

A Five-Component Wideband Amplifier for Your Receiver

Give your VHF receiver a boost!

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Imagine a very wideband amplifier which covers a range of from about 100 MHz to 2,000 MHz, and requires only four other components to make it work. The Mini Circuits catalog lists just such a device, called a MAR-8. It is extremely small, measuring about 0.078 (5/64) inch in diameter by about 0.62 (1/16) inch thick. It has a gain of about 33 dB at 100 MHz, pretty impressive for such a small device.

Getting It Together

I needed a preamplifier for one of my VHF



Photo A. Close-up of the finished amplifier: MAR-8 (center), chip caps, resistor, stand-off insulator bead on the resistor lead, BNC connectors and 12 volt wires.

receivers and decided to try this device. I obtained a MAR-8, two 100 pF chip capacitors, a 120 ohm 1/4 watt resistor, and a ferrite bead and hooked it all up. The amplifier worked very well. I heard signals which I had never heard before. The old marginal signals

were now fully quiet. This amplifier makes a nice weekend project.

The amplifier uses chip capacitors so, while some care must be taken when soldering them into the circuit, constructing the amplifier was easy. Here is how I did it.

It's easy to make a printed circuit board, but I chose to hard wire the device instead. I mounted five small standoff insulators on a piece of copper-clad board (i.e. double-sided printed circuit board material) as shown in Figure 2. The circuit board material measured approximately 1/2" wide by 1-1/2" long. After mounting BNC connec-

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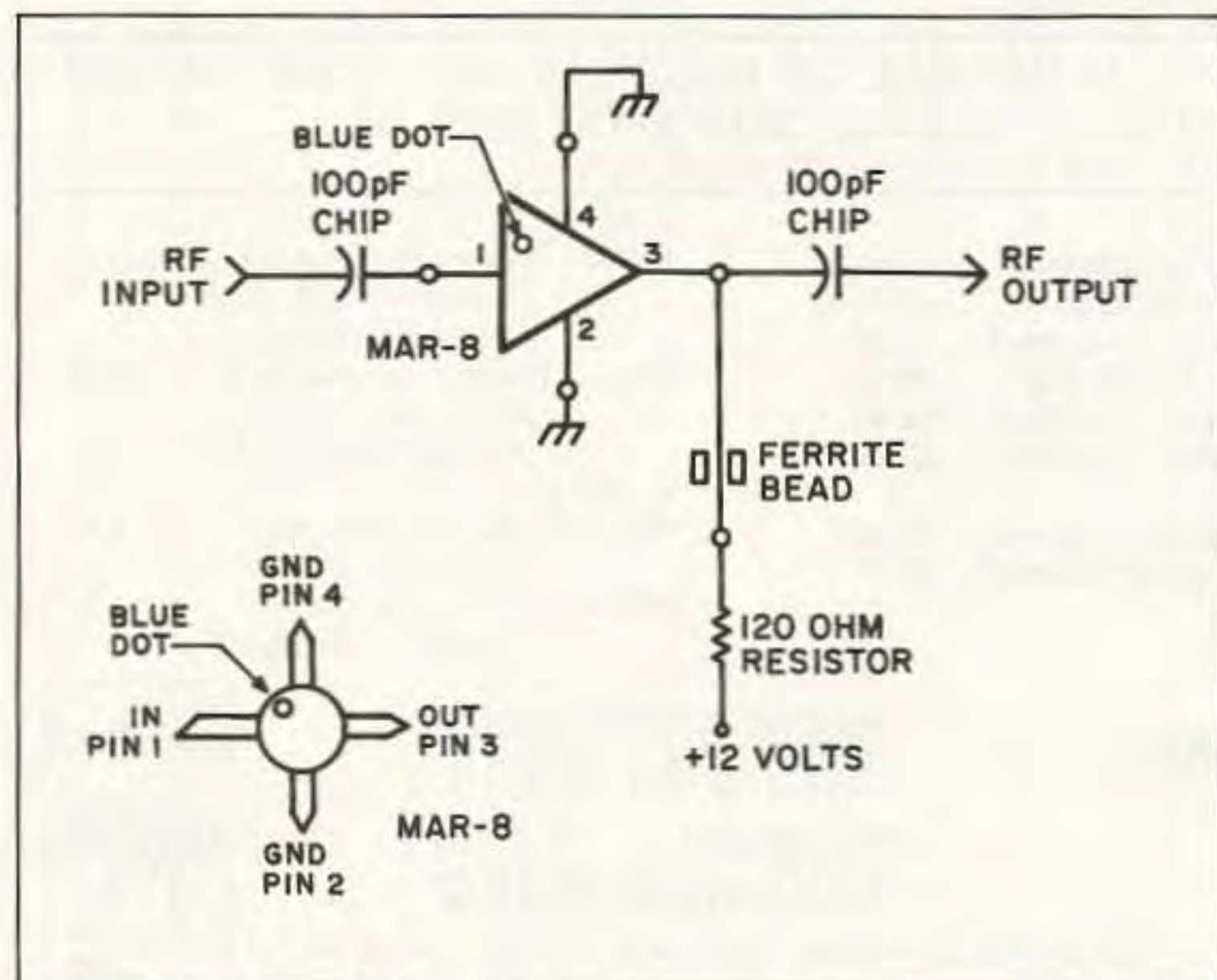


