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# CQ

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Kantronics KPC-3 Mini TNC,  
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**Plus A New Commentary by  
Ray Kowalski**

On the cover: Eric Scace, K3NA,  
Frederick, MD

THE RADIO AMATEUR'S JOURNAL

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# The Radio Amateur's Journal



**ON THE COVER:** Eric Scaze, K3NA, enjoys a little keyboard work at his neat Frederick, MD QTH. (Photo by Larry Mulvehill, WB2ZPI)

**NOVEMBER 1992**

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# ZERO BIAS

## EDITORIAL

Last month when I wrote about the terrible devastation that hit Florida and Louisiana, I commended the amateurs who immediately responded with health and welfare traffic. Shortly after that, another monumental hurricane hit Hawaii, and once again amateurs carved out a communications niche, helping wherever possible. While I certainly take pride in what my fellow amateurs continue to accomplish, part of what they were accomplishing was a complete abstraction to me. I couldn't imagine the experience of enduring and surviving such a catastrophe.

For most of us, the closest we come to that devastating feeling is prolonged blackout or loss of power. We had a prolonged blackout over a large portion of Long Island shortly after the hurricanes, also due to a storm. Starting late in the afternoon and lasting for the most part for about seven or eight hours, there was no electric power for a large number of Long Islanders. There were no street lights, no traffic lights, nor telephone service. Everything was dark and quiet. Granted, the weather was warm and so one major problem was avoided, although there was a sense of momentary isolation.

I scrounged around the house and found a flashlight and was grateful that the batteries were still good. The light enabled me to find the few candles I had for some ambient lighting, and then the search began for the portable battery-operated AM/FM radio I knew I had, but had forgotten where I last saw it. It was in the basement, and there was still some life left in that battery. Now at least I knew what was happening. At another spot in the house I found my stash of assorted batteries. So after a relatively short while, I had some light and news from the "outside world." I couldn't prepare food, as every appliance I have is electric, and I really didn't want to open and close the refrigerator too many times. I had always meant to pick up a small propane camping-type stove, but never got around to it.

After a relatively short period of time, my basic creature comforts were satisfied. Since it was dark, and I couldn't watch TV or turn on the rig, I went to bed. In the morning everything was back to normal. In relation to what the hurricane victims experienced this was hardly even a miniscule annoyance. What it does do, however, is point out how prepared or unprepared any of us are to handle an emergency situation. Granted, total devastation is total devastation, but most emergencies seem to fall short of that kind of damage.

There is considerable latitude in that continuum between inconvenience and being wiped out. There is also the distinct possibility that at any time we may be on the receiving end rather than on the helping end. Therefore, the existing problems are how do we cope with an emergency that befalls our community, and how do we maintain our households during that time?

Probably more of us should think in terms of preparing a small cache of batteries, flashlights, and basic necessities to keep us going for a day or two in case of emergency. Most of us don't have generators, so if we want to maintain contact with the "outside world" with other than an HT, we might have some difficulty. There aren't too many of us who keep car batteries in the shack.

While there was no real way to prepare for the two big hurricanes and the monumental damage, we should keep in mind that these were the exception to the rule. Most of us, however, could stand to be a little better prepared than we are so that we can help ourselves and our neighbors, too.

### Anniversary

It was just about a year ago that as far as amateur radio went, Albania became just another European country. ZA1A made amateur radio history by putting Albania back on the amateur radio map. For many it was a very long wait between countries, but for the vast majority it was pure magic to hear that ZA1A prefix. The 1991-92 DX season was phenomenal for most amateurs.

### November

By the time you read this the 1992 CQ WW DX SSB Contest will be history and the CW event is still a few weeks off. Judging by the rate we've been filling log requests (yes, not everyone uses a computer), this should be a big one. Please mark the outside of the envelope with the mode when you send in your completed logs, and if you are entering the Low Power or Assisted categories, don't forget to note that on your logs.

Although these two big contests come at the end of the year, they do in effect kick off the 1992 CQ contest season, which is absolutely guaranteed fun for all those who take part. How good an operator you are and how well your station stands up are

quickly found out during a contest.

If you are a fledgling DXer or first-time tester, don't be afraid to jump right in. It's also a terrific time to collect prefixes or whatever else you may collect for amateur radio's many awards. Contests are a time when each and every contact is important and everyone wants to contact you. So whether you make a few or a few thousand contacts, they are all important. You'll be surprised at what you can work with relative ease during a contest. If it's a new country or a strange prefix, don't be afraid to ask the QSL route.

Also, don't forget to exercise your right to vote on November 3rd. It's important to take part in the process and to make your vote count. We are each part of the system, whether beneficiary or victim. If we fail to vote, to exercise that option of saying yes or no, then we are always victims, no matter who wins.

### December

Have you started your holiday wish list yet? I know I have. I also know that I won't get most of the things on the list, but that's okay, too. I've been looking over all of the product reviews and checking out the ads to see what might fit nicely in my shack. There are a lot of accessories and just general "stuff" out there that I could enjoy with a little effort. There are some things out there that I could really enjoy if I only could figure out what they do. One thing that you realize quickly by checking through *CQ* or our *Buyer's Guides* is how vast a hobby amateur radio really is.

There is virtually an unlimited variety of special vertical interests all under the umbrella of amateur radio. All of these interests have gadgets, equipment, literature, collectibles, devout followers, and even heroes noted for their specialized accomplishments within that interest. Imagine all of this going on without even knowing about it.

So this year I think I'll put a few more things on my list that will broaden my outlook on the hobby a bit and let me try something new. I'd also like to have my shack as neat as some of the ones seen on our covers, but that might be a little too much to ask for. A new rig might be easier to get. On that point, however, I have a hunch that they dump all of the papers and good stuff out in the driveway before Larry comes to take the picture, and bring it back in when he leaves.

73, Alan, K2EEK

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# ANNOUNCEMENTS

• **The following Special Events are scheduled for November:**

**WA3DFU/3**, DXpedition from the state of Delaware; Warminster ARC; Nov. 1; freq. 7.275, 14.275, 21.375, 28.375 MHz, CW on request. QSL with SASE to Warminster ARC, Box 113, Warminster, PA 18974.

**AB4TT**, from Sampson County Expo, Clinton, North Carolina; Sampson County ARS; 1700-2400Z Nov. 5; in lower portion of General bands. For certificate send QSL and SASE to SCARS, P.O. Box 64, Clinton, NC 28328.

**KN4RY**, from 7th anniversary of UDT-Seal Museum, Fort Pierce, Florida; Fort Pierce ARC; 1400-2100Z Nov. 14; General portion of 40, 20, 15, and Novice portion of 10 meters. For certificate send QSL

and #10 SASE to Fort Pierce ARC, P.O. Box 4, Fort Pierce, FL 34954.

**W4NJA/KY200**, from Kentucky Bicentennial Celebration, Paducah, Kentucky; Nov. 2-8; operation 25 kHz from bottom of General and Novice subbands. For QSL send SASE to KC4ENA, P.O. Box 1732, Paducah, KY 42002-1732.

**N4MAD**, from Ft. Pickens State Park, IOTA 142, Santa Rosa Island, Florida; Serious Hams ARC; 1200-0000Z Nov. 7; on 80, 40, 20, 15, 10 meters code and voice portions of the bands. Contacts will receive a special QSL (no route given).

**W4SKH**, from Oak Ridge, Tennessee 50th birthday celebration; Oak Ridge ARC; Nov. 15 to Dec. 15; lower 25 kHz of General 40, 20, 15, 10 meters SSB and CW

on 14.050 and 28.050. For certificate send SASE and QSL (make sure your contact number is on the card) to Oak Ridge ARC, P.O. Box 4291, Oak Ridge, TN 37831-4291.

**WH6R**, from 50th anniversary of the rescue of Eddie Rickenbacker in the Pacific; Army MARS; 1900Z Nov. 7 to 1900Z Nov. 8; lower portion of all bands, all modes, including Novice subbands. For commemorative QSL send QSL and SASE to Joe Hao, 3251 Pakanu St., Honolulu, HI 96822.

**KH6-land**, from Kalaupapa Settlement, Kalawao County, Hawaii; Kalawao Co. ARC; 2200Z Nov. 13 to 2200Z Nov. 14; on most bands SSB and CW, including Novice subbands. QSL with SASE to individual stations, or to James Koch, NH6YH, P.O. Box 299, Kualapuu, HI 96757.

**KC6CEM & KB6GKX**, from Pasadena Doo Dah Parade, Pasadena, California; 1600-2100Z each day Nov. 28-29; General and Novice phone bands around 28.343, 21.343, 14.343. For QSL send SASE and QSL to Jack Eifer, KC6CEM, P.O. Box 612, Altadena, CA 91003.

**W0AA**, from St. Paul Civic Center Hamfest Minnesota and Computer Expo; The Southwest Metro Amateur Radio Transmitting Society; 7:30 AM to 3 PM CDST Oct. 31; lower 25 MHz of General portion of 20 and 15 meters plus 10 meter Novice. For special event Hamfest Minnesota QSL send #10 SASE to W0AA, P.O. Box 53, Hopkins, MN 55343.

**NC0A**, from world's highest suspension bridge, Royal Gorge Bridge, Colorado; Royal Gorge ARC; 1500-2200Z Nov. 14; lower 30 kHz of General 20 and 15 meter subbands and Novice 10 meters. For certificate send QSL and 9 x 12 SASE to NC0A, Chuck Ward, 1011 Harrison Ave., Canon City, CO 81212.

**VF7L**, from annual meeting of the British Columbia Cabinet, Fort Langley, BC, Canada; Fraser Valley ARA; Nov. 19-22 from 1700-2300Z each day; General portion of 20, 15, 10 meters. For 8 1/2 x 11 certificate send \$1.00 U.S. to Fraser Valley ARA, Box 50, Fort Langley, BC, Canada V0X 1J0. QSLs will be handled through the various bureaus.

**VG3W**, from Remembrance Day celebration, McCrae House Museum, Guelph, Ontario, Canada; Guelph ARC; Nov. 7-11 from 1500-2200Z each day; SSB and CW on 10, 15, 20, 40 meters. For QSL send QSL with SASE or IRC to Guelph ARC, P.O. Box 1305, Guelph, ON, Canada N1H 6H9.

• **The following hamfests, etc., are slated for November:**

Nov. 1, **Boone & Clinton Co. Hamfest**, Community Building, Boone Co. 4-H Fairgrounds. Contact Don Jackman, N9ILX, 317-482-5211, or Don Lecklitner, N9GBO, 317-654-6580. (VE exams nearby)

Nov. 7, **6.91 Friendly Fest**, Serb Hall, Milwaukee, Wisconsin. Contact The Milwaukee Repeater Club, P.O. Box 2123, Milwaukee, WI 53201. (Exams)

Nov. 8, **Radio Central ARC HAMEXPO**, Suffolk Community College, exit 62 on the LIE, north 1 mile, Long Island, New York. Contact John Mark, KB2QQ, 516-689-6336, or Jo Ann Colletti, N2IME, 516-399-1877. (Exams)

Nov. 7, **Lake ARA Hamfest & Electronics Expo**, Lake County Fairgrounds, Eustis, Florida. Contact Cole A. Ruck, KC4UIG, 407-273-1624. (Exams beginning at 1 PM)

Nov. 14, **Montgomery Hamfest**, Garrett Coliseum, South Alabama State Fairgrounds, Montgomery, Alabama. Contact Jiggs at 205-365-0380, or Fred at 205-270-0909. (Exams beginning at 8 AM)

Nov. 14-15, **Fort Wayne Hamfest & Computer Expo / 1992 ARRL Indiana State Convention**, Allen County War Memorial Coliseum, Fort Wayne, Indiana. Contact Don Gagnon, WB8HQS, 219-484-3317. (Exams both days)

Nov. 15, **JARSFEST '92**, American Legion Complex, Benson, North Carolina. Contact Bill Lambert, AK4H, Rt. 3 Box 315, Benson, NC 27504 (919-894-3352 evenings 7-9 PM). (Preregister for exams by Nov. 9 to

(continued on p. 159)

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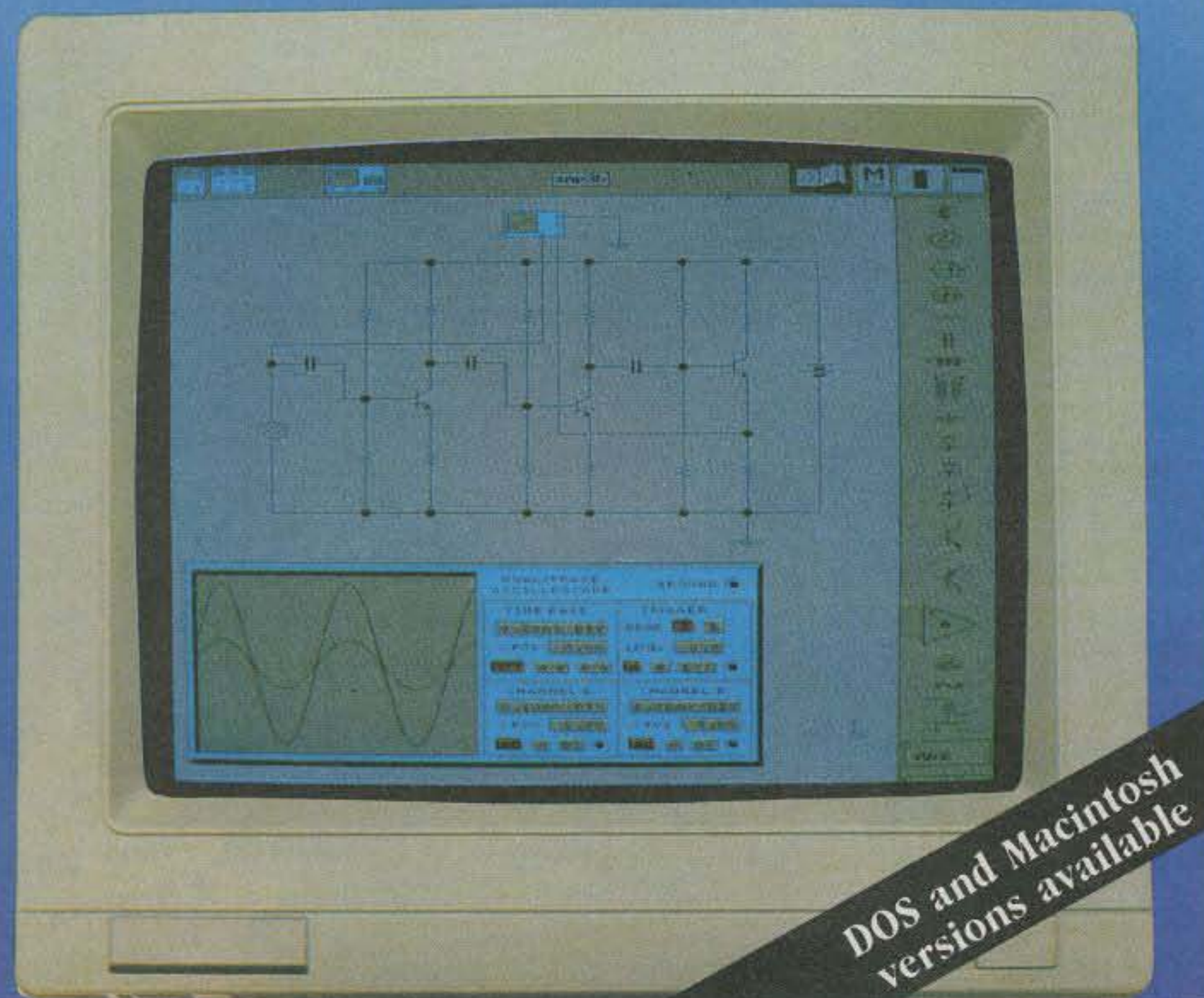
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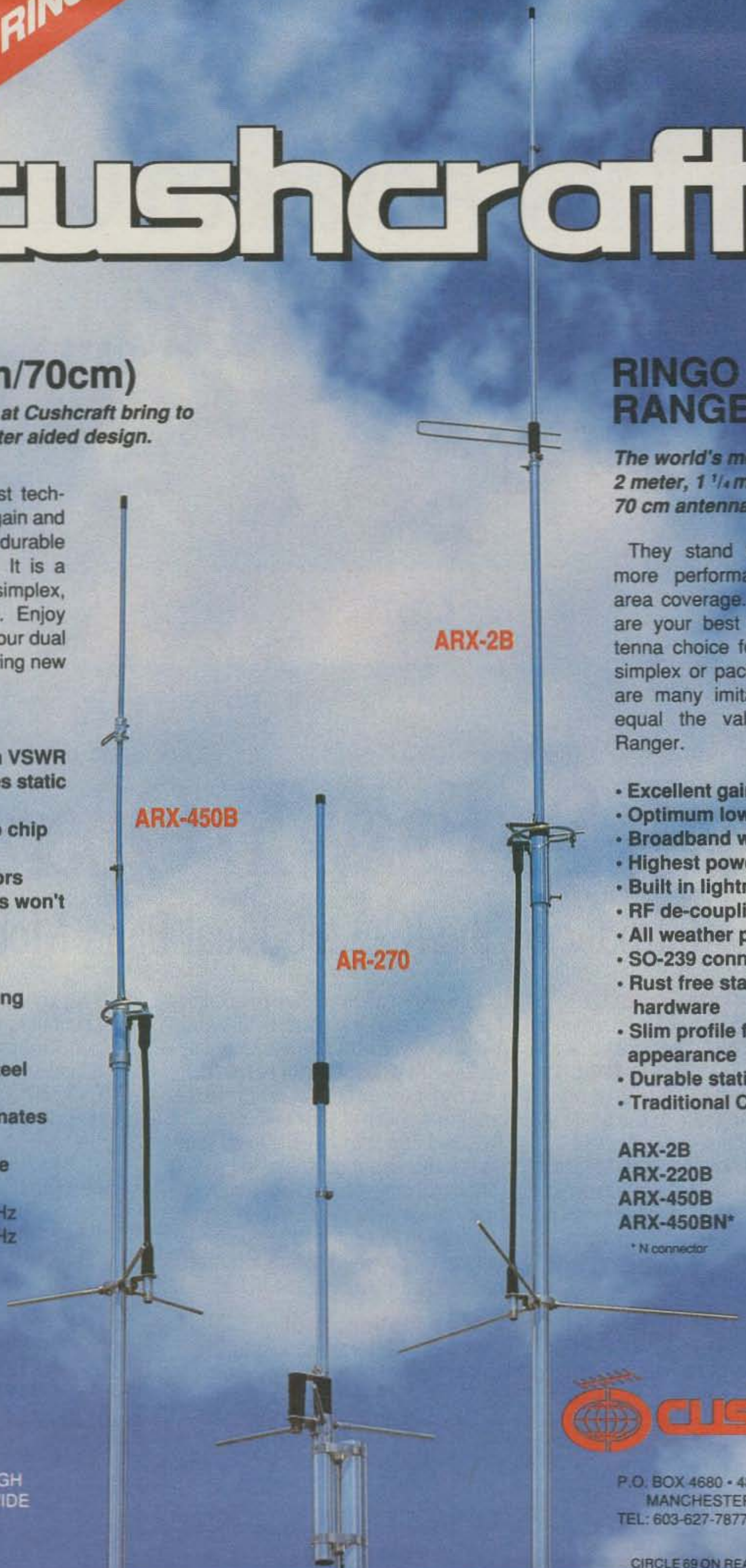
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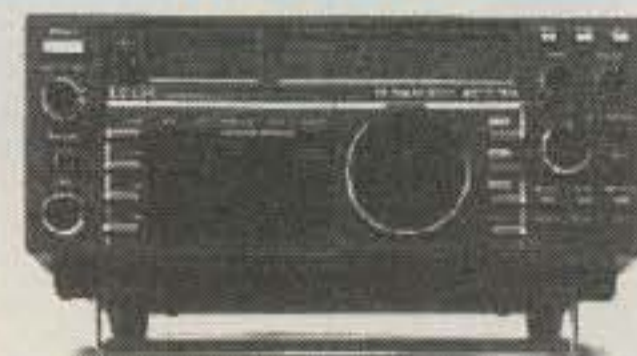
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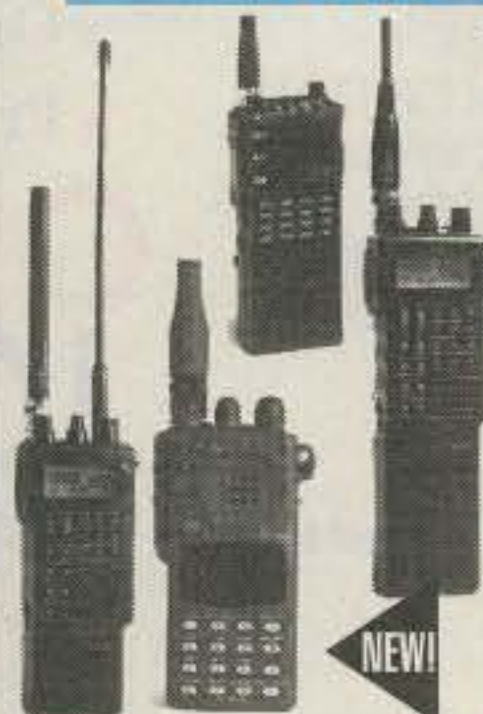
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**Hard as it may be to believe, the FCC does involve itself in other things besides amateur radio. Where we fit in the scheme of things may surprise you, and where we're going becomes a very good question.**

## Currents

BY RAY KOWALSKI\*

*Ray Kowalski is a partner in the Washington, DC law firm of Keller and Heckman, where he practices telecommunications law. For 19 years Ray was an official of the Federal Communications Commission. He was responsible for the Amateur Radio Service from 1980 to 1988, when he left the FCC for the private practice of law. He can be reached at 202-434-4230.*

—K2EEK

This article, and those to follow from time to time, will not necessarily be about amateur radio. These articles will be about telecommunications, about Washington, and about the Federal Communications Commission, from the perspective of a communications professional who just happens to have more than a casual interest in amateur radio.

These articles will not appeal to everyone. For many, if not most, amateurs amateur radio is a hobby that is enjoyed at its simplest level. For them, the pleasure of making new friends or communicating with stations in far-off places is the extent of their involvement in the hobby. They feel that amateur radio is pretty much the same as it has always been, and they have no interest in what's going on in the larger world of telecommunications. It sounds too much like criticism to say they take amateur radio for granted, so let's just say they have plenty of other things in their lives to worry about without also worrying about their hobby.

Amateur radio has endured because of the depth of interest that it offers. Amateur radio enthusiasts can explore virtually any communications technology known to man. They can get involved in clubs. They can design and build equipment. They can compete in contests. They can share their

knowledge and expertise with newcomers. They can serve their community. They can save lives. People who buy magazines about this hobby probably have interests that extend to one or more of these dimensions. My thesis is that some of these people may want to know more about how amateur radio fits in the big picture.

The world of telecommunications is like a giant jigsaw puzzle. Each piece of the puzzle is complete in itself, but you can understand an individual piece better if you can see how and where it fits in relation to the other pieces. To gain a rough idea of the dimension of the jigsaw puzzle, consider this: the FCC's rules and regulations comprise a total of 2,651 pages in *Title 47 of the Code of Federal Regulations*. The rules and regulations for the Amateur Radio Service comprise 32 of those pages. It is a relatively small piece.

This has nothing to do with the importance of amateur radio. My own belief is that amateur radio is more than just another radio service authorized by the FCC. I believe that amateur radio is a national resource that deserves to be nurtured, preserved, and defended. But amateur radio derives its importance from the voluntary activities and contributions of its members. Despite the way it may appear to most amateurs, the FCC devotes comparatively little time and attention to the Amateur Radio Service.

Let's take a closer look at our telecommunications jigsaw puzzle. Imagine, if you will, that the individual puzzle pieces are made of wood and that they are floating on water. If someone were to drop a stone on the puzzle, the individual piece or pieces that were hit by the stone would bob around and bump into other nearby pieces. More distant puzzle pieces would also be affected as the ripples from the stone spread out through the water. Perhaps the pieces farthest away from the point where the stone hit would remain relatively calm, but there would be subtle effects even on those pieces. It is safe to say that there

would be some rearrangement of the puzzle, most noticeably near the point where the stone fell.

The problem is that more and more stones are falling in more and more places. The surface of the water is anything but tranquil. The little puzzle piece that represents amateur radio is riding on a churning surface that never truly calms down. And lately some pretty hefty rocks have been tossed on the jigsaw puzzle. It does not matter if none of these rocks has been aimed at amateur radio's puzzle piece. Amateur radio will still be affected.

This is as far as our floating jigsaw puzzle analogy can take us. No analogy is perfect, but this one serves to illustrate the point that amateur radio does not exist in isolation. It exists in an interdependent world of diverse telecommunications interests. This world is constantly changing and the rate of change is accelerating. To predict where it is going, we need to understand where it has been.

### Regulatory Stability

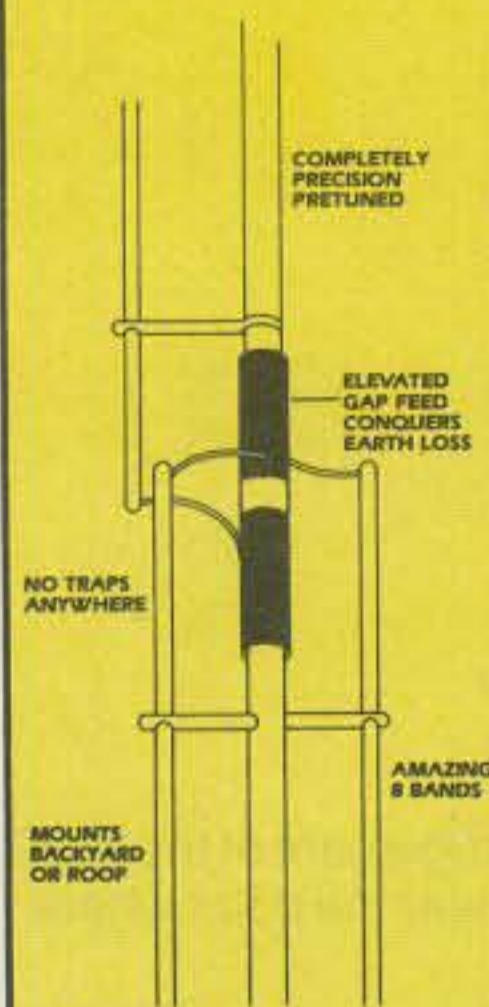
No one knows better than amateurs the intricate relationship between government regulation and technological advances. Before 1921 it was thought that reliable communications over distances of 2,000 to 3,000 miles required wavelengths of 15,000 to 20,000 meters. In 1921 the amateurs at station 1BCG demonstrated that transatlantic communications were possible on "short" wavelengths of around 200 meters, wavelengths that were then considered to be of little commercial value and therefore perfect for amateur radio operators. Having pioneered the territory, amateur radio became a victim of its own success.

Over the next sixty years or so constant advances in radio technology—many accomplished by amateurs—made possible the commercial use of vacant chunks of the radio spectrum that were ever higher

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in frequency. As technology tamed the spectrum, the regulators' response was to create new "services" and to grant licenses to users in these services.

(My predecessors in the communications bar prospered as they represented clients who wanted the FCC to allocate the new bands for this or that type of service and as they obtained FCC licenses for their clients, often in highly competitive situations. No sooner would a round of frequency allocations and licensing be concluded, than another round would begin in the next higher band of frequencies.)

The beauty of this pattern was that there was always more spectrum to conquer. That, however, has come to an end. One of the last examples of this pattern was the creation in the 1970s of the common carrier Cellular Radio Telephone service and its private radio counterpart, the Specialized Mobile Radio Service. These services use chunks of spectrum in the 800 MHz region for land mobile communications. They are among the last new radio services that the FCC was able to create for use on essentially vacant spectrum.

It comes as no surprise to amateurs, however, that technological advances are still being made. The problem is that there is no more unused spectrum that can be tamed to support these new technologies. Thus, today's regulatory response to new technologies is to find a place for them on spectrum already occupied by existing services.

Amateurs got a taste of this in the 220-225 MHz band reallocation proceeding. The new technology with no place to go was narrowband, amplitude modulated, single-sideband, or ACSB. The 220-225 MHz band was an ideal candidate for restructuring, since amateurs were being allowed to use the band only as "caretakers" until the FCC and the National Telecommunications and Information Administration (which does for government radio users what the FCC does for non-government radio users) could figure out what to do with it.

It had taken so long for the FCC and NTIA to make up their minds about how to use this band, that amateurs lost sight of the fact that they were only temporary tenants. When the regulators finally decided to use 2 MHz of the band for a new land mobile service and to give 3 MHz of the band to the Amateur Service, the amateur community felt it had suffered a terrible loss. (I could make a good case that the Amateur Radio Service actually benefited from the reallocation, since "owning" 3 MHz of spectrum may well be worth more than "renting" 5 MHz of spectrum.)

The Amateur Radio Service is not the only service that is threatened by the demands of new technologies. The Amateur Radio Service is only one of many "first generation" services—that is, first occupants of any given segment of spec-

trum. Other first-generation services include radio and television broadcasting, radio common carriers, the maritime mobile radio service, and the public and private land mobile radio services.

The threat to the first-generation services is not that they might be abolished. The threat is that they might at some point have to give up a portion of their allocated radio spectrum. To a certain extent, the first generation services are using valuable spectrum to support outmoded, inefficient modes of communication that are really only vestiges of their original radio technology. Therefore, it is becoming the task of the FCC to decide when a first-generation radio service has evolved to the point where it can give up spectrum to other uses and still remain viable.

Having once held FCC responsibility for the Maritime Mobile Radio Service, let me use that service as an example. The Maritime Mobile Radio Service represents the oldest of all licensed radio services. The first practical application of radio technology was on ships at sea for distress communications. (The FCC's roots in the maritime service are evident even today, as FCC field offices still tend to be located in port cities because of the FCC's responsibility to inspect ship stations.)

While there have been many advances in maritime communications over the years, the backbone of the distress and safety system is still Morse telegraphy on the frequency 500 kHz. Operational communications for ships on the high seas still use high-frequency bands. Over the years, however, the INMARSAT satellite system has gained acceptance for operational communications and the world is now implementing a new Global Maritime Distress and Safety System, which will take advantage of satellite-based communications. When the transition is complete at the end of this century, the question will be whether all of the maritime bands are still necessary for maritime operational and distress communications.

The private land mobile radio services are another good example of the effects of evolution on first-generation services. These are the two-way radio services that are used by companies and public safety agencies to dispatch their vehicles. In the early days of radio, they would put a base station at their headquarters and mobile units in the vehicles. Then along came repeaters. Now there are high-capacity trunked systems. Yet the frequency bands for all of these different technologies still exist. The FCC is currently looking at this situation and considering whether it isn't time to "refarm" this spectrum.

Something else is happening, too. Besides the evolution of radio technology, there is also a curious phenomenon taking place in radio use. A professor at the Massachusetts Institute of Technology, Nicholas Negroponte, calls it the

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"Negroponte Switch." Prof. Negroponte has observed that wireless communications and wireline communications are "switching" places. Things that have traditionally been transmitted over wirelines, such as telephone calls, are increasingly being transmitted by wireless—for example, cellular telephone. Conversely, things that have traditionally been transmitted over the air, such as television, are increasingly being transmitted by wire—for example, cable television.

If video entertainment becomes a predominantly cable-delivered service (and in a future article I will examine the FCC's recent decision to allow the telephone companies to provide "video dialtone" services), sooner or later the question must be asked whether television broadcasting still needs all of the spectrum now allocated to it. Again, the question is not whether there should continue to be over-the-air, "free" TV. The question is whether the opportunity cost of continuing the present television broadcasting allocation is justified. In other words, what would be the alternative uses for some of this television spectrum? What leading-edge communications services could be implemented in America, if we shrunk the television allocation and used the resulting spectrum to support new communications technologies?

For years and years we have been comfortable with a relatively stable communications regulatory environment. Like the Pax Romana, this stability has fostered an era of investment and implementation in telecommunications equipment and services. However, the forces of change that I have described above are now disrupting the tranquility.

Out beyond the non-pecuniary walls of the amateur radio fortress, the commercial telecommunications world is engaged in a titanic struggle. At stake is telecommunications supremacy, or maybe even survival. Telecommunications users and service providers with enormous investments in their existing systems are battling telecommunications innovators who see their chance to gain a share of the multi-billion-dollar industry. Given the absence of vacant spectrum to support new technologies, the spectrum innovators can only prevail at the expense of the spectrum incumbents.

The federal government is allowing the marketplace to decide the outcome of the struggle. Perhaps this is an enlightened approach, since nothing is more irresistible than an idea whose time has come. Or perhaps this is an abdication of the government's responsibility to take positive steps to assure that spectrum—which, after all, is a natural resource like forests and minerals—is used in the public interest.

This is how amateur radio fits into the jigsaw puzzle. These are the trends and events that must inevitably have an impact on the service.





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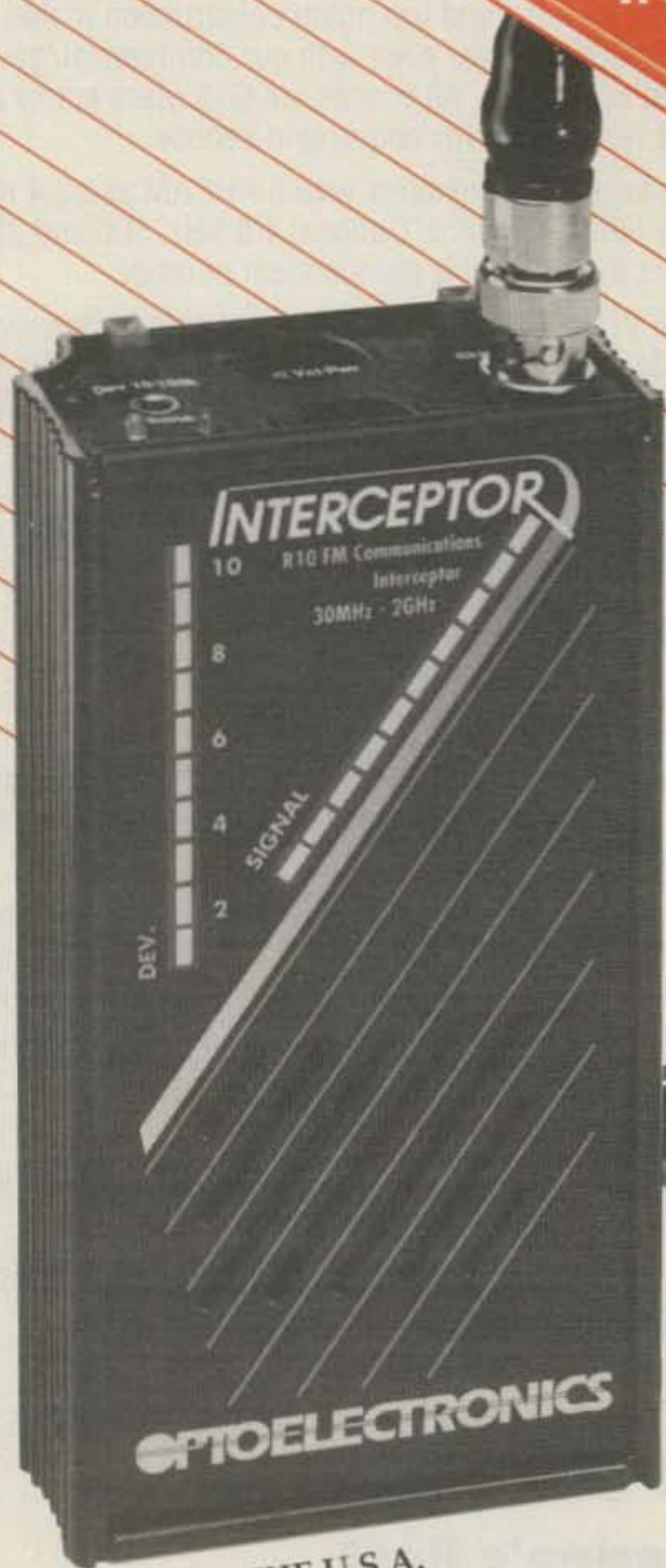
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**As we enter the winter contest and DX season, many of us routinely make use of beacon stations to check propagation paths. DL1IX fills us in on the history and origins of beacons. W3ASK also provides us with a preface to relate his experiences with this wartime innovation.**

## The Origin of Amateur Radio Beacons

BY WALDEMAR F. KEHLER\*, DL1IX (ex-D3FBA)

### PREFACE

By George Jacobs, W3ASK

*While I can't vouch that the German wartime beacons discussed in this article were the first "amateur" beacons, I can say from my own wartime experiences that they, or ones similar to them, did exist. From December 1944 until the end of the war in Europe I served in the 8th Air Force as an electronic navigator. I flew on B-17s and Mosquitos (radar planes made primarily of wood). I navigated on seventeen missions over Germany and occupied territories, using Radar (PPI), GH (a hyperbolic navigational device which eventually led to the development of LORAN and DECCA), Radio Direction Finders, and other electronic equipment. I knew of the 28 MHz beacon near Berlin discussed in this article because I could see it "blink" on my GH Radar, which also operated near 28 MHz. I do remember that the callsign used by the beacon was similar to pre-war German callsigns, but I did not relate it to amateur radio at the time. Incidentally, the Germans were also listening to us! On B-17 missions the Radio Operator would always check his radio equipment over the English Channel. Many of the Radio Operators were radio amateurs. On one mission we had four radio amateurs aboard: myself, the Radio Operator, the Co-pilot, and the Tail Gunner. As we crossed the Channel, the Radio Operator, who tested his equipment with a long series of V's, broke in on the intercom to announce that he had just had a "QSO" with a D4. After sending V's, a signal came back from the ground saying something like "dr OM I QSL ur test. CUL 73 de D4—. I no longer recall the entire callsign. While the following article gives credit to amateur radio for developing German beacons during World War II, it is ironic that these very beacons were also used by radio amateurs in the Allied air forces as well!*

**T**oday, most amateurs and shortwave listeners know how useful beacon transmitters can be in determining propagation conditions along any given path. They go a long way in maximizing the hunt for DX and in formulating contest plans.

The value of beacons as a tool or aid has increased along with the increase in the number of available beacons. By transmitting continuously, or at fixed intervals day and night, they immediately show any band opening. Some beacons transmit propagation data and forecasts which enable ama-

teurs to use odd paths to make long-distance contacts.

In the beginning, beacons were the domain of amateurs. They were devised, built, and used strictly by amateurs for their own use. More recently, scientific institutions and the military have taken to using their own beacons to study and understand propagation techniques. Traditionally, though, amateurs have pioneered much of the development work in communications.

As with a lot of technology, war accelerates its development and use. In 1942 the German *Wehrmacht* was spread over most of the continent of Europe. This situation often resulted in difficult if not impossible communications links between front-line units and German headquarters.

Faced with the problem of selecting reliable shortwave communications frequencies, the idea arose to build and operate a continuously operational (24 hours per day) transmitter (called a *Richtsender*) somewhere near Berlin. No sooner said than done.

The basic design for the transmitter (beacon) was the responsibility of Herbert Salzbrunn, D4WYF, who was employed at the German High Command (OKW). He took the idea and designed two variations—a two-stage and a three-stage transmitter, based on a two-or three-tube rig. The tubes were types RL12P10, RL12P35, and a P50. The design called for a transmitter with an input power of 50 watts. The actual transmitter was built by a technician in a workshop located in Ludwigsfelde, a small village situated south of Berlin.

There existed in Ludwigsfelde at the time a monitoring station designed to receive foreign radio services. It was known and called by some "Giftkuche des OKW," which literally translates to "The poison kitchen of the German High Command." This was due to the fact that foreign propaganda messages were received there and passed on to a select few staff personnel and certain military units. Anyone else receiving or intercepting this information risked either a concentration camp or death.

The installation itself was highly visible with its vast antenna systems. The building that housed all of the receiving equipment was a simple wooden structure located in the middle of an open field.

To check on the viability of beacons and to get some first-hand feedback on how well they worked, tests were conducted on CW between Berlin and Madrid. These were in the form of hourly 5 minute contacts. These tests had to be conducted with extreme care, as the station in Madrid

\*Beethovenstrasser 69, D-7200 Tuttlingen, Germany

was located in a building that was part of the German Embassy and situated at the well-known Castellana, where General Franco normally held his military parades. Adjacent to this area was the Spanish News Agency, EFE. Any distortion or interference to their operation had to be strenuously avoided. There were two test periods lasting two weeks each, and both proved extremely stressful during the transmission and reception periods.

The transmitter in Madrid was a portable unit capable of 20 watts input. It was fed into a matched windom antenna 47 meters long, one end fastened to an old tree and about 15 meters below the long-wire transmission antenna of the news agency EFE. The test period ended in late 1942.

At the same time, other tests were being conducted in a rudimentary form of scanning equipment. Although designed for a different purpose, it would eventually find use at the monitoring station. The principle was based on a mechanical mechanism which turned the rotor of a capacitor very slowly from one end of a linear scale to another and back again. The moment a signal was heard, an operator

simply pushed a button to stop the moment. If there was no interest in the signal, another button was pushed to resume the scanning.

The next problem to arise was mainly philosophical rather than technical. Since stations operating as beacons were unknown by the effective German law at the time, the question of callsign came up. Rather than create more problems and in order to save time, Mr. Salzbrunn decided that the beacons would have his amateur radio callsign with a supplementary number. The 80 meter beacon transmitter was designated D4WYF2, and the 10 meter version had the callsign D4WYF5.

We then had to figure out an appropriate mechanism for keying each transmitter. After several trials we chose one which was simple and worked well. It consisted of an ebonite disk, the edge of which was engraved with the Morse symbols for the callsign. The disk was driven or rotated by a motor governed by a slow-speed reduction gear. The edge of the disk came in contact with the contacts of a relay which "rode" up and down the Morse symbols, thereby keying the anode circuit of the transmitter in the rhythm of the callsign.

Up through 1944 we German "amateurs" had the bands to ourselves for propagation research. In 1944 a few British "amateurs" also appeared on 40 and 80 meters using a "G7" prefix. Our beacons were set exactly on 3.500 MHz and 28.000 MHz. A little later on we added two additional beacons, one on 40 meters and the other on 20. These two were installed in the former office building of a German insurance company (Allianz-Versicherung) at Fehrbelliner Square in Berlin-Wilmersdorf. This place became well known with the attempt on Hitler's life on July 20, 1944.

Six months earlier, the night of January 1st, there was an all-out air raid on the monitoring station in Ludwigsfelde. There was a low-level strafing attack followed by a series of bombing runs, the first of these with large demolition types and then various and numerous incendiary bombs. The wooden building and monitoring equipment were obviously destroyed, but none of our personnel were seriously injured.

Fortunately for us, the beacons had been installed about 3 to 400 feet away from the wooden building in a small brick structure which was not touched in the raid. The only damage the beacon station sustained was to the connection to the main power line and some of our antennas. The down-time was minor and allowed us to do some maintenance and increase the power of the transmitters. After a few days the station went back on the air again as if nothing had happened.

The monitoring station, however, had been destroyed and would take considerable effort to reactivate. All of the fixed station equipment had to be temporarily re-

placed by portable military equipment procured from an army warehouse. To get the station and antenna system up and running again took three weeks.

Several months before the raid, a member of the crew had in fact requested a protective roof be put on the building, but that had been viewed as seditious, and he experienced personal difficulties as a result. After the raid, the German High Command decided to replace the burned out wooden building with a hardened shelter.

By this time the interest in beacons had increased and proposals to add new ones were being accepted by the High Command. Early in 1944 steps were taken to find a suitable site in East Prussia which would use the callsign D3FBA2. Another was planned for Silesia. These plans were eventually scrapped and halted after the attempt on Hitler's life when General Thiels, Chief of the German Intelligence Corps, was executed as a conspirator. The whole expansion project ended in September 1944.

One month earlier in August our new building and shelter was completed. In September representatives from various communications firms such as Philips, Siemens, and Telefunken were invited to demonstrate their latest production equipment so that we might replace the portable military gear. What followed was a series of competitive struggles between the companies to the point where nothing could be decided. We therefore continued our operation with updated military equipment until the station was closed down in March 1945, when the Russian Army closed the ring around Berlin. The beacon stations themselves ceased their transmissions at the end of February 1945.

When the war ended, the idea of beacon transmitters drifted into the background and was seemingly forgotten. Knowledgeable amateurs figured out how to use official time signal stations operating outside the amateur bands to do roughly the same thing. Emerging German amateurs, however, were initially handicapped by being forbidden to receive any stations outside of the amateur frequencies. During the 1970s amateurs rediscovered the idea of beacons, thereby proving the old adage that there is nothing new under the sun.

### Postscript by K2EEK

Fifty years ago, between October and November 1942, the author helped establish what he calls the first amateur radio beacon stations to operate as end-markers in the 80 and 10 meter bands and as a means of determining propagation paths. Subsequently, two other stations were set up on 40 and 20 meters operating from the center of Berlin. War and time have taken their toll, and the author may indeed be the last surviving crew member from that era.

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# CQ REVIEWS:

## The Ten-Tec Argonaut II QRP Transceiver

BY PAUL CARR\*, N4PC

**T**he Ten-Tec Argonaut is a full-featured QRP transceiver covering 160–10 meters. Additionally, it has receive capabilities from 100 kHz through 30 MHz. It transceives on CW, SSB, and FM, and receives on AM.

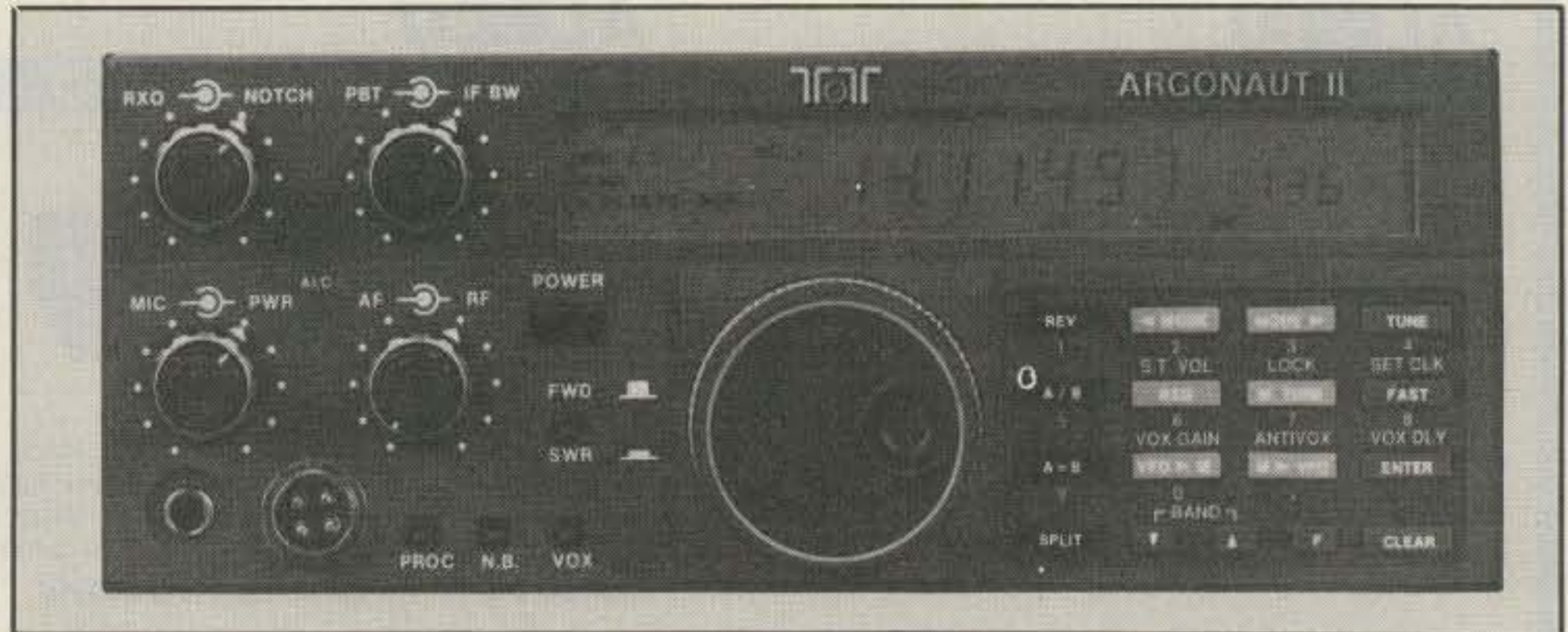
I was impressed by the craftsmanship of the equipment. It has a very "clean" appearance and is ruggedly constructed. The unit is small, but inside there is enough room so that you don't need watchmaker's skills to work on the unit should the need ever arise.

My first test of the unit was to evaluate the "human engineering" aspects of the unit. When the rig came, I took the package to the basement. I carefully unpacked the unit, put the instruction booklet aside, and took the transceiver, microphone, and power supply to my operating position. I connected the power supply, microphone, antenna, and ground to the rig. Next I looked at the control panel, turned on the power, and the rig came to life. The controls were clearly marked, and the digital readout was backlit and easy to read. To the right of the tuning knob is the data entry pad. I found two of the buttons marked **Band**. One had an up arrow, and the other had a down arrow. I pushed those buttons until I got the rig on the 17 meter band. I tuned across the band until I heard a familiar voice, and then I called. My friend, Gus Hansen, KBØYH, came back on the first call. Twenty minutes after I took the package to my basement, I was in QSO. The engineers at Ten-Tec have done a great job building a rig that is easy to operate.

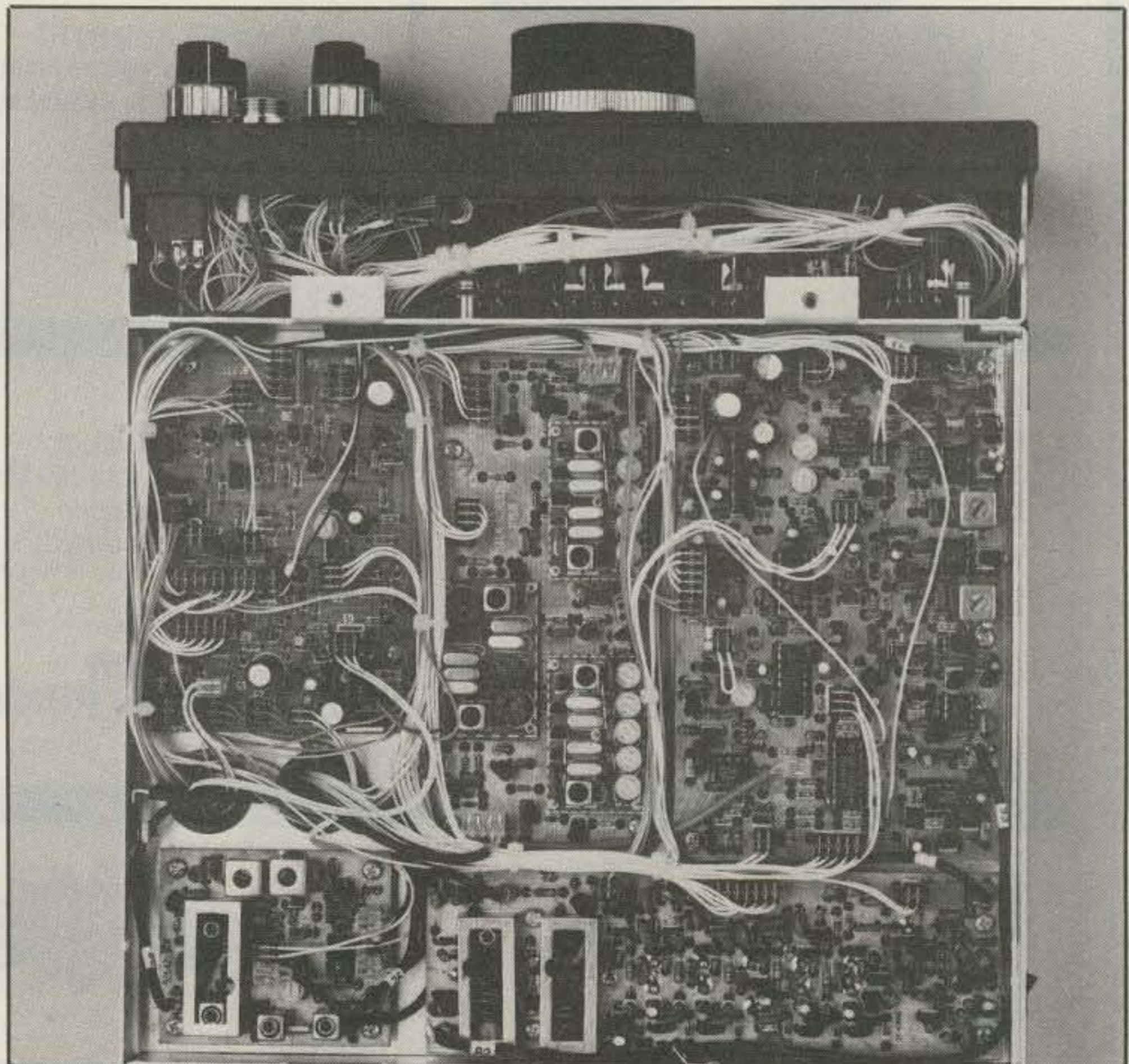
### Specifications

As you can see from Table I, the Argonaut II is a full-featured transceiver for QRP operation. Instead of trying to discuss each entry in the specification list, I would like to emphasize the features that really impressed me.

\*97 West Point Road, Jacksonville, AL 36265



Front view of the Ten-Tec Argonaut II. While the front panel may appear slightly sparse, check the inside views to see how much actually is packed into the cabinet.



Top view of the QRP transceiver. QRP obviously doesn't have to mean bare-bones simplicity and can be quite sophisticated.

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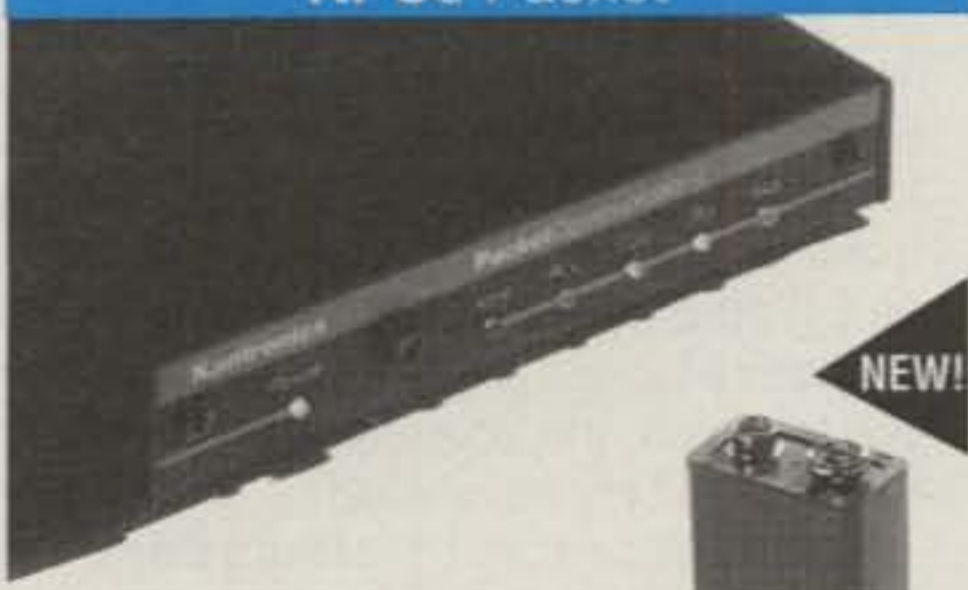


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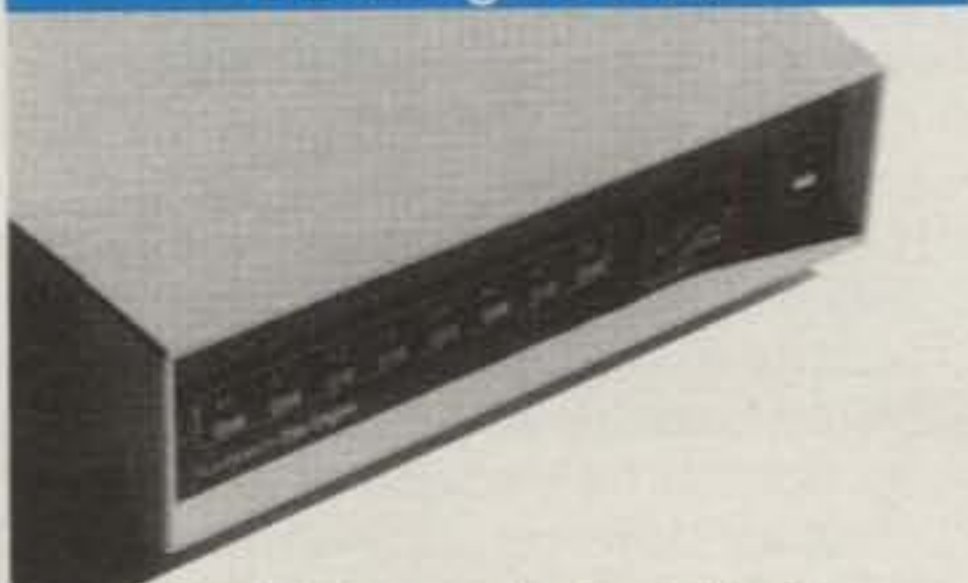
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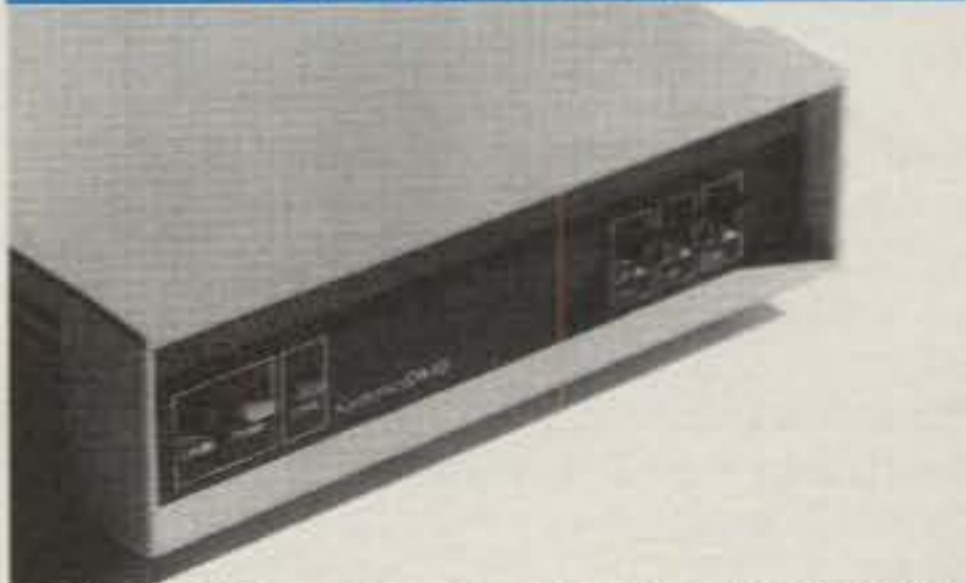
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Antenna Impedance:	50 ohms unbalanced.
Power Required:	Argonaut II: Receive = approximately .75A Transmit = approximately 3A@13.8 VDC
Construction:	Rigid aluminum chassis. Molded ABS Cyclac front panel. Textured top and bottom, snap up stainless steel bail, carrying handle. Printed circuit boards G-10 epoxy glass.
Dimensions:	Argonaut II HWD 3.75" × 9.75" × 12.50" (9.53 × 24.77 × 31.75 cm)
Net Weight:	Argonaut II 8 lbs., 10 oz. (3.91 kg).

## TRANSMITTER

Modes:	USB, LSB, CW, RTTY (AFSK), and FM.
RF Power Output:	Argonaut II—Zero to 5 watts adjustable with front-panel PWR control.
Microphone Input:	Four-pin front-panel connector accepts microphones with 50K ohms or less and with 5 mV (− 62 dB) output. Polarizing voltage is available for electret types.
T/R Switching:	VOX or PTT.
CW Sidetone:	Internally generated, volume is adjustable from keypad and is independent of AF gain control.
SSB Generation:	Double sideband modulator; 8 pole crystal ladder filter.
Carrier Suppression:	50 dB or more typical
Unwanted Sideband Suppression:	45 dB typical at 1.5 kHz tone.
Spurious Output:	More than 45 dB below peak power output.
Meter:	Switchable forward power (FWD), SWR, S-meter.
CW Offset:	700 Hz factory preset.

## RECEIVER

Modes: USB, LSB, CW, AFSK, AM, FM

Sensitivity:	FREQUENCY MHz		
	.1–1.6	1.6–29.999.99	
MODE			
SSB, CW, AFSK	.50µV	0.25µV	10 dB S/N @ 2.5 kHz
AM	3.50µV	1.00µV	10 dB S/N @ 6.0 kHz
FM	1.00µV	.30µV	12 dB SINAD @ 15 kHz

Selectivity:	SELECTIVITY		Shape factor
	− 6 dB	− 60 dB	
MODE			
SSB (BW @ MAX)	2.5 kHz	4.9 kHz	2.0:1.0
AM	5.1 kHz	15.8 kHz	3.1:1.0
FM	15.0 kHz	30 kHz @ − 30 dB	2.0:1.0

Crystal Filter:	8-pole ladder-type, "Jones" Filter (Patent #5051711). Bandwidth continuously adjustable from 2.5 kHz to 500 Hz.
Attenuator:	Approx. − 20 dB for 0.1 to 29.999 MHz.
IF Frequencies:	1st = 45 MHz, 2nd = 6.144 MHz (FM 3rd = 455 kHz).
Image Rejection:	> 80 dB
IF Rejection:	> 70 dB
Noise Blanker:	Switchable on/off.
S-Meter:	Automatically switched on during receive; calibrated to 50 µV at S9 with attenuator off.
Dynamic Range:	95 dB typical.
Noise Floor:	− 129 dBm (.25µV for + 10 dB s/n in SSB).
Squelch Sensitivity:	FM = Less than .6µV.
Pass Band Tuning:	± 2.5 kHz, digitally controlled
Audio Output:	1.5 watts @ 4 ohms with less than 2% distortion.
Notch filter:	250 to 2.2 kHz, 50 dB notch typical.
BFO:	Digitally controlled PLL.
Receiver Offset	± 1.27 kHz (± 2.54 kHz when <b>FAST</b> is enabled) digitally controlled with RXO control, unlimited with second VFO.

Table I—Specifications of the Ten-Tec Argonaut II QRP transceiver.

## The Receiver

The first thing that really impressed me was the "Jones Filter." This is an 8-pole variable-bandwidth filter which is adjustable from 500 Hz to 2500 Hz. The filter has nice skirts, and since it is adjustable, there is no reason to purchase extra filters (none are needed or available) for the rig. This filter when used in conjunction with the **Pass Band Tuning** (more about that later) allows you to "customize" the audio response to your own desires. To check the validity of this statement, I invited two of my friends who are also QRP enthusiasts to my shack for a "test drive." After explaining the IF Bandwidth/Pass Band feature to them, they were left alone to use the rig. When each finished his turn, I would listen and note the way the rig sounded. Each of my friends had his own preference for the controls, and each was different from what I chose. This is a great innovation. You can now custom design your IF response from the front panel, and when you transmit, the rig automatically returns to the 2500 Hz bandwidth.

Now a word about the **Pass Band Tuning** control. I am old enough to remember rigs that had a control on the front marked **BFO**. If you changed the BFO frequency and returned the VFO, the audio response would sound different, having more high or low response depending on how the control was adjusted. Well, the **Pass Band Tuning** control on this rig works much the same way with one great exception: you no longer have to retune; the VFO and Pass Band Tuning (BFO) are synchronized to the microprocessor. This allows you to set the BFO to the position you want it on the skirt of the IF filter without tuning the VFO to maintain intelligibility. The PBT/IF BW controls are concentric, allowing you to change both at the same time, which makes it easy to eliminate QRM. The day of customized IF response has arrived.

The notch filter is a real joy to use. This filter is tunable from 250 Hz to 2.2 kHz and is rated by Ten-Tec for 50 dB typical depth. I have no way to accurately measure a notch of 50 dB, so here is the way I proceeded. From a second rig operating into a dummy load I produced a 1 kHz audio tone of S9 on the meter of the Argonaut. By adjusting the notch filter, I could remove all audio from the receiver. The notch is easy to use and readily removes unwanted heterodynes.

Another circuit that works extremely well is the Noise Blanker. The one characteristic that is common to many noise blankers occurs when the circuit is activated. Splatter from adjacent frequencies increases. However, not with the Argonaut. When the circuit is activated, pulse-type noise disappears and no splatter results. This is a very effective circuit and a real pleasure to use.

The **AGC** circuit has a provision not



found on many modern rigs: you can disable the circuit. Most of the time you will use either the **Slow** position for phone or the **Fast** position for CW. On rare occasions when you are trying to work a weak station, a strong station comes on near your operating frequency. With a strong signal present, the receiver gain will decrease. What to do? The answer is simple: turn off the AGC and use the IF Bandwidth, Pass Band Tuning, and notch filter to reduce the effects of the strong signal. This can mean the difference between a complete QSO and losing a weak station in strong adjacent QRM.

## The Transmitter

So far I have spent most of the time talking about the receiver. Now let's take a look at the transmitter side of the package.

I checked the output on all bands from 160 to 10 meters, and the result was a good solid 5 watts. The oscilloscope pattern was clean both on phone and CW. The keying pattern was firm but clean—no signs of key clicks or spurs.

On-the-air reports confirmed what I saw on the oscilloscope. All keying reports were T9. Most reports described the keying as clean and crisp. The circuit keys very well either with contacts (key or relay) or with transistor output keying circuits. Ten-Tec is known for its excellent break-in characteristics, and the same is true here. In fact, there are two break-in time constants—fast for those who want to hear between characters and slow for those who want to hear between words.

The rig draws equal praise on phone operation. The transmitter has one internal speech processor which is switch selectable from the front panel. On numerous contacts, comparisons were made between the signal with and without the processor activated. More than 90 percent of the time I was requested to leave the processors in the circuits. The standard comment was "Great audio. Boy, that doesn't sound like 5 watts. I hope my rig sounds that good."

## Controls and Keypad

The pushbuttons on the keypad are dual function and clearly marked. This is where frequencies are entered for memory storage as well as direct frequency assignments. There are a total of 48 memories; 00-32 are simplex and 32-47 are duplex—i.e., you can store information from both VFO A and VFO B. In addition, there is one scratch-pad memory which can be used to hold one more temporary frequency without affecting the other programmed memories.

Many of the analog adjustments that were traditionally located on the rear panel have been brought up front to the keypad.

VOX, ANTIVOX, VOX delay, and sidetone level are all controlled from the keypad. Another added operator convenience is a very accurate clock on the digital display. There are also provisions for split operations. Other keypad features all are clearly detailed in the instruction manual.

## Potpourri of Features

Other features that impressed me do not logically fit in any of the above sections. For example, the knobs are large enough

to use easily, and they are conveniently located. Those controls which are related to each other are concentric. There are no controls on the back panel. They are either up front or on top of the unit. This is a real operator convenience. The operator's manual is excellent. It goes far beyond what you normally think an operator's manual should be. There is a detailed circuit description, clear photographs, and excellent schematic diagrams. This book is misnamed; it should be the Operator/Maintenance Manual.

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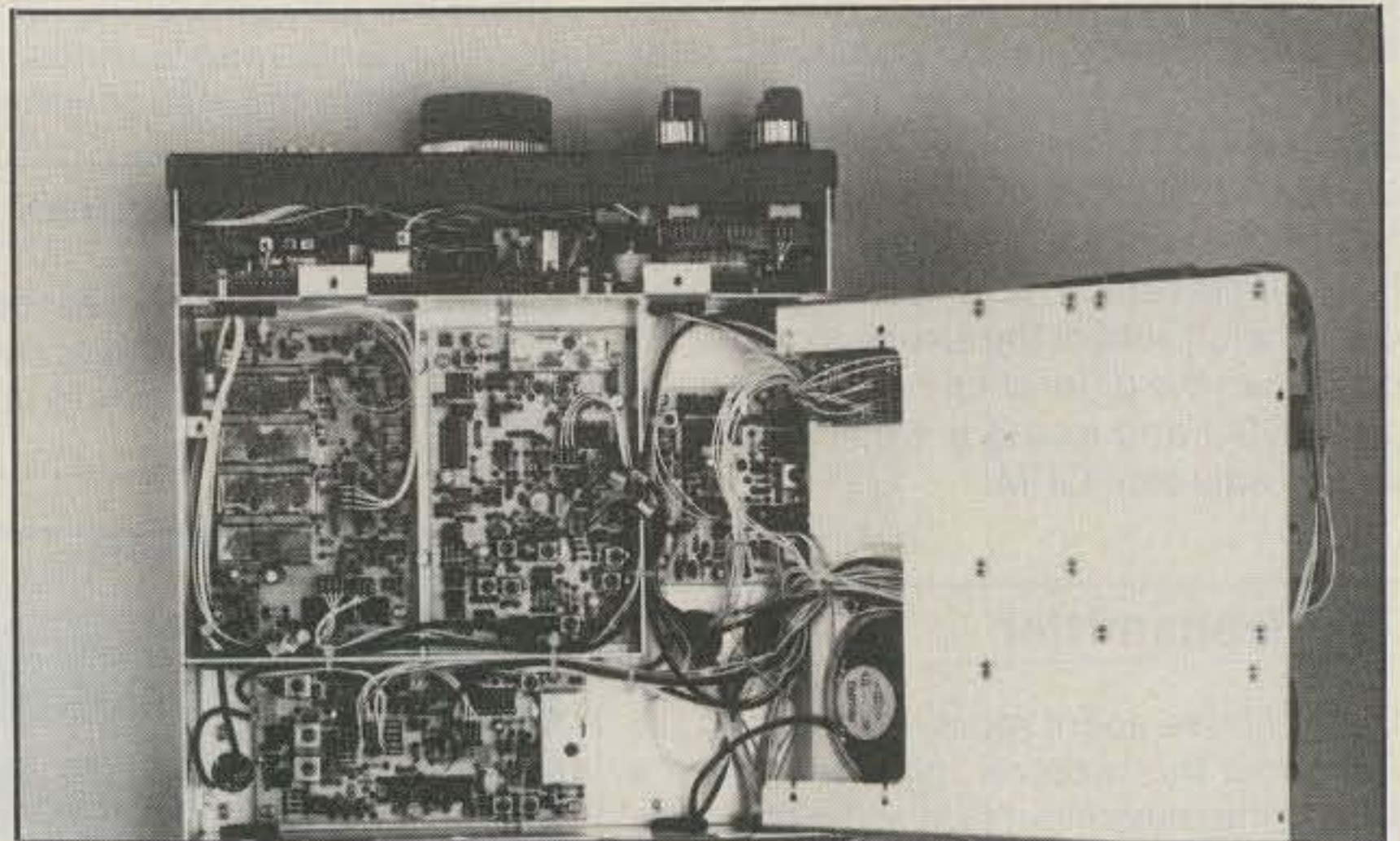
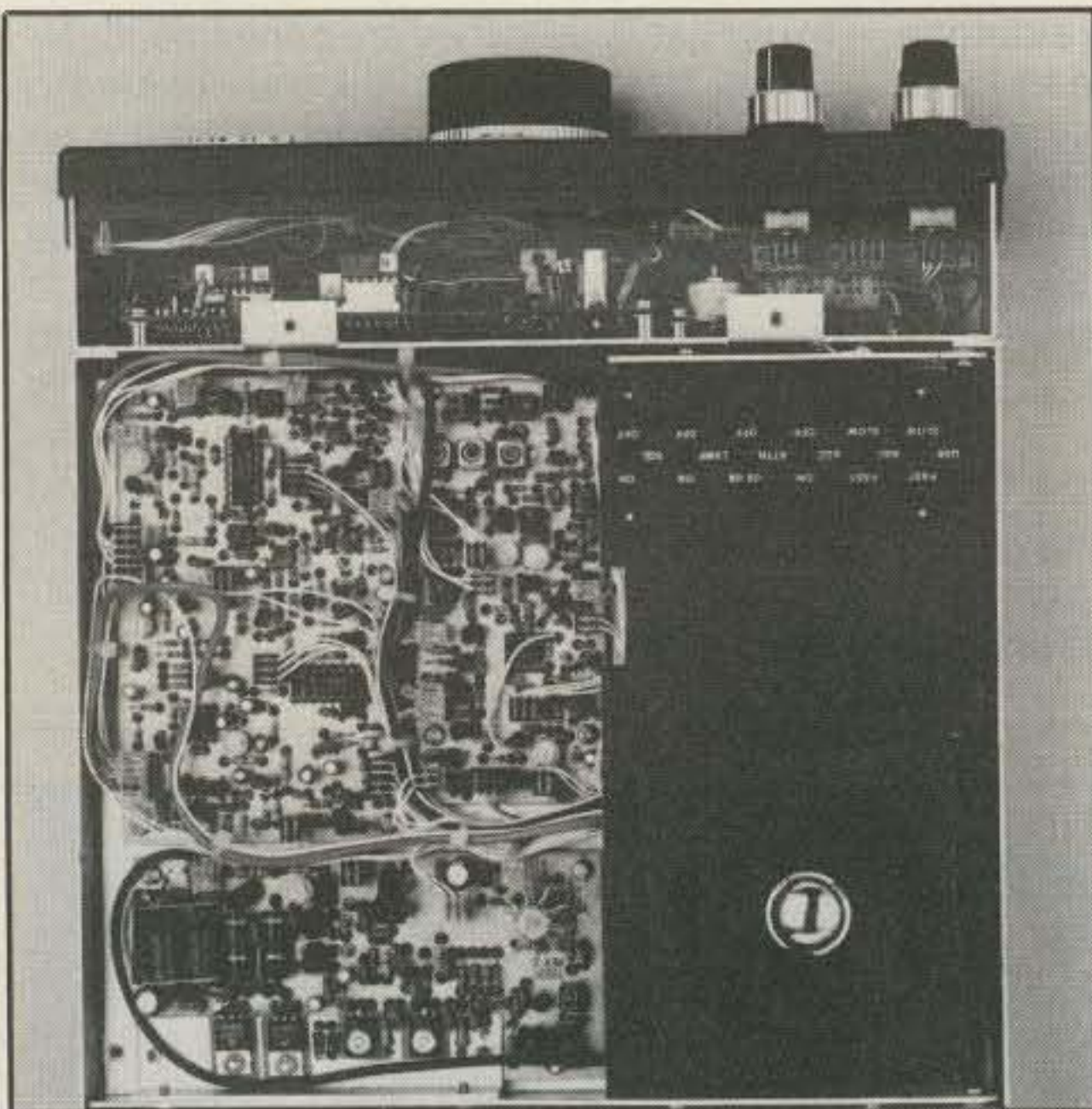
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The bottom view(s) show the transceiver with the switchable control panel in place on the left, and on the right the panel is lifted to reveal the remainder of the components.


### Afterthoughts

What feature do I like best? The "Jones Filter/Pass Band Tuning." To me, the ability to have a front-panel controlled customized IF response is an innovation. What would I change? The meter. The metering

circuit does everything very well just as it should. I am probably old-fashioned, but I like to see the needle move up and down.

I have been a dedicated QRP operator most of my 35 years in amateur radio. There is nothing to compare with breaking a DX pileup with a QRP rig. Now there is

a modern, full-featured transceiver for the QRP operator.

The Ten-Tec Argonaut II is priced at \$1195.00; the matching power supply, Model 935, sells for \$79.00. They are products of Ten-Tec, 1185 Dolly Parton Parkway, Sevierville, TN 37862. 



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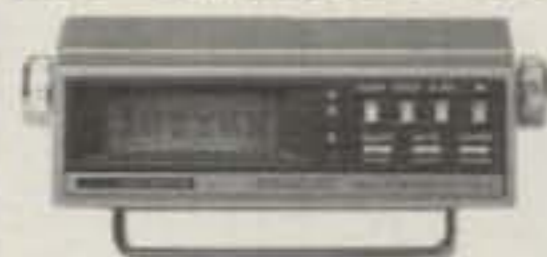
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# The 1.5:1 and 1.33:1 Ununs

## Unbalanced-To-Unbalanced Matching Transformers

BY JERRY SEVICK\*, W2FMI

**U**nbalanced-to-unbalanced transformers (ununs) with impedance transformation ratios of 1.5:1 and 1.33:1 should find many uses in matching 50 ohm coaxial cable to ground-fed antennas. The 1.5:1 unun is particularly interesting since it also allows for an efficient and broadband match of 50 ohm cable to 75 ohm cable. Since the energy is transmitted to the output circuit by a transmission line mode, well-designed ununs are practically lossless (only 0.04 to 0.08 dB of loss).

Furthermore, these two ununs also play an important role in making possible other useful baluns. Some examples are (a) connecting a 1.5:1 unun (50:75 ohms) in series with a 1:1 balun (75:75 ohms) results in a broadband 1.5:1 balun (50:75 ohms); (b) connecting a 1.5:1 unun (50:75 ohms) in series with a 4:1 balun (75:300 ohms) results in a broadband 6:1 balun (50:300 ohms); and (c) connecting a 1.33:1 unun (50:66.7 ohms) in series with a 9:1 balun (66.7:600 ohms) results in a broadband 12:1 balun (50:600 ohms). As a result of this class of transformers called *fractional-ratio* ununs, a continuum of baluns (and ununs) are now available to match 50 ohms (unbalanced) to impedances as low as 3.125 ohms and as high as 800 ohms.

My first attempt to obtain ratios less than 4:1 was by tapping one of the wires in a 4:1 bifilar unun. It only met with moderate success. Recently, I found that higher-order windings (trifilar, quadrifilar, etc.), with taps in some cases, provide much wider bandwidths.<sup>1</sup> This article describes two of them using a quintufilar winding.

\*32 Granville Way, Basking Ridge, NJ 07920

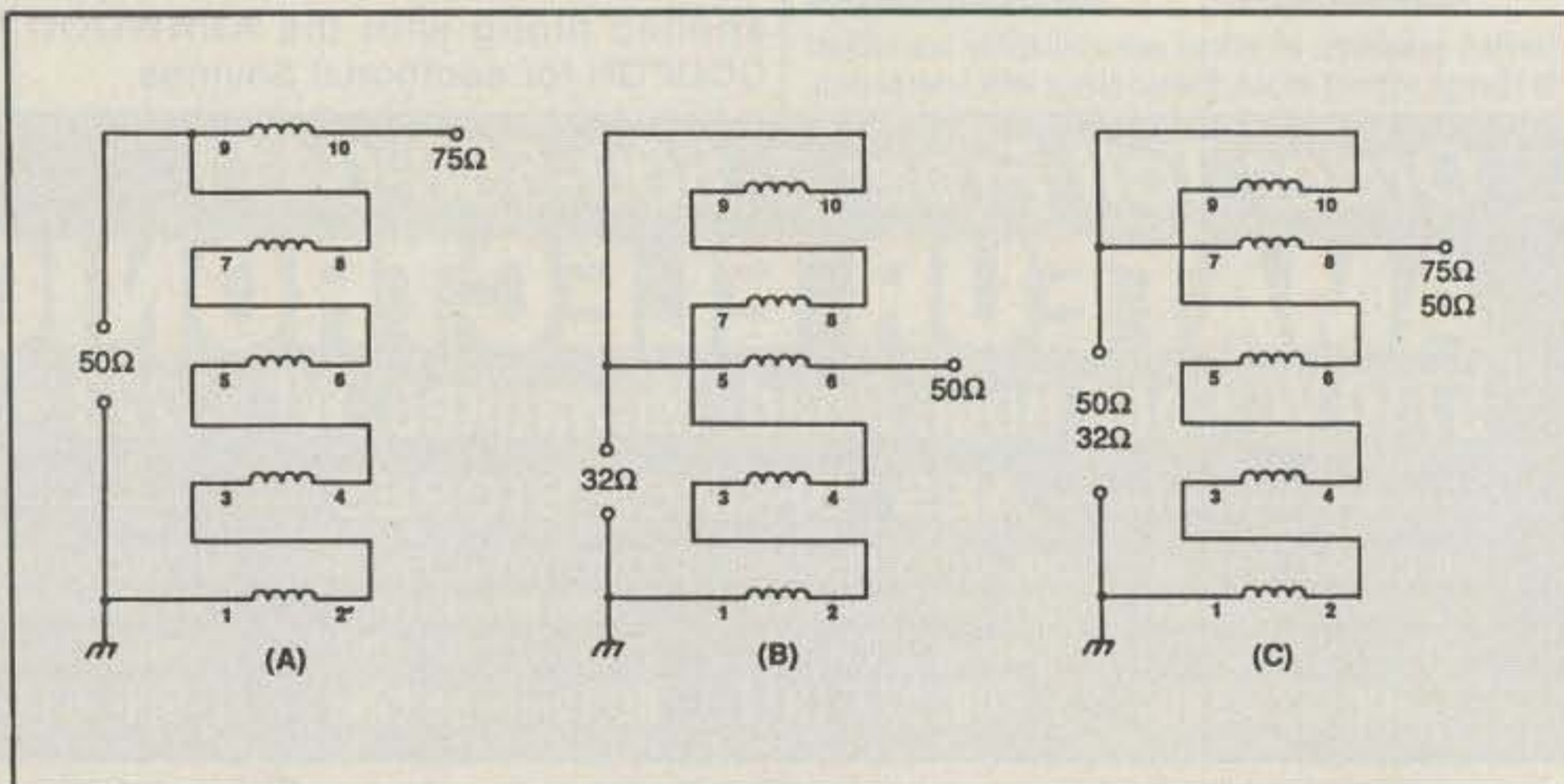


Fig. 1— Three basic forms of a quintufilar 1.56:1 unun: (A) optimized to match 50 ohms to 75 ohms, (B) optimized to match 32 ohms to 50 ohms, and (C) optimized to match 40 ohms to 62 ohms, resulting in a good general-purpose design.

### 1.5:1 Ununs

Fig. 1 shows three basic forms of a quintufilar 1.56:1 unun which should satisfy most of the 1.5:1 requirements. As can be seen, the only difference in the schematic diagrams is in the interleaving of the windings. This is done to optimize the performance of these ununs at the various impedance levels. Schematic (A) is optimized for matching 50 ohms to 75 ohms. Schematic (B) is optimized for matching 32 ohms to 50 ohms. Schematic (C), while optimized for matching 40 ohms to 62 ohms, still yields quite broadband ratios at both 50:75 ohm and 32:50 ohm levels. It should be a useful, general-purpose unun.

Fig. 2 is a photograph of the bottom-views (showing the connections) of the three different designs. They are in the

same order as the schematics of fig. 1— i.e., (a) the unun on the left is designed to match 50 ohms to 75 ohms, (b) the unun in the center is designed to match 32 ohms to 50 ohms, and (c) the unun on the right is designed to work quite well at both impedance levels. The SO-239 connectors are all on the low impedance side of the ununs.

All three transformers have four quintufilar turns on a 1.5 inch OD ferrite toroid with a permeability of 250. Their differences are:

1. **50:75 ohms** (on the left in figs. 1 and 2). Winding 9-10 is No. 14 H Thermaleze wire. The other four windings are No. 16 H Thermaleze wire. When matching 50 ohms to 75 ohms, the transformation ratio is constant from 1 MHz to over 30 MHz. In matching 50 ohms (on the right side in fig.

