

ICD 08241

# Amateur Radio

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JUNE 1992 \$2.9

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On the cover: WN2K teaches new Hams



THE RADIO AMATEUR'S JOURNAL

# KENWOOD

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### TH-28A/TH-48A

- ▼ Dual receive with single band HT  
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TX 144-147.995 MHz  
TH-48A - RX 438-449.995 MHz (main) 136-173.995 MHz  
TX 438-449.995 MHz
- ▼ TH-28A: 2.5W, TH-48A: 2W. Both models 5W output with PB-14, PB-17, or ext. 12VDC
- ▼ 40 Full function memory channels, expandable to 240 with optional ME-1

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TX 144-147.995 MHz, 438-449.995 MHz
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- ▼ Alpha numeric message paging
- ▼ CTCSS Encode/Decode built-in
- ▼ Ten 15 digit DTMF autodial memories. A,B,C,D,\*,# can also be memorized
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- ▼ Remote control speaker microphone - SM-33 (optional)
- ▼ Clock/Timer with alarm



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# The Radio Amateur's Journal



**ON THE COVER:** At the Unatego (NY) High School Amateur Radio Club, teacher Paul Agoglia, WN2K, guides students Thomas Carvin, N2JSU, (left), and Peter Brayman, KB2HPU, through some of the fine points of Amateur Radio operation. See "Our Readers Say" in this issue for Paul's description of how the station came about. (Photo by Larry Mulvehill, WB2ZPI)

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**W**e've passed the one year mark for the Codeless Technician license and the numbers indicate an overwhelming success. More and more people are finding out about amateur radio and working towards their first license. Many of these new amateurs have begun studying Morse code and a number have upgraded to Tech Plus. Has it changed the nature and texture of the hobby? In some refreshing ways it has. I see a lot of younger faces now at hamfests, and by and large these new people seem eager to learn. Their new licenses have not imbued them with an enormous vocabulary of amateur radio jargon or buzzwords. Somehow, the mysterious link between license and omnipotence was not forged in these new licensees, and this phenomena represents a curious anomaly.

From the very beginning days of Novice Enhancement followed by the advent of Codeless Tech, I expected to hear from disgruntled amateurs how these new people were ruining everything with their inexperience and liberalized privileges. I listened on the air for anything out of the ordinary and quickly realized that this exercise was a waste of time, since there were no distinctive callsigns to cull out the newcomer. Aha! An insidious plot to make them blend in with the rest of us. Somebody in the government had foisted this cruel and nefarious proviso whereby we would be forced to focus on an individual amateur's actions rather than smugly generalize about a group. Somehow, though, I still had this gnawing feeling that there had to be a simple way to single out these newcomers to amateur radio.

I started out with the supposition that newcomers to anything prefer to blend in rather than stand out and appear foolish. What I actually found out over the past year was that most Codeless Techs I met were not embarrassed to be newcomers nor were they put off from asking questions, thereby admitting they didn't know something. The only distinctive quality about which I could sort of generalize is the lack of ego involvement and a willingness to find out about the unknown.

As I noted earlier, there is also a noticeable reserved use of jargon and buzzwords and an attempt to use them in proper context. I started to ask why, and how are they different from the rest of us? The one major distinction, of course, is Morse code. For the newcomer to amateur radio, learning about Morse code or learning the code itself is not within the technical realm of tradition, since by definition the person is a newcomer. It may become tradition, but it certainly doesn't start out that way.

Well, from some simple questions and a great deal of empirical observation it became not only clear but blatantly obvious

that a significant number of our fellow amateurs were the subjects for secret government behavior modification experiments. It really had nothing to do with Morse code at all, or to put it another way, the medium was the messenger not the message. It was simply a matter of chance and convenience that more of us weren't affected by or subject to these experiments.

Those of us who have taken some form of code test fall into two groups. The first group listened to the code via speakers set up in the testing area. This group was apparently unaffected by the experiment. The second group copied code using headphones supplied by an obscure government agency. The headphones were the messenger, not the code. Since it couldn't be a universal practice (it would become too obvious), every nth applicant was chosen. These random applicants put on the headphones and focused in on the task of copying code. About 30 seconds into the test a white-noise track was superimposed onto the test and a infinitesimally small microchip passed from a device in the headphone through the ear canal and was planted in the subject's brain.

The difference was night and day. Picture, if you will, an applicant showing up for an amateur exam who is wide-eyed, pleasant, and eager to learn about our favorite hobby. Imagine this polite, respectful individual moments later after passing the exam and experiencing the effects of the microchip. Behavior modification is putting it mildly. The eyes are still wide, but suddenly they're all seeing and all knowing. This person has in one instant mastered all the buzzwords and terms of amateur radio and become master of the universe. By virtue of this new license the mysteries of life are answered. On the surface it may look like the ability to copy code that produced these changes in personality, but it clearly isn't. These powers are somehow magnified behind a microphone or key, and diminish in person (obviously RF induced).

If we could think in terms of amateurs as individuals and not by license class, we would tend to find some of the rudest, egocentric, abhorrent behavior linked to those nth number headphones. I'm reasonably sure that if we could remove these people from strong RF fields and return them to the rest of society, family, and friends they would soon be their old selves again. Apparently this curious behavior is analogous to a battery. The more the subject is exposed to RF energy (increased charging rate) the more the bizarre behavior manifests itself. This has been readily demonstrated (but hitherto unexplained) by several protracted DX pileups. Remove the RF and the symptoms diminish proportionally. It goes without saying that these people

should also avoid all forms of DXing and contesting until a cure can be found.

### Epilogue: Dayton 1992

The 1992 Dayton Hamvention is history. The foul weather arrived just about the same time as the show opened, noon on Friday, and stayed with us through the weekend. Did it stop anything? No way! I have to admit that the weather helped to keep the interior exhibit areas packed and barely passable at times (I'm very glad I wasn't the Fire Marshall), and if anyone left there on Sunday not buzzed out, he or she must have slept through the whole thing. It really was a treat for everyone's amateur radio senses. The only food I tried there were the pretzels (very good). The lines outside for the grilled Polish sausages were too long to wait on when on a break, but the sausages did smell good.

I had heard rumors of all sorts of parking problems before the show but nothing seemed to materialize in the way of parking conflict. I didn't hear anyone complain about parking, nor did I see the tremendous traffic jams this year. The large satellite parking fields seemed to do the trick. The flea market seemed bigger this year, and if you managed to get through it to the other side, both Kenwood and ICOM had large display areas. Kenwood had their giant van on display hosting 30 hams at a time through an amateur radio program. ICOM also had a large display featuring videos and 10 complete working stations.

Steve Bolia, N8BJQ, and his wife Barbara coerced Gail and me into attending the annual DX Banquet downtown at Stouffers and later visiting one of the DX hospitality suites. There were 560 people at the banquet, and I have to commend the committee and Stouffers on a job well done. Yes, the food was very good too. I'm still amazed at some of our fellow amateurs' ability to party all night and hamfest all day. I've come to the conclusion that John Dorr never sleeps. Dick and Cathy drove out to Dayton, which was very fortunate, as they had the unique distinction of driving home all of the wonderful (but questionable) stuff some of us purchased in the fleamarket (no names).

If you missed Dayton this year shame on you. Start planning for 1993. Everyone else try to get out to at least one hamfest this year and find out how much fun they really can be. If you are a brand new amateur looking to have a clear shot at all the DX there is (without ANY local QRM), stay home next Dayton weekend and work the world. The rest of you come on out and join in on experiencing the greatest amount of amateur radio sensory overload there is.

73, Alan, K2EEK

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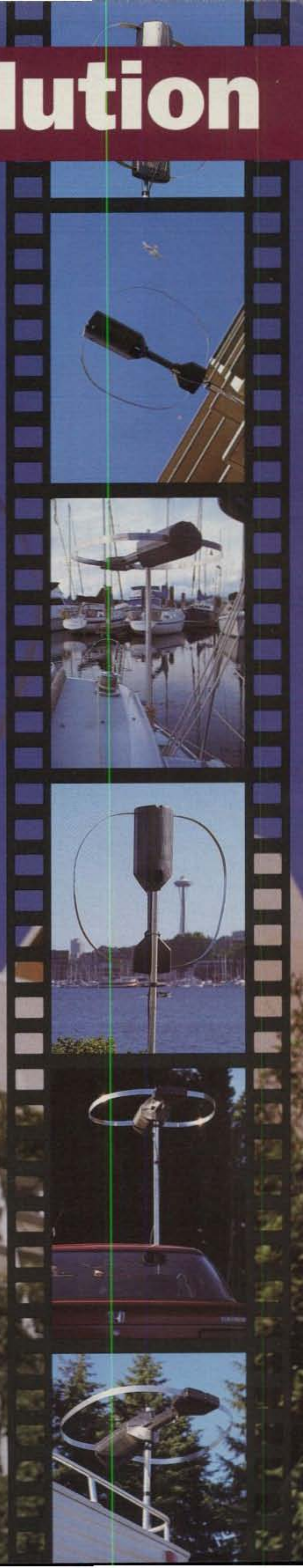
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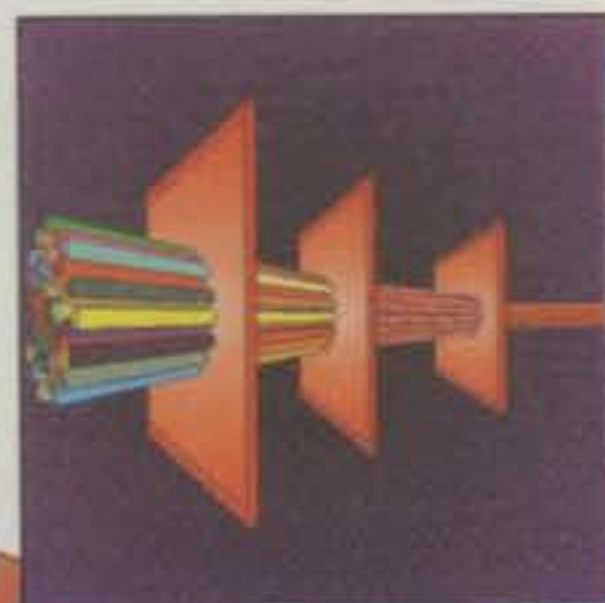
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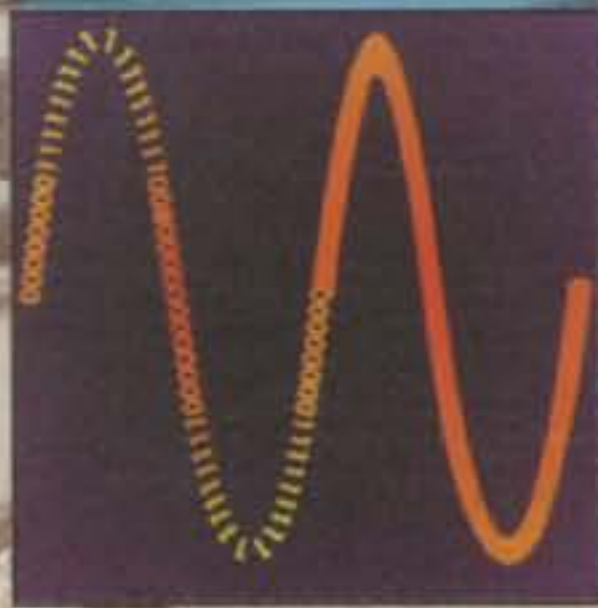
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# ANNOUNCEMENTS

• **FARS/SeaPac CW Competition** - The Friendship ARS in conjunction with SeaPac will host a world-class CW competition on June 13. Categories will include CW sending, receiving, and CW pile-up competition. Top scorers will be eligible for the US Team in the third Friendship ARS Sport Games next summer in Victoria, BC, Canada. For more information, contact FARS, or call Stan or Pat Griffiths, 503-649-0837.

• **Earthquake Research** - Vince T. Migliore, editor of Geo-Monitor, is conducting research into experiments that record low-frequency electromagnetic disturbances associated with earthquakes. He is looking for anyone who has been or wants to be involved in amateur re-

search in this field. Contact him at Geo-Monitor, 65 Washington St. #400, Santa Clara, CA 95050 (408-749-6770).

• **Nathaniel Narbonne High School Reunion** - K6HCJ would like to contact former students of Nathaniel Narbonne High School (ex-WB6RTO) in Harbor City, California, who got their Novice license between 1965 and 1976, for the purpose of having a reunion. Those interested can contact Marv Fagenson, K6HCJ, 2100 Sawtelle Blvd. Ste. 202, Los Angeles, CA 90025 (310-478-1777).

• **Amateur Radio Summer Camp** - The Gateway To Ham Radio Club is having their third annual amateur radio summer camps. Day camp:

July 20-24 (\$35); week camp August 2-6 (\$75). Scholarships are also available. For details contact Rev. Dave Novak at 314-795-4436, FAX 314-225-1952; or Angie at 314-225-5560.

• **The following special events are scheduled for June:**

**KD1GJ**, from Monadnock Region Hot Air Balloon Festival, New Hampshire; 1400-2300Z each day June 6-7; lower portion of General phone bands 80, 40, 20 meters, Novice 10 meter subband. For QSL send QSL and SASE to KD1GJ, 52 Manchester St., Keene, NH 03431.

**WB1CAG**, from International Children's Festival, Somersworth, New Hampshire; Great Bay Radio Assn.; 1200-2400Z June 20; CW and SSB in General and Novice portions of all bands. For certificate send QSL and SASE to Great Bay Radio Assn., P.O. Box 911, Dover, NH 03820.

**NY1H**, from Governor's Hurricane Conference, Tampa Florida; Tampa Bay amateur radio ops; 1300-2100Z Wednesday and Thursday and 1300-1700Z Friday, June 3-5; 80-10 meter phone subbands including Novice 10 meters, and packet on 145.050 MHz and HF. For certificate send QSL and SASE to Hurricane Conference, c/o Duane Archibald, N4WDH, 408 Evergreen Dr., Oldsmar, FL 34677.

**N2LDU**, from 214th anniversary of Battle of Monmouth, Freehold, New Jersey; Highway Gentlemen RC; June 27-28 (no times given); Novice portion of 10 meters. For QSL send QSL and SASE to Jerry Ham, N2LDU, 82 Braeton Way, Freehold, NJ 07728.

**WA2ZWP**, from 167th anniversary of Fort Hamilton Army Post, Ft. Hamilton, Brooklyn, New York; Kings County Repeater Assn.; 1200-2400Z June 14; General and Novice phone bands around 28.343, 21.343, 14.343, 7.243. For certificate send QSL and SASE to Charles Quartana, N2JZA, 2175 East 8th St., Brooklyn, NY 11223.

**W3QZF**, from US Cycling Federation Olympic Road Trials and National Championships, Altoona, Pennsylvania; Horseshoe ARC; 1300-2100Z June 20-21; lower portion of General phone bands on 40-15 meters and lower portion of Novice 10 meters. QSL with SASE to HARC, P.O. Box 225, Hollidaysburg, PA 16648.

**K4LLQ**, from Golden Anniversary of US Army Communications-Electronics Command, Vint Hill Farms Station, Warrenton, Virginia; Fauquier ARA; 1300-2200Z June 13-14; SSB 7232, 14232, 21322, 28432 kHz (may move depending on band conditions), CW on request. For QSL send SASE, or for 9 x 12 certificate send SASE and \$3.00, to Fauquier ARA, 500 Hunton St., Warrenton, VA 22186.

**N4HID & WA4QMQ**, from Kentucky Bicentennial celebration, Simpson County, Kentucky; 1400-2200Z June 6; N4HID near 28.350 or WA4QMQ near 7.250. For QSL send SASE to Western Kentucky DX Assn., P.O. Box 73, Alvaton, KY 42122.

**W4NJA/KY200**, from Kentucky Bicentennial celebration, Paducah, Kentucky; Paducah ARA; June 1-7 (no times given); CW and phone 25 kHz from bottom of General/Novice bands. For QSL send SASE to KC4ENA, P.O. Box 1732, Paducah, KY 42002-1732.

**WA5DTK**, from summit of Pikes Peak, Colorado; June 13-14; SSB 28.450, 21.350, 14.250, 7.250, 144.2, and FM 146.58. QSL to 6670 Gambol Quail Drive West, Colorado Springs, CO 80918.

(continued on p. 140)

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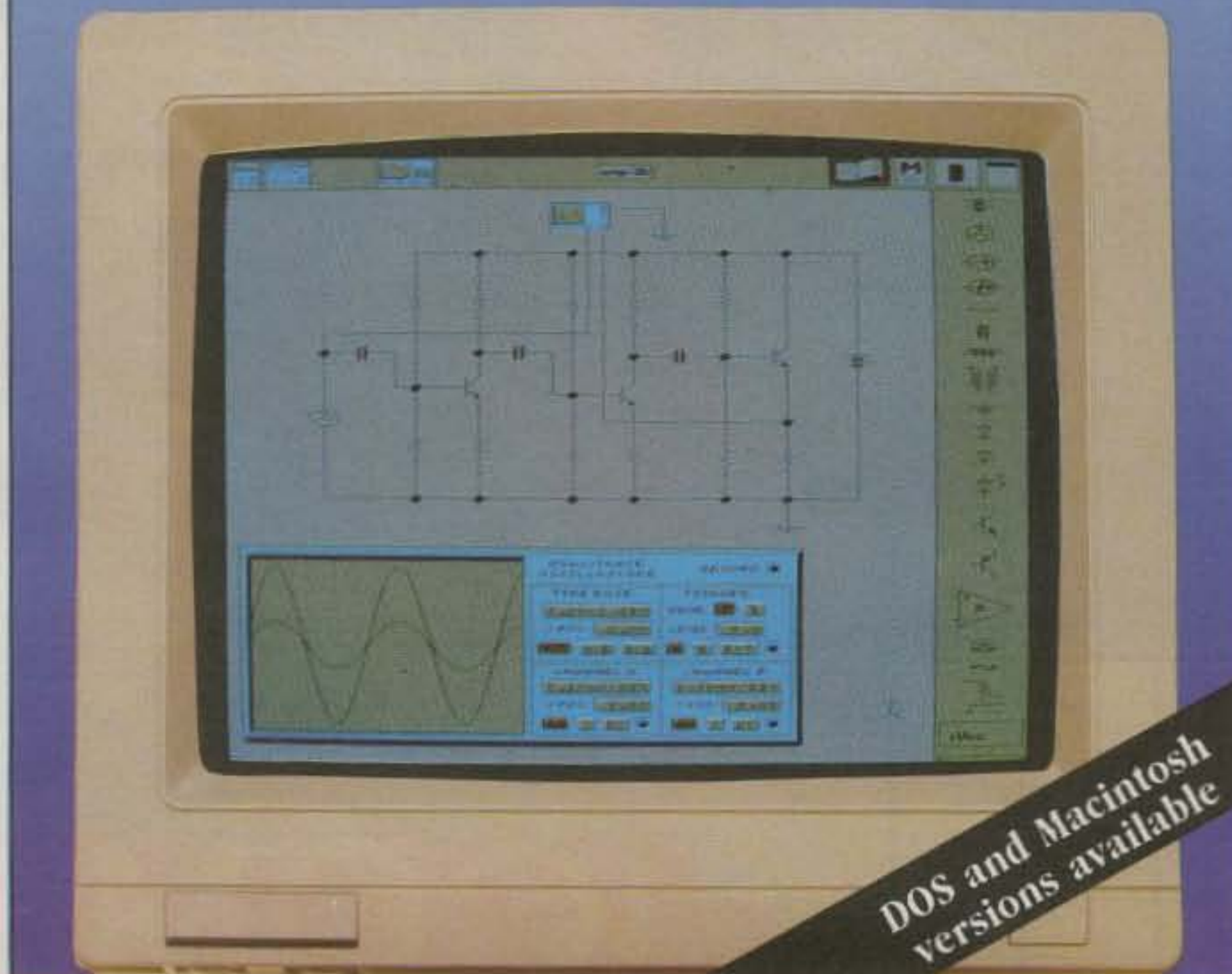
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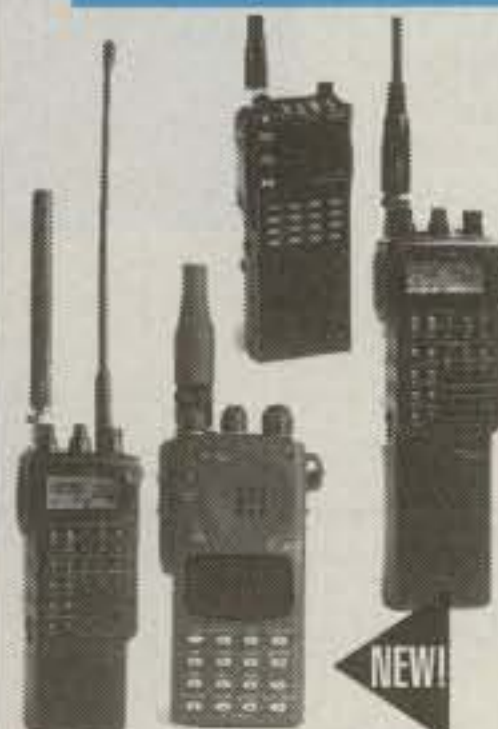
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# The McCoy Dipole (The Real One) And How It Came To Be

BY LEW MCCOY\*, W1ICP

**F**rankly, I have never been known as one who is modest—at least that is what I have been told (probably by people who are less modest than I). Nevertheless, I have been asked many times how the "McCoy" dipole came into being. I wouldn't for a moment pretend to be on a par with G5RV, 8JK, Windom, or any other of the greats who have antennas named after them. I did name mine the "McCoy Dipole," but it was more or less in humor at an antenna lecture I was giving in Los Angeles, California.

Let me give you a little history so all this will be in correct perspective. Many years ago, about 40 or so, I went to work at the ARRL, working in the Communication Department. I was hired as The Assistant Communications Manager for Phone Activities, because for some strange reason the ARRL Board of Directors felt that the ARRL needed some "phone" guidance. I have grown more mellow over the years, but at that time a phone man was about as welcome at ARRL Headquarters as the plague.

In any case, one of the fellows in the Technical Department left and I applied for his job. The Technical Director at the time was George Grammer, W1DF, and a very fine gentleman he was indeed, but to be honest, he also had little use for phone men. In any case, they (ARRL) needed someone who had some moxie in dealing with the public, because television had reared its ugly head. I had been a professional entertainer (magician), so I had some experience in going before the public. George, in his infinite wisdom, said, "McCoy is just the guy to go out and con the public on the fact that hams are not to blame for TVI. It is probably going to take a magician!" He hired me and I did the job.

There came a time, however, when the Novice license became a part of our lives,

and George called me in and said something to the effect, "Well, McCoy, you are a phone man, so you don't know much, but neither do all these new Novices, so I want you write an article every month and educate them." I am also noted for using cliches in my writing, and this is no exception: At that time it was a case of the blind leading the blind!

My fascination with amateur radio was not so much with transmitters or receivers, even though I built and described many, but rather it was with antennas. Even more important, I had the very best teachers in the world. For example, George Grammer and By Goodman put together the very first antenna handbook. Ed Tilton knew just about all there was to know about VHF-UHF. In fact, I noted that in a recent *QST* article they were discussing VHF records. I can't understand why he wasn't mentioned, but Ed Tilton was the very first amateur to work across the Atlantic on 6 meters. In any case, I resided at the well of knowledge and profited from it.

I quickly learned, for example, that antennas was a subject that all amateurs were very hooked on, Novices being no exception. So I studied and learned, and in my usual modest manner I will say that I think I became quite knowledgeable on the subject.

I found that you could tolerate extremely high standing-wave ratios if you used a feed line that had very low losses. Open-wire feeders are such types of lines. In fact, they are almost a lossless line. If you had a flexible enough Transmatch (they use to be called antenna couplers and still are by people who don't know better), then no matter how bad the SWR was, you could match the antenna system to the rig. Also, I learned that many amateurs lived by the rule that a dipole must be a half wavelength long in order to work at its best. I soon learned that idea was pure hogwash.

Let me define a dipole. Simply, in amateur radio we think of a dipole as two equal

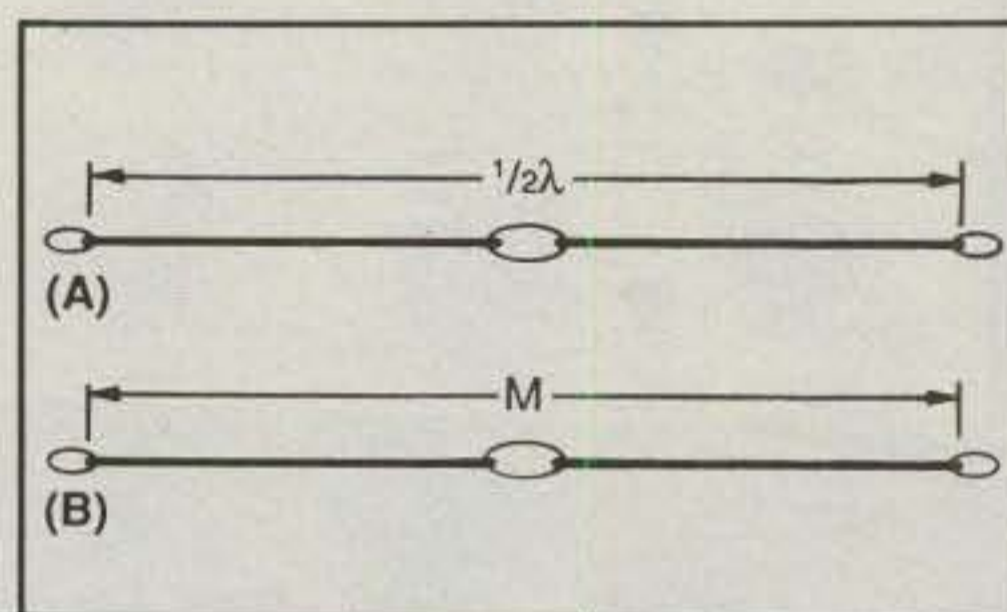


Fig. 1— At (A) we have a conventional half-wavelength dipole. At (B) is a McCoy dipole, which as you will read from the text can be many lengths.

lengths of conductors, usually wire or tubing. The difference comes in when we designate a given overall length to this dipole—for example, a half-wavelength dipole, or a full wavelength dipole—this usually means a resonant antenna of a given frequency. (Keep in mind that as soon as you QSY the dipole is no longer resonant!) But all we have done is state that that dipole is now a length which "should" be resonant on a given frequency. We QSY up and down the band, or use the antenna on

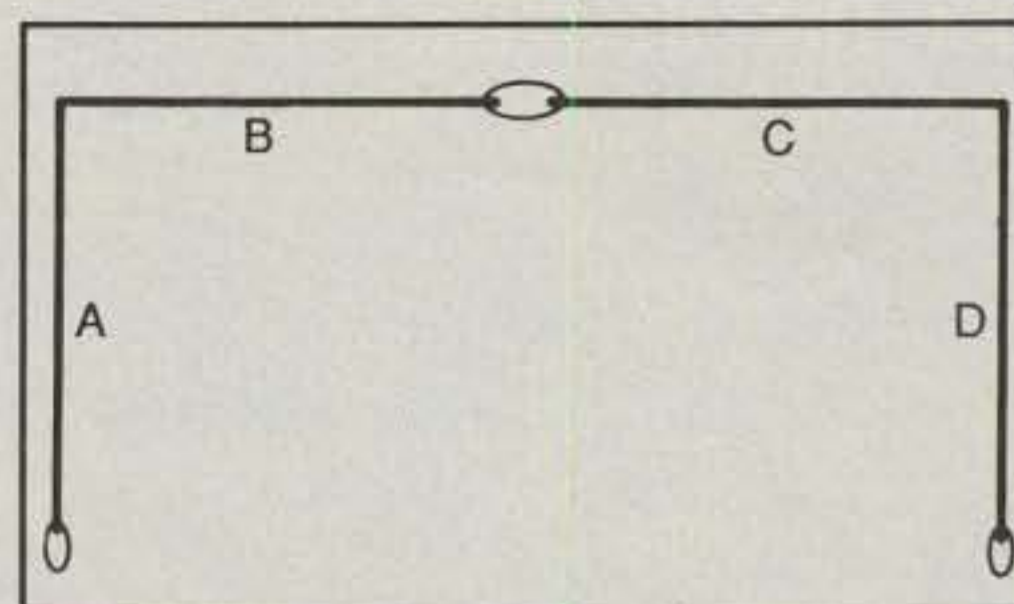


Fig. 2— This is a drooping dipole with the ends dropped. The object here is to make lengths B and C equal but as long as feasible, and then A and D also equal lengths and as long as feasible. Keep the bottom ends of A and D high enough to be out of the reach of anyone, because there will be high RF voltages present.

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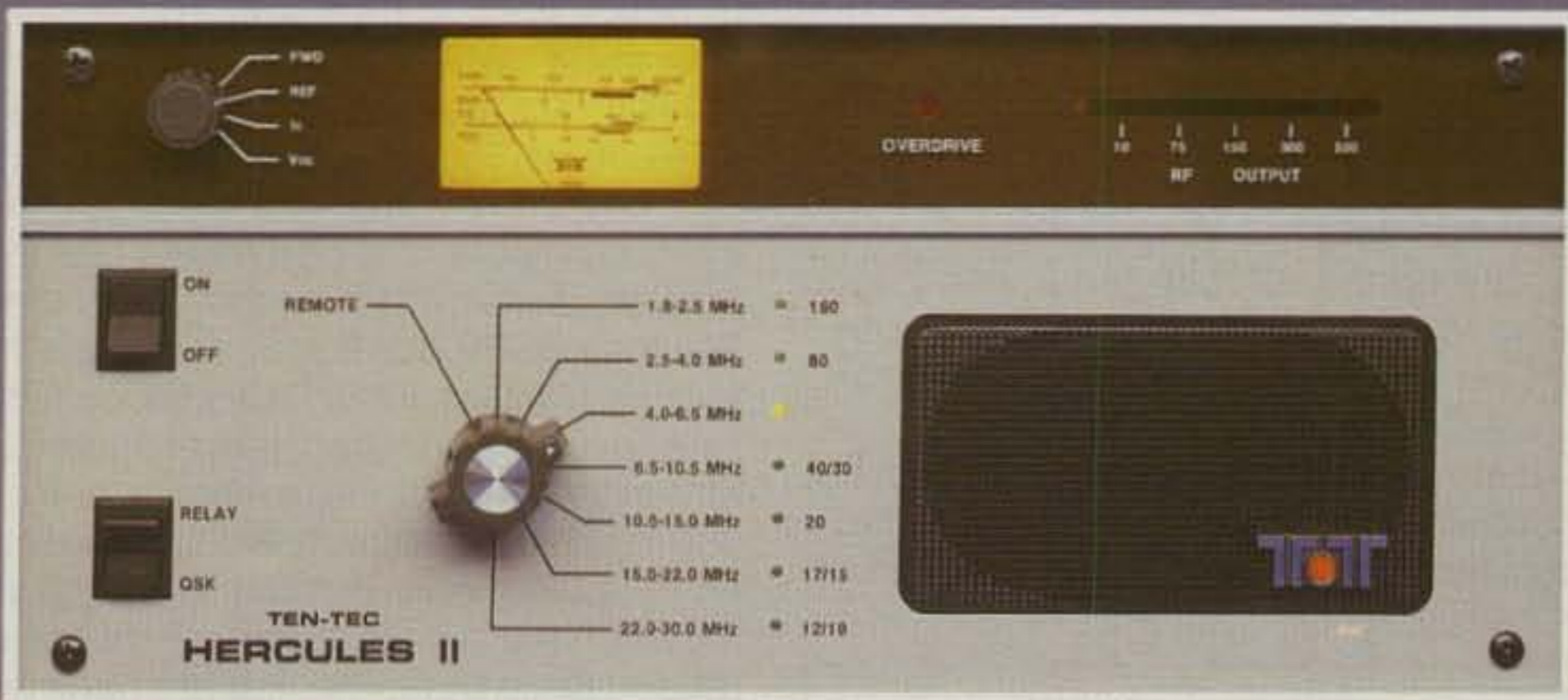
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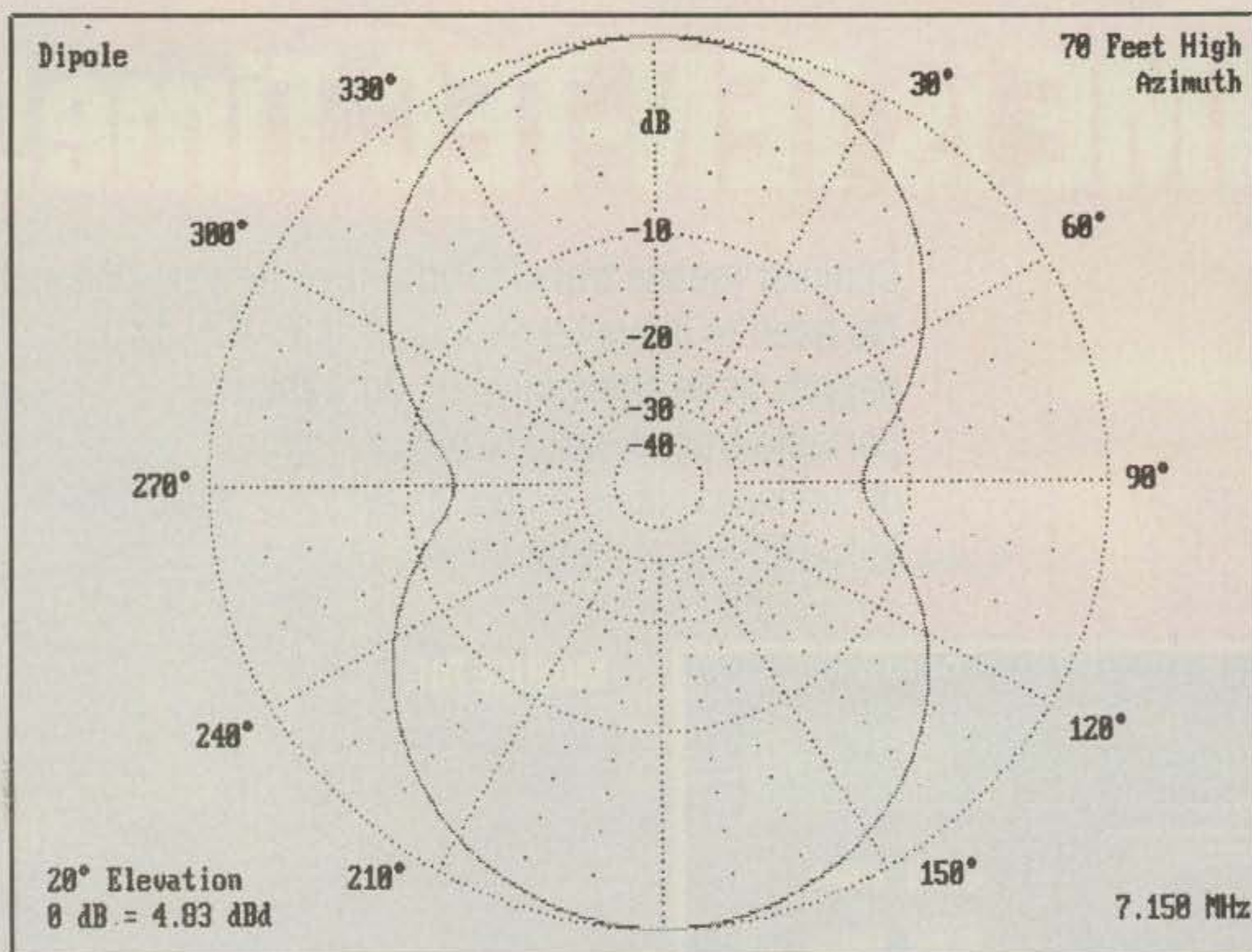


Fig. 3— This plot, from computer program MN, is a full-size (half wavelength) dipole. Careful examination of this, compared to fig. 4, will show some minor differences as described in the text.

other bands, and when we do, the antenna is no longer as resonant, but for some strange reason it still works, and I might add very well.

I remember clearly the first time I put up a "McCoy" dipole. My plan was to build an 80 meter half wave dipole about 130 feet long to be used as a multiband antenna. I had recently moved to a new location and found that on one corner of my property there was a telegraph (power) pole. The other pole was 92 feet away at the farthest.

I pondered long and hard as to what I should do, when I finally realized that having a dipole somewhat shorter than the 80 meter, 130 foot long version was just not that important.

I put up the 92 feet, fed it with 2 inch open-wire feeders (homemade, but I wouldn't do that now), and brought the end into a Transmatch.

I found I worked everything I heard, but more important it made me realize that a lot of the "book" lengths are just not worth

worrying about if you don't have space—or more important, have more space than required. In fact, I think the worst crime that handbooks inflict on newcomers is to specify low-band antenna lengths—160, 80, or 40, with inches or even fractions of inches given. For example, telling a beginner that his antenna should be 130 feet, 6 inches long can confuse the heck out of him simply because he has to put insulators on the ends of the antenna. So how does he "count" that length that goes around the insulator?! The bottom line is that this just isn't important—on beams, etc., yes, but not on a wire dipole for the low bands.

So after many years, and many dipoles later, one night I was in Los Angeles lecturing on antennas. An amateur raised his hand and asked, "How long should a multiband antenna be, one for 80 through 10?" Half joking I said, "Long enough to fit between your two supports." The next guy asked, "What do you call such an antenna?" Naturally, I couldn't resist. I said, "A McCoy Dipole"—modestly, of course.

So really, a McCoy Dipole can be best defined as any length dipole that can fit between two supports, fed in the center with open wire line, the line being long enough to reach your station and Transmatch. Now there are a few exceptions, and this is important and not said humorously! If, for example, your antenna comes out to be 102 feet long overall, you no longer have a McCoy Dipole. You now have a G5RV Dipole, because 102 feet is the length specified for a G5RV. But if your antenna is 104 feet, or 100 feet, it is a Real McCoy. What I am saying here is that there are some antennas that have definite lengths, and that defines them—such as a double extended Zepp. But keep in mind that once you move off the design frequency of the extended Zepp or G5RV, you are back with a McCoy Dipole. Another simple method of describing the McCoy antenna is simply that it is a dipole of an oddball length, fed with open wire line.

There are several questions that the reader may have, and I will attempt to answer them. First no doubt would be "How short can this multiband dipole be and still work well?"

Let's try to set some simple ground rules and use some examples to do so. Most amateurs consider a multiband dipole as one which covers 80 through 10 meters. It is a fact of life that many amateurs also think in terms of trap dipoles, or off-center fed types. While you may read or be told that such antennas will cover all bands and all frequencies without using a Transmatch, that is another load of hogwash, regardless of all the pretty SWR curves that are shown. All you need to do is take one of the antenna computer programs such as ELNEC and calculate the impedances of such antennas on *all the bands and all the frequencies*. Believe me, it is a revelation.

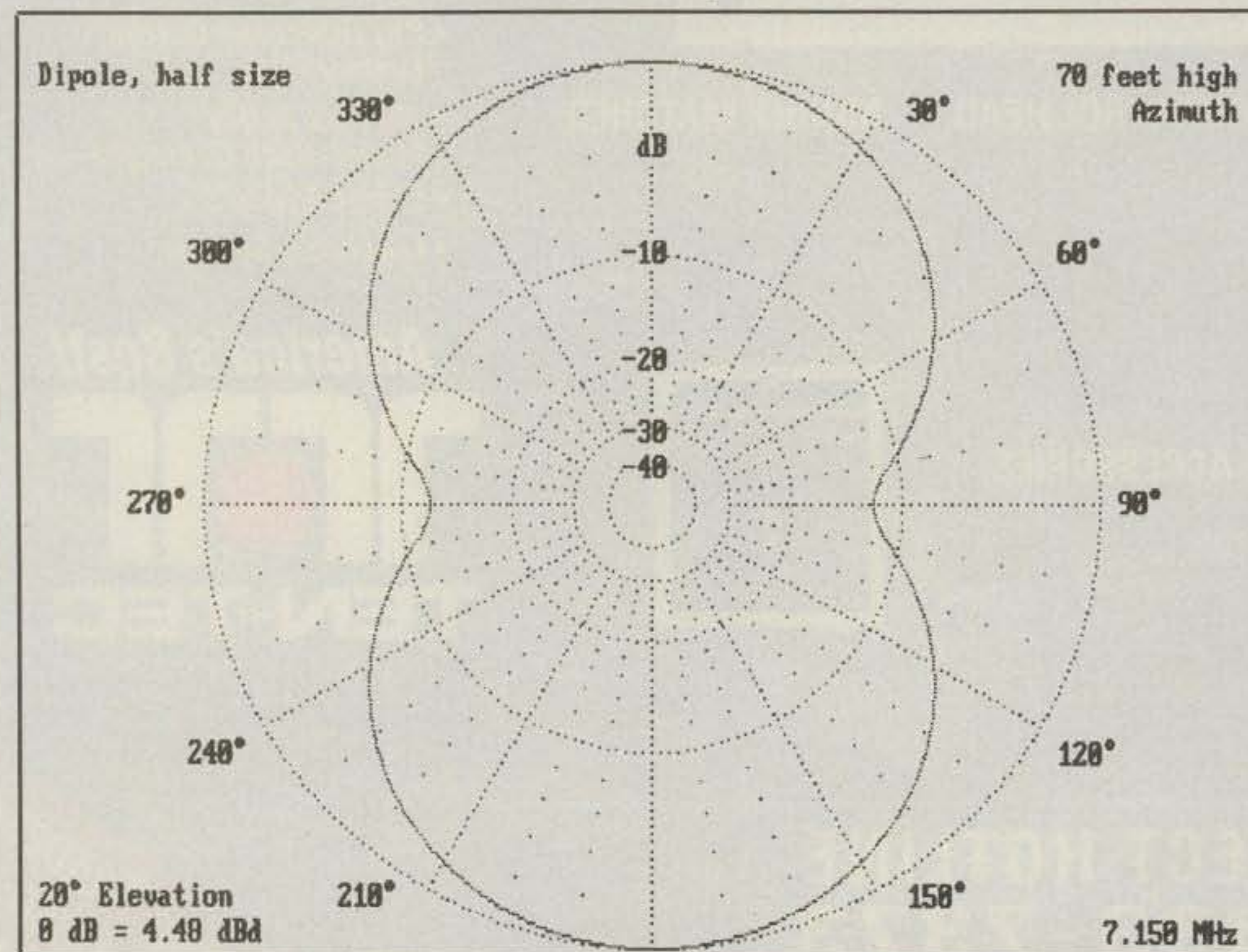



Fig. 4— This is the half-size dipole.















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I also recall a recent write-up of an off-center fed dipole that used dual coax as "balanced" feeders plus ferrite beads to prevent the feed line from radiating. This antenna would be very expensive if you wanted run high power, simply because it would take a special, hard-to-find, very expensive coax. The premise of the antenna is really very stupid. Why stupid? Simply because a center fed dipole with cheap open wire feeders will outperform the off-center fed antenna, with no serious worry about feeder radiation (not that there ever was), and the dipole would be roughly 80 to 90 percent cheaper. In addition, the dipole would be much simpler to build.

Forgive me for getting off-track. So where does that leave us? Rule No. 1 is that if one wants to work all bands/frequencies then tuned feeders using a Transmatch must or should be used. The feeders that I like are what are called "open wire," but actually is a type of ladder line and such is available from many dealers. How long should the feeders be? Simple. Long enough to reach the station. You'll hear amateurs tell you that feeders should be a half wavelength of multiples of a half wavelength, but again that is hogwash.

Here is the big question: "How short can my McCoy dipole be and still be productive?" There is a rule that works pretty well in a general sense for most antennas. The larger (longer or bigger) the antenna, the more gain it will have. Some amateurs use

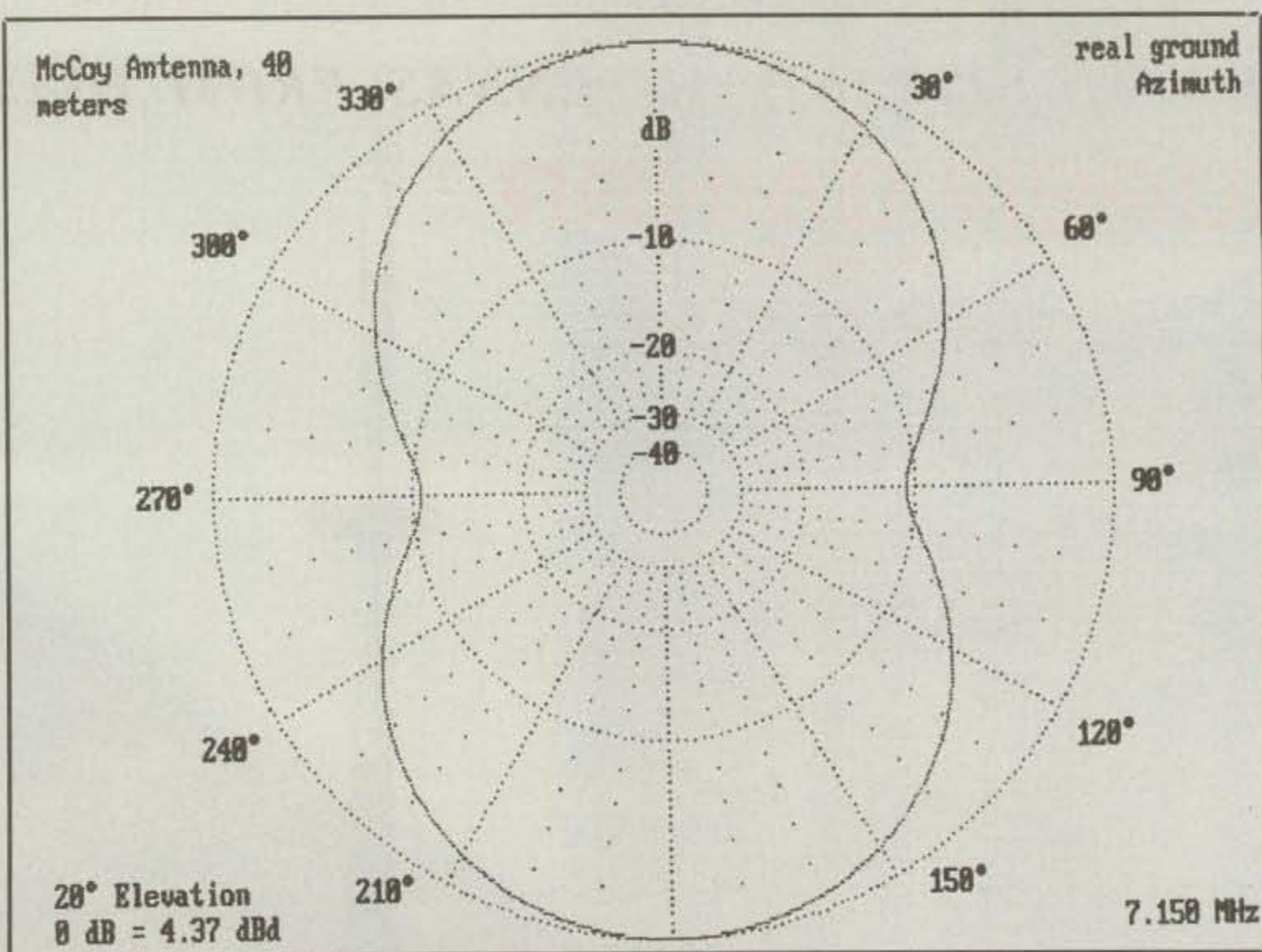
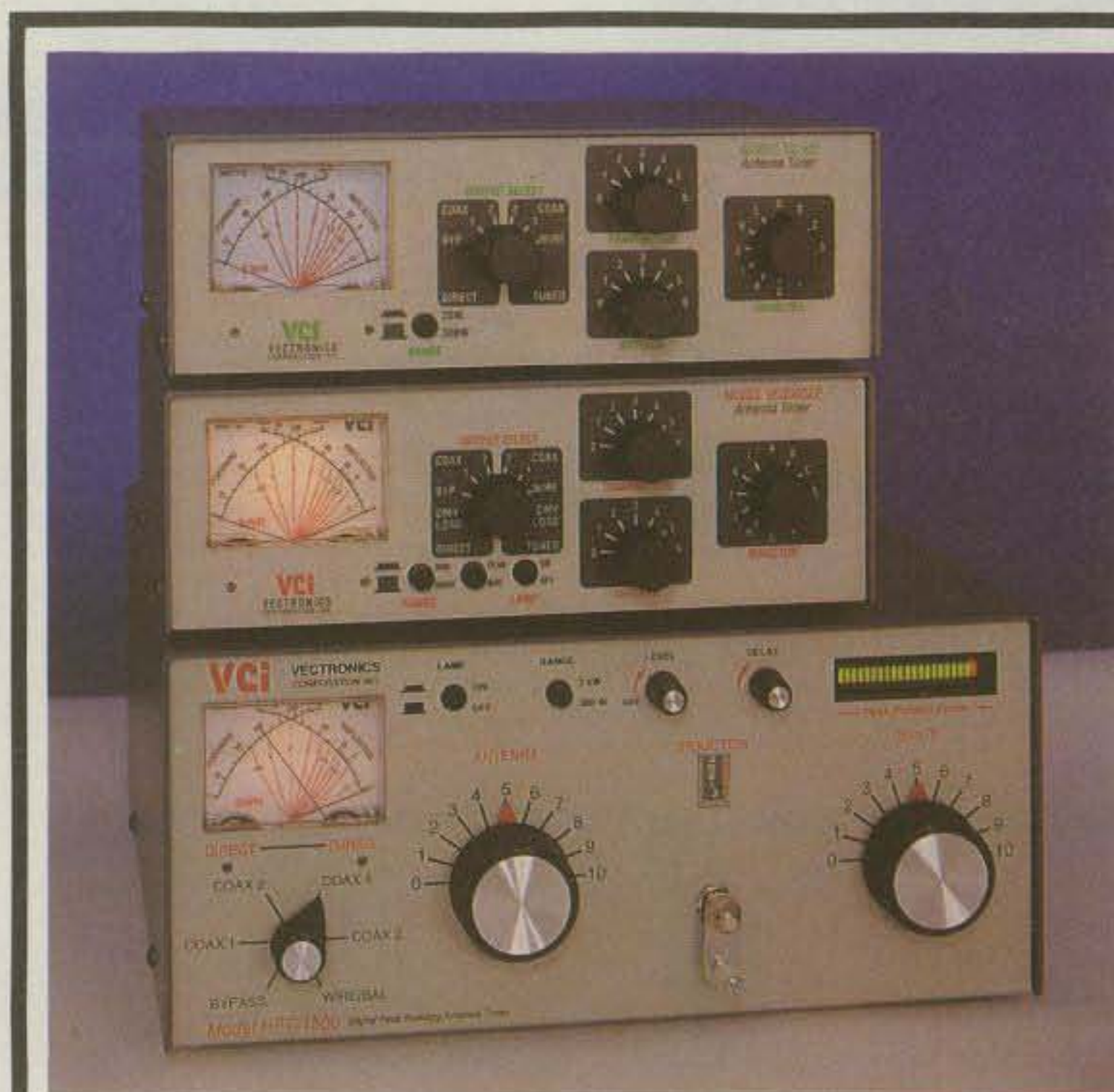


Fig. 5- This is the pattern of the dropped ends dipole shown in fig. 2. You will not see much difference between this and the half-wavelength dipole pattern.

the term "capture area" when referring to the size of an antenna. However, there is no technical basis for this term. An antenna has an "effective area" or sometimes correctly called "effective aperture," and

the larger the effective aperture, the greater the gain of the antenna. However, I suppose all this doesn't mean anything when it comes to actual performance.

All I can write from is actual experience.



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I have found from such experience that one should shoot for something close to one-quarter wavelength (and even less) for the lowest chosen frequency. Example: I put up a half wavelength long 80 meter dipole, 128 feet overall. I made numerous tests and then changed the antenna to half-length, one-quarter wavelength long, or 64 feet. Honestly, the reports on 80 didn't change that much. Because the patterns changed, I was stronger and weaker in different directions. I then went to 32 feet overall (keep in mind that these were all center-fed, open wire line jobs), and again, while I noted changes in performance, they were not what I would call serious—in fact, they were very acceptable.

I then decided to run the antenna lengths through some antenna computer programs I have (MN [MINNEC] and ELNEC) using various dipole lengths for comparison. I have shown the readout in the various figure diagrams. Assuming we can trust completely (which I don't) the computer programs, there wasn't a heckuva lot of difference in the quarter-wavelength dipole compared to the half-wavelength job. I ran the plots shown for a 67 foot dipole at 70 feet above average ground and the same for the dipole 33.5 feet long. You can note there is a very slight difference in the patterns. The regular size is tucked in more at the plane of the dipole, and there is slightly less than 1/2 dB difference from full size to half size. I also ran the same short antenna on 80, but in this case the gain dropped about 5 dB (from front versus side) and the vertical radiation pattern changed dramatically with much high angle radiation for the short antenna. Nevertheless, and this is the bottom line, even the short antenna would work on 80 meters.

Still another computer run consisted of taking a half-wavelength dipole and dropping the ends 1/8 wavelength. In other words, I had 1/4 wave across the top horizontal and 1/8 wavelength drop. Many, many amateurs encounter this kind of situation, and dropping the ends permit more antenna length. What do we call it? A Drooping McCoy—Hi! In any event, the computer showed this to be within a fraction of a decibel to the fully horizontal dipole—in fact, so little difference it isn't worth running a plot in this article.

However, my conclusions are that you should make your multiband McCoy Dipole as long as you possibly can and try to stay away from very, very short lengths. Also, the antenna can be in an inverted-V configuration or a sloper. With some of the short lengths I tried I did find that the Transmatch was more critical as to tuning, but in all cases I could get a match. To be fair, I even tested the "current" type balanced feed, but surprisingly, the beads got rather hot on the coax when running near a kilowatt (which was with some short antennas and loads). On the other hand, my conventional 4 to 1 transformer/balun using three T-200

cores and Teflon wiring stayed nice and cool.

There has been a swarm of talk and descriptions of what are called "current" type baluns. I cannot help but state that I have found over the years, and continue to find, the stacked cores wound with the Teflon wire that I used in my first Ultimate Transmatch are still a very effective method for use with open wire or balanced lines. On the other hand, I believe the ferrite beads over coax for coax feed at the antenna can be an effective RF choke in many cases. But that is a different subject.

Forgive me for getting away from the main subject, but as I said, a Transmatch is required with the McCoy antenna. In the case of open wire feeders, don't worry if someone tells you that you will have some feeder radiation. Such radiation is not lost power. Additionally, some people will tell you that such radiation, being primarily vertically polarized, will cause TVI. It can, but no more so than horizontally polarized radiation. Some of these "experts" seem to forget that many, many amateurs use vertical antennas that are 100 percent vertical polarization. Each TVI case has its own characteristics as to cause, and vertical radiation is no more guilty than any other kind.

As I said earlier, if your overall antenna

length comes out to 102 feet, then call it a G5RV. I did run this length through the ELNEC program, and found that as G5RV did, the antenna is an excellent match to 50 or 70 ohms on 20 meters. However, in all likelihood, you are going to have to use a Transmatch for multiband operation. The impedances become too far out for a direct all-band match with coax or by virtue of using several other techniques. A tuner is necessary. But I know that Varney, G5RV, will forgive me here because he has said the same thing.

It is important for the reader to understand that the impedances of short dipoles are much lower than those of full-size jobs. This, in simple language, increases the ratio of power losses from ohmic to radiation resistance losses. But these ratios are not really significant unless the dipoles are extremely short. However, using the open wire feeders as I have specified, while not changing these ratios, do for all practical purposes provide an essentially lossless feed system and efficient operation.

Whether you call the antenna a McCoy Dipole or not, this is still the lowest cost and finest multiband skywire one can use. You only have the cost of the wire and feed line. You can even make your own insulators. It is mighty tough to beat as a performer, and you'll be using a Real McCoy. Hi!



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CIRCLE 69 ON READER SERVICE CARD

# CQ REVIEWS:

## The Yaesu FT-990 HF Transceiver

BY JOHN J. SCHULTZ\*, W4FA

Every now and then I really hate to break away from operating a transceiver to write about it. It's not that I don't enjoy writing. I do. I have done so for 40 odd years, ever since one of my high school English teachers was foolish enough to declare that I had some minor talent for composition. Be that as it may, the FT-990 is a hard rig from which to break away, and I'll explain my reasons as we go along.

It would be easy to conclude from the advertisements for the FT-990 that the FT-990 is just an FT-1000 with a few less features and a few less front-panel controls. In reality, the electrical design of the FT-990 parallels that of the FT-1000 in many important respects, but there are also notable differences. The most striking difference is that the FT-990 does not have a built-in second receiver. Physically, the FT-990 is also quite different from the FT-1000 in that it has about half the volume and weight. However, the FT-990 is not a miniature transceiver. Its front panel has "full-size" controls that are extremely easy to manipulate.

Price-wise, of course, the FT-990 is considerably "lighter" than the FT-1000 or FT-1000D—about 30% and 55%, respectively. However, I would very much hesitate to label the FT-990 as just a junior or inexpensive version of the FT-1000. If the FT-1000 had never existed, the FT-990 as it exists could easily stand on its own as an advanced state-of-the-art transceiver with a host of interesting features.

### Specifications

Table I presents the main specifications for the FT-990. You might not immediately note that the FT-990 with 28 lbs of weight and measuring 14½" x 5" x 13" is quite different from the FT-1000 (51 lbs and 16½" x 6" x 14¾"). Unlike the FT-1000, the FT-990 does have a carrying handle. However, it is not of the size normally considered suitable for mobile operation.

\*302 Glasgow Lane, Greenville, NC 27858



The Yaesu FT-990 HF transceiver.

Like the FT-1000, the FT-990 is a completely integrated transceiver with a built-in 110/220V AC power supply, automatic antenna tuner, and CW keyer. A 500 Hz CW filter is standard, and optional 250 Hz W and 2.0 kHz SSB filters are available (the latter to complement the standard 2.4 kHz SSB filter). Other selectivity features include IF Shift tuning, an IF notch filter, and a rather unique AF SCF (switched capacitance filter) with independent high/low cut controls.

On the transmit side the FT-990 provides a nominal 100 watts output but with the same excellent IMD figures as the 200 watt amplifier in the FT-1000. RF speech processing is standard with audio-response tailoring. Full break-in is available on CW, and special attention has been given to packet operations. The built-in antenna tuner runs on its own microprocessor and has 39 frequency memories.

For overall operation the FT-990 has 90 memories which are *tunable* as VFOs and which can store frequency, mode, filter selection, and RX-TX clarifier settings. The memory channels can be scanned manually or automatically (for instance, until an encountered signal is strong enough to open the squelch). There is no continuous scanning, however, between preset low- and high-frequency scan limits.

Two 10-bit direct digital synthesizers driven from a single master crystal oscillator are the basis for the extraordinarily

quiet receive performance in the FT-990, as in the FT-1000. A TCXO option is available.

### Circuitry Overview

The FT-990 like the FT-1000 utilizes, of course, a multiple-frequency conversion scheme in both the receive and transmit signal chains. It's interesting to note that the first three IFs in the FT-1000 are 73.62 MHz, 8.215 MHz, and 455 kHz, whereas the three IFs in the FT-990 (as shown in Table I) are 47.21 MHz, 10.94 MHz, and 455 kHz. Therefore, the user has to be careful that any optional filters used are suitable for the transceiver involved. Most users would agree that the receive dynamic range of the FT-1000, specified conservatively as 108 dB (50 kHz signal spacing, 500 Hz bandwidth, RF preamplifier off), is one of the best of any transceiver on the market today. The performance of the FT-990 differs a few dB here or there, but not to the extent that any operator will notice any difference.

The power amplifier unit in the FT-1000 developed 200 watts output with very respectable third-order IMD products of -31 dB by using two MRF422 transistors with about a 30 volt collector voltage. The FT-990 power amplifier uses two 2SC2879 transistors operating with a collector voltage of 13.8 VDC from the internally regulat-

## General

Receiving frequency range: 100 kHz — 30 MHz

Transmitting frequency ranges:

- 160-m band, 1.8 to 2.0 MHz
- 80-m band, 3.5 to 4.0 MHz
- 40-m band, 7.0 to 7.5 MHz
- 30-m band, 10.0 to 10.5 MHz
- 20-m band, 14.0 to 14.5 MHz
- 17-m band, 18.0 to 18.5 MHz
- 15-m band, 21.0 to 21.5 MHz
- 12-m band, 24.5 to 25.0 MHz
- 10-m band, 28.0 to 29.7 MHz

Frequency stability: < 10 ppm from -10 to +50°C

- (except FM, < 200 Hz),
- < 0.5 ppm from -10 to +50°C w/TCXO-2 option (FM < 150 Hz)

Emission modes: LSB/USB (J3E), CW (A1A), FSK (J1D, J2D), AM (A3E), FM (F3E)

Basic frequency steps:

- 10 Hz for J3E, A1A and J1D;
- 100 Hz for A3E, F3E and J2D

Antenna impedance: 16.5 to 150Ω, 50Ω nominal

Supply voltage:

- 100 ~ 117 or 200 ~ 234 VAC 10%, 50/60 Hz

Power consumption (approx.):

- 60 VA receive, 470 VA for 100 watts transmit

Dimensions (WHD): 368 × 129 × 370 mm

Weight (approx.): 13 kg. (28.6 lbs)

## Transmitter

Power output:

- adjustable up to 100 watts (25 watts AM carrier)

Duty cycle: 100% @ 100 watts,

- 50% @ 100 watts (FM & RTTY, 3-minute tx)

Modulation types

- SSB: Balanced, filtered carrier
- AM: Low-level (early stage)
- FM: Variable reactance
- FSK: Audio frequency shift keying

Maximum FM deviation: ± 2.5 kHz

FSK shift frequencies: 170, 425 and 850 Hz

Packet shift frequencies: 200, 1000 Hz

Harmonic radiation: at least 50 dB below peak output

SSB carrier suppression:

- at least 40 dB below peak output

Undesired sideband suppression:

- at least 50 dB below peak output

Audio response (SSB):

- not more than -6 dB from 400 to 2600 Hz

3rd-order IMD: -36 dB or better @ 100 watts PEP on 14.2 MHz

Microphone impedance: 500 to 600 Ω

## Receiver

Circuit type:

- triple-conversion superheterodyne

Intermediate frequencies:

- 47.21 and 10.94 MHz, and 455 kHz

Sensitivity:

- (for 10 dB S/N, 0 dBμ = 1 μV)

Frequency ⇒ Mode (BW) ↓	100 - 250 kHz	250 - 500 kHz	0.5 - 1.8 MHz	1.8 - 30 MHz
SSB, CW (2.4 kHz)	< 2 μV	< 1 μV	< 2 μV	< 0.25 μV
AM (6 kHz)	< 10 μV	< 2 μV	< 4 μV	< 1 μV
29-MHz FM (for 12 dB SINAD)	—	—	—	< 0.5 μV

Selectivity (-6/-60 dB):

Button	Modes	Minimum -6 dB BW	Maximum -60 dB BW
2.4 kHz	all except FM	2.2 kHz	4.0 kHz
2.0 kHz	all exc. AM, FM	1.8 kHz	3.6 kHz
500 Hz	CW, RTTY, Packet	500 Hz	1.8 kHz
250 Hz	CW, RTTY	240 Hz	700 Hz
—	AM (wide)	8 kHz	15 kHz

Squelch sensitivity:

- 1.8 — 30 MHz (CW, SSB, AM): < 2.0 μV
- 28 — 30 MHz (FM): < 0.32 μV

IF rejection (1.8 — 30 MHz):

- 80 dB or better

Image rejection (1.8 — 30 MHz):

- 80 dB or better

IF shift range: ± 1.2 kHz

Maximum audio power output:

- 2 watts into 4Ω with <10% THD

Audio output impedance: 4 to 8Ω

Control ↓	Mode ⇒	LSB, USB, CW, RTTY, PKT-LSB	AM, FM, PKT-FM
Tuning knob, Mic Up/Dwn Keys	Normal	10 Hz	100 Hz
	w/FAST button	100 Hz	1 kHz
DOWN/UP Pushbuttons	Normal	100 kHz	100 kHz
	w/FAST button	1 MHz	1 MHz
One rev of Tuning knob	Normal	10 kHz	100 kHz
	w/FAST button	100 kHz	1 MHz

Fig. 1—Tuning steps/rates.

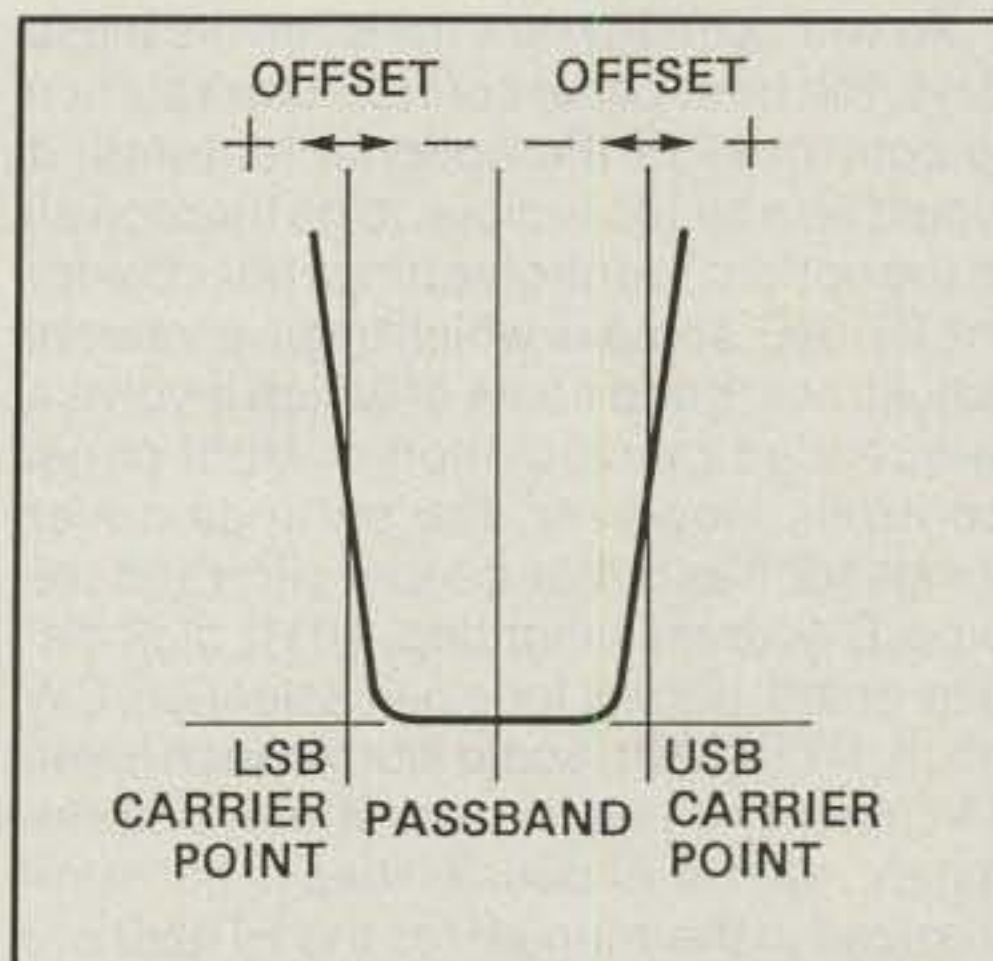


Fig. 2—Frequency-Shifted Processor (FSP) in the FT-990 varies the carrier point independently for both LSB and USB.

knob. The pushbutton field also allows setting up split operation (either using a VFO or memory channel), checking the contents of the memory channels without disturbing them, shifting the displayed frequency up/down in 100 kHz or 1 MHz steps, etc. An "RPT" key shifts the transmit frequency 100 kHz above or below the receive frequency and also activates an 8.5 Hz subaudible tone on transmit for 10 meter repeater operation. The keypad/pushbutton fields on the FT-990 are the clearest I've encountered on any sophisticated transceiver.

The selectivity controls—notch tuning, IF shift, and digital filter low/high cut—all operate very smoothly. The digital AF filter deserves special note in that it is very sharp and very effective. SCF filters are not new, but somehow seem not to have become common in HF transceivers. It might be argued that they are not quite as effective as some sort of variable response IF filtering, but considering the cost factors involved, SCF filters are a "winner." The low/high cut controls for the SCF filter in the FT-990 can "pull-in" the audio response, on any mode, from the full bandwidth on a given mode down to less than 100 Hz with extremely steep skirt response. Normally you would use only the low or high cut controls to escape QRM, but both controls can be used to form the AF equivalent of various IF filter bandwidths.

Table 1—General specifications for the FT-990.

ed power supply to produce 100 watts output with -36 dB third-order IMD products. I'm not going to argue a dB here or there, but the power output from the FT-990 is as rated and very clean!

## Operating Controls

The FT-990 has an extraordinarily well laid out front panel, and as was just mentioned, all of the controls are full-size. Basically, the frequency manipulation and selectivity controls are located to the right of the main tuning knob, while the perhaps less frequently used general controls are located on the left side. The tuning knob itself has a very smooth feel. I sort of wondered why and took off the knob. It

weighs about 182 grams! That is almost twice the weight of the old SP-600 knobs, which to my mind sort of set a benchmark for smooth tuning. The tuning steps/rates are shown in fig. 1. It's interesting to note that the tuning rates can be doubled *independently* for SSB, CW, AM, FM, or RTTY by means of internal solder-type jumper connections.

The keypad to the right of the main tuning knob allows for simple, direct frequency entry, bandswitching, and filter selection. The FT-990 utilizes the dual VFO A/B system, and frequency data can easily be transferred back and forth between the VFOs or back and forth to any of the memories, all of which are tunable, by means of a pushbutton field below the main tuning

A small keypad to the left of the main tuning knob provides for mode selection. Multiple pressing of the RTTY and PKT buttons will switch between LSB and USB for RTTY and LSB and FM for packet.

The rest of the analog controls to the left of the main tuning knob are clearly labeled as to their function. The metering is extremely complete with six functions, including SWR. I have become a fan of bargraph meter displays, but classic, analog displays when multicolored, such as in the FT-990, are certainly clear enough.

As with so many new transceivers these days, the front-panel controls don't suffice to control all of the optional features. It would be a bit too tedious to go through all of the optional control settings possible for the FT-990, some of which involve internal adjustments and some of which involve a sequenced manipulation of front-panel controls. However, the settings cover things such as button beeper pitch and volume, CW keyer weighting, 10 Hz digit display on/off, packet tone pair selection, CW pitch, RTTY shift, scale illumination level, TNC display offset for packet, etc. Unfortunately, the list of possibilities is not summarized in the manual for the FT-990 or I would present it here, but I can't quite imagine any option which has been forgotten.

The FT-990 does have a true RF-type speech processor. One of the most interesting adjunct features in the transceiver is what Yaesu calls FSP, or Frequency Shifted Processing. I guess it's a new name for what many old-timers will recognize as shifting the carrier point on an SSB filter skirt to emphasize either the lower or higher transmit audio frequencies. It's an old, well-known trick and very effective.

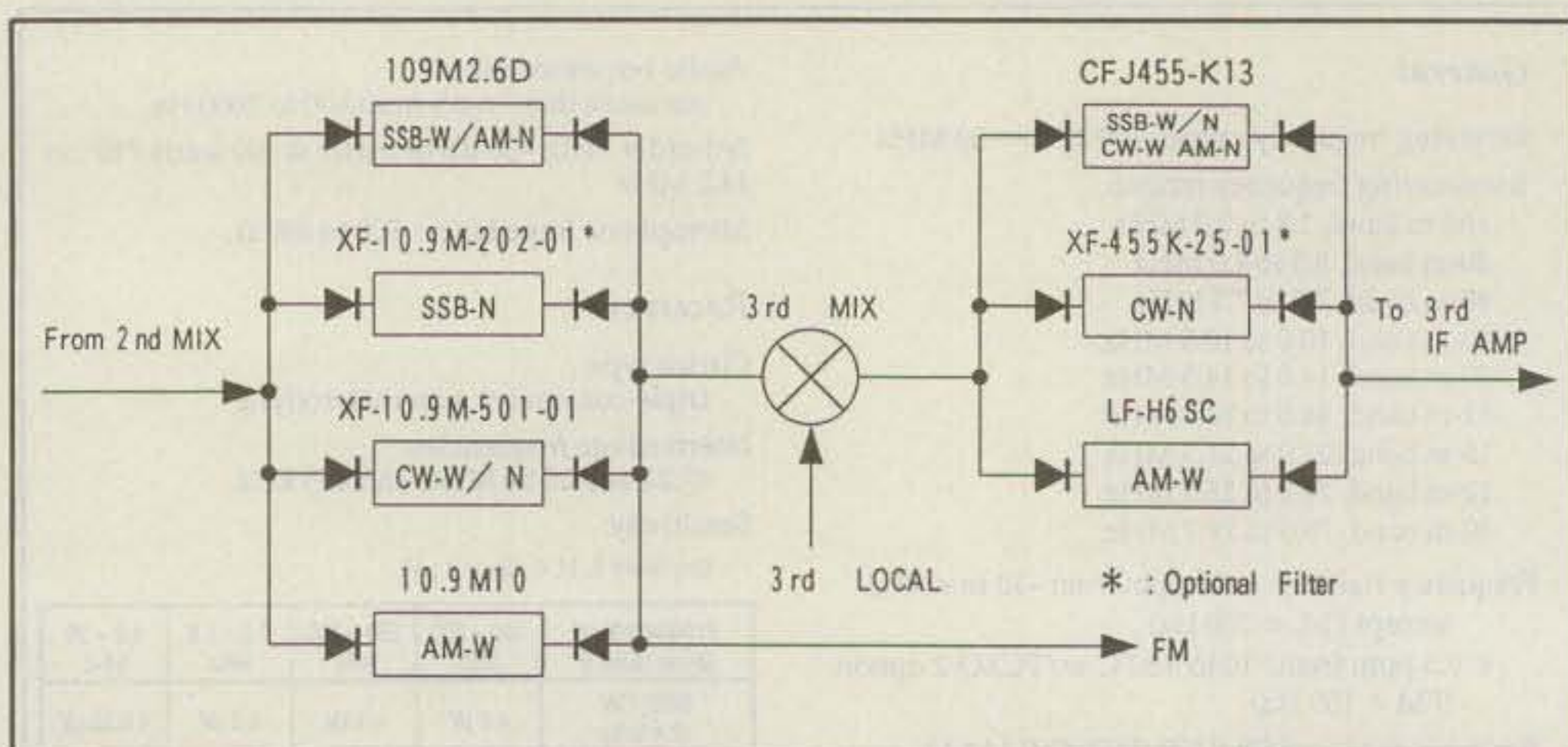


Fig. 3- Optional IF filter possibilities.

What Yaesu has done very neatly is make the "trick" into a truly calibrated adjustment. Fig. 2 shows part of the idea. By shifting the carrier point from its normal setting on the skirt of an SSB filter down 300 Hz or up to 500 Hz higher, you can rather dramatically boost or cut the higher or lower transmit audio frequencies. The digital display on the FT-990 will display the exact shift in 50 Hz steps, and you can even test out the processing on the air while watching the FSP frequency shift display. The adjustment can even be made independently for LSB and USB in case you desire more of the quasi hi-fi sound on the lower bands and a crisper speech response on the higher frequency bands!

Like to check all the display possibilities? You can perform what Yaesu calls a "Las Vegas" diagnostic test by means of

certain keypad entries. It's a rather interesting light show, as every possible front-panel indicator illuminates. However, it's also a good learning tool. If some indicator comes on which you don't understand, it's time to go back to the instruction manual for the transceiver, as obviously you have not understood or appreciated some feature.

CW buffs will greatly appreciate the Spot button in the FT-990, the same as in the FT-1000. It provides a tone that is exactly the same as the IF frequency offset from the true carrier frequency. Therefore, you can zero beat on receive easily and also change IF filter bandwidths without losing track of a station. Both the CW pitch offset (400 to 700 Hz) and carrier frequency display (with or without regard for the pitch offset) are selectable.

### Optional IF Filters

Fig. 3 illustrates both the standard and optional IF filter possibilities for the FT-990. Actually, there are only two optional filters—a 2.0 kHz SSB filter for the 10.9 MHz IF and a 250 Hz CW filter for the 455 kHz IF.

I installed both filters and found them to be extremely good. However, both filters have to be soldered in place after you remove a PC board from the transceiver. I found no difficulty at all in installing the filters, but if you are not adept at soldering, I would highly suggest that it be left to a dealer.

### External Connections

The rear panel of the FT-990 contains a variety of almost every possible type connector for external interfaces. There is even a rather unique 1/2 inch unused, covered punch hole which according to Yaesu "is provided for user installation of a accessory switch or jack"! I did use it for the installation of a PTT foot switch connection, but I suspect other users will explore all sorts of possibilities.

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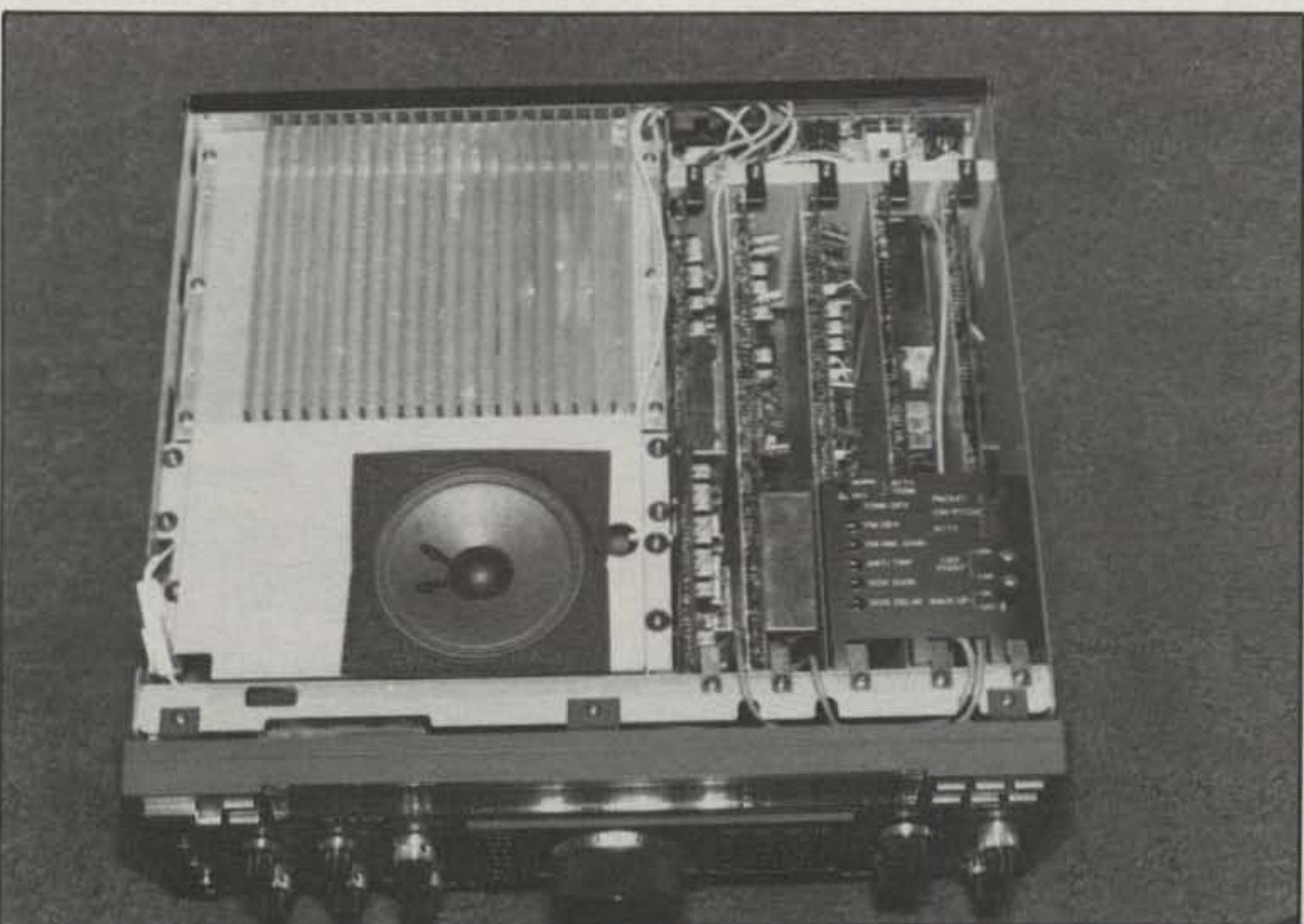


The FT-990 with the SP-6 optional speaker unit. The "Gentleman from Williamsburg" on the right is exactly 6 inches high, for size comparison.

There are dedicated DIN-type connectors for packet, RTTY, and CAT which I think many users are going to greatly appreciate, at least in the sense of keeping under control the cable mess behind a transceiver. The dedicated connectors provide for external computer control of the FT-990 and various input/output signal paths. I regret that it just would not be practical to present detailed data on these connectors as part of this article, but the information is available from Yaesu.

### Operating the FT-990

The FT-990 is what I would describe as an easy-to-learn, fun transceiver to operate. To be sure, it's a very sophisticated piece of equipment. However, its clear and large front-panel layout sort of invites you to take it out for a "test drive." I sort of got spoiled when I first tried out the FT-990. A 4N7 station responded to me with a 59 report in the midst of a moderate pile-up. The frequen-



Removing the top cover, the large heatsink for the final amplifier can be seen. Plug-in circuit boards (secured by screws) for most RF signal functions are to the right.

