

Maker Faire Success for Ham Radio Clubs

**Meet Makers on their turf, on their terms,
with technology that adds value to their current interests.**

David Witkowski, W6DTW

A Maker Faire, for those of you who have never been to one, might be described as one part festival, one part flea market, one part rock concert. Maker Faire Bay Area, or “MFBA” (makerfaire.com), is the original flagship event, which has grown into an international effort with Maker Faire events happening around the world throughout the year. MFBA 2016 attendance was approximately 145,000 attendees over the 3 days of the event.

Makers and Maker Faire guests come from all walks of life, drawn together by a love of building, tinkering, creating, and sharing ideas. Projects exhibited at MFBA 2016 included 3D printing, electronics and microcontrollers, robotics and drones, music and dance, homemade electric vehicles, art and textiles, cooking, science, wood-working, and blacksmithing.

Anyone who claims that consumer-oriented culture and intellectual laziness are harming hands-on hobbies like Amateur Radio has never attended a Maker Faire. Makers are likely to tear something apart within minutes of buying it, eager to modify the design, or to connect two pieces of gear in a unique way to make something new. “Void Your Warranty” is a popular t-shirt slogan at Maker Faire.

WW6BAY’s Past Maker Faire Projects

In the Maker Faire vernacular, your booth or exhibit is called a “project,” and for the past 4 years, I’ve led a project team with volunteers from the Bay-Net Group, WW6BAY (www.bay-net.org).

Each year, the Bay-Net team approaches the Faire differently. One year we created a hands-on display that showed the relationship between wave-



In 2015, people from all walks of life built 40-meter NVIS dipoles for hams in Nepal.

length and frequency. Using a portable vector network analyzer, guests were invited to attach and remove clip-lead wire jumpers of various lengths and watch how this changed the VSWR. In 2015, we focused our efforts on building 40-meter NVIS dipoles for use in Nepal — just a couple of weeks before the Maker Faire, Nepal had experienced a devastating earthquake near Kathmandu. We received two Editor’s Choice awards for that project, and I was invited to write an article for *Make*: magazine — the *QST* of the Maker universe — on Amateur Radio in Nepal and Bay-Net’s efforts to help bring our hobby to that country.¹

¹<http://makezine.com/2015/09/09/the-great-nepali-radio-shake-up/>



Maker Faire 2016 team (from left): Kenneth Finnegan, W6KWF; Pieter Noordhuis, KK6VXV; Derek Kozel, AG6PO; Bernard Van Haecke, KI6TSF; David Witkowski, W6DTW, and Beric Dunn, K6BEZ. Not pictured: Mariya Pikusova, KK6ADP; Bob Somers, KK6YEQ; Marcel Stieber, KI6QDJ, and Suresh Ojha, W6KTM.

Meet Makers on Their Terms

Our strategy for getting Makers interested in Amateur Radio involves an indirect approach. Rather than show a lot of heavy gear that's only useful with advanced licensing, we focus on applying Amateur Radio techniques to things Makers are already doing —

The Maker Faire attracts an enormous number of people with a very similar mindset to our own.

adding value where we can. Makers drop by for advice on projects that use Wi-Fi or Bluetooth for wireless data links. Many ask about long-range data systems, which leads naturally to a discussion about packet and digital modes. At the 2016 Faire, we focused on software-defined radio using microcomputers like the Raspberry Pi or inexpensive Android tablets. We showed off ADS-B receivers, weather satellite receivers, spectrum analyzers, cable and antenna sweepers, and a lot of APRS-enabled gadgets that we described as, “the Internet of Things via Amateur Radio.” These were good topics because (a) microcomputers like the Raspberry Pi and Arduino are already everywhere at the Maker Faire, (b) many of the projects we showed were license-free (receive only) and so were

immediately accessible to anyone, and (c) they led to many conversations about getting into licensed operation, such as transmitting APRS packets, extending range, etc.

I built our 2016 Maker Faire team around younger hams. The majority of them had been involved before graduation with college Amateur Radio programs at Cal Poly San Luis Obispo, University of California Davis, and Carnegie Mellon University.

These recent graduates have a current and personal understanding of the many tools and platforms used by Makers. Our group was busy all 3 days, often with a crowd extending into the aisle, even after we pulled the tables back to make more room.

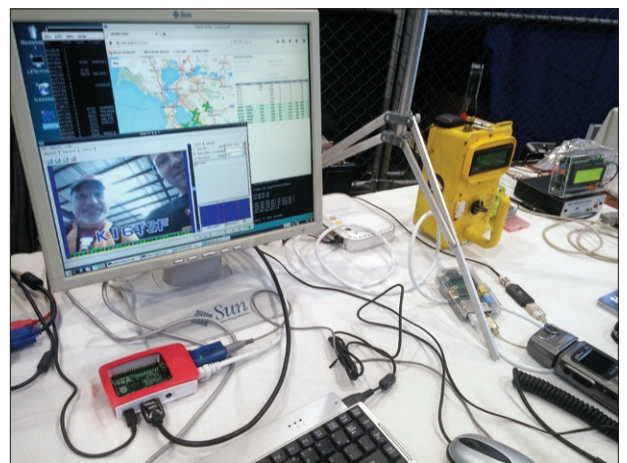
Strategies and Tactics

My strongest recommendation for a successful Maker Faire strategy is to be welcoming and low-key. I've seen some Amateur Radio groups go to a Maker Faire with big HF gear, CW keys, large antennas, and tons of “Get Licensed” pamphlets. The truth is, these don't attract a lot of attention. If we're asked about licensing or club involvement, we give that information, but generally, we're there to promote technologies and projects that dovetail with what the attendees are already interested in. In addition, I recommend:

- Focus on topics that are accessible to everyone. SDR dongles are great because they're inexpensive, license-free, and fairly easy to explain. Many of us got started as SWLs with receivers — this is no different.
- Simple is best. A display about antenna resonance, with a hands-on activity for kids, will keep their parents in the booth talking for quite a while.
- By the way, the kids' activity doesn't have to be related to electronics or radio. Every year my daughter sets up a small table and spends the weekend showing people how to make jewelry with colorful zip-ties.
- If you plan to do something like a kit-building clinic, create a sign-up schedule and ask people to reserve slots. It's chaotic to have a never-ending series of people of various skill levels starting at various times.
- Let your circuit boards shine. Most Makers want to look inside of gear. Clear polycarbonate cases are great for Maker Faire projects.
- Make liberal use of microcomputers and microcontrollers. Raspberry Pi and Arduino projects are everywhere, and most Makers understand them well.
- Recruit an energetic, friendly, knowledgeable team. Make sure your team includes some young people. They can be especially helpful with microcontroller and microcomputer projects.



The Bay-Net project booth at Maker Faire 2016 was rarely empty.



95% of our projects were microcomputer-based.

Lessons Learned from Three Years of Success at the RVA MakerFest

The Richmond Amateur Radio Club (RARC) has been a fixture at the RVA MakerFest (rvamakerfest.com) since it started in 2014. The 2016 event was held at the Science Museum of Virginia on September 24. After 3 years of participating in the event, we've learned a lot, including:

- Maker events give ham radio groups exposure to a wider range of people than you will find most anywhere else. Families have walked up and asked how old you have to be to get a license. (Our youngest student was 9, and he passed.)

- Visitors are not interested in watching a ham sit hunched over a transceiver, making contacts. They *are* interested in the reasons they might want to get a license. We show and explain those reasons. In order to do that, it's best to face the visitors, rather than any equipment we might have brought.

- At the MakerFest, we do not promote operating. Instead we promote the things hams do that look like the things Makers are already doing. We talk about the technology we use. We experiment. We build stuff.

- It's helpful for us to know our numbers, so we can share them with visitors. There are 740,000 licensed hams in this country, and that number is growing. There are about 19,000 in Virginia, and about 3,000 in our metropolitan area.

- It's exhausting, but in a good way. The first year, we learned that we need three to four hams each on 2-hour shifts during the 6-hour festival. Working in shifts keeps us all fresh to greet visitors.

At our 2016 booth Ken Zutavern, K4ZUT, worked on an aircraft radio receiver kit, though he didn't get much done because visitors peppered him with questions about ham radio and sources of kits. At the other end of our booth John King, WB4NHX, used a tiny SDR receiver, a vertical antenna, and a computer to show radio signals on a spectrum display. He, too, was very busy answering questions.

Though we made a point of bringing projects that didn't require a license and didn't focus on operating, we also displayed pictures of activities that are possible once you have a license to transmit. Launching and tracking high-altitude balloons, search and rescue teams, "fishing" for a hard-to-contact country, and SKYWARN weather reporting were all represented.

As a result of the traffic to our MakerFest booth, our club's Radio School gets new students for its licensing classes, and we educate people who thought ham radio was a thing of the past. We've found that Maker or "hacker" festivals are ideal venues for hams, as long as we focus on Making and not so much on operating. Perhaps your radio club can take a "field trip" to a local Maker event, see what's on offer, and gather ideas for what to display at your own booth, at the next event. — *Bruce MacAlister, W4BRU*



The spectrum display in the back came from a 2-inch x 3-inch SDR receiver connected to a vertical on a tripod. In the foreground are ham "Maker" tools; a meter, a PanaVise®, and a soldering iron.

Going Forward

I believe strongly that the Maker Faire provides a unique opportunity to revitalize Amateur Radio with new ideas and licensees. The Maker Faire attracts an enormous number of people with a very similar mindset to our own. It's fertile ground in which we can plant seeds of interest. Sometimes it takes a while; 2 years ago, a young guy came to our project booth asking some antenna questions. The following year, he built a dipole in our project booth. In 2016, he passed his General exam at Mike Pechner's, NE6RD, onsite VE test session. One of our Maker Faire team members this year was a guy who got licensed after meeting us last year, and who has since become one of Bay-Net's most active members.

In addition to the large flagship Maker Faires, a series of increasingly popular Mini Maker Faires are annually held in cities around the world. These are locally hosted events, which operate under the blessing and guidance of the Maker Faire organizers. These are great opportunities for local clubs and groups to demonstrate how Amateur Radio is very relevant in the Maker world.

David Witkowski, W6DTW, is a co-founder of the Bay-Net Group (WW6BAY), where he heads up their Maker Faire and Field Day teams. By day, he's the Executive Director at Joint Venture Silicon Valley (www.jointventure.org), responsible for their wireless and smart city initiatives, and the Founder & Principal of Oku Solutions (www.okusolutions.com). He serves as an adviser to the Carnegie Institute of Technology Dean's Council, as a member of the UC Davis Industrial Affiliates Council, as a member of the CTIA Innovation Council, and as a member of the 21st Century Communications Infrastructure Committee of the Bay Area Council. David obtained his BSEE from University of California at Davis, and is a Senior Member in both the IEEE and the Radio Club of America.

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