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Second Century

The Road Ahead

In 1995, Bill Gates released The Road Ahead*, which was, at the time, a very important book on the future of computing. He was doing revolutionary things at Microsoft, from the work going into their Encarta series of digital encyclopedia products, to his own home where he was experimenting with digital art as you moved from room to room, causing him to purchase the digital rights to great works of art. In that same book, he said that he saw no commercial value to the internet being realized for another decade. Wow, did he get that wrong!*

Not long after that, as hams migrated from Commodore 64-based computing to PC clones, dial-up internet gave way to cable modems and high-speed access. The claim that the internet would be the death of amateur radio soon followed. Again, how wrong that prediction turned out to be. Early hits included ARRL's Logbook of The World, which made QSLing fast and free, and websites like eHam and QRZ, which continue to be popular. These simple databases were joined by real-time data tools such as the Reverse Beacon Network, PSK Reporter, and WSPRnet. Collectively, with hundreds of billions of records of stations heard and reported live, these tools make amateur radio more fun for award and DXpedition chasers, and provide higher scores, especially for casual contesters looking to work new multipliers.

Are we at the tipping point of a new revolution in amateur radio? I believe the answer is yes — and the next wave of tech will be in the artificial intelligence, or AI, space. There's likely going to be development coming that may cause you to say AI is the death of amateur radio!

It's important to understand what AI is about in order to begin to guess how it might impact amateur radio. For us, there are two critical elements: data mining and machine learning. For AI to become efficient and extensive, it requires access to massive amounts of information. And unlike a program on your computer, AI is a process that is constantly running and learning. So ultimately the best programming and access to the best data will win. How can access to massive amounts of data, smart programming, and integration into our daily use of amateur radio products and services change the way we operate? Let's look at two examples.

If you've ever made a serious effort in a 48-hour international contest, you know that part of the fun is in the complexities of the game. The extra work you put into planning which bands you'll be on, understanding propagation ahead of and during the contest, and real-time reporting tools like spotting networks and the Reverse Beacon Network all mean there are many moving parts to manage. By day 2, you're getting tired — and your reliance on tech can help you get over the finish line.

Imagine this: Your SDR is not only receiving a single signal for you to make contact with, but it is listening to the entire band, as well as processing all of the spots. As you work stations, they disappear from the SDR. Not just showing as a duplicate, but disappearing from the band! If you go up and down the bands, you'll hear only stations you need to work, and you'll see only their signals in your display. Now imagine this presented in color: AI knows that a given station (presented in one color), when it is on the air, rarely puts in much of a time effort, and that what looks like a rare station (presented in another color) will be there all weekend. Or perhaps there is a narrow window of propagation, calculated in real time, where a new multiplier may be on for only a matter of minutes. AI will be using real-time and historical data not just to display a list of what you need to work and a scrolling VFO window to show who is where based on spots, but to give you real-time customized information so you can target the highest possible score. Now AI becomes a competitive tool that can add to the scores of even the largest stations.

Another example has to do with filtering. Imagine going beyond the **NB** and **NR** buttons on your rig to a button labeled **AIF**: Artificial Intelligent Filtering. The software in the rig would use data stored in the cloud to access patterns of CW signals and even voice to dynamically peel away the QRM and QRN to make signals vastly more readable. As we've marveled at what static algorithmic filtering can do to make signals readable, this would go to a much higher level, taking into account your own noise challenges along with the nuances of the specific station you are listening to.

AI represents a bold future for amateur radio. It offers us the ability to use the vast quantities of data we have access to today, and foretells of the data needs of the future for hams to innovate with what AI can do within radios and within the shack. It is a very different way of thinking about amateur radio, and will challenge us even more than how we view FT8 and FT4's role in the hobby today.

So be radio active! Think about how you might use the emerging AI tools in your shack. Be a connector by getting involved with the teams progressing this revolution. And feel good about the role we are playing in fulfilling FCC Part 97.1(b): *Continuation and extension of the amateur's proven*

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