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-------	---------------------	----------------------	--------------------	--------------	---------------

50 MHz					
0503G	1-5	10-50	6	15/0.6	LPA
0508G	1	170	28	15/0.6	Standard
0508R	1	170	28	+	Repeater
0510G	10	170	25	15/0.6	Standard
0510R	10	170	25	+	Repeater
0550G	5-10	375	60	15/0.6	HPA
0550RH	5-10	375	60	+	Repeater HPA
0552G	25-40	375	55	15/0.6	HPA
0552RH	25-40	375	55	+	Repeater HPA

144 MHz					
1403G	1-5	10-50	6	15/0.6	LPA
1406G	25	100	12	15/0.6	Standard
1409G	2	150	25	15/0.6	Standard
1409R	2	150	24	+	Repeater
1410G	10	160	25	15/0.6	Standard
1410R	10	160	24	+	Repeater
1412G	25-45	160	20	15/0.6	Standard
1412R	25-45	160	19	+	Repeater
1450G	5	350	56	15/0.6	HPA
1450RH	5	350	56	+	Repeater HPA
1452G	25	350	50	15/0.6	HPA
1452RH	25	350	50	+	Repeater HPA
1454G	50-100	350	40	15/0.6	HPA
1454RH	50-100	350	40	+	Repeater HPA

220 MHz					
2203G	1-5	10-40	6	14/0.7	LPA
2210G	10	130	20	14/0.7	Standard
2210R	10	130	19	+	Repeater
2212G	30	130	16	14/0.7	Standard
2212R	30	130	15	+	Repeater
2250G	5	220	40	14/0.7	HPA
2250RH	5	250	40	+	Repeater HPA
2252G	25	220	36	14/0.7	HPA
2252RH	25	250	36	+	Repeater HPA
2254G	75	220	32	14/0.7	HPA
2254RH	75	250	32	+	Repeater HPA

440 MHz					
4403G	1-5	7-25	4	12/1.1	LPA
4410G	10	100	19	12/1.1	Standard
4410R	10	100	18	+	Repeater
4412G	20-30	100	19	12/1.1	Standard
4412R	20-30	100	18	+	Repeater
4448G	5	100	22	12/1.1	HPA
4448R	5	100	22	+	Repeater HPA
4450G	5-10	175	34	12/1.1	HPA
4450RE	5-10	175	34	+	Repeater HPA
4452G	25	175	29	12/1.1	HPA
4452RE	25	175	29	+	Repeater HPA
4454G	75	175	25	12/1.1	HPA
4454RE	75	175	25	+	Repeater HPA



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### RX Preamplifiers

Band	Model	NF (dB)	Gain (dB)	Connector
50 MHz	0520B	.5	25	BNC
50 MHz	0520N	.5	25	N
144 MHz	1420B	.5	24	BNC
144 MHz	1420N	.5	24	N
220 MHz	2220B	.5	22	BNC
220 MHz	2220N	.5	22	N
440 MHz	4420B	.5	18	GNC
440 MHz	4420N	.5	18	N
1.2 GHz	1020B	.9	14	BNC
1.2 GHz	1020N	.9	14	N



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Los Angeles, CA 90025

cy shift feature on the RF speech processor is excellent, and I'm sure it's one reason why my audio penetrated the pile-up. Numerous tests indicated that a plus shift of 200 to 300 Hz produced the best results and was every bit the equivalent of using a microphone with a very tailored speech response.

It was fascinating to hear stations sound as loud as S5 to S7 but not even move the S meter on the FT-990, although I did measure the S9 level on the FT-990's S meter, and it did correspond to approximately the 50  $\mu$ V level. For all practical purposes, I would judge the receive performance of the FT-990 to easily match that of the benchmark FT-1000.

What didn't I like or miss? Well, the only feature I missed was that of SSB sidetone or voice monitoring. I think it's quite useful to have a constant check on modulation quality and also to help the operator maintain a steady modulation level. There is probably an "ersatz" way to achieve such monitoring with the FT-990 by using the Patch In phone jack as an output audio monitoring jack. Of course, it will *not* provide a sample of the processed audio, but it will provide a useful sidetone signal.

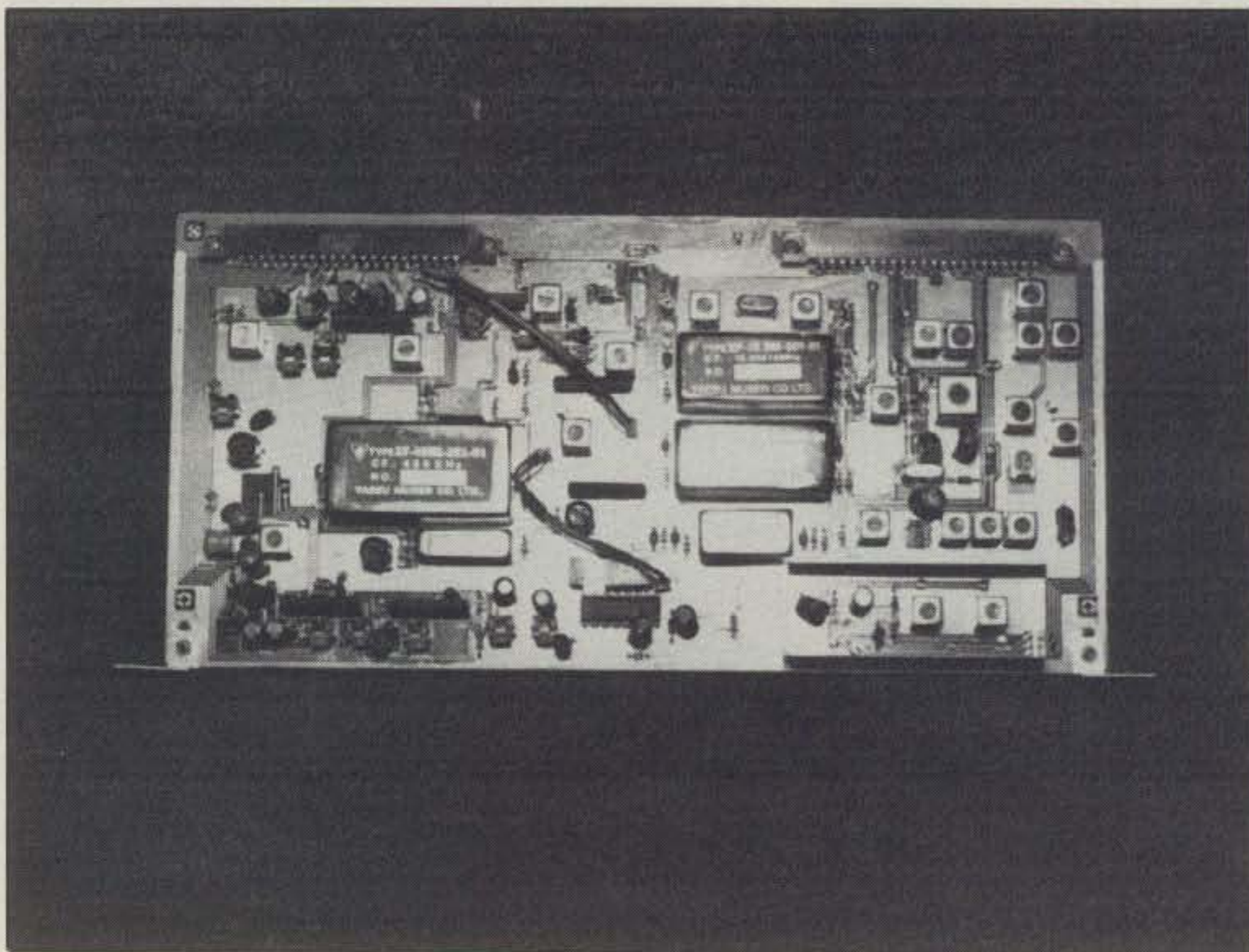
The automatic antenna tuner is very fast and quiet in operation, although initially it may take the tuner up to 30 seconds to "learn" the settings for different frequencies and to store them in one of its 39 memories. Once "trained," the tuner compares a tuned frequency with frequencies in its own memories and resets itself if it has stored information for the frequency involved. Therefore, if you activate the tuner for a few frequencies within each band for a given antenna, the tuner will almost instantly return to the settings it has learned when those frequencies are used again.

The FT-990 is basically a very solid, comfortable transceiver to use. Its orange frequency display (shades of the old FT-107M) is still one of the most comfortable on the eyes for extended operating periods.

SWL fans will enjoy the fact that general-coverage receive extends down to 100 kHz.

## Manual

The operating manual for the FT-990 is excellent. It contains a wealth of information without being overly large. Little boxes here and there highlight various special features. If I had any suggestion to make, it would be to include a separate section that summarizes the optional adjustments. For instance, one very minor complaint I had about the FT-1000 was the Fast tuning button was a momentary type (you had to hold it down to increase the tuning rate while using the main tuning knob). One evening as I was reading the fine print in the FT-990 manual, there it was! The Fast button in the FT-990 can be set up for either



*This is the RF board which must be removed temporarily to solder in either of the two optional IF filters.*

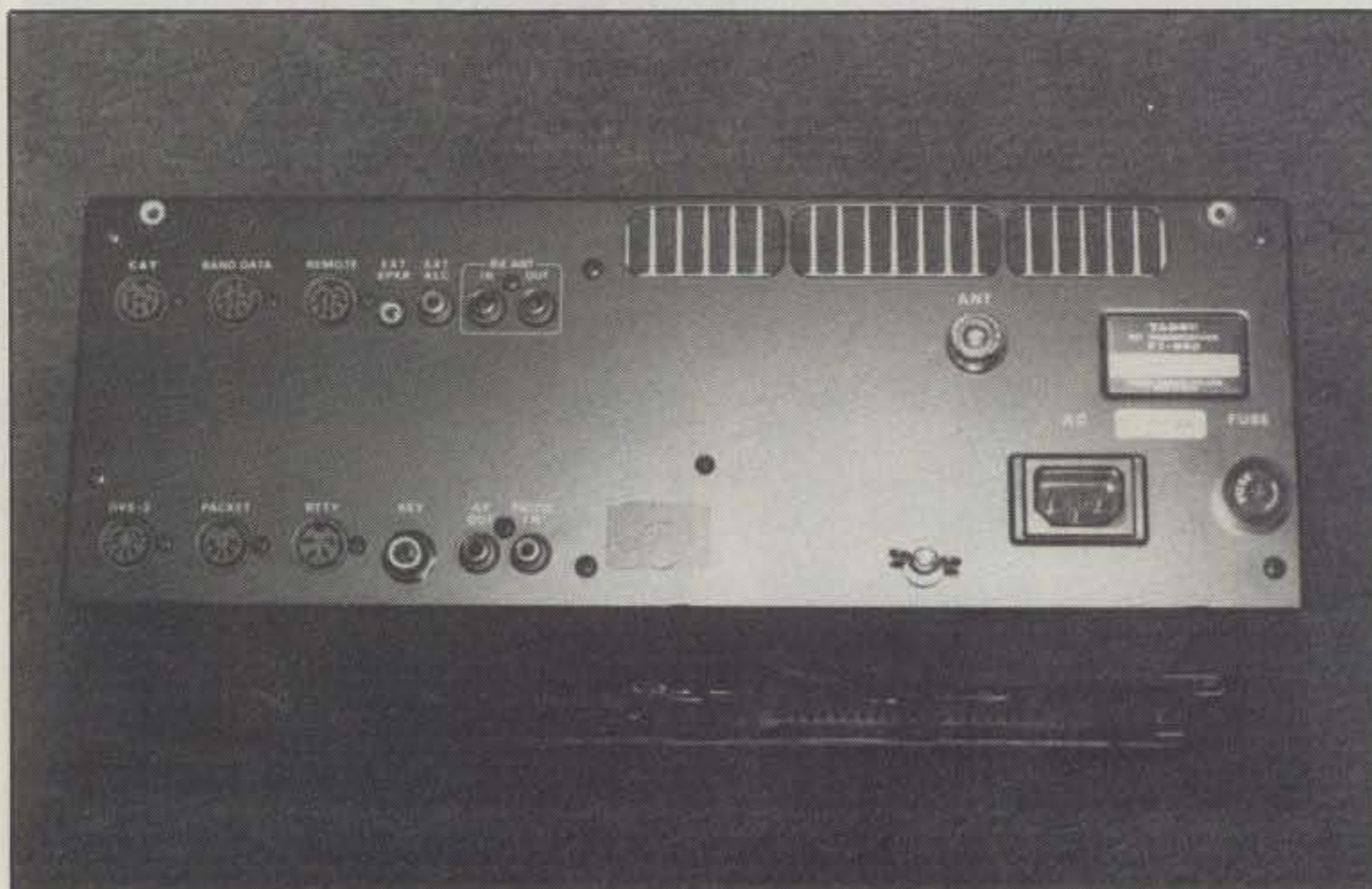
momentary operation or as a push-on/push-off button it increase the tuning rate ten times—a small point, but one likely to be overlooked by many operators.

## Accessory Items

Besides the optional IF filters, Yaesu has various other accessories available for the FT-990 ranging from desk microphones to external speakers. Two of the more interesting items are the SP-6 external speaker

and the DVS-2 digital recorder/playback unit.

The SP-6 speaker contains a 4 $\frac{3}{4}$  inch, 3 watt loudspeaker with a rather massive magnet. It also contains low- and high-pass AF filter units with front-panel selectable filter positions for 300 and 600 Hz low cut-off and 700, 1000, or 2400 Hz high cutoff. The filter slopes at -6 dB/octave are not extremely sharp. However, the SP-6 certainly does sound quite good for casual listening, and the fact that the speaker faces



*The back panel of the FT-990 is clearly arranged with a variety of connectors for just about any possible external interface.*



# Low Discount Prices & Top Trades on YAESU Equipment at AES®

**Note:** The Prices shown here are LIST ☎ Call Toll Free for our Discount Quote



- HF Transceivers** **List**
- FT-1000D Deluxe 9-band HF transceiver..... \$4399.00
  - FT-1000 9-band HF transceiver ..... 3399.00
  - FT-990 HF xcvr w/ps/tuner/mic ..... 2399.00
  - FT-990DC HF xcvr w/o ps or CW filter, 12V .... 1999.00
  - FT-890 **NEW!** Compact HF transceiver ..... 1339.00
  - FT-890/AT **NEW!** Compact HF xcvr/tuner ..... 1529.00
  - Accessories for above ..... CALL



- FT-767GX 160-10m HF transceiver ..... \$2068.00
- 2M/767 2m module ..... 239.00
- 6M/767 6m module ..... 196.00
- 430/767 430-440MHz module ..... 296.00
- 440/767 440-450MHz module ..... 296.00
- SP-767 Speaker w/audio filters ..... 99.00
- SP-767P Speaker/phone patch ..... 136.00
- FIF-232C Computer Interface ..... 95.00



- FT-757GX MkII HF transceiver w/mic ..... \$1089.00
- FP-757HD Heavy duty supply with fan ..... 309.00
- FP-700 Power supply ..... 244.00
- FC-757AT Automatic ant. tuner w/memory ..... 429.00
- FAS-1-4R Remote antenna selector ..... 120.00
- SP-767 Speaker w/audio filters ..... 99.00
- SP-767P Speaker/patch ..... 136.00
- FRB-757 External relay box ..... 14.00
- MMB-20 Mobile mount ..... 26.00



- FT-747GX HF transceiver (left) ..... \$833.00
- FP-757HD Heavy duty power supply w/fan . 309.00
- FP-700 Power supply ..... 244.00
- SP-767 Speaker w/audio filters ..... 99.00
- MD-1C8 Desk microphone ..... 115.00
- FM-747 FM unit ..... 47.00
- MMB-38 Mobile bracket ..... 14.00
- TCXO-747 Increased freq. stability unit ..... 42.00
- FT-650 100w 12/10/6M xcvr (right) ..... \$1599.00
- FL-7000 1KW Solid State HF amplifier ..... \$2279.00

- Other HF accessories** **List**
- MD-1C8 Desk microphone ..... \$115.00
  - MH-1B8 Mobile microphone ..... 29.00
  - YS-60 1.8-60 MHz 2KW PEP wattmeter ..... 127.00
  - YS-500 140-520 MHz 200w PEP wattmeter ..... 99.00
  - YH-55 Lo-Z headphones ..... 28.00
  - YH-77 Lightweight headphones ..... 26.00



- VHF/UHF Base** **List**
- FT-736R 25W 2m/430MHz transceiver ..... \$1922.00
  - AD-3 50w 2m/440 duplexer ..... 48.00
  - FEX-736-50 6m module ..... 294.00
  - FEX-736-220 220MHz module ..... 322.00
  - FEX-736-1.2 1.2GHz module ..... 589.00
  - FIF-232C Interface; VIC-20/most RS-232 ..... 95.00
  - TV-736 1.2 GHz ATV converter ..... 163.00
  - SP-767 Speaker w/audio filters ..... 99.00
  - Keyer-B Electronic keyer unit ..... 19.00
  - FTS-8 Encoder/decoder ..... 55.00
  - FVS-1A Voice synthesizer ..... 37.00

## YAESU U.S.A.



- VHF/ UHF Mobiles** **List**
- FT-212RH/C8 45w 2m FM w/TTPmic ..... \$405.00
  - FT-712RHT/C8 35w 440 FM w/TTPmic ..... 497.00
  - FT-912RH 10w 1.2GHz FM transceiver ..... 581.00
  - FT-290R MKII 25w 2m FM/SSB transceiver ..... 610.00
  - FT-690R MKII 10w 6m FM/SSB transceiver ..... 752.00
  - FT-790R MKII 25w 430-450 FM/SSB transceiver ..... 681.00
  - FBA-8 Holder for C-cell Nicads ..... 32.00
  - NC-26B Wall Charger for FBA-8 ..... 10.00
  - CSC-19 Soft case ..... 16.00
  - MH-10E8 Hand microphone ..... 24.00
  - FTS-7 Encoder/decoder ..... 40.00



- FT-5200 50/35w 2m/440MHz FM xcvr/TTP ..... \$769.00
- FT-6200 35/10w 440MHz/1.2GHz FM xcvr/TTP ... 899.00
- FT-2400H 50w 2m FM transceiver/TTP ..... 429.00



- VHF/UHF Handhelds** **List**
- FT-411E 2.5w 2m FM HT/TTP ..... \$355.00
  - FT-811 2w 440MHz FM HT/TTP ..... 394.00
  - FT-911 1w 1.2GHz FM HT/TTP ..... 489.00
  - FT-470 2.3w 2m/440 FM HT ..... 499.00
  - FT-23R-12 2m 5W HT ..... 309.00
  - FT-23R-17 2m 2.5w HT ..... 290.00
  - FT-33R 5w 220MHz HT ..... 328.00
  - FT-26/25 2w 2m FM HT ..... 299.00
  - FT-26/27 5w 2m FM HT ..... 319.00
  - FT-76/25 2w 440MHz FM HT ..... 329.00
  - FT-415 2w 2m FM HT/TTP ..... 409.00
  - FT-815 2w 440MHz FM HT/TTP ..... 439.00
  - FT-73R/TTP 2w 440MHz HT • Closeout \$259<sup>95</sup>



- SWL Receiver** **List**
- FRG-8800 150 KHz-30 MHz Shortwave ..... \$784.00
  - FRA-7700 Indoor active receive antenna ..... 58.00
  - FRT-7700 Antenna tuner ..... 77.00
  - FRV-8800 118-174 MHz VHF converter ..... 107.00
  - Other accessories for FRG-8800 ..... CALL
- Antenna Rotors** **List**
- G-500A Heavy duty elevation rotor ..... \$249.00
  - G-5400B Azimuth/elevation rotor combo ..... 497.00

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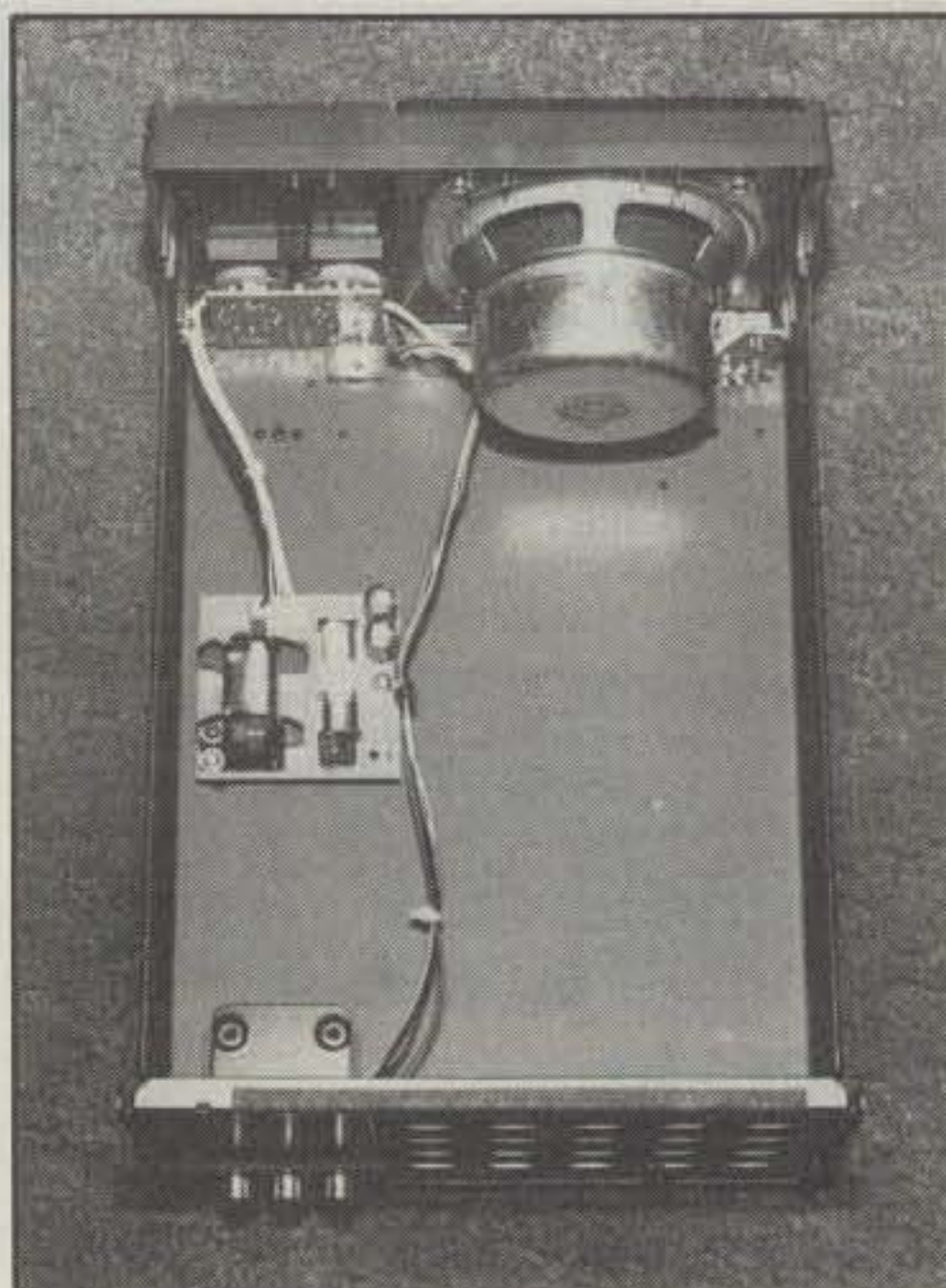


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CIRCLE 52 ON READER SERVICE CARD



*Interior of the SP-6 optional speaker. There is plenty of room inside for an optional phone patch or user-generated accessory items.*

you rather than upward (e.g., the built-in speaker in the FT-990) does make a distinct apparent difference in intelligibility. As can be seen from one of the photographs, the SP-6 does have a lot of space inside. The left side of the unit is designed for the insertion of an LL-5 phone-patch option. The LL-5 is a rather neat unit and includes separate receive/transmit gain controls and a front-panel level meter. It can be operated manually or in conjunction with VOX operation. Even with the LL-5 installed, there is still quite a bit of room within the SP-6's enclosure to install any manner of homebrew accessory item.

The DVS-2 digital recorder was first introduced with the FT-1000. It can function as either a continuous receive audio recorder or recordings can be made from the microphone used with the FT-990 for on-air playback. A single control cable interconnects the DVS-2 and the FT-990. Essentially, the DVS-2 is the electronic equivalent of a dual 16 second endless loop recorder/playback unit except that one 16 second period can be broken down into two 8 second periods or four 4 second periods for transmitting microphone recorded messages (e.g., CQ call, contest call, ID, etc.).

On the receive record side, you can have access to any last 16 second period, if the receive record is left on continuously, to sort out calls during a pile-up, for instance.

The fidelity of the unit is extremely good. Playbacks from microphone recordings sounded crisper and cleaner than the original audio! Users of the DVS-2 with the FT-1000 sometimes encountered a problem with audio overdrive from the DVS-2 on playback. The FT-990 has an internal adjustment to compensate for varying output levels from a DVS-2. If you're into DXing, contesting, or net operations where you have to repeat some call or message frequently, the DVS-2 is an interesting option to consider.

### Price Data

Following is the pricing of the FT-990 and accessories: FT-990, \$2399; XF-10.9M 2 kHz SSB filter, \$129; XF-455K 250 Hz CW filter, \$159; SP-6 speaker, \$149; LL-5 phone patch, \$139; and DVS-2 digital recorder, \$299. Brochures are available from Yaesu U.S.A., 17210 Edwards Road, Cerritos, CA 90701.



*The MH-1 hand microphone supplied with the FT-990, the two optional IF filters, and the optional DVS-2 digital recorder. The back of the microphone is shown to illustrate a small switch, below the clip, which controls an RC time constant which slightly tailors the frequency response of the microphone. There are so many frequency response tailoring possibilities on both the transmit and receive sides in the FT-990 system that it's hard to believe that any operator can't be satisfied.*

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**TM-241A • 50W 2m FM xcvr/TTP mic.**  
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**Display**

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- AT-940 • Internal ant. tuner for TS-940S . **\$149<sup>95</sup>**
- HMC-1 • VOX headset; 2600A/3600A/TH-A/B **\$39<sup>95</sup>**
- PB-9 600ma 7.2v Battery w/built-in chgr. . . **\$29<sup>95</sup>**
- PB-10 600ma 7.2v Battery . . . . . **\$29<sup>95</sup>**
- BC-6 • 2-pack quick chgr for PB-21/21H. . . **\$49<sup>95</sup>**
- MS-1 • Combination mobile stand, charger and power supply for TR-2600A handheld . . . . . **\$49<sup>95</sup>**
- TU-4C • Prog. encoder for TW-4000A . . . . . **\$19<sup>95</sup>**
- SC-9 • Soft Case for TR-2600A . . . . . **\$ 9<sup>95</sup>**



**MC-44 • Microphone for TM-331A/631A/731A and TM-241A 441A/541A. PTT button, UP/DWN switches plus Call, VFO, MR, PF keys (No TTP). 8-pin mic. plug installed . . . . . Closeout \$19<sup>95</sup>**

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The following are CW high-claimed scores. These are raw scores only, subject to verification.

## WORLD Single Operator All Band

EA8EA	13,311,605
P40W	11,292,576
CR3A	10,864,352
4Z2DX	8,757,660
8R1K	8,723,040
HC5M	8,534,275
PJ7A	8,484,004
ZP0Y	8,422,596
8P9Z	8,021,292
T11C	8,003,350
6V6U	7,358,226
KP2A	7,074,861
JY8VJ	6,226,505
7Q7TT	5,793,642
EX9S	5,245,305
CT4A	5,024,016
9M6NA	4,682,496
HC1OT	4,674,670
IS0QDV	4,619,780
ZD8LII	3,951,490
EA6/N6RA	3,870,630
HA4XT	3,724,420
4S7/N6AA	3,567,320
C56A	3,184,440
Z21HQ	3,069,297
CK7C	2,984,204
IS0/K1RX	2,899,395
G3MXJ	2,880,900
OZ1LO	2,764,025
G4BUO	2,711,476
OK1ALW	2,695,353
F6BEE	2,690,898
IR8A	2,507,760
HZ1HZ	2,432,730
YU1ZZ	2,371,500
LY3BA	2,343,974
YL2GD	2,221,290
5V7RC	2,165,527
5U7M	2,151,888
XO1XX	2,094,750
G3TXF	2,021,400
JH7WKO	2,014,268

## 28 MHz

ZS6BCR	1,421,310
CE3DNP	1,084,032
ZY5EG	971,138
IT9A	654,336
OH0BA/EA7	530,585
4N2V	434,975
DK5PD	411,840
TE5T	364,540
HA9BVK	364,080
LY3BI	339,590
U5WF	325,500
RI8AO	315,372
YZ9AF	303,261
YU3QZ	282,905
G3UFY	277,656
VK2KS	260,731
UA9OA	257,040
JN1LSB	251,667
4X4VF	241,920
UA4CJJ	240,265
I2HVE	234,234
JA3YWW	217,103
JA5EXW	216,832
OH5TS	214,533
AH6JF	208,040
SM6BJI	206,092

## 21 MHz

ZW5B	1,866,508
P40J	1,756,890

C56B	1,408,608
9Y4VU	1,050,720
KG6DX	963,815
4Z4T	939,900
ZP6CW	838,714
OK3CLA/5N0	802,593
7L1GVE	683,879
YZ9A	644,600
YV4ABR	635,166
VS6BG	632,170
FF0XX	528,160
HK6KKK	478,781
LY2WW	474,166
LZ2KRU	421,225
EA2IA	420,064
EA9TY	412,944

## 14 MHz

P40V	1,903,140
TU2MA	1,259,928
ZL3GQ	1,152,306
TF3CW	760,268
OH0BVI	673,056
LZ5W	572,800
G3LNS	552,948
I3JSS	552,352
OH7MA	475,499
ZY5CW	456,642
UT4UZ	435,862
RA9JP	432,300
4M5F	342,601
SK0UX	326,340
RB2SB	308,136

## 7 MHz

C42A	983,802
LX/OH2PQ	383,460
OH5BM	369,208
G3FXB	337,659
F6EZV	329,875
OH2AQ	292,572
OH7UE	261,225
UA9TT	242,520
JW8XM	217,464
UJ8JI	189,516
OZ1FTE	165,908

## 3.5 MHz

ZB2X	446,554
UV9CAF	383,040
LZ5A	233,740
G3KDB	207,045
OH0AM	195,151
KH2D	179,330
UT5UGR	171,798
YT3L	166,740

## 1.8 MHz

UL0A	110,760
4X4NJ	107,991
ON4UN	81,754
OK3COR	52,785
LZ1KOZ	37,467
IT9T	28,260
LY2BTS	28,224
HA8KX	25,462
F6AML	21,952
OE6IMD	20,976
UC2IEF	18,090
OK1JDX	15,950

## Low Power All Band

9M8DX	2,423,546
RZ9UA	1,951,910
YU3BC	1,702,292
ZC4CZ	1,648,320
OA4ZV	1,353,800
GD4UOL	1,315,405
JF1SEK	1,245,394
YB2HAP	1,050,560

VY2SS	1,020,226
DL2OBF	1,001,376
OE2VEL	917,896
F1JCB	845,495
YL2KO	749,840
UA3DQH	737,622
NP2I	725,250
PY2NY	701,956
YU3FA	674,172
G3SWH	605,484
DA1DC	602,667
OZ1BIZ	600,568
FI5X	569,052
Y88VO	552,610
WC5P/KH8	528,206
FD1PGP	524,226
SV5/SM0CMH	523,107
SM0COP	504,754
UA3DPX	500,193

## 28 MHz

C56/G4ODV	902,967
LU4FD	293,238
VK4XA	199,656
JN3TMW	141,328
RB5QDP	139,240
HK5/N3JT	137,808
I1XPQ	125,868
OK1XW	112,922
DJ2HH	105,774
UC2ADX	105,490
UA6BPJ	100,648
OK3CAP	100,165

## 21 MHz

LU1ICX	545,034
HA8RH	218,625
JN1VOC	200,283
JE1VTZ	180,658
SP5JTR	179,200
UB5PCU	162,664
OK2PLH	137,632
HA6NW	135,408
UV3DPP	128,520
EC6QZ	126,360
OH3NXW	126,259

## 14 MHz

JE0UXR	173,932
VU2PTT	141,658
JH4JNG	132,124
VK4TT	131,670
LY2BRJ	122,192
OH9UW	118,248
SM2CDF	118,125

## 7 MHz

HA8QC	49,392
RB5OCT	38,356
RQ2GIG	37,740
UY5WA	29,568
Y21EF	28,275
OH5QY	26,956

## 3.5 MHz

UT5JAJ	51,903
EA8AF	44,880
OK1DRQ	36,139
LY2BIP	32,800
IK1OWC	30,008
OK3ZBU	29,607
RZ3AW	28,770
OK2BWJ	24,507
UB5UFO	21,780
LZ2WA	20,888

## 1.8 MHz

OY6A	36,800
Y21PO	17,316
OK1DRU	16,677
OK3TWJ	12,152
OK2PWJ	10,763
DF3LP	9,460
OK1FFC	9,202

## QRP All Band

HI8A	3,316,768
DK3GI	1,359,280
4A2MX	724,785
AA2U	719,136
G4BUE	702,117
N4KG	536,157
DA1SJ	531,300
IK8EJN	463,143
OK3CUG	314,839
N7IR	286,456
P29DK	272,630
N1AFC	266,304
DL2HQ	241,868
4F3BAA	228,900
N0AX/7	205,632
JA6VZB	201,810
LY1DS	181,692
PA0ADT	150,588
Y26JD	147,084
PA3ELD	137,735
UA9SG	123,228
UB5PCS	119,024
UW3WW	118,150
OK2PBG	106,596
WB6JMS	105,504
KS9U	103,904

## Assisted All Band

N4RJ	4,593,680
K3WW	3,356,945
WR3E	3,021,513
N3AD	2,953,643
AD1C	2,913,396
W1RR	2,879,104
W3XU	2,821,115
AA2Z/1	2,767,050
K2SX	2,267,397
KC1XX	2,232,264
N2MM	2,190,000
DF3CB	2,150,016
IQ2A	2,050,030
DJ2YA	2,000,928
GB5CW	1,917,396
K2LE	1,877,960
YU3EA	1,832,341
DF8WS	1,556,894
UT2L	1,509,452
SK3LH	1,083,390
DL4MCF	1,060,290
HB9BGV	1,048,695

## Multi-Operator Single Transmitter

IQ4A	9,390,864
RZ1A	9,161,620
LZ9A	9,047,880
C56N	8,472,712
UW2F	7,662,270
HG1S	7,363,200
XN3EJ	7,034,930
GW8GT	6,806,205
VP5P	6,782,160
FQ2M	6,660,201
VS6WO	6,181,665
TK5C	5,986,584
EA3KU	5,975,865
OK5W	5,576,879
4U1VIC	5,464,800
C6A/K1XA	5,062,020
Y34K	4,828,816
HZ1AB	4,578,000
A35MX	4,498,628
T77C	4,444,119
V85HG	4,115,328
VK6LW	3,747,114
JA3ZOH	3,727,496
VE7SV	3,708,474
EI7M	3,584,106
RY0Q	3,567,890
DJ4AX	3,506,390

## Multi-Operator Multi-Transmitter

PJ9A	33,126,235
CT3M	28,781,109
J6DX	27,321,360
KH0AM	21,913,645
HG73DX	16,673,666
4N31A	10,502,844
R6L	8,107,344
JE2YRD	7,678,320
NL7G	7,474,278
LY2ZO	6,551,869
PI4COM	6,532,551
DL0KF	6,255,711

## USA Single Operator All Band

KM1H	5,011,872
W1KM	4,142,319
K1CC	3,908,712
K3TUP	3,827,835
N2NT	3,827,252
K3ZO	3,500,790
N2LT	3,409,750
W3BGN	3,393,024
N6BV/1	3,211,070
WM5G	3,039,420
N6AR/4	2,752,288
W9RE	2,728,120
W1PH	2,644,608
K5GN	2,574,760
W4RX	2,546,565
K5MA/1	2,506,350
W2SC	2,426,490
K8GL	2,050,081
W8FJ/3	1,938,176
K4VX/0	1,888,476
W1WEF	1,868,730
W1NG	1,828,096
N2DT	1,634,236
NN7I	1,598,485
KC1S	1,448,450
W3UM	1,434,348
W1OO	1,410,808
K3TEJ	1,359,616
K2SIG	1,238,983
AA4S	1,222,585
K6OY	1,216,816
K1TN	1,214,124
AK3Z	1,204,008
N6DA	1,200,600
W6UE	1,148,674
W4XJ	1,116,586
K7QQ	1,080,750
AA5VC	1,061,746
N6EK	1,017,744
WF2W	1,013,220
K2PS	1,000,178

## 28 MHz

K8CX	387,847
W0UN	387,005
W6QHS	231,434
K5RX	202,212
WS1M	163,609
W6AXX/3	148,561
N6TU	147,840
KJ0G	91,140
KN5H/3	77,165
K0BFR/9	74,354
KS6H	57,592

## 21 MHz

K1RM	562,624
KR2Q	509,250
K5MR	414,018
WA8DXB	304,869
KC0D	275,128
NQ0I	232,974
N4CT	227,626
KA2HMJ	214,272
W9XR/3	211,582
N4MO	198,376
W6BSY	165,875

**14 MHz**

K4XS	481,270
KC2X	354,900
K3EST/6	303,002
N5GM	289,037
K8MFO	286,440
W5FO	204,900
KQ9L	164,835
W1YN	150,852

**7 MHz**

K4JPD	531,465
W0ZV	386,560
K1MM	258,579
W2UP/3	148,480
W5WMU	114,608
N9NS	94,076
WF5E	78,864
K0OD	65,895
W1BWS	54,282
KJ0B	51,611

**3.5 MHz**

K1ZM/2	178,959
W1FV	177,944
W1MK	170,640
WE3C	82,071
KO0U/4	37,525
NX7U	27,336

**1.8 MHz**

K5UR	10,030
N6SS/7	9,800
WB9Z	8,415
KV0Q	7,222
K4TEA	6,630
AB4RU	6,192

**Low Power  
All Band**

W2TZ	1,159,128
NM2L	1,107,635
W6JTI	912,216
K9QVB	814,484
N4YDU	783,090
KG1D	768,950
WA1FCN	765,438
K6XV	742,560
WB8YJF	668,100
WS1E	583,128
N9AW	557,667
AK0M/4	552,024

**28 MHz**

WB4TDH	185,472
N4EJW	146,064
W5VGX	113,796
KA4RRU	102,080
WT8P	62,008
NK8Z	53,376
NA9N	37,410
KI6YB	23,680
WD9GGY	17,850

**Multi-Operator  
Single Transmitter**

K5NA/2	6,718,160
N3RS	6,621,024
K1RU	6,489,078
K2TR	4,895,800
K1IU	4,220,192
K2WI	3,812,400
W6GO	3,445,629
K3ANS	2,706,660
AG6D	2,656,465
K2SG	2,619,232
NN3Q	2,602,570
WD8LLD	2,522,539
AA6TT/0	2,286,438
NK7U	2,273,624
N0ZA	2,233,013
KB1H	2,124,759

**Multi-Operator  
Multi-Transmitter**

N2RM	13,375,600
W3LPL	12,037,908
K1AR	10,875,118
K1ST	8,920,488
K8CC	5,990,985
N6ND	5,959,530
N6DX	5,620,486
KY1H	5,293,080
W0AIH/9	5,140,188

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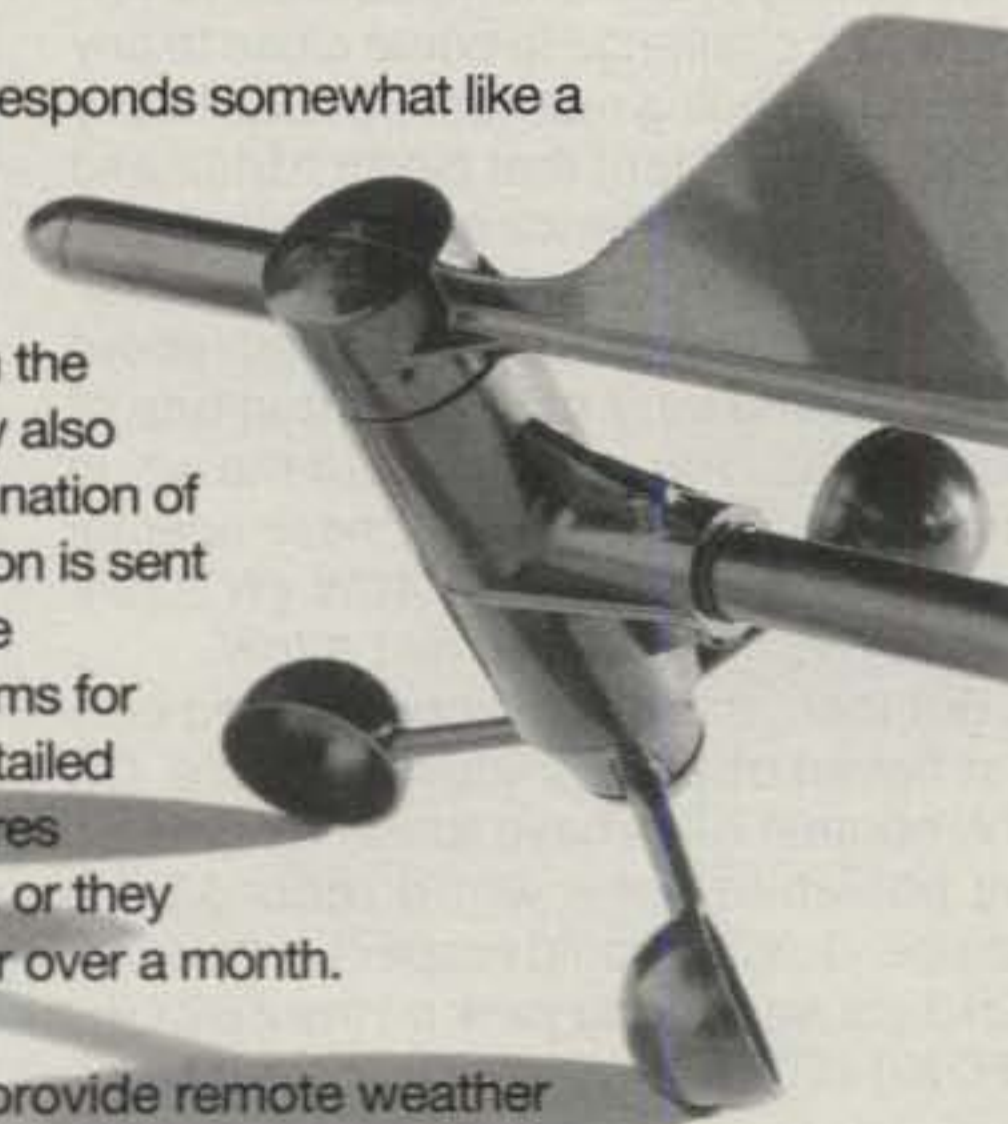
The Weathernode is not a TNC. It is a data gathering device that attaches to your TNC and station computer. The internal program is set to gather data from several types of sensors: internal and external temperature, wind speed, wind direction and rainfall. The temperature sensors come with the unit. The anemometer, for wind measurements, and the rainfall gauge are optional and are available from your favorite dealer or the factory.

If you are the SYSOP for the Weathernode, you'll have control over how often the sensors are sampled and stored, and you'll be able to change your preferences remotely, by password.

If you are a user, a Weathernode responds somewhat like a packet BBS. You may connect to the node, get a listing of commands, and then indicate what you would like dumped from the Weathernode's memory. You may also specify a range of time and combination of sensors. The requested information is sent back in tabular form which may be imported into spreadsheet programs for graphing. Users may look at a detailed record, for example, of temperatures taken every five minutes for a day, or they may wish to scan daily weather for over a month.

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# AH3C sets out on a mini-DXpedition as a member of the SCCC Contest Team to operate the 1991 CQ World-Wide DX CW Contest.

## The IS0QDV Story

BY PETER H. GRILLO\*, AH3C

**W**hen I returned home from my stay on Johnston Island, I took with me the excitement of operating a contest from a rare location. With those memories still fresh in my mind, the challenge would be to come up with something for the 1991 season. In early April 1991 I met with the SCCC gang at the Visalia DX Convention, and it reminded me of how much fun it was to be a member of their 1990 CQ World-Wide DX Contest CW Team. We talked about our remote mini-DXpeditions and promised each other an even greater effort for the coming contest season.

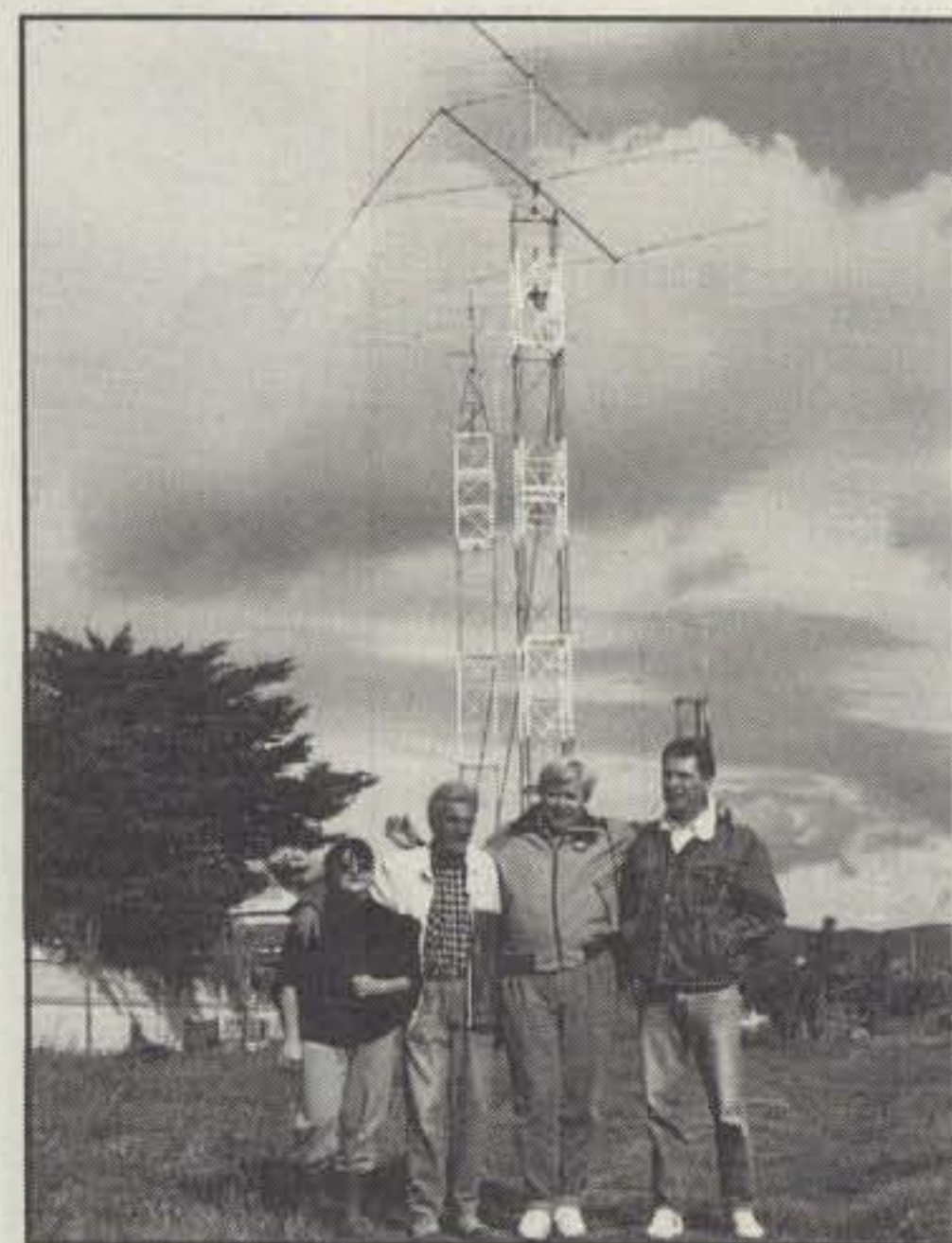
So to borrow a phrase from Martti, OH2BH, "Where do we go next?" the search began in earnest around mid-July 1991. John Laney, K4BAI's incredible record 5286 QSOs from North America in 1990 looked formidable. With decreasing conditions it would take over 5500 QSOs to surpass John's record. The 4539 QSOs from AH3C in 1990 to set the Pacific record seemed extremely demanding. It took a total 48-hour commitment. To do another 1000 Qs?

Other CQ WW CW continental records were beckoning. Certainly, with the solar cycle having peaked, it would be an ever-increasing challenge to come close to any of the outstanding records. Obvious to any observer is the fact that North Africa and northern South America are so strategically located that it would be virtually impossible to make an attempt at the world record without some very major effort in one of those areas. Top testers of the world have rooted themselves in these special areas—9Y4H (K6NA), P40W (W2GD), D44BC (N6TJ), to name just a few.

But then, there is Europe, sacred contest haven of the miraculous Finn's. CQ WW contest rules have totally eliminated the possibility of a world record from Europe. So who would suspect a sneak attack by a wandering yank on the ZB2X (by OH7KI) 1988 European record? And then

again, why not? When Jim Neiger called to advise me that IS0 could possibly be available, the juices started flowing. What fun! 4500 QSOs could do it. Cagliari, Sardinia may just be far enough south to provide decent propagation on 10 meters—the secret weapon of world record holders. A quick confirmation to Paolo, I2UIY, a letter to Mario, IS0QDV, and the challenge was on! At last, an opportunity to return to the continent where I was born (in the French Alps, just 100 miles from Milan).

Now for the preparation. Computer logging is not in its infancy any more. K1EA, K8CC, N6TR, and K7RI all had useful programs suitable for the CQ WW test, but we figured there must be dozens more out there. The argument was efficiency. To be efficient with a 101 Key keyboard after 40 hours of trying to stay awake takes machine-like automatic punching. It was critical to be proficient at typing, remembering dozens of special function keys, and sending high-speed code all at the same time. When would you have time to fine-tune a station that is calling? But the advantage was computing power . . . track-



Left to right are Anna and Mario, IS0QDV, my hosts, the author, and Mario's brother Enrico, IS0QDU. Mario's three 60 foot towers are in the background, and you can check out the 2½ element 40 meter beam.



Here's AH3C at the IS0QDV operating position.

\*6493 S. Lombardy Dr., Salt Lake City, UT 84121

BAND	QSO'S	Q-PTS	PTS/Q	ZONES	COUNTRIES
160	150	167	1.11	7	41
80	366	561	1.53	14	64
40	800	1867	2.33	26	88
20	765	1530	2.00	34	102
15	927	1846	1.99	28	89
10	706	1665	2.36	29	83
TOTALS	3714	7636	2.06	138	467

FINAL SCORE: 4,619,780

Table 1—The final IS0QDV tally.

ing multipliers. Also, interconnection with Kenwood or ICOM for instant band changing . . . but mine was a Yaesu FT-1000. Hmm.

The K1EA CT program had just completed its latest revision (7.07). Not much change to CQ WW, but lots of other contests were supported. On Johnston Island (AH3C, 1990) I had used the K7RI program on phone and K1EA on CW. Since the K7RI program did not interface directly with the keying line of the transmitter, I chose to use the K1EA program again. My first problem was that I did not have a laptop computer for the trip. After checking around for prices, I chose to rent one for one month. I found a dealer with a 286 machine with 1 MB RAM and 40 MB hard disk for \$180 (later I found out I could have had the same for under \$90). Since both my entire AH3C logs for 1990 added up to less than 1 MB, I figured that there would be no problem.

I was going to be gone for 10 days, so I waited until the last minute before getting the laptop. Bad decision! I loaded up my 1990 AH3C log as a test and was surprised to find that CT could only take 2800 contacts and said "not enough memory."

Time for Dr. PC. The manual was of no help, except for the clue "get emm.sys from your hardware supplier." My dealer was at a loss. He offered to put in an extra 1 MB of RAM. Of course I accepted his offer, but still the machine could not load a full log. Finally I learned of a utility that was available for the PC that would link the extra 1 MB of RAM to make it look like 2 MB of expanded memory. I loaded the utility (EMM386.SYS). Again, failure.

Computers are great when they are working. When they keep coming up blank and you are in the middle of nowhere, what then? Does it take a computer whiz to survive a computer-assisted contest? Was I just lucky in 1990 or was this a very simple problem that would quietly go away with just a little "smart" help.

In desperation, on the eve of my departure for Italy I contacted Mark Tomkinson, a friend of mine who lives 70 miles from my home. He suggested that he had a copy of EMM.SYS and could load it on the computer by modem. What a novel idea. I had never truly needed a modem before, but I was willing to try. Two hours later we were ready for the test. It worked! There was

enough room for another 6000 QSOs on top of last year's log.

Just 20 hours later, on November 17, a warm, friendly face from across the sea, Mario, I2MQP, was waiting for me at the Milan airport. We zipped away from Milan to a little town called Broni, where we met our friend Paolo, I2UIY, who I had met previously at the Seattle World Games. It is interesting to note that Paolo's callsign is similar to Vic's, K9UIY, who is QSL manager for my Johnston Island efforts. We settled down momentarily—no time for talk, just time for pasta! What a feast! How can anyone win a contest without pasta? It turns out that eating pasta is a contest all by itself, even to the last wipe of the bread on the rim of the bowl. In Sardinia, it is called "Achupai"—sopping up the very bottom of the bowl with bread.

The next day we had an evening with a local radio club to show some slides and establish new friendships. After another day of visiting and plotting we called Mario, IS0QDV, to check on the station—high winds (150 km/hr), 40 meter beam was broken, ouch!

We advanced the flight to Sardinia one day. It was off to meet Mario. No time to pick up a European/USA connector, but Mario had the transformer for 220/110 VAC conversion (to power the computer, keyer, and tape recorder), so not to worry.

Sardinia is a jewel of an island located in the heart of the Mediterranean. It has a deeply rooted history. Old Cagliari is a giant fortress overlooking the south access to the port of greater Cagliari. Byzantine structures dot the pinnacle. Mario's brother Enrico, IS0QDU, gave the grand tour, Cagliari by night. By day we were busy watching Salvatore, IS0CDS, string an inverted Vee for 160 and wishing we could fix the 3-element 40. Mario insisted that I not climb his tower to assist in the antenna project. Oh well, 2.5 elements on 40 sure beats a dipole! The power adapter became a genuine nuisance. Besides Salvatore, Enrico was also a hero for the day. After two trips to town, he came through with the exact connector we needed for power conversion.

Mario and Anna were the perfect hosts. All activity centered on success for the contest. The food and accommodations were spectacular. But the language barrier was something else again. Mario introduced me to a young man, Jon Luke, who had been in the U.S., so he could act as interpreter. No problem, as long as Jon Luke was within earshot. Each night, however, he would go home and return around 10 AM the next morning. Mario and his XYL, Anna, would wave their arms and intone their voices to help me understand the daily routine.

It was a sensation of true accomplishment for all of us when Mario finally was able to get me to understand his question, "What to drink for breakfast?" "Latei," I said—"milk." "Buono," was his reply. The



Members of the Cagliari Amateur Radio Club meet with AH3C prior to the contest.

next morning Mario heard me stirring in the room, and as I walked out he said, "Mange, breakfast." What a pleasant surprise when I tasted my first cup of *warm* milk since I was a child. I recommend this to every serious contester. It sure beats the acid from Coca-Cola!

Each evening Mario had a special event planned. We did another show of slides for the Cagliari Radio Club and then again for a private showing at Mario's QTH, where I met Alfredo, IMØGSA, and Rinaldo, ISØFPH.

Friday evening before the contest I had been abroad 6 days. By this time laundry was becoming a problem. While taking my usual 2 minute shower I noticed a cord hanging down from the wall. It looked like the cord sometimes found in hotel bathrooms for hanging out the laundry, so I tested the cord by pulling on it. It didn't reach the other side of the shower, so I pulled it again. Suddenly there was a knock on the door. I opened the door and there was Mario, all excited about the cord. We both looked embarrassed, but the true purpose of the cord was never in doubt again!

Finally it was contest time. My FT-1000

was sick. There was no power output probably from the banging around in the airplane. We hooked up Mario's healthy TS-940 and tied it to the computer key line and paralleled the keyer. It was too bad I didn't bring a communication cable to use the automatic band-change feature of CT. However, I was smart enough to bring my N3JT interface so that there would be no RF feedback problems as I had experienced at KH3. The FT-1000 receiver was functional, so a switching arrangement was fabricated so that I could listen on 160 and 80 using the superior front end of the FT-1000. I was convinced that the 172 zone multiplier from AH3C the year before was principally due to the FT-1000.

Six hours before contest time WWV reported a K index of 5 and A index of 39. Time for a change in strategy. It was clear that by morning the 10 meter band would favor equatorial stations and it would be a struggle for the Northern Hemisphere population centers of Europe, Japan, and USA to work each other. Our only hope was that by the second day the flux would settle down. Unfortunately, Japan is a first-day target, because the second day the JAs go


to work. The secondary goal was therefore to remain extremely flexible and move all over the bands with both running and pouncing. This strategy was followed to the letter.

Each time a good run was started on 10 or 15 it would dry up after 10 or 15 minutes. To beg for Qs meant disaster! Switch, switch, switch. That was the only solution. The result yielded a great multiplier count, but as predicted, the 10 meter QSO total was awful. What a delightful surprise to get a call from ZA1TAG and a perfect exchange of information. The entire world of DXers and contesters can appreciate that simple fact. ZA is now a reality thanks to the incredible efforts of the ZA1A team. I wonder how ISØ/K1RX did?

## Prologue

The one point per QSO penalty that Europeans must pay simply destroys the challenge for a world record. Europeans can only compete among themselves for a trophy or other award, or go to another continent. It is obvious that the Finns learned this lesson a long time ago. The European record has a QSO net multiplier of 2.15. The world record has a 2.89 QSO multiplier. If you ratio these and multiply by the European record score, the result is less than 7.5 MM points. To be in the top 10 in the 1991 contest, over 8 MM points was required. Europeans love to work into North America. By installing the 3 point rule across the board to all areas, nighttime contesting would spurt and long haul would not suffer in the least. It would also be possible for North America to have a shot at the record. This would greatly increase DXpedition and club team competitions.

The final score for this ISØQDV effort, when using a 3.00 QSO multiplier, would end up at 6.7 million. This is still out of range for the top ten, but illustrates the difficulty of scoring from Europe. Granted, this would exceed the ZB2X score of 5.3 MM based on a 2.15 multiplier. To compensate for inequities in the world records each record reported in CQ magazine would be recomputed to reflect the new multiplier. Therefore, the ZB2X record would stand, adjusted to 7.4 million.

World-wide contesters need to organize an international convention. The friendships and technology exchanges established through personal contact cannot be overstated. We are testing the pinnacle of communications technology. There is always room for advances in technology through amateur radio. Each contest in which we perform provides a unique knowledge for the operator. What better way to explore and optimize our technology than to get together? DXers have set the stage. We have traditionally huddled about in our contest corners at DX conventions. We are a dynamic group, hungry for new challenges. Let's get it going! 



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**More insidious than war-time espionage, the erstwhile amateur's urge to communicate will overcome all adversity—at least for a while.**

## A Loaf of Bread, A Jug of Milk, And Me Stealthily in The Bathroom

BY MICHAEL KLEIN\*, KC3NE

I have had beams and wires and verticals, big metallic things that marked my house as a ham's house. I've also lived and operated, very enjoyably, in apartments with no-antenna rules. But how to get on the air while living with a wife who finds the mere concept of sitting in front of a rig stupid, pointless, and a waste of time, and has banned amateur radio from the house? In other words, a no-antenna, no-rig restriction.

No steaming cups of coffee in one hand and a Bencher paddle in the other. No screaming into the mic to work a VK9 when the band is starting to fold and the ship is waiting to take them away. No racing to unplug everything when I hear thunderstorms on the weather forecast.

Can you say "QRT"?

Friends suggested I just set up a rig in the car. Nope. There's no bumper for a suitable HF whip and she'd never let me drill a hole in the body.

Others suggested divorce. My answer: She'd drill a hole in *my* body.

So I did what millions of married men do: I went to sit and think in the place where millions of married men go to sit and think and escape. I went into the bathroom. My bathroom. I was sitting and thinking and then it occurred to me: "Why not set up a shack *here*?"

I had a couple of things going for me. One is that wifey is not the most enthusiastic housekeeper in the world. For this project to work, I'd have to volunteer to clean the bathrooms. The other plus is that I already spend—in her words—an "inordinate" amount of time in the bathroom. My spending a half hour in there (to work DX) would not arouse suspicion. ("Suspicion of what?" is a good question.)

Here's how in eight short months I went from being rigless to the proud holder of a DXCC (DX Can Club?) certificate.

*May 2, 1990:* Rigless. The idea of outfitting the bathroom occurs to me. I pull out the Radio Shack catalog and begin memorizing part numbers of coax fittings, insulators, coax, and No. 18 wire. I remember that I have a W2AU balun, a keyer, and a paddle in a box in the garage, the sorry last remains of my former life. Sigh . . .

*May 3, 1990:* Go to the store for a quart of milk and a loaf of bread. Sneak into a bookstore next door that stocks amateur radio magazines. Go through the ads to find an HW-9 and power supply for sale by a guy in the next state. Go home and call him, whispering into the phone. We agree on a price. He agrees to hold it for a month while I scrounge up the money.

*May 4, 1990:* I figure out that the HW-9 (Hot Water 9!) will fit very nicely inside a watertight plastic box that I have, which in turn will fit very nicely into the toilet tank. There's even room inside the box for the keyer and paddle. I hunt for a place to stash the power supply and logs. I find a great way to route coax out of the bathroom.

*May 5, 1990:* Go to the store for a quart of milk and a loaf of bread. Sneak into Radio Shack for the connectors, insulators, coax, and antenna wire. Bury the stuff in the garage.

*May 6, 1990:* Antenna day. Wifey runs out to the store. I go into the bathroom and drill a small hole near the baseboard, through the inside of the back of the vanity. I thread RG-58U through the hole, run outside, grab a ladder, climb to the bathroom level, pull the dangling coax, and carry it up to the roof. I then measure off 66 feet of wire, cut it in two, solder a PL-259 to the end of the coax, solder the ends of the antenna wire to the balun, and hook it up. Then I fasten the free ends of the wire

to the far ends of the roof. The whole thing runs about 3 inches off the rooftop, invisible to all but birds and roofers. I run into the bathroom and solder a PL-259 to the station end. I then spray air freshener to get out the solder odor. To see the coax, you'd have to open the vanity, get down on all fours, and really look hard.

*May 7, 1990:* Go to the store for a quart of milk and a loaf of bread. I pocket the change to add to my rig fund, which has really grown since I raided both cars for the change under the seats.

*May 8, 1990:* Start cleaning the bathrooms to show my interest in housekeeping. Occurs to me that the only place for the power supply and logbook would be the bottom of the hamper. I get to thinking about making a fake bottom for it.

*May 9, 1990:* Go to the store for a quart of milk and a loaf of bread. Wifey tells me to start buying half-gallons and to cut out the bread, which is piling up in the kitchen. I sneak into the hardware store for a piece of plywood. They happen to have a scrap that is very close to the size I need. Stash it in the garage.

*May 12, 1990:* Wifey goes to a doctor's appointment. I install the fake bottom inside the hamper.

*May 19, 1990:* I find a \$5 bill in an old coat. This is it. I have all the money for the rig! I go to the store for a half-gallon of milk and buy a money order and mail it off with instructions for him to send the rig to my work address.

*May 29, 1990:* The rig arrives. I sneak it from my car into the garage.

*May 30, 1990:* Dragged into going to a cookout.

*May 31, 1990:* Wifey goes off to a Memorial Day sale, leaving me . . . *home alone!* I bring up the rig; set it down on the vanity; plug in the power supply, keyer, antenna, and an old earphone; and switch i

\*Box 306, Cheltenham, PA 19012

n. I don't care about SWR or sunspots or anything. I lock the bathroom door and sit down. A ham on his throne. Fifteen sounds fairly open. I hear an IK3 calling CQ. I come back to him. He gives me a 549. I give him 579. Too bad I don't know "bathroom" in Italian. We chat for a few minutes and sign when I hear wifey's car pulling into the driveway. I disconnect everything and stash the rig, keyer, and paddle in the plastic case. I flush the toilet to allow me to sink the case into the toilet tank without pilling. I put the log and power supply in the hamper and close up the vanity.

The days and months rolled along. I caught some great stuff on 40 around sunrise, especially in the fall. Afternoons meant Europeans on 15. I worked 25 new countries one week when I had a bad stomach virus. I worked a dozen more during the CQ WW Contest after eating a box of pitted prunes. I tried to be cool after each new country, but in December, when I cracked a 3A pile-up, I blurted out, "NAILED 'IM!'" Wifey called through the door, "You fall in?"

If she only knew. By January 1991 I had massed 102 countries on all continents. I was a happy guy.

Jan. 16, 1991: Go to the store for a half-gallon of milk and a loaf of bread. Come back to find a contractor in the bathroom, writing up an estimate for a complete remodeling. He was leaning on the hamper.

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# YAESU

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<b>P4AT</b>	440 mhz ht 2 watts	389.00	<b>FT-890</b>	HF 100watt no tuner	1069.00
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<b>4GAT</b>	440mhz HT	319.00	<b>767-2M</b>	2 mtr unit for FT-767	229.00
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<b>PS-55</b>	20 amp ext ps 725-751A	199.00	<b>NC-37</b>	1 hr quick chg 411/470	95.00
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# CQ REVIEWS:

## The Oak Bay Technologies LP-11P Low-Pass Filter (Plus Some Basic TVI Information)

BY LEW McCOY\*, W1ICP

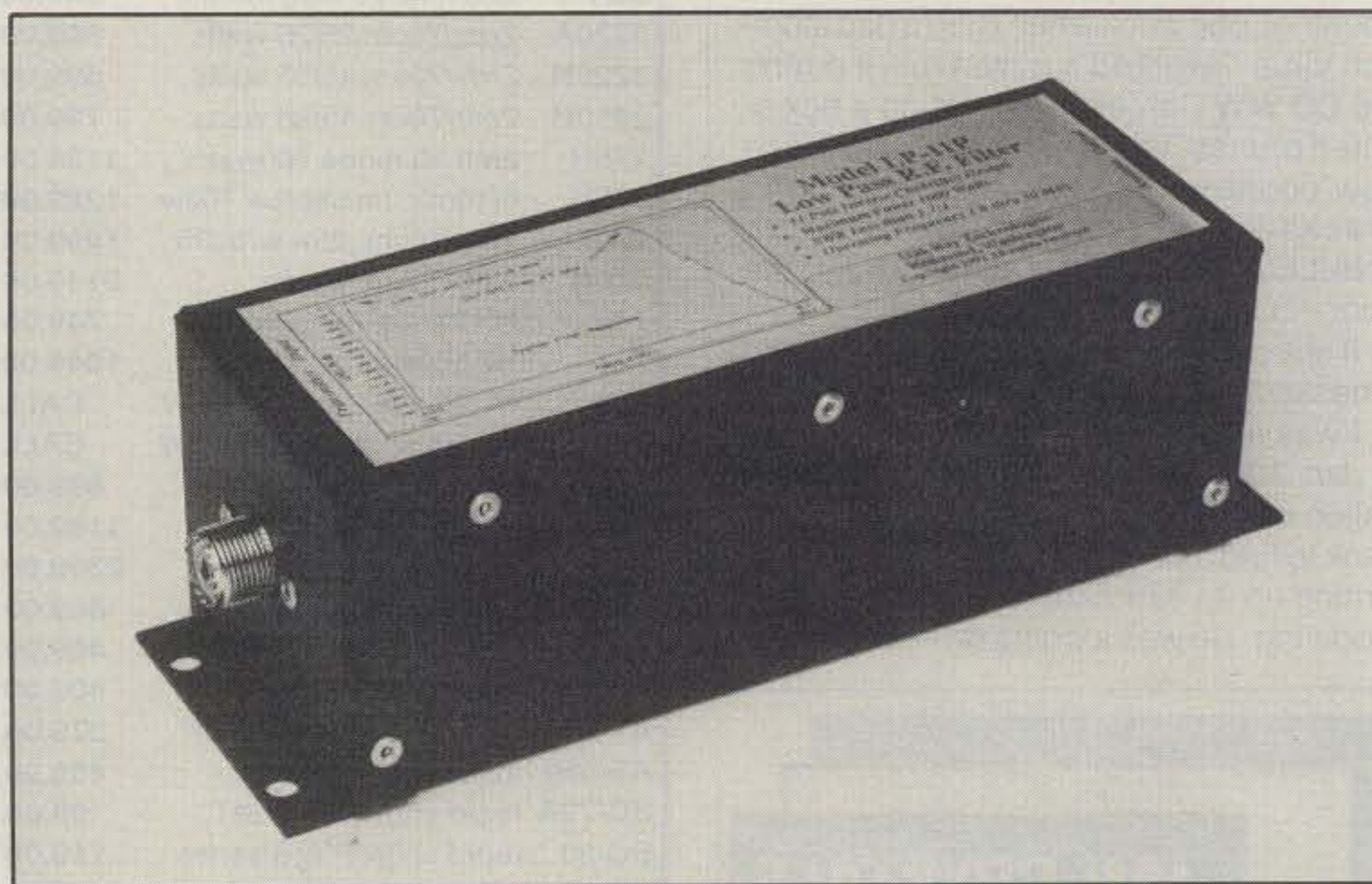
**O**ak Bay Technologies of Redmond, Washington has come out with an excellent low-pass filter for TVI reduction. Before describing the filter, let me go into a few details about TVI and why the reader should be concerned. Most of today's amateurs entered the hobby long after the advent of television, so they have no concept of exactly how seriously amateur radio was and is affected by TV.

Television was invented long before World War II, but it didn't really become available to the public until the very late 1940s. At first, the only TV sets available had small screens, 5 inches or so, were very expensive, and usually only could be seen at the stores that sold them or in taverns. It wasn't very long before amateurs realized they had a serious problem.

In those days we all operated transmitters that used what is known as Class C amplifiers, which, while being very efficient, were very bad at amplifying harmonics of the fundamental signal. In other words, when an amateur operated on 28.3 MHz, he or she also had a very bad harmonic at twice the frequency, 56.6 MHz, which is channel two, plus another harmonic at channel 6. These harmonics would beat with the television picture or sound frequency, causing both visual and audible interference. In most cases the TV viewer was helpless.

The ARRL realized that television could well be the death knell of amateur radio. At the time, in 1950 and 1951, I was employed in the Technical Department of the ARRL, QST, and I know the concentrated effort made by our staff to find a solution. George Grammer, W1DF, who was head of the department, did monumental work in filter research and transmitter shielding, plus research in finding better methods of generating an RF signal with less harmonics. In other words, more linear operation, and single sideband, in addition to being more frequency conservative was the answer.

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



The Model LP-11P low-pass filter from Oak Bay Technologies.

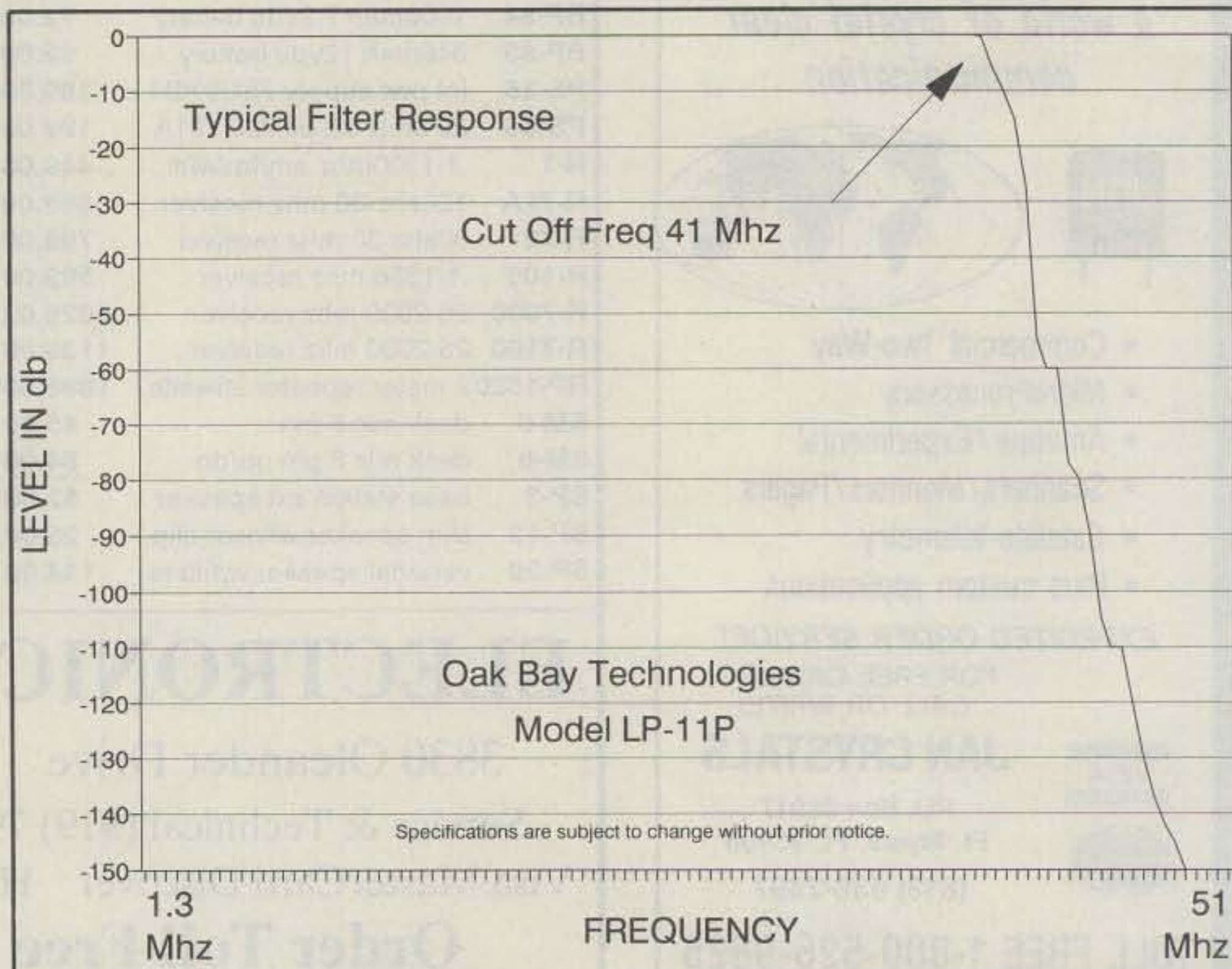
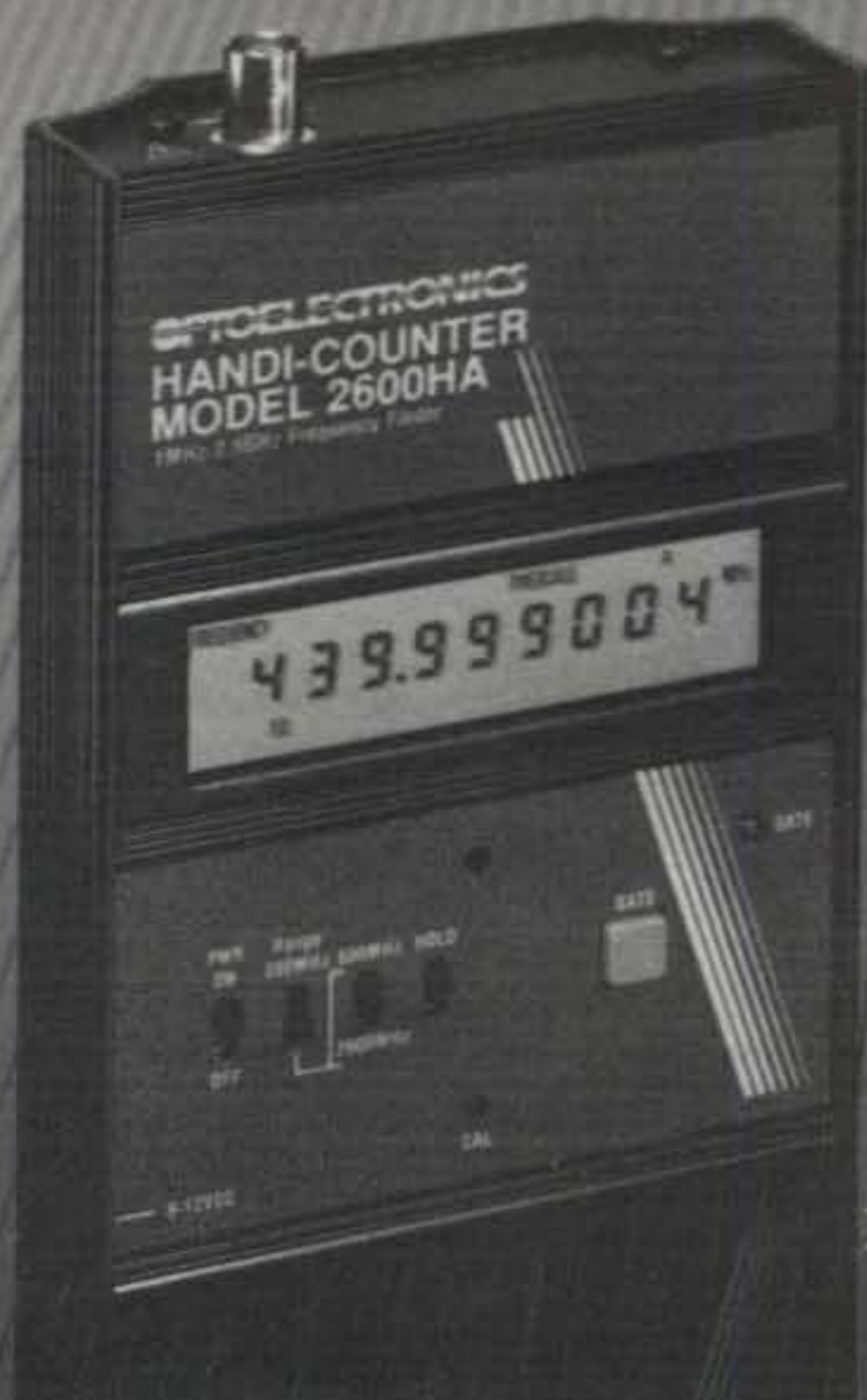


Fig. 1- This is the attenuation curve of the Model LP-11P low-pass filter.

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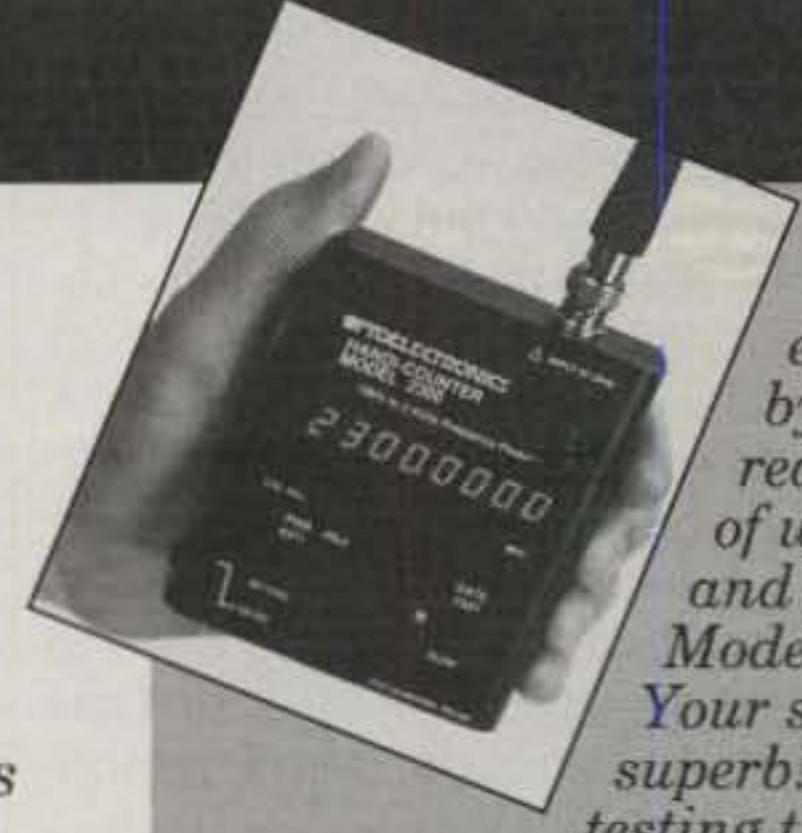
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Display	10 Digit LCD w/Function Annunciators	10 Digit LCD w/Function Annunciators	10 Digit LCD	10 Digit LCD	10 Digit LCD	8 Digit LED	8 Digit LED
RF Signal Strength Indicator	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	.	.	.	.
Hold Switch	Yes	Yes	Yes	Yes	Yes	No	Yes
Price	\$579.	\$375.	\$325.	\$259.	\$225.	\$179.	*\$99.

Sensitivity: <1 to <10mV typical. Time Base: ± 1 ppm; ±2ppm add \$100. - LCD Models only. Nicads & AC charger/adapter included except for 2300. \*For 2300, available with NiCad installed & AC charger/adapter, complete package \$128. A full line of Antennas, Probes & Carry case are sold separately. (One year parts & labor warranty.)

Again, the ARRL through the efforts of primarily Byron Goodman, W1DX, led the way with SSB. We all knew only too well that any harmonic signals had to be cut down (attenuated) to a degree where they could not cause interference.

This led to the designs of low- and high-pass filters, plus extensive shielding of the transmitter. The first step was to completely shield the RF sections of the transmitter so that any RF leaving the rig could be fed to a filter so that the resulting signal was only the desired one. Then the low-pass filter (more on that in a moment) was inserted in the line to the antenna—via coax. This resulted in a clean, harmonic-free signal, but that fundamental, clean signal still could knock the pants off a TV set.

What was happening was the fundamental signal was overloading the TV causing the TV set to generate harmonics within itself. Again we found the answer by installing a high-pass filter at the antenna terminal of the TV set.

The common problem resulted primarily from amateur operation of 20 meters and higher. The harmonics generated from 80 and 40 meter operation were usually too weak to cause problems. However, 10-meter operation could generate a second harmonic that could knock TV sets for a wide area—in some instances miles away! But the filters worked if properly installed. Basically, a high-pass filter was one which would pass all frequencies above its designed cutoff frequency, usually all frequencies above 40 MHz. This kept the fundamental signal out of the TV. On the other hand, the low-pass filter was designed to pass all signals *below* its cutoff frequency, which was usually below 41 MHz.

