Versatility is the key word in this article. N4PC shows us how to really "increase the mileage" out of a 40 meter antenna.

My 40 Meter Double-Extended-Zepp Antenna Shows Its Versatility

BY PAUL CARR*, N4PC

It is not unusual to receive a telephone call from one of my readers with an antenna question. I enjoy talking to these people, and hopefully I am able to provide answers to some of their questions.

One often-asked question lately is what kind of antenna will work on the 160 meter band and will provide good results through 10 meters? I have also heard readers comment that they have tried a 160 meter dipole, but had trouble tuning the antenna on some of the higher bands.

Well, there is a fairly simple solution to this problem: Use a 40 meter antenna! Let me explain. The 40 meter extended double Zepp is the antenna to try. It is slightly shorter than a half-wave 160 meter antenna, and it eliminates some of the tune- up problems you may have encountered in the past.

Background

You don't have to listen on the bands very long to find out that one of the most popular wire antennas in use today is the G5RV. That antenna is designed to be a three half-wave dipole cut for 20 meters. This makes the antenna 102 feet long, and the antenna is useful from 80 through 10 meters.

In recent years the double G5RV has made an appearance. It is 204 feet long and is useful from 160 to 10 meters. This was the starting point for my research on this antenna project.

Although the double G5RV was about the physical length that I was looking for, a computer analysis showed the antenna produced

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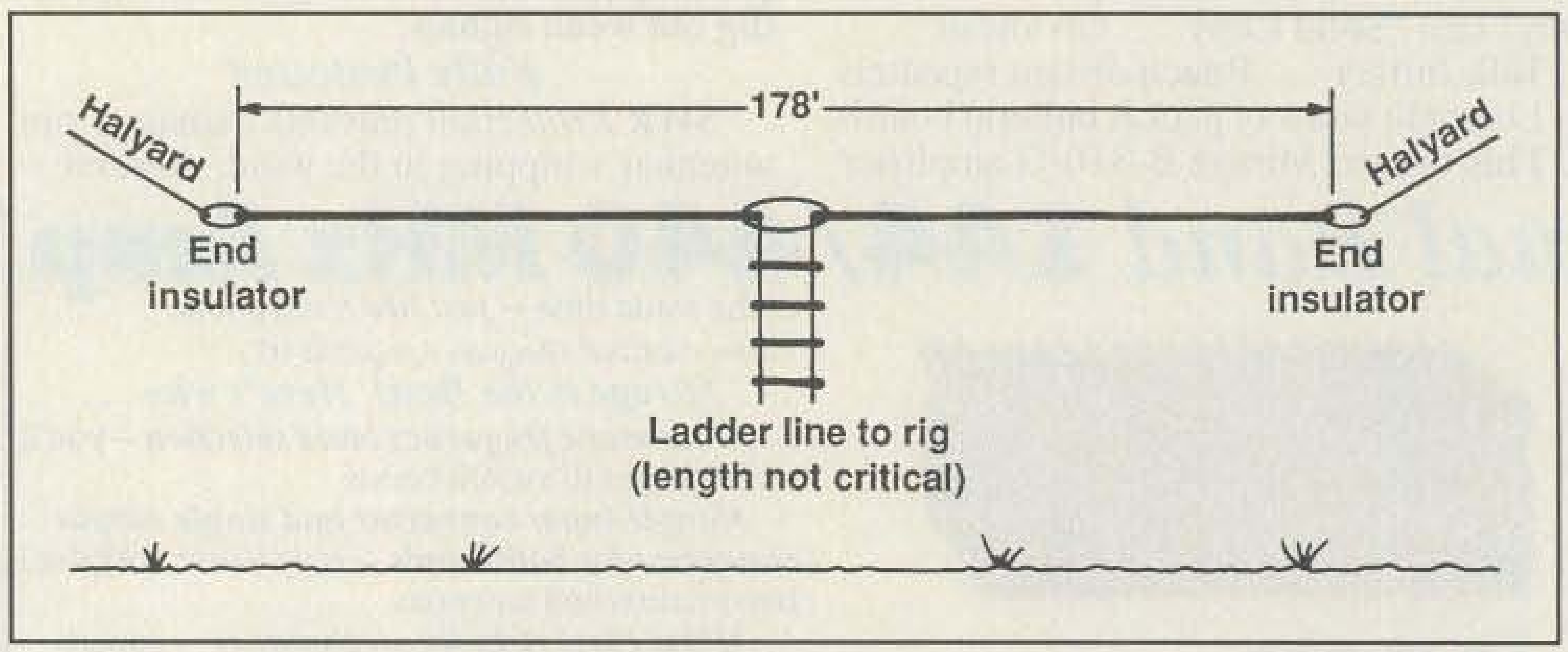

