

Amateur Radio & 802.11

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It's an interesting coincidence that the main unlicensed frequency bands used for wireless networking overlap with ham bands. It's not a new thing for hams to take advantage of this fact by using hardware designed for "Part 15" operation at 900 MHz and 2.4 GHz under amateur rules; I was personally involved in such a project about 10 years ago.

But in the last year, and particularly in the last few months, the idea of using 2.4 GHz 802.11b (sometimes called "Wi-Fi") wireless devices has really taken off. The ARRL has launched a "High Speed Multimedia" task force that's not only done good work, but has also generated a lot of publicity. TAPR has launched a mailing list (ham-80211@lists.tapr.org) dedicated to this topic, and we plan to have in-depth presentations on 802.11 technology at the DCC this fall.

I'm as intrigued as anyone by the idea of using inexpensive commercially-available gear to do high speed digital radio — after all, faster bits are better bits. And 11 megabits per second is pretty fast.

However, before we invest a lot of energy (and money) building an 802.11 infrastructure, I think we should look carefully at the environment we live in to make sure we're not making a risky investment.

The problem lies in the advantage: 802.11 is attractive to hams because it's abundant and it's cheap. But it's only abundant and cheap because we're piggybacking off the unlicensed users who outnumber us by thousands to one.

All those users mean lots of opportunity for interference to our attempts at DX (and with Wi-Fi, that's anything over a mile), and unlike the past when interference to ham operations typically came from single sources, now there may be hundreds of potential interference sources. And, despite the fact that the law is on our side in any contest between Part 97 and Part 15 (sorry for the US-centric references!), the reality is that your neighbors aren't likely to turn off their Wi-Fi cards or cordless phones (lots of those inhabit the 2.4-GHz Part 15 band, too) in deference to your 10-mile path.

But that's actually the easier problem to deal with. Consider the reverse situation. Hams aren't the only ingenious folks, and lots of ISPs have gotten the idea that 802.11 can be used for metropolitan area networks. They're using the same hardware we are to shove signals farther than the 802.11 designers had in mind. Like ours, their links are pretty fragile.

Now imagine what happens when a ham fires up his 10-mile link, taking advantage of Part 97 to run a lot more ERP than the Part 15 crowd is allowed. Suddenly, the ISP's customers, who happen to be in the ham's beamwidth, find that their throughput has gone down, or worse, their connection disappears entirely. It'll be "those damn hams" just like in the days of TVI. And, even though we're in the right, we'll get the bad press.

This wouldn't be so bad if it were Joe Ham vs. Joe ISP. But there are a lot of big players involved, and we've already seen attempts, both open and covert, to enhance the position of Part 15 users against interference sources like our licensed transmissions. The reality is that, rightly or wrongly, the public's perception of our "value proposition" isn't what it was, and today's auction-driven FCC is a different beast than the Friendly Candy Company of the old days. The bottom line is that it's not at all clear that we could withstand a determined onslaught by the wireless industry to elevate the position of

Part 15 devices *vis-a-vis* hams. There's a real danger that Part 15 could end up with greater protection from interference than Part 97.

Now, am I saying we shouldn't experiment with the cheap and plentiful Wi-Fi gear that's out there? Absolutely not! We should definitely keep working and learning how we can take advantage of this kind of technology. But, at the same time, we should be considering several things.

First, let's look for ways to get the benefit of Wi-Fi on our other bands where we don't have to coexist with Part 15 users. We have lots of microwave spectrum that's at ever-increasing risk because of our failure to use it, and this phenomenon gives us an opportunity to address that failure.

A "simple" solution would be a transverter using a Wi-Fi card as its driver, with an output on our 3300 or 5600 MHz bands. I put "simple" in quotes because TAPR has the scars to show that RF projects are never as easy as they seem, but one like this may be quite feasible. And, frankly, a product like this is important to our future. TAPR doesn't currently have anyone working on something like this, but (I say this with some trepidation) we'd be prepared to support a team trying to develop a Wi-Fi transverter.

Second, let's see if we can use Wi-Fi for things *other* than Internet access and long-haul links. In other words, we should use Wi-Fi to complement, not necessarily replace, our existing ham services. For example, Wi-Fi could provide a link between the APRS station in your car, and your laptop while you sit in the coffee shop (hams in Seattle are doing this already). There have to be other opportunities like this, and we'd like to hear about them.

Finally, a growing number of Wi-Fi enthusiasts are building networks and pushing long-haul link; it's hard to distinguish some of the things they're doing from what we'd like to with Wi-Fi. Should we try to turn them into hams? To be frank, many are interested only in extending Internet access, and when they learn that ham links can't legally do that, the conversation ends with a "why should I bother?" But there are probably some Wi-Fi experimenters who deep in their hearts have the ham spirit, and we should try to bring them into our ranks. TAPR is currently working on a strategy to reach these folks through targeted marketing.