Just so the reader understands how serious this problem was, we at the ARRL at that time worked in conjunction with RCA (major TV manufacturer) and the FCC. They sent me out to tour the country with two TV sets, transmitting equipment, interference-causing devices, etc. I went to every city in the United States that had low band (channels 2 through 6) and demonstrated how to cure TVI.

One must understand that in those days we had very weak TV signals to deal with, not really great TV sets, no cable TV, and a great deal of what was known as fringe-area reception—meaning extremely weak TV signals. As TV transmitting tubes improved, TV stations sent out better and better signals. Amateur radio switched over to SSB, and the result was a departure from Class C operation to Class B and AB1 and AB2. These modes resulted in lesser harmonic output, *but it should be emphasized that these modes still can have harmonics produced.* This is why an amateur operating in an area with low-band TV, channels 2 through 6, would be wise to have a low-pass filter on his rig. All rigs? Please don't write and ask me if one rig is

better than another as far as harmonic generation and TVI are concerned. Instead of looking at all the knobs and readouts, a prospective buyer should look to see what shield techniques are used around the amplifier portion. One thing to remember: For a filter to work, the RF cannot be permitted to flow *around or through it.* This leads us up to the reason for this review—a very excellent low-pass filter.

The LP-11P is a commercial-grade low-pass filter of the 11 pole inverse Chebishev design. The operating frequency is 1.8 MHz through 30 MHz. The cutoff frequency is 41 MHz, and the maximum attenua-

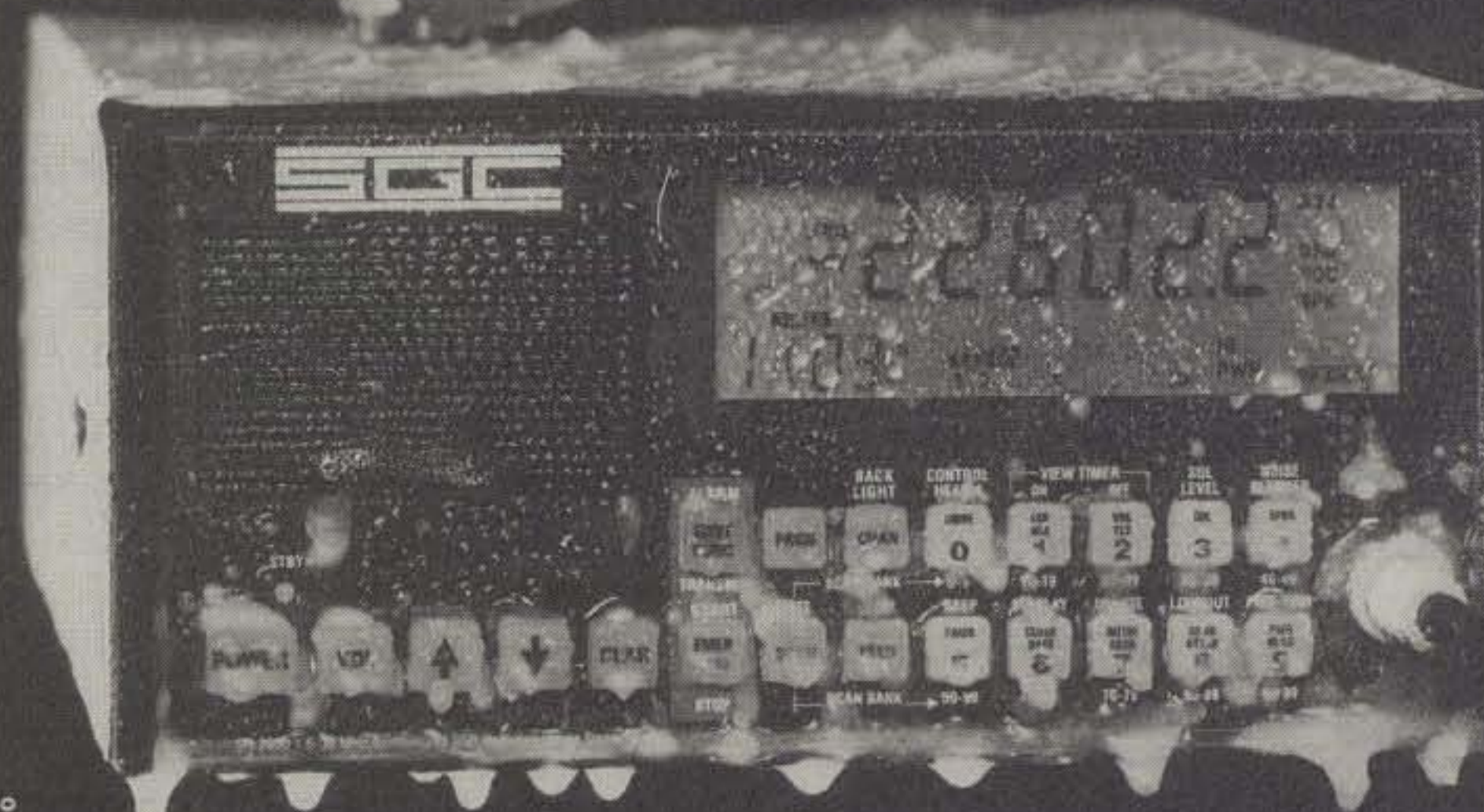
tion at 51 MHz (just below channel 2) is 150 decibels! I can guarantee that a harmonic knocked down 150 dB will not cause TVI to the weakest TV signal. Maximum power through the filter is rated at 1000 watts, but in true amateur spirit I checked it at 1500 watts, being careful to work into a matched load (via Transmatch) with no problems. In any case, fig. 1 is the attenuation curve for the filter.

The manufacturer is Oak Bay Technologies, Redmond, Washington 98052, and the filter is marketed through local amateur radio dealers. Retail price of the LP-11P is \$69.95.

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- AC amp out
- Linear dB mirrored scale

This True RMS Analog AC Meter was manufactured for the U.S. Air Force in the 1980's for \$ 2,250.00. Conforms to OSHA and UL requirements. Comes equipped with ruggedized case and probe. Can optionally be operated with an internal battery pack (11 C cells) for 8 hours, but will work standard on 110 VAC. Checked to be fully operational.

### TRUE BLUE IBM PC PRE-OWNED \$389



- 640K RAM
- 360K floppy drive
- 30 MB hard drive
- Keyboard
- Includes mono monitor

### TEKTRONIX 465B DUAL TRACE OSCILLOSCOPE \$995



RECONDITIONED  
UNIT

- 100 MHz at 5 mV/div
- 2 nsec/div Sweep Rate with X10 Sweep Magnifier
- Trigger View
- Versatile Trigger Selection
- Alternate Sweep

The 465B is an upgraded version of the reliable TEK 465. It offers improved trace selection which allows choice of Channel 1 and/or Channel 2, sum or difference, or A trigger view in any combination. This unit comes complete with operating manual.

### GR 1650A RLC BRIDGE \$249



A completely portable unit which measures resistance (1 m $\Omega$  to 11 M $\Omega$ ), capacitance (1pF to 1100  $\mu$ F), and inductance (1  $\mu$ H to 1100  $\mu$ H). Also measures D and Q. Accuracy is 1%. Has built-in 1 kHz oscillator and null detector.

### HP 204C/H20 OSCILLATOR \$199



- Rechargeable batteries
- Wide ranged oscillator, solid state and highly portable
- Frequency range from 5 Hz to 1.2 MHz
- Output is 5 V into an open circuit and 2.5 V into 600  $\Omega$
- Output impedance is 600  $\Omega$
- The output is variable with greater than 20 dB attenuation for an open circuit output of less than 50 mV RMS

### SIERRA 164B BI-DIRECTIONAL POWER MONITOR \$199



- Meter scales: 0-10, 0-25, 0-50 W; 1-20 VSWR
- 50  $\Omega$  impedance, primary line
- Comes with two elements: 25-250 MHz; 200-1000 MHz. Both have ranges of 10, 50, 100, and 500 W
- Works with type C, N, HN, LC, BNC, TNC, UHF 1-5/8 rigid line connectors
- Carrying case included!

# The 1991 CQ WW DX SSB Contest High-Claimed Scores

The following are SSB high-claimed scores. These are raw scores only, subject to verification.

## USA Single Operator High Power All Band

K1AR	5,396,202
KM1H	4,524,975
K4XS	4,394,124
WM5G	4,167,878
K3OO	3,826,578
K3ZO	3,285,150
N6BV/1	3,091,624
W3BGN	2,805,660
W9RE	2,776,431
W1PH	2,481,744
N2LT	2,424,495
N6KT	2,421,900
K2DM	2,333,145
N6AR/4	2,056,775
K3ZJ/8	1,617,984
AA6PG	1,492,092
W6UE	1,468,764
W2GD/1	1,390,830
K5MA/1	1,376,646
K3ZA	1,364,880
K2PS	1,328,297
DK2XX	1,312,965
K9ZO	1,255,340
AA2GO	1,229,436
W1NG	1,145,564
KE2NL	1,060,142
W1BR	1,054,235
W1OO	1,034,520
WB4PRX	1,021,383
K16CG	1,000,944

## 28 MHz

NR5M	478,830
W0UN	450,282
K1NG	420,624
KT4W	378,840
K5MR	332,210
WX9U	262,570
K9UWA	230,330
WE3C	222,159
WS9V	200,524
N8MSF	194,461
KF7VB	185,820
WX6M	181,684
AA0CR	181,536
K6OY	170,316
K1KNO	159,286
NY1L	158,286

## 21 MHz

K3RV/4	850,980
KW8N	556,374
WB9Z	552,532
WC6H	499,212
NX1P	457,864
KK9A	443,220
KC0D	423,598
N6RZ	364,350
KC9AL	330,480
N4CT	314,916
WA4QQV	293,058
WA8DXB	275,652
WA4ZBC	269,712
N4MO	247,902
N6YKL	247,000
K9BGL	244,745
WB5UDX	226,083
WJ7S	214,054
W1XS	186,956
W7FP	159,951

## 14 MHz

KS1L	515,406
KV4P	371,169
KC2X	314,560
W8TWA	185,440

W5FO	182,368
K9CAN	175,696
WV9Q/0	153,349
KF5QR	143,226
WA2UZI	141,665
K0OD	139,995
W0RRY/5	134,142
W8UD	101,115
W8ILC	100,402

## 7 MHz

KC7EM	263,048
KV0Q	194,327
N4ZC	108,250
KZ2I	40,326
KD9Q/0	36,864
K5NU	34,356

## 3.8 MHz

K1UO	105,609
K8PO/1	90,944
K7EG	80,800
W0CD	37,037
KQ3V	29,200
K4JEX	18,407
KM0J	18,270

## 1.8 MHz

AB4RU	4,725
AA4MM	2,700
W2FCR	1,600

## Low Power All Band

K7RI	1,286,946
K5RX	993,806
KX5Z	842,898
KG1D	769,880
W3UJ	603,630
K6XV	591,426
W3KXR	504,839
KD5GD	487,602
KB3TS	432,398
WM2D	422,712
KJ4TE	411,312

## 28 MHz

W0LSD	161,868
K2MFY	139,997
WB5CRG	111,875
KC4TIR	88,288
WB6MBF	83,754
W6EUF	81,290
WV5S	80,230
W9HLY	77,990
KB9BIB	75,221
KB9ABI	69,215
AC4HI/9	67,100
N3GPU	56,661
KA1SPO	54,366
KC6ETY/2	52,630

## 21 MHz

KC1SJ	398,025
NI5M	132,928
N7RO	119,952
KE2JO/4	105,564
WA4APM	104,520
KA1GTR	101,598

## 14 MHz

N4IJ	71,424
WB8ORV	28,428

## 7 MHz

N1XZ	27,455
------	--------

## QRP

WA2UUK	316,608
WM4Z/5	270,663
K5KLA	214,320
NY3Y	173,712
KB7VD	163,410
N3HHE	127,957
N9AW	112,344

K7GEX	89,870
W1OK	71,373
W5VGX	66,810
AA2U	59,616
KA8NRC	49,006

## Single Operator Assisted

N4RJ	4,089,010
K1ZM	4,014,325
K3WW	2,636,856
KC1XX	2,629,560
N4WW	2,520,903
W1RR	2,458,827
AK1A	2,307,016
N7AVK	2,162,322
N2MM	1,926,519
AA2DU	1,783,098
K1KP	1,648,620
WB2K	1,642,823
K1IU	1,569,856
WB2P	1,524,635
N3RR	1,501,215
W5KFT	1,487,398
AG1C	1,430,428
KK9V	1,381,856
W3HHG	1,243,410
K2WK	1,214,912
AA3B	1,151,280
K3ND	1,147,206
W3FV	1,082,708
KC1F	1,080,432
K8MR	1,040,156

## Multi-Operator Single Transmitter

K3LR	5,512,429
K1YR	4,792,752
N3RS	4,572,087
W6QHS	4,239,284
AA6TT/0	4,111,440
K5NA/2	4,062,062
W6GO	3,777,566
W3XU	3,685,500
W5WMU	3,197,400
W2HPF	3,093,460
N5RZ	2,957,626
KS9K	2,886,078
K1VR	2,808,276
NK7U	2,682,056
N2NU	2,512,948
KZ1M	2,437,871
W0CP	2,383,700
KA5W	2,320,731
K2SG	2,276,712
WB3FIZ	2,275,620
NQ0I	2,150,694
N6AW	2,134,809
NN3Q	2,106,038
N0ZA	2,035,104
K3YL	1,762,590
WA6IET	1,533,630
W4AQL	1,486,428
KC5DX	1,483,482
W2RR	1,482,048
WB8IFP	1,373,904
W4PRO	1,362,422
K3ANS	1,339,770
KI6X	1,337,031
AG6D	1,332,465
W6YX	1,164,932
KF0H	1,155,824
WA2MKM	1,131,696
K2OWE	1,048,312
K3IVO	1,035,333
W1BK	1,011,496
WA2C/3	1,003,000

## Multi-Operator Multi-Transmitter

N2RM	13,216,032
W3LPL	12,409,592

K1ST	10,610,844
W7XR	10,127,558
K2TR	8,950,995
N5AU	8,438,987
N6ND	6,948,864
KY1H	6,339,416
K8CC	5,804,688
NQ4I	5,492,631
NF2L	4,665,276
W3AP	4,408,340
W0AIH	4,275,191

## World Single Operator High Power All Band

CR3A	13,257,424
P40W	11,516,154
HC5R	10,516,662
OH1RY/EA8	9,468,270
9L1US	9,427,704
V29W	9,347,532
P40V	9,293,376
KP2A	7,851,618
ZB2X	7,401,950
J82A	7,267,392
6W7S	6,507,852
CE3FIP	6,189,120
RL2O	5,811,880
9L1SL	5,717,601
P29DX	5,330,160
KG4QQ	5,168,543
WR6R/KH6	5,105,985
5Z4BI	4,723,464
GW4BLE	4,457,115
H18A	4,136,349
CE3BFZ	3,856,860
V47KP	3,659,965
K1RX/BV	3,446,961
IR6L	3,178,664
YT1BB	3,436,884
V47NS	2,997,290
L33F	2,927,394
TI2MEN	2,656,455
TT0A	2,604,393
JE4VVM	2,495,983
EA7BA	2,419,533
HS0E	2,328,726
DJ4PT	2,281,644
VK2BEX	2,146,658
F6HLC	2,114,820
5U7M	2,046,928
UA9MA	1,891,892
VO1MP	1,867,533
JH5FXP	1,830,630
OH8LQ	1,814,540
6Y5X	1,795,640
GM0ECO	1,780,929
UB5EDU	1,685,448
XN4VV	1,679,954
DJ4AX	1,663,885
OH2PM	1,629,064
DL8PC	1,613,520
EA3OK	1,588,816
YU3HR	1,558,187
EA8DM	1,539,054
DU9RG	1,500,408
CU1AF	1,453,872
PA3FNE	1,448,808
XE2BEU	1,368,828
5V7JG	1,365,236
OY9JD	1,245,136
EA4CQT	1,193,876
JE5MCV	1,186,380
VE3AT	1,168,090
JJ1NNJ	1,134,580
CU3LF	1,131,760
HZ1HZ	1,127,828
G3LZQ	1,111,206
YV5CLK	1,092,896
CQ0A	1,051,830
SM5IMO	1,038,680
Z21HS	1,017,170
DJ3HJ	1,013,856

## 28 MHz

ZV5A	3,024,117
ZD8Z	2,360,136
ZY5EJ	2,125,200
HC1OT	2,068,028
CE6EZ	1,824,592
FR5DX	1,782,066
TI4CF	1,774,452
CE3DNP	1,770,556
ZS6WPX	1,464,460
VO1SA	1,381,913
LU1HOO	1,263,168
CQ4A	1,219,185
ZW5B	1,128,741
ZS6BRZ	1,020,048
L2Q	833,625
IT9A	801,220
JA5EXW	643,095
UF6VM	614,625
YV1EQW	608,546
JL1BLW	606,240

## 21 MHz

ZX9A	2,548,650
ZP0Y	2,133,068
FM6A	1,936,735
KG6DX	1,861,358
CT3M	1,855,722
9Y4VU	1,493,220
AP2SQ	1,381,392
VO1QF	1,212,848
7L1GVE	1,212,840
5Z4DU	1,166,375
JA0JHA	1,111,823
LU9AEV	1,026,324
JA8GYQ	918,480
Y63YL	876,645
OK1RI	805,896
VE7SV	752,946
OH1AU	746,200
CE2HI	743,654
TM1K	663,217
OH5TS	636,976
KH6XT	620,866
EA8LS	612,766
EA6FO	604,962
YU7AV	586,710
CE3DKZ	564,984
OH6NIO	543,306
YZ3A	534,686
LY2WW	518,760
VE7EIK	507,000

## 14 MHz

LZ5W	1,618,520
YW1A	1,393,846
ZY5EG	1,246,461
SM2EKM	955,749
TF3CW	822,300
YW5N	743,800
HA4XX	713,240
YT3E	658,060
LU1DF	575,210
CE0YAD	543,490
UA6LQ	542,320
HK3JH	529,750
OG7AB	518,150
JA1DXR	512,130
JG4AKL	497,670
KH6FKG	495,630
RV3ZA	480,470
PY3WW	469,620
LZ5G	463,130
CT0A	431,840
LZ6C	406,350

## 7 MHz

4Z4DX	852,550
ZF2JR	632,670
FG8Y	527,120
G3NLY	404,130
LU1IV	399,600
OH2AQ	219,310
JA2BAY	210,270



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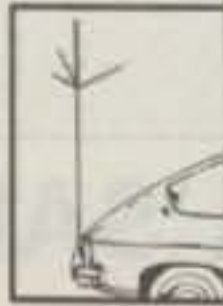
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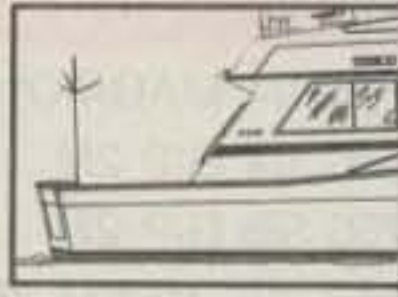
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SM6DOI	82,222
LZ5P	79,385
I5JHW	78,921
RA0FU	74,820
VE7FIE	69,552
EA3CUO	58,596
YO3JF	49,968

### 3.8 MHz

GW4OFQ	183,590
Y21CW	162,450
DL3LAB	122,194
ES5RY	116,958
VE3VN	102,305
YU3XU	97,020
XE3EB	92,750
YV5MRR	88,507
OH6RM	86,390
LY1BY	76,725
UC1AWK	55,699
SP8TQ	51,546
UI8ZAA	40,000
UB4QYA	37,887
IK5EKB	34,425
DL0WPX	34,176
RB5NS	33,062
IK5JAN	31,537

### 1.8 MHz

IV3PRK	28,864
EA3ALD	18,961
RY7D	17,500
OK1JDX	13,230
VE1ZZ	12,948
UC2IEF	10,948
F6AML	10,350
I5OYY	9,264

### Low Power All Band

ZC4BS	5,244,877
9M6RO	2,924,380
ZK1XC	2,215,343
LY3BX	2,107,140
JF1SEK	1,966,968
NH6T	1,934,998
PX1Z	1,810,710
P29KH	1,345,986
EA8BVH	1,230,876
EA3BKJ	1,121,324
EA3CWK	990,318
9Y4/KN4TX	922,167
CN8NS	907,616
VE3RM	905,000
EA7FTR	745,032
W8HNI/KP4	712,368
Y48PJ	712,194
7K1BWM/1	678,680
XT2BW	625,456
EA3GBU	605,440
CX3CE	601,354

### 28 MHz

Z21HQ	1,118,611
V47TV	857,934
Z21BL	844,074
J43A	444,288
LU2NI	435,666
ZY5IO	420,243
EA8BDW	381,990
YC3OSE	368,806
HK6HFY	327,420
VK2ARJ	317,499
EA8IN	301,440
AC4IG/HP1	301,395
JH8CLU	300,846
VO2AA	300,432

### 21 MHz

LU1ICX	493,608
I5NSR	480,144
VU2BIX	415,936
YT3SW	316,236

JH7LGJ	246,369
HS1ZEB	209,716
EA4DX	209,280
JQ1QET/JD1	209,024
VP2EE	190,872
JA7ZWD	176,732
JN1VOC	174,342
J17DUD/0	159,766
UL7OAG	150,080

### 14 MHz

VU2PTT	281,820
EA6AAX	272,272
JH0OBD	140,239
5N0RJM	127,335
JE2UFF	121,155
EA3AAY	110,288
EA3GCT	95,920
JA2NNF	89,948
LX1SG	83,646
RB5EG	83,210
OK3YK	81,852
JP1AVZ/JD1	80,712

### 7 MHz

HA9BVK	139,664
JA1LZR	32,311
JA0UMV	23,680

### 3.8 MHz

LZ1DM	47,872
OK3YCL	24,300
HJ6RXI	21,712
F6BVB	16,610
YO3RU	13,008
OK2HI	11,750

### 1.8 MHz

OZ3SK	19,372
OK3IQ	15,989
CT1AOZ	11,395
RV9WG	4,784

### QRP

4M1G	1,981,223
ZX5A	1,874,114
UA3DQH	450,822
TO1W	439,872
G4BUE	341,130
JA6VZB	267,729
IK1GKE	236,062
YU1KN	189,104
LY1DS	178,860
UA9SG	171,666
UW0SR	164,465
LZ2EW	148,925
LZ1OJ	117,782
OH5NHI	101,850

### Single Operator Assisted

IR8A	2,738,757
UT2L	1,783,400
ON4UN	1,523,334
DJ2YA	1,501,161
F6AOJ	1,320,170
DF3CB	1,262,226
7L1GVV/8	1,242,500
SM5IMO	1,103,220
F6FGZ	1,056,953
DF4RD	1,045,160
IQ2A	993,750
I2SVA	974,680
DL0LA	811,958

### Multi-Operator Single Transmitter

PJ1B	21,314,088
P40T	19,061,848
8P9Z	16,003,716
PJ7A	13,391,515
IQ4A	12,462,704
KH2S	11,119,332
6D2X	10,947,960
CR3M	10,410,486
5B4BCC	10,310,976
ZF8AA	10,305,372
EA9LZ	10,114,375
RY1U	10,007,028
LZ9A	8,896,642
VE3EJ	8,649,575
V85HG	8,463,824
J37H	8,081,910
C6AFO	7,927,731

FV7A	7,641,221
ZF2JI	7,350,480
4Z7M	7,246,176
F6GYT	7,181,298
GW8GT	6,585,736
L4D	6,265,186
Y34K	5,888,740
OK5W	5,582,970
PT7F	5,542,188
V31ZR	5,541,316
EI7M	5,539,824
VS6WO	5,393,146
CU20T	5,392,986
DL8OH	5,389,030
OH5NQ	5,265,939
UW2F	5,142,544
CK7C	5,001,750
5K6CO	4,783,347
LY2ZO	4,777,871
PP0F	4,765,117
WE5I/KH9	4,358,946
HZ1AB	4,282,725
YZ4Z	4,198,305
F1B	4,072,149
ED3MM	4,066,160
RZ1A	3,982,666
VP5X	3,900,050
BY1PK	3,828,990
HE7H	3,767,454
OK3KCM	3,583,424
JA7YAA	3,548,665
UB3IWA	3,544,605
XE1/NV1P	3,469,564
HG1S	3,450,492
V31X	3,439,100
OE2XEL	3,421,696
PS4B	3,397,229
I4AUM	3,336,718
ON6NL	3,284,820
G3NKC	3,105,797
VE6JY	3,051,454
RY0Q	3,016,080
ZW0JR	3,000,664
JE6ZIH	2,809,896
4A2MX	2,807,015
JA3YBF	2,742,579
CE2AA	2,739,529
6I2A	2,698,360
ZA1ZJ	2,608,400
PI4COM	2,508,649
5B4ES	2,508,350
LX6A	2,472,225
D73DX	2,471,760
VK1DX	2,434,244
VE2UMS	2,390,166
KH6GMP	2,314,026
HL9HH	2,295,549
IY8X	2,278,164
JH5ZCP	2,247,840
OH4JK	2,241,258
KH6GMP	2,213,156
ON7UN	2,183,888
UB4WZA	2,152,590
YV5NCJ	2,125,035
UC1AWC	2,042,326
H8KCK	2,029,580
JA3YKC	2,023,436
YB0ASC	2,008,958

### Multi-Operator Multi-Transmitter

VP9AD	28,404,558
KH0AM	25,680,480
ZA0RS	19,767,769
LU4FM	19,218,348
IZ3A	17,660,068
HG73DX	15,959,514
VC1DX	15,832,531
RH2E	15,602,637
J80D	14,689,532
G0KPW	12,430,589
TA3KC	11,512,452
R6L	10,660,857
4N31A	10,466,667
ZM2K	8,683,565
KL7Y	7,482,840
JE2YRD	7,232,400
4U1VIC	7,204,290
KL7RA	7,173,120
VE7ZZZ	5,541,855
ON7LR	4,695,789
JA7YRR	4,414,896
HB0/HB9AON	4,078,735
JA1YXP	4,025,550

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FRANK W. COOPER W3NV

October 15, 1991

Mr. Bill Sattler  
DX Engineering, Inc.  
618 Spaulding Ave.  
Brownsville, Oregon 97327

Dear Bill:

I thought you might like to hear about the results I have been having with your two super beams! As your records will show I have your 20 meter six element beam on the 58' boom and the 24 foot boom 11 element log periodic for 10,12,15 and 17 meters.

The performance has been nothing but spectacular. Words cannot describe the super results I have had with these two beams. I have heard and worked everything on the bands with only my exciter running 100 watts! Have no need for my linears even when the pile-ups for the 2A's and 3B7's were unbelievable the beams put me right through with the usual 5/9 plus reports!

I know location is important and most Florida spots are good but believe me the beams are doing a super job and it would be remiss not to write and tell you how pleased I am with my choice of antennas! Keep up the good work!

I might mention that I am quite surprised and pleased with the performance of the Log Periodic antenna. Never was too keen on that type of antenna but it sure does a super job and makes operating four bands just great. Your new 5 band log sounds great and I might have chosen that if it was available at the time of my purchases.

I am enclosing some better photos of the beams which I thought you might enjoy seeing. Thanks again for doing such a super engineering job on the antennas and it has made my dxing a real fun part of the hobby.

73 de W3NV  
*Frank W. Cooper*  
Frank W. Cooper

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enc: photos  
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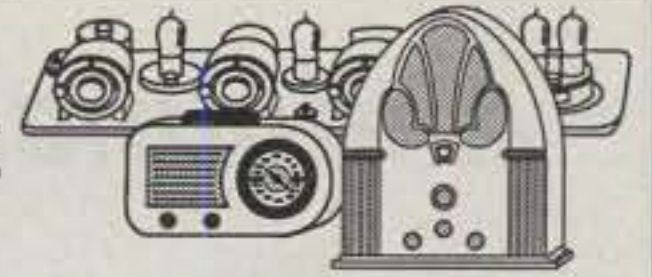
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IC-4KL 1 kW Amp	7275.00	Call \$
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IC-R71A 100 kHz - 30 MHz Rcvr	999.00	Call \$
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IC-R72 30 kHz - 30 MHz Rcvr	972.00	Call \$
IC-R100 100 kHz - 1856 MHz Rcvr	707.00	Call \$
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IC-2SRA, 2m, HT/Scanner	599.00	Call \$
IC-901 New Remote Mount Mobile	1199.00	Call \$
<b>UHF</b>		
IC-P4AT New 70cm HT	467.00	Call \$
IC-4SAT Micro Sized HT	449.00	Call \$
IC-4SRA, 70cm w/Scanner, HT	600.00	Call \$
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**Announcing:**

# The 1992 CQ World-Wide VHF WPX Contest

**Starts: 1800 UTC Saturday, July 11, 1992**

**Ends: 2100 UTC Sunday, July 12, 1992**

**I. Contest Period:** 27 hours for all stations, all categories. Operate any portion of the contest period you wish.

**II. Objectives:** The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the allotted 27-hour period, to promote VHF and above activity, to allow VHF and above operators the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF and above prefixes and Maidenhead locator grid squares for awards credits.

**III. Bands:** All authorized amateur radio bands above 50 MHz may be used.

**IV. Class of Competition:** (1) Single op fixed station. (2) Multi-op class I fixed station. (3) Multi-op class II fixed station. A fixed station is defined as one which is a regular home station location. You may operate from your home station or you may be a "hired gun" at another home station to qualify for a fixed station category. A multi-op class I station is one which operates on all authorized amateur frequencies above 50 MHz. A multi-op class II station is one which operates on four or less of the authorized amateur frequencies above 50 MHz. (4) Single op portable station. (5) Multi-op class I portable station. (6) Multi-op class II portable station. A portable station is defined as one which you set up away from a regular home station location. (7) Rover station. A rover station is one which is manned by no more than two operators, must travel to more than one prefix and/or grid square, and must sign "rover" or /R. The spirit of this class is to encourage operation from rare grid squares by persons who are inclined to do so. It is not the intent of this class to encourage one operator to move from one super station to another super station in another prefix or grid square in order to compete in this category.

**V. Exchange:** Callsign and Maiden-

head locator grid square (4 digits—e.g., EM15). Signal reports are optional and need not be included in the log entry.

**VI. Multipliers:** The multiplier is the number of different prefixes worked plus the number of different grid squares worked per band. A "Prefix" and a "Grid Square" are counted once per band. Exception: The rover who moves into a new grid square or prefix can count the same prefix and/or grid square more than once per band as long as the rover is himself or herself in a new prefix or grid square location. Such change in location must be clearly indicated in the rover's log. It is required that rover category operators maintain separate logs for each grid square and/or prefix location.

**A.** The letter/number combinations that form the first part of the amateur callsign are considered the prefix. *Examples:* N8, Y22, WB3, ZS65, etc. Any difference in the numbering, lettering or order of prefix will form a separate prefix. An operator on the air from a DXCC country different from his or her callsign is required to sign portable. The portable prefix must be an authorized prefix of the country or call area of operation. In the portable operation, the portable designator becomes the prefix. *Example:* N8BJQ, operating from Wake Island, signs N8BJQ/KH9 or KH9/N8BJQ. Conversely, KH6XXX, operating from Ohio, cannot sign /KH8 which is American Samoa's prefix. Nevertheless, that operator can sign /W8, /N8, /K8, etc., or any other prefix authorized in the US 8th call district. However, if the license you are issued designates a prefix as part of the callsign, that is the prefix you must use. *Examples:* W4/G0XYZ counts as W4; VP2M/N6CL counts as VP2. Portable designators without numbers will be assigned a zero (0) after the second letter of the designator to form the prefix. *Example:* WA4VCC/PZ becomes PZ0. All callsigns without numbers are assigned a

zero (0) after the first two letters and/or numbers that form the prefix. *Examples:* 9NGHK counts as 9N0; RAEM counts as RA0. Aeronautical mobile (/AM), maritime mobile (/MM), mobile (/M), /A, /E, /J, /P, /R, or other portable or interim license class identifiers (/KT) do not count as prefixes.

**B.** A station in a call area different than that indicated by his or her callsign is not required to sign portable. However, the prefix of that station can be counted only once, and then only for the actual prefix. *Example:* N6CL is permanently located in Oklahoma (grid square EM15). However, N6CL chooses not to sign N6CL/5. If you work N6CL, you count the prefix only as N6, not N5, or N6 and N5.

**C.** The rover who changes location during the course of the contest is free to contact as many other stations as he or she wishes. The rover becomes a new QSO to the stations working him or her when the rover changes either grid square or call sign district and indicates the change in prefix. *Example:* K5CPZ operates from EM16 in Oklahoma. When you work her you count the grid square (EM16) and the prefix (K5). While in Oklahoma she moves to EM06. You work her again. You then can count her from the new grid square (EM06). When she moves into Kansas and signs K5CPZ/0 from EM07 you work her again. You then can count the grid square (EM07) and the prefix (K0). Assuming you work her only on one band, you may claim credit for three QSOs with the potential of five multipliers (EM16, EM06, EM07, K5, and K0) presuming you work no one else with the same prefix or in the same grid square. She, in turn, is able to count you as three separate QSOs and whatever multipliers you give her. That is, she can count you prefix and your grid square each time, for a total of six multipliers, assuming you stay in one location.

D. The grid square is the Maidenhead grid locator to four digits (FM13).

E. Special event, commemorative, and other unique prefix stations are encouraged to participate.

**VII. Scoring:** One point per QSO on 50, 70, and 144 MHz; 2 points per QSO on 222 and 432 MHz; 4 points per QSO on 903 and 1296 MHz; 6 points per QSO on 2.3 GHz and above. Work stations once per band, regardless of mode. Multiply total QSO points times total number of prefixes (PX) plus the total number of grid squares (GS) worked. This differs from the scoring for the CQ HF WW WPX Contest, where a prefix counts only once regardless of band (and, countries, rather than grid squares, are the multipliers). Contest entrants may not transmit on 146.52 MHz, or your country's national 2 meter FM simplex calling frequencies, or commonly recognized repeater frequencies for the purpose of making or requesting contacts. Contacts made within your own country, in the DX window of 50.100-50.125 MHz, are discouraged. Contacts made on the SSB calling frequencies of 50.110 MHz, 50.125 MHz, and 144.200 MHz are discouraged. Contest participants are required to use UTC as the logging time.

**Incentive scoring:** Operators completing two-way CW or MCW contacts may add one point to the QSO value for each contact.

*Example:* W1XX works stations as follows:

37 QSOs, with 3 QSOs on CW ( $34 \times 1 = 34$ ;  $3 \times 2 = 6$ ;  $34 + 6 = 40$ ) and 12 PX's and 10 GS's (22 multipliers) on 50 MHz.

45 QSOs ( $45 \times 1 = 45$ ) and 18 PX's and 8 GS's (26 multipliers) on 144 MHz.

26 QSOs ( $26 \times 2 = 52$ ) and 10 PX's and 4 GS's (14 multipliers) on 222 MHz.

38 QSOs ( $38 \times 2 = 76$ ) and 11 PX's and 5 GS's (16 multipliers) on 432 MHz.

2 QSOs ( $2 \times 4 = 8$ ) and 2 PX's and 2 GS's (4 multipliers) on 903 MHz.

6 QSOs ( $6 \times 4 = 24$ ) and 3 PX's and 2 GS's (5 multipliers) on 1296 MHz.

W1XX has 245 QSO points ( $40 + 45 + 52 + 76 + 8 + 24 = 245$ ) x 87 multipliers ( $22 + 26 + 14 + 16 + 4 + 5 = 79$ ) = 21,315 total points.

**VIII. Awards:** Engraved trophies will be awarded to the top-scoring stations in each category in the world (for a total of seven trophies). Certificates suitable for framing will awarded to the top-scoring stations in each category in each continent. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Certificates will be awarded to top scoring stations in each category in geographic areas where warranted. Geographic areas include states (U.S.), call areas (Japan), provinces (Canada), and countries, and may also be extended

to include other subdivisions as justified by competitive entries.

**IX. Miscellaneous:** An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location. All contacts above 300 GHz must use coherent radiation on transmissions and employ at least one stage of electronic detection on receive. A station located exactly on a dividing line of a prefix and/or a grid square must choose only one grid square and/or prefix from which to operate for exchange purposes. A different multiplier cannot be given out without moving the complete station at least 100 meters.

**X. Log Submissions:** This is a new contest with new log sheets. Therefore, old log sheets are no longer usable. You must request new log sheets from: **The CQ VHF WPX Contest, CQ Magazine, 76 N. Broadway, Hicksville, NY 11801.** Please include an SASE with your request.

Completed logs must be postmarked no later than August 31, 1992 to be eligible for awards. All logs should be mailed to: Joe Lynch, N6CL, VHF WPX Contest Chairman, P.O. Box 73, Oklahoma City, OK 73101. Logs may be submitted on disk, provided a hard copy of the log is sent with the disk and the data is in an ASCII format compatible with an IBM-PC type computer.

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CIRCLE 65 ON READER SERVICE CARD



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The MFJ-247 is a multi-purpose instrument for tuning HF beams, verticals, dipoles, and mobile antennas for lowest SWR at the desired frequency. The fully self-contained unit shows an antenna's SWR over the entire band and works without additional equipment. Simply plug in the antenna to its top SO-239 socket, set the MFJ-247's readout to the frequency you wish to operate, and read the SWR directly on its meter. Unit reads SWR directly from 160-10 meters, and also reads frequencies with high accuracy to 150 MHz. It has a separate BNC input connector for use as a frequency counter (has one PPM accuracy).

The MFJ-247 carries MFJ's one full year unconditional guarantee and sells for \$189.95. For more information, contact MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (601-323-5869; FAX 601-323-6551), or circle number 104 on the reader service card.

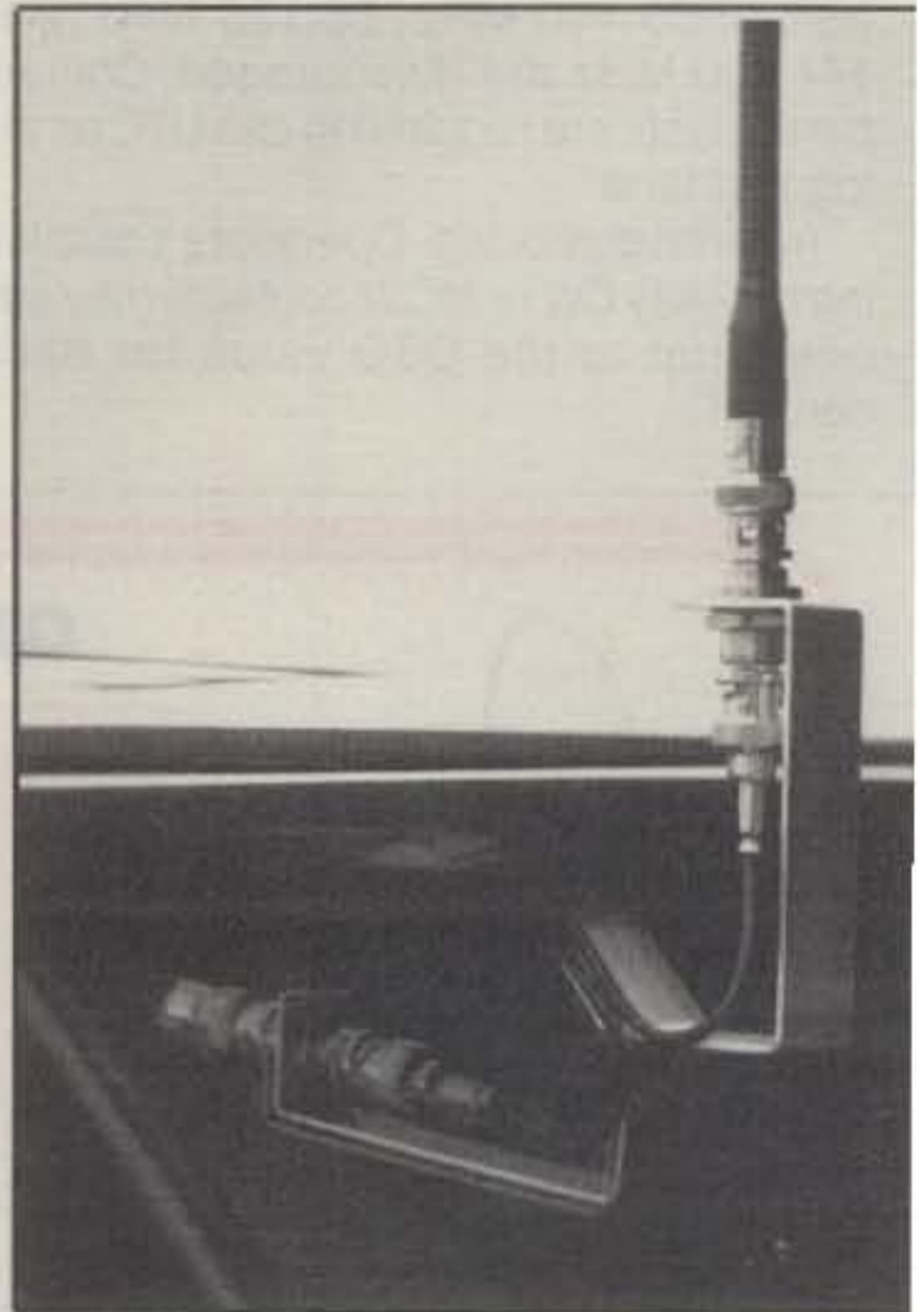


## Azimuth WeatherSTAR Computerized Weather Stations

The new Azimuth WeatherSTAR Generation II Stations feature expanded state-of-the-art capabilities with virtually all weather functions available to the user: wind, temperature, rain, humidity, and barometric pressure. At your option you can add rain, outside humidity and dew point, and computer interface capabilities. WeatherSTAR Wizard II includes all of the most

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Following are special introductory prices. WeatherSTAR Wizard II is \$199.95 (after July 1, 1992 \$259.95) and WeatherSTAR Monitor II is \$299.95 (after July 1 \$399.95) plus shipping and handling. For more information, contact Azimuth Communications Corp., Dept. CQ, 3612 Alta Vista Ave., Santa Rosa, CA 95409 (800-882-7388 or 707-577-8007; or FAX 707-573-1482), or circle number 103 on the reader service card.

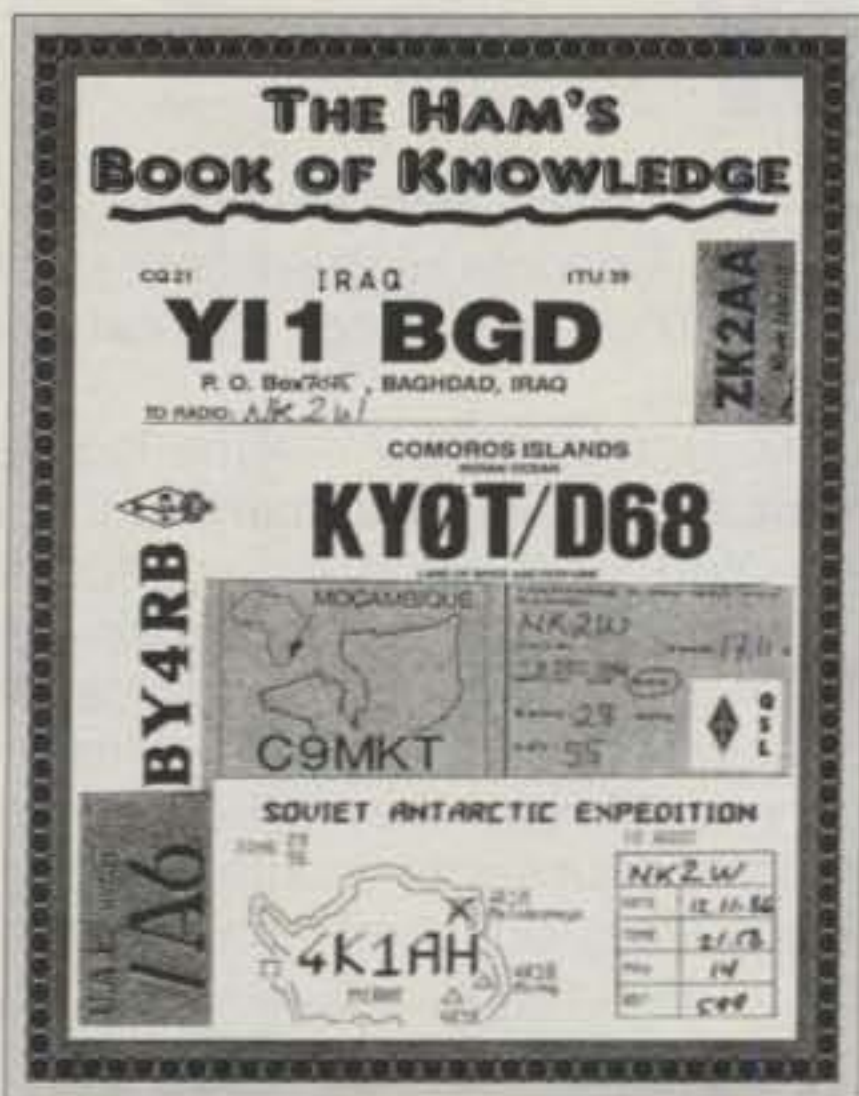


## Window Antenna Mount From Trionics

Trionics' new Window Mount Antenna, Model BWM-1, is designed to get the user's antenna out of the car and above most roof lines. The rugged metal mount fits into the car or truck window for temporary mounting of handheld antennas, such as the rubber duck. The almost 4 inch height to the top of the connector is an aid in extending the range of the handheld's signal to local repeaters. The mount features a dual BNC type connector which allows the user to use his own coax or the optional Model BC 6-174, a 50 ohm, 6 foot, BNC-BNC, small coax cable.

The BWM-1 is priced at \$13.95, and the BNC 6-174 cable is \$10.95. Both the mount and cable are available as a combined package for \$23.00. For more information, contact Trionics, P.O. Box 1434, Rancho Cordova, CA 95741-1434 (916-366-7408), or circle number 106 on the reader service card.

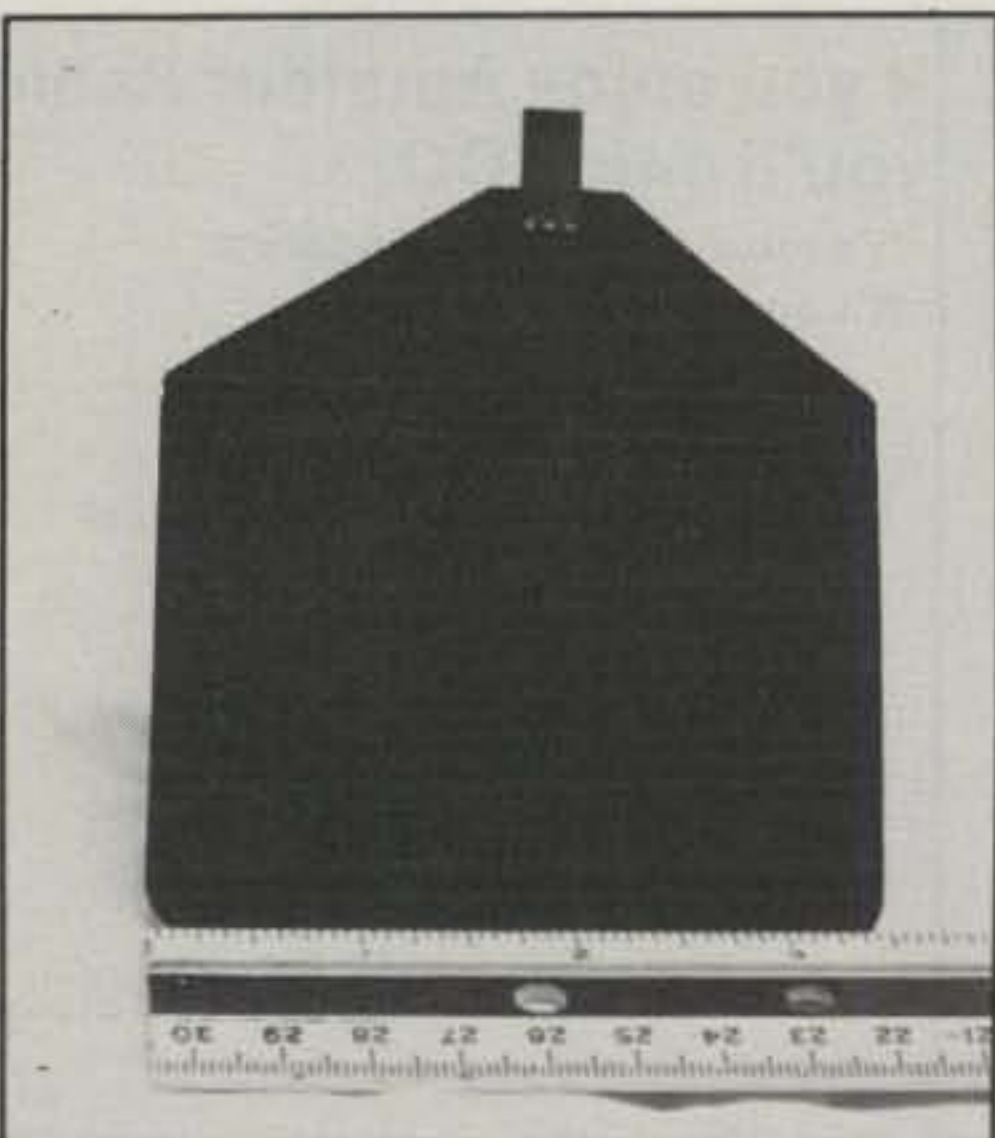




### "The Ham's Book of Knowledge" From In-Phase Publications

The Ham's Book of Knowledge is written by hams for hams and features personalized beam headings; DX operating information; operating and safety tips; formulas and conversions; QSL information; a comprehensive list of dealers, manufacturers, and equipment; two sorted worldwide prefix cross-reference lists; awards and certificates available; and more.

The book can be purchased for \$21.95 plus \$4.00 shipping (US funds) worldwide. For more information, contact In-Phase Publications, 4665 E. Palo Brea Lane, Cave Creek, AZ 85331-5822 (602-585-6121; FAX 602-585-6120), or circle number 101 on the reader service card.



### j•Com Stealth Antenna

The Stealth Antenna from j•Com is available in models for 146, 220, and 440 MHz, and is a 3½ inch square of 0.003 inch thick copper-clad polyimide coated with a noncorrosive graphite colored coating which adheres to the inside of a car windshield. It looks so much like a decal that it is even available with an optional printed warning symbol to deter would-be thieves and vandals. The antenna is multipolarized to reduce QSB, and the antenna presents a low SWR over the entire band and requires no adjustments or tuning.

The standard model can handle 50 watts of input power and costs \$59.95 including shipping in the continental USA. A high-power version capable of handling 110 watts costs \$69.95. Six-

teen feet of RG-58U coax is included. For more information, contact j•Com, Box 194, Ben Lomond, CA 95005 (408-335-9120; FAX 408-335-9121), or circle number 105 on the reader service card.

### K-COM RF-1 Coiled Cord Filter

The Model RF-1 Coiled Cord filter from K-COM uses mini-modular connectors for easy insertion in the coiled cord between telephone base and handset. The new design provides a convenient method of blocking RF from either the telephone handset or base. Telephones with touch-tone pad, dialer, and other electronics in the handset are protected best with filter insertion at the handset. Insertion at the base is recommended for telephones of traditional design.

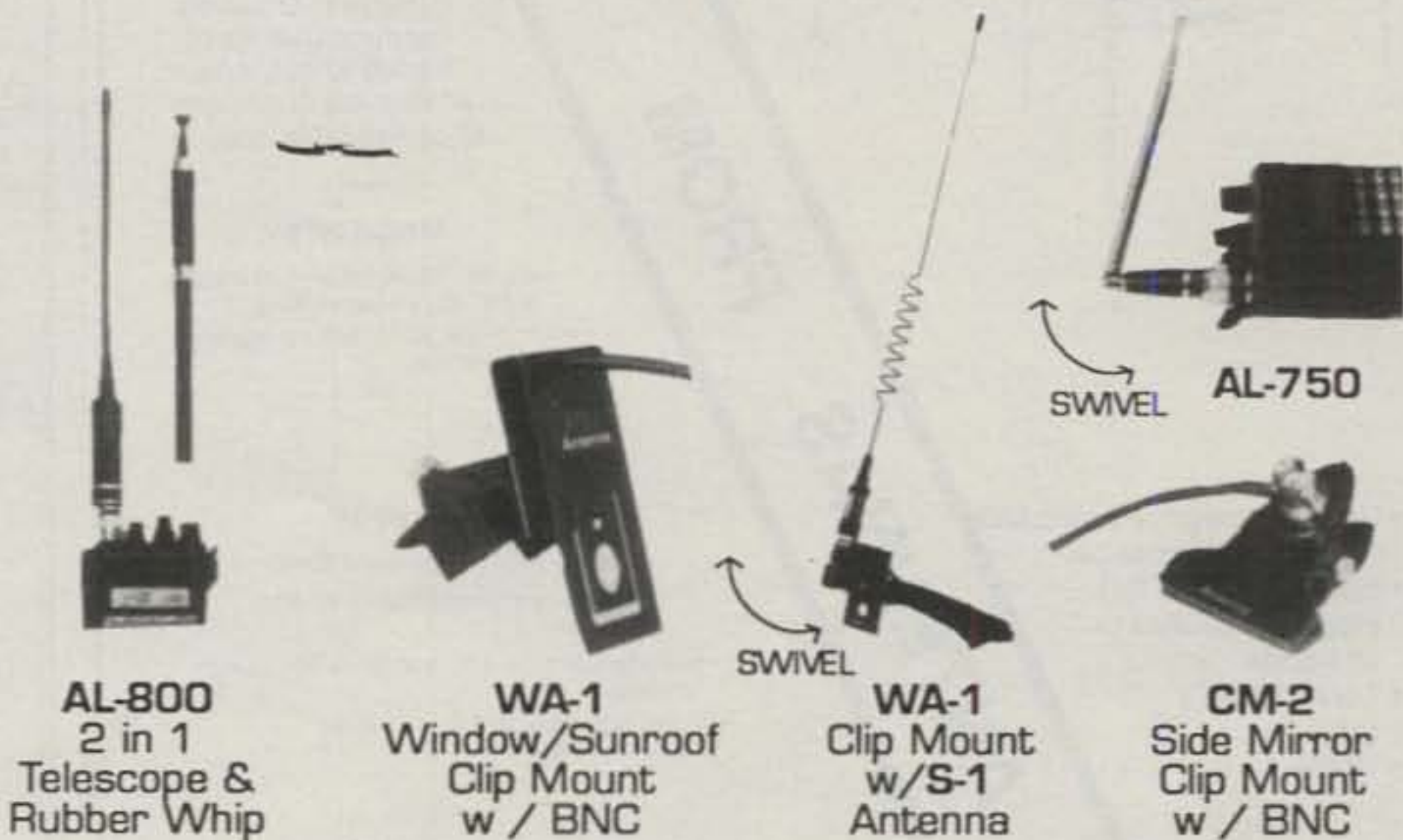
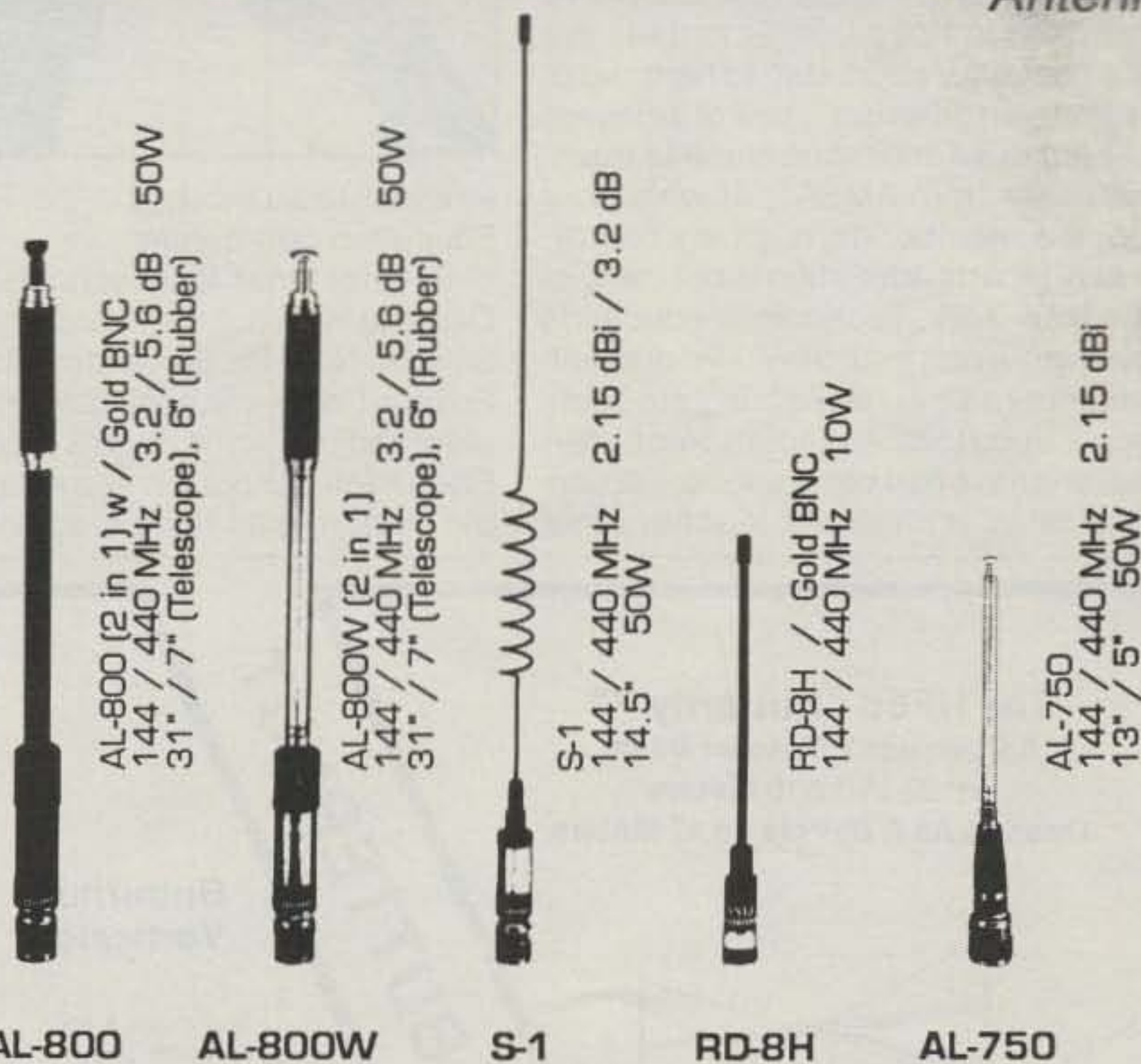
The Model RF-1 Coiled Cord filter introduc-



tory price is \$19.95 plus \$1.50 shipping and handling. For more information, contact K-COM, Box 82, Randolph, OH 44265 (216-325-2110; FAX 216-325-2525), or circle number 107 on the reader service card.

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CIRCLE 87 ON READER SERVICE CARD

# OUR READERS SAY

## Hams in the Classroom

Editor, CQ:

This letter serves as a brief introduction to the Unatego (NY) High School Amateur Radio Club.

In 1985 I initiated a club here using a mini-grant of \$500.00 to purchase an antenna and an HF radio. Soon after, my partner, Rodney Gould, applied for and received a \$100,000 legislative grant to be used to set up a model Technology Education Classroom. Over two years, we used close to \$9000.00 of that money to set up what I considered at the time to be a state-of-the-art amateur radio station as part of the model classroom.

We can do satellite work, HF work, and 2 meter work. We're also on packet. We've licensed around 20 students to date. We have a computer dedicated to ham radio, with about ten different types of software on its hard drive, including satellite tracking software from AMSAT, of which our school is a member (through my name).

Industrial Arts education is out the window in New York. Technology education is now the current mainstay. I've presented amateur radio at New York State Technology Educators Association conferences, and have had some success at convincing other technology teachers that



amateur radio belongs in the Technology Education curriculum.

Several other local schools, including Oneonta High School, Worchester Central School, New Berlin Central School, and Roscoe Central School, have initiated amateur radio to some degree. Spencer Van- Etten High School will see an amateur radio station in its technology department

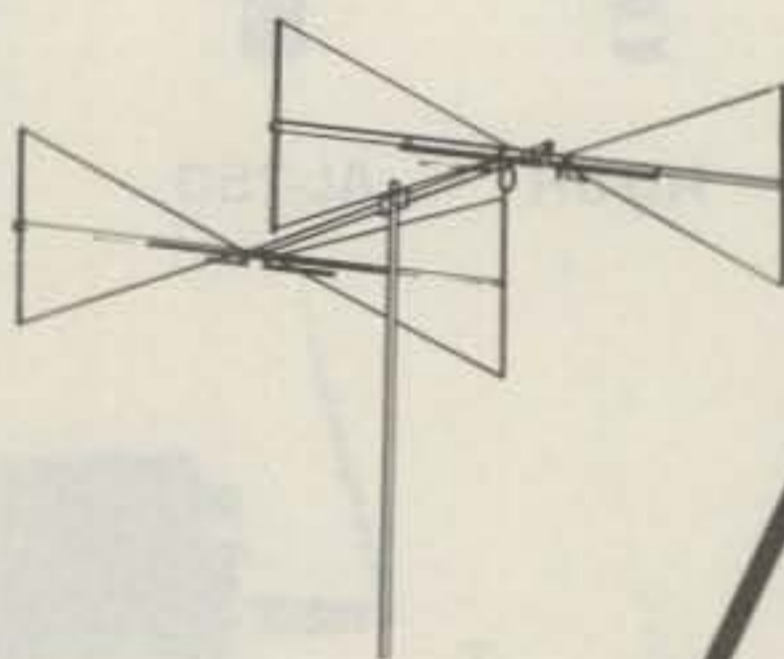
next year, along with reactivating its own call sign. Oneonta High School's station is also in the Technology Education Department.

Mr. Gould, who wrote the legislative grant application, was named the 1990 New York State Technology Educator of the Year. My school board just gave me an award for achievement, which carries as much weight as school district teacher of the year. Most of the work I did that won me that honor had to do with the new technology classroom and more importantly, the stories the board members heard about the amount of time I put in with kids related to amateur radio!

Publishing what we have done is important to amateur radio, but will also be important to where amateur radio fits in with education in New York. Many other states will be watching New York over the next few years. If amateur radio can find an abode in technology classrooms, then when school districts begin to stock their facilities and hire staff, they will be looking for amateur radio equipment and teachers who are also licensed hams. Both needs are good for amateur radio.

Paul Agoglia, WN2K  
Oneonta, NY

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- Designed for the low-band DXer
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MFJ-9020

**\$179<sup>95</sup>**

- 15 Meter and other bands available soon
- Free MFJ-9020 manual
- Unconditional Guarantee for one full year



knob set. Machine screws and pressed-in PEM nuts are used — not sheet metal screws.

Has power-on LED, transmit LED and SO-239 coax connector for antenna.

**Designed by Rick Littlefield, K1BQT**  
The MFJ-9020 was designed by Rick Littlefield, K1BQT. He's known worldwide for his

Throw this tiny CW rig in a corner of your briefcase and enjoy DXing and ragchewing wherever you go.

You'll turn lonely nights into exciting adventures as you contact fellow amateurs around the world.

20 Meters is open day and night so you can operate whenever you have a free moment.

With 5 watts you'll have plenty of power to work the world even with a makeshift antenna.

At home with a good dipole, vertical or beam, you'll be able to work almost anyone you hear — can you imagine earning DXCC with 5 watts?

**Big gun DX'ers:** Try a new DX challenge for the price of a simple station accessory.

It's good enough to be your only rig — you get a high performance superhet receiver, razor sharp 8-pole crystal filter, RIT, AGC, vernier tuning, sinewave sidetone, built-in speaker, headphone jack, adjustable semi-break-in, up to 5 watts output plus much more.

Covers lower 20 Meter CW band, 14.000 to 14.075 MHz. 6x6½x2½ inches. Weighs 3/4 lb. Uses 12-15 VDC. Optional plug-in Curtis chip keyer, narrow audio filter, antenna tuner, power pack and antenna.

## High Performance Superhet Receiver

You get a high performance superhet receiver with a selective double tuned front end and double-balance mixer. It's sensitive enough to copy weak DX signals down to the noise floor yet resist overload when a strong local comes on.

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You'll slice through QRM and pull weak tones out of the mud with an 8-pole crystal filter that gives you razor sharp selectivity with steep sided skirts.

## Instant Recovery AGC Circuit™

Weak DX signals are just as loud as strong local ones because the MFJ-9020 graceful Automatic Gain Control (AGC) keeps your

audio level constant.

You get smooth break-in operation because MFJ's exclusive *Instant Recovery AGC Circuit™* gives you *instantaneous* transmit recovery.

## True Receiver Incremental Tuning (RIT)

True Receiver Incremental Tuning (RIT) lets you dodge QRM and compensate for other's drift without moving your transmit frequency.

## MFJ Integrated CW Station

Transceiver, tuner, power pack fastens together to form tiny 6x6½x8½ inch integrated CW station.

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MFJ-9120B

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buys complete MFJ CW Station. Includes MFJ-9020 transceiver, MFJ-971 tuner, MFJ-4114 power pack, MFJ-1760 antenna ... order MFJ-9120B. \$369.80 if purchased separately (keyer and filter not included.)



## Enough Power to Work the World

With 5 watts you'll have plenty of power to work the world even with a makeshift antenna.

You can use any antenna with an SWR up to 3:1. The MFJ-9020 is rugged enough to withstand momentary antenna opens or shorts without damage.

If you're really into QRP you can reduce your power down to milliwatts.

A pleasing *sinewave* sidetone lets you monitor your sending.

You also get quiet adjustable semi-break-in and adjustable automatic transmit offset.

You'll get hours of battery operation — draws only 50 ma. receive, 1 amp transmit.

## Looks Great!

The MFJ-9020 is housed in an attractive matte-black aluminum enclosure with a deluxe brushed-aluminum front panel and matched

reliable high-performance transceiver designs and countless articles.

K1BQT has given careful attention to board layout, heatsinking, mechanical rigidity, voltage regulation and component selection to ensure stable operation and long-term reliability.

It meets or exceeds all FCC requirements.

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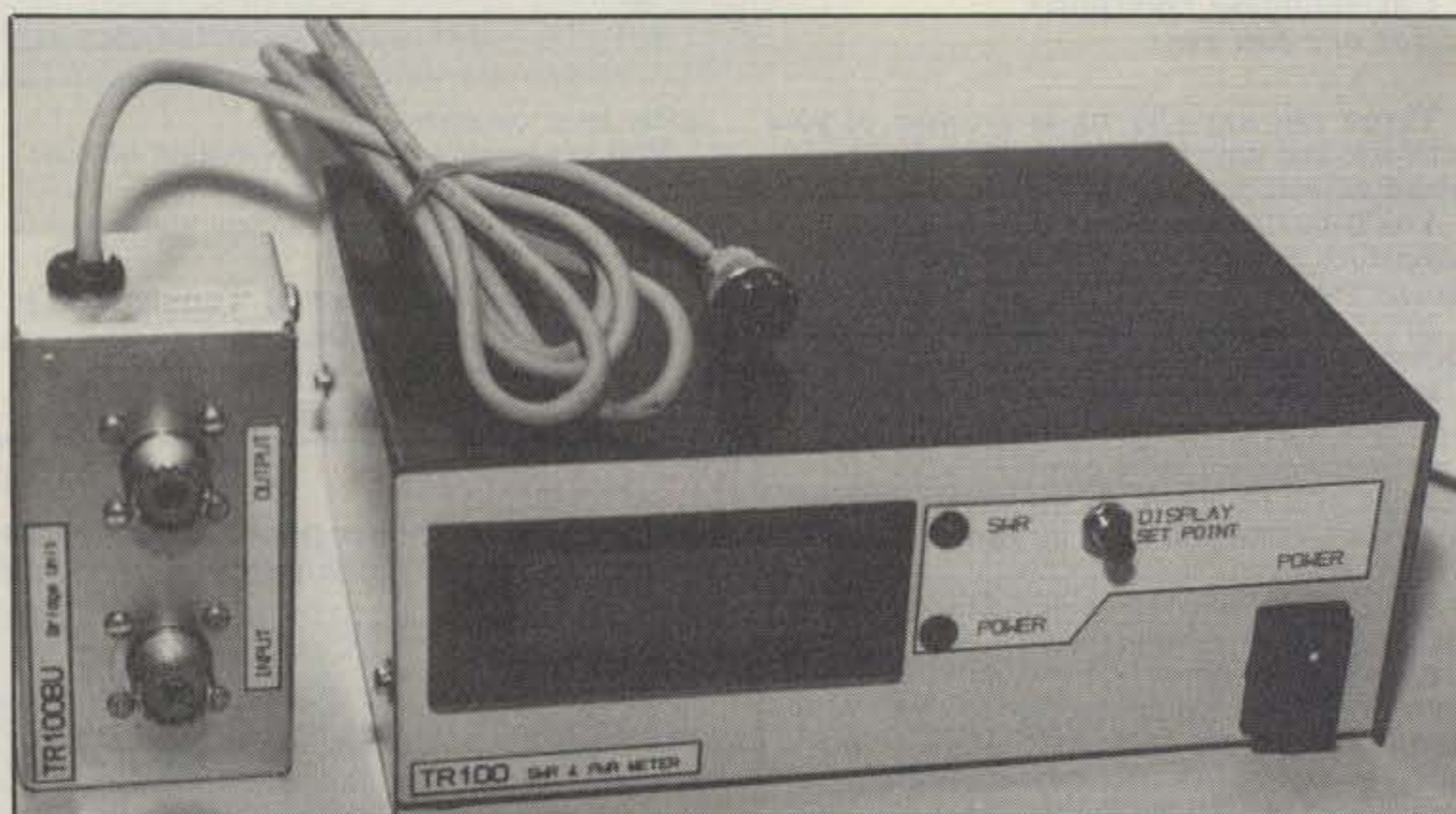
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# CQ REVIEWS:

## The Rupp Enterprises TR100 Power Bridge

BY LEW McCOY\*, W1ICP



Here is the Rupp TR-100. At the left is the bridge proper, which can be mounted remotely. The photo doesn't do the LED readout justice, because in actual use it is very clear and easy to read.

I have had a strong interest in SWR and RF power output indicators ever since I built the first Monimatch back in the 1950s. Rupp Electronics (owner Tom Rupp, KU8T) has chosen a new and novel approach to both the display indicator and sampling electronics. We old timers grew up with standard panel-type meters, but over recent years the swing has been to LED displays. That is what the TR100 power/SWR bridges use. The actual numerals to display either power or SWR readings are LEDs which are 0.7 inches high. These are rather large LEDs and consequently are very easy to read.

The heart of the TR100, or rather two hearts, is the actual bridge, and then the solid-state sampling network. The bridge is similar to the device originally designed by Warren Bruene (who worked at Collins Radio at the time). The circuit uses a non-frequency-sensitive sensing device that samples the forward and reflected voltages. This circuit can be used to very accurately measure power output, reflected power, and of course, the standing wave ratio—doing it from 1.8 through 30 MHz.

The power output is displayed on the LEDs in a range of from 1 to 1625 watts(!). The SWR portion will provide indications of from 1 to 1 all the way up to 25.5 to 1. The power sampled in the bridge unit is fed to an 8748 computer chip, where several actions take place. First the power is sampled for amount and SWR several hundred times every one-half second. It holds the worst-case value of SWR and highest pow-

er value and then updates this information every half second. This therefore is a practical peak power indicator.

Why hold the worst-case SWR? Because the TR100 has a very useful and important feature. Many pieces of modern equipment will not tolerate a badly mismatched condition of SWR (or load). In the TR100 you can adjust some set points (16 of them) so that an alarm will sound if the SWR exceeds the set value. The instrument can be set in various steps from 1 to 1, up to 4 to 1 SWR. If your SWR goes to more than the set point, a built-in beeper will sound. There is a small push button on the front panel which when pushed shows the SWR setting for the alarm to sound.

I cannot emphasize enough the importance of the above feature because very costly damage can (and does) occur with antenna or feeder problems, or Transmatches being accidentally mistuned. The unit can be locked into reading SWR or power—or both—via a switch on the rear of the indicator case.

As you can see from the photo, the bridge can be set up remotely, and it is connected via an appropriate length of 50 ohm coax which plugs into the rear of the indicator unit. The main enclosure measures 6 inches deep, 8 inches wide and 3 inches high.

Tom Rupp markets the TR100 built and tested for \$210.00 or in kit form for \$159.00. In kit form the bridge is furnished built and tested. If you don't want the LED display (provided you own meters), the kit is available for \$124.00. The TR100 is available from Rupp Electronics, 5403 Westbreeze Terrace, Fort Wayne, IN 46804 (219-432-3049).

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

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THINGS TO LEARN, PROJECTS TO BUILD, AND GEAR TO USE

## Ideas From The Twilight Zone

I find that a lot of ideas and schemes designed for other people and other communication services are often of great interest to radio amateurs—if they only had knowledge about these innovations. Here are some interesting techniques gleaned from magazines and other sources dealing with communication innovations that may be of interest to the readers of this column.

### Noise-Free Compatible AM Radio

"Summertime, and the static is heavy." Maybe that's not the way the song goes, but it is certainly true, especially in the midwest with its plethora of summer thunderstorms. An idea was launched a few years ago for noise-free AM, which might have definite advantages for amateur use on, say, 160 meters which is almost wiped out by summer static. The concept is shown in fig. 1.

The transmitter delivers a 90% amplitude modulated signal, which in addition has FM superimposed on the carrier with plus or minus 3 kHz deviation. The "static-free" receiver is a conventional AM superhet having an intermediate frequency of 428 kHz. The IF signal is passed through a "times 25" multiplier to produce a resultant signal at 10.7 MHz (the standard FM IF channel). This signal is converted to audio in a conventional FM detector/audio circuit. The signal may also be received in the normal fashion on a regular AM radio.

48 Campbell Lane, Menlo Park, CA 94025

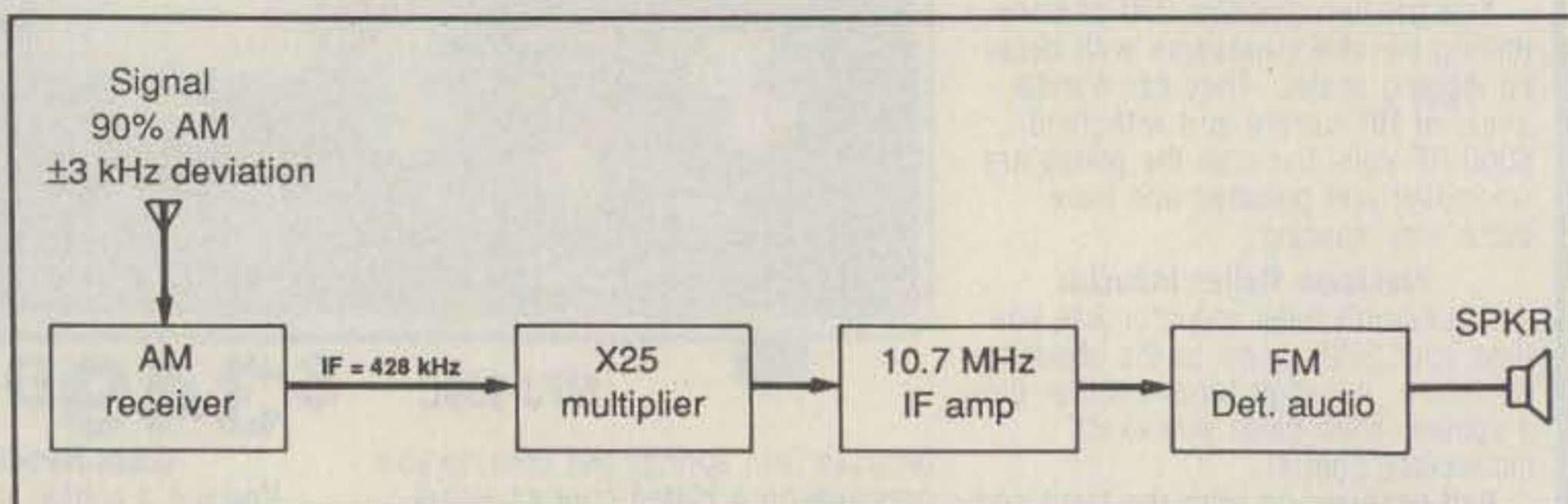


Fig. 1— "Noise-free" compatible AM receiver.

A second scheme is shown in fig. 2. The transmitter delivers an AM signal which is 90% amplitude modulated, also having FM added to it with plus or minus 1 kHz deviation. The IF channel is 455 kHz. A "times 75" multiplier produces a 34.125 MHz signal which is mixed with a local oscillator (23.425 MHz) to provide the conventional 10.7 MHz FM IF channel. The IF amplifier and FM detector are conventional.

An interesting concept! It would be fun to move the system up to the 160 meter band and give it a try. An old DX-100 or Viking II could easily be modified to FM the oscillator. The receiver would have to be built of various modules. Maybe I'll try this idea this summer. (Sorry I can't give more details about the source of this material. Part of my file was lost a month or so ago, so apologies to the inventor of the idea and the publication in which I saw it!)

### A Broadband HF Antenna

This antenna was described in the March 1992 issue of *RF Design* magazine. It was

designed at the U.S. Army Communication and Electronics Command, Ft. Monmouth, New Jersey apparently in 1985. It is a vertically polarized, terminated log-periodic-type array designed for quick erection in the field (fig. 3). It is designed to cover the range of 2.0 to 30 MHz.

Other field-expedient antennas investigated by the Army were the dipole, the terminated dipole, the terminated sloping vee, and the long-wire beverage. All of them had problems such as size, frequency sensitivity, or poor angle of radiation. The solution to the problem was a zig-zag antenna that had similar impedance and radiation characteristics as a log periodic array. This array is quite small for the frequency span it covers, and the small size limits the gain to about that of a dipole.

The primary objective was to design a broadband, directional, low-angle sky-wave radiator that is extremely small, easy to erect in a minimum of time, and inexpensive.

The final design was a zig-zag wire whose sections are of a predetermined increasing height. The far end of the wire is

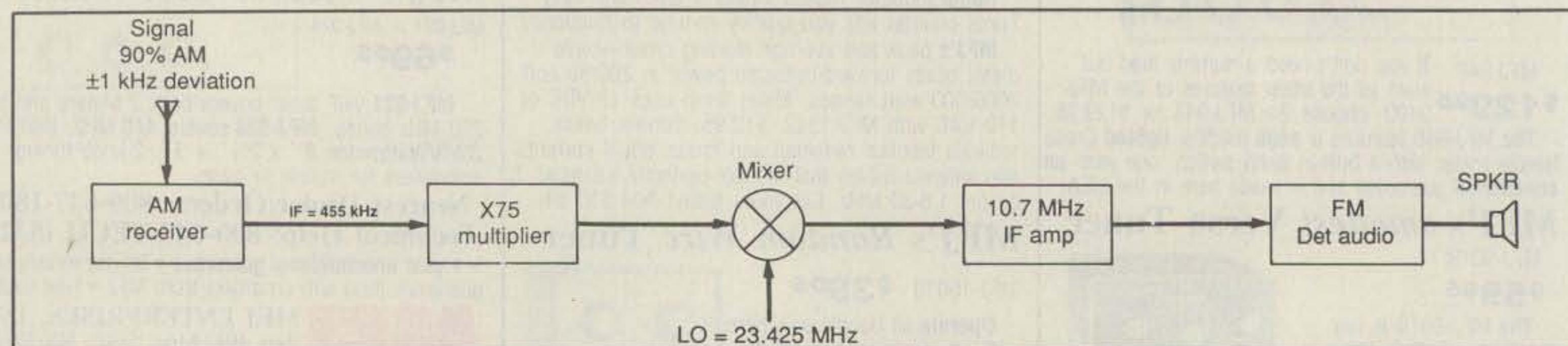


Fig. 2— Advanced "Noise-free" receiver.

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terminated to ground. A ground counterpoise wire is utilized to balance the system. Power is coupled to the shortest zig-zag section by a nine-to-one broadband balun.

The angle of elevation above the horizon averages about 30 degrees regardless of operating frequency within the antenna operating range. Performance plots for 2, 10, and 30 MHz are shown in figs. 4, 5, and 6.

I hope to have some physical dimensions and construction data for this interesting antenna in my next column. Stay tuned.

## FM Intermodulation Effects

The December 1991 issue of *Broadcast Engineering* discusses a problem which could possibly show up when two or more VHF or UHF amateur repeaters are operating in the same area.

"Imagine you are driving down the highway and the signal from your FM station disappears as if you were entering a tunnel—only there is no tunnel." That's how the article describes the effects of FM intermodulation. This complicated phenomena occurs when two stations' signals interact inside the listener's receiver.