Fig. 1– Basic antenna configuration.

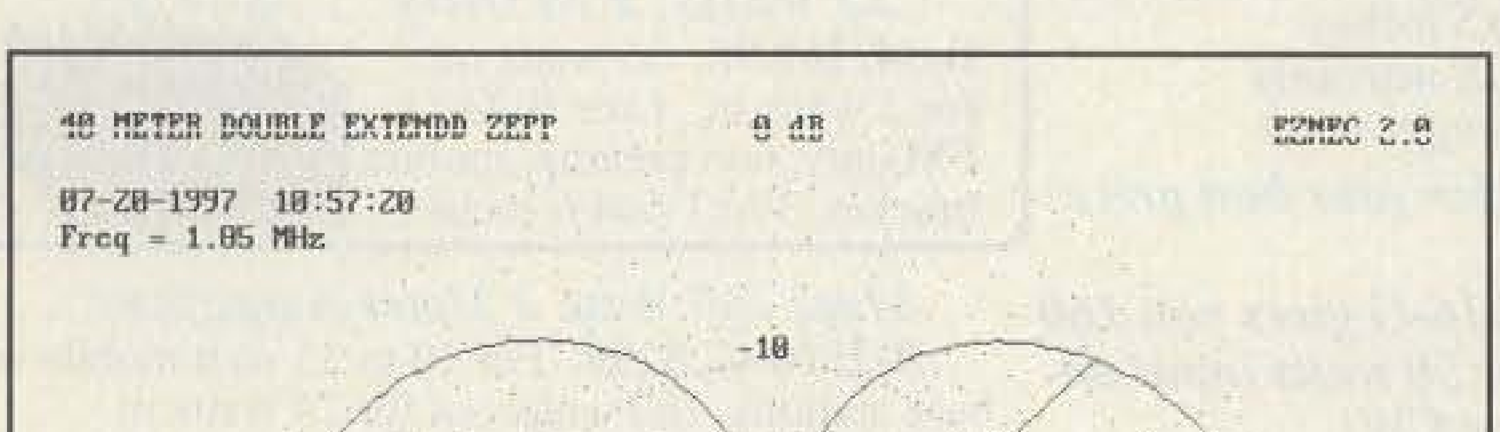

Fig. 2– Computer analysis of the antenna pattern on 160 meters.

