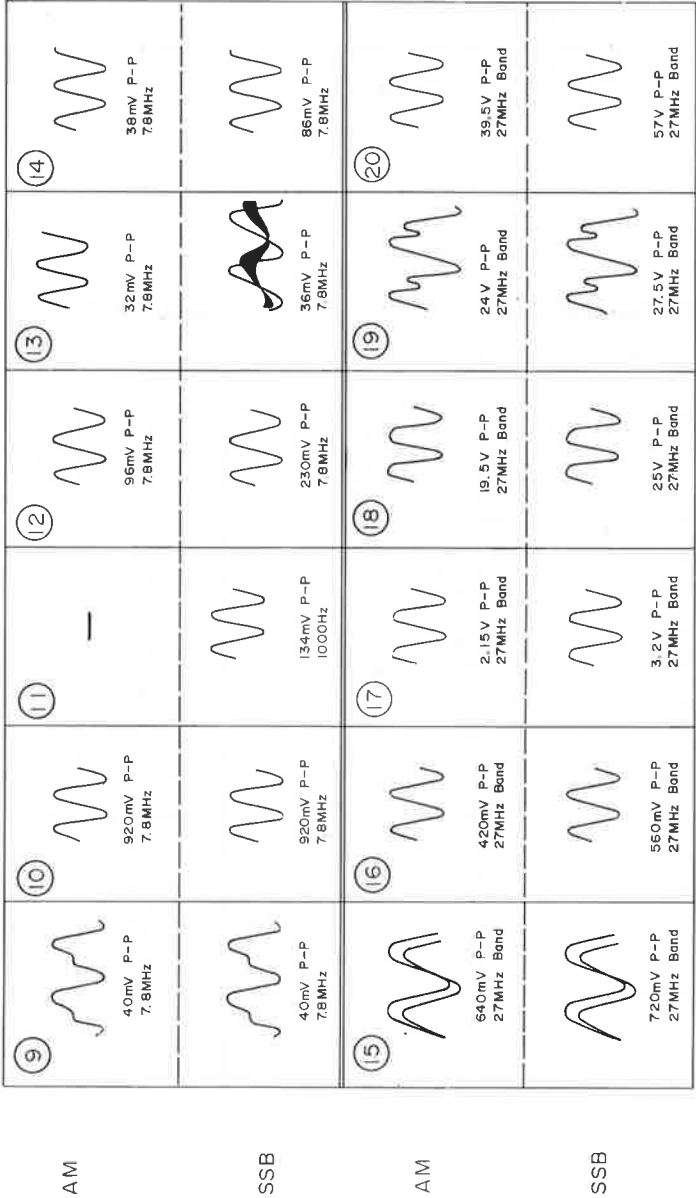
[Note] 1. In transmitting at AM mode, the frequencies f_{3n} and f_6 are same as that at USB mode. The frequency f_4 is 18.2575 MHz in all positions, however.

2. In receiving at AM mode, the frequencies f_{3n} , f_4 and f_6 are equal to those marked by * in the table.

WAVEFORMS OF EACH SECTION (the voltage values refer to P-P ones.)



Waveforms in Transmitting AM Non-modulation (output 3.5W)/SSB Single-tone (mic. input 6mV, 1,000Hz) Signals.
As for the waveforms ⑨ to ⑮, they are to be observed after removing the drive and final current adjusting plug.
If otherwise, the observation is adversely affected by transmitting signals through the probe.



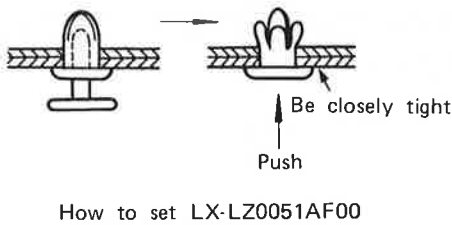
< TABLE OF OPERATING VOLTAGES OF TRANSISTORS (Q) AND INTEGRATED CIRCUITS (IC) >

NOTE

- 1- Voltages in the reception refer to those under the conditions of: channel "20", antenna input 0 dB and the volume "MIN."

-2- Voltages in the transmission refer to those under the following conditions:
(AM; Non-modulation
SSB; Microphone terminal input 6 mV (r.m.s.))
- 3- Voltages of the transistor Q206 and the pin No. ① of IC201 can vary according to AM/USB and LSB operations (the variation is never concerned with whether the operation is in transmission or in reception).

-4- For the transistors Q2 and Q305, the following symbols are used:
(G₁; No. 1 gate
G₂; No. 2 gate
D; Drain
S; Source)



LHLDW1073AFZZ

IC Operating Voltages

(the same in both transmission and reception)

(UNIT: V)			
IC No. Pin No.	IC201	IC301	IC501
1	*(1)	3.9	13.5
2	*(2) 0	3.2	12.3
3	*(2) 0	3.2	3.9
4	*(2) 0	3.9	7.9
5	*(2) 6.25	1.05	1.5
6	*(2) 6.25	7.1	3.3
7	*(2) 0	0	3.3
8	6.25	6.25	1.2
9	3.6	0.25	0
10	3.1	6.25	6.7
11	2.6	0.3	
12	6.3	7.0	
13	3.0	0.25	
14	0	0	
15	6.25		
16	2.0		
17	2.0		
18	6.25		
19	2.4		
20	3.05		
21	3.05		
22	6.2		
23	0		
24	6.25		

[Note]

*(1) In AM/USB: 5.9V
In LSB: 0V

*(2) As for the pins No. 2 to 7 of IC201, the voltages can vary according to the channels.
For the other details, refer to "Connection Table of Channel Selector Switch (SW101-A).

Transistors' Operating Voltages in Reception

(UNIT: V)									
TRANSISTOR NO.	AM			USB and LSB			NOTE		
	Base	Collector	Emitter	Base	Collector	Emitter			
Q1	2.2	8.9	1.5	2.2	8.9	1.5			
Q2	G ₁ 0	G ₂ 0.36	D 8.7	S 0.4	G ₁ 0	G ₂ 0.36	D 8.7	S 0.4	
Q3	0.7	4.9	0	0.7	4.9	0			
Q4	0.7	4.7	0	0.7	4.7	0			
Q5	8.0	0	8.5	8.0	0	8.5			
Q6	0	0	0	0	0	0			
Q7	1.7	8.8	1.05	1.7	8.8	1.05			
Q9	0.7	3.8	0	0.7	3.8	0			
Q10	3.8	8.2	3.1	3.8	8.2	3.1			
Q11	—	—	—	1.1	6.5	0.54			
Q12	0	1.2	0	0	1.2	0			
Q13	1.1	6.6	0.42	1.1	6.6	0.42			
Q14	0.24	6.7	0	0.24	6.7	0			
Q15	0.64	0	0	0.64	0	0			
Q101	0	7.9	1.4	0	7.9	1.4			
Q102	7.9	9.6	7.2	7.9	9.6	7.2			
Q103	7.2	10.6	6.6	7.2	10.6	6.6			
Q104	0	5.0	0	0	5.0	0			
Q105	1.25	1.9	1.2	1.25	1.9	1.2			
Q201	0	0.63	0	0	0.63	0			
Q202	0	7.63	0	0	7.63	0			
Q203	0.67	5.8	0	0.67	5.8	0			
Q204	1.8	6.0	1.1	1.8	6.0	1.1			
Q205	2.7	8.5	2.1	2.7	8.5	2.1			
Q206	0	5.9	0	0	5.9	0	In the case of USB		
				0.7	0	0	In the case of LSB		
Q207	2.1	2.1	1.45	2.1	2.1	1.45			
Q208	4.6	8.4	4.0	4.6	8.4	4.0			
Q209	0.6	0	0	0.65	0	0			
Q504	0	7.61	0	0	7.61	0			
Q505	0	0	0	0	0	0			
Q506	1.25	2.3	0.62	1.25	2.3	0.62			
Q601	13.3	13.5	12.6	13.3	13.5	12.6			
Q701	—	—	—	3.6	8.8	3.0			
Q702	—	—	—	3.4	8.8	2.75			

Transistors' Operating Voltages in Transmission

(UNIT: V)									
TRANSISTOR NO.	AM			USB and LSB			NOTE		
	Base	Collector	Emitter	Base	Collector	Emitter			
Q7	—	—	—	1.23	8.9	0.57			
Q8	1.25	8.9	0.6	—	—	—			
Q15	0.63	0	0	0.63	0	0			
Q101	0	7.9	1.4	0	7.9	1.4			
Q102	7.9	9.6	7.2	7.9	9.6	7.2			
Q103	7.2	10.6	6.6	7.2	10.6	6.6			
Q104	0	5.0	0	0	5.0	0			
Q105	1.25	1.9	1.2	1.25	1.9	1.2			
Q201	7.6	8.3	8.35	8.4	9.1	9.1			
Q202	0.7	0	0	0.7	0	0			
Q203	0.67	5.8	0	0.67	5.8	0			
Q204	1.8	6.0	1.1	1.8	6.0	1.1			
Q205	2.7	8.5	2.1	2.7	8.5	2.1			
Q206	0	5.9	0	0	5.9	0	In the case of USB		
				0.7	0	0	In the case of LSB		
Q207	2.1	2.1	1.45	2.1	2.1	1.45			
Q208	4.6	8.4	4.0	4.6	8.4	4.0			
Q209	0.64	0	0	0.64	0	0			
Q301	0.56	13.0	0	0.57	13.3	0			
Q302	0.62	13.0	0	0.66	13.3	0			
Q303	0.9	13.0	0.3	0.9	13.3	0.3			
Q304	1.0	6.55	0.4	1.0	6.53	0.4			
Q305	G ₁ 0	G ₂ 0.75	D 8.1	S 0.75	G ₁ 0	G ₂ 0.75	D 8.1	S 0.75	
Q501	0.93	3.4	0.3	0.93	3.4	0.3			
Q502	1.2	2.3	0.55	1.2	2.3	0.55			
Q503	5.9	7.6	5.3	5.9	7.6	5.3			
Q504	0	7.5	0	0	7.5	0			
Q505	0	0	0	0	0	0			
Q601	12.5	12.7	11.8	12.5	12.7	11.8			
Q602	9.0	12.6	8.4	9.0	12.6	8.4			
Q701	3.6	8.8	3.0	3.6	8.8	3.0			
Q702	3.1	8.0	2.45	3.1	8.0	2.45			

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations:

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

Order to : Parts Center

P.O. Box 664 Paramus, New Jersey 07652 (201) 265-5600

P.O. Box 20394 Long Beach, Calif. 90801 (213) 830-4470

REF. NO.	PART NO.	DESCRIPTION
INTEGRATED CIRCUITS		
IC101	RH-IX1031AFZZ	Diode Array, Channel Indicator (LED)
IC201	RH-IX1073AFZZ	C-MOS LSI (Large Scale Integration), P.L.L. Frequency Synthesizer (Low Pass Filter, Phase Detector, Programmable Divider, Crystal Oscillator, Divider) (HD42851B3)
IC301	VHIMC1496/-1	Balanced Modulator (MC1496N)
IC501	RH-IX1070AFZZ	Audio Power Amplifier (TA7205AP)

TRANSISTORS		
Q1	VS2SC535-B/-1	Receiver, RF Amplifier (2SC535(B))
Q2	VS3SK45-B//1F	Receiver, Mixer (3SK45(B))
Q3	VS2SC460-B/-1	Receiver, Noise Amplifier (2SC460(B))
Q4	VS2SC460-C/-1	Receiver, Noise Amplifier (2SC460(C))
Q5	VS2SA844-D/-1	Receiver, Noise Amplifier (2SA844(D))
Q6	VS2SC458-D/-1	Receiver, Noise Switching (2SC458(D))
Q7	VS2SC460-B/-1	IF Amplifier (2SC460(B))
Q8	VS2SC460-B/-1	IF Amplifier (2SC460(B))
Q9	VS2SC460-A/-1	Receiver, IF Amplifier (2SC460(A))
Q10	VS2SC460-B/-1	Receiver, IF Amplifier (2SC460(B))
Q11	VS2SC460-C/-1	Product Detector (2SC460(C))
Q12	VS2SC458-D/-1	Squelch Switching (2SC458(D))
Q13	VS2SC460-B/-1	Squelch Amplifier (2SC460(B))
Q14	VS2SC458LGD-1	AGC Amplifier (2SC458 LG(D))
Q15	VS2SC458-D/-1	RX Delay (2SC458(D))
Q101	VS2SC454-B/-1	9-channel Flashing Oscillator (2SC454(B))
Q102	VS2SC454-B/-1	9-channel Flashing Oscillator (2SC454(B))
Q103	VS2SD468-C/-1	LED Driver (2SD468(C))
Q104	VS2SC454-B/-1	Switching (2SC454(B))
Q105	VS2SC454-B/-1	LED Driver (2SC454(B))
Q201	VS2SA844-D/-1	P.L.L. Synthesizer, Switching (2SA844(D))
Q202	VS2SC454-B/-1	P.L.L. Synthesizer, Inverter (2SC454(B))
Q203	VS2SC461-B/-1	P.L.L. Synthesizer, Down Mixer (2SC461(B))

REF. NO.	PART NO.	DESCRIPTION
Q204	VS2SC461-B/-1	P.L.L. Synthesizer, Buffer Amplifier (2SC461(B))
Q205	VS2SC461-C/-1	P.L.L. Synthesizer, Crystal Oscillator, 18.2575MHz or 18.2561MHz (AM RX only) (2SC461(C))
Q206	VS2SC454-B/-1	P.L.L. Synthesizer, Inverter (2SC454(B))
Q207	VS2SC461-C/-1	P.L.L. Synthesizer, V.C.O. (Voltage Controlled Oscillator) (2SC461(C))
Q208	VS2SC461-C/-1	P.L.L. Synthesizer, Buffer Amplifier (2SC461(C))
Q209	VS2SC454-B/-1	P.L.L. Synthesizer, Unlock Protector (2SC454(B))
Q301	VS2SC1969/-1	Transmitter, Final (2SC1969)
Q302	VS2SC2166/-1	Transmitter, Driver (2SC2166)
Q303	VS2SC2086/-1	Transmitter, Pre-Driver (2SC2086)
Q304	VS2SC1210-D-1	Transmitter, Buffer Amplifier (2SC1210(D))
Q305	VS3SK45-B//1F	Transmitter, Mixer (3SK45(B))
Q501	VS2SC458LGC-1	Microphone Amplifier (2SC458 LG(C))
Q502	VS2SC458-C/-1	Audio Pre-Amplifier (2SC458(C))
Q503	VS2SC458-D/-1	Audio Amplifier (2SC458(D))
Q504	VS2SC458-C/-1	Modulation Limiter and Power Output Limiter (2SC458(C))
Q505	VS2SC458-C/-1	Modulation Limiter and Power Output Limiter (2SC458(C))
Q506	VS2SC458-C/-1	Audio Amplifier (2SC458(C))
Q601	VS2SC458-D/-1	Ripple Filter (2SC458(D))
Q602	VS2SC1061-C-1	Voltage Regulator, TX (2SC1061(C))
Q701	VS2SC460-B/-1	B.F.O. (Beat-Frequency Oscillator) (2SC460(B))
Q702	VS2SC460-B/-1	Buffer Amplifier (2SC460(B))

