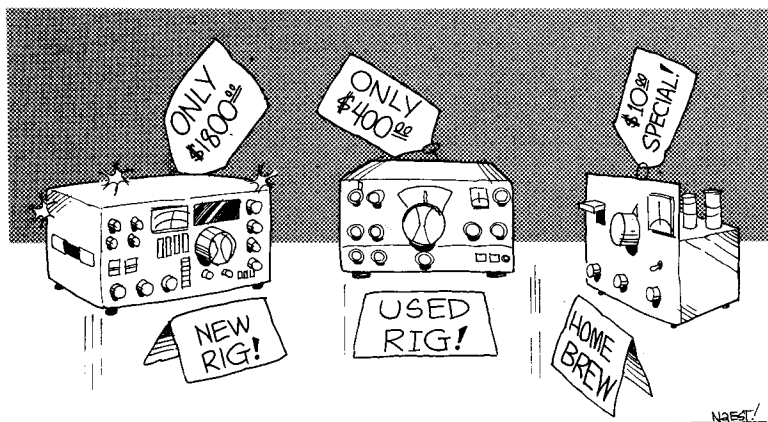


# Equipping Your First Ham Station



**Part 19:** You've learned the theory and acquired the needed code speed, and you'll soon be on the air. Now's the time to buy your ham gear and prepare for that first QSO.

By Doug DeMaw,\* W1FB

**N**ew equipment? Used ham gear? Or homemade transmitters and receivers? These are important questions you'll ask yourself when considering the task of putting together an Amateur Radio station. Each of you will want to get maximum benefit from the money you invest, and you will not want to make an error in judgment. Such a mistake in equipment choice could waste money, and the thrill of being a new ham could easily disappear if the gear performed poorly.

In this final installment of our series, let's examine the many avenues that are open to us when collecting the necessary items to send and receive communications effectively. The choices open to you are directly related to dollars: There is a definite cost difference between homemade, used and new gear.

## Building Your Own Equipment

Some of you are technically skilled. Perhaps you work in the electronics industry and feel comfortable designing or duplicating circuits. In fact, the very reason you have worked for a ham ticket is to be licensed to test transmitters of your own design. That was my motivation when I obtained my license many years ago. You may be more interested in the technology than in operating and ragchewing. If so, you will get many rewards from being an amateur.

But, what about those of you who have no background or special skills in elec-

tronics? Building anything other than the simplest of circuits could cost you valuable time and dollars, and you could end up with a unit that works poorly or not at all. For you, I recommend that the building of complex gear be limited at first to kits that are provided by manufacturers with good reputations. Kit building is fun, and it can be educational if you pay attention to the features of the parts and how they work in a circuit.

Assuming that you still want to build some of the station equipment, select uncomplicated things for your first attempts to construct items of convenience or necessity. This list contains a few units that can be easy to build and get working, provided you have a suitable *QST* or *Handbook* presentation to follow.

- 1) Transmatch (aka antenna tuner or antenna matcher)
- 2) Field-strength meter for antenna testing
- 3) Antennas (most popular types)
- 4) SWR (standing-wave ratio) indicator
- 5) RF power meter
- 6) Electronic CW keyer (avoid complex memory keyers)
- 7) Audio processors for microphones
- 8) Outboard CW filters (passive or active types)
- 9) One- or two-transistor transmitters (QRP—low power)
- 10) Crystal-controlled frequency markers (100, 50 or 25 kHz)

Most of these projects can be completed in an evening or two, and there will be satisfaction connected with the successful building and use of such accessories for

your station. As you build more and more simple ham equipment, your skill, knowledge and confidence will increase. This will help you to upgrade your license class. It will also prepare you for some of the more complicated home-constructed circuits.

## The Used-Equipment Market

Some of you may prefer to think of used gear as "previously owned equipment," which has a nicer sound. But, no matter what expression you adopt, there are certain dangers lurking in the second-hand-equipment market. Some of the available used gear has "bugs" in it, and that is why the owner decided to get rid of it. This is a chance we must take whenever we purchase second-hand apparatus.

