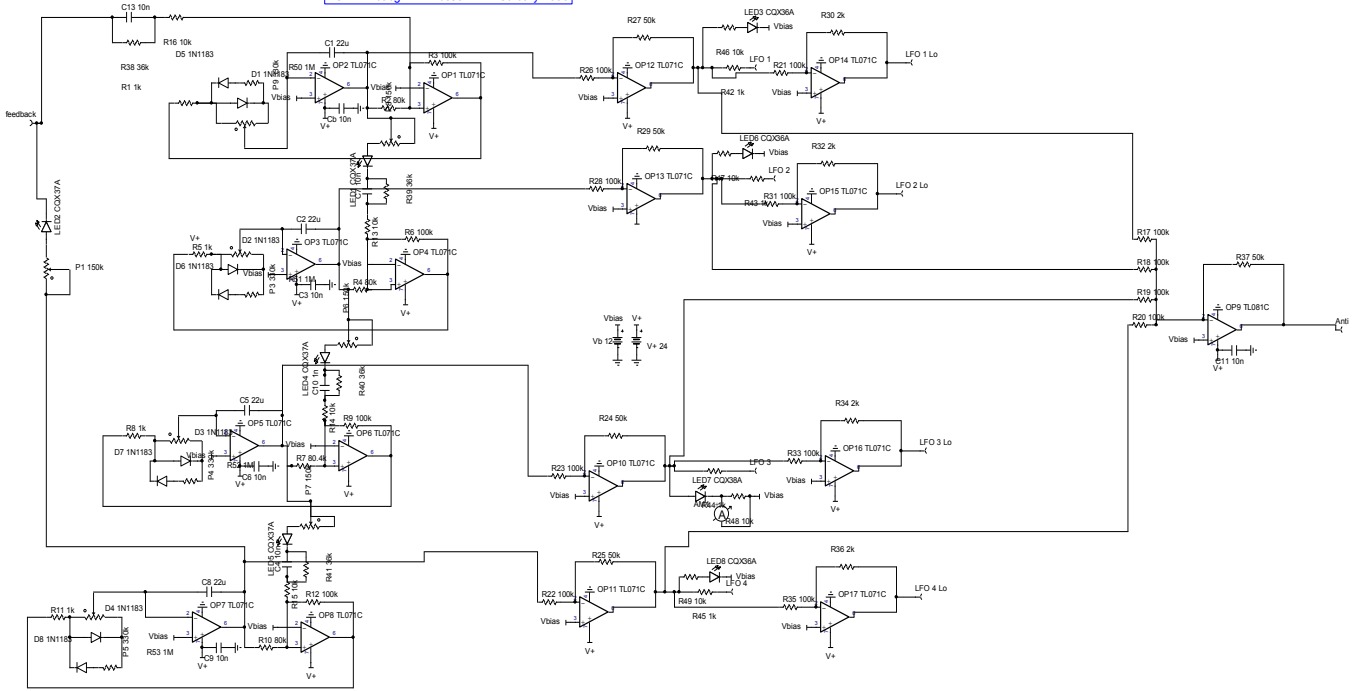


### Multiple Synced LF Oscillators

Based on  
 Triangular & Square Wave Oscillator  
 Neil P. Albaugh TI- Tucson 24 February 2006



This oscillator produces both a triangular and a square wave output. U1 functions as an integrator, creating a triangular wave out of the square wave produced by U2. Op amp U2 is used here as a comparator with a very large amount of hysteresis, centered around Vbias. As shown the oscillator frequency is 19kHz. The oscillator frequency is dependent on R1, C1, and the peak- to- peak output of U1. Decreasing the hysteresis of U2 by making R2 lower will increase the oscillator output frequency. It is necessary to use a reasonably fast op amp for U1 & U2; the low input bias current of an OPA354 allows the use of high resistances in R1, R2, & R3 without creating significant offset errors; its r- characteristics are also used to advantage here.  
 $V_{oTri} = V_{oSq} \cdot R_2 / R_3$  and  $F = V_{oTri} / (4 \cdot V_{oTri} \cdot C_1 \cdot R_1)$  where the output voltages are: Volts peak- to- peak.