This interference was noticed in 1988 when WKLX-FM (Rochester, NY) moved its

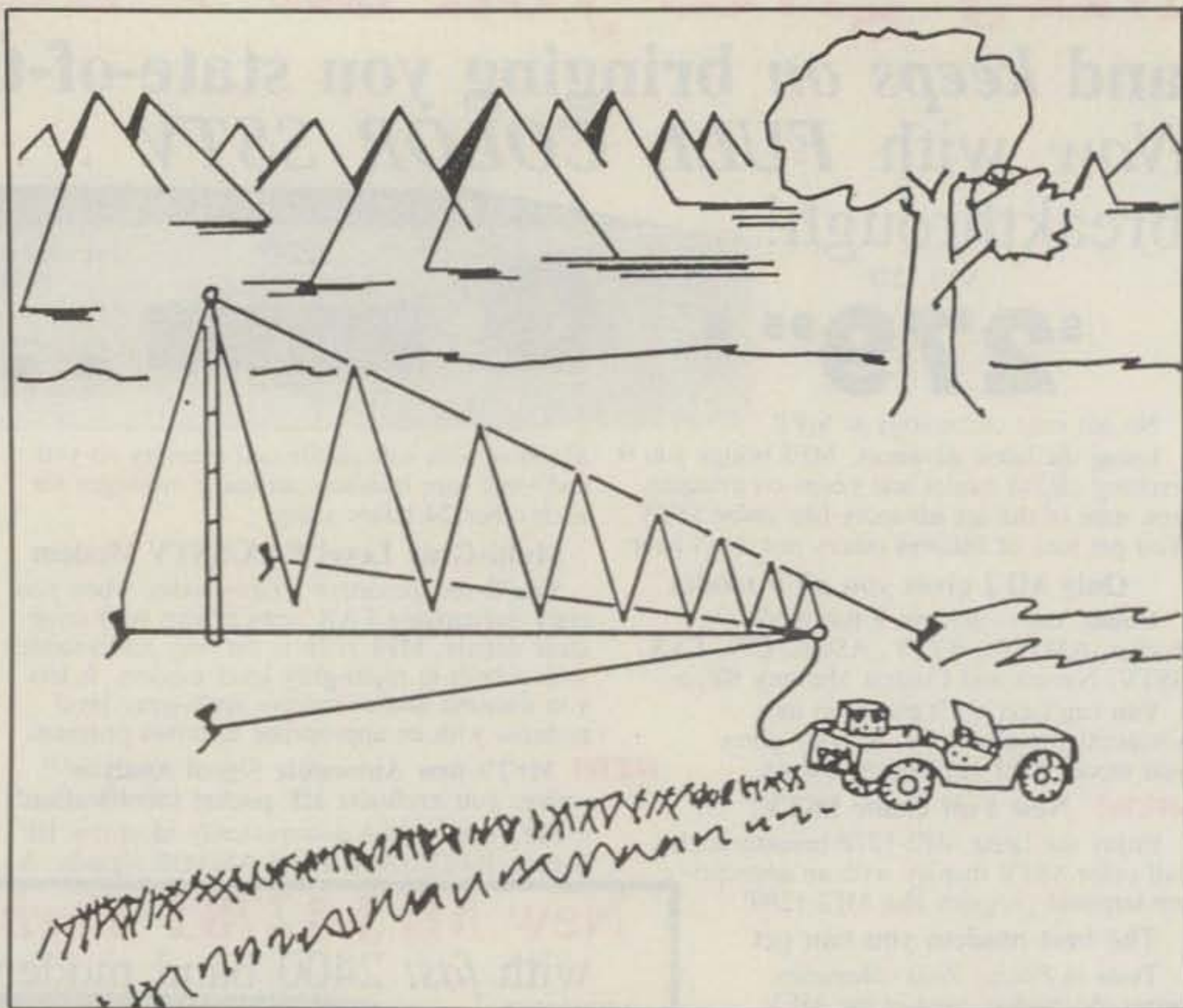


Fig. 3— "Zig-zag" version of log periodic antenna covers 2 to 30 MHz. (Drawing courtesy RF Design magazine.)



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location about 6 miles. It was now co-located with WRMM-FM. Soon WCMF-FM (also in Rochester) began receiving complaints of interference from an unknown cause. An investigation showed that the carriers of WRMM (101.3 MHz) and WKLX (98.9 MHz) formed a two-frequency, third-order intermodulation product at 96.5 MHz— $(98.9 \times 2) - 101.3 = 96.5$ . This was the channel of WCMF-FM.

This was a legal and technical issue only of interest to amateurs in that certain frequency combinations of co-located repeaters can cause mysterious intermodulation products which can interfere with nearby amateur channels or (heaven forbid!) nearby commercial channels adjacent to an amateur band. A good thing to keep in mind if problems arise with your repeater.

## The KN6J Radial System for 160 Meters

Any 160 meter band enthusiast who has clashed with Bob, KN6J, over some rare

DX knows what a potent antenna system he has. The top-loaded vertical wire is nothing unusual in itself, but his radial system is unique. Together, the assembly makes a superb system that really gets results (fig. 7). The vertical has sufficient top-loading so that when it is series-resonated to 1.85 MHz, the input impedance is close to 50 ohms.

Because of space limitations, Bob had to use radials much shorter than a quarter wavelength. He solved this problem by making his radials out of old coax cable, fashioning each one into a quarter-wave resonant line, making the velocity factor of the line work for him. For ordinary cable, the factor is 0.66, so a radial for 1.85 MHz turns out to be only about 88 feet long—a lot shorter than the usual length of 136 feet!

Bob left the far end of each radial unshorted and taped to protect it from the weather. The shields at the center point of the radials are connected to a ground rod. The radials are run helter-skelter about the ground. A very simple and effective installation that really works!

## In the Workshop

PL-259 style coax plugs, connectors, and splices exposed to weather have an evil affinity for water. Moisture seeps into the plug and from there enters the line, drawn along irresistibly by capillary action. The connection quickly corrodes as does the shield of the line. Soon the operator notices a high SWR on his feedline and wonders what in the world is going on.

A simple solution to the problem is to fill the plug, or coax joint, with a compound that prevents moisture penetration by occupation. The filling material should be waterproof, should not oxidize, and should be compatible with the cable dielectric. A big order? Well, such a substance is in use for cable TV, cellular phone circuits, and satellite feed systems. It has the unglamorous name of STUF (Silicon-teflon-unionizing filler). It comes in a tube like toothpaste. You fill the coax plug or joint with STUF and tighten it until excess STUF seeps out. The remaining STUF is forced into the voids in the connection. It is for use in cable sys-

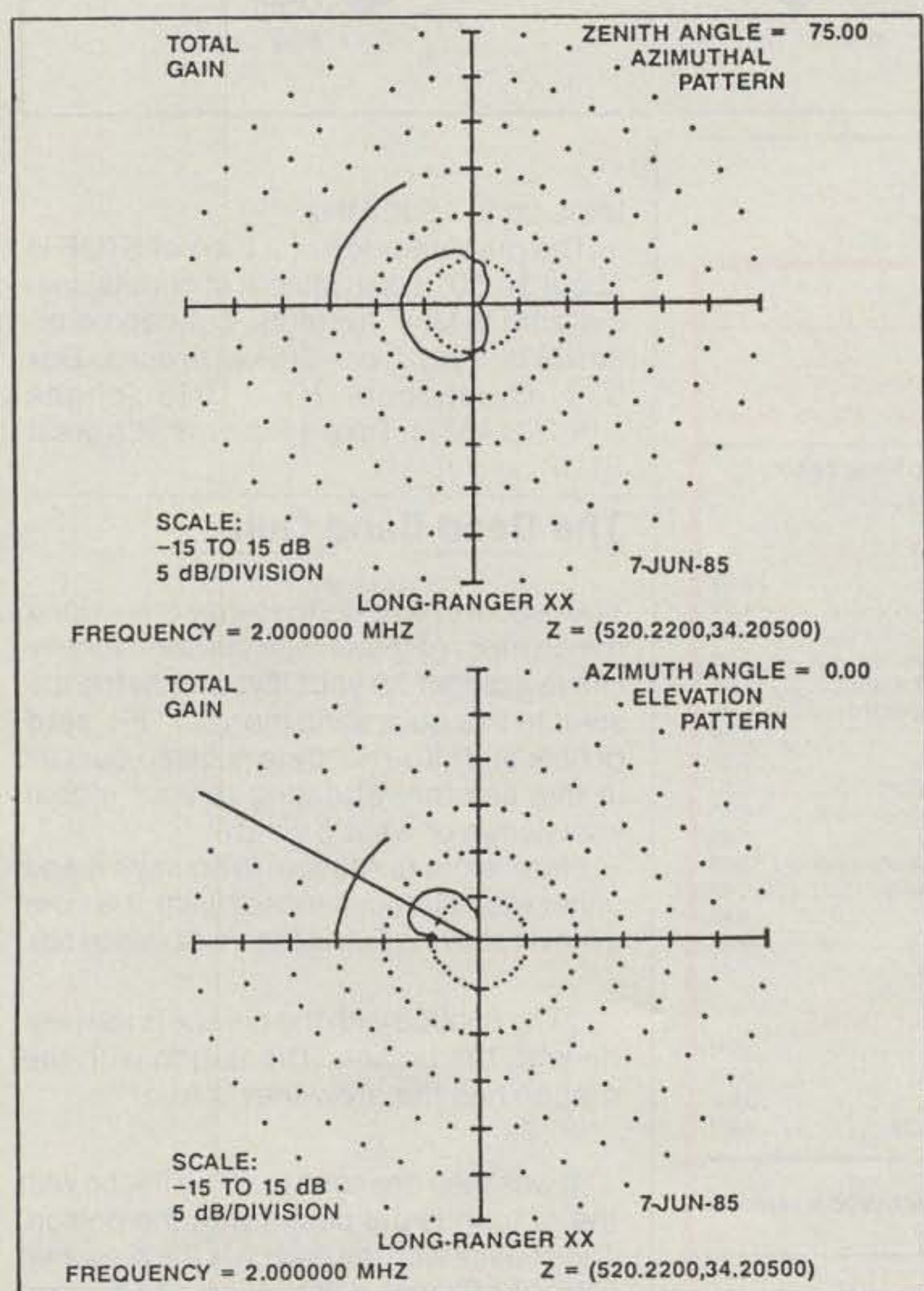


Fig. 4—Azimuth and elevation plots of zig-zag antenna. Take-off angle at 2.0 MHz is 30 degrees. (Drawing courtesy RF Design magazine.)

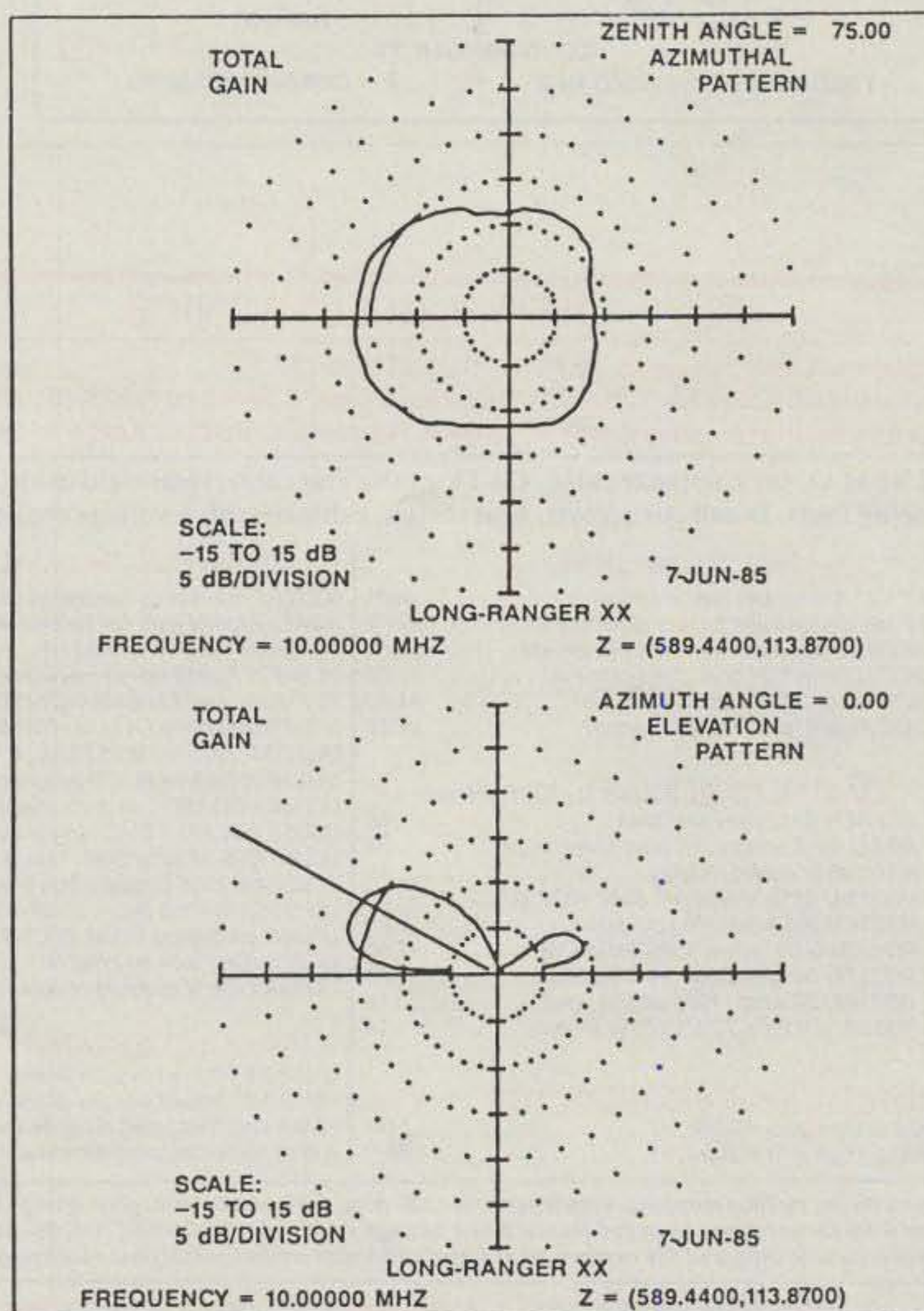


Fig. 5—Front-to-back ratio of zig-zag antenna is about 7 dB.

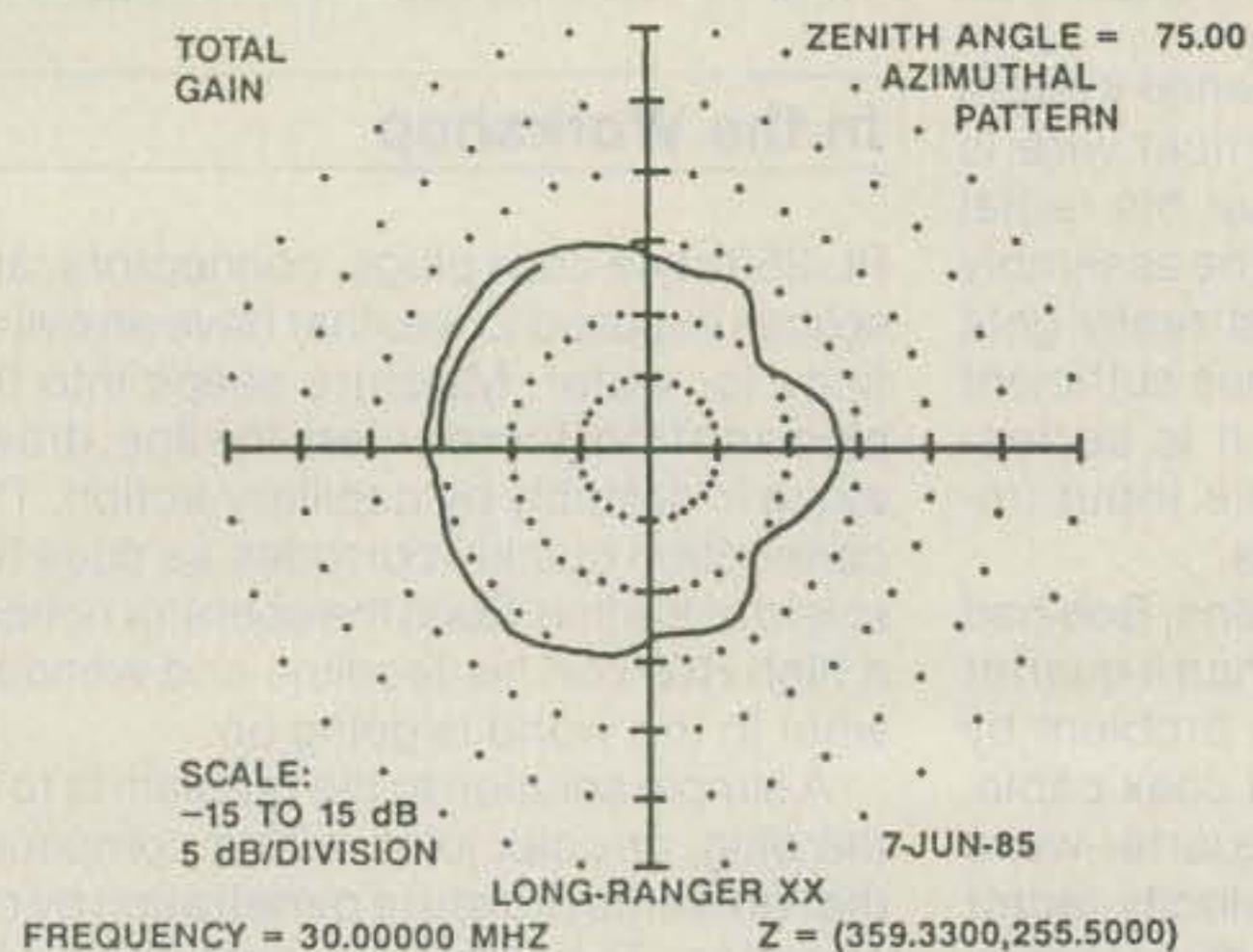


Fig. 6- The pattern remains substantially the same from 20 to 30 MHz.

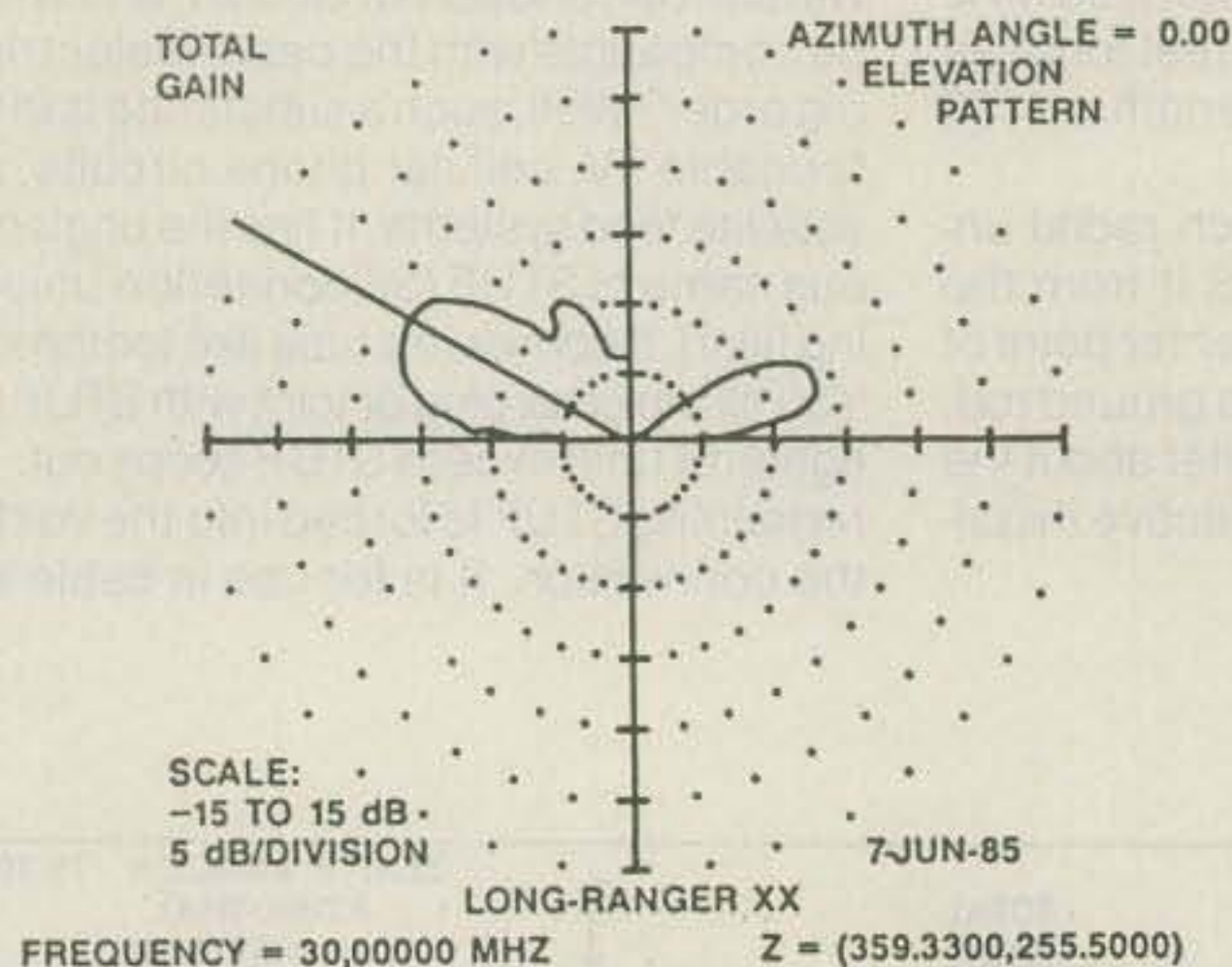
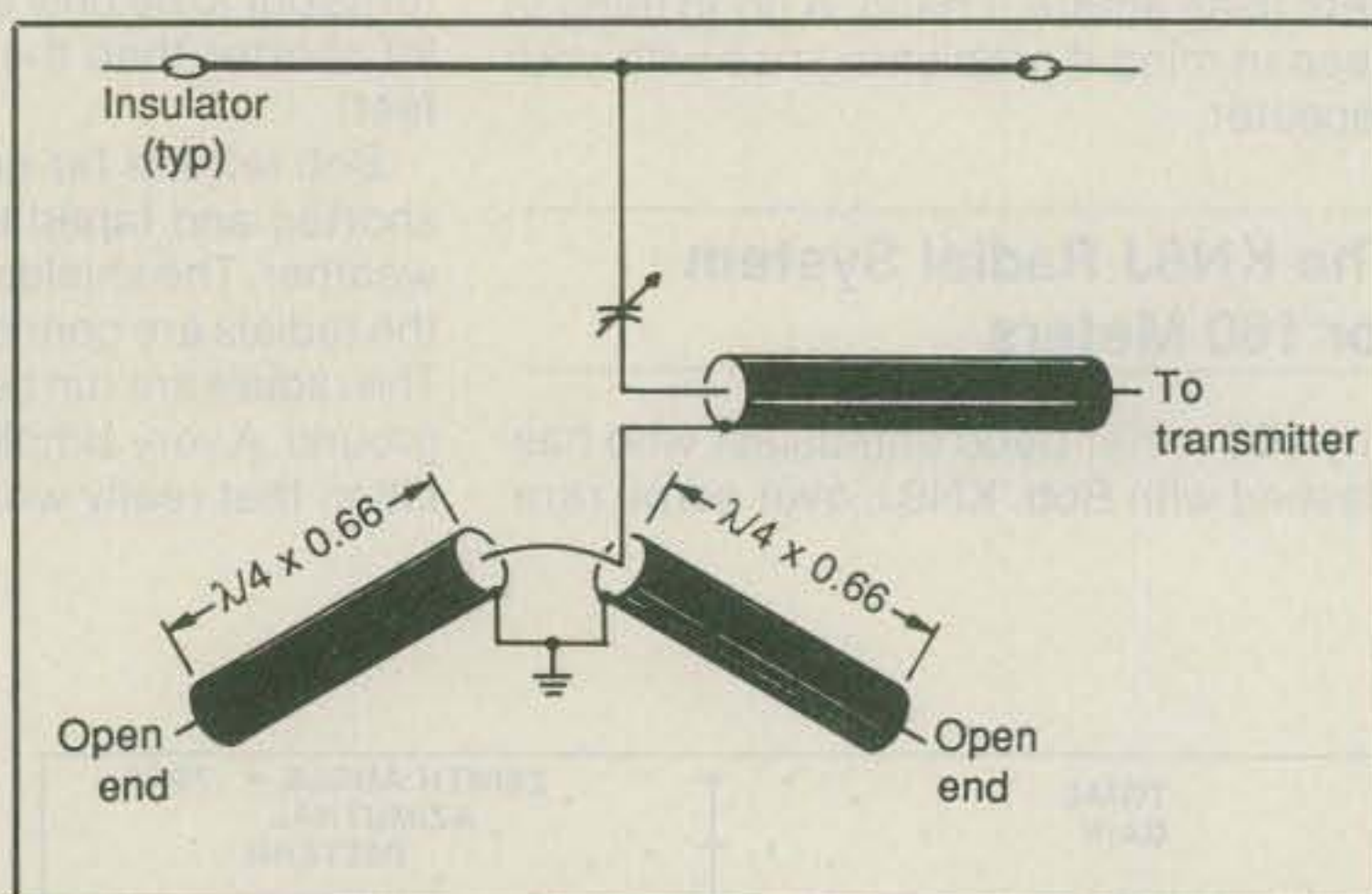


Fig. 7- One-sixty meter T-antenna of NR6J uses coaxial radials to conserve ground space.



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## The Dead Band Quiz

You readers have consistently one-upped me on most of these little quizzes. Finally I have a dinger for you! If you know the answer to this quiz, send me your QSL card or note and I'll be happy to publish your call in this column, attesting to your global knowledge of what's what!

Here is the quotation. Who says it and under what circumstances? (Hint: It is from a movie starring Sylvia Fine's ex-husband).

"The chalice with the palace is the pestle with the poison. The flagon with the dragon has the brew that is true!"

It was then changed to, "The flagon with the dragon is the pestle with the poison. The chalice with the palace is the brew that is true!" Or was it the reverse? The hero of the movie was very confused.

Please send all reader inquiries directly.

73, Bill, W6SAI

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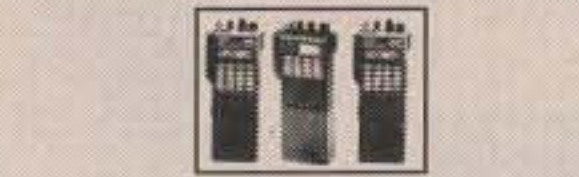
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## ALL ABOUT THE WORLD ABOVE HF

### New CQ WW VHF WPX Contest Rules

**A**re you excited? I am! The new CQ WW VHF WPX Contest is scheduled for July 11-12 and is expected to draw entrants from all over the world. Will you be one of them? I hope so!

Elsewhere in this issue you will find the complete rules for the new CQ VHF WPX Contest. However, within this column I will now go over the changes from the old contest in order to acquaint you with the new one.

**I. Contest Period:** Previously the contest was run over a 48 hour period. It will now be a 27 hour contest. The dates of July 11-12 were selected because the time of year does fall within possible sporadic-E openings and tropo-enhanced propagation.

**II. Objectives:** Nothing was changed in this category from the previous contest rules.

**III. Bands:** All bands are now included in this contest. You will see the different point values for the new bands in the scoring category.

**IV. Class of Competition:** This category was completely revamped. There are now seven different categories. Limited multi-op categories will be offered. For this year low power has been eliminated. Depending on your responses (your input on your completed logs), it may be reinstated in future contests. From your input in the published survey, I eliminated the FM-only category. We have instituted the "rover" category for this contest. However, we and the ARRL differ in the definition of "rover." Their position is that if a person operates from his or her home station and then travels to a new grid square and operates from another home station that person is considered a "rover." This puts the person who loads up the back of his pickup with a bunch of aluminum, goes out to a rare grid square, sets up equipment, operates, tears down, moves, and repeats the procedure at a different location at a disadvantage to the roving home station operator. Therefore, the moving of an operator from one fixed station to another fixed station location is discouraged.

**V. Exchange:** Nothing was changed in the exchange. However, the grid square now counts for a multiplier. (See the next topic below.)

**VI. Multipliers:** The big change in multipliers is the addition of the grid square as a separate multiplier category. Most of the paragraphs in this category are devoted to explaining what constitutes a prefix. Much of the writing is from the CQ HF WPX Contest rules. You should read over this section very carefully, especially if you are contemplating entering the rover category or if you are contemplating doing something exotic for a prefix.

**VII. Scoring:** The QSO points per band are the same as in previous contests, with the exception of the new bands. If you are operating above 2.3 GHz, then pay attention to the points



Rodney, Z21AF, now active on 6 meters, with his friend, Paddy, Z21AY. (Photo courtesy Bruce Siff, W2GBX)

assigned to contacts on these higher bands. Also note the CW or MCW incentive point. If you complete a 2-way QSO on CW or MCW, you may add one point to the total points for a QSO for the band from which you are operating. For example, if you make a 2-way CW QSO on 10 GHz, the total point value of that QSO is increased from 6 to 7. Make sure you note the QSO in the log by checking the appropriate column.

It is tempting to get on the repeater and urge other operators to meet you on a simplex frequency. However, resist the temptation. Enough said.

**VIII. Awards:** There are plenty. You are competing against stations in your own category, so do your best and you may win a trophy. To date two sponsors have been lined up. If your group is interested in sponsoring a trophy, please let me know.

**IX. Miscellaneous:** This category is a "clean up" category. What has not been spelled out earlier, hopefully is clarified here. If you have any questions, call me at 405-528-6625.

**X. Log Submissions:** Because this is a new version of an old contest, new log sheets have been designed. Write to the CQ VHF WPX Contest, CQ Magazine, 76 N. Broadway, Hicksville, NY 11801. Please include an SASE.

By the way, as of this writing I know of at least one station that will be active with a special prefix from Mexico. Terry, N6CW, will activate DM11 and will have a special prefix to go along with this rare grid square operation.

I hope this explanation of the rules will help you understand the changes and give you incentive to get into the contest. As I said, the rules are new and there is potentially lots of fun for everyone. I will see you on the air next month.

## DXpeditions

**Aves Island:** Amateur radio operators from the Amateur Radio Club of Venezuela activated YX0A for several days in late February. Stations in the midwest and southwest and as far northeast as parts of VE3 reported working them either February 23 or 24. Among the stations lucky enough to work them was every active 6 meter operator in Oklahoma City (including the QRP stations) except one. Unfortunately for him, he was babysitting a bunch of misbehaving Civil Air Patrol Cadets and was forced to be away from the radio. Maybe next time, Larry. QSLs for this operation go to YV5ARV.

**Curacao:** As part of the Finnish contest team, Jan, OH1ZAA, operating as PJ2/OH1ZAA, activated this location around the weekend of the ARRL Phone contest. While there he installed a six-element beam on one of the tall towers used for HF contesting. He, along with others, helped repair one of the permanent resident's linear amplifiers. You can expect to see much 6 meter activity from this location in the coming months. Jan left behind a beacon station that is now on the air on 50.000 MHz as PJ2SIX. It runs 20 watts into two crossed dipoles and is located in grid square FK52.

**Chausey Island (France):** Jean, F6IXI, activated Chausey Island during the latter part of February to the beginning of March as TM6CH. He was worked by a few east coast Ws and VE stations on 6 meters during his IOTA DXpedition. QSL via Jean Claude Bernard, 2 Chemin d'une Ruelle, L'Autre, F-95300 Pontoise, France.

**Palau:** Charlie, W0RRY, set up operation from KC6 in early March, first as KC6/W0RRY and then later as KC6RR. He was immediately struck

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## VHF Plus Calendar

June 5-7  
June 7

HAM-COM Hamfest, Arlington, TX.  
Arietids meteor shower peak 0226 UTC. Very good EME conditions. First quarter moon.

June 8  
June 13-15

Perigee.  
ARRL June VHF QSO Party, 1800 UTC 13 June to 0300 UTC 15 June. See Contest Calendar column for rules.

June 14  
June 15  
June 19  
June 20-21

Very poor EME conditions. Full moon.  
Noisy EME conditions. Sagittarius-A.  
Apogee.  
SMIRK 6 Meter Contest, 0000 UTC June 20 to 2400 UTC June 21

June 22  
June 22-26

VK5MC-Europe, 0106 UTC, 144.012 (call .010-).  
N8NQS to EN87, 88, 97, and 98.

June 23  
June 25-30  
June 27

Last quarter moon.  
W5OZI to DL79-89 and DM70-80.  
VK5MC NA, 1932 UTC.

June 27-28  
June 28  
June 30

ARRL Field Day. See Contest Calendar column for rules.  
Moderate EME conditions.  
New moon. Noisy EME conditions.

(Courtesy W4ZD and others.)

by Murphy! First he lost his voice keyer; next he lost his CW keyer. Thus, the plans for a beacon were put on hold until other operators arriving from Oklahoma could bring replacement parts. Additionally, he was not able to hook up the 500 watt linear. Nevertheless, he had regular openings to JA at around 1200 UTC for the first three or four days of the operation. His first contact was with Shel, NI6E, and his second contact was with Joel, KG6DX. Interspersed among over 1000 contacts with Japan were contacts with XX and VS6. He was heard once in Los Angeles but no QSOs with the mainland ever took place. If you were lucky enough to work him or the low-band counterparts—KC6/WV5S, KC6/N5RJM, KC6/NJ1V, KC6/KB5BOB, KC6/N5OK, KC6/N5CG, KC6SS, KC6OO, KC6VV, KC6OK, KC6GG, or KC6MM—you can QSL to OKDXA, P.O. Box 88, Wellston, OK 74881.

**Clipperton:** Arie, PA3DUU, and the rest of the gang arrived on the air on HF Friday evening, the 6th of March. While working the pile-up on 10 meters, the operator indicated that 6 meters would be attempted the following day. And indeed it was, with some success. At 0004 UTC, March 8 Peter, PY5CC, PY2DSC, PY2ELZ, and CX2IA all worked him in an all too short 2 minute opening. Reportedly, the signals were 30 dB over both ways. Twenty-one hours later they had another brief opening into Brazil. Finally, the flood gates opened at 0200 UTC the next day, when they worked a number of South American stations, including PJ2/OH1ZAA, and many LUs, HCs, PYs, and others. The most northerly contact was with Luis, XE1L. The opening lasted until around 0330 UTC. As the week progressed Arie continued to make QSOs until they went QRT over the following weekend. Thanks to Arie's very hard work around 200 QSOs were made. Many of the contacts were with North American stations who had the patience and the luck to work him on back-scatter or side-scatter propagation. Thanks also go to Joel, N6AMG, for loaning practically his whole station, including a KW amplifier. QSLs for the FO0CI operation (and their N7QQ/MM operation) go to N7QQ, via his *Callbook* address.

**San Andres:** Jim Treybig, W6JKV, signing W6JKV/HK0, activated this island in early April, as this column was being prepared. From his first day of operation Jim reported around 30 or so QSOs, with his best DX being EA8. Among

the lucky guys in the States so far have been W5OZI, W3XO/5, and K6QXY, for bob's 100th country (*congratulations, Bob!—ed*). As always, QSLs go to Jim's home call.

**DM07 and DM17 to be Activated:** Ron Hammel, KC6WLC, will activate DM07 and DM17 on the White Mountains during the ARRL June VHF QSO Party. He will operate on 144.190 and 144.200 MHz SSB and 146.55 and 223.5 MHz FM. QSL to Ron's home QTH.

**Grid Square DXpedition to EN87, 88, 97 and 98:** Dave, N8NQS, will be operating /VE from the above grid squares this month as follows: EN97, 2300-0200 UTC June 22/23 and 1100-1400 UTC June 23. EN98, 2300-0200 UTC June 23/24 and 1100-1400 UTC June 24. EN87, 2300-0200 UTC June 24/25 and 1100-1400 UTC June 25. EN88, 2300-0200 UTC June 25/26 and 1100-1400 UTC June 26. He will operate on 50.125 MHz on 6 meters and 144.170 MHz on 2 meters, with an alternative frequency of 144.200 on 2 meters. Dave has been a ham for just over a year. Within two weeks of having his code-free Technician ticket in hand he passed his 5 wpm code test. In February of this year he passed his General. By the time you read this Dave will probably be an Advanced class licensee. Who said code-free Techs are not interested in incentive licensing? Dave said that his host, Al, VE3XAL, has made excellent arrangements for him. For example, the location in EN97 is 60 feet above the horizon. QSLs (with an SASE) go to Dave Bostedor, N8NQS, 434 Pattie Ave, Jackson, MI 49202.

**Pat, W5OZI, to Activate DL79-89 and DM70-80:** Pat, W5OZI, is planning a DXpedition of his own. He will be active from the exact intersection of DL79-89 and DM70-80 for the day of June 25-30. He will be on 50.125 MHz on 6 meters and 144.200 MHz on 2 meters. To be sure of the intersection, Pat is going to the trouble of having a survey made. Therefore, when you work him you will be able to take credit for all four grid squares for VUCC according to the rules. QSLs go to Pat's home QTH.

## Current Contests

**June VHF QSO Party:** This is probably the most popular contest of the VHFer's year. Sporadic E is in full swing and it is not yet too hot to can-

ut. If Emil, W3EP's interpretation of the sporadic-E cycle is correct (see March 1992 QST), there may be a possibility of some excellent multiple-hop propagation going on during the contest. The complete rules will be found in John Dorr, 1AR's Contest Calendar column. However, the dates to remember are June 13-15.

**SMIRK 6 Meter QSO Party:** The 17th annual SMIRK 6 Meter Party Contest is scheduled from 0000 UTC June 20 to 2400 UTC June 21. Exchange is callsign, grid square, and SMIRK number. Scoring is 2 points for member to member QSOs and 1 point for member to nonmember QSOs. No USA to USA QSOs are allowed below 10.125 MHz. Send logs and a summary sheet that clearly shows your name, callsign, and SMIRK number to Pat Rose, W5OZI, P.O. Box 93, Junction, TX 76849 by July 6, 1992.

**Field Day:** Who can forget his or her first Field Day? This is an event more than a contest (although some want to take the contest part seriously). I remember my first one as a new general class licensee. Our club had a policy that the callsign of newest General class was used on Field Day. I was fascinated with all of the contacts being made with my callsign. Particularly, I was intrigued with the openings on 6 meters. One sporadic-E opening lasted well into the night with many contacts being made to Washington and Oregon from our location on the edge of the bay (on the tidelands) in Chula Vista, California.

With the number of new Technician class licensees, activity on VHF should increase. This is an opportunity for the old timers to bring out the weak-signal radios and introduce the new amateurs to an aspect of amateur radio that does not use repeaters. Remember, you can set up a Novice/Technician station that will not go against your transmitter count. Many of the code-free Techs will have a chance to taste their first DX on VHF. Again, the rules can be found in John's column, and the dates to remember are June 27-28.

## On The Airwaves

**First 903 MHz Aurora QSO:** What is believed to be the first ever 2-way aurora contact on 903 MHz took place on the night of November 8. Harry, K3HZO, had just completed a QSO with Paul, WA3NZL, on 432 MHz. Since the auroral returns were well over S-9 on that band, they mutually agreed to try 903 MHz. The signals were very weak, and they found the Doppler shift to be between -2.5 and -3.0 kHz from the same frequency, which exceeded that of previous and subsequent multi-path signals. Harry feels very strongly that the signals were not multi-path. Thanks to John, KØIFL, and Kent, W5VJB (who was so excited that he published the info twice in the NTMS newsletter), for information on this record.

**First KH6-DL 6 Meter QSOs:** On March 20 between 0918 and 0945 UTC Shel, NI6E/KH6, completed two contacts with Germany, first with 2RE, then followed by DK5EJ, thereby achieving the first ever KH6-DL 6 meter QSOs. I wonder if anyone is keeping track of all of the records firsts being established on 6 meters during this solar cycle?

**6 Meter openings to Central America:** Eric, W1NA, reported that he, TI2HL, and TI2KD/5 were the recipients of a 45 minute 6 meter opening to Japan starting around 1300 UTC on Sunday, March 29. It was reported that the signals were over Africa and because KD's beam was back pointing west, he had to use his vertical.

Nevertheless, he was able to participate unimpeded. Many JAs in call districts 2, 4, and 5 were made happy with contacts with Costa Rica. Almost two weeks earlier Andy, YS1AG, reported an opening that occurred in the evening around 2300 UTC, with several QSOs being made, again in multiple call districts.

**Rotuma on 6 Meters:** Antoine, 3D2AG, was active from Rotuma during March and April.

## This and That Trivia

**A New Op from Zimbabwe Now on 6 Meters:** Bruce Siff, W2GBX, reports that Rodney, Z21AF, is now on 6 meters. Look for him on the usual DX frequencies.

**Mongolia:** Reportedly JT1CO is now active on 6 meters.

**Lebanon:** Samir, OD5SK, is now active on 6

meters with 5 watts and a ground-plane antenna. He has been worked by a number of Europeans. QSL via KB5RA.

**Zambia:** Peter, 9J2HN, was scheduled to go home to Japan in April. However, he requested an additional year extension. Therefore, he went home only for a few weeks and was expected to be back on the air late last month.

**Estonia:** The first operation took place in August of last year, with a group signing the call-sign ESØSM. This DXpedition worked 550 stations in 26 countries. Since then several stations are now on the air and, as reported in April's column, have been worked in North America.

**Tanzania:** 5H3RA was worked in Malta in the middle of February.

**Spain:** After many false starts, it appears this country will be on 6 meters this month, with approximately 90 permits. Curiously, ARRL's DXCC desk has been granting credit for EA8

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(Canary Island) operations for some time.

**Poland:** This country is also expected to be on the air this summer. Watch for future announcements.

**Hungary:** Officials in this country are exploring granting privileges for 6 meter operation. Maybe by this summer another one will be active on 6 meters.

**Grenada:** Jim, J37AE, was back on 6 meters in late March and early April. He reports that he spends six months in Grenada and six months in Arkansas. Look for him again in November.

**Paupua-New Guinea:** P29CW is on with a 100 watt linear and a 4 over 4 quad.

**Kuwait:** 9K2ZR and 9K2WR are now active and as of this writing have worked 18 countries, including 7Q7RM and several other 7Q7s, several ZS6s, LU3EX and other LUs, ZP6CW, and PY5CC. QSL 9K2ZR via K8EFS and 9K2WR via Don's wife, Amy Nutt, N6UXB, 5005 Willow Rock Way, Sacramento, CA 95841-4912.

**Belize:** After more than a year's absence V31PC is now back on 6 meters. This is good for sporadic-E contacts to the U.S. this summer.

**Haiti:** HH7PV reports that since the embargo has been in effect he has received no mail. However, he maintains a receiver on 50.110 MHz and is often heard on 28.885 MHz around 1400 UTC. QSLs go to N2AU.

**Lesotho:** Ray, 7P8SR, is now active on 6 meters. QSL via Ray Schenkweiler, P.O. Box 333, Maseru 100, Lesotho.

**Diego Garcia:** Jason, VQ9JY, is now on 6 meters. QSL via his home call, KB7CDA.

**Asiatic Russia:** Kan, JA1BK, reports that Mike, EK0JA, is now on 6 meters from the Vladivostok area. Due to TVI Mike is only on between 2000 and 2200 UTC, once per month, when the local TV station is off the air.



Arie, PA3DUU, waiting to cast off from San Diego, on his way to FO0CI. (Photo courtesy Terry Baxter, N6CW)

**Second VUCC on 678,733 GHz LASER:** Kent, WA5VJB, reported processing a VUCC application from Terry, WA7LYI, for the second VUCC on LASER. The first ever LASER VUCC went to KY7B. Congratulations, Terry!

**Ten GHz Attempts Being Made Across the Gulf:** An informal group of three stations headed by Mort, WA2STA, in Florida, and four stations headed by Kent, WA5VJB, in Texas, are attempting to make contact across the Gulf of Mexico on 10 GHz. If you are interested in becoming involved in this group contact Mort at 407-433-4031 at home; or Kent at 214-266-1606 at work or 214-660-2810 at home; or Al, WB5LUA, at 214-699-4369 at work or 214-542-6817 at home; or Greg, AA5C, at 214-575-5621 at work or 214-736-6459 at home.

**Another New 6 Meter Beacon on the Air:** Greg Hart, WB9STR, has notified me that he has a new beacon on 50.071.5. Located at 41° 10' 40" N and 87° 53' 01" W, in Bourbonnais, Illinois (grid square EN61), it transmits "WB9STR/B EN61 ILL" on CW 24 hours a day. The transmitter power is 5 watts and the antenna is a turnstile at 130 feet. You may send reception reports to Greg Hart, WB9STR, P.O. Box 533, Bradley, IL 60915.

## EME Operations

**ZB0T:** Mike Salkovskis, ZB0T, advises that he is active on 2 meter EME. However, he has tremendous QRM from military and other official communications on the rock. He also has to contend with cigarette smugglers who use handhelds to communicate at will within the 140-170 MHz frequency spectrum. Mike indicates his best frequency is 144.065, due to the QRM. Schedules can be arranged through the 14.345 EME net. Mike may also be back on 432 EME this month if he has the time to reconstruct his array that was damaged last year. He is scheduled to depart in August, but may be extended until next March. If you want to work Gibraltar via EME, you had better do it soon because Mike doesn't think anyone who has an interest in the

moon will follow him. Thanks to John, K0IFL, and the 2-meter EME NEWS for information on Mike.

**DU1 on 432 EME:** Thanks to the efforts of Steve, K1FO, and Frank, NC1I, Louis KG6UH/DU1, is now on 432 EME. He is running 500 watts and is active on 432.012 MHz random. However, since Subic Bay is shutting down, Louis is not sure how much longer he will be in the Philippines. He is scheduled to leave this month, but may be extended until December. Louis reports that his next assignment may take him to Chile, Ecuador, or Panama, or somewhere else. We will keep you advised. Thanks to Allen Katz, K2UYH, and the 432 And Above EME News for the report on Louis.

**How to get on 432 EME:** If you are looking for a good "how to" article on 432 EME, you might want to check out the two-part article written by Steve Powlishe, K1FO, that appeared in the Premier and Fall 1991 issues of CQ's sister publication, *Communications Quarterly*. Steve does an excellent job of explaining the basics of operating and the equipment needed for a successful 432 EME station. You will be surprised on how uncomplicated it is to operate on that band "on the moon." Back issues of the magazine are available by contacting CQ Communications at 516-681-2922. While you are there, tell the operator that I said that you should subscribe to the magazine.

## Arietids Meteor Shower

Between May 29 and June 19 the *Arietids* meteor shower will make its annual reappearance. However, don't look for the rocks in the sky because this is principally a daytime shower. The north to south path seems to be the best for the shower, with the peak day being June 7, around 0226 UTC.

## Current Conventions

The fifteenth annual HAM-COM Convention will be held again at the Arlington, Texas Conve

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onCenter June 5-7. It is a biggie. The average attendance is in excess of 7000. Last year the North Texas Microwave Society presented two excellent programs. It is anticipated that they will again present programs. CQ will have a booth and I will be available to sign autographs, etc. (Hi!) And you might even find the editor of another national publication's column somewhere around there as well. (You know, "The World Above 50 MHz"). Seriously, there will be a lot for everyone who attends. It is anticipated that the Shuttle astronauts will be there to present seminars as well as DXers to cover some of your favorite DXpeditions. Plans are being made for an expanded outdoor fleamarket. There are plenty of hotels and motels around the Arlington area, including, adjacent to the convention center, the Sheraton Arlington (800-325-3535). For family entertainment, Six Flags is nearby and the Texas Rangers have scheduled baseball games for all three days at the Arlington Stadium, which is within walking distance of the convention center. For convention information contact the HAM-COM Convention, P.O. Box 25028, Dallas, TX 75225-1028 (14-521-9430).

### Still More Publications

**QJBUS**, an excellent quarterly magazine that has been around for 20 years, has recently taken on a new North American subscription agent. The magazine is well known in Europe for its technical articles and information pertaining to HF and above activities over there. The articles are printed in German and English for the bilingual reader. If you are interested in subscribing, contact Russel Miller, N7ART, 12041 S.W. Peninsula Dr., Crooked River Ranch, OR 97760 (503-548-1221). The subscription rate is \$24.00 per year and the magazine, which is published in Germany, will come from there to your mailbox.

"VHF UHF DXer" is a new newsletter started in March by Dave Hardy, G8ROU. The newsletter is designed to fill the void created by the cancellation of RSGB's "The 6 Metre & Up K'er" and is expected to be published approximately every six weeks during the rest of this year and monthly beginning in 1993. A sample copy may be obtained by sending \$2.00 to Dave Hardy, G8ROU, Thorntree House, Wensley, Hatfield, Derbyshire DE4 2LL, United Kingdom. All subscription rates are \$14.00 for airmail and \$2.00 for surface mail.

### W3CL and W3ZD Silent Keys

The Mt. Airy VHF Radio Club reported the passing of two of their longtime members. Harry Wein, W3CL, became a Silent Key on February 15 and Dave Zimmerman, W3ZD, joined his silent club on March 22.

Harry was one of the original ten members of Mt. Airy. He held the position of president for two terms and served on the board of directors. One member put it, "He was without question the most influential member of the Packrats in the club's history." He was editor of "Cheese and Crackers" from the mid-70s to 1989. He was always available as an advisor and a father to the members of Mt. Airy. He was a true contender to the top. In spite of failing health, Harry was active in the January VHF Sweepstakes, even submitting a log for their club competition. Not so many years ago Harry was honored by the Atlantic Division of the ARRL by awarding him the "Grand

Old Ham Award." This award acknowledges amateurs who, by their outstanding record, merit recognition for lifetime contributions to the Amateur Radio Service. Donations are being accepted to plant trees in Israel in Harry's name. Contact K3EOD if you are interested.

Dave also served as president of the Packrats. Additionally, he served as chairman of various committees. He created the fleamarket, called HAM-O-RAMA. This was the basis of what was later to become the Packrats' VHF conference. In 1976, the year of the U.S. Bicentennial, Dave organized and chaired Philadelphia Area Radio Association's huge Ham Radio Convention. Dave will be most notably remembered by the Packrats as the host of the annual club White Elephant Sale at his "Zimmerman's Glen." Dave and his wife Jane, WB3DSK, often opened their home for contest wrap-ups, HAM-O-RAMA planning sessions, and executive board meetings. Another contester, Dave often used the club call from his home QTH to run a multi-op station. He was an excellent homebrewer. He produced many hardline connectors for club members on his basement metal lathe. Additionally, his jewelry was well known among the YLs.

It was said that his greatest pleasure was derived in helping someone in the amateur radio hobby. Six months before his passing Dave moved to Nevada to enjoy his other favorite pastime, that of being outdoors and skiing. He was stricken ill on the slopes and had to be evacuated to an area hospital, where he died four days later.

It is sad to lose one influential member of a club. Unfortunately for the Packrats, they have lost two giants in a very short time span. We in the VHF community share their loss.

### And Finally

This is all the space for the news this month. Where does all the space go? More news next month. Thank you very much for supporting this column. Thanks also to Ted, G4UPS, John, K0IFL, Al, K2UYH, Kent, WA5VJB, Shel, N16E, and their respective newsletters for input to this column. Please keep your contributions coming. And call me if you have some news that cannot wait for the mail. You know the number: 405-528-N6CL (6625). Until next month . . .

73, Joe, N6CL

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# ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

## Software Snapshot

Last month we devoted the column to our regular mix of antenna and software-related topics. This time we'll turn to software for a change of pace. Let's get started.

### Software Topix

**PSPLOT.** Paul Terwilliger, NX1H, has put the finishing touches on a laser printer utility designed to complement Brian Beezley, K6STI's popular antenna design and modeling programs—MN, YO, and NP. Paul's program, PSPLOT, takes K6STI's ".PLT" format and converts it into PostScript commands to send to a PostScript compatible laser printer.

Paul says he wrote PSPLOT to provide a way to use his HP Laserjet IIP and PostScript emulation cartridge for MN, YO, and NP plots. The initial program he developed emulated the PLOT program supplied with MN, YO, and NP, in the modes he typically used—polar plots, log-dB scale, and dBi only. Along the way PSPLOT grew and now has the ability to print up to 18 different plots on each page, overlay up to four plots on one coordinate chart, read input file names and option selections from a DOS text command file, use polar or rectangular coordinates, and perform other graphics printing tricks.

PSPLOT for the IBM PC is available for \$25 from Paul Terwilliger, NX1H, 11 North Shore Rd., Chester, NH 03036.

While I don't have a laser printer on which to try PSPLOT, Paul sent me some sharp-looking laser antenna pattern prints, one of which is shown in fig. 1.

**WR9R Field Day Logging System.** Larry D. O'Cull, WR9R, has made this specialized logger available in shareware for several years, but with the new Version 3 he says it's about time to get the word out. The program logs callsigns, associated reports, and QTHs to support Field Day QSOing. This fast, slick program's primary purpose is to serve as a real-time data entry system that aids in avoiding contact duplication and increases QSOs/hour by minimizing logging "hassle." The program is designed so that one person can easily handle logging and operating simultaneously.

The program logs all QSOs into a common ASCII database for easy access. The system can later split the log by mode and band into separate files, sort it in alphanumeric order by callsign, and generate summary sheets. Typically, over 9000 stations can be logged, with duplicate entries being detected and rejected at a high rate. Automatic dupe checking and partial call checking can be disabled. If you have a printer, it can print QSOs as they are entered in the log. The latest version offers extended summary sheet generation, online help, an ARRL section abbreviation list window, and dupe sheet generation.

317 Poplar Drive, Millbrook, AL 36054

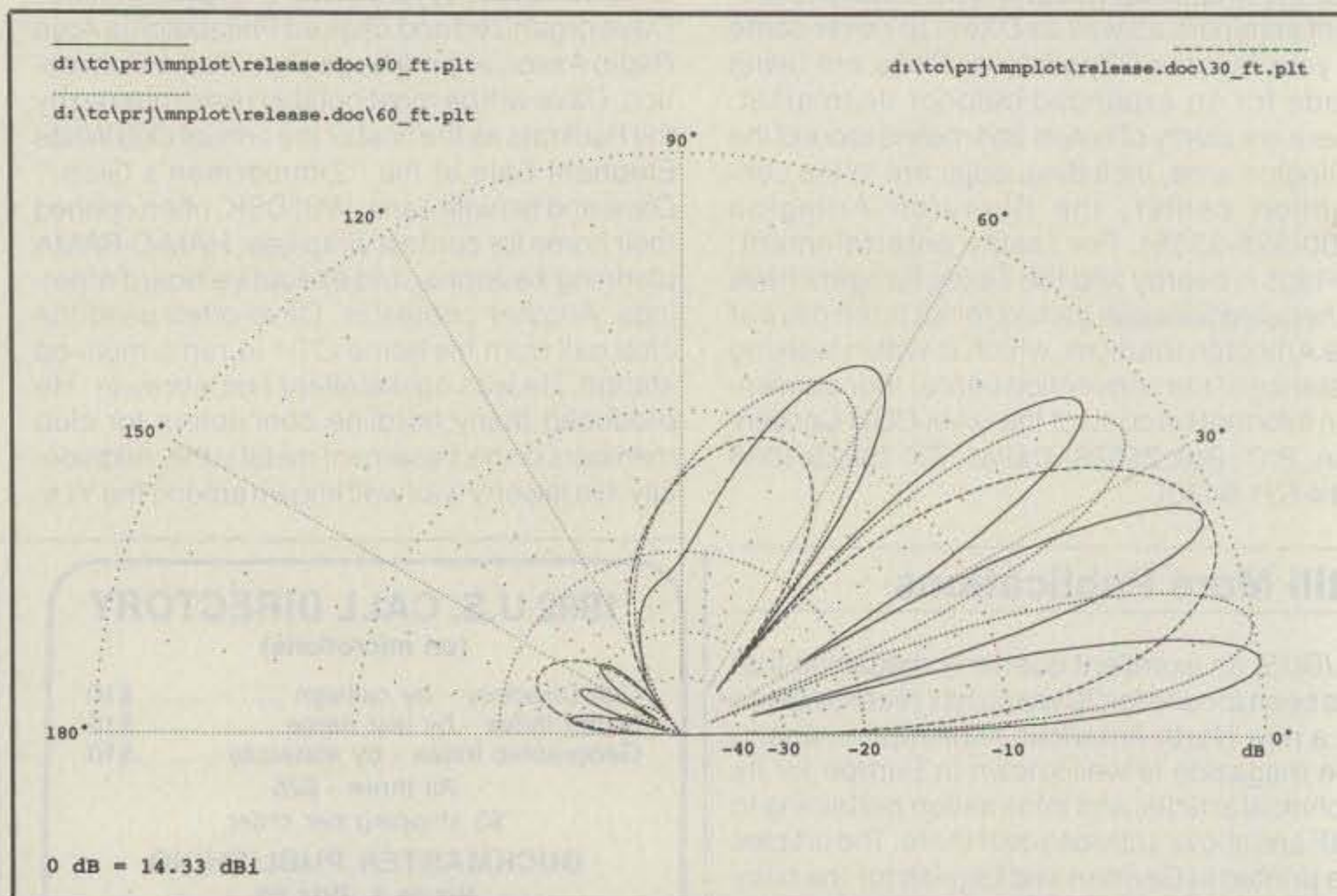


Fig. 1—Paul Terwilliger, NX1H, offers a laser printer utility to complement Brian Beezley, K6STI's popular antenna design and modeling programs, MN, YO, and NP. Paul's program, PSPLOT, takes K6STI's ".PLT" format and converts it into PostScript commands to send to a PostScript compatible laser printer. Shown here is a full-page laser-printed antenna plot using PSPLOT. PSPLOT also has the ability to print up to 18 different plots on each page, overlay up to four plots on one coordinate chart, read input file names and option selections from a DOS text command file, use polar or rectangular coordinates, and more.

The latest version is available for \$10 from Larry D. O'Cull, WR9R, 3725 Tara Ct., Westfield, IN 46074.

**Propagation Path Collection.** Jim Mills, N5IKJ, sent me the Propagation Path Calculator series of programs for the IBM PC, offered by Valle Verde de Rio Grande (VVDRG) Electro.

The program series is best described as a toolkit—a collection of propagation-related tools useful for radio amateurs and experimenters to improve their understanding of HF propagation paths in point-to-point communications. Several stand-alone programs are included. These calculate Great Circle distances and bearings, determine optimum signal launch angle, calculate the time of high noon for antenna orientation purposes, and compute attenuation over a given path. Various useful measurement conversion utilities are also included in the package.

The price of the Propagation Path Calculator series is \$9.50. It is available from VVDRG Electro, 1724 Regal Ridge, Las Cruces, NM 88001.

**LOGic Duo.** Twice previously, in the January and May 1990 columns, we noted LOGic™, a full-featured logger suitable for DXing, nets, paper chasing, and ragchewing. Dennis Hevener, WN4AZY, Personal Database Applications' proprietor, has significantly expanded his product line to feature two separate versions, LOGic Jr. and LOGic II, since we last touched on LOGic.

LOGic Jr. is an inexpensive, simplified product which allows logging in real-time and non-real-time modes. It has a customizable screen, flexible data retrieval, logging of data from previous QSOs, automatic tracking of practical awards, QSL management, user-defined fields, sophisticated print options, and the ability to store up to 20 pages of free-form notes per QSO. The \$39 program is available for the IBM PC, Commodore Amiga, and Atari ST, and the Mac is on the way.

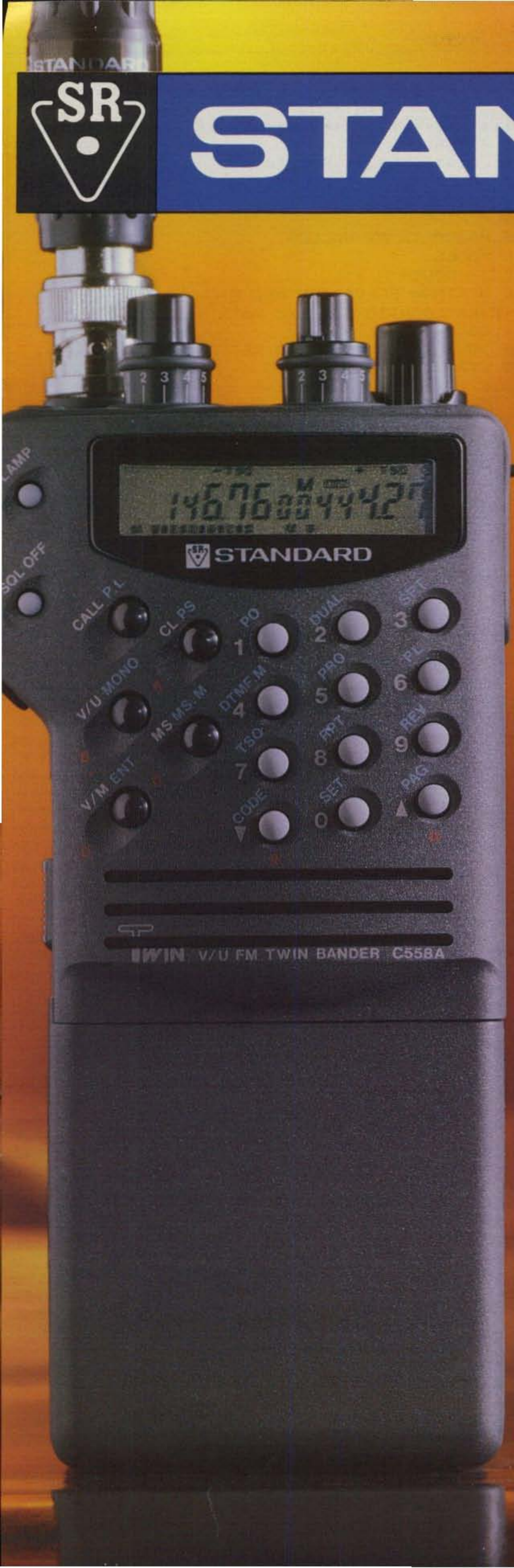
Its bigger brother is LOGic II. It boasts all of the features of LOGic Jr., but also interfaces to most computer-compatible rigs to control the radio. Other features include logging of mode, frequency, and band; automatic duping and scoring for most any contest; antenna rotor control; a menu-driven report writer; a "QSL manager" that ties in with a database subscription plan; and a grayline propagation chart. LOGic II also can be switched to the LOGic Jr. mode for an easy initiation to computerized logging. It's available for the same computers as LOGic Jr. and is \$79.

For more information, contact Personal Database Applications, 2616 Meadow Ridge Dr., Duluth, GA 30136-6037. A LOGic demo is available for \$5, or you can send diskettes and postage for the demo.

**HF Propagation Hotline.** This really is



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software, but I mention the Hotline here because there's a tie-in between DX Enterprises and Personal Database Applications, which we'll get to in a moment.

The HF Propagation Hotline is run by DX Enterprises' Michael J. Klein, NV1L. The hotline is an online audiotext service for amateurs and others who need up-to-date, accurate historical and prediction information. It features plain-language reporting of Northern Hemisphere conditions sector by sector, as well as forecasting for the following 24-hour period. Updated twice daily, the hotline provides smoothed sunspot numbers specifically for HF propagation computer modeling. Thus, you can benefit from the service even if you use your own propagation forecasting software. Calls are \$2 per minute to 1-900-535-9500, ext. 599. For more information, contact DX Enterprises, P.O. Box 2182, Lynn, MA 91903-2181.

Incidentally, we understand that Mike, NV1L, does the prefix table and the awards tables for LOGic; the contest awards definition table is kept as close to 100% up to date as possible, and the prefix table has about 3800 prefixes, allowing many callsigns to yield information down to the region within a country. LOGic owners can subscribe to the NV1L data updates, along with LOGic program updates, from Personal Database Applications on a quarterly basis.

**Ham Organizer.** Mario Signorelli, KC5IY, sent me a demo of Ham Organizer (HO) for the IBM PC and compatibles. The program is not just another logger, but is designed to be a complete organizer for the hamshack. Future updates are planned to include a date calendar and other new features.

There are four major modules that make up HO. These are Directory, Contest Log, Regular Log, and Inventory. The Directory module is a database designed mainly to maintain club membership rosters. The Contest Log was originally for Field Day use, but can be used for any contest; it keeps track of the number of contacts on each band worked and the combined total number of contacts. The Regular Log directly replaces the pen-and-paper logbook, tracking all contacts and displaying the last contact made with the station currently being worked. The Inventory module is a custom database manager that allows you to do a complete inventory of your hamshack or home equipment for insurance or reference purposes. A separate shareware backup utility, Point and Shoot, is furnished with HO at no extra charge.

HO is priced at \$69.95 plus \$3 shipping. A demo version is \$5; this is refundable toward purchase of the full working version. For more information, contact P M Associates, P.O. Box 1359, Milton, WA 98354.

**MacMININEC.** Slowly, ever so slowly, the Mac is (rightfully) gaining ground in the hamshack. Chris Smolinski, N3JLY, has developed what he believes to be the only implementation of the MININEC algorithm for the Mac. MacMININEC V4.4 is an NEC-based antenna analysis program that analyzes antennas, calculating the feedpoint impedance and current distribution, and producing plots of the resulting radiation patterns.

The program was written specifically for the Mac and fully uses the Macintosh graphical user interface (GUI). Menu selections are available for the various analysis modes and presentation formats; the menus are dimmed when their selection is inappropriate. A bar graph display appears when calculating antenna currents, showing how far along the program is in solving the equations. You can print results on either the

```

***** W1FM IONSOUND, VER 4.00B *****
*                                     *
*                                     *
*****
CHANGE TIMES                                0
CHANGE LOCATION(S) & S/L PATH              1
CHANGE SUNSPOT/FLUX/EF LAYER HT          2
CHANGE FREQUENCIES                        3
CHANGE MONTHS                             4
CHANGE MAJOR TX/RX VALUES               5
CHANGE MODES                             6
CHANGE TX POWER                           7
CHANGE MINIMUM ELEVATION ANGLE           8
SWAP TX/RX LOCATIONS & S/L PATH          9
CHANGE COLORS                             10
ENABLE DOS (TYPE 'EXIT' TO RETURN)      11
CHANGE E/F LAYER HEIGHTS                 12
TABULATE TX/RX ANTENNA GAINS             13
TABULATE ANTENNA LOBES/NULLS            14
CHOOSE NEW LAT/LON/CTY FILE             15
PRINT DISTANCE/BEARING TABLE           16
EXIT IONSOUND                            17

ENTER CHOICE: <DEFAULT=CHANGE TIMES: 0 OR RETURN>

```

Fig. 2- IONSOUND is W1FM's sophisticated HF ionospheric propagation prediction program for IBM PCs and compatibles. The menu-driven program produces an easy-to-interpret tabular and/or graphic prediction of RF link performance between any two locations. It also provides distance and bearing information. Shown here is the IONSOUND Main Menu.

ImageWriter or a laser printer (PostScript or non-PostScript). You also can enter lumped impedances such as loading coils and traps, and you can take into account the effects of ground. Several example antenna files are included, and three versions of the program are supplied for different Macs, with or without coprocessors.

MacMININEC, which is System 7 compatible and MultiFinder-friendly, requires 1 MB of RAM. It is priced at \$35 postpaid from Chris Smolinski, N3JLY, 40 South Lake Way, Reisterstown, MD 21136.

**MacHam Radio Software.** While we're on the Mac, we should mention another new product, MacHam™ Radio. It's an amateur radio test generator for the code-free Technician license. The new program contains all 700 possible FCC test questions. It covers both element 2A (Novice) and 3A (Technician).

The program generates FCC-style exams, with any number of unique tests being possible. You can test yourself on the entire pool of questions or on individual chapters and can take exams on-screen or in printed form. On-screen exams provide the option of immediate feedback or scoring at the end of the exam. The on-screen test results can be printed. Printed tests include questions with blank answer sheets, correct answer keys, and all necessary diagrams. An online glossary of key terms is included.

The subject matter is broken down into nine chapters for both the Novice and Technician parts of the exam. The 55-question test includes questions from all chapters based upon the FCC guidelines for exam subject matter.

MacHam is compatible with System 6.07 and 7 and ships with HyperCard 2.1; the program requires a Macintosh Plus with 2MB of RAM and a hard disk. Price is \$49.95 postpaid. For more information, contact Richard Coyne at the Coyne Co., P.O. Box 2000-200, Mission Viejo, CA 92692-2446.

**IONSOUND Follow-Up.** Most readers are aware of the skywave propagation prediction program, IONSOUND™, which we covered several times before (in the July and December

1990 columns and in the September 1991 columns). Jake Handwerker, W1FM, is at it again. Jake now has a very much-enhanced IONSOUND Version 4.

For those who don't want to dig out their old CQs, IONSOUND is a sophisticated HF ionospheric propagation prediction program for IBM PCs and compatibles. The goal of the menu-driven program is to produce an easy-to-interpret tabular and/or graphic prediction of RF link performance between any two locations. It also provides distance and bearing information as an operating aid. The graphic "chirp plot," which is widely used by commercial and military users, depicts simulated oblique ionospheric sounding and provides a useful tool for predicting the best possible frequencies for communications.

IONSOUND V4 is a significant enhancement. Some of the nicer pluses include improved color-coded chirp plot graphics, "IONGRAM" graphic displays that now are selectable as 30 or 60 MHz wide windows, a user-modifiable location file, printout of a distance and bearing table to or from any location, the capability to assess the vertical angle characteristics of antennas at various heights above ground, a user-definable frequency information database, and much more than we describe here. Fig. 2 shows the IONSOUND Main Menu.

IONSOUND is \$35, plus \$15 for a printed and bound user's manual. Upgrades are reasonably priced. For more information, contact Jacob Handwerker, W1FM, 17 Pine Knoll Road, Lexington, MA 02173.

**KB0ZP CONTEST LOG Follow-Up.** In the March 1991 column we briefly mentioned the KB0ZP CONTEST LOG offered by Larry Keibel. Larry's come up with a new version, F.1, which bears noting.

To recap, the program is a full-featured contest logger that handles 17 contests, plus a "generic" contest. I won't detail them, but all the biggies are there, including the CQ World-Wide WPX Contest, CQ World-Wide RTTY Contest, CQ World-Wide DX Contest, and the CQ 160 Meter DX Contest, among others.

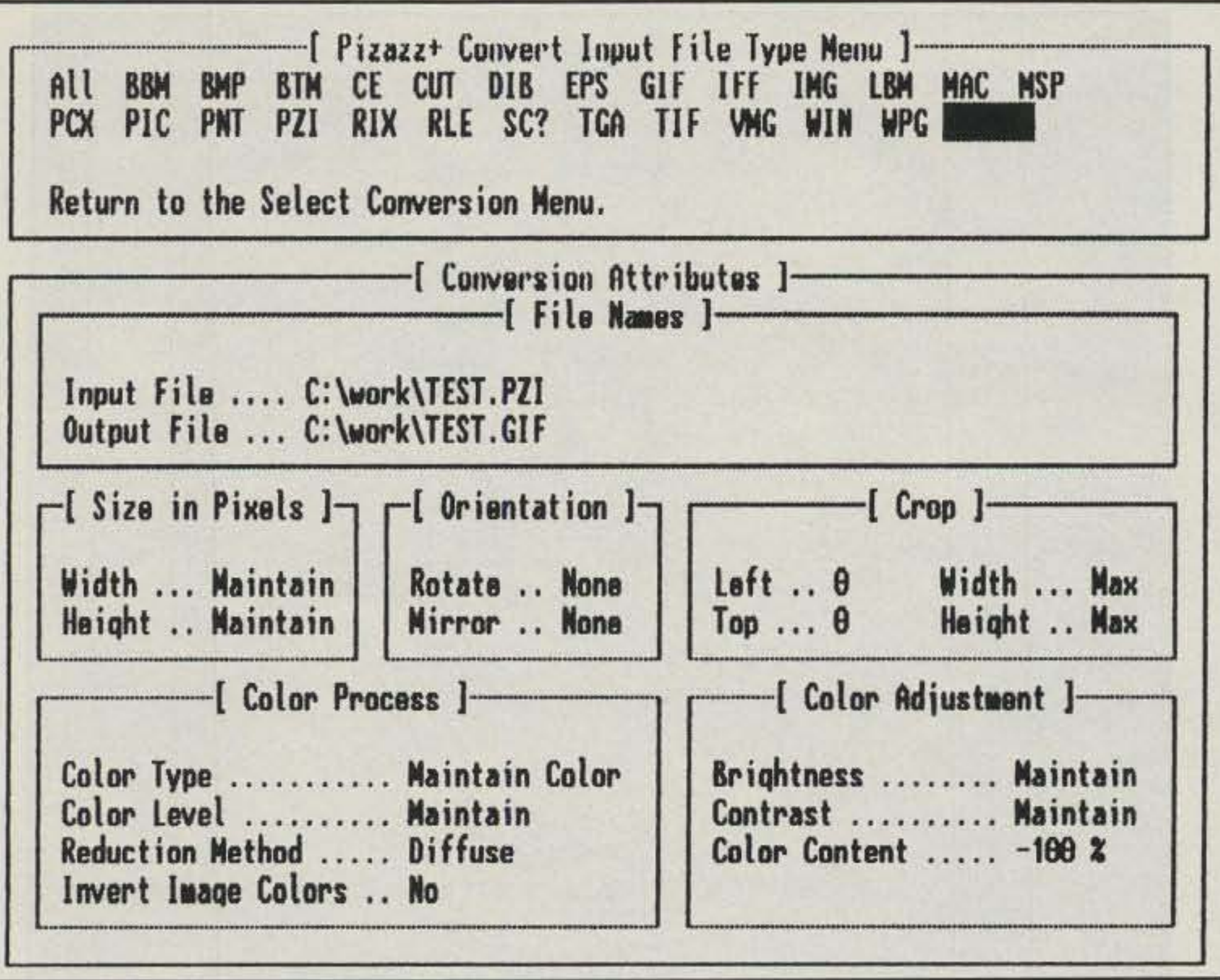


Fig. 3- Pizazz Plus is a sophisticated IBM PC graphics screen capture and print utility program. The program provides a high-tech screen-dump replacement for the DOS screen print program. Pizazz Plus now includes a separate graphics file converter that allows you to read graphic files in any one of about two dozen popular formats and convert them to other formats. When using the converter, you can manipulate images, enhance them, change their color content, and rotate, mirror, or crop them.

From one of the main operating screens you select the band and mode simply by using the arrow keys; the program does all scoring in real time and displays it on the main screen. In some contests you can change the scoring parameters. Duping is supported and may be turned on and off "on the fly."

A separate report/utility program allows you to make complete contest submissions for each contest supported by the program. Furnished utilities include a printer setup that allows you to fully configure your printer for QSL graphics printing. A particularly nice feature is the option to print good-looking, postcard-size QSLs; it makes use of the databank created by the main program. You also can create a test disk to aid in learning the program.

All things considered, the KB0ZP CONTEST LOG is an easy-to-use, fast, and complete package for the serious contester. It's available for \$25 for the registered version, or \$5 for a demo. Contact Larry Keibel, P.O. Box 2010, Sparks, NV 89432.

**Namlulu Follow-Up.** In last December's column we briefly mentioned two programs from Namlulu Communications. These were QSL Record (QSL) and Calculate (CAL) for the IBM PC.

QSL, we noted, was designed to help you gain and keep control of your QSL cards; it featured a sophisticated sort function using several different criteria. CAL offered 32 major electronics formulas to solve at least 119 different types of problems involving frequency, impedance, inductance, capacitance, power, temperature, Ohm's law, and more.

According to William F. Baylor, Jr., NN8Z, new versions of both programs are available. The QSL program now contains a print label, generated by your sorted function; the price still

is \$19.95. CAL now contains an antenna calculation section and some new utility features; it remains priced at \$17.95.

Namlulu Communications also offers several other software programs, including a line of eight instructional programs that teach Turbo Pascal. Each diskette comes complete with a running program and the original source code; prices start at \$3.95.

For more information, contact Namlulu Communications, 1120 Meadowview Road, Willard, OH 44890.

**Private Collection.** DataStorm Technologies is best known for its best-selling (and my favorite) communications program, Procomm Plus (we reviewed V2.0 in the September 1991 column). Recently DataStorm introduced Private Collection, an interesting assortment of "productivity utility" software programs for the IBM PC and compatibles.





The package of utilities consists of more than 20 handy utility "tools" relating to productivity, keyboards, printers, communications, and batch files. Originally developed by the DataStorm programmers for their own use, the package now is available to the public for \$29 on 5.25 or 3.5 inch media.

Among the programs included are productivity tools such as a configurable electronic card file and telephone dialer, a file viewer, a PC-to-PC file transfer program, a file finder, an editor, directory utilities, and screen capture and file dump routines. There also are keyboard utilities such as function key macro and keyboard speed-up programs; printer tools include a file printer and a print spooler. There are some communications-related programs, too, including ones that let you "talk to" your serial ports directly. Rounding out the package are two useful batch file enhancers.



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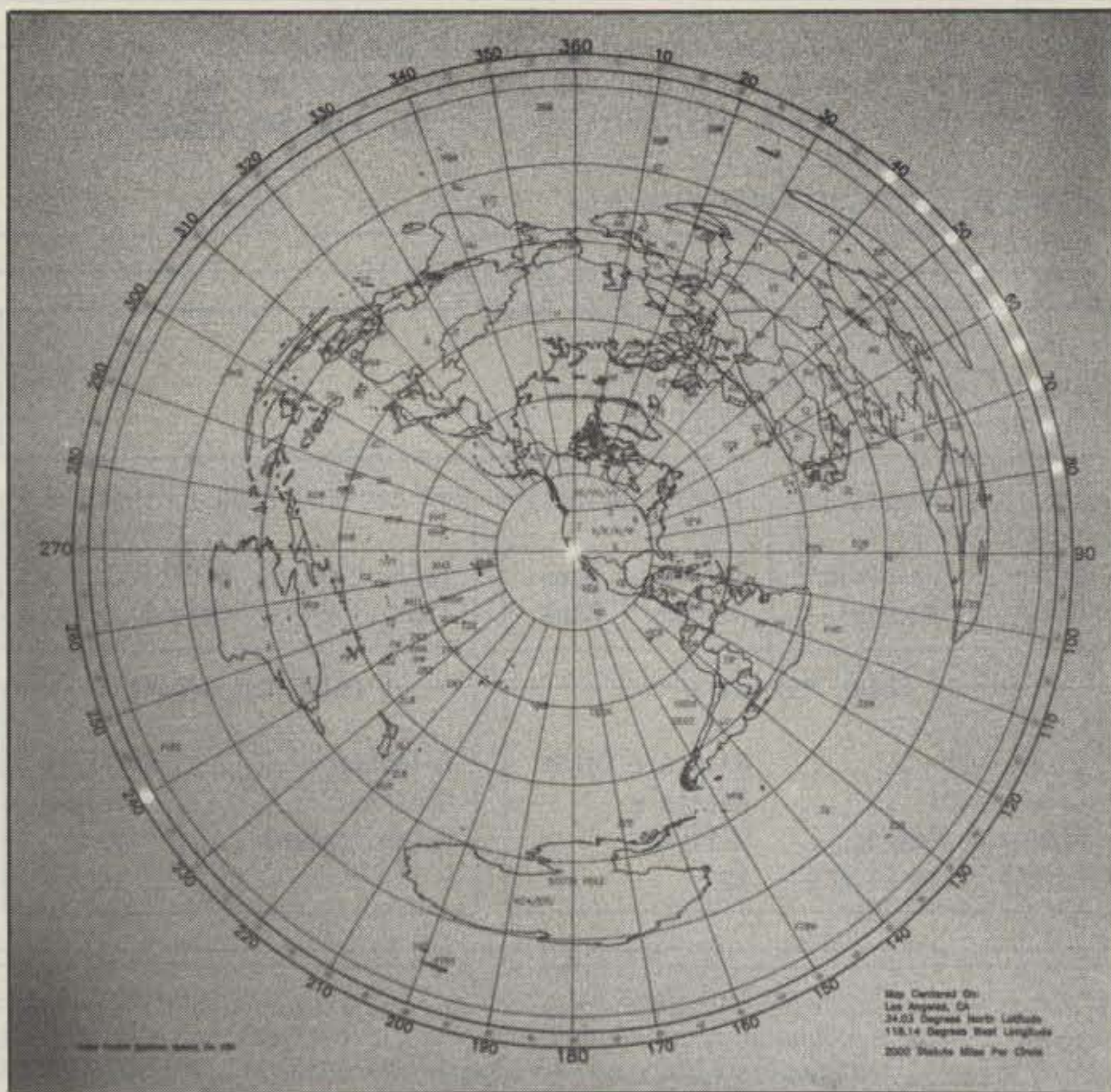
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CIRCLE 124 ON READER SERVICE CARD



The VBI-360 Beam Indicator provides a graphical view of your beam's heading on both long and short path; coverage is shown on a Great Circle map centered on your location. Coastlines are in black, country boundaries in green, radial lines and distance circles in blue, and callsign prefixes in red. Some 72 LEDs around the map periphery provide 5-degree azimuthal resolution. Unfortunately, it's difficult to show the contrast between the white map background and the red LEDs in a black-and-white photo, but you should get the idea; the company's product brochure does a better job. (Photo courtesy Vector Control Systems)

Bottom line: I found the Private Collection utilities fun to play with and, for the most part, useful and professionally executed. However, most of the utilities are available in plain-vanilla public domain and shareware equivalents if you don't mind searching them out and doing with minimal documentation. On the flip side, I found several of the Private Collection utilities to be real gems that alone were worth the price of the package. For example, Rcopy, which allows PC-to-PC file transfers via a serial or parallel cable, is an outstanding file transfer utility that's very fast and easy to use. A 111-page user's manual is included.

For more information, contact DataStorm Technologies, Inc., 3212 Lemone Blvd., P.O. Box 1471, Columbia, MO 65205.

**Pizazz Plus 3.0.** Pizazz Plus is no stranger to this column. We reviewed earlier versions on three occasions, most recently V2.0 in February 1991.

As you may recall, Pizazz Plus is a sophisticated IBM PC graphics screen capture and print utility. The program, in effect, provides a customizable, super high-tech screen-dump replacement for the relatively simple screen print program that comes with your computer's DOS. The RAM-resident Pizazz Plus lets you capture almost any black-and-white or color image you can display on your computer's monitor, graphics or text, from any applications program. The program then allows you to manipulate the images in various ways and faithfully print them out or store them in a disk file.

The newest release of Pizazz Plus greatly increases the program's capabilities in three

ways. First, there's a new graphics file converter. Second, there's an enhanced Windows 3 screen capture capability. Third, there's new video board and printer support.

Pizazz Plus now includes a full-featured bit-image graphics file converter (see fig. 3) that allows you to read graphics files in any one of about two dozen popular formats (including GIF, IFF, PCX, PIC, TIF, WIN, and Pizazz' own PZI format) and convert them to other formats. Not only that, but when using the graphics converter you can manipulate the images, enhance them, change their color content, and rotate, mirror or crop them.

The new Windows 3 screen capture utility lets you capture the Windows screen directly without using the Windows clipboard; you can capture either the entire screen or just the "active" window. Basically, if you can show an image on your Windows screen, you can capture it.

