



SERVICE MANUAL



UV-3

FM TRANSCEIVER

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CHAPTER 1

INTRODUCTION

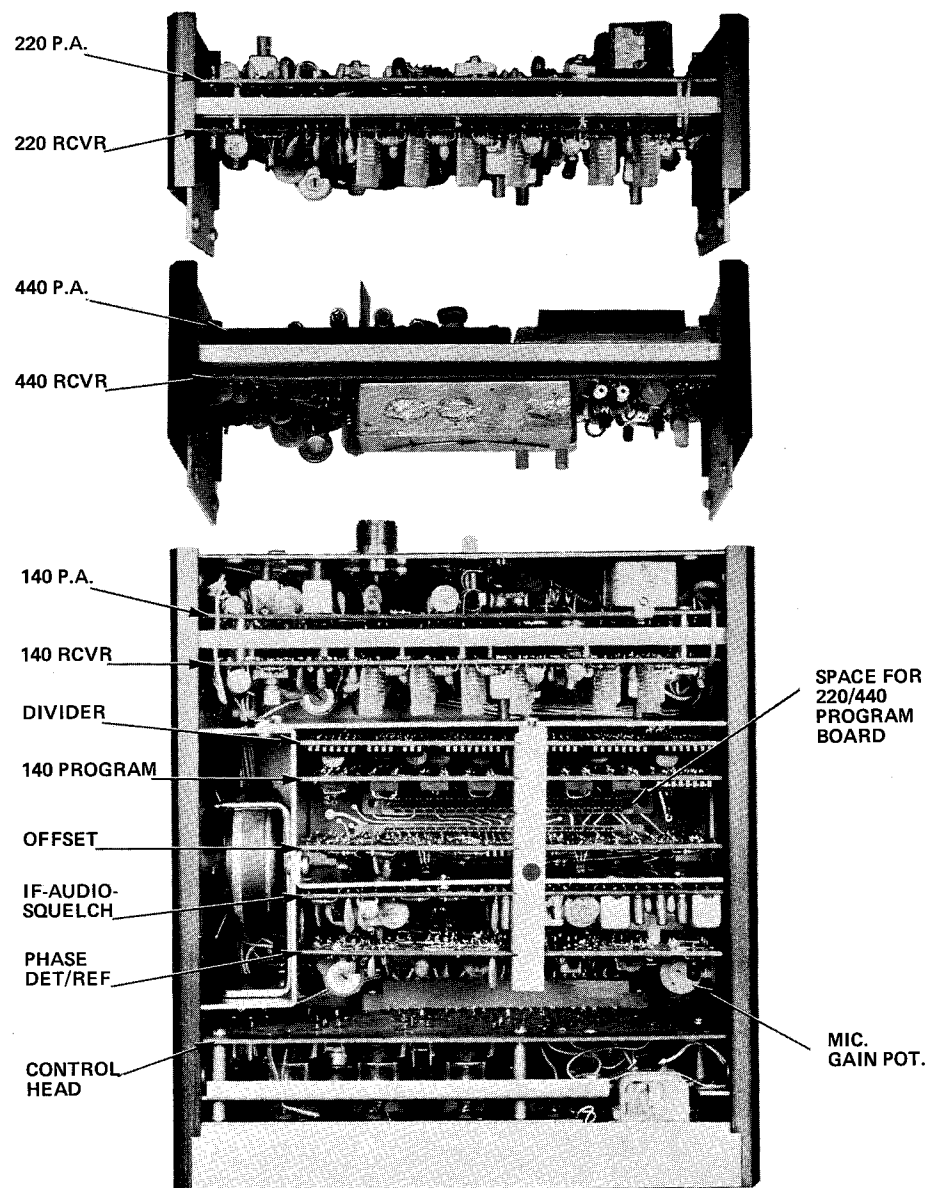


FIGURE 1-1. BOARD LOCATIONS

1-1. Locating Area of Difficulty.