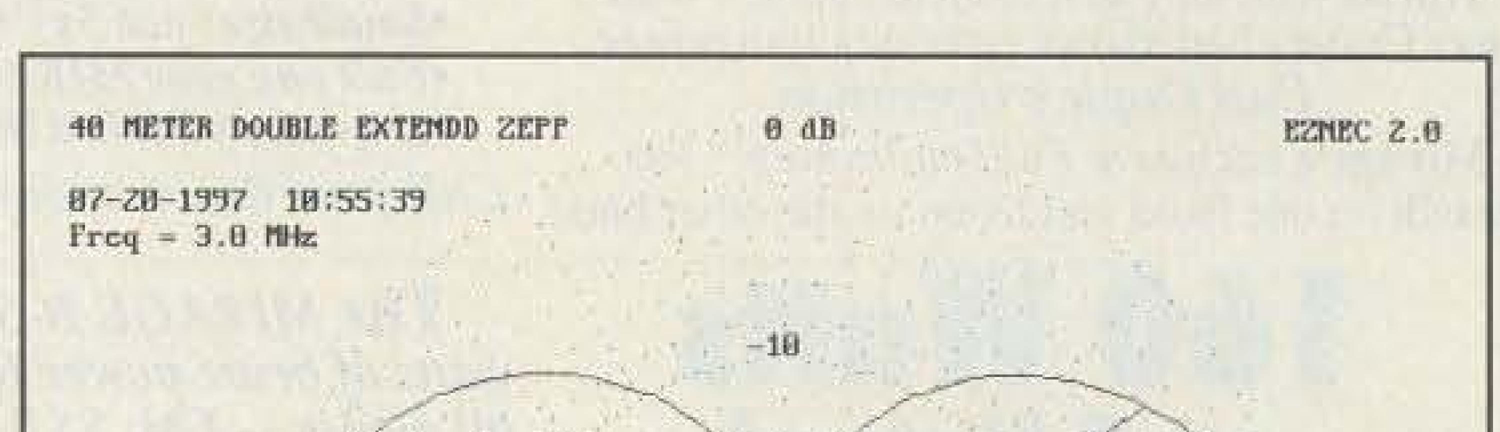

Fig. 3– Computer analysis of the antenna pattern on 75 meters.