Finally, the new version now is compatible with the graphics modes of many of the new PC video boards. It also works with over 500 printers of various types, including most laser and ink jet printers, such as the new HP DeskJet 500C ink jet color printer.

Pizazz Plus 3.0 is list priced at \$149, though registered users of earlier versions can upgrade at very attractive prices. While the high list price may put the program out of reach of many amateurs for casual work, many SSTV and FSTV users should find the product well worth the investment. For several years I've used Pizazz and Pizazz Plus to prepare this column each month, using it to capture screens from many of the applications programs I review.

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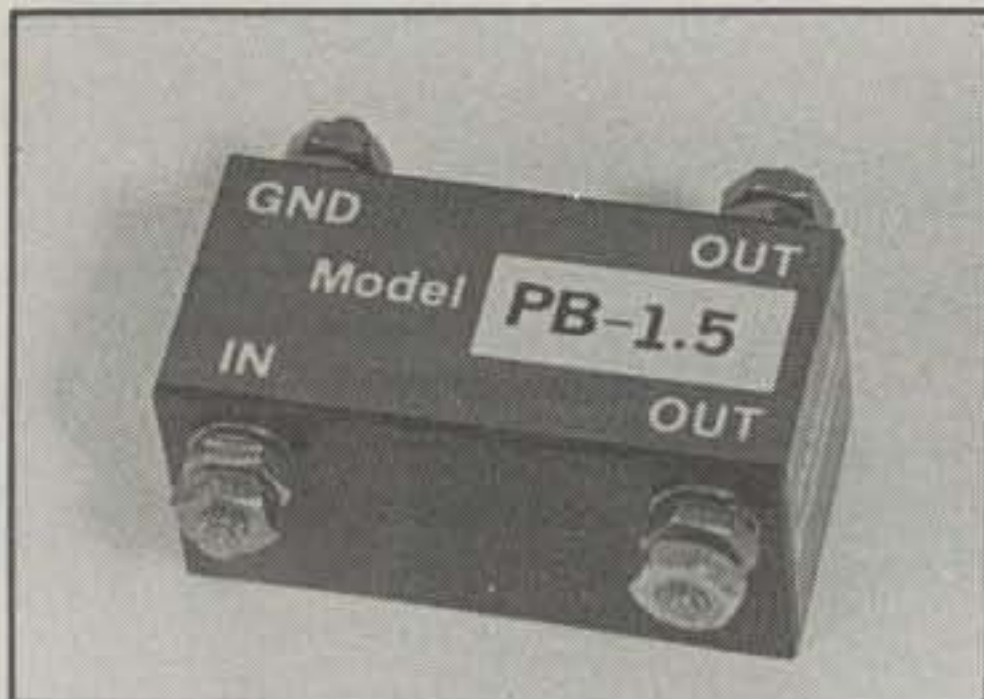
Gain \_\_\_\_\_ 6 dBd VHF  
6 dBd UHF

Design \_\_\_\_\_ 5/8 over 5/8VHF  
4 x 5/8 UHF

Bandwidth \_\_\_\_\_ 2 MHz under 1.5:1 VHF  
10 MHz under 1.5:1 UHF

Termination \_\_\_\_\_ Shunt fed - D.C. Ground  
Type N female

CIRCLE 176 ON READER SERVICE CARD



The Palomar Engineers Model PB impedance matching balun transformers are handy miniature devices you can use as straight baluns, unbalanced-to-unbalanced transformers, or step-down transformers. Available in 11 impedance ratios, they operate over the range 1.7 to 30 MHz and handle up to 150 watts PEP. (Photo courtesy Palomar Engineers)

For more details, contact Application Techniques, Inc., 10 Lomar Park Drive, Pepperell, MA 01463.

## Here and There

**Reflections—Transmission Lines and Antennas.** This is the title of a book by respected antenna expert Walt Maxwell, W2DU; it's been quite popular, enough so that it's already into the second printing. Most readers probably are familiar with Walt's impeccable credentials, having been a longtime ARRL Technical Adviser (TA) and, from 1960 until his retirement in 1980, in charge of the RCA Astro-Electronics Division



Closely related to the Model PB baluns are their bigger cousins, the Model MB metal case baluns. These heavy-duty units handle 2 KW average power (6 KW PEP) and are available in eight different impedance ratios. They are useful for matching rhombics and other relatively high impedance antennas to 50 ohm coax. (Photo courtesy Palomar Engineers)

Space Center Antenna Laboratory and Test Range.

Walt's 24-chapter book is about the care and feeding of antennas. A special objective of the book is to improve knowledge among amateurs of reflection mechanics and transmission line propagation. Another is to debunk erroneous thinking about reflected power, transmission lines, antenna matching, and antenna tuners. The book's highlight is Walt's detailed explanation of the wave mechanics involved in all impedance matching operations, whether using transmission-line techniques, or lumped-con-

stant networks, such as those in antenna tuners.

The author's explanation reveals how wave interference within the matching network produces a perfect match to forward-traveling waves, but develops a totally-reflecting mismatch to all rearward-traveling waves reflected by a mismatched load. This is why all power reflected by a mismatched load that reaches the network adds to the source power within the network, and is re-reflected back to the load. This explains why no reflected power gets past the matching network to reach the transmitter. Walt's explanation shatters the myth that reflected power is fictitious, lost, or causes tube and tank-coil heating in the transmitter. And, based on the principles of conjugate matching, it also explains how an antenna tuner at the input of a feed line tunes a non-resonant antenna to resonance.

The first seven chapters are derived mostly from Walt's popular series of articles published in *QST* in the early 1970s, "Another Look at Reflections," although there is some new and revised material. The other seventeen chapters are a collection of new and previously unpublished material that effectively concludes the series. In addition to closely examining the mystique surrounding "King SWR," the book also is a wealth of information on matching networks, the use of the Smith Chart, and antennas in general.

A full chapter is devoted to BASIC program listings for use with an IBM PC or compatible. The programs aid in designing T and Pi networks, calculating transmission line constants from measurements, and determining complex impedances encountered in lines having attenuation loss. Actually, the chapter is more than just a collection of utility programs. Included is a con-

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vincing argument that debunks the notion that a halfwave feedline is needed to measure the impedance or SWR of an antenna. In fact, notes the author, these parameters can be measured with a feedline of any length, and he provides some computer programs to help you do so.

While technically authoritative and written with scientific precision and accuracy in mind, the book is still highly readable and understandable by non-engineers. The text, which clocks in at more than 384 pages, lacks little except perhaps wrap-up summaries at the end of each chapter and an index. Hopefully these will find their way into a promised second edition. The book is published at \$20 by the American Radio Relay League, 225 Main St., Newington, CT 06111. The companion BASIC program disk is available separately for \$10.

Incidentally, in the January 1992 column we mentioned that some errors slipped by the final proofreading of the first printing. These errors have been corrected in the second printing, but if you have an early copy of the book you may wish to make some pen-and-ink changes. The corrections were printed in a letter from Walt in the QST Technical Correspondence column in the August 1991 issue, p. 42. Also, for a different perspective you might peruse Lew McCoy's review of the first printing, which appeared in the April 1991 CQ, p. 32.

**VBI-360 Beam Indicator.** A product that's drawing a lot of attention these days is the VBI-360 Beam Indicator offered by John Hurst, KU6X, of Vector Control Systems. The new device is unique in that you can connect it to most antenna rotators to give a graphic display of your antenna's heading and pattern on a Great Circle map centered on your QTH.

The VBI-360 has a variable beam display that allows you to match the width of the display, in 10-degree steps, to the nominal value of your beam's radiation pattern or beamwidth. This feature makes it easy to visualize your antenna's coverage at any given rotator setting. As you rotate your beam its coverage is indicated by a group of light-emitting diodes (LEDs) around the periphery of the map. You can adjust the number of illuminated LEDs to show your beam's effective radiation pattern.

Both long- and short-path headings are shown on the display. The long path feature turns on a single LED, 180 degrees from the center of the antenna's forward pattern. This facilitates working long path, where you simply point the LED to the desired country. The long-path indicator can be switched off if you wish.

The input circuit matches a variety of rotator systems; the VBI-360 also can be used with homebrew rotor systems if you mechanically couple a suitable potentiometer to the rotator shaft. The calibration controls are designed for a minimum of interaction. Once the span has been adjusted, you can set the end stops so that the indicator's display exactly matches the antenna's direction.

The 16" x 16" x 1" metal-frame unit is furnished with a glass cover and is priced at \$179.95 plus \$8 shipping and handling. It's available from Vector Control Systems, 1655 N. Mountain Ave., Suite 104-45, Upland, CA 91786.

**Palomar Engineers Baluns.** I frequently receive inquiries about the availability of small, "oddball ratio" baluns for matching unusual antenna impedances to coaxial cable, or for interstage impedance matching, such as between a transceiver and a linear amplifier. A recent inquiry from Ciano R. Strachan, C6ANI, about matching a particular impedance antenna sys-

tem to a 50 ohm receiver input, prompted me to dust off my information on the Palomar Engineers Model PB baluns.

The PB series impedance matching balun transformers are 350 watt PEP devices for HF use, available in eleven different impedance ratios from 1:1 to 16:1. They can be used as baluns or matching transformers to match folded dipoles, rhombics, beverages, and other relatively high impedance antennas to 50 ohm coaxial cable. Connected properly, they also can be used as unbalanced-to-unbalanced transformers or even backwards as stepdown transformers, as the Palomar Engineers application note accompanying the baluns shows. The baluns are \$26.95.

Palomar Engineers also offers a similar but much heavier duty line of Model MB metal case baluns. These baluns handle 2 KW average pow-

er (6 KW PEP) and are available in eight different impedance ratios of 1:1 to 1:12. The larger baluns are especially useful for matching rhombics and other relatively high impedance antennas to 50 ohm coax. The MB series baluns are \$100 to \$165, depending on the impedance ratio.

Contact Palomar Engineers, Box 462222, Escondido, CA 92046.

## Wrap-Up

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

*Overheard:* When dealing with the government, it's easier to seek forgiveness than permission.

73, Karl, W8FX

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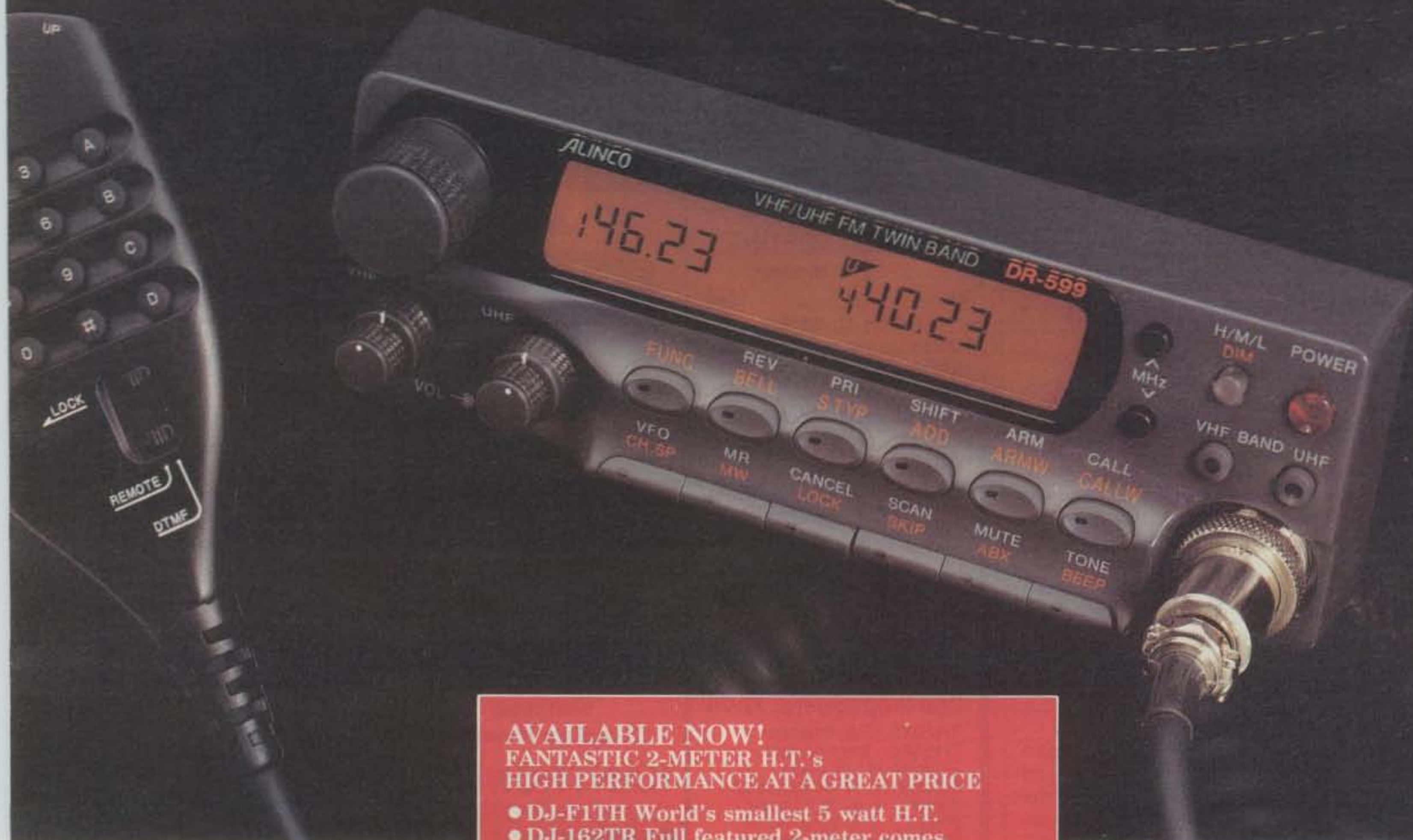
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This DR-599T has full duplex cross band operation and cross band repeater functions with real-world

power and excellent sensitivity. Airband receive is also possible with a simple modification.

The standard features include 3 power output selections, ARM, ABX, Bell, Reverse, Mute, and Auto Dialer functions. Also, with the optional EJ-8U DTMF Decoder board installed, the DR-599T can be remotely operated from another transceiver.

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CIRCLE 178 ON READER SERVICE CARD

## NEWS OF CERTIFICATE AND AWARD COLLECTING

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

**Alex F. Burr, K5XY**  
**USA-CA All Counties #685**  
**All 20M SSB Mobile, 12-17-90**

"My circumstances are such that I have very little time to devote to county hunting except on occasional trips, so most of my work is mobile. I have been collecting or giving out counties for almost 20 years. (It certainly does not seem that way, but that's what the log says.) When I had only a few left, I did not make much effort to publicize the fact because it was difficult to coordinate my schedule with anybody who could make a special trip. I did mention to N7BKW that I needed only two more from North Carolina, however, and therein lies the tale.

"One Sunday morning my wife said that some man had called to say that my next-to-last county was on the air. I quickly rushed to the car. I pushed the key in, turned it, and—nothing happened. The battery was dead.

"That happens reasonably (or unreasonably) often, so I applied the usual remedy. I drifted backwards down the driveway to get a rolling start. The driveway is short, and it takes a practiced hand to let in the clutch at the exact moment the coasting speed is a maximum with enough driveway left to start the engine. My coordination was off. The engine coughed once and died with the rear end just sticking out into the road. So much for that opportunity.

"I needed the car later in the day, so I dug out the battery charger (2 A max) and hooked it up. About 10 minutes later I said to myself, 'Well, I can at least listen.' But while there were some strong signals on the ICOM 735, they were badly distorted and had lots of AC hum on them. The charger just could not pump enough energy into the depleted battery.

"Ten minutes later I tried again. The hum was gone, and I could hear the net on 14.336 MHz. It did not seem too busy, so I tried a short transmission. I got almost as much output as I usually get with the engine off, but I was a little surprised that I was heard at once. I was told that N4SPN was in Gates, North Carolina on 14.343. And sure enough, he was.



Alex F. Burr, K5XY, USA-CA All Counties #685, All 20M SSB Mobile, 12-17-90.

"N4SPN did not hear me, however. In due time I was relayed in. But he still could not hear me. Too much QRM. N7BKW came to the rescue and arranged for the contact to be made on the net frequency. The 33's were exchanged, and I had my next-to-the-last county.

"I had to be away from the house for a short while. On my return my wife said another call had arrived saying that my last county was on the air. Back to the car. It still would not start, but there was a reasonable amount of voltage across the battery, so contact was again made with the net.

"It turned out that N4SPN was going to make a special trip to Beaufort, North Carolina for me. Because I had to leave in 20 minutes, some net time was taken to make sure that I would be back when he got there. I even heard a few comments to the effect that I should get my priorities straight, which after 20 years seemed reasonable.

"Almost two hours later I returned. This time the car did start, so I had my usual power. The net directed me to 14.329 MHz, where a Texas mobile was running. After she finished her run, I was told that N4SPN would be run next. I could just hear him. The signal path was deteriorating. He could not hear me, but he said he was near a Voice of America SWB station and he would drive farther away. I disconnected the charger from the now running car and prepared to drive to a quieter location myself. Just as I was putting the charger away, I heard AA4LY, the alternate frequency NCS, calling me for another try. I raced to the driver's seat and hit the push-to-talk switch before he gave up on me.

333 South Lincoln Ave., Mundelein, IL 60060

### USA-CA Special Honor Roll

Randy Bean, KC4JC  
 USA-CA All Counties #743  
 Mixed, 2-8-92

George C. Hooper, WD8AGC  
 USA-CA All Counties #744  
 All SSB Mobile, 2-8-92

Percy E. Ford, KA1JPR  
 USA-CA All Counties #745  
 All 20M SSB Mobile, 2-21-92

Jerold M. Goetsch, KF7RU  
 USA-CA All Counties #746  
 All SSB, 2-25-92

Ira G. Deutsch, WA1FNS  
 USA-CA All Counties #747  
 Mixed, 2-27-92

Mark C. Michel, W9OP  
 USA-CA All Counties #748  
 Mixed, 2-27-92

This time 22's were exchanged and the last county was in the log book.—73, Alex, K5XY"

### Awards Issued

Randy Bean, KJ4JC, filed his completely filled Record Book in good order and received USA-CA All Counties #743, USA-CA 3000 #771, USA-CA 2500 #852, USA-CA 2000 #929, USA-CA 1500 #1016, USA-CA 1000 #1217, and USA-CA 500 #2573, Mixed, dated 2-8-92.

George C. Hooper, WD8AGC, did it all in one motion by claiming USA-CA All Counties #744, USA-CA 3000 #772, USA-CA 2500 #853, USA-CA 2000 #930, USA-CA 1500 #1017, USA-CA 1000 #1218, and USA-CA 500 #2574, All SSB Mobile, dated 2-8-92.

Percy E. Ford, KA1JPR, completed all of his paperwork, garnering a full complement of endorsements covering USA-CA All Counties #745, USA-CA 3000 #773, USA-CA 2500 #854, USA-CA 2000 #931, USA-CA 1500 #1018, and USA-CA 1000 #1219, All 20m SSB Mobile, dated 2-21-92. Percy also added the same endorsement to his USA-CA 500 #2422, Mixed.

Jerold M. Goetsch, KF7RU, took the

## USA-CA Honor Roll

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WD8AGC 772	WD8AGC 1017
KA1JPR 773	KA1JPR 1018
KF7RU 774	W9OP 1019
W9OP 775	
2500	1000
OE5KE 851	KJ4JC 1217
KJ4JC 852	WD8AGC 1218
WD8AGC 853	KA1JPR 1219
KA1JPR 854	W9OP 1220
W9OP 855	
2000	500
OE5KE 928	WK5A 2570
KJ4JC 929	GW4OFQ 2571
WD8AGC 930	KD1CJ 2572
KA1JPR 931	KJ4JC 2573
W9OP 932	WD8AGC 2574
	PA0JMJ 2575
	EA6AAK 2576
	AH6JG 2577
	W9OP 2578

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, U.S.A. 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, U.S.A. DX stations must include extra postage for airmail reply.

final steps in his quest and received USA-CA All Counties #746, All SSB, and USA-CA 3000 #774, All 20M SSB Mobile, both dated 2-25-92.

Ira G. Deutsch, WA1FNS, put the finishing touches on his good record and qualified for USA-CA All Counties #747, Mixed, dated 2-27-92.

Mark C. Michel, W9OP, collected a complete set of county confirmations and claimed USA-CA All Counties #748, USA-CA 3000 #775, USA-CA 2500 #855, USA-CA 2000 #932, USA-CA 1500 #1019, USA-CA 1000 #1220, and USA-CA 500 #2578, Mixed, dated 2-27-92.

Adolph Kerschbaum, OE5KE, filed his good application for USA-CA 2500 #851 and USA-CA 2000 #928, Mixed, dated 2-3-92.

USA-CA 500 certificates went to:  
Gordon Kennett, WK5A, USA-CA 500 #2570, All SSB, 2-3-92.

Roger Hunter, GW4OFQ, USA-CA 500 #2571, Mixed, 2-4-92.

Richard C. Emmert, KD1CJ, USA-CA 500 #2572, All 10M, 2-6-92.

Randy Bean, KJ4JC, USA-CA 500 #2573, Mixed, 2-8-92.

George C. Hooper, WD8AGC, USA-CA 500 #2574, All SSB Mobile, 2-8-92

Meindert van der Laan, PA0JMJ, USA-CA 500 #2575, All CW, 2-14-92.

Juan Estape Font, EA6AAK, USA-CA 500 #2576, All CW, 2-21-92.

Alexander P. Lapinski, AH6JG, USA-CA 500 #2577, Mixed, 2-21-92.

Mark C. Michel, W9OP, USA-CA 500 #2578, Mixed, 2-27-92.

## Awards Available

**Russian Robinson Award.** The Russian Robinson Club issues the Russian Robinson Award for QSOs (also SWL) with amateurs on islands belonging to Russia. The diploma has three classes:

**Class 1**—20 different stations on 10 different islands.

**Class 2**—16 different stations on 8 different islands.

**Class 3**—10 different stations on 6 different islands.

Each QSO counts double for stations or SWLs located on islands. The dates of QSOs, bands, and modes are not limited.

The fee for each class is 12 IRCs, or \$6 U.S. A list of Russian islands with their numbers (RRA list) costs 2 IRCs, or \$1 U.S.

Send GCR list (no QSL cards) and fee by registered letter to Award Manager UA3GPA, Valery Sushkov, P.O. Box 3, 398000 Lipetsk, Russia.

**LU 25 PX Award.** The LU 25 PX Award is sponsored by the Grupo Argentino De DX (GADX). It is available to amateurs who have worked at least 25 different Argentinian prefixes since January 12, 1989, the founding date of the GADX. Argentine prefixes include the series AY-AZ, L2-L9, LO-LW, and some L1 authorized call signs.

Endorsements are available for 26, 27, 28, . . . prefixes. There are separate certificates for mixed, phone, and CW modes.

**Fees:** First submission, \$6, or 10 IRCs. Endorsements are \$2, or 3 IRCs.

Send certified list to GADX Award Manager, P.O. Box 420, 1000 Buenos Aires, Argentina. (*This is a new address for GADX.*)

**3A CW Award.** The 3A-CW Award, issued by the 3A-CW Group, is available to amateurs and SWLs worldwide.

All contacts or SWL reports with stations in Monaco must be on CW (two-way) only. Each QSO or SWL report counts as one point; joker counts as two points (only one time). Jokers are 3A0CW, 3A2ARM, 3A200SM, 3A7A, 3A8A, 3A9A, 3A7JO.

Several QSOs or SWL reports with the same station are permitted on different bands only. All bands, including WARC, are

acceptable. There is no minimum RST. QSO or SWL reports must be after January 1, 1981.

The 3A-CW Award is issued in three classes: Basic, First Class, and Excellence. For Europe, Basic requires 4 points, First Class requires 8 points, and Excellence requires 12 points. For other than Europe, Basic requires 2 points, First Class requires 4 points, and Excellence requires 6 points.

The cost is 20 IRCs, or \$8 U.S. (add \$3 U.S., or 8 IRCs, for registered airmail). Upgrades are \$2 U.S., or 5 IRCs. Submit log book entries certified by the national award manager or by an official country CW club, or submit QSLs to Claude Passet, 7 rue de la Turbie, MC 98000 Monaco, Principaute (Europe).

**STB (RA) EG Program.** The purpose of the Scottish Tourist Board (Radio Amateur) Expedition Group is to (a) set up worldwide communications stations in Scotland that are unique, scenic, cultural, historic, or in any other way related to Scotland; and (b) to make the public more aware of the hobby of amateur radio through a public relations display at each event. All events are open to the public.

**Awards:** The Thistle Award and the Supreme Tartan Banner Award are issued by the group on a continuous basis. Both awards are in color. Claims for all Scottish Tourist Board awards should be sent to Awards Manager Robbie, GM4UQG, P.O. Box 59, Hamilton, Scotland ML3 6QB. Checks and postal orders should be payable to STB(RA)EG.

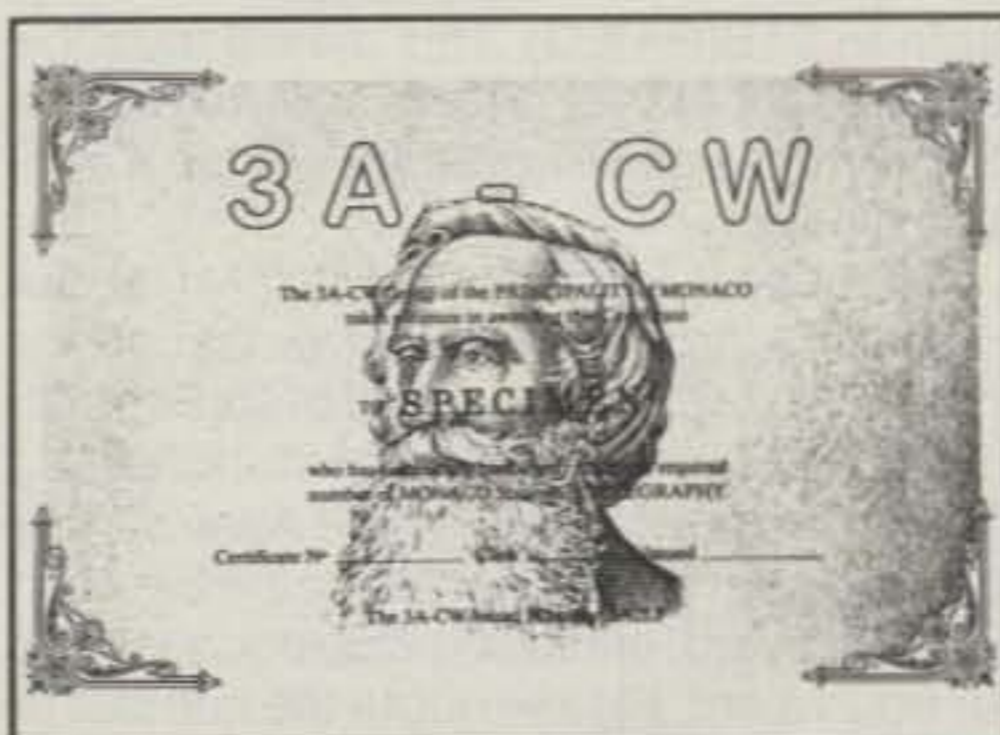
Awards are also issued for some "single" events during the year. These are applicable only for the duration of that event. Annual events include the following: Scottish Activity Weekend (third weekend in April each year), Castles on the Air, 8 Nations National Trust event, and International St. Andrews Day.

**Frequencies:** CW—3510, 7010, 10140, 14010, 21010, 24905, 28010 MHz. SSB—3765, 7065, 14140 & 14240, 18130, 21250, 24950, 28400 to 28600 MHz. On 14 and 21 MHz bands frequencies will be plus or minus 35 kHz. The CW frequency of 10140 will be a dedicated station mainly for the UK novice license holders.

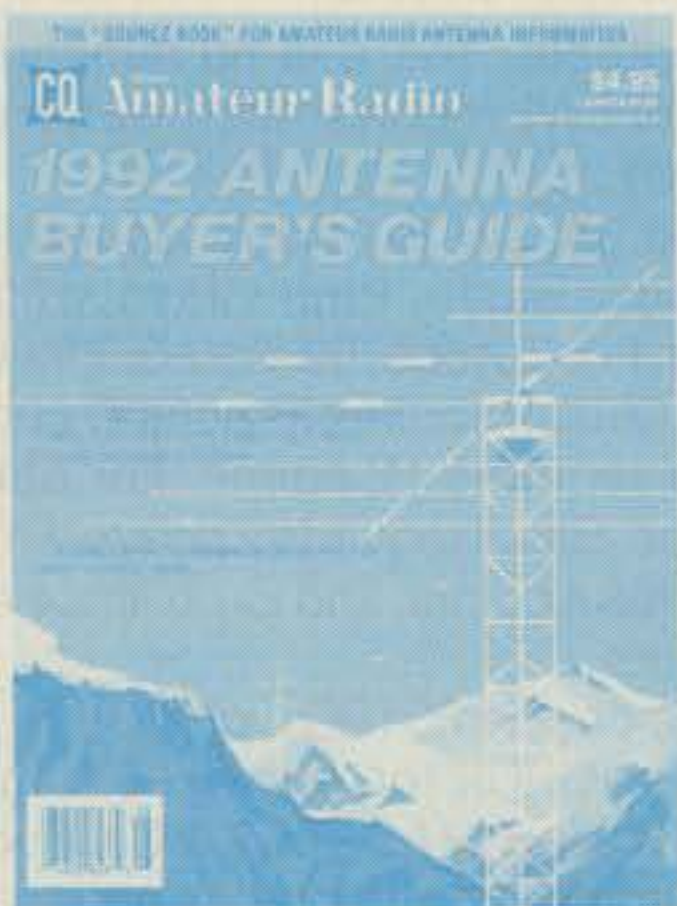
**Times of events:** Normally, Saturdays 0800 to 2200 UTC; Sundays 0900 to approximately 1500 UTC. Times of operation are subject to change. Check bands for any activity.

A list of events/information pack is available from Paddy, GM3MTH, coordinator/QSL Manager, on receipt of two second-class stamps or equivalent for return postage. Please address Paddy (aka John McGill) at 9, Ramsay Pl., Coatbridge, Lanarkshire, Scotland ML5 5RE. List of events for 1992:

April 11th, GB2SMC—Scottish Museum of communications, grand opening, Bo'ness.



The 3A CW Award issued by the 3A CW Group, Monaco.



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April 18/19, GB2STB—1st Annual Scottish Activity Weekend. Twelve Scottish regional stations, clubs, and individual stations taking part. Certificate and trophies. Summerlee Museum, Coatbridge. Multi-station participation: GB2STB, GB0BR, GB0CTR, GB0DGL, GB0FFE, GB0GRN, GB0HLD, GB0LTH, GB0ORK, GB0SLD, GB0SCD, GB0TYS, GB0WIL, plus club stations and individual Scottish stations.

May 16/17, GB400CA—Crathers Castle, second Annual Castles on the Air. Nine castles in UK and Ireland. Certificate (Crathers 400th Anniversary). Multi-station participation: GB400CA, GB8RC, GB2NIC, EI7M/P, EI4DCD, GB2CPC, GT3FLH, GJ3DVC, GB0CC, EI? (sic).

June 20/21, GB8GC—Glamis Castle, Angus, a Royal residence since 1372, family home of the Earls of Strathmore and Kinghorne.

July 18/19, GB2SMC—Scottish Museum of Communications, Bo'ness.

August 1, GB8PP—Pollok Part Glasgow, home of the Burrell Collection and Pollok House, birthplace of The National Trust for Scotland 1931.

August 22/23, GB6SM—third annual West of Scotland Steam Fair, Summerlee Museum, Coatbridge.

September 19/20, GB2NTS—Culzean Castle, Maybole, Ayrshire. Fourth Annual 8 Nations National Trust Event, 10 stations UK and Ireland from National Trust Properties. Certificate. Multi-station participation: GB2NTS, GB2NTU, EI7M/P, EI4DCD, GB2NTW, GB2NTC, GB2NTE, GB?(sic), GJ3DVC, GT3FLH, EI?(sic).

November 30, GB6SA—St. Andrews Day. Second Annual International St. Andrews Day, involving Moscow Radio Club (MTI) & St. Petersburg Radio Club, Aberdeen ARS. Multi-station participation: GB6SA, R1SA, UA3 or RA3, GB0ASP.

Number 1 Perpetual Award—*The Scottish Thistle Award*. Issued for contacting or hearing *four* separate Scottish Tourist Board special event stations operating in Scotland. Please note that other stations operating outside Scotland do not count towards number 1 or number 2 award, but only apply to the station operated by the STB Radio Group. Forward log extract only (QSL cards not required) to Awards Manager enclosing 2.00 pounds sterling or \$6 or equivalent (checks/postal orders payable to STB(RA)EG). This award must be claimed separately prior to applying for the Supreme Tartan Banner Award, as a separate claim.

Number 2 Perpetual Award—*The Supreme Tartan Banner Award*. Issued for contacting or hearing a total of six Scottish Tourist Board special event stations (i.e., including four for the Thistle Award). File claims in same manner as for the Scottish Thistle Award, enclosing 2.50 pounds or \$8 or equivalent. Please quote the number of your Thistle Award.

Single event awards for 1992 include

the September 19/20 National Trust Event Overseas contact any 3 stations, UK and Ireland contact any 6 stations. Send log extracts only (QSL cards via bureau). The costs are: UK, 1 pound sterling; Ireland, pounds sterling; overseas \$4 or equivalent payable to STB(RA)EG.

Claims for all awards and trophies should be sent to Awards Manager Robbie GM4UQG, P.O. Box 59, Hamilton, Scotland ML3 6QB. Please write the name of the award on the back of the envelope.

**VA1S Special Event Award.** The Marconi Amateur Wireless Society of Sydney Nova Scotia operated special event station VA1S during the month of December 1991. The operation celebrated the 89th anniversary



Special-event station VA1S certificate by the Marconi Amateur wireless Society, Nova Scotia.

sary of the first west to east trans-Atlantic transmission by Marconi on December 15, 1902 from Glace Bay, Nova Scotia to Poldhu, Cornwall, England. VAS was the original callsign of the Marconi station at Glace Bay.

Certificates are being sent to stations contacted during the December operation. Requests for certificates should go to Alan Leith, VE1AL, 846 George St., Sydney Nova Scotia, Canada, B1P 1L9. Please include \$3 or 5 IRCs.

## Of Special Interest To County Hunters

*Please Note:* The cost of the USA-CA Record Book is now \$2.00.

The 1992 Mobile QSL Bureau Director is currently being distributed. The director is 8 1/2" x 11", printed on quality paper and is plastic ring bound so that it will lie flat when in use. The price is \$7.50 including shipping and handling in the U.S. Outside the U.S. the cost is \$9.00 U.S. funds surface mail. Send to: Mobile QSL Bureau, Route 3, Box 400, Timmonsville, SC 2916 U.S.A. The bureau also has available an information booklet which will be helpful to all county hunters. The booklet is available for SASE only.

73, Dorothy, WB9RC

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## WHAT'S NEW AND HOW TO USE IT

**A**s a continuation of last month's discussion on power supplies, there are a couple of additional circuits I think will be of interest to the experimenter.

Often, particularly when using operational amplifiers, there is a need for a negative supply. Of course, you could always add another rectifier and regulator in an AC line powered device, but for something that has to work from batteries, another battery is usually the result. There are ways to solve this problem, however, so take heart!

Fig. 1 is a schematic of a negative voltage converter using a 7660 integrated circuit. This IC is manufactured by several companies and is designed to specifically convert a positive voltage into an equal negative voltage at current levels of several milliamperes. As you will notice, the circuit only requires two common electrolytic capacitors, which can be of any value from 10 to 100 microFarads. Some manufacturers' 7660s may need an additional diode if the input voltage is between 6.5 and 10 volts, so be sure to check on the IC you plan to use. Operation of the 7660 can best be explained by referring to fig. 2.

An internal oscillator first connects the electrolytic capacitor connected to pins 2 and 4 so that pin 2 goes to the positive input, and pin 4 to ground or common. This causes the capacitor to charge to a voltage equal to that of the input supply. It then effectively reverses the capacitor leads and reconnects it to the output producing the reversed polarity. Now pin 2 is connected to ground or common, and pin 4 to the output. Since this switching action occurs at a rate of approximately 10 kHz, the output electrolytic capacitor stores enough energy between switching cycles to provide a smooth negative DC output. However, because the output capacitor does discharge during alternate switching half-cycles, regulation is not perfect and the output voltage does drop as a function of load current. Fig. 3 shows just how much the voltage actually drops as the load varies.

Although not exactly regulated, the 7660's output is nevertheless ideal for use as a negative supply for low-power op-amps or as a simple negative bias supply for many other low-power applications.

A similar but less accurate negative voltage converter can be built with the ubiquitous LM-555 timer chip as shown in fig. 4. Here the 555 is connected as an astable multivibrator, producing a 5 volt pp square

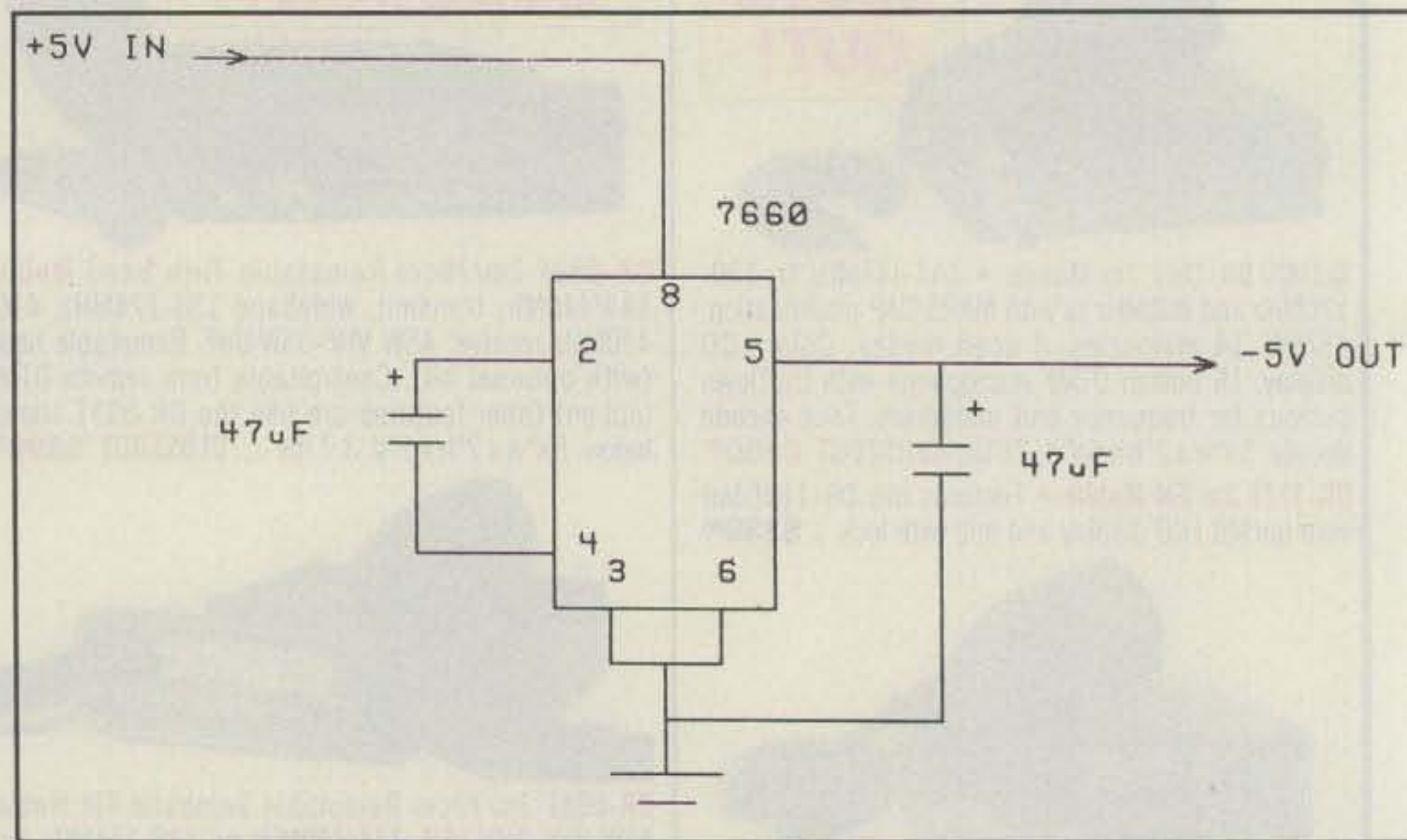


Fig. 1- The +5 volt to -5 volt converter.

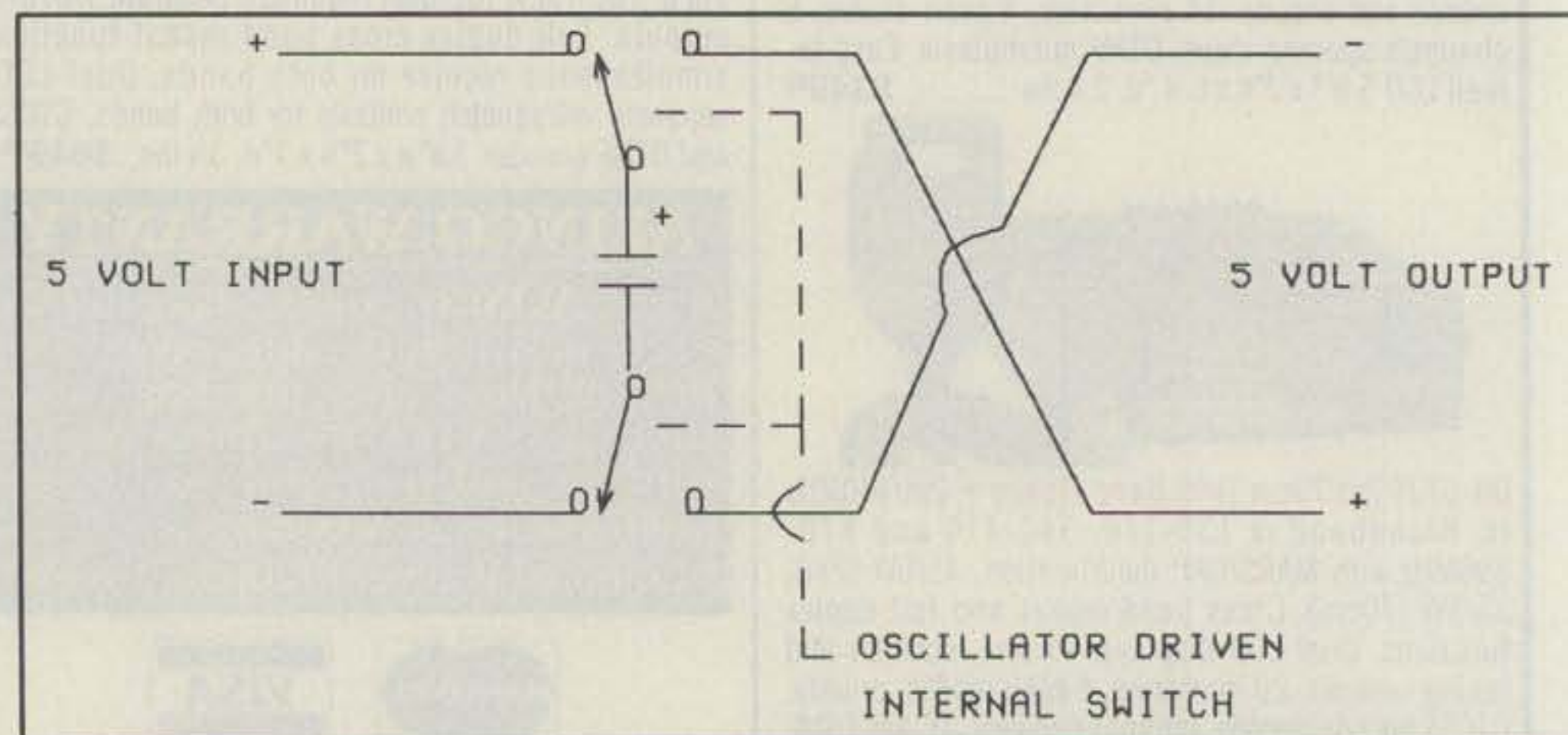


Fig. 2- Basic operation of the 7660.

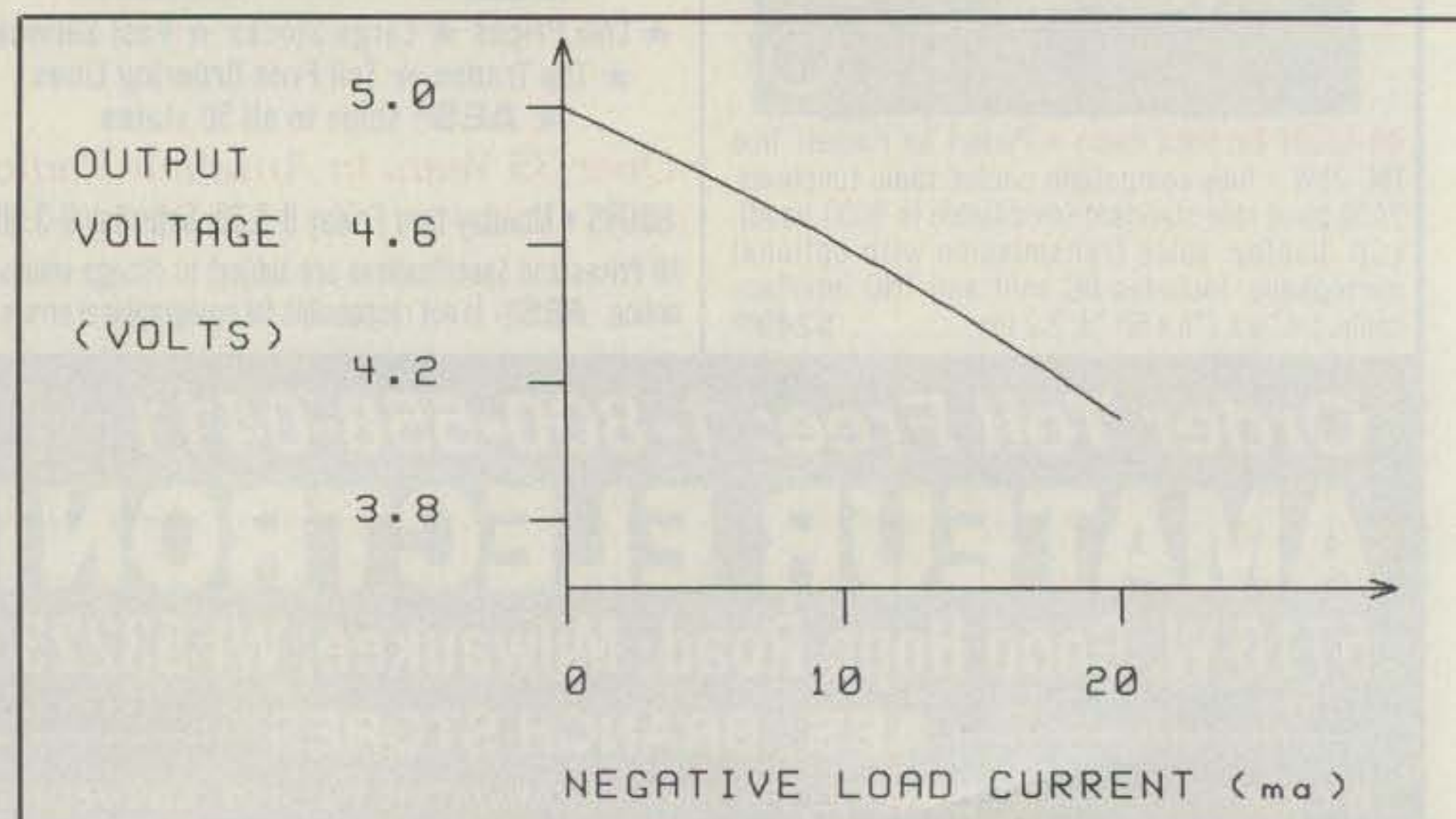


Fig. 3- Output voltage verses load current.

c/o CQ magazine



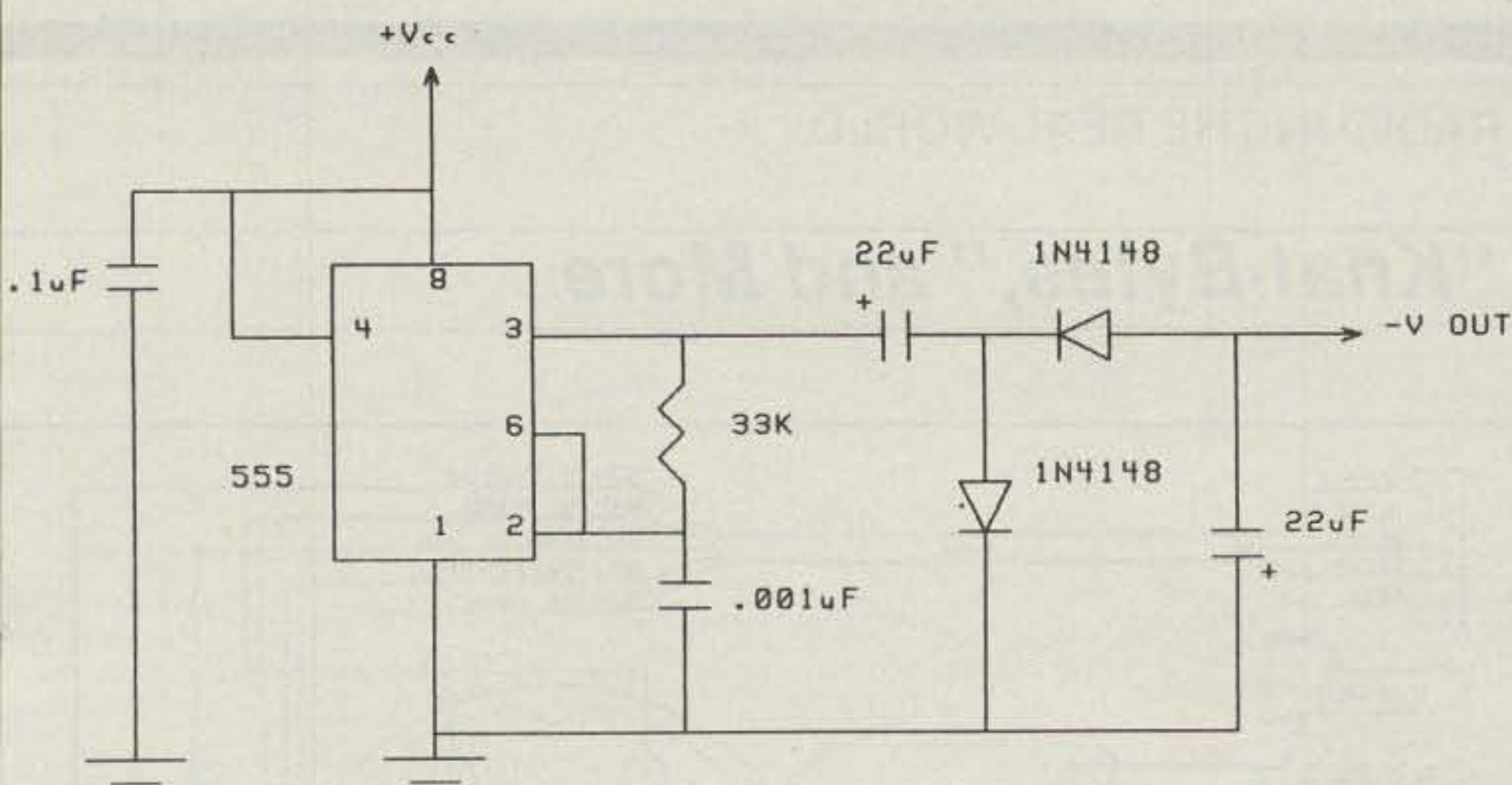


Fig. 4— Negative voltage converter using a 555.

wave. This output, from pin 3, is coupled through a 22 microFarad capacitor to the diode voltage doubler formed by D1 and D2. Capacitor action converts the 5 volt square wave to a  $\pm 2.5$  volt signal centered around ground. Diode D1 shorts the posi-

tive half of the square-wave signal and in conjunction with diode D2 produces a negative output equal to twice the peak positive value of the input, across the output 22 microFarad capacitor.

As in the case of the 7660, the choice

of values for the two capacitors determines the output current and regulation that can be achieved by the circuit.

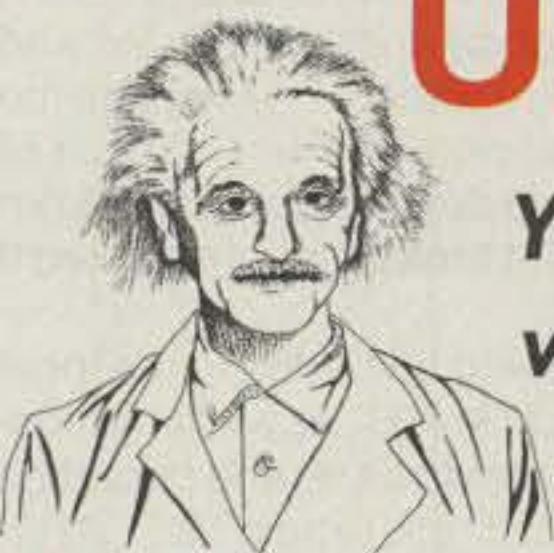
Finally, I would like to make you aware of two very simple voltage reference chips offered by MAXIM Integrated Products of Sunnyvale, California. These chips produce a highly precise +5 volt (MAX-675) or +10 volt (MAX-674) output and are ideal for inexpensive calibration standards. Each is pre-trimmed to  $\pm 0.15\%$ , but can be adjusted to  $\pm 300$  mv if desired, and draws only 1.4 milliamperes maximum. They will hold their outputs to 0.03% for the 5 volt unit and 0.06% for the 10 volt unit over temperatures from 0 to 70 degrees C. In addition, input voltage variations of +8 (for the 5 volt unit) or +13 (for the 10 volt unit) to 33 volts and output load currents of up to 10 milliamperes will not affect the output. Best of all, it takes just one or two 9 volt batteries, depending on the unit you choose, to make a highly accurate, portable calibration standard. If this sort of application interests you, contact MAXIM for more details.

Next month we will leave the power supplies for a while and take a look at the various data communications standards that we may have to deal with in our experimentation.

73, Irwin, WA2NDM

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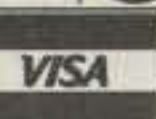
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## CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

### Mods, "Knat-Bytes," and More

**W**hen mid-year rolls around we begin thinking about the new innovations for the digital modes. June allows us a finite look at some of the present and future packet topologies via the SouthNet Packet Conference in Albany, Georgia. Plan now to be there, and if you have a new idea for packet, AMTOR, or any of the other digital modes, come to SouthNet and tell us about it. This is the time and the place to show your wares to the rest of the packet world for them to see, hear, and use. There are some new innovations that will be introduced and discussed at the conference this year.

I will be conducting a packet forum and discussion on high-speed packet operation using 9600 and 19,200 bauds. This session will begin at 10 AM Saturday morning, June 20th.

Much of what is occurring in digital communications is happening at the higher speeds. We are hoping this will impact the transceiver manufacturers enough so that they will come up with easy access connections or tie-points inside the transceivers. The tie-points which we hope they will give us are "to" the varactor stage(s) of the true FM transceiver (transmit audio) and "from" the quadrature detector and/or discriminator (receive audio). The push-to-talk line is another point that will need to be accessed via these external connectors.

The input and output lines to and from each of these circuits must be shielded from each other. There is no common shield for both signals. I repeat, each signal *must* have a separate shield, because the data within these lines can be corrupted and destroyed by offending noise or interference from surrounding circuitry.

Come on, manufacturers. Give us a modular connector on the rear of the VHF and UHF transceivers that connect to the (true FM) varactor modulator, and the output of the quadrature detector. Include the push-to-talk line, and you have the blessings of this author and many other serious packeteers.

#### More 9600 Baud Mods

Last month I covered several transceiver modifications that would allow 9600 baud

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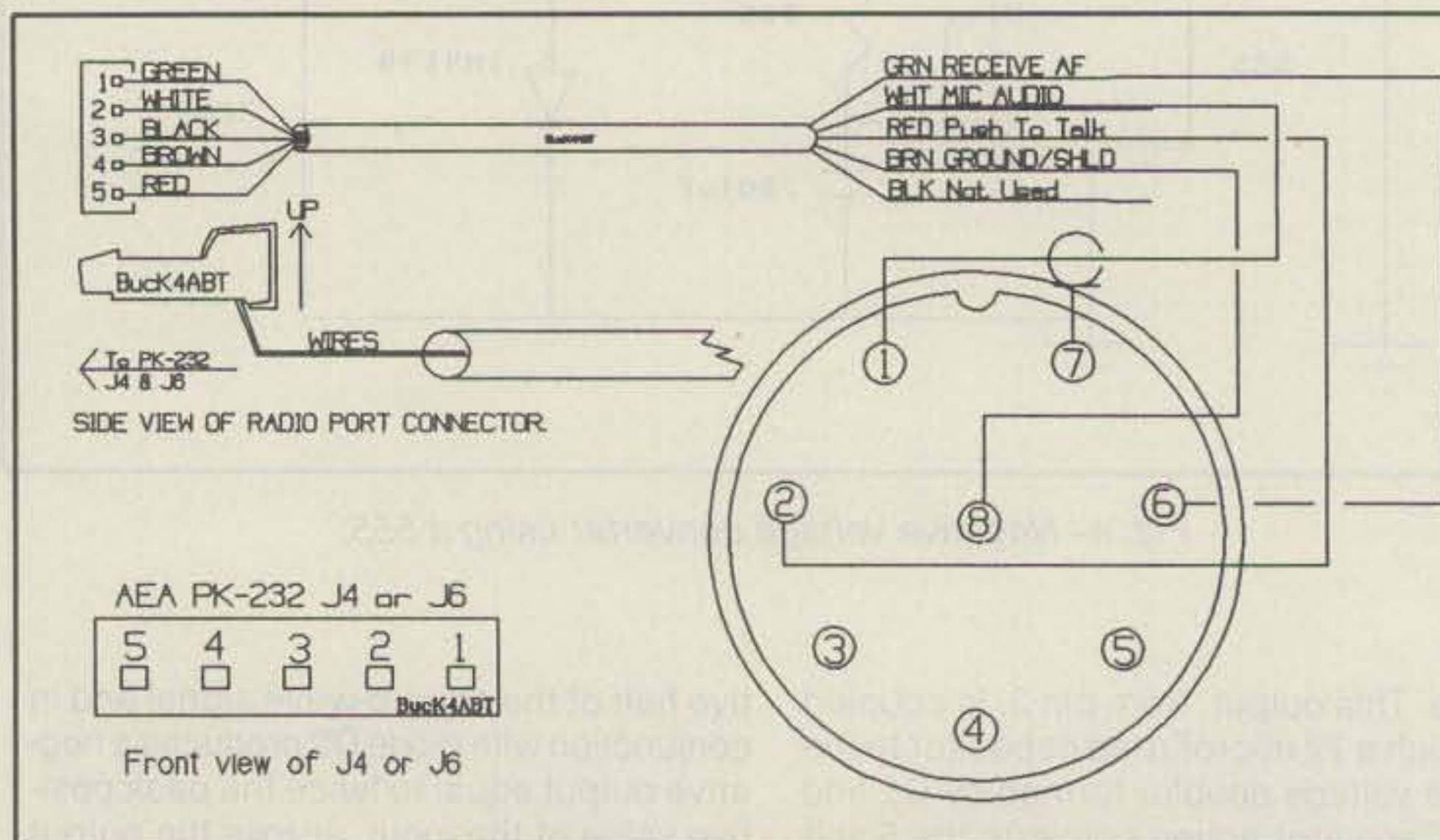


Fig. 1- The AEA PAKRATT 232 port 1 or 2 to the Radio Shack HTX-100.

use. I'm trying to add as many of these mods to the "Packet User's Notebook" as I can, and as I receive these mods I'll also try to print them in this column.

I hope you will understand that I have no way of trying all the modifications that are being undertaken to implement 9600 bauds! Therefore, I am not responsible for any errors or omissions. The publisher and I assume no liability for loss due to the use of the information contained herein.

Here is another 9600 baud modification for the TM-721 and TM-731. Credit for uploading the following information into the packet BBSes goes to Jeff, WA6FWI @ WB6YMH.#SOCA.CA. The text of his message, as received, follows.

The mods to do 9600 baud packet using a K9NG or G3RUH modem are fairly simple to do with the Kenwood TM-721/621 radios. Look at your schematic.

Receive data is taken from the discriminator output. Look for the 3.3K resistor coming off pin 9 of the last IF stage. Connect a 1K series resistor from the modem RX input to the junction of the .001 and 3.3K.

PTT is taken off pin 2 on the microphone connector. TX data is fed through a 1K series resistor to the top of VR3 (the deviation control).

This mod has been tested and works quite well on 440 MHz and 220 MHz. The mods haven't been fully tested on the 2 meter portion of the radio.

The TM-731 radio is different enough to cause problems. What needs to be done is to add another RX Mute transistor. (Look at the schematic and see how the TX deviation is shorted to

ground during receive.) Use a plain NPN and a pair of 10K resistors (copy the one used on VR3 in the schematic). Take the TX data and feed it to the collector through a series 1K resistor, and then feed that through another 1K resistor to the wiper of the deviation pot. This was a result of Kenwood changing the deviation pot value from 10K to 100K. (It wasn't broken, but they fixed it anyway.)

This message is being uploaded to the local BBS with the modified TM-731. As with any modifications, take reasonable care, and I won't be responsible if you trash your radio. BE CAREFUL; it is full of surface mount devices. —73 es GE from Jeff, WA6FWI @ WB6YMH.#SOCA.CA (Schematics and layouts are available on request.)

#### A Dose of Vitamin "AEA"

I've just received a letter with some welcome news about a modification for the AEA PK-232 which turns it into a "high-performance" AMTOR controller. A minor drawback is that it may sacrifice the use of 300 baud HF packet and ASCII operation. To many of us who use AMTOR on HF, this is no great loss, as long as we still have the use of 1200 bauds above 28 MHz.

In his letter Mike Lamb, CEO of AEA, explains that the modification is a simple *factory approved modification*. This simple mod may save some money while improving the AMTOR performance to a level that rivals the AMTOR/RTTY-only controllers.

The user who already possesses a PK-232 may wish to try this modification

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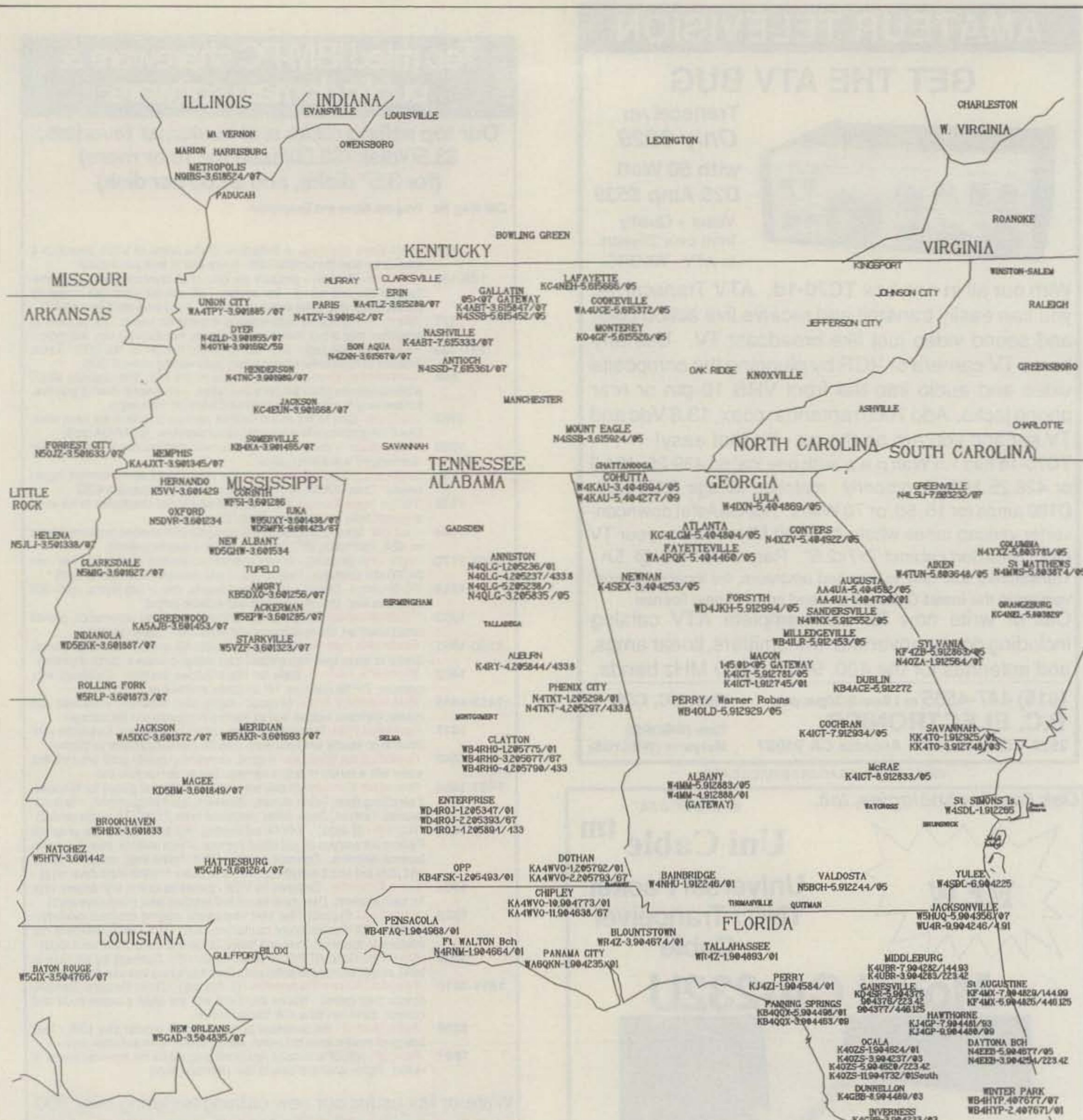


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### ROSE SWITCH NETWORK MAP

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<p><small>THIS MAP IS UPGRADED ONCE EACH MONTH WITH NEW SITES, AND PATH CHANGES. Copyright 88,89,91,92 AND 1992 by G. Estes Rogers Sr. WHERE ONLY A 'V' AND TWO DIGITS ARE DISPLAYED, THE WHOLE NUMBER FREQUENCY IS 145.000</small></p> <p style="text-align: right;"><small>REV. 920315</small></p>	<p style="text-align: center;"><small>LEGEND</small></p> <p><small>* = 1200 BPS INFO=Directory Assmt.</small></p> <p><small># = 2400 BPS o = 145.01 Port</small></p> <p><small>** = NON-RADIO PATH</small></p> <p><small>&lt; = USER Input Frequency &gt; = Trunking</small></p> <p><small>- = Under Construction</small></p>
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before dashing out to purchase an AMTOR-only controller. Mike points out that a performance test of the PK-232 with this mod added was conducted by the R. F. Harris engineers and was found to be equal to or exceeding virtually any commercial SITOR unit on the market.

The modification consists of simply changing resistors R42, R52, R62, and R72 from 174K ohm 1% to 432K ohm 1%. Mike says, "If any readers of this column don't have the 432K ohm 1% resistors, they can send a self-addressed, stamped envelope to AEA with a request for the 'AMTOR PK-232 Modification Kit' and AEA will return the envelope with the parts at no charge."

In addition, Mike says they will send along 4 of the original value 174K ohm resistors, should you wish to return the unit to its original condition at a later time. I don't think we can beat a deal like that anytime soon.

The address for AEA is: Buildings O & P, 2006 196th SW, Lynnwood, WA 98036-0918 (P.O. Box C2160).

### Another PK-232 Mod

This modification is from Tom, WA8WFB, and it has to do with a minor problem when accessing the PK-232 mailbox with the PAKRATT software. Here is the text of Tom's message.

If you are not using a PK-232MBX and PAKRATT software, you probably won't be interested in reading any further.

How many times have you hit the escape key to get out of your PBBS before you said bye to it? Or have had your TNC lock up because RF was getting into it?

You find yourself angry at the software and TNC for losing all your messages and because you have to take the TNC apart to reset it.

I have come upon a solution to the lockup problem that has worked for me every time. I have installed a single-pole, single-throw (SPST) switch on the rear apron of my PK-232MBX which allows me to switch the battery in and out of the memory.

Now when I can't relink with the TNC due to not exiting the PBBS correctly, from the DOS prompt of the computer and with the battery switched in to hold the memory, I turn off the PK-232MBX with the (ON/OFF) push switch located on the front panel of the TNC, then I reach behind the TNC and flip the battery switch (taking the battery out of the memory circuit) for *not more than 1 second* and then flip it again (putting the battery back in to hold the memory).

I then push the front-panel OFF/ON switch again to ON and reboot the software. Only once did I leave the battery out of the circuit too long and lost the information that would have been lost anyway. You don't have anything to lose and have everything to gain by trying it. Good luck and let me know if it works for you too.—73, de Tom, WA8WFB, in Lansing, Michigan, WA8WFB @ WA8PEJ.

### An Abundance of "Knat-Bytes"

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gram that will allow the user easy access in to and out of the KISS mode. Here is the text of the N0NUF message.

I have just completed a new TNC configuration program. If you have or have heard of my others, KKPC and KKAM (utils to put TNCs into KISS mode from DOS), then you will appreciate this one even more. It allows the user to create his/her own configuration files and then send them to a TNC from the DOS prompt or from a \*.BAT file.

With this program you can do more than just put your TNC into KISS mode. You can do any TNC command for any TNC on any comport. You can configure different TNCs on different comports at different baud rates. Use your imagination. Complete docs are included. If you have R9530 or 7PLUS, you can send packet mail to me, and I'll return it to you in nine or ten 2K sections. Better yet, you may download it from one of the following LL HAM BBSes: WB2COY NET New York 914-485-3393; or Cleveland HamNet 216-942-6382.

All of the software is *freeware*. If you have any questions or suggestions, you can reach me at BBS N0NUF @ N0NUF.#NCMO.MO.USA.NA.

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**Ten Meters is A Buzz of Packet and Voice.** As many readers know, I'm not big on voice communications. I am heavy into digital modes such as packet, AMTOR, RTTY, etc.

Jean Ann, WB4EDZ, uses one or more of my PCs while I'm at the office. While she is "word crunch'n" or using a spread sheet database, she usually has the HF transceiver tuned to the local 10 meter net frequency. Lately she has been making more and more contacts on 10. Her listening began to crowd into my evening work schedule in the computer room.

I'm fortunate to have a wife who enjoys amateur radio as much as she does. Purchasing amateur radio gear around this

household is not as difficult as it might be if she were not a ham. She suggested that I purchase a 10 meter transceiver for her birthday and place it in the great room. Here she could use it while I am in the computer room writing, drawing, beta-testing, EPROM burning, etc.

**Enter the Radio Shack HTX-100.** She wanted something small and compact so it would not take up too much space. The decision was easy. I purchased a Radio Shack HTX-100 ten meter transceiver. My first inclination was to run the coax and place the transceiver next to her "easy chair," but when I unpacked the radio, I began wondering about its performance on 10 meter packet. Better yet, I wondered how it would handle 1200 bauds at 10 meters.

My curiosity got the best of me. I trekked to the computer room, removed the HTX-100 manual from the cellophane wrapper, and began searching the manual for the schematic of the unit. Pages 38 and 39 presented me with enough information to complete the task of fabricating a quick interface cable.

Before laying the manual aside, I thumbed back a few pages to see if there was any other information that would be of help to me. Bingo! There on page 33 was a larger drawing and pinout information of the mic connector.

For some reason the drawing seemed familiar to me. The connections for mic audio in, receive audio out, and the push-to-talk lines were the same as those of my Alinco DR-1200 DataRadio.

I had made a cable earlier that morning to interface the PAKRATT 232 to my Kenwood TS-450S mic port (contrary to Kenwood's manual, the ACC2 port doesn't work for packet, AMTOR, etc.) to run some tests on an AMTOR modification that Mike Lamb of AEA had told me about.

**Ready-Made.** Because Kenwood and Alinco use similar mic connections, I've modified my Kenwood and Alinco transceivers to include receive audio on the unused pin 6 of the mic connector. Thus, the construction of an interface cable from the TNC to the HTX-100 was unnecessary, because I already had an interface cable that would work (see fig. 1).

I connected the HTX-100 to the 10 meter antenna (a converted CB antenna), set the PK-232 to 300 bauds on port 1, and tuned around. Wow! Was the band open or was it a "hot" receiver in the HTX-100? At 28.103 through 28.111 there were all kinds of 300 baud packet stations with which to connect.

My rush was based on my desire to give the HTX-100 a toot at 1200 bauds. Up to 28.195, or in that region. Tuning around was easy with the selectable "step" button on the HTX-100. I made two connects, and had short QSOs with a station in RIO, and another in Jamaica, and after that I just enjoyed answering the "\*\*\* connect requests" from ... 73 de Buck4ABT



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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

## International Agreements Applicable To Amateurs

**O**ur government has two sets of international agreements which are particularly important in regard to operation by United States amateur radio operators. The current reciprocal operating and third-party traffic agreement lists were updated 1 February 1991 and 31 January 1990, respectively, by the Federal Communications Commission (FCC). We have reciprocal operating agreements with 43 countries. We have both reciprocal operating and third-party traffic agreements with 36 countries.

One set of agreements (reciprocal operating) permits USA amateurs to operate in foreign countries, and it permits amateurs of those countries to operate in this country. This is called *reciprocal operating*. In neither case are amateurs required to pass tests to operate in the other country; all nations' licenses are accepted as proof of operating qualification. This reciprocal operating system is greatly appreciated by active amateurs who visit other countries.

The other set of agreements (third-party traffic) concerns the exchange of noncommercial (personal) traffic between people in different countries (via amateur radio), which is greatly appreciated as a person-to-person service.

Table I shows the countries with which we have reciprocal operating (R) and/or third-party traffic (T) agreements. The most commonly used callsign prefixes are included, but many other callsign prefixes are also used on the air.

### Reciprocal Operating and Licensing

The FCC only issues reciprocal operating permits to visiting alien amateur radio operators who are licensed by (and are citizens of) the indicated countries. Alien amateurs must apply for a permit to operate from any area where amateur radio is controlled by the FCC.

USA citizens are not eligible to receive an FCC-issued reciprocal operating permit. Similarly, an alien holding a USA amateur radio license is not eligible to receive an FCC-issued reciprocal operating per-



*This is Dan Trantham, KC4WXV, of Clyde, North Carolina. His station includes a Yaesu 901DM transceiver and a homebrew 40 meter dipole antenna. Dan operates on the 15 and 40 meter bands.*

mit. If an alien amateur holds an FCC-issued USA reciprocal operating permit, it is superseded by whatever FCC-issued USA amateur radio license she/he obtains. In this case, the alien's operating privileges are no longer related to her/his home country's privileges; they are the privileges of the class of FCC-issued amateur license she/he earned.

Foreign amateurs are encouraged to obtain USA licenses if they are going to be in this country for a long time. Except for representatives of foreign governments, anyone may apply for a USA amateur radio license. Such applicants simply have to pass the same examination elements that are administered to Americans.

Alien amateurs may apply for a permit by completing an FCC form 610-A, attaching a copy of her/his (foreign) valid amateur license, and mailing these items to the Federal Communications Commission, P.O. Box 1020, Gettysburg, PA 17326 USA. Some USA missions (in foreign countries) have the FCC form 610-A, and it can be obtained by writing to the FCC, 1919 M Street NW, Washington, DC 20554 USA. The form 610-A you use must be dated August 1986 or later. Earlier versions will not be accepted. They will be returned without action. An FCC-issued permit is valid for one year, until the alien's home country amateur license expires, or until the alien obtains a USA amateur license, depending on which occurs first.

Operating privileges of a permit holder are detailed in the FCC Rules and Regulations. Part 97 governs the USA Amateur



*Troop 73 Boy Scouts and Pack 73 Cub Scouts of Springfield, New Jersey participated in the 34th annual Jamboree on the Air (JOTA). They set up an outside station at the Watchung Reservation in Mountain-side. They used a Kenwood TS-430S, Windom antenna, and a portable gasoline-powered electric generator to talk with other amateurs in several states and countries. This picture shows Adam Seidel, KB2KOQ; Justin Katz; Zachary Goldstein; Scott Seidel, WA2WUX; Marc Lepore, N2GIH; and Marc Marshall, KB2KEC, left to right. As a merit badge counselor, I also participated in the JOTA, working several Scouts in foreign countries.*

Radio Service. Basically, the permit holder is limited to the operating privileges that apply to her/his class of license in her/his home country. However, FCC regulations must be obeyed, and USA Extra class operating privileges may not be exceeded by reciprocal licensees, regardless of the privileges existing in their home countries. As an example of this, reciprocal licensees are not allowed to transmit (on voice) in the 14,100 to 14,150 kHz portion of the 20 meter DX voice segment. Reciprocal permit holders have only the privileges of their own licenses, but not to exceed USA Extra class operating privileges. Violations should be reported to the FCC.

The exact callsign shown on the permit must be used by the reciprocal licensee when identifying her/his station. The appropriate USA letter-numeral prefix precedes the reciprocal licensee's home callsign. As an example, if CP5WDX is operating in California, his identification is W6/CP5WDX (code) or W6 stroke (or slash) CP5WDX (voice). The entire callsign must be used when identifying a station. In this example do not shorten it to W6/CP5WD. The reci-

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Country	Prefix	R	T	Country	Prefix	R	T
Antigua and Barbuda	VP2A	*	*	Mexico	XE	*	*
Argentina	LU	*	*	Monaco	3A	*	
Australia	VK	*	*	Netherlands	PA	*	
Austria	OE	*		Netherlands Antilles	PJ2-9	*	
The Bahamas	C5A	*		New Zealand	ZL	*	
Barbados	8P5	*		Nicaragua	YN	*	*
Belgium	ON	*		Norway	LA	*	
Belize	VP1	*	*	Panama	HP	*	*
Bolivia	CP	*	*	Paraguay	ZP	*	*
Botswana	A22	*		Peru	OA	*	*
Brazil	PY	*	*	Philippines	DU	*	*
Canada	VE	(1)	*	Portugal	CT1/CT4	*	
Chile	CE	*	*	St. Kitts & Nevis Islands	VP2K		*
Columbia	HK	*	*	St. Lucia	J6	*	*
Costa Rica	TI	*	*	St. Vincent & The Grenadines	VP2S	*	*
Cuba	CO		*	Republic of Seychelles	S79	*	
Cyprus	5B	*		Sierra Leone	9L1	*	*
Denmark	OZ	(2)		Solomon Islands	H44	*	
Dominica	J73	*	*	Republic of South Africa	ZS	*	
Dominican Republic	HI	*	*	Spain	EA1-EA5//EA7	*	
Ecuador	HC	*	*	Suriname	PZ	*	
El Salvador	YS	*	*	Swaziland	3D5		*
Federal Islamic Republic of Comoros	D6		*	Sweden	SM	*	
Federated States of Micronesia	V63	*	*	Switzerland	HB9	*	(4)
Fiji Islands	3D2	*		Thailand	HS	*	
Finland	OH	*		Trinidad & Tobago	9Y4	*	*
France	F	(3)		Tuvalu Islands	T2	*	
The Gambia	C53		*	United Kingdom	G/GA/GI/GM/GW	(5)	(6)
Germany	DL	*		Uruguay	CX	*	*
Ghana	9G1		*	Venezuela	YV	*	*
Greece	SV	*		Yugoslavia	YU	*	
Grenada & Dependencies	J3	*	*				
Guatemala	TG	*	*				
Guyana	8R1	*	*				
Haiti	HH	*	*				
Honduras	HR	*	*				
Hong Kong	VS6	*					
Iceland	TF	*					
India	VU	*					
Indonesia	YB	*					
Republic of Ireland	EI	*					
Israel	4X	*	*				
Italy	I	*					
Jamaica	6Y5	*	*				
Japan	JA	*					
Jordan	JY	*	*				
Kiribati	T3	*					
Kuwait	9K2	*					
Liberia	EL	*	*				
Luxembourg	LX	*					

**Notes**

(1) No reciprocal operating permits are required between Canada and the United States.

(2) Also applies to Greenland.

(3) Also applies to French Guiana, French Polynesia (Gambier, Marquesas, Society, and Tubuai Islands, plus Tuamotu Archipelago), Guadeloupe, Ile Amsterdam, Ile Saint-Paul, Iles Crozet, Iles Kerguelan, Martinique, New Caledonia, Reunion, Saint Pierre and Miquelon, plus Wallis and Futuna Islands.

(4) USA/ITU agreement authorizes third-party traffic to be exchanged between the USA and 4U1ITU (Geneva, Switzerland) and 4U1VIC (Vienna, Austria).

(5) Reciprocal licensing also applies to Bermuda, British Virgin Islands, Cayman Islands, Falkland Islands, Gibraltar, Montserrat, Saint Helena, plus Turks and Caicos Islands.

(6) Third-party traffic may be exchanged with United Kingdom special events stations (GB prefixes), except stations with the GB3 prefix.

Table 1- Countries with which we have reciprocal operating (R) and/or third-party (T) agreements.

procal licensee is required to indicate (in English) the approximate geographic location (city and state, etc.) from which she/he is operating. This information is required at least one time during each contact. Canadian amateurs still identify the original way with the American indicator following their callsign, such as VE7SR/W6.

USA amateurs who want to obtain reciprocal operating permits from the countries with which we have such agreements should request the appropriate forms from officials of those countries. USA-based foreign embassies and legations may have the required forms. If not, they should be able to provide information about where such forms can be obtained. Forms may also be obtained by requesting them from the amateur radio licensing authority of the

country you intend to visit. The ARRL has a reciprocal licensing expert who provides names, callsigns, addresses, telephone numbers, and related data in response to requests for reciprocal licensing information received from American amateurs. The ARRL's address is 225 Main Street, Newington, CT 06111.

