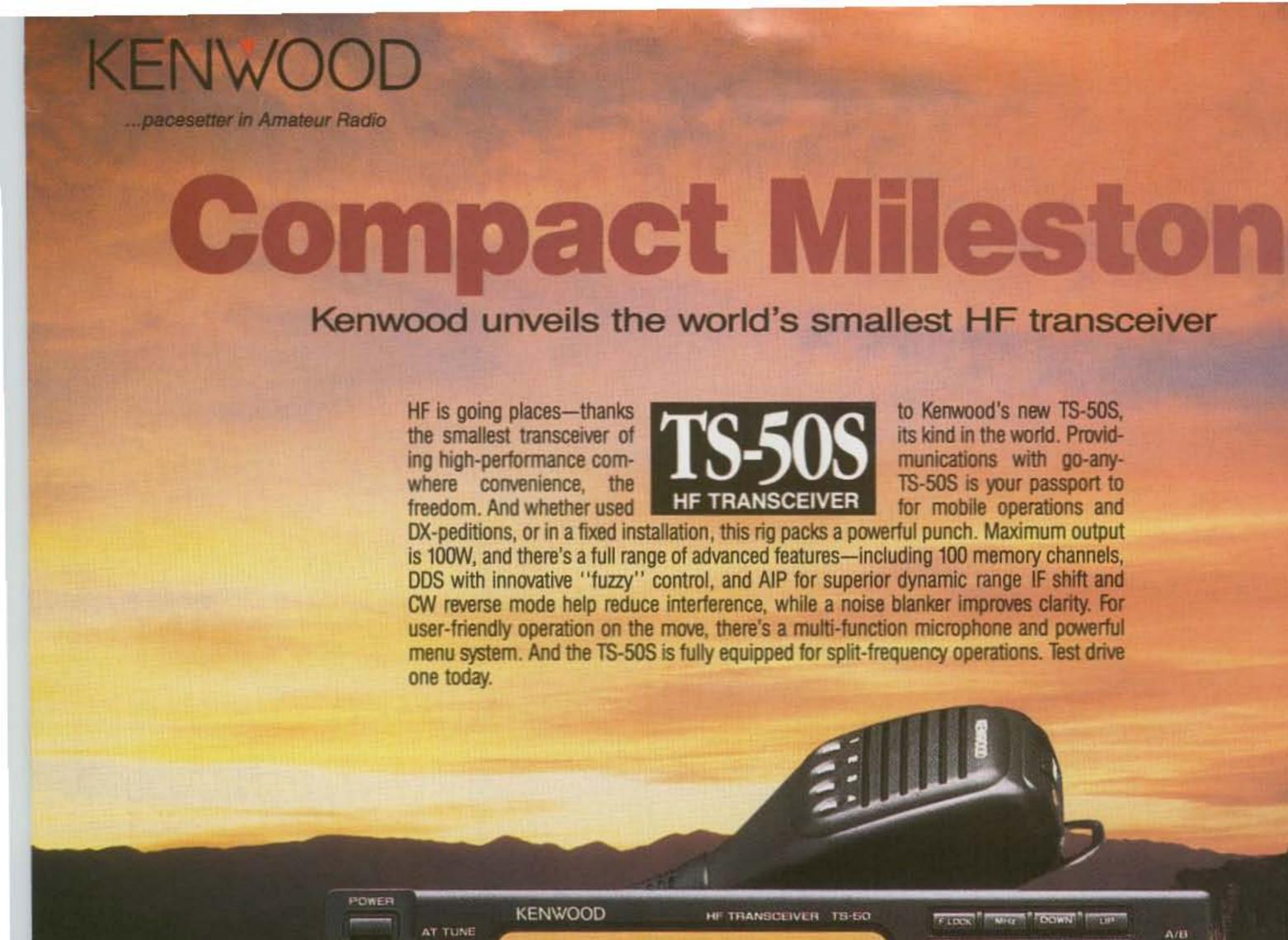


THE KADIU-AMATEUR'S JOURNAL

the cover: Alfred A. Laun, III, K3ZO, Temple Hill, MD



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The Radio Amateur's Journal



ON THE COVER: Fred Laun, K3ZO at his Temple Hill, Maryland OTH with a bit of aluminum sprouting in the background. Anyone who has spent more than a few years in the DXing end of the Amateur Radio hobby will recognize Fred as a noted DXer in his own right, and a provider of countless DX contacts from rare and exotic settings. (Photo by Larry Mulvehill, WB2ZPI)

APRIL 1993

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ZERO BIAS

EDITORIAL

o some people April is just the fourth month of the Gregorian calendar. To others it signifies an aura of spring and flowers, and the burgeoning of new life. To amateurs throughout the world, however, April triggers a mysterious synapse that makes us lock reason and logic in the garage and head on out to Dayton, Ohio.

There are probably as many fables about "Why Dayton?" as there are for the origin of our use of the word "ham." Years ago I guess it could just as easily have been Bisbee or Yaphank, but somehow that mysterious synapse homed in on Dayton, Ohio. We're lucky in one respect, for it seems there are thirteen states with a city named Dayton, and yet we all wind up in the right place each year. "Why do we do it?" you might ask. Well, simply put, it's fun to plan on going, it's certainly fun to be there, and it's fun to spend the rest of the year talking about it when you get home.

The actual nitty-gritty "why" is probably too metaphysical and too individualistic to spell out, but I have a feeling that it springs from a traditional strict upbringing. Most of us even had a strict introduction to amateur radio, where we were informed that we "didn't need" this or that to accomplish marvelous deeds; we could do it with basic, simple, humble gear. Somehow, our mentors always seemed to manage to have what we "didn't need." It really didn't matter if they were right or wrong. At some level we all knew that we wanted what they had. Even today, when we tell newcomers about amateur radio, we also tell them what they "don't need" and expect them to accept it more readily than we did.

Well, fellow amateurs, Dayton allows us all to covet the best there is, and it's okay to do so. We can take or learn from the best minds in amateur radio. We literally can see hundreds upon hundreds of commercial exhibits featuring the latest and greatest of everything, plus what seems like thousands of fleamarket tables chock-full of unimaginable goodies and delights. What's not to like? For three days, at least, we all believe that we most definitely are worthy and unabashedly do deserve it all. For three days, at least, there is no distinction between "need" and "want," and everything you could ever hope for (and then some) is right there.

The operant word for three days becomes "if," as in if I had this I could do that, or if I had that I could do this. It's pure amateur radio—the stuff dreams are made of. Sure, we all could do with less, and there are things we "don't need," but none of that has anything to do with it. I think we all know at some level that even if we had the best possible station in the world we wouldn't automatically become either the best DXer or Contester by virtue of that station alone.

One of the best things about amateur radio is that it becomes a new ball game each time you turn on the rig. You never know what you may find. For most of us it's always the dream,

the quest, and the challenge each time we flip the switch. It's the anticipation that leads to the adrenalin rush when you come across a weak signal calling CQ, and for that split second you mentally compute where in the world that signal is coming from and foolishly think that you're the only one who hears it. That momentary exultation is the stuff that amateur radio dreams (and Honor Rolls) are made of. We've all had it in one fashion or another, and as we all know, that feeling can become addictive. This feeling is not limited to DXers or Contesters alone, and don't think you're safe since you only kerchunk the local machine now and then. I can imagine what some of you would be like if someone suddenly took away your HTs and made you quit cold turkey.

Another year goes by in the amateur radio calendar, and once again we're drawn like a magnet to Dayton, Ohio. If you've been there before, you know there's no need to ask why. It's enough to say that Dayton Is, just like DX Is. If you haven't been there at least once, you should go. It's the best three days you can spend in amateur radio. For three days you can covet, and speculate, and dream, and enjoy. You can even buy and bring home things you didn't know existed a few short days earlier. For almost all of us, amateur radio is a hobby, a pastime, or a service, depending on how you see it. It is meant to be enjoyed, to have fun with, and to give us a sense of accomplishment. You can make of it what you want, but you certainly should have the best time doing it and enjoy every moment.

Cinema Verite

A number of years ago (not too many) I started to take up woodworking. As with amateur radio, my philosophy has always been more is better. In reality, though, it generally just means bigger and more complicated and not necessarily better. Well, let me tell you that the manuals that come with power tools are second only to the manuals that come with amateur gear. I therefore became adept at making wood chips and sawdust and spilling blood. It was only with great deference and fear that I managed to hold on to my digits. I started to buy videos such as "Your Friend The Radial Arm Saw" and "I'm Your Drill Press, Call Me Chuck," and little by little I learned how to do things by watching the tapes over and over again. There's a big difference between reading a manual and watching someone perform the same thing. By the time I started watching "This Old House" and "The New Yankee Workshop" on TV, I could sit back smugly and think "I can do that." I have to say that my wood chips and sawdust are now far more precise and I hardly ever spill blood.

When I took up competitive target shooting I again went the route of buying video tapes as an adjunct to training. Not only can you see and

learn from experts, in a sense you can take that lesson over and over again, checking what you do against what they do. With both woodworking and target shooting you can also see other equipment and how it is used and get helpful hints that you can practice. The videos in a sense walk you through what it is you want to learn. You can go at it in your spare time, and amazingly the instructor never gets tired or needs a break.

Why not do the same thing for amateur radio? Well, we did! We formed CQ Productions, and utilizing the talents of Rich Moseson, NW2L, a three-time Emmy Award winning TV Producer, we came up with the first four in a series of amateur radio videos. They are: "Getting Started In Ham Radio," "Getting Started In Amateur Satellites," "Getting Started In Packet Radio," and "Getting Started In DXing." Others are now in the works, but the first four are available now, either through our offices or through your local dealer. They're also great for club meetings, amateur radio classes, and as a loner to that person you're trying to get interested in amateur radio. Check our ads for complete details on the videos.

Speaking of videos, does anyone know of a video like "Hi! I'm Larry Your Lathe, and We're Going To Have Fun'"?

Buckmaster Redux

For those of you still trying to find the Buckmaster review in the March issue, stop and save your time. We goofed. We had a last-minute ad change and needed another page, so the review was pulled. Needless to say, we changed everything else but the table of contents. It did make it in this month, however.

CQ Author's New Book The Telegraph

If you've got some discretionary funds left over after Dayton, I would suggest ordering a copy of Lewis Coe's new book The Telegraph. If the name Lewis Coe sounds familiar, it should. Lewis has written historical articles for CQ over the years, and this new book is certainly worth adding to your library. The book's subtitle states that it is a history of Morse's invention and its predecessors in the United States. The book is fascinating reading and includes numerous illustrations detailing the history of the telegraph system in this country. In his youth, Lewis was a commercial telegraph operator, and the reader picks up immediately that the book was a labor of love for a bygone era. The book is published by McFarland & Company, Inc., Box 611, Jefferson, NC 28640. It sells for \$27.95 postpaid.

73, Alan, K2EEK

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ANNOUNCEMENTS

• Foundation for Amateur Radio Scholarships - The Foundation plans to administer 47 scholarships for the academic year 1993–94. Licensed radio amateurs may compete for the awards if they plan to pursue a full-time course of study beyond high school and are enrolled or have been accepted for enrollment at an accredited university, college, or technical school. The awards range from \$500 to \$2000. Additional information and an application form can be requested by letter or QSL postmarked prior to April 30 from FAR Scholarships, 6903 Rhode Island Ave., College Park, MD 20740.

 DXpedition to Bermejo Island - The Radio Club Del Sur, Mar del Plata, Argentina, will be on from Bermejo Island (which is 20 miles south of Bahia Blanca City in the Atlantic Ocean, IOTA SA-021) April 2-4, 1993 using the callsign L1DSR on the following frequencies: SSB 3690, 7090, 14190, 21290, 28590, 29000, 50110 kHz; CW 3510, 7010, 14010, 21010, 28010, 50110 kHz.

• First North West QRP Club Contest - The object of the "Spring NWQRP Sprint" is to contact as many QRP stations as possible within a three hour period, 1700-2100Z April 17, on 7035-7040, 14060 kHz. Contacts with NWQRP members count 5 points, nonmembers 3 points. Non-NWQRP members must give power level used. Exchange: RST, State, and NWQRP #. Sample CQ: "CQ NWQRP TEST." Multipliers: Multiply total score by five for 1 watt or less; multiply by three for 1 to 3 watts: multiply by two for 3 to 5 watts. Awards

ple CQ: "CQ NWQRP TEST." Multipliers: Multiply total score by five for 1 watt or less; multiply by three for 1 to 3 watts; multiply by two for 3 to 5 watts. Awards will be given for the highest score in each call area, including the top score. Results will be published in the June 1993 NWQ newsletter. Send completed logs by May 15, 1993 to Bob Farnworth, WU7F, Contest Editor NWQRP Club, 6822 131 Ave. SE, Bellevue, WA 98006.

 RSGB International HF Convention - Plan ahead for this event, which will take place September 24-26 at the Beaumont Cenference Centre located a few minutes from Heathrow Airport, England. For full convention prospectus, send an SAE to HF Committee, P.O. Box 599, Hemel Hempstead, Herts, HP3 OSR, UK.