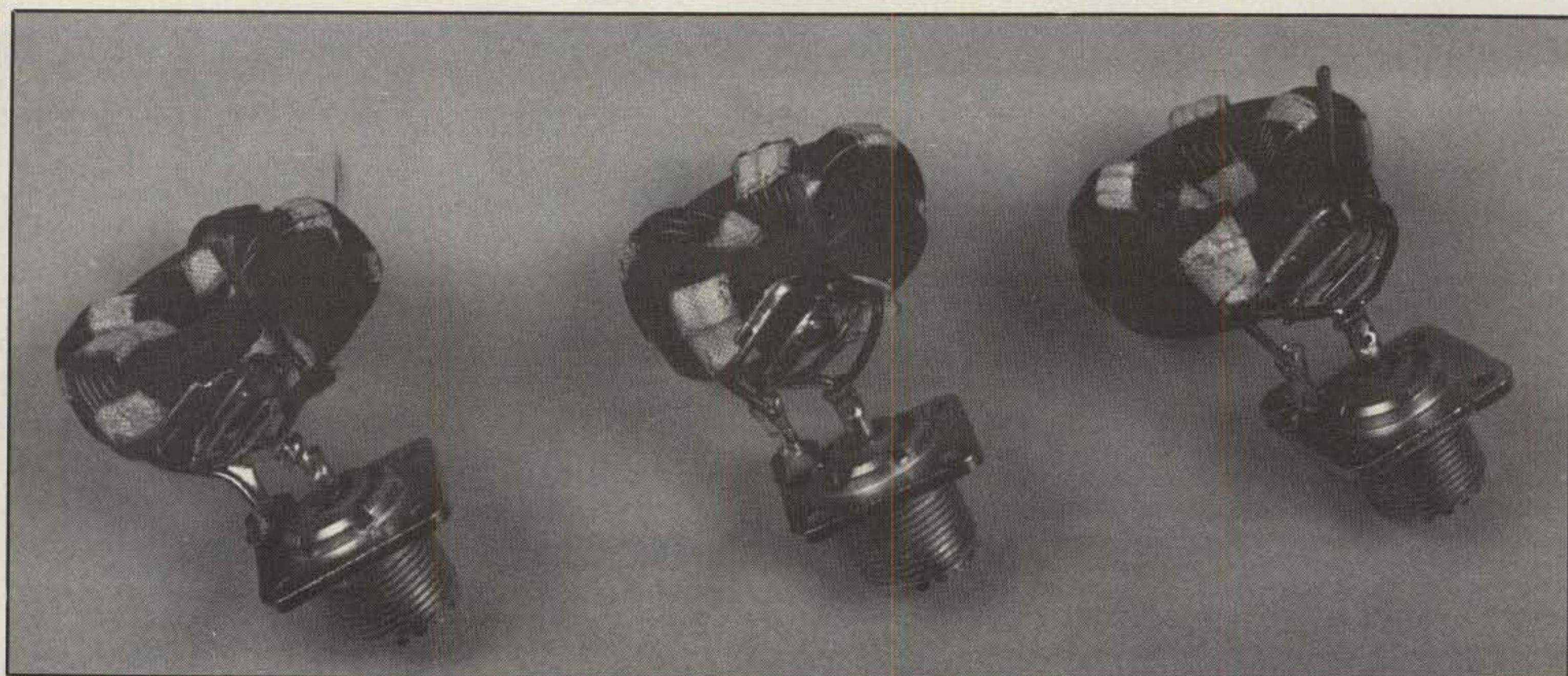


Fig. 2- Photograph of the three different unun designs shown in fig. 1: (A) on the left, 50:75 ohms; (B) in the center, 32:50 ohms; and (c) on the right, a general-purpose design matching both impedance levels quite well.

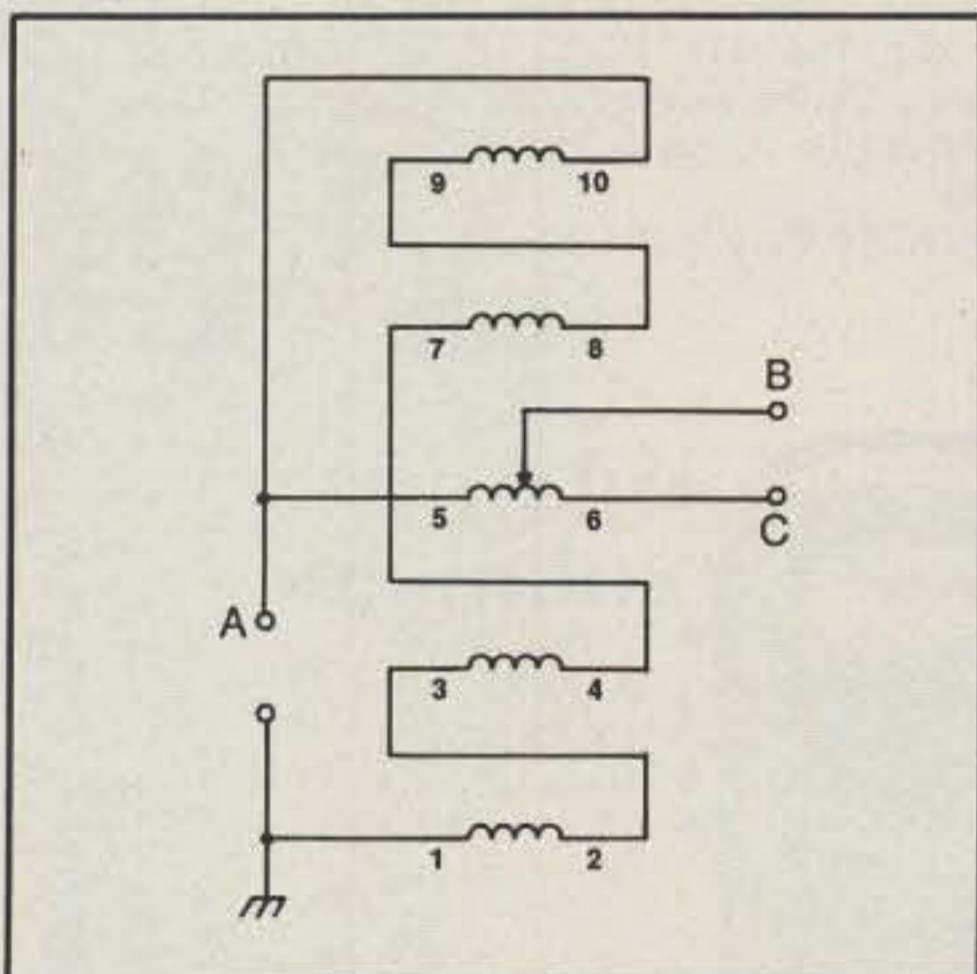


Fig. 3- Schematic diagram of a quintufilar unun specifically designed to yield a broadband 1.33:1 ratio (66.7:50 ohms; connection B-A). Connection C-A also yields a broadband 1.56:1 ratio (50:32 ohms).

1) to 32 ohms, it is still constant from 1 MHz to 15 MHz.

2. **32:50 ohms** (in the center in figs. 1 and 2). Winding 5-6 is No. 14 H Thermaleze wire. The other four windings are No. 16 H Thermaleze wire. When matching 32 ohms to 50 ohms, the transformation ratio is constant from 1 MHz to over 30 MHz. In matching 75 ohms (on the right side in fig. 1) to 50 ohms, it is still constant from 1 MHz to 15 MHz.

3. **50:75 ohms; 32:50 ohms** (on the right in figs. 1 and 2). Winding 7-8 is No. 14 H Thermaleze wire. The other four windings are No. 16 H Thermaleze wire. In matching 32 ohms to 50 ohms the transformation ratio is constant from 1 MHz to 30 MHz. In matching 75 ohms (on the right

side in fig. 1) to 50 ohms, it is still constant to 21 MHz. This is quite a good general-purpose design.

Even though a small toroid (with only a 1.5 inch OD) is used, these ununs are still very sturdy transformers. Since their efficiencies are so high (98 to 99 percent), they can easily handle the full legal limit of amateur radio power.<sup>1</sup> Furthermore, the windings carrying the majority of the current (80 percent) are all No. 14 wire. Only when well-designed ununs are subjected to very high VSWRs will excessive heating be found. Ununs (and baluns) should never be exposed to these severe conditions.

### 1.33:1 Unun

After many attempts at obtaining a broadband match of 50 ohms to 66.7 ohms (1.33:1), the circuit in fig. 3 evolved. Fig. 4 shows the bottom view of an actual design. The SO-239 connector is on the low-impedance side. Fig. 5 shows the unun mounted in a CU-3015A minibox.

Specifically, this unun has five quintufilar turns on a 1.5 inch OD ferrite toroid with a permeability of 250. Winding 5-6 is No. 14 H Thermaleze wire and is tapped at three turns from terminal 5 (fig. 3). It is also covered with one layer of Scotch No. 92 polyimide tape optimizing the performance at the 50:66.7 ohm level. The other four windings are No. 16 H Thermaleze wire.

In matching 50 ohms to 66.7 ohms (A-B), the transformation ratio is practically constant from 1 MHz to 30 MHz. The ratio only decreases by 3 percent across the band. In matching 50 ohms to 32 ohms (C-A), the transformation ratio is constant from 1 MHz to 30 MHz. In matching 75

ohms to 50 ohms (C-A), the ratio is constant from 1 MHz to 15 MHz. In matching 50 ohms to 37.6 ohms (B-A), the ratio is constant from 1 MHz to 15 MHz. As can be seen, this unun has some useful broadband multimatches.

As in the case of the other three ununs, this tapped-unun also easily handles the full legal limit of amateur radio power.

### Construction Helps

As mentioned in an earlier article,<sup>2</sup> these higher-order-winding transformers are a



Fig. 4- Photograph of the 1.33:1 unun (66.7:50 ohms). This transformer also has a broadband 1.56:1 ratio (50:32 ohms).

# DISCOVER



## TEK 453 Oscilloscope

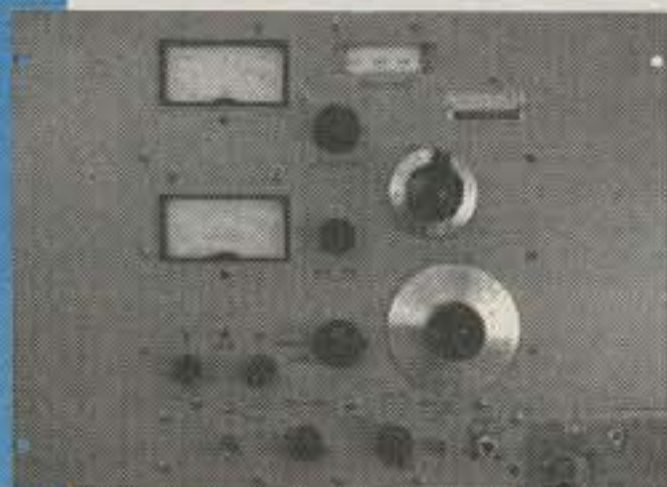
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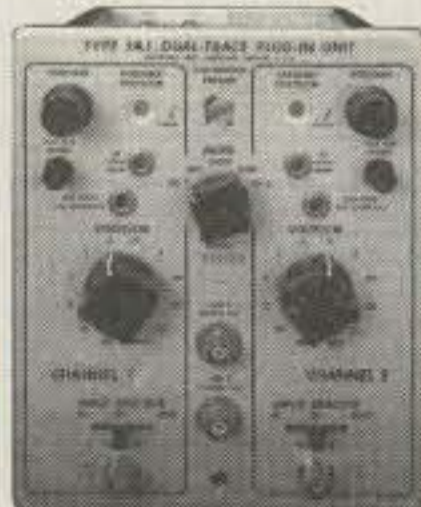
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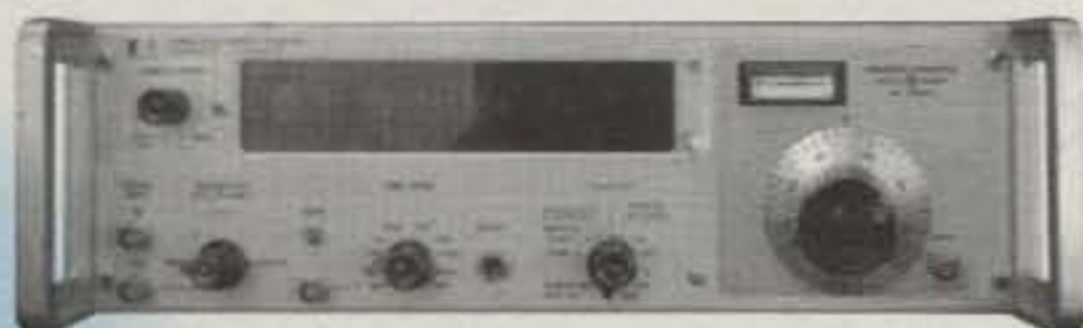
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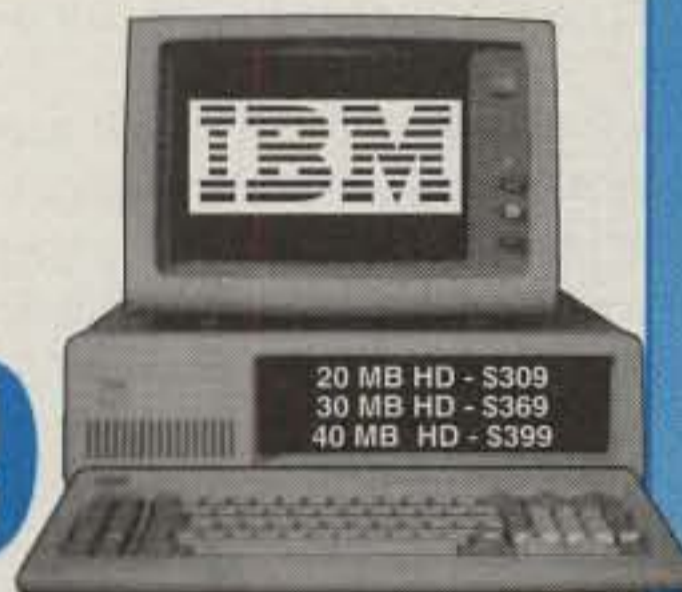
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test of strength. The wires are usually formed into a ribbon and wound at the same time. One quickly experiences how copper wire can become very stiff (work-hardened) only after a single turn. However, persistence and a pair of pliers help in completing the job. Also, all of the components (in kits or completed units) are now readily available.<sup>3</sup>

One might ask, why use such small toroids? A 2 inch OD toroid would make the winding easier. The answer is in the electrical performance. In order to realize the highest frequency response (and hence more general use, such as stepping up or down from 50 ohms), the length of the windings should be as short as possible. The smaller 1.5 inch OD toroids offer this advantage. Furthermore, quintufilar (and higher-order windings) ununs are also eventually limited in their high-frequency responses by self-resonances. Shorter lengths of windings keep these self-resonances well out of the HF band. For the ununs in this article, they occur between 45 and 65 MHz, with fig. 1(A) having the higher value.

There is also a mechanical advantage in using the smaller toroids. One finds that the popular CU-3015A minibox makes an excellent enclosure for the 1.5 inch OD toroid. Furthermore, since ferrite is a ceramic and therefore unaffected by moisture, no special precautions have to be taken for out-of-doors use. Potting the transformer in plastic is unnecessary. One only has to keep the unun out of a pool of water.

In closing, the following suggestions are given regarding winding quintufilar transformers:

(a) The ribbon of five wires (which are made as straight as possible at the beginning) is formed by clamps of No. 27 glass tape every  $\frac{1}{2}$  inch. The clamps are made by strips  $\frac{3}{16}$ th inch wide and  $1\frac{1}{4}$  inch long.

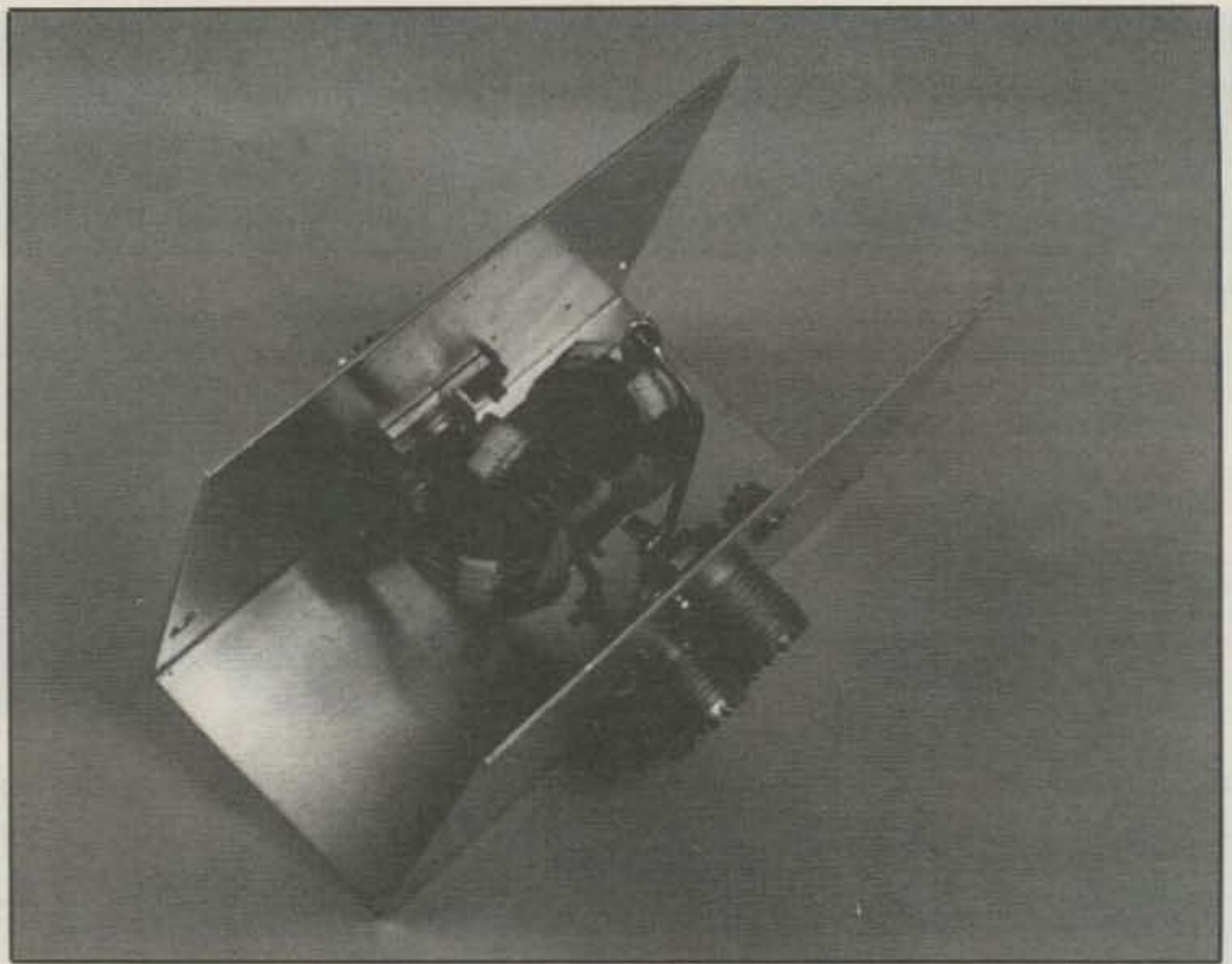


Fig. 5- The 1.33:1 unun mounted in a CU-3015A minibox.

The major problem is to make sure that the wires do not get out of their positions in the winding process.

(b) It helps to recognize the wire pattern present in a quintufilar winding. Fig. 6 shows a pictorial of the pattern. Make sure that terminals 1 and 10 in figs. 1 and 3 are on the outside as shown in fig. 6. If not, it's best to start over again.

(c) For the five-turn 1.33:1 unun, I started with wire lengths of 15 inches. The tap should be at 6 inches from one end (for tapping help see reference 2 at the end of this article). The winding process starts at the tap position, resulting in two turns in one direction and three turns in the other.

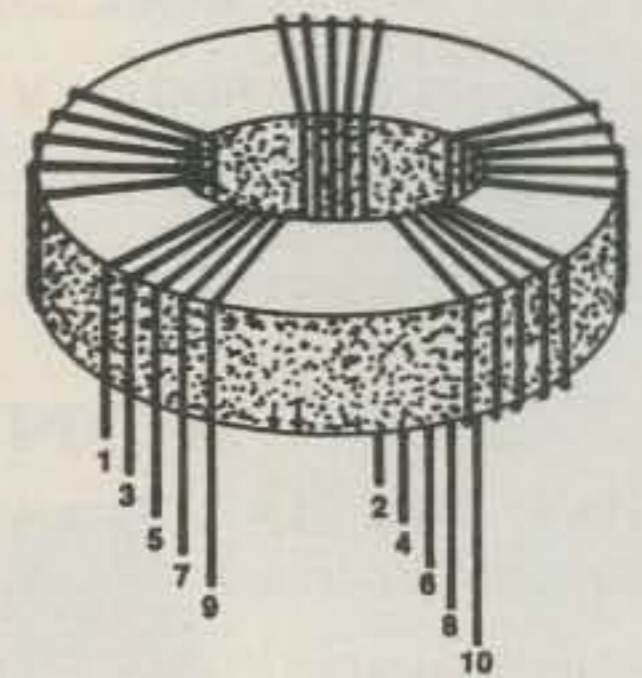


Fig. 6- Pictorial of a quintufilar winding.

(d) For the four-turn (untapped) ununs, I started with wire lengths of 13 inches. The winding is usually started at one end with a 2 inch over-hang. Also, the wires of a four-turn unun tend to get out of position more than the one with five turns.

(e) Expect to have some difficulty in the construction process. It takes considerable effort (and practice) to properly wind these ununs and thus realize the very excellent performance of which they are fully capable.

## References

1. Sevick, J., *Transmission Line Transformers*, 2nd ed., Newington: ARRL, 1990.
2. Sevick, J., "The 2:1 Unun," *CQ*, August 1992, p. 13.
3. Kits and finished units available from Amidon Associates, Inc., 2216 East Gladwick Street, Dominguez Hills, CA 90220.



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## How To Build A Small ATU For Campers

BY DOUG DEMAW\*, W1FB

**S**mall amateur gear is essential when you are camping in a van, pickup-truck cap, or short camp trailer. I use my Ranger pickup truck or my 16 foot camper, depending upon the nature of the junket. In both situations there is little room for radio equipment amid all the other essentials for survival away from home. I attend numerous three-day muzzle-loader meets (rendezvous), and the camper is filled with all manner of guns, powder, costumes, and accessories. This leaves little room for the amateur!

I chose a Kenwood TS-140 for the transceiver, owing to its ability to operate from the 12 VDC truck battery and because it is a compact 100 watt rig. I needed a miniature antenna tuning unit or Transmatch that would permit using the rig with random-length wire antennas from 160 through 20 meters. The tuner needed to handle up to 150 watts safely, and the design called for a built-in SWR bridge. The clutter of an outboard bridge was thus eliminated along with the extra connecting cables.

I "scrunched" the package to a height of 5 ¼ inches, a width of 5 inches, and a depth of 4 ¼ inches. A skilled packaging engineer could easily compress the circuit further, depending upon the size of the parts used. In any event, emphasis was placed on low cost and small size. The tuner described here is the result of that exercise.

### A Not-So-Special Circuit

Most Transmatches today, commercial or not, follow the basic T-network design. It's simple and provides a wide matching range. The circuit in fig. 1 is based on this popular network. L1 is a tapped inductor. It does not offer the resolution afforded by a roller coil, but there are enough taps to permit matching to any end-fed wire I have tossed into the trees. A tapped coil and a rotary switch are less expensive by far than is a roller coil, and the end product is much more compact.

My SWR bridge is the one which was described in the winter 1989/1990 edition of *SPRAT*, the British QRP journal. The circuit appears also in *W1FB's Design Notebook*, page 173 (ARRL publication). The circuit was designed by D. Stockton, GM4ZNX, and is easy to build and get working. There are no tedious nulling adjustments to perform. Just build the bridge and use it! PC boards for this bridge are available for the Design Notebook version from FAR Circuits, 18N640 Field Ct., Dundee, IL 60118. There is no reason, however, why you can't use an SWR bridge of your choice in the tuner.

\*P.O. Box 250, Luther, MI 49656



The front view shows a well-balanced layout of controls. The size (5 ¼" × 5" × 4 ¼") gives rise to its name of mini-matcher.

### Construction Details

Emphasis is placed on construction rather than the circuit, since some cost-saving measures have been taken and because the effort is toward miniaturization. The photos provide side views of the assembled unit. C1 is stacked atop C2 in order to save space and maintain short leads. C2 is a 150 pF variable capacitor taken from a WW II Command transmitter oscillator circuit. It has two threaded posts atop its frame to which I attached a piece of phenolic board (minus the copper) as an insulating platform for C1. The latter capacitor is a 200 pF James Millen No. 5910-00039. Any 150 or 200 pF capacitor may be used, provided it has ample plate spacing for 150 watts of RF power. In fact, you may use the fixed air variable (200 pF) from the front end of a Command transmitter.

L1 is wound on a piece of 1 ¾ inch diameter high-impact polystyrene tubing I bought from U.S. Plastics in Lima, Ohio. Phenolic or fiberglass tubing will work okay, too. I don't recommend PVC tubing, although I did not try it in this circuit. Other coil form sizes may be used if you employ enough turns to obtain 32 µH of inductance. The first coil tap is placed 12 turns above the grounded end. The remaining taps are made every four turns above the

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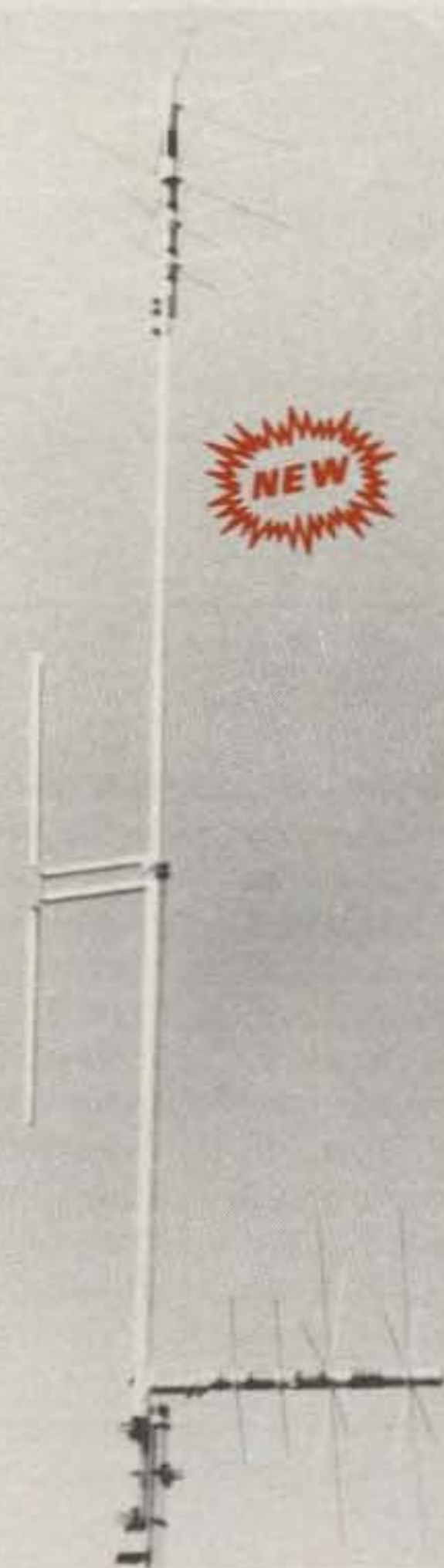
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Two earphone jacks let you and your child or grandchild listen together with your Walkman style earphones or plug-in speakers. 7x6x2 1/2 inches.

Order one as a gift for your child or grandchild . . . or for yourself.

MFJ-8100K, \$59.95 kit; MFJ-8100W, \$79.95 wired and tested.

## 300 KHz-200 MHz Active Antenna

Wish you could hear everything your expensive general coverage transceiver or receiver is capable of receiving?

Your ham band only antenna does great in the ham bands . . . but plug this new MFJ all band active antenna into your general coverage transceiver or receiver and you'll hear strong clear signals from all over the world from 300 KHz to 200 MHz--including low, medium, shortwave and VHF bands.

You'll enjoy up-to-the minute international shortwave newscast, ship-to-shore, airline, commercial RTTY and even military traffic. Use your data controller to receive FAX news photos, weather maps, Navtex and more.

Take it on trips and use it with your mobile or QRP rig to listen.

Also improves weak noisy scanner radio reception from low band to high band VHF -- hear signals you couldn't hear before.

A J-310 FET handles strong signals and a new noiseless feedback circuit gives you excellent low noise reception. A 4.5 GHz MRF-901 transistor lets you receive weak signals well into VHF.

Detachable 20 inch telescoping antenna. Uses 9 volt battery or 110 VAC with MFJ-1312B, \$12.95. 3 1/2 x 1 1/4 x 4 inches.

MFJ-1022  
\$39<sup>95</sup>



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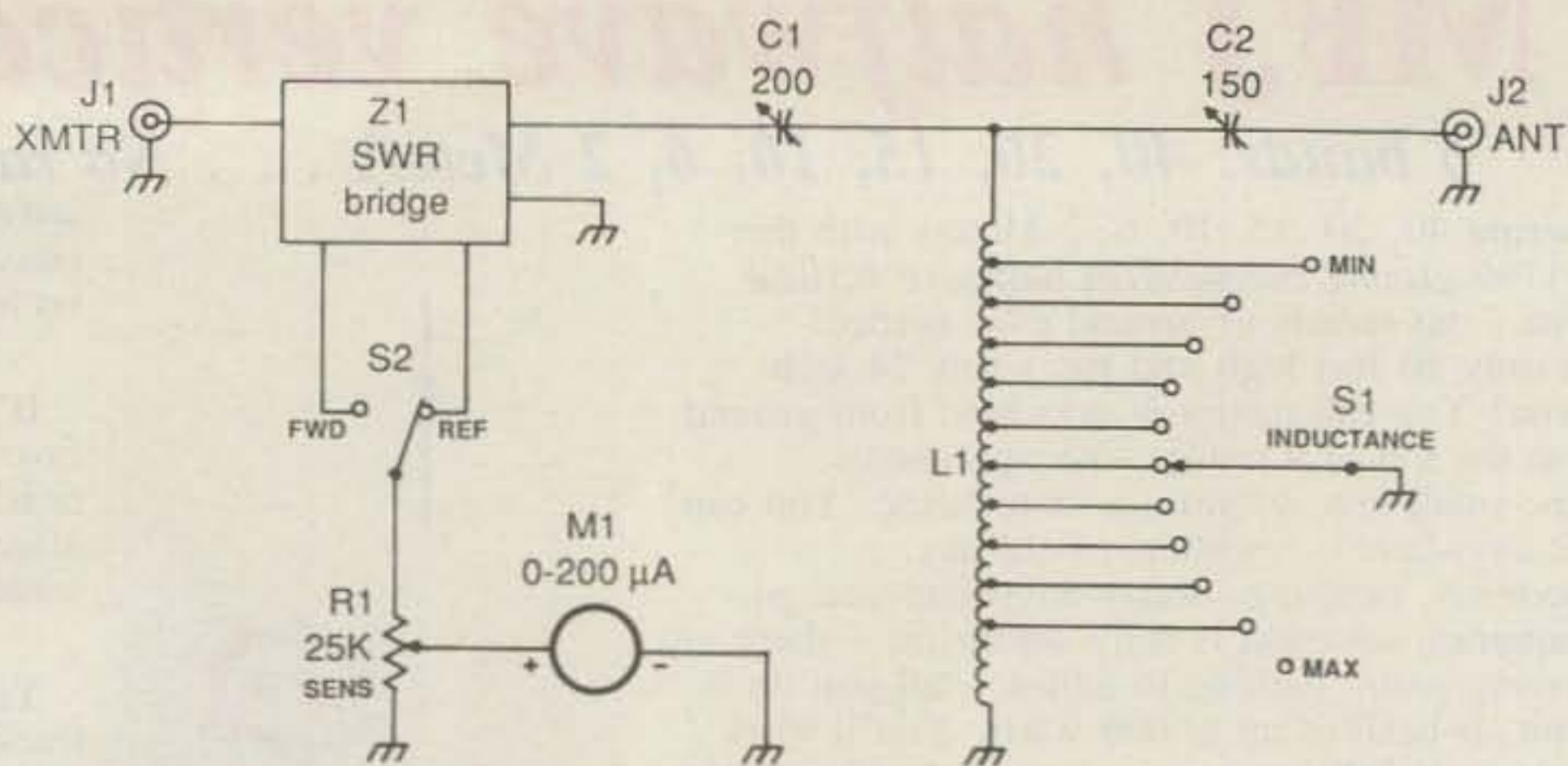
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CIRCLE 160 ON READER SERVICE CARD

Fig. 1—Schematic diagram of the ATU. SWR bridge Z1 is discussed in the text. C1 and C2 are air variables with plate spacing to accommodate up to 150 watts of RF power (see text). L1 has 40 closewound turns of No. 20 enamel wire on a  $1\frac{3}{4}$ " x 3" form. First tap is 12 turns above grounded end. Remaining taps are made every four turns from the top of the coil downward. M1 is a surplus edgewise 200  $\mu$ A tuning meter. A 100  $\mu$ A meter may be used for M1. R1 is a linear taper carbon composition control, 25K ohms. S1 can be a multi-position ceramic (preferred) or phenolic wafer switch, single pole, eleven positions or greater.



first tap. S1 is an 11-position phenolic rotary switch, single pole. My switch is a Mallory unit I found at a fleamarket for 25¢.

The bottom of L1 is set into the  $\frac{3}{4}$  inch thick wooden chassis. I undercut the base with a  $1\frac{3}{4}$  inch Forstner bit to a depth of  $\frac{1}{4}$  inch. L1 is glued into the recess by means of latex-style bathtub caulking.

The front and rear panels are made from single-sided PC board. The copper sides face toward the circuit components. The non-copper faces are sanded lightly before applying paint. This ensures that the paint sticks to the surfaces. You will need to remove the copper from around the tuning capacitor shaft holes to prevent C1 and C2 from shorting to ground (both must be above RF and DC ground). I used a motor tool and an abra-

sion bit to remove the copper until the non-copper circles were  $\frac{3}{4}$  inch diameter.

The coil taps for L1 were made by pulling out  $\frac{3}{4}$  inch of the winding and twisting it a few turns at each tap point. The enamel was then scraped from the wire to permit solder connections to the taps. The completed coil was doped with polyurethane varnish.

The PC board that contains the SWR bridge is mounted on the inner wall of the rear panel. Two SO-239 coaxial jacks are also mounted on the rear panel. I used a surplus edgewise 200  $\mu$ A tuning meter for the SWR indicator. It is glued to the inside of the front panel with a dab of epoxy cement under each mounting ear.

C2 is mounted directly on the wooden chassis. Be sure to

# BATTERIES

You've bought our replacement batteries before . . .  
NOW YOU CAN BUY DIRECT FROM US, THE MANUFACTURER!

## BUYER BEWARE!!!

Some replacement battery manufacturers misrepresent their products.

a) All battery packs should have stated on their labels the voltage and capacity of the pack they represent. As an example: W & W Associates recently came out with the Alinco replacement battery pack series for the Alinco DJ580 transceiver. All our packs state clearly the specifications. Example: 12v@800 mAh, 7.2v@800 mAh and \*7.2v@1500 mAh. \*same mAh as the EBP-22N

b) Some manufacturers state they have high capacity batteries but they neglect to tell you that their case size is considerably LONGER than the original case size (DON'T BE SURPRISED THIS SHOULD BE STATED).

c) DON'T HESITATE to ask the AFTERMARKET BATTERY MANUFACTURER to state which cells they are using. Example: We are now using a SANYO KR1100AAE Nicad in our 10(S) packs.

## BUYER BEWARE!!!

FOR THE MONTH  
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**10% OFF**  
Replacement Batteries  
for ALINCO DJ580

WC-520-20N - 7.2v@800MAH  
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WC-525-22N - 12v@800MAH  
\*same physical size as EBP-22N

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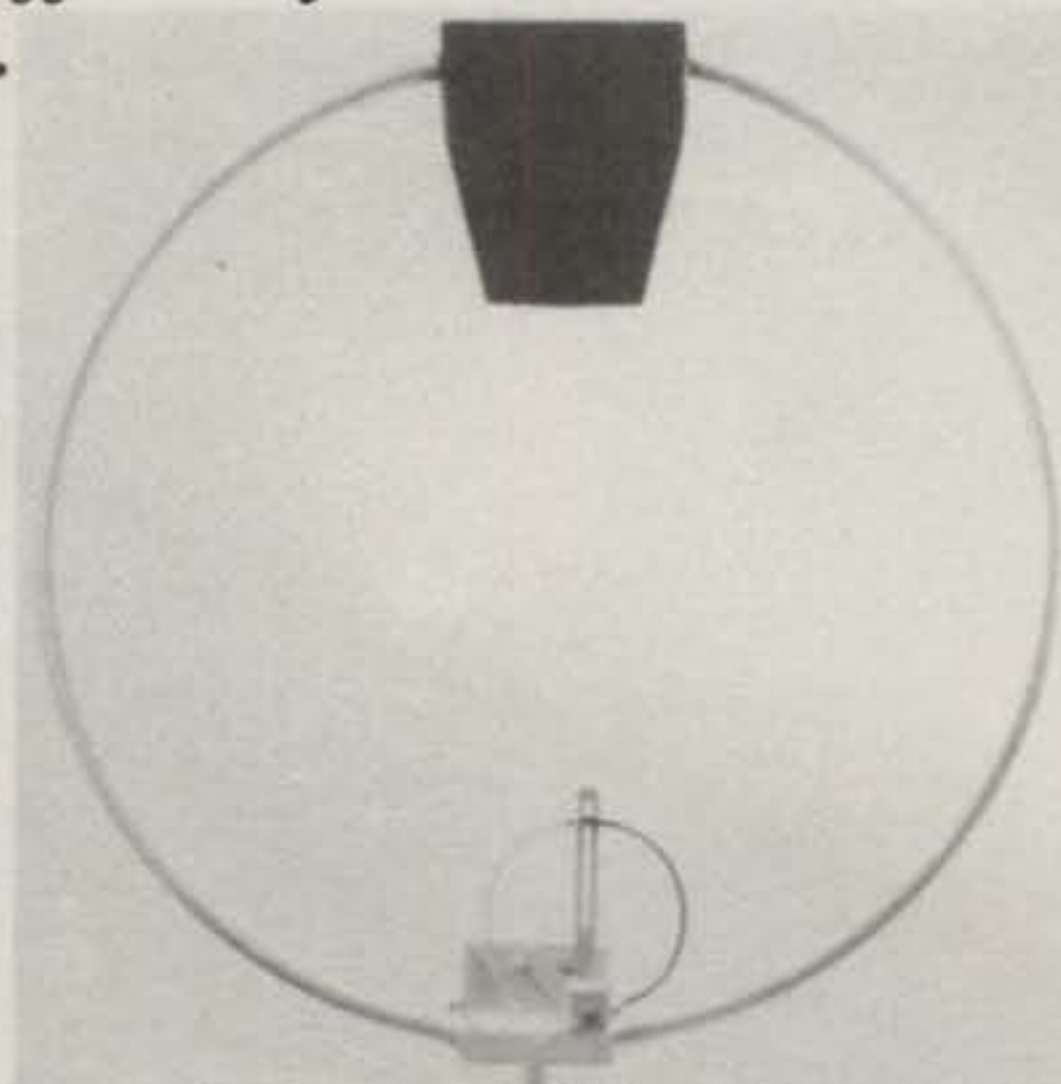
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# New MFJ Super Loop™ Antenna

. . . 36 inch diameter -- it's the smallest, high efficiency 10-30 MHz continuous coverage antenna ever made for ham radio . . .

- Only 36" diameter but covers 10-30 MHz
- Round conductor more efficient than flat strip
- No control cable needed
- All welded construction
- Welded butterfly capacitor, no rotating contacts
- Automatic Band Selection™, SWR/Wattmeter

MFJ-1784  
\$199<sup>95</sup>



When was the last time you saw a fully assembled multiband HF antenna that fits in the back of a tiny Toyota?

Only 36 inches in diameter, the portable MFJ Super Loop™ is the smallest high efficiency 10 to 30 MHz continuous coverage antenna ever manufactured for ham radio.

You can take it with you and have it up and operating in minutes from nearly anywhere -- on trips, vacations, from hotels, DX-peditions, camping, even from a motorhome.

Its rugged all welded aluminum construction with built-in mounting bracket makes it ideal for home installations where space is limited -- apartments, condos, small lots, attics, closets -- it's so small it'll hardly be noticed.

The excellent performance of a high efficiency small loop antenna is well known and well proven by users all over the world.

It's almost as efficient as a dipole but gives you much better DX performance -- especially when mounted vertically near ground level.

Vertical mounting gives you both low angle radiation for DX and high angle radiation for close-in local contacts -- it's like having a vertical and a dipole combined into one. By rotating it you can null out QRM. Horizontal mounting gives you omni directional coverage.

The MFJ Super Loop™ antenna is a remotely tuned high-Q antenna with a narrow bandwidth that reduces transmitter harmonics, receiver overloading and out-of-band interference. It does not need a ground, radials or counterpoise. It covers 10-30 MHz continuously including the WARC bands with SWR less than 1.3 and handles 150 watts. No external antenna tuner is needed.

It's also a very quiet receiving antenna because it responds to magnetic fields and not electric fields -- you'll hardly notice static crashes during a storm.

## 10 reasons why the MFJ Super Loop™ beats the competition

**Reason 1.** The MFJ Super Loop™ has a more efficient radiator -- its large round conductor has less RF loss resistance than a thin flat strip conductor. You radiate more power.

**Reason 2.** It's built like a tank -- 1.050 inch diameter, thick wall aluminum radiator, all welded construction, no mechanical joints,

welded butterfly capacitor with no rotating contacts.

**Reason 3.** You don't need a separate control cable -- the coax feedline carries both RF power and tuning control signals. The feedline is decoupled and isolated by a balanced to unbalanced transformer (balun) so the feedline does not radiate.

**Reason 4.** MFJ's exclusive Automatic Bands Selection™ auto-tunes to your desired band and lets you know with a beep.

**Reason 5.** Dual Fast and Slow tune push buttons make the remote control much simpler to use.

**Reason 6.** A Cross-needle SWR/Wattmeter with two ranges is built into the remote control.

**Reason 7.** The remote control is completely self-contained because it

because most of the strip carries very little current . . . it is not the amount of conductor surface that determines the resistance to alternating current, but rather the way in which the conductor material is arranged."

**Fact:** A large round conductor has much less RF resistance than a thin flat strip.

**Because** the MFJ Super Loop™ uses a large 1.050 inch diameter round conductor for its radiator -- not a thin flat strip -- it's more efficient. You radiate more precious power and waste less as heat.

## How can MFJ make the Super Loop™ so affordable?

By setting up an entire operation to build the MFJ Super Loop™ in volume, MFJ can reduce production and material cost and improve quality.

A production machine was custom built to automatically form thick wall aluminum tubing into precise loop antenna radiators.

MFJ builds the variable capacitor, does the welding, punching and forming and builds the electronics.

By doing as much as possible in-house MFJ reduces cost and brings you a better quality product -- it's Made in USA at its best.

## No Matter What™ Guarantee

You get MFJ's famous one year No Matter What™ unconditional guarantee. That means we will repair or replace your MFJ Super Loop™ (at our option) no matter what for a full year.

## Call your dealer for your best price

Take this portable multiband HF antenna with you and enjoy ham radio wherever you go. Call your dealer for your best price and get your MFJ Super Loop™ today.

Nearest Dealer/Orders: 800-647-1800  
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## Remote Control (included) makes MFJ Super Loop™ easy-to-tune and extra portable



Super Loop™ Remote Control

MFJ's exclusive Automatic Band Selection™ feature auto-tunes to your desired band and lets you know with a beep.

It's extra portable because . . .

. . . you don't need a separate control cable -- the coax feedline carries both RF power and tuning control signals.

. . . you don't need a separate SWR meter -- a two range Cross-Needle SWR/Wattmeter is built-in.

. . . you don't need a separate power cord because it's battery powered -- you can also use 12 VDC or 110 VDC with optional MFJ-1312B, \$12.95, 3x6x2¾ inches.

uses internal AA batteries (not included). You can also use 12 VDC or 110 VAC with MFJ-1312B, \$12.95

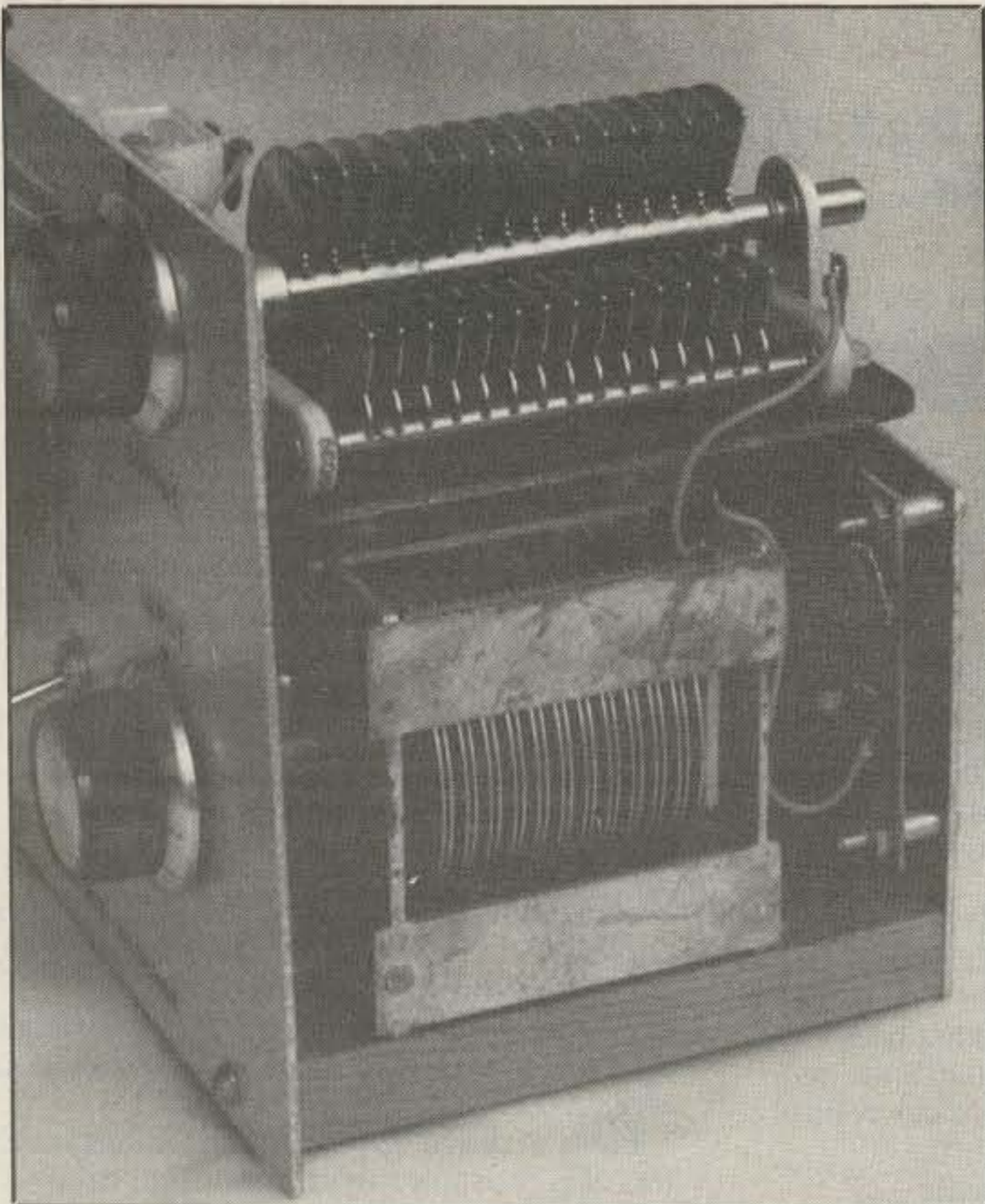
**Reason 8.** It's an incredibly low \$199.95 -- that's 40% less than the nearest competition.

**Reason 9.** You're protected by MFJ's famous No Matter What™ one year Unconditional Guarantee.

**Reason 10.** If you ever need help with your MFJ Super Loop™, you can call MFJ's exclusive toll-free technical help line 800-647-TECH(8324) and get expert help from a friendly MFJ Customer Service Technician.

## Round conductor has less RF resistance than flat conductor

The following is quoted from *Electronic and Radio Engineering* by Frederick Terman, 4th edition, page 22: ". . . with a conductor consisting of a thin flat strip, . . . the current flows primarily along the edges, . . . the true or effective resistance will be high



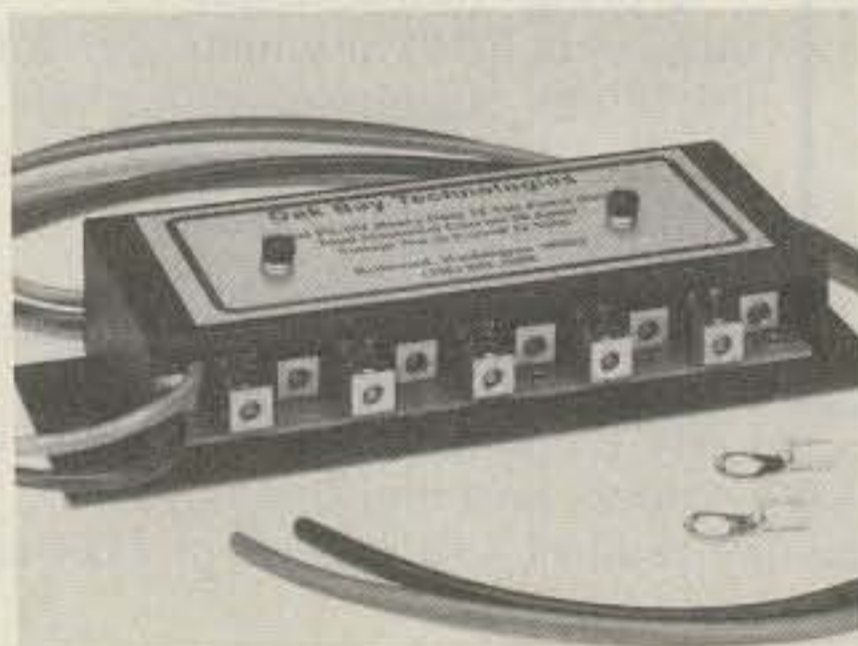
Right-side view of the tuner, showing how C1 is stacked above C2. The SWR bridge is visible at the lower right on the rear panel.



View of the left side of the tuner. L1 and its taps are visible in the foreground.

## Heavy Duty 50 Amp 12 Volt Power Strip & Antenna Mount

Model PS-101



- Perfect for HF Radios
- 5 Fused Outputs
- 50 Amps total Current
- Heavy Duty Steel Enclosure
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- Improves Mobile Handheld Operation
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ground the copper plating of the front and rear panels. My panels are connected to the bottom of L1 and the ground leads for M1 and R1 are soldered to the front panel.

I did not build a cabinet for my tuner, but an inexpensive one can be fashioned from single- or double-sided PC board stock. The inner seams may be joined by soldering them with a 40 watt or greater iron.

### Using The Tuner

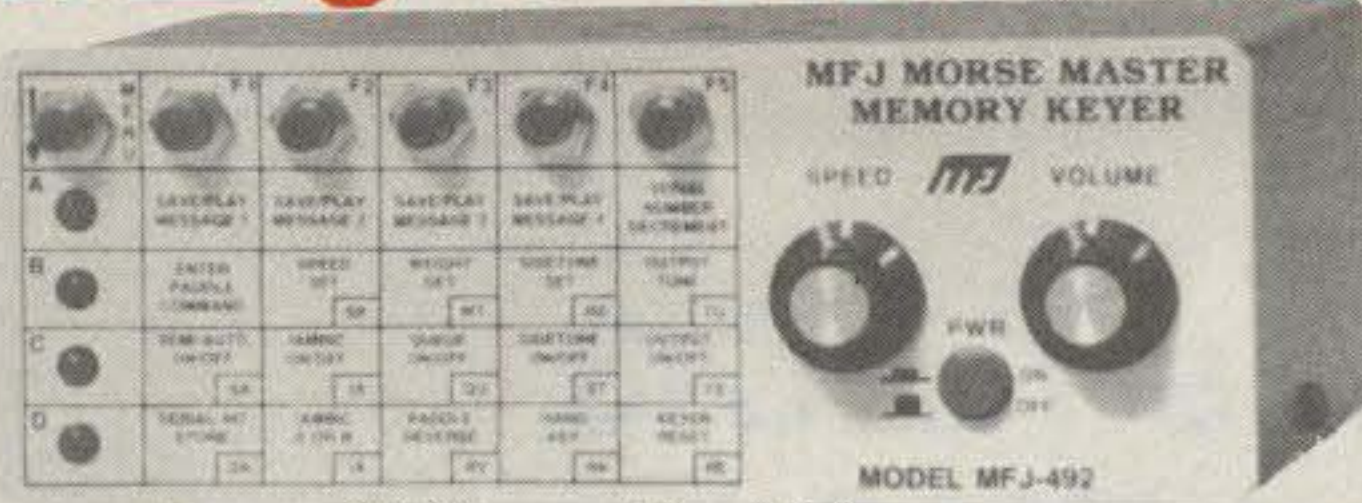
The circuit in fig. 1 is adjusted in the same manner as the Ultimate Transmatch or any other T-network ATU. I like to find the approximate settings by adjusting S1, C1, and C2 for maximum signal on receive. Next I apply low RF power and observe the reflected-power reading. I adjust the three controls until an SWR of 1, or nearly so, is obtained. I increase the transmitter power and touch up C1 and C2 for minimum reflected power. R1 is set for a full-scale reading on M1 with S2 in the FWD position. I have experienced no arcing in the tuning capacitors at power levels up to 150 watts. Insects and dirt in the plates, however, will cause arcing at maximum rated power.

### Final Comments

This tuner is designed for use up to 14 MHz. The 10 and 15 meter bands can be covered by adding a small coil between L1 (top) and the junction of C1 and C2. If this is done, it will be necessary to use one position on S1 to short out all of L1 when operating 10 or 15 meters. I have no interest in those bands when afield, and hence did not provide for them when building the tuner.

The front panel on my tuner is painted with almond color spray enamel. I used two coats. When they were dry I applied press-on labels and added a coating of clear polyurethane spray varnish. This protects the paint and the labels, and gives you a professional-looking project of which you can be proud.

# MFJ Menu Driven Memory Keyer™



## Powerful Morse Code Trainer

A powerful Morse code trainer lets you practice or teach code in Farnsworth or normal mode.

You can select letters, numbers, punctuation marks or prosigns or any combination for practice. You can use standard 5

character groups, more realistic random 1 to 8 character groups or select specific six character sets to work on.

You can instant-replay a random session to check your copy.

You can store custom code practice sessions in memory for later replay.

## Here's what you can do with Message Memories . . .

**Message Repeat™** lets you repeat messages continuously and you can insert pauses within a message. This lets you call

You can insert commands within a stored message. As you play it back, these commands will execute. For example, you can insert automatically incrementing serial numbers, replay messages continuously, call and play other messages, insert pauses or combine all these in one message!

When you play your messages back, automatic word and character spacing make your CW sound like perfect code. Or you can adjust the spacing for a more distinctive individual sound that DX stations will notice.

## Plus more . . .

You get contest serial numbering (0-9999) with auto-increment. You can send an N for 9 and a T for 0 to save time.

**MFJ's Analog Set™** lets you adjust speed, weight and sidetone just as smoothly as a knob - dot/dash paddles are used as an up/down control.

You get built-in sidetone, speaker, front panel volume control knob and adjustable 300-3000 Hz tone.

You can use automatic, semi-automatic bug or handkey modes, reverse dot/dash paddles, select iambic A or B or non-iambic modes.

You can adjust weight from 5 to 95% and compensate for transmitter distortion with a special transmitter compensation feature.

A tune feature lets you key your transmitter for tuning.

You can turn off the keying output so you can practice without keying your transmitter or unplugging your keyer.

You get direct and grid block keying. Keys solid state and tube rigs.

Special MARS characters are recognized and can be used in messages.

Uses 9 volt battery, 12 VDC or 110 VAC with MFJ-1312B, \$12.95. 6½x2½x6¾ in.

**MFJ-80**, \$14.95, Memory Expansion Kit. Expands your MFJ-492 to 8000 characters and adds four additional message.

**MFJ-492X**, \$114.95. MFJ-492 with MFJ-80 Memory Expansion Kit installed.

**MFJ-78** \$19.95. Full function Remote Control puts message memories and menu control at your finger tips for real convenience.

## MFJ's new Menu Driven

**Memory Keyer™** lets you immediately enjoy your MFJ-492 without reading an instruction manual - there's no keypad, no complex sequences, nothing to remember.

You simply select a menu by pressing a button. An LED lights to show you which menu is active. You select a feature by pressing a feature button. It's as easy as using a computer touch screen! Each menu is clearly printed on the front panel - there's no confusion.

From the menu you can save and play messages . . . decrement serial numbers . . . set speed, weight, sidetone . . . enter iambic, semi-auto, handkey, message queue, paddle command modes . . . turn on/off sidetone, transmitter tune, keying output on/off . . . select iambic A or B, reverse paddle, Morse trainer and store starting serial number.

You can bypass the menu by keying in simple two letter commands.

When you select a feature the keyer tells you its status in CW.

## Memory expandable to over 8000 characters

You can expand the MFJ-492 standard 192 characters in four soft sectored message memories to over 8000 characters in eight message memories by simply plugging in the MFJ-80, \$14.95, Memory Expansion Kit. Memories backed-up by lithium battery.

## Smooth Speed Control

Matching your CW speed to a QSO is best done by ear. The MFJ-492 lets you match speed by turning a knob or by using MFJ's Analog Set™. In this mode, pressing the dot or dash paddle smoothly increases or decreases speed from 5 to 100 WPM. You can also customize the range of the speed knob for precise control.

## MFJ Super Menu Driven Memory Keyer™/Keyboard



## MFJ-493

**\$139.95** You get all the features of the MFJ-492 plus these . . .

★ You get 32,000 characters of memory.  
★ Plug-in a standard IBM compatible 101 AT type keyboard and you have an extremely powerful full featured standalone keyboard keyer. All commands, functions and memories can be done through the keyboard. Plus you get additional message memories and features.

★ Built-in serial port lets you combine the power of your computer with the MFJ-493. Use your computer to compose, build and store a complete library of often used messages, generate custom code practice sessions and exams and download to MFJ-493, control your keyer, automatically set up keyer for different operators during contest, display, edit and save message memories and keyer settings.

## Menu Driven Memory Keyer/Bencher Paddle Combo

### MFJ-490

**\$164.95**

The best of all CW worlds - nearly all the features of the MFJ-492 Menu Driven Memory Keyer in a compact configuration that fits right on the Bencher iambic paddle! You can buy the combination or just the keyer for your Bencher.



You get message memories, Morse trainer, sidetone, automatic serial numbering - plus more. 5x3x5½ in. Uses 9 volt battery, 12 VDC or 110 VAC with MFJ-1312B, \$12.95. **MFJ-490**, \$164.95, Keyer/Bencher Combo. **MFJ-490X**, \$109.95, Keyer only. Memory expansion kit not available.

CQ, listen for an answer and then resume calling CQ by pressing a single button. Each pause can be up to an hour - it makes a perfect Automatic Beacon.

**Message Call™** calls other messages and Message Queue plays messages in sequence. You can store QTH, rig, weather and other information in separate message memories and play these in any sequence you want!

**Message Edit™** lets you correct mistakes while recording a message - you don't have to start all over if you make a mistake.

While you're playing a memory message you can break-in at any time and insert comments from your paddle and then resume playing your message.

As you key in CW, ASCII is also being sent to the serial port. You can use your computer to record an entire transmission.

★ In addition to the powerful Morse Code Trainer, in the MFJ-492 you get . . .

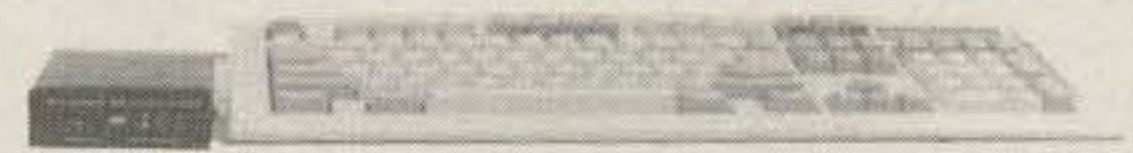
. . . an **FCC Exam Simulator** that sends random QSOs exactly like the FCC exams. When you can copy these random QSOs, you're ready to pass your exam and upgrade!

. . . **MFJ's QSO Simulator** makes learning Morse code really fun. It's like making real on-the-air contacts. You can answer a CQ or call a station and enjoy a nice a QSO. You'll get operating experience while boosting your code speed.

. . . a new **Word Recognition Mode** gives you hundreds of commonly used words in amateur radio for you to practice recognizing entire words instead of individual letters. With practice you can learn to copy words in your head without writing it down and carry on an entire CW conversation without paper - just like the pros.

**Compact** 7½x2½x6¾ inches. Use 12 VDC or 110 VAC with MFJ-1312B, \$12.95. **MFJ-78**, \$19.95, full function Remote Control.

## Dedicated CW Keyboard



### MFJ-451

**\$89.95**

**Dedicated CW Keyboard** has 200 character type ahead buffer and two 100 character message memories with buffer and memory full indicators. Select features with **One Touch™** function keys. Use **Analog Set™** or type-in Speed (5-100 WPM), Weight (5-95%) and Sidetone (300-3300 Hz). Has speaker. 3½x1¼x3½ inches. Use 12 VDC or 110 VAC with MFJ-1312B, \$12.95. Keyboard supplied may vary from the one shown here.

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# CQ REVIEWS:

## The Kantronics KPC-3 Mini Packet TNC

BY BUCK ROGERS\*, K4ABT

**A** "new wave" of TNCs are being readied for distribution, and they are designed to make packet communicating easier. Command structure is being made easier to comprehend, and the number of commands is being reduced. The TNC that we are about to describe to you is a forerunner of this new breed.

In many of my books and articles over the last eight or nine years I've often indicated my desire to use packet in a more portable environment. Even the terms we've used such as "Easy-Packet" and "Porta-Packet" sometimes allude to this kind of operation.

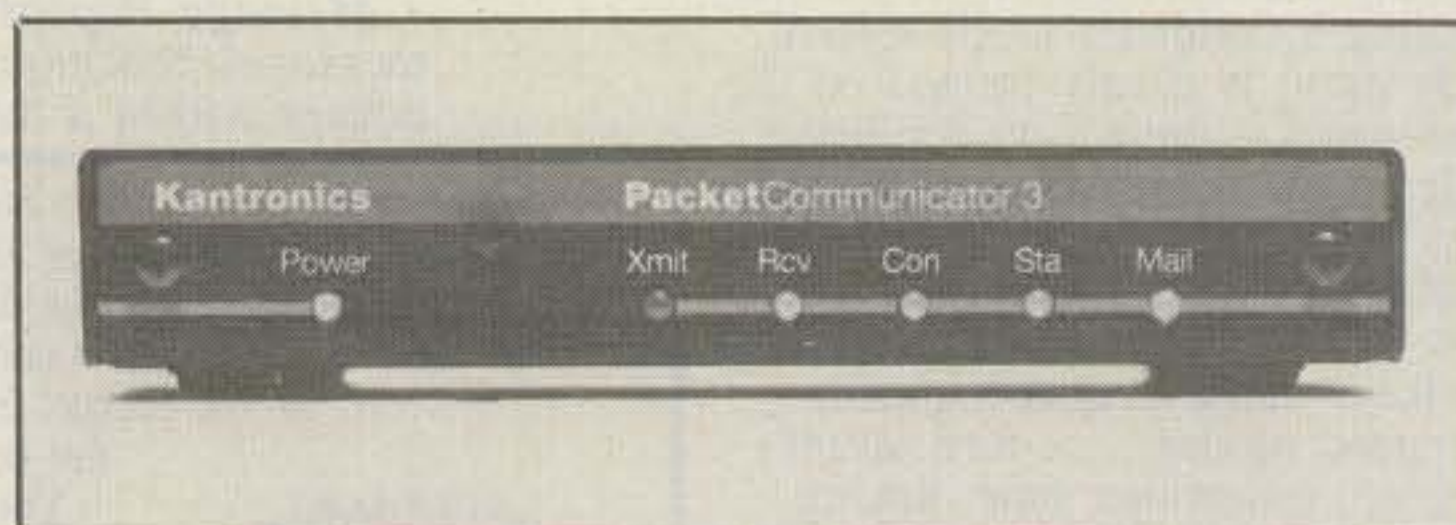
The idea for this class of TNC is not new, but the product is! So many times I've expressed my feelings, questioning why we need so many commands in a TNC, some of which are never used. If they are not used, then default them and place them in a mute buffer so they cannot be seen or heard. Even the idea of a two-tier command set was sometimes considered.

### Bingo!

Kantronics was listening, and they not only carved the thoughts into stone, they read the words. The hardware and software engineers at Kantronics developed exactly what the packet world has been looking for. In fact, Kantronics went several steps further by designing this new-wave TNC as a low-cost, low-power-consumption, two-tier command set, and compact TNC, so that some rather nice enhancements can be added later.

The Kantronics Packet Communicator 3 (KPC-3) is the new leader that is being offered for the newcomer or advanced packeteer. The two-tier command structure makes the KPC-3 easy for the beginning packeteer to simply "aim and shoot," so

\*1584 Oxford Court, Gallatin, TN 37066



The Kantronics KPC-3 mini packet TNC.

to speak. When the new packeteer learns the ins and outs of packet, he or she simply types the command **INTERFACE TERMINAL** and the **INTERFACE** command is moved from the **NEW-USER** level into the advanced **TERMINAL** mode of operation.

### Did I Say Compact?

You bet I did! If you've waited for the ideal TNC that will fit into a briefcase, and in a manner of speaking a TNC that will also fit your purse or wallet, here it is. It is a compact TNC that measures 5 inches square, and only 3/4 inch thick.

### Did I Say "Low Power Consumption"?

The power requirements are even more interesting. The KPC-3 operates from a power source that delivers from 6 to 24 volts and consumes only 20 milliamperes—fully lit.

Current drain was almost 34 milliamperes until they rewrote the code for the firmware (software inside an EPROM) and reduced the battery drain by 14 ma. Now the current drain is only

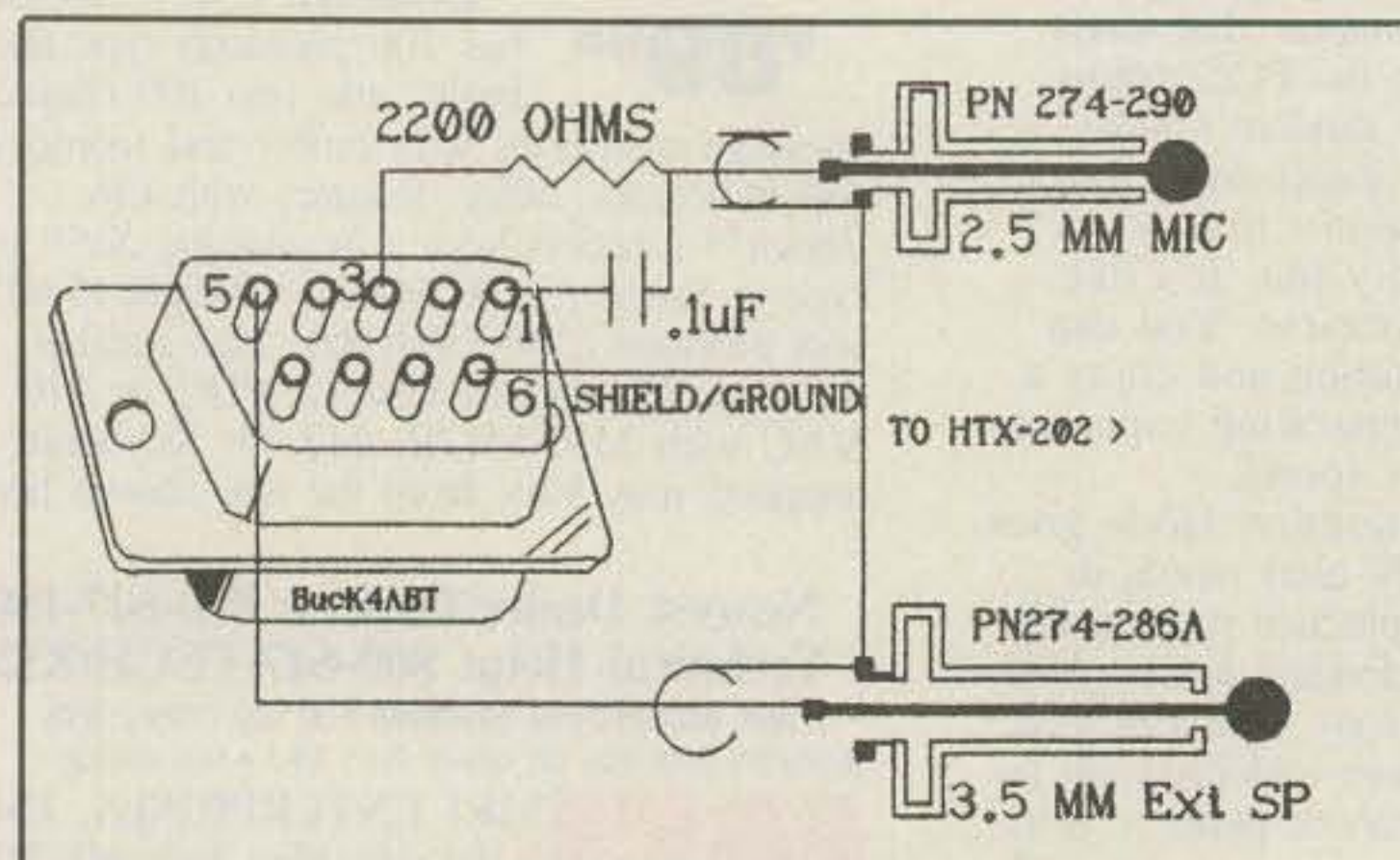


Fig. 1—KPC-3 connected to the Radio Shack HTX-202 HT.

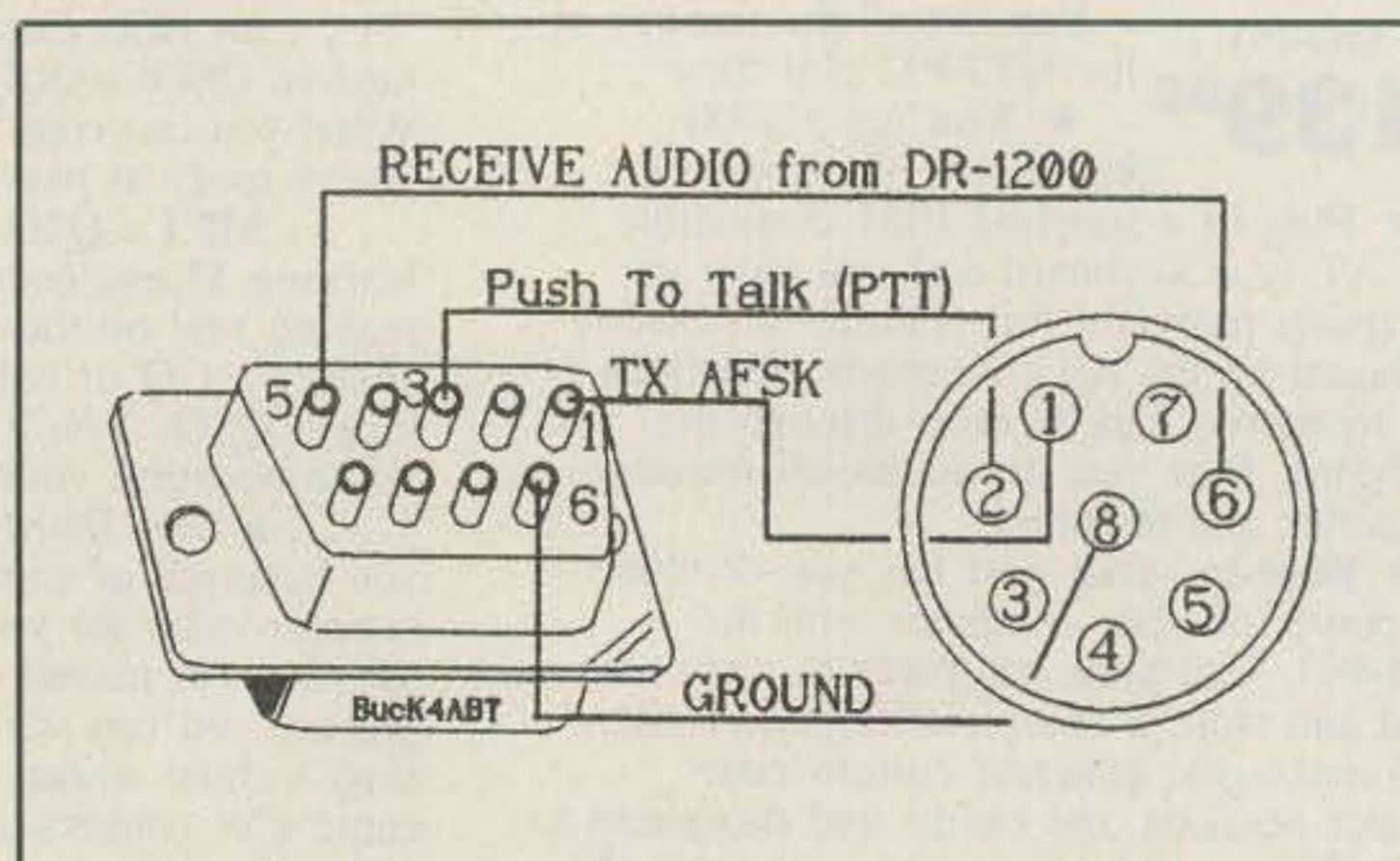
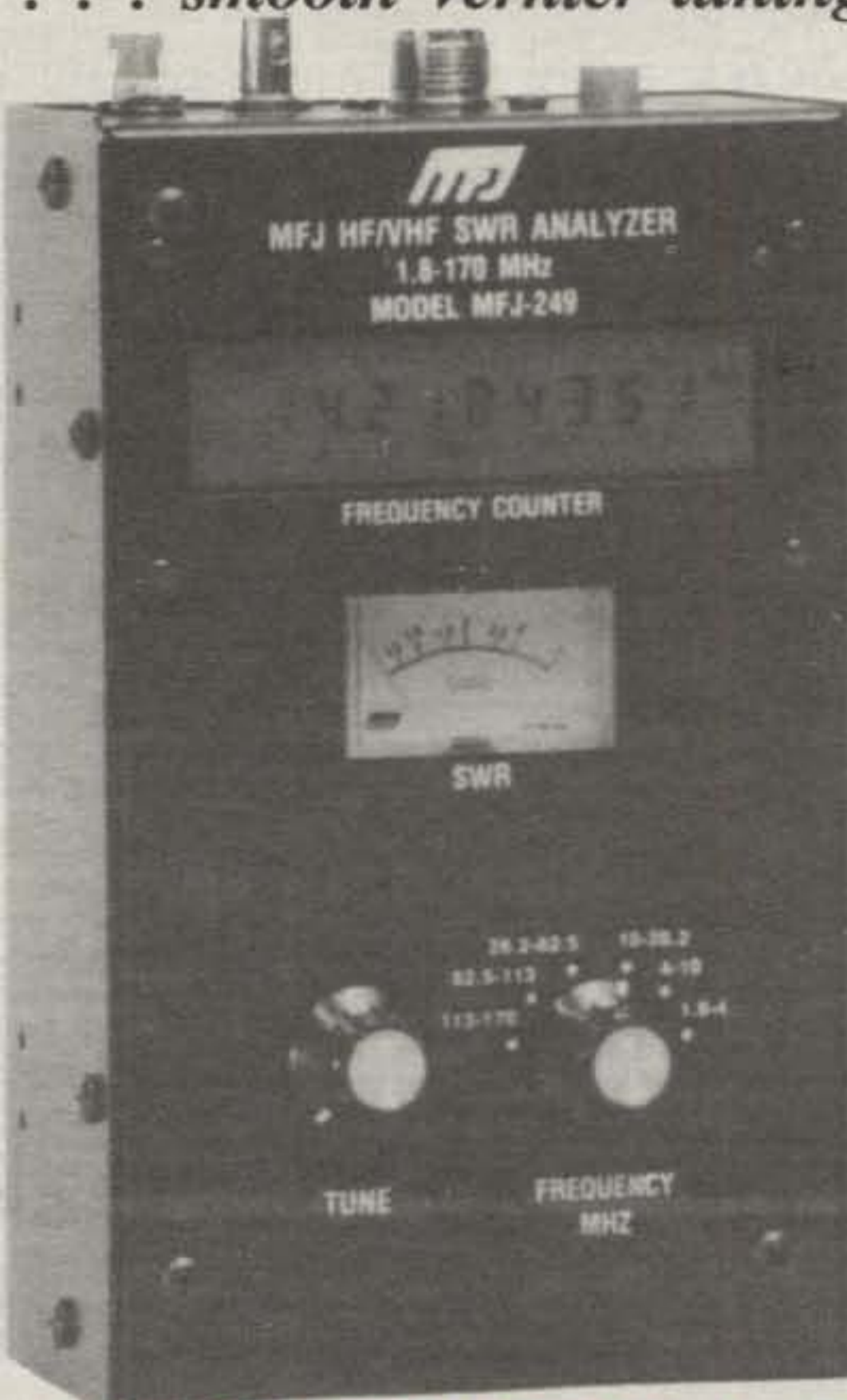


Fig. 2—KPC-3 to the Alinco DR-1200 VHF transceiver.



# MFJ HF/VHF SWR Analyzer™

... covers 1.8-170 MHz continuously ... built-in 10 digit LCD frequency counter  
... smooth vernier tuning ...



MFJ-249  
**\$199<sup>95</sup>** MFJ's newest, most versatile SWR Analyzer™ covers more frequencies than any MFJ SWR Analyzer™ – 1.8-170 MHz continuously. It has smooth vernier tuning and a built-in 10 digit, high accuracy, high contrast LCD frequency counter that makes reading SWR in the sun easy.

This wide range MFJ-249 covers all frequencies between 1.8-170 MHz including all ham bands from 160 Meters to 2 Meters, commercial 2-way radio, police, fire, FM broadcast, military, marine and shortwave.

A velvet smooth vernier reduction drive makes it easy to set frequency precisely.

It's battery powered and handheld size. You can take it right to your antenna and work on it until it's just the way you want it.

Here's what it does ...

The MFJ-249 SWR Analyzer™ gives you a complete picture of your antenna SWR over an entire band -- without a transmitter, SWR meter or any other equipment!

Reading SWR is automatic. All you do is plug in your antenna, set your MFJ-249 SWR Analyzer™ to the frequency you want and read your SWR -- it couldn't be easier!

Here's what you can do ...  
You can instantly find your antenna's true resonant frequency right at your feedline -- that's something a noise bridge just can't do.

You can shorten or lengthen your dipole or mobile whip and see the effect immediately.

You can monitor how SWR changes as you adjust your beam or vertical -- you'll know right away if you should lengthen or shorten it.

You can see how SWR varies over an entire band ... find 2:1 SWR bandwidths ... adjust mobile antennas in seconds ... find all resonant frequencies of multiband verticals, dipoles and beams ... tune up your antenna tuner without transmitting.

You get three instruments in one

You get three instruments in one ... a low distortion RF signal generator ... a sensitive high accuracy 170 MHz frequency counter ... an SWR Analyzer™

Has BNC connector for use as high accuracy frequency counter. Counter has four gate times, .1 Hz resolution, 1 ppm 10 MHz crystal time base with adjustable calibration.

Use 6 AA cells or 110 VAC with MFJ-1312B, \$12.95 4x2½x6¾ inches.

## 1.8-170 MHz HF/VHF SWR Analyzer™



MFJ-209  
**\$109<sup>95</sup>** If you don't need a built-in frequency counter but want 1.8-170 MHz continuous coverage and smooth vernier tuning, choose the MFJ-209.

It'll help get your antennas in tip-top shape. Same as MFJ-249

without LCD frequency counter. Has jack for external frequency counter. Use 6 AA cells or 110 VAC with MFJ-1312B, \$12.95. 4x2½x6¾ inches.

## 10-160 Meter HF SWR Analyzer™



MFJ-207  
**\$79<sup>95</sup>** If you're an HF man, this compact MFJ-207 HF SWR Analyzer™ will help you build antennas that'll make working DX almost routine.

Just plug in your coax to find the SWR of any HF antenna on any ham band 10-160 Meters. Has jack for external frequency counter. Use 9 volt battery or 110 VAC with MFJ-1312, \$12.95. 7½x2½x2¼ inches.

## 2 Meter VHF SWR Analyzer™



MFJ-208  
**\$79<sup>95</sup>** MFJ-208 2 Meter VHF SWR Analyzer™ finds the SWR of any antenna from 142-156 MHz.

Jack for external frequency counter. Use 9 volt battery or 110 VAC with MFJ-1312, \$12.95. 7½x2½x2¼ inches.

For Commercial VHF Radio Same as MFJ-208 but for commercial VHF. MFJ-217, \$79.95, covers 30-50 MHz and MFJ-218, \$79.95, covers 150-170 MHz.

## MFJ Bandswitched Dip Meter™



MFJ-203  
**\$99<sup>95</sup>** The MFJ-203 is a sensitive Bandswitched Dip Meter™ that covers all ham bands from 160-10 Meters. There are no plug-in tuning coils to keep up with or break.

It's the easiest dip meter you'll ever use -- just tune for a dip. There's no sensitivity control to constantly adjust.

Saves time and takes guesswork out of pruning antennas, winding coils, tracking down parasitics, measuring inductance and capacitance, measuring velocity factor and electrical lengths of coax. Determine resonant frequency of tuned circuits and antennas. Measure Q of coils. Also use as signal generator.

Has detachable coupling coil, dual FET oscillator, op-amp meter amplifier and jack for external frequency counter. Use 9 volt battery or 110 VAC with MFJ-1312B, \$12.95. 7½x2½x2¼ inches.

## MFJ Antenna Resistance Meter™



MFJ-205  
**\$89<sup>95</sup>** Need to measure the feedpoint resistance of your antenna?

Simply plug your coax into the MFJ-205 Antenna Resistance Meter™, set it to the frequency you want and read your feedpoint resistance directly from its calibrated resistance meter. It's perfect for designing impedance matching networks for your antenna.

Reads up to 600 ohms RF resistance and covers all ham bands 160-10 Meters.

With a conventional antenna bridge you have to constantly alternate between adjusting the null and frequency controls until you find the best null.

You can also determine resonant frequency and if your antenna is too long or too short.

Has jack for external frequency counter. Can be used as an RF signal generator. 7½x2½x2¼ inches. Use 9 volt battery or 110 VAC with MFJ-1312B, \$12.95.

## 600 MHz 10 Digit LCD Counter



MFJ-346  
**\$189<sup>95</sup>** Add this handy MFJ-346

frequency counter to your station and get high accuracy frequency measurements to 600 MHz with 10 digit precision.

Easy-to-read 1/4 inch LCD digits don't wash out in bright sunlight like LEDs.

Compatible with MFJ SWR Analyzers™, Dip Meter™, Antenna Resistance Meter™ and Antenna Bridge™.

Four gate times, .1 Hz resolution, high accuracy 1 ppm 10 MHz crystal time base.

Use 9 volt battery or 110 VAC with MFJ-1312B, \$12.95. 4x1½x5¼ inches.