When USA amateurs operate (as reciprocal licensees) in other countries, they must abide by the regulations which apply to those countries. ITU Region II (North, Central, and South Americas) regulations do not go with you when operating in ITU Region I (Europe and Africa) or ITU Region III (Australasia and the rest of the Southern Hemisphere). All licensees must abide by the radio regulations of the International Telecommunications Union (ITU).

**Third-Party Traffic**

Third-party traffic involves at least one person in addition to the operators who are handling the traffic. Third-party traffic includes message traffic handled directly between amateurs, plus telephone (phone) patch traffic, in which people (not just amateurs) speak to each other directly (normally using the telephones in their homes) via amateur radio. Any recognized language must be used when handling international third-party traffic, but station identification must be in English. AMTOR, ASCII, RTTY, and other modes may also be used. Third-party traffic must be of a personal nature. Business messages are prohibited, except during emergencies. Am-

ateurs are not allowed to accept money, services, or goods in exchange for handling third-party traffic.

Only personal messages may be handled by amateur radio operators under normal circumstances. These messages must be such that they would not normally be sent by any existing means of electrical communications, or would not be sent except for an amateur radio station being available.

The callsigns of both (foreign and American) stations must be transmitted to identify stations handling third-party traffic. Your own callsign (alone) does not suffice in this case.

If you have a question about the status of a country (in regard to these lists), you could call the ARRL or the Personal Radio

Branch of the FCC at 202-632-4964 to obtain the latest information.

### Expanding The Opportunities

The US Government is willing to establish reciprocal operating and/or third-party traffic agreements with other countries. Such agreements are negotiated through the US Department of State. The support of the other country's amateurs is necessary to initiate meaningful negotiations. It is best to have action initiated by the country seeking to reach an agreement with the USA, since their cooperation is essential in getting the task completed. Our government is receptive to providing draft notes, which could form the basis of such agree-

ments, to any interested country. Notes can be requested from the US Department of State or from the Federal Communications Commission. The FCC's address is Washington, DC 20554, and requests should be directed to the Chief of the Spectrum Engineering Division. DX amateurs are urged to initiate appropriate action in their countries, if they do not presently have both agreements with the USA. American amateurs could help expand these lists by discussing these agreements with foreign amateurs, particularly when visiting their countries.

### Photographs Wanted

Photographs of new amateurs in their shacks provide introductions to a few of the newer licensees. Photograph size is unimportant, but good definition, contrast, and subject matter are important. Color pictures can be used, but black-and-white photographs are preferred. Operating activities and achievements, plus a self-introduction, are needed with each picture. Send an SASE if a picture must be returned. A free one-year CQ subscription (or renewal) is awarded to the one amateur whose picture I select as the winner for the month. If you are a subscriber, please enclose the mailing label (or copy) from your latest CQ issue. One award is made each month, no matter how many photographs are printed. DX amateurs, who frequently work the American Novice bands, are also urged to submit photographs.

### Printed Aids

My previous columns contain information that is useful to new and aspiring amateurs. Many of these items have been reprinted for distribution to students of licensing courses I instruct. For ease of use, these printed aids have been separated into six categories. These categories are introduction, code, theory, station, operating, and miscellaneous. Outdated items are continually replaced with newer material. Fifteen dollars brings a complete set of current printed aids, including shipping costs. A list of these printed aids will be sent to anyone who requests it and sends a business-size (#10) self-addressed and stamped envelope to my California address. Any single item is available at no charge to anyone who supplies a self-addressed and stamped envelope. When a single item is being requested, it is advisable to supply a large (at least 9 by 12 inch) envelope and to include a couple of extra stamps (loose in your envelope) in case extra postage is required. Some items are long. Licensing-course instructors are welcome to revise and/or duplicate these items to suit their requirements.

73, Bill, W6DDB

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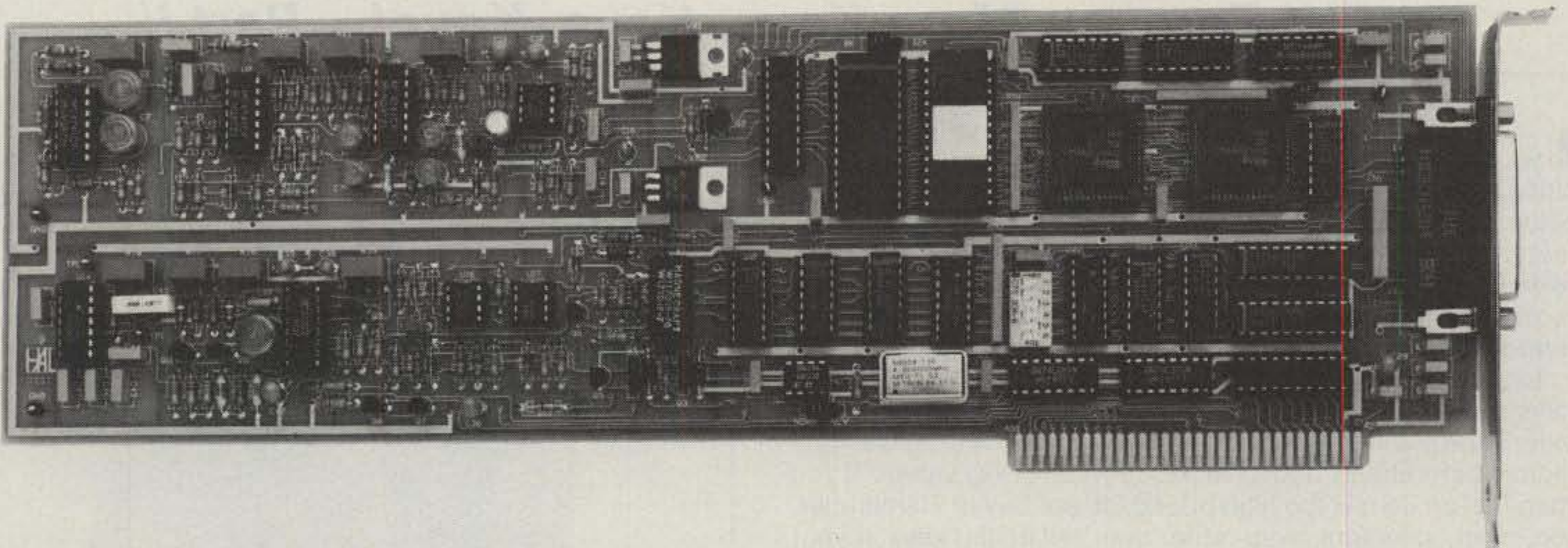
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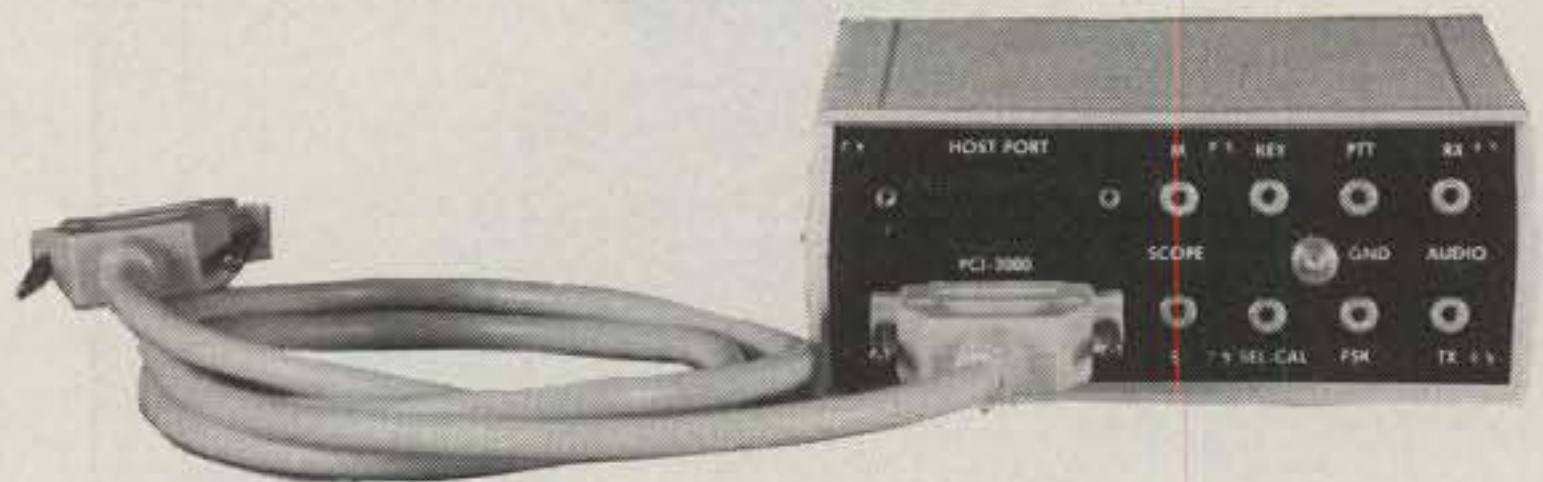


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## A LOOK AT THE WORLD AROUND US

### *CW Forever: More Keys, Keys, Keys!—Part II*

If you thought last month's views of bugs and paddles were exciting, check out the photos of hand/pump keys in this month's column! They are old, new, classic, and pure gold. If this double feature and the preceding two columns highlighting QRP do not rekindle your CW interest, check your pulse! Once again we must move at a fast pace to get everything in, so I will streamline this introduction as much as possible.

Last month I mentioned price gouging in the world of old-time keys and bugs is unethical and should be avoided. How? Consider the key's importance to you personally, talk with other collectors beforehand, and have a rough idea of key values. If you then feel an item is too high priced, do not buy it! Remember, too, most collectors swap rather than sell prized keys. If your heart is captivated by a particular key, however, ignore your conscience and go for it. You only live once!

Several amateurs asked us to remind everyone that DX and contest contacts made on 30 meters are not accepted for DXCC and contest credit. As a result, most continental and DX QSOs on 30 are more casual conversation oriented. Congeniality is the order of the day on 30 meters. If a pile-up seems heavy, allow a few minutes for the action to quell and you can make an enjoyable contact with few problems.

Our double feature on QRP in February and March proved quite popular, and we are planning to spotlight this area more in the future. I am presently working on some mini-rigs you will like, and I also invite your input. Surely you have some QRP pet projects (and photos!) to share with *CQ* readers. Send them to me, and I will feature them herein and give you full credit.

That's enough soapboxing. Now let's fast forward to the keys with this month's guests Bill Holly, K1BH; Gordon Crowhurst,

4941 Scenic View Drive, Birmingham, AL 35210



Photo 2— Check out this small and most unusual camelback key. It is mounted at a strange angle, for sure, and sports a heavy-duty spring that looks like it came from a Colt 45 revolver! An operator using this key could truly be dubbed a genuine brass pounder! (Key owned and photographed by K1BH)

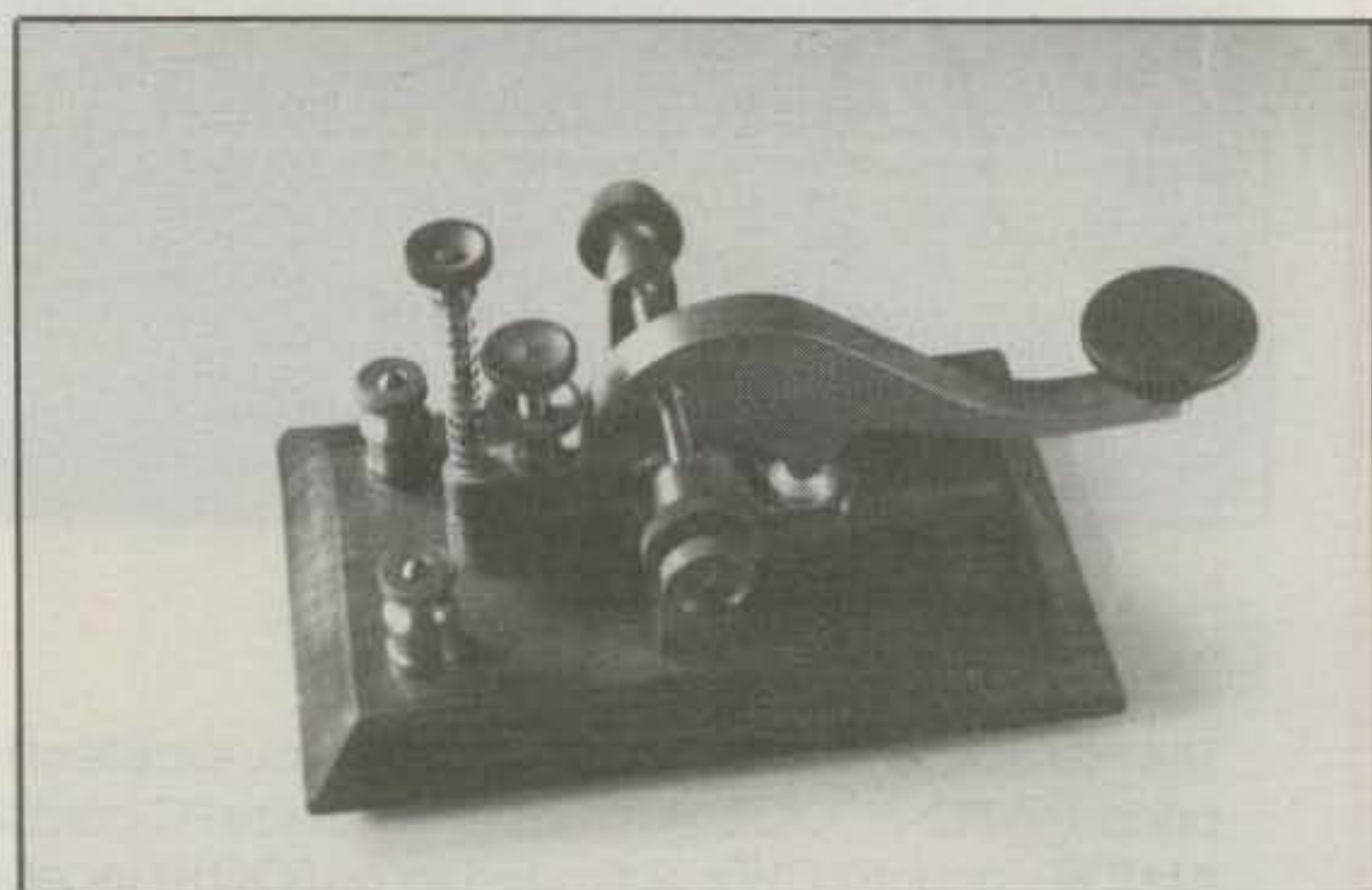


Photo 1— This unique Chubbock key dates back to the 1850s and is most interesting in design. Notice the arm's pivot point lets it sit almost flat on the base, and the tall rear screw adjusts tension. The bottom contact is also insulated from its brass base. (Key owned and photographed by K1BH)

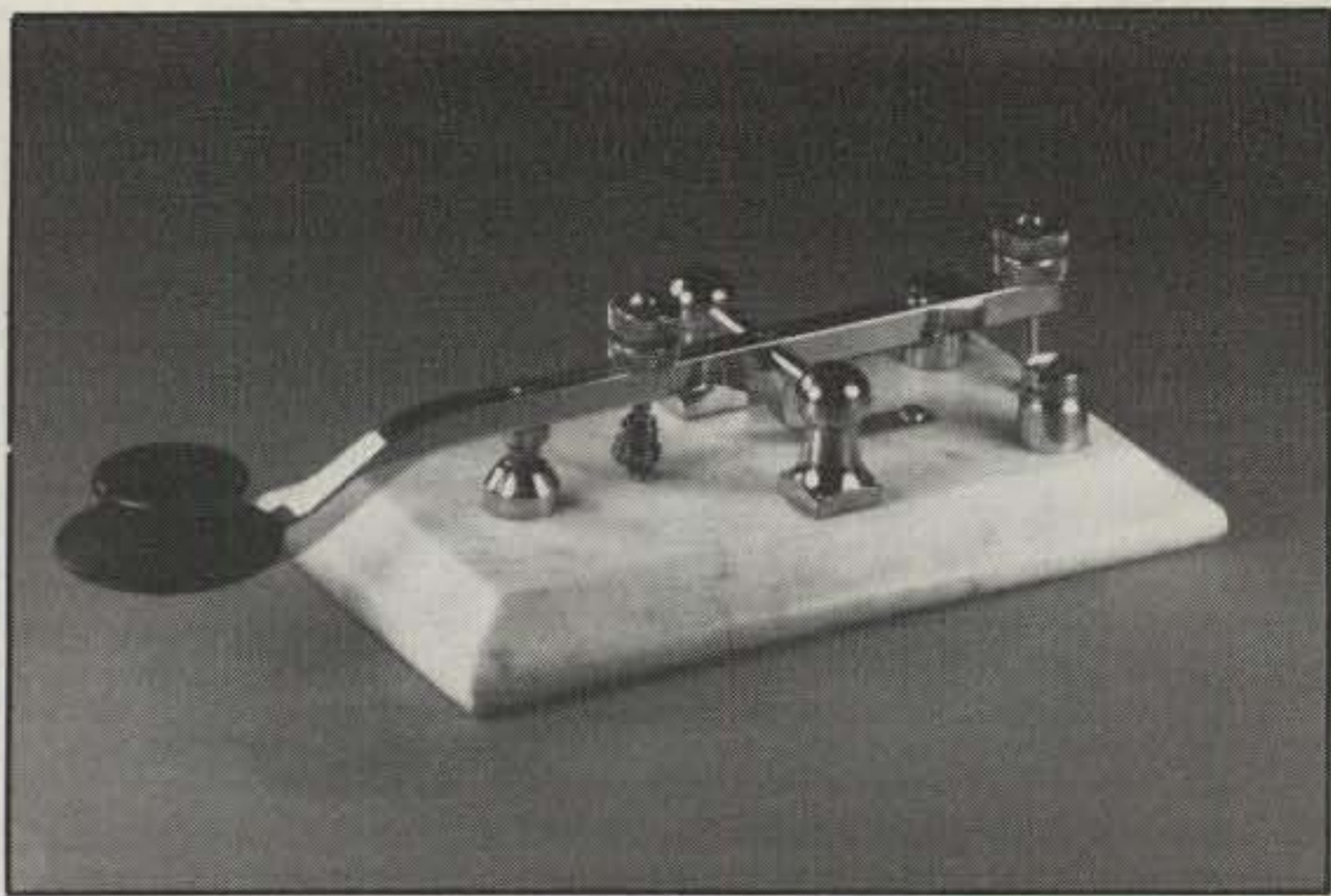
G4ZPY; Rick Van Krugel, VE7FOU; Bob Rainbolt, WB0AUQ; and our guest "mystery collector."

#### Photo 1

Our views begin when telegraphy was young and keys were as wild as the old west. The Chubbock key shown here was made during the 1850s and may have been a forerunner of more con-



Photo 3— German-made Zimmerman Leipzig camelback made during the late 1800s. Notice rear support and simple, yet effective design. Cone-shaped adjustment nut often carries over to modern designs in German keys. (Photo courtesy K1BH)



*Photo 4- Do any of our readers recognize this unnamed and elegant-looking key? If so, owner K1BH would like to hear your comments. Notice the rich chrome plating of upper parts, round mounting pedestals for the pivot bar, and double locknuts on adjustments. The base is exquisitely finished marble, and overall appearance is quite impressive.*

ventional camelback designs of that era. Its brass mechanism is mounted on a wood base and reflects very good workmanship for the period. The pivot bar is press-fitted through the arm and secured with knurled adjustments on each side. The tall rear screw threads into the base and supports a spring that is adjustable by the top knob for tensioning. This remarkable and exceptionally clean piece of history belongs to K1BH.

## Photo 2

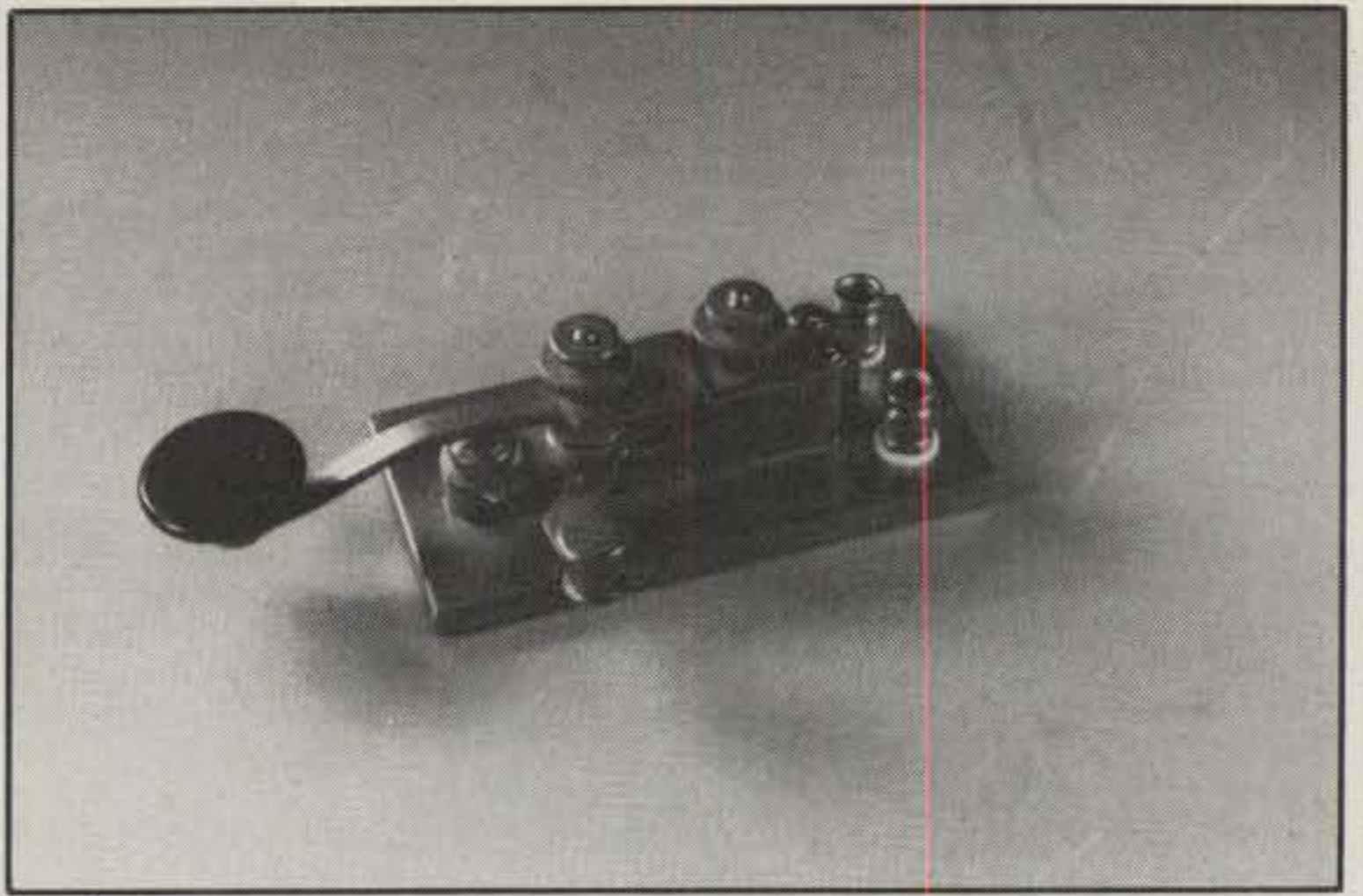
Based on available information, this unusual camelback key dates between 1860 and 1880. It sports brass parts mounted on a wood base, and only two of these gems are known to exist. Possibly the key was used in some type of alarm box, as the leaf spring is not adjustable and much too stiff for serious operating. Personally, I wonder what contorted position one would assume to use the little critter. Maybe it's a bedside key you place on the floor and hang an arm (or leg!) off the edge to manipulate. Maybe the key was designed by Ernie Kovac's grandfather.

## Photo 3

As illustrated here, camelback designs were not limited to the United States. This E model Zimmerman Leipzig was made in Germany during the late 1800s, and it is a good example of how various countries retain their classic heritage (yes, even in keys). Notice the arm's rear support and pivot point, and cone-shaped tension adjusting nut. These designs are still popular on many German keys today. Likewise, the English incorporate large ball bearings or racing in their center pivot fulcrums. Knobs also vary between countries and range from conventional to skirted, mushroom, smokestack, round mint, concave, etc.

## Photo 4

This classy looking and unmarked key is quite large (9½ inches) and has high-lustre chrome parts mounted on a marble base. Attention to fine detail is apparent throughout; there are even double nuts on tension and travel adjusting screws. Neither owner K1BH nor I have information on the key's manufacturer or date. Can any readers help? The key's large size suggests early 1900 production for spark use, but the contacts are too small



*Photo 5- Another collector's item from the mid-1800s is this Stiener key made by Western Union Telco. The arm is attached to the rear nut only. The forward nut sets tension by applying downward pressure on the rear arm. Neat, eh? (Key owned and photographed by K1BH)*

for high-powered use. Nickel rather than chrome plating was also popular until the 1930s. The marble back leads us to think it was a custom-made item. Interesting, eh?

## Photo 5

Here is another neat little gem from yesteryear. This is a Stiener key made by Western Union in approximately 1870. Rather than using a standard center fulcrum, the arm is attached to the upper rear screw. Tension is adjusted by a hold-down leaf spring affixed to the upper front screw and knurled nut. The leaf spring may be difficult to see after photo screening for publication. Look close midway between the two upper screws; the "split" is where the leaf spring "bends up" to fit over the main arm. While looking closely, also notice the key closing lever emerges from beneath the arm's support screw and "mates" with a small strap on the key's base contact. Our special thanks to Bill Holly, K1BH, for sharing these key views.

## Photo 6

Although Gordon Crowhurst, G4ZPY, mainly designs and makes modern collectible keys and paddles, he occasionally comes face-to-face with some golden oldies that cannot be ignored. Here is one example: a 1915-vintage creed post office key. The key's large size, thick arm, top-hat knob, and shape of fulcrum assembly truly look British, although traditional ball race bearings are not included. Looking closer, even the tension adjusting screw and base also reflect British design. Where are the key's contacts? At the arm's rear (upside down) under the inverted "U" section.

## Photo 7

While discussing British designs and G4ZPY, I cannot resist highlighting Gordon's marvelous gold pump key I acquired two months ago. This collector's item looks like it is made for a king, and has a deep lustre like the finest Beverly Hills jewelry. I cannot decide whether to use the key or wear it! Notice the classic English influence in the top-hat knob, thick arm, and bush bearing assembly at the pivot point. This 7 by 4 inch show stopper handles well and looks great, adjustments are exceptionally precise, and the key really adds a touch of luxury to on-the-air

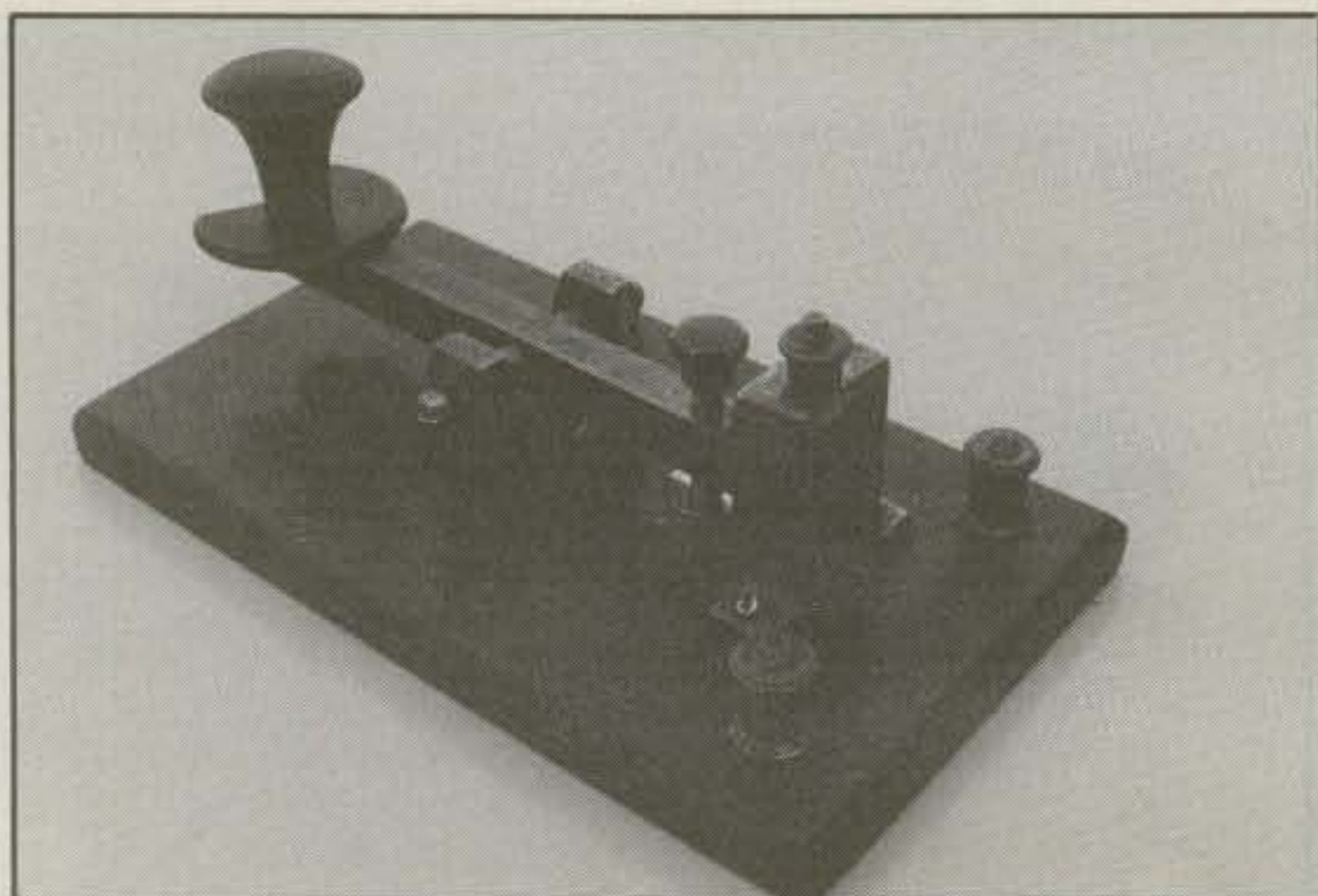


Photo 6- G4ZPY sent this photo of his 1915 Creed post office key, and it is an interesting study of British tradition. Notice the large arm, "squared off" fulcrum assembly, and top-hat-type knob. Key contacts are inside the rear bracket, with travel adjustment on top. Fascinating!



Photo 8- Sparton of Canada Ltd. made this waterproof key during 1943, and it is a delightful little gem. All adjustments are internal; thus it should be ideal for portable operating at the beach or maritime mobiling. Miniature keys such as this are a real treat to use on the air today, but finding them continues to be a real challenge. (Key owned and photographed by VE7FOU)

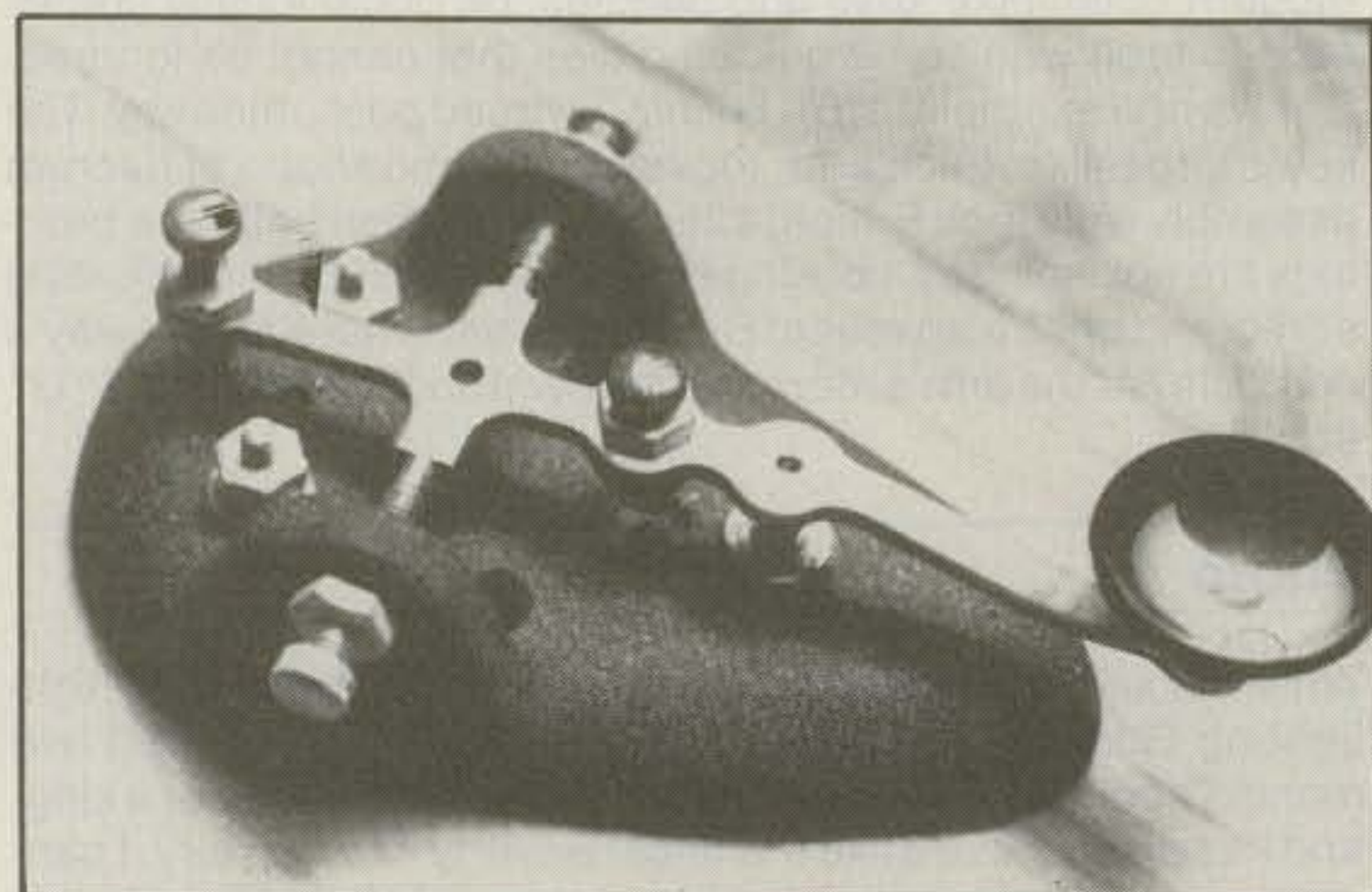


Photo 9- The famous and always popular McElroy Teardrop hand key. This gem exhibits outstanding workmanship for its era and handles exceptionally well. Many amateurs continue using these classic keys on the air today.

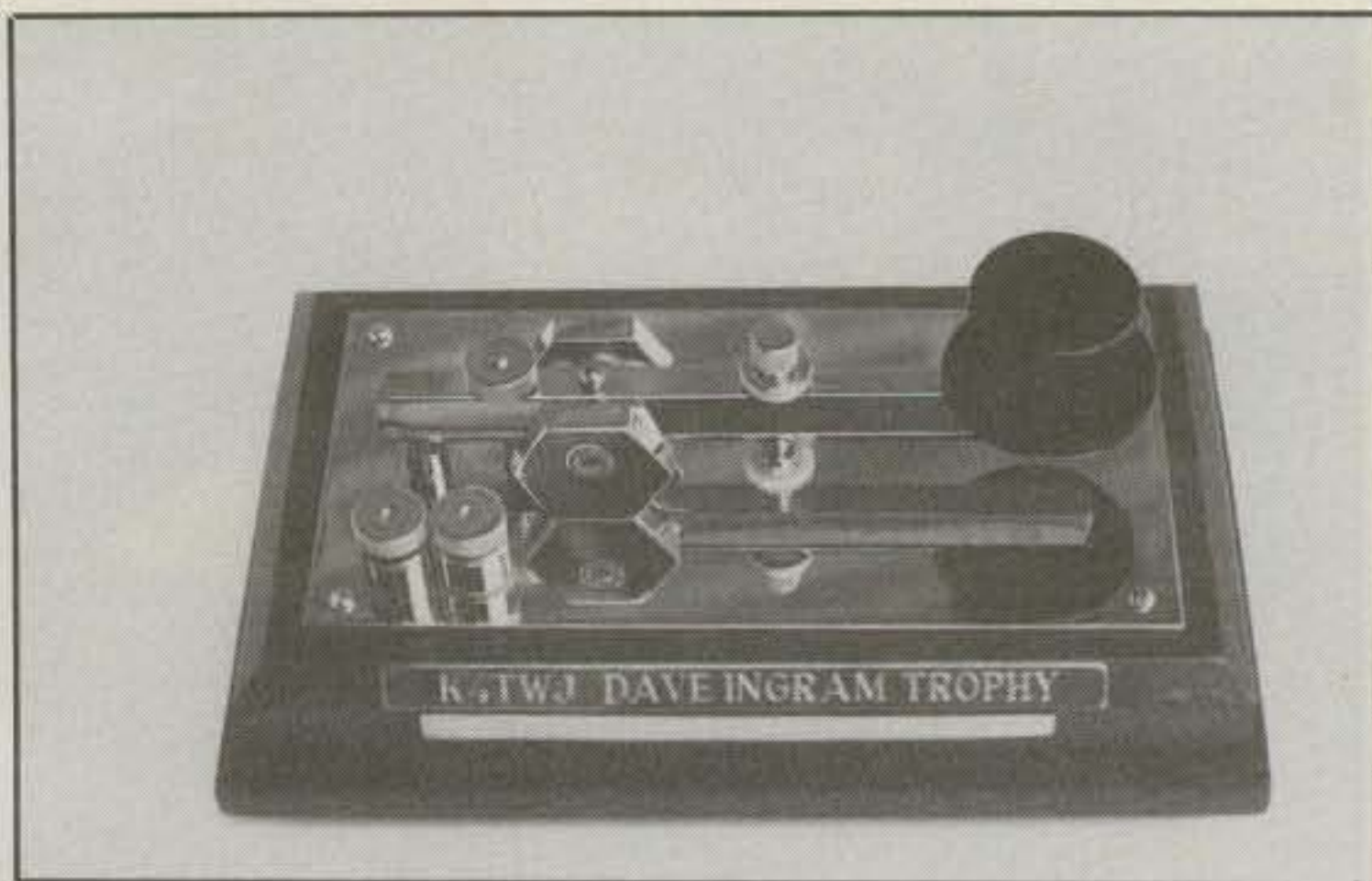


Photo 7- This heart throb is G4ZPY's magnificent gold pump key, and it is absolutely spectacular! The key sparkles from every angle and has a deep lustre that is breathtaking. The contacts are set in teflon insulation, and adjustments are exceptionally precise. Using this hand key is like driving a Rolls Royce! (Photo by K4TWJ)

operations. Carry this trophy on your next portable outing and really impress the natives!

### Photo 8

Check out this pocket-size treat. You can hold it in your palm and send CW with an index or ring finger and, since it is fully enclosed, even use it while boating or water ski mobiling. Needless to say, it is the ideal mate for a small QRP rig. Yes indeed, CW forever! Seriously, however, this little gem is reported to be a ship's key used to send sonar burst communications to submarines. Maybe that also explains why the fingerpiece appears to have a lock-down nut at the base. This key was manufactured by Sparton of Canada Ltd. during 1943 and now resides in the collection of VE7FOU. Rick and his new bride, incidentally, run a bed-and-breakfast historical home in Victoria, BC.

### Photo 9 and 10

These two pictures are an interesting study of McElroy's famous teardrop hand keys, compliments of our guest mystery collect-

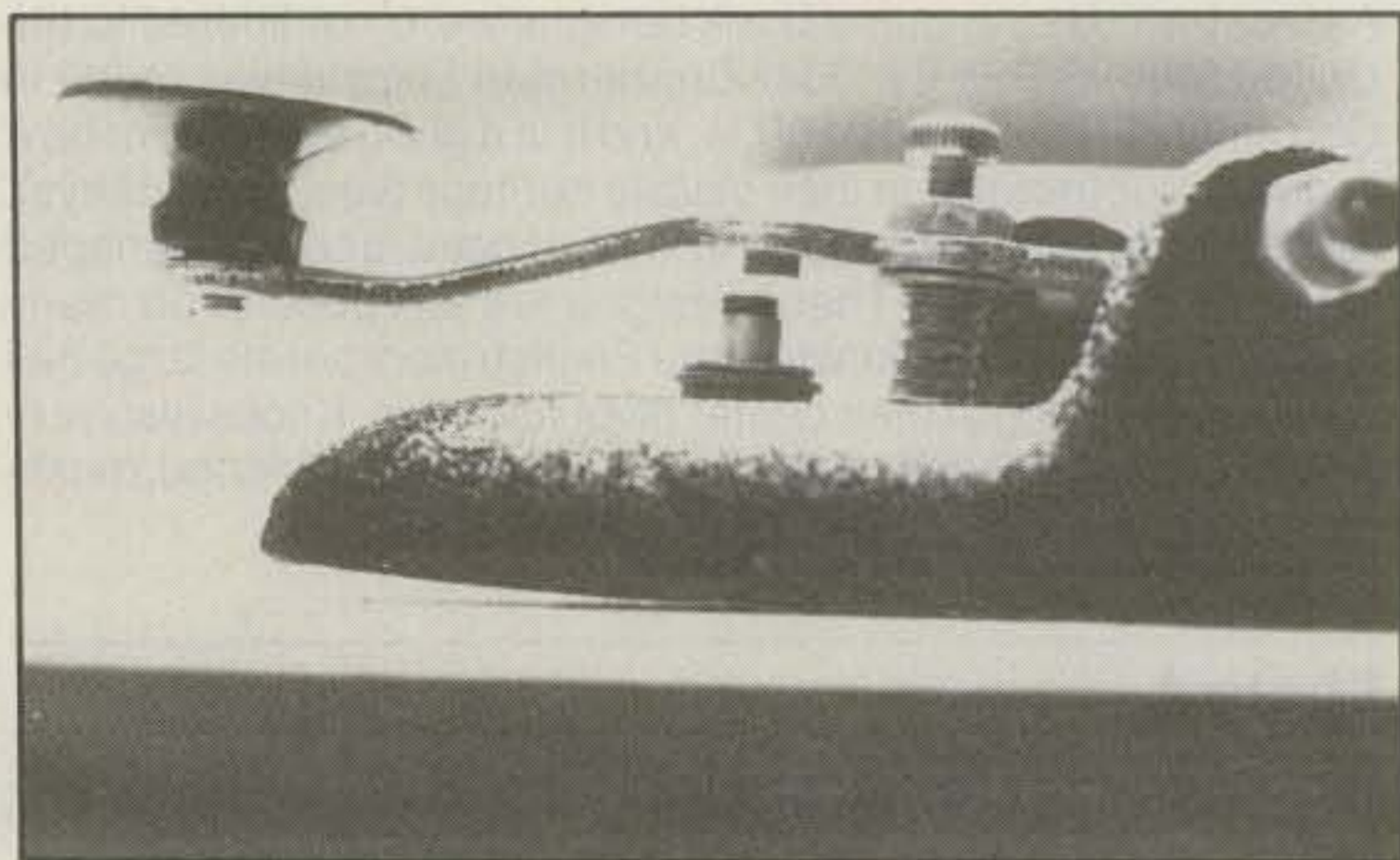


Photo 10- Close-up view of a counterfeit McElroy Teardrop. Notice the grainy finish, warped base, and misaligned contacts. These phony reproductions occasionally surface at hamfests and truly reflect the adage "nothing like the real thing!" (Photo courtesy our "mystery collector")

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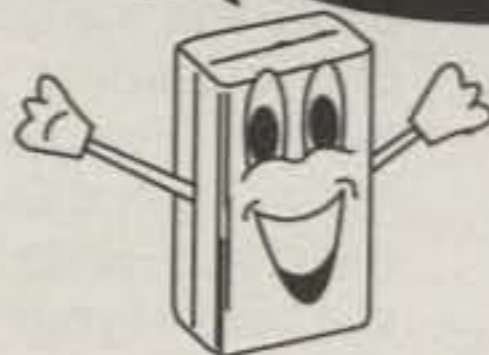
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BP-84S 7.2V 1400mah <b>\$63.00</b>	FNB-14S 7.2V 1400mah <b>\$59.75</b>	
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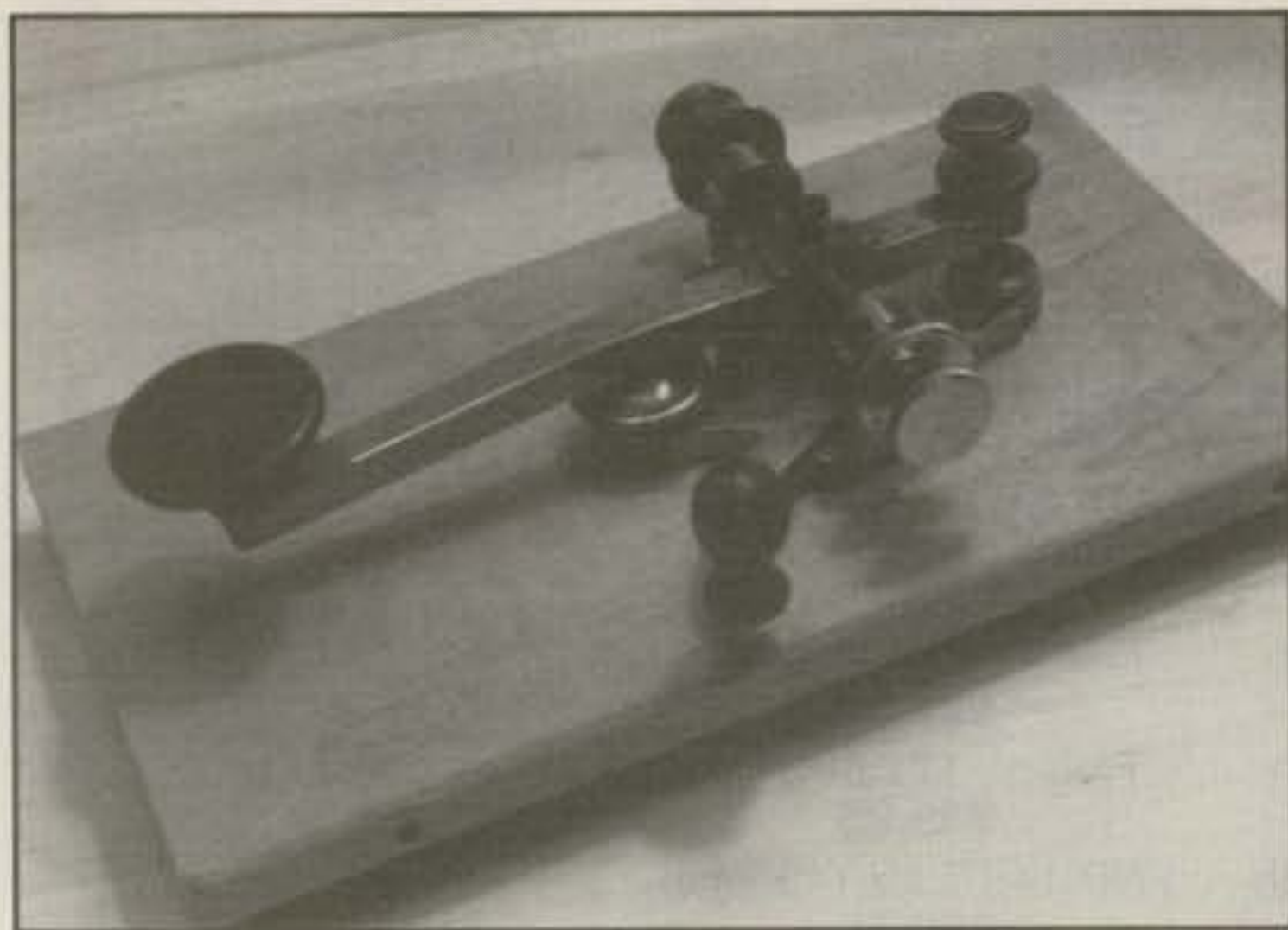


Photo 11- There are no distinguishing marks on this little orphan, but it looks like an item from the Civil War era. Most of its works are cast iron, and pivot mounts are set into the base in a manner resembling a miniature cannon assembly. The bottom contact sits inside a large disk which also turns to vary travel. If you recognize this relic of the past, drop me (K4TWJ) a note and I will pass it on to our "mystery guest collector" and owner.



Photo 12- An interesting combination of elegance and simplicity is apparent in this neat Japanese hand key made by Sato Company. Its small adjustment screws have very fine threads, and pivot adjusting screws are set into locknuts at the fulcrum. Owner WB0AUQ did not tell us how the key feels during use, but judging by its workmanship, I would say it's a gem.

or. As you know, Mac was the world's champion radio telegrapher, and he took extreme pride in his production of hand keys and bugs. Use one on the air and you will understand my statement. Mac keys are a joy to operate. McElroy's classic teardrop, shown in photo 9, has a cast iron base and precision upper assembly that continues surviving the years with miniscule deterioration. Some counterfeit versions of McElroy's teardrop were produced,

and they are a completely different story. Workmanship was poor, and the bases were easily cracked. Look closely at the phony teardrop in photo 10 and you will see the finish is rough, the base is warped, and the key's contacts are not properly aligned. Many "look alikes" also have "made in U.S.A." stamped inside their base, while Mac's have no markings. Hopefully, these notes will help in your search for original McElroy teardrops.

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RCA APT & Monitor Package	.....\$195
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### Photo 11

Our mystery collector found this golden oldie at a swap meet, and asks if readers can help identify it. General design and workmanship indicate it is from the Civil War era. The only marking is a #24 on the base. The key has iron screws and short iron legs at pivot points. The base contact is small and mounted on a large disc which the closing lever presses against. Keys of this type, incidentally, are usually preferred for their historical background rather than for their feel or use. Who knows? Maybe this key relayed the first message that started the California gold rush or announced the Civil War.

### Photo 12

This hand key is made by Sato Co., and it is almost identical to a popular key made by Hi-Mound, Japan's leading manufacturer of paddles and keys. The Sato has a chrome mechanism with very precision adjustments and a black plastic base. Traditional Japanese design is reflected in the key's elegance, Junior Mint looking knob, and "squared off" center mount with tiny adjustment screws inside chromed nuts. This attractive key belongs to fellow collector Bob Rainbolt, WB0AUQ.

### Photo 13

Heads up, office-confined CW enthusiasts. Here is a clever executive desk key you may be able to reproduce at home with a little ingenuity. WB0AUQ acquired this Regal stapler key at an estate sale and yes, it is a real stapler. The previous owner was not connected with telegraphy; evidently he just appreciated the art. The stapler is mounted on an impressive-looking chrome base, with a pinion-type assembly to hold the critter in place. I



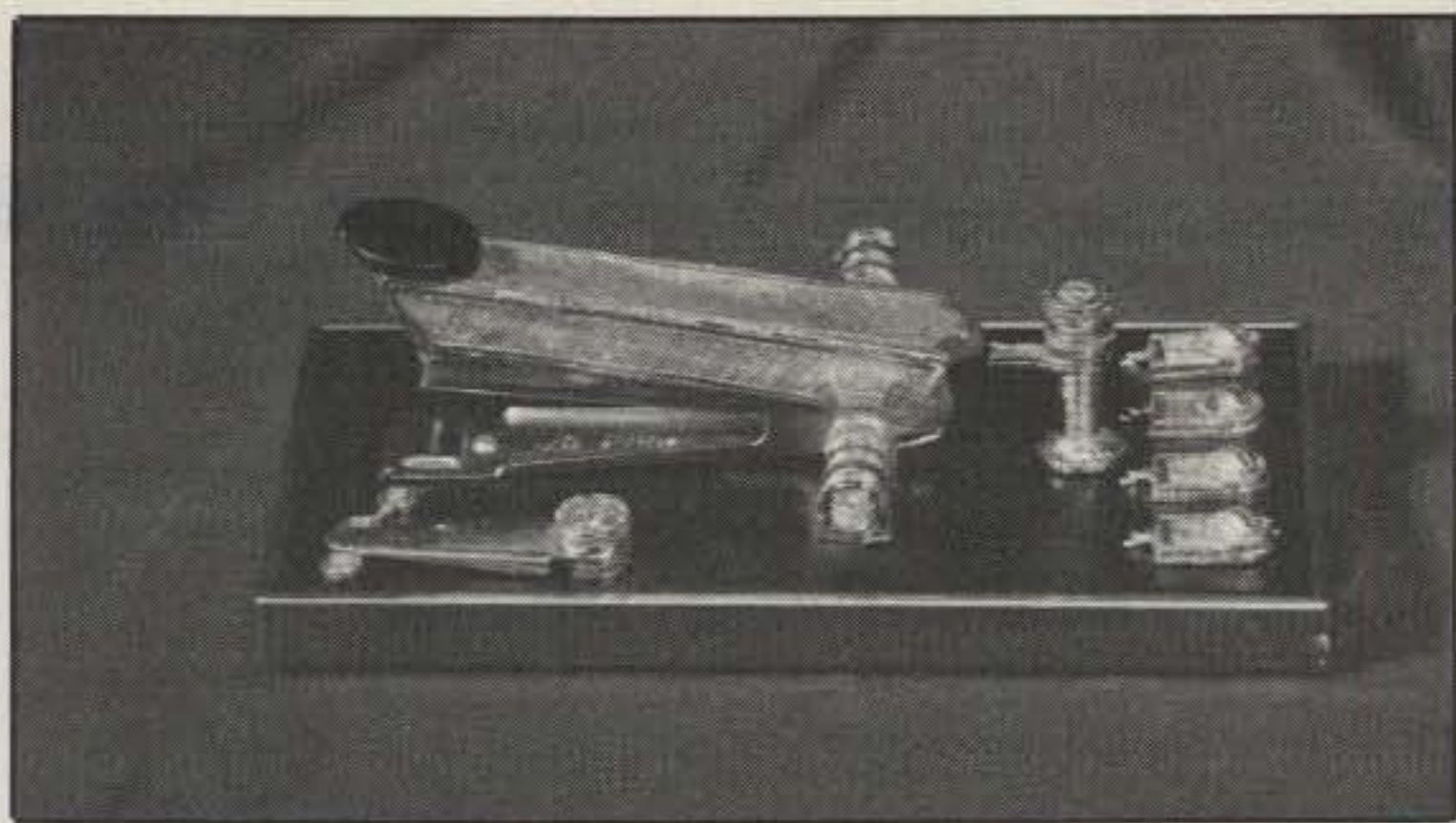


Photo 13- The ideal desk key for office-confined CW enthusiasts—the Regal stapler key. No, it does not actually send CW; it just sits on the desk and stirs warm thoughts of our favorite mode! (Photo via WBAUQ)

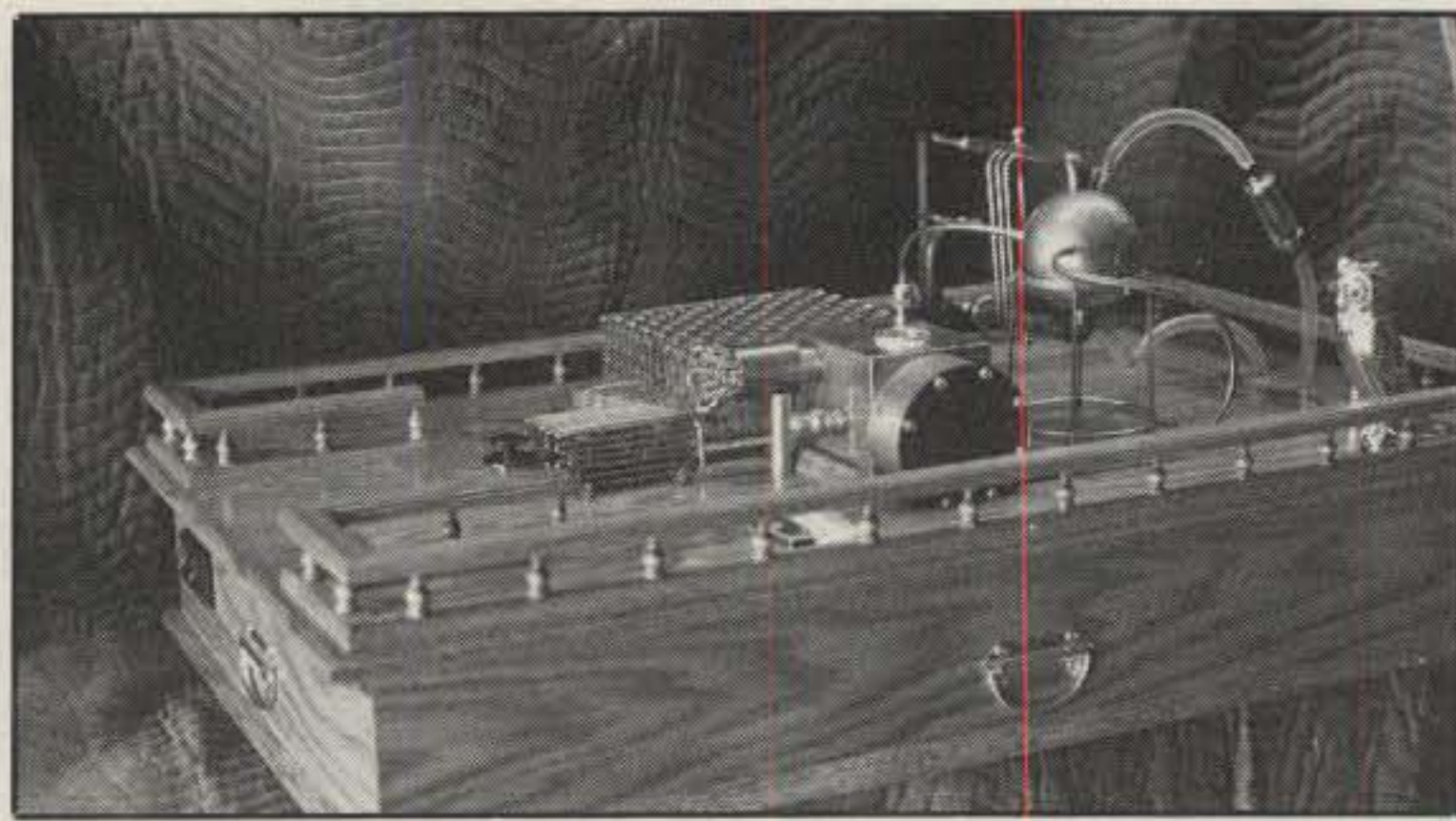


Photo 14- KK4AA's reproduction of a water-cooled hand key for high-speed CW. Note heat dissipating fins on key, rear distillery, and on-looking owl. Big-time CW indeed! (Key owned and photographed by KK4AA)

assume the four rear contacts are simply for looks. Ditto the contact closing lever. The stapler's bottom arm sits against the base, so you insert papers, wham the fingerpiece, and papers are stapled. Let's hope such Armstrong techniques are not carried over to the QTH!

#### Photo 14

This view arrived when we were wrapping up the column, and although there was not time for checking with its owner, Greg Seagraves, KK4AA, on fine details, the critter is a good upbeat closing item. This is Greg's own reproduction of a water-cooled hand key for high-speed CW work. The contraption was originally designed by Gustave Rochello (don't ask!), but the semi-automat-

ic "bug" beat it to market. Gus then abandoned the key, disappeared into the woodwork, and has not been heard from since.

Greg says the setup is built on a 24 by 39 inch box. The units behind and beside the actual key convert water into oxygen and hydrogen for greater cooling (a small hydrogen bomb? Oh, well, I'm sure Greg knows what he is doing. Good show, old boy!—ed.).

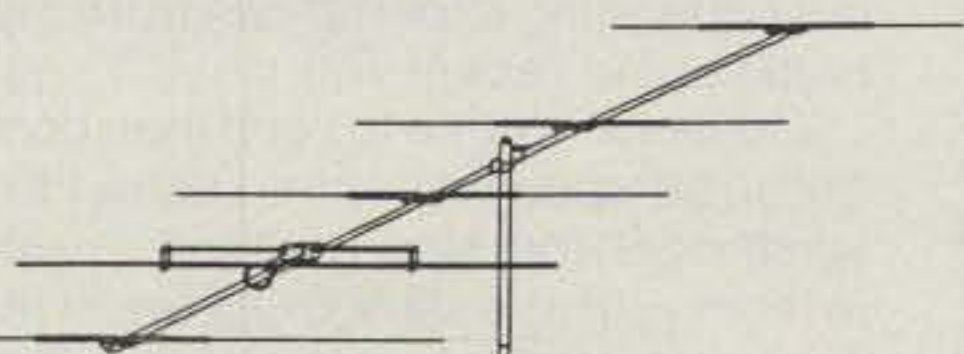
That winds down this month's column and the second part of our "Keys Special." Pardon this brief closing, but we are also out of space. I trust you enjoyed the views, and encourage everyone to keep those photos of keys, classic rigs, QRP gear, and mobile setups coming so we can continue sharing ideas. Meanwhile, keep pumping that good CW, and I look forward to working you on 30 meters during the near future.

73, Dave, K4TWJ

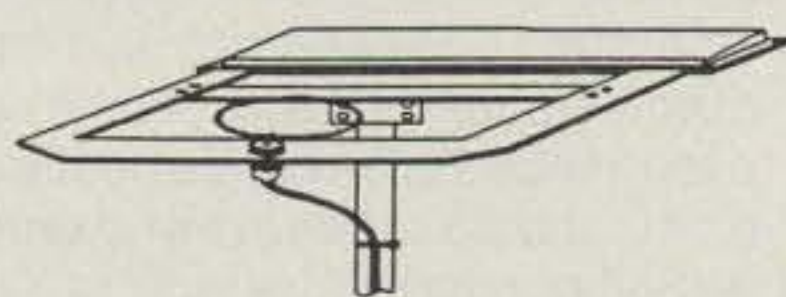
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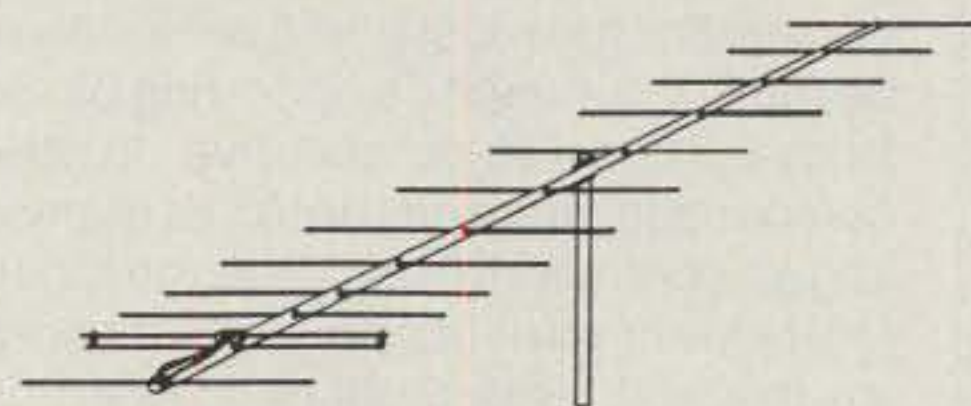
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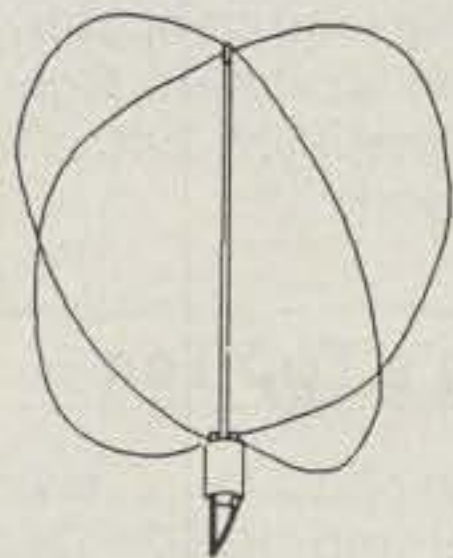
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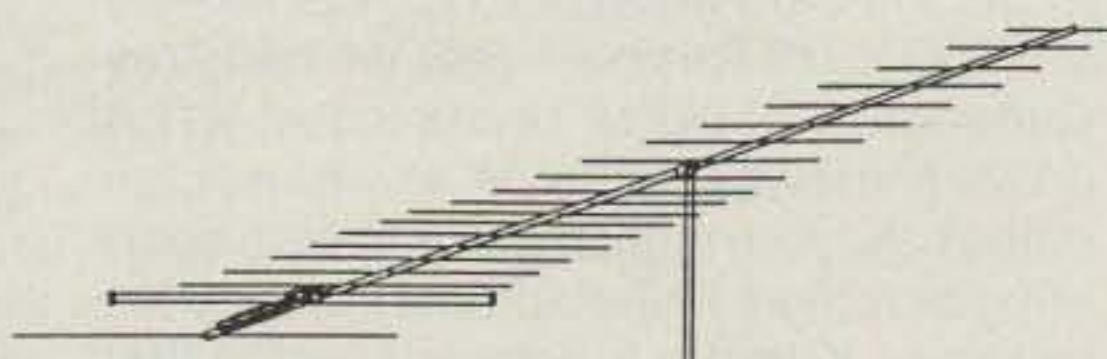
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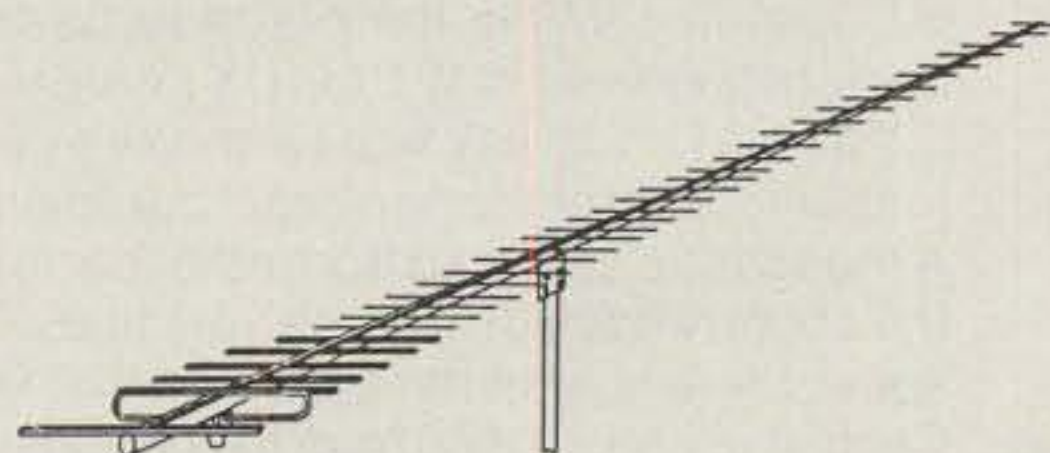
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## NEWS/VIEWS OF ON-THE-AIR COMPETITION

### The Northeast Paradigm

**P**aradigm. Isn't that one of those 1990s words? As it turns out, according to Webster's, a paradigm is a standard or model of comparison that we use in various aspects of our lives. For example, there are a few lucky ones among us whose work hour paradigm is 8 AM to 5 PM. Or maybe there is that one set of rules you use to accomplish a task or measure its success.

Just as in real life, the contester experiences an operating paradigm as well. This became obvious to me during a recent business trip while I sat at the operating position of VS6WO in Hong Kong. The standard for Steve's location is very different from the one that most of us are used to. For example, how many times from the United States have you had a "roaring" pile-up of W's calling you? Have you worked a European pile-up on 10 meters at 1 AM lately? How many fellows have asked you for your QSL manager in the past month? Steve's operating paradigm from Hong Kong is vastly different from the one that we use when operating in the States.

Over the years much has been said about contest operating from the east coast in general and the northeast in particular. For the most part it is perceived to be the DX contester's operating paradise from a Stateside perspective. In striking comparison, there just aren't as many well-known contesters lining up at the Montana (sorry Montana!) border waiting to organize the next large multi-multi operation.

Let me set the record straight from my perspective. Anyone who tells you that northeast contesting isn't the best in the U.S. either doesn't understand, is outright lying, or just got laid off from a travel agency. Just like W5 is the place to be for Sweepstakes, so is W1 for DX contests.

I guess I could say that I am now a permanent victim of the northeast paradigm. Although I've operated from other parts of the country (including some very fine stations), there is no better Stateside WW DX Contest operating than from the northeast. While everyone can recall those special moments (e.g., an S-9OH station on 80 meters from the west coast), the northeast offers them with regularity.

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#### Calendar of Events

May	30-31	CQ WW CW WPX Contest
June	6-7	RSGB Field Day
June	7	Portugal Day
June	13-15	ARRL June VHF QSO Party
June	20-21	All Asian DX CW Contest
June	27-28	ARRL Field Day
July	1	Canada Day Contest
July	4-5	Venezuela SSB DX Contest
July	11-12	IARU HF World Championship
July	11-12	CQ WW VHF WPX Contest
July	18	Colombian Independence Day
July	18-19	Barcelona '92 Olympics HF
July	25-26	Venezuela CW DX Contest
Aug.	1-2	YO DX Contest
Aug.	8-9	Maryland-D.C. QSO Party
Aug.	8-9	Worked All Europe CW Contest
Aug.	15-16	New Jersey QSO Party
Aug.	15-16	SARTG RTTY Contest
Sept.	5-6	Bulgarian DX Contest
Sept.	5-6	All Asian DX SSB Contest
Sept.	6	North American CW Sprint
Sept.	13	North American SSB Sprint
Sept.	26-27	CQ WW RTTY Contest
Oct.	24-25	CQ WW SSB DX Contest

Over the years I have continued to be amazed at how good it can be from here. Operating rates seem to be climbing at incredible speed. It has become common to experience 200+ QSOs/hour into Europe on 10 and 15 meters. For example, I had a 188/hour during this year's CQ WW WPX SSB Contest with a single 4-element 10 meter Yagi at 80 feet. Of course the northeast is also renowned for low-band conditions. I'll never forget the 160 meter SSB European pile-up I had going a few years back in the CQ WW Contest. Who could forget the time when G3LNS was 59+30 on 1839 kHz? This past year we had Trey Garlough, WN4KKN, operating at K1EA under somewhat marginal low-band conditions. As you might expect, Trey's operating paradigm shifted dramatically when he heard 80 meter Europeans for the first time.

Final scores, including QSOs and multipliers, seem to be ever climbing as well. It is now fairly routine to work 3000+ QSOs in a DX Contest from this area. If you don't have 3 million points at the end of the first day in the CQ WW, you are destined for a dismal national finish.

Yes, the northeast DX Contest paradigm is something at which to marvel. However,

now that you are totally depressed and ready to trade your equipment for a 1938 U.S. Graf Zeppelin stamp set, don't lose sight of the non-northeast successes of recent years. Wasn't there a fellow by the callsign of KR0Y, operating at WM5G, who won the CQ WW SSB Contest in 1989 with over 6 million points? I'll never personally forget the year Gary Caldwell, WA6VEF, beat me in a CQ WW from AI6V. And there have been a number of outstanding efforts from the "eastern midwest" at K3TUP (only miles from the Ohio border).

Obviously, there is something more to contesting than the excitement that exists in the northeast. If there weren't, the local QRM east of Albany, New York would be low indeed. I believe the interest comes from our own individual operating paradigms. We adjust to the model under which we physically live, just as we adjust to the limitations of our stations. Under those rules, contesting is fun for everyone. I used to say, after returning from a trip to HI8 or TI2, that I'll never operate from the States again. After all, that \$500 really was money well spent. However, time and personal budgets diminish strong opinions, and fortunately I didn't miss out on some of the best operating experiences from my own backyard in recent years.

Contesters need to keep their competition in perspective. While I know I'll never win the SS from New England, I'm always in there with at least 500 QSOs just to have some fun. My SS paradigm is much different, yet I'm willing to put in the time simply because it's fun! And that should be the way it is for all of us. Experiencing the highest scores and the best rates is undeniably exciting. However, so is the thrill of turning on the rig (and computer) and logging VR6MW on 10 meters. Contesting's diversity, not where you live, is what this game is all about!

#### Contesting's Top Ten

Today I had the pleasure of having lunch with John Golomb, KZ2S. During the course of our conversation we thought about some of the great moments we have experienced in contesting. I composed a quick list of my own that I would like to share. More important, I'd be interested in hearing some of yours. If there is one experience that particularly stands out, you

may want to send me a small write-up about it so that I can share your excitement with our readers. Try out a few of these for size and maybe it will make you smile when you think of your own special times.

1. Participating in the WRTC events of Seattle in 1990.

2. Operating and winning the World Multi-Single category with K1DG at HI8XWP in the 1979 CQ WW SSB Contest.

3. Participating in my first multi-multi from W3AU by operating 40 meters with Bob Cox, K3EST.

4. The two (yes, two!) 15A KW Field Day efforts at W2RQ/2 organized by N2NT.

5. All of the opportunities I had to operate at W2PV (Multi-Multi, SS, etc.).

6. Operating at K1EA; especially our 11 meg multi-single effort on SSB and the six-man multi-multi on CW in the 1990 CQ WW Contest.

7. My trip to TI1J in the 1989 CQ WW SSB Contest.

8. My first real single operator effort from K1GQ in the 1979 CQ WW CW Contest.

9. Dayton 1975-1992.

10. My first contest, the 1970 Novice Roundup (what a disaster).

I would love to see your list. Feel free to send it along!

## On a Heavier Note

The past few months have not been the most pleasant for contesting, as we have lost a few of our friends. Most notably was the passing of Don McClenon, N4IN, Jorge Bozzo, LU8DQ, and more recently Janos Bolyoczki, HA0NNN. I can't give our companions the justice they deserve, but I at least want to offer a few thoughts in their honor.

I will always remember the enthusiasm and smile of Don, N4IN. The first time I met Don was while operating at W3AU. Don was the stalwart of 160 meters from Ed Bissell's super station and seemed to have endless fervor for that band. He was fun to be with at any hour and at any place. Don was active for decades as a member of the Potomac Valley Radio Club. His involvement included participation in PVRC's Field Day efforts (W3IN/3), where Don could always be found with his soldering iron in one hand and a paddle in the other. And of course Don's contributions to CQ's 160 Meter Contest are immeasurable. Even on the day of his passing, Don had a mound of CQ WW 160 Meter Contest logs that he was in the midst of checking.

Who can forget the incredible operating talent of Jorge, LU8DQ? Any of my closer friends will confirm that I always thought Jorge was the best in the world, a real master at the art of CW contesting. To me Jorge was the true inventor of "computer contesting," and it was long before IBM conceived the PC. I'll never forget the occasional times I would challenge Jorge by

calling him off frequency with 5 or 10 watts, only to be the one fooled as he returned my call without skipping a beat! In a world of diminishing CW talent, Jorge was a winner. More important, he will be missed as a friend.

Janos, HA0NNN, was one of contesting's youth, passing away in March at the age of 26. Unfortunately, Janos was the victim of a terrible car accident that ended his life prematurely. Janos will always be remembered as one of the organizers of the HA operations in Albania last year. However, he should also be noted as a true radio contest enthusiast who ate and drank contesting with his every waking hour. His accomplishments included several successful DXpeditions to rare contest countries such as Turkey. The amateur community needs more enthusiasts like HA0NNN who have what it takes to lead and not just follow.

Goodbye, fellows. Our thoughts are with you.

## Final Words

Within a few weeks I am about to board another plane to Ohio. I was hoping this would be the year that my non-amateur friends would finally begin to appreciate the appeal of Dayton. But as usual, not this time. For the 18th year in a row I am still getting the "cross-eyed look" from everyone I know saying, "Dayton, Ohio?" Oh well, let's keep it our secret. I'm not sure the HARA Arena can handle another 100,000 people. Hope to see you there.

Please be sure to take note of the re-emergence of the CQ WW VHF WPX Contest. The only thing holding back this contest over the past year or two was finding an able coordinator. Fortunately, that has been accomplished, and the contest is now under the competent leadership of Joe Lynch, N6CL. The rules can be found in this issue. My guess is this contest will be one not to be missed.

As always, please remember that the deadline for the September issue is July 1st.

73, John, K1AR

## RSGB National Field Day

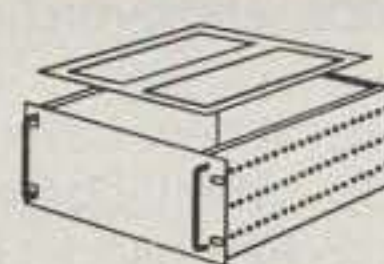
1500 to 1500Z Sat.-Sun., June 6-7

Activity for this CW-only Field Day is not confined to Great Britain. You will also hear some portable activity out of Germany and Switzerland.

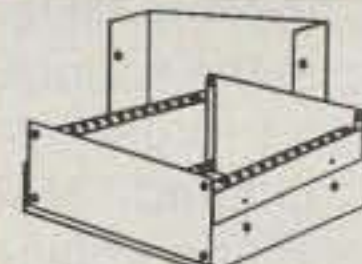
Although overseas stations are not directly eligible, they are invited to participate and submit a report of the stations worked.

A certificate will be awarded to the overseas station in each continent that shows the most contacts. Send your logs to: RSGB HF Contest Committee, P.O. Box 73, Lichfield, Staffs., WS13 6UJ England.

## ELECTRONIC ENCLOSURES

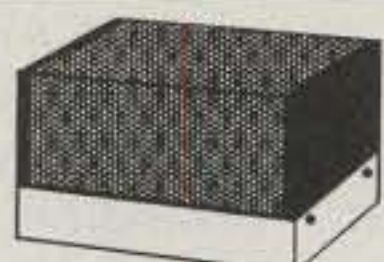


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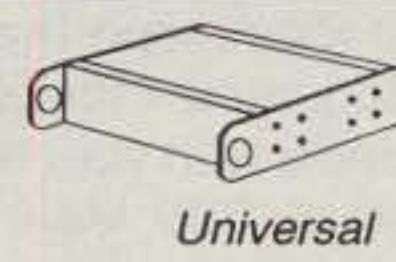


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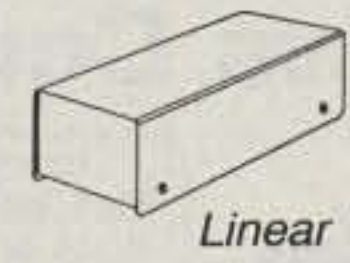
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## ARRL VHF Contest

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Action will be found on the 50, 144, 220, and 420 MHz bands, and even higher up in the spectrum.

Don't forget last year's new categories: Limited Multi-Op (multi-operator class that combines top four bands) and Rover (combines score from total number of grid squares; Rover may be worked once per grid).

The scoring varies with the different bands used, and there are certain requirements and restrictions in the rules. Working WAS on 6 meters is a possibility. Complete rules will be found in the May issue of QST.

I recommend that you write to ARRL Headquarters for official forms. Include an SASE with your request to: ARRL VHF Contest, 225 Main St., Newington, CT 06111.

## All Asian DX Contest

CW: June 20-21 Phone: Sept. 5-6  
0000Z Sat. to 2400Z Sun.

This is the 33rd year of this activity sponsored by the JARL. The exchange is between Asian countries and the rest of the world.

**Classifications:** Single operator, both single and all band. Multi-operator, both single and multi-transmitter, all band only (one signal per band only).

Club stations are classified as multi-operator and each operator will give his age in the exchange.

**Exchange:** For OMs—RS(T) plus age of operator. For YLs—RS(T) and 00.

**Scoring:** 3 points for contacts on 160; 2 points for contacts on 80; 1 point on all other bands. (KA contacts do not count.)

**Multiplier:** For Asians the multiplier is determined by the number of different

countries worked on each band (DXCC list). For non-Asians it is determined by the number of different Asian prefixes worked on each band (CQ WPX list).

**Final Score:** Total QSO points from all bands times the sum of the multiplier from each band.

Keep in mind that non-Asians use Asian prefixes as their multiplier, not countries.

**Note:** JD1 stations on Ogasawara (Bonin and Volcano) are in Asia, and JD1 stations on Minamitori Shima (Marcus) are in Oceania.

**Awards:** Certificates to the top scorers, both phone and CW, in each country and each U.S. call area. In each class, both single band and all band, up to the fifth rank, depending on the number of returns. Medals to the all-band continental leaders, both single and multi-operator.

**Logs:** Keep all times in GMT. Use a separate column for the country or prefix multiplier, and fill in only the first time it is worked. Use a separate log for each band. Include a summary sheet showing the scoring and other information, and a signed declaration that all rules and regulations have been observed.

There is a strict disqualification clause for taking credit for duplicate contacts in excess of 2% of the total on each band, as well as other infractions.

Logs must be received no later than Sept. 30th for the Phone section, and July 30th for the CW section. They go to: JARL Contest Committee, P.O. Box 377, Tokyo Central, Japan.

**Asian Country List:** A4; A5; A6; A7; A9; AP; BV; BY; CR9; EP; HL/HM; HS; HZ/7Z; JA-JR; JD1; JT; JY; OD; S2, TA; UA/UK/UV/UW9-0; UD6; UK6C, D, K; UF6/UK6F, O, Q, V; UG/UK6G; UH8/UK8H; UI8/UK8A, G, I, L, O, T, Z; UJ8/UK8J, R; UL7/UK7; UM8/UK8M, N; VS6; VS9M/8Q; VU; VU (Andaman & Nicobar); VU (Laccadive); XU; XV/3W; XW; XZ; YA; YI; YK; ZC4/5B4; IS (Spratly); 4S; 4W; 4X/4Z; 70 (S. Yemen); 70 (Kamaram); 8Z4; 9K; 9M2; 9N; 9V; (Abu Ail).