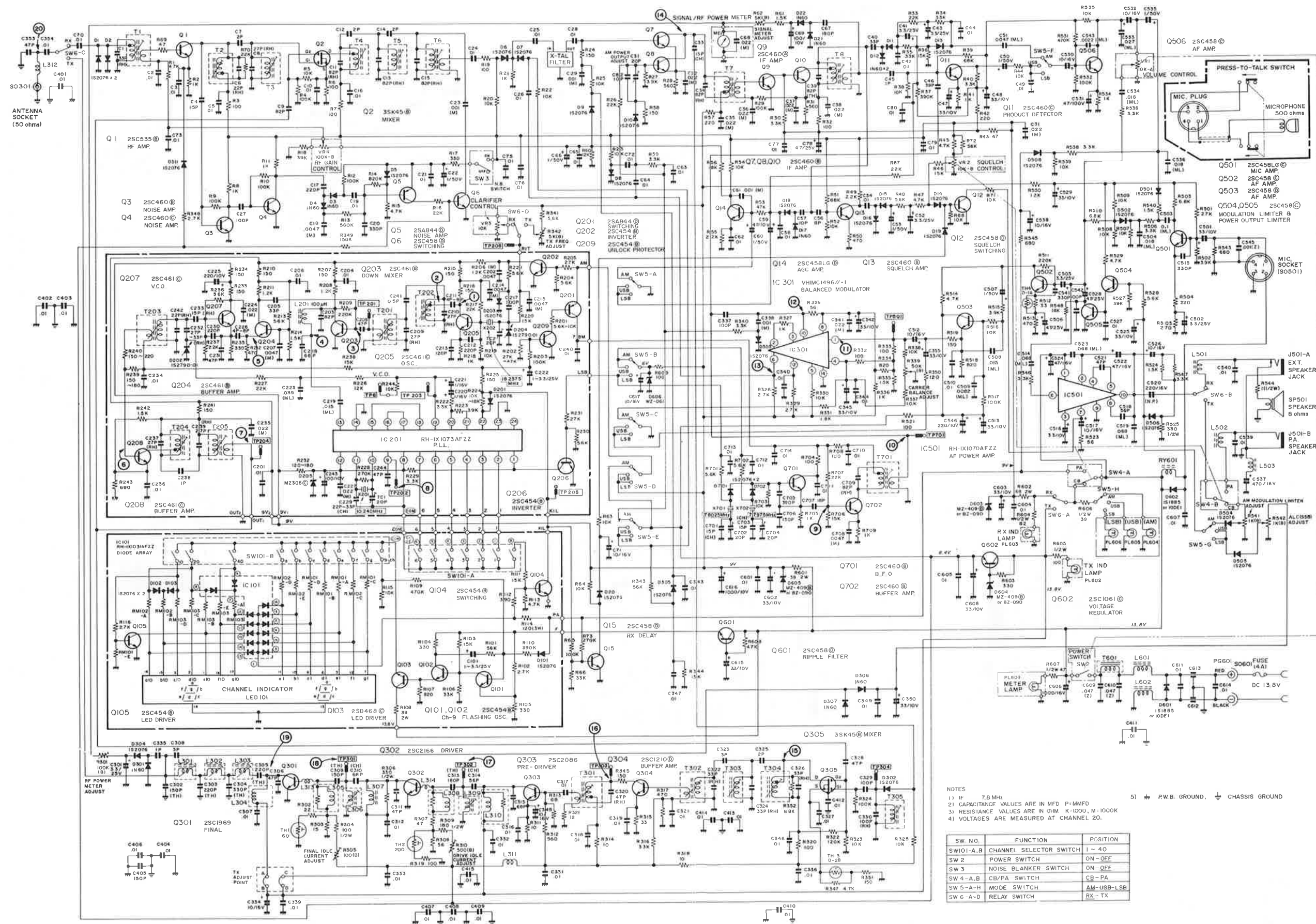
DIODES

D1	VHD1S2076/-1	Static Protector (1S2076)
D2	VHD1S2076/-1	Static Protector (1S2076)
D3	VHD1N60////-1	Noise Detector (1N60)
D4	VHD1N60////-1	Noise Detector (1N60)
D5	VHD1S2076/-1	Bias Stabilizer (1S2076)
D6	VHD1S2076/-1	Switching, IF (1S2076)
D7	VHD1S2076/-1	Switching, Transmitter (SSB) (1S2076)
D8	VHD1S2076/-1	Switching (1S2076)
D9	VHD1S2076/-1	Switching (1S2076)
D10	VHD1S2076/-1	Switching, Transmitter (AM) (1S2076)

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
D11	VHD1N60///-1	AM Detector (1N60)
D12	VHD1N60///-1	AM Detector (1N60)
D13	VHD1S2076//1	A.N.L. (Automatic Noise Limiter) (1S2076)
D14	VHD1S2076//1	Switching (1S2076)
D15	VHD1S2076//1	Squelch (1S2076)
D16	VHD1S2076//1	Squelch (1S2076)
D17	VHD1N60///-1	AGC (1N60)
D18	VHD1S2076//1	AGC (1S2076)
D19	VHD1S2076//1	Switching (1S2076)
D20	VHD1S2076//1	Switching (1S2076)
D21	VHD1N60///-1	Signal Meter (1N60)
D22	VHD1N60///-1	Signal Meter (1N60)
D101	VHD1S2076//1	Switching, P.A. (1S2076)
D102	VHD1S2076//1	LED Indicator (1S2076)
D103	VHD1S2076//1	LED Indicator (1S2076)
D201	VHD1S2076//1	Switching (1S2076)
D202	VHC1S2790WS1F	Varicap, V.C.O., (Voltage Controlled Oscillator) (1S2790-01)
D203	VHD1S2076//1	Switching (1S2076)
D204	VHC1S2790WS1F	Varicap, RIT Voltage (1S2790-01)
D205	VHEMZ306C//1	Zener Diode, Voltage Regulator, 6.0~6.6V (MZ306C)
D301	VHD1N60///-1	RF Power Meter (1N60)
D302	VHD1S2076//1	Switching (1S2076)
D303	VHD1S2076//1	Switching (1S2076)
D304	VHD1S2076//1	RF Power Meter (1S2076)
D305	VHD1S2076//1	Switching (1S2076)
D306	VHD1N60///-1	ALC (Automatic Level(or Load) Control) (1N60)
D307	VHD1N60///-1	ALC (Automatic Level(or Load) Control) (1N60)
D311	VHD1S2076//1	Switching, +B (1S2076)
D501	VHD1S2076//1	Switching, P.A. (1S2076)
D502	VHD1S2076//1	Switching (1S2076)
D504	VHD1S2076//1	Modulation Limiter (1S2076)
D505	VHD1S2076//1	ALC (Automatic Level(or Load) Control) (1S2076)
D506	VHD1S2076//1	Switching (1S2076)
D508	VHD1S2076//1	Switching, P.A. (1S2076)
D601	VHD1S1885//1	Circuit Protector (1S1885)
D602	VHD1S1885//1	Protector (1S1885)
D603	VHEMZ409B//1F	Zener Diode, Voltage Regulator, 8.6V~9.5V, (MZ409B)
D604	VHEMZ409B//1F	Zener Diode, Voltage Regulator, 8.6V~9.5V (MZ409B)
D605	VHEMZ409B//1F	Zener Diode, Voltage Regulator, 8.6V~9.5V (MZ409B)
D606	VHEWZ061///1	Zener Diode, Voltage Regulator (WZ-061), 5.7V~6.5V
D701	VHD1S2076//1	Switching, B.F.O. (1S2076)
D702	VHD1S2076//1	Switching, B.F.O. (1S2076)
LED		
LED101	VHGPL-6P201-1	LED (Light Emitting Diode), Channel Indicator (GL-6P201)

REF. NO.	PART NO.	DESCRIPTION
THERMISTORS		
TH1	VHH16D47///-1	Temperature Compensation, Final Idle Current, Violet
TH2	VHH22D27///-1	Temperature Compensation, Drive Idle Current, Black
TH3	VHHD2B-R///-1	Temperature Compensation, Mixer (D-2B)
TH4	VHHD1A/////1	Temperature Compensation, Bias (D-1A)
CRYSTALS		
X201	RCRSB0059AFZZ	10.240MHz, P.L.L.
X202	RCRSB0058AFZZ	18.2575MHz, P.L.L.
X701	RCRSB0057AFZZ	7.8025MHz, B.F.O.
X702	RCRSB0056AFZZ	7.7975MHz, B.F.O.
COILS		
L201	RCILC1500AAZZ	100μH, Low Pass Filter, P.L.L. Circuit
L301	RCILR0326AFZZ	Transmitter, Matching
L302	RCILR0327AFZZ	Transmitter, Matching
L303	RCILR0326AFZZ	Transmitter, Matching
L304	RCILR0328AFZZ	Transmitter, Tank
L305	RCILZ0056AFZZ	Transmitter, RF Choke
L306	RCILR0325AFZZ	Transmitter, Drive
L307	RCILC0011AFZZ	Transmitter, RF Choke (Drive)
L308	RCILZ0056AFZZ	Transmitter, RF Choke
L309	RCILR0325AFZZ	Transmitter, Pre-Drive
L310	RCILZ0057AFZZ	Transmitter, RF Choke
L311	RCILC0024AFZZ	Transmitter, RF Choke
L312	RCILR0332AFZZ	Antenna Choke
L313	RCILR0333AFZZ	Transmitter, RF Choke
L314	RCILR0334AFZZ	Transmitter, RF Choke
L501	RCILC0059AFZZ	RF Choke
L502	RCILC0059AFZZ	RF Choke
L503	RCILC0059AFZZ	RF Choke
L601	RCILC0011AFZZ	Power Choke
L602	RCILC0059AFZZ	Power Choke
FILTER		
	RFILP0001AFZZ	X-tal Filter, 7.8MHz
TRANSFORMERS		
T1	RCILR0316AFZZ	Receiver, Antenna
T2	RCILR0317AFZZ	Receiver, RF
T3	RCILR0318AFZZ	Receiver, RF
T4	RCILR0319AFZZ	Receiver, IF
T5	RCILR0319AFZZ	Receiver, IF
T6	RCILR0319AFZZ	Receiver, IF
T7	RCILR0320AFZZ	Receiver, IF
T8	RCILR0321AFZZ	Receiver, IF
T201	RCILR1001AAZZ	P.L.L. Circuit, 18MHz Band Filter

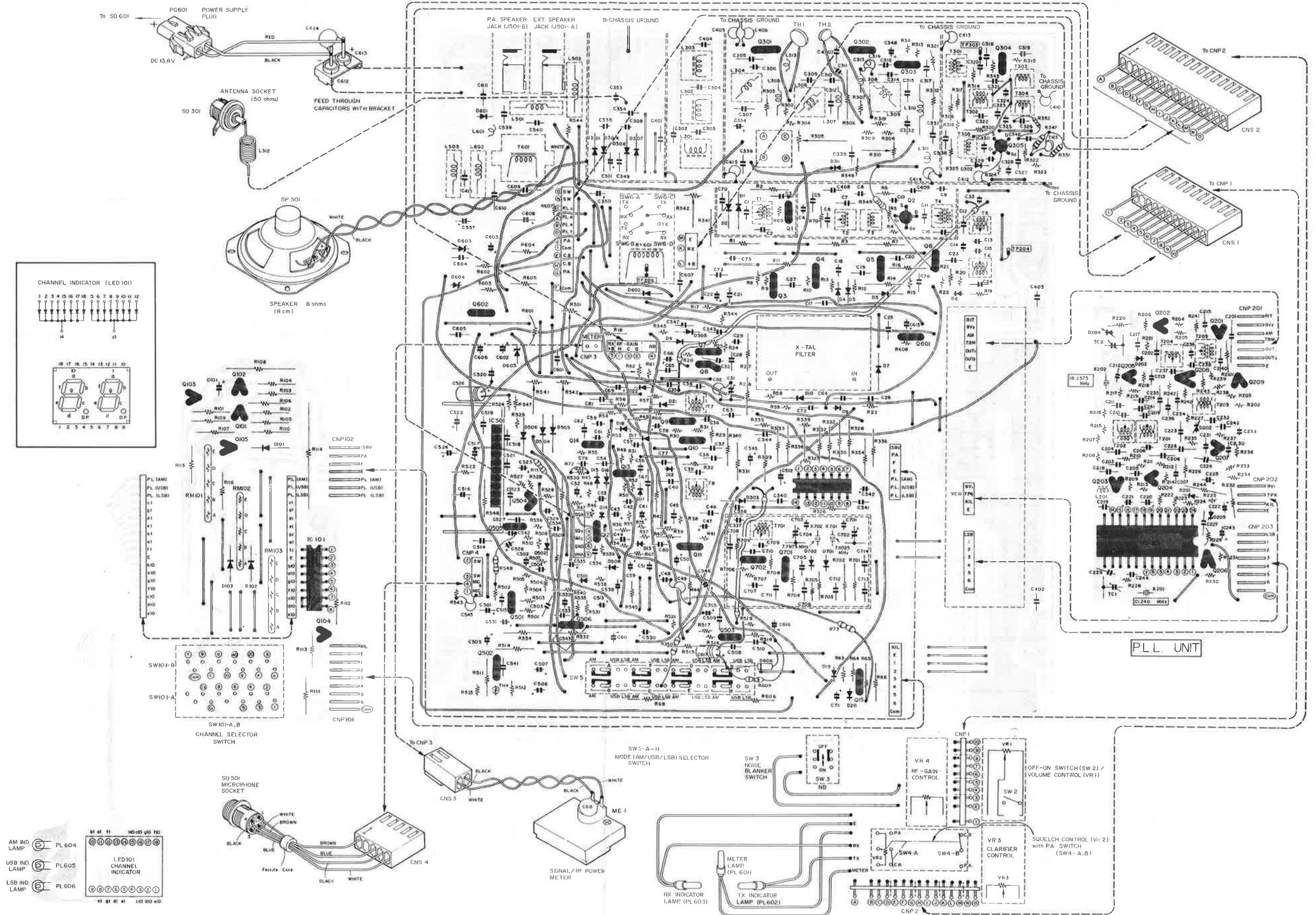


NOTES

- 1) IF 7.8MHz
- 2) CAPACITANCE VALUES ARE IN MFD P=MMFD
- 3) RESISTANCE VALUES ARE IN OHM K=1000, M=1000K
- 4) VOLTAGES ARE MEASURED AT CHANNEL 20.
- 5) P.W.B. GROUND, CHASSIS GROUND