Figure 1. Schematic for the 5-component RF amplifier.

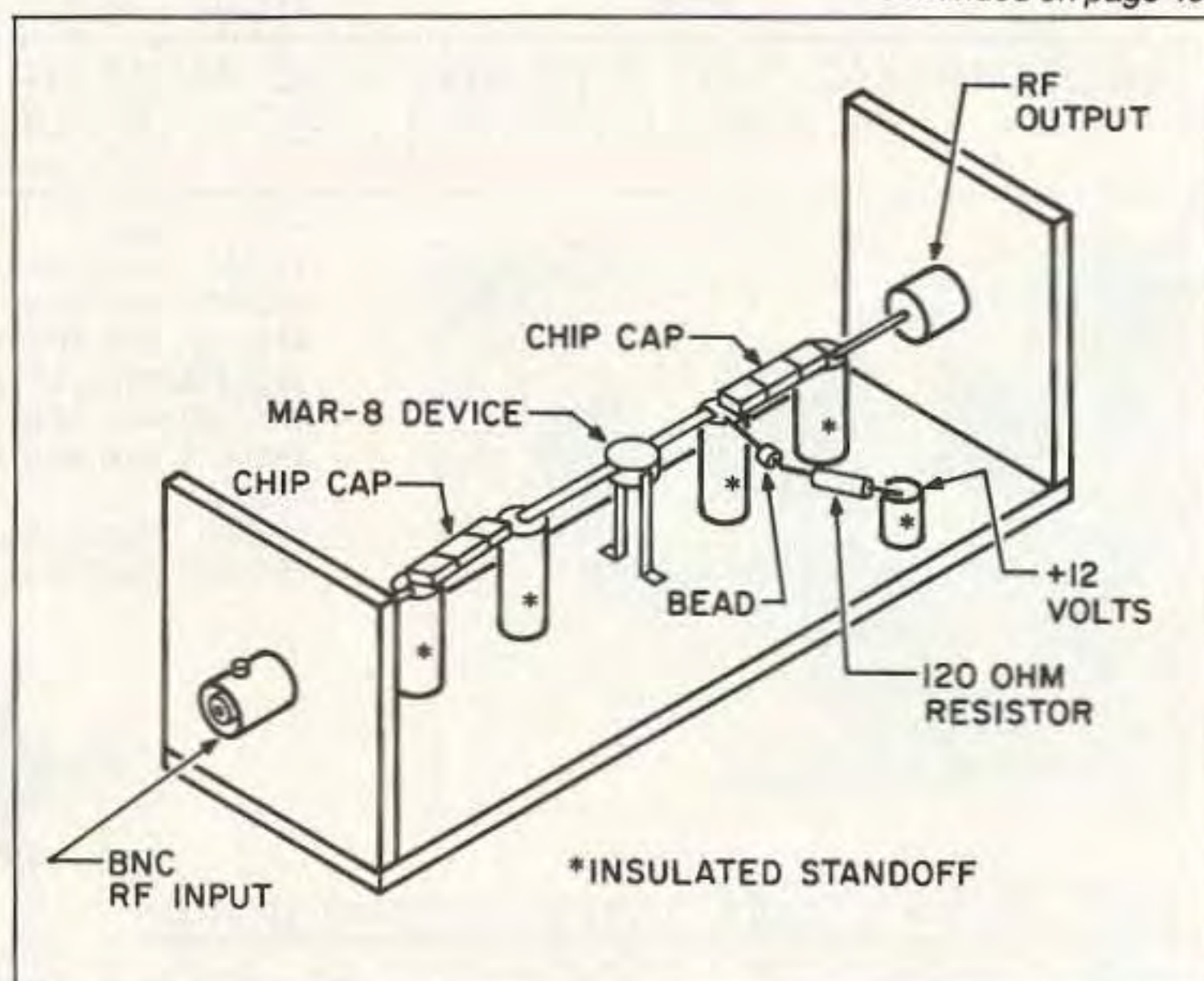


Figure 2. Parts placement for the RF amplifier assembly.

Five-component wideband amplifier

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tors at each end of the board, I installed the standoff insulators. I then soldered the chip capacitors in place with great care—they are small.

Next, I mounted the MAR-8. First I bent pins 2 and 4 down so they touched the copper-clad board (ground), then I soldered them to the board. Pins 1 and 3 were bent straight out to span between the standoff insulators which support the input and output capacitors. Then they were soldered in place.

After this, I slipped the ferrite (or powdered iron) bead over the resistor lead nearest to pin 3 of the MAR-8. I soldered this lead to the standoff insulator connected to pin 3 of the MAR-8. The other end of this resistor was connected to another standoff insulator and became the attachment point for the +12 volt supply. Incidentally, the size of the resistor is chosen to provide approximately 36 mA to the MAR-8. The data sheets recommend 111 ohms, but I used 120 ohms because that is what I had on hand. The data sheets also recommend a 1 μ F capacitor from the +12 volt point to ground if erratic behavior is experienced. My amplifier did not need this capacitor.

Figure 1 shows the schematic for the amplifier. Figure 2 gives a pictorial representation of how the amplifier was assembled.

Photo A is a close-up picture of the device. The length of the little enclosure is about 1-1/2" inside of the box. It is about 1/2" wide and about 5/8" deep. In this view the sides of the box have been removed to show the components. MAR-8 can be seen in the center.

After I tested the amplifier, I cut three more pieces of copper-clad board and enclosed the device by soldering the three pieces together to form a box. I have used the amplifier for about six months now with good results. **73**

Parts List

Qty.	Device
1	MAR-8
2	100 pF chip capacitors
1	120 ohm resistor
1	ferrite bead
2	chassis mount female BNC connectors
5	insulated standoffs
Misc:	Box (made out of PC board material).

Parts Sources

MAR-8: Mini-Circuits, Box 350166, Brooklyn NY 11235-0003; phone (718) 332-4661.

100 pF chip capacitors & resistor: Mini Circuits, or Digi-Key, 701 Brooks Ave. South, P.O. Box 677, Thief River Falls MN; (800) 344-4539.

RF Bead: Amidon Associates, P.O. Box 956, Torrance CA 90508; phone (213) 763-5770.

BNC connectors: Radio Shack stores.