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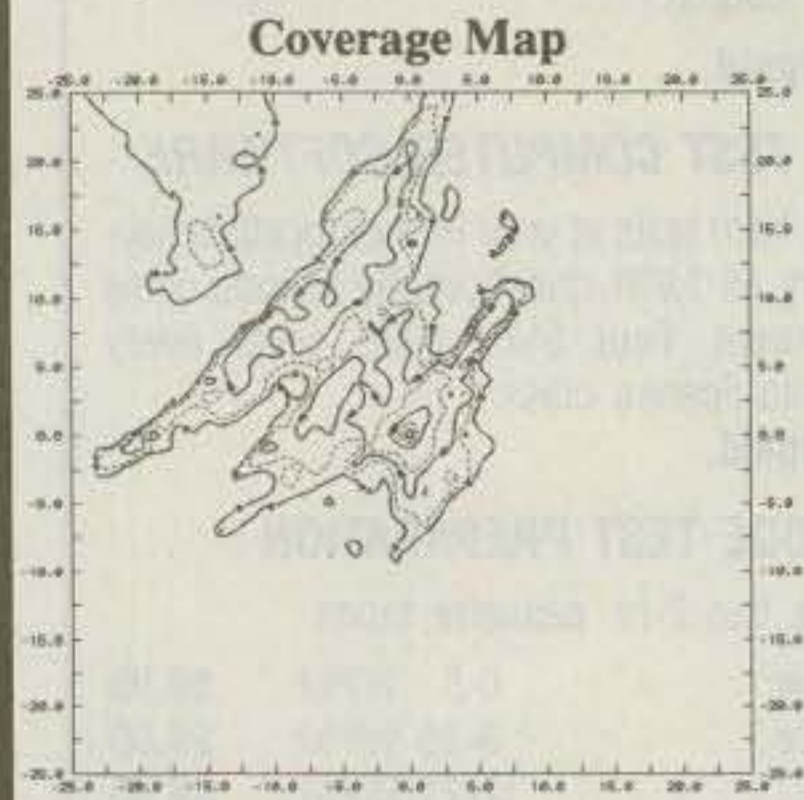
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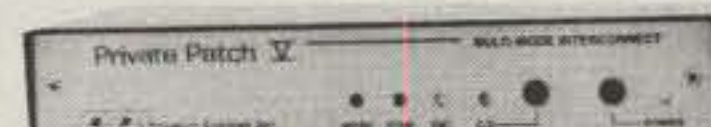
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## NEWS OF COMMUNICATION AROUND THE WORLD

*Packet Etiquette*

**P**acketCluster™ DX spotting networks have had a major impact on DXing in the past few years. Pile-ups have become more intense as a DX "spot" cascades from node to node in some of the larger networks. On the DX end, you can always tell when you've been "spotted"; the pile-ups from a particular region increase dramatically.

Many DXers have come to depend on their packet spotting network, to the point of not turning on their rigs until a needed spot appears. PacketCluster has made successful DXing possible for many who might otherwise miss subtle band openings or rare DX stations. But as with any valuable tool, it can be misused. As the DXing fades into the summer doldrums, perhaps it is time to review proper "packet etiquette."

PacketCluster is very different from most amateur packet systems in one important feature. With conventional packet systems, you should connect, do your business, and immediately disconnect. This is because a conventional packet system has only one "port," or available connection. However, connecting and disconnecting is the *worst* thing you can do with PacketCluster. There is no need to disconnect, as each node has 26 or more available ports, enough for all local users.

The best way to use the PacketCluster system is to connect, directly and reliably, to a nearby node, and *stay connected*. Staying connected makes it easier to forward your mail, allows talk messages to circulate freely, and decreases the "overhead" on the major links between nodes. The extremely high overhead traffic inherent in an interconnected system such as PacketCluster can be the limiting factor in the size and efficiency of a network. While it's great to have hundreds of pairs of ears connected via the packet network, the system can bog down when many users connect and disconnect. And it doesn't make any difference to the system whether you disconnect voluntarily, or time out due to a poor path; either way you are dropped by the system, and that information must be shared with all the other nodes.

Several packet and logging programs will store all your messages and DX announcements for your review when you return to the shack. This is especially impor-

tant when the PacketCluster system is extremely busy, such as during major DXpeditions and contests.

There is one exception to this general rule to stay connected at all times. If your connection to a node is poor, and you frequently time out, *don't* attempt to stay connected, at least until you can improve the connection. Sometimes simple adjustments of frequency, deviation, squelch, etc., may solve the problem. Other times more drastic measures such as a higher, directional antenna may be necessary.

The absolutely *worst* thing you can do is leave the TNC and VHF radio on, but disconnect or turn off the computer. This "hangs up" the entire system. You may find yourself "locked out" of the network if this happens. If you must remove the computer from the packet setup, be sure to disconnect from PacketCluster first.

After establishing a reliable, retry-free connection to your local node, next learn the various user commands. In addition to the SH/DX and SH/WWV, the PacketCluster system provides beam-heading information, maximum usable frequencies, countries needed, and many additional databases, such as QSL managers and bureaus, contest information, FCC license data, and more. Contact your local SYSOP for a copy of the user commands, or send \$12.50 to DXPSN-UG, P.O. Box 1077, Los Altos, CA 94023 for a copy of the user's manual.

Then experiment with the different commands, filters, switches, databases, etc., *at other than busy times*. Early in the morning (after the long path fades), in the middle of a weekday, or on a slow weekend, explore some of the valuable information that PacketCluster puts at your fingertips. Then you won't be fumbling through incorrect commands when you really *need* to know the long-path direction to South Sandwich.

While you're communicating with your SYSOP about the copy of user commands and available databases, ask how you can help support this system. In contrast to the DX club supported VHF repeaters, most PacketCluster spotting networks are owned by individuals who donate the equipment, upkeep, and time to keep the system running. Most SYSOPs have thousands of dollars tied up in their systems, and would appreciate a contribution toward upgrades, backbone improvements, and electricity. In any case, it doesn't hurt to ask how you can help.



*TV9CEE will operate from the summit of Mont Blanc next month, with operators from many European countries.*



*Kanu, 9J2KP, operates out of Lusaka, Zambia. (KF7E photo)*



*Victor Vuthithan Thaveekij, HS1ABU, is one of only three Thais who have permission to have an HF station in their homes. Victor prefers 15 meter SSB. (K3ZO/HS1ABD photo)*

Once you have established a reliable connect and learned the basic commands, you're on your way to becoming a *considerate* packet user. The key to this is to listen, and spot, and listen, and spot. A PacketCluster system with everyone waiting for someone else to spot DX is like 10 meters at sunspot minimums: the band is open but nobody is transmitting, so no one makes

any contacts. *Someone* has to actually tune the bands and spot the DX. That person might as well be you.

The active spotter has an important advantage over the passive packet user: he or she gets to the DX *before* the packet pile-up begins. A very effective DXing technique is to tune around a band on which a major DXpedition is generating a huge pile-up. With most DXers concentrating on the DXpedition, the competition for other DX is greatly reduced. While the DX community was locked onto FO0CI's or VP8SSI's frequency, lots of choice DX went begging on the same bands. So take a few minutes off of the fruitless calling in the pile-ups and tune around for less popular DX.

After you make contact, spot the station. Simply send DX [callsign][frequency] plus any notes. Typical notes are QSL routes, beam heading for best signal, operating pattern, etc. It's easy to know what to include in a packet spot: send all the information that you would want to *receive* in such a spot. In other words, if the DX station is working by call areas and your call area is coming up, say so.

Among the most important notes one can include are beam heading and listening frequencies. If the signal is stronger on the long path, say so in the spot. Many DXers neglect to check skew and long paths, and may give up on the DX simply because their beam is pointed in the wrong direction. Likewise, include listening frequency or operating style. In a major pile-up DXers will often spot the frequency of the last contact. This is especially helpful for those DXers who haven't yet mastered the art of listening to both the DX station and the listening frequency. While the South Sandwich crew was active, a typical spot might have been "DX VP8SSI 21295 QSX 21309 by #s, on 2s sp." This says VP8SSI is transmitting on 21295 kHz, listening at 21309 kHz, working by call areas, on number 2s, and is strongest in the short-path beam direction.

One important aspect of using the PacketCluster system that many DXers neglect: Make any corrections yourself, and immediately. It's very easy to get a letter of the callsign wrong, or mis-type the frequency or QSL route. If you make a mistake (and we all do at one time or another), repeat the spot with the correction noted. Likewise, when you see an obvious error come across the screen, immediately send a talk message to the spotter questioning the spot. If a CW spot for UP8SSI comes in, you might ask the spotter if that shouldn't be VP8SSI. Let the spotter make the correction to avoid embarrassment.

It is very important to correct any errors immediately, as many other DXers depend on the accuracy of this information. A mistyped callsign will not show up in a SH/DX VP8SSI command, for example.

Finally, if you make a contact via a PacketCluster spot, send the spotter a talk message thanking him or her. This serves to



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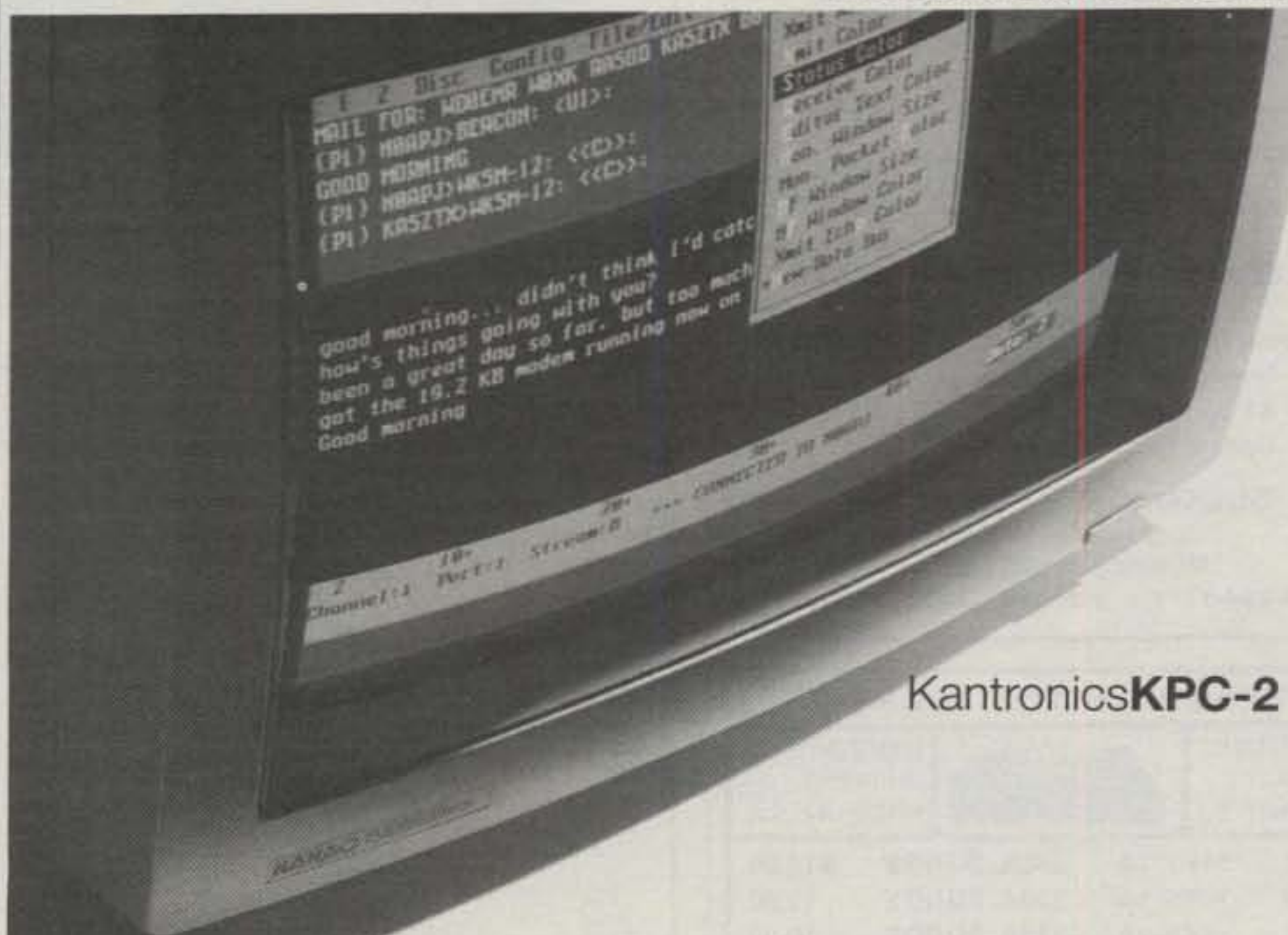
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From left to right: Renato Langona, PY2IRG; David Cowdin, WD0HHW; Junior Torres de Castro, PY2BJO in Renato's shack in Vera Cruz, SP, Brazil.

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SSB: 350 DL2KDW, N3DRO, IK6JYY, HB9DDZ, JH1RMH, EA7BR. 400 N3DRO, IK6JYY, HB9DDZ, EA7BR. 450 IV3JDD, HB9DDZ, DL8AAV, EA7BR. 500 HP2CWB, HB9DDZ, KD5ZD, EA7BR. 550 HP2CWB, HB9DDZ, WB0GFV, EA1IF. 600 HB9DDZ, WB0GFV, OZ1DYI, EA1IP, EA2BOT, HP2CWB. 650 IK0JMS, OZ1DYI, EA1IR, EA2BOT, WB4FOT. 700 IK0JMS, EA1IF, EA3EJI, WB4FOT. 750 IK0JMS, EA3EJI, WB4FOT. 800 IK0JMS, EA3EJI, WB4FOT. 850 WB4FOT. 900 IV3VCG, OE6CLD, WB4FOT. 950 OE6CLD. 1000 OE6CLD. 1050 I3ZSX, OE6CLD. 1100 I3ZSX, K2EEK. 1150 IK9DBB. 1200 JR4NUN, IK7DBB, LU8DY. 1250

JR4NUN, IK7DBB. 1300 IK7DBB, WB8ZRL, IK8BMW. 1350 I1HAG, IK8BMW. 1400 I1HAG, IK8BMW. 1900 I8RFD. 1950 I8RFD.

CW: 350 DF4SA, 3A2LF, HB9DDZ, I2VRF. 400 DF4SA, 3A2LF, HB9DDZ, I2VRF. 450 DF4SA, 3A2LF, HB9DDZ, I2VRF. 500 DF4SA, 3A2LF, HB9DDZ, SM0TW, I2VRF. 550 DF4SA, 3A2LF, HB9DDZ, SM0TW, I2VRF. 600 I2MQP, DF4SA, IK8DDY, 3A2LF, HB9DDZ, SM0TW, I2VRF. 650 DF4SA, IK8DDY, 3A2LF, HB9DDZ, SM0TW, I2VRF. 700 DF4SA, IK8DDY, 3A2LF, SM0TW, I2VRF. 750 VE1HA, IK8DDY, 3A2LF, SM0TW, I2VRF. 800 IK8DDY, 3A2LF, SM0TW, I2VRF, LA3GI. 850 3A2LF, SM0TW. 900 CT1YH, 3A2LF, SM0TW. 950 CT1YH, SM0TW, IS0FIC. 1000 CT1YH, WA2EYA, SM0TW, IS0FIC. 1050 CT1YH, SM0TW. 1100 SM0TW. 1150 SM0TW. 1200 IS0MVE, SM0TW. 1250 I8RFD, IS0MVE, I2IWM, SM0TW. 1300 I2IWM, SM0TW. 1350 I2IWM, SM0TW. 1400 SM0TW. 1450 SM0TW. 1500 VE1RJ, G4SSH, SM0TW. 1550 SM0TW. 1600 SM0TW.

Award of Excellence Plaque Holders: I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2\*\*, AB90, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, KA5W, K0JN, W4VQ, KF2O, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YL/W4, NN4Q, KA3A, YB0TK, VE7WJ, VE7IG, K9QRF, YU2NA, N2AC, W4UW, NX0I, W9NUF, N4NX, SM0DJZ, DK5AD, WB4RUA, DK5AD, WD9IC, W3ARK, I6DQE, LA7JO, VK4SS, K6JG, I1EEW, I8RFD, I3CRW, VE3FXR, N4MM.

Award of Excellence Plaque Holders with 160 Meter Endorsement: FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, H18LC, KA5W, UR2\*\*, 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, K9QFR, NN4Q, W4UW, K9QFR, NN4Q, W4UW, NX0I, G4BUE, LU3YL/W4, I4EAT, WB4RUA, VE7WJ, N4NX, DE0DXM, VE7IG, K9BG, I1EEW, AB90.

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.



## 5 Band WAZ

As of Feb. 29, 1992, 336 stations have attained the 200 zone level.

New recipients of 5 Band WAZ Award with all 200 zones confirmed:

UA4RZ  
YU2WV

The top contenders for 5 Band WAZ are:

N4WW, 199	W0PGI, 199
SP9PT, 199	W2YY, 199
K6YRA, 199	W9WAQ, 199
PY7ZZ, 199	K6EID, 199
DL9WW, 199	IK8CNT, 199
K0CS, 199	W1JR, 199
KB0G, 199	I8IGS, 198
AA4KT, 199	VE7AHA, 198
K7UR, 199	SM6AHS, 198
K9EL, 199	K1ST, 198
NA0Y, 199	4X4DK, 198
VE7DX, 199	

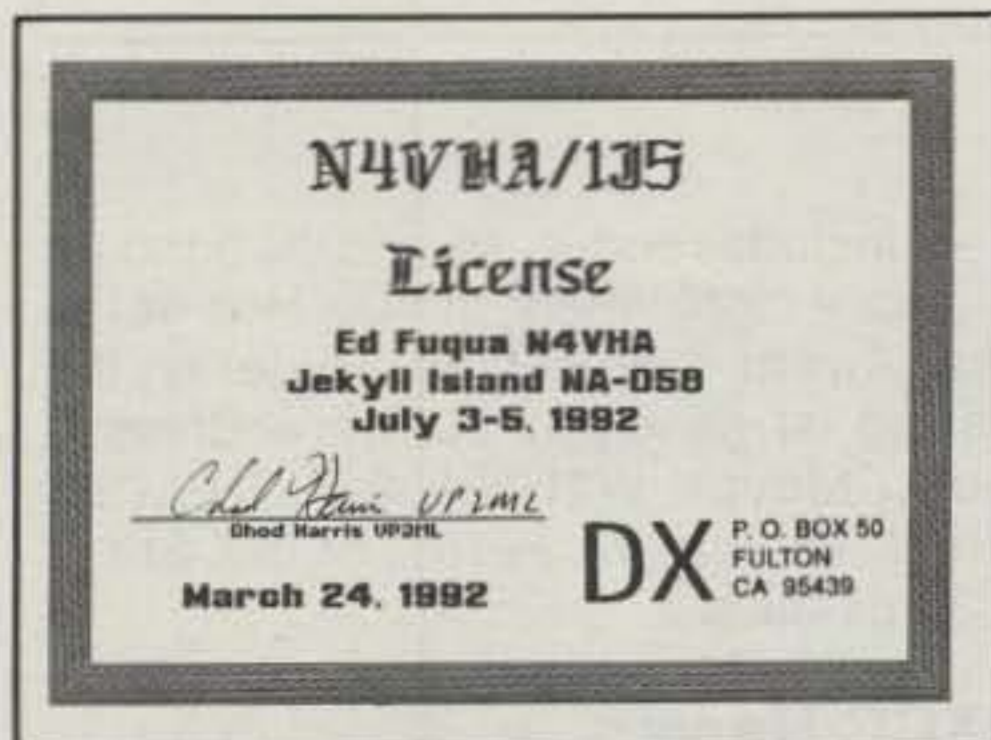
771 Stations have attained the 150 zone level as of February 29, 1992.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4 1/2 x 9 1/2 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).

show how valuable these spots are to the many DXers connected to the network, and to encourage the spotter to make more such spots. It takes only a few seconds to send "T KA6ING Thanks for VP8SSI spot; new one for me." This positive feedback will work wonders; try it.

## DX Conventions

The first New Orleans International DX Convention will be held August 28-30 at the Royal Sonesta Hotel, on Bourbon Street, in the heart of the Historical French Quarter. Registration is \$50 until 31 July, and includes the Saturday banquet (\$60 at the door). MasterCard and Visa accepted until July 15. Send your check or credit-



Ed Fuqua's N4VHA/1J5 "license" for his July 3-5 Jekyll Island operation.

## The WAZ Program

### Single Band WAZ

#### 10 Meter SSB

416	OH3MIG	419	ON4VT
417	N8HUR	420	DL1SWG
418	JR4VMS	421	OE6GND

#### 15 Meter SSB

412 ..... JR4VMS

#### 17 Meter SSB

1 ..... N4VZ

#### 20 Meter SSB

879	PT7NK	881	WB6ALC
880	KA1CLV		

#### 10 Meter CW

128 ..... K8LJG 129 ..... DK7SU

#### 12 Meter CW

5 ..... W7KQU 6 ..... W1WAI

#### 15 Meter CW

228 ..... DK7SU

#### 20 Meter CW

415 ..... KA1CLV 416 ..... DK7SU

#### 40 Meter CW

150	NR1R	152	LA7AFA
151	DK7SU		

#### 12 Meter Mixed

8 ..... DJ5JH

#### RTTY

2A-10M ..... JR1JV

#### All Phone

607 ..... N4RFN

#### All CW

10 ..... N4UA

#### All Band WAZ SSB

3904	EA5DIT	3913	K5LC
3905	EA5GKE	3914	KC4NHB
3906	AL7HS	3915	WA4APM
3907	W4ZPO	3916	WA1DHM
3908	N8HUR	3917	IK8NRL
3909	KF4BU	3918	WW1N
3910	WK8N	3919	WB5JHK
3911	SV1AOZ	3920	JH1KKT
3912	WA4MCZ		

#### CW/Phone

7171	EA5CZ	7182	JH6AUS
7172	VE3NDX	7183	OH3PY (CW)
7173	K6XZ	7184	K1CVF (CW)
7174	K1TG (CW)	7185	ND1X
7175	VE1HA (CW)	7186	AA6KX
7176	W7KQU	7187	K5LC (CW)
7177	SM7AML (CW)	7188	JL3JTD
7178	KG5YA	7189	JJ1ZXE
7179	VK3EFD	7190	HA7CY (CW)
7180	JH4RCD	7191	KM4FI
7181	HB9AKB	7192	HA7XL (CW)

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4 1/2 x 9 1/2 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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100%  
MADE  
IN  
USA

for  
H. F. MOBILE OPERATION

**\$16<sup>00</sup> each**

- Monobanders for 75 to 6 meters
- Very rugged fiberglass and stainless steel
- Telescopes for easy adjustment
- 3/8 x 24 TPI base fits most mounts
- Low profile & low wind load
- Needs no springs or guys
- Complete tuning & matching instructions included
- Approximately 7 ft. tall
- 1,000 watts

Cat. #	Band	Cat. #	Band
9175	75 meters	9115	15 meters
9140	40 meters	9112	12 meters
9130	30 meters	9110	10 meters
9120	20 meters	9106	6 meters
9117	17 meters		

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3620-9A Whitehall Rd.  
Anderson, SC 29624  
800-226-6990 (Orders Only)

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Catalog Available • Dealers Welcome

CIRCLE 47 ON READER SERVICE CARD

## 1691 MHz Weather Satellite System

1691 MHz HEMT Pre-amp.  
model TS-1691-P Amp ..... \$299

1691 MHz Receiver  
model TS-1691-Recvr ..... \$450

Decoder Board & Software  
model TS-VGA-SAT3 ..... \$300

or  
Decoder Board & Software  
model TS-VGA-SAT4 ..... \$399

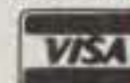
Low Loss (microwave) Coaxial Cable  
(65 ft) with connectors  
model 1691-coax ass'y ..... \$55

1691 MHz Loop-Yagi Antenna  
model 1691-LY(N) ..... \$99

1691 MHz Loop-Yagi Extension  
model 1691-LY-XTN ..... \$85

Demonstration Disc (IBM-PC VGA  
compatible) of signals recorded from  
WX-SAT system ..... \$5

Shipping: FOB Concord, Mass.  
Prices subject to change without notice.  
Write for details.



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Concord, Mass. 01742, U.S.A.  
Phone: (508) 263-2145  
Fax: (508) 263-7008

CIRCLE 68 ON READER SERVICE CARD

## THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with CQ master prefix list. Scores are based on the current prefix total regardless of an operator's all-time count. Honor Roll must be up-dated annually by addition to, or confirmation of, present total. If no up-date, file will be made inactive. Lifetime Honor Roll fee is \$4.00 (U.S.) for each mode, with no fee for additions.

### MIXED

4271	YU2AA	2577	ZP5JCY	2288	W1BWS	1956	K8LJG	1628	WB8ZRL	1313	YU4BR	1065	YV7QP
4016	F9RM	2564	PA0SNG	2276	IT9QDS	1938	W4UW	1626	SM6CST	1306	WB3DNA	1041	ISZTC
3904	K2VV	2559	KA5W	2205	SM0AJU	1856	N6JM	1604	W9IL	1304	W3KH	1008	IK2BLA
3219	EA2IA	2558	IN3ANE	2202	I2MQP	1848	K2POF	1604	WB4RUA	1296	IK2ILH	1001	W0IZV
3152	K6JG	2534	IT9TQH	2158	KF2O	1829	K9AGB	1599	KB0G	1294	JAG6WU	994	WM0G
3105	K6XP	2524	I1EEW	2141	YU4EXA	1811	I2DMK	1589	YU2CO	1287	I2EAY	975	F6CDJ
3078	VE3XN	2523	YU7SF	2133	3A2LF	1793	YT7WW	1553	VE1RJ	1249	N3ED	963	CT3CU
3005	N6JV	2499	YT7DX	2106	K5UR	1783	DK5AD	1522	YU3NU	1241	TF1MM	920	WB2PCF
2943	W4BQY	2479	I2UIY	2068	K9QFR	1782	WE2L	1468	K5DB	1238	KA5TQF	908	NH6T
2933	N4NO	2472	W2FXA	2062	4N7ZZ	1778	YU1GR	1466	W7CB	1236	KI3L	906	YU7FT
2904	I2PJA	2471	I6SF	2042	SM6DHU	1776	W6OUL	1455	YU7DR	1222	WD9IIC	880	W4USW
2821	N9AF	2466	YU7BCD	2040	W0SFU	1759	K2OLG	1439	YB0TK	1197	LU8DY	875	RB5MP
2817	YU1AB	2458	N2AC	2040	YT3AA	1737	W8UMR	1384	KS4S	1192	KS0Z	833	WK0B
2779	PY4OD	2418	HA0DU	2013	UA3FT	1730	YU7RU	1352	WB2ABD	1164	W9IAL	815	W6LC
2774	N4MM	2409	K9BG	2010	YU3EO	1709	G4OBK	1341	DF4ZL	1120	W0JIE	733	N3KR
2770	SM3EVR	2382	SM7TV	2001	I2EOW	1667	VE3FXR	1335	AI6Z	1101	G4SDJ	684	K6DYP
2760	WA8YTM	2376	I8YRK	2000	KL7AF	1659	WB2YQH	1332	YU3PG	1094	K0IFL	642	VE3GOV
2748	W9DWQ	2340	4X4FU	1989	HA0HW	1646	N2AIF	1329	F1HWB	1081	K9BQL	641	VE6BMX
2663	K0BLT	2320	YU2NA	1970	HA0IT	1629	DF6EX	1323	YU1PJ	1075	NJ1T	634	WK3Z
2649	I2PHN	2295	HA8XX										

### SSB

3937	F9RM	2256	PA0SNG	1856	KF2O	1511	KL7AF	1216	WN5MBS	1050	KB2DE	881	WM0G
3634	I0ZV	2245	W4BQY	1852	YU2NA	1508	I2TZK	1200	ZS6ACO	1029	W5LLU	854	VE3FXR
3303	K2VV	2244	I4ZSO	1812	I8KCI	1490	IK5ACO	1199	LU8DY	1028	OE2EGL	829	KB4HU
3229	ZL3NS	2216	I8YZP	1797	K5UR	1468	N6FX	1195	KB0C	1025	W3GXX	822	WD5KBB
3020	VE1YX	2211	I1EEW	1793	W4UW	1465	CX6BZ	1151	G4OBK	1019	CT1COK	806	I6KYL
2887	I2PJA	2180	WA8YTM	1762	I2EOW	1422	YU7SF	1148	DK5WQ	1017	CT1BWW	791	KA9MOM
2836	K6JG	2124	KA5W	1758	LU8ESU	1414	IN3QCI	1142	IK2DUU	1010	CT1DIZ	787	CT1YH
2753	K6XP	2111	I2UIY	1747	SM0AJU	1394	K9LJN	1138	N2AIF	1010	LU1VK	750	NM5Y
2714	WD8MGQ	2089	HA8XX	1718	PY4OY	1391	HA0IT	1137	W5ILR	996	W5AWT	736	EA1IF
2622	I2PHN	2085	I2MQP	1713	K5RPC	1360	K8LJG	1136	I7VEZ	984	WB6SRK	728	YU1PJ
2608	CT4NH	2067	I8YRK	1687	KD9OT	1349	K2POF	1112	WA2FKF	981	K8MDU	708	EA3EOT
2515	N4MM	2037	EABAKN	1686	CT4UW	1341	KE6KT	1111	K2EEK	972	K9BQL	707	KE7UH
2484	ZP5JCY	2024	W9DWQ	1673	EA4KK	1332	F1HWB	1104	HP6AYV	958	IK2DUW	697	YV7QP
2481	I6ZJC	2010	PY4OD	1652	WE2L	1317	N2AC	1101	FE6FNA	956	WB6GFJ	690	I8IYW
2466	I0AMU	1971	WF4V	1645	IK8GCS	1288	WB8ZRL	1097	W6OUL	942	KC2FC	664	SM6CST
2409	W0YDB	1969	I5ZJK	1633	KC8YM	1286	IK7DBB	1091	TF1MM	941	5Z4BP	646	KB8DAE
2379	IT9TQH	1948	WA4QMQ	1604	CT1BY	1285	EA3FHT	1090	I3ZSX	910	KB0G	632	IK5DNE
2354	OZ5EV	1944	EA3AQC	1592	4X6DK	1267	G4MVA	1081	K3IXD	899	AI6Z	632	HP2CWB
2332	EA2IA	1940	YU7BCD	1590	XE1OX	1256	W7HJM	1073	KS4S	898	IK2AEQ	625	G4XTA
2280	I4CSP	1913	K9QFR	1565	CT1AHU	1255	KF7RU	1062	IK0EIM	894	N3ED	624	YB1RED
2272	NJ0C	1897	W3ARK	1534	EA2AOM	1244	KA0ZFX	1056	G4SDJ	885	EA3BOX	608	CE5FSB
2264	N4NO	1883	HR1KAS	1522	SM6DHU	1229	IT9JKY	1055	OE6CLD	884	KK5P	608	VE3GOV

### CW

3216	K2VV	2211	I6SF	1619	TI4SU	1442	K8LJG	1294	ZS6BCR	1033	NJ1T	853	W0JIE
3083	WA2HZR	2128	LZ1XL	1572	YU2NA	1439	YU3NU	1261	LA9XF	1022	EA5AR	851	K9QFR
2984	N6JV	2085	4X4FU	1560	KL7AF	1433	F6HKD	1244	DL2HBX	1013	WB8ZRL	846	AC5K
2717	VE7CNE	2071	WA8YTM	1556	SM0AJU	1430	W1WAI	1243	KB0G	1010	YU1PJ	813	ZP5JCY
2555	N4NO	1951	YU7BCD	1533	EA7AZA	1428	I7PXV	1230	DJ1YH	993	N3ED	808	YV7QP
2486	PY4OD	1926	YU7LS	1529	W8IQ	1420	K2POF	1222	YU2CO	988	VE4CE	763	W4UW
2386	W3ARK	1884	VE7DP	1526	HA0IT	1417	KF2O	1195	I1EEW	959	KA1CLV	754	WB5MTV
2373	EA3IA	1861	KA5W	1525	VE1RJ	1380	G3VCO	1187	YU3PG	951	N4IR	752	EA6AAK
2362	K6JG	1852	N4MM	1524	G4SSH	1362	I2IWM	1173	IK3GER	949	IS0FIC	749	W8LRY
2345	IT9TQH	1710	N4YB	1518	N6FX	1359	HA8XX	1167	VE3FXR	933	K3UA	744	RB5MP
2344	I1YRL	1676	KA7T	1517	SM6CST	1323	VS6UW	1110	I2EAY	923	YU4BR	700	EA1MV
2328	K6XP	1673	K5UR	1513	K9LJN	1319	W6OUL	1109	W5AWT	909	AH6JF	698	4X6DK
2300	W4BQY	1656	G4UOL	1509	W9PWM	1310	G4OBK	1093	EA1AK	907	IK2ECP	659	TF1MM
2299	YU7SF	1642	I2UIY	1486	SM6DHU	1303	N2AIF	1091	NF5Z	905	W9IAL	606	I5OQV
2252	W9DWQ	1632	IT9VDO	1468	IK0ADY	1295	I8YRK	1059	AI6Z	858	KS4S	601	N5GFX
2225	N2AC												

card information to Weston Strauch, W5VBX, 2238 Lake Oaks Parkway, New Orleans, LA 70122. Rooms at the Royal Sonesta are \$105/night for two people; ask for the special New Orleans International DX Convention rate when you call them at 504-586-0300.

The 40th Annual W9DXCC Convention will be held Saturday, September 12, in the Chicago, Illinois area. This one-day event is very popular, with seminars, DXpedition slide shows, and a banquet. The Northern

Illinois DX Association has an excellent track record of sponsoring this event. For registration details contact Paula Uscian, WF9K, 4965 Castaway Lane, Barrington, IL 60010.

The National Capitol DX Association announces that DXPO-92 will be held October 10-11 at the Holiday Inn, College Park, Maryland, at Exit 25A on the beltway, near Washington, DC.

The event begins at 1 PM on Saturday and runs through noon Sunday. The pro-

gram includes seminars, and the banquet Saturday night where the DX Hog of the Year Award is presented. To get on the mailing list, send your current address to Stuart Meyer, W2GKH, 2417 Newton Street, Vienna, VA 22181, or call Stu at 703-281-3806.

### DXCC News

The DXCC Desk has announced that the brief **VP8CIZ** CW operation from South

## ASTRON POWER SUPPLIES

• HEAVY DUTY • HIGH QUALITY • RUGGED • RELIABLE •



MODEL VS-50M

### SPECIAL FEATURES

- SOLID STATE ELECTRONICALLY REGULATED
- FOLD-BACK CURRENT LIMITING Protects Power Supply from excessive current & continuous shorted output
- CROWBAR OVER VOLTAGE PROTECTION on all Models except RS-3A, RS-4A, RS-5A, RS-4L, RS-5L
- MAINTAIN REGULATION & LOW RIPPLE at low line input Voltage
- HEAVY DUTY HEAT SINK • CHASSIS MOUNT FUSE
- THREE CONDUCTOR POWER CORD except for RS-3A
- ONE YEAR WARRANTY • MADE IN U.S.A.

### PERFORMANCE SPECIFICATIONS

- INPUT VOLTAGE: 105-125 VAC
- OUTPUT VOLTAGE: 13.8 VDC ± 0.05 volts (Internally Adjustable: 11-15 VDC)
- RIPPLE Less than 5mv peak to peak (full load & low line)
- All units available in 220 VAC input voltage (except for SL-11A)

### 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 1/4 x 7 1/2 x 9 1/4	11

- LOW PROFILE POWER SUPPLY

### RS-L SERIES



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

- POWER SUPPLIES WITH BUILT IN CIGARETTE LIGHTER RECEPTACLE



### 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

- 19" RACK MOUNT POWER SUPPLIES

- Separate Volt and Amp Meters

### RS-A SERIES



MODEL RS-7A

MODEL	Colors		Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
	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 1/2 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

- Switchable volt and Amp meter

- Separate volt and Amp meters

### VS-M AND VRM-M SERIES



MODEL VS-35M

- Separate Volt and Amp Meters • Output Voltage adjustable from 2-15 volts • Current limit adjustable from 1.5 amps to Full Load

MODEL	Continuous Duty (Amps)			ICS* (Amps) @13.8V	Size (IN) H x W x D	Shipping Wt. (lbs.)
	@13.8VDC	@10VDC	@5VDC			
VS-12M	9	5	2	12	4 1/2 x 8 x 9	13
VS-20M	16	9	4	20	5 x 9 x 10 1/2	20
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

- Variable rack mount power supplies

### RS-S SERIES



MODEL RS-12S

- Built in speaker

MODEL	Colors		Continuous Duty (Amps)	ICS* Amps	Size (IN) H x W x D	Shipping Wt. (lbs.)
	Gray	Black				
RS-7S	•	•	5	7	4 x 7 1/2 x 10 3/4	10
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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3X0HNU to F6FNU  
4K2CC to UV3CC  
4K2MAL to UA4RC  
4K2OLQ to UV3CC  
4K3/UA1ZFQ to UA1ZX  
4K3OLL to RA3YG  
4N2Y to YU2CCY  
5N0EPT to N6QLQ  
5R8GW to F6FNU  
6W6JX to F6FNU  
7P8EG to K0JZM  
7Q7BR to JK3GAD  
7Q7XX to JH3RAA  
8P9CP to KD6WW  
8P9CV to W2GD  
9H1EL to LA2TO  
9J280 to W6ORD  
9J2FR to I2ZZU  
9J2SZ to SP8DIP  
9K2NU to 9K2AR  
9K2WR to N6UXB  
9K2ZZ/NLD to W8CNL  
9M2NA to VE3CHZ  
9X5NH to DJ6EA  
A22BW to DK3KD  
AP/WA2WYR to KK6TX  
AP2JZB to K2EWB  
AZ9F to LU9FHF  
8V2DA to DL7FT  
C30CAB to F6DGT  
C31HK to C31LHK  
C56/GM3XOR to GM3YOR  
C9RDM to W8GIO  
CM2VS to I0WDX  
CQ1A to CT1EEB  
CR5CIH to CT1FS  
CR7EEN to CT1EEN  
CT0A to CT1DVV  
CT1EKY to CT1EEB  
CT7YH to CT1YH  
CU3/KF2EJ to KD4XN  
DX2VQA to W7KNT  
EA6ZZ to WA1ECA  
EH8URL to EA8ZX  
EX0FWR to YU1XA

FE10GG to F6DGT  
F00CI to N7QQ  
F00PT to DJ0FX  
FS4PL to FG4BG  
FY4FT to FY5KRV  
FY5FP to ON4ZD  
HC8K to HC5K  
HF8POL to SP9DWT  
HI8/KP2A to N6CW  
HI8A to JA5DQH  
HI8AX to JA2PLT  
HP1X8H to W4YC  
HS0ZAA to KM1R  
HU0PAX to YS1OD  
HV3SJ to I0BUD  
HX1LVL to F1LVL  
HZ1AB to K8PYD  
HZ1MM to OE6EEG  
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J37M to W9VW  
J73AI to G2BAP  
J77DX to VE5RA  
J77UY to DK7UY  
JW0E to UC2AHE  
JW1MFA to LA1MFA  
JW8THA to LA5NM  
JX3P to LA3DH  
KC6GG to OKDXA  
KD7P/NH7 to KD7P  
KG4DD to N5FTR  
KG6SL to WA6AHF  
KH0/JA1SLS to JH4WEE  
KH2/K8MX to N8CC  
KP5/K0BJ to K0BJ  
L09F to LU9FHF  
N68FM/4U to W8CNL  
OG0BBF to OH2BBF  
OG1XX to OH1XX  
OX3XR to OZ3PZ  
P29DK to N4EOF  
P30FN to 5B4FN  
P43FM to PA0FM  
PJ9JT to W1AX  
PY0FZ to PY7ZZ  
RF0FWW to UF6FFF  
RH2E/RA3QAK to DL9LJ

RV45A to OH7AB  
RW8T/UW0SR to UW0SR  
RW9FW to RA9FCB  
S79KMB to KN2N  
SU1ER to OE6EEG  
SV0HW/SV9 to KA5EJX  
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T32BW to HA8XX  
TG9GI to I0WDX  
TI2DX to WA9BXB  
TI4SU/7 to SM0RBO  
TK5EL to F6FNU  
TL8CK to F6EWM  
TL8IM to AC3D  
TR8GL to F6IXI  
TU4SR to OH8SR  
TZ6NU to F6FNU  
TZ6VV to N0BLD  
UC1AWZ to DL10Y  
UF6FAL to YU1XA  
UF6FJ to OZ1HPS  
UF6VG to RA6AR  
UH8EA to W5BWA  
UJ8KA to UJ8JMM  
UJ8S to UW9LA  
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V63AX to W9GW  
V85KX to G3JKX  
VC8DR to DL8AAM  
VE2EST to KT8Y  
VE8DR to DL8AAM  
VK9LW to WI0S  
VK9XM to W5BOS  
VK9XN to W5KNE  
VP2EST to KT8Y  
VP8BZL to AA6BB  
VP8CGK to VK4MZ  
VP8CIZ to LA6ZH  
VP9HE to KD8IW  
VQ9QM to W4QM  
VQ9RS to ND0F  
VR6FM to K16YN  
VR6MW to NZ9E  
VU2KOJ to RA9UA

VU2ZAP to W3HNC  
WA9POX/D2 to WA9POX  
WF6FAL to YU1XA  
WH4/WH6ASW to WH6ASW  
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XE2MX to K6VNX  
XF0C to XE1BEF  
X00X to CE3ESS  
XQ3SIX to NI6V  
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YJ8RN to N9DRU  
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YX0AI (SSB) to YV5ARV  
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PB24 Tabs	9.6v	600mah	\$15.00
PB-25/26	8.4v	500mah	\$18.00

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FNB-17	7.2v	600mah	\$18.00

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Georgia Island in March has been accredited for DXCC. That means the cards from Ruth Tollefsen, LA6ZH, will be acceptable for CW credit as soon as received. Less expected, the DXCC also accepted the paperwork for **EP/HA5BUS**, the Hungarian Globex Around-the-World tour. Although there are many EP stations on the air, none has received DXCC accreditation for years.

In the wake of the **SY/DJ6SI** Mt. Athos controversy, the DXCC desk has issued new, more restrictive requirements for DXCC accreditation of Mt. Athos operations. They will require a Greek-issued (or recognized under treaty [including CEPT?] —ed.) amateur radio license, the Diamonitirion (written permission to enter the Mount Athos region), and entry and amateur radio permission must come from the Common Congregation of the 20 separate monasteries that dot the Mt. Athos peninsula.

**Top Of The Honor Roll Recognition.** The DXCC desk announced that DXCC members who reach the top of the DXCC Honor Roll for the first time will be identified in *QST* each month. This begins with applications received on or after April 1, 1992. Such DXers may also order a plaque commemorating their achievement. Order forms are available from the DXCC desk.

The ARRL has simplified the DXCC application procedure. DXers who send their cards to ARRL Headquarters for checking no longer need to copy the QSO data from their cards onto the back of the DXCC application form. This information will be copied directly from the cards into your DXCC computer record. Note that DXers who have their initial DXCC application checked in the field *must* copy the QSO data on their application. The DXCC prefers use of the latest version of the DXCC application form. A copy is in the DXCC Countries List, available for \$2.00 from the ARRL, or the application only is available for a business-size, self-addressed, stamped envelope (SASE) from ARRL Headquarters.

## Upcoming DX Operations

The Wiesbaden (Germany) Amateur Radio Club will operate as **HB0/DA1WA** from Liechtenstein May 22 to June 14. This is the 17th year the club has operated such an event. The club members will be active on 160-10 meters, SSB and CW. A special QSL card will be available via KN6G for US and Canadian stations, or via DJ0LC for others. Please include an SASE.

## CQ DX Awards Program

### SSB

1941	XE1PM	1944	WA4APM
1942	IK7MCJ	1945	XE1ILI
1943	KA3UNQ	1946	FD1OZF

### CW

851 KA3UNQ

### RTTY

13 I0AOF 14 WA8MEM

### SSB Endorsements

320	ZL1AGO/323	310	WB3CQN/318
320	OE3WWB/323	310	KF5AR/311
320	N4MM/323	310	WD0DMN/310
320	WA3HUP/323	300	IN3ANE/308
320	W4NKI/323	300	WB2JZK/302
320	WD8MGQ/323	275	4X4JO/290
320	I8KCI/322	275	EI6FR/283
320	K2JLA/322	275	XE1ILI/283
320	K8LJG/322	275	FD1OZF/285
320	SV1ADG/322	275	N8HUR/280
320	WA4DAN/321	275	KJ6HO/276
320	WA4IUM/321	250	IN3PEE/257
320	OE2EGL/321	200	WA4APM/228
320	K9HQM/321	200	WA4PMF/214
320	W2CC/320	150	KA3UNQ/164
310	IK8GCS/319	28 MHz	KJ6HO
310	W6NLG/318	3.5/7 MHz	KJ6HO
310	WZ4I/318	1.8 MHz	A92BE

### CW Endorsements

320	N4MM/323	310	WA4IUM/314
310	K8KJG/318	300	WA4DAN/302
310	WA4JTI/317	300	G2FFO/301
310	KB8DB/315	275	G3KMQ/295
310	KZ4V/315	250	IK2ILH/252

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.

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All scopes include probes, schematics, operators manual and 3 year (2 yrs for Elenco scopes) world wide warranty on parts & labor. Many accessories available for all Hitachi scopes. Call or write for complete specifications on these and many other fine oscilloscopes. 1x, 10x Scope Probes: P-1 65MHz \$17.95, P-2 100MHz \$21.95

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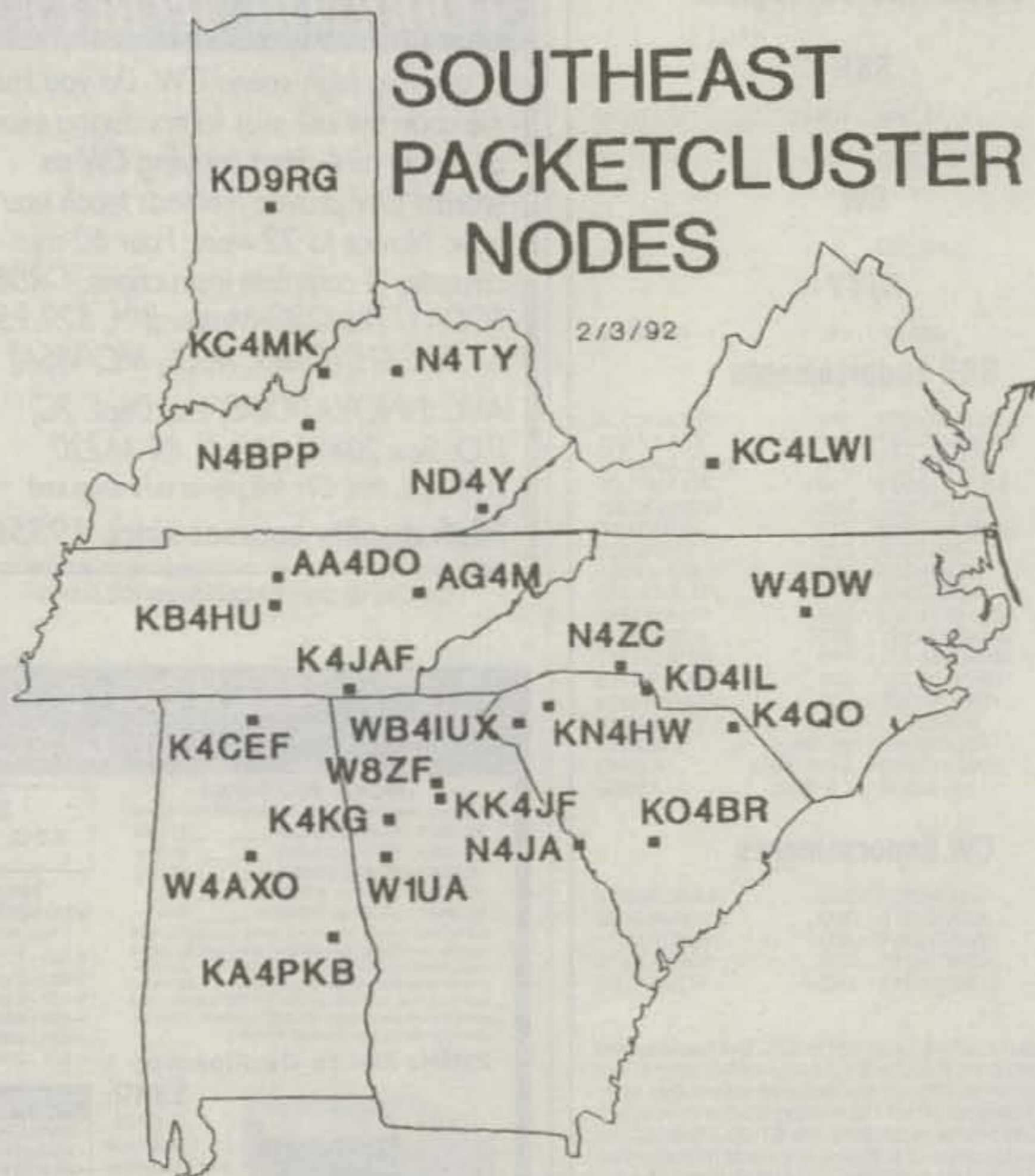
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try. Lee Groff, WW5B, is planning a July 20-28 operation from the 9000 foot high peak of the Korab mountains, in southeastern Albania. He seeks equipment and funds to help with the trip. Contact Lee at P.O. Box 460, Brookshire, TX 77423.

Another upcoming mountain DXpedition is set for August. Amateurs from several EEC (European Economic Community) countries will operate **TV9CEE** from Mont Blanc for three weeks. The operation will be a joint amateur radio and mountaineering trip, with the aim of operating from the peak of Mont Blanc. For more information on joining the trip, contact Caudroy Daniel, F6BXC, La Croix du Guidon, 45240 Marcilly en Villette, France.

That's it for this month. Coming next month: A comprehensive report on the DX Advisory Committee and their current deliberations. Meanwhile, take some time to clean your antennas, replace the feedline if necessary, and maybe get effective antennas up for the new bands. Seventeen and 30 meters will be important DX bands as the sunspots wane. Don't forget to wear your safety belt while working on your tower.

73, Chod, VP2ML

## QSL Notes

Agi, **HI8A**, has returned to Japan after his extended stay in the Dominican Republic. QSL *only* via Agi's home call: JA5DQH. Use the JARL bureau, or direct to P.O. Box 73, Ishii, Tokushima 779-32, Japan. Agi's other HI calls were **HI500A** and **HI160M**.

QSL the CQ WW SSB operation of **FM6A** via M. Le Cloitre Gildas, F6HMQ, 6, Residence des Ch'nes, 77380 Combs la Ville, France.

**TI4SU** has a new QSL manager: Bror Nordling, SMØRBO, good in most *Callbooks*, or via the Swedish bureau. SMØRBO also has the old logs for: **TI4SU**, **TE5T**, **TE4T**, **TE2T**, **TE1T**, and **TI73F**.

Jose (Joe) Pereira, HI3JMP, is the QSL manager for Dominican Republic's Union Dominicana de Radio Aficionado, Inc. (UDRA). The club call is **HI3UD**, and they have operated as **HI500UD**, celebrating the 500th anniversary of the discovery of the Americas, as well as several Island DXpeditions, including: **HI1UD**, **HI2UD**, **HI3UD/HI4**, **HI7UD**, and **HI9UD**. Contact Joe at P.O. Box 902, Santiago City, Dominican Republic, West Indies.

JH8BKL is QSL manager for **HP1XFG**,

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V47ITU is Craig Maxey, WB7RFA; QSL direct at Box 608, Basseterre, St. Christopher (St. Kitts), Leeward Islands.

The 4J1FS QSL cards are arriving from OH2BU. According to many recipients, the times of QSOs differ from Stateside clocks by 4-26 minutes. If you get a *not in log*, try again, mentioning the clock differences.

WB2CVL has delivered the 400 or so XY0RR QSLs that he arranged to be answered in exchange for \$4-20. No word on when the rest of us may expect our cards.

K6PBT reports that the ZK1XC QSLs may be delayed, as operator WQ7R is on the move (again). K6PBT, who is not answering the cards, but acting only as a mail drop for the oft-moving Ray Cameron, asks DXers to be patient.

Ken Wells, V73CT, asks for QSLs via the Oklahoma DX Association, P.O. Box 88, Wellston, OK 74881.

The Belize V3 QSL bureau has faded away. Correspondence directed to the bureau has been returned unclaimed and unforwardable. The ARRL Out-Going QSL

service will return cards destined for the V3 bureau; QSL direct, or via a manager.

Bob Preston, W7TSQ, is back in Indonesia, using his old call of YB3ASQ. Cards for this operation won't be answered (via Bob's home call) until his return Stateside in May. Bob arranged for another ham to handle the YC3OSE/YB3OSE cards in his absence, but Ahmed forwards logs only once a month. Again, please be patient.

Mail to Haiti HH has been erratic since the coup. At times, mail has been returned to sender. Some post offices say mail service has resumed, but suggest routing the mail through Canada. If you can wait, we suggest you do so.

Pirates recently on the air include: 3A2DD, 3A2HA, LI3D (come on now; couldn't you guess this one was no good?), VK0WW, and the February 6 operation of JX3P. In the latter case, LA3DH, QSL manager for the real JX3P, has sent a nice letter to those who worked the pirate, at his own expense. Further, he donated the postage sent to the Norwegian Church Aid, which collects for food to the poor on the Kola Peninsula in northern Russia. DX can use more QSL Good Guys like Sandy! Fi-

nally, AL7S reports that he has never operated as AL7S/0; he suggests trying AL7H, who lives in Colorado.

## Corrections and Amplifications

There was a minor typo in the address for KB9ABI, (who now has the logs and cards for 9Q5NW and TN4NW); the correct route is Dan Voils, 9640 North, 950 East, Brownsburg, IN 46112.

WB7DZX is **not** the manager for 3B8CA; QSL direct.

The correct address for UA0KG on Wrangel Island is Box 225, Magadan 685030 Russia.

Chuck Bowers, KJ6DO, says he is getting QSL cards for KJ6DO operations from Johnston Island 10-plus years ago. He wants to forward these to the operators/managers. Does anyone have any QSL or operator information on Johnston Island KJ6DO QSOs?

N6LUY reports that he is *not* the QSL manager for XX9AS, but that N6LVY is (P.O. Box 1671, Escondido, CA 92033).

And K1ER says PY1MAG, who operated as PY0MAG and other PY0 operations, is now a Silent Key. He suggests some Brazilian amateur obtain the logs and cards, to help fulfill QSL requests. Any takers?

## QSL Manager Volunteers

Paul Mezzapelle, WA6NLJ, Box 883, Carmichael, CA 95609, and Robert Schwartz, N0LSX, 2507 Maple Crossing Drive, Ellsville, MO 63011 offer their services.

**P29DX/P20A QSL Policies.** Stephen Telenius-Lowe, P29DX, shares his very reasonable and well thought out QSL practices with CQ's readers.

QSL P29DX direct to Stephen Telenius-Lowe, P.O. Box 1783, Port Moresby, N.C.D., Papua-New Guinea. A self-addressed envelope (SAE) and return postage in the form of one new-style (airmail) IRC, or three old-style (surface mail) IRCs, or one US\$1, is much appreciated. QSL requests sent with one or two old-style IRCs will be replied to via surface mail. If no return postage is sent, reply will be via the bureau. USA operators *only* may send a US 29 cent SASE; Steve has arranged for bulk mailing of Stateside QSLs in the USA. Europeans *only* may QSL via G3LQP, again with adequate return postage. Note that G3LQP does *not* have the complete P29DX log; only European QSOs. If stations outside Europe attempt to QSL via G3LQP, they will experience *very long* delays. Bureau cards for P29DX are acceptable, but not encouraged. This is because there are very few active P29 amateurs, and bureau cards may sit for months or years in an outgoing bureau before sufficient cards have built up to justify a direct shipment to Papua-New Guinea. Thus, many bureau cards do not arrive until after the P29 amateur has left the country. QSL the contest call of P20A direct only, to the above address.



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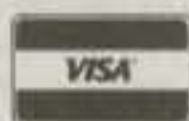
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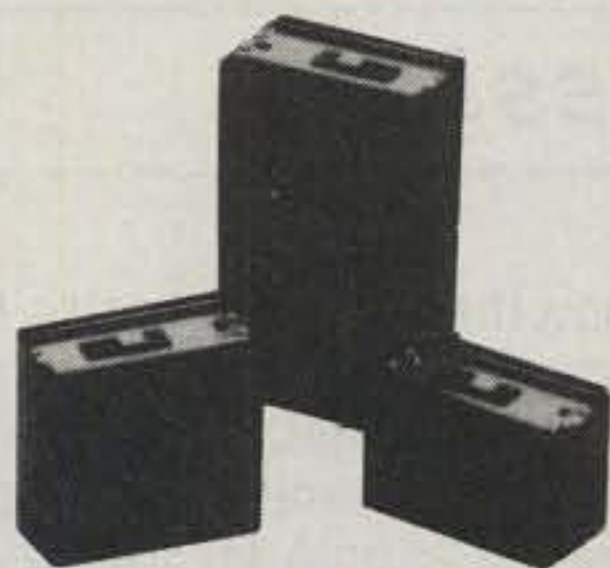


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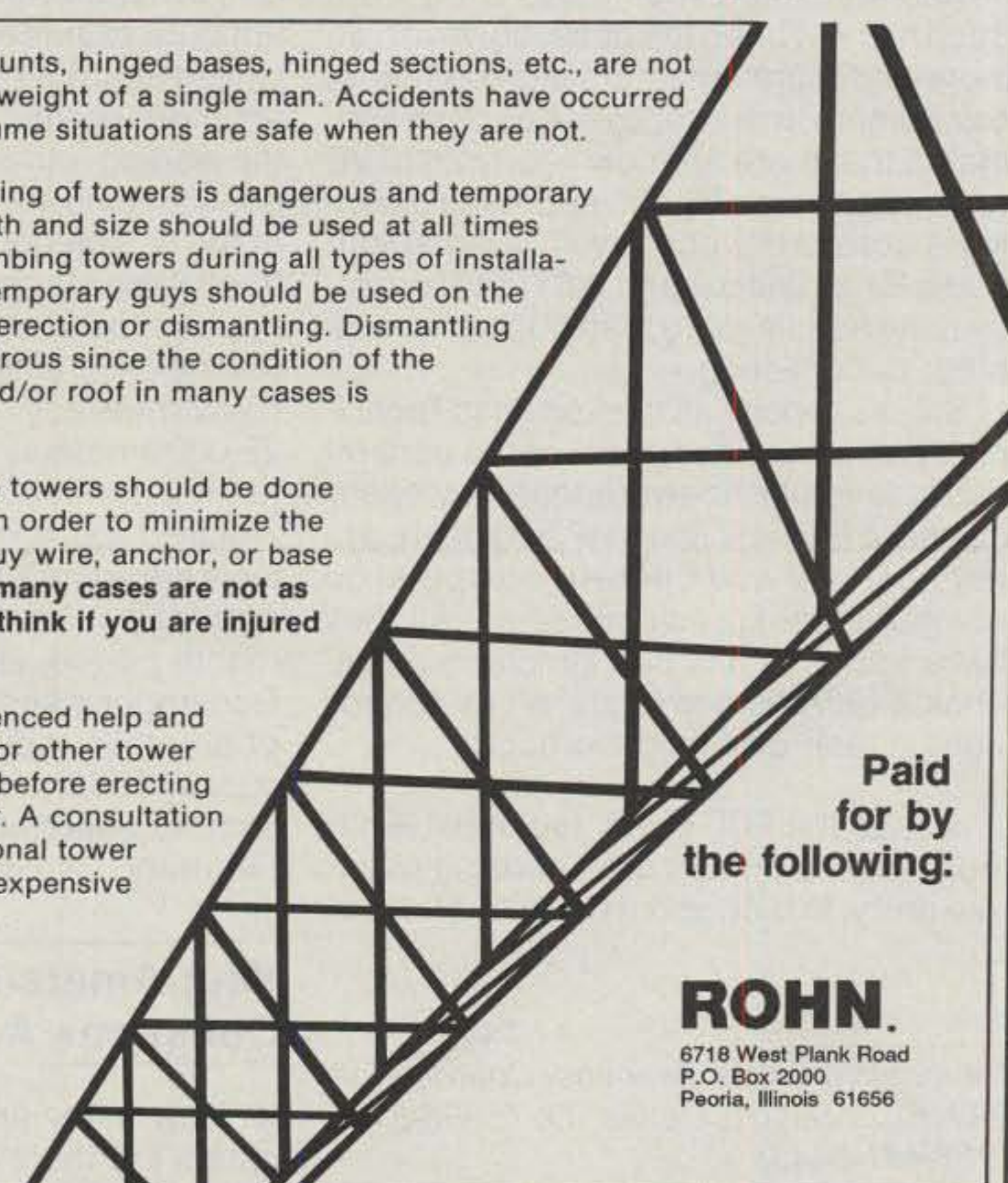
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## REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

### *Technician Class—A Very Big Success!*

**T**he Federal Communications Commission has been keeping a close eye on how its new Codeless Technician amateur radio class has been doing! It is getting good marks on all fronts. In fact, its approval by the public has been nothing short of phenomenal! The first Tech ticket without a Morse code requirement was issued in mid-March 1991. Since then the number of newcomers to amateur radio has been doubling month after month!

Unlike "Novice Enhancement," the popularity of which quickly fizzled out, the No-Code Tech continues to grow in acceptance as more people discover the many benefits of amateur radio and how easy it is to qualify. The 1987 Novice Enhancement proceeding permitted beginners to use voice for the first time on a tiny sliver of the 10 meter HF band and FM repeaters above 220 MHz. It obviously wasn't what the public wanted, however.

Due to the emergence of the Code-free Technician Class, the number of amateur radio tests given by VEs leaped by more than 60% in 1991. So far this year, the number of VE exams is more than twice that of last year! There was a concern that perhaps the Volunteer Examiner program might not be able to handle the influx of newcomers if the Tech Class caught on. Such has not been the case, however, as more and more amateurs sign on to test newcomers to the hobby. It has been estimated that there are now nearly 2000 VE teams and some 30,000 approved examiners across the country. The American Radio Relay League and W5YI-VEC organizations handle more than 80% of all amateur radio testing.

Still, as popular as the Codeless Technician Class has been, most of the general public is totally unaware that they easily can have crystal-clear VHF personal communications and operate computer to computer using radio modems. All they have to do is pass two simple multiple-choice quizzes administered by friends right in their own neighborhood!

Just as the FCC predicted, most amateur radio beginners are choosing code-free entry. In fact, about three-quarters of

the nearly 50,000 first-time amateur radio licensees who joined the hobby during the past year have entered through the no-code route. It has really caused the amateur ranks to grow, and the FCC agrees that the amateur radio hobby is healthy once again.

Ham radio is undergoing a remarkable transition! The Novice Class is no longer the amateur radio entry path of choice. In fact, its popularity is declining. The January 1992 figures are a good example of what is happening. Five out of six newcomers to amateur radio chose the Technician rather than the Novice path in January. In 1990 nearly 90% of all beginners were Novices.

The FCC originally wanted to eliminate the Novice Class, which required 5 words-per-minute telegraphy proficiency and substitute codeless entry. Personal Radio Branch statistics now show that most beginners enter amateur radio without code. Many later upgrade to the Technician "Plus" level; that is, Tech plus telegraphy knowledge. The code is now being learned after rather than before being first licensed.

The demographics of amateur radio testing are also interesting. Applicants in the southern part of the United States and California are taking more than half the amateur exams being administered in the United States. Possibly this is because the southern portion of the country contains the leading retirement states. The heavily populated northeast and central portions of the U.S. account for about 20% each, the Pacific Northwest about 5%. California has the most active amateur radio testing program of any state in the country with nearly 15% of the total. Over 25,000 amateur radio tests were administered in California last year.

It also appears that more amateur radio tests are administered during March, April, and May than during any other three-month period; October, November, and December is second. The least incidence of amateur radio testing, as you might guess, occurs during the summer from June to September, and in January and February.

#### **Your Amateur Testing Questions Answered**

**Q:** How many amateur radio exam programs are there?

**A:** Right now there are two, but the FCC is in the process of reducing that to one. Essentially, the informal Novice testing program allows two General Class amateurs to conduct exams for the Novice Class. The VEC System is a more formal program that utilizes three "accredited" (or approved) Advanced and Extra Class volunteer examiners (VEs) to conduct tests for all other classes. There are no charges associated with Novice testing. Applicants usually pay a \$5.40 exam fee to take Technician and higher class license tests. The FCC is proposing to bring the Novice testing program under the VEC System.

**Q:** Why don't General Class VEs have to be accredited?

**A:** The Novice examination was already in place when volunteer testing began for the Technician and higher class licenses in 1984. The FCC elected to make no changes in the Novice examination program when they set up the VEC System, since it had yet to prove itself. Novice level VEs did not require specific approval by a testing coordinator (VEC), since the Novice Class was not a part of the VEC System. Now that it appears that Novice testing will be falling under the VEC System, all examiners (General Class and higher) must go through the VEC accreditation process.

**Q:** What is the advantage of accreditation? Doesn't this just make it more difficult for a Novice applicant to find a VE team?

**A:** There are several reasons for VEC approval of an examiner. First the VEC reviews the status of the potential VE to ensure that he is qualified under the rules. VEs are accredited as General (when approved), Advanced, or Extra Class level. General Class VEs may examine the Novice Class only. Advanced Class VEs may conduct tests for the Novice and Technician Class. Amateur Extra Class examiners may conduct all examinations. VEs must also certify that they are 18 years of age and do not manufacture or distribute amateur radio equipment or license preparation materials. VECs also have the power to reject (disaccredit) an examiner once approved. No such "filtering" process exists under the current Novice testing program.

It is the responsibility of the VEC to ensure that their Volunteer Examiners are kept current on all facets of the testing function. The VECs periodically advise their Advanced and Extra Class VE teams of all changes in the Amateur Service test-

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Wire wound, 7 watt, 50 K ohm equalizing resistors safely protect each filter capacitor — not 2 watt, 100 K ohm carbon composition resistors that can open and cause your filter capacitors to explode or fail.

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### Two illuminated meters

Two illuminated meters give you a clear picture of your AL-811 operating conditions so you can tell right away if something is wrong.

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ing program, including deleted, added, and revised test questions. Bringing the Novice program under the VEC System will allow Novice examiners to be kept current on testing matters.

VECs distribute testing instructions to their test teams and screen successful applications to ensure that all rules are followed before they are forwarded to the FCC. Many Novice Form 610 applications are not properly completed and must be returned by the FCC. This is an administrative hardship for the FCC at a time when all available resources must be utilized to process VEC System applications which are being submitted in greater than ever numbers due to the success of the Codeless Technician Class. The FCC simply does not have the financial or personnel resources available to accredit, equip, and maintain a roster of Amateur Service examiners.

**Q:** Will I have to send my Novice students to a VEC System test session?

**A:** You may, especially since there are now VEC System testing teams virtually everywhere. However, you will still be able to conduct the Novice examinations if you were qualified under the previous Novice program. The only difference is that you must be a VEC-approved examiner and you will also have to recruit two other accredited VEs to assist you instead of one. The accreditation (in the form of a

document) is provided by a VEC at no charge.

The W5YI VEC has already begun accrediting General Class level VEs who wish to participate in Novice testing once it falls under the VEC System. Although the exact implementation date has not yet been determined, it is anticipated that all Novice testing must be handled through the VEC System in 1993. This is to coincide with changes that will taking place in the Element 2 and 3A question pools now under review and revision by the VECs Question Pool Committee.

New question pools are scheduled to be released at year end for use in Novice (and Technician) tests conducted after July 1, 1993. General Class accredited VEs have the option of establishing their own testing team, or participating with another VEC accredited team. VEs who establish their own team are stocked with the needed testing materials.

**Q:** How do I apply for accreditation as a volunteer examiner?

**A:** Each VEC has a slightly different procedure. The W5YI-VEC accredits examiners as VE-G (Volunteer Examiner/General), VE-A (Advanced), and VE-E (Extra Class). In addition, a sequential serial number is assigned to each VE. For example, VE-12998G would be an approved General Class volunteer examiner who is authorized to conduct examinations for the Nov-

ice Class once required by the FCC. VE-12999A would be an Advanced Class VE qualified to test both Novice and Technician Classes, etc.

This accreditation number is very important, since this number is keyed into a computer which immediately confirms an examiner's status to conduct examinations. Form 610 applications are rejected and returned if one or more of the certifying examiners cannot be verified in the VE database.

There are four criteria for VE accreditation by the W5YI-VEC. Volunteer examiners:

1. Must be 18 years of age or older;
2. Must not have a significant interest in the amateur radio equipment or license preparation business;
3. Must never have had their amateur station/operator license suspended or revoked; and
4. Must hold either a current General, Advanced, or Extra Class operator license.

*Important:* Remember that General Class accredited examiners will only be required after FCC rules are adopted which require Novice testing under the VEC System.

Every VEC has their own volunteer examiner application form and so does the W5YI-VEC. You may request an application form, or simply send the following signed statement along with a copy of your General, Advanced, or Extra Class opera-

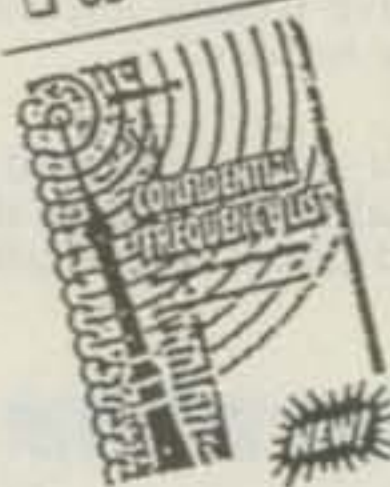


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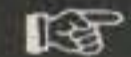


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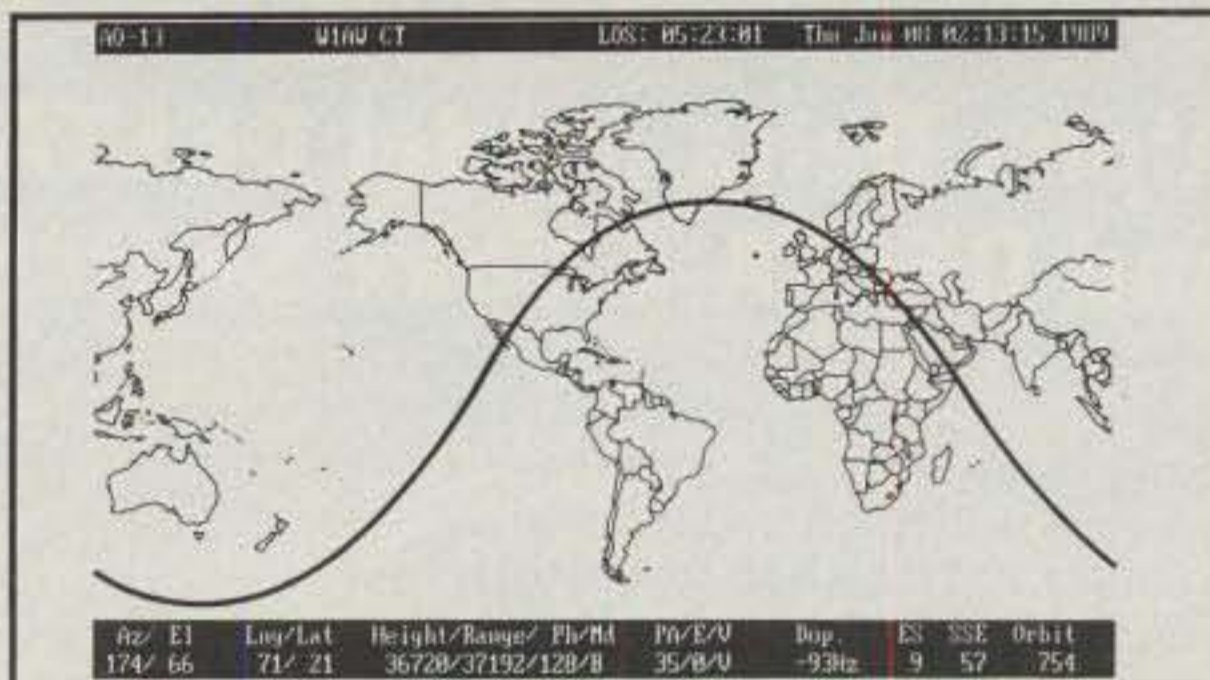
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for license to: W5YI-VEC, P.O. Box 565101, Dallas, TX 75356.

A prospective VE must have received and must forward a copy of his most recent license. VECs may not accredit examiners on the basis of having recently passed an upgrade examination as evidenced by a Certificate of Successful Completion of Examination (CSCE). Here is the signed affidavit the W5YI-VEC requires from every VE. (We also need a telephone number.)

"I am a currently licensed General (or Advanced, Extra Class) amateur radio operator and wish to be a volunteer examiner. I have never had my station or operator license revoked or suspended. I do not own a significant interest in nor am an employee of any company or entity engaged in the amateur radio equipment or license preparation business. My age is at least 18 years old."

**Q:** What will I receive from the VEC after I am accredited?

**A:** Every VEC operates just a little differently, but you can expect to receive at least a document of some type which denotes your status as an authorized volunteer examiner in the Amateur Radio Service under the auspices of a specific VEC program. In addition, a set of instructions and testing materials will be made available should you wish to conduct amateur radio operator examinations.

The W5YI-VEC also has examination software available at no cost for its VEs

who have IBM/compatible personal computers. VEs are also furnished with properly prepared multiple versions of each examination they are qualified to administer.

Volunteer examiners may prepare their own Morse Code test tapes or request them (again no cost) from the W5YI-VEC. In addition, IBM/compatible telegraphy generation software is available. The testing materials the W5YI-VEC provides are supplied at no cost, and we ask that each VE team conduct examinations in their area at least quarterly, even if only for one applicant.

Some VECs automatically renew your accreditation; others (including the ARRL-VEC) require participation at least once a year to maintain your VE status. W5YI-VEC accreditation is good until canceled by either the VE or the VEC.

**Q:** As a VE, am I required to use the services of every other VE who shows up at my test session? Can I refuse to examine an applicant?

**A:** As a volunteer examiner you are given wide latitude in the amateur radio license examining function. There can be a fine line, however, between VE activities and discrimination. You may refuse to utilize the services of an examiner or to test an applicant as long as it cannot be construed as intolerance based on race, sex, religion, national origin, or other prejudice. For example, volunteer examiners may not refuse to examine an applicant for the

Codeless Technician Class simply because they do not agree that this class is in the best interest of the Amateur Service. The use of otherwise qualified handicapped volunteer examiners is at the discretion of the majority of VEs at the session.

**Q:** Must all examinations be taken and passed in order?

**A:** It used to be that the Morse code tests were administered in descending order of difficulty and the written tests in ascending order. The FCC's instructions to VECs requires VEs to follow the instructions contained on the Form 610 application. This form used to specify that a written examination had to be passed before the next higher written examination could be administered.

The current Form 610 (which expires December 31, 1992) does not address the issue of taking the written test elements in order, and neither does the Part 97 FCC rules. Therefore, strictly speaking, any amateur radio operator examination may be taken in any order. An applicant must pass all required test elements required for upgrading, of course, before a new operator license can be authorized.

From a practical standpoint, it is desirable for an applicant to attempt a telegraphy exam at a faster speed and then go down to the next lower speed if not passed. Since both Element 2 and 3(A) are required for the entry-level Codeless Technician, we

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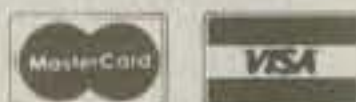
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recommend that 3(A) be administered if Element 2 is failed and a CSCE be awarded if 3(A) is passed. It is *recommended* (but not required by the rules) that the remaining written elements—that is General 3(B), Advanced 4(A), and Extra Class 4(B)—be passed in ascending order of difficulty. It really, however, is up to the VE team.

**Q:** Why is it that two General Class VEs may administer the Novice 5 wpm code test, but three VEC-approved Advanced or Extra Class VEs must administer the 5 wpm exam once the applicant qualifies as a Codeless Technician?

**A:** The Technician Plus code is considered an upgrade from the Codeless Technician class. In any event, the examinee is attempting to obtain another version of the Technician Class ticket. Part 97.511(b) requires "Each examination for a Technician Class operator license must be administered by 3 administering VEs, each of whom must hold an FCC-issued Amateur Extra or Advanced Class operator license."

Actually, it all depends when you take the 5 words-per-minute Morse code test. If you hold no Amateur operator license at all, the 5 wpm code test may be taken before two General (or higher) Class examiners as part of the Novice testing program. Once you hold a Codeless Technician license, however, you must take the test at a VEC System test session before three accredited VEs.

**Q:** Why don't Codeless Techs who upgrade to Tech Plus receive an upgraded license from the FCC?

**A:** While Codeless Technicians will receive a Certificate of Successful Completion of Examination (CSCE) stating they upgraded to "Technician Plus" code, the FCC will not issue the successful applicant another upgraded license. Instead, the CSCE becomes the operating authority for the HF spectrum authorized to Novices and Technicians who pass a telegraphy examination.

For radio-wave enforcement purposes all VECs are required to notify the FCC of all Technician Class licensees who have HF privileges. This is accomplished through a database of Tech Plus licensees maintained by the VECs and periodically made available to the Commission.

The reason why a Technician Plus operator license is not issued by the FCC is purely "economic." The FCC conserves money and personnel resources by having the CSCE "ticket" issued through the VEC System. So far, the procedure seems to be working. The amateur community can anticipate that the VEC System will be asked to assume more of the functions previously handled by the government as the amateur ranks continue to grow and government resources do not.

**Q:** If handicapped applicants who can't pass the 13 or 20 wpm code test can obtain an exemption, why can't the 5 wpm telegraphy test also be eliminated?

**A:** Article 32 of the International Radio Regulations compels every nation to require Morse Code sending and receiving proficiency as a prerequisite for operation on the amateur bands below 30 MHz. There is no speed criteria specified in the international law. Our FCC takes the position in Part 97.509(d) that "Passing a telegraphy receiving examination is adequate proof of an examinee's ability to both send and receive telegraphy" and in Part 97.509(h) "The administering VEs must accommodate an examinee whose physical disabilities require a special examination procedure."

Volunteer examiners may employ any number of special accommodative procedures including, where warranted, pausing the telegraphy examination message after each sentence, phrase, word, or even after each character. A sending test may also be substituted for a receiving test.

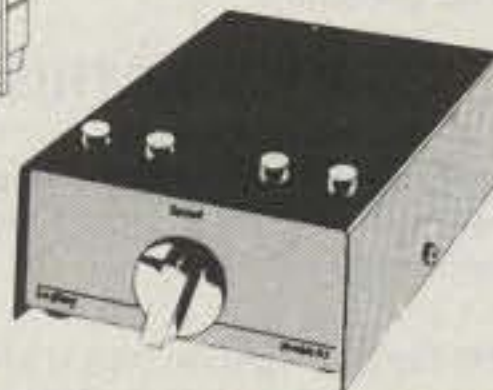
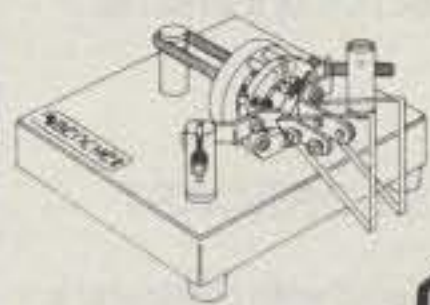
To qualify for a telegraphy exemption, a severely disabled applicant must have

passed a code test in some manner and the necessary written examinations needed to upgrade his license. In addition, a Physician's Certification of Disability and Patient's Release form must be completed by the handicapped applicant's doctor (an M.D. or D.O. only) and submitted with the Form 610. The doctor's certification form is available from any VEC, including the W5YI-VEC (P.O. Box 565101, Dallas, TX 75356). A temporary disability does not qualify. The handicapped applicant is granted exemption credit for the 13 and 20 wpm telegraphy examination when all conditions have been met.

That's all for this month. Drop us a line if you have any questions on FCC regulations or amateur radio testing. Also let us know if you would like to conduct amateur radio exams in your area. We will set you up if you do. If anyone needs study material for any amateur radio license class, just give us a call at (toll free) 1-800-669-W5YI 73, Fred, W5YI

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## THE SCIENCE OF PREDICTING RADIO CONDITIONS

### Sunspot Cycle Stalled

The present solar cycle, the 22nd observed since accurate records have been kept, appears to have stalled. Fortunately for radio amateurs and the other users of the HF spectrum, a solar plateau has been reached at an exceptionally high value of sunspot count.

The present cycle reached a peak count of 159 during July 1989. From then, and until May 1990, the cycle declined slowly to a level of 147. From May 1990 until August 1991, the date for which the latest smoothed sunspot number is available, the cycle has remained in a narrow up-and-down range between 141 and 148. The progress of sunspot cycle 22 is shown numerically in Table I.

An indication of how high this plateau is can be seen from the fact that the peak intensity of 17 of the previous 21 recorded cycles never reached the 140 level!

The present plateau has given users of the HF spectrum an extended period of exceptionally good propagation conditions. How long will this continue? Probably sooner than later, Mother Nature will cause the cycle to begin to decline again towards an eventual minimum level and the start of a new cycle. Meanwhile, enjoy!

The Royal Observatory of Belgium reports a mean sunspot number of 160 for February 1992. Daily values ranged between a high of 238 on February 1 and a low of 99 on the 18th. February's mean value results in a 12-month running smoothed sunspot number of 146 centered on August 1991.

A smoothed sunspot number of approximately 115 is forecast for June 1992.

The Dominion Radio Astrophysical Observatory of Canada reports an adjusted mean value of 227 for the February 1992 10.7 cm solar flux level. This results in a smoothed value of 207 centered on August 1991. A level of approximately 190 is expected during June 1992.

Fig. 1 graphically depicts progress of Sunspot Cycle 22 in terms of sunspot data and 10.7 cm solar flux values. This data has been prepared by Hirman and Greer at the Space Environment Services Center, NOAA, Boulder, Colorado.