 International Marconi Day - The Cornish RAC will sponsor the Fifth Annual Marconi Birthday Event on April 24 from 0000-2400Z. Twenty-one Marconi Special Event stations worldwide representing Marconi historic station locations will take part, including GB4IMD, GB0IMD, GB2IMD, GB4MDI, GB0SFL, GB2MDI, GB4MID, CT1TGM, EI2IMD, EI4IMD, DA0IMD, IY0TCI, IY1TTM, IY4FGM, IY0GA, ZS6IMD, VE1IMD, VO1IMD, K1VV/IMD, N2FCZ/IMD, and KK6H/IMD. Certificate for working 12 of the 21 stations. For info contact Mike, G4WQL, c/o CRAC, Box 100, Truro, TR1 1RX, Cornwall, England.

 The following Special Events will take place during April:

NT1I, from IOTA DXpedition, Martha's Vineyard (NA-046), Dukes County, Massachusetts; April 30 to May 3 on or near the usual IOTA frequencies. QSL direct to NT1I or via the bureau.

N2MXR, from 125th anniversary of Ogdensburg, New York; Ogdensburg ARC; 1400–2100Z April 25; on 7.280, 14.325, 21.325, and Novice 10 meters, plus/minus QRM. For certificate send QSL with contact number and #10 or 9 × 12 SASE to Pete Baltradis, RD 1 Box 206, Norwood, NY 13668.

W2KGY, from Constitution Island, New York; West Point Cadet ARC and Orange County ARC; 1400– 2000Z April 17; 10–80 meters in first 10 kHz of General phone portion. QSL with SASE to W2KGY.

2-land, from commemoration of WW II operation of Voice of America relay station WBOU; Piscataway, New Jersey ARC members signing /VOA; 0000-2400Z April 3-4; CW—Novice portion of bands, phone—lower third of General portion 75-15 meters and Novice 10 meters. For certificate send QSL and SASE to station worked.

KK4VN, from commemoration of ending of Civil War, Appomattox Courthouse, Virginia; Southside ARC; 1400Z April 10 to 1400Z April 11; CW and SSB in Novice and General portions of 10, 20, 40, 80 meters. For QSL send SASE to KK4VN, Route 3 Box 221, Cumberland, VA 23040.

AA4TJ, from 250th anniversary of Thomas Jefferson's birth (Shadwell Plantation), Charlottesville, Virginia; Albemarle ARC; 1400–2230Z April 10, 11, 13; CW 7043, 7143, 14043, 21043, 28043; SSB 7243, 14343, 21343, 28443. For certificate send QSL and large SASE to AARC, P.O. Box 6833, Charlottesville, VA 22906.

W4UCJ, from 72nd Annual Rose Festival, Thomasville, Georgia; Thomasville ARC; 1600–2400Z April 23 and 1300–2200Z April 24; lower General portion of 80, 40, 20, 15 meters phone or CW subbands and Novice 10 meters phone. For certificate send QSL and SASE to Thomasville ARC, P.O. Box 251, Thomasville, GA 31799.

KO4KP, from celebration of first written request for independence, Halifax, North Carolina; Roanoke Valley ARS; 1400–2400Z April 12; in General subbands and 10 meter Novice. For QSL send QSL and SASE to RVARS, Rt. 2 Box 519B, Roanoke Rapids, NC 27870.

N5QWF, from Bay City Heritage day Festival, Bay City, Texas; Matagordo Co. ARC; 0000–2400Z April 2–4; all bands, all modes. For QSL send SASE to N5QWF, 4404 Doris St., Bay City, TX 77414.

W5DDL, from Festival International Delouisiane, Lafayette, Louisiana; Acadiana ARA; 1300-0200Z April 24-25; lower portion of General 40, 20, 15 meter phone bands, and lower portion of Novice 10 meter phone subband. Send QSL and SASE to W5DDL Callbook address or c/o P.O. Box 51174, Lafayette, LA 70505-1174.

N5CND, from 50th Year Navy CincPac Reunion and in memory of Admiral Nimitz, Fredericksburg, Texas; Fredericksburg area amateurs; 1300–2200Z April 16 and 17; lower 30 kHz of General phone segments of 40, 20, 15, and Novice segemnt of 10 meters, 146.560 FM. For certificate send QSL and SASE to Ken Pehl, N5CND, 108 E. Centre St., Fredericksburg, TX 78624.

KC6LUC, from commemoration of "The Historical WW II 390th Bomb Group," Blythe, California; Billy Hol-

(continued on p. 159)

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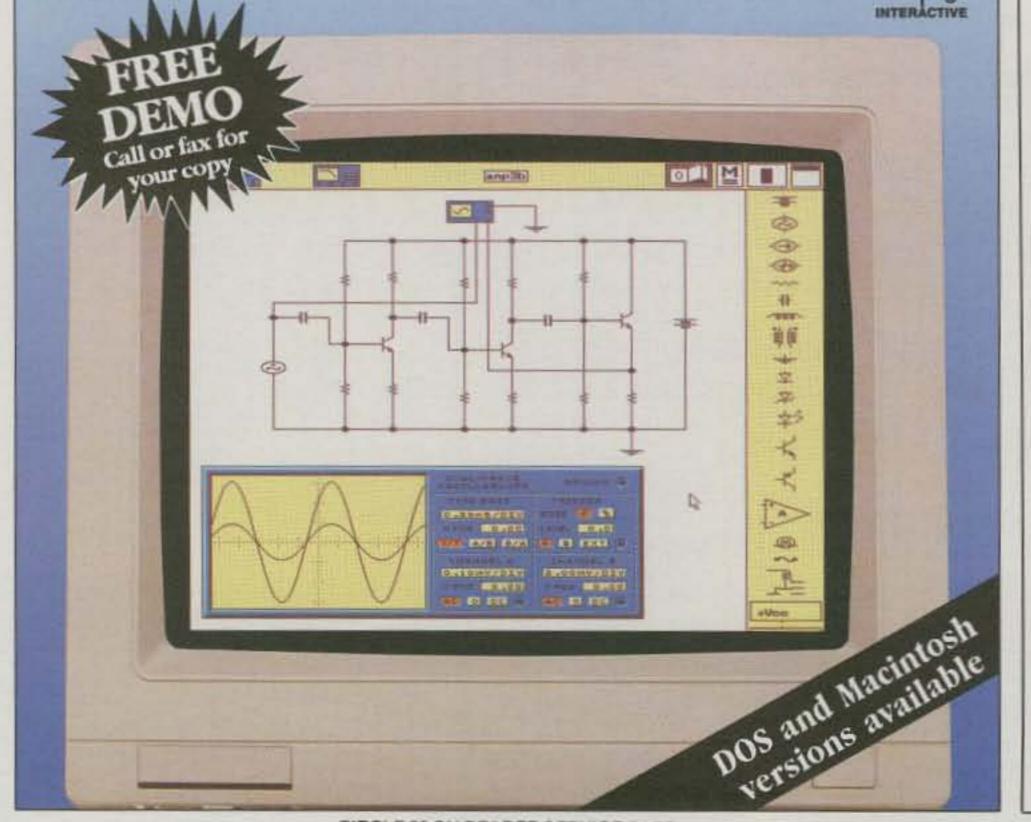
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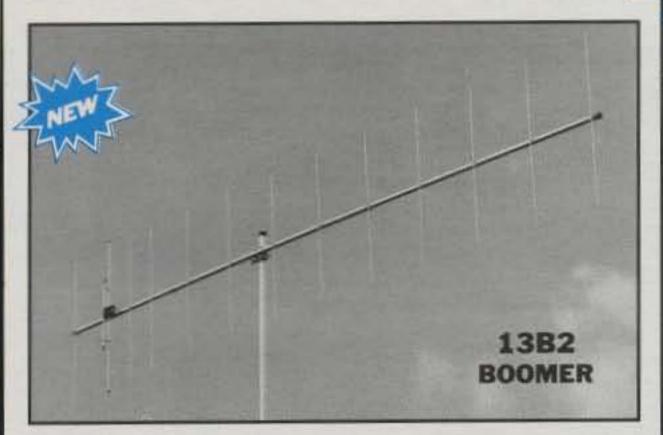
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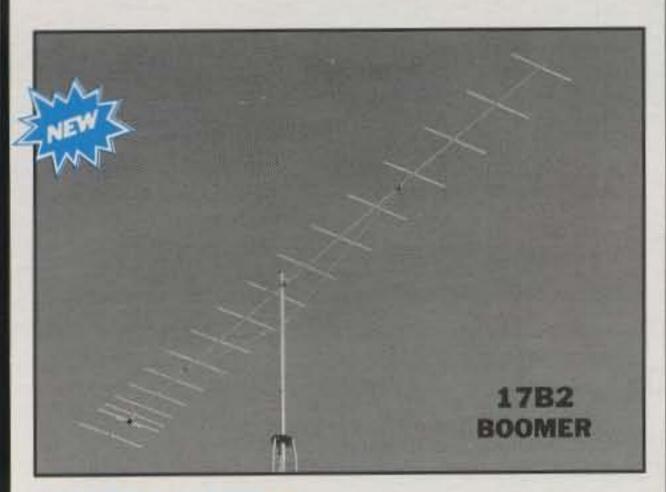


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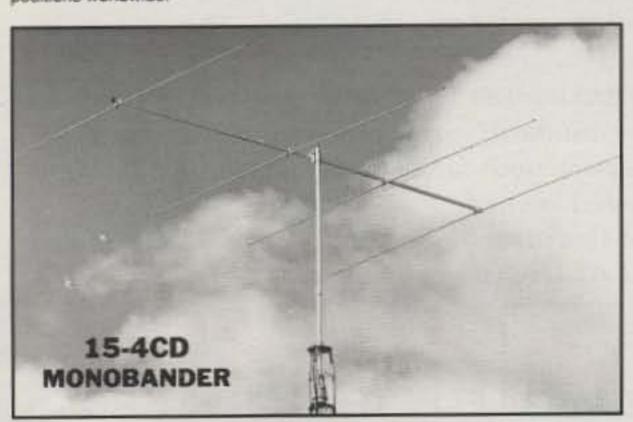
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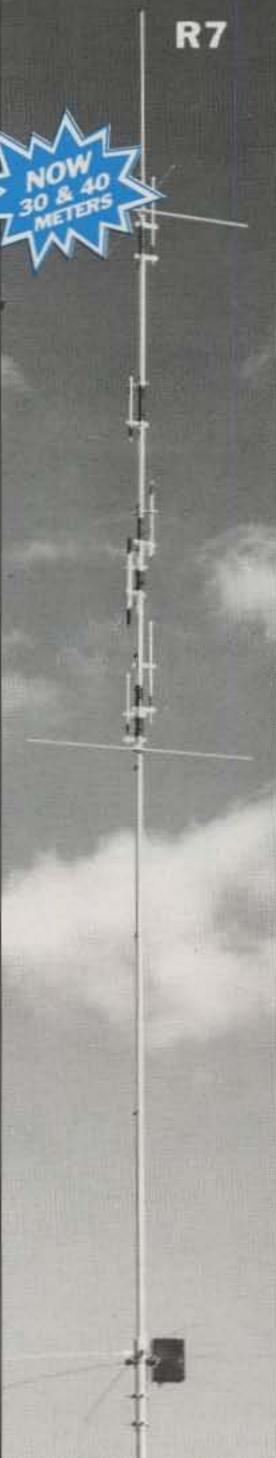


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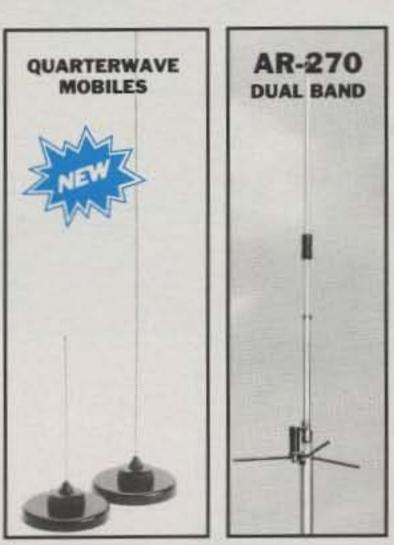