The modular design of the UV-3 permits easy exchange of most of the printed circuit boards. All P.C. boards are easily removed with the exception of the power amplifier sections, the receiver front end, and the VCO sections. The first step in trouble-shooting the UV-3 should be interchanging suspected P.C. boards with boards known to be in good operating condition. In most cases the problem will involve just one board and substituting boards will easily

isolate the problem. Locating problems on the receiver front end, VCO, and the power amplifier will necessitate removing these boards from the chassis. The heat sinks that these boards are mounted on may be unbolted and moved clear of the chassis, permitting access to the components and test points. Once the problem area is isolated, refer to the appropriate section of the manual for a full description of the circuit.

NOTES:

CHAPTER 2

RECEIVER/VCO'S

2-1. 140 MHz Receiver/VCO.

The receiver board for each band is mounted on the front side of the heat sink for that module. Remove the rear panel from the transceiver and remove any additional modules that may be mounted behind the 140 MHz heat sink. All modules are held in place by four mounting screws through the side frames. Remove all screws and carefully slide the heat sink clear of the chassis. Do not exert excessive force on the wire harness connecting the heat sink and the attached boards to the main chassis. If it is necessary to unsolder leads or cables going to the rear panel, carefully note their original placement. When service work is finished, all wires must be placed back in the respective original positions. After the receiver front end is positioned for servicing, refer to figure 2-2 for placement of all the components.

The 140 Receiver board consists of four major sections; The receiver front end or RF amplifier, the mixer, the voltage-controlled-oscillator (VCO), and the low-pass filter for the control line. Figure 2-1 shows all the circuit DC voltages for both receive and transmit.

The signal from the antenna is fed through a low-pass filter (located on rear panel) and antenna relay located on the 140 P.A. board (which is mounted on the opposite side of the heat sink). Capacitors C841 and C844 match the antenna to the 2 pole band-pass filter consisting of L812, L813, C842, and C845. This filter is centered at 146.00 MHz and attenuates signals that are outside the 2 meter band. Transistor Q812 is an enhancement mode FET which is biased for optimum gain and noise figure. The drain of the FET drives a four pole band-pass filter consisting of L814, L815, L816, L817, and the associated capacitors. This filter section is also centered at 146.00 MHz and provides additional selectivity in the front end. The output of the filter is coupled to a J-FET mixer Q813. Injection from the VCO is coupled to the source of Q813, and is 10.7 MHz lower in frequency than the signal to be received. Q811 is a buffer for the VCO and has a resonant circuit for a collector load. L810, C837, and C838 form a resonant circuit at approximately 135 MHz and provides matching to the 300 ohm source resistance of mixer Q813. The mixer has a drain impedance consisting

of T801 and C840 which resonates at 10.7 MHz. The secondary of T801 provides drive to the 50 ohm input of the IF/AUDIO board. R850 supplies DC to a PIN diode switch located at the input of the IF amplifier.

Transistors Q803 and Q806 are cross coupled to form an oscillator which runs at approximately 67 MHz for receive and 74 MHz for transmit. The frequency of oscillation is determined primarily by L804, C809, and varicap CR801. Transistors Q802, Q801, Q800, and Q805 operate as switches to parallel capacitors C801, C803, and C805 with C809 and CR801, thereby lowering the frequency of oscillation by 10.7 MHz for receive. Varicap CR804 is loosely coupled to the resonant circuit described above. On transmit the signal from the audio amplifier/processor circuitry, changes the capacitance of CR804, and produces a change in the frequency of the VCO. The level of audio applied to CR804 is determined by the setting of R820, the deviation control. The exact frequency of the VCO is determined by the value of the control line voltage which is developed by the phase detector. During receive, the control line will have a value of 3 to 7 volts. Resistors R828, R829, R839, capacitors C832, C833, and C823 form a notch filter at 5 kHz to remove the reference frequency from the control line.

