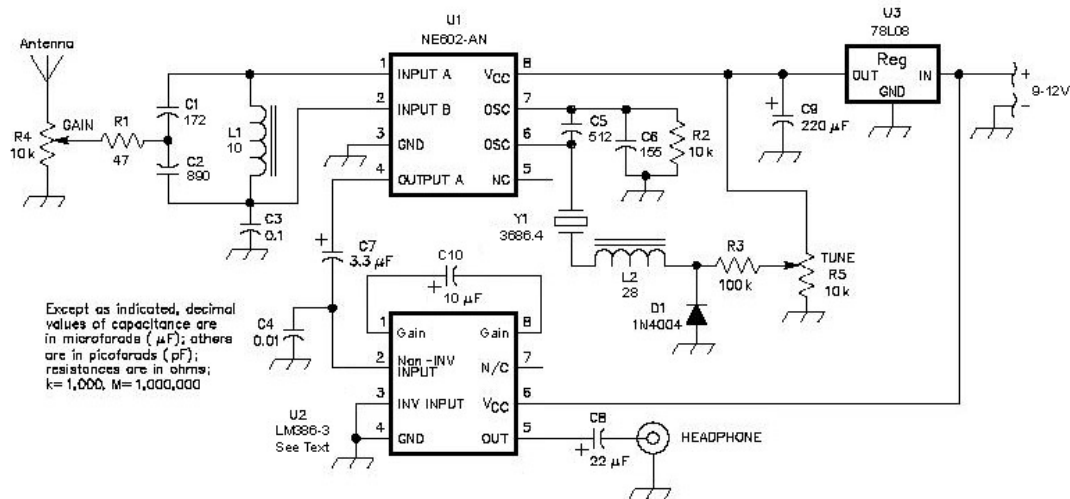


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Converting the MRX-40 to 80 Meters (3686.4 KHz)

Schematic

The same basic circuit is used. However, some modifications were used due to parts availability and some performance improvements were made as well.



Except as indicated, decimal values of capacitance are in microfarads (μF); others are in picofarads (pF); resistances are in ohms; k=1,000, M=1,000,000

Figure 1. Schematic for MRX-80 (MRX-40 converted to 80 Meters)

Modifications

Component Changes

1. U1, the NE612 was replaced with a NE602. Either component will work in this circuit, however, the NE602 has 4 dB more conversion gain than the NE612.
2. U2, the LM380 was replaced with a LM386. The LM386 is a more easily obtainable part (available at most Radio Shack stores) than the LM380N-8. However, it does have less power output. The LM386-3 provides up to 700 mW of power, more than adequate for headphone use. Note that C10 was added to the circuit to boost the LM386 gain to 46 dB (200).
3. U3, the 78L06 was replaced with a 78L08. Either component will work in this circuit, however, running the NE602 at 8V yields an extra 1 dB of conversion gain.

RF Component Scalings

1. C1 – scaled to 172 pF ($X_c = 250 \text{ Ohms}$); not a standard value, but can be made using a 150 pF and a 22 pF (or 20 pF) in parallel, or a 180 pF would probably work also.

2. C2 – scaled to 890 pF ($X_c = 48$ Ohms); not a standard value, but can be made using a 820 pF and a 68 pF (or 82 pF) in parallel.
3. C5 – scaled to 512 pF ($X_c = 84$ Ohms); not a standard value, but 470 pF works just fine as a replacement
4. C6 – scaled to 155 pF ($X_c = 277$ Ohms); not a standard value, but 150 pF is plenty close enough
5. L1 – scaled to 10.6 uH ($X_l = 246$ Ohms); can use standard value 10 uH molded inductor
6. L2 – scaled to 28 uH ($X_l = 660$ Ohms); can use standard value 27 uH or 33 uH molded inductor

“Manhattan”-Style Construction

The original MRX-40 PC board layout measured 1” x 2”, which is a little tight for construction (especially Manhattan-style construction). You should “stand on end” all resistors, inductors and the diode. Use the smallest capacitors you can—there are no voltages over 12V to 15V (depending on supply).

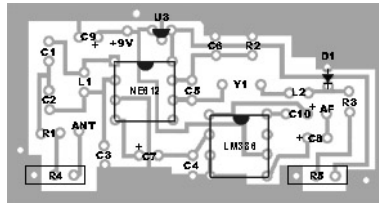


Figure 2. PC board layout for MRX-40 converted to 80 Meters

Install the NE612 and the LM386 first. Then work outward from the center of the board, first installing the capacitors and L1 and L2. Then install Y1, R2, wire to AF and ANT pads, R3, R1, U3 and then finally, R4 and R5. Finally, install wire for power supply and ground wires and wire ANT and AF wires to appropriate jacks.