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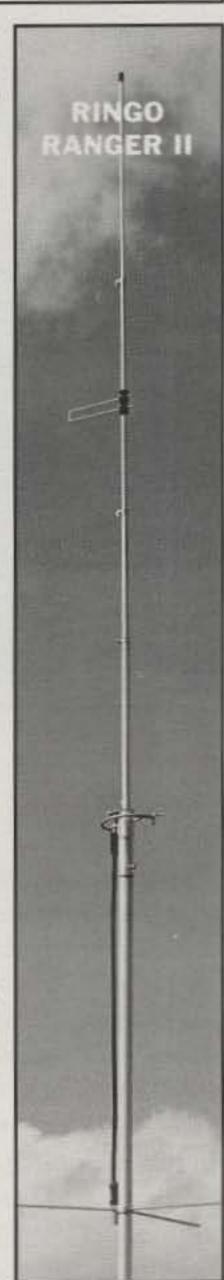
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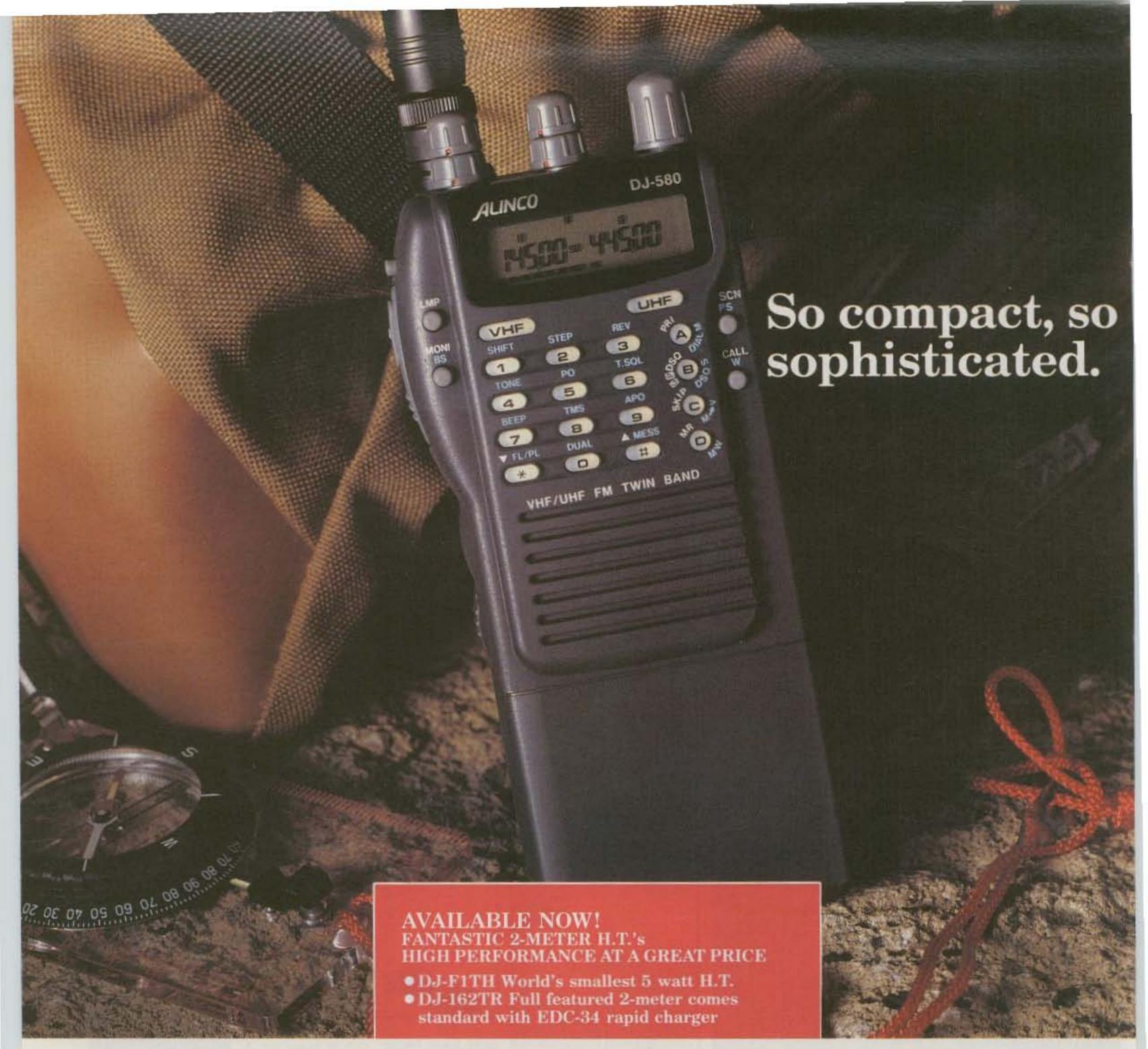
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OUR READERS SAY

QSL Exchange Sought

Editor, CQ:

Do any of your readers know of any association or radio amateur who maintains a QSL card collection other than for one amateur station? The Wireless Institute of Australia has built up a collection of nearly 400,000 QSL cards, both pre-war and recent QSLs derived from the generous donations of cards of people who believe that DXing and QSLing are an important part of the history of amateur radio.

We are anxious to contact anybody who has formed a similar collection with a view to exchanging QSLs. Please write to the Hon. Curator, Ken Matchett, VK3TL, 4 Sunrise Hill Rd., Montrose Vic. 3765, Australia.

> Ken Matchett, VK3TL Montrose, Vic., Australia

Brings Back Memories

Editor, CQ:

Just a note to say how much I enjoy reading CQ, especially the "Nostalgia Specials." The articles bring back many fond memories for me of the middle fifties when I started dabbling in electronics and later in amateur radio.

Although solid-state devices were on the scene then (CK722's, 2N109's, etc.), tubes were more interesting (and forgiving). Also, with the availability of old TV chassis (power transformers, electrolytics, and other components) and military surplus parts to cannibalize, tube equipment was fun to build and easy on the pocketbook!

Hope to see more of these articles from time to time.

> Jim Mitchell, KØWYW Communications Systems Engineer Burlington Northern RR

The CQ Fleet

Editor, CQ:

Enclosed is a photo of a 400 passenger stern wheeler that operates with a sister ship on a lake called Grand Lake of the Cherokees located 60 miles northeast of the city of Tulsa, Oklahoma. The name of this vessel is the Cherokee Queen 2. Note the sign on the stacks in the photo.

I operate a marina and thought the readers



of CO magazine may not know that you folks have a "fleet" or a "navy" located in Oklahoma. Ramon L. Glidden, W5NOO Langley, OK

Info On A.E. A Surprise

Editor, CQ:

The only article I will need to "justify" my subscription to CQ for the next ten years appeared in the February 1993 issue in the DX column beginning on page 112.

I am very much interested in anything on Amelia Earhart (A.E.), and must admit that this article carried more practical info on A.E. than I had ever read, seen, or heard in my 69 years! To now understand if A.E. had minimum amateur radio training she would probably be able to write her own account of that fateful trip in 1937. To throw out her CW key and "long wire" antenna (because of "zero" knowledge of Morse Code and radio) leaves me in shock!

A large group of hams tell me that CQ is only full of contest news. They have a lot to learn. These poor, uneducated hams need to read and understand instead of just looking at the pictures!

I am forever indebted to CQ for this article on A.E. Thanks a million!

> Fletcher W. Harris, Jr., KB5VGV Galveston, TX

PS: I've got to go study my code to upgrade to General Class! After 40 years in communications, etc., I got my no No Code Tech license in September 1992.

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> Editor's Choice Passport to World Band Radio Tabletop Receivers for 1992

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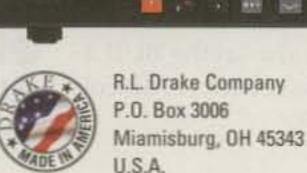
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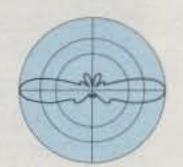


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X-510NA	144/440	8.3/11.7	200	N	17.2	90
X-510MA	144/440	8.3/11.7	200	UHF	17.0	90
X-500HNA	144/440	8.3/11.7	200	N	17.8	90+
X-700HA	144/440	9.3/13.0	200	UHF	24.0	90
X-2200A	144/222	6.0/7.8	150	UHF	11.5	112
X-3200A	144/222/440	6.0/7.8/8:0	100/200	N	10.5	112
X-6000A	144/440/1240	6.5/9.0/10.0	100/100/60	N	10.5	112



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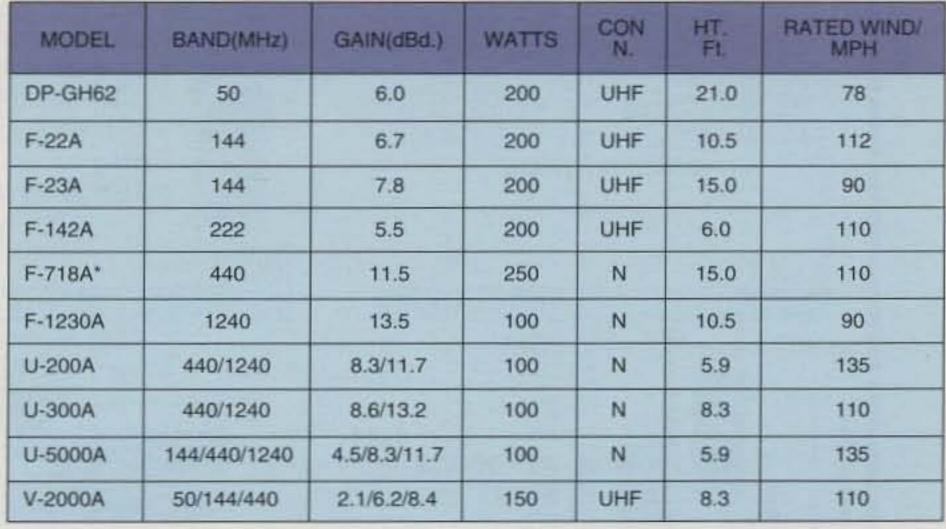
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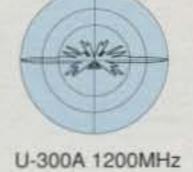
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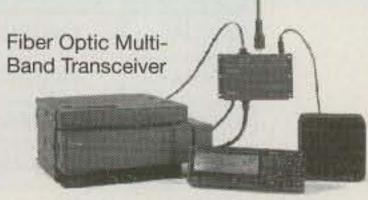


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Imagination and dreams. That's all it takes. One of of the big reasons we're all interested in improving our antennas is to increase our ability to talk to far-away places. ZS6EZ explains what it took to make some of our dreams come true.

Of Seagulls and Mountain Ponies The Story of ZS0Z and 7P8EN

BY CHRIS R. BURGER*, ZS6EZ

tall started with a short note in a newsletter. It concerned a Battle Creek Special low-band antenna that was reportedly "significantly better" than the antenna I had been using. It sounded too good to be true, but I decided to investigate.

I wrote to Charlie Dewey, WOCD, about the possibility of making the plans available for the antenna, so that I could try to make a copy for DXpedition use. Charlie's reply was a surprise. They (there were other lowband DXers in Battle Creek, Michigan-Charlie, George Taft, W8UVZ, and George Guerin, K8GG—who were involved in getting the antenna together) had decided that I couldn't have the plans, but that they would do one better: They would make the Battle Creek Special Mark I available for a year. This antenna had become famous for its exploits on Bouvet Island. It had been responsible for the loud low-band signals from 3Y5X.

The antenna came complete with a shipping crate, which included all the necessary tools, supports, guys, anchors, radials, and even a matching transformer for 160 meters. The DXpeditioner only needed to transport the crate, plus a screwdriver and hammer, so that two people could set it up in about an hour. This sounded great. Even better, they had collected funds from a number of low-band DXers to ship the antenna to me. It would be available for a number of DXpeditions which I had been tentatively planning for some time.

Then political developments made up my DXpedition mind for me. I saw a newspaper story to the effect that South Africa and Namibia were negotiating a joint administration agreement for Walvis Bay and the Penguin Islands. Walvis Bay was annexed by Richard C. Dyer of HMS Industry



The yacht Sagitta ready to sail for Penguin Island.

in 1878, and enacted into law in both England and the Cape of Good Hope in 1884. The Penguin Island group was annexed to the Cape of Good Hope (then a British Colony) in 1861. The original proclamation mentions the islands by name: Ichaboe, Hollamsbird, Mercury, Long Island, Seal, Penguin, Halifax, Possession, Albatross Rock, Pomona, Plumpudding, and Roastbeef or Sinclair's Island. The annexation was formalized in 1874.

In 1890 an agreement on African territories was entered into between Germany (then colonial ruler of what is now Namibia) and England, specifically mentioning an agreement on these areas. In 1910 the Union of South Africa was established, and the Cape colony, with all its territories, became the Cape Province of the Union.

When the Republic of Namibia became independent, however, its constitution in-

cluded in its definition of its territory "including the enclave, harbour and port of Walvis Bay, as well as the off-shore islands of Namibia."

As the existence of both Walvis Bay and the Penguin Islands on the DXCC list



ZS4TX and ZS6RAD manning two of the stations.

^{*}P.O. Box 4485, Pretoria, 0001 Republic of South Africa



The antenna farm. Left to right: 10 meter beam, 6 meter beam, Battle Creek Special, and TH5DX.

hinged on the existence of Namibian territory between these areas and the rest of South Africa (DXCC rules section II point 3), it appeared to me that Namibian participation in their administration would jeopardize their DXCC status. This might then be the last opportunity to activate this DXCC country!

I had done most of the logistics for the previous year's ZS9Z/1 DXpedition from Penguin Island. Much of the equipment and the know-how was still available, so staging another Penguin Islands expedition would be relatively simple.

Operators were not easy to come by. I first approached G3XTT and ZS4TX, as I needed operators who could handle phone and CW, as well as the low bands. Don Field, G3XTT, was initially very keen, but

had to pull out eventually due to a business trip and family commitments. Bernie van der Walt, ZS4TX, had joined me on a DXpedition before, but this time he had something else lined up. His Lesotho license, 7P8EN, was about to expire, and he intended to run one more operation from there. His leave had been set aside for that purpose. We eventually struck a deal. He would join the Penguin Island crew if I would operate from Lesotho on his behalf. I had a little more flexibility, and could squeeze in a second operation, so the deal was on. Bernie is an electronic technician, and is a proficient CW operator. He also has ample low-band experience. He recently became the first ZS4 to achieve 5BDXCC.

I also approached Rad Handfield-Jones

ZS6RAD, who had been to Walvis Bay with me for the ZS9Z operation a year before. Rad immediately agreed. He is the holder of a PhD in mining geology, and is a department head at a Johannesburg college. He would be our VHF man, and he is a very tenacious phone operator, capable of respectable rates for long stretches.

