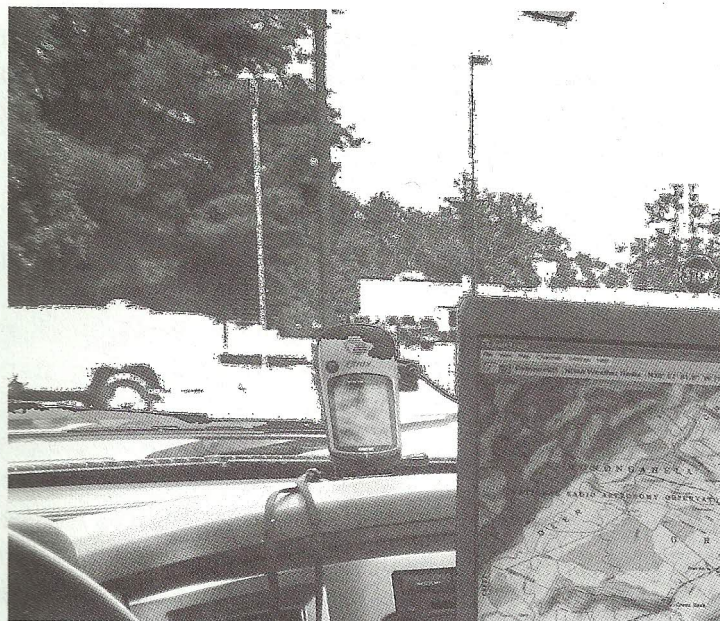


they are not eavesdropping on communications. They put the site there because of the natural shielding in the Deer Creek Valley, and the fact that the area was rural, and had minimal man-made RF sources compared to urban areas). The proliferation of sources of RF in the last 50 years, either intentional radiators or unintentional, has meant job security and sometimes headaches for those whose job it is to track down and mitigate interference to the sensitive receivers at **NRAO**.

The sensitivity of their receivers is so far beyond what most people, even radio people, are accustomed to, that it really requires a different mindset to appreciate the steps that are required on a daily basis to ensure the radio telescopes have a quiet enough background to be able to hear the radio emissions from distant targets. (No matter how good your hearing, if you are in a room with many people talking, you cannot hear the speaker. Those with hearing aids can attest that even though their effective hearing sensitivity may be higher than unaided, the background noise renders it ineffective). More on this later.

I spoke with **Wesley Sizemore**, who has been at Green Bank for 29 years, and is Technical Specialist I. He is the Interference Man. **Paulette Woody** administers the **NRQZ** and coordinates the public's FCC applications. **Carla Beaudet** is the RFI group leader on-site and deals with internal Green Bank RFI mitigation measures. Wes has served in various capacities over the years, but is known by many Amateurs as "the" RFI expert on the ground (and frequently on the road), seeking out and mitigating interference sources in the local area.



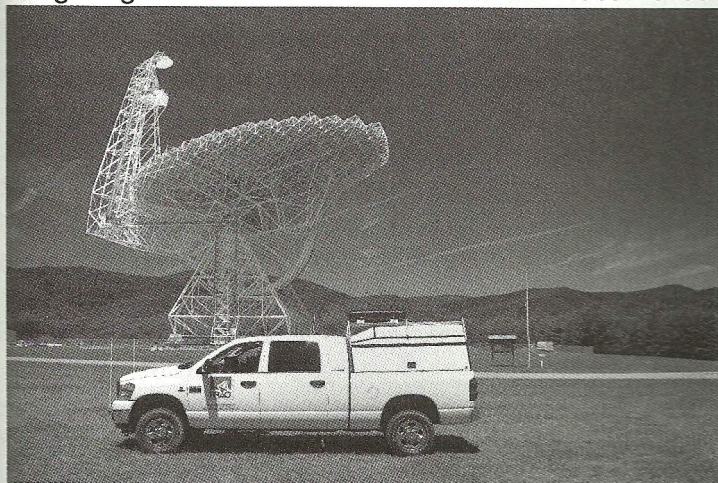
Some of E.M.I.T.T.'s receiving and DF gear. Mouth-watering equipment to a ham, but used here for a very serious mission.

Photo by W. Sizemore

Some of the noise sources he has encountered over the years include things you would not be surprised at—power line noise, spurious radio transmitters, electric fences, thermostats--- and things that might not immediately come to mind, such as those little plastic hand-held LED message fans, digital cameras, and a heating pad in a dog house!! RFI from digital cameras can indeed be heard by the sensitive receivers at Green Bank. Hence, digital cameras are not allowed in the immediate radio telescope areas. Their web site has complete documentation with spectral displays of a test they ran with a digital camera. Wes states that those LED fan gadgets put out broadband noise to above 1 GHz. They don't sell those in the gift shop anymore!

SKEETERS AND SNOWFLAKES

It has been roughly calculated that the total energy collected by all radio telescopes all over the world since radio astronomy began is less than that of a mosquito taking off--or less than the energy released by a snowflake when it hits the ground. Try to understand the implications of that in terms of needing a quiet receiver (low internal noise) and low external noise. The term state-of-the-art is overused, but that is literally what they do every day at Green Bank, not only in electronics but in cryogenics (super-cold). Cryogenic refrigeration systems are used to get the noise temperature to a



Wes's truck E.M.I.T.T. - ElectroMagnetic Interference Tracking Truck. In the background is the new Robt. C. Byrd GBT- over two acres of surface, 17 million pounds; one of the largest moving structures on earth.

Photo by W. Sizemore