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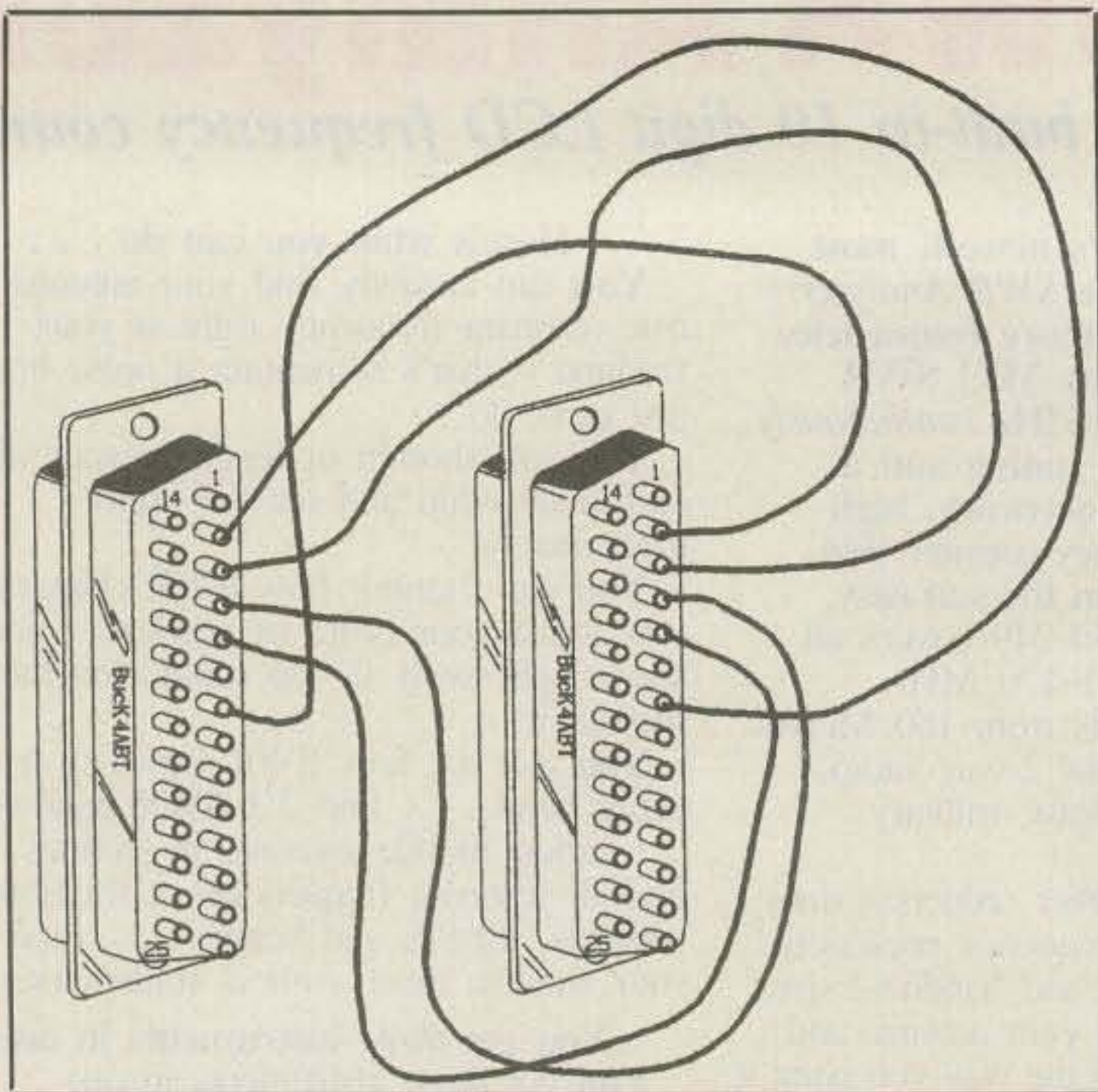


Fig. 3- PC or compatible 25-pin comport to KPC-3.

20 ma with the LEDs **ON**. When the LEDs are set to **OFF**, the current drain is reduced to less than 14 ma. A bit of humor from inside the walls at Kantronics is that if they rewrite the code again, the new KPC-3 may become a power *source* rather than a power *user*. Hmmm... think about it: a TNC that powers your HT.

The features of the KPC-3 keep coming. As soon as we open the box and make the connections to our computer and trans-

ceiver, we found a new command, the one we addressed earlier, called **INTERFACE**. Why this command was used, I do not know, but I'm sure it has to do with possible conflict with other commands in the TNC. The **INTERFACE** command is explained in greater detail in the "Getting Started" booklet included with the KPC-3.

In a few words, the **INTERFACE NEWUSER** command is just that—a new user command. By setting the **INTERFACE** command to **NEWUSER**, we are setting the command arrangement in the KPC-3 to only 23 of the most often used commands. This configuration is a feature that has been needed for a long time, and it allows the new packeteer to be operating much sooner than if he or she had to digest a long list of complicated, let alone needless, commands.

After the new packeteer becomes comfortable with the operation of the KPC-3 and wishes to move to the advanced command level, he or she may do so simply by setting the **INTERFACE** command to **TERMINAL** or one of the four commands that are available from the **INTERFACE** instruction set. When set to **TERMINAL**, the KPC-3 will exhibit over 100 commands that relate to TNC transparent, timing, flow, host, link, async, and PBBS parameters.

### The Best Is Yet To Come

First things first. The new owner of the KPC-3 should read the short "Getting Started" manual to learn how easy the KPC-3 is to put into service. Cables and connectors for the KPC-3 are included. A few radio interface drawings are included in the manual. To add to the complement of interface drawings, I've included a few more in figs. 1, 2, 3, and 4.

As many of us have learned, there are times when the mailbox feature of some TNCs are limited to only a couple of Kbytes, which precludes the use of the mailbox to hold more than three or four messages while we are away from the keyboard. There



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FT-736R Xcvr 144-148, 430-450 ..... CALL  
FT-5200 2M/440 50/35W ..... CALL  
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# MFJ TNCs for VHF/HF Packet

MFJ-1270B super TAPR TNC clone has a world wide reputation as *the most reliable packet TNC in the world!* Thousands used as digipeaters, nodes, BBS and in all kinds of commercial applications working 24 hours a day — many work for years without a single failure . . .

## NEW ENHANCED MAILBOX

- Expandable 32K, 128K or 512K
- Separate callsign for mailbox
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- Auto forwarding and reverse mail forwarding
- Remote Sysop access, Sysop paging
- Chat mode, mailbox C-text
- "Has mail" LED indicator

The MFJ-1270B super TAPR TNC clone has a world wide reputation as *the most reliable TNC in the world!*

Thousands are dedicated as digipeaters, nodes, BBS and used in all kinds of commercial applications working 24 hours a day — many work for years without a single failure.

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The widely acclaimed MFJ-1270B may not be the cheapest TNC, but it gives you the most for your money. You get features that others just don't have. See for yourself . . .

## Fully TAPR TNC-2 Compatible

You get full TAPR TNC-2 compatibility — all software and hardware designed for the TAPR TNC-2 standard works without modification.

You get Net Rom compatibility that turns your MFJ-1270B into a Layer Three and Four networking node and Rose Switch compatibility that gives you another networking option.

## VHF and HF operation

You get high performance VHF and HF modems as standard equipment — lets you double your fun on packet.

You get a true DCD circuit that dramatically reduces sensitivity to noise and dramatically increases completed QSOs.

## FREE AC Power Supply

You get a free 110 VAC power supply at no extra cost. With other brands, the AC power supply could cost you an extra \$20.95.

## New enhanced Personal Mailbox

The enhanced Easy Mail™ personal mailbox allows dedicated call-sign for mailbox. Now your mailbox can stay on while operating packet. The new mailbox also will auto forward or reverse forward mail to and from other BBS. Plus, the "has mail" LED blinks when you have mail. More



**NEW LOWER PRICES!**

MFJ-1270B  
**\$119<sup>95</sup>**

MFJ-1274, with HF tuning indicator  
**\$139<sup>95</sup>**

features: remote Sysop access, sysop paging, mailbox C-text, chat mode and many other features not available in other TNCs or multimodes. The MFJ-1278 mailbox memory is expandable to 32K, 128K, 512K.

## WeFAX gives you Weather Maps

You get a WeFAX mode that lets you print full fledged weather maps from your HF radio to screen or printer or save to disk using an MFJ Starter Pack.

## 2400 or 9600 Baud Modem simply plugs in

You can add MFJ's optional internal 2400 baud or 9600 baud modem just by plugging it in and making a few simple connections.

## KISS interface

You get a KISS interface that lets you run TCP/IP and MYSYS.

## MFJ Anti-Collision™ Technology

You get MFJ's Anti-Collision™ technology (Prioritized Acknowledgement) that prevents packet collisions to improve performance on busy channels.

## Plus more . . .

You also get 32K RAM, IC sockets for easy service, true DCD for HF, 256K ROM, speaker jack, lithium battery backup, RS-232 and TTL serial ports, radio cable (you have to add a connector for your particular radio), Fast-Start™ Manual plus much more. Use 12 VDC or 110 VAC. Measures 9-1/2 X 1-1/2 X 7-1/2 inches.

## One Year Unconditional Guarantee

You get MFJ's famous *No Matter What™* one year unconditional guarantee.

## Enjoy Packet for a long, long time

If you want a packet TNC that'll work 24 hours a day without failure — one that has more features than any other — get the ultra reliable MFJ-1270B today and enjoy packet for a long, long time.

TNC with built-in HF Tuning Indicator  
MFJ-1274, \$139.95. Same TNC as MFJ-1270B but has precision tuning indicator for HF packet — makes operating HF a pleasure. Just tune your radio to center single LED and you're precisely tuned in to within 10 Hz — and it shows you which way to tune!

New 2400 baud Turbo TNCs  
MFJ-1270BT, \$209.95 and MFJ-1274T, \$229.95 have built-in fast 2400 baud modem. Lets you operate 300, 1200 and 2400 baud packet.

## ACCESSORIES for TNCs

### MFJ Starter Packs

An MFJ Starter Pack, \$24.95, gets you on the air instantly. You get interface cable, software on disk and instructions — just plug it all in and start enjoying packet. Order MFJ-1284 for IBM or compatibles, MFJ-1282 for Commodore 64/128 or MFJ-1287 for Macintosh. For VIC-20 or C64/128 with tape drive use MFJ-1283, \$24.95.

### Mailbox Memory Expansion Board

For all MFJ TNCs. MFJ-47A, \$49.95, 32K RAM; MFJ-47B, \$69.95, 128K RAM; MFJ-47C, \$239.95, 512K RAM. Complete with Firmware.

### MFJ TNC Real Time Clock

MFJ-43, \$29.95. Ends frustration of setting TNC clock everytime you turn it on. Maintains correct time even when TNC is turned off. Plugs into RAM socket. Works with MFJ TNCs and TAPR TNC clones.

### MFJ TNC Firmware Upgrade Release 1.2.9

New firmware features enhanced mailbox and supports expandable mailbox up to 512K. MFJ-40C, \$24.95.

### MFJ 2400 and 9600 Baud Modems

MFJ-2400, \$89.95. Operates 300, 1200 and 2400 baud packet. Works with any radio. MFJ-9600, \$109.95. G3RUH compatible 9600 baud modem. Not all radios compatible with 9600 baud. Both plug in MFJ TNCs and MFJ-1278 for easy installation.

## MFJ's new TNC/Mic Switch . . . lets you switch between your TNC or microphone by pushing a button!

The MFJ-1272B **\$34<sup>95</sup>**

is the most popular TNC/multimode accessory in ham radio! Why? Because you can switch between your microphone and packet TNC or multimode by pushing a button.

You won't have to unplug your microphone and plug in your TNC everytime you want to work packet or other digital modes.



Just plug the pre-wired cables into your rig's microphone connector and into your TNC and you're ready to go — no more hunting for hard-to-find connectors and wiring up complicated cables.

Works with HF, VHF and UHF radios with 8 pin mic connectors — including Kenwood, ICOM, Yaesu, Alinco and others.

Plug-in jumpers let you quickly set-up for virtually any radio. Factory set for Kenwood and Alinco. Includes easy to follow instructions. Has audio-in and speaker jacks. 3-1/4 x 1-1/4 x 4 inches.

MFJ-1272B, \$34.95, for MFJ TNC/multimodes and TAPR TNC-2 clones.

MFJ-1272BX, \$39.95, wired with connector for PK-232.

MFJ-1272BYV, \$39.95, wired with connector for KAM, VHF Port.

MFJ-1272BYH, \$39.95, wired with connector for KAM, HF Port.

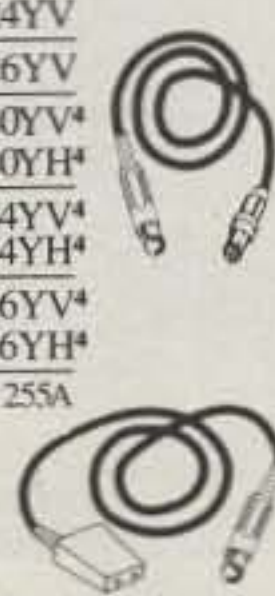
MFJ-1272BZ, \$39.95, wired with connector for PK-88.

## Pre-wired Radio-to-TNC cables . . . \$14<sup>95</sup>

	All MFJ	PK-232™	PK-88™	KAM™
Icom/Yaesu HTs	MFJ-5024	MFJ-5024X	MFJ-5024Z	MFJ-5024YV
Kenwood HTs	MFJ-5026	MFJ-5026X	MFJ-5026Z	MFJ-5026YV
Yaesu 8 pin radios	MFJ-5080	MFJ-5080X	MFJ-5080Z	MFJ-5080YV <sup>4</sup> MFJ-5080YH <sup>4</sup>
Icom 8 pin radios	MFJ-5084	MFJ-5084X	MFJ-5084Z	MFJ-5084YV <sup>4</sup> MFJ-5084YH <sup>4</sup>
Kenwood/Alinco 8 pin radios	MFJ-5086	MFJ-5086X	MFJ-5086Z	MFJ-5086YV <sup>4</sup> MFJ-5086YH <sup>4</sup>

1 does not include IC-W2A 2 does not include 2500 3 does not include 25A & 255A  
4 YV models connect VHF port of KAM. YH models connect HF port of KAM

MFJ-5082, \$9.95, open end cable with 8-pin microphone connector  
MFJ-5224, \$9.95, open end cable for Icom/Yaesu handhelds  
MFJ-5226, \$9.95, open end cable for Kenwood handhelds  
MFJ-5268, \$7.95, open end cable with 8-pin modular telephone plug for Yaesu FT-2400H, Kenwood TM641A, TM714A, TM732A



## MFJ-1271 turns your Commodore 64/128 into full featured packet TNC!

Just plug in this MFJ-1271 modem and boot up the public domain Digicom/64 software (not included) to enjoy VHF or HF packet at 1200 and 300 bauds.

You get a high performance modem featuring true DCD circuit with adjustable threshold. DCD detect LED tells you when you're receiving a good signal. Plugs into cassette port and uses 12 VDC or 110 VAC with MFJ-1312, \$12.95.

MFJ-1271  
**\$49<sup>95</sup>**



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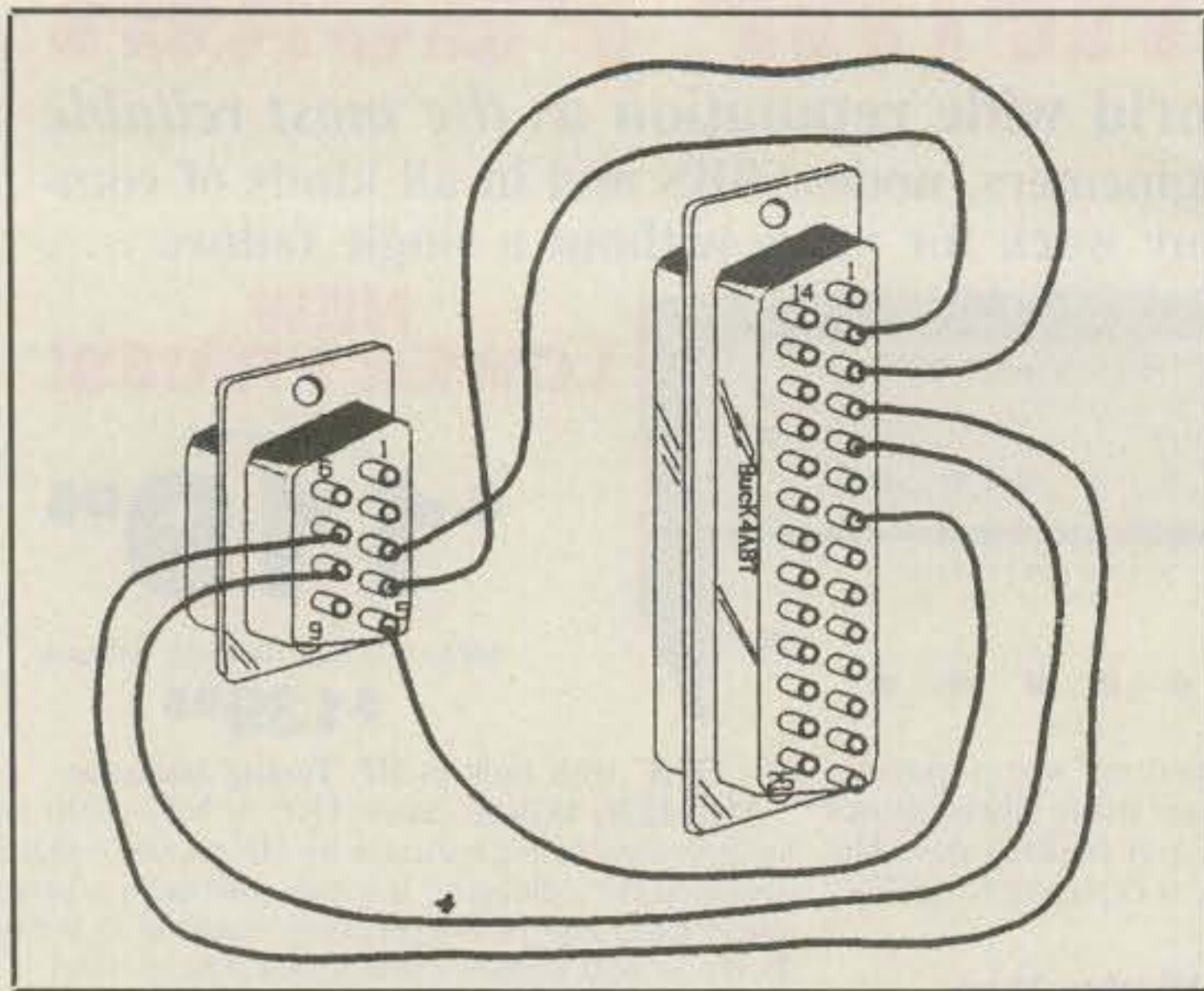


Fig. 4- PC or compatible 9-pin comport to KPC-3.

are also times when I've connected to a friend's personal mailbox and began sending a short message, only to receive **MESSAGE TRUNCATED, MAILBOX FULL!**

The KPC-3, as supplied, comes with 32,000 bytes of RAM. From this 32 Kb, up to 24,000 bytes can be allocated for mailbox use. Now as if this might not be enough, Kantronics has an update option that can be added so the mailbox size can be increased to over 100,000 bytes (128 Kb). When 512K RAM becomes available, there are provisions in the KPC-3 to add 512,000 byte RAM (half a million bytes) to this TNC.

The PBBS supports both forwarding and reverse forwarding. This feature makes it suitable as a small area, or LAN, BBS. KaNODE is also included in the KPC-3, along with the JHeard

and JHeard Long features. The MYCALL, MYPBBS, MYALIAS, MYREMOTE, and MYNODE features can be addressed with different callsigns; for example:

- MYCALL K4ABT
- MYPBBS K4ABT-10
- MYNODE K4ABT-7
- MYALIA K4ABT-3
- MYREM K4ABT-2

Inside the KPC-3 there are two solder pads where a 9 volt battery clip can be connected which will allow the installation of an internal power source. I picked up a package of these battery clips (five to the package) at the local Radio Shack store (part number 270-325) and made this simple addition. Yes, there is ample room inside the KPC-3 for the 9 volt battery.

To add a bit of flavor to this add-on feature, if an external power source is connected to the standard TNC barrel connector of the KPC-3, the internal battery is disconnected from the power circuit(s), thus conserving the internal battery for portable operation.


I've been using the same battery on and off for more than two weeks, and it has yet to fail. I do use a small 12 volt DC wall-type supply when I'm not operating Porta-Packet.

### Speaking of Battery Power












The KPC-3 RAM has battery backup that is supported by an internal lithium battery which holds all mail and other data in the event of a power failure. A real-time clock can be added as an option.

Considering the suggested retail price of \$119.95, and combining all the good points of this new TNC, we have the makings to build an economical, easy-to-carry, low-power-consumption, space-saving packet station.

For more information, contact Kantronics Inc., 1202 E. 23rd Street, Lawrence, KS 66046 (for orders phone 913-842-7745).



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		<b>NCG CO.</b> 1275 N. Grove Street, Anaheim, CA 92806 (714) 630-4541 • (800) 962-2611 CALL FOR COMPLETE CATALOG OR NEAREST DEALER		 		<b>2M-70cm DUPLEXERS</b> Power: 146MHz 800W 446MHz 500W  <b>CF-416A</b> <b>CF-4160K</b>	

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R7 ..... 40-10m no radial vertical  
13B2 ..... 13 element 2m beam  
17B2 ..... 17 element 2m beam  
26B2 ..... 26 element 2m beam  
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# CQ REVIEWS:

## The AEA-FAX WeFax (Weather Facsimile)

BY BUCK ROGERS\*, K4ABT

**N**ot a new name to our ham shack, AEA-FAX is a new idea for the avid graphics buff and those interested in global weather conditions.

Coupled with the increase in interest in global weather conditions, we're witnessing an increase in terrestrial interest centered around observing the weather-related earth-orbiting satellites. This attention to weather satellite monitoring has driven several TNC manufacturers to include a weather facsimile feature in their equipment. This feature is appropriately called "WeFax."

With the WeFax feature supported in some multi-mode controllers, the digital user is provided a method by which to participate in this interesting and fun-filled means of capturing pictures from space via earth-based relay stations.

### But What About The Casual User?

There is one small catch to all this graphic capturing of pictures from space, and that is the price of the multi-mode controllers that include the WeFax features. The "casual" weather observer may not need other features in the multi-mode controller, yet he or she wants an economical means to monitor the weather facsimile.

Here then is the answer to that need. In some applications the device about which I'm going to tell you may be a requirement. The system may also be worthy of use in some commercial applications.

### Hardware Considerations

The AEA-FAX presents the user with superior performance and display when used with an IBM PC or compatible that is equipped with a VGA monitor/display. Although I use all SVGA monitors, the PC XT/AT/386/486, etc., can be used with CGA and EGA monitors.

The PC should have a serial port (COM1 or COM2) and have at least 512K of RAM, running under MS/DOS version 2.11 or higher. A dual-floppy disk drive or a hard-



The AEA-FAX weather facsimile system.

disk drive is needed to run the AEA-FAX software. In addition, the WeFax pictures are stored on disk for later viewing or printing.

The AEA-FAX can give a multi-level grayscale facsimile presentation on the display, and it can print the received WeFax picture to an Epson-compatible dot-matrix printer or a Hewlett-Packard LaserJet/DeskJet printer.

### Installation

When installing the AEA-FAX software, there is a built-in autosense that quickly examines your PC for the type of graphics adapter that is in use. It will configure the program accordingly. Therefore, it is not necessary to search or otherwise try to configure your system for an unknown display type.

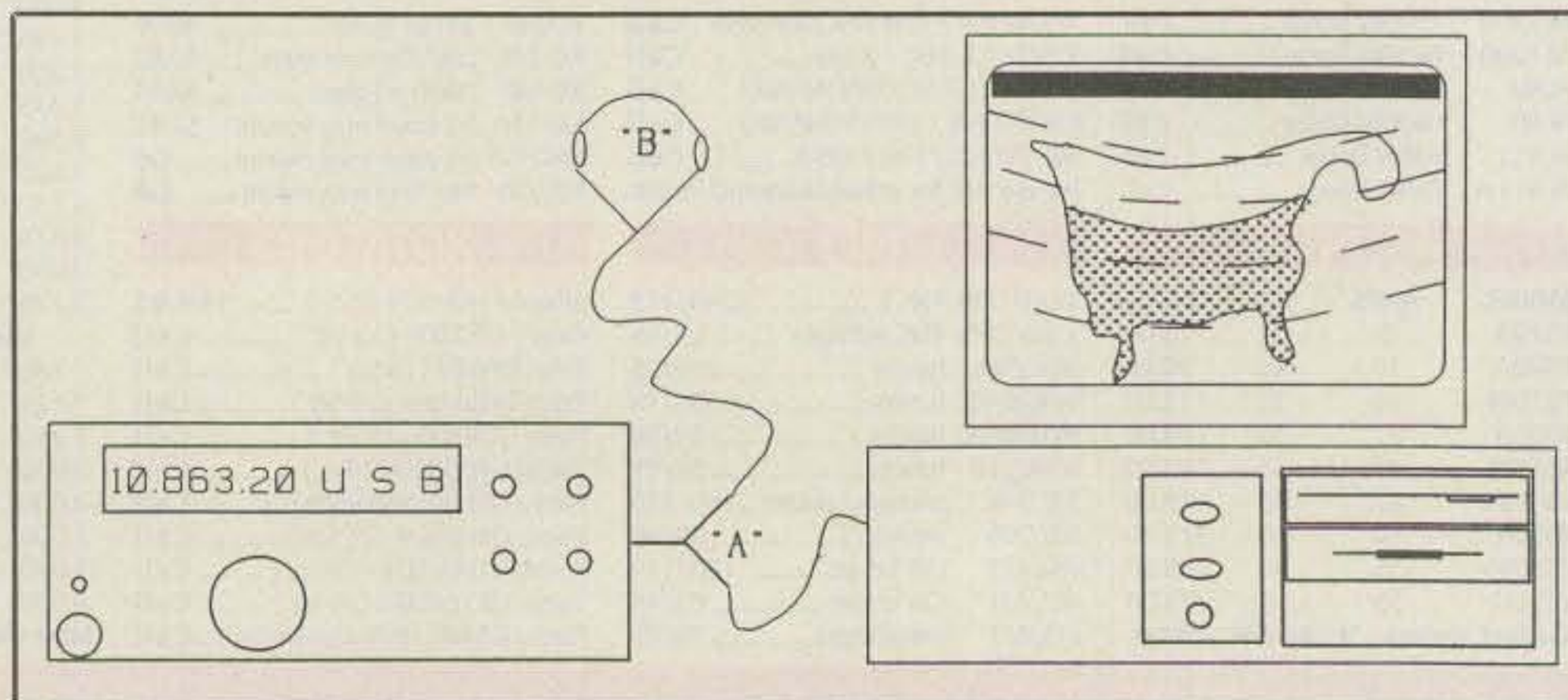


Fig. 1- Configuration for use with the AEA-FAX WeFax demodulator, and application of "Y" cable (A) and receive audio listening at "B."

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**YAESU**



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**Holiday Value IC-3230**

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CIRCLE 37 ON READER SERVICE CARD



A WeFax picture as it appears on the screen.

After the software installation the rest of the installation is a piece of cake. There are no internal connections or plug-in cards to add inside your PC. Simply remove the AEA-FAX demodulator from its packaging and attach it firmly to one of the comports (COM1 or COM2) of the PC.

If your computer has only a 9-pin serial interface, you will need to acquire a DB9 to DB25 adapter. Be sure the gender of the

two are correct so that the demodulator and the adapter interconnect properly.

The demodulator is equipped with a 3.5 mm plug which attaches to the external speaker output. If your receiver, or transceiver, has an external speaker jack other than a 3.5 mm size, it will be necessary to have a speaker jack adapter to complete this part of the interface. If you wish to listen to the received audio while

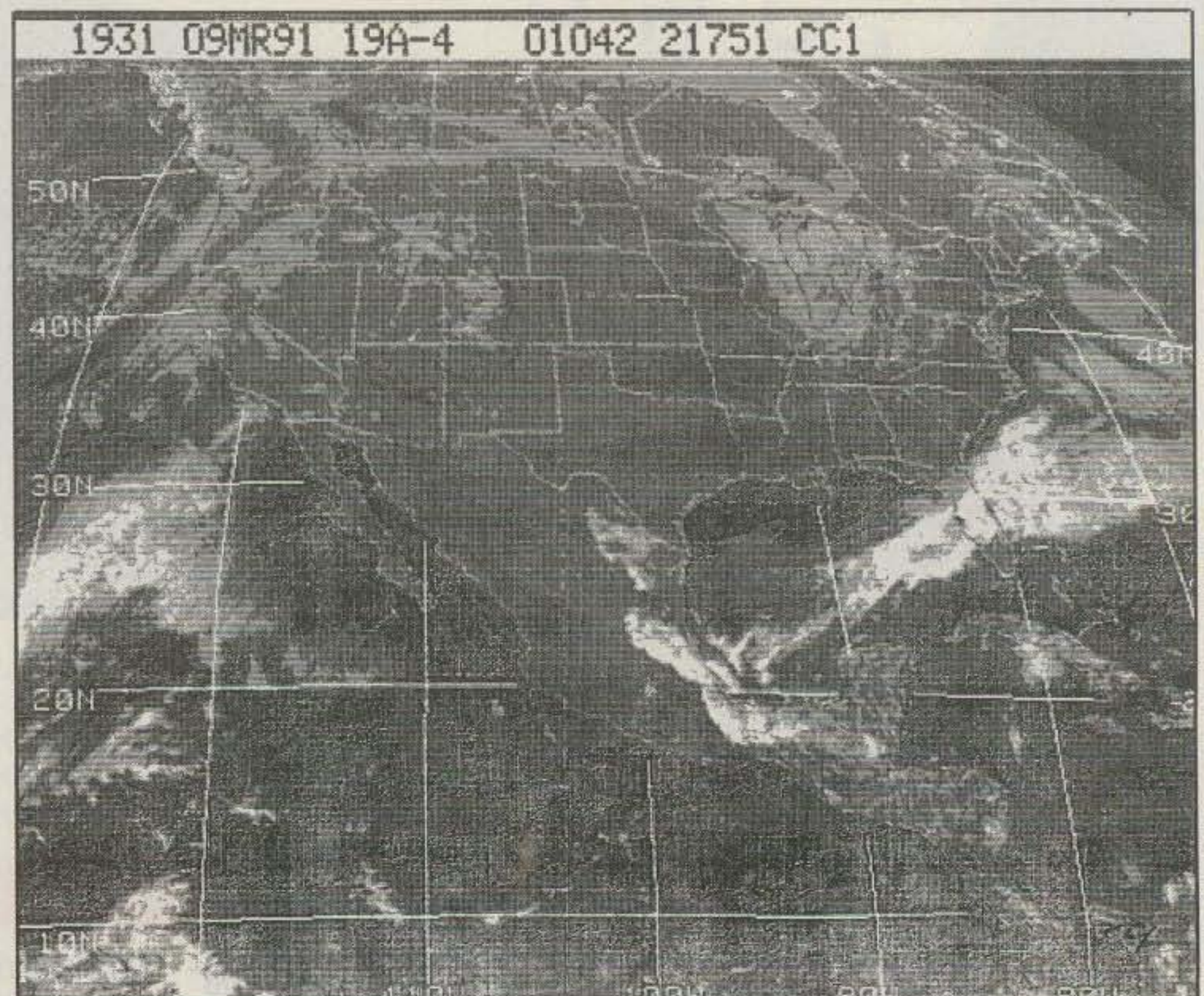


Fig. 2- The hard-copy laser-print of the display shown in the photo.



the WeFax signal is being received to the demodulator, a final option in the form of a "Y" connector is needed (see fig. 1).

## Plug 'n Play

At this point we are ready to run the AEA-FAX program. To address the correct COMPORT, you must remember to which COMPORT you connected the demodulator. If you connected it to COM1, then all you have to do is type **FAX** and press ENTER. On the other hand, if you connected the demodulator to COM2, type **FAX 2**.

Other loading options are possible when executing AEA-FAX. Page seven of the manual defines the applications and how they are to be implemented.

Another nice feature of the AEA-FAX software is that it will sense the presence of a mouse. It senses the presence of a Microsoft bus mouse, plus other mouse driver formats. This makes it possible to choose menu selections either by letter, or by pointing and then pressing a mouse button.

Page eight of the manual provides the user with a quick introduction and basic theory for receiving WeFax signals. Then on page nine the user is given a good explanation of the mapping procedures of a WeFax picture.

## Exporting of FAX To PCX

The AEA-FAX software allows the user to export FAX pictures from the normal WeFax format into the ZSoft™ PCX format. By doing so, you may use the ZSoft "PC-PAINTBRUSH" (copyright ZSoft) program to edit, add color, or to add text to the FAX/WeFax picture.

The display in fig. 2 is a hardcopy printed to my EPSON Action Laser printer.

So that I can give the reader a better understanding of the WeFax jargon, I'm including the following short glossary, which is supported in the WeFax community.

**APT:** Automatic Picture Transmission.

**CGA:** Color Graphics Adapter.

**CW:** Continuous Wave (reference to radio telegraph).

**dB or db:** The logarithmic measure of signal strength, or the sound level increase perceived by the human hearing sensor(s).

**EGA:** Enhanced Graphics Adapter.

**FSK:** Frequency Shift Keying—the transmission method using encoded values when transmitting different frequency tones.

**GOES:** Geosynchronous Orbiting Environmental Satellite.

**LPM:** Lines Per Minute—the transmission rate or facsimile format for picture transmission—i.e., 60 LPM (press photos), 120 LPM (most used FAX standard), 240 LPM (GOES and Soviet WeFax standard).

**Mini Scope:** An on-screen facility that provides a display of the incoming FAX signal, but in scope display format rather than WeFax display.

**USB:** Upper Side Band—the most used side band for facsimile transmission.

**NOAA:** National Oceanographic and Atmospheric Administration; reference is to earth-orbiting satellites.


**Pixel:** The description of the smallest element of a picture associated with the display of either CGA, EGA, or VGA computer screens.

**Rastering:** The scanning of images in a sequential motion a line at a time.

**S unit:** The level of signal strength being received which corresponds to approximately 6.3 dB change.

**Start Threshold:** A value encoded tone that is used to trigger the beginning of a WeFax picture transmission, so that automatic receiving stations may begin receiving a picture.

**WeFax:** The acronym for Weather Facsimile transmission.

The suggested list price of the AEA-FAX is \$149.95. However, the ham net price is \$99.95. To order the AEA-FAX contact your AEA dealer. If you need more information about the AEA-FAX demodulating system, contact AEA/Advanced Electronics Applications, Inc., P.O. Box C2160, 2006 196th St. S.W., Lynnwood, WA 98036-0918. 

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***W9IWI brings us another page out of history and puts a name behind a term we tend to take for granted.***

# A Page Out of History

## Edouard Branly Inventor of The First Detector

BY JULIAN N. JABLIN\*, W9IWI

**A**sk any radio amateur whether his or her receiving system (whatever the mode of communication) includes a detector and the answer will be "Of course!" Ask what kind of detector it is, and the answer probably will be "product detector," or possibly "limiter/discriminator." If the amateur collects old radios, the answer may be "6AL5"—a vacuum tube dual diode.

Now ask your amateur friend what a *coherer* is. The almost universal response will be "A what??"

The coherer was, in fact, the earliest effective detector in the days of spark. Invented around 1890 by Edouard Branly, it changed wireless waves from an interesting phenomenon to a means of communicating intelligence. Experimenters, from Hertz on, learned how to generate electromagnetic waves, detect their presence, measure them, direct them, investigate their characteristics. But until Branly's coherer, they had no means of using the waves to spell out messages. Guglielmo Marconi, in his first transmission from England to France in 1899, sent a message to Branly paying his "respectful compliments by wireless telegraphy" and stating that "this splendid achievement is due in part to the remarkable work of M. Branly."

The coherer was a simple gadget which did big things. Basically, it was a glass tube with metal plugs at the ends. The space between the plugs was loosely packed with metal particles. Iron filings were used, and later nickel dust. When an electrical spark was produced at a moderate distance, the particles stuck together, increasing the conductivity of the device.

A tap on the tube separated the filings, and the current through the gap dropped to zero and the tube was ready to "hear"

the next spark. A later refinement added an automatic "tapper" which struck the tube after each signal so that the coherer could receive Morse, although very slowly. For a time it was not understood that Hertzian waves were producing the cohering effect. Branly himself thought that it was the light from the spark which was responsible. No less a scientist than Sir Oliver Lodge, in a 1874 lecture he proved that the tube was actually detecting Hertzian waves, and he named the device a "coherer" because it made the signals "coherent."

Marconi made countless experiments to improve the tapping "decoherer" and substituted a Morse printer for the voltmeter usually employed to indicate that signals were present. Since the current available from the coherer was too weak to drive the Morse machine, Marconi added a battery, making the coherer, in effect, a relay.

Like many devices of that era, the coherer was discovered in part by accident. However, accidents of this nature usually happen only to people who are well prepared and ready to recognize them.

Edouard Branly was born in 1844 in Amiens, France. His father was on the faculty of the Lyceum de St. Quentin; young Edouard studied there and at the Ecole Normale Supérieure in Paris. A brilliant student, he went on to the famed Sorbonne, where he received his doctorate in physics and was given a position in the physics laboratory. Later he was appointed a professor and research physicist at the Institut Catholique, a denominational university in Paris.

In a career move that had overtones in today's world, Branly, already in middle age, realizing that the salary of a researcher was inadequate for his needs, decided to study medicine and become a physician. His income as a doctor enabled him

to engage in his own scientific experiments, which occupied the next quarter-century.

Branly's medical studies led directly to his invention of the coherer. While investigating the manner in which nerves carry messages to and from the brain, he observed that nerves are not continuous fibers. Rather, they are composed of neurons packed closely but not necessarily in direct contact. Branly tucked this bit of information aside for future reference in his work with electromagnetic waves, and later he used this model for his coherer.

The action of the coherer had been observed but not understood at least 30 years before Branly. In 1830 a Frenchman named Guitard observed that dust formed strings and clumps when the air was electrified, but it meant nothing to him. About 15 years later S.A. Varley devised a lightning protector for telegraph lines which used carbon dust in a tube. It very likely was connected between the line and ground, and when a lightning stroke occurred nearby, the carbon granules coalesced, conducting the voltage induced on the line to ground.

An Italian, Calzecchi Onesti, did some really serious work on the subject, publishing his results in a scientific journal in 1884. Indeed, there have been references to the "Onesti-Branly coherer."

When Marconi needed a device to translate sparks into readable Morse, the coherer was ready for him. It was crude and it was slow, and it represented only the beginning in the search for devices to "detect" radio signals. However, it was the first.

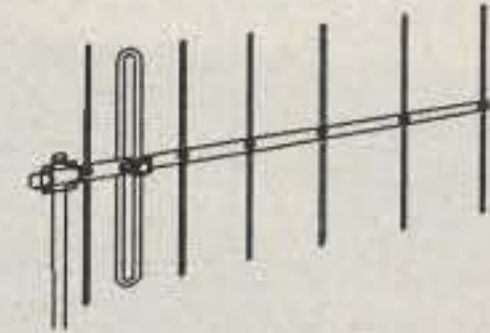
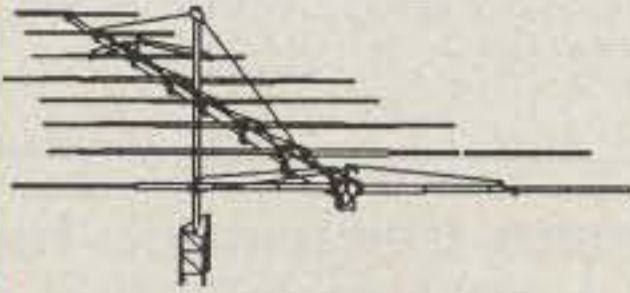
Branly died in 1940 at the advanced age of 95, angry that radio, which he had so great a part in making possible, had become an instrument of propaganda in the developing European war.

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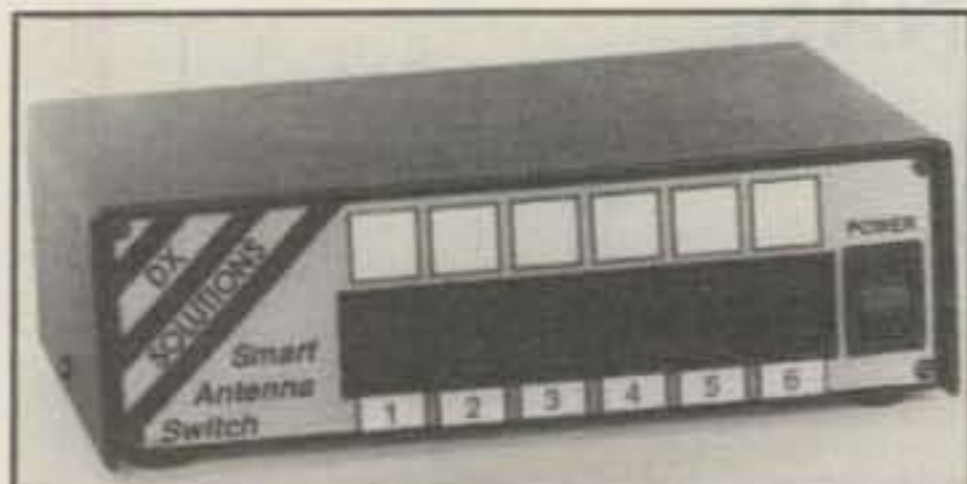
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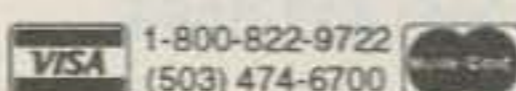
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**Have you ever had one of those days, weeks, or years? W8WOJ relates some of the "hidden" costs that can arise out of collecting.**

# "Don't Collect Tubes"

BY DON CHRISTENSEN\*, W8WOJ

I never knew one antique vacuum tube could cause so much grief. Be careful, collectors, it could happen to you.

The problem started when my friend W8EEF mentioned he was cleaning out the shack. A couple of boxes of old transmitting tubes had to go, he said. Since I had a modest collection of old tubes and needed (?) more, I told him "Norm, don't throw them away. Send them to me." In retrospect, I should have kept my mouth shut.

Within a few days a large carton containing a dozen or so antique tubes in grubby old boxes arrived at my QTH. There were beauties such as an Eimac 250TH, a Heintz & Kaufman HF-300, a Hytron HY-75, and a tired looking old Taylor T-20 with its white isolantite base. They don't make 'em like this anymore.

Obviously, W8EEF had not been storing his junk tubes in a "clean room," so I proceeded to remove some of the crud. I started with the old T-20. As it turned out, it would have been less painful and much less expensive had I simply gone to the shack and worked a little DX.

A bit of dishwashing soap and water did wonders. Mr. Taylor's tube began to sparkle. As I reached to pick it up to dry off the water, the stupid tube began to roll off the countertop. I reacted quickly, as one does when attempting to catch a falling object. In so doing I kicked the lower part of the kitchen cupboard, but thought nothing of it at the time. An hour or two later, as I removed tennis shoes and socks in preparation for a shower, I noticed blood around the nail of the large toe on my left foot. Oh, well, I said, a nice shower and soak in Epsom-salt water will take care of this. It was June 14.

I continued the soaking on my own for four days. It didn't help. An infection had set in; the toe was red and very, very sore. By Sunday the 17th something had to be done, so off I went to the emergency room at the local hospital. What a way to spend Father's Day! After quite a wait because of real emergencies, I left, deciding to

return the following day. Early Monday morning ER people X-rayed the toe, but found no broken bones. They confirmed I had an infection and told me to soak my foot in Betadine, a microbicide. Further, if no improvement was noticed in a couple of days, I should return to the emergency room or see my family doctor.

June 20 was a scheduled doctor's appointment day for my XYL, so I rode in on her coat tails. The toe was still badly infected. My doctor's instructions were as follows: continue soaking in Betadine, start taking an antibiotic, stay off the foot, keep it elevated, apply a prescribed ointment to the nail, and wear only white cotton socks over the bandaged toe. That was the good news. The bad news was that if there wasn't any substantial improvement in seven days, hospitalization might be in order. Good God, Norman, why did I ever ask for those tubes!

It was then June 27 and I was back at the doctor's office. Good news this time. He said things were looking much better. I could forget the hospital bit, but he wanted me to continue with a refill on the antibiotic. No need for further soaking, he said. It was a good thing. My foot was turning brown from the Betadine and I thought it had shrunk.

During a routine office visit on August 1 my doctor said everything looked just great. The only thing left was for the toe nail to drop off. It did on August 10.

I've itemized the cost of a Taylor T-20 triode vacuum tube below.

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Bottle of Betadine microbicide .....	5.87
Tube of Silvadene Ointment .....	4.66
Bandage .....	1.65
Package of white cotton socks .....	5.00
Doctor's office call June 27 .....	28.00
Second prescription for antibiotic .....	29.78
Second box of bandage .....	1.65
Doctor's office call of August 1 .....	28.00
Total cost .....	\$256.99

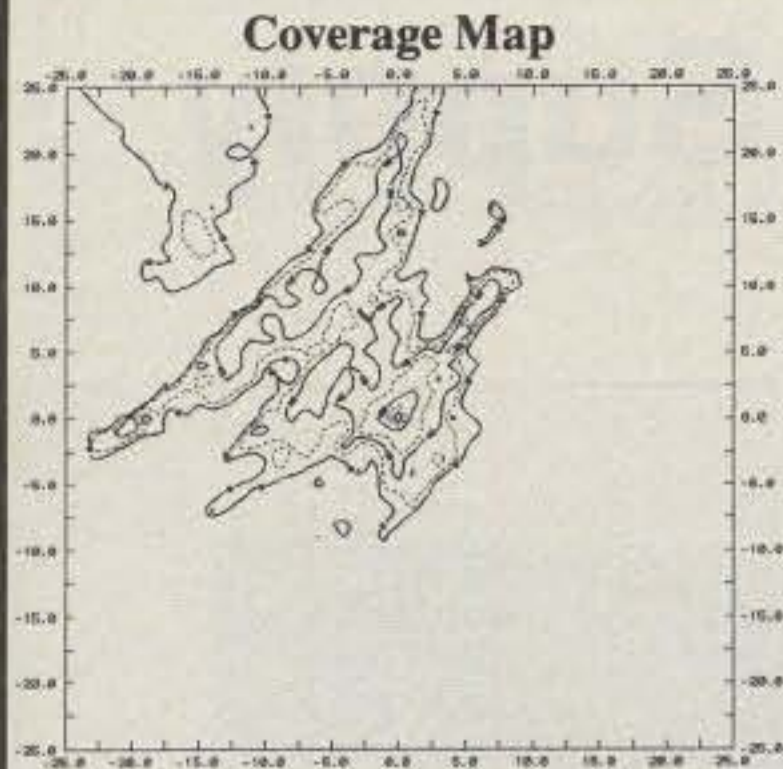
I'm looking for something different to collect. I can't afford to collect any more antique vacuum tubes.



\*1179 Grey Road, Midland, MI 48640-9501

## Terrain and VHF Propagation Services

Unlike HF propagation which is primarily determined by the ionosphere, non-enhanced VHF propagation is determined by the local terrain. This allows VHF propagation to be predicted much more accurately than HF. The problem is that detailed terrain data must be examined and extensive calculations performed. When done manually, this is a tedious process at best. Computers offer a solution, however software and digitized terrain data costs put these systems out of reach for most amateur applications. To address this issue, we offer a variety of low cost Terrain and VHF Propagation services. These services include terrain profile plots, coverage maps, 3-D terrain plots and shadowing studies. These plots can be used to:



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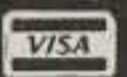
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# CQ REVIEWS:

## The Daiwa PS-304 Power Supply


BY LEW McCOY\*, W1ICP

**D**aiwa Industry Co. Ltd. of Japan has been in the business of making power supplies and numerous other items for the amateur market for many years. I have been using and testing their Model 304 power supply for nearly a year.

The PS-304 is an adjustable supply, from 1 volt to 15 volts, providing a continuous output of 24 amps with a maximum rating of 30 amps. This is more than adequate for most of the transceivers made these days. The front-panel meter provided can be switched to read either voltage or current, full-scale current, 40 amps, full-scale voltage 20 volts.

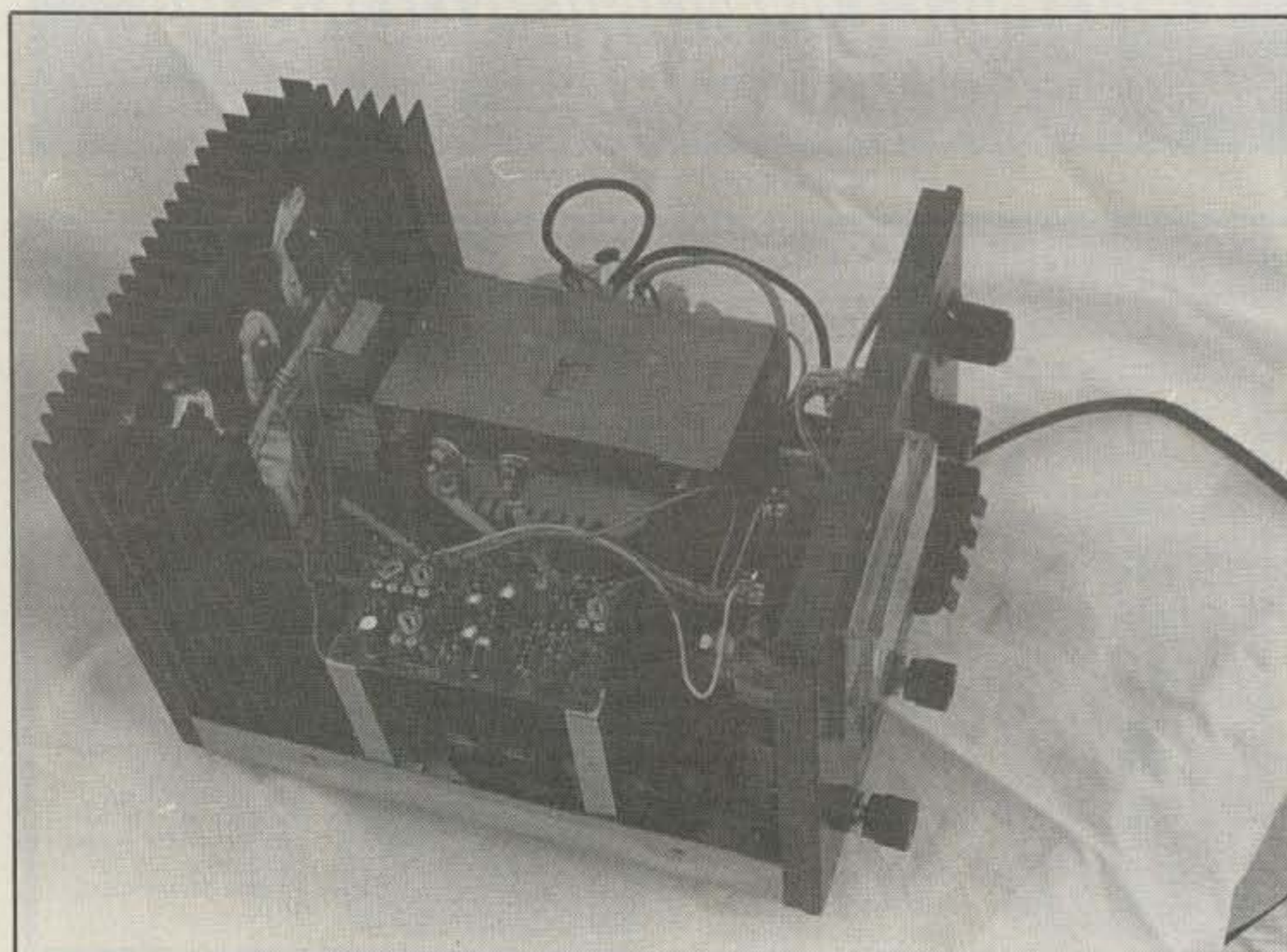
A rather unusual feature of this supply is that it has a cigarette-lighter jack built into the front panel, just below the meter. I guess this would be a popular feature for those amateurs who use a cigarette-type plug with their radio in mobile operation. Immediately below the jack are the two terminals, plus and minus, for transceiver hookups. There are also two sets of terminals for accessories. These are rated at 5 amps each.

As you can see from the photograph of the inside of the unit, the power transformer appears to be very rugged. I put a scope on the output voltage to test for any ripple, and I had to go all the way to a 30 amp load before there was any sign of ripple. The circuitry has crow-bar protection and will shut down in the event you short the output. I consider this a very necessary feature in a power supply. Another item in this supply that I like very much is the very extensive heat sink—in other words, the supply is a "class act."

List price of the supply is \$169.95. It is manufactured by Daiwa Industry Co. Ltd. and is distributed in this country by EDCO Electronic Distributors, 325 Mill St., Vienna, VA 22180 (1-800-344-0397). 



Front view of the Daiwa PS-304 power supply. At the upper left is the meter and immediately below is the cigarette-plug receptacle. The high-output terminals are at the lower right.



Inside view of the PS-304. The control circuitry is mounted alongside the power transformer. Note the heat-sink array on the rear. The power supply measures 172 mm wide by 150 mm high by 240 mm deep. Total weight is 8.9 kg.

\*Technical Editor, CQ, 200 Idaho Street, Silver City, NM 88061



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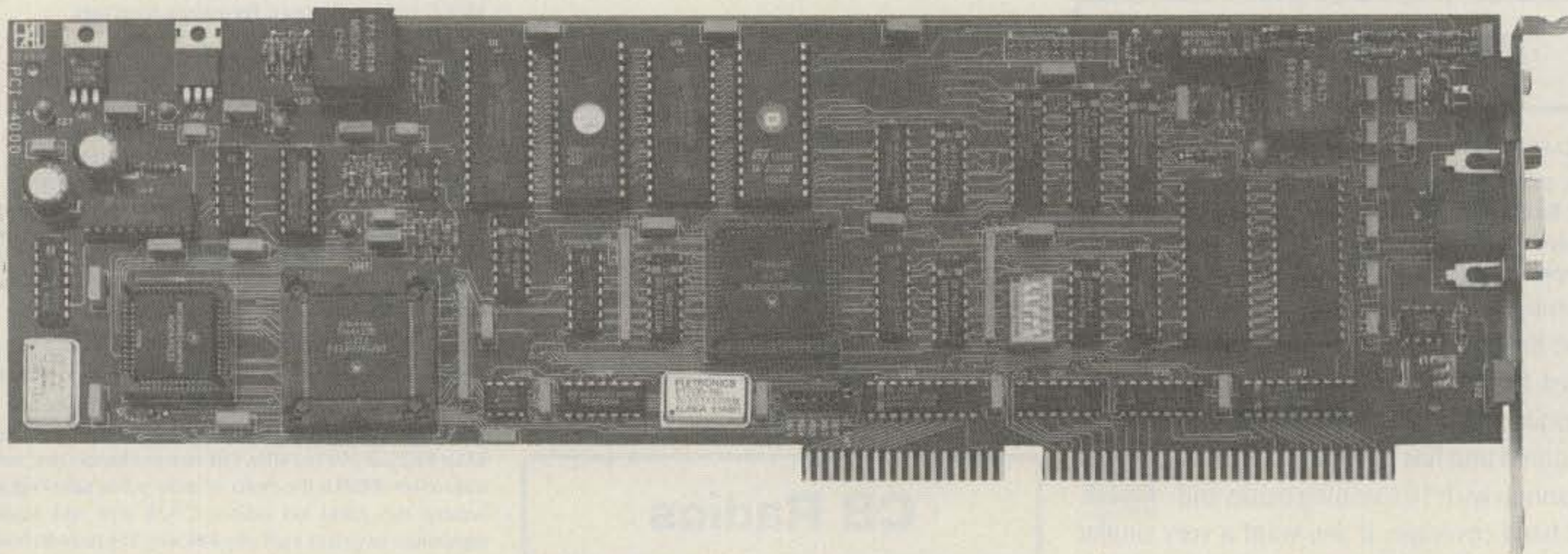
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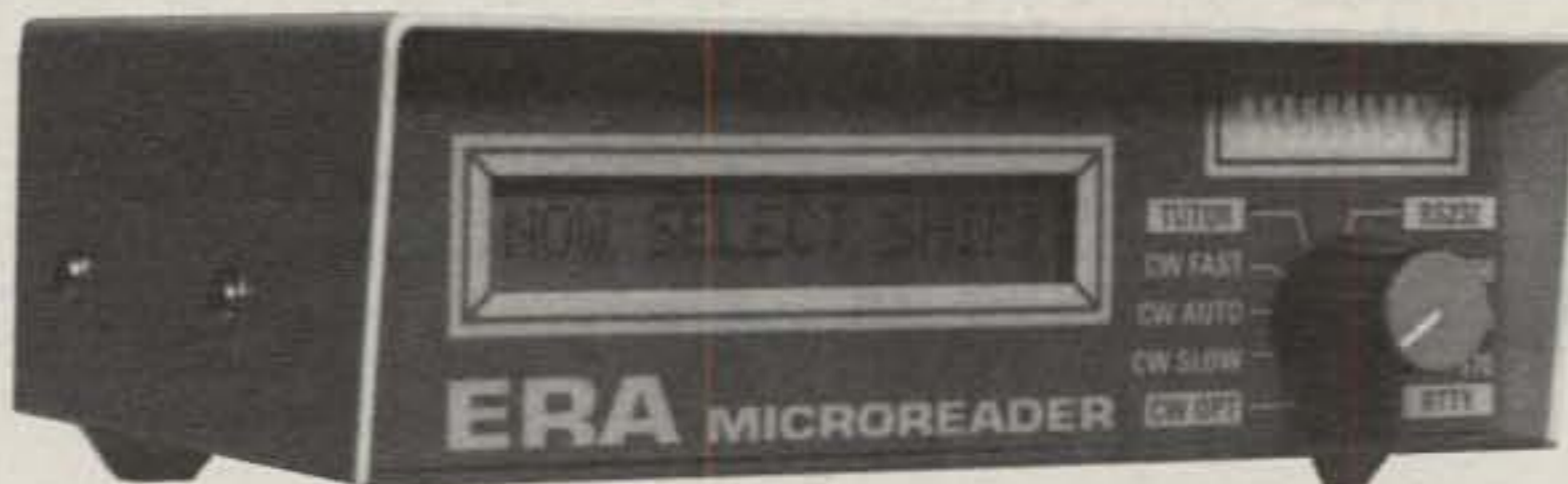


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CW: January 29-31, 1993 SSB: February 26-28, 1993

Starts: 2200 GMT Fri. Ends: 1600 GMT Sun.

**H**ere is your chance to add to your state and country totals in a very short time. We expect activity from all 50 states and over 100 countries on both CW and SSB. Look for Pacific or Japan to transmit 1907-1912 and specify a listening frequency. A voluntary DX window (both modes) and two new plaques have been added to make this competition even better!

**Classes:** Single and multi-operator. Use of packet, a spotting net, or logging assistance makes an entry multi-operator. Multi-operators show the actual operator for each QSO. There are no other classes or power levels for this contest!

**Exchange:** RS(T) and state for USA, province for Canada, and either prefix or country abbreviation for DX. Entries without some location indicator will not be credited as valid.

**Scoring:** Contacts with stations in own country, 2 points. Contacts in other countries on same continent, 5 points. Contacts with other continents, 10 points. Maritime mobile points are determined by location from the entry station. A European working a maritime mobile off South America gets 10 points for the QSO. All Canadian QSOs count 5 points for USA and vice versa.

Careful attention is paid to unique contacts in competitive logs, so please mention in your log each call that you persuade to get on 160.

**Multiplier:** Each continental U.S. state (48), Canadian area (13), DX country, and each maritime mobile. KL7 and KH6 are considered DX, not states, for this contest. DX countries are DXCC plus WAE (IT, UN1, et al). Canadian areas include VO1, VO2, NB, NS, PEI, VE2, VE3, VE4, VE5, VE6, VE7, NWT, and Yukon. WAC boundaries are used for maritime mobiles.

**Final Score:** Total QSO points times the sum of all multipliers (states, VE, DX countries plus maritime mobiles).

**Penalties:** Three additional contacts may be deleted for each unacknowledged duplicate or unverified contact removed from the log. A second multiplier may be removed for each one lost by the above action. Logs with over 200 QSOs and no check or dupe sheet are subject to a score

reduction in addition to the above penalties.

**Disqualification:** A log may be disqualified for violation of amateur radio regulations, unsportsmanlike conduct, or claiming excessive duplicate/unverified contacts or false multipliers. If the corrected score without penalties shrinks more than 3%, disqualification will be considered.

**Awards:** Certificates to the top scorers in each class for each state, Canadian area, and DX country. Runners-up with high scores may also receive certificates. The following plaques with donating sponsors as indicated will be awarded to reward exceptional efforts.

### SINGLE OPERATOR

	CW	SSB
World (N5JJ Memorial)	K5AAD	K5AAD
USA	K4TEA	K4JRB
Canada*	K5NA	K5NA
Zone 3 USA	KM4MG	N4ONI
Zone 4 USA	K5NA	KC4MJ & KM4HH
Zone 5 USA	WA4CUG	K4ODL
Europe	K4UEE	N4NX
Africa	K4SB	WB4ZNH
Oceania	K4TKM/6	K4DLI & KB4SSS
Asia	NE4S	W4LVM
Japan**	W0ZV	—
South America	K4JAG	KL7JAR/4

### MULTI-OPERATOR

	CW	SSB
World	N4RJ	Southeastern DX Club
USA	WS9V	WB9Z

\*New in 1993. The zone awards are for USA only.

\*\*Unpublished award in 1992 at request of W0ZV.

The procedure for the plaques is that the top score in the indicated area wins the plaque. However, a station can only win one plaque per contest section. If a station is eligible for a second plaque, the second plaque is awarded to the next highest station. For example, WX8ZZZ wins top World Multi-Operator. Then the next station in the USA wins the USA plaque. (Plaque coordinator is Bill Barr, N4NX.)

**Volunteer DX Window:** On both modes 1830 to 1835 kHz should be left clear for DX stations for intercontinental QSOs. Please note this is voluntary, but essential if the contest is to attract rare DX as entries. DX stations will specify a listening frequency outside the window. *Let's all make this work* and increase our scores!

**Computer Logging:** A legible copy of the log must be submitted along with the computer disk. The use of computer logging makes setting up a master call list and final checking go much quicker. Please submit a computer log and dupe sheet if at all possible.

**Dupe/Check Sheets:** All logs over 200 contacts must provide a check sheet or dupe list. The computer-generated lists are especially welcome.

Sample log and summary sheets may be obtained from CQ by sending a large SASE with sufficient postage to cover your request. You can make your own log sheets with 40 contacts per page with columns for GMT, exchanges, multiplier, and points. Show the multiplier and its sequential number only the first time it is worked. Please sub-total each page. Dupe sheets with every entry are requested and are required with over 200 QSOs. Include a summary sheet with your entry showing the scoring and other essential information. Include a printed name/ mailing address and a signed declaration that all rules have been observed. Please put the summary sheet at the front of the log. All logs should clearly indicate total multiplier, W/V multiplier, and DX multiplier.

Mailing deadline for CW entries is February 28, 1993 and March 31, 1993 for the SSB section. Please try to mail early to assure receipt. Save yourself some money and include an SASE postcard or SAE envelope with stamp or 1 IRC for a verification of log receipt rather than use certified or other more costly mail methods! Send logs to 160 Meter Contest Director, David L. Thompson, K4JRB, 4166 Mill Stone Court, Norcross, GA 30092 USA. Logs may also be sent to CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801 USA. **Please indicate CW or SSB on the envelope.** Good luck!



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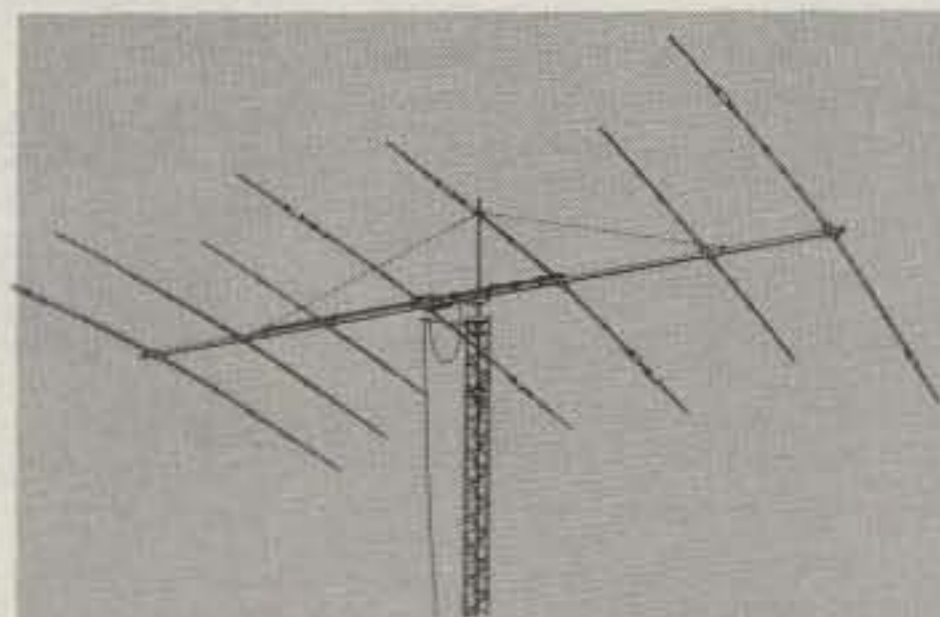
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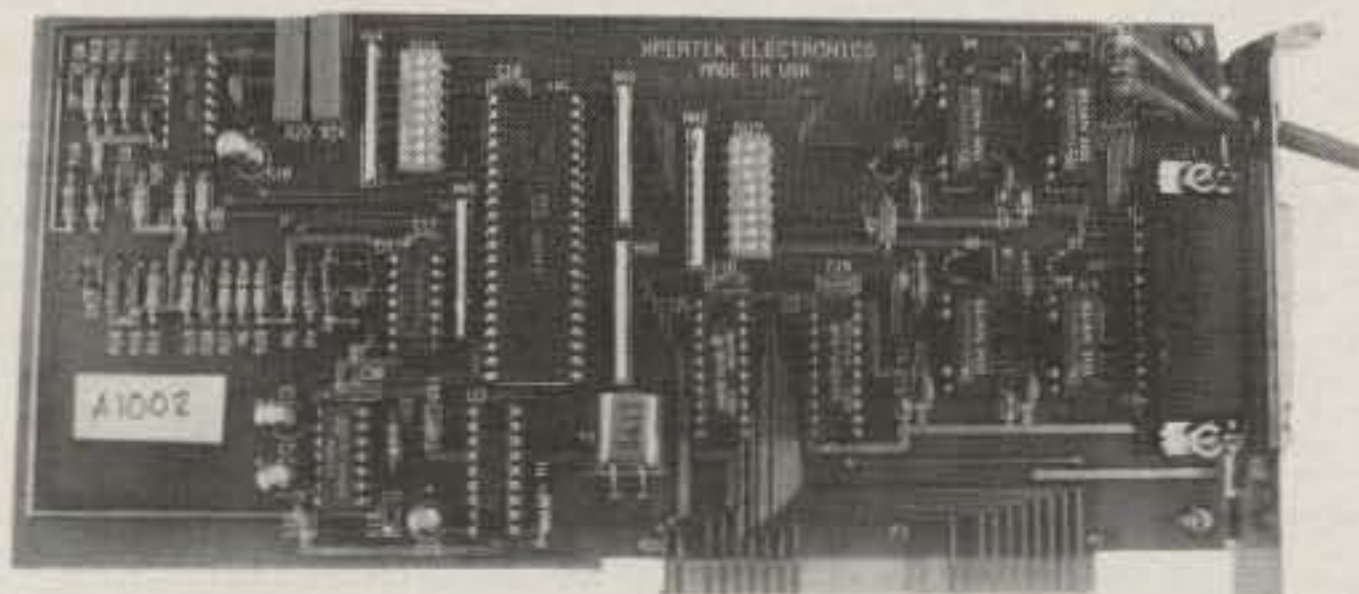
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## WHAT'S NEW AND HOW TO USE IT

Last month we described several 1.5 volt DC/DC converter circuits but neglected to mention two fairly new devices from Linear Technology Corporation. The LT1073-5 is similar to the units of last month. However, it can operate from 1 volt to 12 volts and only requires 95 microamperes for its internal operation. The device also has an internal current limiting feature and will produce 5 volts at 40 milliamperes from a single 1.5 volt battery. The circuit for the LT1073-5 is shown in fig. 1 and only requires a single low-resistance 22 microHenry choke coil.

In the same series is Linear's LT1173-5, which can be used as a step-down DC/DC

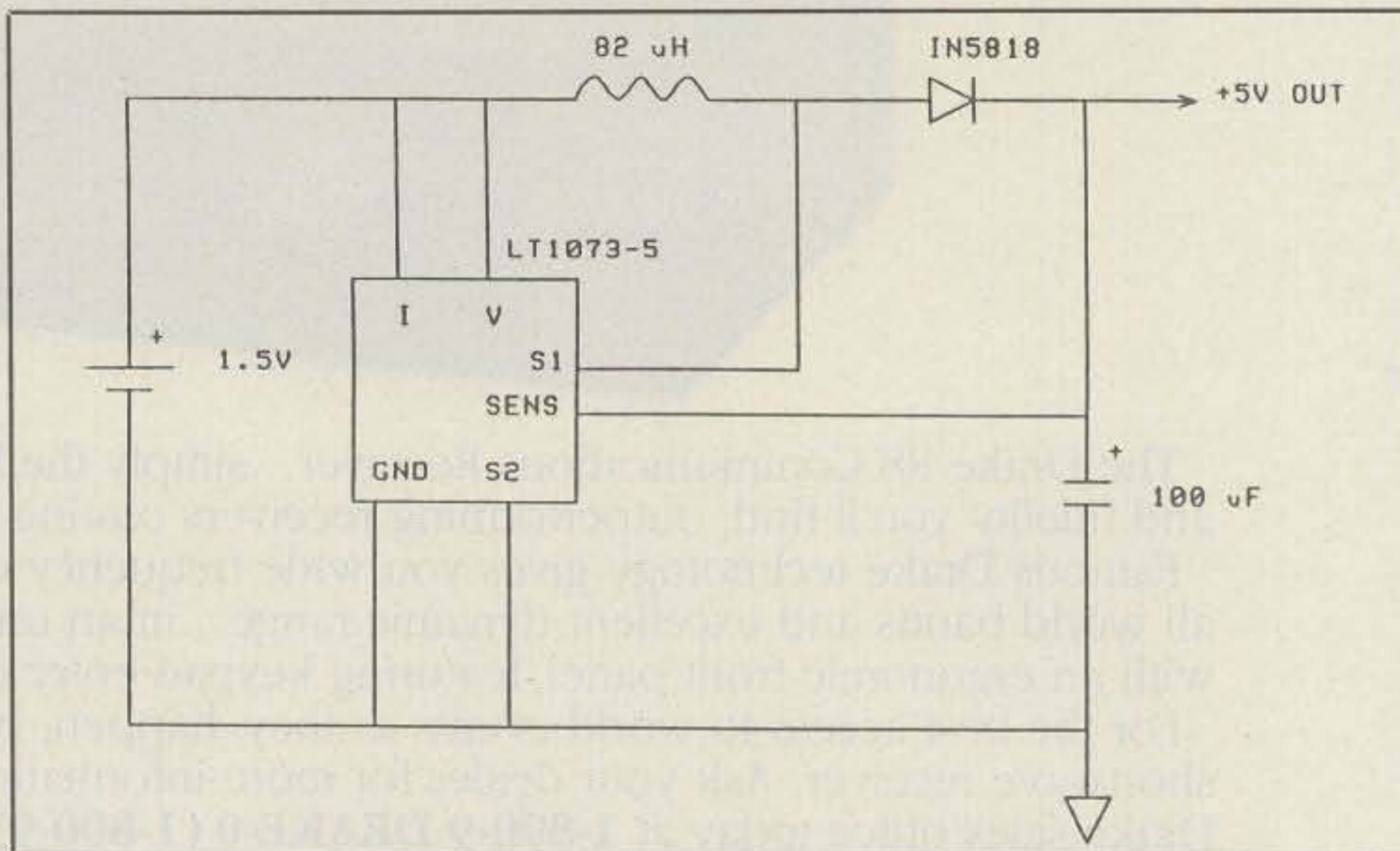


Fig. 1- Step-up application of LT1073-5.

c/o CQ magazine

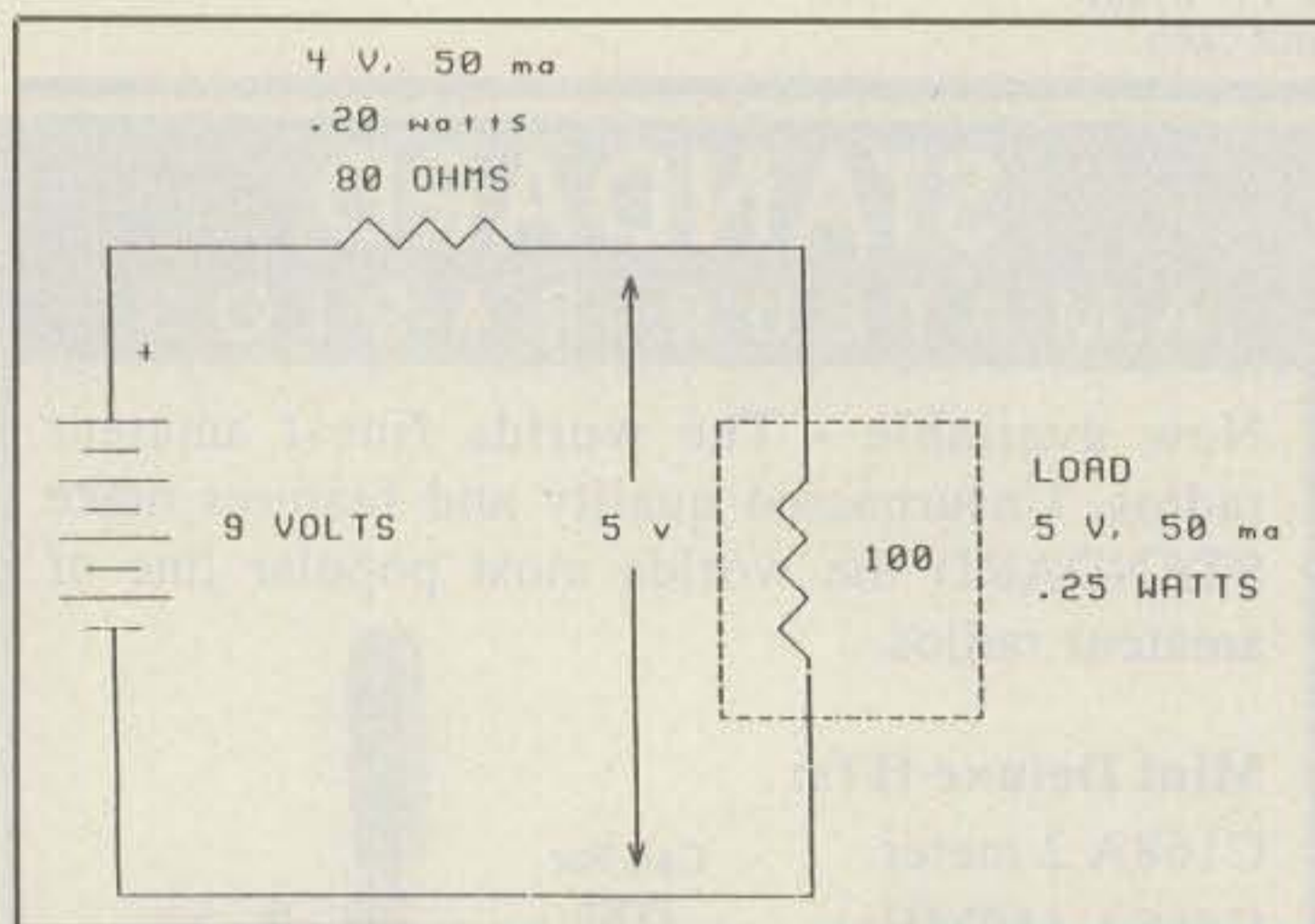


Fig. 2- The dropping resistor dissipates almost as much power as the load.

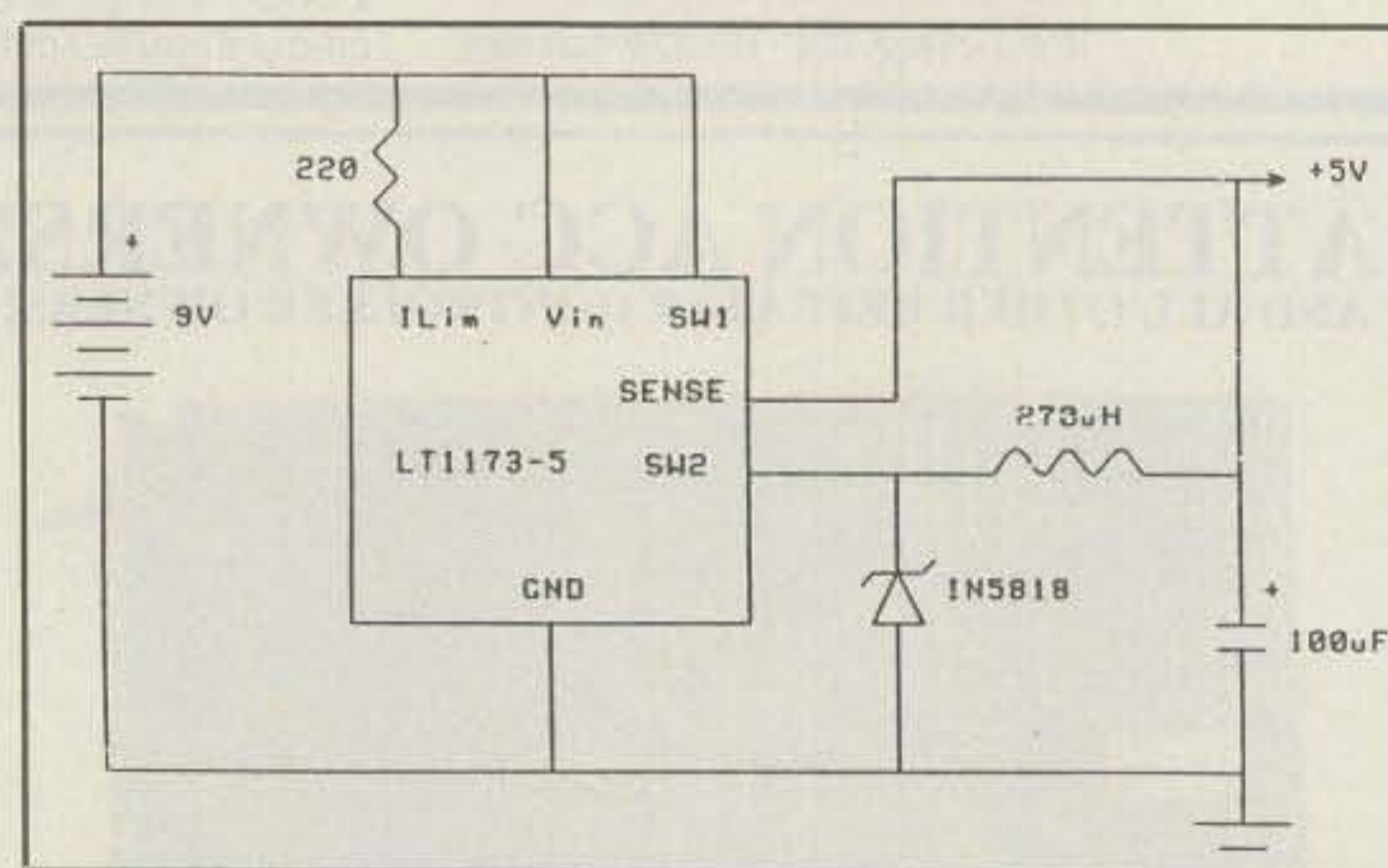


Fig. 3- DC/DC converter step-down circuit.

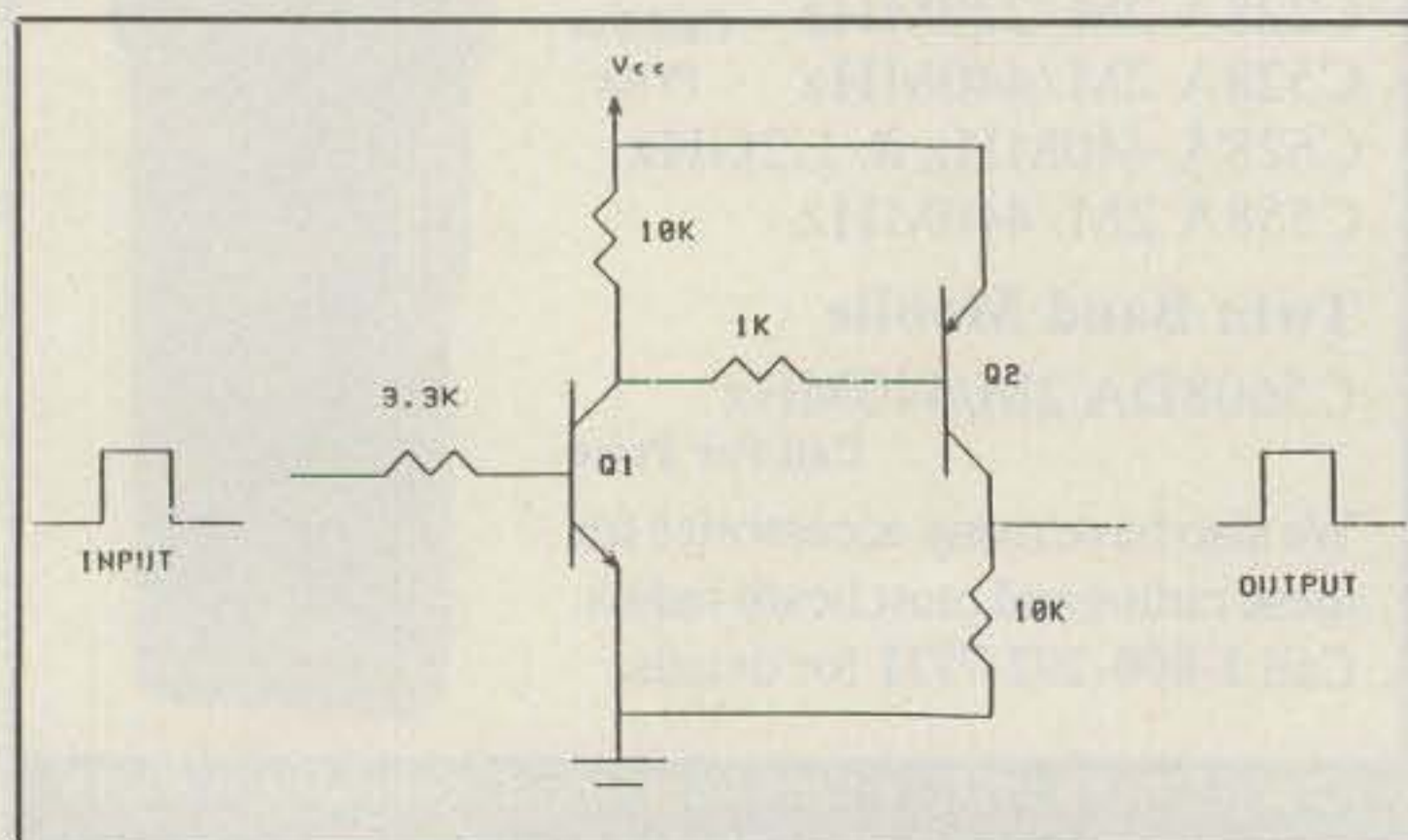


Fig. 4- Zero-current pulse amplifier.