This left me with a predicament: one week before departure, the crew was decidedly inadequate on the phone side for the task at hand. A solution came up when I discovered that ZS6BUV had leave and nowhere to go.

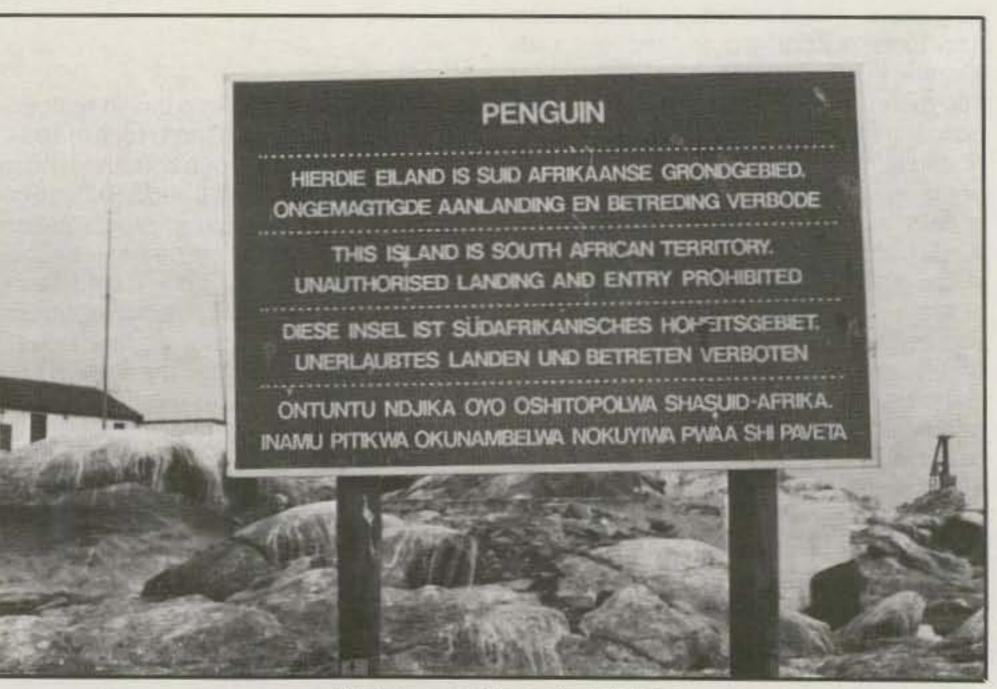
Jan van Niekerk, ZS6BUV (now ZS6NW), is an electronic engineer, and had recently been bitten by the contest bug. I had spent some time with him before the CQ WW DX Contest, and he was starting to wake up to the possibilities of big rates and big signals. He was keen to go, but had to approach his wife for permission to go. Her reply was a surprise: he could go, and at the same time she applied for a job as landlady and chef for the proposed trip. DXpeditions are always under-staffed, so her application was accepted immediately in the presence of witnesses. Ilze is a lawyer, and I wasn't taking any chances.

The callsign was a slight problem. With Bernie's help, I located the official with the necessary clout to make these decisions. He was a little apprehensive for various reasons. However, a thick pile of paper including a thoroughly documented motivation and many DXpedition stories landed on his desk, and ZS0Z became the first ever ZS0 callsign to be issued. It was, however, emphasized that this would be a one-off concession, and that the official prefix for the islands would remain ZS1, as always.

Some weeks before departure I wrote to Bill Poellmitz, K1MM, to request help in obtaining a Cushcraft A3WS for the WARC



ZS6NW working SSB.



Welcome to Penguin Island.



The crew: Ilze, ZS6NW, ZS4TX, ZS6EZ, ZS6RAD. (ZS6NW photo)

bands. Bill eventually managed, with some help from W1JR and K1GW, to finalize the deal within three days, and the antenna arrived with two days to spare.

During the ZS9Z/1 operation we had been transported between Luderitz harbor and the island by Heiko Metzger in a small motorboat. This time he would be unavailable. However, he introduced me to a friend, Hans Rogge, who owned a yacht and would be prepared to help us out. A deal was concluded quickly, and the show was on the road.

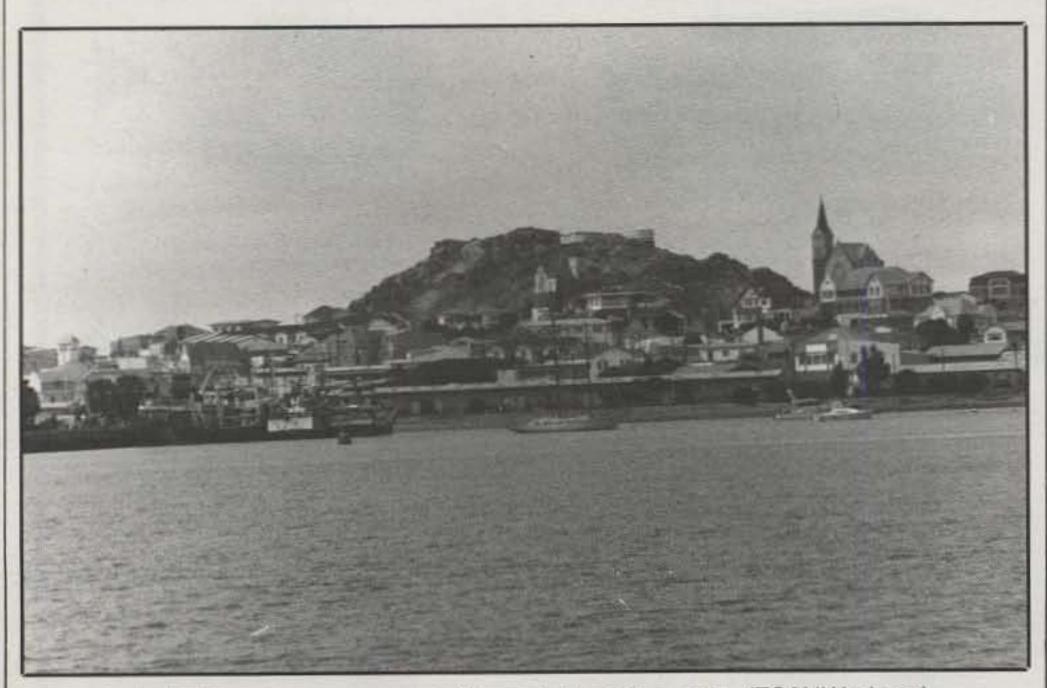
A few inevitable snags had to be dealt with at the last moment. While packing the vehicles and trailers, we discovered that most of my liquid containers had hardened in the sun and had to be replaced. We are about 1500 meters above sea level, and

the harsh sun hardens plastic in no time flat. We couldn't locate enough containers in time and had to introduce strict water rationing while on the island.

The Island

The distance to Luderitz is a bit over 3000 miles long and is a tedious journey in the extreme. Our convoy consisted of Rad's station wagon with a small trailer, and my sedan with a long trailer supporting all the antenna hardware and some of the other hardware.

My deal with Hans Rogge was that I would meet him at the docks at 8 AM. We arrived in Luderitz in the early hours of the morning and got a few hours of sleep in the deserted airport. Our troubles were not



Luderitz from the sea-more German than Germany. (ZS6NW photo)

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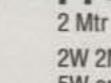
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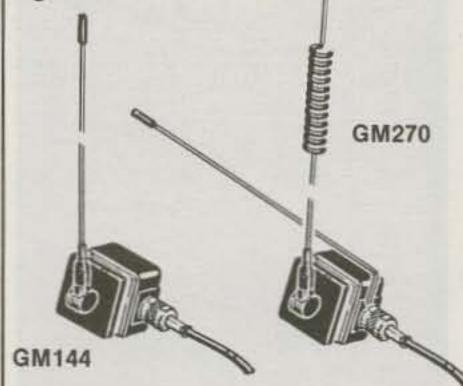
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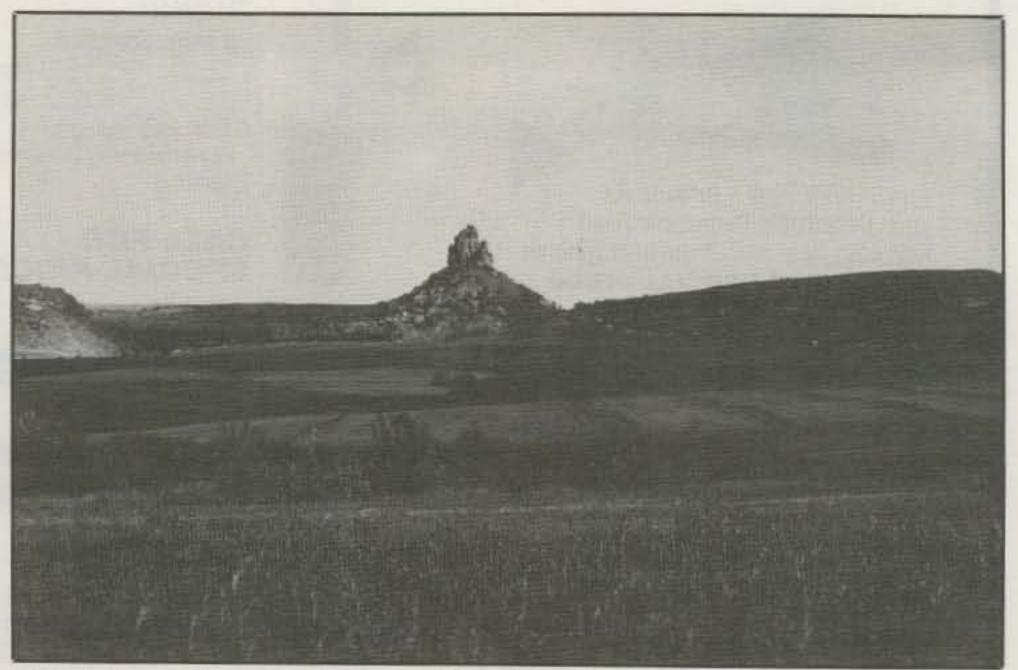
ZS4TX and 7P8EG putting the finishing touches on the tower.

over yet. We had to ask the Namibian police for assistance in locating the gas station attendant, who was nowhere to be seen at the official opening time of 7 AM. We finally located him almost an hour later.

Luderitz is not only an anachronism, but also seems totally out of place. It is a little piece of medieval Germany in the middle of the oldest desert on earth. The nearby ghost town of Kolmanskop was a beehive of activity during the last century, with an opera house that hosted visiting European stars at least once a week! The whole town of Luderitz is built in the German style, and German is still the most common language spoken there. Today it is still a diamond mining town, and most of the people in the town are connected with either the diamond mining industry or the fishing indus-

try. Some of the world's biggest crayfish are found in the ice-cold water of the south Atlantic.

It has Namibia's only port capable of accomodating sizable vessels, and is connected to Keetmanshoop in the interior by a telephone cable, a power line, and a good road (only about 50% of its length is gravel). It is also in the middle of the Sperrgebiet (German for "prohibited area"), which was established on the Namibian coast to prevent pilfering of the uncut diamonds that litter this former seabed. This area is also known as the "Skeleton Coast"; it is totally barren and devoid of life, and many a shipwrecked crew has perished along its length. Straying more than a few meters from the road makes you fair game for the notorious "diamond detectives," a shoot-



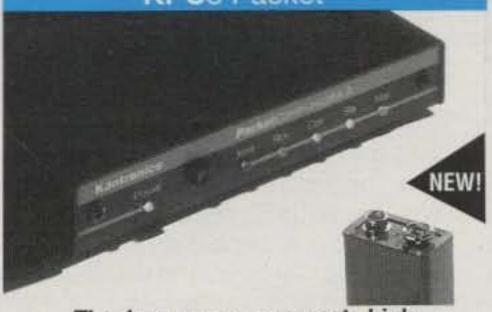
The hill near Thaba Bosigu from which the traditional Basotho hat got its shape.

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Luderitz also has the most corrosive atmosphere on earth. A double-galvanized chain section that I left bolted to a rock on Penguin Island had corroded to half its original diameter in only a year. Cars last about four years before they have to be disposed of, due to rust flaking. Driving a car during a sandstorm totally strips its paint and leaves bare metal that corrodes within days.

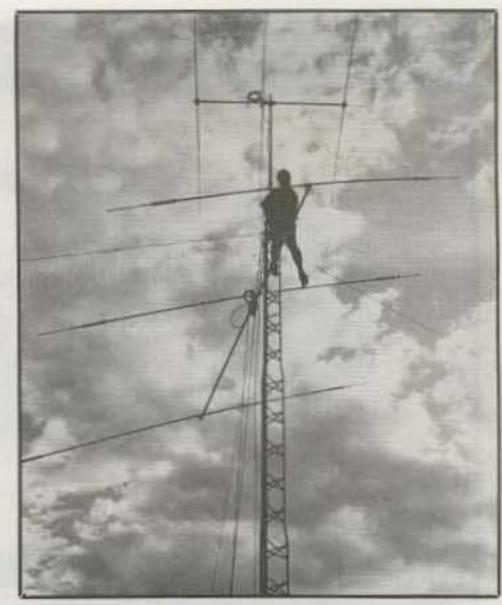
Even more scary than the sandstorms, which can move sand dunes onto roads overnight, are the pebble storms encountered on the islands. These occur when small pebbles (about % inch in diameter) are propelled at terrifying speeds through the air. Part of logistical planning for an island expedition is carrying enough provisions for a week more than planned; if the wind starts blowing, it may be impossible to get off the island for a week or more!