#### Summertime Conditions

June marks the changeover from equinoc-

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#### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for June 1992

Propagation Index . . . . .	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 1, 3, 10, 16, 20, 24, 28	A	A	B	C
High Normal: 2, 9, 11, 15, 17-19, 25-26, 29-30	A	B	C	C-D
Low Normal: 6-7, 14, 22-23, 27	B	C	D	D-E
Below Normal: 5, 8, 12-13, 21	C	C-D	D-E	E
Disturbed: 4	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 excellent (A) on June 1, good (B) on the 2nd, excellent (A) again on the 3rd, poor (D-E) on the 4th, fair-to-poor (C-D) on the 5th, etc.

tial to summertime propagation conditions on the HF bands. Solar absorption is expected to be at seasonally high levels, resulting in generally weaker signals during the hours of daylight when compared to reception during the winter and spring months. Thunderstorm activity, and the associated level of static, increases considerably during June and the summer months, and higher static levels should be noticeable on all HF bands, particularly the 40, 80, and 160 meter bands.

Maximum usable frequencies during the daytime hours are considerably lower during June and the summer months than during the other seasons, and considerably higher during the hours of darkness. This changeover should have its greatest impact on the 20 meter band, which during other seasons is a near-optimum daytime DX band, but during the summer months becomes the optimum DX band during the hours of darkness.

Sporadic-E propagation peaks during

June and the summer months, increasing the number of short-skip openings possible on the HF bands, and often making possible openings up to 1300 miles and sometimes beyond on the 6 and 2 meter bands.

This month's CQ Propagation Charts contain DX predictions for the period June 15 through August 15. Short-Skip Charts for June for openings between 50 and 2300 miles and from Hawaii and Alaska appeared in last month's column.

#### June Forecast

While fewer east-west openings are expected, 10, and 12 meters should continue to provide excellent daytime propagation, particularly on north-south paths to Central and South America, Africa, Asia, and the Pacific areas. Conditions should peak during the afternoon hours. Short-skip openings, primarily as a result of sporadic-E ionization, should be possible between approximately 500 and 1300 miles. While sporadic-E openings occur most often during the hours of daylight, some may occur at night as well. Some F2-layer openings for distances beyond 1300 miles should also be possible, mainly during the afternoon hours.

The 15 and 17 meter bands will likely be the optimum DX bands during the daytime hours of June. They are expected to open shortly after sunrise, peak during the afternoon hours, and remain open for DX through the early evening hours. During this span openings should be possible to most areas of the world. Conditions will favor paths towards Central and South America and Africa during most of the daylight hours, with signals peaking towards Europe during the late afternoon, and towards Asia and the Pacific area during the late afternoon and early evening. Don't be surprised if on some days the 17 meter band remains open for DX to as late as midnight! Short-skip openings ranging between 500 and 2300 miles should be possible throughout the daytime hours and well into the evening.

The 20 meter band should open to some area of the world or another for the entire 24-hour period on most days of the month. Signals should peak in all directions just after local sunrise. Intense solar absorption, however, will reduce DX openings considerably from about mid-morning through the early afternoon hours, although fairly good openings still should be





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### HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An \* indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. 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.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate daylight time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength 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.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

### June 15 - August 15, 1992 Time Zone: EDT EASTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe & North Africa	16-18 (1)	08-09 (1) 09-12 (2) 12-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	09-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-03 (3) 03-05 (2) 05-07 (3) 07-09 (2)	20-21 (1) 21-22 (2) 22-23 (3) 23-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 21-22 (1)* 22-23 (2)* 23-00 (3)* 00-01 (2)* 01-02 (1)*

Northern Europe & European USSR	15-17 (1)	11-15 (1) 15-18 (2) 18-19 (1)	09-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-01 (3) 01-03 (2) 03-06 (1) 06-09 (2)	21-22 (1) 22-23 (2) 23-00 (3) 00-01 (2) 01-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	16-18 (1)	11-13 (1) 13-17 (2) 17-18 (3) 18-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	12-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-01 (3) 01-03 (2) 03-06 (1) 06-08 (2) 08-09 (1)	20-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Western Africa	11-13 (1) 15-17 (1) 17-19 (2) 19-21 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-23 (4) 23-03 (3) 03-04 (2) 04-05 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-03 (4) 03-04 (3) 04-05 (2) 05-07 (1)	20-22 (1) 22-00 (2) 00-02 (1) 22-00 (1)*
Eastern & Central Africa	17-19 (1)	09-12 (1) 12-14 (2) 14-17 (3) 17-19 (4) 19-22 (3) 22-23 (2) 23-00 (1)	14-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-02 (3) 02-03 (2) 03-05 (1)	21-00 (1)
Southern Africa	10-13 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-13 (4) 13-14 (3) 14-15 (2) 15-16 (1) 01-03 (1)	23-01 (1) 01-03 (3) 03-05 (2) 05-08 (1) 14-15 (1) 15-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	21-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*
Central & South Asia	NIL	09-10 (1) 10-12 (2) 12-13 (1) 17-19 (1) 19-22 (2) 22-23 (1)	17-20 (1) 20-23 (2) 23-03 (1) 03-06 (2) 06-08 (1)	19-21 (1) 04-06 (1)
Southeast Asia	NIL	10-14 (1) 14-16 (2) 16-19 (1) 19-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-19 (1) 19-21 (2) 21-23 (1) 23-02 (2) 02-03 (1)	04-06 (1)
Far East	NIL	09-10 (1) 10-12 (2) 12-18 (1) 18-20 (2) 20-22 (1)	06-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 18-21 (1) 21-23 (2) 23-02 (3) 02-04 (2) 04-06 (1)	04-06 (1)
South Pacific & New Zealand	16-18 (1) 18-20 (2) 20-22 (1)	09-11 (1) 14-16 (1) 16-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-01 (1)	18-20 (1) 20-23 (2) 23-01 (3) 01-04 (4) 04-05 (3) 05-06 (2) 06-09 (3) 09-10 (2) 10-12 (1)	01-03 (1) 03-05 (2) 05-06 (3) 06-07 (2) 07-08 (1) 04-06 (1)*

Australasia	18-19 (1) 19-21 (2) 21-22 (1)	10-12 (1) 17-18 (1) 18-20 (2) 20-22 (3) 22-23 (2) 23-00 (1)	21-23 (1) 23-01 (2) 01-03 (3) 03-05 (4) 05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1) 16-18 (1)	03-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Caribbean, Central America & Northern Countries of South America	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	08-09 (2) 09-12 (4) 12-14 (3) 14-21 (4) 21-01 (3) 01-03 (2) 03-08 (1)	06-07 (3) 07-10 (4) 10-11 (3) 11-15 (2) 15-17 (3) 17-03 (4) 03-05 (3) 05-06 (2)	19-20 (1) 20-21 (2) 21-23 (3) 23-03 (4) 03-04 (3) 04-05 (2) 05-06 (1) 22-23 (1)* 23-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-21 (2) 21-22 (1)	07-08 (1) 08-11 (2) 11-15 (1) 15-16 (2) 16-17 (3) 17-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	10-16 (1) 16-18 (2) 18-19 (3) 19-02 (4) 02-04 (3) 04-07 (2) 07-09 (3) 09-10 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-04 (2) 04-05 (1) 22-03 (1)*
McMurdo Sound Antarctica	15-17 (1)	16-18 (1) 18-21 (2) 21-22 (1)	17-19 (1) 19-22 (2) 22-03 (3) 03-05 (2) 05-06 (1) 07-09 (1)	02-05 (1)

### Time Zones: CDT & MDT (24-Hour Time) CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	NIL	11-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-20 (1) 23-01 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-18 (3) 18-22 (4) 22-02 (3) 02-03 (2) 03-05 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-00 (1)*
Northern & Central Europe & European USSR	NIL	10-15 (1) 15-17 (2) 17-18 (1)	02-06 (1) 06-09 (2) 09-15 (1) 15-18 (2) 18-19 (3) 19-21 (4) 21-00 (3) 00-02 (2)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Eastern Mediterranean & Middle East	15-17 (1)	11-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-02 (1) 07-09 (1)	21-23 (1)
Western Africa	10-12 (1) 15-16 (1) 16-18 (2) 18-20 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-21 (4) 21-00 (3) 00-02 (2) 02-03 (1)	14-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-02 (3) 02-04 (2) 04-06 (1)	20-00 (1) 22-00 (1)*
Eastern & Central Africa	16-18 (1)	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	15-17 (1) 17-18 (2) 18-19 (3) 19-22 (4) 22-00 (3) 00-02 (2) 02-04 (1)	21-23 (1)
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (4) 12-13 (3) 13-14 (2) 14-15 (1) 00-02 (1)	23-00 (1) 00-02 (3) 02-04 (2) 04-06 (1) 12-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	21-22 (1) 22-20 (2) 00-01 (1) 22-00 (1)*
Central & South Asia	NIL	09-11 (1) 11-12 (2) 12-13 (1) 15-18 (1) 18-21 (2) 21-23 (1)	17-19 (1) 19-22 (2) 22-02 (1) 02-06 (2) 06-08 (3) 08-09 (2) 09-10 (1)	19-21 (1) 05-07 (1)

Month	1986	1987	1988	1989	1990	1991	1992
January		18	58	142	151	148	128
February		20	65	145	153	148	125
March		22	71	150	152	147	123
April		24	78	154	149	147	120
May		26	84	157	147	145	117
June		28	94	158	144	145	115
July		31	104	159*	141	146	112
August		35	114	158	141	146	109
September	12	39	121	157	142	141	106
October	13	44	125	157	142	138	103
November	15	47	130	158	142	135	100
December	16	51	138	153	144	131	97

Table I- Progress of Sunspot Cycle 22 and Predictions for the remainder of 1992. Predicted values are shown in italics. \*Denotes peak of Cycle 22.

possible towards the Caribbean area, Central America, and the northern tier countries of South America. By late afternoon, however, signals should begin to increase considerably, peaking towards the east and the south during the early evening hours. During the hours of darkness propagation should be possible to almost all areas of the world, with signals peaking towards Asia and the Pacific after midnight. Exceptionally high signal levels may often be noted during nighttime openings on this band. Short-skip during the day should extend from 250 to 2300 miles, and during the hours of darkness from 500 to 2300 miles. During the late afternoon and evening hours conditions may often peak for both short and long skip, resulting in an exceptionally high level of interference.

The 30 and 40 meter bands should continue to provide good DX conditions during the hours of darkness despite the higher static levels mentioned earlier. These bands may not sound as good as they did during the spring months, with some of the long inter-hemispheric openings gone, but the DX will be there, and signals often will be exceptionally strong. Look for openings towards Europe and Africa as early as sunset. Signals should peak towards the east and the south before midnight, and towards the south and the west after midnight. The best bet for DX towards Asia and the Pacific area would be an hour or so before daybreak. Short-skip should be possible out to about 750 miles during the daylight hours. During the hours of darkness short-skip should extend out to the 2300 mile limit.

Look for some DX openings on 80 meters, following the same east-south-west pattern as on 40 meters, during the hours of darkness. Signals should peak from an easterly direction before midnight and from the west before sunrise. Expect considerably higher noise levels and much weaker signals on this band compared to 40 meter openings. Daytime short-skip openings will be limited to approximately 250 miles due to intense solar absorption, but at night openings should extend out to beyond 1800 miles.

Not much DX is expected on 160 meters until the fall, when static levels should subside and solar absorption decrease. An occasional opening, however, towards the Caribbean, Central America, and the northern tier countries of South America may be possible during the nighttime hours. At best, however, openings will be weak and noisy. Fairly frequent nighttime short-skip openings should be possible over a range of approximately 1000 miles. It is very unlikely that any daytime skip openings will be possible on this band due to very intense solar absorption.

Expect plenty of *short-skip* openings on the shortwave bands this month. For distances less than 250 miles, try 40 and 80 meters during the day and 80 and 160 meters at night. For openings between 250

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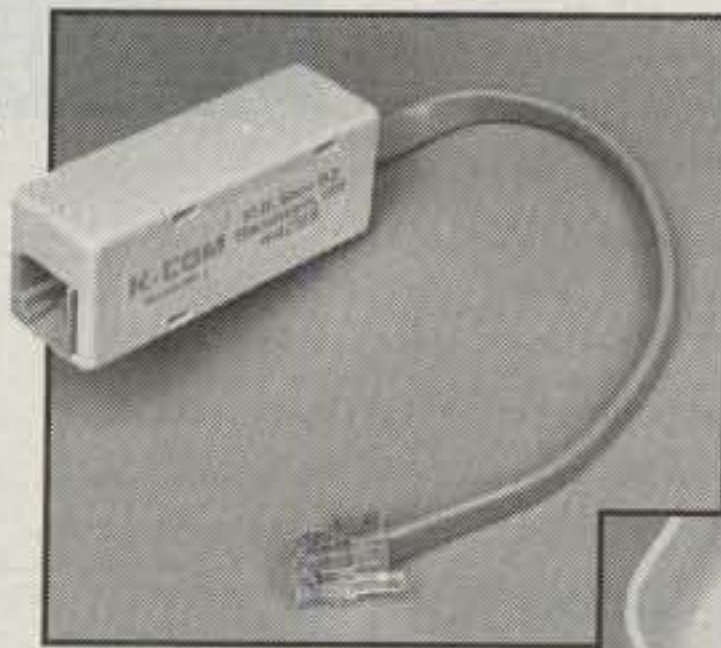
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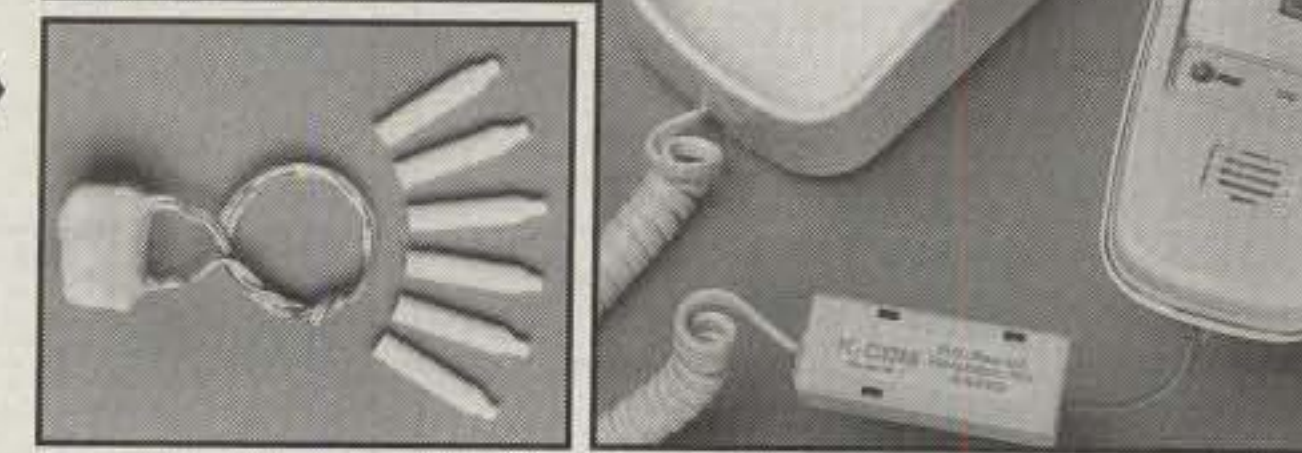
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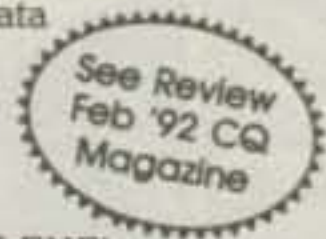
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Southeast Asia	NIL	10-11 (1) 11-14 (2) 14-19 (1) 19-22 (2) 22-00 (1)	07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-23 (1) 23-00 (2) 00-01 (3) 01-02 (2) 02-03 (1)	03-05 (1)
Far East	NIL	09-11 (1) 13-15 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 20-22 (1) 22-00 (2) 00-03 (3) 03-04 (2) 04-05 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)*
South Pacific & New Zealand	14-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-01 (1)	17-19 (1) 19-23 (2) 23-02 (4) 02-05 (3) 05-07 (2) 07-09 (4) 09-10 (3) 10-11 (2) 11-13 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-08 (1) 01-04 (1)* 04-06 (2)* 06-07 (1)*
Australasia	16-17 (1) 17-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	14-15 (1) 15-17 (2) 17-19 (1) 19-20 (2) 20-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	22-00 (1) 00-01 (2) 01-04 (4) 07-08 (1) 04-05 (3) 05-07 (2) 07-09 (4) 09-11 (2) 11-12 (1)	01-03 (1) 03-07 (2) 07-08 (1) 03-06 (1)*
Caribbean, Central America & Northern Countries of South America	10-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-23 (3) 23-01 (2) 01-08 (1)	03-05 (2) 05-07 (3) 07-09 (4) 09-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-03 (3)	19-20 (1) 20-21 (3) 21-23 (4) 23-00 (3) 00-03 (2) 03-05 (3) 05-06 (1) 20-22 (1)* 22-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	07-08 (1) 08-10 (2) 10-14 (1) 14-15 (2) 15-16 (3) 16-22 (4) 22-00 (3) 00-01 (2) 01-02 (1)	10-15 (1) 15-17 (2) 17-18 (3) 18-01 (4) 01-03 (3) 03-07 (2) 07-09 (3) 09-10 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-03 (2) 03-05 (1) 20-03 (1)*
McMurdo Sound Antarctica	15-18 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	17-19 (1) 19-22 (2) 22-02 (3) 02-04 (2) 04-07 (1) 07-09 (2) 09-10 (1)	02-06 (1)

**Time Zones: PDT (24-Hour Time) WESTERN USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	NIL	08-09 (1) 09-11 (2) 11-15 (1) 15-17 (2) 17-18 (1) 21-23 (1)	23-01 (3) 01-06 (1) 06-08 (2) 08-14 (1) 14-16 (2) 16-21 (3) 21-23 (2)	20-23 (1)
Central & Northern Europe & European USSR	NIL	07-09 (1) 13-14 (1) 14-16 (2) 16-17 (1)	13-15 (1) 15-19 (2) 19-00 (3) 00-01 (2) 01-06 (1) 06-08 (2) 08-10 (1)	20-22 (1)
Eastern Mediterranean & Middle East	NIL	07-09 (1) 11-15 (1) 15-17 (2) 17-18 (1) 22-00 (1)	13-16 (1) 16-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 06-08 (1)	20-21 (1)
Western & Central Africa	09-14 (1) 14-16 (2) 16-18 (1)	07-11 (1) 11-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	13-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-00 (3) 00-04 (2) 04-08 (1)	20-22 (1)

Eastern Africa	NIL	09-14 (1) 14-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 00-02 (1)	15-17 (1) 17-19 (2) 19-22 (3) 22-00 (2) 00-02 (1)	NIL
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-14 (2) 14-15 (1)	14-15 (1) 15-17 (2) 17-18 (1) 22-23 (1) 23-00 (2) 00-02 (3) 02-03 (2) 03-06 (1) 06-08 (2) 08-10 (1)	20-23 (1)
Central & South Asia	NIL	08-10 (1) 10-12 (2) 12-14 (1) 17-19 (1) 19-22 (2) 22-23 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1)	05-07 (1) 19-20 (1)
Southeast Asia	11-15 (1)	08-09 (1) 09-11 (3) 11-13 (2) 13-16 (1) 20-22 (1) 22-00 (2) 00-02 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	03-07 (1)
Far East	14-16 (1)	09-10 (1) 10-12 (2) 12-15 (1) 15-17 (2) 17-19 (3) 19-21 (2) 21-23 (1)	19-21 (1) 21-23 (2) 23-01 (3) 01-04 (4) 04-06 (3) 06-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	01-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 03-05 (1)*
South Pacific & New Zealand	12-14 (1) 14-16 (2) 16-18 (3) 18-20 (4) 20-21 (2) 21-22 (1)	11-13 (1) 13-15 (2) 15-18 (3) 18-21 (4) 21-22 (3) 22-23 (2) 23-01 (1)	17-19 (1) 19-21 (2) 21-03 (4) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	22-23 (1) 23-01 (2) 01-06 (3) 06-07 (2) 07-08 (1) 23-02 (1)* 02-05 (2)* 05-06 (1)*
Australasia	14-17 (1) 17-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	07-09 (1) 13-17 (1) 17-19 (2) 19-22 (3) 22-00 (4) 00-01 (3) 01-02 (2) 02-03 (1)	20-22 (1) 22-00 (2) 00-05 (4) 05-07 (3) 07-09 (4) 09-10 (2) 10-13 (1) 13-15 (2) 15-17 (1)	22-00 (1) 00-01 (2) 01-05 (3) 05-06 (2) 06-08 (1) 01-04 (1)*
Caribbean, Central America & Northern Countries of South America	09-11 (1) 11-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-21 (3) 21-00 (2) 00-08 (1)	08-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-04 (3) 04-05 (2) 05-06 (3) 06-08 (4)	19-21 (1) 21-22 (2) 22-00 (3) 00-03 (2) 03-04 (3) 04-05 (2) 05-06 (1) 21-23 (1)* 23-03 (2)* 03-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-12 (1) 12-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-09 (2) 09-13 (1) 13-15 (2) 15-16 (3) 16-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	09-15 (1) 15-17 (2) 17-18 (3) 18-01 (4) 01-03 (3) 03-06 (2) 06-08 (3) 08-09 (2)	20-21 (1) 21-00 (2) 00-02 (1) 02-03 (3) 03-04 (2) 04-05 (1) 02-04 (1)*
McMurdo Sound Antarctica	17-19 (1)	14-16 (1) 16-17 (2) 17-19 (3) 19-21 (2) 21-22 (1)	16-18 (1) 18-19 (2) 19-02 (3) 02-04 (2) 04-06 (1) 06-08 (2) 08-10 (1)	00-23 (1) 23-01 (2) 01-04 (1) 04-06 (2) 06-07 (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.  
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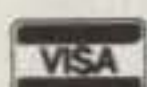


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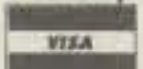
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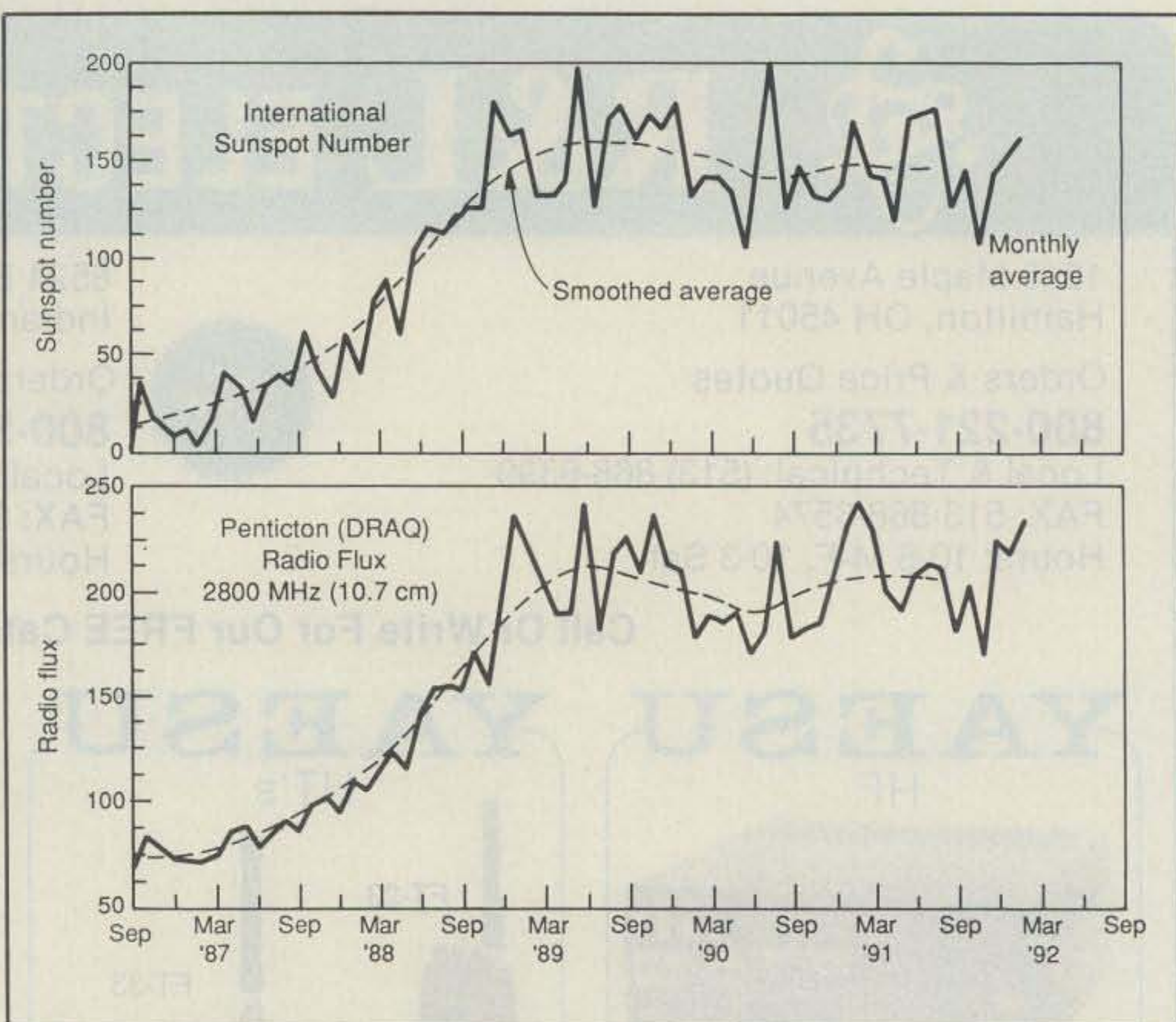


Fig. 1—Progress of Sunspot Cycle 22 since its birth during September 1986.

and 750 miles, 30 and 40 meters should be best during the day, with 20 meters a close second. Try 80 meters at night, with 40 meters a second choice. Twenty meters should be best for daytime openings between 750 and 1300 miles, with 30 and 40 meters best at night, backed up by 80 meters. Between distances of 1300 and 2300 miles use 20 meters during the day, with 17 and 15 as a second choice. Thirty and 40 meters are expected to be best for this distance range at night. Frequent short-skip openings, resulting from an expected seasonal increase in sporadic-E ionization, should also be possible on 10, 12, 15, and 17 meters over distances ranging between approximately 450 and 1300 miles. As its name implies, sporadic-E ionization can occur at any time, but it is usually most prevalent between 10 AM and 2 PM and again between 6 and 10 PM local daylight time.

**VHF Ionospheric Openings**

June is generally a good month for VHF ionospheric openings. A sharp seasonal increase in sporadic-E ionization is expected during the month, which should result in some fairly frequent 6 meter short-skip openings over a range of 1000 to 1400 miles. During periods of widespread ionization, two-hop 6 meter openings may occasionally be possible up to distances of approximately 2300 miles. An occasional 2 meter short-skip opening between approximately 1200-1400 miles may also be possible during periods of intense sporadic-E ionization. Short-skip openings are

likely to occur between 10 AM and 2 PM and again between 6 PM and 10 PM local daylight time, although they can take place at all other times as well.

While June is not usually a good month for F2-layer propagation on 6 meters, an occasional DX opening may be possible. The best time to check for 6 meter DX openings is during the afternoon hours, on days when conditions are expected to be High Normal or better. Occasional openings should be possible towards Latin America, southern Africa, the South Pacific, and Australasia.

Two minor meteor showers are expected during June—the *Herculids* and *Scorpiids*. They may produce enough meteor ionization between June 3rd and the 5th to permit an occasional meteor-type opening on the VHF bands.

Trans-equatorial (TE) scatter openings are expected to fall off considerably during June, but a rare opening on 6 meters may be possible between 8 and 11 PM local daylight time on long north-south paths which cross the geomagnetic equator at an approximate right angle. TE openings, if they are to occur at all, will favor locations in the southern tier states.

While very little auroral activity is expected during June, some may occur during periods of radio storminess. Check the Last Minute Forecast at the beginning of this column for those days in June which are expected to be Below Normal or Disturbed. These are the most likely days on which auroral activity may occur.

73, George, W3ASK



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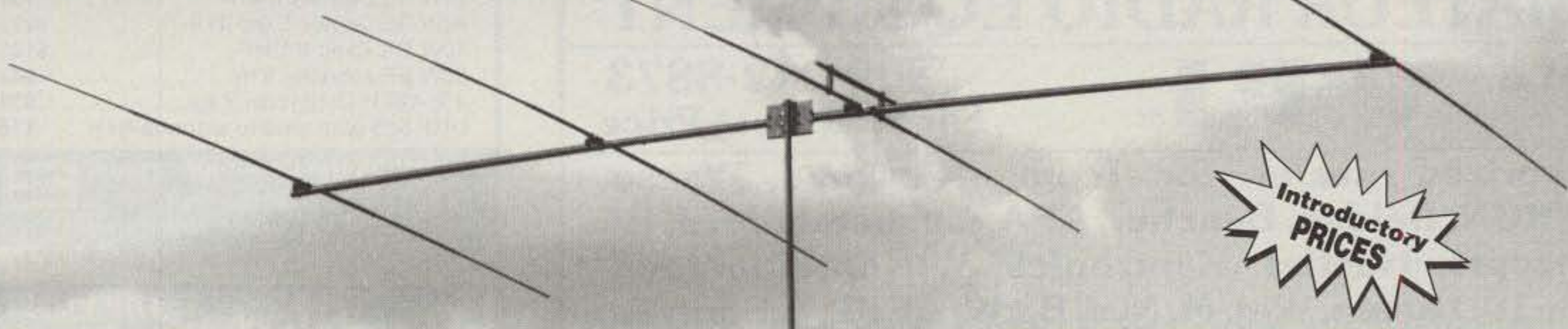
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DX de	AR4U	14089.3	8Y1GN	RTTY Gp	VFO A			VFO B
DX de	K1IU	14089.0	8Y1GN	RTTY Gp	14.215.94			14.223.74
DX de	NR1L	21294.0	3D2D5	RTTY Gp				

DX: USERS: DX DE: S

MSG: Connect SHWVW: S

Log Entry

QSO Information

DATE/UTC: 12/08/91

Call: 14.215.94

Hg My Freq: 59 59 14.214

Mde: 99B

Pwr: 750

Name: Brian

Comment: Brian Young POB 21 Pitcairn I

DXCC/Award Information

Prefix: VRB

Country: Pitcairn

Cont: OC

Bearing: 231 DEG

District: 6057

Award Type: Mode: 160 80 40 30 20 17 15 12 10

DXCC: [VRB] S

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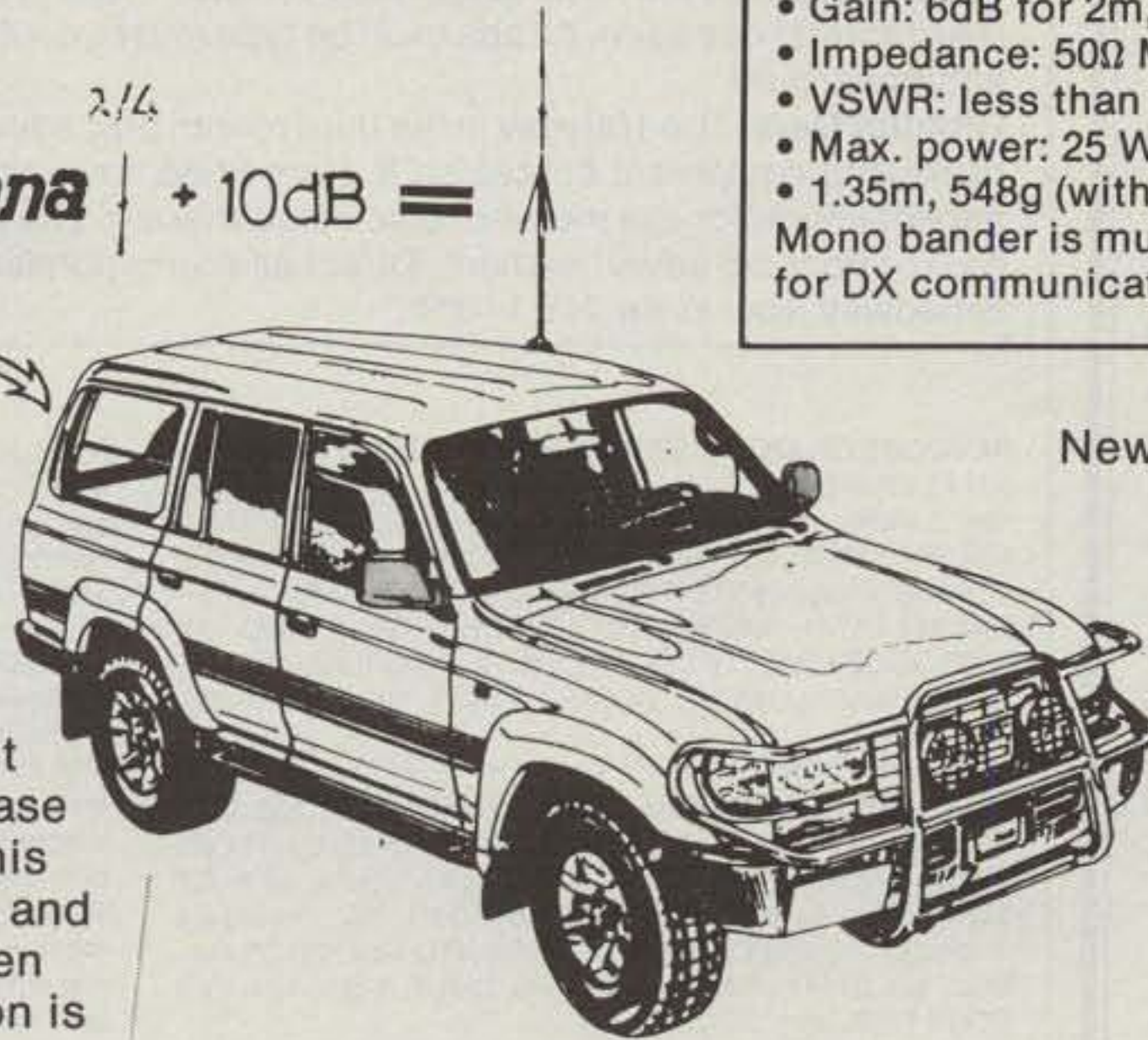
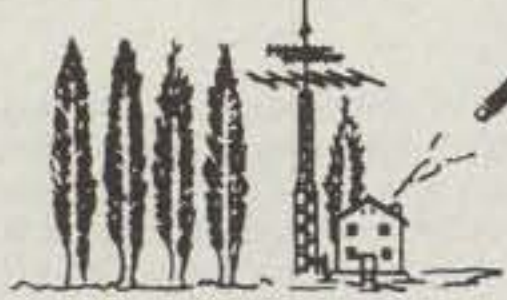


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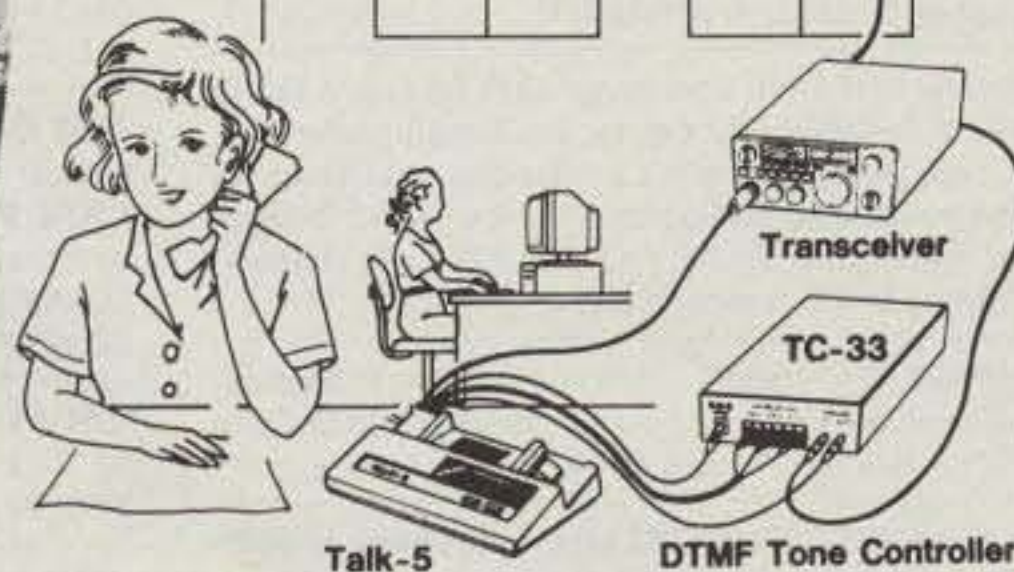
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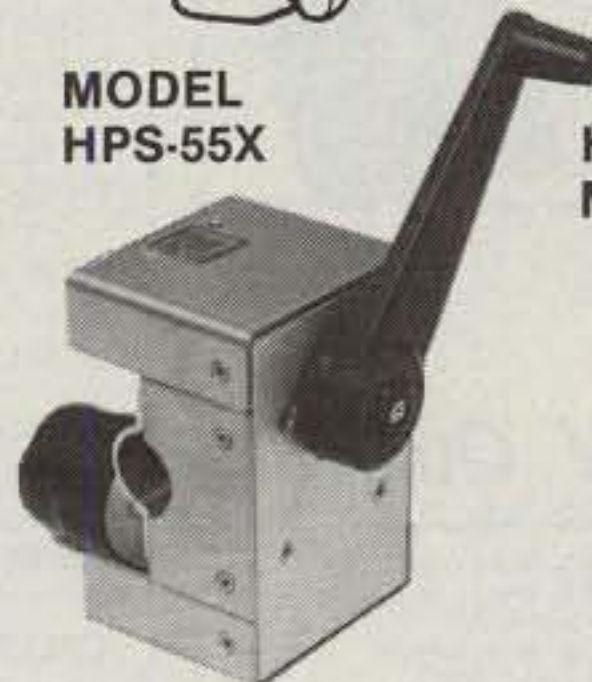
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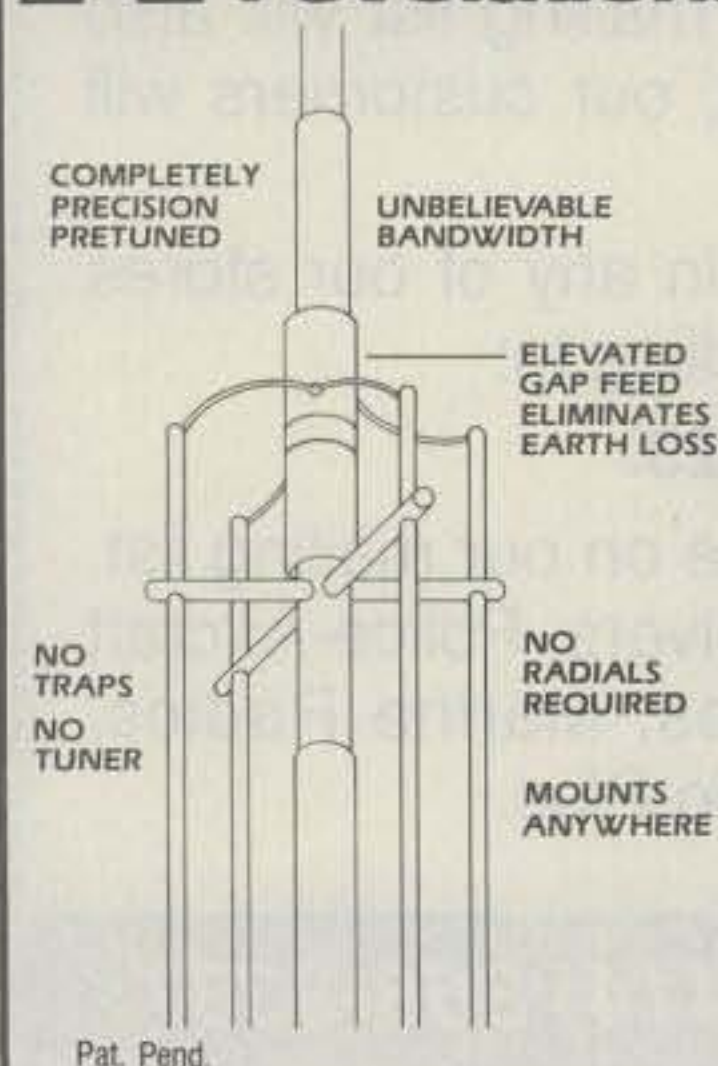
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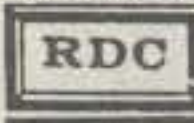
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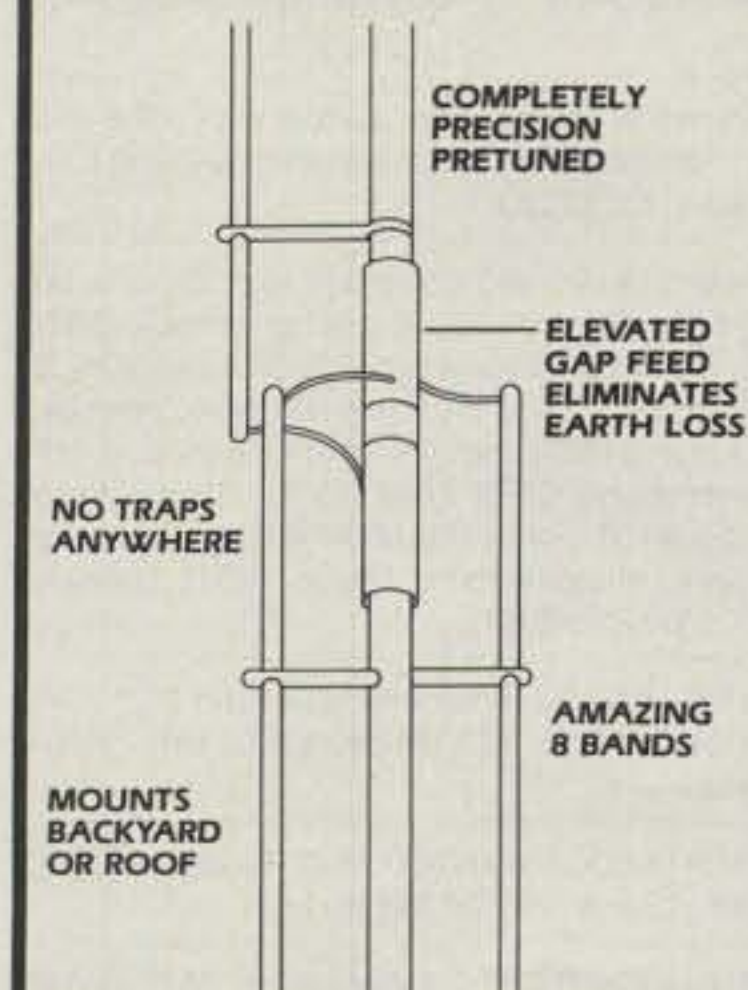
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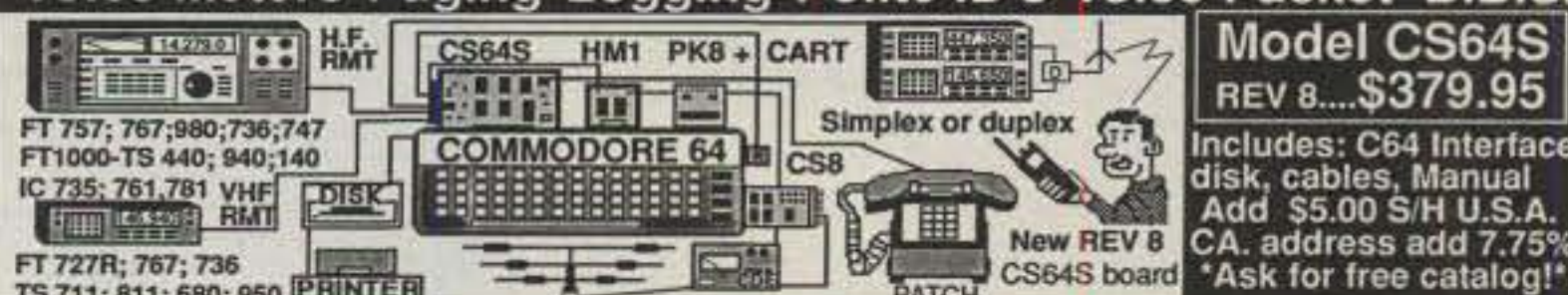
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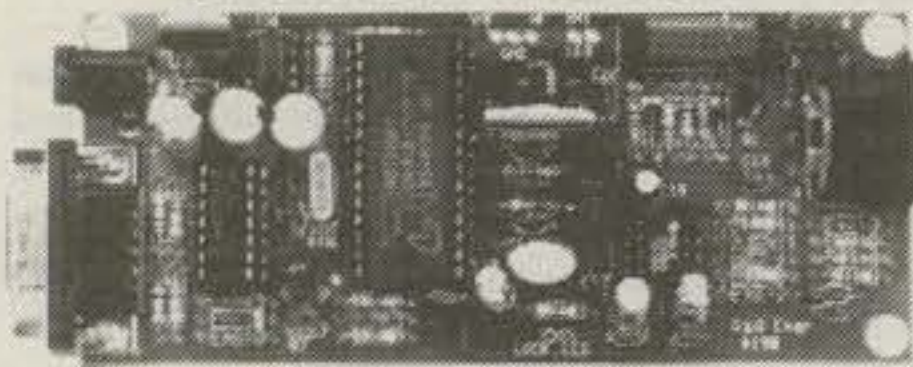
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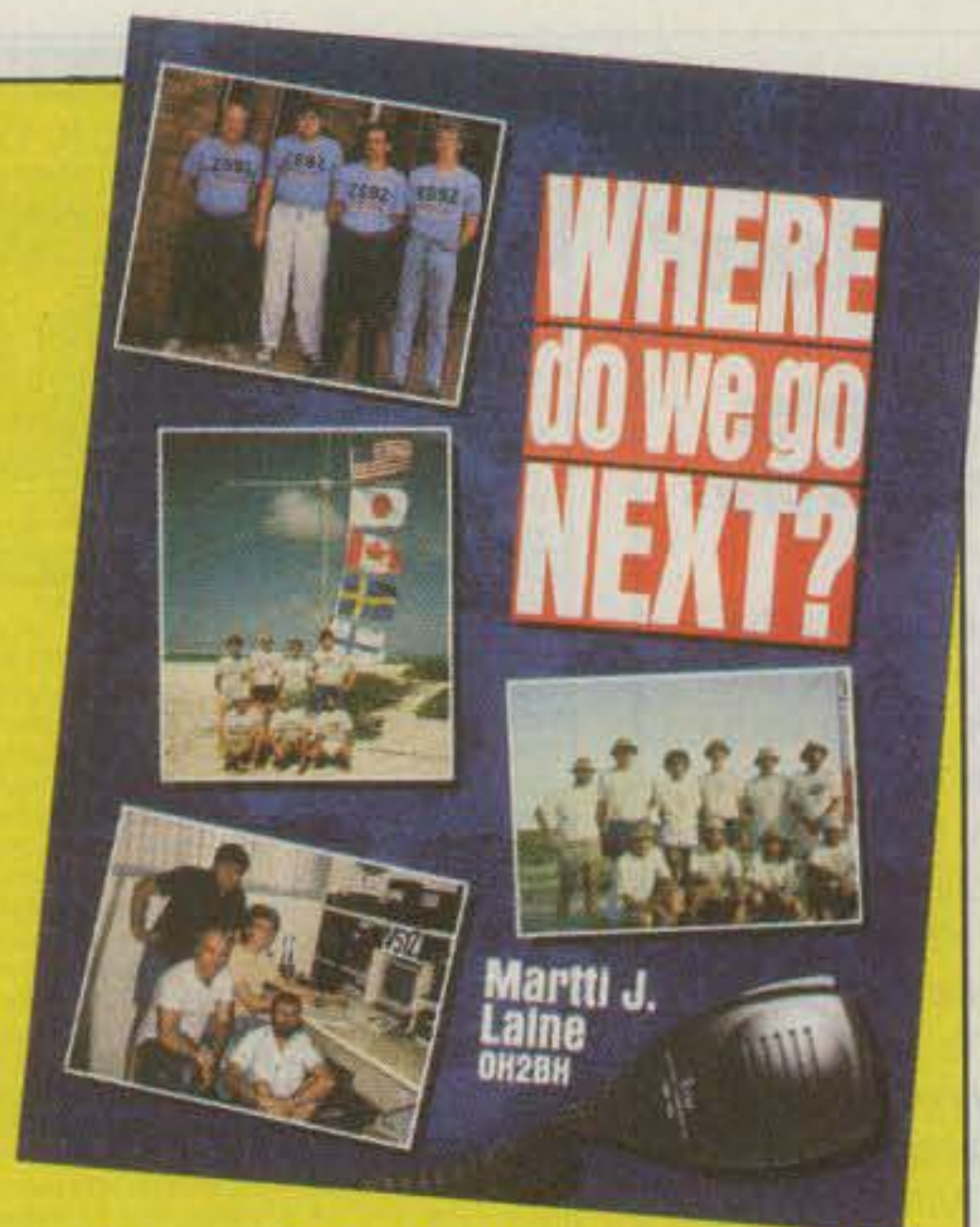
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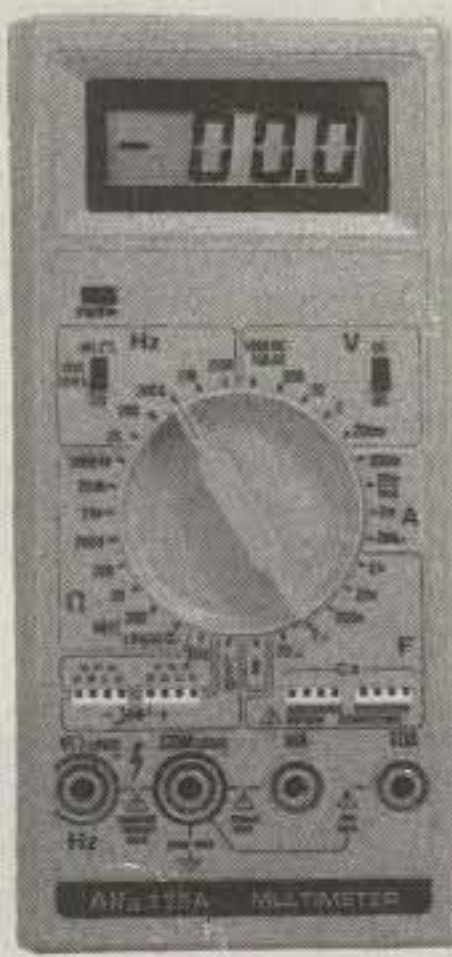
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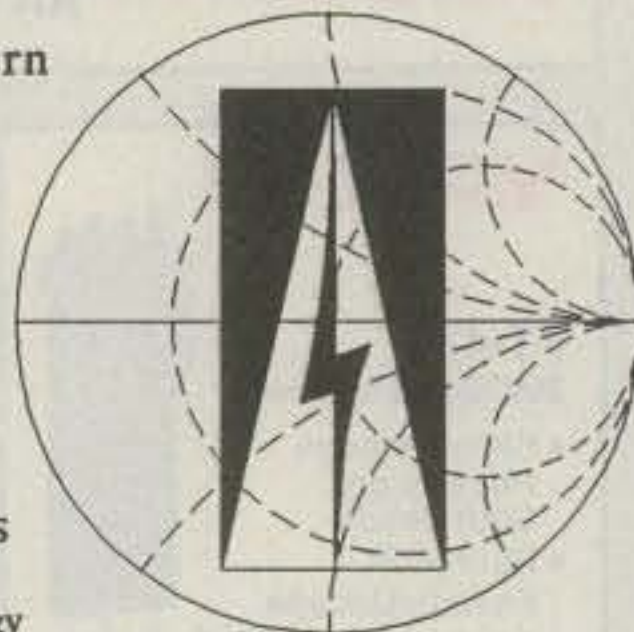
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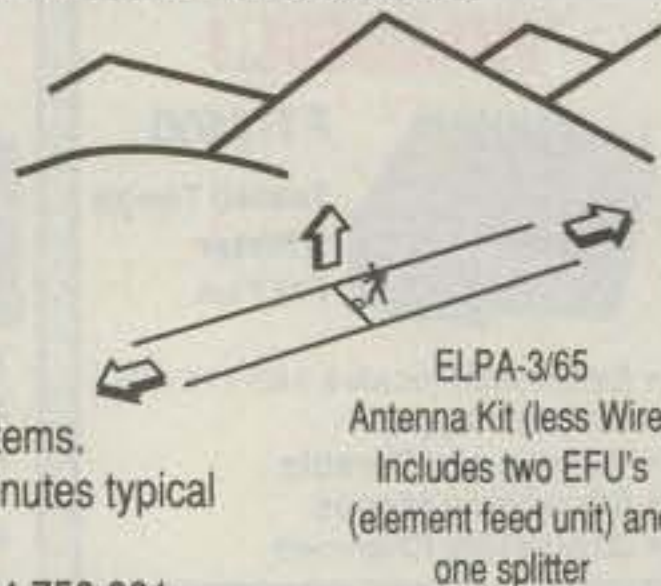


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## Announcing

(from p. 8)

**N6PZA**, from Boy Scout Camp Whitsett, Sequoia National Forest, north of Kernville, California; June 28 through August 13; 40 and 17 meters Monday-Friday 2100-2400Z, and 17 and 20 meters Monday-Thursday 0100-0400Z, with occasional 10 meters. To QSL send postcard-size SASE to Chuck Smith, N6PZA, P.O. Box 1867, Lake Isabella, CA 93240-1867. For information on a possible Boy Scout/Girl Scout summer camp net, contact N6PZA.

**N8NQS**, portable operation grid square expedition for "EN" grid squares 87, 88, 97, 98; June 21-26 (EN-97 2300-0200Z June 22/23, 1100-1400Z June 23; EN-98 2300-0200Z June 23/24, 1100-1400Z June 24; EN-87 2300-0200Z June 24/25, 1100-1400Z June 25; EN-88 2300-0200Z June 25/26, 1100-1400Z June 26. QSL to Dave Bostedor, Jr., N8NQS, 434 Pattie Ave., Jackson, MI 49202.

**W0ERZ & KD0IR**, from 20th anniversary of Gateway Chapter of 10-10 International Net; W0ERZ from 0000Z June 13 to 2400Z June 14 SSB 28,650 kHz and 28,450 kHz alternating frequencies every 2 hours; on CW KD0IR on 28,100 kHz. For certificate/QSL send QSL and SASE to John Ellison, 2 Douglass Lane, St. Louis, MO 63122.

**W0CS**, from first anniversary of Riverboat Gambling out of Clinton, Iowa, from Mississippi Belle II on Mississippi River; Clinton ARC; 0900-2100 CDT June 13-14; lower 50 kHz of General subbands (phone) on 40, 20, 15 and Novice 10 meters (also 144.210 plus/minus phone for EN-41/EN-42). QSL with #10 SASE to Darryl Petersen, KD0PY, 1344 400th Ave., Bryant, IA 52727.

**K0AAR**, from 120th anniversary of steamboat river race between The Nelle Peck and Far West, Sioux City, Iowa; Siouxland ARA; 1500-2100Z June 6-7; phone 7.243, 14.255, 21.355, 28.355. For certificate send SASE to K0AAR, 3407 Jennings St., Sioux City, IA 51104.

**H2STT**, from publicizing of plight of Mediterranean Green Turtle, Lara Bay, Cyprus; Cyprus Wildlife Society, international team; 1500Z June 5 through 1200Z June 7; 10, 15, 20 meters SSB and CW. For QSL send QSL and SAE, IRCs appreciated. A certificate will be awarded for contact with three different ops. Send to Tony Solomonides, 5B4AS, P.O. Box 565, Nicosia, Cyprus.

**TM6JUN**, from D-Day Commemoration, Utah Beach, Normandy; ARAM.50; June 3-8 (no times given); CW 3544, 7030, 14044, 21044, 28044; phone 3775, 7070, 14244, 21344, 28444. QSL via FF1PFW, via French Bureau, or direct to P.O. Box 234, F 50102, Cherbourg, France.

• The following hamfests, etc., are slated for June:

May 31, **Chicago ARC Hamfest**, DeVry Institute of Technology, Chicago, Illinois. Call 312-545-3622. (VE exams 9 AM to noon)

May 31, **Jackson Co. (WV) ARC Hamfest & Fleamarket**, Ripley Middle School, Ripley, West Virginia. Contact Bob Dehart, KF8AR, 304-372-8566. (VE exams 9 AM, walk-ins okay, info Art Ellis, W8PBO, 304-273-4997)

June 6, **1992 ARRL Hudson Division Convention**, Fairleigh Dickinson University, Teaneck, New Jersey. Contact Jim Joyce, 201-664-6725. (VE exams, info Pete Adely, K2MHP, 201-796-6622 before 10 PM)

June 6, **Northern Vermont Summer Hamfest & Computer Technology Fair**, South Burlington Middle School Complex, exit 14-E off I-89.

Contact N1DMP, 802-893-6458. (VE exams 2 PM, info WB2JSJ, 802-879-6589.)

June 6, **Athens, Georgia Hamfest**, VFW Post 2872, Athens, Georgia. Contact George Kelley, WB4VNT, 404-546-7713. (VE exams 9 AM)

June 6, **Knoxville Amateur Radio & Computer Fair**, Tennessee Valley Fairgrounds, Chilhowee Park, Knoxville, Tennessee. Contact Angela Crigger, N4RPR, 615-694-9075. (VE exams, info Rich Slover, ND4F, 615-539-4821)

June 6, **Central Ontario Amateur Radio Fleamarket**, Bingeman Park, Kitchener, Ontario, Canada. Contact Ray Jennings, VE3CZE, 61 Ottawa Cres., Guelph, Ontario, Canada N1E 2A8 (1-519-822-8342).

June 7, **Manassas, Virginia Hamfest & Computer Show**, Prince William County Fairgrounds, Manassas, Virginia. Contact Rosemary, KI4VO, 703-361-5255. (Wheelchair accessible)

June 7, **Chelsea Swap 'n Shop**, Chelsea Fairgrounds, Chelsea, Michigan. Contact Robert Schantz, 313-475-1795.

June 7, **Newington AR League Amateur Radio & Computer Hamfest**, Newington High School, Newington, Connecticut. Contact Les Andrew, KA1KRP, c/o NARL, 68 Wildermere Ave., Waterbury, CT 06705 (203-523-0453). (VE exams, no walk-ins, to register send SASE to Susan Fredrickson, WM1B, P.O. Box 165, Pleasant Valley, CT 06063.)

June 7, **Breezeshooters Hamfest & Computerfest**, Butler County Farm Show Grounds, west of Butler, Pennsylvania. Contact Rey Whanger, W3BIS, Box 8, RD 2, Cove Road, Cheswick, PA 15024 (412-828-3694).

June 7, **Central Kansas ARC Hamfest**, 4H Building, Kenwood Park, Salina, Kansas. Contact Mitch Johannes, KA0IFW, 1318 Springfield, Salina, KS 67401 (913-827-2027). (VE exams June 6)

June 7, **Starved Rock Radio Club Hamfest**, Bureau County Fairgrounds, Princeton, Illinois. Contact Bruce Burton, KU9A, or Debbie Burton, N9DRU, 1153 Union St., Marseilles, IL 61341 (815-795-2201).

June 7, **Contoocook, New Hampshire Spring Fleamarket**, Contoocook, New Hampshire, near Concord. Contact Rob Fair, KA1AUA, 603-224-3899.

June 12, **Chaverim 6th International Convention**, Fallsview Hotel, Ellenville, New York. Contact Arnold Halpern, W2GDS, 450 Brighton Ave., Long Branch, NJ 07740 (908-222-3009).

June 13, **Winston-Salem Computer & Electronics Fair**, Benton Convention Center, Winston-Salem, North Carolina. Contact Henry Heidtmann, N4VHK, Winston-Salem Hamfest, P.O. Box 11361, Winston-Salem, NC 27116 (919-785-3900). (VE exams, preregistration)

June 13, **Bangor, Maine Hamfest & Computerfest**, school on Billings Road, Bangor, Maine. Contact Roger Dole, KA1TKS, RR 2 Box 730, Bangor, ME 04401 (207-848-3846). (VE exams)

June 13, **Eastern Ontario Hamfest**, Marmora Area Curling Club, Marmora, Ontario, Canada. Contact George Foster, VE3NKJ, 613-472-5948.

June 13, **Raritan Valley RC Hamputer Fest '92**, Watchung Hills High School, Warren, New Jersey. Contact Walt, W2FLB, 908-968-5993. (VE exams at 10 AM by preregistration post-marked by May 30 only; call John, WA2F, 908-722-9045.)

June 14, **Humboldt ARC Hamfest**, Humboldt High School, Humboldt, Tennessee. Contact Ed Holmes, W4IGW, 501 N. 18th Ave., Hum-

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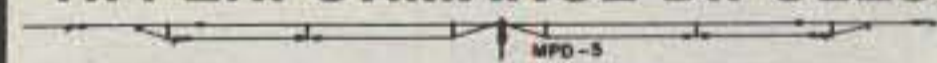
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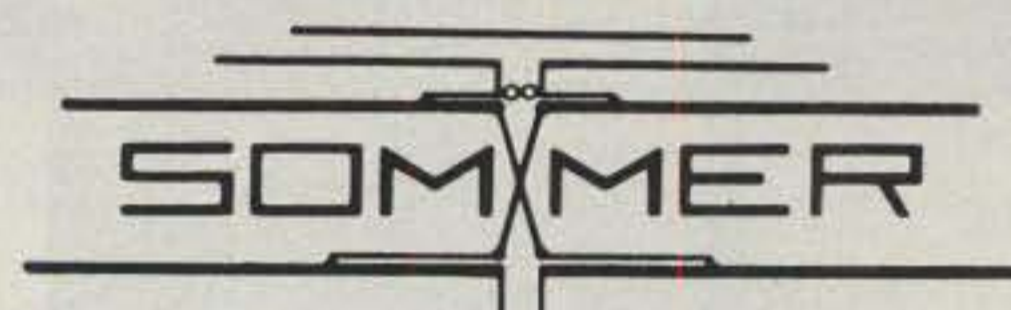
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June 14, **HAM-O-RAMA 92**, Erlanger Kentucky Lions Park. Contact KC4FET, c/o NKARC, P.O. Box 1062, Covington, KY 41012, or call 606-341-1213.

June 14, **Six Meter Club Hamfest**, Santa Fe Park, Willow Springs, Illinois. Contact Mike Corbett, K9ENZ, 606 South Fenton Ave., Romeoville, IL 60441.

June 14, **Goodyear ARC's Hamfest & Family Picnic**, Wingfoot Lake Park, near Akron, Ohio. Contact William Dunn, W8IFM, 4730 Nottingham Lane, Stow, OH 44224 (216-673-8502).

June 14, **EGYPTIANFEST**, club grounds, Chouteau Place Rd., Granite City, Illinois. Contact Jim Cleland, K9RKU, P.O. Box 562, Granite City, IL 62040, or call 618-344-2401. (VE exams, preregistration requested, call 618-344-2401)

June 14, **Lancaster, New York Hamfest**, Elks Club Hall, Lancaster, New York. Contact Dick Dukat, K2RDD, 15 Sherwood Rd., Lancaster, NY 14086.

June 14, **Central Wisconsin Radio Amateurs Swapfest**, University Center, University of Wisconsin-Stevens Point campus, Stevens Point, Wisconsin. Contact Art Wysocki, N9BCA, 3356 April Lane, Stevens Point, WI 54481 (715-344-2984). (Handicapped accessible; VE exams)

June 14, **Long Island, New York Summerfest**, Cultural Center, Bald Hill, LIE exit 63. Contact John Mark, KB2QQ, 516-689-6336.

June 19-21, **Central Alberta Radio League Picnic**, Burbank, Alberta, Canada. Contact Pat Wight, VE6ALD, 346-3013.

June 20, **Central Michigan ARA Hamfest**, Community Center, Midland, Michigan. Contact Joe, WD9GUF, 517-631-8818 evenings and weekends. (VE exams)

June 20, **UCARS Annual Hamfest**, Farmers Market, Cookeville, Tennessee. Contact Dave Sparks, N4OZO, 615-528-6954. (VE exams, pre-registration at 9 AM)

June 20, **Skyline ARC International Hamfest**, Cortland County Fairgrounds, Cortland, New York. Contact Skyline ARC, P.O. Box 5241, Cortland, NY 13045.

June 20-21, **Northeast Montana Hamfest Picnic**, Frontier School Wolf Point, Montana. Contact Jack Greenwood, WB7QDN.

June 21, **Santa Maria Radio Swapfest**, Unocal's Newlove Picnic Grounds, south of Santa Maria, California. Contact Santa Maria Swapfest, P.O. Box 2067, Orcutt, CA 93457-2067.

June 21, **Monroe County Hamfest**, Monroe County Fairgrounds, Monroe, Michigan. Contact Fred Lux, WD8ITZ, P.O. Box 982, Monroe, MI 48161 (313-243-1053 evenings).

June 21, **Frederick ARC Hamfest**, Frederick County Fairgrounds, Frederick, Maryland. Contact Frederick Hamfest, P.O. Box 1260, Frederick, MD 21701.

June 21, **Lake County ARC Dad's Day Hamfest**, Lake County Fairgrounds, Crown Point, Indiana. Contact Mike Warot, KA9DGX, 7751 Chestnut Ave., Hammond, IN 46324 (219-845-7970). (VE exams)

June 21, **Cuyahoga ARS Pre-Field Day No-Frills Hamfest**, Longwood Park, Macedonia, Ohio. Contact Cuyahoga ARS, 6423 E. Sprague Rd., Independence, OH 44131-6545 (216-526-3807).

June 28, **South Bend, Indiana Hamfest Summer Swap & Shop**, Parking Garage by Society Bank Bldg and Century Center, South Bend, Indiana. Call 219-233-5307, write Wayne Werts, K9IXU, 1889 Riverside Dr., South Bend, IN 46616.



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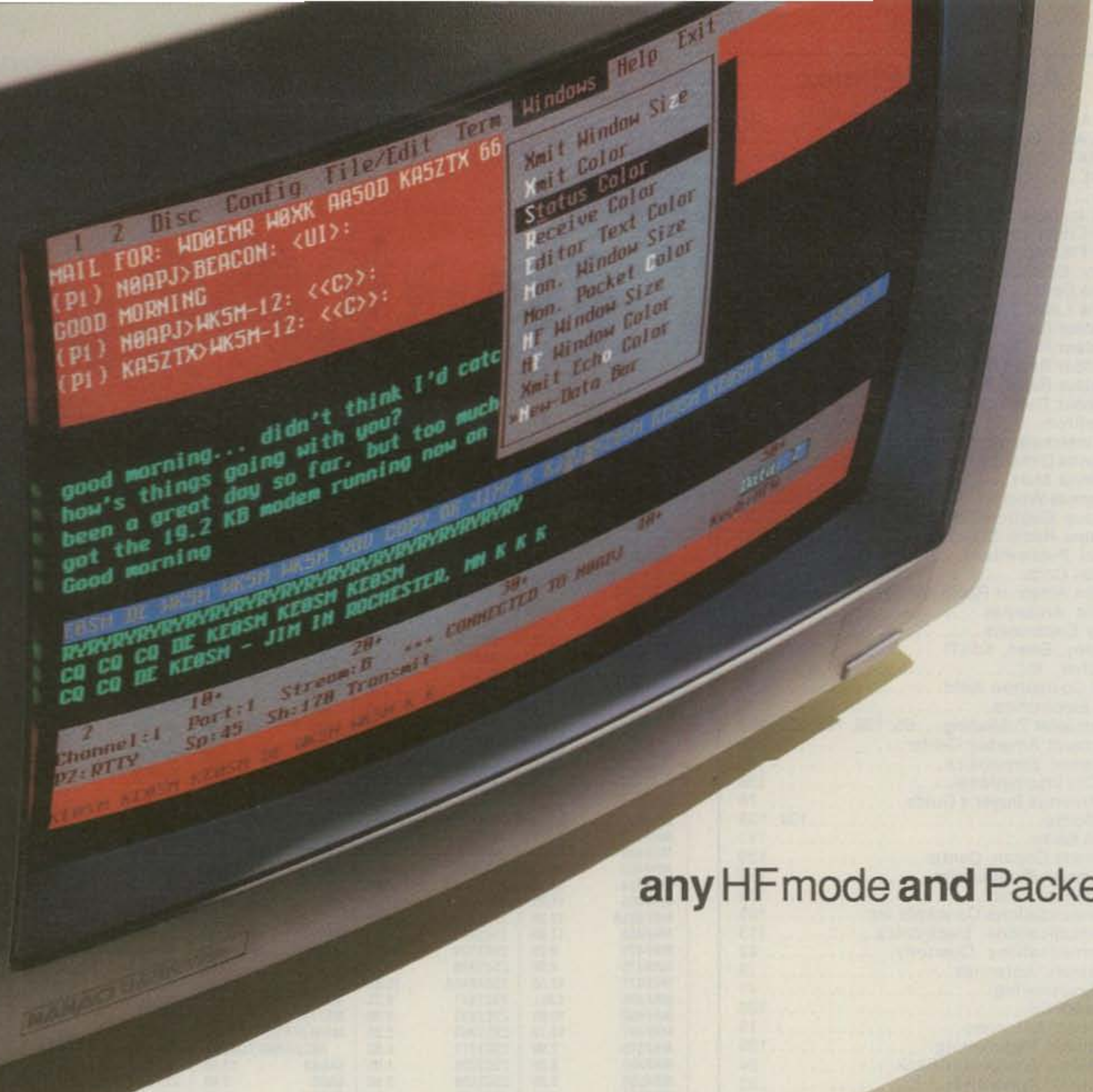
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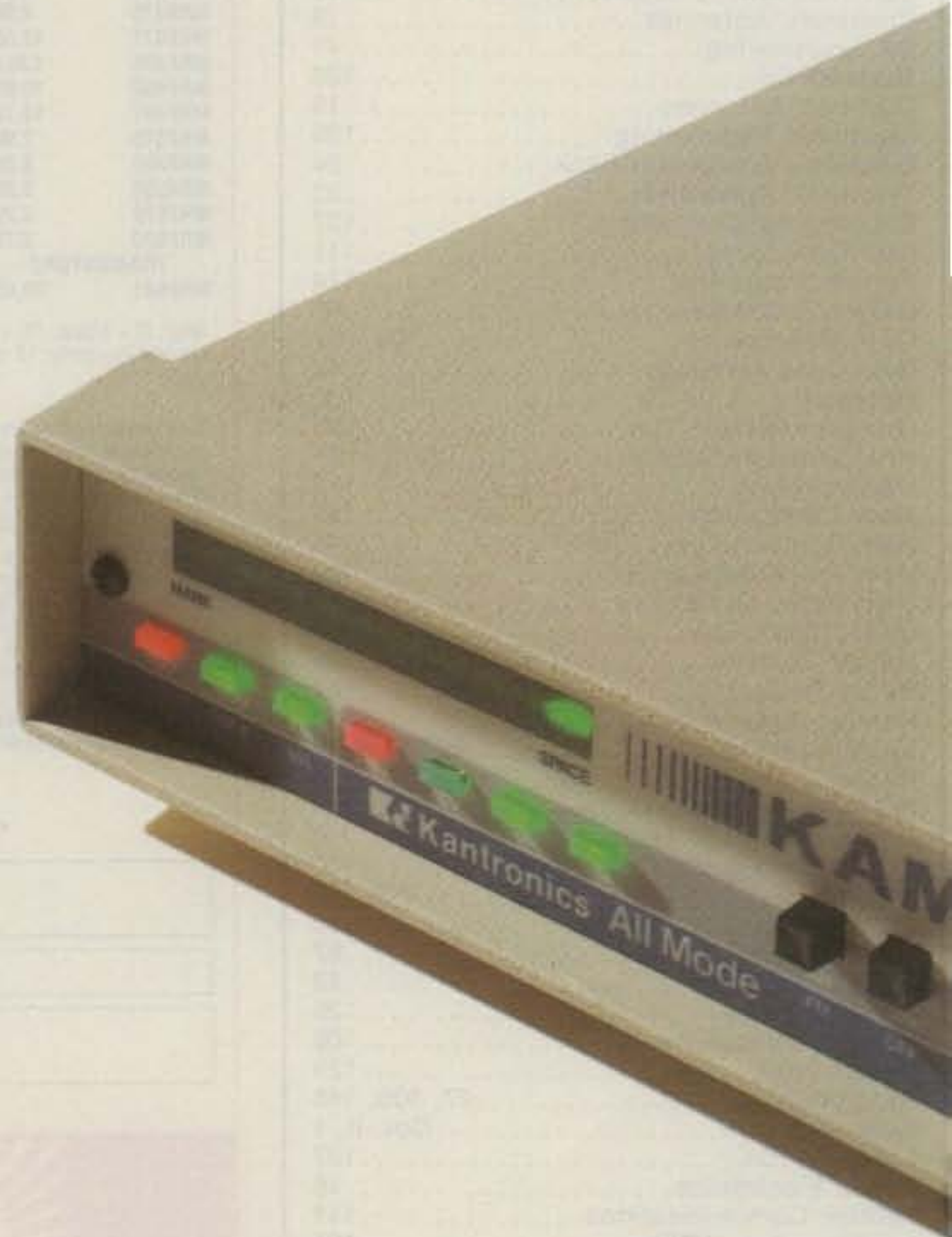
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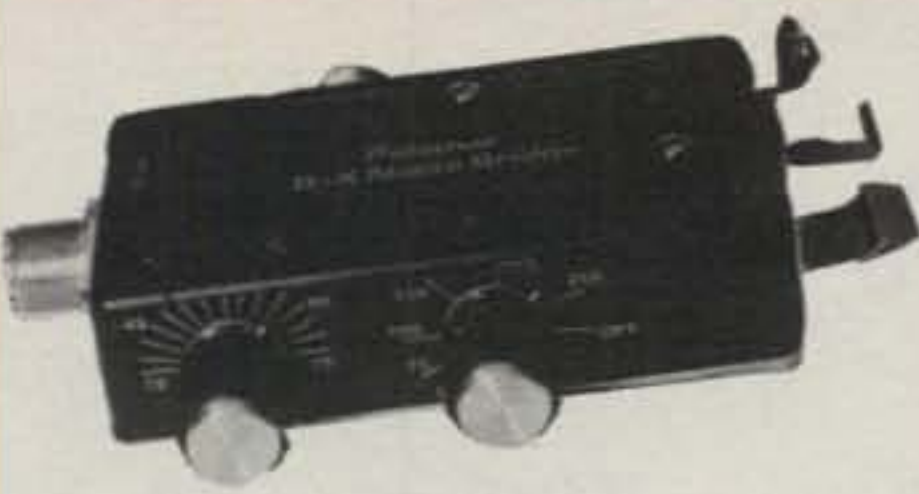
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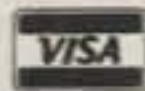
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# FT-2400 Military Spec'd TOUGH

## NOTHING COMPARES...

Whether you're roughing it on the tortuous dirt roads of the Baja 1000 or through the big city canyons, the ruggedly designed FT-2400 is built to take the abuse. In fact, the FT-2400 is the first and only amateur radio to be awarded a MIL-STD-810 rating for the shock and vibration. That's why Yaesu is the official radio of the Nissan off-road race teams.

Exceptional features are packed into the FT-2400 such as: ■ **LCD Display** — the largest display available on any 2 meter mobile ■ **Alpha Numeric** — for entering names or callsigns ■ **Backlit DTMF Microphone** — for making autopatch calls safely at night ■ **31 Memories** ■ **Odd Splits** — on any memory channel ■ **3 Selectable Power Level Outputs** — 50, 25 and 5 watts or user select ■ **Advance Track Tuning**



(ATT) — eliminates big city intermod ■ **Automatic Display Dimmer** — 4 levels ■ **FM Modulation** — for true voice clarity ■ **DTMF Selective Paging (optional)**.

Other features include: Wideband receiver coverage 140-174 MHz RX, 140-150 MHz TX • CTCSS encode built-in and selectable from the front panel • Five scanning functions: Band Scan, Limited Band Scan, Memory Scan, Memory Channel Lock-out with Selectable Scan Stops and Priority Scans • One piece die-cast construction with extra large heat sink • Automatic Repeater offset • Programmable call channel.

Options: DTMF coded squelch and paging (requires FRC-6 paging unit) • CTCSS Decode Unit (FTS-17A).

If you're serious about affordable communications, you'll want the FT-2400. Contact your Yaesu dealer today.

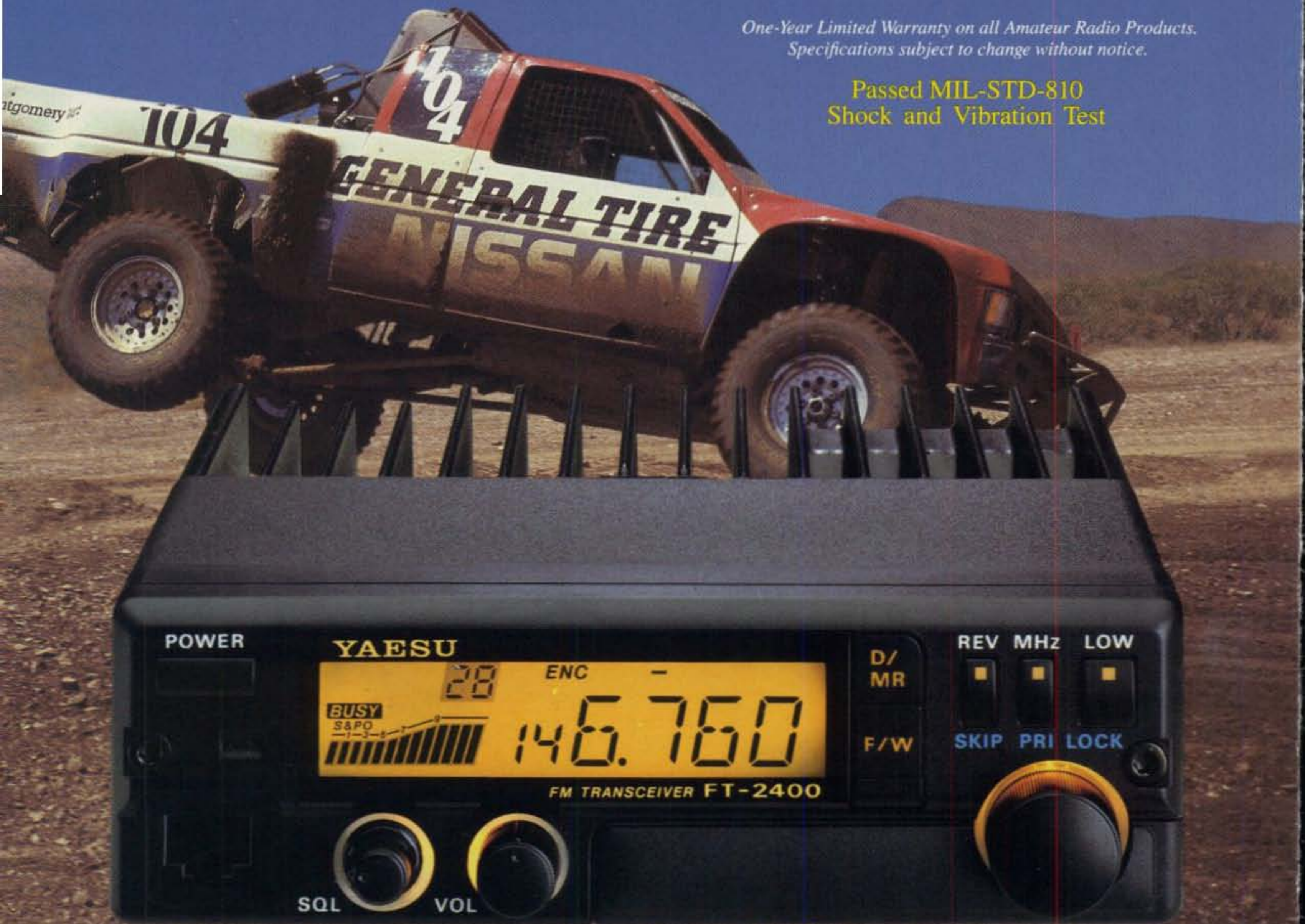


## YAESU

*Performance without compromise.™*

*One-Year Limited Warranty on all Amateur Radio Products.  
Specifications subject to change without notice.*

**Passed MIL-STD-810  
Shock and Vibration Test**





#### 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 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 know but you know



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.

# Listen In With the Pros

**NEW**

Did you know ICOM receivers are used by local, state and federal government agencies? The professionals in these critical positions require the utmost in signal clarity, performance and reliability. ICOM's R7100 ultra high-tech receiver meets, and even exceeds, these stringent demands.

**Listen To Them All** ...on ICOM's R7100. Capture lowband, marine, aircraft, amateur, emergency— or relax with FM and television! Cover the entire 25 MHz to 2 GHz bands in 8 tuning steps: 100 Hz, 1-, 5-, 10-, 12.5-, 20-, 25- and 100-kHz, and 1 MHz.

**900 Memory Channels.** 9 bands of 100 channels each let you group and access all your favorite frequencies automatically.

**All Mode Scan.** Super fast scanning in Programmed Scan, Selected Memory and Window Scan— flexibility never before realized.



**Auto Memory Write Scan** automatically records busy frequencies for later monitoring.

**Loud and Clear With DDS.**

Direct Digital Synthesis means an extremely low carrier-to-noise ratio for the ultimate in receiver performance. Compare it and hear the difference!

**Dual Windows.** Scan in one window, tune in the other— like two receivers in one!

**The Most Important Feature.**

Designed and backed by ICOM. Our reputation for quality, reliability and service is unsurpassed in the communications industry. The pros don't settle for anything less. Neither should you.

*For more information, see your ICOM dealer or call our Brochure Hotline 1-800-999-9877.*

ICOM America, Inc., 2380-116th Ave. N.E.  
Bellevue, Washington 98004

Customer Service Hotline (206) 454-7619

All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. R7100392



**IC-R1**

Put the whole world in your pocket.

Only 4" high!

**BUY ANY R7100,  
GET A TINY R1  
AT A TINY PRICE!**  
Special limited time offer.  
See Icom Dealer for details.

CIRCLE 141 ON READER SERVICE CARD

**ICOM**  
Simply the Best