

NVIS ANTENNA TEST

Written by Earl Pack AE5PA. Permission granted for use in ARES training.

A Near Vertical Incident Skywave (NVIS) antenna test activity was conducted on November 10, 2013 by ten members, from various units, of the Harris County ARES. The group got together at the George Bush Park – Equestrian Area (Grid square EL29dr) and set up six NVIS antennas to test them out from the same location. Contact was made on 7.29MHz to an JoAnn KA5AZK in Gilmore, Texas and to George K5BMR in Lubbock, Texas. The performance of the antennas varied as did the ease of setup. I will briefly describe each antenna, the difficulty of setup, and the reception report. The antennas tested were as follows:

1. A 40 meter dipole with an auto tuner mounted at the dipole junction and elevated 2' above ground with the aide of poly cones. This antenna is very easy for one person to set up in less than 15 minutes. With the counterpoise lying on the ground directly beneath the antenna wire, the reception was poor. With the counterpoise laying on the ground 180 degrees from the antenna wire the reception was better but still not 5/9 with 100 watts transceiver output. With this antenna formed in a loop the reception was best with 5/9 (S8-9 to both Gilmore and Lubbock, TX). The ICOM 706MK2G transceiver was powered by a generator and 120vAC power supply. TJ Butler (N5CFT)
2. A 40 meter flat-top dipole mounted 10' above ground. The dipole wires were connected directly to a SO239 and feed with LMR400 superflex or equivalent coax. With some trees in the area, this antenna is quite and easy for one person to set up in about 15 minutes using PVC pipe with T's on top to support the antenna at 10'. It would take a little longer to set up this antenna in an open field without trees. The reception was good on 100 watts. The ICOM 706MK2G transceiver was powered by a generator and 120vAC power supply. Jim Burrough (N5DTT)
3. An inverted V dipole using a 1:1 balun at the center and elevated 18" above ground with the aid of fiberglass poles and a fiberglass pole tripod. This antenna can easily be adjusted for 20, 40, and 80 meters by connecting different sections with Anderson power poles. It is quite easy to set up by one person in a little more than 15 minutes. The reception was good with a 5/9 (S10-20 to Gilmore and S5 to Lubbock, TX) on 100 watts. A LDG 100 auto tuner was used. The ICOM 706MK2G transceiver was powered by a generator and 120vAC power supply. Hal Merritt (KD5HW)
4. A homemade army style combined 40/80 meter inverted V antenna with a SO239 at the center and feed with LMR400 superflex equivalent coax. The center was elevated 18' above ground. With a specific procedure this antenna can easily be setup by one person in less than 15 minutes. It received a solid 5/9 (S10 to Gilmore and S8 to Lubbock, TX) on 100 watts. A MFJ 949D tuner was use. The ICOM 706MK2G transceiver was powered by a generator and 120vAC power supply. Dave Scott (WD8RZA)
5. A commercial army style combined 40/80 meter inverted V antenna just like the previous one mentioned. It received the same signal report. One side of the 40 meter dipole measures 25' 4". One side of the 80 meter dipole measures 38' 2". A MFJ 949D tuner was used. The ICOM 706MK2G transceiver was powered by a generator and 120vAC power supply. Carl Hacker (WC5WM)
6. A 40 meter 140' total length loop with a 2:1 balun mounted in one corner and elevated 19' above the ground. The feed line was RG-8/U. Fiberglass poles were used to elevate the antenna. As currently designed, this antenna requires a minimum of 3 people to setup in a period ~30 minutes of time. A tuner was not used. The reception on this antenna was phenomenal with a 5/9 at 5 watts. At 25 watts output the reception was excellent (S10-20 to

Gilmore and S5 to Lubbock, TX) with transceiver powered by a motorcycle battery. At 100 watts the reception was (S9 to Lubbock, TX). Dave Wells (KD5E)

This exercise demonstrated the ease in which very good communication beyond the range of VHF/UHF can be achieved with simple setups that can be assembled in an open field. We have discussed the use of NVIS in previous training sessions. It is designed for communication in the 30 to 400 mile range. This is very useful in the event of the loss of VHF/UHF repeaters. Antennas designed for normal HF communication will usually skip over this distance range.