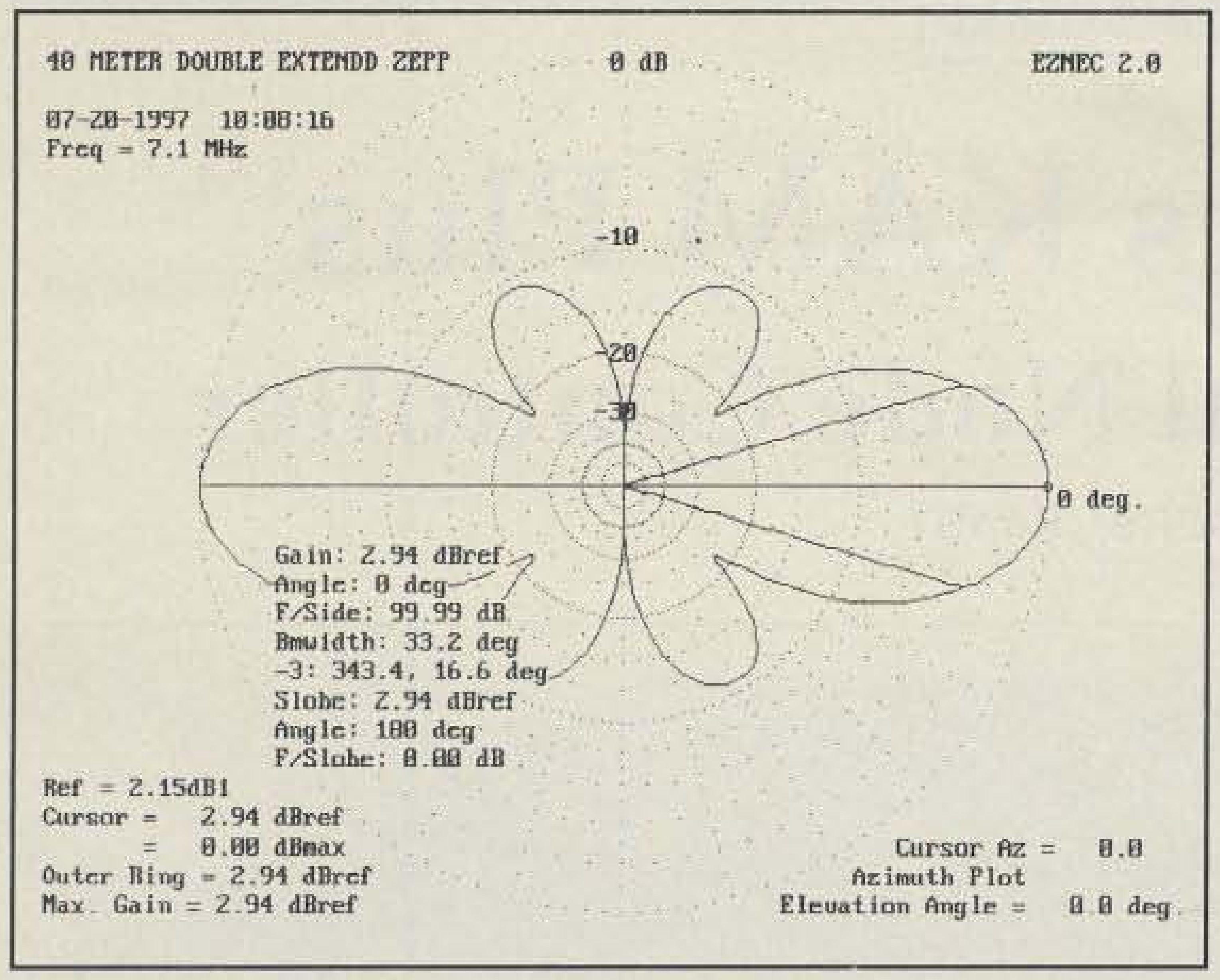

Fig. 4– Computer analysis of the antenna pattern on 40 meters.

