

RF Spectrum Update

The Latest Piece of Falling Sky in the Wireless Jungle

By Karl Winkler

First off, let me say that writing this article has put me in a bit of a pickle since I work for one of the major wireless microphone manufacturers. In researching this piece, I encountered loads of interesting and frightening information, and talked to a handful of other people who feel as I do: that fairly soon, things will not be pretty. On the bright side, immediate doom is not yet spelled out because there is enough concern from various

parties to keep pressure on the Federal Communications Commission (FCC). But the bad news is that the trend is not encouraging, and now, the clock is seriously ticking.

The basic gist of it is this: big business, specifically computer, software, mobile phone and content providers are vying for our precious RF spectrum so that they can entertain us, inform us, and allow us to connect whenever and wherever we so

choose, using an array of devices from mobile phones, laptops, PDAs, and whatever newfangled gadgets the future brings around. And the FCC sees this as an enormous source of revenue by auctioning off the “unused” TV channels in chunks at a time. These chunks would be used by unlicensed devices.

SOME BACKGROUND

This issue has been covered extensively on these very pages by Gary Stanfill, in his *Wireless Jungle* series in *Live Sound* (March/August 2003, May/September 2004 and March 2005), and most recently by our esteemed editor, Andy Wood, in his Perspective piece on *The View from Abroad: Electronic Real Estate*, (*Live Sound* August 2006). But the issue, of course, goes back much further, to FCC rulings back in the late 1990s describing how Digital Television (DTV) would be handled and calling for the auctioning of the “White Space” spectrum, i.e. the remaining “unused” parts of the TV spectrum.

Just for reference, there is a big difference between the rules for analog TV spectrum usage and that for DTV. Analog transmissions contain a picture carrier and a sound carrier – both are within the allocated 6 MHz chunk of bandwidth. And there is a ‘slot’ between them, allowing for things like wireless mics to be used. Probably more importantly, it is not allowed to have a TV channel carrier closer than 6 MHz from the next TV

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carrier set. However, DTV signals are allowed to be adjacent to each other. Thus, in theory, all white space could possibly be used up simply by having a seamless swath of DTV signals from the low 400s right up through the high 800s. That is, if the broadcasters can out-bid others vying for that same spectrum!

microphones were equal under the new FCC rules. Because the Sennheiser line offered “macro” ranges and “micro” ranges, and covered a wider overall spectrum choice than many other competitors, they felt “DTV Proof” and wanted customers to know about it. As it turned out, their campaign was somewhat premature,

years, that it has become increasingly difficult to operate wireless microphone systems with large numbers of channels. And in some instances, such as in downtown Manhattan, film sound mixers have had a challenging time even finding a dozen clean frequencies. That being said, some of the largest wireless mic users, namely

Write letters to your congressmen and senators explaining the situation in straightforward terms: a large part of our industry, along with major award shows, sporting events, news coverage and film production will suffer.

One of the first manufacturers to address this impending situation, at least from a marketing point of view, was Sennheiser. They initiated an ad campaign called “DTV Cometh” warning potential wireless system users and purchases that not all wireless

because some large spectrum chunks, such as the 700 MHz band, were not auctioned in the early 2000s as originally planned.

Nevertheless, users in some metro areas, particularly NYC and LA, certainly noticed that in the last few

award shows, sporting events, theaters and touring productions have had remarkable good fortune in coordinating larger systems (often more than 100 channels) without many problems. In fact, some of the unfortunate events we’ve seen at award shows and other large events in the past few years happened because of hard-wire mis-patches rather than anything to do with wireless audio systems.

THE LATEST NEWS

Under the Digital Television and Public Safety Act of 2005 (DTV Act), which was signed into law earlier this year (2006), the FCC is required to commence an auction of previously un-auctioned spectrum in the 700 MHz band no later than January, 2008. Other than guard bands and some slots for public safety services, the majority of spectrum between 698-806 MHz stands to be gobbled up by the highest bidders, including potentially Microsoft, Sprint, Intel, and several investment consortiums looking to make serious money as access to this spectrum real estate becomes increasingly more difficult to access.