After a short trip we dropped anchor off the famous Penguin Island. It is incredibly inhospitable. No vegetation more than knee-high grows on the island. It is very arid, and the desert winds don't help either. Almost a million birds live on the island, and the ammonia from their droppings can be smelled on the mainland on a bad day. When humans first landed on some of the islands, the guano was up to 33 feet deep! The island consists mainly of solid rock, with some loose gravel and decomposing

gull remains also in evidence. Some buildings from the guano mining era are still on the eastern side. Apart from some holes in the roof and broken window panes, a few of the buildings are still usable, and we chose two of these in which to set up shop.

Seal Island is only a few hundred meters farther north, but its buildings are all very close together, and the landing area is not very safe. Also, the ground rises very steeply towards the west, which covers the path to the USA. This was the location of the first Penguin Islands operation by DK9KX and his group. They made about 12,000 contacts. The second operation was the ZS9Z/1 operation less than a year later, netting well over 30,000 contacts. This would be the third operation, and would try to clean up the more exotic modes and bands, as it was felt that most people had been given a fair shot at the country. The only exceptions were Japan and Europe, where the islands remained in the top 35 of The DX Magazine's Most Wanted Countries survey. We would try to work Japan whenever the band was open, as the path was a very difficult one.

We unloaded over 4500 lbs. of equipment in several trips with a light dinghy, expertly rowed by Hans. Then started the laborious process of setting up the stations. We finished by nightfall, and took to the air as ZS0Z on 21 MHz CW. Our TH5DX tribander was installed at the apex of the island, with a clear shot in all directions. This



The beams going up.

was the main antenna for the phone station. The second station had several antennas. The Battle Creek Special covered the low bands. A separate monoband Yagi went up for 28 MHz, and separate towers supported rotary antennas for the WARC bands and for 50 MHz. There were also wire antennas for 10 and 7 MHz. The third station was located in the same room as the second one, and would be used mainly for VHF and WARC band operation. All

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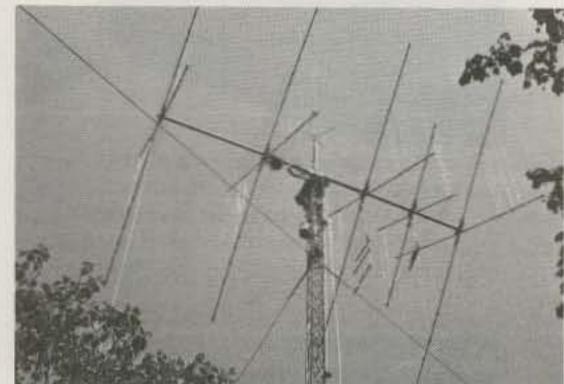
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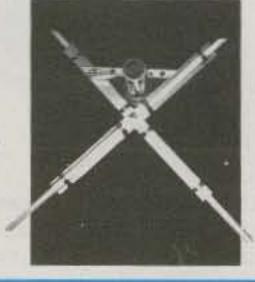


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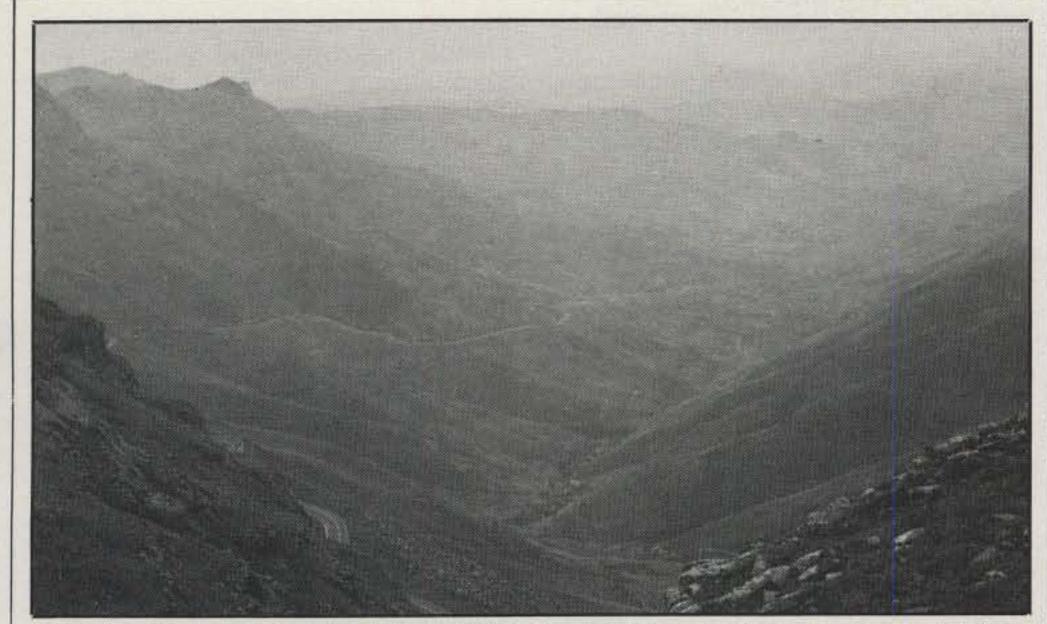








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Looking down a typical Lesotho valley from an elevation of more than 11,000 feet.

three stations could be operated simultaneously.

So started the tedium of around-theclock operation for a week. We arranged the shifts in such a way that at least two operators were working at any given time. During off periods we had to sleep, build and maintain the station, and do some sightseeing.

After a few days the storm started. We had howling wind for about a day. This time was a tense one for all, and extra guys had to be added to some of the lighter antenna hardware. The 28 MHz monobander was on a thin pole, which ended up about 30 degrees from the vertical. The weather station on the mainland recorded 50 knots of wind during this period.

Bernie and I took over most of the CW and low-band operating. Rad did mainly phone, and spent a lot of time on the WARC bands. Jan spent most of his time on 10 meter SSB, and also did most of the RTTY operating. Bernie had nightly skeds on 40 meters with his wife, Tokkie, ZS4TZ. These skeds became a focal point of our attention —a sign that the real world still existed.

Getting off the island was more exciting than getting on. It was low tide, and most of the equipment had to be hand-carried across slippery rocks and waded through waist-deep ice-cold water.

We spent only a few hours in Luderitz, and I took the opportunity to send OH2BH a postcard as confirmation of our contact. Martti had been at ZS9Z/1 a year before, and this QSL was the only one he needed to get back to the top of the DXCC Honor Roll.

QSLs for ZS0Z are being handled by ZS6EZ (listed as ZS6BCR in all Callbooks before 1993).

The Mountain Kingdom

The party broke up on arrival in Pretoria. Everyone went home and slept the sleep

of the dead. I had a lot to keep me busy, as I was scheduled to leave for Lesotho the next day. My car needed attention, and Tjerk Lammers, ZS6P, offered invaluable assistance. I also had to rearrange the equipment. Generators and a lot of logistics would not be needed at Lesotho, and the tribander was also left behind. Lesotho appears on 15 and 20 meters virtually daily, and on any self-respecting DX net one can imagine the occasional 7P8 quite easily. My first priority would be the low bands, and CW would be the mode of choice. would also play on the WARC bands, and a bit of RTTY would be tried.

Bernie met me in Lesotho to help with the introductions and setting up. He introduced me to the Nordic Giant, Hans Smedstuen, 7P8EG. Hans is a construction supervisor, and had arranged a building site some distance from the capital, Maseru, from where I could operate.

The location worked well, but severe power-line noise and shaky power did hamper operations somewhat. We set up the Battle Creek Special for the low bands, a wire antenna for 30 meters, and a tower with the 10 meter monobander and the A3WS for 12 and 17 meters stacked at the top. Low-band conditions were terrible, and it took four days before the first 160 meter contact was made. The next three days made up for it, and several dozen stations were worked on this band.

After about the third day the power went off during the day, and I finally had an opportunity to see the place. Lesotho is also known as the Mountain Kingdom, and for very good reasons. Even its lowest point is over 3000 feet above mean sea level! The primary mode of transportation in the interior is a rugged breed of pony known as a mountain pony, which traverses terrain inaccessible to any other mode of transport. Lesotho is unique in being the only country in the world that is an enclave within another country. It has no routes to

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the outside world except through South Africa.

The country had its origins in the 1820s, when the dynamic king Moshoeshoe (pronounced Mor-shwe-shwe) assembled his people at Butha-Buthe, in the north of the country. They soon moved to the mountain fortress of Thaba Bosigo. This is an amazing place. There are more than two dozen wells on the mountain, some of which are providing water to this day. The mountain is surrounded on all sides by sheer cliffs, and the few access routes were easily defended. More than 1000 people lived on the mountain and amused themselves by raiding surrounding farmers and "borrowing" their cattle. Several times the farmers tried to avenge the raiding parties, but their attempts were easily resisted. Eventually, the mountain was surrounded and a siege was maintained until the overburdened wells ran dry. The Basotho finally surrendered and returned the cattle that hadn't been eaten. Today Moshoeshoe and his wives are all buried on the mountain, and it is a national monument.

7P8EN operations, a 10,000 foot elevation spot on the new road for the Highland water project. This project includes the Katse dam, which will be the tallest dam wall in the world when completed. It is a joint effort by South Africa and Lesotho, and is intended to supply water to the major metropolitan area of Pretoria and Johannesburg, about 650 miles to the northwest.

I also got to meet Hans's family and a few of the local amateurs. Ray Schankweiler, 7P8SR (ex-JY9SR), had just arrived and was very active on the WARC bands during my stay. Ed Douglass, 7P8DX, was very active on 80 meters at the time, and was interested in hearing about the antennas

and tricks used for high-volume work on the low bands.

As far as operating was concerned, RTTY proved to be disappointing. The terminal had a mishap on Penguin Island and never worked properly again. An attempt was made to find a workshop manual in the U.S., but without success. Therefore, no contacts could be made.

The WARC bands were good fun. The pile-ups never seem to get big enough to bring the policemen, but are always big enough to keep a run going.

Bernie van der Walt, ZS7TX, is the callholder for 7P8EN, and is taking care of the QSL cards, as always. His best address is Box 28691, Danhof, 9310 RSA.

The Aftermath

Immediately after arriving back I was absorbed in the rat race with a vengeance. I had to finalize one examination before graduating from university and had to start with a new job a few weeks later. I enrolled for graduate studies at university during this time, and started working on the database to get the QSL cards out.

The latter was a mammoth task. Firstly, the software had to be developed. I wrote the system in such a way that it required a minimum of typing, but entering into a computer tens of thousands of contacts logged by operators who were sometimes half asleep is still a formidable challenge. The better part of eight months eventually went into getting databases ready for 7P8EN and ZS0Z, and getting all the direct QSL requests in the mail.

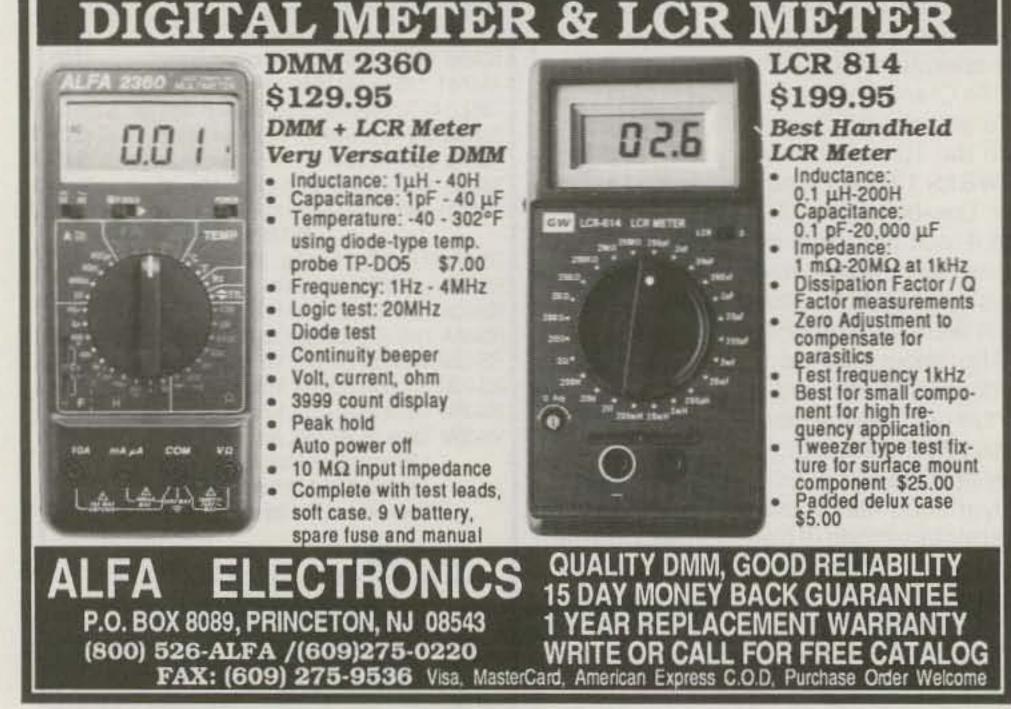
I initially thought that ZS0Z would not give many people a new country, except possibly in Japan. The object of the exercise was, after all, to make it available on other bands and modes not covered by the first operation. I was mistaken. Over 100 DXCC Honor Roll members worked us for a new one, and over two dozen individuals needed only our card to complete them all! The total amount of mail exceeded two full mailbags, and just opening the envelopes took an estimated 100 hours. Over 7000 direct requests for ZS0Z QSLs have been handled.

