

# Digital Hamming: A Need for Standards

**A**mateur radio is a curious blend of the new, the old, the traditional, the innovative, the adaptive and the (dare I say it?) the stubborn. As we all know, "Magic In The Sky" comes in many forms; we are a diverse group, but we continue to enjoy our mutual pursuit, whether it's moonbounce, AM, FM, ATV, PSK 31, CW, SSB, RTTY, APRS, or any other "alphabet soup" concoction you can think of.

## A New Age

As 2003 dawns, we find ourselves standing Janus-like in the doorway, considering two new modes that need our collective attention and pondering what was along with what will come to pass. By "ourselves," I mean you, me, the FCC, the ARRL, the manufacturers, and anyone else defined as a "stakeholder" in ham radio. Those new modes are digital and spread spectrum. Why are they important *now*? Read on.

In a ham radio context, digital communications are in their infancy. Given that packet started to become popular almost 15 years ago, I dare opine that it's an arrested infancy, but in this case I'm referring to digitally modulated voice communications. We, as hams, are merely scratching the surface in this pursuit, in that to date, only one manufacturer has come forth with radios that transmit digital voice signals. To say the format is off to a tepid start is to be kind. Yet we pride ourselves on being the innovators, the forebears of new technology, the place where things happen first. <ahem> A funny thing happened while perusing the bands; you may have noticed that many public-safety agencies, for better or worse, have already gone digital—so have cell phones, home phones, and even garage-door openers.

## The Good, The Bad and The Ugly

Proponents of digital say we can make more of available spectrum through narrower bandwidths and enjoy better quality audio. Detractors say what we have now works just fine and digital signals are easily corrupted, making them unusable where conventional FM now functions. The problem is, both sides are right.

The biggest challenge I see to the adoption and exploration of any available digital benefits is simple: *We have no standard format!*

Public safety has rallied around the APCO 25 protocol. Whether or not it would work for ham

radio could be debated, but by whom? Ah, go back to the second paragraph of this missive.

## Some History

In the world of commercial communications, the FCC used to decide things such as acceptable formats. Old-timers may recall the battle over the adoption of the NTSC TV format, or later on, the selection of color TV conventions and stereo FM standards. The bottom line is, right or wrong, the FCC made selections that resulted in a standard everyone could build to, and it worked. As deregulation came along a turn was made, "letting the marketplace decide." This gave us incompatible Betamax and VHS standards for videotape and the resulting marketplace battle that VHS eventually won. It also resulted in broadcast AM stereo becoming a still-born in the early 1980s. There were four formats proposed, the FCC refused to make a choice, and AM stereo has been little more than a footnote ever since. The marketplace decided it couldn't decide and confusion reigned.

The marketplace may be adept at decisions such as DVD being better than VHS and VHS over Beta, but in the world of ham radio we can't afford to have a standards battle, and the manufacturers have shown no signs of agreeing on a digital voice format.

Why is that important? It may seem to be a frivolity or inconvenience if you can't talk to your friend because he has a different brand of radio. It takes on blood-curdling proportions when it means you are unable to pass emergency traffic because you don't own the "right" brand of radio. Imagine the chaos when different emergency agencies in the same geographic area choose different digital standards for their responders. *We need to avoid that scenario.*

In these post 9-11 times, if we can't serve the public in a time of need, it only strengthens the arguments of those who covet our spectrum.

## A Time For Leadership

The ARRL has a Digital Voice Working Group studying possible standards for digital voice, but it has declined to recommend any one standard be adopted. "We continue to embrace the idea that there is room for more than one digital voice system in Amateur Radio right now," the group wrote in its July 2002 report to the ARRL Board of Directors. "Rather than dictate a single standard, we choose to allow things to evolve as experimenters do their bit. Users will ultimately decide what is best."

Unfortunately, this is the very same philosophy that brought us VHS vs. Betamax, and the non-

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growth of AM stereo broadcasting. We need a standardized format, folks, or there are only two possible outcomes:

1. Ham radio voice communications will remain forever analog or
2. Chaos will prevail.

What scenarios are possible under the second possibility? Imagine a repeater system or simplex communications where only one manufacturer's digital radios work. If you own a Kenwood, you won't be able to talk to the owner of a digital ICOM, etc. Is this possible? Yes. Is it progress? You decide.

The first draft of this column suggested that someone, perhaps the ARRL, consider organizing a conference that gets *all* the major manufacturers, and perhaps the FCC, around the same table to discuss digital formats for HF, VHF, UHF, and ATV. Well, the idea caught the interest of the powers that be at CQ, and we all are engaged right now in figuring out whether such a conference will be feasible and what it might accomplish. We will keep you informed as the discussions progress.

Here's my take on one major goal: If we can "simply" aid in getting the manufacturers to agree on a digital protocol that is open to all, with no royalties due anyone, I say we have a chance at making amateur radio ready to take that first, giant, digital step. It *sounds* simple, but it's not. Manufacturers and engineers have a lot of pride. They are competitive. It may be tempting for one manufacturer to try to develop "THE" standard, at the expense of its competitors, either in driving them out of business or exacting stiff royalties. My guess is that the other guys won't roll over and play dead without a fight. The result will be a terrible conflict of protocols, from which there can be only one winner and many, many losers. This is avoidable bloodshed. OK, I over-dramatize, but the "blood" in this case is your money. How would like to be the owner of an expensive but useless radio? Imagine tuning across the 2 meter band and hearing nothing but buzzing from protocols your radio can't decode. Doesn't sound like fun to me.

### Does Government Have A Role?

The FCC may have a role, too. Through rule-making or directives, it can help ensure that amateur radio continues to serve its most valued role—emergency response. Ambitious thinkers might even consider the formation of new "digital only" bands for the Amateur Service. Wouldn't that be a breath of fresh air,

and help us avoid "turf wars" on existing bands? Surely a sliver of spectrum exists, particularly in areas now being abandoned by public-safety users as they embrace digital communications and trunking protocols on higher frequencies.

These are heady problems, and they won't be solved by your author dropping the FCC an NPRM in the mailbox. We need a good collective period of thought, discussion, and leadership from all concerned.

### Whither SS?

The second "new" issue that needs to be addressed is Spread Spectrum, where again, amateur radio seems to be lagging. It seems that the FCC is allowing everyone and their uncle to engage in SS communications while keeping it in the developmental stage for us hams, meaning you and I can't do it under the aegis of our ham licenses. I have telephones that are SS. Wireless computer routers and seem-

ingly a zillion other over-the-counter devices use SS, all adding merrily to the noise floor. The question is, when will you, me, the League, and the FCC get serious about an SS format for amateur Radio? It's the 21st century, and I'm sure we could do our typical ham radio thing by coupling fun, experimentation, and innovation with SS, and who knows what good may result? How can you not have fun with an idea conjured up by Hedy Lamarr? (It's true! Like they say, you can look it up!)

### The Keys to Resolution in 2003

All that's needed in these matters is some good, honest, unselfish thinking, some give and take, the cooperation of the manufacturers, the ARRL, and other key players, and we just might get the ball rolling. The digital train is leaving the station, but it's not too late for us to run and jump aboard. It's a project that's achievable in 2003, and it has the potential to ensure there's much more "Magic In The Sky." 73, Jeff, AA6JR

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