There is money to be saved by avoiding the purchase of new ham gear. Your best opportunity for not being "stung" is to buy the equipment from someone you know and trust. Ask to borrow the item for a day or two while you make up your mind concerning the purchase. Alternatively, you may request a written money-back guarantee for within, say, 10 days of delivery.

My second suggestion is to purchase your used equipment from an established, reputable ham-gear dealer. Be sure there is an option to return the unit if it does not function properly. Several organizations advertise used, reconditioned amateur equipment. Check the ads in *QST*.

The worst-choice plan calls for buying used equipment from classified ads, on-the-air trader nets and trader bulletins. Under these circumstances, you are dealing on a

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# SQUARE-DEAL SAM'S



one-to-one basis with unknown persons; therein lies the gamble. *Caveat emptor* is strictly the rule in this "let the buyer beware" game!

## Good Things About Used Gear

Most used equipment operates properly. Rather than spend \$1200, for example, when buying a new super transceiver, we may select an 8- or 10-year-old clean (well-cared-for) transceiver for as little as \$300. Among the older units that can serve you well as a Novice or Technician are

- 1) Yaesu FT-101B, EE or E series
- 2) Drake TR-3 or TR-4 transceivers
- 3) Kenwood TS-520
- 4) Ten-Tec Triton 4 and its successor
- 5) Heath SB-100 or SB-101.

None of these units contains digital frequency readout, but you can do just fine with the analog dials and built-in crystal calibrators. After all, Amateur Radio succeeded marvelously for decades before digital readout was conceived! Certain sophisticated features, such as passband tuning, IF shift, speech processing, memories and outboard redundant VFOs, are missing, but you don't need them to communicate over the airwaves.

## Are Transceivers Necessary?

We are the products of a trend toward transceivers that began some years ago with the Collins KWM-series rigs. I must confess that they are a convenience, and provide a more compact station layout than we would have if we chose separate transmitters, receivers and VFOs, as in the

old days. But, if you can get a super deal on "separates," don't pass it up for the sake of convenience. A good surplus military receiver, such as the R-390 or 51J1, will work very nicely for you. You may also purchase older civilian receivers like the Collins 75A2, 75A3 or 75A4 for reasonable cost.

For CW transmitters, you may consider a Johnson Viking II, Johnson Valiant, Heath SB-400 (also works on SSB) or one of the old Collins 32V-series AM/CW transmitters. The major inconveniences in using a separate transmitter and receiver is that you will need to (1) employ an antenna changeover relay (controlled by the transmitter), (2) connect a receiver muting line and (3) perhaps use an external VFO for frequency control. Judicious shopping could net you a complete ham station in the 100-W class for as little as \$300. The fancy rig can always come later, after you gain experience and learn from other hams the names and model numbers of modern rigs they feel are reliable and cost-effective. You may visit other amateur stations and try the various rigs, thereby developing a first-hand impression of features and performance before laying out money.

## Purchasing New Equipment

Today's dealers for new amateur gear attempt to dazzle us with ads that instruct us to "call for prices." Some offer toll-free 800 numbers for this purpose. Personally, I find this annoying, for when I'm considering a new rig I want to compare prices for comparable units of different makes or

models. Making several phone calls is time consuming, to say the least. Mail-order purchasing has, however, become a way of life in the USA, and we are almost forced to accept it.

One of the problems relating to mail-order sales is that the dealer you select may be 3000 miles from your location. This makes it difficult and costly to return defective equipment, and new units do come through from time to time in an inoperative condition.

Getting factory service, for foreign-made gear in particular, may be traumatic for you under certain conditions. The quality of the service varies with the manufacturer. It can take weeks to have a warranty repair made, which leaves you high and dry without a rig. Buying a mail-order rig can save money, and the unit may never break down while you own it. But, few of us would consider purchasing a new car from a dealer 2000 miles away! It is an "iffy" proposition, and you should be aware of it. I would definitely check the reputation of the mail-order dealer you decide to become involved with. Many of them have excellent track records in dealing squarely with their customers. Those who advertise in *QST* are screened and approved before their ads are accepted, so you're generally on safe ground with them.