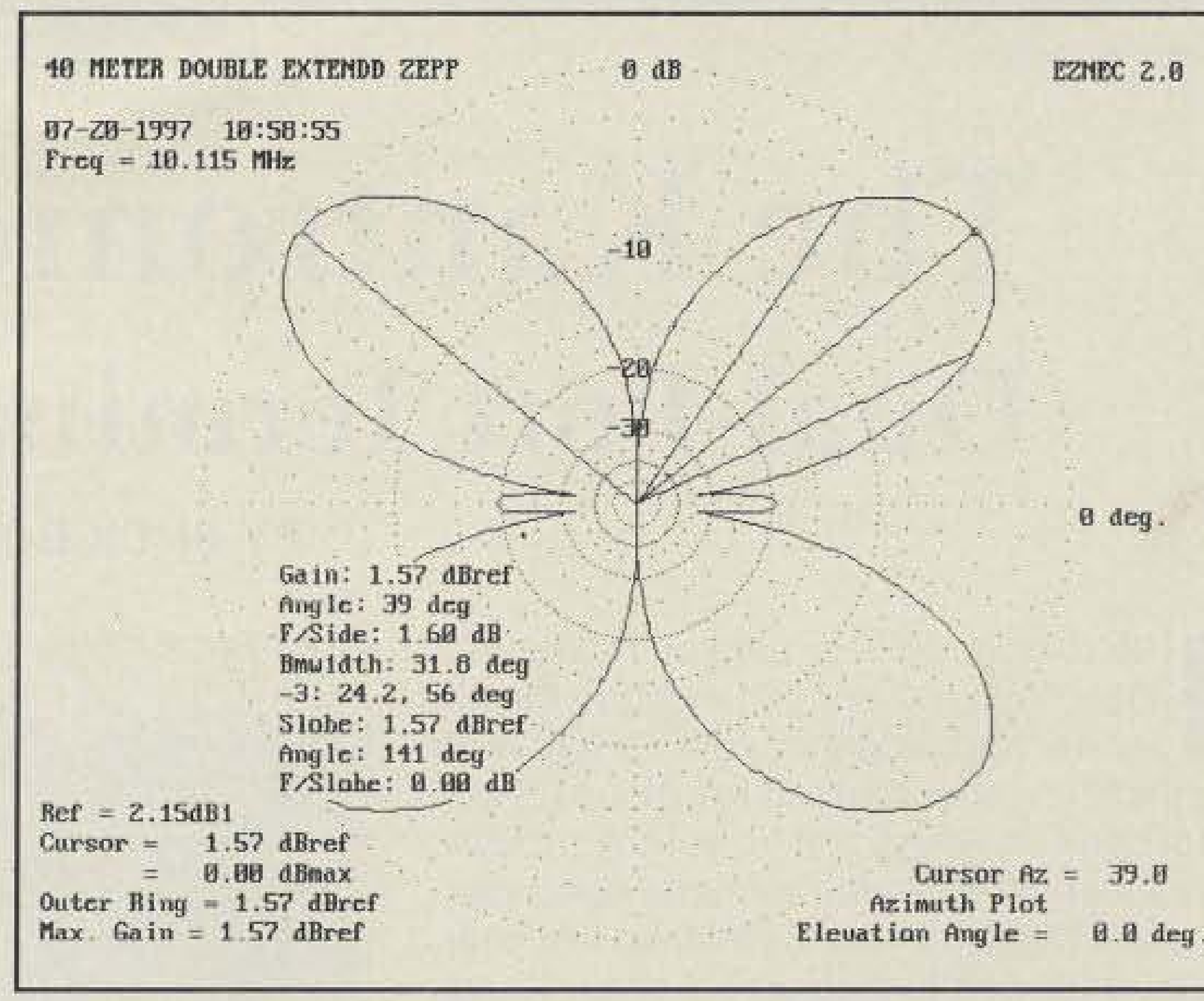

Fig. 5– Computer analysis of the antenna pattern on 30 meters.

a six-lobe pattern. I wanted to have the antenna produce a bit of gain on 40 meters, and the simple answer was to shorten the antenna to about 178 feet. This greatly attenuated two of the side lobes and provided about 3 dB of gain. Further computer analysis showed that the performance was not greatly affected on 160 and 80 meters.

I have generated free-space antenna patterns for this antenna for the 160 through 20 meter bands. I also checked the predicted impedance of the antenna on each band in question, and there were no weird values predicted. This initial analysis seemed to be sound, so on to the construction phase.

Construction

Basically, this antenna is nothing more than a long dipole fed with a balanced feed line. I built my antenna from No. 14 stranded, insulated wire. The overall length of my antenna is 178 feet, but that dimension is not critical. I cut a total of 180 feet of the wire, doubled the wire, and cut it in the middle. This gives two lengths of 90 feet. I attached the two pieces of wire to the center insulator, connected the ladder line that I was using for a feeder, and soldered the connections. Be sure these connections are well-made both mechanically and electrically. The performance of this antenna depends on the structural integrity. Subsequently, attach the end insulators and the antenna is ready to go into the air.