The VCO provides drive to the power amplifier (during transmit), the divider board (continuously), and the mixer (during receive). Two buffer stages are provided to increase isolation between the three outputs of the VCO. The buffer made of Q808 operates over the frequency range of approximately 135 MHz to 150 MHz and drives transformer T800. This transformer splits the VCO output to provide drive to the P.A. and divider chain. Each output of T800 should be approximately 2.8 Vp-p or 1.0 V rms. Transistor Q810 acts as a buffer for the VCO and drives the doubler made of Q809. Q809 then drives the buffers Q808 and Q811, discussed earlier. Transistors Q804 and Q807 apply voltage to the entire board when the "BAND" switch is in the "140" position.

140 VCO BOARD

DES	DESCRIPTION	PART #
C800	Capacitor, Mica, 20 pF \pm 5%, DM-15	3170010
C801	Capacitor, Ceramic Disc, 15 pF \pm 5%, NPO	3160510
C802	Capacitor, Mica, 490 pF \pm 5%, DM-15	3170410
C803	Capacitor, Variable Trimmer, 1.2-10 pF	3205370
C804	Capacitor, Ceramic Disc, 6.8 pF \pm 5%, NPO	3160240
C805	Capacitor, Mica, 20 pF \pm 5%, DM-15	3170010
C806	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C807	Capacitor, Mica, 20 pF \pm 5%, DM-15	3170010
C808	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C809	Capacitor, Mica, 30 pF \pm 2%, DM-15	3170030
C810	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C811	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C812	Capacitor, Tantalum, 22 μ F \pm 20%, 15 V	3183050
C813	Capacitor, Mica, 490 pF \pm 5%, DM-15	3170410
C814	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C815	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C816	Capacitor, Tantalum, 10 μ F \pm 20%, 25 V	3183030
C817	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C818	Capacitor, Composition, 0.68 pF	3187040
C819	Capacitor, Ceramic Disc, .01 μ F \pm 20%, Z5U	3161520
C820	Capacitor, Ceramic Disc, 27 pF \pm 5%, NPO	3160650
C821	Capacitor, Ceramic Disc, 220 pF \pm 20%, Z5U	3161270
C822	Capacitor, Ceramic Disc, 68 pF \pm 5%, N750	3160990
C823	Capacitor, Mica, 5000 pF \pm 1%, DM-20	3170710
C824	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C825	Capacitor, Ceramic Disc, 27 pF \pm 5%, NPO	3160650
C826	Capacitor, MYLAR, .01 μ F \pm 10%, Z5U	3184040
C827	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C829	Capacitor, Tantalum, .1 μ F \pm 10%, 35 V	3183098
C830	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C831	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C832	Capacitor, Mica, 2400 pF \pm 2%, DM-19	3170650
C833	Capacitor, Mica, 2400 pF \pm 2%, DM-19	3170650
C834	Capacitor, Ceramic Disc, 220 pF \pm 20%, Z5U	3161270
C835	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C836	Capacitor, Ceramic Disc, 20 pF \pm 5%, NPO	3160580
C837	Capacitor, Ceramic Disc, 25 pF \pm 5%, NPO	3160620
C838	Capacitor, Ceramic Disc, 100 pF \pm 5%, N750	3161060
C839	Capacitor, Ceramic Disc, 68 pF \pm 5%, N750	3160990
C840	Capacitor, Ceramic Disc, 68 pF \pm 5%, N750	3160990
C841	Capacitor, Tubular, 3.3 pF, NPO	3185070
C842	Capacitor, Composition, .68 pF	3187040
C843	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C844	Capacitor, Tubular, 3.3 pF, NPO	3185070
C845	Capacitor, Composition, 1.5 pF	3187070
C846	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C847	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C848	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C849	Capacitor, Composition, .15 pF	3187005

