

DISCRIPTION

The Model T06 Oscillator utilizes fundamental cut crystals and provides sufficient deviation for the GLB Exciter strips. The T06 is directly modulated for True FM.

This strip can be interfaced to the Model OC-1 for super stability.

ASSEMBLY INSTRUCTIONS

1. Check the parts off on the parts list in the spaces "()" next to the quantities shown. Report any parts shortages to GLB immediately.
2. Use the parts layout and the parts list as guides to install the components. Use the silk-screened designations on the boards themselves as aids only, there may be discrepancies.
3. Insert and solder the resistors first. Clip off excess lead lengths on the trace side as you go.
4. Solder in the capacitors. Observe polarity on the electrolytic and tantalum types.
5. Solder in the transistors.
6. Solder in the diodes, observing polarity. The MV2209 looks like a plastic-cased transistor with only two leads. The flat side faces C1.
7. Insert and solder L1, L2 and L3. Be sure to orient L2 correctly, there is a primary and secondary.
8. Insert and solder L4.
9. Proceed to tuning procedure.

TUNING PROCEDURE

EQUIPMENT REQUIRED

1. A 12 volt power supply. (50 ma or better)
2. A frequency counter, good to 50 mhz.
3. A diode detector. (see fig. 1)
4. A 0-1 or 0-2.5 volt scale voltmeter. (20,000 ohms/volt or better)
5. For adjusting modulation, use the complete oscillator, transmitter and audio section in combination. See the audio processor instructions for adjustment. (see figure 1.)
6. A crystal, suitable for the intended output frequency.

TUNING INSTRUCTIONS

1. Solder the crystal into the board. Interconnect the equipment as shown in fig. 1.
2. Turn on the power supply.
3. Connect the diode detector as shown, and clip the meter leads to it. (see fig. 1.)
4. Tune L2 and L3 for about 1 volt of output.
5. Remove the detector from the output. Connect the frequency counter to the output (marked "out").
6. Adjust L1 for the exact frequency required. The counter readings should approximate the following chart:

T50	Indicates Output frequency
T144	Indicates 1/8 Output frequency
T220	Indicates 1/12 Output frequency

 CRYSTAL INFORMATION

Fundamental Cut - HC 18 Holder
 Series Resonant
 Cal. .0025% @ 25 C
 Operating temp. .001% -10 to +50 C

To calculate the frequency when ordering use the following formula:

For use with	formula
T50	$F_c = F_o/3 + 1 \text{ khz}$
T144	$F_c = F_o/8 + 1 \text{ khz}$
T220	$F_c = F_o/12 + 1 \text{ khz}$

1 khz is added to the crystal for "pulling".

 THEORY OF OPERATION

Q1 is the oscillator stage. L1 is used to tune the crystal to exact frequency and to enable the varactor D2 to "Pull" the frequency back and forth to provide FM. D1 regulates the voltage to the base of Q1 and the varactor, stabilizing the circuit against supply voltage variations.

The collector circuit of Q1 is coupled into L2 via the primary link of L2. L2 and L3 are tuned to twice the crystal frequency for 50 mhz operation. The T50 can be driven at 17, 25 or 50 mhz. The T144 and T220 can be driven at 18, 24, 36 or 72 mhz. The T06 oscillator will drive the T50 at 50 mhz, and the T144 and T220 at 36 mhz.

THEORY OF OPERATION CON'T

Q2 acts as a buffer amplifier to provide sufficient drive for the transmitter strips and it acts as a limiter to remove any AM resulting from the modulation process.

Audio is fed into the oscillator for modulation via the same cable that carries RF out to the transmitter strip. It is coupled in via R10 (which also acts as a RF choke) and C5, through R6 to D2. Audio variations on D2 change its capacitance, hence the oscillating frequency. C6 bypasses RF but not audio. R5 is used to bias the varactor to approximately 6 volts. Deviation is about 0.9 khz per volt RMS of applied audio, multiplied by the transmitter multiplication factor. On 50 mhz the factor is 3, hence deviation is 2.8 khz per volt. For 5 khz of deviation it requires about 1.8 volts of audio. Higher frequency bands require less, of course.

KEYING

It is recommended that the B+ of the oscillator be connected to the Keyed B+ of the transmitter. If continuous operation of the oscillator is desirable then connect this point to continuous +12 v.

MULTI-CHANNEL OPERATION

If you want to switch multiple crystals into the oscillator, use the circuit shown in fig. 2. It is necessary to provide a separate coil and 4.7K resistor for each crystal. Separate coils will provide independent netting adjustments for each channel. Only the D2 end of the crystal/coil/resistor combination must be switched. Keep lead lengths down to 2 inches or less.

