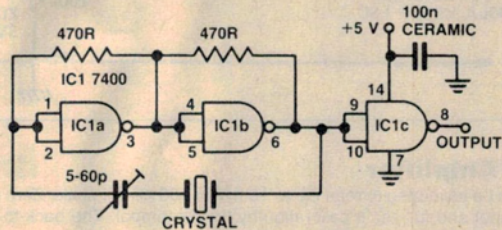
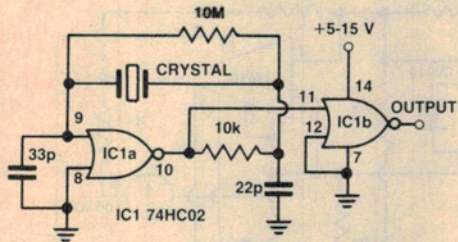


HCMOS Crystal Oscillator

This circuit works well with crystals in the MHz region, up to 15 MHz, perhaps more. It starts reliably and can be operated on any supply rail between 5 V and 15 V. The 22p and 33p capacitor values may need to be increased for lower frequency crystals — but maintain the ratio.



Reliable TTL Crystal Oscillator

Many TTL crystal oscillators have been published over the years, and many exhibit unreliable oscillation — particularly on startup. This one has none of

those problems. This will work with crystals in the 1 MHz to 20 MHz range as well as with 'Ceralock' ceramic resonators. The trimmer is to set the crystal to frequency, if necessary. If not, substitute a 100p-1n ceramic capacitor.