THE CLOUD WARMER NVIS BEAM

AIM FOR THE CLOUDS AND GET BETTER "LOCAL" SIGNALS! AN NVIS STYLE "BEAM" ANTENNA FOR BETTER "LOCAL" AREA COVERAGE ON HF

Some of you may recognize this design as nothing more than a half wave dipole, but upon closer examination, you will see that there is a reflector at the bottom of the antenna spaced at about .15 wavelength or less from the driven, (dipole), element. This in fact, makes this antenna a 2 element wire "beam" aimed straight up at the clouds! Hence the name "Cloud Warmer Beam". NVIS style antennas work best below about 8 MHz as confirmed by the U.S. military.

If you already have a half wave dipole up and running, then you have been using this type of antenna to some extent without knowing it, however, yours is not as effective in getting your signal to the "local" area out to a few hundred miles due to the properties of the ground underneath, your present dipole, and the nature of the dipole pattern.

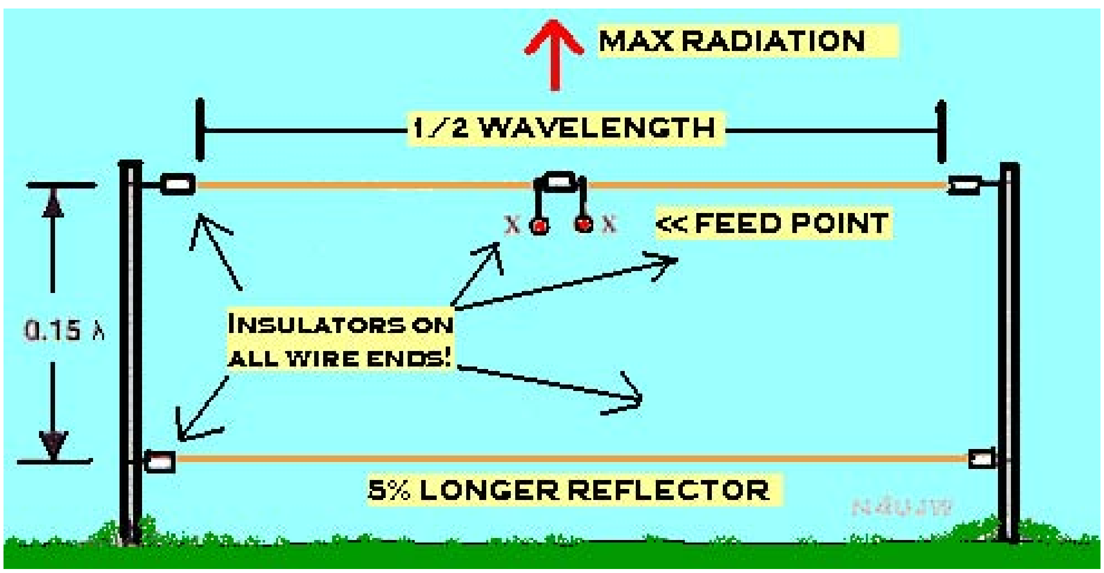
This design gives you the ability to more closely match the ideal situation for your dipole to perform much better in the close in range, (a few hundred miles radius), from your station and give you a little added" gain"!!!!

The military uses the NVIS configuration while operating mobile for better "local" coverage on their low bands by laying down their whips in a horizontal position on their mobile units. THERE IS NOTHING SPECIAL ABOUT THIS ANTENNA CONSTRUCTION OTHER THAN

THE ADDED REFLECTOR AT THE BASE OF THE DIRECTOR (DIPOLE)!

By adding the reflector, which is 5% longer than the driven element, and spacing it .15 wavelength or less below it, you turn your dipole into a beam type antenna projecting your signal up to that big reflector in the sky where it is bounced back down into a sort of upside down cone pattern extending out several hundred miles! THIS IS NOT A DX ANTENNA!

