

NVIS EXPERIMENT

Sometime back in January/February 2007, and in a conversation with David Houser (WA9OTP) and Bob Ammann (KD5OMY), it was decided to perform an NVIS Experiment whereby an NVIS Group would be formed and a station would be set up in a specific location of mountainous terrain to test the efficacy of the NVIS antenna and radiation characteristics of this methodology with an underlying task of determining if an NVIS setup could effect 2-way communications in mountainous terrain where normal VHF/UHF-type communications and cell-phone were blocked by the terrain. This latter determination would answer the question "Could HF & NVIS carry on communications in mountainous areas during ARES Search & Rescue Operations?".

In framing up the Experiment, David "appointed" me as the coordinator of this project. I accepted the task and David supplied me with a skeleton list of those he knew to be interested in the NVIS concept. To that list, I added several hams local to Lenoir, Marion, & Morganton areas. After the first "test" Net, several more "checkins" were added to the list, mostly from the Asheville area. These became the "core" members of the newly formed NVIS Experiment Group. Subsequently, the members of the Group were contacted by email and were informed of the intentions of the Experiment.

An initial Group Net was established for Saturday, March 31st on 3920 kc at 6 PM for the first session of the net...with the second session of the net called at 7 PM on 3885 kc. A second Net was called a week later on April 7th with same setup as the March 31 net. These were "test" nets to allow members to build/test/tune NVIS antennas for the actual NVIS Experiment Net to occur on April 14th. During these test nets, the Net was called from my back yard here in Lenoir, NC while using the Hamstick dipole only.

To effectively test the overall mission of the NVIS Experiment, however, we needed to locate the Net Control station in a location that would present the actual Experiment with a true-to-life Search & Rescue scenario while using NVIS antennas and methodology. The location aspect of this part of the Experiment was turned over to Jerry Gragg (KF4PJL) to locate a suitable area that was ringed by mountains and with an area large enough to string a 125-ft wire dipole.

Jerry came through on a grand scale: The location selected was the campground at Pisgah National Forest at Mortimer, NC (just above Edgemont, NC). This area was totally surrounded by mountains on all sides (actually, we were in a "bowl" – very mountainous, heavily forested, and with limited access..perfect!). On the afternoon of April 14th, our "crew" (Jerry, KF4PJL; Floyd, KF4PJJ, and myself, N4EUX) traveled to the setup site. We secured permission from the Park Ranger to string the 125-ft wire dipole and to setup the Hamstick antenna on it's A-frame mount/8-ft PVC pipe. The Hamstick horizontal dipole was oriented to broadband East/West while the 125-ft wire dipole was oriented NW/SE.

At 6 PM, we began the first session of the NVIS Group Net on 3920 kc using the Hamstick dipole. The checkins and their signal reports can be seen in the April 14 Experiment results on another attachment. At 7 PM, we began the second session of the NVIS Group Net on 3885 kc but...using the 125 ft wire dipole at 7 feet above ground level. Results are also in the same attachment as above.

CONCLUSIONS:

(1) The question "can we use NVIS methodology" during a real-life search & rescue operation while deeply embedded in inhospitable locations and during inclement weather (it started raining on us during the Net as a result of an incoming storm with high winds, etc.). The answer to that question is a very emphatic "YES!". Please note that the use and

/or operation of VHF/UHF handie talkies, mobile rigs, and cell-phones were out of the question...no coverage was affordable in either case from our setup location!

(2) During the "testing phase" of our Nets on March 31 and April 7th (and the first session on April 14th) only mediocre results were obtained, receiving signal reports in the S5 to S7 range while using the Hamstick dipole. Switching to the wire dipole for the second session (7 PM) of the actual Experiment yielded superior results...on the order of 2-3 S-units for each checkin! Therefore, the antenna choice, in our case, for a real-life search & rescue type operation would dictate the use of a wire dipole mounted 7 feet off the ground.

(3) Other antenna types would probably be just as effective as the center-fed wire dipole, such as an end-fed long wire...or a random length of wire with a suitable antenna tuner. The use of a Hamstick horizontal dipole should only be used as a "backup" antenna or in situations where a long 75-meter antenna can't be erected due to lack of supports, etc. Floyd, KF4PJJ, tested an unusually designed portable antenna during the setup and received an S9+ report out of a station in Virginia. The antenna appeared to be a mobile-type vertical antenna bent over horizontally and with ground radials just beneath it. The antenna was only about 3 feet off the ground! So I am sure antennas of custom design will work as well.

MORE TESTS?

After the conclusion of the NVIS Experiment, it brought up an interesting question: "can the use of a HF QRP backpack or "go pack" that would be used by a rescuer on foot cut the mustard using some sort of portable antenna "just on the other side of the mountain , ravine, or gorge" to get back to a base-camp similar to our fixed base-camp NVIS Experiment setup & location?? A QRP backpack would be, say, a 10-watt HF rig along with a 12-volt gel-cel battery in a canvas backpack, and a whip antenna bent horizontal to the ground. An interesting question. Maybe even another NVIS Experiment!

THANKS!

Thanks goes to each and every station that hung in there while we conducted the various "tests" as well as the actual on-location Experiment on April 14th! Without your diligent checkins, the Experiment wouldn't have been possible!

73, Jim Rogers, N4EUX
NVIS Experiment Coordinator
NVIS Group Net Control