SW. NO.	FUNCTION	POSITION
SW101-A,B	CHANNEL SELECTOR SWITCH	1-40
SW 2	POWER SWITCH	ON-OFF
SW 3	NOISE BLANKER SWITCH	ON-OFF
SW 4-A,B	CB/PA SWITCH	CB-PA
SW 5-A-H	MODE SWITCH	AM-USB-LSB
SW 6-A-D	RELAY SWITCH	RX-TX

Sharp CB-5470



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
T202	RCILR1001AAZZ	P.L.L. Circuit, 18MHz Band Filter
T203	RCILB1600AAZZ	P.L.L. Circuit, V.C.O. (Voltage Controlled Oscillator)
T204	RCILR1002AAZZ	P.L.L. Circuit, Band-Pass Filter, 19MHz
T205	RCILR1002AAZZ	P.L.L. Circuit, Band-Pass Filter, 19MHz
T301	RCILR0324AFZZ	Transmitter, Buffer
T302	RCILR0323AFZZ	Transmitter, 27MHz Band Filter
T303	RCILR0318AFZZ	Transmitter, 27MHz Band Filter
T304	RCILR0317AFZZ	Transmitter, 27MHz Band Filter
T305	RCILR0322AFZZ	Transmitter, IF
T601	RTRNC0003AFZZ	Power Choke
T701	RCILR0315AFZZ	B.F.O. (Beat-Frequency Oscillator)

CONTROLS

C31	RTO-H2007AFZZ	Trimmer Capacitor, AM Power Output Adjust
TC1	RTO-H2007AFZZ	Trimmer Capacitor, P.L.L. Circuit, 10.240MHz Adjust
TC2	RTO-H2007AFZZ	Trimmer Capacitor, P.L.L. Circuit, 18.2575MHz Adjust
C702	RTO-H2007AFZZ	Trimmer Capacitor, B.F.O. (7.8025MHz) Adjust
C704	RTO-H2007AFZZ	Trimmer Capacitor, B.F.O. (7.7975MHz) Adjust
R62	RVR-M0003SGZZ	5K (B) ohm, Signal Meter Adjust
R301	RVR-M0007SGZZ	100K (B) ohm, RF Power Meter Adjust
R305	RVR-M0149AFZZ	100 (B) ohm, Final Idle Current Adjust
R310	RVR-M0147AFZZ	500 (B) ohm, Drive Idle Current Adjust
R339	RVR-M0006SGZZ	50K (B) ohm, SSB Carrier Balance Adjust
R342	RVR-M0003SGZZ	5K (B) ohm, TX Frequency Adjust
R541	RVR-M0116AFZZ	1K (B) ohm, AM Modulation Limiter Adjust
R542	RVR-M0116AFZZ	1K (B) ohm, SSB ALC Adjust
VR1/SW2	RVR-A0122AFZZ	10K ohm, OFF/Volume Control
VR2/SW4, A, B	RVR-B0137AFZZ	10K (B) ohm, Squelch Control with P.A. (Public Address) Switch
VR3	RVR-Z0062AFZZ	10K ohm, Clarifier Control
VR4	RVR-B0149AFZZ	100K (B) ohm, RF Gain Control

ELECTROLYTIC CAPACITORS

C22	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C41	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C43	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C47	VCEAAU1AW336Y	33MFD, 10V, +50 -10%

REF. NO.	PART NO.	DESCRIPTION
C48	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C50	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C52	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C53	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C59	VCEAAU1AW476Y	47MFD, 10V, +50 -10%
C60	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C66	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C69	VCEAAU1AW107Y	100MFD, 10V, +50 -10%
C71	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C78	VCEAAU1EW475A	4.7MFD, 25V, +75 -10%
C101	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C220	VCAAKU1CA105M	1MFD, 16V, ±20%, Aluminum
C221	VCAAKU1CA105M	1MFD, 16V, ±20%, Aluminum
C222	VCEAAU1EW105R	1MFD, 25V, +150 -10%
C225	VCEAAU1AW227Y	220MFD, 10V, +50 -10%
C243	VCEAAU1AW107Y	100MFD, 10V, +50 -10%
C301	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C334	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C342	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C345	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C348	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C350	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C355	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C501	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C502	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C505	VCEAAU1EW335A	3.3MFD, 25V, +75 -10%
C506	VCEAAU1EW475A	4.7MFD, 25V, +75 -10%
C507	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C512	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C513	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C516	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C517	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C520	VCEAAU1CB227M	220MFD, 16V, ±20%, Non-polar

C522	VCEAAU1CW476Y	47MFD, 16V, +50 -10%
C524	VCEAAU1CW476Y	47MFD, 16V, +50 -10%
C525	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C526	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C528	VCEAAU1EW475A	4.7MFD, 25V, +75 -10%
C529	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C530	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C531	VCEAAU2AW474A	47MFD, 100V, +75 -10%
C532	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C535	VCEAAU1HW105A	1MFD, 50V, +75 -10%
C537	VCEAAU1CW477Y	470MFD, 16V, +50 -10%
C538	VCEAAU1CW106Y	10MFD, 16V, +50 -10%
C546	VCEAAU1AW227Y	220MFD, 10V, +50 -10%
C602	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C603	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C606	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C608	VCEAAU1CW108Y	1000MFD, 16V, +50 -10%
C615	VCEAAU1AW336Y	33MFD, 10V, +50 -10%
C616	VCEAAU1AW108Y	1000MFD, 10V, +50 -10%
C617	VCEAAU1CW106Y	10MFD, 16V, +50 -10%

CAPACITORS

(Unless otherwise specified capacitors are +80 -20%, Ceramic Type).

C1	VCCRP1HH330J	33PF (RH), 50V, ±5%, Ceramic
C2	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C3	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C4	VCCSPU1HL150J	15PF, 50V, ±5%, Ceramic
C5	VCKYPU1SD103Z	.01MFD (Z5T), 30V

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
C6	VCCRP1HH220J	22PF (RH), 50V, ±5%, Ceramic
C7	VCCSPU1HL2R0C	2PF, 50V, ±0.25PF, Ceramic
C8	VCCRP1HH270J	27PF (RH), 50V, ±5%, Ceramic
C9	VCCSPU1HL820J	82PF, 50V, ±5%, Ceramic
C10	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C11	VCCRP1HH820J	82PF (RH), 50V, ±5%, Ceramic
C12	VCCSPU1HL2R0C	2PF, 50V, ±0.25PF, Ceramic
C13	VCCRP1HH820J	82PF (RH), 50V, ±5%, Ceramic
C14	VCCSPU1HL2R0C	2PF, 50V, ±0.25PF, Ceramic
C15	VCCRP1HH820J	82PF (RH), 50V, ±5%, Ceramic
C16	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C17	VCCSPU1HL221J	220PF, 50V, ±5%, Ceramic
C18	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic
C19	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C20	VCCSPU1HL331J	330PF, 50V, ±5%, Ceramic
C21	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C23	VCKYPU1HB102M	.001MFD, 50V, ±20%, Ceramic
C24	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C25	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C26	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C27	VCCSPU1HL101J	100PF, 50V, ±5%, Ceramic
C28	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C29	VCKYPU1HB102M	.001MFD, 50V, ±20%, Ceramic
C32	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C33	VCCCPU1HH150J	15PF (CH), 50V, ±5%, Ceramic
C34	VCCRP1HH820J	82PF (RH), 50V, ±5%, Ceramic
C35	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C36	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C37	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C38	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C39	VCCRP1HH820J	82PF (RH), 50V, ±5%, Ceramic
C40	VCCSPU1HL330J	33PF, 50V, ±5%, Ceramic
C42	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C44	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C45	VCCSPU1HL1R0C	1PF, 50V, ±0.25PF, Ceramic
C46	VCCSPU1HL390J	39PF, 50V, ±5%, Ceramic
C49	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C51	VCQYKU1HM472K	.0047MFD, 50V, ±10%, Mylar
C54	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C56	VCCSPU1HL8R0C	8PF, 50V, ±0.25PF, Ceramic
C57	VCCSPU1HL100C	10PF, 50V, ±0.25PF, Ceramic
C58	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C61	VCKYPU1HB102M	.001MFD, 50V, ±20%, Ceramic
C62	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C63	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C64	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C65	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C67	VCCSPU1HL181J	180PF, 50V, ±5%, Ceramic
C68	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C70	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C72	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C73	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C75	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C76	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C77	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C79	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C80	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C81	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C82	VCCSPU1HL100C	10PF, 50V, ±0.25PF, Ceramic
C201	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C202	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic
C203	VCCSPU1HL820K	82PF, 50V, ±10%, Ceramic

REF. NO.	PART NO.	DESCRIPTION
C204	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C205	VCCSPU1HL330K	33PF, 50V, ±10%, Ceramic
C206	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C207	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic
C208	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic
C209	VCCRP1HH270J	27PF (RH), 50V, ±5%, Ceramic
C210	VCCRP1HH270J	27PF (RH), 50V, ±5%, Ceramic
C211	VCCSPU1HL6R0C	6PF, 50V, ±0.25PF, Ceramic
C212	VCCSPU1HL221K	220PF, 50V, ±10%, Ceramic
C213	VCCSPU1HL121K	120PF, 50V, ±10%, Ceramic
C214	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic
C215	VCKYPU1HB472M	.0047MFD, 50V, ±20%, Ceramic
C217	VCCSPU1HL101K	100PF, 50V, ±10%, Ceramic
C218	VCCSPU1HL680K	68PF, 50V, ±10%, Ceramic
C219	VCQYKU1HM153K	.015MFD, 50V, ±10%, Mylar
C223	VCQYKU1HM393K	.039MFD, 50V, ±10%, Mylar
C224	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C226	VCCSPU1HL5R0C	5PF, 50V, ±0.25PF, Ceramic
C227	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C229	VCCCPU1HH270J	27PF (CH), 50V, ±5%, Ceramic
C230	VCCSPU1HL221K	220PF, 50V, ±10%, Ceramic
C231	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic
C232	VCCRP1HH330J	33PF (RH), 50V, ±5%, Ceramic
C233	VCCRP1HH150J	15PF (RH), 50V, ±5%, Ceramic
C234	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C235	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic
C236	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C237	VCCRP1HH270J	27PF (RH), 50V, ±5%, Ceramic
C238	VCCSPU1HL1R0C	1PF, 50V, ±0.25PF, Ceramic
C239	VCCRP1HH270J	27PF (RH), 50V, ±5%, Ceramic
C240	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C241	VCCSPU1HL0R5C	0.5PF, 50V, ±0.25PF, Ceramic
C242	VCCRP1HH220J	22PF (RH), 50V, ±5%, Ceramic
C244	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic
C302	VCCTPU1HH151J	150PF (TH), 50V, ±5%, Ceramic
C303	VCCTPU1HH221J	220PF (TH), 50V, ±5%, Ceramic
C304	VCCTPU1HH331J	330PF (TH), 50V, ±5%, Ceramic
C305	VCCTPU1HH221J	220PF (TH), 50V, ±5%, Ceramic
C306	VCCSPU1HL470J	47PF, 50V, ±5%, Ceramic
C307	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C308	VCCSPU1HL3R0C	3PF, 50V, ±0.25PF, Ceramic
C309	VCCTPU1HH151J	150PF (TH), 50V, ±5%, Ceramic
C310	VCCCPU1HH680J	68PF (CH), 50V, ±5%, Ceramic
C311	VCCSPU1HL470J	47PF, 50V, ±5%, Ceramic
C312	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C313	VCCTPU1HH181J	180PF (TH), 50V, ±5%, Ceramic
C314	VCCCPU1HH560J	56PF (CH), 50V, ±5%, Ceramic
C315	VCCSPU1HL680J	68PF, 50V, ±5%, Ceramic
C316	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C317	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C318	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C319	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C320	VCCRP1HH470J	47PF (RH), 50V, ±5%, Ceramic

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
C321	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C322	VCCRPUIHH330J	33PF (RH), 50V, $\pm 5\%$, Ceramic
C323	VCCSPUIHL3R0C	3PF, 50V, ± 0.25 PF, Ceramic
C324	VCCRPUIHH330J	33PF (RH), 50V, $\pm 5\%$, Ceramic
C325	VCCSPUIHL2R0C	2PF, 50V, ± 0.25 PF, Ceramic
C326	VCCRPUIHH330J	33PF (RH), 50V, $\pm 5\%$, Ceramic
C327	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C328	VCCSPUIHL470J	47PF, 50V, $\pm 5\%$, Ceramic
C329	VCCSPUIHL101J	100PF, 50V, $\pm 5\%$, Ceramic
C330	VCCRPUIHH101J	100PF (RH), 50V, $\pm 5\%$, Ceramic
C331	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C332	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C333	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C335	VCCSPUIHL1R0C	1PF, 50V, ± 0.25 PF, Ceramic
C336	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C337	VCCSPUIHL101J	100PF, 50V, $\pm 5\%$, Ceramic
C338	VCKYPU1HB102M	.001MFD, 50V, $\pm 20\%$, Ceramic
C339	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C340	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C341	VCKYPU1HB223M	.022MFD, 50V, $\pm 20\%$, Ceramic
C343	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C344	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C346	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C347	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C349	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C353	VCCSPUIHL470J	47PF, 50V, $\pm 5\%$, Ceramic
C354	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C401	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C402	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C403	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C404	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C405	VCCSPUIHL151J	150PF, 50V, $\pm 5\%$, Ceramic
C406	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C407	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C408	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C409	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C410	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C411	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C412	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C413	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C414	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C415	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C503	VCQYKU1HM104K	.1MFD, 50V, $\pm 10\%$, Mylar
C504	VCQYKU1HM183K	.018MFD, 50V, $\pm 10\%$, Mylar
C508	VCQYKU1HM153K	.015MFD, 50V, $\pm 10\%$, Mylar
C509	VCQYKU1HM822K	.0082MFD, 50V, $\pm 10\%$, Mylar
C510	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C514	VCQYKU1HM683K	.068MFD, 50V, $\pm 10\%$, Mylar
C515	VCCSPUIHL331J	330PF, 50V, $\pm 5\%$, Ceramic
C518	VCCSPUIHL560J	56PF, 50V, $\pm 5\%$, Ceramic
C519	VCQYKU1HM683K	.068MFD, 50V, $\pm 10\%$, Mylar
C521	VCCSPUIHL470J	47PF, 50V, $\pm 5\%$, Ceramic
C523	VCQYKU1HM683K	.068MFD, 50V, $\pm 10\%$, Mylar
C527	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C533	VCQYKU1HM273K	.027MFD, 50V, $\pm 10\%$, Mylar
C534	VCQYKU1HM183K	.018MFD, 50V, $\pm 10\%$, Mylar
C536	VCQYKU1HM183K	.018MFD, 50V, $\pm 10\%$, Mylar
C539	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C540	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C541	VCCSPUIHL331J	330PF, 50V, $\pm 5\%$, Ceramic

