Instruction Booklet

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101-342
VOLTAGE CONTROLLED CRYSTAL OSCILLATOR

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ADDENDUM

Circuit modifications have been made to the VCXO to reduce stray 60 MHz output. These modifications include the addition of:

a. A 0.001 μF decoupling capacitor between the -15V input and ground.

b. A 0.001 μF capacitor between the junction of L6 and the edgeboard connector and ground.

c. Ferrite beads in series with the +15V and -15V inputs.

VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR

GENERAL

The 101-342 Voltage-Controlled Oscillator (VCXO) is designed for use with Microdyne telemetry receivers and functions as the second local oscillator. The VCXO generates a 60 MHz signal for application to the associated second mixer.

A schematic diagram of the VCXO is shown in figure 2. The oscillator consists basically of a voltage-controlled crystal oscillator U1, a summing amplifier U2, and a multipole L-C filter. The mean frequency of the oscillator is 60 MHz. The oscillator frequency is controlled by the output of U2 which sums its three inputs to develope the tuning voltage for U1.

INSTALLATION

The module is composed of a printed circuit card mounted in a wraparound metal housing which plugs into a receptacle in the parent receiver. All signal and power connections are made to the VCXO through a single connector located on the bottom of the module. Since the module can be installed in various receiver chassis, any special installation procedures are presented in the overall receiver instruction manual.

MAINTENANCE

PREVENTIVE MAINTENANCE

Preventive maintenance requirements for the second local oscillator consists of a semi-annual check of the connector for corrosion and loose pins, and the module itself for signs of damage and loose components.

TROUBLESHOOTING

In the event of a malfunction, the trouble should first be isolated to a certain section of the module circuitry; crystal oscillator, summing amplifier, or output filter. This is accomplished by using normal signal tracing methods. Once the defective circuit is found, the faulty component should be located and replaced.

REPAIR

All components used in the second l-o module are non-repairable and must be replaced when found defective. A list of replaceable components is given in this booklet and a recommended procedure for replacing components mounted on a printed circuit board is given in the parent unit REPAIR section.

ALIGNMENT

After the fault has been located and corrected, the module should be realigned.

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The test equipment necessary for alignment is as follows:

Extender Module	Microdyne 300-355
Frequency Counter	HP5245L
DC Voltmeter	HP412A
Broadband Sampling Voltmeter	HP 3406A w/50Ω Tee/Termination

a. Connect the second local oscillator module to the parent unit through extender module.

b. Place the front panel 2ND LO MODE switch to the XTAL position.

c. Connect the HP3406 RF Millivoltmeter to the receiver second l-o monitor.

d. Adjust the receiver controls for 0(±0.01)V AFC/APC and 0(±0.01)V fine tuning at pins 6 and 8 of the VCXO card.

e. Adjust L1 through L5 for a maximum output indication on the HP3406.

f. Disconnect the HP3406 and connect the HP5245L counter to the l-o monitor. Note a frequency of 60 MHz ±200 Hz.

g. Adjust the frequency trimmer located on the end of the module, if necessary, to obtain the 60 MHz ±200 Hz counter reading.

REPLACEMENT PARTS LIST

The following replacement parts list provides the reference designation, description, manufacturer, and manufacturer's part numbers for each electrical component used in the second local oscillator.

Reference Designation	Description
C1	Capacitor, ceramic, .001 uF ±5%, 100V, Erie 8121-100-COG-102J
C2	Capacitor, ceramic, 100 pF ±5%, 100V, Erie 8131-100-COG-101J
C3	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C4	Capacitor, ceramic, 7.5 pF ±0.5 pF, 100V, Erie 8101-100-COG-759D
C5	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C6	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C7	Capacitor, ceramic, 6.8 pF ±0.25 pF, 100V, Erie 8101-100-COG-689C
C8	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C9	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C10	Capacitor, ceramic, 6.8 pF ±0.25 pF, 100V, Erie 8101-100-COG-689C