DES	DESCRIPTION	PART #
C850	Capacitor, Composition, .15 pF	3187005
C851	Capacitor, Composition, .15 pF	3187005
C852	Capacitor, Ceramic Disc, 6.8 pF \pm 5%, NPO	3160240
C853	Capacitor, Tubular, 4.5 pF, NPO	3185100
C854	Capacitor, Ceramic Disc, 5 pF \pm 5%, NPO	3160150
C855	Capacitor, Ceramic Disc, 5 pF \pm 5%, NPO	3160150
C856	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C857	Capacitor, Ceramic Disc, 18 pF \pm 5%, NPO	3160550
C858	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
CR800	Diode, 1N4148	3020090
CR801	Diode, MV-104	3020274
CR802	Diode, 1N4148	3020090
CR804	Diode, MV-104	3020274
U800	Integrated Circuit, 78L05ACP	3040030
L800	Choke, RF, 5.6 μ H	3520510
L801	Choke, RF, 5.6 μ H	3520510
L802	Choke, RF, 5.6 μ H	3520510
L803	Choke, RF, 5.6 μ H	3520510
L804	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-7)	3524087
L805	Choke, RF, 5.6 μ H	3520510
L806	Coil, Variable, 2 $\frac{1}{2}$ T (Drake A46097-1)	3524091
L807	Choke, RF, 5.6 μ H	3520510
L808	Choke, RF, 5.6 μ H	3520510
L809	Coil, Variable, 2 $\frac{1}{2}$ T (Drake A46097-1)	3524091
L810	Coil, Variable, 2 $\frac{1}{2}$ T (Drake A46097-1)	3524091
T801	Coil, Variable, 20 T Pri., 2T Sec. (Drake)	A46099
L812	Coil, Variable, 4 $\frac{1}{2}$ T (Drake A46090-1)	3524081
L813	Coil, Variable, 4 $\frac{1}{2}$ T (Drake A46090-1)	3524081
L814	Coil, Variable, 4 $\frac{1}{2}$ T, Tapped (Drake A46090-2)	3524082
L815	Coil, Variable, 4 $\frac{1}{2}$ T (Drake A46090-1)	3524081
L816	Coil, Variable, 4 $\frac{1}{2}$ T (Drake A46090-1)	3524081
L817	Coil, Variable, 4 $\frac{1}{2}$ T (Drake A46090-1)	3524081
Q800	Transistor, 2N3563	3030060
Q801	Transistor, 2N4402	3030120
Q802	Transistor, 2N3904	3030105
Q803	Transistor, SPF-796, Matched FET	3030355
Q804	Transistor, TIP-32	3030379
Q805	Transistor, 2N3563	3030060
Q806	Transistor, SPF-796, Matched FET	3030355
Q807	Transistor, 2N3904	3030105
Q808	Transistor, 2N3563	3030060
Q809	Transistor, 2N3563	3030060
Q810	Transistor, 2N3563	3030060
Q811	Transistor, 2N3563	3030060
Q812	Transistor, MFE-521	3030262
Q813	Transistor, J-309	3030500
R800	Resistor, Carbon Comp., 10 k Ω \pm 10%, $\frac{1}{4}$ W	3220235
R801	Resistor, Carbon Comp., 1 M Ω \pm 10%, $\frac{1}{4}$ W	3220355
R802	Resistor, Carbon Comp., 47 k Ω \pm 10%, $\frac{1}{4}$ W	3220285