REF. NO.	PART NO.	DESCRIPTION
C542	VCCSPUIHL101J	100PF, 50V, $\pm 5\%$, Ceramic
C543	VCQYKU1HM222K	.0022MFD, 50V, $\pm 10\%$, Mylar
C545	VCKZPU1HF102Z	.001MFD, 50V
C601	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C604	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C605	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C607	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C609	VCKZPU1HF473Z	.047MFD, 50V
C610	VCKZPU1HF473Z	.047MFD, 50V
C611	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C612, 1	RC-KZ1009AFZZ	Feed Through Capacitors with Bracket
C613, 1		
C614	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C701	VCCCPU1HH150J	15PF (CH), 50V, $\pm 5\%$, Ceramic
C703	VCCCPU1HH150J	15PF (CH), 50V, $\pm 5\%$, Ceramic
C705	VCCSPUIHL391J	390PF, 50V, $\pm 5\%$, Ceramic
C706	VCCSPUIHL151J	150PF, 50V, $\pm 5\%$, Ceramic
C707	VCCSPUIHL180J	18PF, 50V, $\pm 5\%$, Ceramic
C708	VCKYPU1HB472M	.0047MFD, 50V, $\pm 20\%$, Ceramic
C709	VCCRPUIHH820J	82PF (RH), 50V, $\pm 5\%$, Ceramic
C710	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C711	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C712	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C713	VCKYPU1SD103Z	.01MFD (Z5T), 30V
C714	VCKYPU1SD103Z	.01MFD (Z5T), 30V

RESISTOR ARRAY

RM101	RMPTC0001AFZZ	680 ohm x 5
RM102	RMPTC0001AFZZ	680 ohm x 5
RM103	RMPTC0001AFZZ	680 ohm x 5

RESISTORS

(Unless otherwise specified resistors are 1/4W, $\pm 5\%$, Carbon Type).

R1	VRD-ST2EE472J	4.7K ohm
R2	VRD-ST2EE102J	1K ohm
R3	VRD-ST2EE101J	100 ohm
R4	VRD-SU2EY104J	100K ohm
R5	VRD-SU2EY103J	10K ohm
R6	VRD-SU2EY101J	100 ohm
R7	VRD-ST2EE101J	100 ohm
R8	VRD-SU2EY102J	1K ohm
R9	VRD-SU2EY104J	100K ohm
R10	VRD-SU2EY104J	100K ohm
R11	VRD-ST2EE102J	1K ohm
R12	VRD-SU2EY104J	100K ohm
R13	VRD-SU2EY564J	560K ohm
R14	VRD-ST2EE824J	820K ohm
R15	VRD-SU2EY472J	4.7K ohm
R16	VRD-ST2EE223J	22K ohm
R17	VRD-SU2EY331J	330 ohm
R18	VRD-ST2EE393J	39K ohm
R19	VRD-SU2EY101J	100 ohm
R20	VRD-SU2EY103J	10K ohm
R21	VRD-SU2EY102J	1K ohm
R22	VRD-SU2EY103J	10K ohm
R23	VRD-SU2EY103J	10K ohm
R24	VRD-SU2EY151J	150 ohm
R25	VRD-SU2EY103J	10K ohm

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
R26	VRD-ST2EE223J	22K ohm	R201	VRD-ST2EY103J	10K ohm
R27	VRD-ST2EE392J	3.9K ohm	R202	VRD-SS2EY473J	47K ohm
R28	VRD-SU2EY561J	560 ohm	R203	VRD-SS2EY104J	100K ohm
R29	VRD-SU2EY104J	100K ohm	R204	VRD-SS2EY562J	5.6K ohm
R30	VRD-SU2EY332J	3.3K ohm	R205	VRD-SS2EY273J	27K ohm
R31	VRD-SU2EY561J	560 ohm	R206	VRD-SS2EY122J	1.2K ohm
R32	VRD-SU2EY101J	100 ohm	R207	VRD-SS2EY151J	150 ohm
R33	VRD-SU2EY223J	22K ohm	R208	VRD-SS2EY122J	1.2K ohm
R34	VRD-SU2EY333J	33K ohm	R209	VRD-SS2EY224J	220K ohm
R35	VRD-SU2EY333J	33K ohm	R210	VRD-SS2EY151J	150 ohm
R36	VRD-SU2EY153J	15K ohm	R211	VRD-SS2EY122J	1.2K ohm
R37	VRD-SU2EY394J	390K ohm	R212	VRD-SS2EY471J	470 ohm
R38	VRD-SU2EY103J	10K ohm	R213	VRD-SS2EY562J	5.6K ohm
R39	VRD-SU2EY683J	68K ohm	R214	VRD-SS2EY152J	1.5K ohm
R40	VRD-SU2EY332J	3.3K ohm	R215	VRD-SS2EY151J	150 ohm
R41	VRD-SU2EY102J	1K ohm	R216	VRD-SS2EY151J	150 ohm
R42	VRD-ST2EE221J	220 ohm	R217	VRD-SS2EY223J	22K ohm
R43	VRD-SU2EY470J	47 ohm	R218	VRD-SS2EY102J	1K ohm
R44	VRD-ST2EE103J	10K ohm	R219	VRD-SS2EY103J	10K ohm
R45	VRD-SU2EY472J	4.7K ohm	R220	VRD-SS2EY153J	15K ohm
R46	VRD-SU2EY153J	15K ohm	R221	VRD-SS2EY562J	5.6K ohm
R47	VRD-SU2EY472J	4.7K ohm	R222	VRD-SS2EY332J	3.3K ohm
R48	VRD-SU2EY562J	5.6K ohm	R223	VRD-SS2EY392J	3.9K ohm
R49	VRD-SU2EY222J	2.2K ohm	R224	VRD-SS2EY103J	10K ohm
R50	VRD-SU2EY471J	470 ohm	R225	VRD-SS2EY151J	150 ohm
R51	VRD-SU2EY683J	68K ohm	R226	VRD-SS2EY123J	12K ohm
R52	VRD-SU2EY103J	10K ohm	R227	VRD-SS2EY223J	22K ohm
R53	VRD-SU2EY473J	47K ohm	R228	VRD-SS2EY274J	270K ohm
R54	VRD-SU2EY103J	10K ohm	R229	VRD-SS2EY332J	3.3K ohm
R55	VRD-SU2EY222J	2.2K ohm	R230	VRD-SS2EY562J	5.6K ohm
R56	VRD-ST2EE183J	18K ohm	R231	VRD-SS2EY273J	27K ohm
R57	VRD-SU2EY221J	220 ohm	R232	VRD-SS2EY121J	120 ohm
R58	VRD-SU2EY151J	150 ohm	R233	VRD-SS2EY151J	150 ohm
R59	VRD-SU2EY332J	3.3K ohm	R234	VRD-SS2EY151J	150 ohm
R60	VRD-ST2EE123J	12K ohm	R235	VRD-SS2EY331J	330 ohm
R61	VRD-SU2EY152J	1.5K ohm	R236	VRD-SS2EY562J	5.6K ohm
R63	VRD-SU2EY103J	10K ohm	R237	VRD-SS2EY222J	2.2K ohm
R64	VRD-SU2EY103J	10K ohm	R238	VRD-SS2EY153J	15K ohm
R65	VRD-ST2EE104J	100K ohm	R239	VRD-SS2EY151J	150 ohm
R66	VRD-ST2EE333J	33K ohm	R240	VRD-SS2EY181J	180 ohm
R67	VRD-SU2EY223J	22K ohm	R241	VRD-SS2EY151J	150 ohm
R68	VRD-ST2EE103J	10K ohm	R242	VRD-SS2EY152J	1.5K ohm
R69	VRD-SU2EY470J	47 ohm	R243	VRD-SS2EY681J	680 ohm
R70	VRD-SU2EY223J	22K ohm	R244	VRD-SS2EY103J	10K ohm
R71	VRD-ST2EY103J	10K ohm	R302	VRD-SU2EY220J	22 ohm
R72	VRD-SU2EY563J	56K ohm	R303	VRD-SU2EY150J	15 ohm
R73	VRD-ST2EY274J	270K ohm	R304	VRD-ST2HA101K	100 ohm, 1/2W, $\pm 10\%$, Carbon
R101	VRD-ST2EE563J	56K ohm	R306	VRD-ST2HA331K	330 ohm, 1/2W, $\pm 10\%$, Carbon
R102	VRD-ST2EE272J	2.7K ohm	R307	VRD-SU2EY470J	47 ohm
R103	VRD-ST2EE153J	15K ohm	R308	VRD-SU2EY560J	56 ohm
R104	VRD-ST2EE331J	330 ohm	R309	VRD-ST2HA181K	180 ohm, 1/2W, $\pm 10\%$, Carbon
R105	VRD-ST2EE331J	330 ohm	R311	VRD-SU2EY100J	10 ohm
R106	VRD-ST2EE333J	33K ohm	R312	VRD-ST2EE561J	560 ohm
R107	VRD-ST2EE821J	820 ohm	R313	VRD-SU2EY680J	68 ohm
R108	VRD-ST3DB390J	39 ohm, 2W, $\pm 5\%$, Oxide Film	R314	VRD-SU2EY100J	10 ohm
R109	VRD-ST2EE474J	470K ohm	R315	VRD-SU2EY330J	33 ohm
R110	VRD-ST2EE394J	390K ohm	R316	VRD-SU2EY332J	3.3K ohm
R111	VRD-ST2EE153J	15K ohm	R317	VRD-SU2EY471J	470 ohm
R112	VRD-ST2EE391J	390 ohm	R318	VRD-SU2EY100J	10 ohm
R113	VRD-ST2EE472J	4.7K ohm	R319	VRD-SU2EY101J	100 ohm
R114	VRD-ST3LB121K	120 ohm, 3W, $\pm 10\%$, Oxide Film	R320	VRD-SU2EY101J	100 ohm
R115	VRD-ST2EE103J	10K ohm	R321	VRD-SU2EY120J	12 ohm
R116	VRD-ST2EE272J	2.7K ohm	R322	VRD-SU2EY124J	120K ohm
			R323	VRD-SU2EY103J	10K ohm

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
R324	VRD-SU2EY104J	100K ohm
R325	VRD-SU2EY103J	10K ohm
R326	VRD-ST2EE560J	56 ohm
R327	VRD-SU2EY102J	1K ohm
R328	VRD-ST2EE272J	2.7K ohm
R329	VRD-ST2EE272J	2.7K ohm
R330	VRD-ST2EE103J	10K ohm
R331	VRD-ST2EE182J	1.8K ohm
R332	VRD-ST2EE101J	100 ohm
R333	VRD-ST2EE101J	100 ohm
R334	VRD-ST2EE821J	820 ohm
R335	VRD-SU2EY152J	1.5K ohm
R336	VRD-ST2EE102J	1K ohm
R337	VRD-ST2EE103J	10K ohm
R338	VRD-ST2EE103J	10K ohm
R340	VRD-ST2EE332J	3.3K ohm
R341	VRD-ST2EE562J	5.6K ohm
R343	VRD-SU2EY563J	56K ohm
R344	VRD-SU2EY153J	15K ohm
R345	VRD-SU2EY151J	150 ohm
R347	VRD-ST2EE472J	4.7K ohm
R348	VRD-SU2EY272J	2.7K ohm
R349	VRD-ST2EE154J	150K ohm
R350	VRD-ST2EY121J	120 ohm
R351	VRD-ST2EE151J	150 ohm
R352	VRD-SU2EY682J	6.8K ohm
R501	VRD-SU2EY273J	27K ohm
R502	VRD-SU2EY392J	3.9K ohm
R503	VRD-SU2EY682J	6.8K ohm
R504	VRD-SU2EY221J	220 ohm
R505	VRD-SU2EY271J	270 ohm
R506	VRD-SU2EY332J	3.3K ohm
R507	VRD-SU2EY103J	10K ohm
R508	VRD-SU2EY103J	10K ohm
R509	VRD-ST2EE103J	10K ohm
R510	VRD-SU2EY682J	6.8K ohm
R511	VRD-ST2EE224J	220K ohm
R512	VRD-SU2EY330J	33 ohm
R513	VRD-SU2EY471J	470 ohm
R514	VRD-ST2EE472J	4.7K ohm
R515	VRD-ST2EE392J	3.9K ohm
R516	VRD-SU2EY103J	10K ohm
R517	VRD-SU2EY104J	100K ohm
R518	VRD-SU2EY821J	820 ohm
R519	VRD-SU2EY151J	150 ohm
R521	VRD-SU2EY101J	100 ohm
R523	VRD-SU2EY560J	56 ohm
R524	VRD-SU2EY152J	1.5K ohm
R525	VRD-ST2HA331K	330 ohm, 1/2W, $\pm 10\%$, Carbon
R527	VRD-SU2EY393J	39K ohm
R528	VRD-SU2EY562J	5.6K ohm
R529	VRD-SU2EY472J	4.7K ohm
R530	VRD-ST2EE122J	1.2K ohm
R531	VRD-SU2EY474J	470K ohm
R532	VRD-ST2EE104J	100K ohm
R534	VRD-ST2EE102J	1K ohm
R535	VRD-SU2EY103J	10K ohm
R536	VRD-SU2EY332J	3.3K ohm
R538	VRD-SU2EY332J	3.3K ohm
R539	VRD-SU2EY103J	10K ohm
R540	VRD-SU2EY152J	1.5K ohm
R543	VRD-SU2EY681J	680 ohm
R544	VRD-ST2HD1R0J	1 ohm, 1/2W, $\pm 5\%$, Carbon
R545	VRD-SU2EY681J	680 ohm

