

**DEM Part Number SHFLO and SHFLOK  
Local Oscillator kit for all DEM SHF Transverters**

**Construction**

All components are surface mounted. Refer to the provided schematics and component placement diagram for assembly.

**Operation**

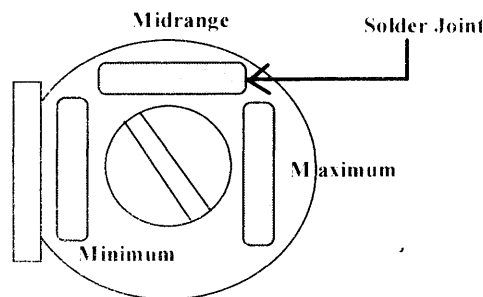
The SHFLO is intended to be used as part of an associated line of transverters; but, may be used as a stand alone oscillator. The following table provides crystal information and multiplication factors for several amateur bands, using a 144 MHz IF and low side injection (these are the standard configurations for the DEM1 microwave transverters).

Band	Crystal	SHFLO Output Frequency	External Mult.	Injection Frequency and Output Power
1269	93.750MHz	562.500 MHz	X2	1125.000 Mhz +10dBm
1296	96.000 MHz	576.000 MHz	X2	1152.000 Mhz +10dBm
2304	90.000 MHz	540.000 MHz	X4	2160.000 Mhz +0dBm
2400	94.000 MHz	564.000 MHz	X4	2256.000 Mhz +0dBm
3456	92.000 MHz	552.000 MHz	X6	3312.000 Mhz +0dBm
5760	93.600 MHz	561.600 MHz	X10	5616.000 Mhz +10dBm

Other frequencies and multiplication schemes are possible, but are restricted to final output frequencies between 520-580 MHz due to the frequency and bandwidth of the etched filters.

**Oscillator Testing and Tune-Up:**

Connect the positive lead of a Voltmeter to the R7 / Q2 junction. Apply 12-15VDC to the Buss line and adjust C1 for maximum voltage. Note where the capacitor is positioned. A midrange position is preferred (see diagram below). If the capacitor is at the maximum position, spread coil L1 1 to 2 turns and readjust C1 for maximum voltage, the capacitor should be near midrange, if not repeat. If the capacitor is at minimum position, repeat process but this time compress coil L1. And if necessary, you may need to wind a new coil and replace it. The final voltage should be approximately 1.0 - 2.0 volts. If a frequency counter is available the Xtal. frequency may be checked at the C11 and C12 junction. The final frequency should be check at the circuit's output. If the voltage or frequency can not be obtained, check all components in the oscillator circuit for proper installation.



**C1 Capacitance Position**

**Voltage test points**

Test junction point	Voltage
L3-C11	5V ± 0.5
R9-C15	5V ± 0.5
R10-FILTER	5V ± 0.5
L6-C21	5.25V ± 0.5

Output power should be approx.  $\geq +10\text{dBm}$ . For the Low level LO it is  $\geq +0\text{dBm}$ .

**Parts List**

All capacitors are chips and all resistors are 1/4W unless otherwise noted. The coils are formed using #24 enamel wire.

C1 1-6 TRIMMER	C12 15	C23 10	L8 3T 1/16" I.D. *	R9 470
C2 1000	C13 10	C24 5	Q1 MPS5179	R10 270
C3 0.1 $\mu\text{F}$	C14 0.1 $\mu\text{F}$	C25 27 ❶	Q2 MPS5179	R11 150 1/2W ❶
C4 15	C15 27	D1 HP 2800's	R1 1.5K	U1 78L08
C5 39	C16 0.1 $\mu\text{F}$	L1 9T 1/8" I.D.	R2 680	U2 MAR3
C6 1000	C17 0.1 $\mu\text{F}$	L2 0.33 $\mu\text{H}$	R3 470	U3 MAR1
C7 3.3 $\mu\text{F}$ TANT	C18 27	L3 8T 1/8" I.D.	R4 100	U4 MAR2
C8 3.3 $\mu\text{F}$ TANT	C19 0.1 $\mu\text{F}$ ❶	L4 8T 1/8" I.D.	R5 47	U5 MAR4 ❶ ❷
C9 1000	C20 27 ❶	L5 6T 1/8" I.D.	R6 470	Y1 CRYSTAL
C10 1000	C21 27	L6 8T 1/8" I.D. ❶	R7 100	
C11 27	C22 5	L7 3T 1/16" I.D. *	R8 150 1/2W	

\* Space wound

- ❶ The 2304-144 and 3456-144 requires the low level option.(+0dBm) Delete U5,L6,C25,C20,R11 and C19.
- ❷ Install a MAV-11 for a High power version  $>+13\text{dBm}$

**Note:** The dots of the MMIC's on the component placement diagram indicate the input. Please refer to the following drawings for the MMIC's markings.