RF INTERCONNECTING CABLE

To interconnect the oscillator to a transmitter strip, use ordinary 50-ohm coax cable such as RG/174. Length is not critical; you can run it 20 feet if need be. Be sure to keep the exposed coax center conductor short and ground the shield at each end to the oscillator and the transmitter boards respectively.

COIL WINDING DATA

All coils are provided prewound. This data is provided for coil identification only.

Coil #	T50	T144	T220
L1	27.5T #36	27.5T #36	27.5T #36
L2 Pri	6.5T #32	6.5T #32	6.5T #32
L2 Sec	10.5T #32	12.5T #32	12.5T #32
L3 Sec	10.5T #32	12.5T #32	12.5T #32

Figure 1; Tuning configuration

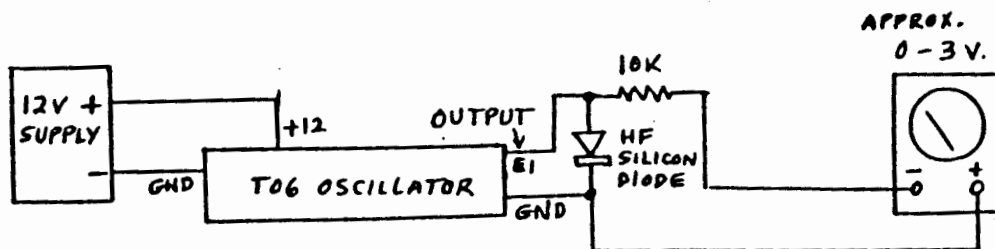
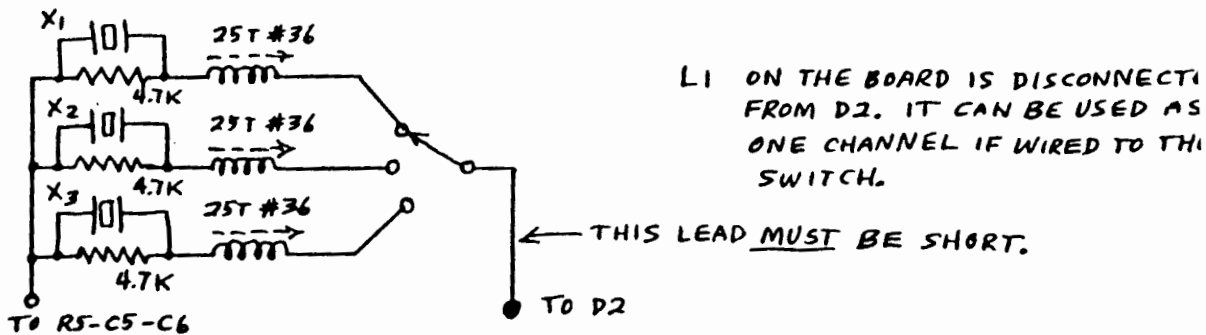


Figure 2; Crystal switching circuitry (optional modification)



MISCELLANEOUS

X1	crystal (18 mhz fund)	()	1 not supplied
	Circuit board	()	
	Instructions	()	

DIODES QUANTITY

D1	1N753	()	1
D2	MV2209	()	1

TRANSISTORS QUANTITY

Q1	2N5179 OR PN5179	()	1
Q2	2N3904	()	1

CAPACITORS DESCRIPTION QUANTITY

C1	.001 uf	ceramic	()	2	
C2	10 pf	ceramic	()	1	
C3	100 pf	ceramic	()	2	
C4	47 pf	ceramic	()	2	
C5	2.2 uf	tantalum	()	1	
C6	.001 uf	ceramic			
C7	.05 uf	ceramic	()	2	may be marked 473
C8	22 pf	ceramic	()	2	
C9	2.2 pf	ceramic	()	1	
C10	22 pf	ceramic			
C11	100 pf	ceramic			
C12	.05 uf	ceramic			may be marked 473
C13	47 pf	ceramic			

RESISTORS DESCRIPTION QUANTITY COLOR CODE

R1	10K	ohm carbon 1/4W	()	3	brown-black-orange
R2	4.7K	ohm carbon 1/4W	()	3	yellow-violet-red
R3-R4	10K	ohm carbon 1/4W			
R5	47K	ohm carbon 1/4W	()	1	yellow-violet-orange
R6	4.7K	ohm carbon 1/4W			
R7	1K	ohm carbon 1/4W	()	1	brown-black-red
R8	470	ohm carbon 1/4W	()	1	yellow-violet-brown
R9	47	ohm carbon 1/4W	()	1	yellow-violet-black
R10	4.7K	ohm carbon 1/4W			

INDUCTORS QUANTITY

L1	slug-tuned form,	()	1	27.5 TURNS #36
L2	slug-tuned form,	()	1	SEC-12.5 TURNS...PRI-6
L3	slug-tuned form,	()	1	12.5 TURNS #32
L4	.33 uh choke	()	1	

End of list