REF. NO.	PART NO.	DESCRIPTION
R546	VRD-ST2EE332J	3.3K ohm
R547	VRD-SU2EY332J	3.3K ohm
R548	VRD-SU2EY183J	18K ohm
R601	VRS-PT3DB390J	39 ohm, 2W, $\pm 5\%$, Oxide Film
R602	VRS-PT3DB680K	68 ohm, 2W, $\pm 10\%$, Oxide Film
R603	VRD-SU2EY331J	330 ohm
R604	VRD-ST2HA820K	82 ohm, 1/2W, $\pm 10\%$, Carbon
R605	VRD-ST2HA101K	100 ohm, 1/2W, $\pm 10\%$, Carbon
R606	VRD-ST2HA390K	39 ohm, 1/2W, $\pm 10\%$, Carbon
R607	VRD-ST2HA470K	47 ohm, 1/2W, $\pm 10\%$, Carbon
R608	VRD-SU2EY472J	4.7K ohm
R609	VRD-ST2EY101J	100 ohm
R701	VRD-ST2EE562J	5.6K ohm
R702	VRD-ST2EE562J	5.6K ohm
R703	VRD-SU2EY103J	10K ohm
R704	VRD-SU2EY101J	100 ohm
R705	VRD-SU2EY102J	1K ohm
R706	VRD-SU2EY153J	15K ohm
R707	VRD-SU2EY223J	22K ohm
R708	VRD-SU2EY101J	100 ohm
R709	VRD-SU2EY102J	1K ohm

MISCELLANEOUS

CPNLC1226AF01	Front Panel Assembly
GMADT0052AFSA	Window, Channel Indicator
HBDGS3051AFSA	Decoration Plate, 40 CHANNEL
HINDM1080AFSB	Emblem "SHARP"
HINDP0017AFSA	Indication Plate, AM/USB/LSB, Green
HINDP0018AFSA	Indication Plate, RX, Green
HINDP0019AFSA	Indication Plate, TX, Red
HPNLC1226AFSA	Front Panel
PCUSS0091AF00	Rubber Cushion
GCABA3449AFSA	Cabinet, Top
GCABB3449AFSA	Cabinet, Bottom (Speaker Side)
HINDM1181AFZZ	Indication Plate, Spec.
JKNBM0219AFSA	Knob, Noise Blanking Switch
JKNBN0299AFSA	Knob, Channel Selector Switch
JKNBN0300AFSA	Knob, OFF/Volume Control, RF Gain Control, Mode (AM/USB/LSB) Selector, Clarifier Control, Squelch Control/P.A. Switch
LANGT0623AFFW	Bracket, Channel Indicator P.C. Board Retaining (See Figure 62-2)
LBRC-0052AFSA	Mobile Mounting Bracket
LCHSM0265AFFW	Chassis, Main
LCHSM1001AAZZ	Bracket, P.L.L. Circuit P.C. Board
LCHSS0122AFFW	Front Chassis
LHLDW1073AFZZ	Wire Clip (See Figure 54-1)
LX-BZ0053AFFD	Bolt (5 ϕ x 10 mm)
LX-BZ0237AFFB	Screw, Cabinet
LX-LZ0001AGZZ	Rivet, Indication Plate of Spec.
LX-LZ0051AF00	Push Rivet, Nylon (See Figure 54-1)
LX-NZ0121AFFD	Flange Nut, Speaker
MSPRP0168AFFW	Plate Spring, Thermistor (See Figure 52-1)
PCAPH0001AGZZ	Cap, N.B. Switch Knob

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	
	PCOVM8056AF00	Cover, N.B. Switch, Rubber		QPWBF0635AFZZ	Printed Circuit Board, Main Circuit	
	PCOVS1001AAZZ	Shield Cover, P.L.L. Circuit P.C. Board (See Figure 62-2)		QPWBF0636AFZZ	Printed Circuit Board, Channel Indicator Circuit	
	PCUSS0091AF00	Rubber, Meter, 26mm x 3mm x 1t, Cushion		QPWBF0637AFZZ	Printed Circuit Board, Control Circuit	
	PCUSS0106AF00	Sponge, Howling Prevention, 60mm x 13mm x 4t P.L.L. Unit		QPWBF0638AFZZ	Flexible Printed Circuits, Channel Indicator	
	PCUSU0220AFZZ	Cushion, Meter		QCNW-0238AFZZ	Connecting Cord with Socket, Speaker	
	PFILW0005AFZZ	Film, LED (Channel Indicator), Red		SO301	QSOCZ2470AFZZ	Socket, Antenna, 50 ohms
	PFLT-0331AF00	Felt, Bottom Cabinet (Speaker Side)	SO501	QSOCZ2468AFZZ	Socket, Microphone	
	PGUMS0108AF00	Cushion, P.L.L. Synthesizer Unit, Rubber (See Fig. 62-2)		QSOCE0401AFZZ	Socket, Test Point(A ~ ㉔)	
	PGUMS0112AF00	Cushion, X-tal Filter, Wiring Side, Rubber, 25mm x 15mm x 5t		QPLGE0403AGZZ	Plug, Test Point(A ~ ㉔)	
	PGUMM0118AF09	Meter Lamp Holder, Rubber	PG601	QSOCZ2454AFZZ	Plug, Power Supply	
	PGUMM0119AF09	Lamp Holder, PL602 and PL603, Rubber	SW2/VR1	RVR-A0122AFZZ	Power Switch (SW2) with Volume Control (10K ohm)	
	PGUMM0120AF08	Lamp Holder, PL604 ~ PL606, Rubber	SW3	QSW-B0028AGZZ	Switch, N.B. (Noise Blanker)	
	PHAG-001MAFFC	Hanger, Microphone	SW4-A, B/VR2	RVR-B0137AFZZ	Switch, P.A. (Public Address) with Squelch Volume	
	PRDAR0006SGFW	Heat Sink, Transistor Q602	SW5-A ~ H	QSW-R0147AFZZ	Switch, Mode (AM/USB/LSB) Selector	
	PRDAR0145AFFW	Heat Sink, Integrated Circuit IC501	SW6-A ~ D/RY601	RRLYZ0007AFZZ	Relay with RX (Receiver)/TX (Transmitter) Switch	
	PRDAR0147AFFW	Heat Sink, Transistors Q301 and Q302	SW101-A, B	QSW-R0146AFZZ	Switch, Channel Selector	
	PSLDM3127AFFW	Shield Plate		RCORF0051AFZZ	Ferrite Core, Microphone Socket	
	PSLDM3128AFFW	Shield Plate	PL601	RLMPM0019AGZZ	Lamp, Meter Illumination	
	PSLDM3129AFFW	Shield Plate	PL602	RLMPM0026AGZZ	Lamp, TX Indicator	
	PSLDM3130AFFW	Shield Plate	PL603	RLMPM0026AGZZ	Lamp, RX Indicator	
	PSLDM3131AFFW	Shield Plate	PL604	RLMPM0069AFZZ	Lamp, AM Indicator	
	PSLDM3132AFFW	Shield Plate	PL605	RLMPM0069AFZZ	Lamp, USB Indicator	
	PSPAG0057AF00	Rubber Washer, Mounting Bracket	PL606	RLMPM0069AFZZ	Lamp, LSB Indicator	
	PZETF0132AFZZ	Fiber, Insulator, 20mm x 10mm, Chassis		RMICD0213AFZZ	Microphone Assembly (with Press-to-talk Switch)	
	QCNCM111KAFZZ	Connecting Plug, 10-Pin, U-bend	ME1	RMTRE0065AFZZ	Meter, Signal/RF Power	
	QCNCM166QAFZZ	Connecting Plug, 15-Pin, U-bend		RTUNS0051AFZZ	P.L.L. (Phase Locked Loop) Synthesizer Unit	
	QCNCM095BAFZZ	Connecting Plug, 2-Pin, Meter		SPAKC1013AFZZ	Packing Case	
	QCNCM0402SGZZ	Connecting Plug, 4-Pin, Microphone		SSAK Z0054AFZZ	Polyethylene Bag, Set	
	QPLGZ0950AFZZ	Connecting Plug, 9-Pin		TINSE0509AFZZ	Operation Manual	
	QPLGZ0750AFZZ	Connecting Plug, 7-Pin	SP501	VSP0080P-288A	Speaker, 8 ohms, 8cm	
	QPLGZ0750AFZZ	Connecting Plug, 7-Pin		XBBSC30W08000	Screw, 3φ x 8mm, Microphone Hanger	
	QPLGZ0450AFZZ	Connecting Plug, 4-Pin		XNESD50-40000	Nut (5φ)	
	QPLGZ0850AFZZ	Connecting Plug, 8-Pin		XWHSD50-05000	Washer (5φ)	
	QCNW-0239AFZZ	Connecting Cord with Socket and Plug Assembly		XWSSD50-13000	Spring Washer (5φ)	
	QCNW-0194AFZZ	Connecting Cord with Socket, 2-Pin, Meter				
	QCNW-0240AFZZ	Connecting Cord with Socket, 4-Pin, Microphone				
	QFS-A402AAFNC	Fuse, 4A				
	QFSHJ9053AFZZ	Power Supply Cord with Fuse Holder and Socket (SO601)				
J501-A, B	QJAKB0051AFZZ	Jacks, External Speaker (J501-A) and P.A. Speaker (J501-B)				
	QPWBF0055AAZZ	Printed Circuit Board, P.L.L. Circuit				

SPECIFICATIONS

GENERAL

CHANNELS	AM 40; LSB 40; USB 40
FREQUENCY RANGE	26.965 to 27.405 MHz
FREQUENCY STABILITY	+130 Hz
MICROPHONE	Dynamic type
POWER SOURCE	13.8 Vdc pos. or neg. ground
CURRENT DRAIN	
RECEIVE:	1.0 A @ maximum audio output, 0.7 A @ standby (no signal)
TRANSMIT:	2.0 A @ AM full mod, 2.5 A, SSB 12 W PEP

TRANSMITTER

RF POWER OUTPUT	
AM:	4 W
SSB:	12 W peak envelope power
MODULATION CAPABILITY	100 %
FREQUENCY TOLERANCE	+0.003 % from -30 °C to +50 °C
SPURIOUS ATTENUATION	60 dB minimum
OUTPUT IMPEDANCE	50 Ohm
FILTER CIRCUIT	Crystal lattice 7.8 MHz filter
CARRIER SUPPRESSION	50 dB
UNWANTED SIDEBAND SUPPRESSION	60 dB

RECEIVER

SENSITIVITY	AM: Better than 0.5 uV for 10 dB (S+N)/N SSB: Better than 0.25 uV for 10 dB (S+B)/N
BANDWIDTH	6 KHz @ -6 dB
AGC	Change in audio output less than 10 dB from 6.0 uV to 1.0 volts
SQUELCH	Adjustable, threshold less than 0.5 uV Tight, more than 250 uV
OUTPUT POWER	2.5 W at 10 % THD
IMAGE REJECTION	Better than 75 dB
IF REJECTION	Better than 85 dB @ 7.8 MHz
ADJACENT CHANNEL REJECTION	Better than 60 dB
IF FREQUENCY	AM: 7.8 MHz SSB: 7.8 MHz
CLARIFIER RANGE	AM: +1,000 Hz SSB: ±1,000 Hz
NOISE-BLANKER	RF parallel gate type

P.A. SYSTEM

OUTPUT POWER	2.5 W
--------------	-------

NOTE: ALL DATA SUBJECT TO CHANGE WITHOUT NOTICE

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.

CRAIG KEY No.	DESCRIPTION
PACKAGING	
L132001	Individual Carton
L132002	Styrofoam, FRONT
L132003	Styrofoam, REAR
L132507	Microphone (Complete)
4101004	Bracket, Mic Mounting
XFU004	Spare Fuse, 4A
L132100	Mounting Bracket (Unit)
L103212	Mounting Screw (Unit)
L103231	Rubber Washer (Mtg Brkt)
L132005	Mounting Hardware Kit
4101033	D.C. Power Plug w/Cord

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.
 (Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

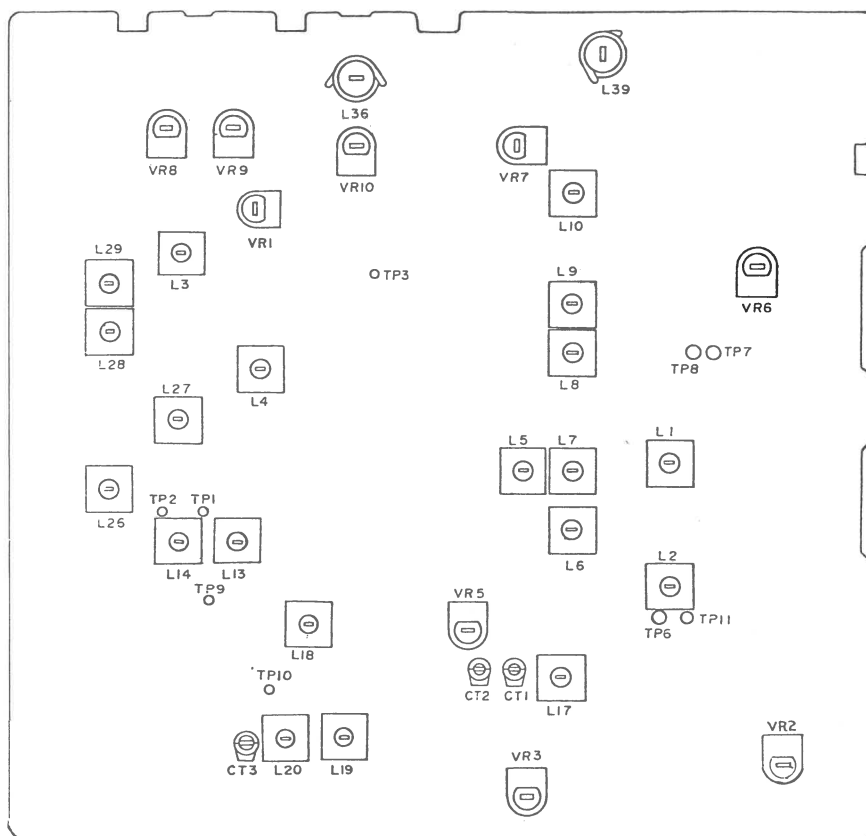
Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.

