AIM4170 Antenna Analyzer Presentation Summary

Ian Wade, G3NRW, gave a talk and demonstration of the AIM4170 antenna analyzer at the Shefford and District Amateur Radio Society (in the UK) on 3 December 2009.

After a brief introduction and a look at the physical construction of the analyzer, Ian gave us a refresher on the meaning of inductive and capacitive reactance, with several diagrams showing how vectors and phase angles vary for non-resonant and resonant antennas.

Next, the main functions of the analyzer were demonstrated, with the aid of a 4m (70MHz) groundplane mounted on a tripod. Then followed a demonstration of measuring the characteristics of a variable capacitor and inductor, leading to tuning an 80m trap.

Examples of actual antenna scans came next, including a 20m dipole, a G5RV on top band, a Hustler 5-BTV vertical on various bands, and a 2kW dummy load (which turned out to be an electric heater).

The use of the analyzer to design a 160m/80m trap dipole was then demonstrated, showing how to measure the resonant frequency of an 80m trap and its inductance on 160m. This led to the use of a software program that calculated the necessary wire lengths for the dipole.

Other AIM4170 functions were then demonstrated, including measuring crystal parameters, distance to fault calculation, quarter-wave stub tuning and the Smith chart.

Then followed a deeper look into how the feeder acts as an impedance transformer, with a graphic representation of how different lengths of feeder can dramatically change the impedance seen by the transmitter.

Ian then demonstrated a very powerful feature of the AIM4170: the ability to measure the antenna feedpoint impedance without moving the instrument to the antenna itself (this being preferable to moving the analyzer to the antenna and observing it at a distance through a telescope).

The next demonstration was of a program to calculate ATU settings to match the impedance of the antenna system to a 50-ohm transmitter output.

The final demonstration was the remote control of the AIM4170, using a small netbook computer connected via WiFi to a wireless router in the shack. The demonstration worked well, but Ian also pointed out some of the hazards of remote operation: namely, the difficulty of seeing the netbook screen in bright daylight, the risk of dropping the netbook (a halter around the neck was recommended), and the risk of overflying birds (the advice was to dress like a scarecrow and wave your arms about).

The talk concluded with a chart prepared from data from ARRL showing the accuracy of the AIM4170 and six other analyzers. The table showed clearly that the AIM4170 was by far the most accurate.

The full PowerPoint presentation is available on Ian's website, at: **homepage.ntlworld.com/wadei/aim4170.htm**

The Shefford and District ARS website is at **www.sadars.co.uk**