The objectives of both expeditions were met. Despite indifferent conditions, about 2000 Japanese stations were worked. More than 140 non-African stations were worked on top band. The WARC bands produced almost 4000 contacts. And almost 10,000 contacts were made on 28 MHz. This included a large number of Novices, many of them indicating that this was their first DX contact.

I have been thinking about trading in my callsign for many years now, but always balked due to the fact that the old one enjoyed a certain amount of recognition and a lot of that would be lost with a call change. This time I figured that many thousands of airmail QSL cards would be available to help spread the word, so I finally took the plunge and traded ZS6BCR for ZS6EZ. I guess I'll get used to it eventually! At the same time, Jan also changed his call from ZS6BUV to ZS6NW.

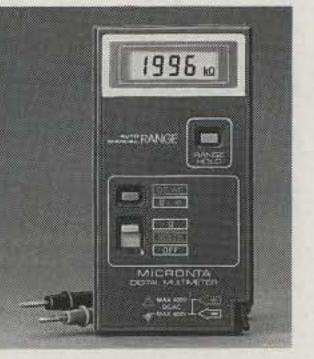
A lot of individuals and organizations contributed to the eventual success of these operations. The Northern California DX Foundation contributed substantially to the expenses of the Penguin Island trip. K1MM, TI2HP, W1JR, and ZS5NK also contributed financially, while K1MM and W0ZV helped with arrangements. K1GW of Cushcraft was very helpful. ZS6BDD of Cabletronics supplied the long run of feedline required to site the tribander at the apex of Penguin Island. ZS6BRZ made his TH5DX available. ZS6WB supplied VHF equipment. ZS6P supplied both generators. WOCD, W8UVZ, and K8GG lent the Battle Creek Special. Mr. Wolmarans of SAPT and Mr. Ramakoa of LTC were very helpful with the licensing issues. My father, as always, helped with the preparatory work that I could not find time for. ZS6VIP of VIP Electronics arranged for the timely repair of my radio, against considerable odds. And numerous other individuals contributed in some way or another to the ultimate success. Thanks to all!

And finally, the impetus for my decision to return to Penguin Island was the impending implementation of joint administration for the islands and Walvis Bay. An announcement was recently made by South Africa and Namibia that an agreement has been reached to implement joint administration for these areas. At this writing details remain to be finalized, so there is still a little time for someone to go to Penguin Island and give me the place for my DXCC. I must be the only DXer in the world who still needs it!



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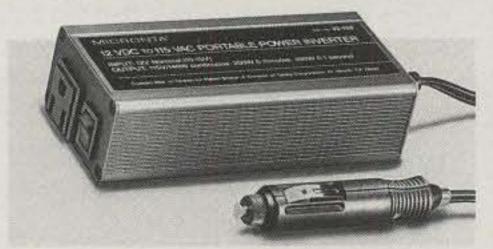


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N1II offers this primer to help us select just the right one to satisfy our needs, and he explains all those terms we banter about.

Buying An Antenna?

BY PAUL M. DANZER*, N1II

Your best amateur friend who went through the same licensing class and got his ticket when you did just bought a Band Boomer II antenna. You are also in the market for a new antenna, but you think that the Outputer III is probably a little better. What do you do now?

This a is common question, not only for new amateurs, but also for many not-too-new amateurs. Some people build their own antennas, but others buy them, and in fact, the mechanical problems encountered in building some types of antennas make home construction for many of us impractical. This is true for both high-frequency (HF—the 1.8 to 30 MHz amateur bands) antennas and the very-high-frequency and ultra-high-frequency antennas

(VHF and UHF, or 50 MHz to 1200 MHz bands).

In order to make an informed decision and get the best antenna for your money —you could hire an expert, or you could spend a few minutes looking at some numbers and make an informed decision yourself.

A Couple of Basic Ideas

An antenna has two functions—matching and directing—and if you look at an antenna in that light you can be your own expert.

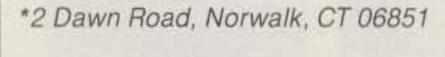
The matching function is shown in pictorial form in fig. 1. The transmitter output is matched to the feedline, the feedline is matched to the antenna, and the antenna—well, it actually matches the output of the feed line to what is called "free space." You might remember that coax feedline is

usually 50 or 70 ohms (plus or minus a few ohms). Free space is 377 ohms. This value of free space is a calculated physical constant, and nothing we can do will change it. The importance to us is that the antenna is actually a matching element, and as with any matching element the less resistance (as measured in ohms) the better.

What Price Efficiency?

Many short antennas, mini-loops, and antennas containing coils are rated in efficiency. This is usually related to the amount of resistance, and the higher the efficiency the better it will work. Thus, an antenna with a claimed 90% efficiency is better than an antenna with a claimed efficiency of 75%, with all other things being equal.

Strangely enough, you can get a quick



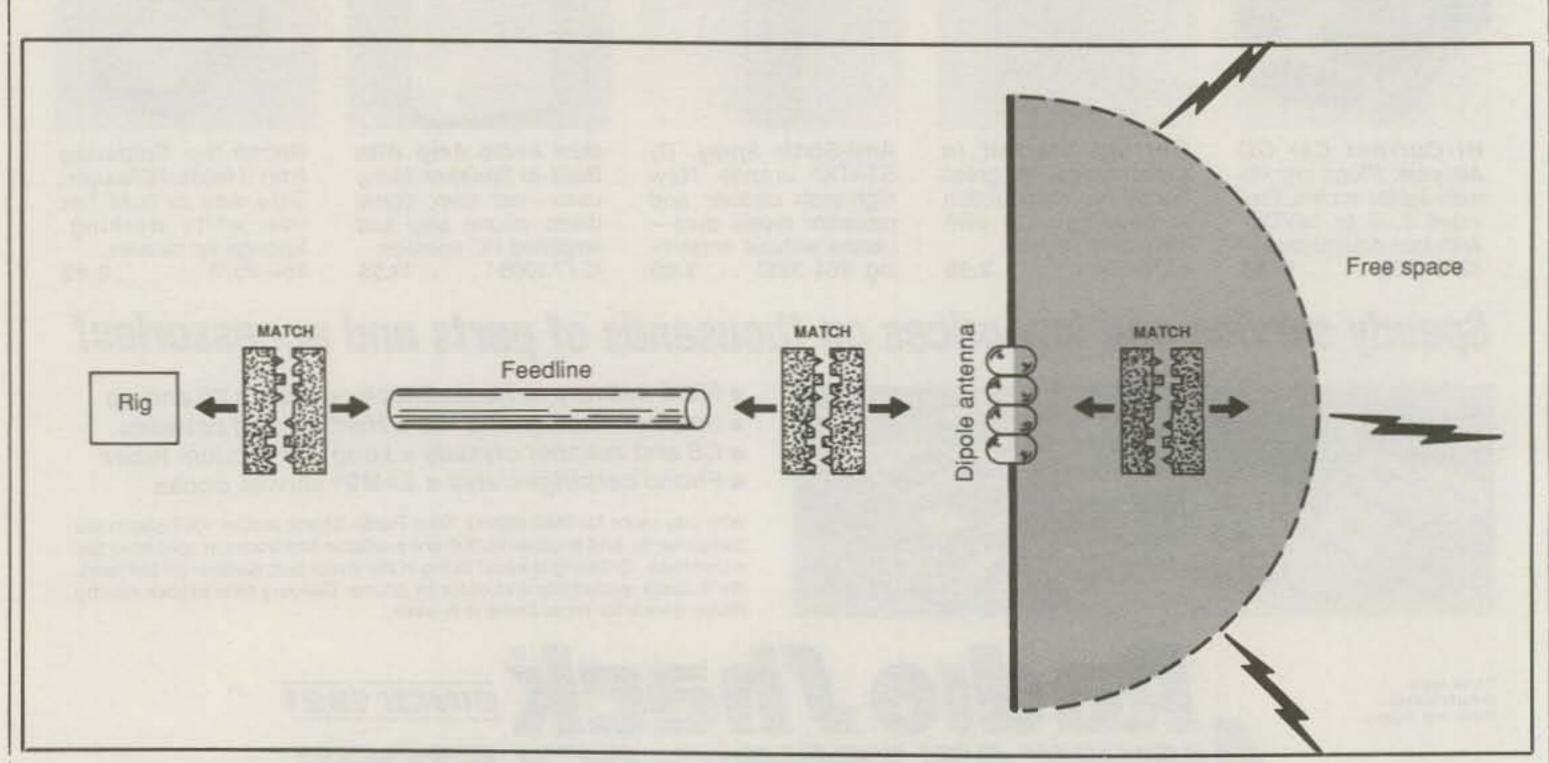


Fig. 1- A basic diagram of an ideal antenna system. This simply shows that all of the components in the matching system "mesh" to work together efficiently.

CQ April 1993 Say You Saw It In CQ

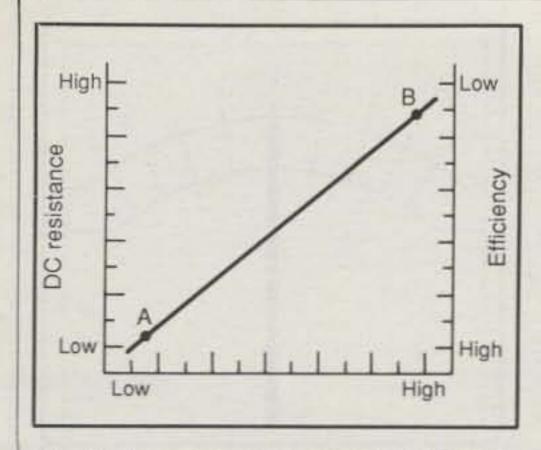


Fig. 2- An easy way to visualize the relationship between DC resistance, antenna bandwidth, and efficiency.

check on the manufacturer's figure by looking at the bandwidth of the antenna. For loops, shortened dipoles, or any antenna which has loading coils look at the bandwidth. If the antenna has a narrow bandwidth-without retuning-then it is probably efficient, since there is little loss. On the other hand, if the advertisement says that you can cover the entire band without retuning, then there is probably a good amount of DC resistance in the antenna, and its efficiency could be quite low. Fig. 2 shows this relationship. The resistance here is true ohmic resistance, which would produce heat if a current flowed through it. We therefore refer to it as DC resistance.

If you are mathematically inclined, it follows the equations for Q, which is the ratio of reactance to resistance. Fig. 2 gives you the result, without the mathematics. Look at the point of the curve labeled "A." The DC resistance is low, the efficiency is high, and the bandwidth is low. Point "B" is just the opposite—lower efficiency, higher resistance, and wider bandwidth.

You tend to pay a price for efficiency, and not just in dollars. I had a mobile antenna for many years made by a leading manufacturer of HF whips. Test after test showed that this manufacturer had a higher efficiency than any of his competitors. When I operated on 75 meters, any time I changed frequency by more than 15 kHz I had to get out of the car and retune the antenna by loosening a nut with a small wrench and sliding a whip section in and out. Needless to say, I did not QSY or change frequency very often. On 40 meters the situation was not quite as extreme. I only had to get to a rest stop on the interstate if I wanted to QSY more than 30 kHz!

Where Does The Energy Go?

The second antenna property we are interested in is "directing." To get an idea of this, look at fig. 3, where a imaginary antenna is shown putting out energy in all directions. If you surrounded this imaginary point source with a sphere, each square

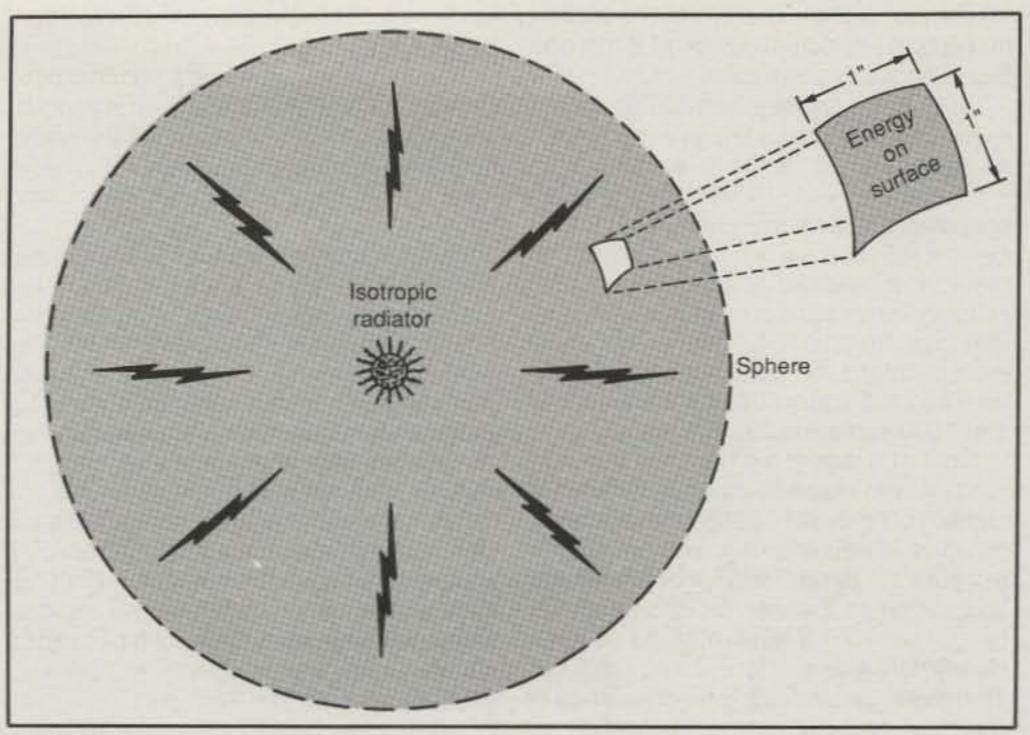


Fig. 3- Directivity starts with the concept of an isotropic radiator, or a device that radiates a signal equally powerful in all directions.

inch of the surface of the sphere would get the same amount of energy.

