WB8IMY

ECLECTIC TECHNOLOGY

High Speed Multimedia at 3.5 GHz

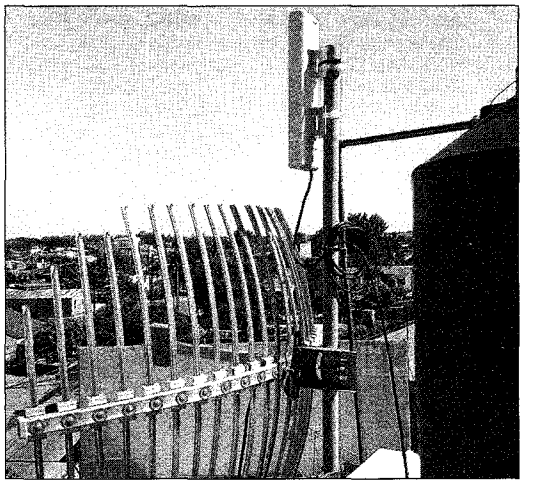
For several years hams have been experimenting with high-speed multimedia (HSMM) communication, primarily at 2.4 GHz using wireless network routers. Yes, the same wireless Internet routers you may have in your home right now. HSMM enthusiasts are turning these routers into ham transceivers by adding gain antennas, external RF power amplifiers and new operating firmware.

What makes this activity legal is the fact that consumer-grade wireless routers use channel frequencies that overlap the Amateur Radio allocation at 2.4 GHz. So long as they operate on frequency channels within our band, hams can use these modified router systems for applications the original manufacturers probably never imagined. As a result, the HSMM folks have been setting up sophisticated networks all over the country, swapping voice, image and other data over substantial distances at Internet speeds. There is an entire chapter devoted to this topic by John Champa, K8OCL, in the *ARRL VHF Digital Handbook*.

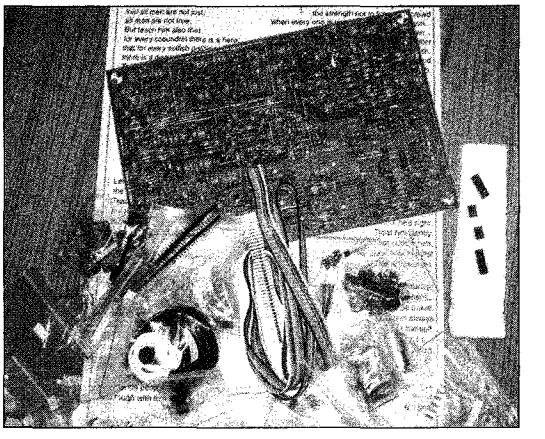
The shared frequency allocation that makes all this possible has a downside, as you've probably guessed. The wonders of spread spectrum notwithstanding, there are plenty of opportunities for mutual interference. John Doe down the street just wants to stream Internet video over his home network. He is oblivious to the ham on the next block who is trying to do HSMM on the same channel. The two gentlemen's activities are bound to clash, and sometimes do.

Hams have been looking to other bands for HSMM, bands where we are virtually alone. The problem has been finding affordable equipment. (Appropriating a $75 wireless router as your 2.4 GHz transceiver has a certain budget appeal.)

Change appears to be on the wind. Steve Lampereur, KB9MWR, passed along a tip concerning a possible solution at 3.5 GHz — another Amateur Radio band at a shared, but much less crowded, allocation. Ubiquiti Corporation (**www.ubnt.com**) has just announced the NanoStation3, a 3.5 GHz wireless transceiver module that retails for only $80. You can read the data sheet at **www.ubnt.com/downloads/ns3_ds.pdf**. Considering the portable size, easy firmware updating and low price, the NanoStation3 units have strong potential. It will be interesting to see what the HSMM hams can do with these.



The Ubiquiti NanoStation transceiver in this photo is the white module just above the parabolic dish antenna. At 3.5 GHz, these inexpensive units have potential for amateur HSMM applications.



An Indian ATS-1 transceiver kit.

Homebrewing a 20 Meter SSB Transceiver in India

The Amateur Radio homebrew spirit is very much alive and well in India — and they are using the Web to keep it going. The object of all the enthusiasm is a 20 meter SSB transceiver known as the ATS-1. Designed by Rajani, VU3CAV, and Gaurav, VU2GTI, the ATS-1 is a communal effort coordinated through VU2GTI's Web site at **www.vu2.in**. Hams who register on the site (create an account) have access to all the design documents, circuit board layouts and so forth. Apparently the ATS-1 is being made available in kit form, although the price wasn't available at press time.

The Sounds of Space

Here is an educational way to waste time at the home or office. The folks at Space Weather have inaugurated a live audio stream from the Air Force Space Surveillance Radar in Texas. Whenever an object (such as a meteor) generates a radar echo, you hear the resulting ping. In the near future they plan to add broadcasts of solar radio bursts and VLF signals from the ionosphere. The streams are punctuated by Daily Space Weather Updates from Dr Tony Phillips. Go to **http://spaceweatherradio.com/**, scroll down to "Space Surveillance Radar" and click the LISTEN! button.

Reversible Diodes?

No kidding! Scientists at Rutgers University have discovered that a crystal made of bismuth, iron and oxygen can function as a reversible diode. They published their findings in the journal *Science* and the results are intriguing.

They also discovered that diodes made from this material generate current when light falls on them, making the material a potential candidate for future solar cells.

The crystal is a *ferroelectric* material, meaning that it exhibits electrical polarization, or alignment. By applying an external voltage to the ferroelectric crystal, the polarization reverses, along with the direction that the diode allows electricity to flow.

The material belongs to a class of crystalline materials known as *perovskites*, which have two positive ions of different atomic sizes (in this case, bismuth and iron) bound to negative ions (oxygen). It has three oxygen atoms for each bismuth and iron atom.

Don't look for these in your favorite parts catalog any time soon. According to the report, the first applications are likely to be in microprocessors. QST

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