Getting on the Microwave Bands

Amateurs who are considering moving to the higher bands are usually driven by some desire to take on new challenges or just to have fun. In a survey of amateurs who are active on the microwave bands, "the technical challenge" was the most prevalent answer to the questions of why they got interested in microwaves in the first place, and why they continue active. I don't intend to scare you away with this comment—I know that many hams consider themselves nontechnical. Consider that more than half of those who took the survey did not have technical jobs or engineering training.

These challenges are the kind that you decided to take on when becoming an amateur in the first place. Getting involved with and operating on the microwave bands is a learning experience where you can apply most of what you have learned already about communications and extend it. All learning is in steps, and getting active on microwaves can and should be accomplished in steps as well. As most microwavers will tell you, the rewards are tremendous.

Rather than just answer the question "How do I get on the microwave bands?" myself, I asked a few well-known microwave operators for advice to new microwavers. This advice could take the form of a list of things to do, or examples of what they have or are doing. Here is what they said, followed at the end by my advice as well.

Bill Seabreeze, W3IY, *is a very active rover, stimulating activity by constantly inviting others to get on the air when conditions are good—and going out to hilltops himself to get the ball rolling.*

Here's what I think is important for someone getting on microwaves.

1. Find someone in your area with experience. This is really a good idea to save you time and money. There are often inexpensive ways to get on various bands, and making contact with other hams is the best way to stay aware of things that become available. Also, maybe your friend will have access to test equipment, which is often very helpful. Another microwave ham with working equipment can be all the test equipment you will need.

2. Consider making your new microwave project portable. This will allow you to take it up in the mountains, where you will have much better luck working other stations. It's really fun to be able to travel to areas with activity, so you can work more stations. It makes them really happy in contests, and will probably be very fulfilling for you as well. Being a microwave-enabled rover is really loads of fun! (Set your browser to **members.fcc.net/wseab/**.)

3. Be prepared to spend a few bucks. There is precious little surplus microwave gear anymore that is really cheap. Lots of guys are making profit from reselling used gear, and you really have to look around for bargains. Your friend from item 1 will hopefully help you to get the best bang for your bucks. Consider purchasing part of your microwave station new, to make the project more manageable. For example, buying a local oscillator can really help you avoid the pitfalls of integrating a new microwave band. Even crystals for existing surplus oscillators are getting more expensive.

4. Be active on the lower microwave bands (including VHF/UHF). You will find many stations with similar interests, with whom you can learn lots of good stuff. Learning who the active hams are will really pay off when you are searching for possible QSOs, or information about a new microwave band.

5. Read. There is much great information available in the microwave conference proceedings, RSGB and ARRL manuals, microwave magazines, etc. You should also subscribe to some of the microwave reflectors available on the Internet.

Doug Millar, K6JEY, *is president of the San Bernardino Microwave Society. His contributions to activity and construction are numerous.*

I have a few suggestions for those struggling to get on microwaves:

1. Work together: two radios are as easy to build as one.

2. Work around problems. Don't let them stump you, work on some other part of the project until an answer comes to you.

3. Shoot the engineer: Don't dote over design. Get building so that you see what the real problems are.

4. Get on the air! You will certainly modify your rig after you use it the first time, so plan on modifying it. You don't need to have the perfect radio when you go out in the field the first time. It takes several times for your radio to get close to the final form.

Al Ward, W5LUA, *is president of the North Texas Microwave Society. Al is probably best known for his preamplifier designs and pioneering work with microwave EME.*

Microwave is often a part of VHF/UHF contesting. This "rover" station by W3IY was used in the 2002 June VHF QSO Party.

N1MU crafted this homebrew 10-GHz transverter.

Tom Williams, WA1MBA ♦ wa1mba@arrl.org

These links and others can be found at **www.wa1mba.org/interest.htm.** Please visit this site for listings of other clubs and overseas resources.

• The San Bernardino Microwave Society publishes an excellent newsletter. To learn more, set your browser to **www.ham-radio.com/sbms/**. As of my last checking, there is no way to join on-line. Send your requests to the Corresponding Secretary, as listed on the site.

• North Texas Microwave Society newsletter is called *Feed Point*. NTMS has a Web site at **www.ntms.org/**. For a subscription, click on "Membership" and follow directions.

• The North East Weak Signal Group publishes a newsletter called *NEWSLetter*. Subscriptions can be obtained by setting your browser to **www.newsvhf.com/**. Click on the membership application form link.

• Mt Airy VHF Radio Club has a newsletter called *Cheesebits*. For subscription go to **www.ij.net/packrats/** and follow the links to subscribe.

• The European *DUBUS* magazine, perhaps one of the best technical amateur microwave periodicals, is available for subscription by setting your browser to **www.dubus.org/** and sending e-mail to the address for your country.