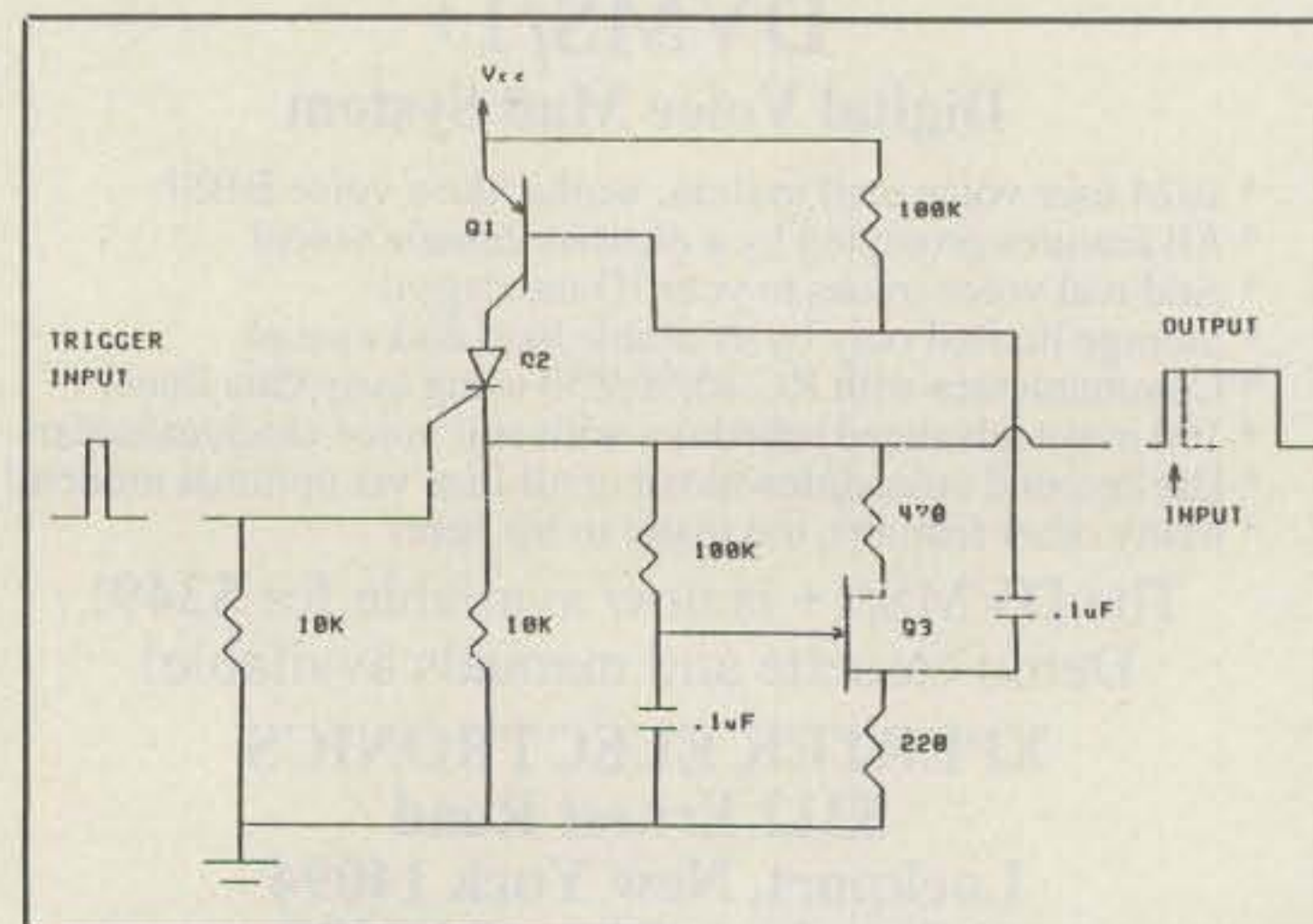


Fig. 5- Zero-current monostable multi-vibrator.



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## SL SERIES



MODEL	Colors		Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
	Gray	Black				
SL-11A	•	•	7	11	2 3/4 x 7 5/8 x 9 3/4	11

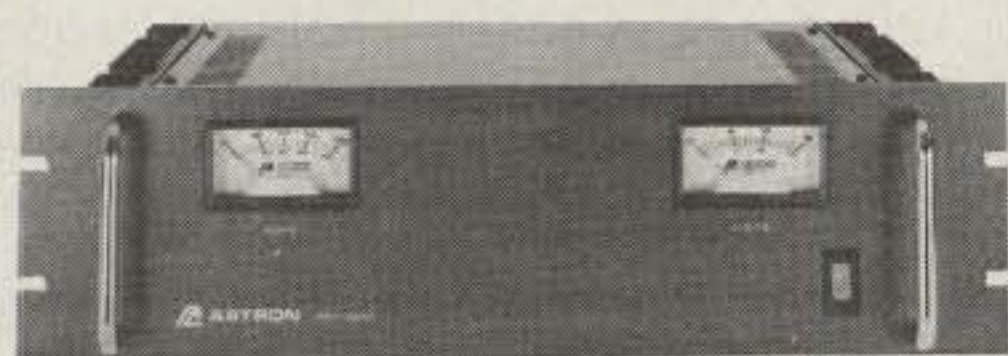
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MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
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RS-5L	4	5	3 1/2 x 6 1/8 x 7 1/4	7

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## RM SERIES

MODEL RM-35M

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RM-12A	9	12	5 1/4 x 19 x 8 1/4	16
RM-35A	25	35	5 1/4 x 19 x 12 1/2	38
RM-50A	37	50	5 1/4 x 19 x 12 1/2	50
RM-60A	50	55	7 x 19 x 12 1/2	60
RM-12M	9	12	5 1/4 x 19 x 8 1/4	16
RM-35M	25	35	5 1/4 x 19 x 12 1/2	38
RM-50M	37	50	5 1/4 x 19 x 12 1/2	50
RM-60M	50	55	7 x 19 x 12 1/2	60

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## RS-A SERIES



MODEL RS-7A

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	Gray	Black				
RS-3A		•	2.5	3	3 x 4 3/4 x 5 3/4	4
RS-4A	•	•	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A		•	4	5	3 1/2 x 6 1/8 x 7 1/4	7
RS-7A	•	•	5	7	3 3/4 x 6 1/2 x 9	9
RS-7B	•	•	5	7	4 x 7 1/2 x 10 3/4	10
RS-10A	•	•	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	•	•	9	12	4 1/2 x 8 x 9	13
RS-12B	•	•	9	12	4 x 7 1/2 x 10 3/4	13
RS-20A	•	•	16	20	5 x 9 x 10 1/2	18
RS-35A	•	•	25	35	5 x 11 x 11	27
RS-50A	•	•	37	50	6 x 13 3/4 x 11	46

## RS-M SERIES



MODEL RS-35M

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RS-12M	9	12	4 1/2 x 8 x 9	13
RS-20M	16	20	5 x 9 x 10 1/2	18
RS-35M	25	35	5 x 11 x 11	27
RS-50M	37	50	6 x 13 3/4 x 11	46

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VS-35M	25	15	7	35	5 x 11 x 11	29
VS-50M	37	22	10	50	6 x 13 3/4 x 11	46
VRM-35M	25	15	7	35	5 1/4 x 19 x 12 1/2	38
VRM-50M	37	22	10	50	5 1/4 x 19 x 12 1/2	50

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RS-10S	•	•	7.5	10	4 x 7 1/2 x 10 3/4	12
RS-12S	•	•	9	12	4 1/2 x 8 x 9	13
RS-20S	•	•	16	20	5 x 9 x 10 1/2	18

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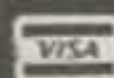
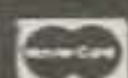
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converter. "Why a chip?" you ask. "Why not just use a resistor?" Of course, you can always use a dropping resistor, but consider the power lost in such a device. Fig. 2 shows a schematic of a 5 volt 50 milli-ampere load supplied from a 9 volt battery. The drop across the resistor is 4 volts (9 - 5) and the current 50 ma, as stated. This results in 0.2 watts dissipated by the resistor and 0.25 watts dissipated by the load. Almost as much power is lost as is used, and it is obvious that battery life is almost half what it could be. Now look at the circuit of fig. 3. True, it is a bit more complicated than a resistor, but the power dissipated by the entire circuit is about 0.001 watt! Just about all of the power goes to the load.

Both chips are available for less than \$5, a sum that is very quickly recovered in reduced battery replacement costs. If this is of interest to you, contact Linear Technology at 1630 McCarthy Blvd., Milpitas, CA 95035 (800-637-5545).

The other consideration in battery equipment is to design circuitry to use as little power as possible to begin with. This means liberal use of CMOS chips for digital circuitry, micropowered op-amps for analog circuitry, and FETs whenever possible. Bi-polar transistors can also be cleverly designed into circuits to minimize power drain.

To illustrate what I mean, look at fig. 4. This is a digital amplifier that only draws current when a pulse passes through. As you can see, with no input Q1 is off, causing Q2, a PNP transistor, to be off also. As soon as a pulse comes along, Q1 turns on, forcing Q2 to come on also. Current is drawn and the pulse appears at the output as required. As soon as the pulse is over, the two transistors return to their off state. The one-shot of fig. 5 is another clever zero-drain quiescent-state device using devices we don't see too much of these days.

In the rest state, with no input trigger, Q1 is ready to conduct as it is biased on. However, the SCR, Q2, is off so there is no current path. When a pulse triggers Q2, it conducts, and now C1 starts to charge. C1 is connected to a unijunction transistor timer that fires when C1 charges to the triggering point of the junction, Q3. The pulse from Q3 cuts off Q1, and the circuit returns to the zero current state. Such a circuit could be used to turn off a portable battery-operated device after a predetermined amount of time, as the unijunction transistor timer can easily work for an hour or more.

Both of the above examples are really intended to show how, with a bit of thought, circuits that draw very little current can easily be implemented.

I would be interested in hearing from readers who have built such circuits and who wish to share them with other readers of this column.

73, Irwin, WA2NDM



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- All entries must be received by January 15, 1993. No purchase is required to enter or win. Winner will be selected in a random drawing from all qualified entries received, and announced on February 1, 1993. Odds of winning are dependent on the total number of entries received.
- Dream Station prize may not be transferred or assigned and no substitution is allowed. Cash will not be awarded in lieu of prize.
- Winner will be required to execute an Affidavit of Eligibility, Indemnity and Release to be returned within 14 days of notification and acknowledge that their name(s) and likeness(es) may be used by Yaesu U.S.A. for publicity purposes without additional compensation. In the event of non-compliance, an alternate winner may be selected.
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- If under 18 years of age, parent or guardian must sign entry Certificate accepting Terms and Conditions of Entry.

Gift Certificate offers expire January 4, 1993!

## NEWS OF CERTIFICATE AND AWARD COLLECTING

**T**he Story of the Month for November is:

### **Jan McLernon, NV6L USA-CA All Counties #704 Mixed, 4-6-91**

"Primarily, I would like to take this opportunity to thank all the mobile stations, all the net controls, and all the county hunters who alerted me that certain counties were on the air. Without all the help, I would not have USA-CA All Counties #704. Many thanks to everyone.

"My first introduction to amateur radio was as a teenager. I had the opportunity to observe an amateur in QSO with a French station. At the time I was taking French in school and was allowed to practice beginning French on the air. My mind was made up that some day I would be a ham. Many years later I bought a CB for the OM for his truck. Then he purchased a base station so we could visit on his way to and from work. After about a year we decided this was not what we wanted, so we became amateur radio operators—he in August 1978, and I in February 1979. We both passed the Extra Class examination on 21 September 1982, our 25th wedding anniversary. My major interests were DXing and the YL ISSB System.

"My first contact on 14.336 was with WA4IMC on 4 October 1989. The next one was on 8 February 1990, which is when I became serious about working all counties. Long time between contacts! The big moment came on 22 March 1991 when WA0SBR/m gave me Logan, NB for #3076.

"My first 18 years were spent on a farm near the St. Clair/Monroe, Illinois county line along old Route 3. The house was large, two story, 100-plus years old, without electricity or plumbing. I would invite my school friends from Dupou to spend the night with me to learn how people lived in Colonial times. I now realize that I had the best of two worlds. The relatives who lived in St. Louis made sure that we farm kids learned how to act in the city. Plans were made for us to attend the opera, art and other cultural exhibits, as well as professional baseball, basketball, and hockey games.

"The years 1950 to 1954 were spent at SIU in Carbondale, IL, where I majored in physical education with minors in mathematics and science. Upon graduation I

333 South Lincoln Ave., Mundelein, IL 60060



*Jan McLernon, NV6L, USA-CA All Counties #704. "County Hunting is Fun."*

was offered a teaching job in a small town in southern Illinois, but I decided to join the USMC instead. I was afraid if I took the teaching position I would never leave Illinois. My first duty station was Quantico, Virginia where I received a commission. Also, I spent 2½ years at Parris Island, South Carolina and one year at FMF Pac on Oahu, Hawaii.

"While in Hawaii I met Jack, and my plans to make the Marine Corps my career changed. We were married on 21 September 1957. Back then married women were not encouraged to remain on active duty, so I resigned. Jack completed his active duty in February 1958. We made California our home. After the first two of our four sons arrived, I began my 21 years of teaching physical education, followed by five years in the mathematics department. I retired in June 1988, and Jack did the same in December 1990, at which time we purchased a fifth wheel with plans to travel. Our shakedown cruise was to La Paz and Yuma counties in Arizona, followed by a trip to Texoma, Oklahoma for the South Central County Hunters Convention.

"We plan to do more traveling and, of course, run counties on the way, as long as my duty driver (NV6L) keeps the radio and antennas in working order. I hope to help others contact counties that they need, as others have helped me. I will be working at completing all counties YL as well as Mobile-to-Mobile.

"Please forgive me if I go off the air in the middle of the day and don't come back for 4 to 5 hours. This will mean that we found a golf course—73-88-33, Jan, NV6L."

### **Awards Issued**

Harold J. Braschwitz, W8PN, finished all of his paperwork and claimed USA-CA All Counties #772, USA-CA 3000 #798, USA-CA 2500 #879, USA-CA 2000 #956, USA-CA 1500 #1043, and USA-CA 1000 #1242, All CW, dated 7-9-92.

Duane E. Traver, WV2B, filed his complete collection of county confirmations and received USA-CA All Counties #773, USA-CA 3000 #799, USA-CA 2500 #880, USA-CA 2000 #957, USA-CA 1500 #1044, USA-CA 1000 #1243, and USA-CA 500 #2619, All 20M SSB Mobile, dated 7-10-92.

Darrel R. Craig, Jr., KK6BB, did it all in one giant leap and received USA-CA All Counties #774, USA-CA 3000 #801, USA-CA 2500 #882, USA-CA 2000 #958, USA-CA 1500 #1046, USA-CA 1000 #1246, and USA-CA 500 #2624, Mixed, dated 7-20-92.

Millard H. Solomon, KN4JR, put the finishing touches on his good record and qualified for USA-CA All Counties #775, All SSB, dated 7-24-92.

Ray E. Skrabut, WA2CNJ, took another good step in his march and claimed USA-CA 3000 #800, Mixed, dated 7-16-92.

Ronald D. Fitch, W7KSK, enhanced his good record by qualifying for USA-CA 2500 #878 and USA-CA 2000 #955, Mixed, dated 7-3-92.

Douglas Cropper, KC2YW, received USA-CA 2500 #881, Mixed, dated 7-13-92.

Toshiki Aoki, JH1AGU, filed his good application and received USA-CA 1500 #1045, USA-CA 1000 #1244, and USA-CA 500 #2622, All 10M SSB, dated 7-15-92.

Ronald D. Sweeney, N8HKJ, took a double step in starting his good record and received USA-CA 1000 #1245 and USA-CA 500 #2617, All SSB, dated 7-6-92.

### **USA-CA Special Honor Roll**

Harold J. Braschwitz, W8PN  
USA-CA All Counties #772  
All CW, 7-9-92

Duane E. Traver, WV2B  
USA-CA All Counties #773  
All 20M SSB Mobile, 7-10-92

Darrel R. Craig, Jr., KK6BB  
USA-CA All Counties #774  
Mixed, 7-20-92

Millard H. Solomon, KN4JR  
USA-CA All Counties #775  
All SSB, 7-24-92

## USA-CA Honor Roll

<b>3000</b>			
W8PN	798	JH1AGU	1045
WV2B	799	KK6BB	1046
WA2CNJ	800		
KK6BB	801		
<b>1000</b>			
		W8PN	1242
		WV2B	1243
<b>2500</b>		JH1AGU	1244
W7KSK	878	N8HKJ	1245
W8PN	879	KK6BB	1246
WV2B	880		
KC2YW	881		
KK6BB	882		
<b>500</b>			
		N8HKJ	2617
		OE6IMD	2618
<b>2000</b>		WV2B	2619
W7KSK	955	ON7ZM	2620
W8PN	956	EA3GBU	2621
WV2B	957	JH1AGU	2622
KK6BB	958	OH3MIC	2623
<b>1500</b>			
W8PN	1043	KK6BB	2624
WV2B	1044	N7OTR	2625

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For non-subscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book which may be obtained from CQ Communications, 76 North Broadway, Hicksville, NY 11801 USA for \$2.00. To qualify for the special subscriber rate please send a recent CQ mailing label with your application. To be eligible for the USA-CA, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 15, 1991. A complete copy of the rules may be obtained by sending an SASE to Dorothy Johnson, WB9RCY, USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060 USA. DX stations must include extra postage for airmail reply.

### USA-CA 500 certificates went to:

- Ronald D. Sweeney, N8HKJ, USA-CA 500 #2617, Mixed, 7-9-92.
- Michael Micu-Budisteanu, OE6IMD, USA-CA 500 #2618, Mixed, 7-9-92.
- Duane E. Traver, WV2B, USA-CA 500 #2619, All 20M SSB Mobile, 7-10-92.
- Jean-Pierre Hubert, ON7ZM, USA-CA 500 #2620, All SSB, 7-13-92.
- Jordi Roura Serra, EA3GBU, USA-CA 500 #2621, All SSB, 7-14-92.
- Toshiki Aoki, JH1AGU, USA-CA 500 #2622, All 10M SSB, 7-15-92.
- Jari Rantapelkonen, OH3MIC, USA-CA 500 #2623, Mixed, 7-16-92.
- Darrel R. Craig, Jr., KK6BB, USA-CA 500 #2624, Mixed, 7-20-92.
- William B. Baxter, N7OTR, USA-CA 500 #2625, Mixed, 7-21-92.

## Awards Available

**FEDXP MBEDX Award.** The Far East DX Ploitiers Club (FEDXP) has announced the FEDXP MBEDX (Multi Band Emission DX) Award which is available to amateurs all over the world (except SWL) in celebration of the 30th anniversary of the club. They hope this award will encourage DXers who have completed, for example, 5 Band DXCC and 5 Band WAZ to expand their activities into low bands as well as WARC bands using various emissions and modes.

Each contact on different bands and modes with the countries included in the DXCC country list counts as one point. (Deleted countries are valid.) Contacts to be counted are limited to those made after August 27, 1952 and on two-way communi-



The MBEDX Certificate of Merit offered by the Far East DX Ploitiers Club, Japan.

cation only. All contacts on MF, HF bands including WARC and 6 meters are valid for the award, and it is essential to include contacts on 80/75, 40, 20, 15, and 10 meter bands. All contacts made using CW, SSB (including AM), FM, and RTTY modes are valid for the award and also it is essential to include contacts made using CW and SSB (AM) modes. Contacts made on each essential band (80, 40, 20, 15, and 10 meters) shall be more than 30 points.

The FEDXP MBEDX certificate is available for confirmation of 1000 points. Endorsement stickers to be affixed to the certificate will be given for every additional 250 points. The FEDXP MBEDX plaque is available for confirmation of 3000 points. The Special Award with trophy is available for confirmation of 3000 points with the condition that contacts made on all 10 bands between 160 to 6 meters (include WARC bands) and each band should be more than 50 points. Example: On 80 meters there are 15 points CW and 15 points SSB for a total of 30 points; on 40 meters there are 100 points CW and 80 points SSB for a total of 180 points; etc.

An application form will be available on request. Apply with SASE to FEDXP Award Manager, Mr. Toshio Takahashi, JA1BWA, P.O. Box 11, Funabashi-Higashi, Chiba, 274 Japan.

QSL lists will be prepared by filling the countries list for each band. There is no need to submit QSL cards. QSL cards shall be checked by two licensed amateurs who hold DXCC certificates, and the application form shall be signed by them for verification (general certificate rule).

Fees are as follows: MBEDX-1000 certificate, 10 IRCs or US \$10; MBEDX-3000 plaque, 40 IRCs or US \$40; Special Award with trophy, 50 IRCs or US \$50; Endorsement Sticker, 2 IRCs or US \$2.

**Columbus America Award.** In honor of this year's jubilee and 500th anniversary of the discovery of the American continent, the Telegraphy Friends Club (TFC) is issuing this diploma. It is possible to get the diploma in subsequent years also (always at the 500th anniversary of subsequent voyages by Columbus).

For stations outside the American continent, it is necessary to accumulate 500

points for QSOs with other stations as follows:

**Italy**—District 1 (I1, IK1, etc.), a minimum of 3 stations, each QSO worth 5 points.

**Spain**—District 7 (EA7, EC7, etc.), a minimum of 5 stations, each QSO worth 5 points.

A total of 20 stations from Italy and Spain is the maximum.

**North America**—At least 2 DXCC countries, each QSO worth 10 points.

**Central America**—At least 1 DXCC country, each QSO worth 10 points.

**South America**—At least 3 DXCC countries, each QSO worth 10 points.

**U.S.A.**—At least 10 states, each QSO worth 10 points.

For stations on the American continent it is necessary to accumulate 500 points. The amateur operators of North, Central, and South America must have a minimum of 3 QSOs with Italy—district 1, at least 5 QSOs with stations in Spain—district 7. Every QSO is worth 5 points. A total of 20 stations from Italy and Spain is the maximum! QSOs with at least 50 DXCC countries are also required, each QSO being worth 5 points. QSOs among amateurs in North, Central, and South America have no point value; they are invalid.

The same rules as outlined above apply to SWL stations. QRP stations (up to 10 watts input) multiply their points by 2; and all QSOs must be 2x CW.

The periods of time during which QSOs may be credited for this award are based on the 500th anniversaries of Columbus's expeditions. The first expedition was 3.8.1492 to 12.10.1492; accordingly, the period for making creditable QSOs is 3.8.1992 to 12.10.1992. The second expedition began 24.9.1493 and ended in 1496; corresponding periods to accomplish creditable QSOs are 24.9. to 3.12.1993, 24.9. to 3.12.1994, 24.9. to 3.12.1995, and 24.9. to 3.12.1996. The third expedition began 30.5.1498 and finished in 1499; corresponding periods for accomplishing creditable QSOs are 30.5. to 8.8.1998 and 30.5. to 8.8.1999. The fourth expedition was from 9.5.1502 to 1504; corresponding periods for accomplishing creditable QSOs are 9.5.2002 to 18.7.2002, 9.5. to 18.7.2003, and 9.5. to 18.7.2004.

Note that the periods for making valid contacts correspond in length to the time covered by the first expedition in 1492. Also note that there are no eligibility periods in the years 2000 and 2001.

Accumulation of 500 points qualifies for a basic award. Endorsements may be earned during subsequent periods in later years. It is possible also to apply for a special prize as well as for all QRP. Additional information is available from OK1HCG for an SASE and one IRC.

Applications for all awards and endorsements must be filed no later than 31.3. of the year following the year of the QSOs—

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**X-50A** DUAL-BAND REPEATER VERSION

PART #	FREQ	GAIN(dB)	PWR(W)	LENGTH(FT)	CONNECTOR	WIND RATING	ELEMENT PHASING
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X-500NA	2m/70cm	8.3/11.7	200	17.2	N	90	2m:3-5/8λ, 70cm:8-5/8λ
X-200A	2m/70cm	6.0/8.0	200	8.3	UHF	112.5	2m:2-5/8λ, 70cm:4-5/8λ
X-50A	2m/70cm	4.5/7.2	200	5.6	UHF	135	2m:6/8λ, 70cm:3-5/8λ

### U series VHF/UHF MULTIBAND

**U-5000A**

PART #	FREQ	GAIN(dB)	PWR(W)	LENGTH(FT)	CONNECTOR	WIND RATING	ELEMENT PHASING
U-300A	70cm/23cm	8.6/13.2	150	8.3	N	110	70cm:4-5/8λ, 23cm:10-5/8λ
U-5000A	2m/70cm /23cm	4.5/8.3 /11.7	150	6.0	N	135	2m:6/8λ, 70cm:3-5/8λ, 23cm:7-5/8λ

### F series VHF/UHF MONOBAND

**F-23A**

PART #	FREQ	GAIN(dB)	PWR(W)	LENGTH(FT)	CONNECTOR	WIND RATING	ELEMENT PHASING
DP-GH62	6m	6.0	200	21.0	UHF	78	2-5/8λ
F-22A	2m	6.7	200	10.5	UHF	112	2-7/8λ
F-23A	2m	7.8	200	15.0	UHF	90	3-5/8λ
F-142A	1 1/4m	5.5	200	6.0	UHF	110	2-5/8λ
F-718A	70cm	11.5	250	15.0	N	90	18-1/2λ
F-1230A	23cm	13.5	100	10.5	N	90	25-1/2λ

\*F-718L:420~430MHz,F-718J:430~440MHz

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i.e., for awards based on the 1992 eligibility period, application must be postmarked no later than 3.31.1993, etc. Send applications, along with a note indicating the required QSOs and calculations of the point values, with a certification statement by two licensed amateurs, to OK1DCE, Jaroslav Formanek, U vodarny c.398, 278 01 Kralupy n/Vlt.II, Czechoslovakia. The charge for the award is 10 IRCs. Supplementary endorsements cost 5 IRCs. The special prize is 30 IRCs.

**Hungarian Radioamateur Society Awards.** These general rules are applicable to the several awards that are sponsored by the Hungarian Radioamateur Society.

Hungarian awards can be obtained by licensed radio amateurs and SWLs all over the world. The specific rules for various awards follow.

All amateur bands and modes may be used, except QSOs via repeaters. (A) Contacts/receptions may be made from any location within the same DXCC country. (B) Each station may be contacted only once on any band, any mode.

The log should show the callsign(s), name, and QTH of the applicant as well as the following information: station worked/heard, date, time UTC, band, mode, and received report (SWLs should indicate the station being worked by the heard station).

(A) Each list must be accompanied by a statement from the applicant's national

society or from any two amateurs other than the applicant that the QSL cards of the contacts/receptions listed are in the possession of the applicant and that the items on the cards are correctly listed. *Exceptions:* The Szeged Festival and Dunafer Awards need only log extract; for the HCS Award, enclose confirming slices cut from the QSL cards. For the HCS award, enclose confirming slices cut from the QSLs.

(B) Foreign participants in HA-DX and HG-VHF contests may apply for the following Hungarian awards using separate application forms: Budapest, Balaton, Duna-kanyar Pannonia, Savaria, WHD.

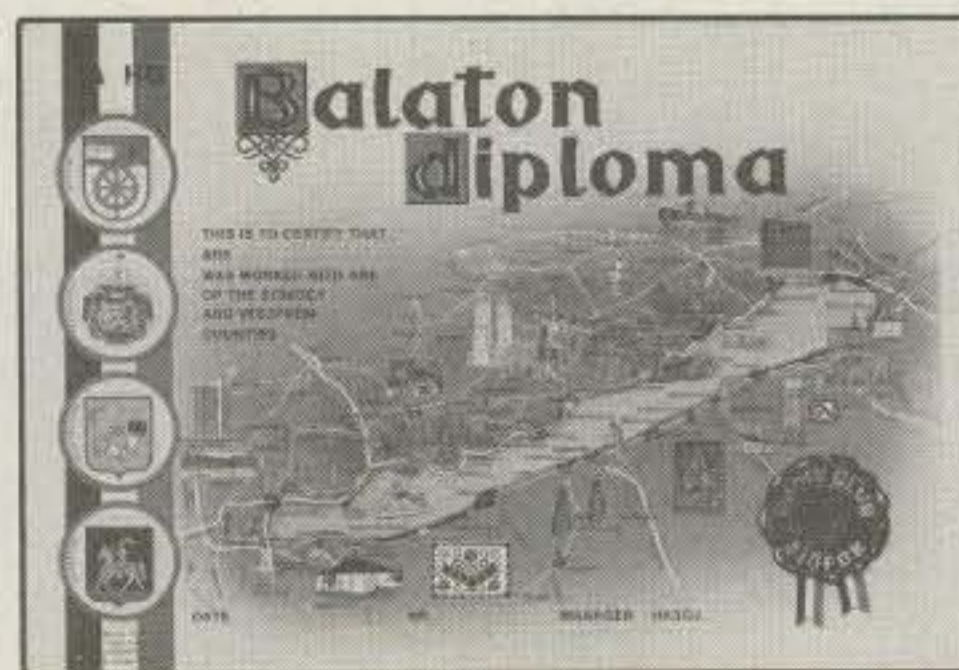
Fees for the various awards are: Pannonia, Savaria, Balaton, and Budapest 10 IRCs; Hungarian Rummy, Hungarian Canasta, Szeged Festival, and Worked Hungarian Districts 5 IRCs; Videoton bronze 2 IRCs, Silver 3 IRCs, Gold 5 IRCs; Hungarian Castle Series Bronze 5 IRCs, Silver 8 IRCs, Gold 10 IRCs; Dunakanyar 6 IRCs; Dunafer no fee, but postage should be sent; sticker SASE or SAE plus IRCs for postage.

Decisions of the MRASz Award Committee are final. All correspondence may be sent to the manager or to MRASz, Hungarian Radioamateur Society Award Committee, P.O. Box 20, Nagytarcsa, H-2142 Hungary.

**Balaton Diploma (BD).** The Radioclub Siofok issues the BD. The applicant must submit proof of contacts made on or after January 1, 1967.

*Conditions:* Two-way communications with amateurs indicated under (a), (b), (c) below.

DX stations have to obtain 15 points; at least 1 contact should be with a member of the Radioclub Siofok. European stations have to obtain 30 points; at least 2 contacts should be with members of the Radioclub Siofok.



The multi-colored Balaton Diploma sponsored by the Hungarian Radioamateur Society.

(a) Radioclub Siofok and its members count 5 points (HA, HG3KGJ, KHL, GI, GJ, GQ, HE, HL, HQ, HZ, IG, IK, IQ, IS, NG, 4XW, 6NP, 8UA).

(b) Stations with constant QTH around Lake Balaton count 3 points (HA, HG1KXX, XA, XH, XX, ZY, 2KRQ, RQ, RC, SH, Y, YRC, 3KHB, KHO, GG, GO, HK, HO, HU).

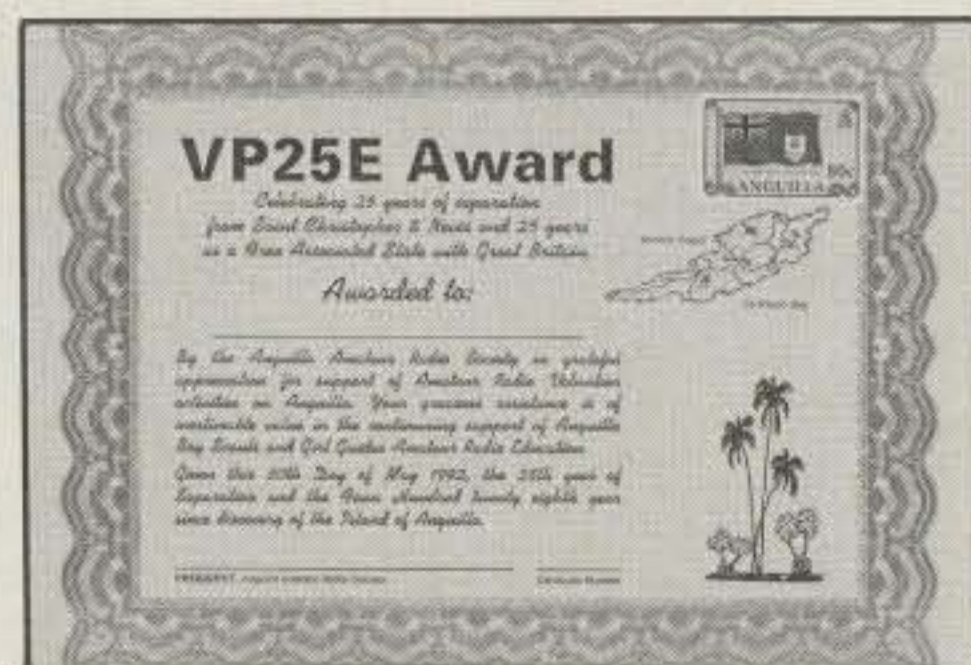
(c) Any other stations in Zala, Veszprem, and Somogy county count 1 point. (Each callsign with: HA, KG1KRA-KRZ, KXA-KXZ, KZA-KZZ, RA-RZ, XA-XZ, ZA-ZZ, DRA-DZZ, 2KPA-KTZ, PA-TZ, ENA-EZZ, 3KGA-KIZ, GA-IZ, FLA-FSZ).

Award Manager is Jozsef Turjanyi, HA3GJ, P.O. Box 78, Siofok, Hungary H-8601. (More on the Hungarian program next month.)

## Anguilla VP25E Certificates Mailed

The following is courtesy of John L. Rouse, KA3DBN/VP2EBN.

Special event certificates issued by the Anguilla Amateur Radio Society (AARS) in commemoration of the island's 25th year of separation from the Caribbean islands of St. Kitts and Nevis have been mailed out to those amateur radio operators who applied for them. All mailing was completed on July 1.



The VP25E certificate available from the Anguilla Amateur Radio Society.

Anyone who worked a VP25E station, normally VP2E, can still receive a certificate by sending \$5 (no SASE required) and a log extract to John Rouse, KA3DBN/VP2EBN, 2703 Bartlett Lane, Bowie, MD 20715 USA. All funds from the certificates will go toward refurbishing the Boy Scout/Girl Guide amateur radio station on the island (VP2EQ). It is hoped to have the station operational before the end of 1992.

Several Anguilla stations were operational during the period of the special event (August 1991 through May 1992), including VP25EE, VP25EHF, VP25EBN, VP25EL, VP25EI, and several stations with reciprocal licenses who appended VP25E to their calls. Contacts with only one of these stations qualifies an operator for the certificate.

There is no deadline for applying for the award, but once the present supply of certificates is exhausted, they will not be reprinted.

Any inquiries about the award or membership in the Anguilla Amateur Radio Society should be addressed to KA3DBN at his Callbook address.

See you next month.

73, Dorothy, WB9RCY

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 IC-449A 35w 440FM xcvr/TTP..... 529.00 439<sup>95</sup>  
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 IC-03AT 2.5w 220 HT/TTP...329.00 279<sup>95</sup>  
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## The G5RV Antenna Revisited—Again

**Y**es, you hear a lot of them on the air and they put out good signals, no doubt about it. But judging from some of the conversations I've heard, there's a lot of voodoo theory floating around about this unusual antenna. Is it really a multiband antenna? Does it have low SWR on all the bands? Does it need, or not need, a balun? Does it reduce TVI? Is it as good as a Yagi beam? What are the optimal dimensions of the antenna?

Well, being a true experimenter, I decided to try a G5RV, so I did what any true investigator would do: I bought one. This is the story of what I learned about this interesting sky wire.

### The Early "G5RV" Antenna

To go back a bit, the G5RV antenna is an offspring of a 3-band antenna (80-40-20 meters) designed by Art Collins (ex-W9CXX) and L.M. Croft and described in detail by Croft in the December 1935 issue of *Signal* magazine, the house publication of the old Collins Radio Company. (Thanks to Bill, K6HV, for supplying me with a copy of the article.) The idea behind the antenna was sound, but the execution was a failure because the antenna used a 300 ohm matching section made of two 82.5 foot lengths of aluminum tubing hanging from the center of the 103 foot flap-top. The weight of the installation made it heavy and impractical. Signal gain of this antenna was about 1 dBd.

In the early 1950s the antenna reappeared in modified form in England, redesigned and popularized by R.L. Varney, G5RV. The Varney antenna (fig. 1A) functions as a  $\frac{3}{2}$ -wave antenna on 14 MHz with a feedpoint impedance slightly over 100 ohms. The matching section of heavy tubing is replaced by a 450 ohm open-wire half-wavelength line. This light-weight transformer closely matched the antenna feedpoint impedance to an 80 ohm transmission line on 20 meters. It is a single-band, practical antenna that can be built easily and cheaply by any amateur who can handle a tape measure and a soldering iron.

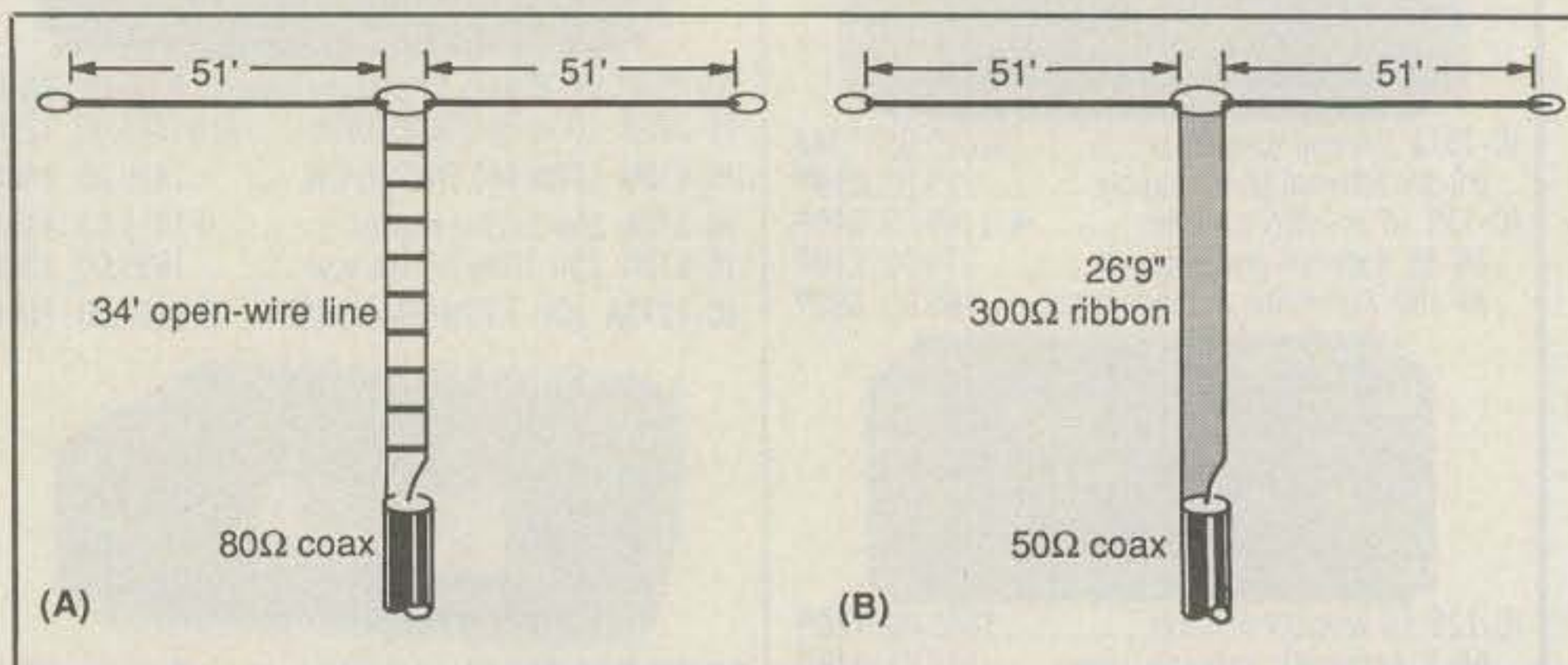


Fig. 1—(A) Original G5RV antenna with open-wire line and 80 ohm coax. (B) Revised G5RV with ribbon line and 50 ohm coax.

Although designed for 20 meters, it was quickly found that the G5RV antenna would function quite well on other bands if an antenna tuning unit (ATU or Transmatch) was used at the transmitter. No one worried much about SWR in those days.

By the time the antenna crossed the Atlantic, it was modified to use a 300 ohm ribbon matching line (no one built open-wire lines anymore) connected to a 50 ohm coax transmission line (80 ohm coax was not available in the USA). That's when problems developed, aided in part by the widespread use of the SWR meter.

A lot of amateurs built and used the modified G5RV (fig. 1B). Some of them reported good results, while others could not get the antenna to load properly. No one was sure what the SWR readings meant, as they varied from shack to shack for supposedly the same antenna design. What did this all mean? What was going on?

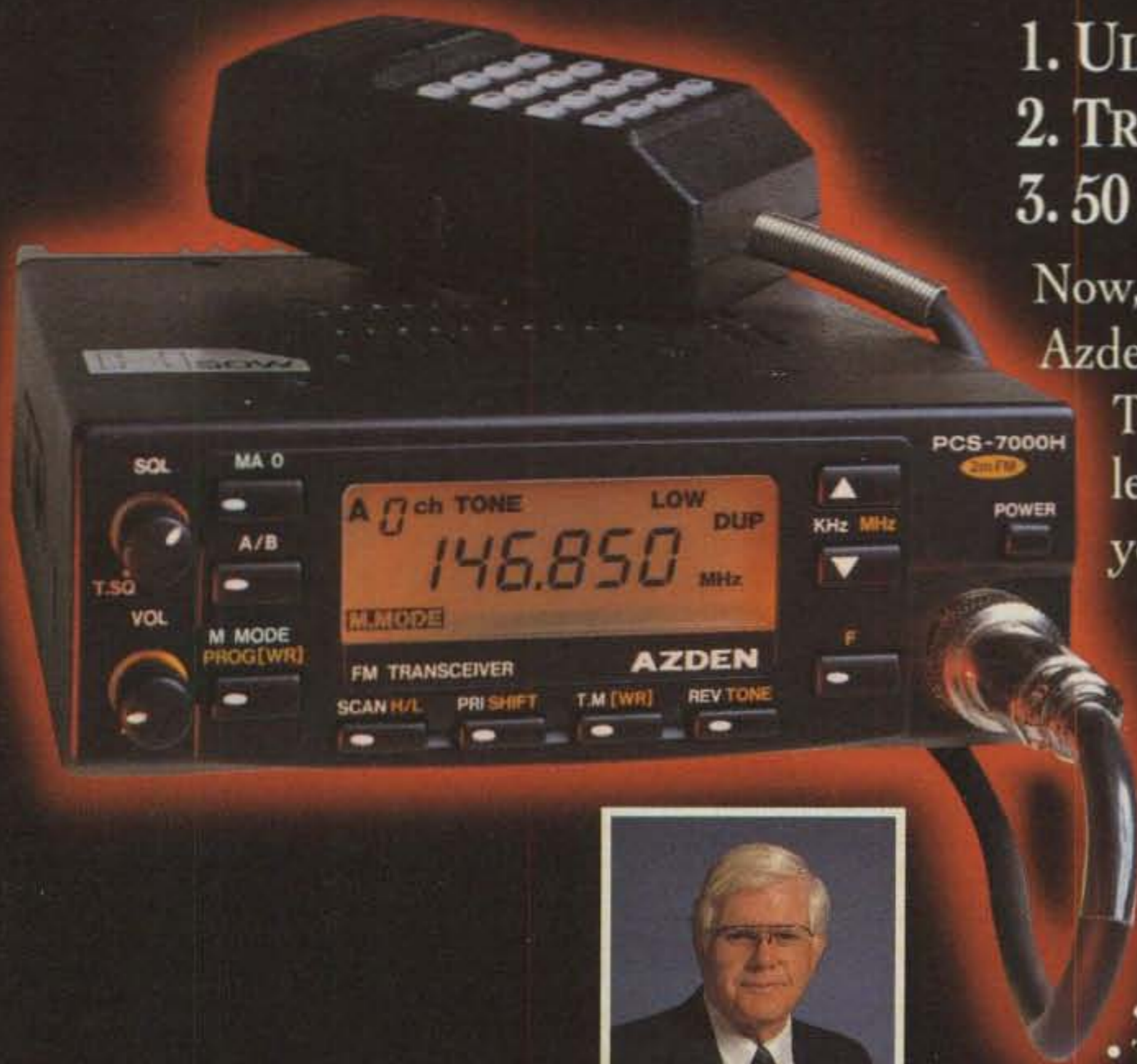
Various versions of the G5RV have been described in the amateur magazines and different designs are advertised for sale. Some use a balun transformer to match to coax, while others do not. No specific make of 300 ohm line was universally used,

Band	Freq.	SWR	Band	Freq.	SWR
80 m	3.5	6.3	10 m	28.0	4.83
	3.6	4.98		28.2	4.81
	3.7	4.47		28.4	4.42
	3.8	4.66		28.6	3.99
	3.9	4.76		28.8	3.64
	4.0	5.67		29.0	3.34
40 m	7.0	2.65		29.2	2.58
	7.1	3.05		29.4	2.29
	7.2	3.67		29.6	1.94
	7.3	4.50		29.7	1.88
	14.00	1.83		<b>WARC Bands</b>	
20 m	14.10	2.15	30	10.1	8.50
	14.20	2.64	17	18.11	1.84
	14.35	3.28	12	24.95	4.52
	21.00	5.90	<b>Representative G5RV Antenna</b>		
15 m	21.10	5.86			
	21.20	5.71			
	21.30	5.66			
	21.45	5.69			

Table 1—Results of the G5RV checks on all bands (including 10 MHz).

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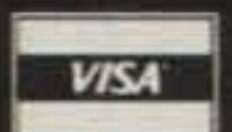
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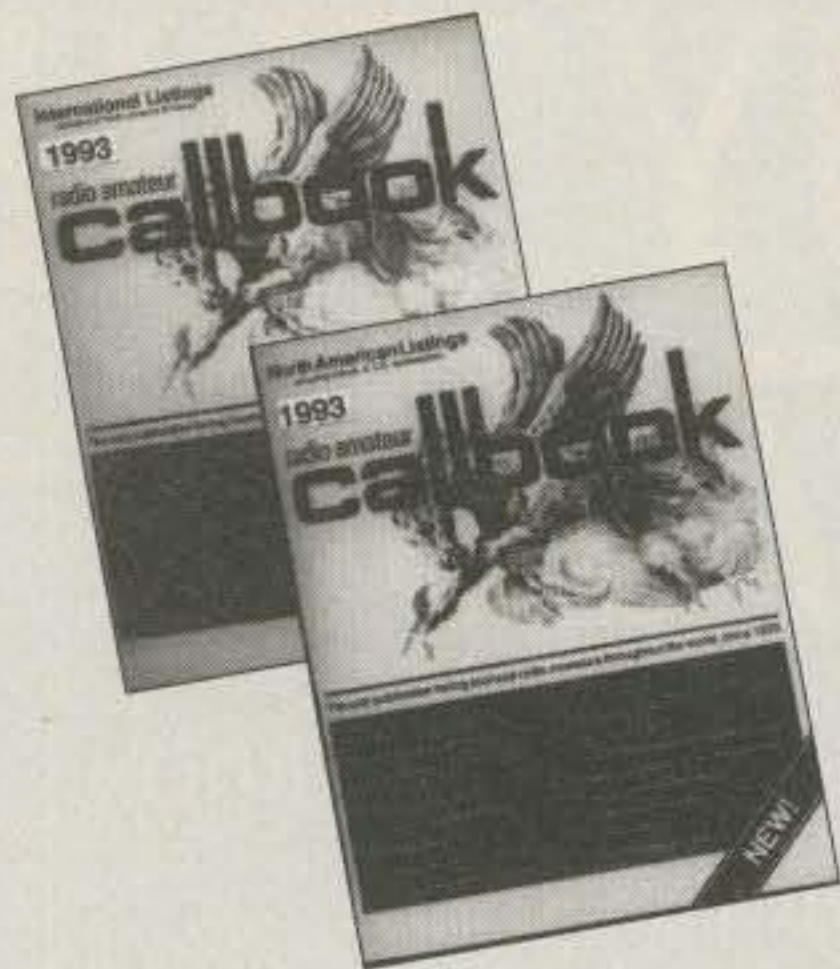
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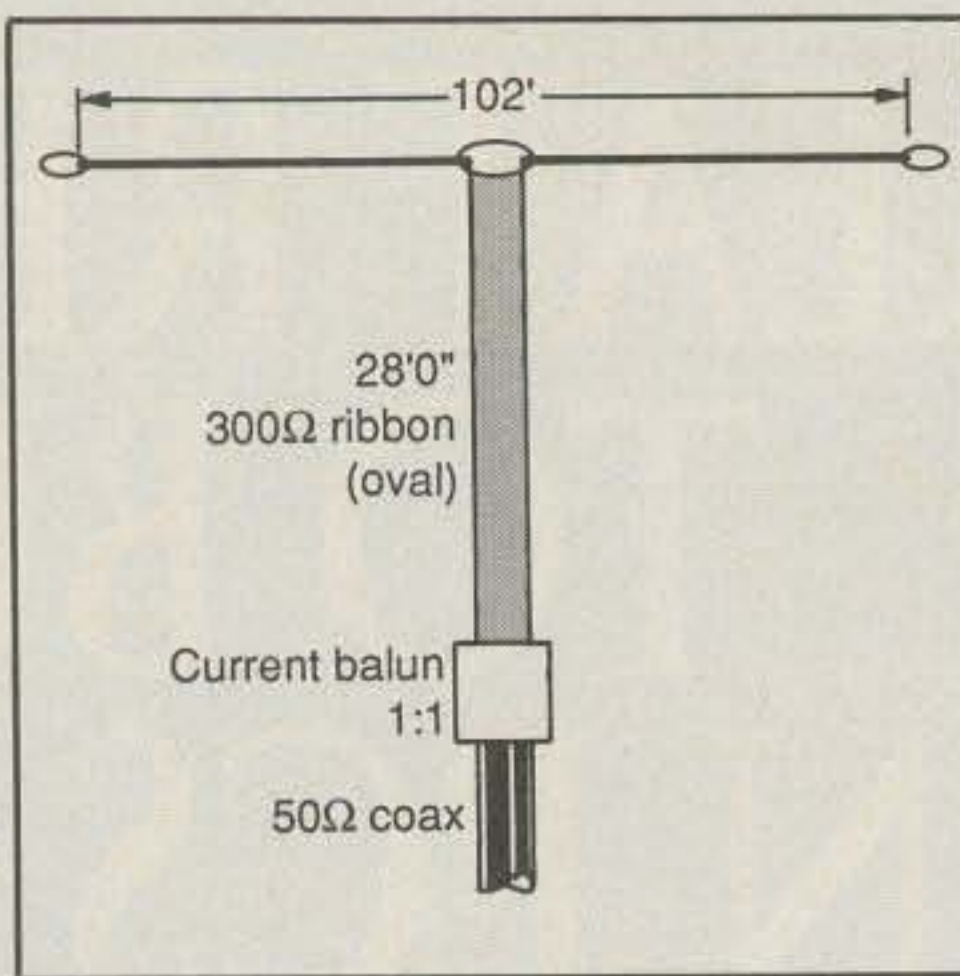


Fig. 2- Revised G5RV with current balun and modified ribbon line.

and there were as many different types of line as there are fleas on a dog. It all depended upon the economics of the manufacturer who built the line. And there was plenty of bad line available.

There didn't seem to be a single design I could point to and say, "That's the real G5RV antenna!"

## Checking a G5RV Antenna

The antenna I bought had conventional dimensions plus an "in-line transformer" (balun) which went between the ribbon line and the coax (fig. 2). The instructions stated the antenna covered 3.5 through 30 MHz except 10 MHz. It suggested the an-

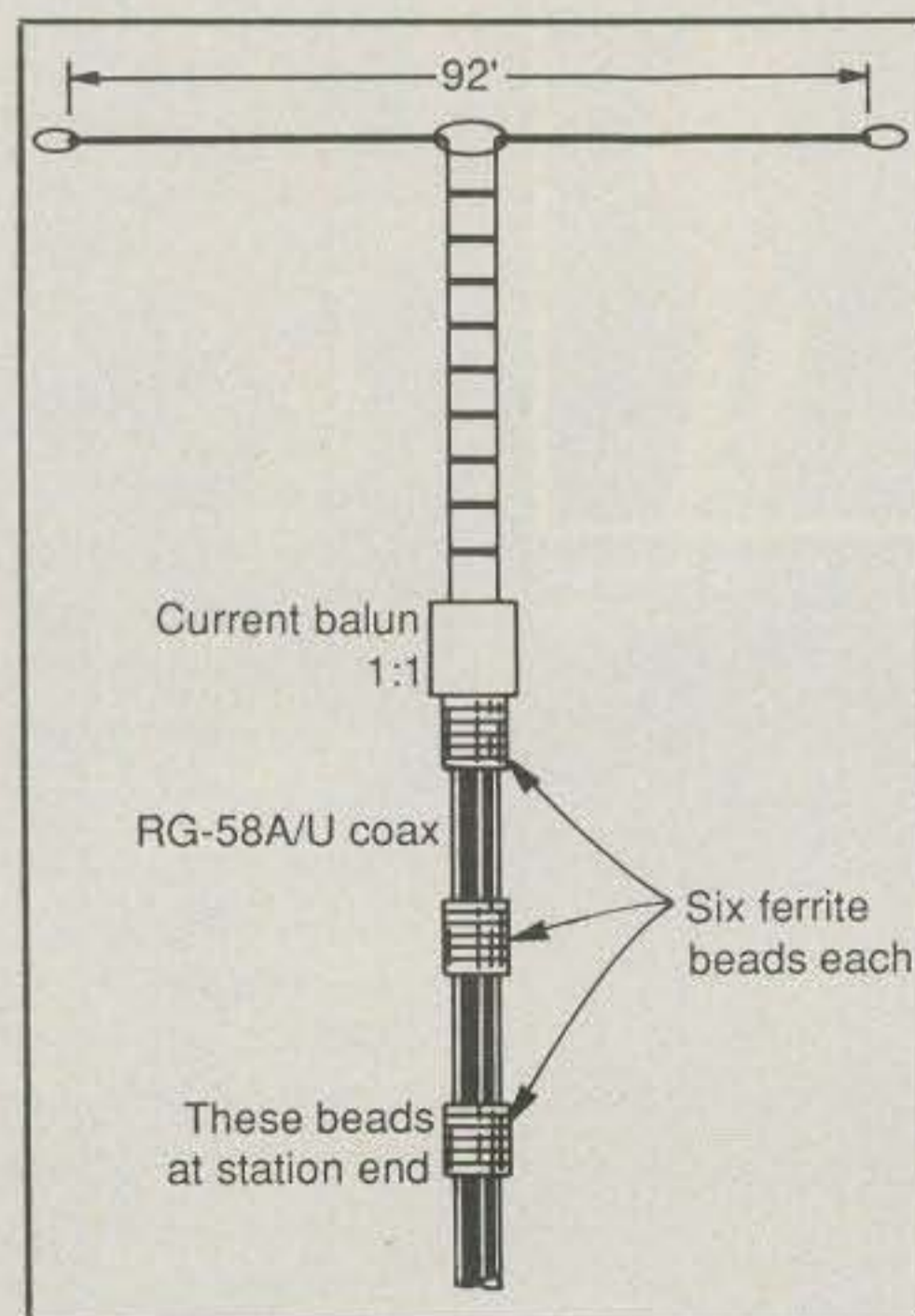


Fig. 3- The modified ZS6BKW multiband antenna with ferrite "sleeves" added to "cool off" coax line. Use Amidon 77-1024 (Type 43) beads for RG-58A/U coax, and Amidon 43-1024 for RG-8/U coax.

tenna be mounted one full wavelength above ground on the lowest frequency for which the antenna is to be used. For 80 meters this would be about 270 feet in the air! The instruction sheet modified this suggestion, saying that this height is impractical in most installations, and urged the user to put the antenna as high in the air as he can. It also recommended that the feedline be brought down vertically to the ground before leading it away at an angle, or parallel to the antenna.

My installation of the G5RV was typical: almost 45 feet high at the center and about 30 feet high at the ends. I brought the feedline down vertically as directed and then ran the coax a few dozen feet to my test instruments. At no point did the line run parallel to the antenna. A little extra coax was coiled up into a simple RF choke to suppress extraneous currents that might flow on the outside of the shield.

My test equipment consisted of an HP-606A signal generator, GR-916A precision RF bridge, and a Kenwood R-2000 receiver which acted as a null detector. The G5RV was checked on all bands (including 10 MHz) and the results are given in Table I.

## Interpreting the Results

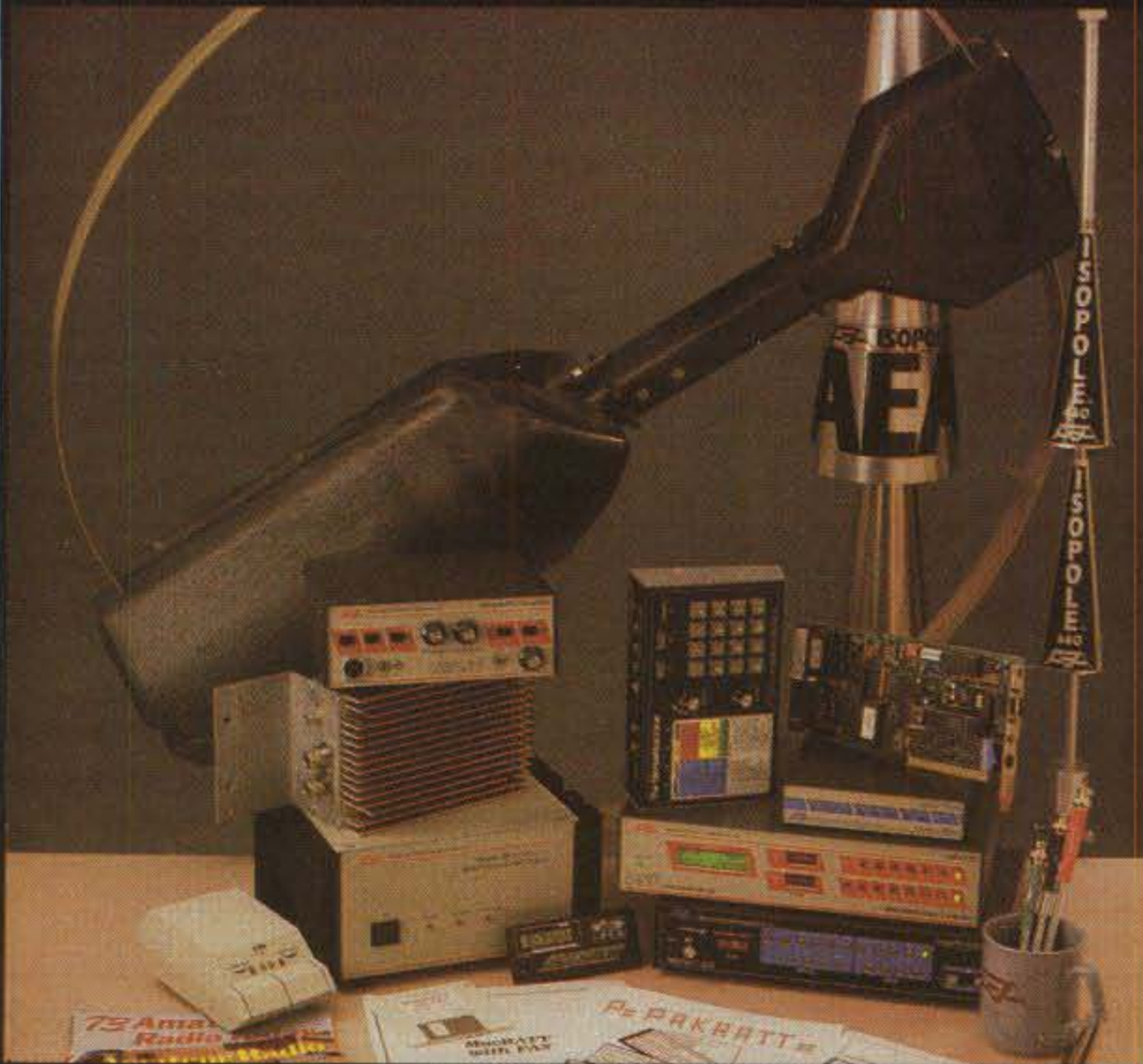
The readout of the RF bridge is in terms of R (resistance) and X (reactance) at the instrument end of the coax line. A computer program changed these figures into SWR values. The coax line was about 50 feet long and to simplify matters it was assumed there was no signal loss in the coax. Measurements were made every 100 kHz across the bands (every 200 kHz on 10 meters). A separate program for my computer was at hand which would determine the feedpoint impedance at the antenna, provided the line constants and length were known, and also translate R and X into SWR.

On 80 meters the measured SWR across the band was quite high, but the G5RV worked well when used with my station equipment and an auxiliary ATU. Tuning of the ATU was very sharp, and the unit required readjustment when the operating frequency was over a few tens of kHz. Reports for the G5RV roughly corresponded to those received when a dipole was used.

On this band, a portion of the flat-top is folded back into the 300 ohm line. Possible heating of the line may be experienced if high power is used. I only ran 150 watts, so I had no such difficulty.

On 40 meters the SWR was much lower and the ATU was required only on the high end of the band. Reports were excellent. However, no comparison antenna was at hand. Stations on my weekly sked with southern California noticed no discernable difference from my signal of weeks previously using a dipole, as compared with another local amateur.

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SWR on 10 MHz was very, very high. No wonder operation on this band was not recommended! I crossed this band off the operating list.

As for 20 meters, the SWR started out at less than 2-to-1 on 14.0 MHz and increased slowly as the operating frequency was raised. The ATU was required at the very high end of the band. Plenty of overseas DX was worked with the G5RV and it seemed as good as a dipole. Maybe slightly better.

Eighteen MHz operation was very good, with a low value of SWR. No ATU was required. Again, I could note no long-term difference between this antenna and a good dipole, except that the G5RV pattern was better than the dipole in the directions near the ends of the wires. Theoretical gain over a dipole in the favored direction is about 1.2 dB.

SWR was high on 21 MHz and an ATU was required. Even so, the antenna sounded "flat" on this band and signal reports received were poor. Operation was passable, but not as good as my quarterwave vertical. I'd rate the G5RV a "D" score on this band.

Twenty-four MHz also showed a high value of SWR. It seemed that the antenna was a poor performer on this band also. I did work a few stations, but the reports were mediocre.

Ten meters exhibited a very high SWR at the low end, gradually decreasing as the

frequency was raised, until it fell below 2-to-1 at the high frequency end of the band. The band was poor, so it was difficult to evaluate the antenna. Theory says the antenna is quite directional off the ends on this band. Theoretical gain is about 2 dBd. An ATU is recommended for general operation.

### What Does It All Mean?

Well, the bottom line is that the G5RV design functions on all amateur bands between 80 and 10 meters, with the exception of 10, 21, and 24 MHz. SWR is not really low on any band, despite some claims.

It was found that the SWR on any one band could be improved at the expense of the SWR on other bands by shortening or lengthening the 300 ohm ribbon matching section. It was also noted that the SWR could be changed for the better on a particular band by moving the coax about with respect to the plane of the antenna. Finally, it was found that an "isolation transformer" or 1-to-1 current-type balun is a necessary requirement at the point the ribbon line meets the 50 ohm coax line or SWR readings would change drastically with changes in coax cable length. Again, running the coax parallel to the antenna resulted in odd-ball SWR readings.

SWR readings at the station proved puzzling. On 20 meters they correlated nicely

with the measurements made with the RF bridge. On 10 meters the readings were higher in the station; on 40 meters they were lower. On 80 meters they were higher at the high end of the band and lower at the 3.5 MHz end.

All this was very perplexing. The SWR readings seemed to be a function of coax line placement and length of the line. I believed the RF bridge readings more than the SWR readings as they were made under the best possible conditions (short coax line running at right angles to the plane of the antenna), whereas I doubted the reliability of the SWR readings taken with a traditional wattmeter at the far end of a long, randomly placed coax line.

I was finally able to reproduce the bridge measurements to a good degree on the wattmeter after I placed ferrite cores along the line to the shack. A group of cores were moved along the coax until they seemed to isolate the line from the antenna field (fig. 3). Readings settled down after that and generally resembled the readings made by the RF bridge.

### Lessons Learned Regarding The G5RV Antenna

1. A current-type 1-to-1 balun should be used to connect the ribbon line to the 50 ohm coax.
2. Placement of the coax feedline with



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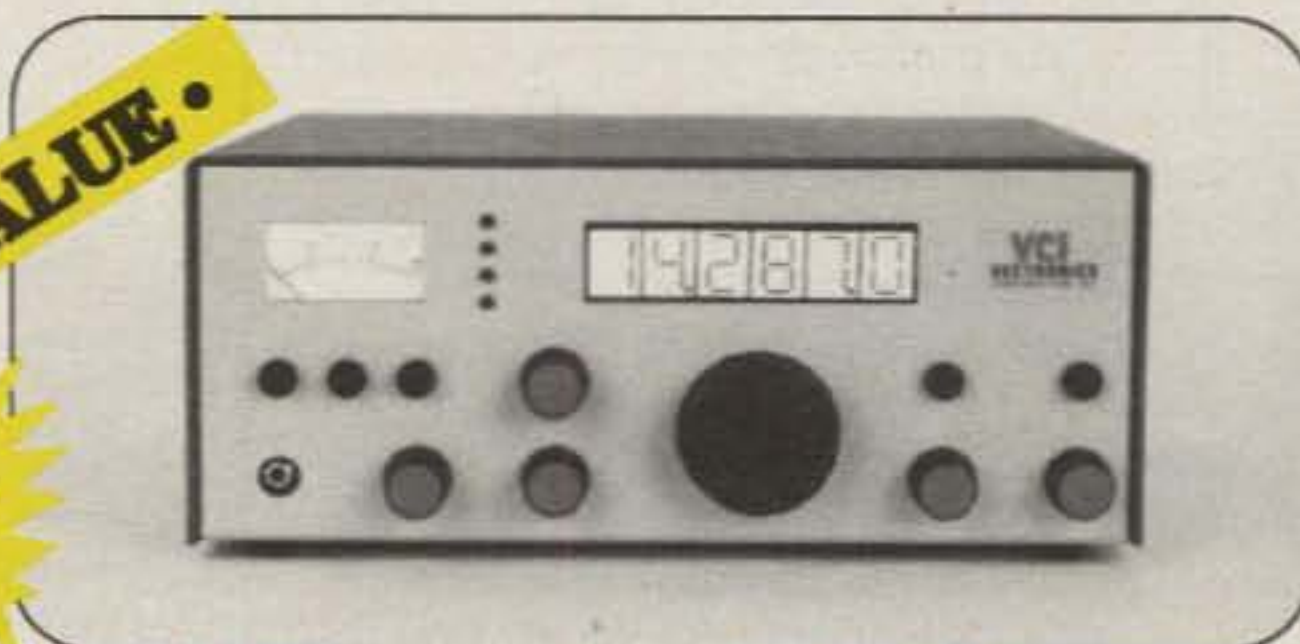
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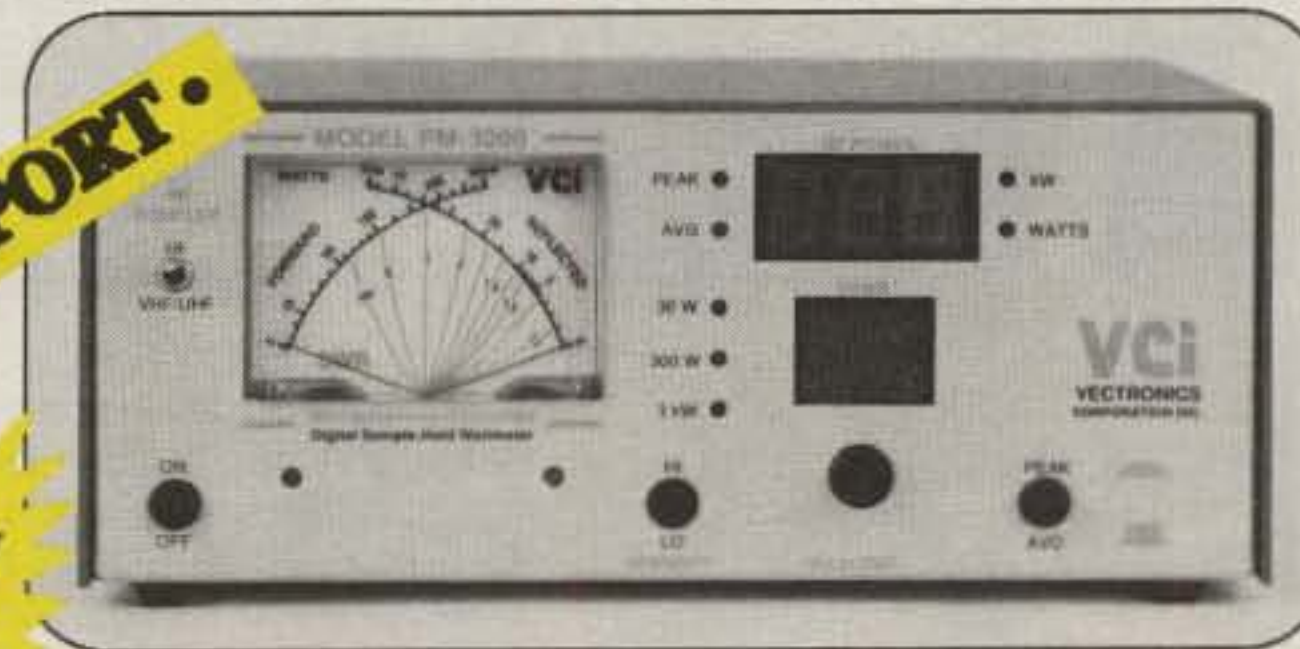
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relation to the antenna is critical, and SWR will change with line position.

3. If the G5RV is slung from a yardarm on a metal tower, the ribbon line should be spaced at least 3 feet clear of the tower.

4. A good match on any one band can be made by shortening or lengthening the ribbon line a few inches at a time. But this advantage is only achieved by a poorer match on some other band.

5. The SWR cannot be changed by changing coax length if the line is properly decoupled from the field of the antenna, but the impedance at the station end of the line can be altered by varying line length to provide the best match to the transmitter. If the SWR at the transmitter changes when line length is changed, it is an indication that there is coupling between the outer shield of the line and the antenna. Groups of ferrite slugs placed along the line at intervals will help reduce this effect if it annoys you.

6. Tube-type rigs with an adjustable output circuit have greater loading range than do solid-state transmitters. In many cases the tube-type rig can be used with the G5RV without requiring an auxiliary ATU.

7. It is a good idea to decouple the outside of the line at your transmitter. Do this by slipping six ferrite beads over the coax shield before you place the plug on the line. Type 43 beads (Amidon #43-1024 for RG-8 coax) will do the job. (Use Amidon #77-1024 for RG-58 coax.)

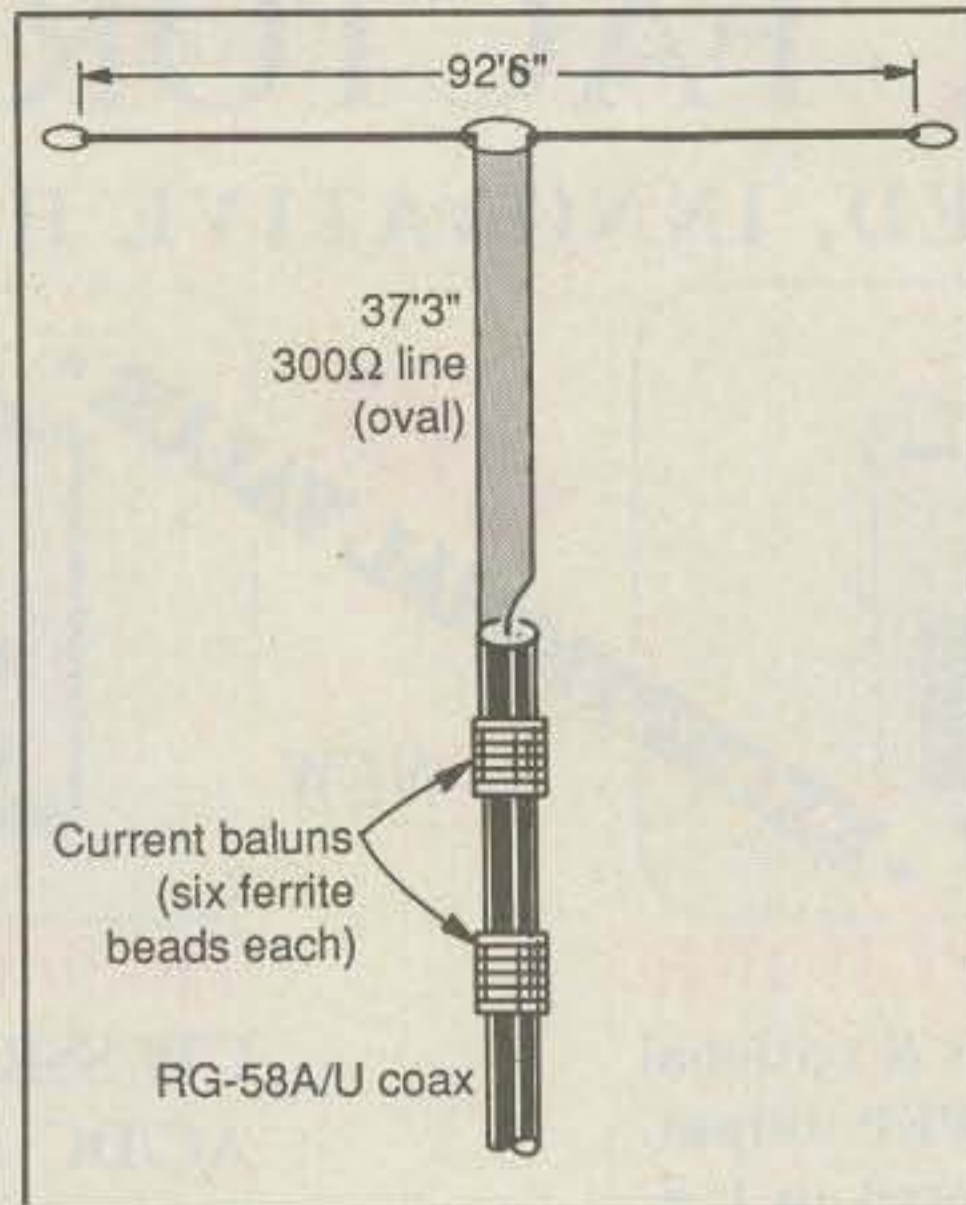


Fig. 4—The W6SAI version of the ZS6BKW version of the G5RV antenna! Normal details covering waterproofing of coax to ribbon connection apply.

8. Finally, the G5RV functions as an "all-band" antenna (less the 10, 12, and 21 MHz bands), but an ATU is usually necessary unless a lot of time-consuming pruning and trimming of the ribbon line is done. Even then, transmitter matching at the station will only improve one band at the expense of another.

Bottom line: The G5RV is a popular antenna and a lot of DX can be worked with it. It has a little gain over a dipole on the higher bands, but not much. If you have a modern rig, be prepared to buy an ATU to make the antenna work properly (unless your rig has an ATU in it).

### A Different G5RV Design

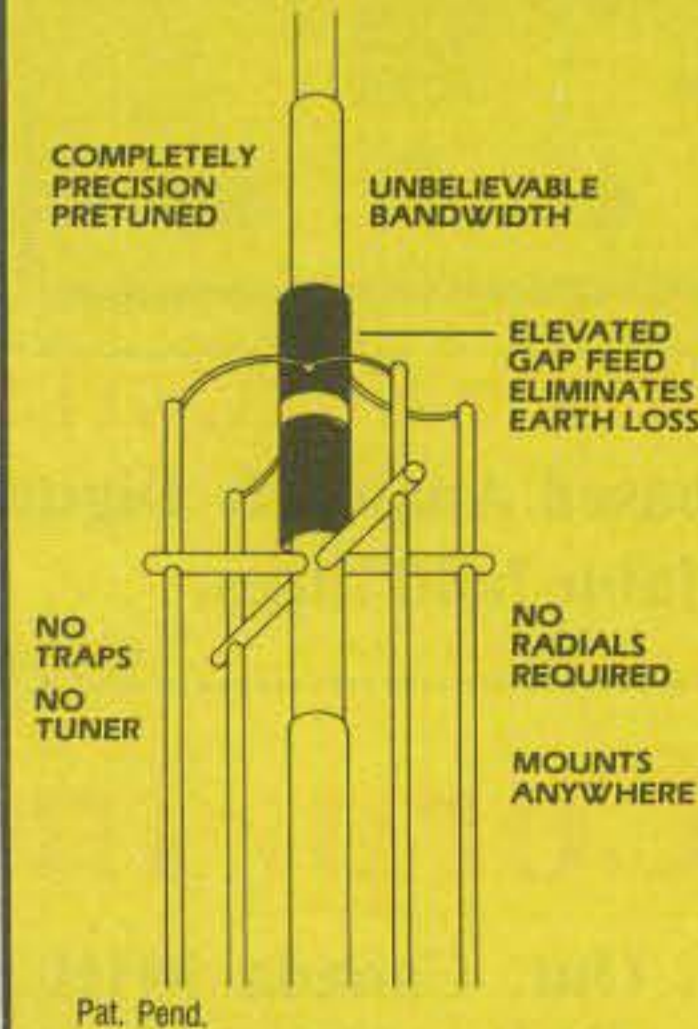
Can the G5RV antenna be improved to reduce the SWR on the transmission line and/or provide better SWR bandwidth? The G5RV has been around a long time, and many attempts have been made to make it a better performer on the HF bands. The most promising results I know of are those of Dr. Brian Austin, ZS6BKW, of the University of Edinburgh, Scotland (see his article "Computer-aided Design of a Multi-band Dipole," *Radio Communication*, RSGB, August 1985, pp. 614-617). Aided by a computer program and field tests, he varied dimensions of the G5RV design, trying to achieve a reasonably low value of SWR response on all major HF bands.

The ZS6BKW design utilizes a 50 ohm coax line and either a 400 ohm open-wire line, or a 300 ohm ribbon line. Unfortunately, the design does not incorporate a balun between the coax line and the balanced line transformer so the SWR measurements run on this design may be open to question.

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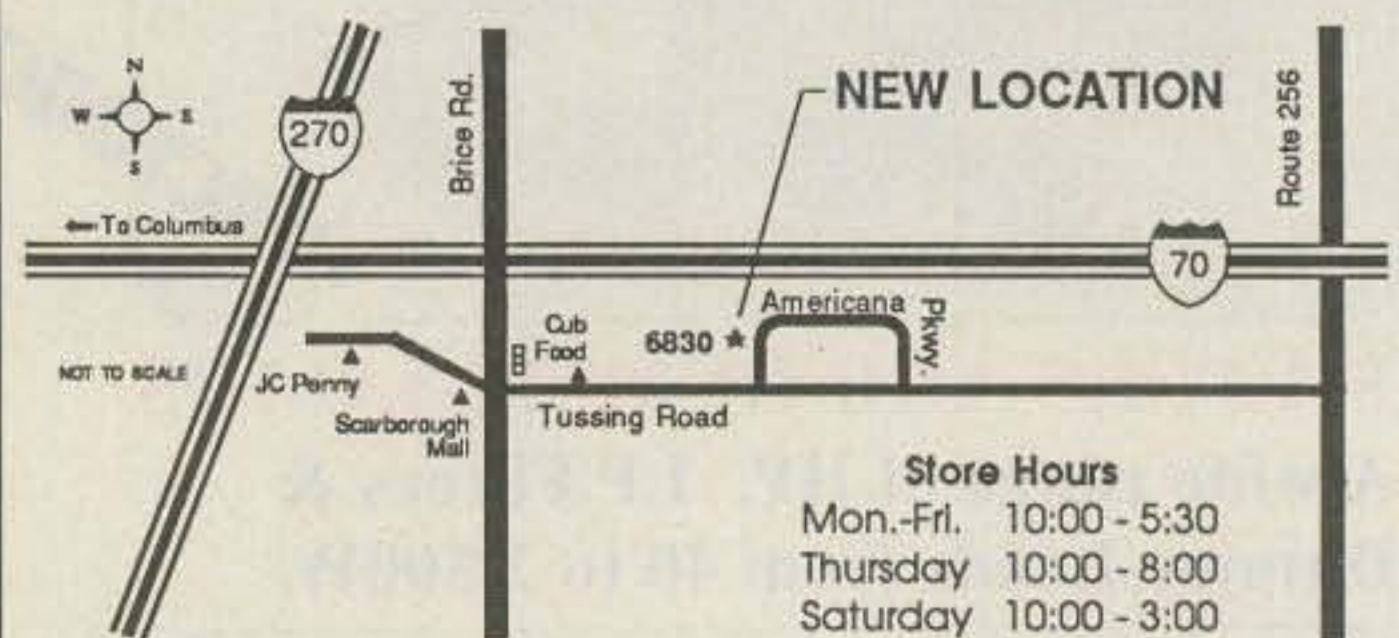
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Band	Freq.	SWR	Band	Freq.	SWR
80 m	3.5	7.68	10 m	28.0	3.38
	3.6	6.26		28.2	3.49
	3.7	5.25		28.4	2.92
	3.8	4.43		28.6	2.53
	3.9	4.36		28.8	2.11
	4.0	4.60		29.0	1.69
40 m	7.0	1.72	29.2	1.48	
	7.1	1.95	29.4	1.68	
	7.2	2.77	29.6	2.40	
	7.3	3.00	29.7	2.55	
	14.0	2.50	<b>WARC Bands</b>		
20 m	14.1	2.20	30	10.1	8.11
	14.2	1.76	17	18.11	1.11
	14.3	1.38	12	24.95	2.75
	14.35	1.42	<b>Representative W6SAI Antenna</b>		
	15 m	21.00	4.96		
21.10		4.94			
21.20		4.72			
21.30		4.70			
21.45		4.70			

Table II—SWR data for the 40, 20, and 10 meter bands for the W6SAI version of the ZS6BKW version of the G5RV.

Alas, I could not buy a ZS6BKW antenna, so as a last resort, I built one. As I went along, I discovered that the velocity of propagation of 300 ohm ribbon line varies from the accepted figure of 0.82, depending upon who manufactured the line and the physical shape of the cross-section of the line. I found I had to add 6 inches to the original BKW line dimension to get best results. Also, a 1-to-1 current balun at the bottom of the line is a necessity. My final dimensions are shown in fig. 4. The SWR data for the 40, 20, and 10 meter bands are shown in Table II. The SWR on both the 18 and 24 MHz bands is very good, but the SWR response on the 80 meter band is about the same as with the G5RV, and an ATU is required. Ferrite beads should be used to "cool off" the coax line.

As with the earlier G5RV design, physical placement of the coax line and its length can determine the SWR at the transmitter. For those amateurs wishing a slightly shorter antenna, or those dissatisfied with the generic G5RV design, this antenna may be an acceptable alternative. The ribbon line can be trimmed for best results on one band. Once the dimensions are adjusted for your particular installation, you will find this a very satisfying antenna.