This is known as an "isotropic radiator," which literally means to exhibit equal tendencies to growth in all directions. The reason this imaginary antenna is important is that it serves as a reference or base line for many antenna advertisements. When the advertisement says that the antenna has a 6 dB (decibel) gain, look carefully. If it is written as 6 dBi, it means that it has a gain of 6 dB as compared to an isotropic radiator. That's what the little "i" stands for.

An antenna is not magic. It is passive that is, it cannot put out more power than is fed to it. The question therefore is where does the gain come from?

The answer lies in fig. 3. If we change from the isotropic radiator to some other type of radiator which only radiates over half a sphere, we get a gain. Now we are taking the same input (to the antenna) power and radiating it over half the area we had before. Therefore, the power as measured in this half a sphere or hemisphere has twice the value per square inch—or twice the signal strength—as before. We therefore now have a gain of 2.

When an antenna is directive, the area over which it radiates is reduced. It has formed a radiation pattern over a smaller area. For the same input power, the smaller the area the antenna can concentrate its output the higher the gain. As an example, a beam antenna or Yagi which has more elements has a narrower beamwidth and therefore a higher gain.

A perfect half-wave dipole antenna has a gain of about 2.15 dB with respect to this isotropic radiator, or 2.15 dBi. Therefore, if antenna **A** has its gain stated as 3 dBi, it has a gain of 3 dB over the isotropic radiator. Suppose a second antenna, **B**, is listed as having a gain of 3 dBd. This means it has a gain of 3 dB more than a perfect dipole, which in turn is 2.15 dB more than the isotropic radiator. The lowercase **d** means perfect dipole.

In calculating gain in decibels, you simply add them. Antenna **B** with a 3 dBd gain is the same as a 3 plus 2.15, or 5.15 dBi antenna. Antenna **A** is 3 dBi, and **B** is 5.15 dBi, so obviously antenna **B** is better.

Even if the idea of the use of dB to measure gain is a little hazy at this point, the basic idea in the comparison of two antennas is to make sure that both are rated with respect to the same reference.

How Important Is One Or Two dB?

With all of this talk of dB let's look at what an increase in gain or dB does for us. In fig. 4 we can see an imaginary S-meter. The meter shows a received signal strength of S5.

Without going into the mathematics behind the idea of a dB, we will start with the definition, or given, that an increase of 3 dB equates to a doubling of power. Therefore, if the amateur transmitting the S5 signal either doubles his power output or gets a new antenna with 3 dB more gain, the received signal will go up from S5. How high? Well, the answer is just one S-unit. This is due to the calibration of S-meters.

The calibration standard, which dates back to the era of World War II, increases the S-meter reading one unit for each 3 dB

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increase in signal. Therefore, the station that doubles its output power adds just one S-unit on the receive side.

In fig. 5 you can see the relationship as it would appear on our imaginary S-meter. As an example, imagine an amateur who is transmitting with 100 watts as the output power and a certain antenna. At the receiving location we will assume that this results in a received signal strength of S5. Holding the antenna constant, we can see that to go from S5 to S6 the output power must double to 200 watts out, double again for S7 to 400 watts out, 800 watts for S8, and 1600 watts for S9.

Now let's look at a difference in antenna gain with respect to our previous discussion of fig. 5. We can see that an antenna which is 1 dB or so higher in gain is better, but this "better" will not be significant as seen on an S-meter. Extensive testing has shown that a human being can just barely perceive a difference of 1 or 2 dB. Therefore, an antenna gain difference of this amount is not very significant.

What Can You Expect From An Antenna?

Every antenna offered for sale has advantages and disadvantages. Independent of the impressive name the manufacturer gives it, it must work within the laws of physics and will not provide miracles. If you are looking at a dipole for 40 meters, and it is smaller than a half wave (66 feet more or less), it will not work as well as a full-size

antenna of the same type (all other things being equal).

Every antenna type has a nominal performance which you can look up in various antenna handbooks. If the antenna you are considering seems out of line with these nominal values, you should find out why before you buy.

As an example, let's look at the values you would find if you looked up a two-element Yagi or beam. According to most books, the two elements provide from 3 to 5 dBd—dB gain as compared to a dipole. A signal from the front of the antenna is 10 to 20 dB stronger than a signal from the rear, which is normally referred to as the front-to-back ratio.

These are the values for a full-size beam, where each element is approximately a half-wavelength long (about 16 feet for the 10 meter band) and the distance between the elements (spacing) is from 0.1 to 0.2 wavelengths (1 to 2 meters, or 3 to 6 feet for our example).

Add one element, and the three-element beam now has a gain of 7 or so dBd. Add another element and the gain goes up about 1 dB for each element added.

Using the rule of no miracles, if a friend tells you that his two-element beam was advertised as having a gain higher than this 3 to 5 dB, you have a reason to be a little doubtful. Adding coils to shorten the elements or traps to make the beam operate over several bands has to provide somewhat less performance.

UHF and VHF vertical antennas can be really fun to compare. Try making a comparison chart from the advertisements. See if you can compare some of the pub-

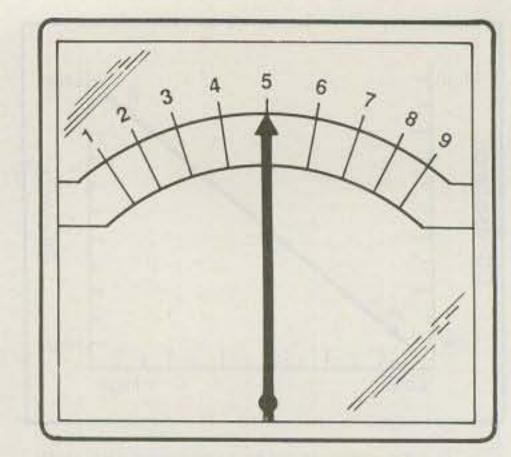


Fig. 4- A pictorial of a typical S-meter showing a received signal strength of S5.

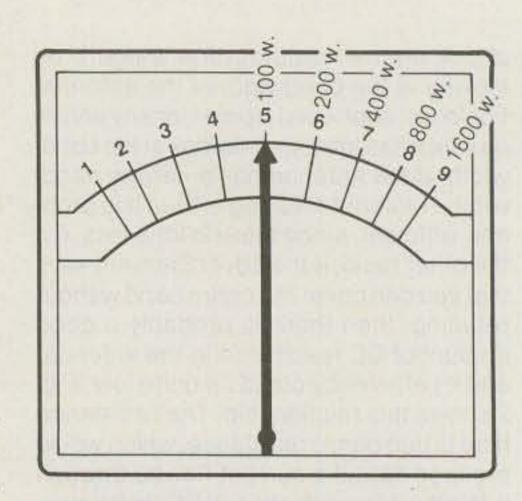


Fig. 5- The same S-meter as shown in fig. 4, now showing the relationship of output power needed to increase our received signal strength one dB at a time. For each dB increase we can measure on our receiver's S-meter, the transmitting station must double his power.







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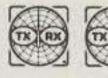
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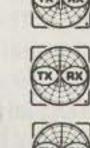










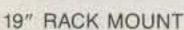


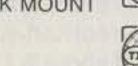


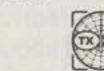




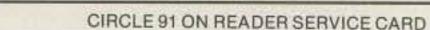












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lished specifications. My favorite one is "wide band." Wider than the amateur band? Does the gain go to zero when you go out of the "wide band"? Any manufacturer who has the information will send you a data sheet on the antenna with real numbers. If your letter or phone call brings you a copy of the same advertisement you saw in the magazine, look for another manufacturer.

Unfortunately, not all manufacturers have the information you need. Some have antennas which have never been tested in an antenna measuring range, which is not at all an easy task for the lower frequencies.

At The Very End

Just as in any purchase, look for advertisements in publications you trust. Before you buy, try to look up the antenna type in a handbook, and see what the normal performance of this type of antenna configuration should be. Good performance is advertised regularly.

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This is it! You can't get any newer in theory and practice than this matching device you can put together now.

A Multimatch Unun

BY JERRY SEVICK*, W2FMI

Froadband multimatch ununs (unbalanced-to-unbalanced transformers) capable of high-power applications have been the goal of many designers throughout the years. Some have resorted to using conventional autotransformers with tapped windings to obtain the many impedance transformation ratios. These met with little success, however, because of their limited bandwidths and efficiencies. Others (including the author's') have tried tapping a bifilar Ruthroff unun.2 Although these designs yielded the high efficiencies of transmission-line transformers, they too had limited bandwidths. Furthermore, their best bandwidths (for the various ratios) occurred at odd impedance levels. In other words, they didn't meet the objective of broadband operation with one of the input or output ports being at 50 ohms.

This article describes a design³ that is capable of broadband operation from 1.7 MHz to 30 MHz with the following five ratios (which are close to): 1.5:1, 2:1, 4:1. 6:1,

and 9:1. Since the two lower ratios work well in either direction (that is, stepping up or down from 50 ohms), this design can match 50 ohm cable to impedances as high as 100 ohms (actually, 112.5 ohms) and as low as 5.6 ohms over the frequency range. Furthermore, since this is a transmission-line transformer which cancels out the flux in the core, losses (in a matched condition) of only 0.04 dB to 0.08 dB can be expected.

The novelty in the design is the use of a trifilar winding (with one winding tapped) on a very small ferrite toroid, resulting in the shortest possible lengths of transmission lines. The windings are also connected in such a manner as to optimize the characteristic impedances of the windings from an overall standpoint. Since the transmission-line transformer is a choke (which limits the low-frequency response) and a configuration of transmission lines, the high-frequency response is not limited by leakage inductance or shunting capacitance (as some say), but by standing waves.

Therefore, the combination of using small ferrite toroids with the maximum allowable permeability (less than 300) for high efficiency, and with sufficient turns

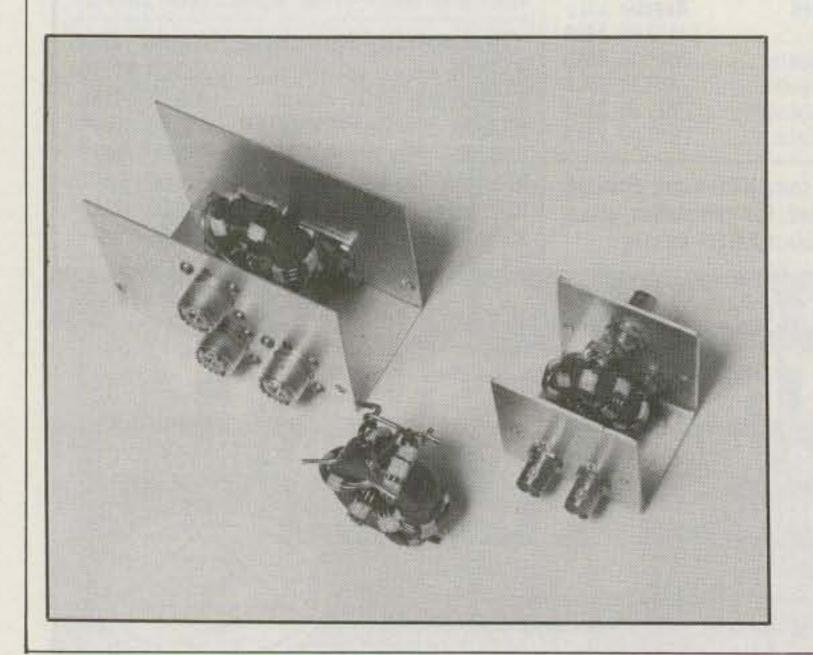
to meet the low-frequency objective, results in the excellent performance exhibited by the designs in this article.

For those interested in the design considerations of this broadband multimatch transformer, a brief review is presented in the first section. It is then followed by a section describing a high-power design capable of handling the full legal limit of amateur radio power. And finally, the last section includes a low-power design capable of handling the output of any HF transceiver. Since transmission-line transformers can be made so efficient in matching 50 ohms to 100 ohms or less, their small sizes will surprise many readers.