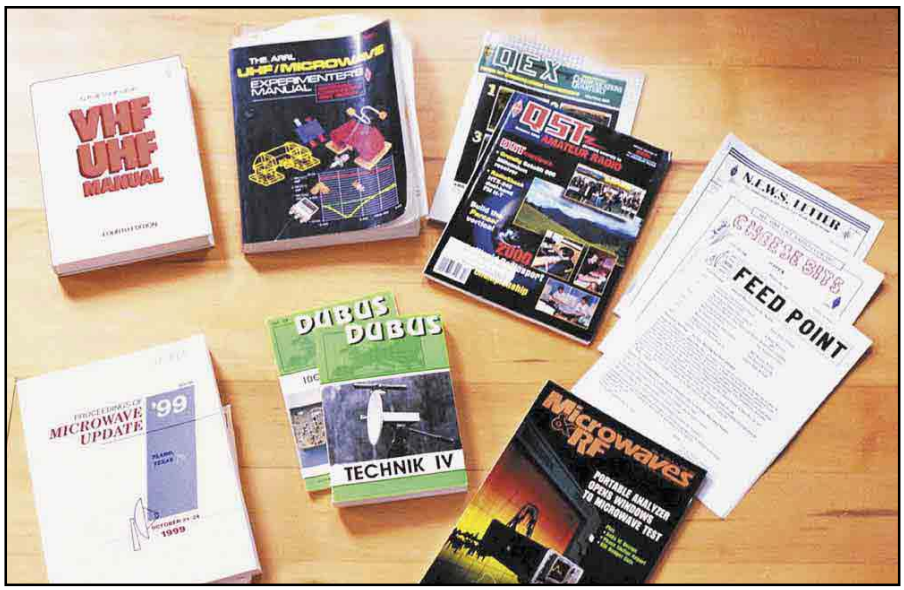
• The latest Microwave Update conference information can be found at **www.microwaveupdate.org/**.

In order to increase local activity in the North Texas Microwave Society, we have started a club project, which consists of building the Down East Microwave 10 GHz transverters.

The basic transverter coupled with a 2-meter multimode IF provides a 4-dB noise figure and 10 mW output at 10 GHz. The basic transverter connected to an 18-inch dish with a 3/4 inch copper pipe feed has allowed our members to make many 30 plus mile contacts in the flatlands of Texas.

Some of the members have also purchased the Qualcom 1-W PAs and have successfully made the modifications to get them tuned up on 10 GHz. The entire NTMS group looks forward to participating in the annual ARRL 10 GHz contest this year.

Tom Whitted, WA8WZG, *is a very active VHF and above operator from Ohio, and often places well in contests.*



Some of the publications of interest to microwavers.

First, try to network with someone who is currently using the microwave bands. This will allow you to overcome many of the pitfalls of starting from scratch, plus, for the experienced microwaver, it allows them to have someone new to work!

Second, read and study as much info as you can; the ARRL manuals and the RSGB series are great sources on info.

Don't try to reinvent the wheel at first. Copy, copy, copy what has worked for others.

The microwave bands are a great place for experimentation, but it will take some time to learn the do's and don'ts.

Above all, don't become disappointed. A good station takes some time and energy to put together.

And Now For My Input...

There is no single answer to the question of getting on the microwave bands because every person asking has different resources and expectations. Here are some useful tips.

Community. Find some other hams that live nearby who are also interested in getting started or are already active. You won't make contacts without other hams, and the first contacts you make will be with others nearby. As the sage said, "Learn from the mistakes of others because you won't live long enough to make them all yourself." Hams are attracted to microwaves because of the technical challenges, and sharing that learning is a very rewarding experience. Many areas of the country have active clubs, often with group projects. Seek them out.

Take your time. Getting on microwaves can be more complicated than getting on other bands. Each part of a radio system is a little more finicky and deserves some effort to learn just what is critical and how to get it right. When the signals are weak, Morse code is often used (usually at a low speed). Without it you will only work the stronger stations—but working the strong ones is a lot better than working none at all. So, even if you haven't learned the code yet, get on microwaves!

Expect some failure. Many hams who try microwaves do not make a contact the first time out. Usually there is something that goes wrong. When you do make your first contact, it will probably be weaker or more difficult than expected. Microwave operation is a process of learning and improving. You are likely to improve your station every time you use it.

Start small. Try a lower microwave band first, such as 1296 MHz. Or try 10 GHz, where there is perhaps the most activity when the weather is good. If you are getting on 10 GHz the first time, use a horn antenna and don't buy a power amplifier. You can get a dish and more power later.

Scrounge for surplus. Go to lots of flea markets and hamfests, especially with your microwave friends. You will quickly learn what is good and what is not. The vast majority of microwavers purchase most of their parts at a small fraction of their original cost, and often swap to get what they need.

Get information. Join a club, subscribe to a few newsletters, get on the Internet, and join mail and news groups. Read publications. See the list of resources that I have found to be continuously valuable. Go to Microwave Update or other weak signal conferences when they are in your part of the country. (Microwave Update 2002 is in Connecticut October 24-27.)