If you have a dealer within driving range of your QTH, I suggest you make an effort to buy from him or her. It's much easier to have problems resolved face-to-face with someone you deal with on a regular basis.

## Which Accessories Are Really Necessary?

A new amateur may be told that all manner of additional "goodies" are necessary for his or her ham setup. Knowing which units are essential to routine operating may be difficult for the newcomer. Take, for example, the Transmatch. You may be told that one is needed no matter what type of antenna you are using.



Some hams believe that an SWR reading should be 1:1 at all frequencies. A Transmatch will fool your transmitter into "thinking" an SWR of 1:1 exists, and that is great!

Most antennas exhibit a low SWR over a very narrow range of frequencies within a given amateur band. But no one will know you have an SWR of even 2:1, and many tube-type transmitters can operate effectively at an SWR of 2:1 or more. The shortfall may be, with some solid-state rigs, that the transmitter power will decrease automatically as SWR increases. This is done to prevent the power-amplifier transistors from being destroyed by the effects of high SWR. Your solid-state transmitter may show a power-output drop of only a few watts when the SWR is 2:1, and the difference may not be discernible in the receiver of the other operator. A tube rig will work just fine in the presence of a fairly high SWR.

If you have dipole, vertical or beam antennas that have been adjusted for a low SWR in your favorite parts of the bands, and assuming your feed system uses coaxial cable, you should not need a Transmatch. If, on the other hand, you elect to use a so-called multiband dipole that has tuned, open-wire feeders, you will need a Transmatch and a balun transformer to ensure a low SWR between the transmitter and the feed line: The Transmatch will not correct for a mismatch at the antenna feed point.

If you wish to use electronic keying rather than a straight key or "bug" key, you will want to obtain a keyer or a keyboard keyer. Check the *QST* Ham Ads for a used Curtis, Autek or MFJ keyer. You will also need a CW paddle (key). Beware of keyers that have built-in paddles. Most of them have sloppy mechanical characteristics, and learning to send good CW with those units can be a dreadful challenge. In general, the better the mechanical quality of the paddle, the better your sending. A WW II surplus J-38 straight key is hard to beat for quality in a hand key, as some call them. Whichever key you choose, it should have a heavy base so that it doesn't slip about on the operating table when you are using it.

External audio filters can be very useful for reducing the effects of interference from stations that are nearby in frequency. If your receiver already has a narrow (250-Hz) CW filter in the IF circuit, you may not realize much benefit from a sharp audio filter. But, a great improvement in reception can be had when using a good CW outboard audio filter with older rigs that have no CW filter, or one that is 600 Hz wide. An audio filter will also "lift" weak signals out of the noise to make an otherwise unreadable signal Q5. Your operating preferences (DX or ragchewing) will probably dictate your need for this accessory. These thoughts are applicable to



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most station accessories. You should evaluate your operating situation versus the style of equipment you have chosen, then decide whether you should invest in additional items. Good circuits for many accessory units are contained in the *ARRL Handbook*.

#### The Final View

It has been a pleasure to walk with you through these 19 installments of First Steps in Radio. I thank all of you who wrote me concerning the series. I hope our presentations have led some of you to that first amateur ticket, and that many who were

Novices have been able to upgrade after studying the basic theory we have covered. Congratulations to all of you, and may your first ham station be a thing of pride and utility!

QST

## Strays



### QEX: THE ARRL EXPERIMENTERS' EXCHANGE

□ Wonder what you've been missing by not subscribing to *QEX*, the ARRL newsletter for experimenters? Among the features in the June issue were:

- "Putting the Azden PCS-3000 on Packet" by Frank Roberts, VE3FAO
- A review of Jordan Asailovic's book, *Videodisc and Optical Memory Systems*, by Maureen Thompson, KA1DYZ
- A "TAPR TNC Modification for 12-V Use" by Robert Ball, WB8WGA.

*QEX* is edited by Paul Rinaldo, W4RI, and Maureen Thompson, KA1DYZ, and is published monthly. The special subscription rate for ARRL members is \$6 for 12 issues; for nonmembers, \$12. There are additional postage surcharges for mailing outside the U.S.; write to Headquarters for details.