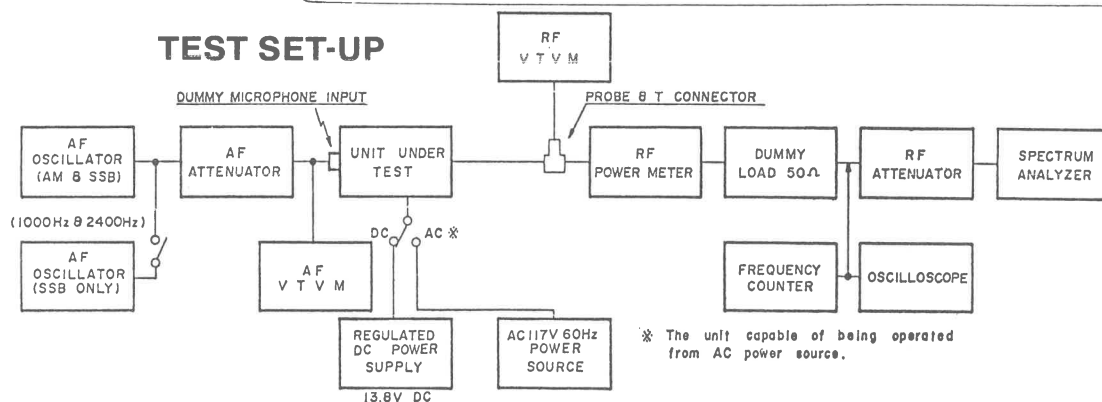
ALIGNMENT PROCEDURES

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
- h) D.C. CURRENT METER



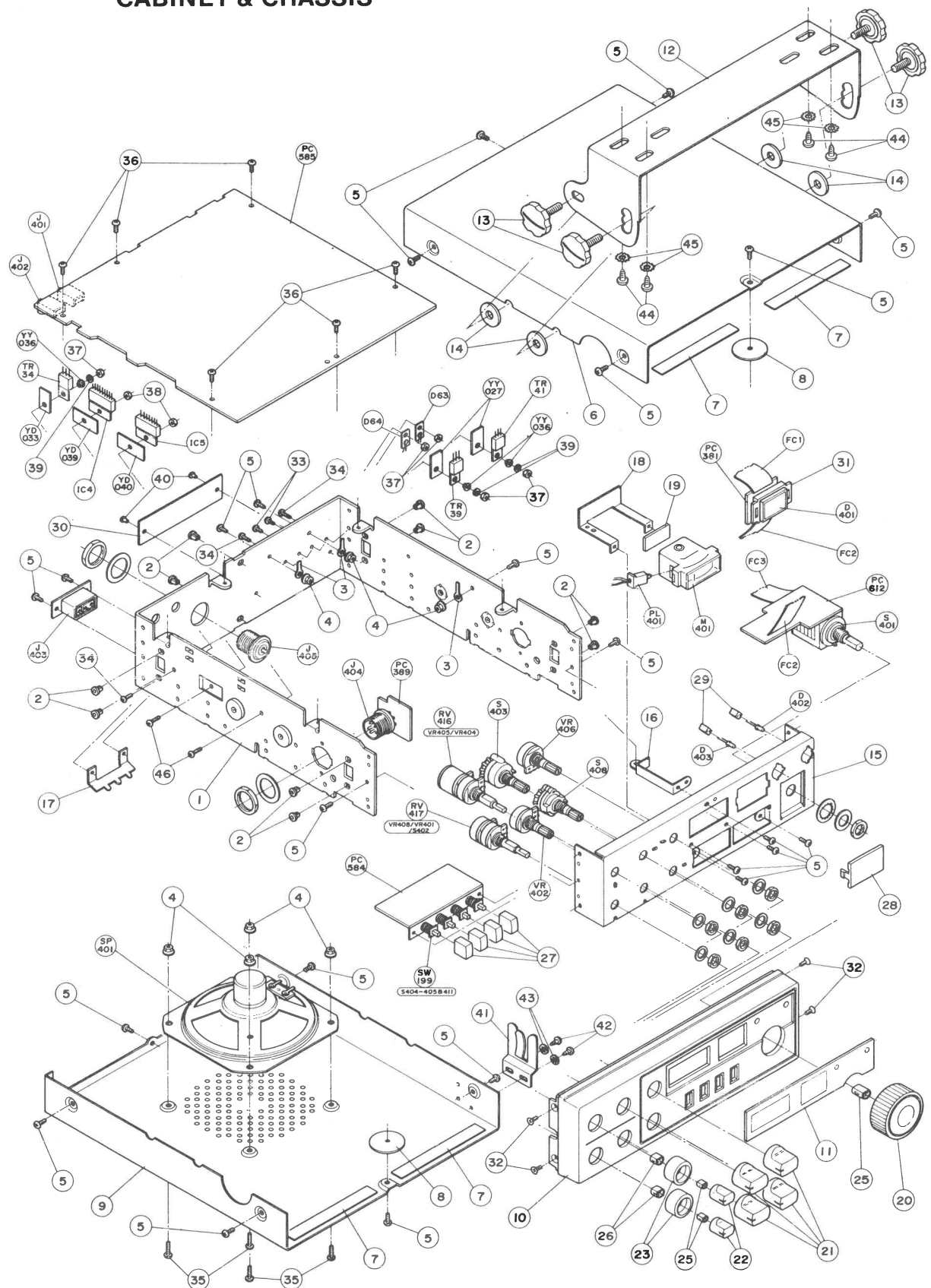
TEST SET-UP



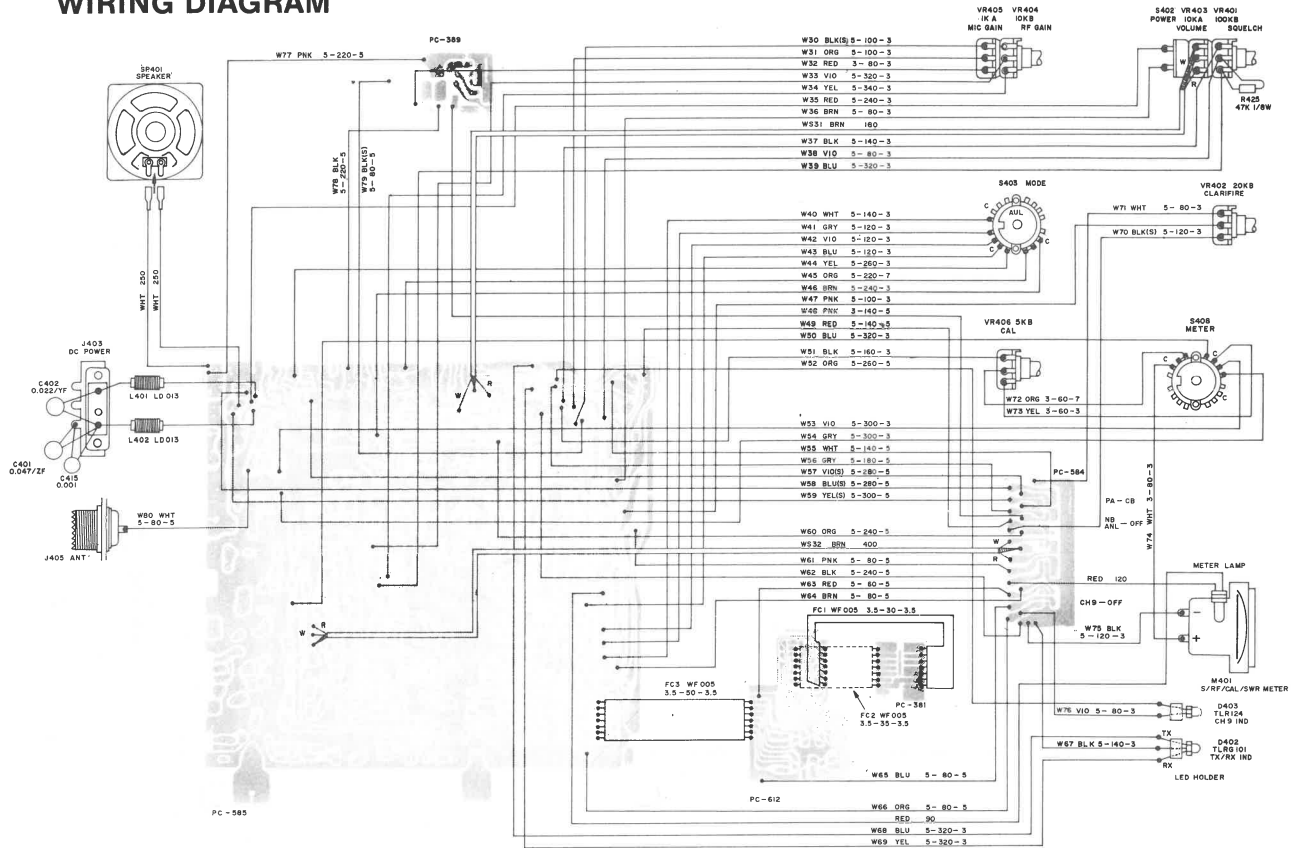
STEP	SET TO	CONNECTIONS	ADJUST	ADJUST FOR
RECEIVER				
1	Channel 19. Volume; MAX. Squelch; MIN. Mode; USB NB/ANL; OFF RF GAIN; MAX. PA-CB; CB	Signal Generator To Antenna Jack (J405) at 27.185MHz w/No Modulation. Output Level; 0.25 uV.	Frequency of Signal Generator.	AF Output Signal of 1,000Hz at Clarifier Control in Middle Position.
2	Same As Step 1	Same As Step 1.	L3, 4, 5, 6, 7, 8, 9 & 10	Maximum AF Output Power.
3	Same As Step 1 except AM Mode.	Signal Generator To Antenna Jack (J405) at 1 KHz w/30% Modulation. Output Level; 1 uV.	L3	Maximum Indication on VTVM.
4	Same As Step 1	Signal Generator To Antenna Jack (J405) at 27.185MHz w/No Modulation. Output Level; 100 uV.	VR1	Reading of "9" on Signal Meter (M401).
5	Same As Step 1 except Squelch; MAXIMUM	Signal Generator To Antenna Jack (J405) at 27.185MHz w/No Modulation. Output Level; 1,000 uV.	VR2	Adjust VR2 Until AF Signal Observed.
6	Channel 19. Volume; MAX. Squelch; MIN. Mode; AM NB/ANL; ON RF GAIN; MAX.	Same As Step 5	L1, 2	Maximum D.C. Voltage at TP6.

STEP	SET TO	CONNECTIONS	ADJUST	ADJUST FOR
P.L.L. CIRCUIT				
1	Channel 40. AM,RX Mode. Clarifier Cont. in middle position.	VTVM To TP10.	L18	Maximum Indication on VTVM.
2	Same As Step 1	D.C. Volt Meter To TP9.	L13	Approx. 6 V on D.C. Volt Meter.
3	Channel 19. USB,RX Mode.	VTVM To Secondary Of L14 (TP1) Local Out.	L14	Maximum Indication on VTVM.
4	Same As Step 3	Frequency Counter To Secondary Of L14 (TP1).	CT3	Reading of 34.9875MHz (± 20 Hz) on Frequency Counter.
5	Channel 19. AM,RX Mode.	Same As Step 4.	L20	Same As Step 4.
6	Channel 19. LSB,RX Mode.	Same As Step 4.	L19	Same As Step 4.
7	Channel 19. LSB,TX Mode.	Same As Step 4.	VR3	Same As Step 4.
CARRIER OSCILLATOR				
1	Channel 19. USB,RX Mode.	Frequency Counter To The Base Of TR13 (TP3).	CT1	Reading of 7.8025MHz (± 5 Hz, -0 Hz) on Frequency Counter.
2	Channel 19. LSB,RX Mode.	Same As Step 1.	CT2	Reading of 7.7975MHz ($+0$ Hz, -5 Hz) on Frequency Counter.
3	Channel 19. AM,TX Mode.	Same As Step 1.	L17	Reading of 7.8000MHz (± 5 Hz) on Frequency Counter.
TRANSMITTER				
1	Channel 19. USB,TX Mode. No Modulation.	D.C. Current Meter To TP8.	VR8	Reading of 30 mA on Current Meter.
2	Same As Step 1	D.C. Current Meter To TP7	VR9	Reading of 60 mA on Current Meter.
3	Same As Step 1		VR5	Minimum Carrier Leakage.
4	Channel 19. LSB,TX Mode. No Modulation.		VR5	Same As Step 3.
5	Repeat Steps 3 & 4 To Obtain Approximately Equal Amount Of Carrier Leakage On Both LSB & USB Modes, While Still Maintaining Minimum Leakage On Both.			
6	Channel 19. USB,TX Mode. AF Input of 2-Tone, Approx. 500 mV to Mic Jack.	Set VR7 Fully Clockwise. VTVM To Antenna Jack (J405)	L26,27, 28,29 & 36	Maximum Indication on VTVM.
7	Same As Step 6 w/RF Output of Approx. 4 W Peak Envelope Power.	Same As Step 6.	L26,27, 28 & 29	Maximum Indication on VTVM
8	Channel 19. AM,TX Mode. AF Input of 500 mV to Mic Jack.	Same As Step 6.	L36	Maximum Indication on VTVM.
9	Same As Step 6	VTVM To Antenna Jack (J405)	VR7	RF Output Power of Approximately 11 W Peak Envelope Power.
10	Channel 19. AM,TX Mode. No Modulation.		VR6	RF Carrier Power of 3.8 W.
11	Same As Step 6		VR10	Correct Reading on Built-In Meter (M401).
12	Same As Step 6 w/Meter (M401) in SWR Position.	Same As Step 6.	VR12	Correct Reading on Built-In Meter (M401).