### The New MN 4.5 Antenna Analysis Program

Brian Beezley, K6STI, introduced his updated MN Antenna Analysis software (MN 4.5) at the ARRL National Convention in Los Angeles in late August. I managed to obtain a disk and have supplanted my old program with the new one, which incorporates many advancements. It features antenna plot overlays on the screen, faster loading of files, optional thick plot traces,

and other features which make it easier to use and faster to run. A companion program, MNH, models very large antennas and complex antenna systems which otherwise would require the use of a mainframe computer. A second auxiliary program, GUY, makes it easy to investigate the effect of guy wires on antenna systems. If you tell GUY where guy wires are attached and anchored, and how they are broken up, GUY generates a complete system model when combined with an antenna file. Interaction between guy wires and the antenna can be fully investigated, and you'll quickly arrive at an optimum guy-wire configuration that won't screw up your beam pattern. (See Antennas & Accessories column this month.)

Shucks, the new programs spoil the whole idea of fiddling around for days, up and down the tower, back and forth, until things work—maybe! All the fun of antenna building is gone! However, if results count with you, the K6STI programs are the way to go. For more information, contact Brian Beezley, K6STI, 507½ Taylor St., Vista, CA 92084, or call 619-945-9824 during 0700-1800 Pacific Time.

### The Dead Band Quiz

Well, every time I think I have outsmarted the readers of this column, I find they are ahead of me! It is a pleasure to know that I have such a bunch of heads-up hams who (sometimes) enjoy these little quizzes.

To bring things up to date, readers who knew their onions about peak, average, and effective values of line voltage include N8PTI, KZ1R, K8KIR, WH6EQ, and KD4BS.

As far as the voltmeter circuit goes, the reading of the meter is zero, as the switch

shorts out the meter circuit. Right? These hams solved the problem quickly: W0DOZ, W4LGK, Ian Johnson, KS2X/1, K6IPV, KL7CMN, W1UBG, K7FC, AA5WE, W2DU, AB4SW/VE3ATU, N5XUS, W6GBA, NW1N/9, W6NPY, W7FSP, AA4ZJ, WA8KNE, WA8MCQ, KM7U, KJ7I, and WB3L (Claudie, congrats on the Extra ticket!)

And how about the Scarlet Pimpernel? The missing words of the song were "elusive Pimpernel." The book, written in 1905 by Baroness Orczy, has been made into several movies, with Leslie Howard, David Niven, Marius Goring, and Anthony Andrews starring as the Pimpernel. These hams really knew this story in great detail: W0DOZ, KS2X/1, KA7OBU, K6IPV, KC4NHB, KL7CMN, K7FC, WD4CNZ, AA5WE, AB4SW, K1XA, W6NPY, AA4ZJ, WA8KNE, KC4TEO, KM7U, KJ7I, VE3ZQ/7, and VE6OA.

Finally, thanks to W2DU, W9WI/4, and KZ1R for their interesting letters.

### A New Quiz For You

This one is so easy. I blush to give it. What character in what book and made-for-TV movie had the following names which he switched back and forth? Herr Lachmann, Barraclough, Alan Angel, Sampson (with a "p"), Standfast, and Max?

Good luck and keep smiling!

73, Bill, W6SAI

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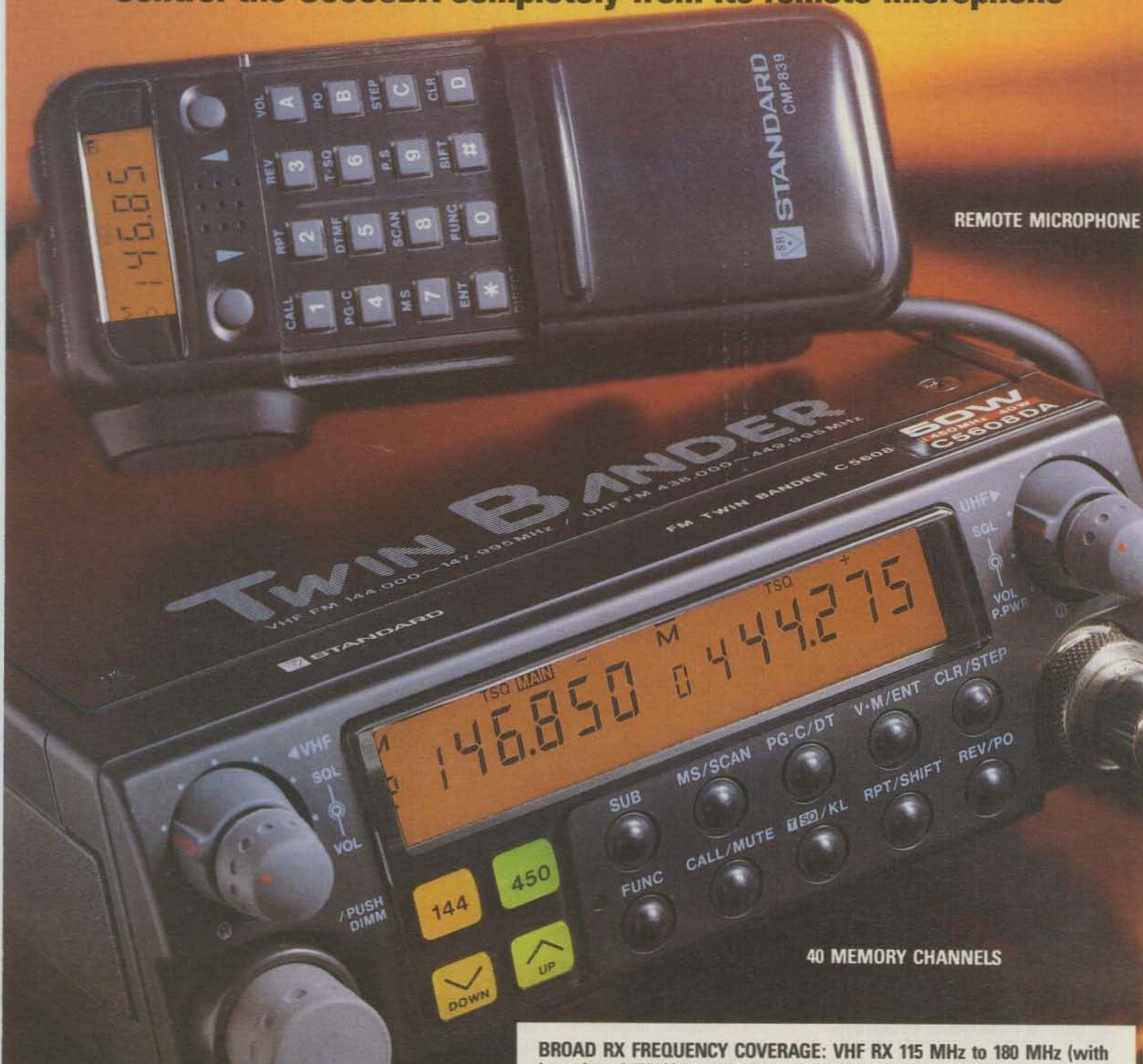
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# ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

## Antenna Update

**T**his month we begin with some antenna notes, and continue on to software topics of interest. Let's dive right in.

**Antenna Dimensions Quads.** Jerry W. Ballard, N4JB, and Ronnie W. Ballard are into the monoband quad antenna manufacturing business in a big way. Jerry, it seems, had his first experience with the cubical quad about 25 years ago. Even though his first quad was commercially made, he recalls vividly the nightmare it was to assemble. He recounts that the day the carton arrived, he was overjoyed and within an hour of its arrival had drafted his father and brother-in-law for the assembly project. However, he was in for a rude awakening. (Sound familiar?) Early the next morning the three began removing parts from the carton, and about halfway through they discovered the giant bag of nuts, bolts, screws, washers, brackets, insulators, and other "strange looking pieces of hardware." Needless to say, the construction gang spent not only that Saturday, but every afternoon for the next week completing the assembly, which, fortunately, worked well despite the difficulty of assembly.

Shortly thereafter Jerry began experimenting with his own quad designs and has done so ever since. His objective was to prove that the quad doesn't have to be a complicated, fragile, and aggravating antenna. The result is several commercial "no compromise" 10 meter quad designs that are well grounded both in theory and in practicality.

Doing business as Antenna Dimensions, Jerry has introduced three 10 meter quads that are furnished 50 percent preassembled. The JB10-2 (two element), JB10-4 (four element), and JB10-6 (six element) models all use 3 foot 5 inch spacing between all elements for a 50-52 ohm input impedance; no matching devices are required. The focal point of the antennas is the lightweight but sturdy hub: die-designed hub halves allow exacting tolerances required for a proper fit and necessary clamping action to survive the force and twisting action of high winds. Sandwiched between two .090 inch aluminum plates are the four spreader arm attachments made of 1 inch O.D., 1/8 inch wall fiberglass tubing. The hub-to-boom attachment is a tight fit on 2 inch diameter, .058 inch wall 6061-T6 aluminum.

The beams range in price from \$145 to \$365, depending on the number of elements. Soon to be available are monoband systems for 6, 12, 15, 17, and 20 meters. For more information, contact Antenna Dimensions, P.O. Box 414, Germantown, NC 27019.

**RadioWorks Carolina Windoms.** In April 1989 we took note of the interestingly configured and good-performing Carolina Windom antenna. To recall, its designer, Jim Thompson, W4THU, operates The Radio Works, whose ads

you probably have seen. Jim has been involved in offering wire antenna systems along with a broad line of baluns and other antenna accessories since 1984.

The Carolina Windom, a modification of the classic off-center-fed multiband wire antenna, has received good reports as an inexpensive (\$74.95) 80-10 meter radiator. The antenna consists of both a horizontal 133 foot and a vertical 22 foot coax radiator, a 4:1 balun, and a second 1:1 balun or "line isolator." The antenna is fed with 50 ohm coax; a transmatch is recommended for all-band operation. While the idea of combining vertical and horizontal radiators in one antenna isn't new, a good deal of the antenna's performance comes from the vertical wire section which helps make it a good low-angle DX antenna, especially on 15 and 10 meters. The horizontal portion provides relatively high-angle radiation characteristics for medium-distance communications.

Having had good success with the original Carolina Windom, Jim later introduced a half-size version, the Carolina Windom/2, a 66 foot flattop fed off-center at the 25 foot point. It makes use of a 10 foot vertical radiator which terminates in a 50 ohm line isolator. Needless to say, this design is popular with amateurs who live on small urban or suburban lots, or those whose hamshack is inconveniently located for center feeding. The shortened (\$74.95) version was given a hands-on review by Richard Arland, K7YHA, in *Worldradio*; the review was reprinted in the November/December 1991 issue of *Digital Digest*. Richard gave the antenna generally high DX performance marks on all intended bands, including the WARC bands, but found results poor on 80 meters, where the antenna clearly is not designed to work efficiently. (If you wish to work 80 meters, use the full-size Carolina Windom. And if you want to operate 160-10 meters Windom-style, try the 265 foot Carolina Windom 160; the latter is \$99.95.)

For more information and an extensive antenna catalog, contact The Radio Works, Box 6159, Portsmouth, VA 23703.

**New Valor Pro-Am Antennas.** Valor Enterprises, which cleverly bills itself as the "clear connection" company, has been in the antenna manufacturing business for many years, although in past years considerable focus has been on CB and commercial antennas and accessories. Recently, Valor's emphasis has broadened to focus on the amateur market. Currently, the firm offers a 17-page amateur antenna catalog that includes not only mobile and fixed station antennas, but also goodies such as mounts, cables, adapters, dummy loads, and other accessories.

Valor introduced several new products in 1992. One of these is the PA series of base repeater antennas. Three 2m/70cm fiberglass verticals feature wideband coverage, high gain, and wind-survival ratings as high as 135 MPH. The antennas are factory adjusted and do not

require tuning; construction features stainless steel radials and hardware and rugged fiberglass radiators. Other new Valor designs include a 144/440 MHz dual-band mobile whip, a 144/450 MHz dual-band rubber duck, and various UHF collinears. Valor also sells a nifty rubber duck "hat clip" complete with BNC connector—good for hamfests, if you don't mind having an active RF field so close to your head.

For more information and a catalog, contact Valor Enterprises, Inc., 185 West Hamilton St., West Milton, OH 45383.

**Austin 500C Dual-Band Antenna.** Austin Antenna (10 Main St., Gonic, NH 03839) offers an interesting and flexibly designed VHF/UHF mobile antenna. The 18 inch antenna is available in single- or dual-band versions; various combinations of frequencies are available from 100 MHz to 2 GHz, but the most popular amateur version is a dual-bander that covers 2 meters and 70 cm.

On UHF the upper whip portion of the antenna is operated as a ground-independent half-wave radiator; performance is claimed to surpass that of the typical 5/8-over-5/8 wave collinear end fed against a vehicle surface or other ground plane. VHF operation has the antenna functioning as an offset-fed quarterwave element. In this mode the antenna requires a ground plane such as the surface of the vehicle. No tuning is required.

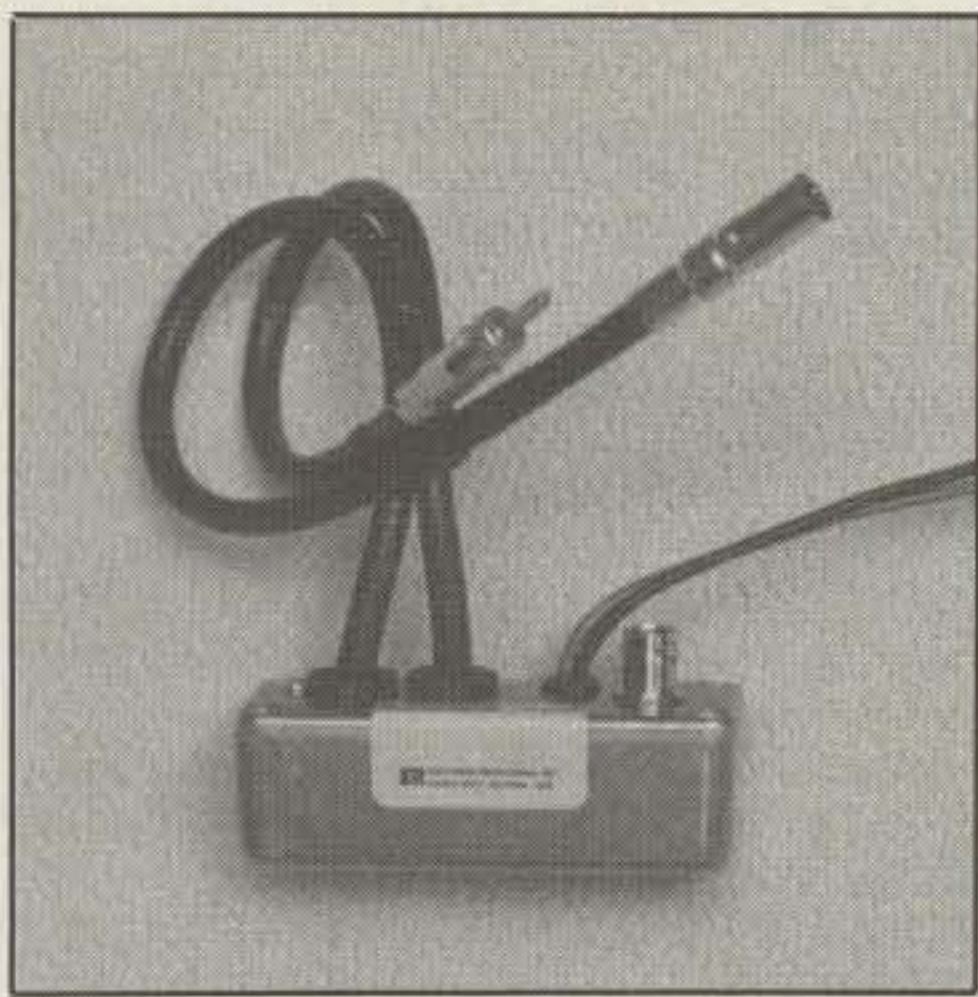
D & L Antenna Supply (P.O. Box 6784, Leawood, KS 66206-0784) heavily promotes the antenna and likes it so well that they offer a 30-day money-back guarantee. D & L also offers a wide range of accessories for the 500C, including a companion magnetic mount, a trunk lip mount, a body mount, and inexpensive silver-plated Teflon insulated PL-259 connectors.

**Slack Enterprises Update.** In two previous columns (May 1990 and January 1992) we noted several prefabricated HF dipole wire antenna systems for all bands from 160 through 10 meters and several high-quality, heavy-duty insulators offered by Slack Enterprises. John W. Slack, WA2BGB, sent me another sample of his antenna insulators, which are becoming quite popular. The inexpensive insulators come in 1/2, 3/4, and 1 inch diameters and are priced at \$2.95, \$3.95, and \$5.95, respectively. John also offers a heavy center insulator with coax connector for \$15.95.

For more information, contact Slack Enterprises, 101 Royal Park Drive, Apt. 2H, Oakland Park, FL 33309.

**AEA IsoLoop™.** The AEA HF IsoLoop was, and still is, a very intriguing compact antenna. The original IsoLoop was a small (32 inches on a side, 12 pounds) loop that transmitted and received on any frequency between 14 and 30 MHz. With the loop mounted in the horizontal plane, the radiation pattern was omnidirectional and horizontally polarized. You also could mount the IsoLoop in the vertical plane to provide a null in a given direction. A precision stepper-motor

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The Electron Processing MSW-1 Mobile Antenna Adapter is an amplifying receiving antenna coupler designed for mobile use. Its purpose is to allow the use of an existing car radio antenna with a separate shortwave or scanner receiver. The MSW-1 covers the range 0.5 to 1000 MHz and includes an internal 10 dB gain amplifier. (Photo courtesy Electron Processing, Inc.)

and a small remote-control box were used for tuning. The antenna didn't require radials.

There were some design and performance compromises in the original IsoLoop that prompted AEA to redesign the antenna. The new IsoLoop is the Model 10-30 which covers 10-30 MHz continuously. It is promoted as a go-anywhere antenna that's ideal for filling in WARC-band coverage that your current antenna may not conveniently offer. The IsoLoop appears to be particularly suitable as a portable or base-station antenna where space or zoning restrictions are a problem. It is effective in apartments and condos where the antenna is sufficiently compact to be mounted on a balcony or in an attic. It's also a near-ideal marine antenna: mechanical joints are minimized, so the possibility of corrosion is greatly reduced.

No ground plane or antenna tuner is required, and, as its name suggests, the IsoLoop is isolated from the feedline to minimize radiation pattern distortion and stray RF in the hamshack. Tuning of the 43 inch diameter, 14 pound hi-Q loop is provided by a direct-drive stepper motor and a small remote-control box, the LC-2 Loop Controller, which is supplied with a 50 foot control cable. Signal strength LEDs on the LC-2 facilitate tuning; an optional frequency indicator makes precise tuning easier. The IsoLoop is rated at 150 watts with a nominal impedance of 50 ohms. SWR is claimed to be less than 1.5 to 1, provided there are no nearby objects. The antenna comes fully assembled and includes an AC power supply. It is \$410.

For specs, contact Advanced Electronic Applications, Inc., 2006 196th St. SW, P.O. Box C2160, Lynnwood, WA 98036.

**Mobile Antenna Adapter.** John Martin, KF8KK, tells of the introduction by Electron Processing of the MSW-1 "hassle free" mobile antenna interface adapter that puts existing car radio antennas to good use for wideband reception. It's designed to minimize the problems associated with getting good mobile shortwave and scanner reception.

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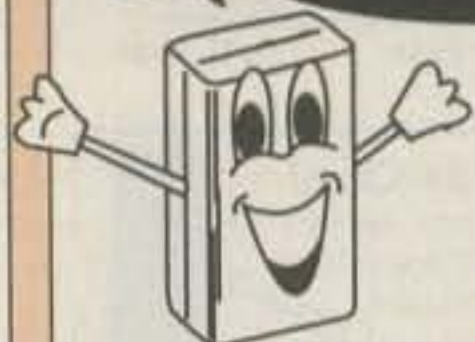
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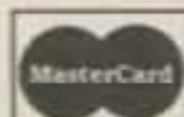
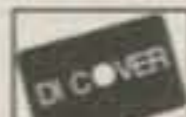
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na with a separate shortwave or scanner receiver. The MSW-1 covers the range 0.5 to 1000 MHz and includes an internal 10 dB gain amplifier. The unit is easily installed in the antenna line of your present car radio antenna via the supplied Motorola-type connectors. A female BNC jack is provided for connection to your receiver.

For more information, contact Electron Processing, Inc., P.O. Box 68, Cedar, MI 49621.

**More WA0KKC Antenna Tips.** Dick Mollentine, WA0KKC, offers some additional antenna tips this month. This one may seem obvious, but it bears repeating: When installing a permanent tower, particularly one you are setting in concrete, *don't* just "eyeball it." Instead, use a carpenter's level to ensure that the tower is indeed level. Even minor errors in leveling the tower at the base will be accentuated greatly in upper sections that may cause the tower to resemble the famed "Leaning Tower of Pisa." Unfortunately, the tower may not exhibit the same longevity as the Italian prototype.

Dick also offers the following: If you have recycled the same metal project box for various construction projects over the years, it probably is full of holes that mean major RF leaks. If you're in quick need of a reasonably RF-tight container, tape aluminum foil to the inside of the box to cover the various holes.

**Soft Topix**

**YagiStress (YS).** Kurt Andress, NI6W, recently sent us a copy of his IBM PC Yagi antenna structural modeling software, YagiStress, or YS, which he released at the April Visalia DX Convention.

Kurt laments the fact that while antenna electrical design is well under control with the introduction of sophisticated antenna *electrical* design software, antenna *mechanical* design still is something of a "black art." This is most likely due to the fact that the process isn't well

understood, and those who are proficient in mechanical design are not likely to do it often, since it can be a real pain. As a result, until now the most common analytical process applied to mechanical design by the homebrewer simply was to put the antenna up and see how long it stayed there.

Kurt started writing the program code to obtain relief from the hours of math required to mechanically optimize his Yagis. Using a personal computer, he found the black art of antenna physical design to be only a smoke screen that could be blown away by a little common sense and some time on the PC.

What Kurt came up with is a powerful structural design tool that is user friendly, informative, and even fun to use. YS determines the wind-load capability of horizontally polarized Yagis constructed with tubular materials, and it allows you to easily modify the models online to design-in survival at higher wind speeds. The program calculates surface area, antenna weight, turning radius, balance point, and the location and value of any required balancing weight. YS calculates the bending stress in every piece of element and boom tubing to determine the safe wind speeds for the antenna, and it provides mast/rotor torque and boom stress values to facilitate optimum mast/boom attachment.

I found the software to be fast, powerful, comprehensive, and reasonably easy to use, especially considering the sophistication of the calculations. YS appears to have a very bright future, as it forms an excellent companion for the electrical design software so many amateurs use today, and Kurt plans a full plate of program enhancements. The 27-page YS user's manual on disk (available in several different wordprocessor formats) is very complete and includes some useful design tips and suggestions for using YS with Brian Beezley, K6STI's popular YO (Yagi Optimizer) electrical design program.

YS is priced at \$50. It is available from Kurt

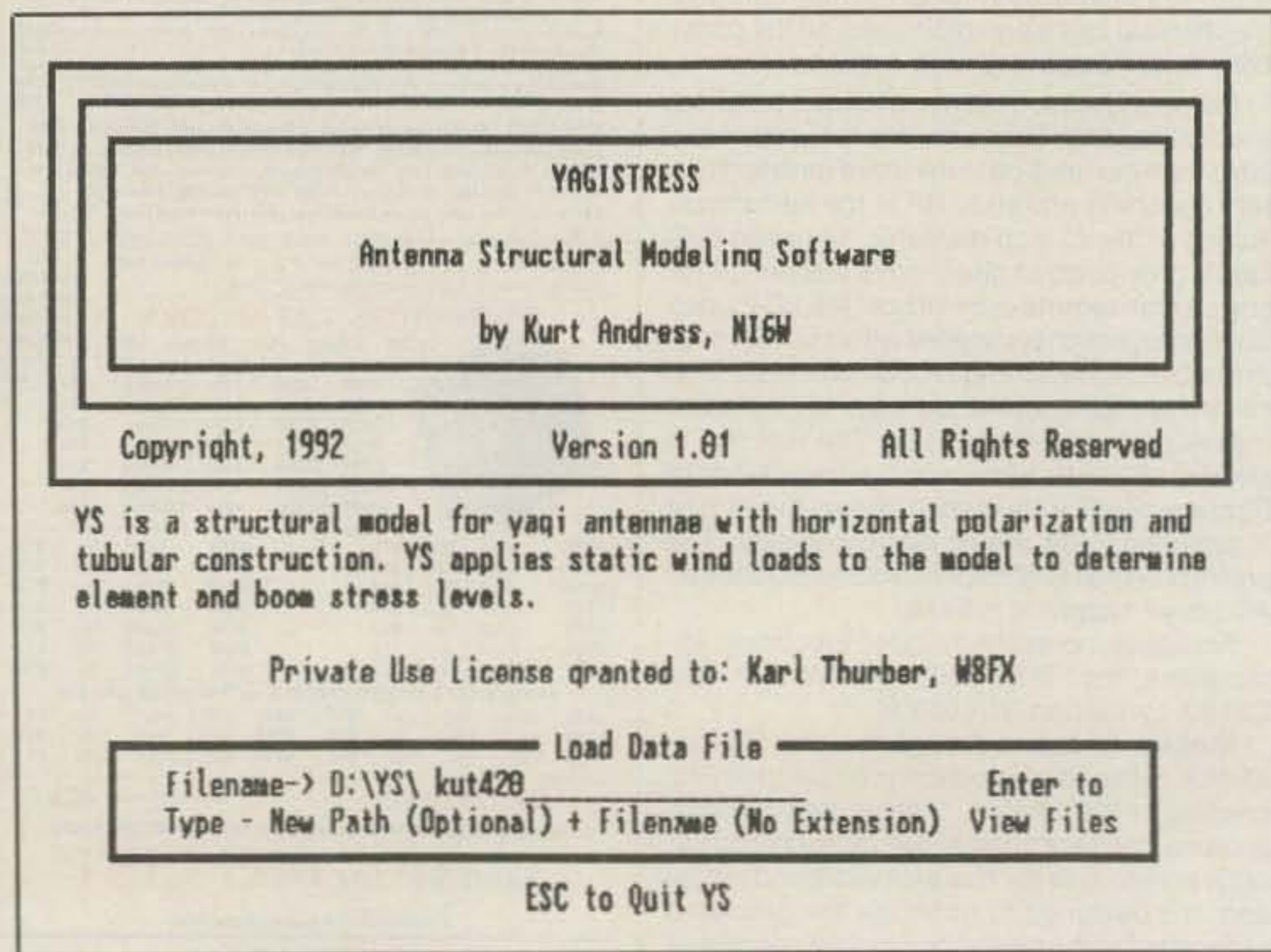


Fig. 1 - YagiStress (YS) by NI6W is a powerful structural design tool for Yagi antennas, one which nicely complements electrical antenna design software. The initial start-up screen shown here allows you to enter the filename of an antenna model for analysis.

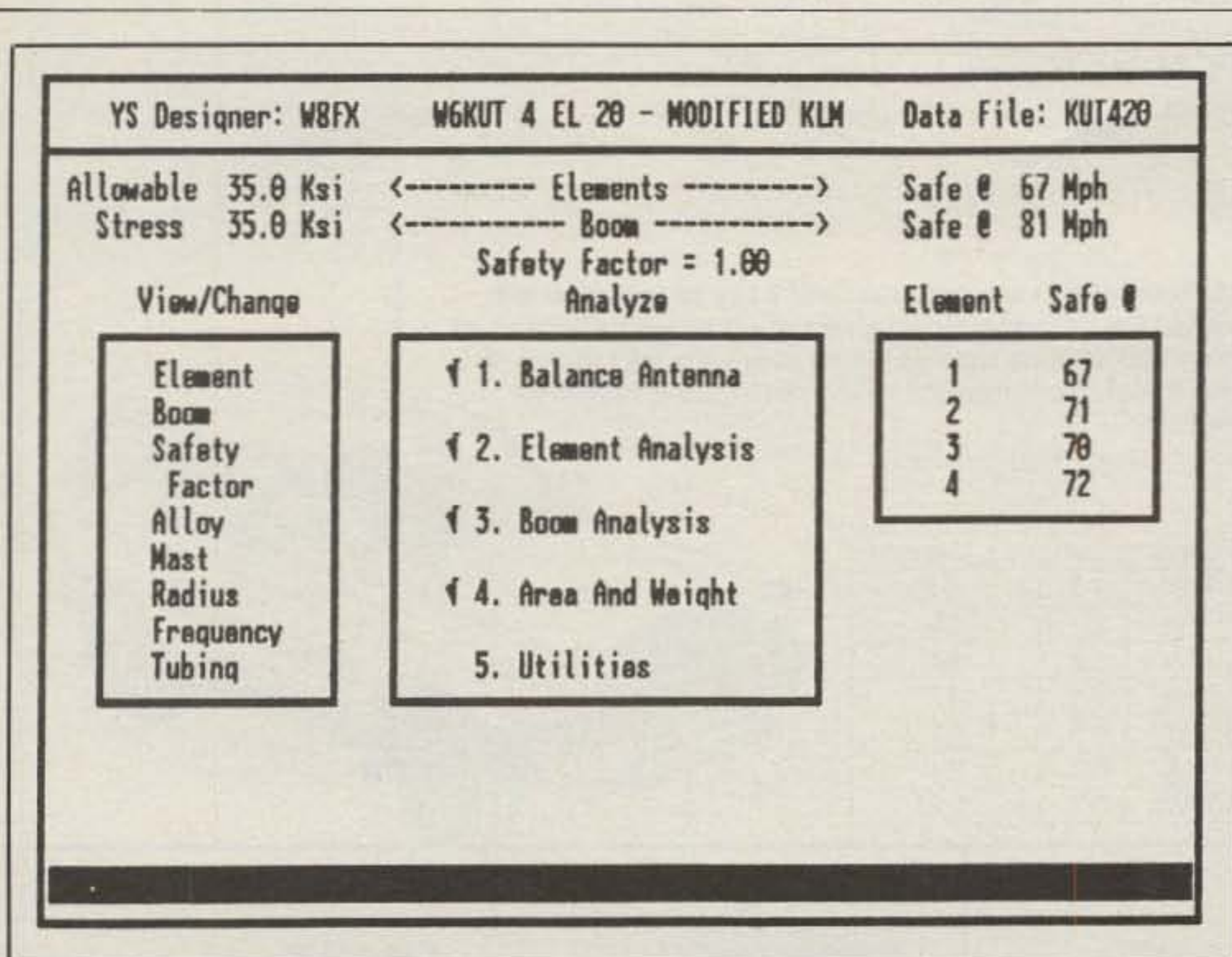


Fig. 2— Once YAGISTRESS (YS) has loaded the data file, it displays a screen containing information about the loaded file and a "press any key" prompt. Pressing a key brings up the YS Main Control Menu, which automatically performs an analysis on the antenna. When complete, an option bar appears at the bottom of the screen (not visible in this screen image) with several functions from which you can select.

Address, NI6W, 2538 S. Center St., Santa Ana, CA 92704. Fig. 1 shows the YS start-up screen while fig. 2 depicts the YS Main Control Window.

**K6STI GUY 1.0 Guy-Wire Modeler.** We've discussed Brian Beezley, K6STI's excellent array of antenna analysis software in several previous columns: September 1988, June and August 1989, April 1990, and May 1991. Brian has set the standard for high-accuracy antenna electrical design software with products such as the MN enhanced MININEC antenna analysis program; YO, for automatically optimizing Yagi antennas; and NEC for Yagis for critical, highest-accuracy analysis of Yagi designs.

Brian has added a new program to his bag of software tricks, the GUY 1.0 Guy-Wire Modeler. The program is intended to make it easy to investigate the electrical effect of guy wires on antenna systems. Why is this investigation important? Even when broken into short insulated sections, guy wires have the potential to devastate the performance of optimized antennas.

Working in conjunction with K6STI's MN antenna analysis software, to use GUY you tell it where guy wires are attached and anchored, and how they are broken up. The program computes the coordinates of the guy-wire sections and combines them with an antenna file to produce a complete system model. The three-dimensional display of guy-wire currents shows which guy sections are causing problems with the antenna's radiation pattern. Needless to say, having this information can save a great deal of time and effort when installing or reworking a guy-wire system.

GUY 1.0 uses either U.S. or metric units, works with or without a math coprocessor, and requires MN 4.0 or later. GUY 1.0 is \$25 (MN 4.0 is \$85). The software package is available from Brian Beezley, K6STI, 507 1/2 Taylor, Vista, CA 92084.

#### SAM Amateur Radio Callsign Database.

Online databases for looking up addresses for sending QSL cards are becoming increasingly popular. One of the more popular (and, I might add, slick and sophisticated) offerings is SAM, the "Search for AMateur" software that resides on hard disk and requires less than 15 MB of disk space. SAM, which was introduced at the Montgomery Hamfest in 1991, originally was developed by Rod Thompson, KC4CQY, and Tom Thompson, N4YOS, as a simple tool for locating amateurs by name to track down lost friends whose callsigns have been forgotten, upgraded, or changed. The idea developed quickly to include callsign lookup and various export capabilities.

The menu-driven program has an attractive user interface that gives you fast access to licensing information such as callsign, name, license class, address, and year of birth. SAM accesses such data by callsign or name directly from the screen, and it lets you export data by city, state, or Zipcode to create mailing lists, regional directories, tables, dBASE™ compatible databases, or other custom printed or disk file outputs. The program also can provide statistics on the numbers of each licensee class within a given area. While the present version can't do complex searches, it can find amateurs by partial names or callsigns using its browse feature, which provides a scrolling alphabetical listing for review.

While the program primarily is menu-driven, the package also offers a stand-alone search utility, LOOKUP.EXE. It lets you find callsigns directly from the DOS command line with minimal screen interface. SAM also has the ability to work with voice synthesizers used by visually impaired users. Further, the program package includes Application Programmers Interface (API) software that allows access to the SAM database by other programs, such as loggers.

SAM interfaces with Hyperlog, LOGic II and Jr., and DxBASE, and others are in the works.

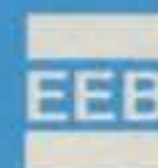
The "standard" SAM version covers all U.S. and Canadian callsigns and costs \$39.95; separate versions (at \$14.95) are available and cover various U.S. regions and Canada. On-disk documentation is furnished. SAM requires an IBM PC compatible with at least 128K RAM and 15 MB hard disk space. The database is updated every 6 months and a semi-annual supplement is offered following revision; annual updates are accomplished through the purchase of a new SAM set at a discount. Fig. 3 shows SAM looking up a callsign, while fig. 4 depicts the SAM Browse Window.

For more information, contact RT Systems, P.O. Box 8, Lacey's Spring, AL 35754.

**R&R.** The many changes in the former Soviet Union have had a real impact on amateur radio, not only because of the changing geography of the Commonwealth of Independent States (CIS), but also in terms of entrepreneurial enterprises in the CIS. One such impact is the introduction by Valery A. Kharchenko, RA6YR, of the disk-based R&R, especially designed for "oblast chasers."

R&R is the computer version of the copyright *Russian and Independent Republics Callbook*, 3rd Edition (1992), which has been published annually since 1989 by the Octavia Company, Ltd., P.O. Box 40, 352700, Maikop, Russia. R&R provides all necessary information for you to get cards to the former Soviet republics, including Ukraine, Belarus, Azerbaijan, Georgia, Armenia, Turkmenistan, Uzbekistan, Tadjikistan, Kazakhstan, Kirghizstan, Moldova, Estonia, Latvia,

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	AL-432FII	70CM	5/8λ × 2	100W	51.1	.64
	AL-207F	2M/70CM	1/2λ + 5/8λ × 2	100W	51.1	.77
Mobile	AL-144FL	2M	1/2λ	100W	55.9	1.1
	AL-432FL	70CM	5/8λ × 2	100W	62.9	1.1
	AL-207FL	2M/70CM	1/2λ + 5/8λ × 2	100W	53.1	1.2



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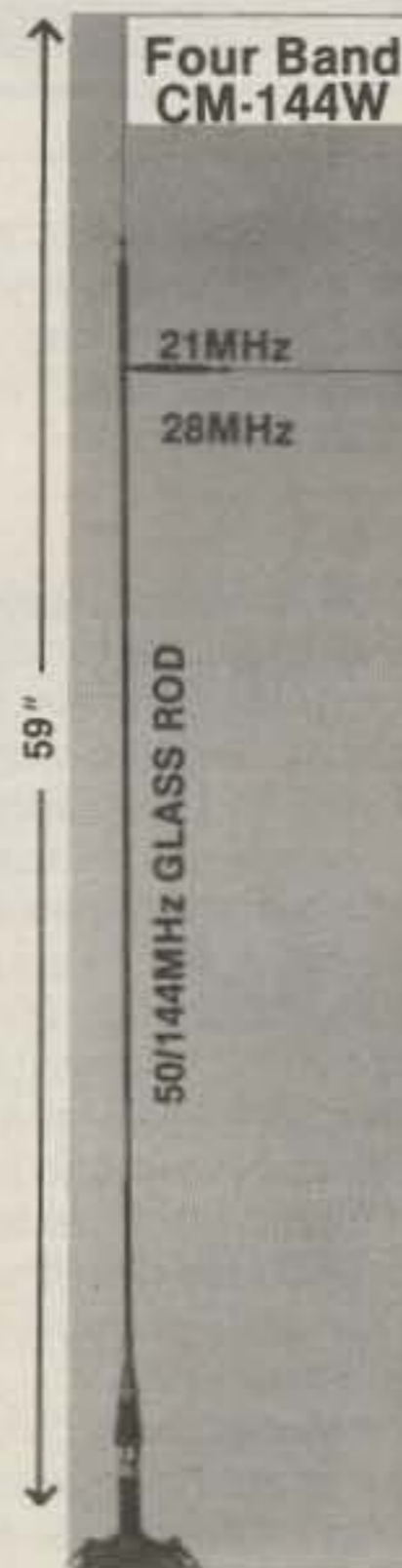


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**HPS-55X**

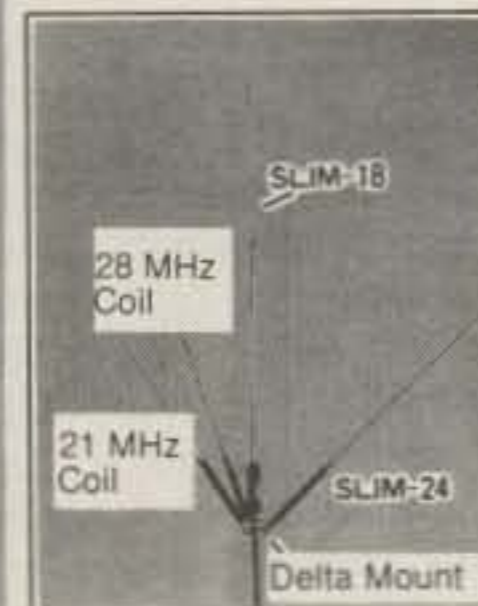


**Four Band CM-144W**

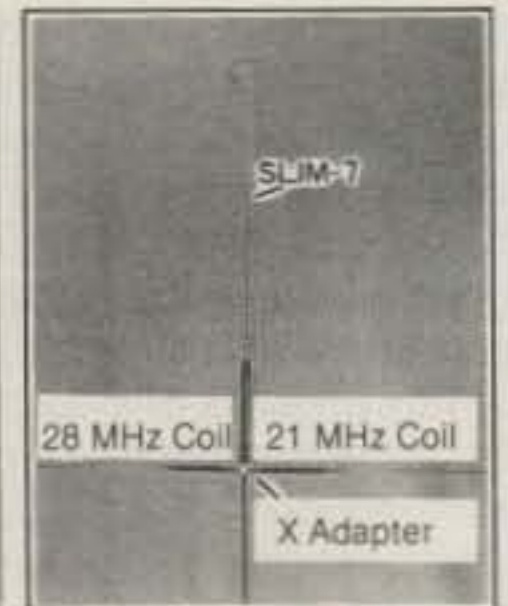
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**Fleming adaptor**  
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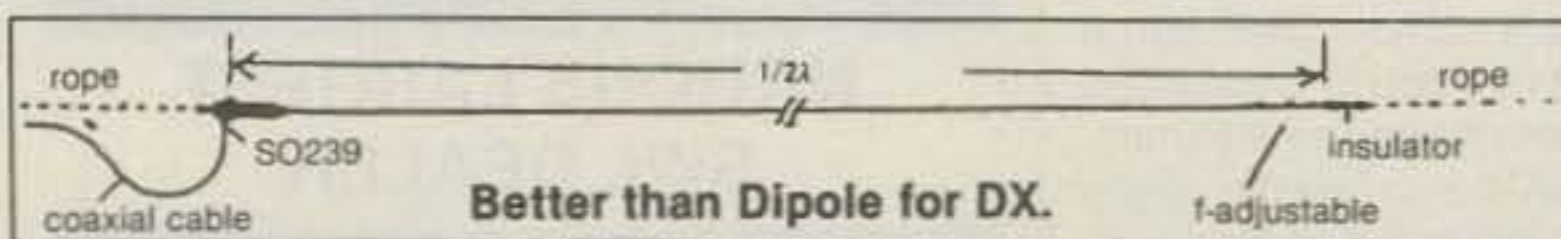
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Model	Band	Length
ZA-3.5K	3.5 MHz	131'
ZA-7K	7 MHz	65'
ZA-14K	14 MHz	32'
ZA-21K	21 MHz	21'
ZA-50K	50 MHz	9'

(Power 1KW SSB)

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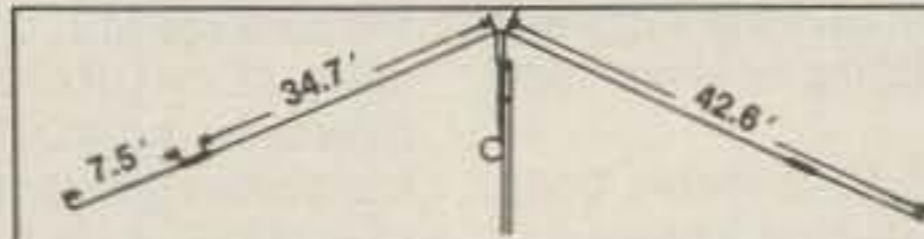


**MT-240XK**  
 3.5-7-14-21-28 MHz  
 Max. Length 72 Ft.

**MT-40XEK**  
 3.5-7-21-28  
 Max. Length 72 Ft.

**EL-40XK**  
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**C-558A 2m/440MHz Twin Band FM Handheld** • Covers 144–147.995MHz tx/115–170MHz rx (w/AM Aircraft Band) and 438–449.995MHz tx/427–470MHz rx. 2W out with std battery, 5W with 12V or optional battery. Plug-in 40 memory channel module with 200 channel unit available. Simultaneous receive on both bands, full duplex operation, AM receive. Dual LCD readouts with 23 program menus. Keyboard entry, rotary channel selector, or step with up/down keys. 7 types and 3 modes of scanning, built in DTMF paging/coded squelch as well as CTCSS encode/decode. 5 3/4" h x 2 3/8" w x 1 1/4" d, 12.5 oz. .... **\$519<sup>95</sup>**

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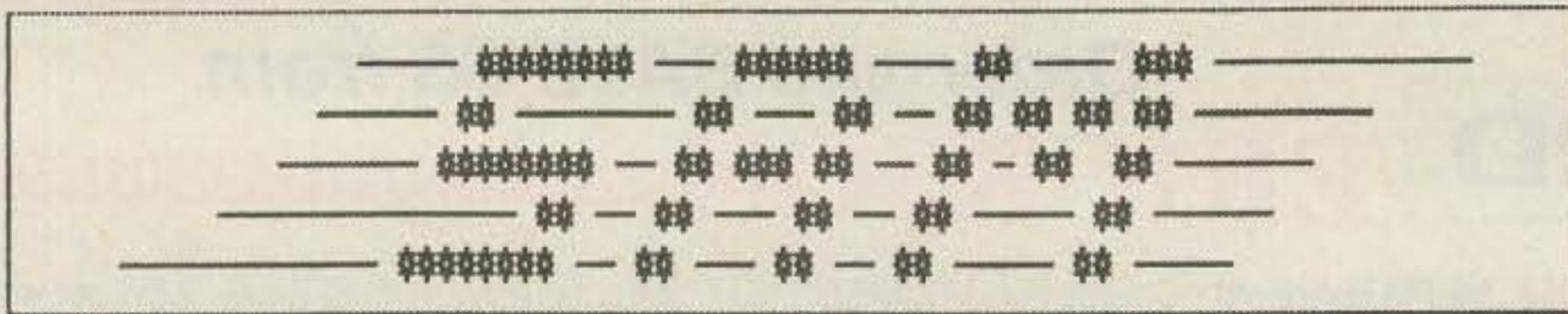
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SAM Version 1.02

Find Call

Copyright 1991, RT Systems



Enter Call for Search

WRFX

[Enter] Begin Search

[F1] Help [F2] Export [F5] Find Call [F6] Find Name [F9] Options  
 [F3] Print [F4] File [F7] Browse Calls [F8] Browse Names [F10] Exit  
 [PaUp] Previous [PaDn] Next [↑↓] Select

Fig. 3- Callsign lookup is the default mode for SAM ("Search for AMateur"), in which you simply type in a callsign and press the computer keyboard's ENTER key. If the call is in the database, the name, address, and other data for the call are displayed in the Info Window. If the call isn't found, information for a "close" call is displayed along with a warning that no match was found. You also can look up database entries by name.

and Lithuania. The program includes more than 30,000 callsigns and addresses, "then-and-now" callsign changes, internal QSL bureaus, and a quick-search feature. The program also prints mailing labels using popular printers.

Valery advises that while the program may be freely copied and shared, it is not in the public domain. Rather, it is copyrighted and offered as shareware, meaning that if you use the program, you should register it for \$15 (U.S. funds). Updated information is available every 6 months

from the distributor, 181YW. In the meantime, Valery has sent copies of the program to several U.S. and Canadian amateur shareware distributors. If you can't find R&R, you can obtain the program free of charge (with a nominal payment to cover disks and shipping charges) from the distributor, Giuseppe Iannuzzi, 181YW, P.O. Box 5083, I-80144, Naples, Italy. Fig. 5 shows the R&R "Look For" Command Window.

Also, the R&R shareware disk I received directly from Valery includes information on a

recently published book for DXers, *The QSL Managers Review*, by Sergei D. Tsybizov, UA0KBZ. The 1991 book lists over 47,000 past and present QSL managers around the world since the 1970s. It is prepared into two principal divisions, by call and manager, and by call and address. The book also includes an ARRL DXCC countries list, allocation listings of international callsign series, and lists of worldwide QSL bureaus. The book is 240 pages and is \$12 (U.S. funds). Like R&R, it is available from Giuseppe Iannuzzi, 181YW (see address above).

### From the Bookshelf

**Electric Radio.** "Ham radio the way it used-to-wuz" might be a more descriptive title for this nostalgia-inspiring monthly, edited and published by Barry R. Wiseman, N6CSW/0. In essence, *Electric Radio* (the subhead of which is "celebrating a bygone era") has since 1989 been a monthly trip down nostalgia lane which explores not just tube-type vintage radio gear, but the people who once produced and now enjoy such gear. According to its masthead:

"*Electric Radio* is published for amateur radio operators and others who appreciate the older tube-type equipment. It is hoped that the magazine will stimulate the collecting of, and interest in, this type of equipment. The magazine will provide information regarding the modification, repair, and building of equipment. We will also work towards a greater understanding of amplitude modulation and the problems this mode faces."

Despite this interest in tube-type gear and AM, *ER* puts this bygone era and its equipment into perspective, acknowledging the technical superiority of modern-day equipment but also lamenting its expense and complexity. While *ER* has historical appeal to amateurs of all ages, it is likely to win special approval from those who were first introduced to amateur radio in the 1940s, 50s, and 60s. I have to admit that as one who was first licensed in 1954, I have a special place in my heart for the "big names" in amateur radio gear of that day, such as Hallicrafters, World Radio Laboratories, Johnson, National, Collins, Harvey Wells, and all the others. An even greater place is reserved for the people who made those bygone names come alive: Bill Halligan, Leo Meyerson, Edgar F. Johnson, Bill Harrington, Art Collins, Cliff Harvey, and the other giants of the era. *ER* does a fine, sensitive, and intelligent examination of the equipment, companies, and personalities of that vintage era.

Each issue is 5½" x 8½" and runs about 40 pages. Subscriptions to U.S. addresses are \$24 by second-class mail and \$34 via first class. Canada and overseas are more. Contact *Electric Radio*, P.O. Box 57, Hesperus, CO 81326.

**Windows Books from Osborne/McGraw-Hill.** Are you having trouble adjusting to Microsoft Windows, that newfangled operating system add-on juggernaut that seems to be over-running the country? Frankly, old fuddy-duddy that I am, I'm not yet comfortable with graphical user interfaces (GUIs). Despite their popularity and many advantages, I still question the merits of GUIs for most amateur applications, and so have not yet made the big conversion from DOS to Windows.

Nevertheless, like it or not, the day is coming to make the transition. Osborne McGraw Hill, perhaps sensing such reluctance on the part of DOS users, recently sent me two excellent books that are designed to ease the transition to the Windows GUI.

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KB2FXQ N THURBER, LEE R	ONEONTA	NY 13820
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N70RV T THURBER, ROBERT F	GLENDALE	AZ 85301
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N410Y G THURBER, STEPHEN F	VIENNA	VA 22180
W2JNH G THURBER, STEPHEN H	SHERRILL	NY 13461
KB2FXR N THURBER, TIMOTHY J	ONEONTA	NY 13820
KB2DCY N THURBER, WILLIAM J	HOOSICK FALLS	NY 12090

[F1] Help [F2] Export [F5] Find Call [F6] Find Name [F9] Options  
[F3] Print [F4] File [F7] Browse Calls [F8] Browse Names [F10] Exit  
[PgUp] Previous [PgDn] Next [↑] Select

Fig. 4- You can thumb through the SAM database either in callsign or name order; here, your columnist is casually browsing the database to see how many Thurbbers are licensed amateurs. When browsing, the program shows information for several calls in the Browse Window. If you select one of the calls with the arrow keys, full information for that call is displayed in the Info Window. You also can print callsigns, save extracted information, and export data using sophisticated criteria.

The first is Tom Sheldon's comprehensive resource, the 848-page *Windows 3.1: The Complete Reference* (\$29.95), which is for readers at any level of Windows experience. Early chapters cover Windows basics, including start-up methods, working with applications, common and special commands, and more. There also is a command reference section that has topics organized for quick reference. More experienced Windows users will find all the newly enhanced features of Windows 3.1 when reading up on customizing and troubleshooting, manag-

ing memory, working with fonts and graphics, networking, and programming macros.

An accompanying mini-text is Allen Wyatt's *Windows 3.1: The Pocket Reference*. This 224-pager, produced using a special lay-flat binding, is a handy reference to all the important Windows 3.1 commands and functions. The book begins with a brief overview of Windows 3.1 and working in the Windows environment, followed by a command reference section that lists essential commands and functions alphabetically, along with brief descriptions. Each

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R&amp;R version 1.0, January 1992

Look for ...

Enter call : RA6YR

Info

CALL : RA6YR  
NAME : VALERY A. KHARCHENKO  
ADDRESS : 352700, MAIKOP, P.O. BOX 40  
REPUBLIC : RUSSIA

F1 Help F2 Label F3 Choose Printer F10 Print Call Enter Print ESC Go Back

Fig. 5- R&R by RA6YR is the online Russian and Independent Republics Callbook. This shareware program allows simple callsign searches by typing the desired callsign in the program's "Look for" Command Window, shown here. R&R also lets you print mailing labels, the format of which you can customize.

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P2AT	2mtr ht 2 watts wide RX	349.00



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P4AT	440 mhz ht 2 watts	389.00
2GAT	2 meter HT 7 watts	319.00
2SAT	2 meter HT S series	319.00
3SAT	220 mhz HT S series	299.00
28H	2 meter 45 watt mobile	329.00
38A	220 mhz 25 watt mobile	369.00
228H	2 meter 45 watt mobile	349.00
229H	2 meter 50 watt mobile	369.00
2330A	2mtr-45w/220mhz-25 w	729.00
3230H	2mtr/70cm 45/35 watts	699.00
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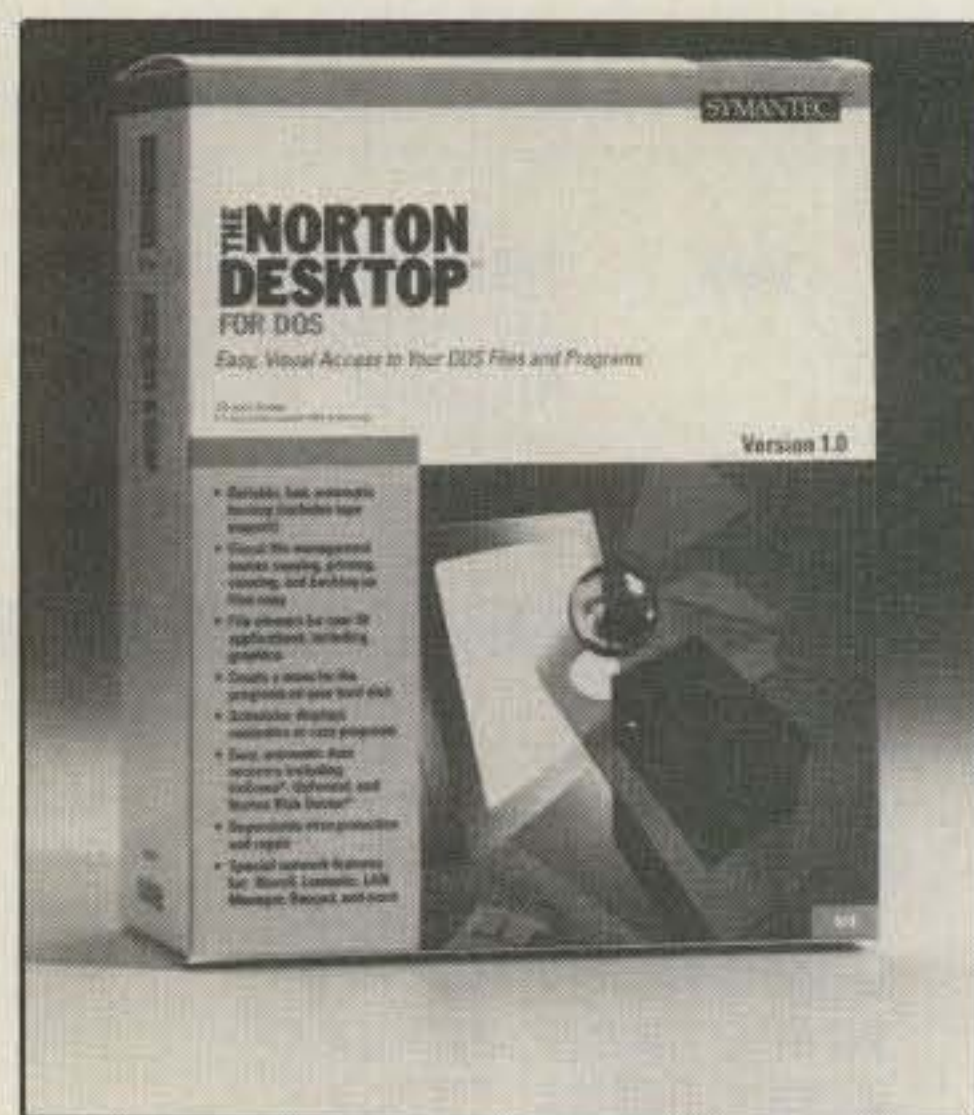
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Not quite ready to make the big move from DOS to Windows? Next month we'll take a look at The Norton Desktop for DOS. Its Window-like interface makes it easy to later move to Windows, where you'll find Norton Desktop for Windows with a similar interface and shared features. (Photo courtesy Symantec Corp.)

command listing also includes a "menu structure" that describes the series of menus to follow, "steps" showing how to invoke the command, "notes" discussing what the command does, and "tips" that provide a series of hints, warnings, and traps. The book also includes a task reference section that lists common tasks and explanations of how to accomplish them. The book is \$9.95.

Both are available through bookstores. For a catalog contact Osborne McGraw Hill, 2600 Tenth Street, Berkeley, CA 94710.

## Short Bursts

**HAM-SOFT: Alive and Well in the Lone Star State.** In last May's column we mentioned HAM-SOFT, which bills itself as the world's largest distributor of amateur radio software. We noted their 60-page catalog of IBM PC, Macintosh, and Commodore software was \$1.00. Many readers, however, found that their letters were returned. However, all is well. Proprietor Ray McKnight, WB3ABN, wrote that he simply moved his business from Louisiana to Texas, and postal mail forwarding didn't catch up with him. HAM-SOFT's new address is P.O. Box 443, Galena Park, TX 77547; the catalog is still \$1.00. (The complete HAM-SOFT catalog is also published in the 200-plus page *Amateur Radio Mail Order Catalog and Resource Directory*, available for \$12 postpaid from John Hart, N0OCF, at Hart Publishing, 767 S. Xenon Court, #117HS, Lakewood, CO 80228.)

## Wrap-Up

That's it for this time, gang. Next month more Antennas & Accessories subjects of current topical interest. See you then.

*Overheard:* If you fool with something long enough, you'll break it. So if it jams, force it; it'll need replacing anyway. Corollary: Get a heavier hammer.

73, Karl, W8FX



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## Hurricane Andrew's Destruction Affects VHF + Hams

**H**urricane Andrew's destruction was visited upon some in the VHF + community. Your editor has been able to confirm only a few incidents because of lack of communications within the affected area as of this column's deadline.

Among the VHF + amateurs affected were the following: In Florida, Marshall Goldblatt, W4EMB, in Miami, lost his tower and all antennas. Jordan Mash, WB2QLP, in Naples, lost his tower and antennas. Bruce Sternstein, K2RTH, in Miami, lost his antennas and sustained damage to his home. Pete Heins, K1FJM, who lives in California most of the year, sustained considerable damage to his antennas, towers, barn, and out buildings on his property in Homestead. Dave Baskin, N4XIH, removed his antennas before the storm, but had his tower bent from the high winds. Pete and Dave made a ceremonial 2 meter SSB QSO during the ARRL September test to signify the rebirth of weak-signal work in the affected area.

In Louisiana, Bob Taylor, WB5LBT, sustained some structural damage to his EME array. Just before the CSVHF conference Bob's place was hit by lightning, causing considerable damage to his equipment. When most of the equipment had been repaired, the hurricane hit. Bob reported that his QTH experienced sustained winds in excess of 100 MPH for over four hours during the storm. However, in the midst of the destruction, the rainbow came in the form of communications. Bob stated that he received numerous telephone calls from fellow EMEers around the world inquiring about his well being. Additionally, Ray May, K5AZU, lost his 34 foot dish that he used on 1296 MHz.

As destructive as it was, the storm was rather compact. Other Floridians fared with little or no damage. Among them were: Bev Cavender, W4ZD (north of the storm), Frank Fugle, W4FF (also north of the storm), and Rene, WB4MJE (south of the storm at the bottom tip of the Keys). Incidentally, after the storm was over, Rene spent several days in the Florida City area as a member of the Monroe County RACES team, providing necessary emergency communications. Also spared were Steve Rutledge, N4JQQ/C6AFP, Jim Cain, K1TN, and in the Bahamas, the QTH of Chod Harris, VP2ML (CQ's "DX" column editor).

Another fellow columnist did not fare so well. My friend Ellen White, W1YL, QST's "How's DX" editor, and her husband, Bob, W1CW, sustained considerable damage to their property in Homestead. As of the writing of this column, they were staying with family in Tampa. By the time you read this, their story of how they rode

P.O. Box 73, Oklahoma City, OK 73101

### VHF PLUS CALENDAR

Nov. 1	Poor EME conditions
Nov. 2	First quarter moon
Nov. 3	Apogee
Nov. 4	Taurids Meteor Shower Peak, 1838 UTC
Nov. 8	Moderate EME conditions
Nov. 10	Full moon
Nov. 11	VK5MC NA: 1040 UTC, 144.012, (Call .010-)
Nov. 12	VK5MC NA: 1140 UTC
Nov. 13	VK5MC NA: 1232 UTC
Nov. 14-15	ARRL EME Contest, second weekend (see last month's column for details)
Nov. 15	Moderate EME conditions
Nov. 17	Leonids meteor shower peak, 0405 UTC; last quarter moon
Nov. 18	Perigee
Nov. 22	Moderate EME conditions
Nov. 24	New moon. Noisy EME conditions
Nov. 26	Noisy EME conditions, Sagittarius A
Nov. 29	Poor EME conditions

(Courtesy W4ZD and others)

out the hurricane will have been told in an issue of the "ARRL Letter."

As mentioned, lack of communications prevented me from documenting more of the storm's damage. In your own local area you probably know of others who experienced losses from the storm. I know you join me, your column editor, in expressing sympathy, god-speed, and support as your (our) friends rebuild from the devastation.

### August Perseids

The consensus of the operators who played the shower was that it was not as predicted (many operators commented that the shower was very good but not as good as last year), but that at the time of the peak it was better than expected for that time of the day. Unfortunately, confusion over the predicted date caused a few operators to be off the air (and probably in bed) during the actual peak. The originally published peak (in Emil Pocock, W3EP's article in July QST) was for 2210 UTC on August 12. When Emil received a phone call from Walt Miller, AJ6T, alerting him to the possible discrepancy, Emil recalculated his predictions, and issued a revised predicted date of one day earlier. Efforts were made through announcements at the CSVHF conference, via packet, and through the "ARRL Letter" to communicate the new date. Nevertheless, the predicted *time* also became a problem. The prediction of 2210 UTC was later than the actual peak that occurred variously between

1800 and 1930 UTC (on the west coast) and between 1900 and 1930 UTC (from the midwest to the east coast).

While some slept through the peak (such as Herman, WB4DBB, and Mark, KE7NS), others worked through it (such as your editor, working on last month's column). Still others, such as Larry Murdoch, K6AAW, discovered the peak in unique accidental ways. At around 1800 UTC Larry decided to take a break and go out for a hamburger. Being the dedicated VHFer that he is, Larry took his TR-751 plus his 350 watt brick with him in his car. Fifteen minutes from home he heard Grant Furnald, VE6TA, call CQ on a long burn. Using a turnstile antenna, Larry called Grant and worked him from the car! Larry then decided that he wasn't that hungry after all.

While most of us have at least a bare minimum station of a Yagi and a brick, others of us have unique antenna systems. Dan O'Connell, WA7TDZ, lives in a condo project that has that dreaded antenna restriction. No matter to him. He has built two 5-element quads and stacked them in his large attic. They are fully rotatable (along with a 2-element quad for 6 meters and an 8-element quagi for 70 cm). From his home he made eight complete contacts, and then he got adventurous. On the night of the peak he set up on a ridge. Early in the evening he was entertained by the shower. Then the sky turned ugly. A thunder storm set off a fire about a half mile from him at around 4:00 AM. In one of his rare appearances on a repeater, he called in the fire. Dan said that he never expected to find anyone

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DRZI 1092

## New Apparent 222 MHz Terrestrial Record Set

Sam Whitley, K5SW, appears to have set a new over-land record for a contact on 222 MHz during the ARRL September VHF test. Sam, located in Muskogee, Oklahoma, in grid square EM25HR, completed a QSO with the contest station W2SZ/1, located in grid square FN32, at Mt. Greylock, Massachusetts. The distance between the two stations is estimated to be in excess of 1300 miles, which supercedes the old record held by Bill Duval, K5UGM, and John Moore, W5HUQ/4 (for the first ever recorded sporadic-E contact on 220 MHz). The method of propagation appears to have been tropo enhancement. W2SZ also completed long-haul contacts with K5UR and other stations closer to its location. More details on this record breaker in next month's column.

on at that hour, but fortunately two people answered his emergency call. Good thing, or his last great burn might have been his own.

While Bill Sattler, N0XX, did not fare as well as Dan, he also found that he could not get away from Dan. While in a conversation with Phil Krichbaum, W0KEA, on 3818 kHz, Bill heard Dan come through Phil's 2 meter radio over Phil's open mike on 80 meters.

Phil also was everywhere. He was found in log entries all over the west, the southwest, the midwest, and the east. I managed to work Phil twice, once on a sked and again later on random.

Another operator who was everywhere was Rick Roderick, K5UR. Among the exceptional contacts Rick had were completions with Paul Kelley, N1BUG, Joe Tremblay, VE1MQ, and VE1AKT.

Still others were recipients of phone calls alerting them to the peak in progress. One such recipient was Larry Lambert, N0LL. After Larry, K6AAW, called him and completed a contact with him, Lambert went on to make several more completions via randoms. Another recipient of a phone call was Dave Greer, WE4K, who, awakened from a nap by Shelby Ennis, W8WN, was able to make several contacts during the 1900 UTC spike on the 11th. He also reports good propagation during the morning of the 12th. Dave completed around 20 contacts, half on random.

Terry Dobler, KJ7F, reported working a dozen stations during the spike. He reported that it sounded to him like he was on 20 meters. Russ Seibert, N5WS, also reported that he made a number of contacts during the spike on the 11th.

Yet others were kept from the peak by Mother Nature. Emil Pocock, W3EP, reported that shortly after the peak started he was forced to QRT by a massive thunder storm that not only convinced him to stay off the air, but deprived him of commercial power, as well. Paul Kelley, N1BUG, reports that the peak occurred for him around 1900 UTC, 11 August. However, he also was forced off the air by the thunder storm.

Pete Heins, K1FJM, operating from a poor location and with low power completed two QSOs, one random (with W2CRS) and one sked (with Dan, WA7TDZ, in 15 seconds at 1856 UTC, on 11 August, during the peak).

Tim Marek, NC7K, wrestled with a blown tire on his first trip up Virginia Peak, Nevada (on the 8th), driving the last half of the distance up the

peak at 5 MPH. It seems that Tim has found a better excuse for missing a sked than falling asleep. Nevertheless, among the contacts he made over the next two days were skeds with Jim, NW7O, who roved to both DM28 and DM29, to fill in Tim's last two needed Nevada grids. Tim went back home and returned to the hill on Tuesday morning. He arrived in time for the peak and for the next 8 hours worked a total of 55 stations in 23 new grids and 6 new states. Among the states worked were WA, OR, CA, NV, UT, ID, AZ, MT, CO, NM, TX, OK, KS, ND, and SD. Tim said that he really appreciated the assistance of rovers such as NW7O, K6AAW, and AA6TZ.

Mark Hoffman, KA2RDO, reported making over 50 QSOs via skeds, random contacts, and back scatter created by the ionization from the meteors. Among his totals were 31 randoms and 27 grids. A list of stations worked include K0YMQ, K1LL, K4CKS, K5TF, K5UR, K9CA, K9MRI (via scatter enhanced tropo), K9SB, KA2DRH, KA9UVY, KB4WM, KB5NPG, KD0PY, KI5KC, KW0A, N00AKC, N0HJZ, N0JRN, N0LL, N4TWX, N5TQB, N5WS, N8PJP (via scatter enhanced tropo), NT0V, VE1SLM, VE3JJX, W0DFK, W0GR, W0HP, W1ENQ (via back scatter), W1FJH, W5FYZ, W8WN, W9NHE, WA0KBZ, WA4CHA, WA9KRT (via scatter enhanced tropo), WB0DSW, WB0YFE, WB4JEM, WB5IGF, WB5YWI, WB9GKA, WB9UWA, WD0SWD, WF9X, and WQ5S. Mark, as well as others, stated that in their observation the peak, for the short time it was present, was more intense than last year's peak.

Jim Phillips, KA3WSZ, completed 18 contacts in 9 new states, while at the same time giving a number of those 18 contacts their first Delaware QSO. Incidentally, Jim has purchased an EME array (K13W's 4 x 4218's) and will be active on the moon very soon, if not already. Incidentally, Jim took time out from 2 meters to give Dennis Pugh, K7VAY/8, his 50th state on 6 meters (on 9 August at 1029 UTC). What was remarkable about this contact was that Jim was running 10 watts into a 3-element Yagi only 20 feet high and Dennis was running 30 watts into a halo antenna at 40 feet.

Greg Cerny, WQ0P, felt that the shower was not as good for him as previous years. However, he did work three new states. State number 45 was Gayland Kellison, WI7Z, in Washington. State number 46 was Chip Taylor, W1AIM, in Vermont. State number 47 was Don Cook, K1DPP, in Massachusetts. Greg reports that he ran with a station in Oregon for 2½ hours without success. Nevertheless, he has made quite an accomplishment, having worked all the others terrestrially, without EME assistance. Greg wonders how many others have worked the "lower 48" without the moon.

Shelby Ennis, W8WN, reports that from his experience, this shower was the second best shower he has observed since beginning operating meteors in 1955. He worked two new states and around six new grids, all on random. He also reported that on the 12th the shower-caused propagation came in large flurries. Shelby reports that the flurries he observed were similar to those reported in an article on visual observation that appeared in the November 1985 issue of *Sky and Telescope*. He feels that the bursts of activity followed by inactivity are worth further studies.

Greg Poel, KC8P, reports that he ran 65 skeds and completed 29 of them. He stated that the conditions on the 8th were a little worse than on the same day last year. Greg goes on to say that condition on the 9th were about the same and



that the conditions on the 10th and the 11th were not as good as the previous year. Unfortunately, he was not on the air during the spike the afternoon of the 11th. Nevertheless, he reported that on the 12th he also observed the flurries of propagation.

Mark Moulding, KE7NS, reported that he contacted 21 stations in 15 new grid squares, thereby putting him over the top for VUCC. He also reported the less than average performance on the morning of the 11th. However, after sleeping through the spike, he reported great success with his skeds overnight from the 11th to the 12th.

While completions on 222 MHz were few and far between, one 222 MHz sked was awarded with Grant, VE6TA, by Chip Angle, N6CA, during a long burn on 2 meters. On 2 meters Grant made 30 other contacts with 24 stations in 9 states.

Conversations with Terry Baxter, N6CW, and other southern Californians indicated that the propagation for them was mostly north-south during the peak of the 11th. Terry reported that he had 13 QSOs in three new grids, with only two of the QSOs via skeds. Other players on the west coast included Charlie, K6UIY, Todd, KB6IGC, Pat, N6RMJ, Jim, WB2ODH, Gordon, WB6NOA, and Walt, AJ6T. Among the stations worked were WB0QMN, KJ7F, KB7N, WA7TDZ, N0XX, VE6TA, VE5LY, W17Z, W0KEA, and WB7Q. Walt reported that he worked about 20 stations, most of them random. It was interesting for him to note the number of stations he worked on back scatter. He stated that when he pointed his beam to the northeast, he could hear stations from all over (including WB6NOA, and other stations in southern California). It was, for him and for me, our first awareness of back scatter on 2 meters related to meteor scatter.

Todd, KB6IGC, completed eleven contacts. Among his log entries on the 11th were VE6TA (random), N7AUV (random), and KJ7F (random), all during the spike. On the 12th he worked K7IEX (sked), KT7G (who tail-ended the IEX sked), N0XX (random), AA7HN (random), N6CL (partial, he got my callsigns, on a sked), WB7Q (random), K5WX (partial, random), W1XE/0 (random), and WB7Q (again on random).

I completed contacts with the following: VE4AQ (sked), W3ZZ (sked, although I heard Gene often on randoms), KE7NS (sked), KM4ID (sked), NW3C (sked), KN5S (random and heard several times later), K0ALL (sked in less than a minute), W8CM (sked), W0KEA (sked and random), NW7O (random), KB8FT (random and heard several times before and after), K1RZ (random), and WA4VCC (sked in three minutes, during a 40 second long burn that found us rag-chewing about the length of the burn). In addition to the meteor-caused propagation, we in the southwest also experienced tropo enhancement. The following stations were worked during the shower via tropo: K0VUA, WB5IGF, KA2DRH, K5IS, W0PW, and KD0HE. Additionally, N4VC and W5AL were both heard (but not worked) trying to work each other via tropo. I believe that because of the tropo conditions, the meteor contacts with W8CM and K0ALL were probably enhanced by the tropo conditions.

An additional report I received was initiated by my article (on listening to the Perseids on your FM radio) in the August issue of *Sky and Telescope*. Joe Rao, from Compu-Weather, Inc., of Flushing, New York, contacted me concerning that article. From our conversations I discovered that Joe, although not (yet) a ham, is very interested in weak-signal VHF communications. Fol-

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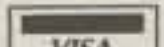
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The Toronto VHF Society has been given permission to use the Algonquin Park (north of Toronto, grid square FN05) Institute for Space and Terrestrial Science 46 meter (150 foot) dish. The dish is fully steerable and usable to 30 GHz. While details have yet to be fully worked out at press time, it is probable that the dish will be available for the ARRL EME test. It is the intent of the group to primarily operate on 432 MHz. According to Mike Owen, W9IP, an operator with an Oscar array is potentially workable with this dish. Among the operators are Dennis Mungam, VE3ASO, Hanz Peters, VE3CRU, Peter, VE3EMS, and Mike Owen, W9IP. More details will be forthcoming in a future column.

Following the shower, Joe sent me a copy of a letter that he sent to S&T. Within his letter he quoted a letter from Dr. Brian G. Marsden, head of the Smithsonian Astrophysical Observatory, Cambridge, Massachusetts. Dr. Marsden is looking for the possible return of the Swift-Tuttle Comet (possibly this month). He believes that the increase in Perseids activity this year was a result of the relationship to the comet's possible return. From the observations he made of this year's shower, he concludes that next year's spike will occur around 0100 UTC, 12 August. He goes on to conclude that there is the "... potential of another outstanding Perseid display in 1993." (Because the moon will be in the third quarter, the visual display may be awesome. A future column will go into more depth on some of Dr. Marsden's reasoning for the potential for success during next year's Perseids.)

Joe concludes his letter by citing an unconfirmed report from Okinawa that the visual display for this year resulted in a count of 8000 rocks falling per hour.

While so much fun was had by the participants of the shower, there were some drawbacks that need to be addressed. First, there were a number of reports from the players (myself included) that indicated QSOs with hams who had no idea that the meteor shower was in progress or what the effects of the shower were. Some players experienced frustration when some of the non-participants ragchewed on the calling frequency, thereby preventing the players from making random contacts. Third, the calling frequency was monopolized for randoms. In metro areas, where a number of amateurs were trying to work the shower at the same time, no one really was successful. As for solutions to these drawbacks, it seems that they are hard to find. If more skeds are a possible solution, I would be happy to maintain a data base of persons interested in making meteor-scatter skeds and sharing this data base with whoever wishes for the cost of copying it. Perhaps you as readers have some other ideas. Please write and let me know.

My appreciation goes to Shelby Ennis, Joe Rao, Mark Hoffman, Mike Owen, Emil Pocock, the "West Coast VHFer," and so many of you who answered my late-night phone calls to compile these reports on the Perseids.

## More on Meteors

One of the respondents to my article in *Sky and Telescope* was the Kirkpatrick Planetarium in Oklahoma City. They wanted me to put on a display of amateur radio during the Perseids. However, because of the short notice, I declined for that shower but suggested a future shower. We agreed on setting up a display on January 4, 1993, in time for the Quads. It was suggested

by them that perhaps schedules could be set with other amateur radio stations at other planetariums around the country. Are you interested in becoming involved with your planetarium on such a project? If so, please contact me so we can coordinate a possible sked.

**This Month's Showers.** The showers for this month include the Taurids and the Leonids. The peak day for the Taurids is 4 November at 1838 UTC. The peak day for the Leonids is 17 November at 0405 UTC. Neither of these are normally strong showers. However, the Leonids have been known to produce storms, and it is predicted that one may occur in 1998 and possibly 1999.

## Current Contests

Did you see the cover of August *CQ*? Bob Jones, KH6O, has quite an array for satellite and EME work. He reported that each of the helixes now have 16 turns. He is ready to run with you on 432 MHz during the second weekend of the ARRL's EME contest. The dates for this month are November 14-15.

Do you think EME is out of reach for you? Well, think again. I hooked up my TE Systems 1452G to my Ham Pro H144-15 antenna and pointed it at the moon at my moon rise on Saturday, 14 August. Paul, N1BUG, heard me. He got full calls. Unfortunately, Faraday rotation killed our attempt. Nevertheless, I will be back, trying again. You too can try to work stations such as W5UN, KB8RQ, DL8DAT, SM2CEW, N5BLZ, K2GAL, and VE7BQH during the contest (or for that matter, anytime else the moon is right for you). If I can be heard with a short (18 foot) boom antenna and 400 watts and Ray Soifer, W2RS, can be heard with a long boom antenna and 150 watts, so can you. So give it a try. Won't your repeater operator friends be amazed when you tell them that your signals were bounced off the moon!

## News From Canada

I have said this before and with good reason. We in the States need to turn our antennas northward so we can communicate with our good neighbors in Canada. Thanks to Dana Shtun, VE3DSS, VHF editor for *QST Canada* (and the new vice-president of the newly formed Radio Amateurs of Canada), I have received some news from our friends up north.

Here is one opportunity for you to check into a regular net. The Gaslight Net meets on 144.240 MHz every night at 9PM, local. VE3HFU is the net control.

Rene Barbeau, VE2UG, is active from FN08, with 500 watts and 14 elements. For skeds, con-

tact him at CP 779, Evain, PQ, J0Z 1Y0, Canada.

A new beacon, VE2TWO/BCN, is now active from FN58JO on 144.277 MHz. The equipment used is a 25 watt transmitter feeding an omnidirectional antenna. Contact Bernie, VE2LC, for more information or to send him reception reports.

Dick Staron, VE3FAC, has designed a cavity for 33 cm. The cavity is based on Chip, N6CA's 1296 MHz amp. For more information, contact him at 10 Forbes Road, Scarborough, ON, M1P 1K9, Canada. You may also call him at 416-288-0569.

There are a number of stations now on 13 cm in the Toronto area. They include VE3WCB, VE3SMA, VE3DJ, VE3BFM, and VE3BFM.

Kazu, VE7RJU, used the special callsign CY7J, for a 6 meter mobile operation during late August and early September, while driving between Vancouver, Banff, Jasper, Calgary, and back again. He operated principally on 50.110 MHz, and 14.280 and 21.280 MHz on the low bands. QSLs go to his Callbook address.

Ed Kucbel, VE3KRP, reports that he, Vic, VE3JAR, Pete, VE3MOE, and Don, VE3CAP, operated the June ARRL contest from fairly rare grid square EN59. Operations were on 6 and 2 meters. Ed stated that the files were horrible and the temperatures were near freezing (in June?) at night. However, they did enjoy barbecued moose steaks between bursts of propagation.

Ed also mentioned in his correspondence that he operates a beacon (VE3TBX) on 144.280 MHz. It runs 25 watts from EN58 with an antenna that is oriented southeast.

Grant, VE6TA, reports that he had two 2 meter sporadic-E openings this past summer. The first was May 23, when he worked K6PVS, K7QXA/6, and WA7TDZ. The second was August 6, when he worked five stations in southern California. Among the entries in his log on that day were Terry, WA6HDX, Jack, N6XQ, Chip, N6CA, Charlie, K6UIY, and Todd, KB6IGC.

Bruce Johnson, VE4KQ, experienced a brief sporadic-E opening on 2 meters on June 19. Among the stations worked were Fred Fish, W5FF, and Rick, K5UR. What happened to Oklahoma, Bruce?

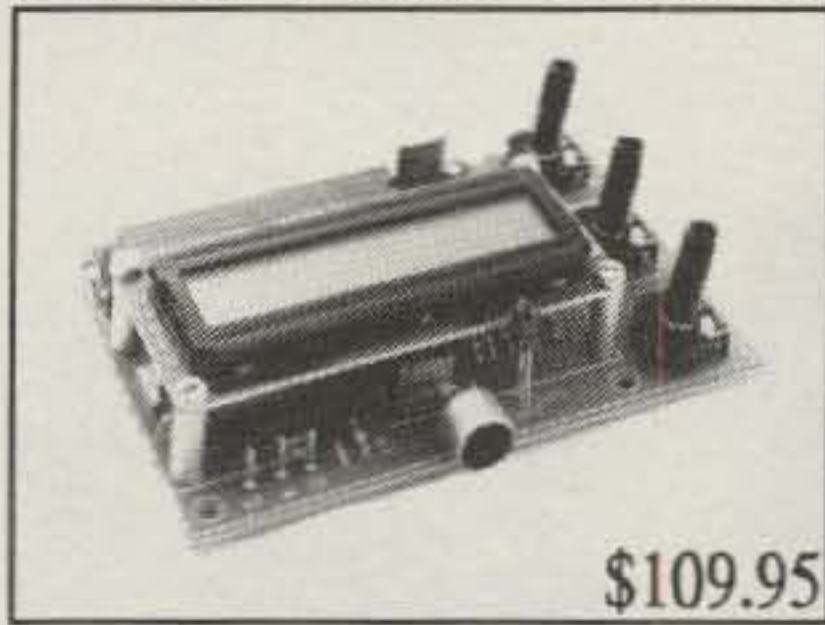
## Two VHF Operators Injured In Separate Accidents

Jack Henry, N6XQ, suffered a crushed right elbow and a fractured left wrist as a result of a fall in Kerrville, Texas, following the CSVHF conference. For awhile in August he had both arms in casts (he didn't discover the break in his left wrist until almost a month after the fall). He is now undergoing physical therapy for his right arm. Jack has received many well wishes from his friends who knew of the accident. However, you can also drop him a get-well card at his home address of P.O. Box 7732, San Diego, CA 92167-0732.

Shep Shepard, W7HAH, fell off a ladder while painting his house August 2. The fall crushed the right side of his hip and chipped his right elbow. He was evacuated to a hospital in Seattle, where he spent the next three weeks there having his hip rebuilt. The doctors say that he should be walking again by December. Shep has also received many well wishes from friends who have known about the accident. However, I am sure he wouldn't mind hearing from you, as well. You can contact him at 471 Groff Ln, Stevensville, MT 59870.

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Ron Hammel, KC6WLC, operating from the Bonneville Salt Flats in Wendover, Utah (grid square DM29) on August 14.

## Grid Expeditions

Bryan Snyder, WA8MZQ, along with his wife, Janice, made their annual trip to Manitoulin Island, Ontario, Canada this past July. However, this year they took amateur radio equipment along and started out their trip by making a detour to FN06. In that grid square he set up on the grounds of the Canadian Air Force base at North Bay. On the evening of July 15 Bryan made his first contacts from that grid square. From then through the morning of July 18 he made 200 contacts on 6 and 2 meters via tropo, sporadic-E, and meteor scatter. His best DX on 6 meters was DM42. His longest contact on 2 meters was a meteor-scatter contact in EM74. He reported one brief sporadic-E opening on 6 meters. He pointed out that because of his past experience of working sporadic meteors on north-south paths in the early morning hours, he was prepared to make random contacts on 2 meters and was not disappointed. (Bryan states that others should make use of this diurnal event in order to complete north-south QSOs. He says his experience shows that these meteors are effective from early July through December.)

For the next several days Bryan went fishing and hiking with his family and their host family on Manitoulin Island. On July 22 he went to EN86 at Elliot Lake. From there, for the next 20 hours he made 100 contacts on 6 and 2 meters. His best DX on 6 meters was EL89. His longest DX on 2 meters was again to EM74, via a random meteor contact. From there he went back to Manitoulin Island.

At this time in their vacation they were joined by Ivan Thackery, KB8BKS, and his wife, Linda. Bryan and Ivan teamed up to operate from Manitoulin Island, in EN85, from July 25-29. Their best 2 meter contact was a contact in EM45. From there they went to EN96. They operated the evening of July 29 and the morning of July 30, making around 60 contacts.