DES	DESCRIPTION	PART #
R803	Resistor, Carbon Comp., 27 $\Omega \pm 10\%$, 1/4 W	3220020
R804	Resistor, Carbon Comp., 3.3 M $\Omega \pm 10\%$, 1/4 W	3220365
R805	Resistor, Carbon Comp., 470 $\Omega \pm 10\%$, 1/4 W	3220110
R806	Resistor, Carbon Comp., 470 $\Omega \pm 10\%$, 1/4 W	3220110
R807	Resistor, Carbon Comp., 10 $\Omega \pm 10\%$, 1/4 W	3220005
R808	Resistor, Carbon Comp., 1 M $\Omega \pm 10\%$, 1/4 W	3220355
R809	Resistor, Carbon Comp., 47 $\Omega \pm 10\%$, 1/4 W	3220035
R810	Resistor, Carbon Comp., 470 $\Omega \pm 10\%$, 1/4 W	3220110
R811	Resistor, Carbon Comp., 3.3 k $\Omega \pm 10\%$, 1/4 W	3220200
R812	Resistor, Carbon Comp., 150 $\Omega \pm 10\%$, 1/4 W	3220065
R813	Resistor, Carbon Comp., 470 $\Omega \pm 10\%$, 1/4 W	3220110
R814	Resistor, Carbon Comp., 47 $\Omega \pm 10\%$, 1/4 W	3220035
R815	Resistor, Carbon Comp., 100 $\Omega \pm 10\%$, 1/4 W	3220055
R816	Resistor, Carbon Comp., 47 $\Omega \pm 10\%$, 1/4 W	3220035
R818	Resistor, Carbon Comp., 10 k $\Omega \pm 10\%$, 1/4 W	3220235
R819	Resistor, Carbon Comp., 1.5 k $\Omega \pm 10\%$, 1/4 W	3220175
R820	Resistor, Variable, 5 k Ω (CTS RL-7153)	3260120
R821	Resistor, Carbon Comp., 68 k $\Omega \pm 10\%$, 1/4 W	3220300
R822	Resistor, Carbon Comp., 100 $\Omega \pm 10\%$, 1/4 W	3220055
R823	Resistor, Carbon Comp., 6.8 k $\Omega \pm 10\%$, 1/4 W	3220220
R824	Resistor, Carbon Comp., 1.5 k $\Omega \pm 10\%$, 1/4 W	3220300
R825	Resistor, Carbon Comp., 470 $\Omega \pm 10\%$, 1/4 W	3220110
R826	Resistor, Carbon Comp., 68 $\Omega \pm 10\%$, 1/4 W	3220045
R827	Resistor, Carbon Comp., 3.3 k $\Omega \pm 10\%$, 1/4 W	3220200
R828	Resistor, Metal Film, 13.0 k $\Omega \pm 1\%$, 1/4 W	3220445
R829	Resistor, Metal Film, 13.0 k $\Omega \pm 1\%$, 1/4 W	3220445
R830	Resistor, Carbon Comp., 15 k $\Omega \pm 10\%$, 1/4 W	3220245
R831	Resistor, Carbon Comp., 220 $\Omega \pm 10\%$, 1/4 W	3220075
R832	Resistor, Carbon Comp., 1.5 k $\Omega \pm 10\%$, 1/4 W	3220175
R833	Resistor, Carbon Comp., 100 $\Omega \pm 10\%$, 1/4 W	3220055
R834	Resistor, Carbon Comp., 6.8 k $\Omega \pm 10\%$, 1/4 W	3220220
R835	Resistor, Carbon Comp., 100 k $\Omega \pm 10\%$, 1/4 W	3220315
R836	Resistor, Carbon Comp., 6.8 k $\Omega \pm 10\%$, 1/4 W	3220220
R837	Resistor, Carbon Comp., 100 $\Omega \pm 10\%$, 1/4 W	3220055
R838	Resistor, Carbon Comp., 15 k $\Omega \pm 10\%$, 1/4 W	3220245
R839	Resistor, Carbon Comp., 6.8 k $\Omega \pm 5\%$, 1/4 W	3220219
R840	Resistor, Carbon Comp., 22 $\Omega \pm 10\%$, 1/4 W	3220015
R841	Resistor, Carbon Comp., 1.5 k $\Omega \pm 10\%$, 1/4 W	3220175
R842	Resistor, Carbon Comp., 68 $\Omega \pm 10\%$, 1/4 W	3220045
R843	Resistor, Carbon Comp., 100 $\Omega \pm 10\%$, 1/4 W	3220055
R844	Resistor, Carbon Comp., 36 k $\Omega \pm 5\%$, 1/4 W	3220280
R845	Resistor, Carbon Comp., 75 k $\Omega \pm 5\%$, 1/4 W	3220305
R846	Resistor, Carbon Comp., 56 $\Omega \pm 10\%$, 1/4 W	3220040
R847	Resistor, Carbon Comp., 47 $\Omega \pm 10\%$, 1/4 W	3220035
R848	Resistor, Carbon Comp., 330 $\Omega \pm 10\%$, 1/4 W	3220090
R849	Resistor, Carbon Comp., 1 M $\Omega \pm 10\%$, 1/4 W	3220355
R850	Resistor, Carbon Comp., 1 k $\Omega \pm 10\%$, 1/4 W	3220160
R851	Resistor, Carbon Comp., 47 $\Omega \pm 10\%$, 1/4 W	3220035
T800	Power Splitter (Drake)	A46100

