



A Ham Radio Makerspace

Build a workspace and the builders will come.

Dino Papas, KL0S

I have always enjoyed building my own ham radio equipment and found that sharing my excitement for the technical side of the hobby with other hams is a real treat. When my spouse, Toby, KLOSS, and I found our retirement spot here in Virginia, we were fortunate that our home's garage was a conditioned space. I knew it could provide a satisfactory year-round "Ham Radio Makerspace" for members of our local Williamsburg Area Amateur Radio Club (www.k4rc.net). After making a presentation on homebrewing at one of our club meetings, I found the discussion that followed gener-

ated enough interest among the members that I volunteered to host a club "Builders Group."

Contrary to popular belief, the essence and spirit of ham radio experimenting and homebrewing remains alive and well today, evidenced by both simple and complex technical project articles in *QST* and *QEX*, on countless ham-related electronics engineering blogs and YouTube videos, and discussions on numerous low-power builder blogs and e-mail reflectors. Additionally, there is a growing interest in the use of microcontrollers — such as the Arduino and Raspberry Pi — in both radio and ham shack accessory projects.

Building a Novice license class, vacuum tube CW transmitter from scratch using salvaged TV parts is no longer the gateway to ham radio that it once was. Although the style of homebrewing and kit building has changed over the years, many hams continue these pursuits and enjoy the technical side of the hobby. But this new ham generation often lacks the Elmer, or mentor, that many of us had back in the day.

It can be tough getting started on a project without ever having seen something like it done before (think about your first PL-259).

From Elmer to Maker

Most hams who have been at it for a while started out building projects under the tutelage of more experienced operators who may have been a family member, friend, neighbor, or a member of a local ham club. My dad George Papas, WN6IFX (SK), was a former Greek Merchant Marine radio operator who helped me learn Morse code.

I was also fortunate to have a high school electronics teacher, Truman Whorton, WB6QFV (SK), who, along with our school's Amateur Radio club, provided my entry to the hobby. Those first homebrew projects were built under their watchful eyes at home and in the school's electronics and metalworking shops.

So where do new hams go now to get that same kind of start? As people both young and old are much busier today, it can be difficult for them to allocate precious time for their own hobby pursuits, especially if they lack the confidence that they will be successful. But the recent explosion of the "Maker" community has in many ways reinvigorated their ham builder counterparts and has sparked a resurgence in returning to the role of curious experimenter and builder, a hallmark of early hams. Surprisingly, some pundits have actually taken offense at being called a "Ham Maker" as opposed to a "homebrewer" or "builder." Personally, it makes no difference to me what you call yourself as long as you're building something related to ham radio — if your soldering iron is hot, you're okay in my book!

Getting Started

The first thing I did to get the Builders Group started was to send a note to our club's e-mail reflector. I asked folks if they would like to participate and requested information about their experience level.



Builders Group Mentor Chris Courson, KC4CMR (standing), helps group members with their projects.

I also inquired about meetings; what would be the best day of the week, time, and meeting frequency. Finally, I asked if they would like to take on a group project or work on their own individual projects. After collecting, collating, and analyzing this information I thought the group might be about 12 – 15 members in size, that bi-weekly Saturday morning sessions worked best for all involved, and that folks wanted to start out by selecting their own projects. I asked friends Chuck White, AI4WU, and Chris Courson, KC4CMR — both of whom have strong technical backgrounds — to act as mentors for the building sessions. Also, before our first get-together, I asked them to check my plan and the proposed workspace layout.

Logistics

Our builders would need tables, chairs, power, additional task lighting for their work area, and some basic supplies, in case they forgot to bring something along in their toolkit (solder, basic hand tools, etc). We set up folding tables, chairs, and floor extension cord protectors, as well as additional magnifying and table lamps. At one of our local “feed and seed” stores, I found two very heavy, hard rubber mats normally used to cover the floor in horse stalls. These were used to provide a buffer between the tables and chairs and the concrete floor. A supply of egg cartons was also gathered for builders to use in organizing their project parts, and finally, a coffee maker and doughnuts rounded out the necessary supplies.

During our first session, we found that Internet access was a useful thing to have, as several questions arose about projects, most often relating to a component data sheet, or for information or instructions for a product or kit. I established an open, temporary access portal to the Internet through our home’s Wi-Fi router. This connection did not require a password, and it allowed the builders to reach the web from their own tablets or smartphones.

We also made a printer available in the event someone needed a hard copy to use at the table. Finally, I made my own shack workbench available to any of the builders who needed to do more advanced construction or access more sophisticated test equipment than they may have brought along.

Safety

Both my spouse and I are retired soldiers, and as safety was always a paramount con-



Builders Group member Gray Reid, W4NGR, takes advantage of the author’s workbench.

cern during military operations, I wanted to make sure the workspace was as hazard-free as possible. My biggest concern was for eye safety, either from snipped component leads being flung through the air or solder splashes. So a quick discussion of safety was included at the beginning of each session and eye protection was a requirement in the form of either a builder’s own prescription eyeglasses or standard safety glasses. A sink for hand washing, a fire extinguisher, and a first aid kit were also available.

We began each session with introductions and members giving an overview of the project they were working on, their progress to date, and any problems they may have encountered since the last get-together. A club member filmed and posted a short video of one of our sessions so we could share the fun with the rest of our club. You can see the video at vimeo.com/62749437.

Projects

Club builders brought a variety of projects to work on and share with the group. These included low-power transceivers, boat anchor radios, digital displays, frequency counters, test equipment, emergency power battery chargers, and some commercial equipment that simply needed a little TLC. Our mentors circulated among the builders providing guidance, while realizing when to let a new builder experience a bit of “discovery learning” by sometimes making a mistake. As an Army service school and ham radio licensing class instructor, it was always satisfying for me to see the light come on in a student’s eyes for the very first time. When one of our builders accomplished tasks they may never have done before, that same satisfying

feeling came along when their project was complete and they were proud to display their new piece of working equipment.

The Future

The group concluded its most recent multi-week session in November 2014, and plans are being made to continue the gatherings in the spring and fall of 2015. I’m sure projects revolving around microcontrollers will become more popular but, surprisingly, there remains a trend among the group to work on older equipment as well. If your club doesn’t have a builders group, please consider starting one; the excitement and personal satisfaction you’ll experience will make your effort worthwhile. I want to acknowledge the valuable early-on input of long-distance friend Mike Doty, W0MNE, for sharing his experiences with his own builders group.

All photos by Dino Papas, KL0S.

Dino Papas, KL0S, Colonel US Army, Retired and ARRL® Life Member, has been a ham for over 45 years. He holds a BSEE degree from the University of California at Davis and a Masters of Engineering Administration degree from The George Washington University. For 26 years he served on active duty as an infantryman with ham radio, shortwave listening, computers, and electronics as his top hobbies. He also shares his excitement for the technical side of ham radio by penning a series of *KL0S Shack Notes* that are distributed among Williamsburg Area ARC members and friends around the country.

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