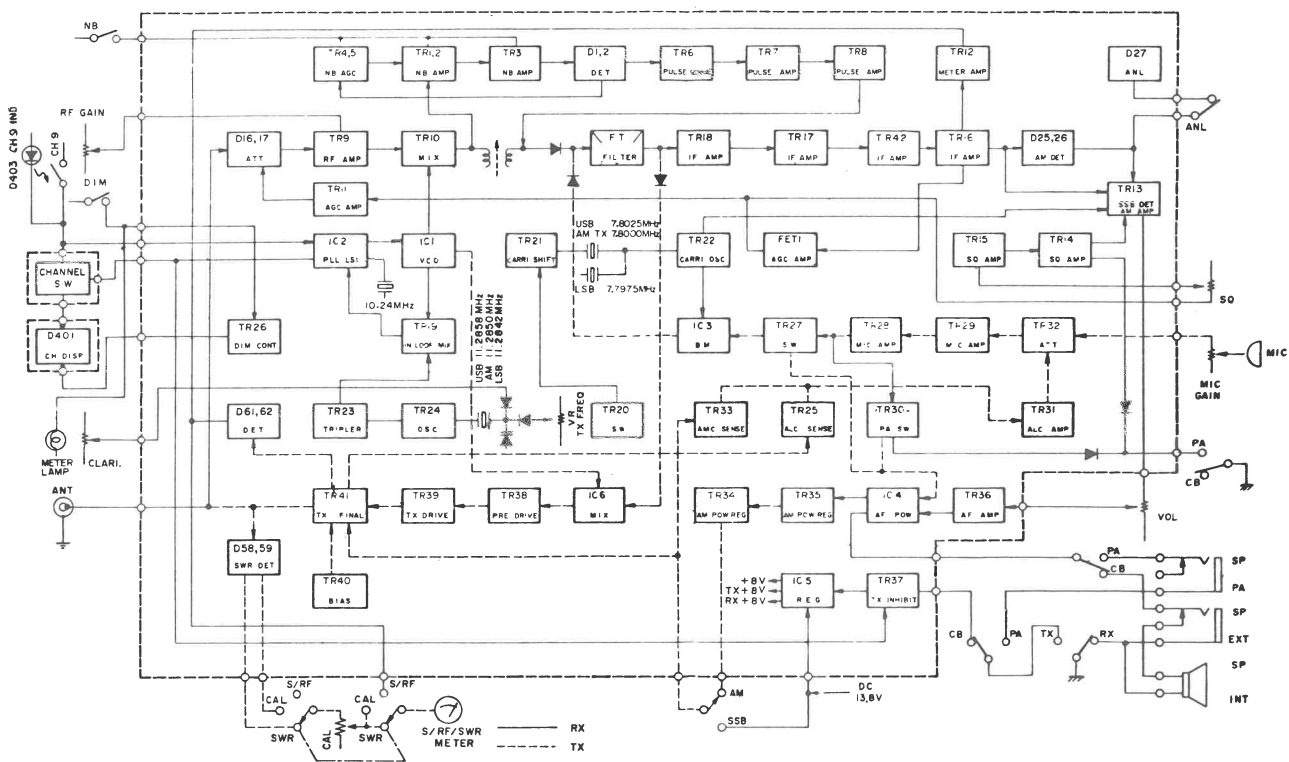
CABINET & CHASSIS



WIRING DIAGRAM

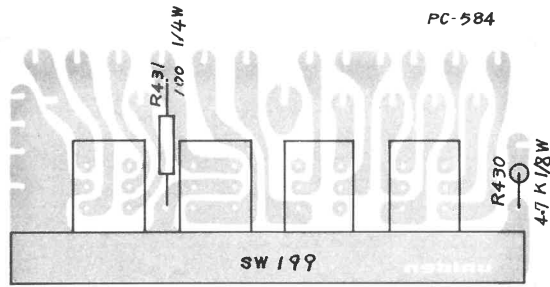


BLOCK DIAGRAM



PUSH SWITCH ASS'Y PCB

PC-584



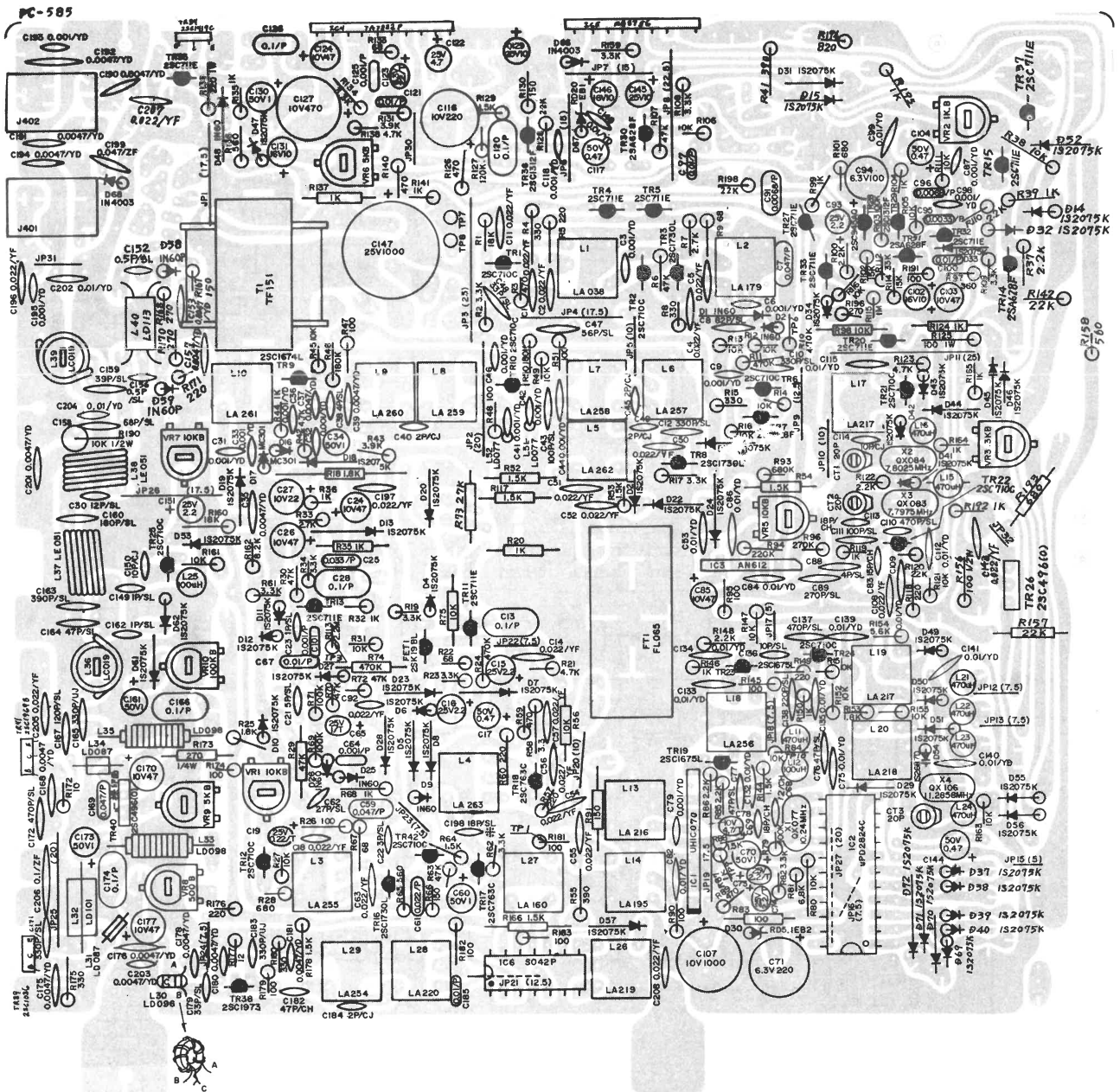
CH 9	BRT	NB/ANL	PA
OFF	DIM	OFF	CB
S411	S406	S405	S404

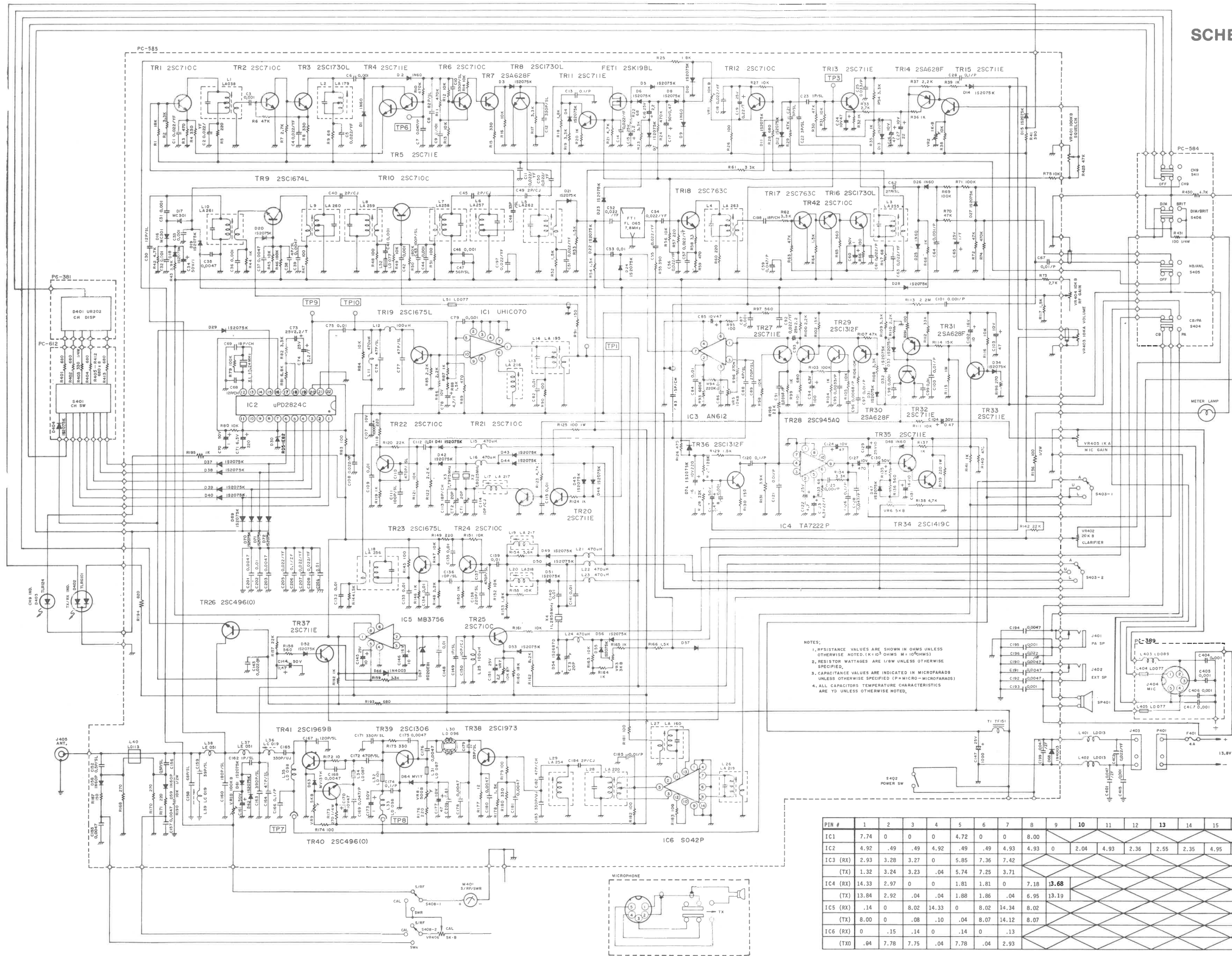
LED CHANNEL INDICATOR PCB

PC-381



MAIN PCB





SCHEMATIC DIAGRAM

VOLTAGE CHART

	E	(RX)	C	F	(TX)	C
TR1	0	0	0	.04	.04	.04
TR2	0	0	0	.04	.04	.04
TR3	0	0	0	.04	.04	.04
TR4	0	0	0	.04	.04	.04
TR5	0	0	0	.02	.04	.04
TR6	0	0	7.36	0	.04	.13
TR7	8.04	7.36	0	.07	.10	.04
TR8	0	0	0	.04	.04	0
TR9	1.46	2.21	7.87	.04	.05	.07
TR10	.12	.38	7.90	.04	.05	.07
TR11	0	0	0	.04	.04	0
TR12	.01	.50	7.95	.04	.05	.09
TR13 (SQ)	1.38	1.68	7.87	.06	.04	.09
TR14 (SQ)	1.29	.62	5.20	.09	.07	.04
TR15 (SQ)	8.02	7.27	8.00	.09	.07	.04
TR16 (SQ)	8.02	8.02	.62	.09	.07	.04
TR17	1.84	2.49	7.27	.05	.04	.09
TR18	0	.39	8.02	.04	.04	.04
TR19	2.21	2.98	7.00	.04	.04	.04
TR20	0	.75	3.68	.04	.04	.09
TR21	1.65	2.40	7.25	.04	.09	.09
TR22	3.31	3.96	8.00	3.36	4.01	8.00
TR23	0	.07	.15	.04	-.02	7.57
TR24	0	.15	.06	.04	.78	2.35
TR25	1.57	2.25	7.63	1.66	2.25	7.66
TR26	.89	1.44	7.94	.94	1.45	7.99
TR27	0	2.87	7.32	0	2.92	7.37
TR28	0	1.63	6.33	.04	2.46	6.38
TR29	7.15	7.78	14.35	7.20	7.83	14.14
TR30	0	.14	2.92	1.23	1.91	1.26
TR31	.99	1.63	3.35	.99	1.63	3.35
TR32	.31	.90	1.63	.07	.66	1.63
TR33	3.34	3.33	0	3.34	3.32	0
TR34	6.43	6.65	.68	6.42	6.65	0
TR35	0	.68	0	0	0	0
TR36	.71	3.94	6.32	.71	1.58	6.32
TR37	12.49	6.20	14.32	5.12	6.21	14.32
TR38	6.20	6.63	14.32	5.82	6.50	13.78
TR39	.33	.98	3.51	.04	.05	.09
TR40	4.93	5.21	14.32	0	.68	.04
TR41	0	.02	.15	.68	1.34	8.00
TR42	0	.13	12.44	0	.62	0
TR43	0	0	.15	1.15	1.15	1.89
TR44	0	0	12.44	0	.79	0
TR45	2.98	3.68	8.02	.04	.08	.09
TR46	0	.21	8.03	.08	.09	.09
FET1	2.90	.21	8.03	.08	.09	.09

VOLTAGES MEASURED ON CHANNEL 9 @ NO MODULATION.