NOTES:

NOTES:

2-2. 220 MHz Receiver/VCO.

The receiver board for the 220 MHz band is mounted on the front side of the heat sink for the 220 MHz module. Remove the rear panel from the transceiver, and remove any additional modules that may be mounted behind the 220 MHz module. Remove all screws that hold the module and carefully slide the heat sink clear of the chassis. Do not exert excessive force on any wire harnesses or cables. If it is necessary to unsolder any wires, take care to note the exact positions, since it is essential that each wire be placed back in the original position after repair work is completed.

Refer to figure 2-4 for the placement of all components on the 220 MHz receiver board. The receiver board for 220 MHz is very similar to the 140 MHz receiver board and is composed of four major sections; The RF amplifier, the Mixer, the voltage-controlled-oscillator, and the low-pass filter for the control line. Figure 2-3, the schematic diagram, shows all the DC voltages for each section during receive and transmit operations.

The signal from the antenna is matched to a 2 pole band-pass filter by capacitors C1041 and C1045. The band-pass filter consists of L1012, C1042, L1011, and the G1 capacitance of Q1011. This filter is centered at 222.5 MHz and provides rejection for signals out of the "220 MHz" band. Transistor Q1011 is an enhancement mode FET which is biased for optimum gain and noise figure. Q1011 provides approximately 10 dB gain and drives a 4 pole band-pass filter consisting of L1013, L1014, L1015, L1016, and the associated capacitors. The band pass filter provides additional selectivity and feeds one gate of a dual gate MOSFET mixer, Q1012. Injection from the VCO is coupled to the second gate of the mixer and is 10.7 MHz higher in frequency than the signal to be received. Q1010 is a VCO buffer with L1010, C1035, and C1038 forming a resonant circuit centered at 233 MHz. The drain of Q1012 feeds a 10.7 MHz resonant circuit made of C1040 and T1001. The secondary of T1001 provides a match to the input of the IF amplifier. Resistor R1052 provides a voltage to turn on the appropriate PIN diode switch on

the IF/AUDIO board.

Transistors Q1002 and Q1005 form a voltage controlled oscillator which operates at approximately 110 to 118 MHz. The frequency of oscillation is determined by L1004, C1008, and CR1002 during receive operation. Transistors Q1000, Q1001, and Q1004 parallel capacitors C1001, C1003, and C1005 with C1008 and C1002 during transmit. The VCO, therefore, runs approximately 10.7 MHz higher in frequency during receive. Varicap CR1004 is modulated by the audio signal from the microphone amplifier/processor circuit located on the phase detector board. CR1004 is coupled to the VCO and changes its frequency of oscillation when driven by an audio signal. The level of audio applied to CR1004 is determined by the setting of R1021, the deviation control. The exact frequency of the VCO is determined by the value of the control line voltage applied to CR1002 and the level of audio applied to CR1004. During receive, the control line voltage should be approximately 5.0 volts. L1004 is adjusted to provide 223 MHz at the VCO output (T1000) for a control line voltage of 5.0 volts. Resistors R1029, R1030, and R1039 along with capacitors C1033, C1034, and C1024 form a 5kHz notch filter to remove any reference frequency which might be on the control line. R1028 and C1030 form a low-pass filter for the control line. Two buffer stages are provided to increase isolation between the three outputs of the VCO. The buffer made of Q1007 operates over a range of approximately 220 to 235 MHz and drives transformer T1000. This transformer provides two isolated outputs from the VCO, one output to drive the P.A. and the other output to drive the divider chain. Each output of T1000 should be approximately 2.0 Vp-p or 0.7 V rms.