Bryan expresses his appreciation to many of his Canadian friends who made his trip possible. Among those who helped were: from FN06, Paul Caccamo, VE3KOI, and his wife, Wanda, VE3KOJ (Paul is with the Ontario Provincial Police), and the officials of the Canadian Air Force base at North Bay who gave him permission to operate from that QTH; from EN86, Glenn Mitton, VE3GMI, and his wife, Catherine, VE3CYM, Mike Ladouceur, VE3JIG, Harold Kenney, VE3HK, and Ken Stainthorpe, the Chief of Police of Elliot Lake, Ontario; and from EN96, Allan Boyd, VE3AJB, who is with the Ontario Provincial Police in Little Current, Ontario. He also appreciates very much the assistance of all the relay stations, particularly on 2 meters, who made possible the many long-haul VHF contacts.

Super-enthusiastic and super-active VHFer Ron Hammel, KC6WLC, took a rover trip to the Bonneville Salt Flats in Wendover, Utah on August 14, 1992, giving four amateurs—Hank, W6GGV, Henry, KD6LFB, Charlie, K6UIY, and Todd, KB6IGC—grid square DM29 on 2 meters.

Tom Legget, N5KWB, and N5JBZ operated from EM33 on August 15-16. From there they gave contacts to W5FYZ, KA5ULI, KF5IU, WA5YOU, and KB5IUA on 144 MHz. They also worked KA5ULI and WA5YOU on 222 MHz and 432 MHz. Additionally, they worked KD5IZ on 432 MHz.

## More Band Openings

**More Reports of 6 August 2 Meter Sporadic-E Openings.** Bill Hein, AA6TT, reports that he worked 19 stations, mostly in the northwest and northern California, during the spectacular sporadic-E opening of 6 August. Bill commented that he heard Dan, WA7TDZ, for over two hours, with S9+ signals. Steve Phillips, W7GZ, reports that he worked WE7P, WA7GSK, W17Z, WA7TDZ, N7MWV, WA7OEU, KE7CX, AA7NH,

and N0XX during that same opening. Previous reports showed southern California working northeast and operators in the northwest working east. It appears that there may have been two active clouds over the Nevada/Utah area during the opening.

**Great Tropo on East Coast Causes Pile-up.** A tropo opening that exhibited propagation all the way up to 3456 MHz took place between 21-22 August. Among the players was Joe McIntyre, WA4ZIA, who had a pile-up of stations on 432 MHz. After working everybody on the band, he QSYed to 1296 MHz, where he worked everyone again. A short while later he worked Dave Hackford, N3CX, on all bands, from 432 MHz to 3456 MHz. He discovered later that during the 2304 MHz contact he was running two milliwatts.

On the other end of the circuit Dave was having his fun. He worked K0BI/8, WA8EUU, K8MD, W8UCI, W3QIZ, K3SIW, and W0RAP, all on 432 MHz on Friday evening. Then on Saturday evening he worked K4CAW on 432 and 1296 MHz. Next he worked WD4KPD on 432 and 222 MHz. Then on Sunday morning he worked N4EVV, WB4TQD, WR3I/4, and WB4YWI, all on 432 MHz. He topped off the morning with the above-mentioned QSOs with Joe. Next, on Sunday night he worked K4CAW on 432 MHz. Then WA3AXV, K4CAW, and Dave had a round-table QSO on 1296 MHz. Next he and other Pack Rats worked K2UOP/8 (in West Virginia) on 1296 MHz. He then worked WD4JQV on 432 and 1296 MHz. Finally, Mike, KM4ID, showed up on the Monday night net to give the Dave and the rest of the Rats who checked into the net a contact with South Carolina on 432 MHz.

**Another Hawaii to California Opening.** Reports from Terry, N6CW, Chip, N6CA, Jack, N6XQ, and Bob, K6QXY, indicate that propagation between Hawaii and California existed for a couple of days between 24-25 August. The 432 beacon first was reported by Bob. Then the guys in southern California got into the act after Paul, KH6HME, made it up the volcano. Terry, Chip, Jack, and one other Californian made contacts with Paul. Attempts were made between Chip and Paul on 903 and 2304 MHz, but with no success. Chip remarks that it took him three weeks to make the records on the other microwave bands and that he is ever hopeful of making contact on these two bands, as well as X band (10 GHz).

**More East Coast Tropo.** It appears that 25 August was a great day on both coasts. Andy Blackburn, WD4AFY, reports that he had an opening to the mid-Atlantic/New England area on 2 meters and 70 cm. On 2 meters, beginning at 0018 UTC, he worked the following stations: K2TXB, WZ1V, W2MCF, K1TR, N2LIV, W1HAD, N2FRB, and KC4YAM. On 70 cm, beginning at 0026 UTC, he worked the following stations: K2TXB, K1FO, W1HAD, WC2K, and WZ1V. Andy reports that it seemed to him that he was the most southern station to get in on the fun. He said that it was frustrating to hear stations 100 or so miles north of him having a field day while he struggled to break the pile-up. Nevertheless, he did manage to have his share of the fun.

**Auroral Openings.** As this column is being prepared, the WWV reported K index has made it up to 8. Rumors of Aurora stimulated openings are starting to surface. Next month's column will carry details of any reported on activities.

**6 Meter F2 Openings.** While it is late in the solar cycle, there is a school of thought that suggests that we have not seen the last of the F2 openings. And this is the time of year for such activities. So be prepared. If you need South Africa, you might be on the lookout for ZR1AEZ,

ZR1EV, ZR1AFC, ZR1L, ZR1GD, ZR1AAH, ZS1RL, ZS6WB, ZS6LW, ZR5ADQ, or ZS4S. Johan le Roux, ZR1AEZ, writes that he is active on 6 meters most of his spare time, running a converted Midland CB, having 40 channels between 50.010 and 50.400 MHz, with 15 watts PEP output into a 5-element Yagi 6 meters high. He states that the conversion was done by ZR1EV and that there are other hams in South Africa using similar radios.

## And Finally

This is the month we in the USA take time out to be with our families and be thankful. Please remember that more important than your hob-

by is your family. Spend time with them and let them know how much you appreciate them, especially when they put up with your hours in front of the radio.

This column is being finished the morning of the ARRL September contest. I hope to have some of your reports of activities in next month's issue. I really appreciate all of you who send me your reports of any of your VHF + activities. Remember, this is your column, and the success of this column is because you make your contributions to it. Please keep sending your reports to the address at the beginning of the column. If you just can't wait, however, call me at 405-528-6625. Next month I think that Santa is going to bring me a FAX machine! If he does, I will let you know. Until then . . .

73, Joe, N6CL

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CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

## Upgrading To The Next Level

Recently the packet world lost two people instrumental in the promotion and support of packet radio in the southeast. Dennis Barrow, WB4GQX, passed away in August, and Bob Grant, WD4BIW, became a Silent Key in early September. Not only will the packet community feel the loss, but I have lost two close friends.

This month's column is dedicated to their efforts and is written in their memory.

—Buck, K4ABT

**S**ince its beginning over a decade ago, our digital hobby has taken on many new faces. We have come from the slow pace of 300 baud to baud rates that now surpass 56,000 bytes of data per second.

In this month's column we will discuss some of those changes, and some of the hurdles that are still ahead. One of the obstacles that now confronts us is the slow pace of change relating to baud rates. No one is ready to say to what level our packet speeds will go next, yet the user level seems to be locked at the 1200 baud rate.

Although we have an easy means to implement 2400 baud in most TNCs, there appears to be some kind of mental constraint that stops the majority of packeteers short of the next speed or level. However easy it may be to add 2400 b/s to a TNC, there

is still an invisible stop-gap that stands in the way of most packet users.

The Kantronics 2400 baud modem can be installed in the KAM and KPC-4 with as few as three PC board trace cuts. As a matter of fact, Kantronics has the KPC-2400 TNC, which operates all three speeds (300, 1200, and 2400 baud) in a ready to plug-'n-play box. The MFJ-2400 modem is easily installed in the TAPR TNC2 clones and the MFJ-1278 (Turbo). The MFJ-1278 can be purchased with the 2400 baud modem already installed. The 1278 is then called the MFJ-1278/Turbo.

The reason I mention the 2400 baud speed is because there are those who want to use the faster speeds, yet they do not wish to modify their transceivers for the 9600 baud modem installation. The 2400 baud modem does not require any changes to the transceiver, and in most TNCs there is very little modification needed. Even adding 2400 b/s to an AEA PK-232 may take as little as two hours, depending on the number of interruptions during the task.

The Kantronics 2400 baud modem and the MFJ-2400 baud modem can be installed in other TNCs with only minimal changes to the TNC. In some cases the user need only remove jumpers from the modem header, push the modem connector into place, and give the command for 2400 baud. Even if your system does not have 2400 baud switches, or nodes, you

can enjoy faster throughput with local connects via 2400 baud.

Once we break away from 1200 baud, the next step up will become much easier. Maybe it's because the "plug-'n-play" syndrome has become ingrained. One way to break that hold is to leap into a project such as the one we discussed in last month's "Packet User's Notebook."

### Speaking of "Keeping Pace"

Two years ago I reviewed a terminal program called "MULTICOM." MULTICOM is written to complement the MFJ-1278/Turbo multimode controller. At that time the MFJ-1278 supported packet, AMTOR, RTTY, CW, NavTec, FAX, and black-and-white slow-scan transmitting and receiving.

Since then there have been many changes in the MFJ-1278 and MULTICOM software. The addition of color SSTV and support for the Robot, Scottie, Martin, and 72-second color SSTV modes has turned this combination into the digital amateur's dream.

### MULTICOM Version 2.2

Included in MULTICOM version 2.2 is the capability to convert the PC PAINTBRUSH (ZSoft ©) PCX pictures into one of the more popular SSTV modes mentioned above.



A picture I received using MULTICOM version 2.2. (The original is in vivid four-color.)



A 16-level facsimile picture transmitted and received by MFJ MULTICOM version 2.2.

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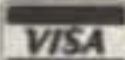
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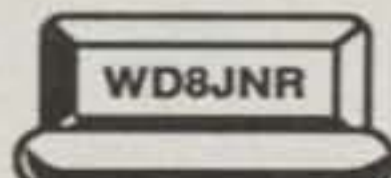


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When you press the F5 key and bring up the SSTV menu you will see the **C**, or convert, command. Once you invoke the convert command, the current directory is displayed. You may change directories or select a PCX file from the current directory. You may use the arrow keys to select (highlight) the PCX picture you wish to convert. After you've made your selection, you are prompted with a menu of the SSTV formats into which you can convert the PCX picture.

The color SSTV picture is written to the screen as it is received. After the picture is complete, a beep sound indicates the screen is ready to be saved. Press the **S** key and you are prompted to give a title to the picture. Type the file name and press **Enter** and the file is saved into the designated subdirectory.

I give the Scottie 1 pictures the extension **SC1**. The 72-second color pictures I give the extension **72C**. You may wish to establish your own format to identify the type and mode of SSTV picture(s) on your disk. I save these pictures into a subdirectory that corresponds to the picture format and type.

The subdirectory for Robot 72-second color pictures might appear as follows:

**C:\STV72C**

Again, the manner in which I save my files is a matter of personal choice, and you may have a better identification method for your SSTV picture storage.

## Packet Picture Support In MULTICOM

Included in MULTICOM software is the capability of sending and receiving high-resolution 256-color pictures via packet. These VGA pictures actually appear on the screen of your PC or compatible VGA monitor. The pictures spool (save) to disk as they are appearing on the screen. The packet VGA pictures may take twice as long to send, and in some cases they may take even longer. The time it takes to send a packet picture depends on the baud rate you use. In either case, the packet picture differs from the SSTV picture because the packet picture is error free. Slow-scan television pictures do not use forward error correction. Thus, they may be subjected to noise streaking or other picture information loss.

## Sixteen-Level WeFAX

Another improvement in the MFJ-1278 is seen in the weather facsimile (WeFAX) feature. There is now a software switch that enables switching between 2 and 16 levels, or gray scales. In prior 1278 releases the maximum gray-scale display was eight (8) levels. If you have satellite

## FAX FORMATS AND FREQUENCIES

FAXMODE (n)	Lines Per Minute (LPM)	Line Per Second (LPS)	Type of Service
1	60 line/min.	1 line/sec.	Wire Photographs
2	90 line/min.	1.5 line/sec.	
3	120 line/min.	2 line/sec.	Weather FAX
4	240 line/min.	4 line/sec.	Satellite Weather
5	360 line/min.	6 line/sec.	

FAX STATION FREQUENCIES					
Service	Side Band	Frequency (KHz)			
Weather	USB	3,357.00	4,268.00	4,975.00	6,946.00
		10,865.00	12,125.00	20,015.00	
Photographs	LSB	10,680.70	17,673.90	18,434.90,	20,738.00

FREQUENCIES (by location)				LOCATION
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9,389.50	11,035.00			Brentwood, NY
4,793.50	10,185.00	12,201.00	14,671.50	Washington, DC
9,157.50	17,447.50			Mobile, AL
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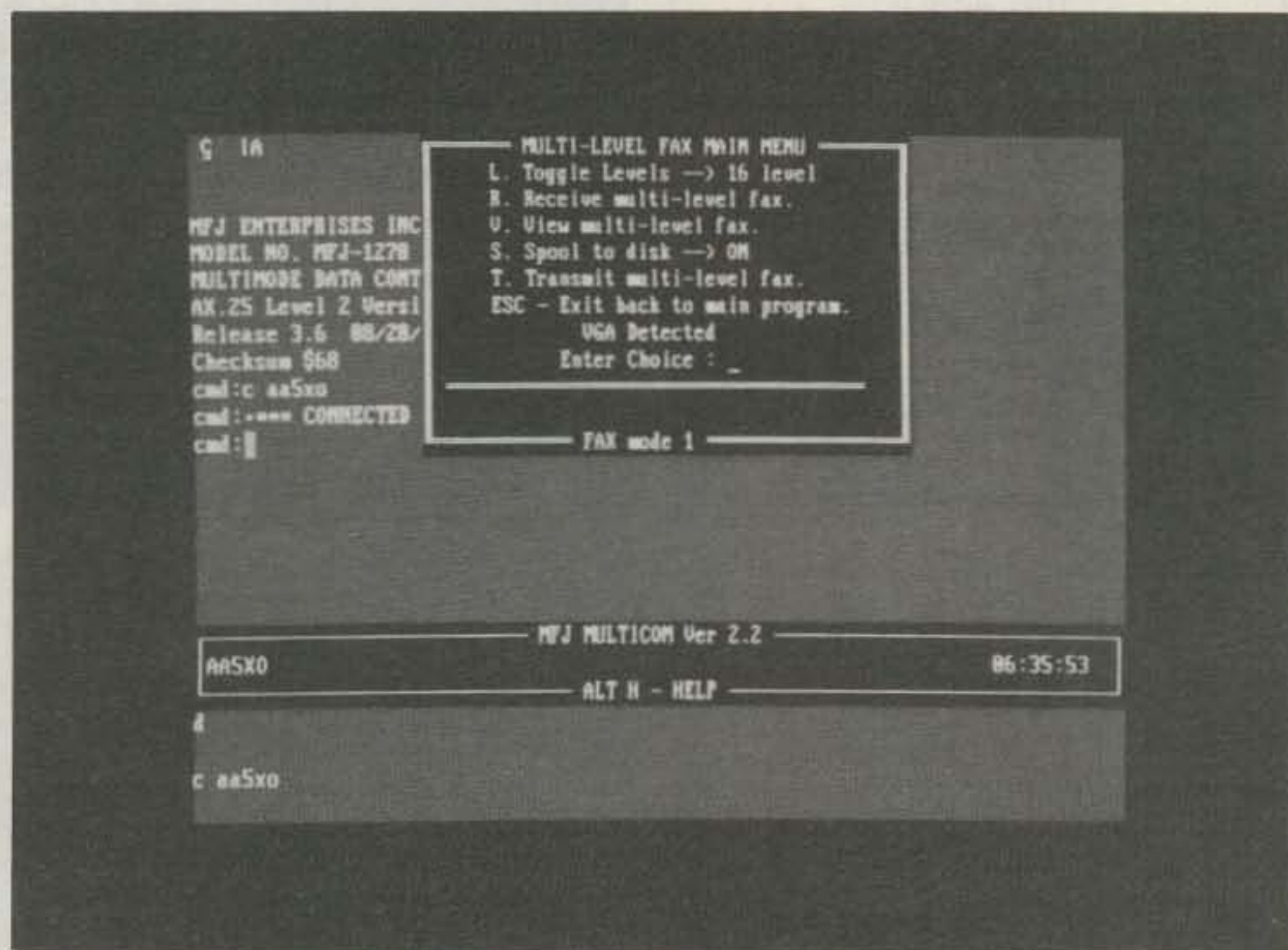
Table I- This table provides the WeFAX user with some of the available facsimile frequencies and defines the various FAX modes. (Note: Some modes and frequencies may change without notice.)

receiving capabilities, there are many commercial wire and news services that send regular broadcasts in FAX mode 1. FAX mode 1 is a very high resolution facsimile display mode that is used by newspapers and some television news and wire services.

You do not have to have satellite receiver capabilities to receive facsimile from the weather service broadcasts. There are many WeFAX broadcasts throughout the day. In Table I, I have listed some of the fre-

quencies where weather facsimile broadcasts can be found. Most WeFAX broadcasts are on upper sideband. It doesn't take long to become proficient at tuning in WeFAX signals.

Like the packet picture reception, the MULTICOM program handles the WeFAX pictures in much the same manner. They are displayed on the screen and spool to disk as they are being received. The difference is the WeFAX file is always saved as **INCOMING.FAX**. To rename the file to



The multi-level FAX main menu of MFJ MULTICOM version 2.2



another title so it will not be over-written with a later file, you may use the F7 directory display; highlight the **INCOMING.FAX** file, and then press **ALT N** and rename the file to another filename.

### Auto-Monitor Alarm (String Trap)

Here is a feature that is often used by DXers and the users of the various packet DX spotting networks. For the DX packet spotting network user the Auto-Monitor feature will prove to be one of the greatest assets for grabbing those hard to get calls and prefixes. This feature also enables the user to set a string of letters or characters to "trap" an on-the-air string that is exactly the same as the trap string. This feature will work with packet, RTTY, CW, AMTOR, or any of the digital text modes associated with MULTICOM and the MFJ-1278.

To set the "Trap" (string), at the **CMD:** prompt press the **ALT** key and the **M** key. Then type the string just as it should appear when displayed on the screen when heard by the controller (the Auto-Monitor is case sensitive). As an example, I press **ALT "M"** and set the string to **>CQ** and press **Enter**.

A "nested" CQ will appear on the screen when someone connects to a node and issues a CQ. With the MCOM ON, the controller sees the callsign and the "greater than" CQ (**>CQ**). This will trigger the Auto-Monitor alarm, and all you have

to do is issue a connect or give a call to the station who called CQ.

Another way to use the Auto-Monitor alarm is when operating HF AMTOR, RTTY, or packet and chasing DX. Set the string to any string of the callsign or country prefix that you need and go about your affairs. If a prefix bearing the "trap string" you have installed with the **ALTM** appears on the screen, it will trigger the alarm and you are on your way to capturing another needed DX contact.

Sure, this gives you an advantage over other stations since you will have the benefit of the alarm sounding to let you know the station you need is there. You will

get first crack at it because the alarm caught the prefix on the first pass.

The Auto-Monitor (trap) alarm can also help you locate another station you may be looking for. Use the **ALTM** to set the string to the callsign of the station you are searching for. Following is another example.

My son, Glynn, lives in another state some 400 miles away. He sometimes connects to me via the ROSE network. If I'm out of the room, I'll miss his connect. However, if I have the Auto-Monitor set with his callsign (WB4RHO) in it, the alarm will call my attention to his connect, and I can converse with him, not missing his call.

```

;AUTO-ROUTER
C WB4RHO V K4ABT-7,205677 ;Connect from the ROSE @ Nashville,
;Tennessee to Dothan, Alabama

;Auto-Router
C ABT8 ;This Auto-Router connects Node to node until final
;destination station is reached. On detection of a CONNECT
;to ABT8, it then sends the next connect request to THO2.

C THO2
; On detection of a CONNECT to GFN5, it will send the next
; node connect request to RHO2

C RHO2
; On detection of a CONNECT to WGA5, it will send the next
; node connect request to WB4RHO BBS

C WB4RHO
; The "AUTO-ROUTER" then gives the originating station a
; display advising that the connect is complete. If the ALT
; S in MULTICOM is set for sound ON, the chimes will sound
; an audible connect signal.
  
```

Table II- Examples of actual Auto-Router files complete with ; comment lines.

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N Connector	For 9913, 9086, CQ-Flexi	\$3.15
Connectors	Full line of Connectors & Adapters	
RG-8X	95% Braid, premium quality	16¢
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#14 Stranded	Hard-drawn (7x22) special antenna wire	8¢
#14 Stranded	Copper-clad (7x22) special antenna wire	9¢
#14 VarFlex	19 strand CuClad, flexible, tight strand	11¢
#13 Insulated	19 strand CuClad, jacket, flexible	15¢
450 Ohm	#18, Cu-Clad, poly, Windows	13¢
450 Ohm	New! #16 19 str, CuClad, Poly, Windows	18¢
300 Ohm	New! #18 19 str, CuClad, Poly, Windows	16¢
300 Ohm Twin	#18 7 str, Cu, similar to orig. Belden	13¢
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4KV-LI 4KW Line Isolator for Verticals, SO-239 in, PL-259 out	\$23.95
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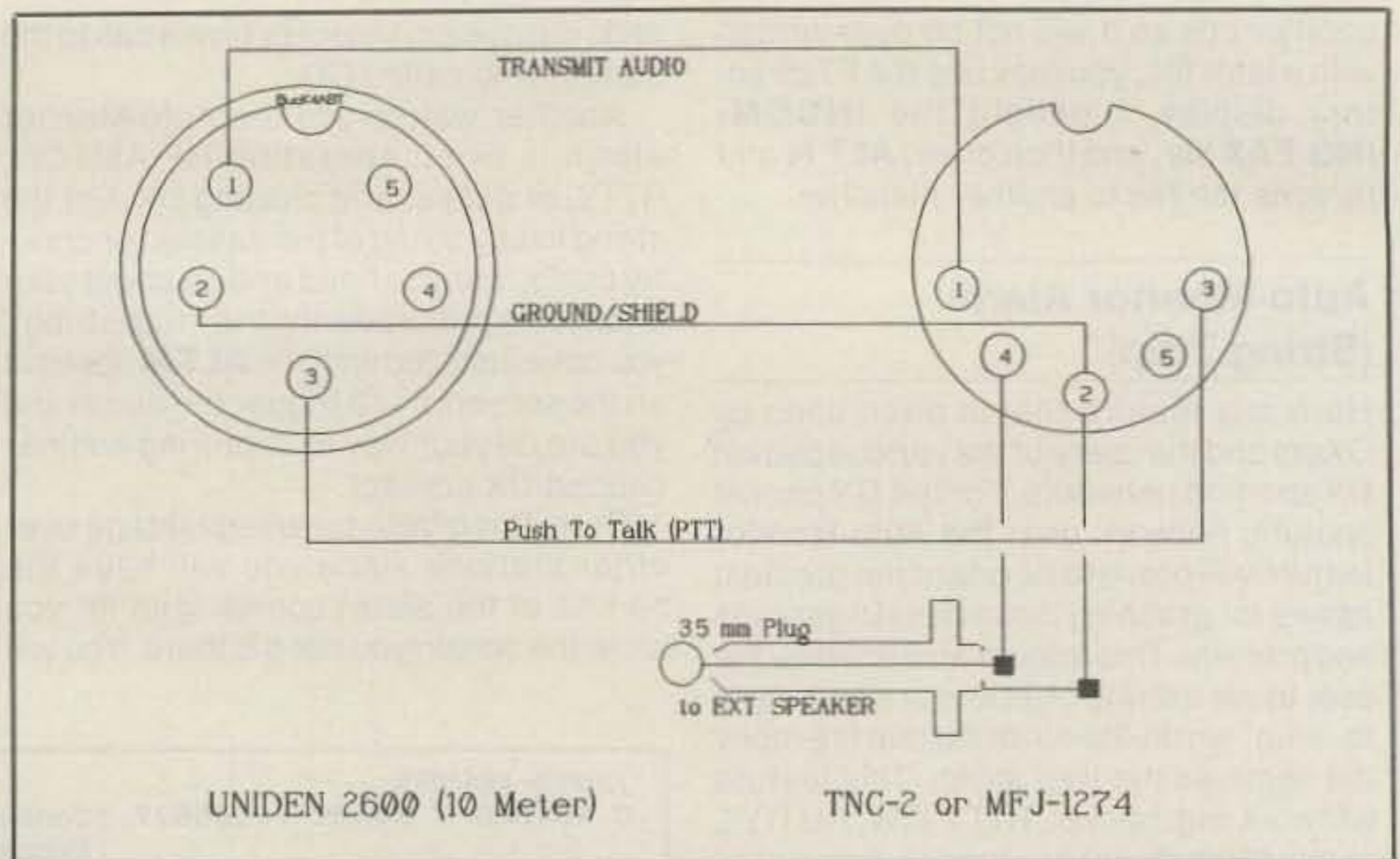


Fig. 1- For The Notebook: TNC-2 or MFJ-1274 connected to Uniden 2600 (10 meter).

### Auto-Router™

The Auto-Router™ is executed with **ALT A** while in the terminal mode. **ALT A** displays all the routes that have been constructed in the text editor (F10) of MFJ MULTICOM. The **ALT A** will display only those files which have the **.RTR** extension. **;**AUTO-ROUTER** <**—This must be the first line of an Auto-Router (RTR) file. Comment lines must have a semicolon (;) in column 1.

Each line (see Table II) will be sent to the TNC upon the detection of a connected state. If the station called is busy, if there is a timeout, or if a key is pressed, the Auto-Router will issue a disconnect to the TNC to tear down the link.

Table II gives examples of actual Auto-Router files complete with ; comment lines. The first file is a connect sequence via the ROSE network. The second file is a connect file used to connect to a distant station via several nodes.

This program is so powerful that it leaves little to be desired. Just about the time you think you've found something else that is needed in MULTICOM, you press **ALT H** and there is the command for it in the **Help** menu.

In the text that follows I've provided the reader with a partial listing of the commands and features in MULTICOM.

#### ALT H—The MULTICOM Main Help Menu

- F1:** Send HEX 03 (Ctrl C) to TNC.
- F2:** Send CONVERSE command to the TNC.
- F3:** Enter program SETUP screen.
- F4:** Enter Multi-Level FAX Menu.
- F5:** Enter Multi-Level SSTV Menu.
- F6:** Enter Function Buffers and Multi-Mode Controller Menu.
- F7:** Enter View/Change/Directory Menu.
- F8:** Enter Binary/Picture file transfer menu.

**F9:** Execute MFJPIC digitizer software (if hardware is installed).

**F10:** Enter MULTICOM text Editor.

**ALT A:** Select and transmit **Auto-Router** path file.

**ALT B:** Dumps screen text to text editor; up to 32,000 bytes of text.

**ALT C:** Clear screen in terminal mode, or buffer in Editor mode.

**ALT D:** Sends date/time from the computer to the TNC.

**ALT F:** Select and load user-defined Function Buffers to the **F6** menu.

**ALTH:** Help menu of MULTICOM features and commands.

**ALT M:** Edit/Change the **Auto-Monitor** alarm (string trap).

**ALTP:** Select Setup Parameters to send to TNC.

**ALT Q:** Displays Free Memory.

**ALT R:** Select and send a file from disk to TNC, or to another connected station.

**ALT S:** Toggles sound on/off (Connect Bells).

**ALT T:** Set or change file transfer "timeout" timer.

**ALT X:** Exit MULTICOM program.

**ALT 1 through ALT 0:** Sends selected line from User Buffer.

Keeping track of contest connects is easy, too. There are several ways to save the screen to disk, or individual lines of text. There is a very useful 32,000 byte text editor included in MULTICOM. To access the text editor, simply press **F10** and you are there. To return to the terminal mode, press **ESCAPE** and continue your QSO, or contesting.

#### Packet Forum Note

The Cookeville, Tennessee Hamfest will take place on November 21 on the campus of Tennessee Tech University. There will be VE exams and a fleamarket, and I will be hosting a packet forum at which we will be handing out free packet handbooks to those who attend.

73, de Buck4ABT

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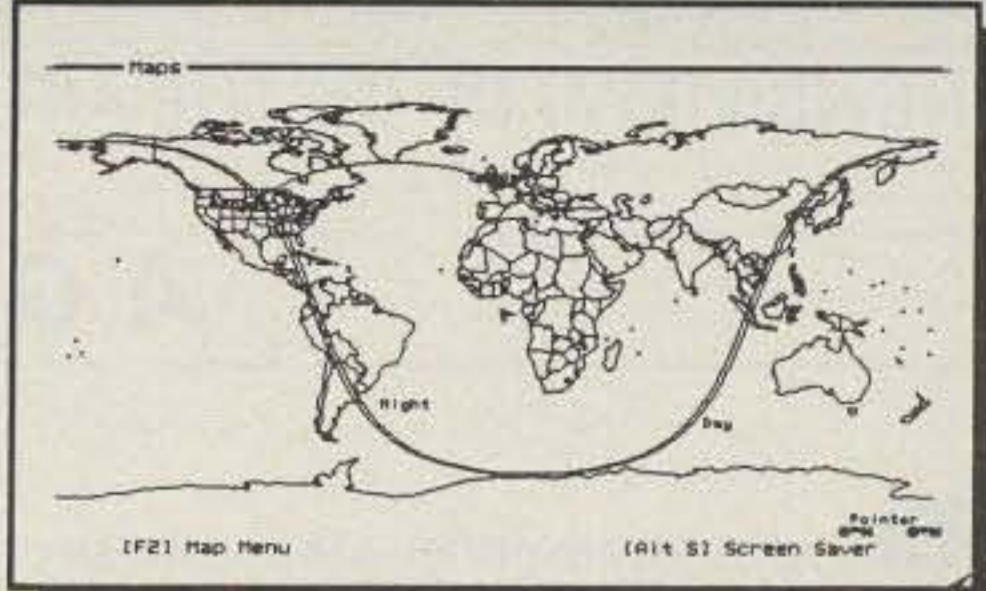
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County Seat & St. Capital	28888	City	5288	.Capital of U.K.	
Denver	8	Region	17	.London	
Colorado	US	Nation	UK	.Greater London	
United States	39°45'N	105°00'W	51°38'N	.United Kingdom--England	
				.800°05'W	
		Day/Date/Time	Now/86Jan02/1827		
		Sunrise/Grayline	0804/37°-217°		
		Sunset/Grayline	1607/143°-223°		
True Bearing					
41°			Short Path		
221°			Long Path		
Short Path Distance					
4,789 Statute Miles	MUF/FOT/LUF	13.1	11.7	18.3	Day/Date/Time
7,578 Kilometers	Frequency (MHz)	12.5	11.8	9.4	Now/86Jan02/1827
4,892 Nautical Miles		18.6	9.8	6.5	Time Difference
		Now	-1 hr.	+2 hr.	-7
		Your Name	-	Your Call Sign	+0

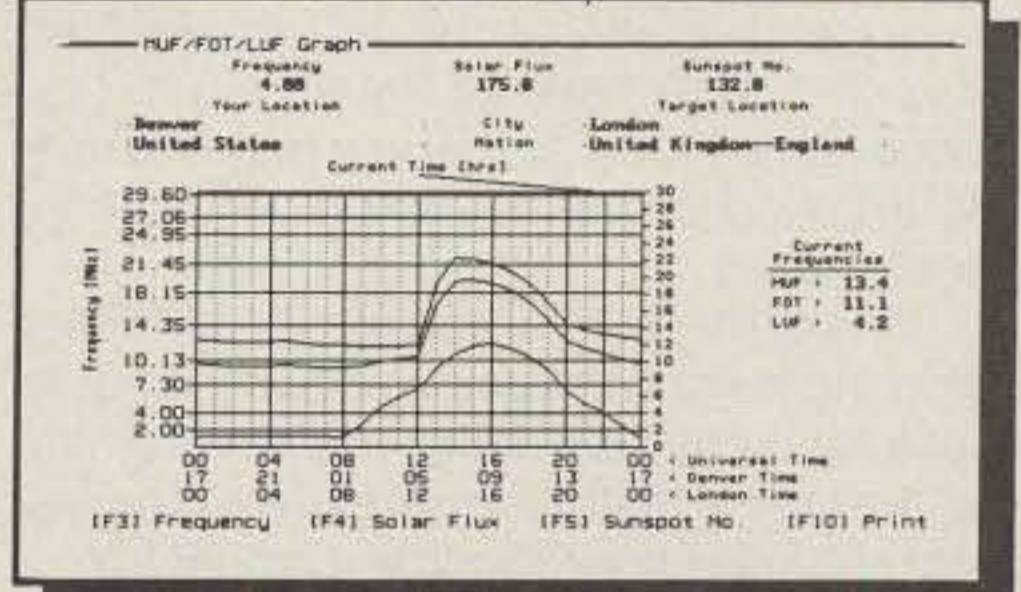
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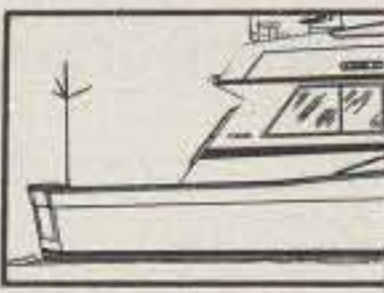


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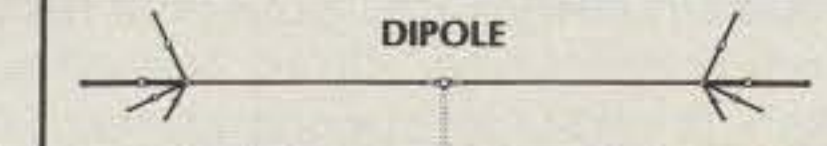
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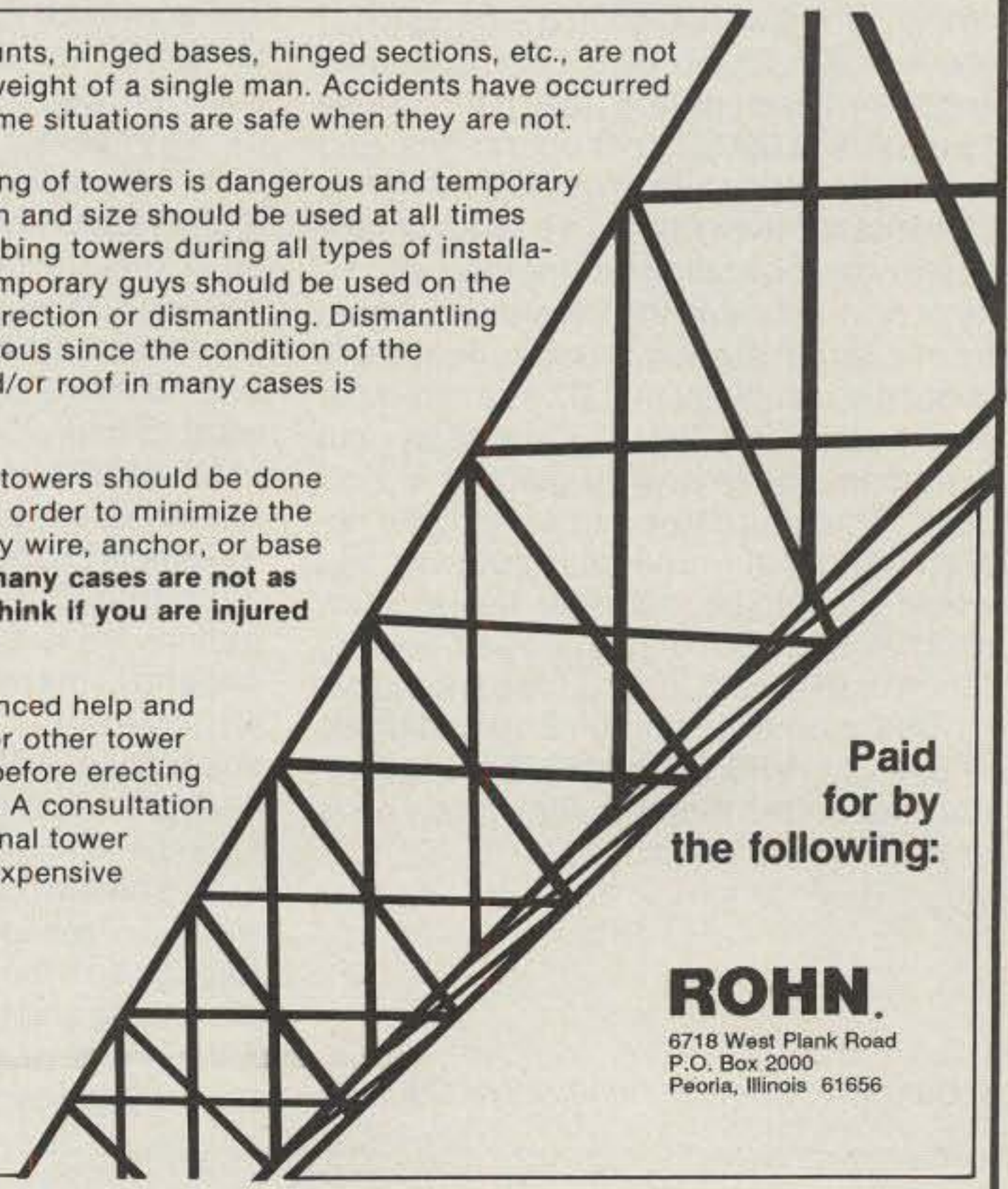
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## NEWS/VIEWS OF ON-THE-AIR COMPETITION

### A Guide to Finding Multipliers

**B**ased on my experiences and those of others, I have determined that finding multipliers in contesting is truly an art form. There always seem to be a few guys who lead the pack in this category; callsigns such as K1KI, KC1F, and others come to mind. In a recent column I discussed the importance of multiplier hunting in competitive contesting, and while I concluded that multipliers are not the most critical component of a winning score, they certainly should not be overlooked!

So what is the secret to this skill? Although I don't have all the answers, I do have some thoughts that you may find useful in your own efforts to improve your contest scores.

One of the biggest aspects of multiplier hunting is knowing when and when not to look for them. Obviously, this is a function of the type of station you are using. The bigger stations generally do not bother to emphasize working multipliers during running periods such as in the early morning. Smaller stations, on the other hand, may want to take advantage of this time because the good multipliers that can be found are often lacking the enormous pile-ups the afternoon brings.

I have always subscribed to the theory that part of the secret of finding multipliers is to look where other guys do not. For example, tuning very high in the band (e.g., above 14300, 21350, etc.), using odd times and beam headings (e.g., long path Asia on 15 meters at 0800Z), net operations, and so forth can bring rich rewards. I wish I had 25 cents for every time I've found a rare country or zone using this method with little or no one calling the DX station! Again from a small station perspective, think about the complaint that DX stations most often raise: "I called CQ endlessly, but everyone's beams were pointed at Europe!" This translates into a multiplier opportunity. If your run rate is not what you would like it to be, consider taking a few minutes and pointing your beam toward Africa or the south, tuning the bands slowly. This is an excellent time to find those 7P8, V5, EL, VP8, CP, and HC8 multipliers. And more often than not, they rarely have anyone calling them.

2 Baldwin Street, Windham, NH 03087

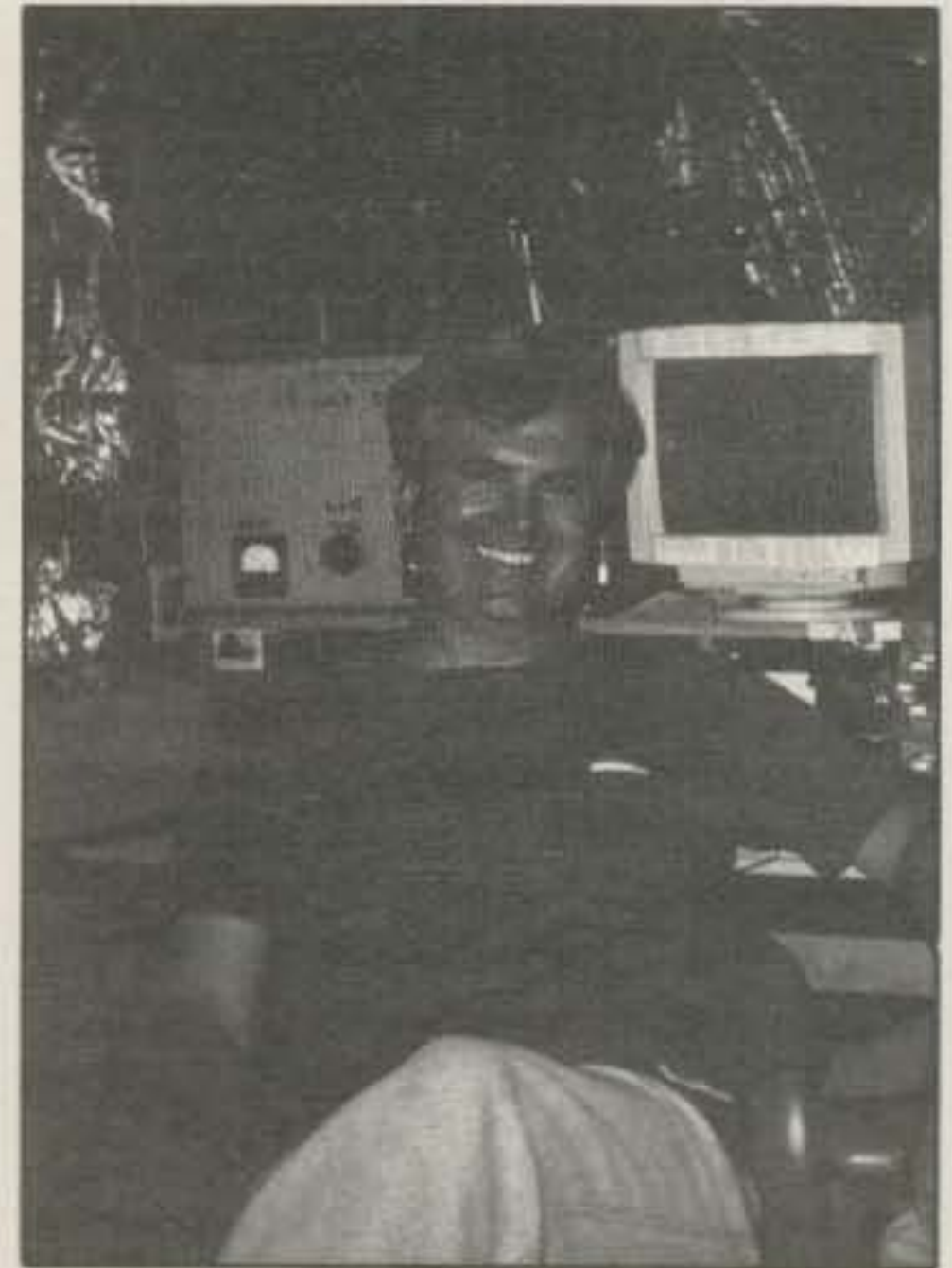
#### Calendar of Events

Oct.	24-25	CQ WW SSB DX Contest
Oct.	28-29	YLRL SSB Anniversary Party
Nov.	6-8	Japan Int'l DX Contest
Nov.	7-9	ARRL Sweepstakes CW Contest
Nov.	8-9	QST QSO Award Party
Nov.	14-15	Worked All Europe RTTY Contest
Nov.	14-15	OK-DX Contest
Nov.	14-15	EME Competition
Nov.	21-23	ARRL Sweepstakes SSB Contest
Nov.	28-29	CQ WW CW DX Contest
Dec.	4-6	ARRL 160 Meter Contest
Dec.	12-13	ARRL 10 Meter Contest
Dec.	31	ARRL Straight Key Night

When building multiplier totals, there is another aspect that is a skill unto itself—passing multipliers. The concept is simple to describe, but often difficult to implement. Passing a multiplier is nothing more than asking a contest station to move to another band where that multiplier is needed. It sounds simple, but this is an excellent example of how delivery is everything.

Most contesters fit into one of two categories: the casual operation just "giving out points" or the serious competitor trying to maximize a final score. You will find that those in the former category more often than not are willing to help you out by moving to another band, if you only ask! The approach you take is the most important point, however. If you say something such as "Can you go to 20 meters now?" it is very easy for the response to be a quick "No!" However, if you are a bit more aggressive and say, "I really need to work you on 20 meters. Let's QSY to 14275 and I'll call you now, okay?" it requires a different response from the other end, and that answer is more often than not the one you want to hear.

Obviously, you want to make a pass frequency as easy as possible, so try to make it a simple change of the band switch (e.g., move from 21325 to 14325, etc.). Passing multipliers is catching on, much to the chagrin of many DX stations who seem to be moved about the bands endlessly by unsuspecting USA competitors. Your success will depend on how convincing you sound and the perceived need by the DX side. Some will say that you have crossed the line of reasonableness when you blast through a 15 meter DX pileup with 200 people calling and ask the guy to move to 20. This is where you need to decide how much you value your friendships (hi). In any



Frank Donovan, W3LPL, is one of contesting's very best.

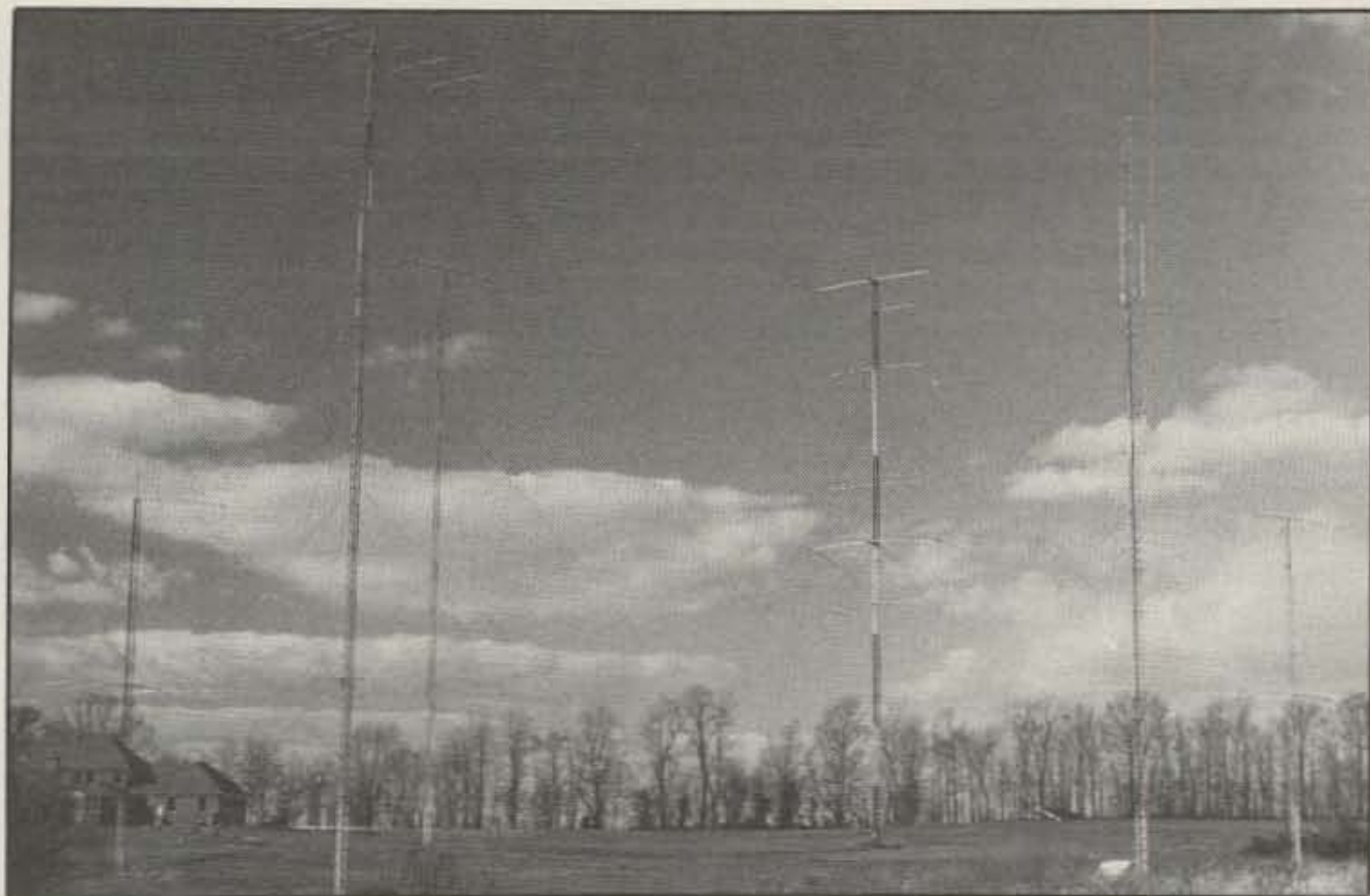
event, remember that you don't have to be using a super-station to achieve success.

Finally, the art of working multipliers is something that takes practice and skill. You need, over time, to be able to easily recognize stations you have already worked and quickly scan the bands over and over. Keep an ear open for weak stations at all times, starting at the low end of the band and working your way up to the top. A little extra attention to this area of contesting can have an immediate impact on your results—and let you have just a little more fun. Good luck!

#### CQ Profiles: Frank Donovan, W3LPL

When you think about the biggest and most competitive contest stations around the world, the callsign W3LPL more often than not rises to the top. Licensed in 1959 as KN1LPL from Rhode Island, Frank Donovan represents the finest in amateur radio contesting and station design.

Frank's impressive station is designed to support multi-multi (multi-operator/multi-station) contest operations. The layout consists of two radios per band (160, 80, 40, 20, 15, 10); six TS-830s and six C-lines. The linear amplifiers are all homebrew,



The amazing antenna farm at W3LPL, north of Washington, DC.

nearly "bullet-proof" single 3-1000Z amps (all original tubes that are nearly 20 years old!). They have survived near disasters from long key down periods at full power. Each amplifier is automatically switched to one (and only one) transmitter at a time. The two operators on each band select their receive antennas separately. In fact, the transmit antenna selection is completely independent of receive antenna selection. This allows the two operators to listen in different directions, or to use separate Beverage receiving antennas.

The operating room is large, allowing the stations to be generously spread out. Adjacent to the operating room is a bunk room with an attached bathroom, allowing up to six operators to sleep. In the 1992 ARRL Phone DX Contest twelve computers were employed in the station, two on each active band, plus the packet spotting node. Of course, they were all networked, running K1EA's CT program.

The HF antennas are all homemade, mostly from military surplus materials (see Table I). Frank has seven towers in total, comprised of AB-105 military iron—four 190 foot towers, and three at 100 feet. Most of Frank's towers and antennas came from a dismantled HF "over-the-horizon" research facility in Whitehouse, Virginia near Williamsburg and from other military surplus sources. An enormous amount of aluminum was obtained from a phased array consisting of eight Hy-Gain 13 30 MHz log-periodic antennas on a 300 foot tower. Miles of 50 ohm hardline and RG-17, and several thousand feet of tower were also procured from that site.

The station was built mainly in 1986, simultaneously with the construction of his home on a 10 acre site, 30 miles north of Washington, DC. Frank's location was specifically sub-divided from a 100 acre farm. This was necessary to avoid the existing deed restrictions on many of the

### W3LPL Antennas

160 m	elevated base 1/4-wave GP
80 m	2-element quad, switchable NE/SW at 150 feet horizontal polarization dipole E/W at 170 feet dipole N/S at 100 feet
40 m	3 over 3 stacked Yagi at 190/100 feet. Bottom Yagi fixed NE. The Yagis can be fed separately or phased.
20 m	5-element K8CC on 58 foot boom at 190 feet 5 over 5 element rotatable ON4UN Yagis at 50/100 feet fixed 5 over 5 ON4UN Yagis (46 foot booms) at 50/100 feet NE
15 m	6-element W1RR Yagi on 46 foot boom at 190 feet 5 over 5 element rotatable Yagis on 36 foot booms at 50/100 feet fixed 6 over 6 element W1RR Yagis on 46 foot booms NE
10 m	7-element WB3BGU Yagi on 43 foot boom at 190 feet fixed 6 over 6 element W1RR Yagis at 35/70 feet NE
Receiving antennas: nine Beverage antennas, various lengths and directions	

Table I—Breakdown of the antenna farm of Frank Donovan, W3LPL.

Ukraine  
**UB4CQ**

Radio	Date	GMT	MHz	RST	Mode
K1ARL	Oct. 23, 90	14:13	7.5	37	SSB
TS-940S					
CA WW DX Contest			P. Box 334		
PSE			Cherkassy, 257000, USSR		
OSL			73! YURI		

Now here's a guy who takes CQ contests seriously!

large lots available at that time. The volunteer effort by the W3LPL operator team, working from sunrise to sunset every Saturday from March to October, was one of his most memorable experiences as a ham. Needless to say, with so many antennas and towers, a great deal of attention must be paid to good mechanical design, or the station would make a slave out of the owner! Few of the antennas and feedlines (all buried) have required any maintenance since the station was built in 1986!

The first W3LPL operation occurred during the 1986 CQ WW SSB Contest from the basement of his incomplete house, field day style, before the house was even ready for occupancy! It wasn't until the 1986 ARRL CW SS that Frank and his XYL were able to officially move in. This was the last house completed (nearly . . .) by his contractor, who went bankrupt days after they took occupancy!

Like many hams of the 1960s and before, Frank was introduced to amateur radio by shortwave listening, in this case using an old Hallicrafters S-38D. He later met several of the neighborhood amateurs who operated 10 meter AM during the peak years of the 1957-58 sunspot cycle. One of them introduced him to the Providence Radio Association. Frank learned Morse Code from an amateur he found through Herb Brier's (W1WJY) column in *Popular Electronics*. Frank says he'll never forget the patience he showed in teaching the code to a young boy!

Frank's first contest was Field Day 1959 with the Providence Radio Association, W1OP, where he operated even before he received his first license. At twelve years old he was so fascinated by contesting that he learned quickly about the lack of sleep during contests.

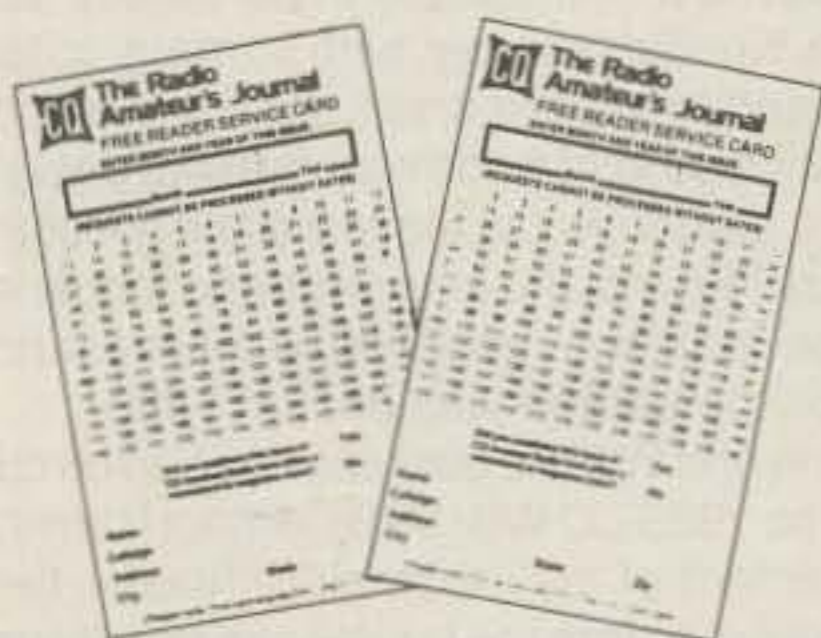
Having been involved at the highest competitive level that contesting offers, Frank has had numerous accomplishments over the years. Most notable were two long winning streaks—(1) single operator CW DX contests, winning six in a row from CQ CW 1975, 76, 77, and ARRL CW 1976, 77, 78; and twelve in a row multi-multi wins on SSB and CW from CQ WW SSB 1987 through ARRL SSB 1990. Today his preferred contest operations remain

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the big multi-multi DX contests.

Today Frank enjoys contesting for many reasons. It provides unique technical and personal challenges, and an opportunity to share skills and techniques with enthusiastic people. It also never stays the same, presenting new challenges year by year. He's especially pleased to see the emphasis in contesting moving more toward participation than winning. The increasing trend toward broad-based recognition programs will offer more incentives for increased participation and enjoyment by a larger segment of the amateur population. The introduction of computers to the contesting hobby has also widened participation.

In recent years Frank has spent considerable time and effort helping to establish a commercial-quality Packet-Cluster network in the Washington DC/Baltimore metropolitan area. This network proudly boasts better than 99.99% availability to its 200 members. Through Frank's efforts and the efforts of others, they are now working on incorporating 1296 MHz links into the network and cellular-radio-like remote sites for each node, using direct 1296 MHz links without the need for digital repeaters.

Frank Donovan, W3LPL, is an extraordinary amateur and contributor to the hobby. Keep up the good work, Frank!

## Final Comments

Over the next few columns I will be covering an area that has tremendous interest among many readers—low-power/QRP contesting. If you don't have a super contest station such as W3LPL, this may be your chance to learn some operating tips from successful operators using more modest setups.

As another reminder, if you haven't yet taken the time, please spend a few minutes completing this year's contest survey found in the September issue. Your input is always the basis for future columns.

Another CQ WW CW Contest is upon us in a few weeks. I hope the declining solar activity doesn't scare you away from the best contest in the world!

As always, please remember that the deadline for the March issue is January 1st.

73, John, K1AR

## Japan International DX Contest

2300Z Fri. to 2300Z Sun., Nov. 6-8

This is the 5th year for the Japan International DX Contest organized by the Japanese *Five Nine Magazine*. It's the JAs working the world on SSB only, all five bands, 10-80 meters (no WARC bands).

**Classes:** Single operator, single and all band, multi-operator all band only. Sin-

## November's Contest Tip

I am beginning this new feature with a surprising entry found in a passage from the *Holy Bible* in Luke 14:28-30: "For many of you desiring to build a tower, does not first sit down and count the cost, whether he has enough to complete it? Otherwise, when he has laid the foundation, and is not able to finish, all who see it will mock him saying, 'this man began to build and was not able to finish.'"

gle operators are limited to 30 hours out of the 48-hour contest period. Off periods of at least 60 minutes must be clearly indicated in the log. Multi-operators can operate the full 48 hours. Stations must remain on the same band for at least 10 minutes before changing bands.

**Exchange:** RS plus a Prefecture number (1-50) for JAs, RS plus a progressive 3-digit QSO number for non-JAs.

**Points:** Two points for 80 meter QSOs, 1 point for 40-15 meters, 2 points for 10 meters.

**Multiplier:** Total number of JA Prefectures, plus #48 JD1 Ogasawara Is., #49 JD1 Okino-Torishima Is., and #50 JD1 Minami-Torishima Is. (maximum of 50 per band).

**Final Score:** Total QSO points from all bands times the sum of the multiplier from each band.

**Awards:** Certificates to the top scorers in each class in proportion to the number of entries from each country and each call area in the U.S. and Japan. Plaques to the continental winners in each class, single and multi-operators. Stations working all JA Prefectures (1-47) during the contest can request a special award with their entry.

**Logs:** Use a separate sheet for each band. Indicate the multiplier in a separate column only the first time it is worked on each band. Entries with more than 500 contacts must include a cross-check dupe sheet. There are the usual penalties for taking credit for duplicate contacts; more than 2% means disqualification.

Mailing deadline is December 31st to *Five Nine Magazine*, Japan International DX Contest, P.O. Box 59, Kamata, Tokyo 144, Japan. Entrants may receive the final results by enclosing one IRC and an SAE.

## ARRL Sweepstakes

CW: Nov. 7-9 Phone: Nov. 21-23  
Starts: 2100Z Sat. Ends: 0300Z Mon.

This is the 59th running of the Sweepstakes, making it the oldest domestic competition going, and it really stirs up a lot of activity.

Say You Saw It In CQ

Operation is limited to stations in ARRL sections. Operating periods are restricted to a maximum of 24 out of the 30 hour contest period. Times off may not be less than 30 minutes and must be clearly indicated in your log.

In order to minimize QRM to non-contesters it is recommended that operation be confined to certain portions of the bands. It is recommended that you check QST for details.

There are several other regulations, including a cross-check sheet if you make 200 or more contacts. A large SASE (45¢ in postage) will get you the "SS Package" and Operating Aid #6 with enough log and summary sheets for an average outing.

**Exchange:** QSO no., power class, call, last two digits of year first licensed, and your ARRL section.

Stations using 150 watts or less are classed "A," over 150 watts "B," and QRP "Q." The same station may be worked only once regardless of the band.

**Scoring:** Each completed QSO is worth 2 points. The multiplier is derived from the number of ARRL sections.

**Awards:** The usual certificates in each class and mode for single operator stations in each section and multi-operator stations in each division.

There is a new trophy program available this year. Check October QST for details.

Taking off on last year's highly successful program, the ARRL will be offering SS pins to participants with 100 QSOs or more (cost is \$3 p.p.). In addition, SS coffee mugs will be made available to participants achieving a "clean sweep" (\$8 p.p.).

Logs must be postmarked no later than 30 days after the contest and go to: ARRL Communications Dept., 225 Main Street, Newington, CT 06111.

## European RTTY Contest

1200Z Sat. to 2400Z Sun., Nov. 14-15

Rules for the WAEDC RTTY contest are mostly the same as for the CW and Phone sections held in August and September.

There is one main difference, however. To generate more activity and increase the QSO points, contacts with stations worldwide are permitted. QTC traffic, however, is not permitted within your own continent.

Check the August Calendar for all the detailed rules and regulations.

**Exchange:** RST plus a progressive QSO number.

**Points:** Each QSO and each QTC exchanged are worth one point. QTCs may be sent/received worldwide between continents (limit of 10).

**Multiplier:** Multipliers are determined from the DXCC list.

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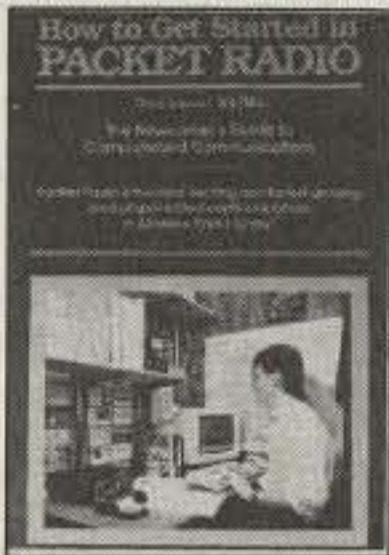
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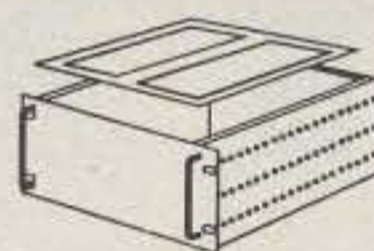
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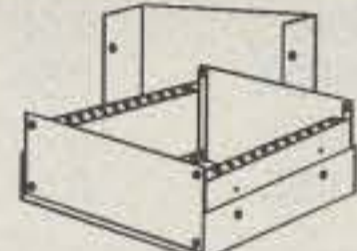
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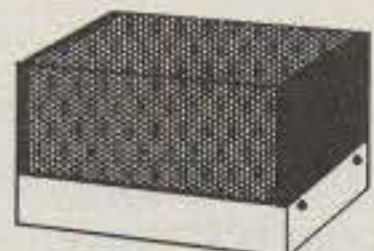


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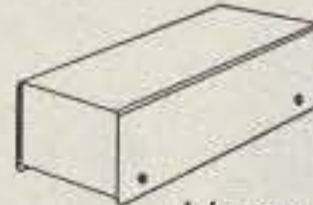
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**Awards:** Certificates will be awarded to the highest scorers in each class in each country with a reasonable score. Continental leaders will receive a plaque. Certificates will also be awarded to stations with at least half the score of the continental leader.

It is suggested that you use the official DARC log forms. A large SASE (IRCs) to the address below will get you a supply.

Mailing deadline for all entries is December 15th to: WAEDC Contest Committee, Postbox 1328, D-8950 Kaufbeuren, Germany.

### Czechoslovakian Contest

1200Z Sat. to 1200Z Sun., Nov. 14-15

The Czechoslovakian Radio Club invites amateurs worldwide to participate in the annual OK-DX contest.

Use all six bands, 1.8 to 28 MHz. The same station may be worked once per band, either phone or CW, for QSO and multiplier credit.

**Classes:** Single operator, both single and all band, multi-single, multi-multi, and SWL.

Only one transmitter and one band permitted during the same 10-minute period for multi-single entries.

**Exchange:** RS(T) and serial number.

**Scoring:** One point per QSO; 10 points if it's with a Czech, 4 points for different continent, and 1 point within same continent. Own country may be worked, but for multiplier credit only.

**Multiplier:** Sum of different OK districts and DXCC/WAE countries worked on each band.

A penalty of three additional contacts of the same point value will be deducted for each duplicate QSO or multiplier removed by the committee. Taking credit for excessive duplicates and other violations (regulations, unsportsmanlike conduct, etc.) will be deemed cause for disqualification.

**Awards:** Certificates in each class to the top-scoring station in each country. Additional awards will be made if returns justify. The "100 OK," "OK SSB," "Slovensko," and other Czech awards will be issued for contacts in the contest if a written application is submitted with your log.

Use a separate log for each band, indicate the zone multiplier only the first time it is worked on each band, and include a cross-check list for each band with 200 or more QSOs.

A summary sheet showing the scoring and the usual signed declaration that all rules have been observed is also requested.

All entries must be postmarked no later than December 15th and go to: Czech-

oslovakian Radio Club, P.O. Box 69, 11327 Praha 1, Czechoslovakia.

### CQ WW DX CW Contest

0000Z Sat. to 2400Z Sun., Nov. 28-29

Just a reminder, as if you needed one, that the CW section of our WW DX Contest is coming up the last weekend of this month. The phone section of course is past history. Complete rules were published in the September issue. The contest trophies list has been updated and well covered in the rules.

All logs, both Phone and CW, must be sent to the CQ office: CQ World-Wide DX Contest, 76 North Broadway, Hicksville, NY 11801 USA.

Deadline for logs for the Phone section is December 1st, and January 15th for the CW section coming up. Be sure to indicate Phone or CW on your envelope. This will avoid your log from being entered in the wrong section.

### ARRL 160 Meter CW Contest

2200Z Fri. to 1600Z Sun., Dec. 4-6

This is the 23rd year for this "Top Band" activity. Exchange is between US stateside, VE, and DX stations. DX to DX not permitted for contest credit.

**Classes:** Single operator, high, low, and QRP; and multi-operator single transmitter.

**Exchange:** RST and ARRL section for WVE. RST only for DX stations; ITU Region for maritime and aeronautical mobiles.

**Scoring:** Contacts between stations in ARRL sections count 2 points, with DX stations 5 points.

**Multiplier:** Determined by number of ARRL sections and DX countries worked (for WVE). (DX use ARRL sections only.)

**Final Score:** Total QSO points times the ARRL section and DX country multiplier.

**Awards:** Certificates to the top-scoring single operator station in each ARRL section and DXCC country. And to the top-scoring multi-operator station in each ARRL Division and continent.

Indicate the multiplier in a separate column only the first time it is worked. Entries with 200 or more QSOs are required to include a dupe sheet. Official log forms are recommended and are available from the ARRL. A large SASE and 45° postage or 2 IRCs will get you a supply for more than 300 contacts.

The usual grounds for disqualification (violation of established rules, excessive duplicate contacts, etc.) will prevail.

Mailing deadline for logs is January 6th to: ARRL Communications Dept., 160 Contest, 225 Main Street, Newington, CT 06111.



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FT411E-811-911 IC02AT/2SRA  
FT-2008/7008 IC2/4GAT/24AT  
IC-A21/U16

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ICOM: U16, H16, V100, U400  
MAXON, MOTOROLA,  
YAESU: FTH 2008/7008  
UNIDEN, REGENCY, KING,  
MARINE ICOM: M7, M56, M700  
AVIATION ICOM: A21 A200 H.T., TAD



Bearcat 200XLT



IC-W2A



IC-H16/U16



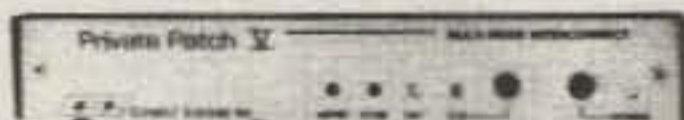
MOTOROLA RADIUS COMMERCIAL RADIOS



TH-78A



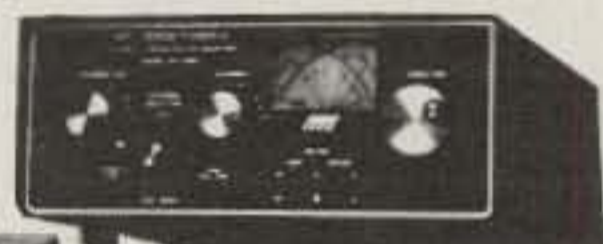
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## "HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

### Goodies

**T**his article contains information about amateur radio specialty items such as awards/license/QSL replicas, badges, belt buckles, bumper stickers, clocks, clothing (caps, golf shirts, jackets, sweatshirts, and T-shirts), cups/mugs, decals, doormats, emblems, eyeball QSL cards, jewelry (key-chains, pendants, pins, rings, and tie-tacs), license-plate frames, lights, maps, patches, pencils, QSL holders, rubber stamps, signs, stationery, thermometers, and tilt stands.

I have included a wide variety of items which amateurs can wear and use. Equipment and accessories directly related to signal reception and/or transmission are not covered in this article. Where prices are stated, they are only included to provide some idea of costs; exact current costs should be determined by requesting that information from the seller. State sales taxes are not included in this article, but they frequently apply. Also, prepaid charges only apply to USA address.

If you know about similar items which are not mentioned in this article, please send such information to my California address. Also, if an outfit goes out of business, I want to receive that information.

It is hoped that this article will make amateur radio a bit more interesting to many new amateurs. I believe in advertising amateur radio. Everyone who knows me is aware that I am an amateur radio operator. I have my callsign on just about everything that can be marked to show my amateur radio affiliation. Almost every day someone asks me what W6DDB means, which gives me chances to tell a little bit about our amateur radio service. Many of those brief introductions have resulted in additional amateurs.

### Amateur Radio Groups

The American Radio Relay League (ARRL) has a nice assortment of items. Most of the League items are only available to members. These items are listed in this article for the benefit of ARRL members. Amateur Radio Emergency Service (ARES) items are available as follows: (a) black and gold stickers (two per package) at 50¢; (b) red,

## W6DDB

Confirming our eyeball QSO

Compliments of MFJ Enterprises, Inc.

QSO WITH	MONTH	DAY	YEAR	LOCATION	RST	MODE
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"Friendship through amateur radio"

MFJ's business-size QSL cards.

white, and blue stickers (two per package) at 50¢; (c) black and gold decals or red, white, and blue decals at \$1 each; (d) plus black and gold patches, or red, white, and blue patches, at \$3 each. The 5 inch member (diamond) decals are \$1. Life-member decals (5 per package) are \$1. ARRL flag license plate is \$5. Cloth ARRL flag patch is \$5, and 4 inch ARRL diamond patch \$1.25. ARRL flag pin is \$5, membership pin \$3, and life-membership (replacement) pin is \$3. Life-membership plaque is \$25. Set of 50 ARRL member letterhead stationery sheets with 50 matching business size (#10) envelopes are \$8. Fifty pieces of stationery \$4, or 50 envelopes



The MFJ world map clock.



The MFJ and Ameritron logos are featured on these mugs available from MFJ.



Vibroplex Company offers an assortment of items of interest to the code enthusiast.

45527 Third Street East, Lancaster, CA 93535-1802



This type of belt buckle is available from Henry Hornsby, N6MRG. He also intends to publish a cartoon-type amateur radio calendar.



Geochron Enterprises offers four models of their world time indicator.



Available from Lightwriters is an assortment of wall signs and wall clocks done in a variety of neon and plexiglas colors.



Caps Unlimited offers a variety of caps, patches, and decals featuring, among other things, SKYWATCH and MARS logos.

(separately) \$5. Spark to Space items are available as follows: (a) bumper sticker \$2; hats \$7, and patches \$3. Exact details can be requested from ARRL Membership Services, 225 Main Street, Newington, CT 06111.

MFJ sells 500 eyeball QSL cards at \$39.95, plus s&h charges. These 2 by 3.5 inch "business" cards are particularly useful at conventions, radio club meetings, and other amateur radio events.

The MFJ world map clock measures 2 1/2" H x 4 1/8" W x 2 1/4" D. The price is \$24.95, plus s&h charges. The MFJ-112 shows the time and date at each worldwide location, and it allows you to see where each contact is located. The MFJ-112 also shows the month, date, and year, plus the day of the week. Pushbutton switches enable you to easily move the display to any location in every time zone. It has a black map on a gold background. An additional feature of the MFJ-112 is that it includes an alarm.

A nice coffee mug is available at \$3.95, plus s&h charges. The MFJ and Ameritron logos are shown in red and blue ink, with one on each side of the cup. This is a nice door prize item at a low price.

The address to use when ordering any of the preceding items is MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762. The order telephone number is 800-647-1800.

The Vibroplex Company, Inc. offers several items which may be of interest to code enthusiasts. Each item features the famous Vibroplex logo (bug) in some way. Their baseball-type light-blue hat (\$6.95) is fully adjustable. It has the Vibroplex emblem in black, red, and gold. The key chain (\$6.95) is cast solid brass and it features the bug logo. Their black-glaze English ironstone mug (\$8.95) shows their bug logo in 22-karat gold. Their black polyester patch (\$3.95) shows the Vibroplex name and logo in gold and red threads. An 8 by 18 inch black felt pennant (\$3.95) shows the Vibroplex name and logo in gold. Their

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light-blue T-shirt (\$11.95) is half cotton and half polyester. It is available in small, medium, large, and extra large sizes. It features the bug logo. A \$5 shipping charge applies to orders being shipped to US addresses. The Vibroplex address is 98 Elm Street, Portland, ME 04101. Their toll-free telephone number is 1-800-262-8387, which is also 1-800-AMATEUR. Their FAX number is 207-775-7710.

Vibroplex offers several other items that are of interest to amateurs. Vibroplex has been in business since 1890, which means their centennial occurred during 1990. I have used their bugs 46 years, and a Vibroplex presentation bug is an essential part of my home station.

The following items are available from Flags and Marketing Unlimited, 3783 East Desert Inn Road, Las Vegas, Nevada 89121. Each item shows the Yaesu emblem and/or name. Crest is embroidered on corduroy caps (\$5.95 each), jackets (\$38 each), pinnacle V-neck sweaters (\$27.50 each), and polo shirts (\$21 each). Silk screening is used on sweatshirts (\$13.50 each), and T-shirts (\$6.80 each). Jackets are silver polyester/cotton. The adjustable size caps are navy blue or silver. All other items are available in navy blue, red, or white. Shipping charges are extra. Extra-extra-large (XXL) size items cost \$2 to \$4.50 more apiece. Allow 4 to 6 weeks delivery time. Write for a brochure if you are interested in these Yaesu related

items. Their telephone number is 702-456-3609. Their FAX number is 702-456-3611.

## Badges

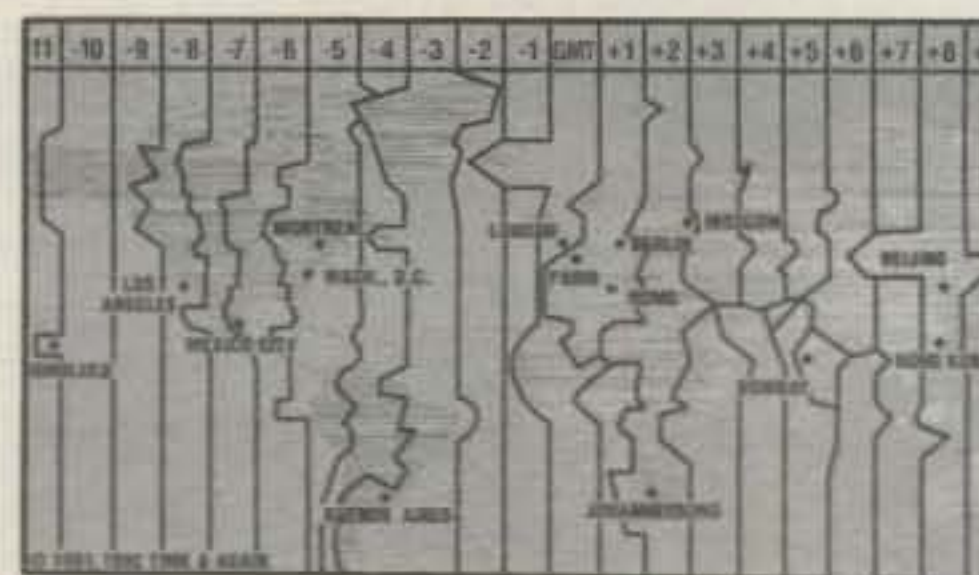
See LQV Engraving/Signs, and Robin Terrill/Signs.

## Balloons, Banners, and Blimps

The Walker Media Group markets an interesting variety of blimps, blimp banners, and balloons. The lengths of these balloons are 9 to 30 feet, and they cost \$292 to \$3750. The 13, 14, and 18 foot blimp banners cost \$30, \$38, and \$42, respectively. Balloon shapes include round, triangular, and tubular, plus special shapes. Accessories, graphics, and lettering are also available from Howard Walker. These blimps provide optimum stability in windy conditions due to their unique design. These unique items are great for use in Field Day contests and other special events. Their address is 6599 Commerce Court, Gainesville, VA 22065 (telephone 703-347-7926).

## Belt Buckles

Henry Hornsby, N6MRG, manufactures a very good solid-brass belt buckle of his own design. Each buckle is machine engraved and hand finished. He custom engraves anything a purchaser requests on his buckles. The price is \$15.99 per engraved buckle (callsign only) plus \$2 shipping and handling charges. Add \$1.00 if you order a second engraved line (name). A nice drawstring-type denim pouch is available for \$1.00 more. His address is P.O. Box 125, Orland, CA 95963 (telephone 916-865-7318). He can be called evenings and



Time & Again sells international time zone map decals. The continents are shown in silver against a blue background.



T-shirts and sweatshirts featuring the amateur radio stamp are available from WOTOK.



Jackets, T-shirts, and caps from Rod Williams can be customized to include name, callsign, etc.

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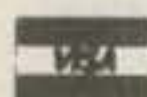
### AR1000

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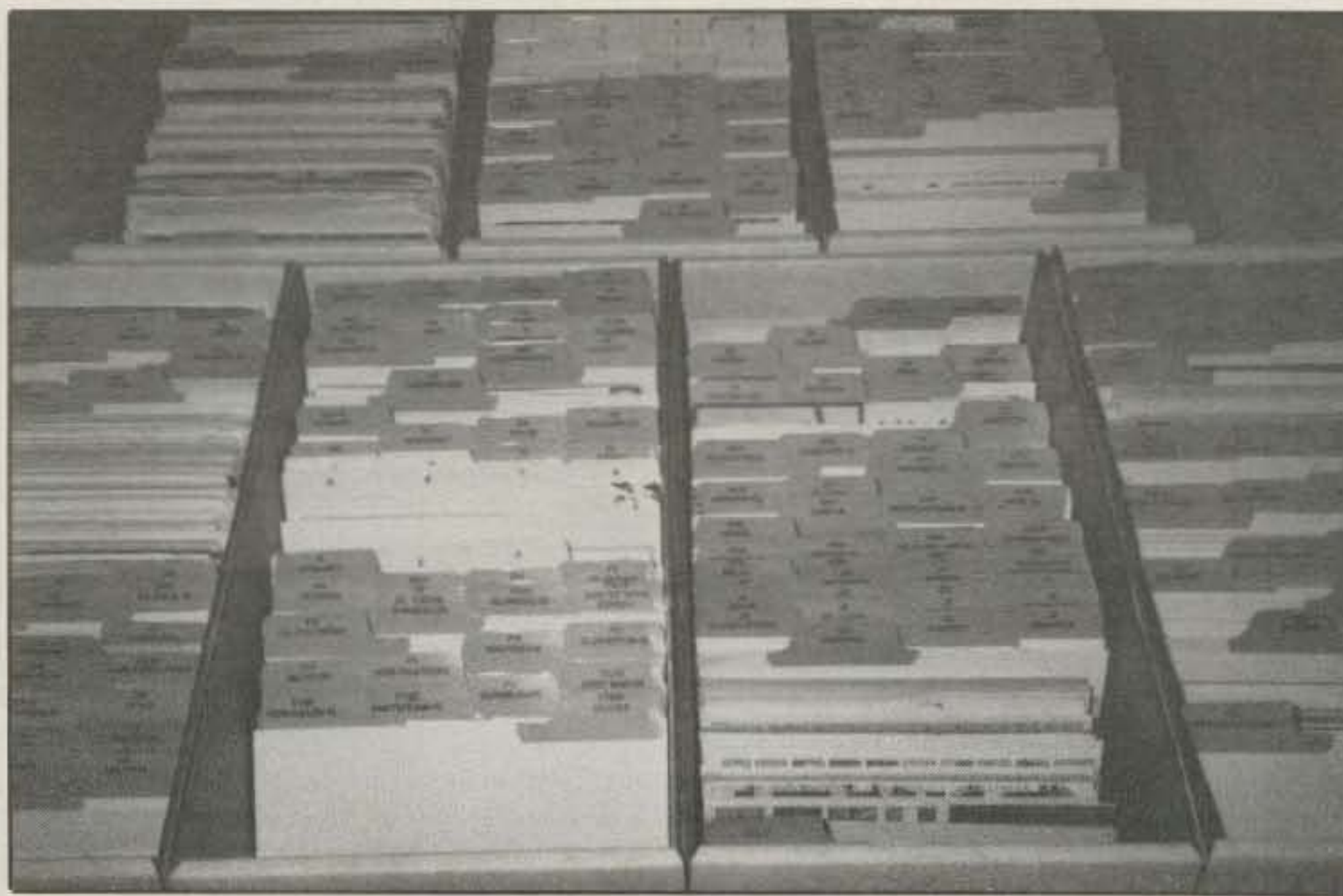
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QSL storage boxes and index dividers can be ordered from 7-Mike Hamstuff.

CIRCLE 70 ON READER SERVICE CARD



Etched-glass and ceramic personalized mugs such as these may be ordered from Todd W. Skogen.

weekends. Henry intends to publish a cartoon-type amateur radio calendar. The price is expected to be about six dollars per calendar. Details can be requested from Henry.

Saul Slonim, W2PD, sells solid-brass belt buckles. One line (name or callsign) buckle price is \$18. Two-line (name and callsign) buckle price is \$20. The shipping and handling fee is included in these prices. If you are a code enthusiast, you may be interested in knowing that Saul has added a telegraph key buckle to his product line. It shows one's callsign below an outline of a key and it is priced at \$20. As many as ten digits may be used on each line. The address is 320 Rose Street, Massapequa Park, NY 11762 (telephone 516-797-1128).

## Calendars

John David, KB1T, sells a very informative amateur radio calendar. It consists of about 50 spiral bound pages, including 12 full-color 8 by 10 inch photographs. When open, its size is 11 by 18 inches. The pages of this calendar are filled with useful data. The price is about \$15 each. The address is P.O. Box 1015-A, Amherst, NH 03031 (telephone 603-673-4100, FAX 603-672-6332).

Also see Henry Hornsby/Belt Buckles.