Mode: AM
S406: "BRITE" Position
RF Gain: FULLY CLOCKWISE
MIC Gain: FULLY CLOCKWISE
CLARIFIER: MINIMUM
P.A.: OFF
ANT/NG: OFF

PIN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
IC1	7.74	0	0	0	4.72	0	0	8.00														
IC2	4.92	.49	.49	4.92	.49	.49	4.93	4.93	0	2.04	4.93	2.36	2.55	2.35	4.95	4.30x 4.90x	2.96	2.96	4.70	4.93	0	2.53
IC3 (RX)	2.93	3.28	3.27	0	5.85	7.36	7.42															
(TX)	1.32	3.24	3.23	.04	5.74	7.25	3.71															
IC4 (RX)	14.33	2.97	0	0	1.81	1.81	0	7.18	13.68													
(TX)	13.84	2.92	.04	.04	1.88	1.86	.04	6.95	13.19													
IC5 (RX)	.14	0	8.02	14.33	0	8.02	14.34	8.02														
(TX)	8.00	0	.08	.10	.04	8.07	14.12	8.07														
IC6 (RX)	0	.15	.14	0	.14	0	.13															
(TX)	.04	7.78	7.75	.04	7.78	.04	2.93															

Craig L132

REF. No.	CRAIG KEY No.	DESCRIPTION
CABINET & CHASSIS (continued)		
1	NSP	Assy, Main Chassis
2	L132212	Expanding Insert M3
3	NSP	Ground Lug
4	-----	Flange Nut M3
5	-----	PH Screw M3x6
6	L132050	Top Cover
7	L103100	Wool Tack
8	NSP	Holder Washer
9	L132051	Bottom Cover
10A	L132010	Assy, FRONT ESCUTCHEON
10	L132011	Front Escutcheon
11	L132070	Window, Front Display
12	L132100	Mounting Bracket (Unit)
13	L103212	Mounting Screw (Unit)
14	L103231	Rubber Washer (Mtg Brkt)
15	NSP	Front Chassis
16	NSP	PCB Mounting Arm
17	NSP	Holder, D.C. Power Socket
18	NSP	Holder, Meter
19	L132430	Cushion, Meter Mount
20	L103026	Knob, CHANNEL SELECT
21	L103027	Knob, CAL/MTR SW/CLAR/BAND SW
22	L105027	Knob, VOL/MIC GAIN Cont
23	L105026	Knob, SQUEL/RF GAIN Cont
24	L103291	Spring Plate, Ch Sel Knob
25	L105292	Spring Plate, Vol/Mic Knob
26	L105291	Spring Plate, Sque1/RF Knob
27	L103028	Push Button, PA/ANL/DIM/CH 9 Sw
28	L132071	Optical Filter (Ch Display)
29	L104380	Holder, LED TX/RX; Ch 9 Ind
30	NSP	Model No./FCC/Serial No. Plate
31	L132380	Holder, LED Ch Ind
32	-----	FH Screw M3x7
33	-----	PH Screw M2.6x6
34	-----	PH Screw M2.6x10
35	-----	PH Screw M3x8
36	-----	PH Tapp Screw M3x8
37	-----	Hex Nut M2.6
38	-----	Hex Nut M3
39	-----	Lock Washer M2.6
40	NSP	Rivet
**	L132005	Mounting Hardware Kit
41	4104004	Brkt, Mic Mounting
42	-----	RH Tapp Screw M3.5x8
43	-----	Lock Washer M3.5
44	-----	RH Tapp Screw M5x10
45	-----	Star Washer M5
46	-----	Plastic PH Screw M3x6
D63	MV13YH	Varistor
D64	MV1Y	Varistor
D401	UR202	LED, CHANNEL Ind
D402	TLRG101	LED, TX/RX Ind
D403	TLR124	LED, CHANNEL 9 Ind
FC1	L103800	7 Lead Flexible Cable
FC2	L103800	7 Lead Flexible Cable
FC3	L132800	9 Lead Flexible Cable
IC4	TA7222P	I.C. (AF POWER)
IC5	MB3756	I.C. (REGULATOR)
J401	L103609	Socket, P.A. Spkr Jack
J402	L132609	Socket, External Spkr Jack
J403	4101027	Socket, D.C. Power Conn
J404	L132607	Socket, Mic Connector
J405	L103607	Connector, Coaxial Antenna
M401	L105604	Meter, SIG/SWR/MOD
PC381	L132516	PCB w/Comp, LED Ch Ind
PC389	L132517	PCB w/Comp, MIC JACK
PC584	L132518	PCB w/Comp, PUSH SW Assy
PC585	NSP	PCB w/Comp, MAIN
PC612	L132519	PCB w/Comp, CH SELECT SW
PL401	L103550	Pilot Lamp, Meter
S401	L132530	Rotary Sw, CH SELECT
S402	-----	Sw, POWER On/Off (See VR417)
S403	L132531	Rotary Sw, BAND SELECT
SW199	L132532	Assy, Push Switch
S404	L132533	Push Sw, PA/CB Select
S405	L132533	Push Sw, NB/ANL On/Off
S406	L132533	Push Sw, BRITE/DIM Select
S411	L132533	Push Sw, CH 9 (AUTO)
S408	L132531	Rotary Sw, METER Select
SP401	L132702	Speaker 8 Ohm/3W
SW199	L132532	Push Sw Assy (S404,5,6 & 11)
TR34	25C1419	Transistor
TR39	25C1306	Transistor
TR41	25C1969	Transistor
VR401	-----	VR 100K, SQUELCH (See VR417)
VR402	L132570	VR 20K, CLARIFIER Cont
VR403	-----	VR 10K, VOLUME (See VR417)
VR404	-----	VR 10K, RF GAIN (See VR416)
VR405	-----	VR 1K, MIC GAIN (See VR416)
VR406	L132571	VR 5K, CALIBRATE Cont

REF. No.	CRAIG KEY No.	DESCRIPTION
CABINET & CHASSIS (continued)		
VR416	L132572	Assy, CONTROL
VR404		VR 10K, RF GAIN Cont
VR405		VR 1K, MIC GAIN Cont
VR417	L132573	Assy, CONTROL
VR401		VR 100K, SQUELCH Cont
VR403		VR 10K, VOLUME Cont
S402		Sw, POWER On/Off
YD033	NSP	Mica Insulator
YD039	NSP	Mica Insulator
YD040	NSP	Mica Insulator
YY027	NSP	Insulation Sheet
YY036	L132330	Ceramic Bushing (TR Mtg)
REF. No.	CRAIG KEY No.	DESCRIPTION
		MFR's SUGG RET. PRICE
COILS, TRIMMERS & XFORMERS		
CT1,2,3	L132670	Trimmer Capacitor 20pF
L1	L132671	Trimmer (LA038)
L2	L132672	Trimmer (LA179)
L3	L132673	Trimmer (LA255)
L4	L132674	Trimmer (LA263)
L5	L132675	Trimmer (LA262)
L6	L132676	Trimmer (LA257)
L7	L132677	Trimmer (LA258)
L8	L132678	Trimmer (LA259)
L9	L132679	Trimmer (LA260)
L10	L132680	Trimmer (LA261)
L11	L132681	Inductor 470uH
L12	L132682	Inductor 100uH
L13	L132683	Trimmer (LA216)
L14	L132684	Trimmer (LA195)
L15,16	L132681	Inductor 470uH
L17	L132685	Trimmer (LA217)
L18	L132686	Trimmer (LA256)
L19	L132685	Trimmer (LA217)
L20	L105671	Trimmer (LA218)
L21,22		
L23,24	L132681	Inductor 470uH
L25	L132682	Inductor 100uH
L26	L132687	Trimmer (LA219)
L27	L132688	Trimmer (LA160)
L28	L132689	Trimmer (LA220)
L29	L132690	Trimmer (LA254)
L30	L132691	Coil (LD096)
L31	L104675	Coil (LD087)
L32	L132692	Coil (LD101)
L33	L132693	Coil (LD098)
L34	L104675	Coil (LD087)
L35	L132693	Coil (LD098)
L36	L132694	Trimmer (LC019)
L37,38	L132695	Coil (LE051)
L39	L132694	Trimmer (LC019)
L40	L105670	Coil (LD113)
L51,52	L105672	Coil (LD077)
L401,402	L132696	Coil (LD013)
L403	L132697	Coil (LD089)
L404,405	L105672	Coil (LD077)
T1	L132641	Coil, AF Choke (TF151)
MISCELLANEOUS ELECTRICAL		
F401	XFU004	Fuse Spare, 4A
FT1	L132722	Assy, Crystal Filter
FC1	L103800	7 Lead Flexible Cable
FC2	L103800	7 Lead Flexible Cable
FC3	L132800	9 Lead Flexible Cable
J401	L103609	Socket, PA Spkr Jack
J402	L103609	Socket, External Spkr Jack
J403	4101027	Socket, D.C. Power Conn
J404	L132607	Socket, Mic Connector
J405	L103607	Connector, Coaxial Antenna
M401	L105604	Meter, SIG/SWR/MOD
MIC1	L132507	Microphone (Complete)
PC381	L132516	PCB w/Comp, LED CH Ind
PC389	L132517	PCB w/Comp, MIC JACK
PC584	L132518	PCB w/Comp, PUSH SW Assy
PC585	NSP	PCB w/Comp, MAIN
PC612	L132519	PCB w/Comp, CH SELECT SW
PL401	L103550	Pilot Lamp, Meter
P401	4101033	D.C. Power Plug w/Cord
S401	L103530	Rotary Sw, CH SELECT
S402	-----	Sw, POWER On/Off(See VR417)
S403	L132531	Rotary Sw, BAND SELECT
SW199	L132532	Assy, Push Switch
S404	L132533	Push Sw, PA/CB Select
S405	L132533	Push Sw, NB/ANL On/Off
S406	L132533	Push Sw, BRITE/DIM Select
S411	L132533	Push Sw, CH 9 (AUTO)

REF. No.	CRAIG KEY No.	DESCRIPTION
MISCELLANEOUS ELECTRICAL (continued)		
S408	L132531	Rotary Sw, METER FUNCT Select
SP401	L132702	Speaker 8 Ohm/3W
SW199	L132532	Push Sw Assy (S404, 5, 6 & 11)
VR1	L105590	Semi-Fixed Res 10K Ohm
VR2	L132590	Semi-Fixed Res 1K Ohm
VR3	L132591	Semi-Fixed Res 3K Ohm
VR5	L105591	Semi-Fixed Res 10K Ohm
VR6	S609590	Semi-Fixed Res 5K Ohm
VR7	L105590	Semi-Fixed Res 10K Ohm
VR8	L104590	Semi-Fixed Res 500 Ohm
VR9	S609590	Semi-Fixed Res 5K Ohm
VR10	L132592	Semi-Fixed Res 100K Ohm
VR401	-----	VR 100K, SQUELCH (See VR417)
VR402	L132570	VR 20K, CLARIFIER Cont
VR403	-----	VR 10K, VOLUME (See VR417)
VR404	-----	VR 10K, RF GAIN (See VR416)
VR405	-----	VR 1K, MIC GAIN (See VR416)
VR406	L132571	VR 5K, CALIBRATE Cont
VR416	L132572	Assy, Control
VR404		VR 10K, RF GAIN Cont
VR405		VR 1K, MIC GAIN Cont
VR417	L132573	Assy, Control
VR401		VR 100K, SQUELCH Cont
VR403		VR 10K, VOLUME Cont
S402		Sw, POWER On/Off
X1	L103722	Crystal (10.240 Mhz)
X2	L132723	Crystal (7.8025 Mhz)
X3	L132724	Crystal (7.7975 Mhz)
X4	L132725	Crystal (11.2858 Mhz)
SEMICONDUCTORS		
D1, 2, 9, 25, 26, 48 D3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 27, 28, 29, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 61, 62, 69, 70, 71, 72, 74, 404	1N60	Diode
	IS2075K	Diode

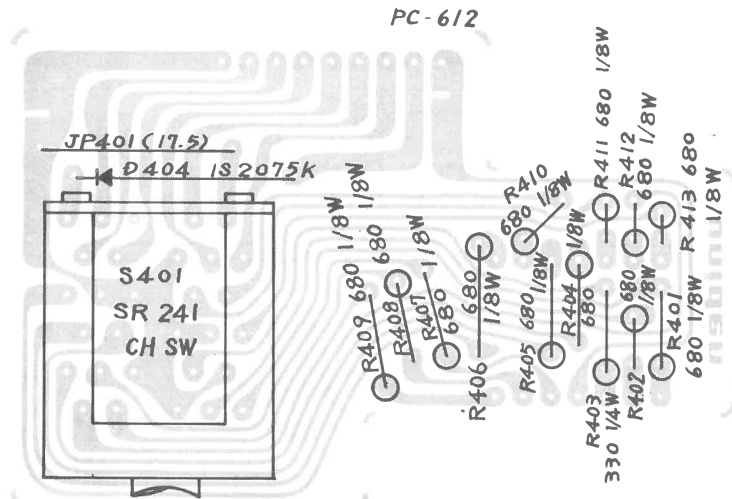
REF. No.	CRAIG KEY No.	DESCRIPTION
SEMICONDUCTORS (continued)		
D16, 17	MC301	Diode
D30	RD5.1EB2	Zener Diode
D54	IS2687D	Vari-Cap Diode
D58, 59	IN60P	Diode
D63	MV13YH	Varistor
D64	MV1Y	Varistor
D66, 68	IN4003	Diode
D67	RD20EB1	Zener Diode
D401	UR202	LED, CHANNEL Indicator
D402	TLRG101	LED, TX/RX Indicator
D403	TLR124	LED, CH 9 Indicator
IC1	UHC070	I.C. (VCO)
IC2	UPD2824C	I.C. (PLL LSI)
IC3	AN612	I.C. (BM)
IC4	TA7222P	I.C. (AF POWER)
IC5	MB3756	I.C. (REGULATOR)
IC6	SO42P	I.C. (MIX)
FET1	2SK19	FET
TR1, 2, 6, 10, 12, 21, 22, 24, 25, 42	2SC710	Transistor
TR3, 8, 16	2SC1730	Transistor
TR4, 5, 11, 13, 15, 20, 27, 32, 33, 35, 37	2SC711	Transistor
TR7, 14, 30, 31	2SA628	Transistor
TR9	2SC1674	Transistor
TR17, 18	2SC763	Transistor
TR19, 23	2SC1675	Transistor
TR26, 40	2SC496	Transistor
TR28	2SC945	Transistor
TR29, 36	2SC1312	Transistor
TR34	2SC1419	Transistor
TR38	2SC1973	Transistor
TR39	2SC1306	Transistor
TR41	2SC1969	Transistor

NOTE:

NSP; Non Serviceable Part

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

CHANNEL SELECT SWITCH PCB



MIC JACK PCB