Transistor Q1009 acts as a VCO buffer and drives the doubler stage made of Q1008. The doubler output is coupled to the buffers Q1007 and Q1010, discussed previously.

Transistors Q1003 and Q1006 operate as a power supply switch that supplies voltage to the entire board when the "BAND" switch is in the "220 MHz" position.

220 VCO BOARD

DES	DESCRIPTION	PART #
C1000	Capacitor, Mica, 20 pF \pm 5%, DM-15	3170010
C1001	Capacitor, Tubular, 3.3 pF, NPO	3185070
C1002	Capacitor, Mica, 490 pF \pm 5%, DM-15	3170410
C1003	Capacitor, Variable Trimmer, 1.2-10 pF	3205370
C1004	Capacitor, Tubular, 4.3 pF, NPO	3185090
C1005	Capacitor, Ceramic Disc, 9 pF \pm 5%, NPO	3160320
C1006	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1007	Capacitor, Mica, 20 pF \pm 5%, DM-15	3170010
C1008	Capacitor, Mica, 20 pF \pm 5%, DM-15	3170010
C1009	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C1010	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C1011	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C1012	Capacitor, Mica, 490 pF \pm 5%, DM-15	3170410
C1013	Capacitor, Tantalum, 68 μ F \pm 20%, 6 V	3183075
C1014	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C1015	Capacitor, Ceramic Disc, .001 μ F \pm 20%, Z5U	3161380
C1016	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C1017	Capacitor, Tantalum, 10 μ F \pm 20%, 25 V	3183030
C1018	Capacitor, Ceramic Disc, .01 μ F \pm 20%, Z5U	3161520
C1019	Capacitor, Composition, 1.5 pF	3187070
C1020	Capacitor, Ceramic Disc, 6.8 pF \pm 5%, NPO	3160240
C1021	Capacitor, Ceramic Disc, 27 pF \pm 5%, NPO	3160650
C1022	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1023	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1024	Capacitor, Mica, 5000pF \pm 1%, DM-20	3170710
C1025	Capacitor, Ceramic Disc, 7.5 pF \pm 10%, NPO	3160270
C1026	Capacitor, MYLAR, .01 μ F \pm 10%, Z5U	3184040
C1027	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C1028	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1030	Capacitor, Tantalum, .22 μ F \pm 10%, 35 V	3183100
C1031	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1032	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1033	Capacitor, Mica, 2400 pF \pm 2%, DM-19	3170650
C1034	Capacitor, Mica, 2400 pF \pm 2%, DM-19	3170650
C1035	Capacitor, Ceramic Disc, 6.8 pF \pm .25 pF	3160240
C1036	Capacitor, Ceramic Disc, 470 pF \pm 20%, Z5U	3161350
C1037	Capacitor, Ceramic Disc, 12 pF \pm 5%, NPO	3160430
C1038	Capacitor, Ceramic Disc, 8.2 pF \pm 5%, NPO	3160300
C1039	Capacitor, Ceramic Disc, 33 pF \pm 5%, NPO	3160700
C1040	Capacitor, Ceramic Disc, 68 pF \pm 5%, N750	3160990
C1041	Capacitor, Composition, 2.0 pF	3187080
C1042	Capacitor, Composition, .68 pF	3187040
C1043	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1044	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1045	Capacitor, Composition, .47 pF	3187030
C1046	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1047	Capacitor, Composition, .18 pF	3187007
C1048	Capacitor, Composition, .18 pF	3187007
C1049	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
C1050	Capacitor, Ceramic Disc, 5 pF \pm 5%, NPO	3160150
C1051	Capacitor, Tubular, 2.2 pF, NPO	3185050

