

# LINE OF SIGHT

## A Message from the Editor

### The APRS Thread

We are now midway through the fifth year of the reintroduced version of *CQ VHF* magazine, and my mind can hardly keep up with the ever-expanding use of the VHF-plus frequency spectrum. As many of you know from reading my VHF column in *CQ* magazine, my background is in weak-signal communications. Those of you who are long-time readers of the column will have noticed that since taking on the responsibilities of editing this magazine, my coverage of VHF activities has greatly expanded beyond weak-signal communications. In fact, occasionally there are columns in which I have very little weak-signal coverage. This is because the increased interest in the VHF-plus ham bands has fractionalized into many different uses for the spectrum.

Ironically, we who are active on these bands are finding some commonality in one particular form of communications—APRS (Automatic Position Reporting System). APRS is increasingly being used for a number of VHF-plus activities, in some respects becoming the thread that weaves itself throughout our use of the VHF-plus spectrum. APRS has become a method used by bicycling-event organizers for tracking locations of lead cyclists and emergency vehicles, such as ambulances. APRS is used by balloonists to track their balloons as well as track various chase vehicles as these teams triangulate the balloon's location for recovery of its payload. APRS is being used by microwave enthusiasts for more precise aiming of their antennas for making record-setting mountaintop QSOs. In short, APRS continues to weave its way into more and more of our use of the VHF-plus spectrum.

Two articles in this issue feature APRS applications. Carlton Doe, W3DOE, describes how to build a simple APRS tracker, beginning on page 15. Gordon West, WB6NOA, reviews the marriage between Kenwood's D-7 and D-700 and AvMap's Geosat 4 beginning on page 20.

#### CubeSats and AMSAT

On July 26 or 27, more than a dozen miniature satellites from ten universities

and one company were scheduled to be launched into orbit via a Dnepr-1LV rocket that was to carry the CubeSats into space from the Baikonur Cosmodrome in Kazakhstan. The following is from the *ARRL Letter* (June 8, 2006) and describes the CubeSat program:

The CubeSat project is a collaboration between California Polytechnic State University-San Luis Obispo and Stanford University's Space Systems Development Laboratory. All of the CubeSats set to launch this month were designed and built by students at various universities in the US and elsewhere in the world.

Cornell University, Cal Poly, and the University of Arizona each will send two CubeSats into space. Other US schools participating in the mass CubeSat launch are the University of Illinois, the University of Kansas, Montana State University, and the University of Hawaii. In addition, schools in Norway, South Korea, and Japan have built CubeSats for this month's launch.

One of the CubeSats, known as SEEDS, was built by students at the Nihon University in Japan. It contains a CW beacon, Digi-Talker, and other experiments. The CW beacon will be on 437.485 MHz and use the callsign JQ1YGU. The Digi-Talker experiment will be activated later. All 13 CubeSats will identify using amateur radio callsigns.

According to AMSAT-NA, the satellites will be put into a 500-by-566 km (310 by 351 miles) orbit with a 97-degree inclination. Each tiny satellite is a 10 cm (4 inch) cube weighing just 1 kg (2.2 lbs) into which the battery, transmitter, and various experiments are packed.

Twelve of the satellites have downlinks in the amateur radio satellite allocation between 435 and 438 MHz, and one will operate on 145.980 MHz, so there will be lots of signals to listen out for after launch. None of the spacecraft will carry a transponder. Transmitter power outputs range from 10 mW to 2 W.

A complete list of the satellites can be found in the Satellite column, which begins on page 44. Ralph Wallo, WØRPK, maintains a website with up-to-date information on the CubeSats. The URL is: <<http://showcase.netins.net/web/wallo/CubeSat.htm>>. Paul Shuch, N6TX, gives some insight into the CubeSat program in his Orbital Classroom column, which begins on page 42. Perennial antenna designer Kent Britain, WA5VJB, has some "Cheap Yagis" that

can be used for communicating via these satellites. You can find these designs beginning on page 28.

Speaking of AMSAT, in this issue's Satellites column Keith Pugh, W5IU, discusses the plans AMSAT has for future launches. In the near term the P3-E satellite is gearing up to be launched in 2007 or 2008, depending upon availability of a launch vehicle. Unique to this satellite will be the use of a software-defined transponder (SDX). Among the benefits from using the SDX are mode versatility, low power consumption, and a major improvement in interference and "Alligator" immunity. The latter is accomplished by way of the inclusion of auto-notching software known as STELLA (Satellite Transponder Equalizing Level Limiting Adaptor). This software is designed to reduce multiple high-level "spikes" without affecting the transponder noise floor and low-level signals.

In the long term, AMSAT is designing the Eagle satellite. Thanks to *EaglePedia*, an open forum available on the AMSAT website (<http://www.amsat.org>), any AMSAT member can view most design details of the satellite while it is being developed.

#### Remembering Two of Our Comrades

Tragically, Mike Obermeier K6SNE, and David Gordon-Ross, N6IDF, lost their lives when Mike's Jeep went off a mountain road near Lake Isabella in Kern County, California on May 27. The two of them were on a hidden transmitter hunt over the Memorial Day weekend. Homing In columnist Joe Moell, KØOV, gives a moving and sensitive tribute to these two members of our amateur radio community. His column begins on page 24.

Every time we in our ham radio community learn of the loss of life of one of our members, no matter what the cause, we need to pause and reflect on the fact that we do participate in a hobby that has some inherent dangers. In reflecting on this fact, we also need to give some thought to how we can play it safe while participating in our wonderful hobby. Until the next issue...

73 de Joe, N6CL