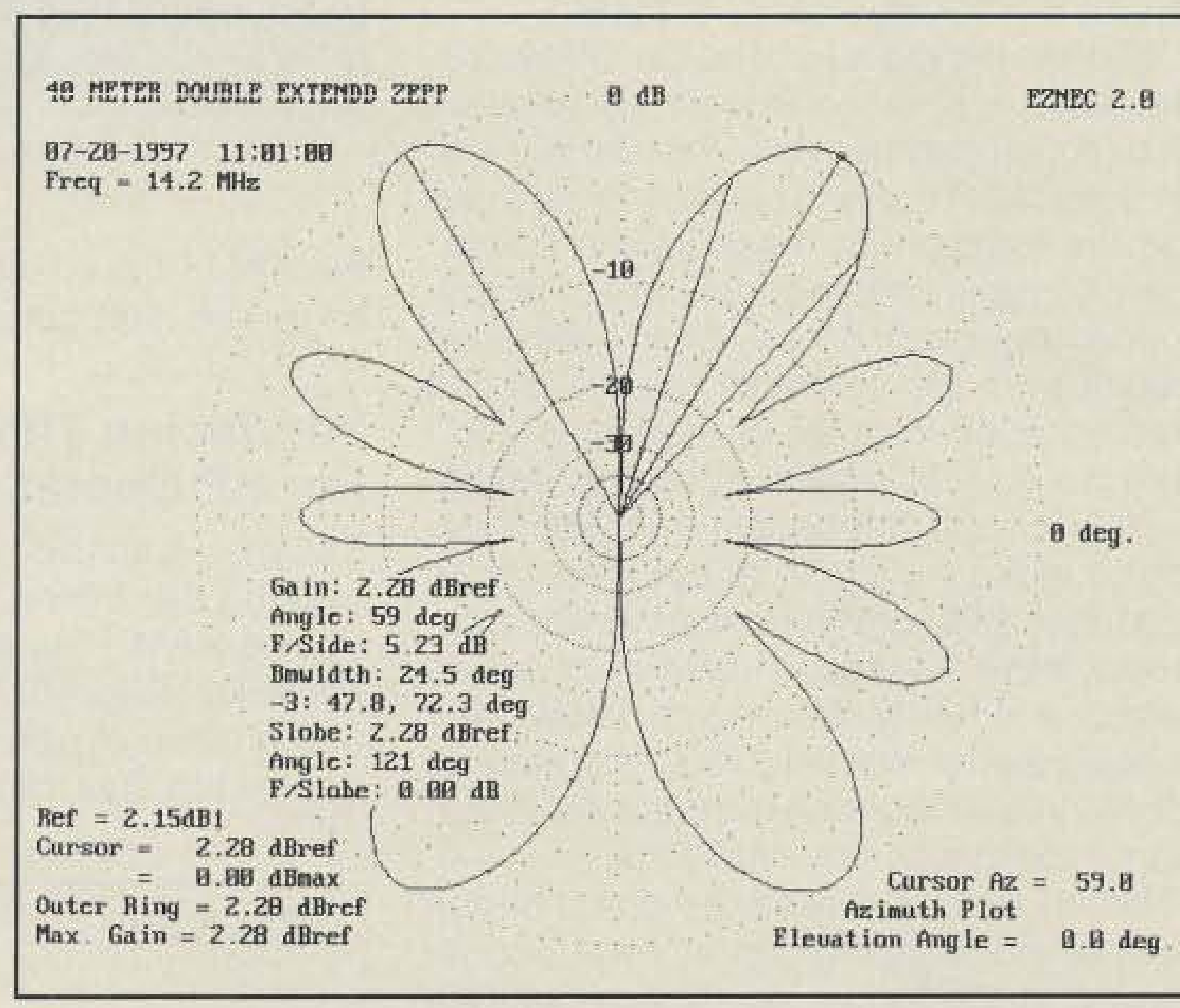

Fig. 6– Computer analysis of the antenna pattern on 20 meters.

Placement

I placed my antenna in a normal "flat-top" configuration, since I have convenient trees on my property. It can also be installed in an inverted "Vee" configuration. The pattern probably will become slightly less pronounced as the ends of the antenna are brought closer to the ground, but I'm sure you would notice the difference on the air. Another option is to place as much of the antenna in a horizontal configuration as possible and let the ends hang vertically. Your choice of placement will depend on what's available to you.

Performance

I have been very pleased with the performance of the antenna on all bands 160 through 10 meters. My MFJ 989c transmatch was very happy with this configuration on all bands. Nowhere in the spectrum did I encounter matching difficulties.

The computer-predicted patterns for 160 through 20 meters are shown in figs. 2 through 6. The patterns on the bands from 17 through 10 meters are not included to save space, but the main radiation will become more closely aligned with the conductor.

Since this is a non-resonant antenna, it avoids the problem sometimes encountered when using a 160 meter half-wave antenna on 80 meters. Matching problems can arise when using a 160 meter half-wave antenna on 80 meters due to the fact that you are attempting to feed a full-wave antenna at a high voltage point. Since this antenna is not a full wave on 80 or a multiple of full waves on higher bands, the high-voltage feed problem does not exist. I have had no trouble matching this antenna on any bands from 160 meters through 10 meters.

I am often asked about bringing balanced feed line into the shack. Most times this presents no problems. If unwanted RF problems present themselves, I wind several turns of high-quality RG-8 coax around a 4 inch diameter piece of plastic water pipe and place the coil of coax outside my shack. I extend the coax to my MFJ 989c transmatch, and the problem disappears. My best advice is to use common sense.

This antenna has proven to be to be a very good performer, providing excellent results throughout the high-frequency spectrum. By the way, if you don't have room to place the antenna as it is described, you can cover the bands from 80 through 10 meters by cutting the dimensions in half. The computer plot for 160 meters will then correspond to 80 meters, and the plot for 20 meters will correspond to 10 meters. The tuning results should be the same as discussed.

Good luck, and I'll see you on the bands. I'm sure you will raise some questions when you tell people that you're using your 40 meter antenna on 160 meters! ■