Reference Designation	Description
C11	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C12	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C13	Capacitor, ceramic, 7.5 pF ±5%, 100V, Erie 8101-100-COG-759J
C14	Capacitor, ceramic, 39 pF ±5%, 100V, Erie 8131-100-COG-390J
C15	Capacitor, ceramic, 100 pF ±5%, 100V, Erie 8131-100-COG-101J
C16	Capacitor, ceramic, .001 uF ±5%, 100V, Erie 8121-100-COG-102J
C17	Capacitor, ceramic, .01 uF ±20%, 100V, Erie 8131-B106-X5V-103M
C18	Capacitor, ceramic, 30 pF ±5%, 100V, Erie 821-100-COG-300J
E1	Cable terminal, P/O W1
L1	Inductor, variable, Microdyne 202660
L2	Inductor, variable, Microdyne 202661
L3	Inductor, variable, Microdyne 202661
L4	Inductor, variable, Microdyne 202661
L5	Inductor, variable, Microdyne 202660
L6	Inductor, 5.6 uH ±10%, Jeffers 4435-1K
P1A1	Coaxial Insert, P/O W1, Cannon
R1	Resistor, fixed composition, 180Ω ±5%, ¼w, Allen Bradley CB1815
R2	Resistor, fixed composition, 30Ω ±5%, ¼w, Allen Bradley CB3005
R3	Resistor, fixed composition, 180Ω ±5%, ¼w, Allen Bradley CB1815
R4	Resistor, fixed composition, 180Ω ±5%, ¼w, Allen Bradley CB1815
R5	Resistor, fixed composition, 30Ω ±5%, ¼w, Allen Bradley CB3005
R6	Resistor, fixed composition, 180Ω ±5%, ¼w, Allen Bradley CB1815
R7	Resistor, fixed composition, 9.1KΩ ±5%, ¼w, Allen Bradley CB9125
R8	Resistor, fixed composition, 39KΩ ±5%, ¼w, Allen Bradley CB3935
R9	Resistor, fixed composition, 24KΩ ±5%, ¼w, Allen Bradley CB2435
R10	Resistor, fixed composition, 20KΩ ±5%, ¼w, Allen Bradley CB2035
R11	Resistor, fixed composition, 10Ω ±5%, ¼w, Allen Bradley CB1005
U1	Crystal Oscillator, 60 MHz, Vectron 275-1952
U2	Integrated Circuit, Fairchild 114148TC