DES	DESCRIPTION	PART #
C1052	Capacitor, Tubular, 3.3 pF, NPO	3185070
C1053	Capacitor, Tubular, 3.3 pF, NPO	3185070
C1054	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C1055	Capacitor, Ceramic Disc, 5 pF \pm 5%, NPO	3160150
C1056	Capacitor, Ceramic Disc, .005 μ F \pm 20%, Z5U	3161470
C1057	Capacitor, Ceramic Disc, 150 pF \pm 20%, Z5U	3161170
CR1000	Diode, 1N4148	3020090
CR1001	Diode, 1N4148	3020090
CR1002	Diode, Varactor, MV104	3020274
CR1003	Diode, 1N4148	3020090
CR1004	Diode, Varactor, MV104	3020274
U1000	Integrated Circuit, 78L05ACP	3040030
L1000	Choke, RF, 3.3 μ H	3520505
L1001	Choke, RF, 3.3 μ H	3520505
L1002	Choke, RF, 3.3 μ H	3520505
L1003	Choke, RF, 3.3 μ H	3520505
L1004	Coil, Variable, 1 $\frac{1}{2}$ T (Drake A46090-6)	3524086
L1005	Choke, RF, 3.3 μ H	3520505
L1006	Coil, Variable, 2 $\frac{1}{2}$ T (Drake A46097-1)	3524091
L1007	Choke, RF, 3.3 μ H	3520505
L1008	Choke, RF, 3.3 μ H	3520505
L1009	Coil, Variable, 2 $\frac{1}{2}$ T (Drake A46097-1)	3524091
L1010	Coil, Variable, 2 $\frac{1}{2}$ T (Drake A46097-1)	3524091
L1011	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-3)	3524083
L1012	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-3)	3524083
L1013	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-5)	3524085
L1014	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-3)	3524083
L1015	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-3)	3524083
L1016	Coil, Variable, 3 $\frac{1}{2}$ T (Drake A46090-3)	3524083
Q1000	Transistor, 2N4402	3030120
Q1001	Transistor, 2N3563	3030060
Q1002	Transistor, SPF796, Matched FET	3030355
Q1003	Transistor, TIP-32	3030379
Q1004	Transistor, 2N3563	3030060
Q1005	Transistor, SPF796, Matched FET	3030355
Q1006	Transistor, 2N3904	3030105
Q1007	Transistor, 2N3563	3030060
Q1008	Transistor, 2N3563	3030060
Q1009	Transistor, 2N3563	3030060
Q1010	Transistor, 2N3563	3030060
Q1011	Transistor, MFE521	3030262
Q1012	Transistor, MFE521	3030262
R1000	Resistor, Carbon Comp., 10 k Ω \pm 10%, $\frac{1}{4}$ W	3220235
R1001	Resistor, Carbon Comp., 6.8 k Ω \pm 10%, $\frac{1}{4}$ W	3220220
R1002	Resistor, Carbon Comp., 27 Ω \pm 10%, $\frac{1}{4}$ W	3220020
R1003	Resistor, Carbon Comp., 1 M Ω \pm 10%, $\frac{1}{4}$ W	3220355
R1004	Resistor, Carbon Comp., 3.3 M Ω \pm 10%, $\frac{1}{4}$ W	3220365
R1005	Resistor, Carbon Comp., 470 Ω \pm 10%, $\frac{1}{4}$ W	3220110
R1006	Resistor, Carbon Comp., 1 k Ω \pm 10%, $\frac{1}{4}$ W	3220160
R1007	Resistor, Carbon Comp., 10 Ω \pm 10%, $\frac{1}{4}$ W	3220005
R1008	Resistor, Carbon Comp., 1 M Ω \pm 10%, $\frac{1}{4}$ W	3220355