## Clocks/Time

Benjamin Michael Industries (BMI) offers "military time" clocks. Their address is 202 Tully, Prospect Heights, IL 60070 (telephone 708-253-0463). The BMI Model 972A has a 14 inch diameter, shows standard 12 hour time, and is priced at \$37.95 each. Model 972AD has a 14 inch diameter, shows standard 12 hour time in an outer ring of large numerals, shows the remaining 24 hour points in an inner ring of smaller numerals, and costs \$39.95 each. Model 973A has a 14 inch diameter, shows 24 hour time in a single series of numbers near its outer edge, and sells at \$59.95 each. Ten inch diameter versions of these clocks, plus 900-series analog clocks, are also marketed by BMI. David Wyatt,

WA9KVE, is the president of BMI.

Geochron Enterprises offers four models of their world time indicator. Each model displays daylight and darkness, sunrise and sunset, correct time in each zone, day of the week, and date of the month. Prices range between \$1265 and \$2465, plus shipping charges and costs of any desired accessories. Each model is 34 by 22 by 5 inches. Their address is 899 Arguello Street, Redwood City, CA 94063 (toll-free 800-342-1661, FAX 415-361-1780).

Lightwriters offers an unusual assortment of wall signs and wall clocks which display one's callsign in a variety of neon or plexiglas colors. Neon colors include amber, blue, green, pink, red, turquoise, white, and yellow. Plexiglas colors include black and white. These units can be powered by 12 VDC, 24 VDC, or 117 VAC. The wall signs are mounted on plexiglas with a solid-state exciter. Each wall sign is 10 inches tall by 22 inches wide and costs \$225. The neon clocks are sold in two sizes; the 20 inch clock costs \$450 and the 26 inch one is priced at \$550 each. The basic clock has ON THE AIR around its top half. A callsign can be added to the bottom half of a clock at the additional cost of \$100. The address is 911 Green Bay Road, Winnetka, IL 60093 (telephone 708-441-9115). The toll-free ordering telephone number is 800-747-9115. Visa and MasterCard orders are accepted.

Time & Again sells international time



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The MM-3 delivers 20 "soft partitioned" memories from standard 8K and expands to 32K (36,000 characters).

PLUS:

- Complete flexibility for your Morse Signal—dot & dash length, letter & word spacing, more.
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zone map decals in two sizes. The continents are shown in silver against a blue background on these durable polyester self-adhering decals. The 2 ¼ by 4 ¾ inch decals cost \$2 each. The 1 ¼ by 3 ¾ inch decals cost \$1.50 apiece. A set of two decals (one each size) costs \$3. Purchasers are requested to include an SASE with the order. The address is P.O. Box 306, Dickinson, TX 77539 (telephone 713-337-5319). Time zone maps are based on the concept that the Sun appears to pass through 15 degrees of longitude each hour. With 24 hours in a day and 15 degrees of movement per hour, 360 degrees of apparent sun movement occur each day. Each time zone is bracketed by a time zone to the east that is one hour ahead, and a time zone to the west that is one hour behind. World time zones became officially recognized by the International Meridian Conference in 1884. These decals are useful to anyone who regularly contacts people and groups in other parts of the world. Some cities are shown on these decals. Full payment must accompany each order.

World View Time, Inc. offers an 8½ by 11 inch map indicator that uses a South Pole projection of Earth with color-coded time zones. The price is \$13.45 each to domestic (US) addresses and \$14.95 each to Canadian addresses. Their address is P.O. Box 266, Brockville, Ontario K6V 5V5, Canada. Their telephone numbers are 613-345-1537 and 613-342-0417. Their

FAX number is 613-345-7264. This indicator is available in two formats; one (model B) shows 12-hour (AM/PM) time and the other (model A) shows 24-hour time. The reverse side of each indicator provides detailed instructions regarding their proper use.

Also see MFJ/Amateur Radio Groups.

## Clothing

Caps Unlimited sells a 2 by 3 inch embroidered SKYWARN patch with heat-seal adhesive backing. It shows a black tornado inside a fluorescent orange eye and it has the word SKYWATCH below the eye. This patch is also available on a black baseball-type summer cap. They sell the same kind of cap (one size fits all) with the words Amateur Radio Communications centered between a pair of lightning bolts in day-glo bright chartreuse. RACES decals are sold to RACES members. They are self-adhesive on the front side for attachment inside vehicle windows and windshields. It is advisable to request a copy of their sales data sheet to obtain detailed information regarding their entire product line. The address is P.O. Box 460118, Garland, TX 75046-0118 (telephone 214-276-0413). They also sell identification badges and embroidered patches. As usual, your SASE would be appreciated if you request data.

Amy Codella sells 100% cotton T-shirts.



A. Roy Fremstad, VE6FRA, of Cardston, Alberta in Canada was an enthusiastic short-wave listener 40 years before he became an amateur radio operator. Roy is retired from the radio/TV business, which enables him to spend more time on the air. His call-sign suffix is his initials reversed.

Solid-color T-shirts, customized with name or callsign, cost \$12 each ppd. Customized tie-dyed T-shirts sell at \$19 each ppd. Solid-color T-shirts are available in black, gray, kelly green, light blue, navy blue, pink, purple, red, royal blue, white, and yellow. Kelly green, pink, and yellow T-shirts are not available in XXL. Letter colors are black, dark blue, dark green, light blue, light green, red, white, and yellow. T-shirt size must be specified as large, extra large, or extra extra large. Amy's address is 27 Heyward Hills, Holmdel, NJ 07733.

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Paul Washa, W0TOK, sells T-shirts and sweatshirts featuring an enlarged reproduction of the 1964-65 five cent amateur radio stamp. T-shirts sell in all sizes (S, M, L, XL, and XXL) at \$10 each ppd. High-quality white sweatshirts sell at \$23 each in sizes S through XL and at \$26 each for XXL, delivered. If two (or more) of the same item are ordered, the price is one dollar less on each item. The desired size must be specified, of course. The address is 4916 Three Points Boulevard, Mound, MN 55364-1245.

Rod Williams offers an interesting variety of jackets, T-shirts, and caps. Each item can be customized to include name, callsign, and other information. His address is Box 352365, Toledo, OH 43635 (419-843-2014). Rod gives a 10% discount when multiple item orders are placed. If you want details about Rod's products, you should request information from him.

Anne Wright, N6BOP, sells a very good assortment of T-shirts, golf shirts, and caps. T-shirts and golf shirts are available in beige (tan), light blue, light yellow, or white. Other light colors are available upon special requests from clubs or other groups, and they can be printed front and back. A red ARRL logo is available in two

sizes: 1.375 by 3 inches and 2.25 by 5 inches. The lettering style can be ivy open or sportswear. Letter color choices are black, brown, green, maroon, orange, red, and royal blue. T-shirts cost \$14.30 ppd, printed both sides. Golf shirts cost \$18.30 each printed one side, and \$20.30 each printed both sides. Anne's caps have a foam front with a mesh back, and they are size adjustable. Caps sell at \$9.30 each ppd. Cap print styles are the same as for shirts, and the print can be in a variety of colors. Anne's address is 2272 Kellogg Park Drive, Pomona, CA 91768.

7-Mike Hamstuff sells QSL storage boxes and index dividers. The sets of dividers are for all 50 states, 322 countries, 1 through 0, A through Z, 10 through 160 meters (including the WARC bands), and a set of do-it-yourself dividers. Lee Finkel, KY7M, also sells four distinctive T-shirts and a wood cover for the Bencher paddle. His address is 7-Mike Hamstuff, P.O. Box 14455, Scottsdale, AZ 85267-4455.

Also see ARRL, Vibroplex, and Yaesu/Amateur Radio Groups.

### Cups/Mugs

Todd W. Skogen sells 13-ounce etched-glass mugs and 11-ounce ceramic coffee cups at \$12.90 each ppd. First name and callsign are etched on the large glass mug. The first name callsign are etched in white on one side of the ceramic coffee cup. The



Vladimir Bykov, UA4WHX, is a member of the Teenage Radio Club (UZ4WWQ) in Izhevsk, Russia. When in America, Vlad operates as AC4LN. The Kentucky Contest Group, the Huntsville (Alabama) Amateur Radio Clubs, and others gave this Kenwood TS-830S transceiver to UZ4WWQ. Bill Cox, AA4NU, supplied the picture and information about UA4WHX and UZ4WWQ.

address is P.O. Box 3025, Fox Valley Station, Aurora, IL 60504 (708-913-2906).

### Summary

This completes the first part of this two-part article. The second part covers decals/labels, desk items, jewelry, lamp, license-plate items, maps, patches, plaques, QSL items, ribbons, rubber stamps, signs, and trophies. 73, Bill, W6DDB

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## REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

### *Realignment of The Amateur Service Is It Time To Simplify The Licensing Structure?*

*"...not all communications in the Amateur Radio Service must pertain to personal development. Recreational communications are permissible, as are many communications relating to matters of personal expediency and public welfare. The Commission's mandate to allocate frequencies in the public interest requires periodic re-examination of amateur radio service regulations and policies to determine whether they continue to serve the public interest." (from Working Paper No. 20, August 1986. Research project by James E. McNally, Jr., WB3APV, FCC Office of Plans and Policy)*

**T**he United States has the most amateur radio license classes and examinations of any country in the world. You only have to check the international *Radio Amateur Callbook* to confirm that statement. Most countries seem to have three classes—usually a beginning class, a no-code VHF class, and an all-band class. Many nations also license amateur radio club stations.

The United States now has what amounts to six license classes (Novice, Technician, Technician Plus Code, General, Advanced, and Amateur Extra), which are granted by passing eight different written and telegraphy examinations. We question whether they all are necessary—or in the public interest. It is my belief that the entire Amateur Service testing and licensing system is overly complex and is in need of simplification and reorganization.

The history of U.S. amateur radio classes is a long and complicated one. Those of you who have been licensed since the 1960s will remember the bedlam over Incentive Licensing. This 1967 FCC program (which was supported by the American Radio Relay League) amounted to the last major realignment of the entire Amateur Service. It also re-established the Advanced Class amateur license, which had not been available for 15 years.

Actually, the FCC originally proposed

that a new Amateur First Class license would be the "...stepping stone to the highest class." Those amateurs who held the old Advanced ticket would be downgraded to the General ticket when they renewed. The new Amateur First Class license would require passing a 16 words-per-minute code test—midway between the 13 wpm General and 20 wpm Extra Class telegraphy requirements.

The FCC elected, however, simply to re-establish the Advanced Class, which had not been available since 1952, and leave the code speed at 13. A controversial proposal to re-issue everyone new amateur call signs to denote their class of license was not implemented. However, the Commission did allow Amateur Extra Class licensees to select a preferential "two letter" call sign (which they characterized as the "mark of the old timer") upon payment of a \$20 processing fee.

#### **What Did Incentive Licensing Do?**

Incentive licensing provided for new reserved phone and CW frequency blocks which would be available only to the Advanced and Amateur Extra Class. These new band segments represented the "incentive," the purpose of which was to motivate some 100,000 General Class licensees to learn more about electronics and upgrade their licenses. The prize for Extras was the exclusive use of the first 25 kiloHertz of the 80, 40, 20, and 15 meter bands, which continues to this day.

Actually, Incentive Licensing had a major impact on every amateur radio operator class. Novices both gained and lost. While they would now be allowed two-year instead of one-year non-renewable terms, they lost access to phone operation in the 145 to 147 MHz amateur band—not a big deal back then, since 2 meter repeaters had yet to emerge. Beginners were banished to CW only using crystal-controlled 75 watt rigs.

The thinking behind deletion of Novice Class voice privileges was to force newcomers to develop more Morse code proficiency so that they could advance to the higher classes of license. Since then, of course, the Novice Class has evolved to

just another renewable HF/VHF/UHF ticket authorizing both voice and code privileges.

Docket No. 15928 provided for seven examinations which continue to this day. (In 1987 Element 3 was split into Element 3[A] and Element 3[B], and we now have eight different examinations.) Effective November 22, 1967 all examinations had to be conducted by FCC personnel. The mail-order Technician and Conditional Class license were abolished. Only the Novice exam remained as a volunteer-administered examination. Anyone who failed a test had to wait 30 days before applying again.

#### **Incentive Licensing Pro and Con**

The thought behind Incentive Licensing was that amateur radio should become a training ground for technicians and engineers instead of a service of non-contributing hangers-on. If the incentive system worked, radio amateurs would once again contribute to American telecommunications.

Everything looked great until you checked the fine print in the final order released on August 29, 1967. General Class frequencies were cut down. To get them back, you had to pass more tests and upgrade to Advanced and Extra. The average ham was outraged!

The result was absolute pandemonium among the General Class amateurs—far more than anyone thought possible. The American Radio Relay League was targeted as having not looked after the interests of the majority of operators. Membership took a nose-dive. One thing became apparent instantly: the bulk of existing amateurs certainly did not think Incentive Licensing was a good idea.

Since 1967, of course, there have been other changes. The concept that the Novice Class would be a beginning temporary stage to introduce newcomers to the backbone of amateur radio, Morse code, has given way to the permanent no-code Technician entry level. It is immensely popular. The number of applicants choosing the Novice path is now greatly diminished, and the Technician Class is now, by far, the en-

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try path of choice. In addition, the amateur testing program has been turned over to the amateur community—another success story.

## Has Incentive Licensing Worked?

Going back through my records, I find in the late 1960s personal—and not necessarily amateur—communications were gaining in popularity. There was great concern that most technological strides were being made by industry and non-amateurs. Equipment construction was going out of style.

A system of forced motivation through government regulations—more radio privileges in exchange for more knowledge and proficiency—was believed to be the answer. The theory was that through Incentive Licensing America could once again rely on amateurs for fresh ideas. Has it worked out that way?

Not according to research conducted by the FCC in 1981. Here's a quote from Working Paper No. 6 published by the Office of Plans and Policy: "The rules that exist today . . . do far less than they could to encourage amateur ingenuity . . . in some cases, regulation may positively have discouraged technical progress."

The conclusion of the two researchers (both of whom were licensed amateurs, one a professional engineer the other an

economist) is to: ". . . propose a new regulatory approach . . . with the fewest possible restrictions on users, uses, and technologies, in order to allow innovation, technological change, and maximum user choice." The answer appears to be in flexibility, not in government regulations.

One can accurately argue that the condition that existed before Incentive Licensing in the late 1960s is still with us in the 90s—only more so. Gone are the construction kits, and gone are the majority of the companies that designed and manufactured electronic gear. Where are Hallicrafters, World Radio Laboratories, Harvey Radio, Hammarlund, National, Heathkits, and on and on.

Actually, most early home-brewing was done out of necessity rather than for fun, simply because mass-production of amateur gear had not yet arrived. Today, more than ever, most amateur radio equipment is store-bought by people who simply want to communicate. While some amateurs are still experimenting, the fact remains that nearly all technological innovation is accomplished by highly trained professionals and members of industry, agreed, many of whom are licensed amateurs. Gone are the vacuum tubes. Today's solid-state components, digital techniques, and telecommunications technology requires considerable training and education.

The reasons why the public wants to communicate are numerous and legiti-

mate. Amateur radio exists for many reasons besides advancing the technical phases of the radio art. It is selfish and not in the public (or amateur radio's) interest to deny newcomers access to amateur spectrum simply because of the potential for congestion—a potential that gets less and less as we explore the microwaves. Remember our frequencies are in great demand by others. I listen to the VHF and UHF bands as I travel throughout the United States. There appears to be little crowding even though more than 4000 newcomers are joining the ranks monthly.

The most recent breakthroughs have come in the area of solid-state devices, software engineering, high-tech telecommunications modes, and computers. One can only wonder what would have happened if the early digital tinkerers had been allowed to experiment with all digital codes and electromagnetic transfer of data rather than by landline. They certainly were amateurs, although not radio amateurs. They should have been and would have been had our technical and entrance rules permitted them easier access to the spectrum.

The answer may be just that. Change the rules to allow more widespread use of radio. Less amateur license classes and examinations is a start. Let the amateur community and public determine their direction through flexibility.

Actually, most early home-brewing was

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The answer may be just that. Change the rules to allow more widespread use of radio. Less amateur license classes and examinations is a start. Let the amateur community and public determine their direction through flexibility.

Does America need six amateur service license classes with eight different examinations? I think not. I know of no other radio service, or any other licensed activity for that matter, that requires such a complicated series of certification terms. It appears Incentive Licensing has not brought about the desired result envisioned in the '60s. And it is irrational and ridiculous to require the radio professionals to demonstrate less competence than the amateur. But such is the case in amateur radio.

### How Do We Start?

Any changes to the licensing structure must take a multitude of things into consideration. Reducing the number of amateur radio classes (and examinations) must

be orderly and carefully thought out, since every area of the hobby is affected. The activities, desires, and requirements of existing operators, volunteer examiners, the public, international radio law, and government must all be weighed. Ideally, there should be a benefit to everyone without a loss of privileges.

Canada simplified and restructured their Amateur Service two years ago. They now have what amounts to four license classes granted by four examinations which they call "qualification levels" (two written exams, basic and advanced radio theory, and two code exams, 5 and 12 words-per-minute). The license classes are no-code Basic, Basic with 5 wpm code, BASIC with 12 wpm code, and Advanced. The two theory tests are 100 questions; passing mark is 60.

The Basic (beginning no-code) qualification allows operation on all amateur bands above 30 MHz. Basic amateurs who pass a 5 wpm telegraphy exam gain access to the lower (80 and 160 meter) HF amateur bands, all modes; 12 wpm allows 40 though 10 meter band operation. Passing the Advanced theory permits a 1 KW power level (all other classes permit 250 watts) and the right to sponsor repeater and club stations, operate remote-control fixed stations, and design and build transmitting equipment.

I have given a lot of thought to simplifying and restructuring the U.S. amateur ser-



Rob, WA3QLS



Gail, KA3ITN



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vice. One way this might be accomplished is by reducing the number of license classes from six to three and examinations from eight to five (see Table I) by:

1. Combining the Novice and Technician into a Basic Class.
2. General would become the Intermediate Class except the code requirement would be 5 wpm.
3. Advanced and Extra Class would be combined into an Expert Class with 13 wpm telegraphy.
4. The three written examinations would be 50 questions each.

## Impact on The Amateur Community

Novices and Technicians with 5 wpm code credit would only have to pass a 50-question Intermediate multiple-choice test to upgrade to what is now the General Class level. Current General and Advanced Class amateurs would pass the 50-question Expert written test to receive full amateur privileges. There would be no further telegraphy requirement for these amateurs. This should prove attractive to existing licensees, since 90 percent of all amateurs hold Novice through Advanced Class licenses. The 20 words-per-minute telegraphy examination could still be made optionally available by VEs if individual amateurs deem it important to their self-esteem.

The major objection to any realignment or lessening of requirements will come especially from the Amateur Extra Class amateurs. James E. McNally, Jr. (WB3APV and a senior engineer with the FCC's Office of Plans and Policy) addressed these objections in his August 1986 research project, "Alternatives for Improved Personal Communications." He said:

"Another possible explanation for questionable barriers to entry in the Amateur Radio Service is that those who have attained the higher license classes with some level of difficulty would naturally object to rule changes that would have the effect of making access to their operating privileges easier. This attitude, while understandable, is nevertheless unreasonable, and it acts to inhibit meaningful restructuring of the service consistent with current circumstances. Another obstacle to worthwhile reregulation may be based on the belief of current licensees that otherwise inappropriate barriers to access should be retained in order to inhibit frequency congestion."

## Impact on VE System

Having less amateur operator examinations to administer would beneficially affect the workload of the VEC System. At present, the VEC's Question Pool Committee (QPC) revises question pools on a four-

REQUIREMENTS	CURRENT QUESTIONS & CODE	*BASIC* QUESTIONS/CODE
	NOVICE 30 5 wpm	BASIC 50 No Code
	TECHNICIAN 25 -	Group D call signs (2-by-3)
PRIVILEGES	CURRENT PRIVILEGES	*BASIC* PRIVILEGES
	NOVICE 80/40/15/10M CW 10M/1.25M/23cm Phone	BASIC All modes/emissions 6M and higher
	TECHNICIAN All modes/emissions 6M and higher	(Current Novices and Technicians become BASIC with current privileges "Grandfathered." Existing Novice/Tech license renewed BASIC.)
REQUIREMENTS	CURRENT QUESTIONS & CODE	*INTERMEDIATE* QUESTIONS/CODE
	GENERAL 25 13 wpm	INTERMEDIATE 50 5 wpm
		Group C call signs (if available - otherwise Group D.)
PRIVILEGES	CURRENT PRIVILEGES	*INTERMEDIATE* PRIVILEGES
	GENERAL Portions of all bands	INTERMEDIATE All current General privileges
		(Novices and Tech Plus pass only written test to become an INTERMEDIATE amateur.)
REQUIREMENTS	CURRENT QUESTIONS & CODE	*EXPERT* QUESTIONS & CODE
	ADVANCED 50 13 wpm	EXPERT 50 13 wpm
	EXTRA 40 20 wpm	Group A call signs (if available - otherwise Group B.)
PRIVILEGES	CURRENT PRIVILEGES	*AMATEUR* PRIVILEGES
	ADVANCED Most of all bands except certain small segments	EXPERT All amateur privileges
	EXTRA All amateur bands, modes and emissions	(Advanced pass only written test to become EXPERT)

One way the U.S. Amateur Service could be simplified is to combine Novice/Technician and Advanced/Amateur Extra into single classes.

Table I- Simplification and reorganization of the Amateur Service.

year basis. (Your author, Fred Maia, W5YI, is Vice-Chairman of that three-member committee.) The Novice and Technician pool are reviewed at the same time, since they are the sole requirement for the Codeless Technician entry level. If there were only three question pools, the review sequence could be reduced to a three-year cycle.

The current questions would be utilized, but the written test question pools would be reduced to three and renamed Basic

(Element 2), Intermediate (Element 3), and Expert (Element 4), instead of 2, 3A, 3B, 4A, and 4B. A portion of the current Advanced pool would be relocated to the "Intermediate" pool by the Question Pool Committee with the balance going to the "Expert" pool.

Specifically, all Element 2 and 3A questions would be combined to form the new Basic question pool. The current Element 3B (General) and approximately 300 of the questions in the 4A (Advanced) would form

There are currently:	370 questions in Element 2 (Novice), 325 in Element 3A (Technician), 286 in Element 3B (General), 507 in Element 4A (Advanced) and; 438 in Element 4B (Extra) pools.
TOTAL:	1926 questions in all pools
New question pools:	695 questions in new BASIC Class, 586 questions in new INTERMEDIATE Class and, 645 questions in new EXPERT Class.
TOTAL:	1926 questions

Table II- Adjustment of the examination questions to accommodate the realigned Amateur Service. The Novice and Technician pools would be merged into a Basic question pool. Some questions taken from the Advanced pool would supplement the General Class pool to form the Intermediate pool. The balance of the Advanced pool plus all the questions in the Amateur Extra Class pool would become the Expert pool.

the new Intermediate pool. The Expert question pool would consist of the balance (207) of the Element 4A (Advanced) questions and all current Element 4B questions (see Table II).

The number of questions could be further reduced to nearer the "... at least ten times the number of questions required for a single examination" (§97.523) during the VEC's Question Pool Committee's regularly scheduled revisions.

Modern transmitting equipment certainly is now universally available and used, which lessens the need for new applicants to be examined on electrical principles, circuits, and basic electronics. Emphasis needs to be placed in the areas that are more appropriate to the planned operation of newcomers—especially on rules, operating procedures, and amateur radio practices.

The Part 97 rules currently require that each examination contain a specified number of examination questions on each of nine topics. Accordingly, it has been QPC practice to provide at least ten times the number of questions required in each subelement for possible selection by volunteer examiners. The QPC should have the flexibility to stress certain topics and is considering asking the FCC to remove the restrictions contained in section §97.503(c).

While current questions would be used at first, the syllabus eventually should be reworked to better reflect the activities and knowledge required of Basic, Intermediate, and Expert amateurs. This would be completed during routine pool revision by the Question Pool Committee. The syllabus of the Basic pool should be oriented towards Rules, Operating Procedures, Amateur Radio Practices, and Amateur Radio Equipment as applies to VHF and higher frequency operation. The Intermediate questions should be geared towards all-band operation, volunteer examination of the Basic Class, with some electronics questions. The Expert examination should be highly technical and contain questions from examinations of all classes (see Table III).

Note that the new Intermediate Class offers the same privileges as the General Class, yet the number of examination questions is increased from 25 to 50. On the other hand, this is balanced by the fact that no additional telegraphy requirements are imposed. Furthermore, additional questions concerning the examination of Basic amateurs may be required. Ideally, to have minimum impact on license preparation publishers, the implementation date of any amateur service realignment should be July 1, 1994, when the Question Pool Committee is scheduled to activate new General Class questions.

In keeping with the availability of modern digital equipment and technology trends towards electronic rather than aural (manual) receipt of digital communica-

	EXISTING TESTS		PROPOSED TESTS	
	Element No.		New Element No.	
Telegraphy Exams:	1A	5 wpm	1A	5 wpm
	1B	13 wpm	1B	13 wpm
	1C	20 wpm	[1C	Not required, but could be available if amateur/VE community desired.]
Written Theory Exams:	2	Novice (30 questions)	2&3(A) to BASIC pool	(50 questions)
Written Theory Exams:	3A	Technician (25 questions)	(Pool: 695 questions)	
	3B	General (25 questions)	3(B) & some 4(A) to INTERMEDIATE (50 questions)	(Pool: 586 questions)
	4A	Advanced (50 questions)	Some 4(A) & 4(B) to EXPERT (50 questions)	
	4B	Extra Class (40 questions)	(Pool: 645 questions)	
TOTAL QUESTIONS:	170 Questions (Current) Pool: 1926 questions		150 Questions (Proposed) Pool: 1926 questions	

Table III—Impact of realignment on the VEC examination system. The current five (Novice, Technician, General, Advanced, and Extra Class) question pools would be reorganized into three question pools: Basic, Intermediate, and Expert.

tions, there would be no 20 wpm telegraphy requirement. Again, it should be pointed out that Canada reduced their 10 and 15 words-per-minute telegraphy requirement to 5 and 12 words-per-minute on October 1, 1990.

### Impact on Government And International Law

The FCC should find attractive any reduction in the number of amateur radio operator licenses which results in fewer different licenses having to be issued. Reducing the number of license classes from five to three could result in approximately 15,000 less operator applications being processed for operator licenses annually. This of course could be balanced by more licenses being issued for the new Intermediate and Expert Classes, since it could be argued that these license classes might be easier to attain due to a reduction in telegraphy speed requirements.

We note from the remarks given by Ralph Haller at the VEC Conference in Gettysburg, Pennsylvania this past June that the FCC is in the process of rewriting computer software to provide for special amateur station licenses and/or callsigns. The Commission should consider adding software capability to change the name of existing license classes or a provision that would later permit a reorganization of amateur service licensing.

It appears to us that the Commission's data processing equipment should be able to easily merge the Novice and Technician

data base into a Basic Class, rename the General Class Intermediate, and combine the Advanced and Amateur Extra Classes into the Expert level without incurring major computer software reprogramming expense.

The suggested new realignment conforms to international requirements which require telegraphy knowledge when the radio operation takes place below 30 MHz.

### So There You Have It!

This proposal is not perfect, but it does provide attractive benefits to potential and existing amateur licensees, volunteer examiners, and the Government, whose resources are limited. It can easily and quickly be implemented, and with a minimum of disruption to testing, licensing, or operator activities.

It grants all Novice (who have been tested on some VHF operation) and Technician licensees full Basic privileges—i.e., all frequencies/modes above 6 meters—without further testing. Novices and Technicians with 5 wpm code credit can upgrade to Intermediate by passing only a written examination. General and Advanced Class licensees who have passed 13 wpm code would be able to upgrade to Expert by passing only a 50-question examination.

I recently wrote to the Federal Communications Commission inquiring if they would be receptive to a suggestion to decrease the number of amateur operator license classes to simplify examination ad-

ministration and license processing. John B. Johnston, Chief of the FCC's Personal Radio Branch, responded by saying:

"The Commission has a goal to provide excellent service to the public in the most efficient, uncomplicated, timely, and courteous manner possible. Your suggestion would require significant changes to the existing amateur operator license class structure, requirements, and privileges. These matters have been the subject of numerous rulemaking proceedings that generated many thousands of comments from the amateur service community. After considering the views expressed, the Commission adopted the rules which are now codified in Part 97. The current operator license classes, requirements, and privileges, therefore, were developed in accordance with the expressed desires of the amateur community to provide motivation for amateur operators to advance their communication and technical skills.

"To justify the initiation of a rulemaking proceeding to revisit these contentious issues would require convincing evidence that a large segment of the amateur service community desires to alter the current license structure in a specific manner or that it is failing to allow the service to fulfill its basis and purpose."

### So How Do You Feel About The Proposal?

Somehow (and I am not sure how), Neal Zipper, KD4EGE, of Bradenton, Florida heard that we were "floating" an idea to eliminate two of the five amateur radio license classes and the 20 wpm telegraphy examination. We wrote back to him about the above proposal and his response was interesting. What he did was start a grass-roots support campaign within the amateur community! Neal had printed hundreds of postcard-size cards which said:

"I am an amateur radio operator and support the proposed W5YI proposal outlined below:

"Combine the Novice and Technician to a Basic Class. Privileges would be all spectrum above 30 MHz with all modes and emissions. Current Novices and Technicians would be 'grandfathered' into current privileges indefinitely.

"General would become the Intermediate Class. Privileges would be the same as now except the code requirement would be 5 wpm.

"Advanced and Extra Classes would be combined into an Expert Class. Privileges would be those of the current Advanced and Extra Class except a 13 wpm telegraphy requirement. Each written examination would be 50 questions. (Three in all.)"

He left a space for the amateur to sign the postcard and fill in his address. The

reverse side of the postcard is a return address to W5YI. The amateur simply mails the card back to us. We have already received dozens of these cards from licensed amateurs in Florida backing the concept.

How do you and your radio club feel about simplifying and reorganizing the Amateur Service? If you agree with the concept, why don't you too start a campaign to register support similar to what

KD4EGE did? We will proceed with a petition to the FCC for rulemaking if we get enough cards indicating widespread support for this proposal within the amateur community.

We would be interested in all comments —both for and against. Send them to: The W5YI Group, P.O. Box 565101, Dallas, TX 75356. Our phone number is 817-461-6443 if you want to talk to us.

73, Fred, W5YI

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A LOOK AT THE WORLD AROUND US

## Romance Recaptured: More Classic Rigs

**P**ush back those fancy "do everything" transceivers and big, high-power amplifiers, gang. This month's column features some real rigs with genuine old-time flair! Yes, indeed, we are taking another light-hearted romp through those thrilling days of yesteryear when excitement flourished with every twist of the dial, DXing was a true art, and the operator rather than the rig made the difference! This fascinating era was best known for its open-air rigs, warm glowing tubes, keys that flashed with high voltage, and antennas that winked with CW in the night. CW was king, bugs were in vogue, and low-power transmitters were the rule rather than the exception. Good times? You bet, and the romance of it all continues today! Dig out your old soldering iron and get ready to scrounge through hamfest fleamarkets for authentic-era parts to build some of our featured rigs. We are going to put some real old-time fun in your amateur radio life!

This time we are traveling in reverse by opening with recent delights appealing to "younger old-timers" rather than beginning with the 1920s and proceeding forward in years. Our column is once again overflowing available space, so strap on your seat belt and let's get rolling!

### Solid Gold: The QRP Midget

Breadboarded transmitters and regenerative receivers are usually considered classic oldies, but many of today's amateurs began their radio life when homebrewed rigs on metal chassis and store-bought receivers sporting names such as National, Hammarlund, and Hallicrafters were popular. Ah... but is not nostalgia in the eyes of the beholder or a 1960s model MG Roadster a modern-day classic? You bet, and with those thoughts in mind, cast your eyes on the classic two-tube "QRP Midget" shown in fig. 1. This pocket-size (well, almost!) rig was originally described in July 1967 *Popular Electronics* by W5LET and was reproduced in 1991 by Bob Hunt, KY7C. The only difference between Bob's rig and its 25-year senior is the original was

built on a gray hammertone Bud cabinet, and KY7C's uses a silver box from Radio Shack. Isn't it simply irresistible? I have already begun collecting parts to build my own. How about you?

Look at the Midget's circuit diagram in fig. 2 and notice the only time-consuming part of assembly is cutting holes in its box for mounting tube sockets, crystal, and coil socket. The tubes are ever-popular 3S4s used in audio amplifier stages of many same-era portable radios. Bob secured his tubes, coil forms, and Midget variable capacitor from Antique Electronic Supply, 6221 S. Maple Avenue, Tempe, AZ 85283. The other parts are easy to obtain at Radio Shacks or hamfest fleamarkets.

Coils for the Midget are wound on a 1 1/4 inch diameter form (or Millen 45004 form, if you can find one). Both L1 and L2 are No. 24 enameled wire. For 80 meters, L1 is 31 turns and L2 is 8 turns. For 40 meters, L1 is 21 turns and L2 is 7 turns. For 30 meters, L1 is 16 turns and L2 is 5 turns. All coils should be close wound. Wind L2 in the same direction as L1 and space it one-eighth inch below L2 on the form. If you

### Correction

In the September column on page 67 we made mention of the Bicycle Mobile Hams of America (BMHA) newsletter. Its editor is **NA0A**, and the address to which to write for membership in BMHA is **Box 4009**, Boulder, CO 80306.

assemble the 80 meter coil, add an additional 50 pFd silver mica capacitor across L1 (mount it inside the coil form for easy band changing).

Tune-up and operation of the Midget is a cinch. After applying voltage and warming up the tubes, tune your receiver to the crystal's frequency, then close the key and adjust the tuning capacitor until the rig oscillates. Doesn't work? Double check your wiring (and tubes!), and then try another crystal. Most "garden variety" crystals (32 pFd load capacitance) work fine in the Midget, but some are always sluggish. Got it? Great! Now adjust the tuning capacitor for maximum output consistent with good keying quality. Typical



Fig. 1—KY7C's QRP Midget. This little gem from the 1960s is easy to assemble and a real treat to use on the air today. (Photo by KY7C's friend, Brent Boone-Roberts)

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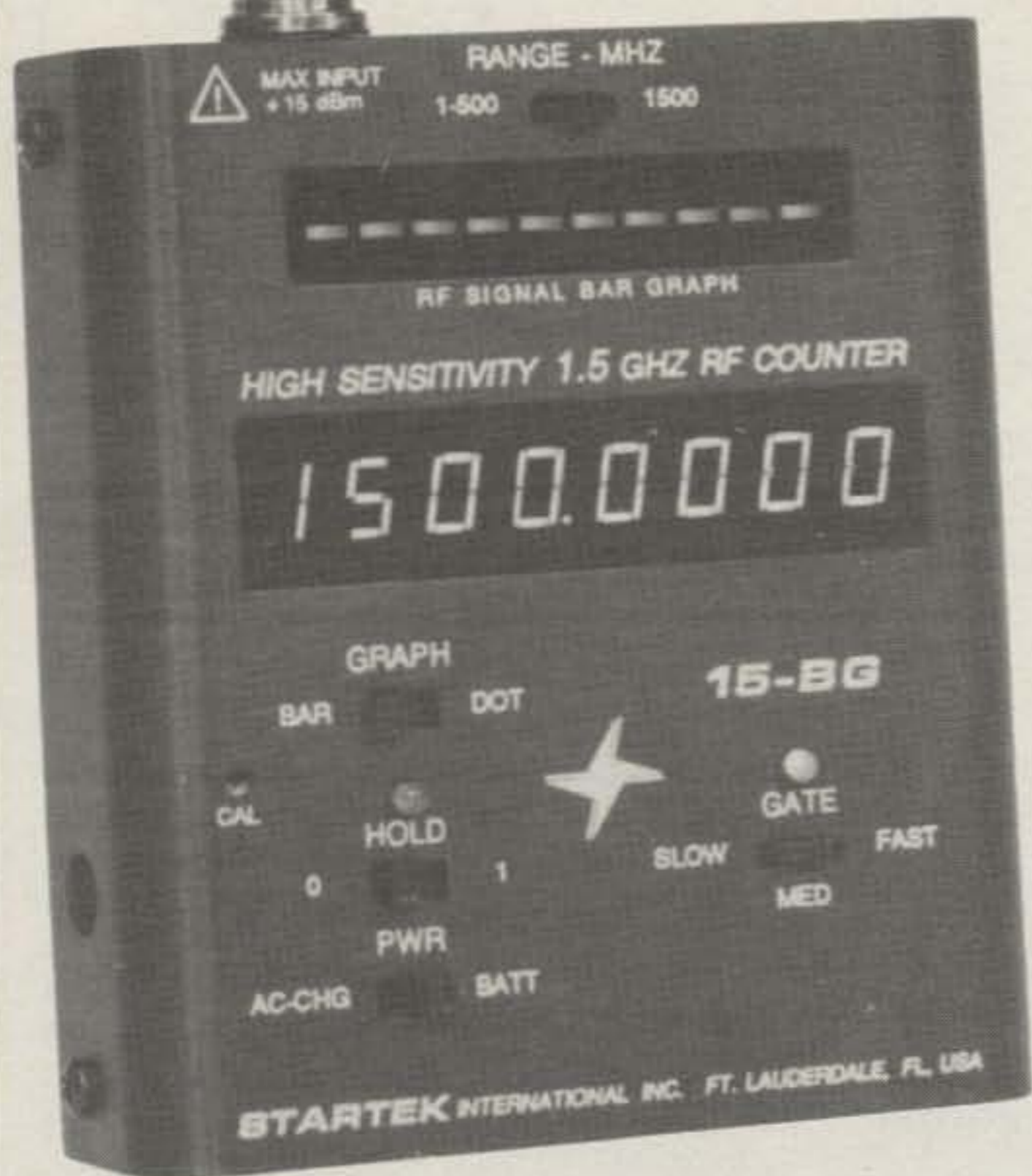
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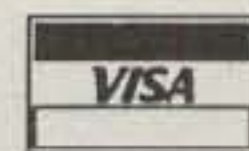
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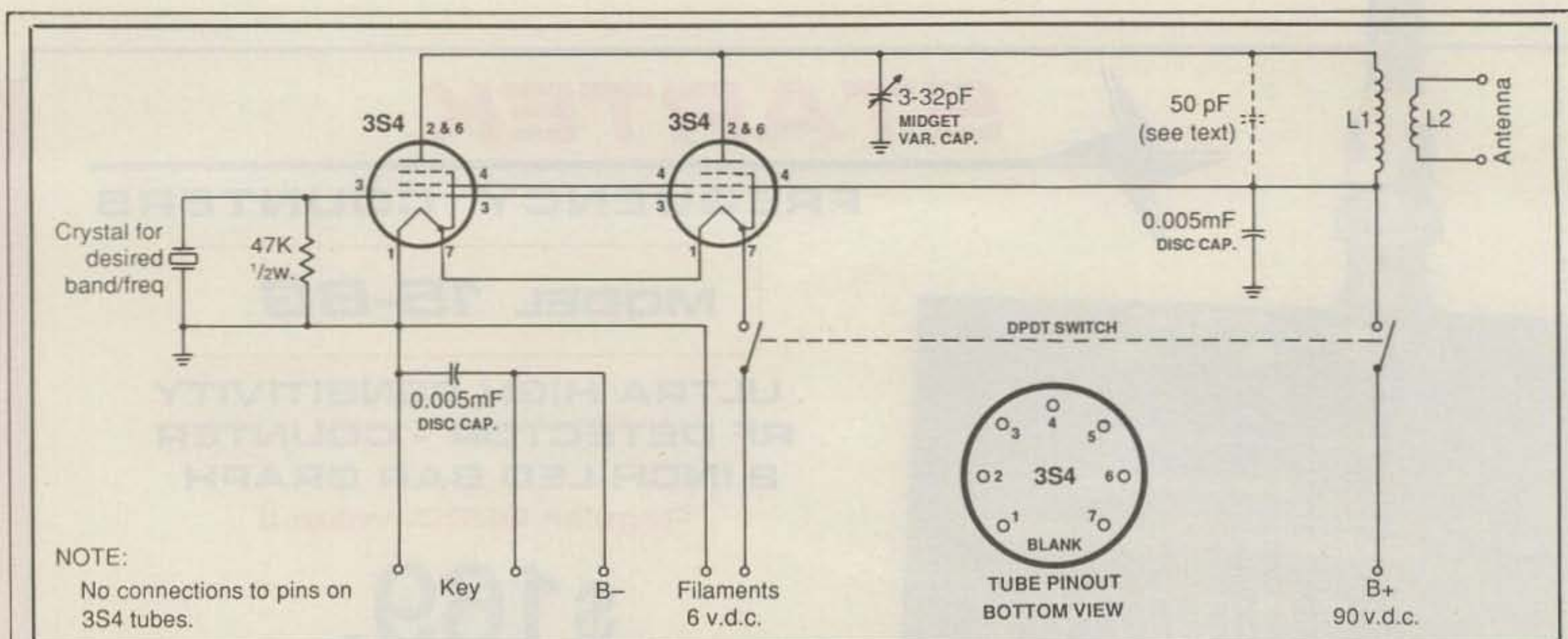


Fig. 2—Circuit diagram of the QRP Midget. Parallel-connected 3S4 tubes pump out 800 mw of RF—perfect for 30 meter DXing.

power output will be 800 mw when using a 90 volt supply (ten 9 volt batteries clip-connected in series work great with this little rig).

An ideal mate for this '60s-style treat is a Hallicrafters S-53 or Hammarlund HQ-100 Receiver, and a good place to check for such golden oldies is Ham Heaven, 645 Wheeling Rd., Wheeling, IL 60090. Ham Heaven's "Musty Manuals" division also has hard-to-find catalogs and service manuals of favorite old-time rigs for sale. Alternately, maybe you can talk John Leary, W9WHM, into restoring one of his special "JRL" Hammarlund Super Pros as shown in fig. 3 for you. John does an incredible job of bringing these golden oldies

back to life, and his finished product with gray cabinet and red trim is beyond description. Unquestionably, gear such as the QRP Midget and Super Pro are the perfect way to relive amateur radio of the 1950s and 1960s in high style!

### "Low Boy" 6L6 Transmitter

Our jaunt down memory lane continues with brief views of another genuine classic: the famous 6L6 transmitter. Variations of this delightful oldie have been built on everything from pie pans to cigar boxes (see our March 1990 CQ column), but I have yet to see one more impressive than

KY81's 1940s-style reproduction shown in figs. 4 and 5. The transmitter is assembled breadboard style with a low, black, crackle front panel so you can see the tube's soft glow during operation and change coils with ease. This nostalgic delight is powered by an external supply delivering 200 to 400 volts at 50 ma, and produces 7 to 15 watts output. The rig's generic circuit diagram is shown in fig. 6, and conventional parts are used throughout. If you wish to reproduce this rig with real old-time flair, use "body-end-dot" resistors, mylar or paper capacitors, Bliley crystals, and a Triplet meter. A 365 pF variable capacitor may be substituted in the tank circuit if 80 meter operation is not desired. The plate coil is wound on a plug-in form 1 1/2 inches in diameter. If you cannot find genuine old-time forms, homebrew equivalents can be made by gluing tissue rollers wrapped with masking tape onto old tube bases after removing their envelopes (this technique also applies to our QRP Midget and upcoming one-tube receiver). The coil consists of 22 turns for 80 meters, 15 turns for 40 meters, and 12 turns for 30 meters. Wide space the turns along the form for smooth tune-up. The antenna pick-up coil is mounted directly below the tank coil, and consists of five turns for 30 or 40 meters, and 8 or 9 turns for 80 meters. All coils use No. 18 enameled wire.

Check-out and operation of the completed 6L6 transmitter is duck soup. Apply filament voltage and allow the tube to warm up for four or five minutes, and then connect the high voltage. Key the rig, and then quickly tune the variable capacitor for a dip in plate current. Check the rig's signal quality on your fancy transceiver. Tune a few ma either side of the dip as necessary for a clean CW note, and then hit the airwaves with a genuine classic! If you really want to go first class, add a small NE-2



Fig. 3—Hammarlund's Super Pro restored to new by W9WHM. John rebuilds these classics of the 1950s in his spare time, and the results are spectacular!



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combined with an indoor control unit lets you stack multiband antennas for maximum performance and makes it easy. The Universal Phase-Box is built to the highest standards, utilizing high-current constant impedance transformer rated at 5 KW, a clean CAD-designed PC strip-line technology and a rugged weatherproof outdoor enclosure. Simply connect a feedline from each remote unit, run an inexpensive 3-wire control cable, to operate! Rugged, reliable and easy to use, the Box is priced at \$295, shipping prepaid.

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Fig. 4— Front view of KY8I's 1940s-style 6L6 transmitter. Visualize using this delight with a National SW-3 receiver today.

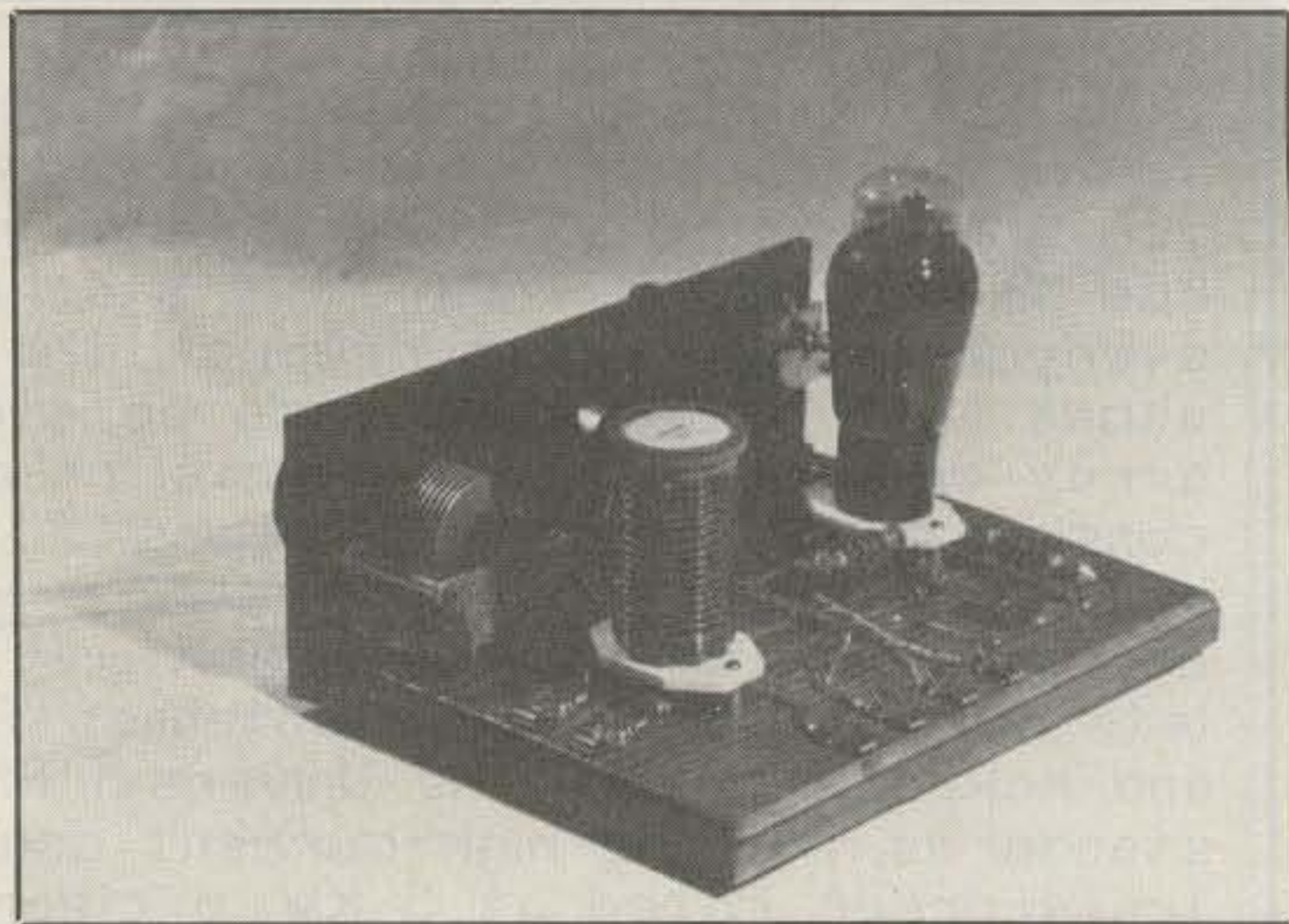


Fig. 5— Rear view of the 6L6 transmitter. Tube and coil sockets are mounted above the wood base with metal spacers.

neon pilot lamp to each end of your dipole. Yes, then you can look out your window at night and watch it blink with transmitted Morse. Heart warming indeed!

### A One-Tube Delight

The little one-tube receiver shown on the right side of fig. 7 is another Tom Jurgens, KY8I, masterpiece, and Tom says he has actually used it on the air and to copy

amateur band signals with good results. A photo cannot do this receiver justice, as it sports a super-fancy version of the classic National Velvet Vernier black dial (with chrome center nut) mounted on a black front panel. The dial in itself is a true show-stopper, yet internal circuitry is equally impressive.

The receiver's schematic diagram is shown in fig. 8, and only eight parts are used in this unique "oscillodyne" circuit. Antenna trimmer capacitor C1 is used to

peak incoming signals, and C2 is the main tuning capacitor. A No. 27 tube serves double duty as a detector and amplifier; its output is passed through L2 for regeneration and CW reception, and then applied to high-impedance earphones. These earphones are the tube's load impedance and should be 25,000 or 50,000 ohms (like classic Baldwin "cans"). Modern stereo-type earphones are low impedance (8 or 16 ohms) and will not work in this receiver.

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CIRCLE 48 ON READER SERVICE CARD

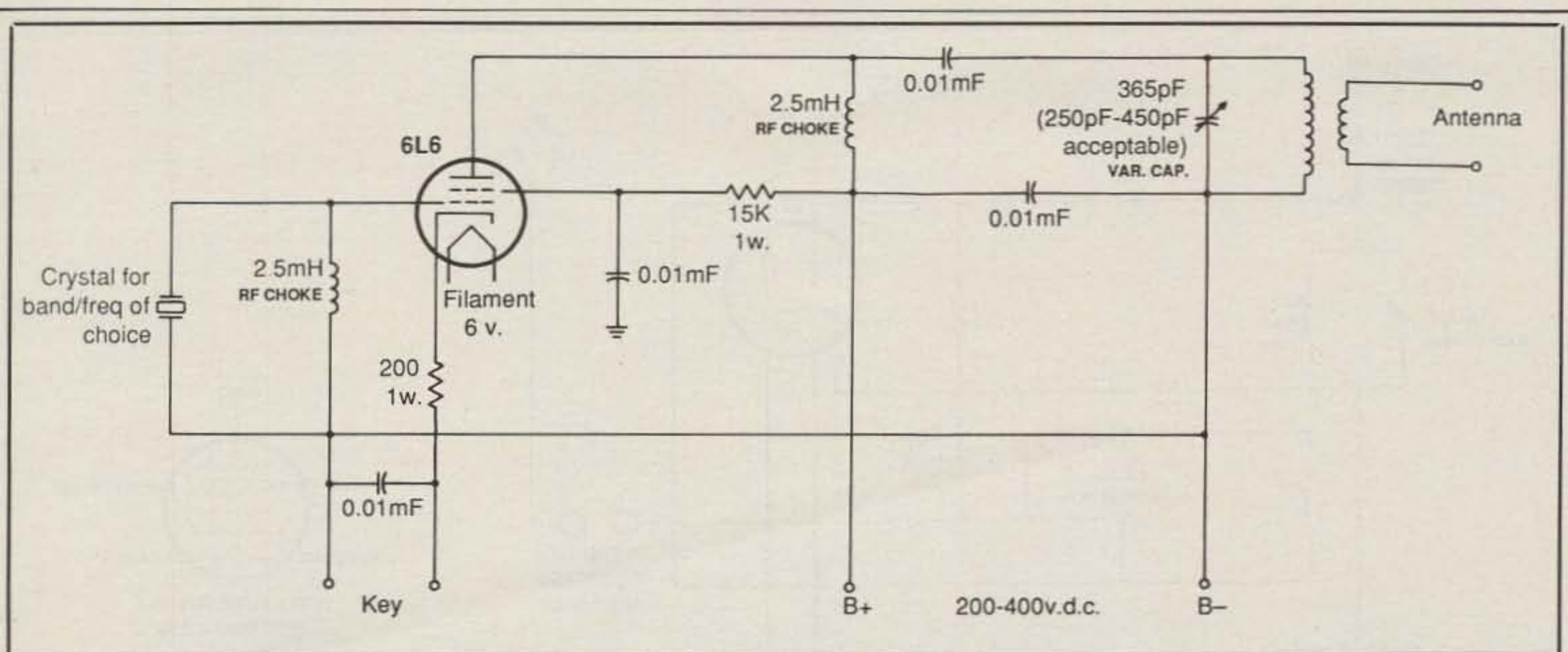


Fig. 6- Schematic diagram of the 6L6 transmitter. Point-to-point wiring is used for simplicity.

thenticity when building this receiver, look for domino-shaped fixed mica capacitors, a fuse-shaped resistor, plastic knurled binding posts, a five-pin tube socket, and a genuine bakelite sheet approximately 4½ by 5½ inches for a bottom (parts-mounting) platform. Alternately, a nice piece of stained oak wood makes a good base plate. Use an aluminum sheet approximately 4½ by 6 inches for the front panel. Use of metal rather than wood for this panel is vital to eliminate hand capacity (otherwise tuning may shift to the opposite end of a band when you move your hand). An old-time Velvet Vernier dial has an additional metal backplate, bottom-mounted tuning knob, and adjustable

speed gear drive, and the combination really brings out the inner beauty of this little receiver.

Good (and even new) No. 27 tubes can still be found today, but they are not cheap (the main difference between old junk and genuine classics). When you find No. 27 tubes, incidentally, I suggest purchasing two or three for good measure. You can then hand-pick the best one (highest sensitivity and lowest microphonics), and store the other for spare(s). If you are really lucky and find a classic Arcturus Blue-Envelope tube, go for it. They were well known for top performance in the good old days, and even if one is not a hot value today, it adds a good touch of glamor.

Coils for this one-tube delight are made by winding number 24 to 36 enamel-coated wire on a plug-in form 1½ inches in diameter (or homebrew equivalents such as that described in our 6L6 rig). Grid coil L1 should consist of approximately 36 turns for coverage of 1.8 to 3.0 MHz, 13 turns for 3.0 to 7.3 MHz, 6 turns for 7.5 to 15 MHz, and 4 turns for 12 to 15 MHz. Original-era coils were wound close-spaced, but spreading the turns over the form's full length should give greater band spread. The tickler coil, L2, is wound in the same direction as L1, and spaced one-eighth inch above it. Wind 35 turns for 160 and 80 meters, 12 turns for 40 meters, 10 turns for 30 meters, and 6 turns for 20 meters.

Checking out the receiver begins by applying 2.5 volts to the tube's filament and 90 volts to its plate. You can use a .5 ohm 10 watt resistor wired in series with a dry cell for filament power, and ten 9 volt batteries for plate power. Connect a 30 foot wire to the rig's antenna terminal, and then advance regeneration control R2 until a howl is heard in the earphones. If you do not hear a hiss or howl (and the tube is good!), swap L2's plate and earphone connections. Assuming you hear a howl or hiss, it indicates the receiver is working (its tuning range, however, is a different matter).

If you have a portable frequency counter, place its pickup lead near the receiver, and then vary the main tuning condenser from end to end and make a chart of its tuning range. No frequency counter? Disconnect the antenna cable from your fancy solid-state transceiver (replace it with a short wire), select general-coverage reception, and start hunting for the one-tube receiver's 'regen signal. Depending on the size wire you used for coils, how much they are spread out, and total circuit capacity, you may then elect to rewind the

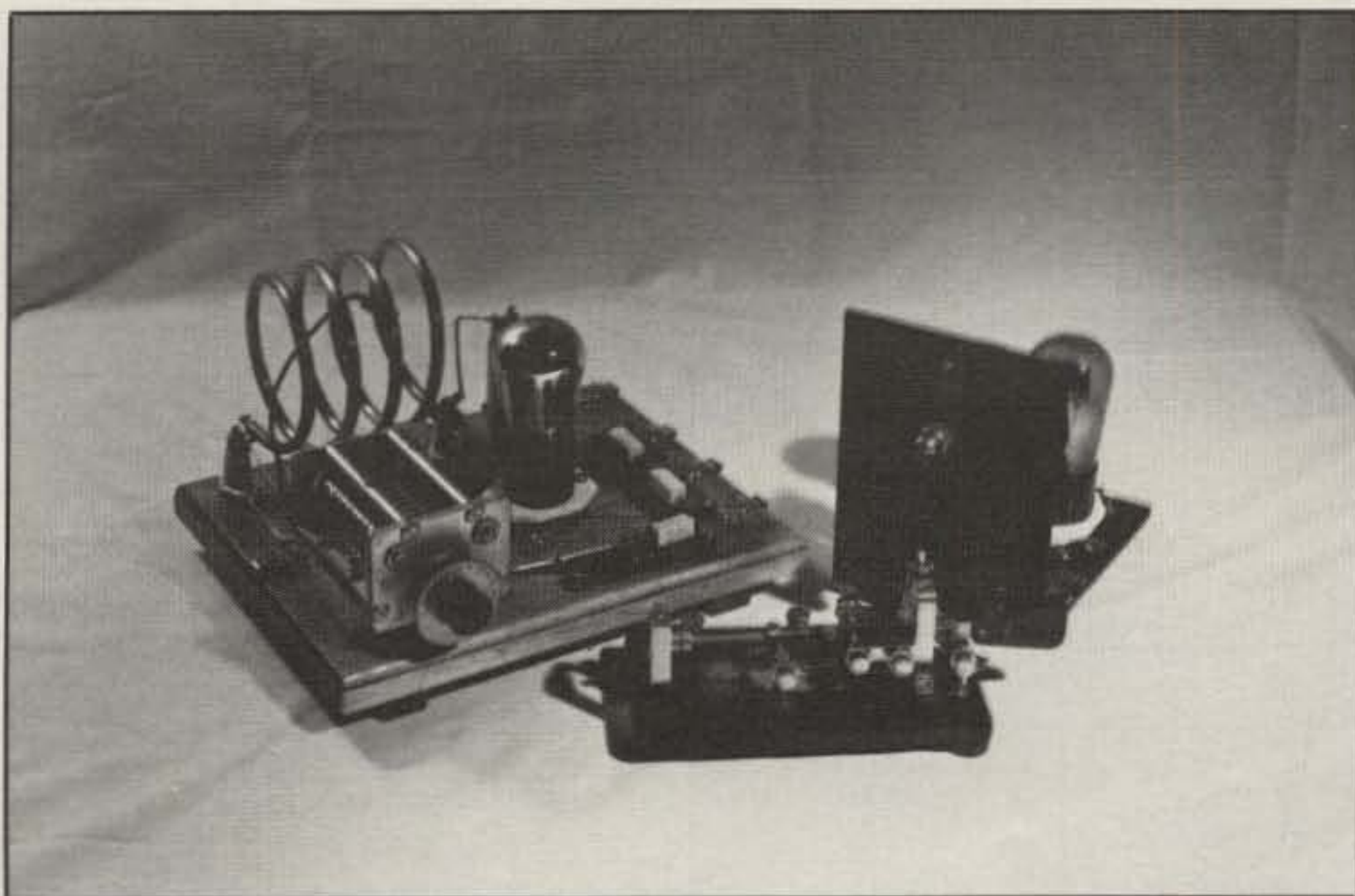


Fig. 7- Golden classics for sure! The 1930s-style Hartley transmitter on the left is mated with a beautiful one-tube 1920s-style receiver on the right and a 1925 bug in the foreground. Rigs were assembled by Tom, KY8I, in 1990.

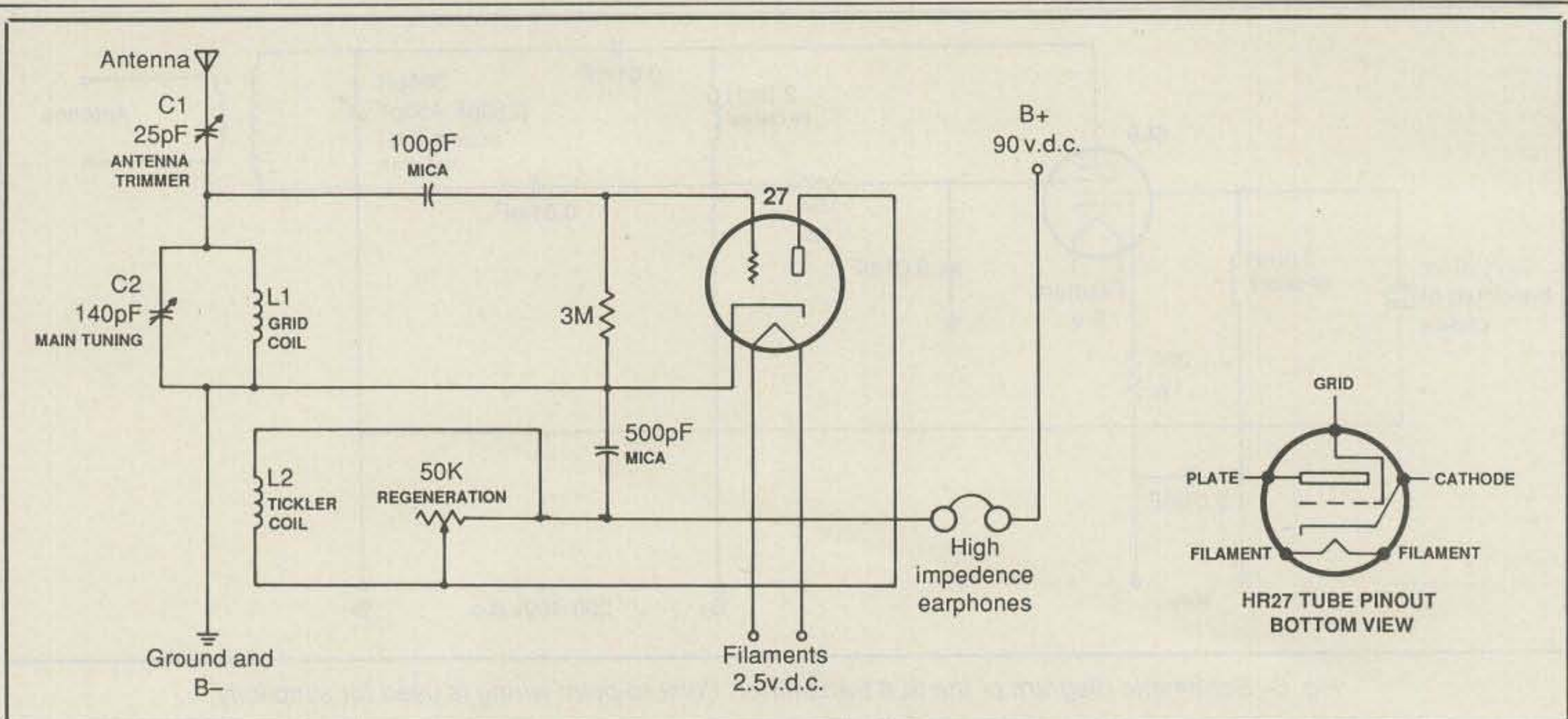


Fig. 8- Schematic diagram of the one-tube oscillodyne receiver. (See discussion in text.)

main coil L1 with more or less turns for smooth amateur band tuning. Do not expect miracles, however. This receiver is quite broad, precise on-frequency tuning is an art, and receiving a specific station usually involves concentrating on a particular tone while ignoring QRM. As I said earlier, the operator rather than the rig

makes the difference. It is challenging, but terrific fun!

Some of our readers are surely curious about the KY81's adjacent Hartley Transmitter shown in fig. 7. Tom built this beauty from a description in my book *Golden Classics of Yesteryear*, which is still available from MFJ Enterprises. We haven't room in this month's column for a full description of this gem, but its schematic diagram is shown in fig. 9. The tank coil is  $\frac{1}{8}$  inch copper tubing wound on a 3 inch diameter form and stretched to a length of 5 inches. It is tapped one turn from the "grid end." This coil is used for 30 meter operation and although combined with a 250 pFd capacitor, the

transmitter tunes continuously from 10-12 MHz. Needless to say, one must be very careful to ensure in-band operation! The tube is a famous 201A powered by "90 volts worth" of batteries. Not only does this transmitter look like a real amateur rig, it also produces a beautiful on-the-air signal. The bug in front of the transmitter, incidentally, is a 1925 Vibroplex "Original" in like-new condition.

So much to say, so little time! As the curtain comes down, I invite you to tell us if you wish to see more views of golden oldies, remind you to include SASEs if a reply is desired, and look forward to working you on 30 meters soon!

73, Dave, K4TWJ

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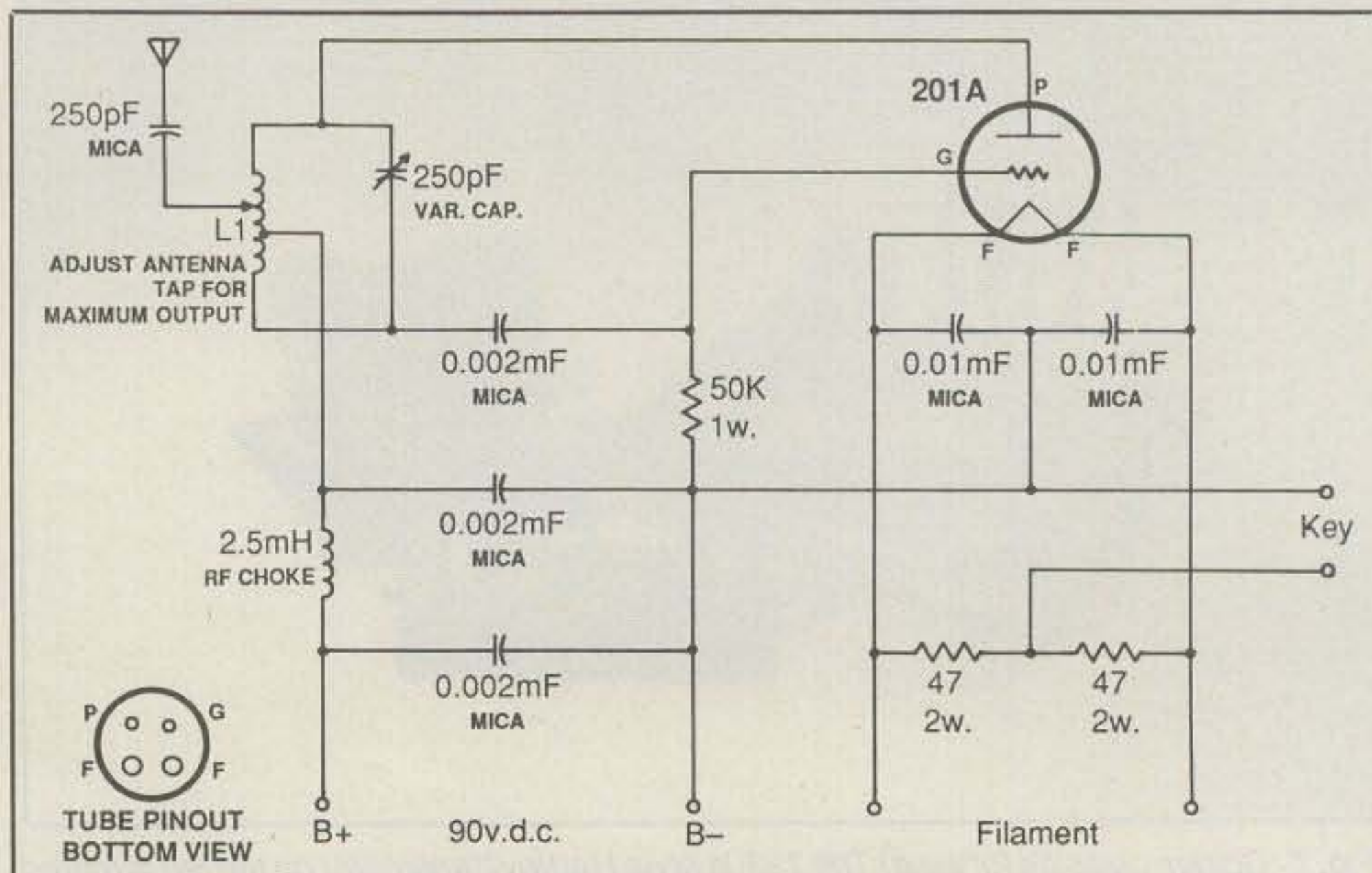


Fig. 9- Circuit diagram of the famous Hartley transmitter that "ruled the roost" during the late 1920s and much of the 1930s.

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**\$149**  
Suggested Retail



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NEWS OF COMMUNICATION AROUND THE WORLD

# 1B1NCC: Pirate Station or Political Statement?

In late June and early July an amateur station signing 1B1NCC worked several thousand DXers. The station claimed to be licensed by the Telecommunication Authority of the Turkish Republic of Northern Cyprus. The operation was marred by extensive deliberate QRM, mostly from stations in Cyprus and Greece. Nor was the antagonism against this station limited to the amateur ranks. The Ministry of Communications of Cyprus asked that "under no circumstances should contact be made with this station." What is the story of 1B1NCC?

To understand both sides of this question, we must review some history of Cyprus. Cyprus is the third largest island in the Mediterranean Sea, after Sicily and Sardinia. It enjoys a strategic location in the eastern Mediterranean, close to Lebanon, Israel, Egypt, and Syria, just 50 miles

below Turkey. Greece is about 500 miles away. The island's location, coupled with mineral wealth and agriculture, has attracted numerous conquerors over thousands of years. As different powers controlled the region they annexed Cyprus: Egypt, Persia, Greece, Rome, Venice, the Ottoman Empire, and Britain. In fact, the Republic of Cyprus has only existed as a complete, independent country for three years of the past 4000!

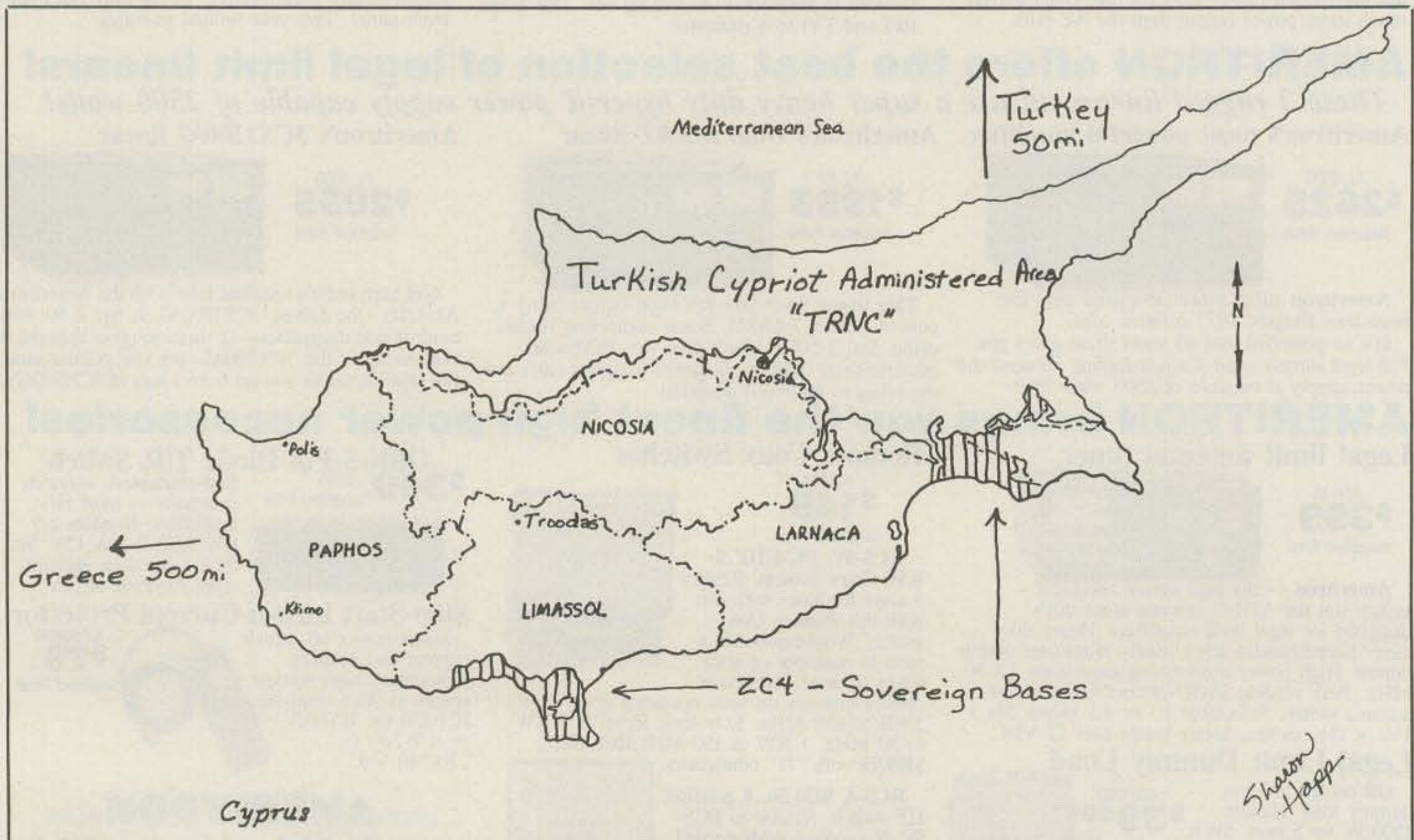
In more recent times the island was under Turkish domination from 1570 to the late 19th century. The largely Greek population suffered economically and politically under Turkish control. Many Turks moved to Cyprus, settling throughout the 3600 square-mile island. In 1878 Turkey leased Cyprus to Great Britain in exchange for a British promise to fight Russian expansion in the region. Great Britain assumed complete control over the island in 1914, when Turkey entered WW I on the side of the Central Powers.

The British greatly improved the lot of both the Greek and Turkish Cypriots with modernization projects, improved education, and new hospitals. (At one point Britain offered the island to Greece, if that country would enter WW I on the Allied side; Greece turned down the offer.)

Following a long and often tumultuous rule, Britain, together with Greece and Turkey, granted independence to Cyprus, under a complicated joint government composed of both Greek and Turkish Cypriots. The independent country of Cyprus came into existence on August 16, 1960. It would survive in its original state for only three years. (When the British granted independence to Cyprus, they retained sovereignty over two military bases: Dhekelia and Akrotiri. These bases are now a separate DXCC country: ZC4.)

The complicated dual control of the island created friction on both the Greek and the Turkish sides. The minority Turks (about 120,000) distrusted the more num-

P.O. Box 50, Fulton, CA 95439



Map of Cyprus.

*Sharon Hagg*

## The WPX Program

### Mixed

1571 ..... EA3CWK 1573 ..... JN3SAC  
1572 ..... N5KUC 1574 ..... VO1SF

### SSB

2326 ..... EA5ZR 2329 ..... DL1RM  
2327 ..... EA2CLK 2330 ..... WB4UMO  
2328 ..... EA1DJS

### CW

2748 ..... OH9TD 2750 ..... JN3SAC  
2749 ..... LU2YA 2751 ..... I5KHX

### Endorsements

Mixed: 450 EA3CWK, JN3SAC, VO1SF. 500 EA3CWK, JN3SAC. 550 EA3CWK, JN3SAC. 600 EA3CWK, JN3SAC. 650 EA3CWK, JN3SAC. 700 EA3CWK, JN3SAC. 750 JN3SAC, KW0U. 800 F6CXJ, IK3DRO. 850 F6CXJ. 900 IN3PEE. 1650 KB0G. 1750 IK2ILK. 2650 IN3ANE. 2700 IN3ANE. 11EEW. 2750 IN3ANE, 11EEW.

SSB: 350 DL1RM. 400 VE1RJ. 650 IT9JPK. 700 IT9JPK. 750 IT9JPK. 800 IT9JPK. 950 KB0G. 1300 KA0ZFX. 2350 11EEW. 2400 11EEW.

CW: 350 OH9TD, LU2YA, HA9PP, JN3SAC, KB6MIR. 400 OH9TD, LU2YA, HA9PP, JN3SAC. 450 N2FKE, LU2YA, HA9PP, JN3SAC. 500 N2FKE, LU2YA, HA9PP, JN3SAC. 550 LU2YA, HA9PP, JN3SAC. 600 LU2YA, HA9PP, JN3SAC. 650 LU2YA, JN3SAC. 700 G3JTO, LU2YA. 750 LU2YA. 800 LU2YA. 850 LU2YA. 900 LU2YA. 950 LU2YA. 1000 KA1CLV, LU2YA. 1050 LU2YA. 1150 OZ5UR. 1200 OZ5UR. 1250 OZ5UR. 1300 11EEW, KB0G, OZ5UR. 1350 OZ5UR. 1400 OZ5UR. 1450 OZ5UR. 1500 OZ5UR.

10 Meters: HA5NK  
15 Meters: OH9TD, JN3SAC, HA5NK  
20 Meters: JN3SAC, HA5NK  
40 Meters: IN3QCI  
80 Meters: OZ5UR

Asia: OH9TD, JN3SAC, KB6MIR  
Africa: HA5NK, OZ5UR  
Europe: OH9TD, JN3SAC  
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**Award of Excellence Plaque Holders with 160 Meter Endorsement:** FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, HI8LC, KA5W, UR2QD, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB0G, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YB0TK, W8ILC, W1BWS, VE7WJ, K9ORF, NN4Q, W4UW, K9ORF, NX0I, G4BUE, LU3YLW4, I4EAT, WB4RUA, VE7WJ, N4NX, DE0DXM, VE7IG, K9BG, 11EEW, AB9O, CT1YH, IV3PVD, KA5RNH, ZP5JCV.

Complete rules and application forms may be obtained by sending a business-size self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to: "CQ WPX Awards," 880, CR13, Clovis, NM 88101-9511 USA.



20,21 y 22 de Noviembre de 1992

*XF1SI is the callsign for the Club de Radioaficionados de los Mochis, A.C., DXpedition to San Ignacio Island November 20-22.*

erous Greeks (about 520,000) and feared eventual annexation by Greece. In turn the Greeks worried about a Turkish invasion and resented the high level of control the Turks enjoyed in the government, far in excess of their percent in the population. Different religions fueled the rift; the Greeks are mostly Orthodox Christians, while the Turks are mostly Sunni Muslim.

In late 1963 the Greek president proposed revisions to the constitution, including eliminating the veto power of the Turkish vice-president. This changes were unacceptable to the Turks. In the tense situation violence erupted, and two Turkish Cypriots were killed. The Turkish representatives, including the vice-president, withdrew from the government, leaving it completely in the hands of the Greeks.

At that time the Turks and Greeks were intermingled on Cyprus. Turkish villages were scattered among the more numerous Greek villages. Many of the larger towns contained significant populations of both groups. The capital of Nicosia was divided by a green line, separating the Turkish enclave from the surrounding Greeks. Some 6500 United Nations troops were stationed on the island to maintain an uneasy truce.

Over the next ten years this situation exploded with skirmishes on several occasions, and came within days of invasion by the Turkish army a couple of times. Relations between the now completely Greek government of Cyprus, and an ever-changing, coup-plagued government of Greece were strongly divided over many issues, including Communism and enosis, or union with Greece. By the early 1970s the official Cyprus government had no control over the Turkish enclaves. Meanwhile, a guerilla war between Greeks who wanted enosis with Greece and the independence-minded government mounted in violence.

The climax came in July 1974. A very anti-Communist military junta had seized the mainland Greek government in November 1973. The new Greek leader strongly favored enosis, and further felt the Cyprus government too accommodating

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CIRCLE 55 ON READER SERVICE CARD

November 1992 • CQ • 137



Ed, SP1MHV, Zenek, SP7LSE, and Roger, LA5GHA, in Lebanon. The Poles are very active, mostly 20 meter CW 0000-0200Z.



Bob Preston, W7TSQ (right), entertains Ron Marra, AA5DX, in Indonesia, where Bob was active as YB3ASQ.

to the hated Communists. The final straw was a letter from Archbishop and President Makarios demanding that Greece withdraw 650 Greek officers from the Cyprus National Guard. The Greek junta responded by ordering the Cyprus National Guard to destroy the presidential palace and kill Makarios. Makarios escaped with the help of British troops from the Sovereign Bases. The Greek junta set up a figurehead president, while Makarios flew to New York to speak at the United Nations against this coup.

Turkey asked Britain to come to the rescue of independent Cyprus, as per the original agreement establishing the country. When Britain refused, Turkey evoked a clause in the Treaty of Guarantee allowing unilateral force: "In so far as common or concerted action may prove impossible, each of the three guaranteeing powers [Greece, Turkey, and the United Kingdom] reserves the right to take action with the sole aim of re-establishing the state of affairs established by the present Treaty." Turkey invaded Cyprus in force.

The Turks claimed that they had a legitimate concern that the new, and illegal, government of Cyprus would push enosis with Greece in violation of the Treaty of Guarantee. While this may have been the case at the beginning, Turkey should have stopped the invasion following the collapse of the junta in Greece and the resignation of the puppet president a few days later. They did not. Subsequent events showed that this proclaimed concern for the legitimate government of Cyprus was but an excuse for a long-planned takeover of a third of the country.

Thousands of Cypriots were killed during the on and off fighting over the next month. As the Turkish Army consolidated their hold on the northern third of the island, Greek Cypriots fled their homes for the south. By the time Turkey finally agreed to a cease fire, its troops were in complete control of about 37% of Cyprus, including

its best ports, much of its industry, water supplies, tourist hotels, and much more.

In partitioning Cyprus into Greek and Turkish sides, Turkey has directly violated the same Treaty of Guarantee that they evoked to invade. Article 2 of that Treaty states: "Greece, the United Kingdom and Turkey . . . undertake to prohibit, as far as lies within their power, all activities having the object of promoting directly or indirectly either the union of the Republic of Cyprus

### 5 Band WAZ

As of July 31, 1992, 344 stations have attained the 200 zone level.

New recipients of 5 Band WAZ Award with all 200 zones confirmed:

None

The top contenders for 5 Band WAZ are:

N4WW, 199	W9WAQ, 199
SP9PT, 199	K6EID, 199
K6YRA, 199	IK8CNT, 199
PY7ZZ, 199	W1JR, 199
DL9WW, 199	W8SEY, 199
K0CS, 199	N7RT, 199
KB0G, 199	VE7AHA, 199
AA4KT, 199	W1FZ, 199
K7UR, 199	I8IGS, 198
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792 Stations have attained the 150 zone level as of July 31, 1992.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4½ x 9½ to the WAZ Manager, Jim Dionne, K1MEM, 31 De Marco Rd., Sudbury, MA 01776. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. Please make all checks payable to the Awards Manager. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).

### The WAZ Program

#### Single Band WAZ 10 Meter SSB

437 ..... 4X4JO 438 ..... W2IJB

#### 17 Meter SSB

5 ..... A92BE

#### 20 Meter SSB

894 ..... JH2QMT 895 ..... WP4U

#### 80 Meter SSB

59 ..... G4BWP

#### 10 Meter CW

132 ..... G4BWP

#### 17 Mixed

13 ..... K4CIA

#### All CW

16 ..... W4ZYT

#### RTTY

71—Mixed ..... DL4MCF

#### All Band WAZ SSB

3977 ..... N0ABE	3982 ..... IK3HAT
3978 ..... DF7HX	3983 ..... JH6GKH
3979 ..... N3ART	3984 ..... G0KJW/M
3980 ..... KM4ZM	3985 ..... LA5YBA
3981 ..... GM4SNP	3986 ..... JA4IR

#### CW/Phone

7246 ..... SM7FHO (CW)	7251 ..... K1WNT
7247 ..... G3ZPF	7252 ..... DJ5FD (CW)
7248 ..... DK3GO (CW)	7253 ..... N4WPG
7249 ..... DL2KDW	7254 ..... N7MC
7250 ..... JH3FCL	

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4½ x 9½ to the WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Rd., Sudbury, MA 01776. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. Please make all checks payable to the Awards Manager. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).