The standard formula can be used for calculating the length of the director....468/freq MHz Reflector length = director length + 5% longer. Spacing = aprox. 140/freq MHz



See further experimentation concerning spacing below~

Example: Design for middle of the General Phone Band around 3.925MHz

468 / 3.925 = 119.24 FEET FOR DIRECTOR (DIPOLE) REFLECTOR = 5% LONGER THAN DIRECTOR = 119.24 X .05 = 5.96 FEET ADDED TO 119.24 = 125.20 FEET SPACING = 936 / 3.925MHZ = 238.47 FEET X .15 = 35.77 FEET FOR SPACING

(See further experimentation concerning spacing below)

If your starting this project from scratch, start with the director, (the dipole), a little longer and prune to lowest swr for middle of band as with any other antenna project! If your dipole is already up with low swr, then just add the reflector at the proper spacing distance. The distance from the reflector and the ground should not make any difference.

You will note by the calculations above that the distance from the driven element and reflector would require that the director be at least 35.77 feet from the ground! If you can't get the formula spacing for installation reasons, then just do the best you can. Some experimenters state that even much lower overall dipole height above the reflector work even better. See below.

UPDATE! Spacing Experimentation

More recent experimentation by Pat Lambert, W0IPL and others conclude the distance from the antenna and the ground can be lowered considerably with much better results.

Here is a teaser comment made by him:

"While 1/8th wave works reasonably well, better coverage is obtained if the antenna is mounted at about 1/20th wavelength above ground. A second advantage of lowering the antenna to near 1/20th wavelength is a lowering of the background noise level. At a recent S.E.T. communication on 75 Meters was started with a dipole at approximately 30 feet. We found communication with some of the other participants to be difficult. A second 1//2 wave dipole was built and mounted at 8 feet off of the ground. The background noise level went from S7 to S3 and back when we switched back the antennas, plus communications with stations in the twenty-five and over mile range were greatly enhanced."

See the complete article here with lots more on NVIS NOTE:

ANTENNA SUPPORTS MUST BE NON-CONCUCTIVE FOR BEST RELULTS! USE A GOOD HEAVY WIRE SIZE SUCH AS # 12 OR 14. OTHER TYPES OF ANTENNAS CAN BE USED NVIS STYLE BY JUST ADDING THE CORRECT LENGTH REFLECTOR AT THE BOTTOM OF THE ANTENNA.

About NVIS antennas

HF NVIS COMMUNICATIONS

Edited from U.S. Military training documents

NVIS propagation is simply sky wave propagation that uses antennas with high-angle radiation and low operating frequencies. Just as the proper selection of antennas can increase the reliability of a long- range circuit, short-range communications also require proper antenna selection. NVIS propagation is one more weapon in the communicator¶s arsenal. To communicate over the horizon to an amphibious ship or mobile on the move, or to a station 60-190 miles away, the operators should use NVIS propagation. The ship¶s low take-off angle antenna is designed for medium and long-range communications.

When the ship¶s antenna is used, a skip zone is formed. This skip zone is the area between the maximum ground wave distance and the shortest sky wave distance where no communications are possible. Depending on operating frequencies, antennas, and propagation conditions, this skip zone can start at roughly 12 to 18 miles and extend out to several hundred miles, preventing communications with the desired station. NVIS propagation uses high take-off angle (60° to 90°) antennas to radiate the signal almost straight up. The signal is then reflected from the ionosphere and returns to Earth in a circular pattern all around the transmitter. Because of the near-vertical radiation angle, there is no skip zone. Communications are continuous out to several hundred miles from the transmitter. The nearly vertical angle of radiation also means that lower frequencies must be used. Generally, NVIS propagation uses frequencies up to 8 MHz. The steep up and down propagation of the signal gives the operator the ability to communicate over nearby ridge lines, mountains, and dense vegetation. A valley location may give the operator terrain shielding from hostile intercept and also protect the circuit from ground wave and long-range sky wave interference. Antennas used for NVIS propagation need good high take-off angle radiation with very little ground wave radiation.

"NVIS techniques concentrate on the areas which are often in the skip zone. The idea is to radiate a signal at a frequency which is below the critical frequency, at a nearly vertical angle, and have that signal

reflected from the ionosphere at a very high angle of incidence, returning to the earth at a relatively nearby location."

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