The FCC released this declaration on August 3, with a “call for comments” on the matter. As their press release states: “Regarding the portions of the 700 MHz Band that have not yet been auctioned, this notice seeks comment on whether there is a

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need to revise the size of the geographic service areas for the remaining un-auctioned spectrum in the band, including the possibility of using smaller areas, such as the 734 Cellular Market Areas composed of Metropolitan Statistical Areas and Rural Service Areas.

“The notice also seeks comment on whether to modify the size of certain spectrum blocks, including the possibility of dividing Block D in the

Upper 700 MHz Band [782-792 MHz] into smaller blocks. The notice also requests input on whether to add or revise performance requirements for un-auctioned spectrum, including such alternatives as specific construction benchmarks.” The FCC announcement also includes a request for comments on whether or not to modify the existing power limits for these un-licensed devices.

Of course what is not requested is

whether or not to allow this at all or perhaps more realistically, whether or not we might be able to preserve any part of this spectrum for use with our wireless microphone systems. This is scary stuff!

FIGHTING THE GOOD FIGHT

Since our own industry is so small, it will take much larger players like the NFL, major TV networks and movie studios, and broadcast industry organizations to make enough of an impact on the FCC. Fortunately, several manufacturers, industry organizations and other groups have been doing just that: appealing to the FCC to see the potential downside of this “White Space” legislation. For instance, Shure has been very active in submitting appeals and comments as this process has evolved. The Sports Video Group (SVG) has also gathered a number of manufacturers together in order to have a larger voice with the FCC.

SOME BRIGHT SPOTS

Just as I was writing this article, I received a newsletter from the Sports Video Group including a piece entitled “FCC Kills Impending White Space Legislation”. Basically, the blurb points out that the FCC has released a Public Notice calling for the need to review further technical information concerning unlicensed devices in the TV band. Thus, any plans to pass laws allowing such devices have been tabled.

ADVANCED TECHNOLOGY?

One argument that the FCC and the large companies vying for this spectrum could make to our audio manufacturers is to go ahead and innovate, as they have, to take all of this in stride by incorporating new technology into our future product lines.

Well, there may be an element of truth to this. However, there are major technical hurdles to overcome before this is possible. Here’s a short list of some of the challenges our industry faces in developing new technology platforms:

Audio Quality. Sure, WiFi and wireless networking are cool and help us be more productive while being free to move around. However, trying to pass

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useable audio through such systems is laughable. Latency and bandwidth are variable, for one thing, and often large chunks of packets are dropped. It's OK for data, because it can just be re-sent. Not so for streaming audio content.

Latency. Today, even the best systems of this type have far more latency than is tolerable for live audio, never mind what we would need for a useable wireless monitor system.

Industry size and funding available for R&D. Perhaps what we can hope for is that some technology gets developed by major companies and trickles down into our industry. This happened before, when compander technology from the telecommunications industry was adopted by John Nady to be used in a wireless microphone. This time, what we'll need is someone like Intel to develop a high-speed, low latency, wide band-

width wireless networking solution that can be adopted.

Seamless hopping without audio glitching as these new devices automatically find and lock onto new frequencies if the original one is stepped on.

Although these are not insurmountable technical hurdles, they are certainly not within the grasp of current technology. And the investments necessary to bring such developments into general use will be considerable.

WHAT YOU CAN DO

The main concern that I think we should have is to delay the destruction of this precious spectrum for as long as possible, while the new platforms are being developed. And the current lobbying by our industry along with the same from broadcasting, sports and movie studios will certainly help. But to have the necessary effect, even more is needed.

One thing that you can do is to write letters to your congressmen and senators explaining the situation in straightforward terms: a large part of our industry, along with major award shows, sporting events, news coverage and film production will suffer. And with it, the economy will suffer. If enough people reach enough of our lawmakers on this issue, we may just get the auctions suspended again, maybe for long enough that the required new technology can be developed.

As we have done on other issues important to our small but dedicated industry, we should continue to band together, speak with one voice, and work to get larger entities to see the importance of our point of view. Although there would be a certain satisfaction in the image of the industry 'Fat Cat' not being able to watch his favorite football game or award show because the wireless audio wouldn't work, let's use that as motivating imagery to not let it happen in the first place. ■

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