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Build Yourself an NVIS

If you want to talk to the guy in the next county on HF, of course.

We have all experimented with antennas. At one time or other we played with dipoles, verticals, quads, yagis, and variations of wire antennas. All for the desire of a low-angle signal, which will help us snag DX stations. There have been numerous articles and books on antennas, making us very familiar with the above antenna names. But have you ever heard of the Australian " District Antenna," or the Russian " Zenith Radiation," or what our military calls NVIS (Near Vertical Incidence Skywave)?

This antenna has been around since World War II. The reason most hams have not heard about it is their desire to work faraway stations. When it comes to local communications, VHF/UHF is more common. But there are many cases where the range of VHF is limited, and reliable communications are needed on HF.

In many population centers, there is the desire of many hams to communicate within a 100- to 300-mile radius.

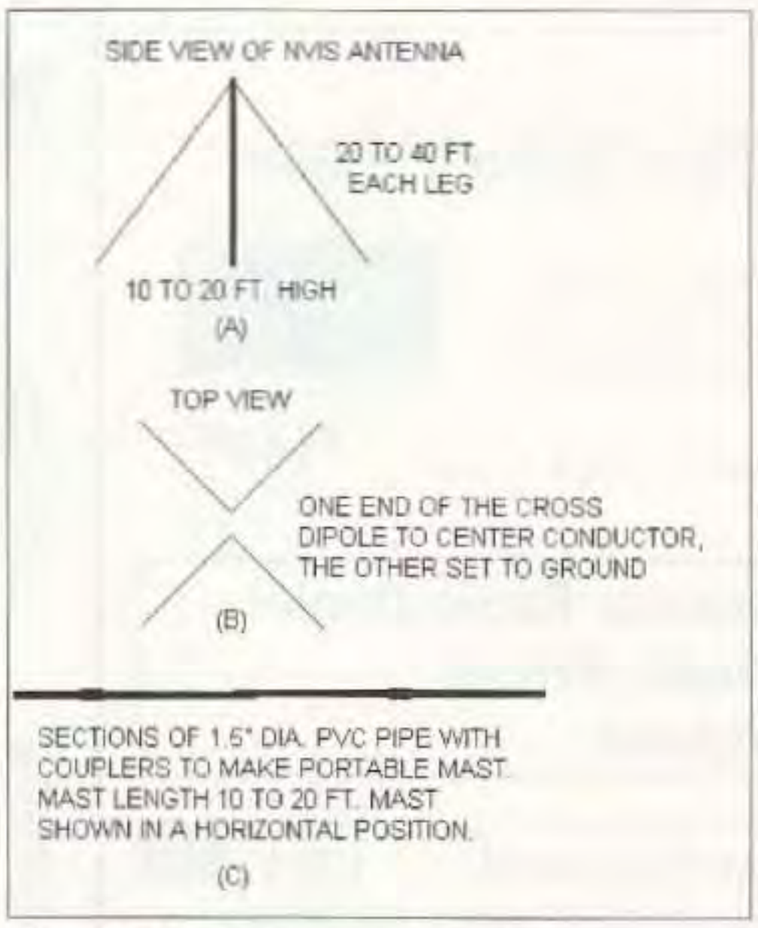

Fig. 1. NVIS antenna details.

In those cases, the known popular antennas might not provide a reliable link. Our military had the same problems, and they found that producing a high angle skywave provided a reliable link, less subject to fading. With a high angle, the surrounding terrain is not an issue.

How to experiment with NVIS

There are many ways an antenna can be made to work in an NVIS mode. The easiest is to run a wire fed with a tuner a few feet from the ground. In most cases, a high-angle skywave will be produced. Stations nearby will be able to communicate.

Another approach is to take your HF mobile antenna and place it in a horizontal position parallel to the ground. You could experiment with the distance between the ground and horizontal antenna. A distance of 3 to 9 feet will work.

When experimenting with NVIS, 80, 40, and 30 meters seem to work best. I tried frequencies between 3.5 and 30 MHz. The factors of working frequencies below the MUF (Maximum Usable Frequency) play a very important role. Power levels of QRP to 100 watts have been used.

Building a simple NVIS antenna

A very simple NVIS antenna can be built, for fixed or portable use. (Please refer to **Fig. 1**.) The basic NVIS antenna is nothing more than two crossed dipoles mounted anywhere from 10 to 20 feet high. The legs of the dipole are sloped and secured to the ground. The crossed dipoles are fed with 50-ohm coax. A tuner, manual or automatic, is required.

A fixed NVIS antenna can be a wooden pole, PVC pipe, or metal mast. The lengths of the wire elements can be anywhere from 20 to 40 feet. For a portable NVIS antenna, a mast could be made from 1.5"-diameter PVC tubing mating with PVC couplers. A piece of coax fed through the mast then feeds the crossfed dipoles.

Please make sure that safety concerns are taken into consideration. You do not want anyone to run into the sloping wires, which will be a few feet off the ground. This type of antenna has been made commercially by Telex. It is called the NVIS Antenna, with a model number of AS-2259/1990.

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References

NVIS Communications, by David Firdler and Edward Farmer. Available for $14.00 from World Radio Books, P.O. Box 189490, Sacramento CA 95818. Excellent.

"NVIS Antennas," by Edward Farmer AA6ZM, *QST Magazine*, January 1995.

US Field Manual 24-18, "Single Channel Communications Techniques." Has a section on NVIS antennas.

Net sources

NVIS Antenna Information (excellent Web site for NVIS systems): [www.tactical-link.com].

Construction of an NVIS Antenna, by Dr. Carl O. Jelinek: [www.qsl.net/vcars/carl/nvis.htm].

NVIS community at onelist.com: [www.onelist.com/community/nvis].