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FT-890



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FT-415



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FT-1000 D



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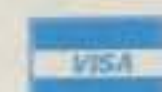
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### CW

W9DWQ 323	W2UE 323	W0SR 320	WA4JTI 317	IT9ZGY 314	WB4RUA 309	K9DDO 302	KA5TQF 295	AA2X 282
K2FL 323	K1MEM 323	DL8CM 320	W9WAQ 317	KQ9W 314	W6DN 308	WA4DAN 302	WD9IIX 295	N3DQN 280
K2TQC 323	K6JG 322	K9IW 320	W1WAI 317	I8WY 314	IT9VDQ 308	K2JLA 302	K1VHS 295	W2LZX 279
ON4QX 323	W2FXA 322	N6AV 319	KD8V 317	WD9IIC 313	W9RY 307	W8XD 301	VE7DX 295	HB9AFI 278
K6LEB 323	DL1PM 322	SM3EVR 319	K9TI 317	W7CNL 312	K4CXY 307	KA2DIV 301	G3KMQ 295	KA3R 277
K9MM 323	W6PT 322	DL3RK 319	KZ4V 316	IT9QDS 312	N4AH 307	G2FFO 300	NC9T 295	VE1RJ 277
YU1HA 323	K9QVB 322	N2KW 319	EA2IA 316	WA2HZR 312	SM6CTQ 305	WA8YTM 300	WB5MTV 294	YV5ANT 276
N4JF 323	K2ENT 322	W0IZ 318	WA8DXA 316	W0JLC 312	I2OMU 305	W6YQ 300	KA7T 294	DF3FJ 276
N6AR 323	K2OWE 322	N6CW 318	AA5NK 316	W4OEL 312	K2JF 303	KU0S 300	N5FW 293	K1HDO 276
K4CEB 323	W4BOY 321	K9BWQ 318	KB8DB 315	N7RO 311	N8MC 303	YU2TW 300	PA0XPO 292	IK2ILH 276
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### SSB

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W9DWQ 323	K9BWQ 323	KD8V 322	I2QMU 320	WD8PUG 316	LA7JO 311	WA6DTG 305	I2ZGC 299	WA9BXB 282
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K9MM 323	WA3HUP 323	OE2EGL 322	W7FP 320	KF5AR 316	K4LR 311	K4RIG 304	KF5DX 297	VE3NUP 281
YU1HA 323	W4NKI 323	WB3DNA 322	WB6OKK 319	KE4HX 315	N1ALR 311	KB1JU 304	NP4CC 297	KA1LMR 281
W2FXA 323	WD8MGQ 323	CT1FL 321	WB5TED 319	KB2HK 315	XE1ZLW 311	ZL1BOO 304	VE3CKP 297	YU1TR 280
OZ3SK 323	K9HDZ 323	K9AB 321	XE1CI 319	W0LSD 315	KB2MY 311	EA3EOT 304	HP1JC 296	PY2DBU 280
DL9OH 323	K0GT 323	N2KW 321	IT9TOH 319	IK7DBB 315	KD5ZM 311	I8IYW 304	XE1OW 296	N8HUR 280
VE3MR 323	K4MQG 323	I8YRK 321	CX1TE 319	KC2FC 315	KA5RNH 310	KA9TNZ 303	EA5RJ 296	NX0I 280
EA2IA 323	KZ2P 323	ON5KL 321	IK8GCS 319	W0ULU 315	YV1CLM 310	AC0A 303	I4CSP 295	K5AOL 279
K4MZU 323	IT9ZGY 323	IK8BQE 321	W9JT 319	K2ARO 315	IK1GPG 310	KB9LN 303	W0IYR 294	WN5K 279
KM2P 323	4Z4DX 323	VE7DX 321	W6NLG 319	YV5DFI 314	WD0DMN 310	KB0SY 303	VE3XO 294	WB8TLI 279
VE3XN 323	OK1MP 323	K4CXY 321	K9TI 319	W9RY 314	LU7HJM 310	W5XQ 303	EA3KW 294	W5XO 270
K6WR 323	W4UNP 323	KA3HXO 321	I4ZSQ 318	KU9Z 314	N6AHV 309	KE5PO 303	IT9VDQ 293	VU2CVP 278
N4JF 323	YV5CWO 323	W2CC 321	G4CHP 318	HR1KAS 314	I5EFO 309	W4BQY 302	WD9IC 293	WP4AFA 277
VE3MRS 323	K8LJG 323	K9HQM 321	ZL1BIL 318	A92BE 314	I1POR 309	RA3YA 302	VE6PW 292	K4BYK 277
K6YRA 323	XE1AE 323	WA4DAN 321	KA9ABC 318	K7EHI 314	G4GED 309	W2LZX 302	Ti2LTA 292	WA9BDX 277
YU1AB 323	YS1GMV 323	AA6AA 321	KQ9W 318	XE1OX 314	KP4P 309	ZS6AOO 302	K9EC 292	WB0UFL 277
N6AR 323	KS0Z 323	WA4IUM 321	WB6PSY 318	OH5KL 314	XE1MD 309	XE1KS 302	KE7UL 291	WN5MBS 277
K6JG 323	I8ACB 323	A18M 321	WB3CQN 318	W6MFC 314	WA8YTM 309	K1VHS 302	WF9K 291	KG9N 277
YV1KZ 323	N6AHU 323	A18S 321	OA4ED 318	K4JLD 314	WD9IIX 308	WA5HWB 302	SV1JK 291	I8WYD 277
I0ZV 323	K9IW 323	K8CSG 321	9H4G 318	I2EOW 313	YV2EJU 308	WB4TGB 301	4X4JO 290	CE7ZK 277
W4JVU 323	W0SFU 323	VE4AT 321	PA0XPO 318	WB4PUD 313	N3ARK 308	N5FW 301	CP5NU 290	KA9I 277
N4MM 323	YV5AIP 323	KE4VU 321	N4CRU 317	W1NG 313	W4BQY 308	VE6PW 301	N5ORT 289	W8/DL2SCA 276
WA4JTI 323	Ti2HP 323	IK8CNT 321	WA4WTG 317	KA6V 313	IN3ANE 308	NO4J 301	I4UFH 289	G4NXG/M 276
KB8DB 323	OZ5EV 323	WA4ECA 320	G4ADD 317	AA6BB 313	KB7VD 308	W3SOH 301	W9TA 288	WB4UHN 276
EA4DO 323	VE7WJ 323	W6DN 320	W6BCQ 317	W1LQQ 313	N6AV 307	YU2TW 300	YB2OK 288	KJ6HO 276
W9SS 323	VE3GMT 323	W3GG 320	XE1XM 317	W4SSU 313	WA2FKF 307	N4CRU 300	Ti5RLI 287	WA4PGM 275
WB4UBD 323	I8TX 323	I4EAT 320	KB3OQ 317	I8INW 313	WD5P 307	WT4T 300	OK1AWZ 287	NX4Y 275
W9OKL 323	WA6OET 323	AA5NK 320	SM6CST 317	W2FGY 312	Ti2JJP 307	WD0BNC 300	EA8TE 287	VE7HAM 275
W6EUF 323	K2JLA 323	NY5L 320	KU9I 317	K8CMO 312	Ti2TEB 307	KB8O 300	N8BJQ 285	HP6AYV 275
OA4OS 323	YV1AJ 323	EA1QF 320	N4WF 316	Ki3L 312	F6BFI 306	W7KSK 300	FD1OZF 285	Ti2SD 275
W3AZD 323	I8AA 322	NJ2C 320	K4POV 316	Ti2KD 312	WA2MID 306	VE3FJE 300	IK8BMW 284	KJ6GC 275
ZL3NS 323	Ti2CC 322	NJ0C 320	I8LEL 316	K8NWD 312	XE1MDX 306	WB4NDX 300	NZ7D 284	KA5YCM 275
N7RO 323	I4LCK 322	K9QVB 320	KC8EU 316	KC4MJ 312	VE2GHZ 306	K3NEE 300	KB5RF 284	Ki4FW 275
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ZL1AGO 323	VE2WY 322	IT9TGO 320	AG9S 316	ZS6BBY 312				

with any other State, or the partition of the Island."

Extensive diplomatic efforts to oust Turkey from the island have failed. United Nations resolutions condemning Turkey for the invasion passed 117 to 1, with Turkey the only vote against. Twenty-six separate UN resolutions called for a peaceful solution to the problem, and for the return of a united Cyprus. Turkey has ignored all such resolutions, and has refused to negotiate an end to its occupation.

Meanwhile, Turkey awarded many of the homes and possessions of the fleeing Greek Cypriots to Turkish soldiers and their families. Thousands of Turks settled in the area now occupied by the Turkish Army. The disruption of 200,000 Greek Cypriot refugees from the north put enormous

strains on the legitimate Cyprus government.

This is where the situation has remained since mid-1974. The Turkish Army maintains complete control of the northern part of Cyprus. The Turks have established a complete, parallel government on the northern side, now self-proclaimed as the Turkish Republic of Northern Cyprus. The only country that recognizes the Turkish Republic of Northern Cyprus is, understandably, Turkey. Representatives from this do-it-yourself country have been refused accreditation to international conferences. The "country" has not been able to join the UN nor its agencies, such as the International Telecommunications Union (ITU).

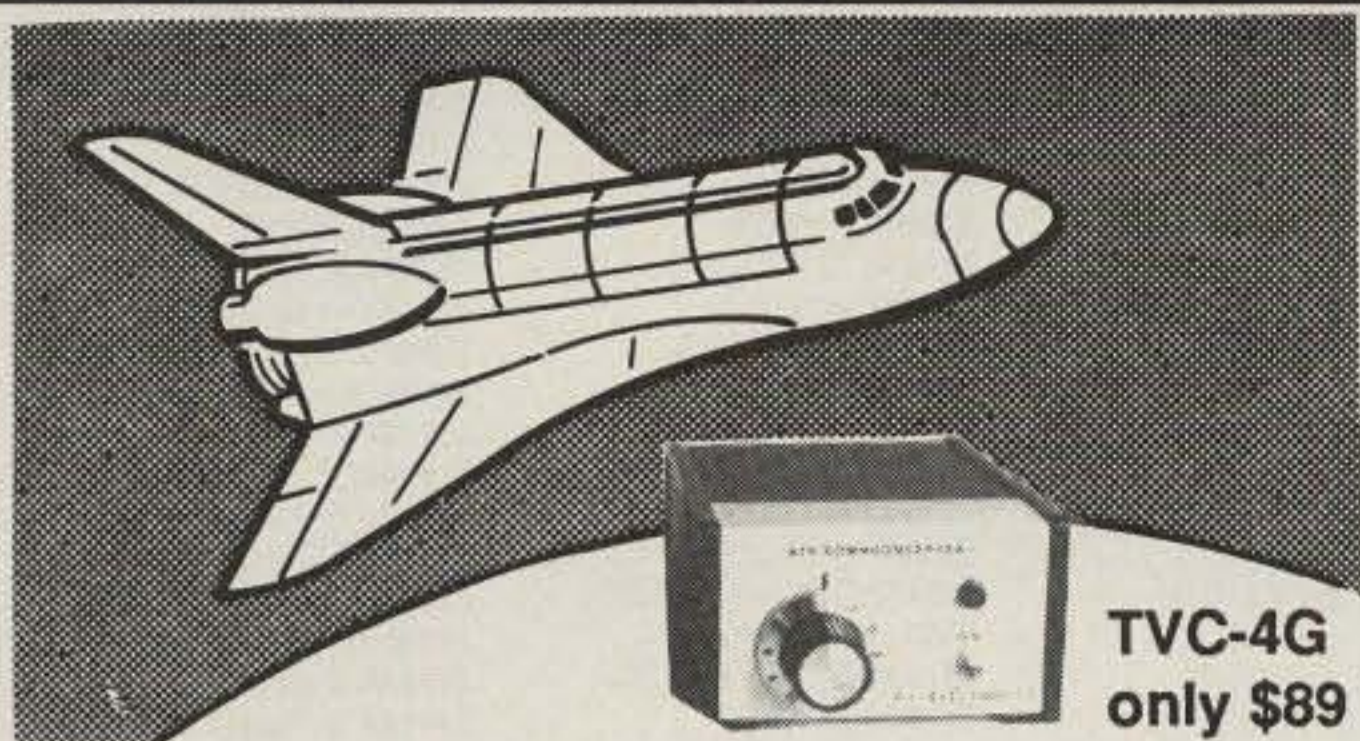
The island is completely divided. A UN-

maintained buffer zone separates the Turkish Army battalions from Cyprus troops. The Turkish-controlled area has its own stamps, uses Turkish lira as its currency, and maintains its own airport and airline, courts and police, and government structure.

### Back to 1B1NCC

For some time radio enthusiasts in the Turkish Republic of Northern Cyprus (TRNC) have been promoting amateur radio in the "country." Some UK-licensed amateurs of Turkish Cypriot origin donated some amateur equipment to the TRNC Amateur Radio Society, and operated 1B1NCC June 24 to July 6, running barefoot into simple dipoles and verticals.

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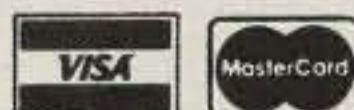
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4J4GAT to DL1VJ	CU95C to CU3URA	PJ8/W5UXXL to W5UXXL	VY2SS to VE7ARS
4J4JJ to UG6JJ	D2CW to DK7PE	PY8TUP to PY1RO	WR1Z/KH9 to VK9NS
4K2MAL to UA4RC	D2FGC to OK1AJN	R8H to EUDXF	XU8CW to FD1GTR
4K30QL to RA1OA	EA9UK to EA9LZ	R388RF to RA3MI	XX9AS to KU9C
4K4/UA6WCG to I8YRK	ED2IZO to EA2LZ	R4ARDC to UZ3AXQ	YB30SE to W7TSQ
4K5ZI to DF8BK	EH8JOB to EA3MM	RA4HW to N7OTR	YB6AVE to DJ5CQ
4L1QRQ to UW3AA	EJ4GRC to EI6URO	RN8KDX to DL1SEA	YI8EB to JX3ZH
4N2PM to KA9WON	EX8G to UB4JWZ	RY8U to K84SE	YJ8RN to N9DRU
4N5DX to YT5AA	F6BLQ/D2 to F6ELE	S21A to W4FRU	YL75QK to YL2GA
4N5GB to YU5GBC	FG4FR to FG5BG	S79KMB to KN2N	YL92QM to YL1WW
5H8ROA to A47RS	FJ/FG5ED to FG5ED	S79SGA to OE3SGA	ZA1A to OH2BBF
5R8GW to F6FNU	FK8GJ to F6CXJ	SU1AY to OE6EEG	ZA1C to HB9BGN
5Z4BI to W4FRU	FM4FZ to FB1MUX	SV8HW/SV9 to KA5EJX	ZA1E to I2MQP
5Z4BJ to W4FNS	FM5GI to FE1OII	T38IL to JA3QIN	ZA1M to HB9BGN
5Z4TT to SP5BUD	FM5WE to F1NCZ	TF/FD1NZO to FD1NZO	ZA1P to I2MQP
6Y5MM to N4YBF	F08FR to WA6SLD	TJ1BG to IK1LBL	ZA1TAA to OH2BBF
6Y5RJ to 6Y5AW	FS/K2BS to W2GHK	TL8NG to WA1ECA	ZA1Z to I2MQP
7Q7XX to JH3RRA	FS4PL to FG4BG	TR8JWH to G4TWT	ZC4FOC to G3YTS
7X4AN to DJ2BW	FY5FX to F1MGZ	TR8YA to F6FNU	ZC4ST to G4SGD
9A1CCY to YU2CCY	GJ8RLV to ON5GK	TU2MA to OH7XM	ZC4TXF to G3TXF
9A1NR to WA4JTC	H88/DLZHRF to DL2HRF	U5A to RB4LWV	ZD8SM to G3ZQL
9A2AJ to 4N2AJ	H88/HA8ET to HA8HW	UA88/UA9CDE to UZ9MXH	ZD8Z to VE3HO
9A2IX to YT2IX	HC8JG to WA6ZEF	UA8KAP to KL7HBC	ZF250 to WB2CZB
9A2MP to YU2MP	HG92HQ to HA5KNB	UA9QCP/R10 to UA9QCC	ZK1AR to WB6HGH
9A2PM to KA9WON	HH2BZ to N1DRS	UB9X/UB2KA to UB5KDD	ZK1JR to AA5WY
9A2TW to YU2TW	HH7PV to AA5DW	UC2AAA to F6AML	ZK1RS to ZL4DO
9A2VC to YU2VC	HI588UD to HI3UD	UC2WE to SP5FLA	ZK1XR to N7NKG
9A3ER to YU2LLL	HK80EP to HK8NZY	UD6/Y42DA to Y42DA	ZP6CW to ZP6XDW
9A3IX to YT2IX	HP1XQN to WT3K	UD6DR to GW3CDP	ZY8FZI to JH1ROJ
9A3NR to WA4STK	HS1BV to W3HCW	UF7FWW to UF6FFF	ZY8RW to PT7WA
9A3ST to YT2ST	I88Z to I88CHF	UI8QU to K9FD	9A2PA to P.O. Box 60, Krizevci, Croatia
9A4AA to 4N2AA	J28FO to F6FNU	UI8ZAA to K9FD	EL2PP to P.O. Box 2274, Monrovia, Liberia
9H1EG to LA2TO	J5UAI to NW8F	UR8UCH to UB5UCH	F040D to P.O. Box 158, Papeete, Tahiti, French
9K2MU to 9K2AR	J73WW to KD6WW	V29JB to W0UN	HJ8VGJ to P.O. Box 852, San Andres Island, Colombia
9MVNA to VE3CHZ	JW1CCA to LA1CCA	V73CT to OKDXA	RX6B/UZ4HWS to P.O. Box 62, Kitee, 82501 Finland
9Y4VU to W3EVW	JW5NM to LA5NM	VE3PJH/C6A to DL2NCCY	XX9GD to P.O. Box 1476, Macau
A22MN to WA8JOC	JW6VM to LA6VM	VE8CWI to VE2SEI	YL2GP to P.O. Box 188, Riga 67, Latvia
A35NP to DK6NP	LX/DL5MFF to DL5MFF	V1158SYD to VK2WI	Y03CJF to P.O. Box 12, Turnu, Severin, Bulgaria
AH8G/TF to DK7PE	LZ2TU to WWB2RAJ	V14FOW to VK4CHB	ZA1BM to P.O. Box 5, Elbasan, Albania
AM258BD to EA3BBD	N6HR/OH8 to N6HR	VK9CB to VK6LA	
AM92GXQ to EA7GXQ	OD5/SP1MHV to SP1MHV	VP8GAV to GM0LVI	
AP/WA2WYR to KK6TX	OD5RH to N3IWM	VP9CB to WB2YQH	
BY4AA to DJ7BU	OH8BH to OH2BH	VP9MN to WB2YQH	
C9RDM to W8GIO	OX/DK20Y to DK20Y	VQ9AC to WN8O	
C9RJJ to W8GIO	OY1HJ to OY6FRA	VQ9QM to W4QM	
CE3CJ to JA3GIY	P29DK to N4EOF	VQ9WM to K7IOO	
C06GG to HK5LEX	P29KH to WD9DZV	VS6WO to K9EC	
CQ3B to CT3EE	P38ADA to 9A2AJ	VS6WV to K0TLM	
CT3BX to EA8IS	P4/N48WS to WB4CKO		

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CIRCLE 5 ON READER SERVICE CARD

A station signing a strange callsign, claiming to operate from a "country" that doesn't appear on the DXCC countries list, will attract a great deal of attention. 1B1NCC was no exception. At times the pile-ups were fierce. So was the opposition. Regular 5B stations, all of Greek descent, tried to jam the 1B1NCC operation, and frequently called the operation illegal. Mainland Greeks joined the opposition. For example, SV2BXA was among those stations that called 1B1NCC a pirate on the air. SV2BXA even sent a packet message saying that there is no such prefix, and that 1B1NCC is a pirate.

The TRNC Amateur Radio Society used the 1B prefix because there is no Cyprus contact nor control over the Turkish-controlled territory. Thus, there are no amateur radio licenses issued in the region. (There are hundreds of 5B4 stations on the Greek-controlled side.) The TRNC club could not obtain a callsign using any of the four prefixes allocated to Cyprus: 5B, P3, C4, and H2. Therefore, they turned to the unallocated list of calls—those beginning with 1 or 0.

Is 1B1NCC a pirate station? Definitely. The station is operating from a country that is still under the legal control of the Cyprus

government. That government says 1B1NCC is illegal. This means that contacts with 1B1NCC will not count for DXCC. But what about the future? Can TRNC qualify as a new DXCC country?

The operators of 1B1NCC are hopeful. Tamer Zaim, G7IYV, writes, "Currently consideration is being given to apply for a DXCC listing [for TRNC]. It is envisaged that if we went ahead this would be a very difficult application that would require a great deal of support from all quarters."

A review of the DXCC Countries List Criteria suggests that such an application would have an uphill struggle. Cyprus is far too close to Turkey to count as an offshore island under the "separation by water" criterion. The only possible criterion would be Point 1: Government. The TRNC displays many of the characteristics of a sovereign country. It is a "united society, occupying a definite country and having a definite population, politically organized and controlled under one exclusive regime" (although Cyprus will probably dispute the latter). It has its own laws, courts, currency, and postage stamps, controls its own immigration and licensing, and maintains a standing army. These are many of the characteristics that determine whether

## CQ DX Awards Program

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320	K2JLA/323	250	K2EEK/271
320	YV1AJ/323	200	OA4DX/204
310	K4JLD/314	150	KG7DJ/M/161
275	CP5NU/290	28 MHz	4X6DK
250	AB4NS/274		

### CW Endorsements

320	K2OWE/322	275	K4JLD/299
310	DJ2PJ/311	275	OZ5UR/276
300	K2JLA/302	28 MHz	IK2ILH

Total number of active countries is 323. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

TRNC has a sufficient degree of sovereignty to qualify as a separate DXCC country.

However, TRNC lacks a vital element: international recognition. One of the most important characteristics of sovereignty is the "capacity to carry out obligations of international law and applicable international agreements." Membership in the United Nations, membership in the ITU, and use of ITU-assigned callsigns are also critical factors in determining separate DXCC country status. TRNC totally lacks these factors.

TRNC is clearly separate, in fact, if not legally, from the rest of Cyprus. Although they have made no progress toward international recognition in the past 18 years, they have created a new political entity. However, as it stands today, the TRNC has no chance of separate DXCC status, and little chance of gaining wider recognition.

Should TRNC use the amateur bands to prompt its cause? One of the greatest assets of amateur radio is the free and open communication between individuals and countries of differing beliefs. With very few exceptions, amateurs worldwide may openly communicate with fellow hams anywhere. If amateurs in TRNC want to operate with an unassigned prefix, they should have a right to do so. While the Cyprus government, 5B amateurs, and the Greeks may object, they will have to admit that they have no more control over such an operation than they do over traffic violations or airline flights in TRNC.

The 1B1NCC operators vow to continue their efforts: "Whatever happens 1B1NCC will continue to operate in the future by its enthusiastic club members. . . . We hope that the radio amateurs world wide will appreciate the difficulties experienced by the Turkish Cypriot radio amateurs. . . ."

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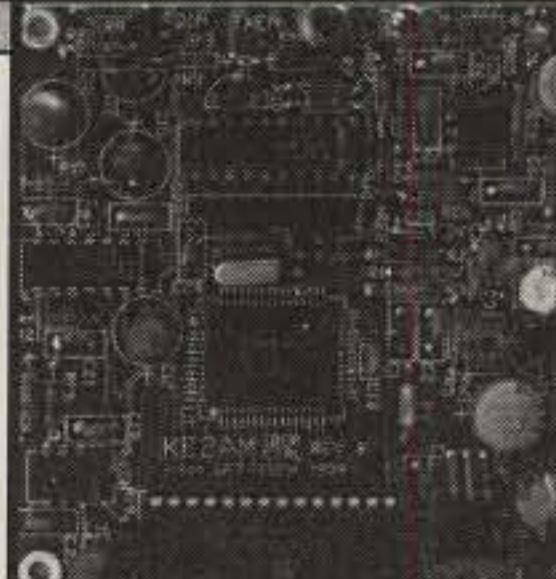
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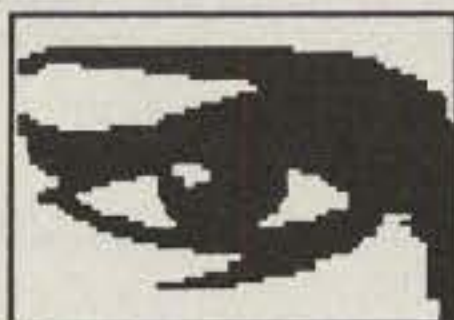
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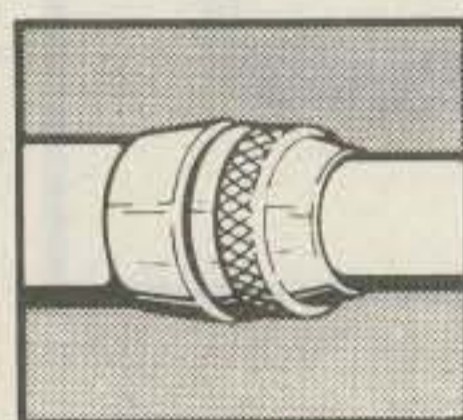
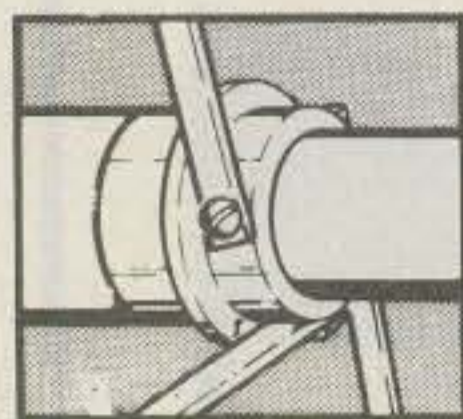
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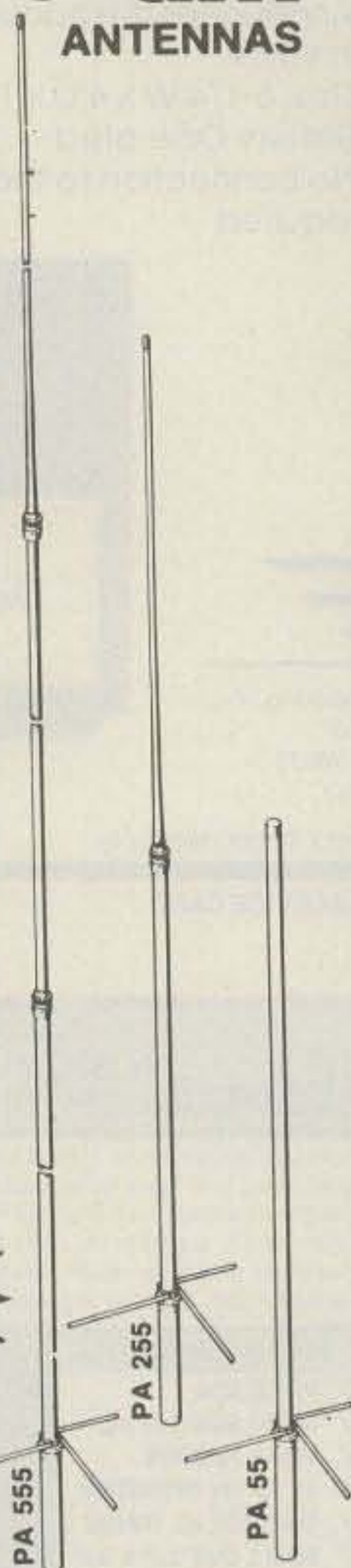
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harassment have no place on the amateur bands, regardless of the political ramifications or history. Since 1B1NCC won't count for most awards, including DXCC, and with TRNC having little or no chance of becoming a recognized separate entity in the foreseeable future, the pile-ups will die away. In time, 1B1NCC will be but another thorn in the side of the Greeks and the Greek Cypriots. 1B1NCC remains a symbol of the deep-set antagonism between the Greeks and the Turks. But let's keep these antagonisms off the amateur bands.

### November Activity (And Late October Info)

From October 21-28 JP1NWZ (A15WZ) and JL1MUT will operate from Antigua V2. They will be on 1.9-28 MHz SSB and CW (w/WARC) using the calls V2/JP1NWZ, V2/A15WZ, and V2/JL1MUT. During the CQ WW DX SSB Contest October 24-25, they will be operating multi-op single transmitter. QSLs for all operations go to JR0AMD.

The CQ WW DX CW Contest November 28-29 is the big event this month. Dozens of amateurs from many countries will head out to islands and rare countries, seeking better propagation, a rare prefix, and a top score. Among the announced operations are a multi-single effort from the Seychelles S7 by Paul Young, K1XM, and Charlotte Richardson, KQ1F. Also Paul, WC5P, will operate from Christmas Island in the Eastern Kiribati as T32BE in the test. He'll be there November 25 to December 6 and will operate mostly CW outside the test. Tuck, KH6DFW, will operate as T32BI November 25-29 on SSB. QSL home calls.

From 0000Z Friday, November 20 until

2400Z Sunday, November 22 the Club de Radioaficionados de los Mochis, A.C. will be on a DXpedition from San Ignacio Island (IOTA NA-171), off the coast of Mexico. They will be on 80-10 meters SSB, CW, packet, and FM using the callsign **XF1SI**. QSL manager is XE2EAA.

Earlier in the month a large group of Dutch amateurs will operate from the Grand Duchy of Luxembourg LX November 4-11. They will sign **LX/PA** . . . on all bands, including the new bands, on CW and SSB. They offer a *free* award for working three members of their group, or the same member on three different bands. You must exchange QSL cards, but the award is free with log data to DAGOE Foundation, P.O. Box 356, Dordrecht, The Netherlands. (DAGOE stands for Dutch Amateurs Going On Expedition.)

Finally, Jose de Pastora, TI2JJP, will operate from Cocos Island as **TI9JJP** November 1-11, SSB only. Try 14195 (listening 14200-215), 21295 (300-315), and 28495 (500-515). Ham activities will take second fiddle to scuba diving. QSL home call.

### QSL Notes

QSL the 1992 **ZA1A** operation via OH2BBF. The NCDXF handles ZA1A cards for the 1991 operation only.

Don Lynch, W4ZYT, has located his **KG6JCT** logs from 1973-1975; he'll be happy to oblige QSL requests.

Dave Mueller, KE2PF, is stationed on Guam KH2 for the next two years. QSL via his home call (mail will be forwarded), or direct to Dave at USGC Marianas Section, PSC 455 Box 176, FPO AP 96540-1056.

The QSL address for the July IOTA operation of **N3FOU** from (NA-139) is Lee

Krenke, N3FOU, 800 Clearview Ave., Pittsburgh, PA 15205.

QSL the **CU30C** (EU-003) Terceira Island operation direct only to Jose Gabriel Alves Silva, CU3AN, P.O. Box 157, P-9702 Angra do Heroismo Codex, Azores, Portugal.

QSL the CQ WPX CW operation of **8P9EA** via Olli Rissanen OH2XX, Suite 599, 1313 So. Military Trail, Deerfield Beach, FL 33442, or via the OH bureau.

QSL **V47ITU**, **V40ITU**, and **J79VHF** via Craig Maxey, P.O. Box 608, Basseterre, St. Kitts, Leeward Islands.

All **FR5ZU/T** QSL cards have been answered; anyone still needing a card should try again.

Seizou Iiyama, JH1GIC, is the QSL manager for **CO2MA** from July 1992. His address, not yet in the Callbook, is 1064-4, Hanawa, Mashiko, Haga-Gun, Tochigi 321-42, Japan.

QSL the Midway island operation of Ted Brattstrom **NH6YK/KH4** directly to Ted at 2464 Halelaau Place, Honolulu, HI 96316.

QSL the **V51/OE3GEA** Namibia via Gerhard Elsigan, OE3GEA, Oberer Markt 7, A-3361, Aschbach, Austria.

Dick, **ZK1AR**, in the South Cooks reports that old-style IRCs are redeemed for only 15 cents; airmail postage to the US for QSL cards is 95¢ and for letters is \$1.05, or **seven** IRCs. A US\$1 works fine.

### QSL Help Provided

TK5FF says that the QSL route for **TK5MH** is Fabien Bernardini, FR3 Corse, ave Noel Franchini, 20000 Ajaccio, France.

**6Y5FS** is N.E. Bethune, G3RFS, 22 Dunbar Road, Wood Green, London N22 5BE, England.

**CU8AI**'s QSL card carries the address: Joao Orlando R. Soares, Parol do Albarnaz, Ponta Delgada, 9970 Santa Cruz das Flores, Azores, Portugal.

Scott Redd, **K0DQI** (for **5A5TA**) is now **K0DQ**. As a Navy Admiral, he moves around a lot, but W3GRF may be able to help with a current address.

QSL **PJ5JP** via AB1U.

Several readers report QSL success for **LU1ZA** via **LU2AH**, or **LU2CN**.

The correct call of the Wake Island operation (for **JA3BKP**) should be **AD1S/KH9**; QSL via the **OKDXA**, Box 88, Wellston, OK 74881.

The correct call for **KF9FU** should be **FV9NDX**, not **5V9**; QSL via **F6AJA**.

Ary Leonardo B. Ferreira, PP1CZ, has the logs and cards from the **PP0MAG/PY0MAG** Trindade/Fernando operations, from Silent Key **PY1MAG**. Ary's new address is P.O. Box 01-1928, 29001 Vitoria ES, Brazil. Ary can also confirm **ZZ1CZ**, **ZZ1AA**, **ZW1CZ**, **PP0F**, and **ZZ0TA**. (Note that US\$1 and Brazilian stamps probably won't pay return postage; send one airmail IRC, or US\$2.)

### Corrections, Pirates, And Not Managers

SV0AA reports that calls such as **SV0MO/8**, **SV0MU/8**, and **SV0MY/8** have never been issued: pirate operation.

The April 1992 **1A0KM** operation was by a pirate.

Stu, K3ND, says he is getting cards from

Italian stations for **9J2SZ**. He's not the manager; try **SP8DIP**.

**TI2SAH** is *not* the QSL manager for **TI9YO**; QSL **TI9YO** to Minor Barrantes, **TI2YO**, P.O. Box 17, San Jose 1003, Costa Rica. (**TI2SAB** let **TI2YO** use his P.O. Box, but **TI2SAB** does not have logs nor cards.)

QSL **HI9UD** via **HI3UD**, **UDRA** Santiago, P.O. Box 449-3, Santiago, Dominican Republic.

73, Chod, VP2ML


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## THE SCIENCE OF PREDICTING RADIO CONDITIONS

### CW DX Contest Special

#### Bulletin

Since this issue of *CQ* should reach most subscribers prior to the start of the CQ World-Wide DX SSB Contest weekend of October 24-25, here is an updated forecast made at press time for the general propagation conditions expected during the SSB Contest weekend. According to the 27-day recurrence tendency for HF propagation conditions, it looks like the entire weekend may see High Normal conditions, with the possibility of Above Normal conditions to many areas of the world. If these conditions should materialize, and the chances are very good that they will, expect good or better openings on most bands, and quite a good contest weekend, despite the declining solar cycle. *There is only one possible fly in the ointment.* A radio storm is expected to begin on October 26, just as the contest is ending. If this storm should start a day, or even a few hours, earlier, it will adversely affect conditions. During the contest be sure to check with the forecast sources discussed in last month's column for up-to-the minute reports on ionospheric conditions.

The initial forecast for the CW Contest weekend of November 28-29 looks good at this time. High Normal conditions are expected for the entire weekend, with generally good openings on most bands to all areas of the world.

A fine-tuned press-time update for the CW Contest weekend will appear as a bulletin in next month's column.

**T**he CW weekend of the 1992 CQ World-wide DX Contest will take place on November 28-29. Special DX Propagation Charts for use during both the phone and CW weekends appeared in last month's column, along with valuable tips and suggestions for increasing scores. Be sure to refer to last month's column if you plan to participate in the CW Contest weekend. Additional tips are discussed in this month's column.

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#### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for November 1992

Propagation Index .....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 6-7, 14, 17, 20	A	A	B	C
High Normal: 1-2, 4-5, 8, 18-19, 26, 28-29	A	B	C	C-D
Low Normal: 3, 10, 13, 16, 21, 25, 27, 30	B	C	D	D-E
Below Normal: 9, 11, 15, 22, 24	C	C-D	D-E	E
Disturbed: 12, 23	C-D	D	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, and with considerable fading and noise.

E—No opening expected.  
3 dB per S-unit.

#### HOW TO USE THIS FORECAST

1. Find *propagation index* associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the *propagation index*, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a *propagation index* of 3 will be good (B) on November 1st and 2nd, fair (C) on the 3rd, good (B) on the 4th and 5th, excellent (A) on the 6th and 7th, etc. Good conditions (B) are expected during the CQ World-Wide DX CW Contest on November 28th and 29th.

#### Sunspot Cycle Progress

The present solar cycle continues to steadily decline. The Royal Observatory of Belgium reports a monthly mean sunspot number of 84.5 for July 1992. This results in a 12-month running smoothed sunspot number, upon which the cycle is based, of 124 centered on January 1992. This is a drop of 8 points from the previous month's level. A smoothed sunspot number of 93 is now forecast for November 1992.

Solar activity during November 1992 is expected to be on the order of 45 points less than the 138 level observed last November. A level of 93, however, is still considered to be an indication of relatively high solar activity. While this year's CW Contest period may not be a record breaker, solar activity is expected to be high enough for 1992 to be another very good WW DX Contest year, as long as nature doesn't pull a surprise radio storm to mar conditions.

A corresponding 10.7 cm mean solar flux level of 132 was reported for July by the Dominion Radio Astrophysical Observatory at Penticton, B.C. This results in a smoothed solar flux value of 1182 centered on January 1992. A smoothed level of approximately 130 is expected during this November.

#### Computer Program

Last month's column mentioned several computer programs which contain propagation and other information that could be useful during a World-Wide DX Contest. Sheldon Shallon, W6EL, developer of the Miniprop™ computer program has informed me that the Miniprop.3 revision is so extensive that instead of it being called Miniprop.4, the program has been renamed Miniprop Plus™. This IBM and compatibles designed program predicts MUF and other propagation data, as well as signal levels that tell the best time to QSO any path. A world map centered on your station's location also displays the great circle path between any two locations and the day-night terminator (gray line) for any time and date. Full information and pricing can be obtained directly from W6EL Software, 11058 Queensland Street, Los Angeles, CA 90034-3029.

#### Contest Tips

If you are planning to participate in the 1992 World-Wide DX CW Contest, be sure to check the special DX Propagation Charts appearing in last month's column for band-opening predictions, work plans, and other propagation data especially tailored for the contest. For a day-to-day forecast of general conditions for November, including the CW Contest weekend, see the Last Minute Forecast appearing in this column.

Here are some propagation tips that should be helpful in working DX during November, particularly during the CW weekend of the 1992 CQ World-Wide DX Contest.

*During and shortly after sunrise*, excellent DX conditions to most areas of the world are forecast for 20 meters. Also check for openings on 40, 80, and 160 meters towards southerly and westerly directions.



### HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Charts the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the charts. For the Alaska and Hawaii charts the predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An \* indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in parentheses ( ) after the time of each predicted opening. In the Short-Skip Charts where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the Last Minute Forecast at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight, 12 is noon, 01 is 1 AM, 13 is 1 PM, etc. In the Short-Skip Charts appropriate standard time is used at the path midpoint. For example, on a circuit between Maine and Florida the time shown would be EST; on a circuit between New York and Texas the time at the midpoint would be CST; etc. Times shown in the Hawaii chart are in HST. To convert to standard time in other USA time zones add 2 hours in the PST zone, 3 hours in the MST zone, 4 hours in the CST zone, and 5 hours in the EST zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14, or 2 PM, in Los Angeles; 17, or 5 PM, in Washington, DC; and 22 GMT. Time shown in the Alaska chart is given in GMT. To convert to standard time in other areas of the USA subtract 8 hours in the PST zone, 7 hours in the MST zone, 6 hours in the CST zone, and 5 hours in the EST zone. For example, at 20 GMT it is 15, or 3 PM, in New York City.

4. The Short-Skip Charts are based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband. The Alaska and Hawaii charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels the propagation index will increase by one level; for each 10 dB loss it will lower by one level.

5. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the US Dept. of Commerce, Boulder, Colorado 80302.

### CQ Short-Skip Propagation Chart November & December 1992 Local Standard Time At Path Mid-Point (24-Hour Time System)

Band (Meters)	Distance Between Stations (Miles)			
	50-250	250-750	750-1300	1300-2300
10	NIL	NIL	07-09 (0-1) 09-11 (0-2) 11-15 (0-3) 15-16 (0-2) 16-18 (0-1)	07-08 (1) 08-09 (1-2) 09-11 (2-3) 11-15 (3-4) 15-16 (2-3) 16-17 (1-3) 17-18 (1-2) 18-20 (0-1)
15	NIL	08-10 (0-1) 10-16 (0-2) 16-18 (0-1)	07-08 (0-1) 08-09 (0-2) 09-10 (1-3) 10-11 (2-3) 11-16 (2-4) 16-18 (1-2) 18-20 (0-1)	07-08 (1) 08-09 (2) 09-11 (3) 11-16 (4) 16-18 (2-3) 18-20 (1-2) 20-22 (0-1)
20	09-11 (0-1) 11-15 (1-2) 15-17 (0-1)	07-09 (0-2) 09-11 (1-3) 11-17 (4) 15-17 (1-4) 17-18 (0-3) 18-20 (0-2) 20-07 (0-1)	07-09 (2-3) 09-11 (3-4) 11-17 (4) 17-18 (3-4) 18-20 (2-3) 20-22 (1-2) 22-07 (1)	07-09 (3) 09-15 (4-3) 15-18 (4) 18-19 (3-4) 19-20 (3) 20-21 (2-3) 21-22 (2) 22-00 (1-2) 00-06 (1) 06-07 (1-2)

40	07-08 (0-2) 08-09 (1-3) 09-17 (4) 17-19 (2-3) 19-21 (1-2) 21-07 (0-1)	07-08 (2-3) 08-09 (3) 09-15 (4-3) 15-17 (4) 17-19 (3-4) 19-20 (2-4) 20-21 (2-3) 21-06 (1-2) 06-07 (1-3)	06-08 (3) 08-09 (3-2) 09-15 (3-1) 15-17 (4-2) 17-20 (4) 20-21 (3-4) 21-03 (2-4) 03-06 (2-3)	06-08 (3-2) 08-09 (2-1) 09-15 (1-0) 15-17 (2-0) 17-19 (4-3) 19-03 (4) 03-06 (3)
80	08-21 (4) 21-00 (3-4) 00-04 (2-3) 04-07 (2) 07-08 (3-4)	08-09 (4-2) 09-16 (4-1) 16-18 (4-3) 18-00 (4) 00-04 (3-4) 04-07 (2-3) 07-08 (4-3)	08-09 (2-1) 09-16 (1-0) 16-18 (3-1) 18-20 (4-3) 20-04 (4-3) 04-07 (3) 07-08 (3-1)	08-09 (1-0) 09-16 (0) 16-18 (1-0) 18-20 (3-1) 20-04 (4) 04-06 (3-2) 06-07 (3-1) 07-08 (1)
160	07-09 (3-2) 09-11 (2-0) 11-17 (1-0) 17-19 (3-2) 19-07 (4)	07-09 (2-1) 09-17 (0) 17-19 (2-1) 19-04 (4) 04-07 (3-2)	07-09 (1-0) 09-17 (0) 17-19 (1-0) 19-21 (4-2) 21-04 (4) 04-06 (2) 06-07 (2-1)	07-19 (0) 19-21 (2-1) 21-04 (4-3) 04-06 (2-1) 06-07 (1-0)

### ALASKA November & December 1992 Openings Given in GMT #

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	16-18 (1) 18-23 (2) 23-01 (1)	15-17 (1) 17-20 (2) 20-23 (3) 23-00 (2) 00-02 (1)	12-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-01 (3) 01-03 (2) 03-05 (1)	06-12 (1) 07-11 (1)*
Central USA	18-20 (1) 20-23 (2) 23-01 (1)	16-18 (1) 18-20 (2) 20-00 (3) 00-02 (2) 02-03 (1)	12-17 (1) 17-18 (2) 18-21 (1) 21-23 (2) 23-03 (3) 03-04 (2) 04-06 (1)	06-08 (1) 08-13 (2) 13-14 (1) 07-12 (1)*
Western USA	18-20 (1) 20-21 (2) 21-22 (3) 22-00 (2) 00-02 (1)	17-19 (1) 19-21 (2) 21-22 (3) 22-00 (4) 00-02 (3) 02-03 (2) 03-04 (1)	12-17 (1) 17-20 (2) 20-22 (3) 22-01 (4) 01-03 (3) 03-05 (2) 05-07 (1)	02-03 (1) 03-05 (2) 05-14 (3) 14-15 (2) 15-16 (1) 04-06 (1)* 06-14 (2)* 14-16 (1)*

### HAWAII November & December 1992 Openings Given in Hawaiian Standard Time #

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	06-07 (1) 07-10 (2) 10-11 (3) 11-13 (4) 13-14 (3) 14-15 (2) 15-16 (1)	06-07 (1) 07-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	13-15 (1) 15-17 (4) 17-21 (3) 21-00 (2) 00-06 (1) 06-08 (2) 08-13 (1)	18-19 (1) 19-20 (1) 20-01 (3) 01-02 (2) 02-04 (1) 19-20 (1)* 20-01 (2)* 01-03 (1)*
Central USA	06-07 (1) 07-09 (2) 09-10 (3) 10-14 (4) 14-16 (3) 16-17 (2) 17-18 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-11 (2) 11-13 (3) 13-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-09 (3) 09-14 (2) 14-16 (3) 16-18 (4) 18-22 (3) 22-00 (2) 00-06 (1) 06-07 (2)	18-19 (1) 19-20 (2) 20-02 (3) 02-03 (2) 03-05 (1) 19-21 (1)* 21-02 (2)* 02-04 (1)*
Western USA	07-08 (1) 08-09 (2) 09-10 (3) 10-12 (4) 12-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-13 (3) 13-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	08-10 (4) 10-16 (3) 16-22 (4) 22-00 (3) 00-03 (2) 03-06 (1) 06-08 (2)	18-19 (1) 19-20 (2) 20-03 (4) 03-05 (3) 05-06 (2) 06-07 (1) 19-20 (1)* 20-21 (2)* 21-04 (3)* 04-05 (2)* 05-06 (1)*

\* Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.

\*\* Indicates best times to listen for F-2 layer openings on 6 meters.

For 12 meter openings interpolate between 10 and 15 meter openings.  
For 17 meter openings interpolate between 15 and 20 meter openings.  
For 30 meter openings interpolate between 40 and 20 meter openings.

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1140 RG214/U dbl silver shld mil spec.....	1.85
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UG255 SO239 to BNC plug adapter, Amphenol.....	4.75
UG255TS SO239 to BNC Teflon Silver.....	5.95
SO239AM UHF chassis mt receptacle, Amphenol.....	.89
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Time PST	Band Meters	Areas To Which DX Conditions Expected To Be Optimum
00-03	20	Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean, Central America, Antarctica, Africa*, South America*
03-06	20	South Pacific & New Zealand, Australasia, Caribbean, Central America, Southeast Asia*, Far East*, South America*, Antarctica*
06-09	20	Caribbean, Central America, South America, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Central and South Asia, Europe*, Eastern Mediterranean*, Middle East*, Antarctica*
09-12	15	Europe, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean, Central America, Western Africa, Eastern Mediterranean*, Middle East*, Eastern, Central & Southern Africa*, South America*
12-15	10	Africa, South Pacific & New Zealand, Australasia, Caribbean & Central America, South America
15-18	10	Central & South Asia, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean & Central America, South America
18-21	15	Southeast Asia, Far East, South Pacific & New Zealand, Caribbean & Central America, South America, Central & South Asia*, Australasia*, Antarctica*
21-00	20	Far East, South Pacific & New Zealand, Australasia, Caribbean & Central America, South America, Antarctica, Europe*, Africa*, Southeast Asia*

\*Propagation index (2), all others (3) or (4)

Table 1- Sample multi-band contest operating schedule, western USA.

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From an hour or so *after sunrise*, and until *late afternoon*, 15 meters is expected to be the optimum band for world-wide DX, with both 10 and 20 meters close runners-up. Reception on all three bands should favor signals from an easterly direction before noon, from the north and south shortly after noon, and from southerly and westerly directions during the later afternoon hours.

During the *late afternoon* and *early evening* hours, check 15 meters for signals arriving from the south and west, and 20 meters for signals from just about every direction. Fairly good DX openings towards the east and the south should also be possible on 40 meters beginning an hour or so before sundown.

During the *late evening* and *early morning* hours, 20 meters should open for DX towards the *south*, *west*, and *northwest*, often with strong signals. Good openings to most areas of the world should also be possible on 40 meters during the hours of darkness. Some fairly good 80 meter, and some 160 meter DX openings are also possible during this period.

Signal levels on most DX openings should be noticeably stronger during November as a result of a seasonal decrease in static levels and solar absorption.

## CW Contest Work Plan

The accompanying sample work chart for

the CW Contest section was devised from the DX Propagation Charts which appeared in last month's column. This particular example is for multi-band operation and for a PST zone QTH. Similar work charts can be devised for other bands, for other operating conditions, and for other time zones.

## VHF Ionospheric Openings

Solar activity is still at a high enough level to permit occasional 6 meter DX openings during November. Conditions should peak towards Europe and in a generally easterly direction before noon. Openings should improve towards Africa shortly after noon and continue to swing in a clockwise direction during the early afternoon hours. Expect openings towards the Caribbean and Central and South American areas from late morning until shortly after noon. By late afternoon start looking for openings towards the south and southwest. For the most part, 6 meter DX openings may be erratic, and the band may remain open for only short periods of time. The best days to look for 6 meter DX openings are those which are expected to be either High or Above Normal.

Some trans-equatorial (TE) type 6 meter propagation may also occur during November. The best time to check for such conditions is between approximately 8 and 11 PM local standard time. TE openings favor locations in the southern tier states, and generally take place to South American countries south of the equator. At best, TE openings are very erratic, with weak signals subject to intense flutter fading.

Two significant meteor showers are expected during November, which should result in some meteor-type ionospheric openings on the VHF bands. The *Taurids* shower, which should last for a day or two, is expected to peak on November 1st, with a peak meteor count of approximately 15 an hour. A second shower of about the same duration and intensity, called *Leonids*, should reach peak intensity on November 14th.

November is usually a month of fairly intense and widespread auroral activity, which can result in short-skip propagation on the 6 and 2 meter bands for distances up to approximately 1200 miles. Auroral activity is often associated with periods of radio storminess, and is most likely to occur on those days shown as Below Normal or Disturbed in the Last Minute Forecast.

This month's column contains short-skip propagation data for use between distances of approximately 50 and 2300 miles, and between the states of Hawaii and Alaska and the continental areas of the United States.

Good luck in the CW section of the 1992 CQ World-Wide DX Contest

73, George, W3ASK

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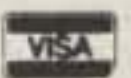
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# OUR READERS SAY

## Lost Contact, Please Help

Editor, CQ:

Since we moved back to Louisiana 2½ years ago, I have lost contact with two friends I met through amateur radio. The first is Robert Morrison, Gunnery Sergeant, U.S. Marine Corps. He was stationed in Okinawa before the Persian Gulf war. I've also lost track of Ed Turner, a Hallcrafters collector, formerly of Youngstown, Ohio. He once had an article in CQ on his Hallcrafters collection.

If anyone knows where either of these men are, please write to me or phone 504-872-5979.

Travis McKee, N5MQY  
135 St. Michel St.  
Houma, LA 70363

## Chrysler (Dodge) Caravan And RF Interference

Editor, CQ:

I own a 1991 Dodge Grand Caravan LE, and from the date of purchase I have been plagued with RF interference from the car on my 2 meter radio. The car emitted a strong unmodulated signal on 146.520, 147.510, and on up into the VHF band at approximately .990 MHz intervals. This interference made HT operation on 146.520 or 147.505 (my local repeater output) impossible from the front seat of the vehicle. Limited mobile operation was possible on these frequencies using a rear-mounted dual-band Larsen antenna attached to the rear luggage rack support in the center of the vehicle. This antenna location was recommended by Chrysler in Detroit to minimize both interference from the vehicle to my radio and interference from the transmitter to the vehicle computer systems. Operation using the rear-mounted antenna and mobile rig on 146.520 with a received signal other than a full quieting one was difficult, as any weaker signals on 52 would heterodyne with the car's typical S2 to S5 signal. I could "copy" my Caravan in my other car when it would be behind me in traffic!

Finally, after a year of troubleshooting the problem, Chrysler was able to identify the problem component and rectify this situation. The problem was traced to the in-dash Infinity One Car stereo that is standard in many of the LE series Grand Caravans. Apparently, the clock in the radio was emitting RF on the above-mentioned frequencies. Chrysler replaced my Infinity One with an Infinity Two and the RF problem disappeared. (Well, it didn't disappear, but it now transmits a weaker signal than before on 146.000, which is better than 146.520!!)

I have driven my car 18,000 miles in the 13 months I have owned it, and other than the above problem of the car interfering with my VHF radio receiver, I have experienced no problems whatsoever with either my 45 watts on VHF or 35 watts on UHF interfering with the car or its many computer sensors using the rear roof-mounted antenna. The roof mount is easily fashioned using a "trucker's" L-shaped mirror mount and drilling out the antenna hole to accommodate an NMO mount. The cable is routed along the luggage rack and into the car through the rear

window and then along the side of the car and floor to the floor between the seats where the rig is located. A friend with the identical car is using Larsen "On the Glass" mount antennas with the VHF antenna on the rear passenger side window and the UHF antenna on the rear driver's side window with no radio-to-car interference problems either. It is possible this Infinity One Radio is used in other Chrysler products, and others may be experiencing similar RF problems from their cars as well. Over the last year Chrysler has been attentive to this problem and worked with me and the local dealer to help correct it. I was impressed by Chrysler's persistence in solving this problem even though it is one which will only be encountered by a "few" (compared to overall sales) radio users nationwide.

Scott Seidel, WA2WUX  
Springfield, NJ

## Are We Too Impersonal?

Editor, CQ:

It was with great interest that I read your "Zero Bias" editorial in the July issue of CQ. The technology advances you addressed are fantastic and have added to the scope of amateur radio beyond the bounds that anyone would have thought possible when I entered the hobby 30-plus years ago. The availability of computers alone to the amateur has opened a whole new world of communication and technology.

However, with the positive advances, I suppose there has to be some negative aspects. It appears to me, both from my personal observations and articles/books, that with the advances the amateur service has become more and more impersonal. The one-on-one communication and help that used to be there appears to be waning as time passes. The "Elmer" who pushed me in the beginning spent a lot of his time and effort to keep me moving towards the goal of a license. Additionally, the early on-the-air help was there instantly any time I asked for it and for as long as I needed it. There were many late hours spent working me through not only problems, but making me understand the technical features that would solve that problem. Incidentally, many of these discussions were conducted via CW.

There may be 9600 baud transmissions and BBS's that come with technology changes, but I am concerned that the very bases under which ham radio got started are slowly disappearing because of this increasing impersonal approach to communication. One of the major goals of the amateur service is to perform public service by conveying messages in the traffic system, communication during emergencies, etc., but we must not lose the one-on-one communication features that have made this one of the most attractive avocations over the years.

Thank you for letting me express my thoughts, and I hope that the technology advances continue at a fast pace, even though they are pushing me right to my comprehension limit.

B.T. (Bud) Jeavons, WA6GEF  
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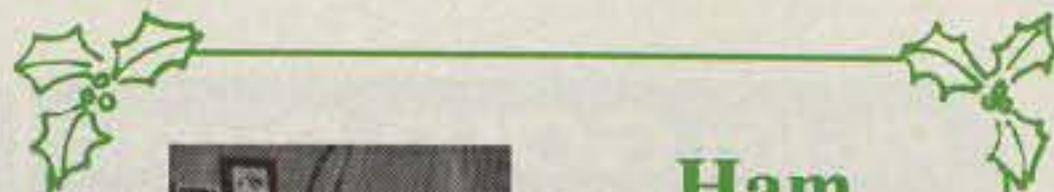
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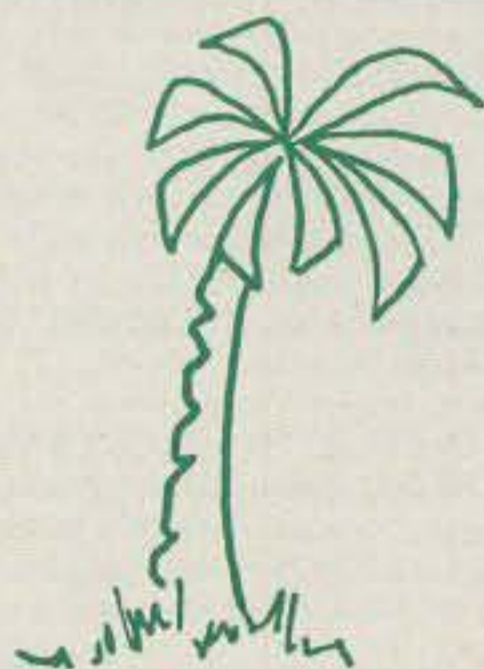
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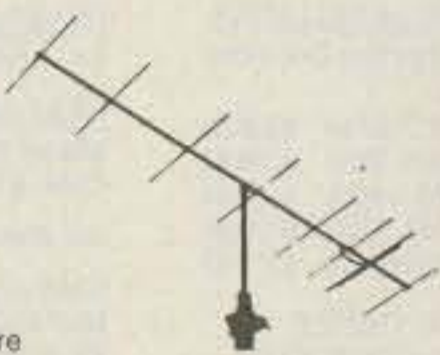
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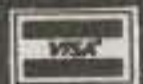
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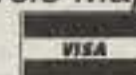
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Nov. 21, **Smokey Hills ARC Hamfest**, Eagles Club, Park Rapids, Minnesota. Contact Nick De Carlos, KA7VLH, Rt. 1 Box 352A, Park Rapids, MN 56470.

Nov. 21, **Cookeville, Tennessee Hamfest**, Hooper Eblen Center, Cookeville, Tennessee. Contact Richard Steward, N4UBR, 615-230-8871. (Exams, walk-ins welcome; K4ABT packet forum)

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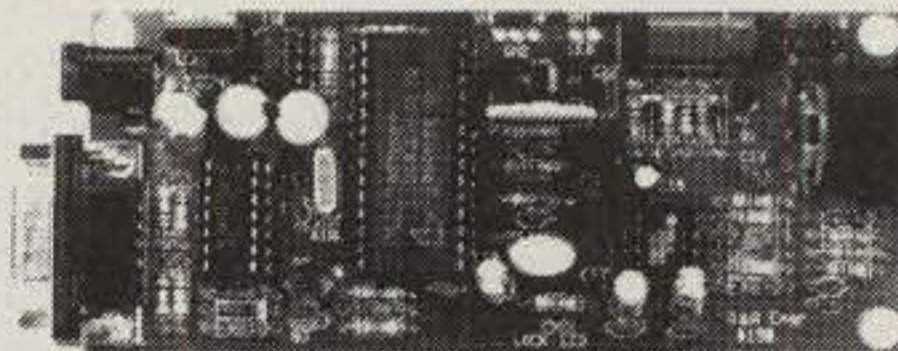
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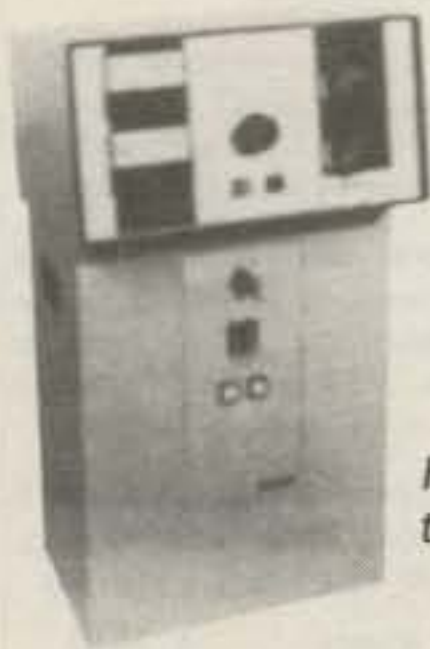
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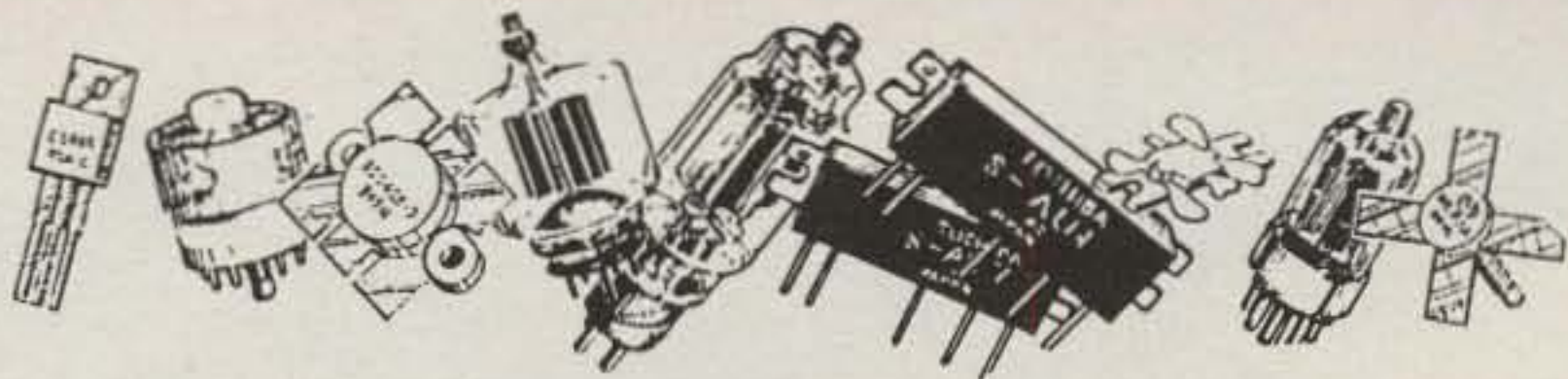
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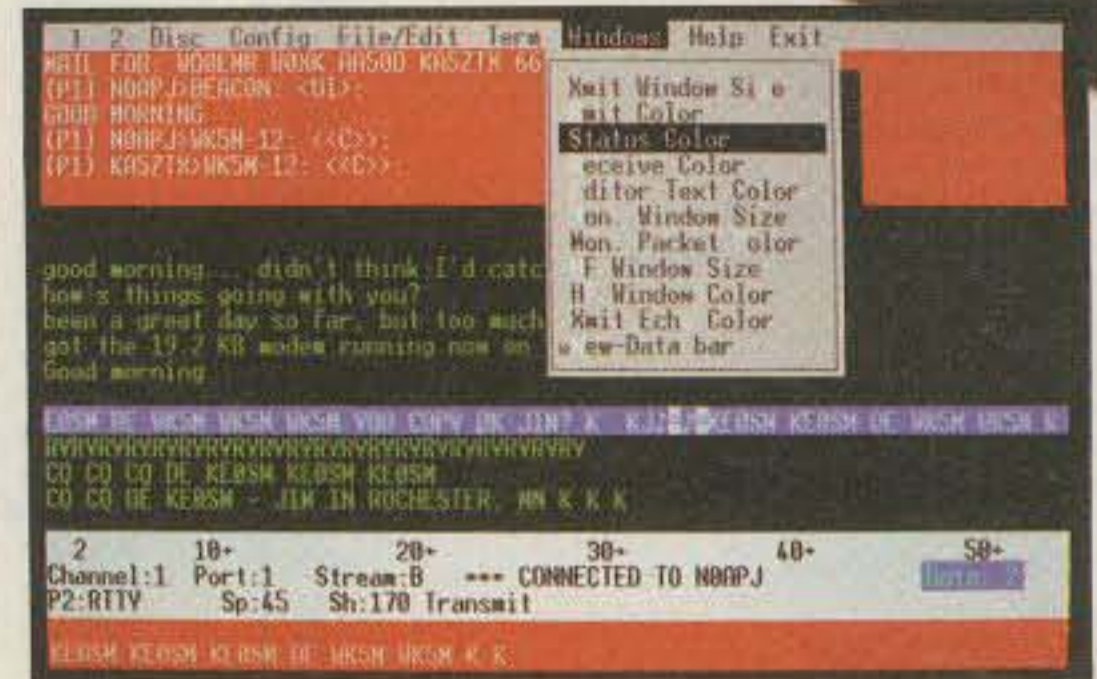
Simultaneous multi-mode terminal hardware & software for the PC, Mac and Commodore-64.

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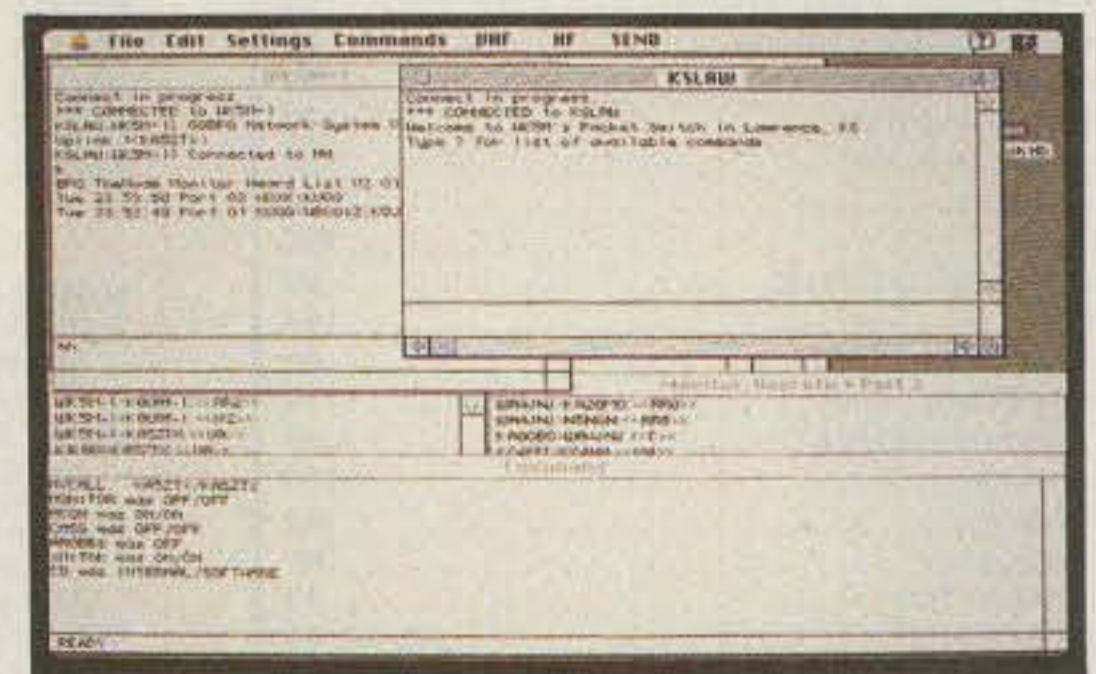
Operate CW, RTTY, ASCII, FEC, ARQ, packet or copy NAVTEX on HF and packet on VHF/UHF simultaneously! Toggle back and forth between any HF mode and packet for sending, while viewing monitored and connected packets and HF data at the same time.

New firmware features (terminal program independent) include AMTOR access to your personal mailbox, remote access for sysops and SEND PRIVATE, SEND BULLETIN, SEND TRAFFIC and enhanced mailbox commands. Blinking mail-waiting LED also provided, independent of software. Hostmaster features include:

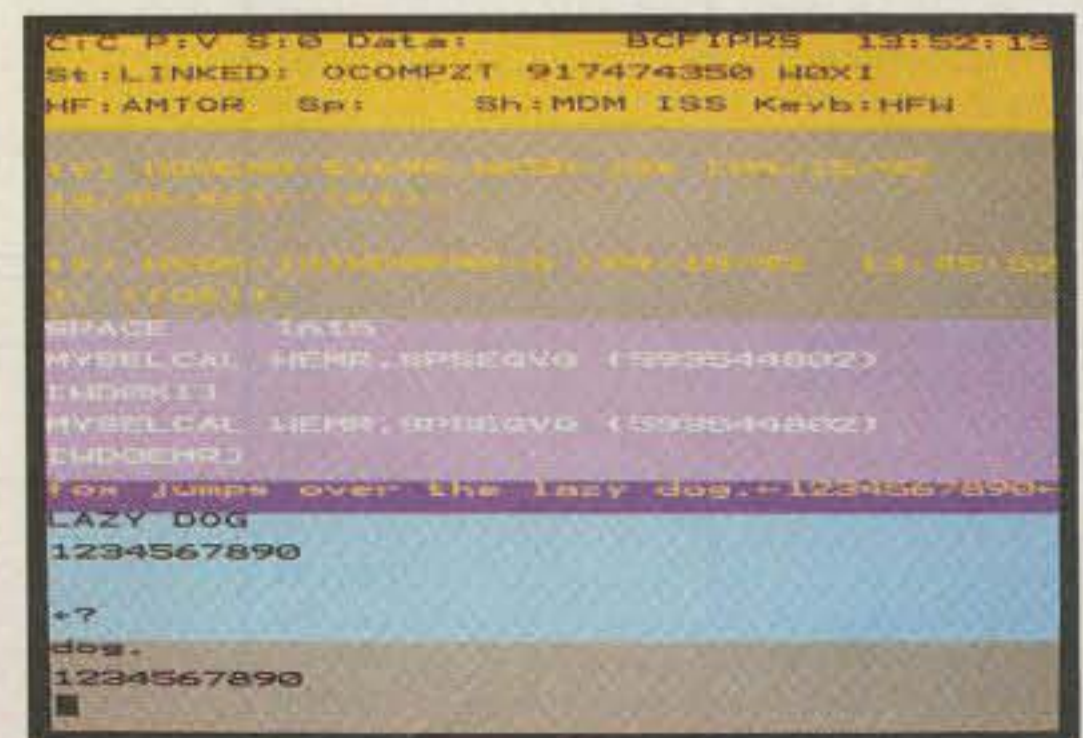
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- menu display line
- packet monitor window
- separate packet connect window per channel
- xmit echo display line
- non-packet window (for KAM only)
- status display lines
- xmit buffer per channel
- file buffer per channel
- file transfers and file captures
- compatible with all Kantronics 5.0 firmware: KAM, KPCs and DataEngine 2.0.



Hostmaster on the PC



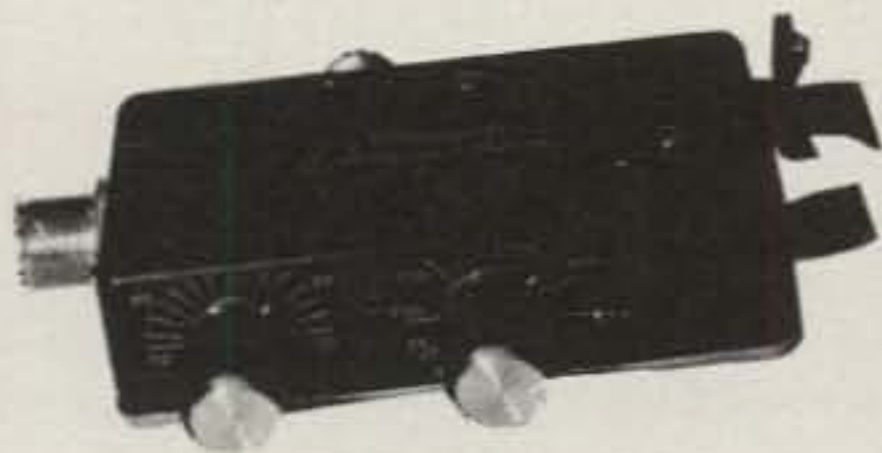
Hostmaster on the Mac



Hostmaster on the Commodore 64



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### • Learn the truth about your antenna.

The Palomar R-X Noise Bridge tells you if your antenna is resonant or not and, if it is not, whether it is too long or too short. It gives resistance and reactance readings on dipoles, inverted Vees, quads, beams, multiband trap dipoles and verticals from 1 to 100 MHz.

Why work in the dark? Get the instrument that really works, the Palomar R-X Noise Bridge. Model RX-100 \$79.95 + \$4 shipping/handling in U.S. and Canada. California residents add sales tax.

## TUNER-TUNER™



- Tune your tuner without transmitting!
- Save that rig!

Do you use an antenna tuner? Then you need the new Palomar Tuner-Tuner to tune it to your operating frequency without transmitting. Just listen to the Tuner-Tuner's noise with your receiver. Adjust your tuner for a null and presto! You have 1:1 SWR. It's as simple as that.

Easy to install. Works with all rigs. Eliminates tuneup damage. Your rig will love it!

Model PT-340 \$99.95 + \$4 shipping/handling in U.S. & Canada. California residents add sales tax.



Send for FREE catalog that shows our complete line of noise bridges, SWR meters, preamplifiers, loop antennas, VLF converters, baluns, SWL equipment, toroids and more.

# PALOMAR ENGINEERS

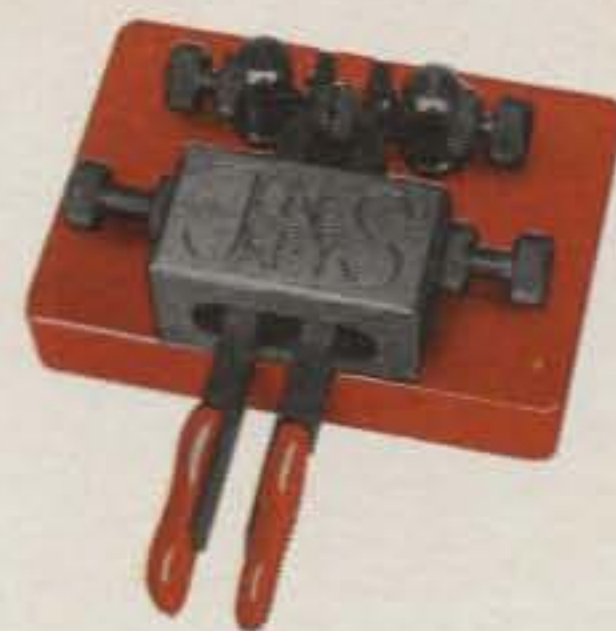
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Fax: (619) 747-3346

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We'd like to see your company listed here too. Contact Arnie Sposato, N2IQO, at 516-681-2922 or FAX 516-681-2926 to work out an advertising program tailored to suit your needs.

## JONES KEY



Now a superb new key from Peter Jones of England. A one piece machined brass block encloses the four rotary ball race bearings. Individual adjustment of contact spacing and spring tension. Adjustable paddle height and spacing. Three and a half pounds of rock solid dual paddle mechanism. This is the World's best key!

Model PK-200 \$135.00 + \$4 shipping U.S. & Canada. Tax in Calif.

## KEYERS

### Iambic Keyer

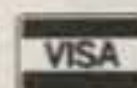


Easy-to-use keyer with dot and dash memories, monitor speaker, fully adjustable speed, volume, weight and pitch. 5-50 WPM. Keys any rig old or new. Model PK-44 \$89.95 + \$4 shipping U.S. & Canada. Tax in Calif.

### Message Memory Keyer



Four message memories, easy error correction, automatic serial numbering, pause, repeat and combining messages, paddle reverse for left handers, weight, pitch, volume, and speed controls, paddle control of all functions, and much more. THE contest keyer. Model PK-50 \$129.95 + \$4 shipping U.S. & Canada. Tax in Calif.



Send for free catalog. Has full details on our Keys, Keyers, Noise Bridge, SWR Meters, Preamplifiers, Loop Antennas, Toroids, and more.

# PALOMAR ENGINEERS

Box 462222, Escondido, CA 92046  
Phone: (619) 747-3343  
FAX: (619) 747-3346



## FT-530 Dual Band Handheld

- **Frequency Coverage:**  
2-Meters 130-174 MHz RX  
140-150 MHz TX  
70 cm 430-450 MHz RX/TX
- 82 Memories (41 per band)
- 4 TX Power levels  
w/FNB-25: 2.0, 1.5, 1.0, 0.5W  
w/FNB-27: 5.0, 3.0, 1.5, 0.5W
- Dual in-band receive feature (V/V, U/U or V/U receive operation)
- DTMF Paging and Coded squelch included.
- AOT – Auto On-Timer with built-in clock
- ABS – Automatic Battery Saver (Super battery life, each band can have separate battery saver)
- Built-in VOX
- IBS – Intelligent Band Select (provides automatic TX band select on scan stop)
- Built-in CTCSS with dual decode
- ATS – Automatic Tone Search (displays incoming CTCSS frequency)
- Back-lit keypad and display with time delay
- Built-in cross-band repeat function
- APO – Automatic Power Off
- 5 Watts output w/ FNB-27 battery or 12 VDC
- 2 VFO's for each band
- **Accessories:**  
NC-42 1-hour Desk Charger  
FNB-25 600 mAh Battery (2 watt)  
FNB-26 1000 mAh Battery (2 watt)  
FNB-27 600 mAh Battery (5 watt)  
FBA-12 6 AA Cell Holder  
CSC-56 Vinyl Case w/ FNB-25  
CSC-58 Vinyl Case w/ FNB-26/27  
E-DC-5 12 VDC Adaptor  
YH-2 Headset for VOX  
MH-12A2B Speaker Mic  
MH-18A2B Lapel Speaker Mic  
MH-19A2B Mini Earpiece Mic  
MH-29A2B LCD Display Mic with Remote Functions  
MMB-54 Mobile Mounting Hanger

"Look at this new FT-530! Simultaneous receive on VHF and UHF, automatic "on" timer, 82 memory channels..."

"Yaesu did it again!"



# Bright minds lead to brilliant "firsts."

That's right, brilliant innovative first-time ever features which make the FT-530 our most exciting HT addition.

Exclusive break-through features, too. Like flexible in-band dual receive. Not just V/U receive. With the FT-530 you can listen to two, 2-meter signals at the same time!

Another remarkable first is the Auto On-Timer<sup>SM</sup>. Here's how it works. Choose the hour you'd like the radio to begin operating. For example, set the time for the morning, then wake up to your favorite net. What's more, the built-in 24-hour clock displays the time when the radio is off.

First out with 82 memory channels included, not an option; a real plus for storing all your favorite frequencies. With this HT, just open the box and QSO.

There's a lot of other terrific features too, such as built-in VOX and DTMF paging. And, since we know you'll find the FT-530 indispensable, we've included an automatic battery saver and voltage display – a powerful handful of exclusive features!

Be the first at your dealer's door to buy one, and the first to show off your new FT-530. What a bright idea!

Multi-Function Digital Display  
Speaker Mic and S Meter. (Optional)

NEW



# YAESU

Performance without compromise.<sup>SM</sup>

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Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.



#### FT-990 High-Tech Innovation

The advanced RF front end design similar to the FT-1000 allows for superior receiving performance. In addition to CW spot, IF notch, IF shift, independent mode and IF filter selection and Yaesu's exclusive DDS, the FT-990 features the industry's only dual digital SCF high performance filters providing unsurpassed receiver selectivity as never before obtained. And the CPU controlled RF FSP gives you that extra pile-up punch when you need it most. A high speed antenna tuner with memories and built-in switching power supply are included.

#### FT-890 Light Years Ahead

World's smallest premium high-performance mobile includes Yaesu's exclusive DDS, IF notch, IF shift, built-in iambic keyer, general coverage receiver and built-in high-speed antenna tuner with memories. Outstanding receiver front end with IPO (Intercept Point Optimization), selectable AGC and all-mode squelch. DFCS (Duct Flow Cooling System) for 100% duty cycle at 100 watts output for up to 30 minutes. A great Field Day or DX-pedition rig!

#### FT-747GX Small Wonder

Features include ultra-lightweight design, multiple scan functions, selectable noise blanker, 20 memories, all-mode squelch, separate drive and mic gain controls. The simplest full-featured 100 watt HF radio, with general coverage receiver at an affordable price.

# know a world leader, know us.

Keeping our world leadership position in HF radio products means knowing what you need to make DX'ing more fun and challenging, then interpreting those needs into technical improvements and innovative features. We're hams too, so we know how exciting advanced engineering can be.

Being a world leader in HF technology doesn't mean anything to us though, unless there are real benefits to you. Like peak performance and unfailing durability – the very qualities that keep our HF equipment on top; the best benefits you can have – and our design goals since 1956 the year Yaesu was formed.

This lineup of radios exemplifies the achievement of those goals and over 35 years of manufacturing "the best of the best" amateur radio equipment.

You see, you do know a world leader – but more importantly, we know you.

Experience the best of the best today! Contact your nearest Yaesu dealer.

## YAESU

*Performance without compromise.<sup>SM</sup>*

"The magazines judged the FT-1000 world's best in it's class. That's leadership!"

*K. Karamanos  
National Sales Manager  
WD6DIH*

"Leadership means innovation, and since we're hams too, we understand what you want."

*C. Margelli  
Customer Service Manager  
K7JA*



"We keep our HF leadership position by constantly improving our products."

*M. Maruya  
Executive Vice President  
WA6F*

### FT-1000 Best of the Best

Unmatched performance, the ultimate DX and Contest radio. Unlimited simultaneous crossband dual receive, 200 watts power output, with heavy duty power supply. World's best receiver performance utilizing quadruple conversion, Yaesu's exclusive DDS, IF notch, IF shift, IF variable bandwidth, CW APF, independent mode and IF filter selection. Also, CW spot and built-in high speed antenna tuner with memories. Proven performance: The choice of the world's top DX'ers.

# You may not think you but you



All of Yaesu's quality HF radios come available with a wide selection of accessories. Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

# ONLY ICOM COULD BUILD THIS MANY FEATURES INTO SUCH A TINY RADIO

## ICOM'S AMAZING MINI FM HANDHELDS

ICOM's "S Series" mini handhelds deliver top performance on the 144, 220 and 440MHz bands with super easy operation and a kaleidoscope of features. Built to fit your needs today, tomorrow, anywhere and anytime.



**Wide Frequency Coverage.** Plenty of overlap for scanning, monitoring, CAP and MARS use. IC-2SAT: 138-174 MHz Rx. IC-3SAT 220-225MHz Rx. IC-4SAT: 440-450 MHz Rx. All units transmit all U.S. Amateur bands.

**Flexible Size And Power.** The IC-2SAT, 3SAT and 4SAT's internal battery packs 2 watts of output on high power. All models deliver five watts when powered via optional BP-85 battery pack or via top-mounted 13.8 volt socket. A small rig with a big punch! **48 Memories.** Store your present frequencies and expand your future interests. Offset frequencies are independently programmed in memory channels 0-9. Memories 10-47 use offset frequency contents of the VFO. Also includes soft-sector memory masking. Use only the number of memories you need! **Band and Memory Scanning** with programmable limits, memory skip

function plus selectable pause times while scanning. Additional features include **Automatic Power**

**Shut-off.** Built-in programmable timer automatically switches off transceiver when you forget. **Optional DTMF Paging**

**Function.** Silently monitors and selected frequency for your preprogrammed 3-digit DTMF-keyed calls, the beeps and displays calling station's code. All ICOM's "S Series" handhelds are supported by an extensive line of optional battery packs, chargers, cases, speaker/mics and other accessories. See the exciting ICOM mini series handhelds at your authorized ICOM dealer today!

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**DC Socket For Charging and Mobiling**

**24 Hour Clock With Timer**

**48 Memories**

**ACTUAL SIZE**

**Optional Battery Packs Vary Size, Power Output**

**Easy Knob or Keypad Frequency Selection**

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