

## X-4046 VCO PARTS LIST

**All fixed resistors are 1/4-watt, 5% values.**

R1	100Ω trimmer
R2, R3	390Ω
R4-R7	1k
R8	1.8k
R9	2k +3500ppm/° C thermistor
R10-R12	2.2k
R13	3k
R14	4.7k
R15-R19	10k
R20	12k
R21	18k
R22	33k
R23	50k trimmer
R24-R26	75k
R27-R35	100k
R36-R41	100k trimmer
R42-R47	100K linear potentiometer
R48, R49	120k
R50, R51	220k
R52	330k
R53	500k linear potentiometer
R54	1.5M
R55	2.2M
R56	3.3M

**All capacitors are 16V or better.**

C1	100pF disc
C2	470pF disc
C3	0.01μF poly or mylar
C4 - C9	0.01μF disc
C10	0.1μF disc
C11	0.22μF mylar
C12, C13	10μF electrolytic

### Semiconductors

D1 – D3	1N4148 diode
Q1-Q5	2N3904 NPN transistor
IC1	4046 CMOS phase locked loop
IC2	LF442 dual op-amp
IC3, IC4	TL074 quad op-amp

### Other components

S1	SPST switch
J1 – J10	1/4" phone jack, n.o.

**Miscellaneous:** printed circuit board, IC sockets, front panel, knobs, wire, etc.

### Notes:

1. Due to modern manufacturing practices, Q1 and Q2 may be close enough in spec for good results. Of course, these could be hand-matched. Best of all would be to substitute a monolithic matched pair for these.
2. If the triangle wave needs to be boosted in amplitude, increase R34 to 120k, say.
3. You may not need much high frequency adjustment, in which case replace trimmer R36 with a 1M value.