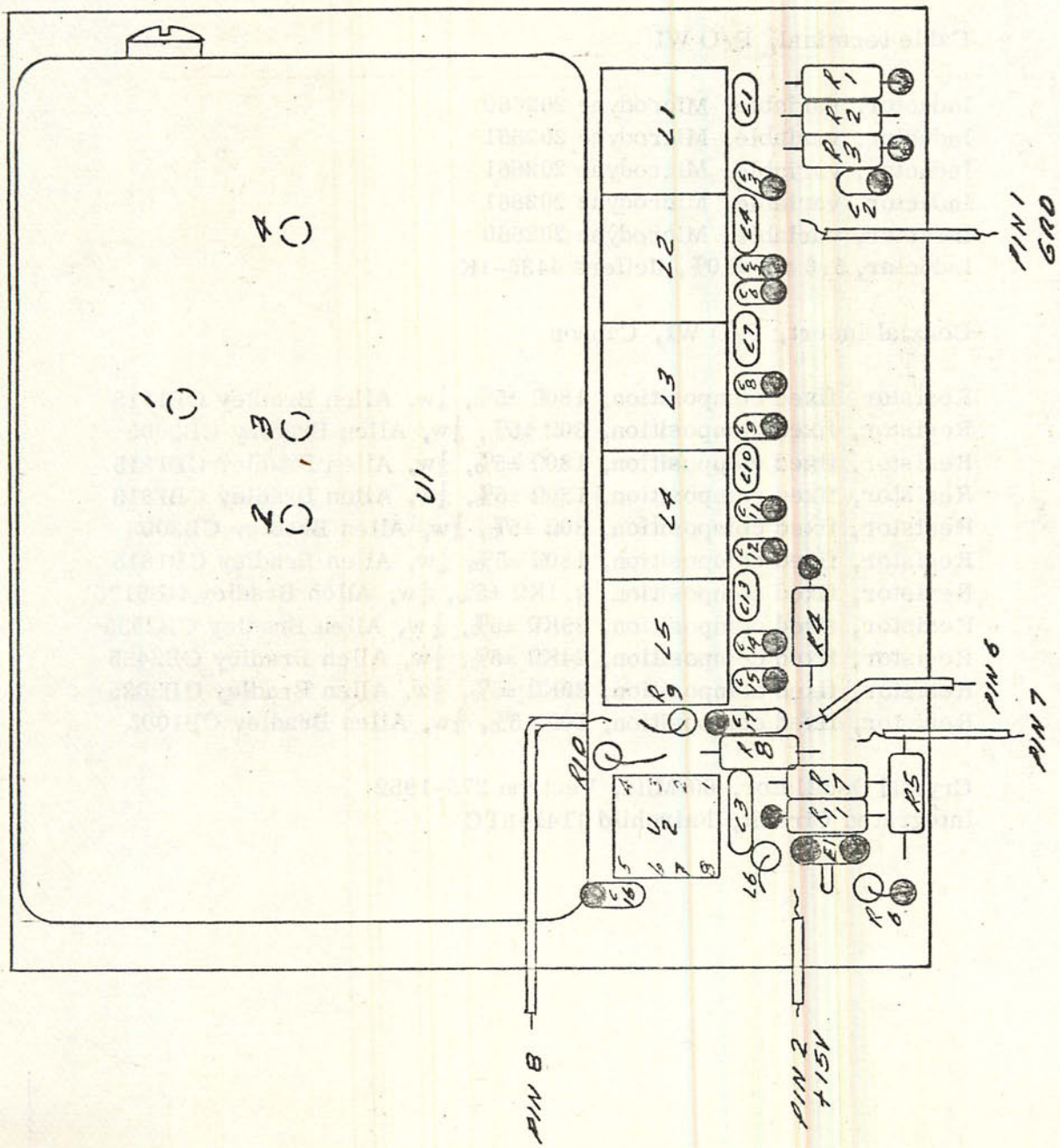

Figure 1. Component Location Drawing

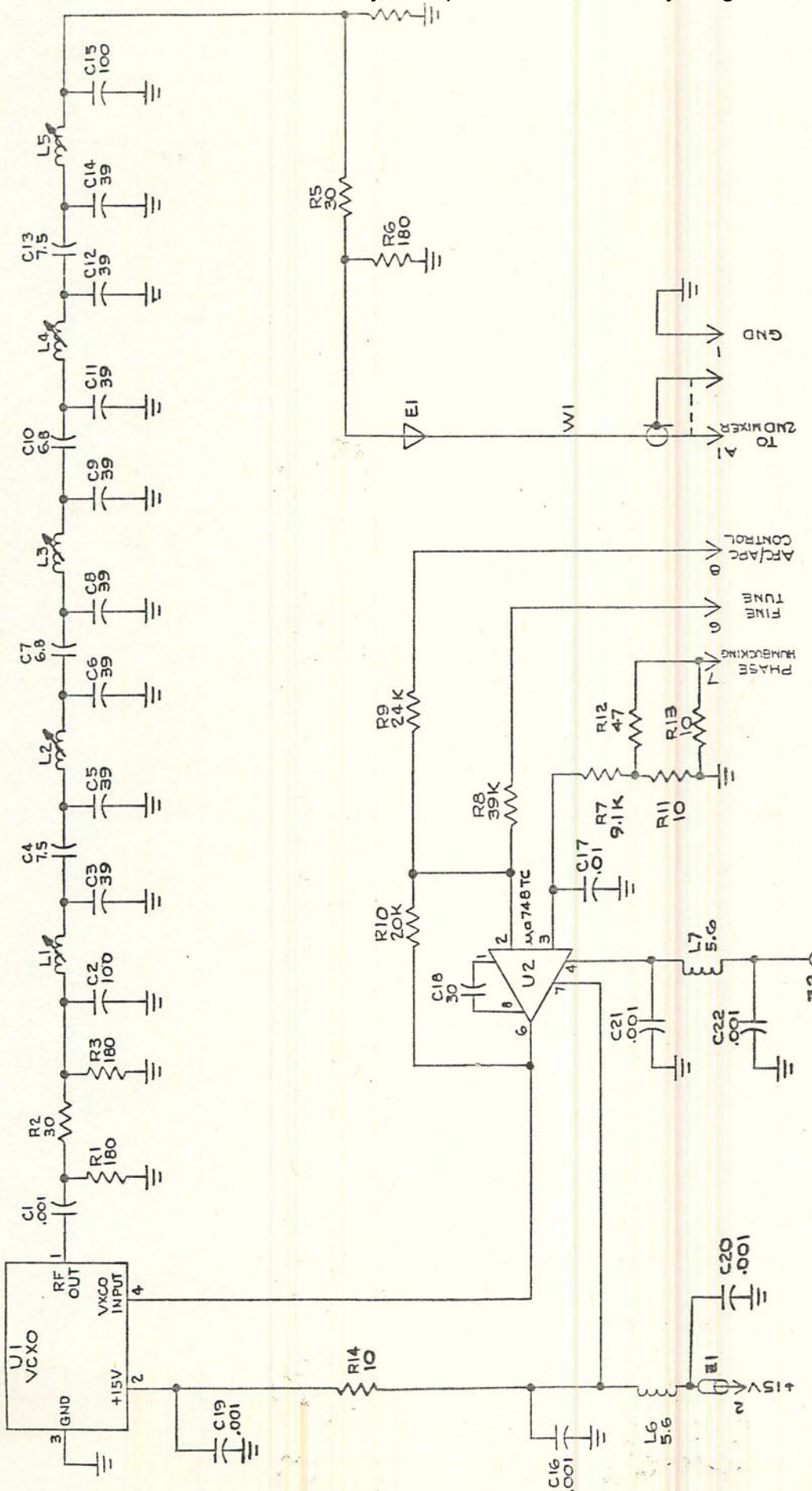

Figure 2. Voltage Controlled Oscillator, Schematic Diagram