The Circuit

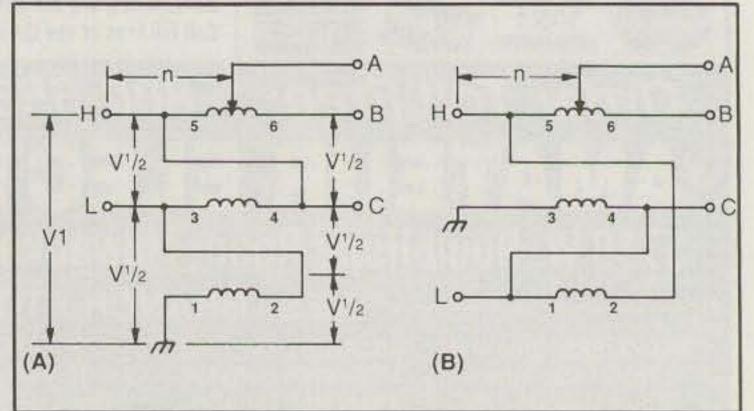
Fig. 1(A) is presented here because it is the easiest form of the trifilar-wound unun to explain. For example, if the input voltage to ground, V_1 , is connected to terminal H, the output terminal B has a voltage to ground of $3/2V_1$. This results in a transformation ratio, ϱ , of $(3/2)^2$, or 2.25:1. This should satisfy most 2:1 requirements. If the

*32 Granville Way, Basking Ridge, NJ 07920



From left to right, the high-power unit, the 5-ratio unun, and the low-power unit. (See text for details.)

Fig. 1-Circuit diagrams for the 5-ratio unun: (A) diagram for analysis; (B) transposed windings for best overall performance.



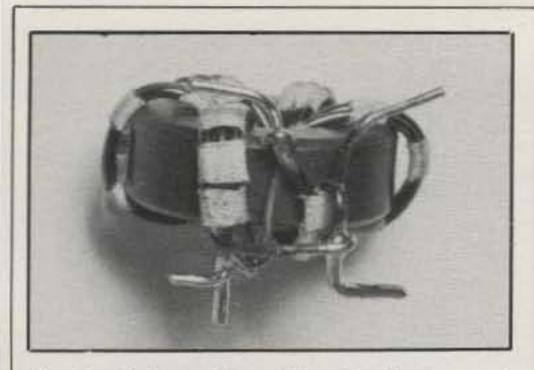


Fig. 2- Bottom view of the 5-ratio unun of fig. 1(B). The upper-left lead is terminal C. The upper-right lead is terminal B. The lower-left lead is terminal H. The straightdownward lead is grounded (terminal 3). The lower-right lead is terminal L.

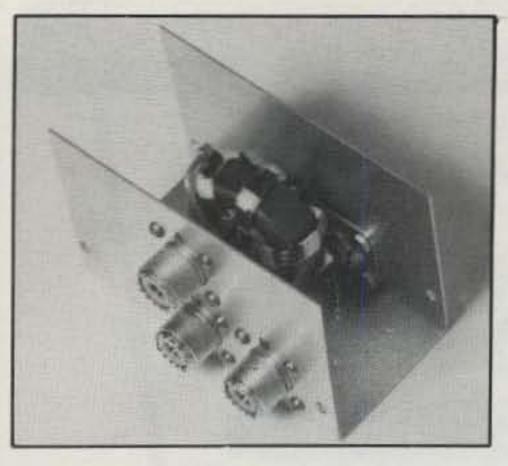


Fig. 3- High-power unit mounted in a 4 "L × 2"W × 2.75"H CU-3015A minibox.

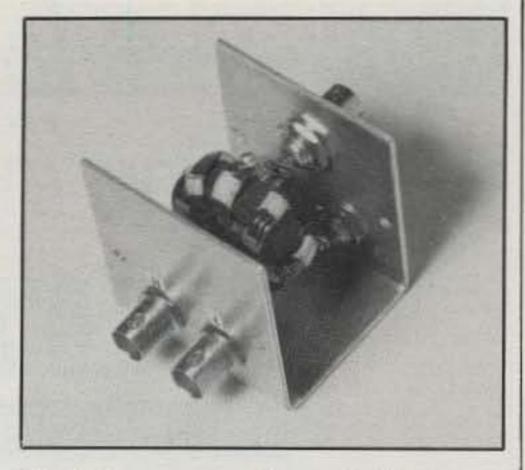


Fig. 4- Low-power unit mounted in a homemade 2"L × 1.5"W × 2.25"H minibox.

output is at terminal A to ground, then the output voltage is

$$V_n = V_1 + V_1(n/2N)$$

= $V_1(1 + n/2N)$ (Eq 1)
where

N = the total number of turns on the winding

n = the number of turns from terminal 5

The transformation ratio, g, then becomes

$$\varrho = (V_0/V_1)^2$$

= $(1 + n/2N)^2$ (Eq 2)

If the input voltage to ground, V,, is connected to terminal L, then terminal C has twice the voltage of V,, resulting in a 4:1 ratio. Terminal B has three times the voltage, resulting in a 9:1 ratio. With terminal A, the output voltage is

$$V_o = 2V_1 + V_1(n/N)$$

= $V_1(2 + n/N)$ (Eq 3)

The transformation ratio, g, then becomes

$$\varrho = (2 + n/N)^2$$
 (Eq 4)

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A High-Power 5-Ratio Unun

After several attempts at rearranging the windings of fig. 1(A) for best overall performance (optimizing the effective characteristic impedances of the windings), fig. 1(B) evolved. Fig. 2 shows the bottom view of an unun, using the circuit of fig. 1(B), capable of handling the full legal limit of amateur radio power. Fig. 3 shows the unit mounted in a CU-3015A minibox. It has five trifilar turns on a 1.5 inch OD ferrite toroid with a permeability of 250. Winding 5-6 is tapped at two turns (n = 2) from terminal 5.

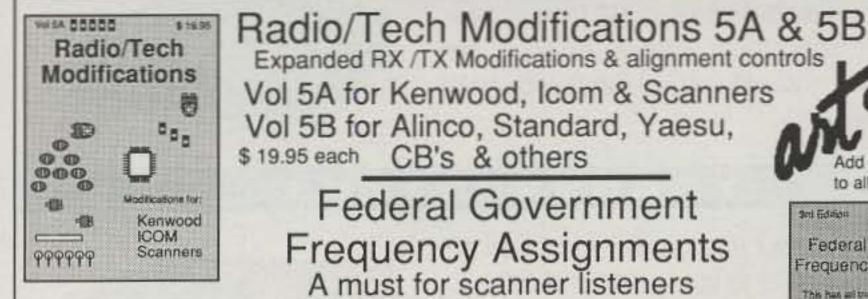
If the 9:1 ratio matching 50 ohms to 5.6 ohms (connection B-L) is to be used at full power, then winding 3-4 should be No. 12 H Thermaleze wire. If not, then all windings can be No. 14 H Thermaleze wire.

A listing of the expected performance across the band from 1.7 MHz to 30 MHz, with the various ratios, is as follows:

9:1 (B-L); 50:5.6 ohms

Ratio is within 1 percent!

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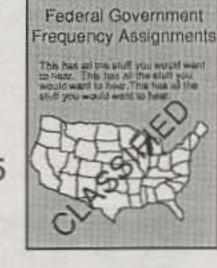
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5.75:1 (A-L); 50:8.7 ohms

Ratio decreases by 5 percent.

4:1 (C-L); 50:12.5 ohms

Ratio increases by 15 percent (the greatest deviation of all the ratios).

2.25:1

- a. (B-H); 50:22.22 ohms
 Ratio decreases by 4 percent.
- b. (H-B); 50:112.5 ohms
 Ratio increases by 8 percent.

1.44:1

- a. (A-H); 50:35 ohms Ratio decreases by 10 percent.
- b. (H-A); 50:72 ohms
 Ratio increases by 2 percent.

Several comments should be made regarding the expected results shown above. First of all, the greatest deviation from a flat response at any ratio occurs when matching 50 ohms to 12.5 ohms (connection C-L; a 4:1 ratio). If an accurate insertion-loss measurement was made at this ratio and impedance level, the result would show an insignificant difference across the band. Second, the major part of the deviations for all ratios occurs beyond 15 MHz (the effect of standing waves). And finally, the higher ratios should never be used to match 50 ohms to 450 ohms, 288 ohms, and 200 ohms, respectively. The characteristic impedances and choking reactances do not allow for broadband operation under these conditions.

A Low-Power 5-Ratio Unun

Fig. 4 shows a low-power unit mounted in a homemade 2 "L × 1.5"W × 2.25"H minibox. It has six trifilar turns of No. 16 H Thermaleze wire on a 1.25 inch OD ferrite toroid with a permeability of 250. The tap on winding 5-6 is at three turns from terminal 5, yielding ratios of 6.25:1 and 1.56:1 instead of the 5.75:1 and 1.44:1 ratios of the high-power unit. In actual use, these differences should be negligible.

Since this unun has shorter transmission lines than its high-power counterpart, the deviations of the ratios across the band are even less. Also, it is interesting to note that if No. 14 H Thermaleze wire was used in winding 3-4, this very small unun could well be rated at 500 watts of continuous power!

Footnotes

- 1. Sevick, J., Transmission Line Transformers, 2nd ed., Newington: ARRL, 1990.
- Ruthroff, C. L., "Some Broadband Transformers," Proceedings of the IRE, Volume 47, August 1959, pages 1337– 1342.
- Kits and finished units available from Amidon Associates, Inc., 2216 East Gladwick Street, Dominguez Hills, CA 90220.

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CQ REVIEWS:

The Naval Electronics HTS-2 Audio Booster Amplified Speaker

BY DAVE INGRAM*, K4TWJ

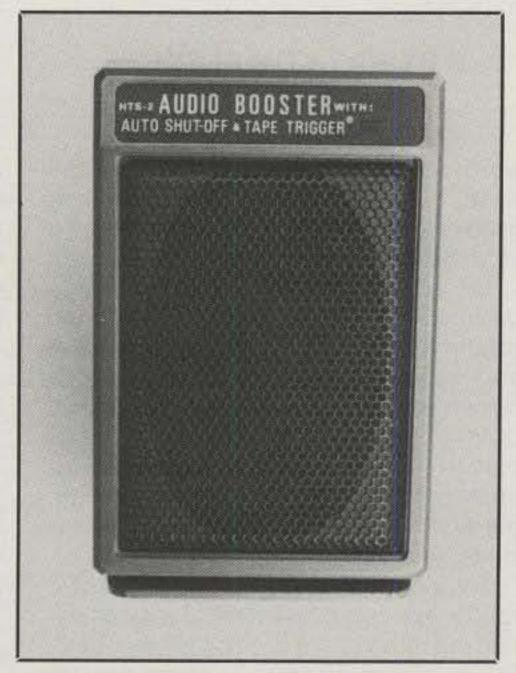
using handheld FM transceivers and cannot visualize going anywhere without one. These pocket-size rigs are great for traveling and emergencies, but they often fall a mite shy of audio output when used in noisy environments. Solving that dilemma is Naval Electronics' HTS-2 audio-boosted speaker system.

This stand-alone unit has a built-in and high-fidelity amplifier with automatic shut-off, tape recorder switch, input level adjustment, and 3.5 inch oval speaker. It plugs into the speaker socket of your FM handheld and produces enough audio volume to be heard throughout the house or across outdoor areas with ease. The unit is powered by four internally installed penlight (AA) cells and easily delivers 12 dB gain. An amplifier bypass switch is also recessed on the back panel, so the unit can also be used as a stand-alone speaker for your HF transceiver or mobile rig, if desired.

Additional applications are limited only by your imagination. As an example, two of these HTS-2 speakers can be connected to your Walkman cassette or CD player to make a compact and quite high-fidelity stereo. In this case, Naval Electronics will supply a free cable for use with twin HTS-2s.

I also found the speaker really worked great with my QRP 30 homebrew transceiver. This little pocket-size rig produced earphone-level volume until I connected it to the Naval speaker. Then it almost blew me out of the shack with audio! This is a nice item to have around when you are experimenting with circuits and need a quick amplifier to check them.

*4941 Scenic View Drive, Birmingham, AL 35210



The Naval Electronics HTS-2 Audio Booster amplified speaker. This compact unit really makes handhelds sound like big rigs.

The HTS-2 is enclosed in a dark gray cabinet measuring $4\frac{1}{2}$ "H \times $2\frac{3}{4}$ "W \times $2\frac{1}{2}$ "D and has an attractive black mesh front grill. Recessed on the back panel are sockets for rig input, external tape recorder on/off switching, external DC power input, and amplifier on/off. Access to the battery compartment and level control is via a hatch on the rear. If desired, you can install nickel-cadmium batteries in the speaker cabinet and charge them through the external DC input socket.

Looking closer at the Naval Electronics speaker, it has some quite impressive features. Audio output is 1.5 watts, for example, and its battery-saver circuit automatically shuts off the amplifier when your HT is squelched for more than 10 seconds. The amplifier turns on again when a signal

is present, and a front-panel LED indicates operation. The HTS-2 draws only microamps during standby, which gives up to two months of normal operation before discharging the normal alkaline batteries. If you prefer powering the speaker from an external source, any voltage between 5 and 14 VDC can be used. A built-in voltage regulator and automatic polarity switch make hookup a cinch.

Using the HTS-2 is super convenient, and it really pumps out the audio for home or portable use. Output is adjustable by your rig's volume control, so readjusting the speaker's gain is seldom necessary. When using it with my handheld on the patio, I could easily monitor a repeater when I was 40 or 50 feet away in the yard.

The HTS-2 proved equally beneficial for mobiling, even with the windows down in the car. While writing this, I was also building a new QRP transceiver and needed an amplifier to check front-end circuitry. Using two clip leads, I connected the HTS-2 to the circuit. I expected low volume, but was greeted by audio that filled the shack! Needless to say, this critter has dozens of applications.

Overall, the Naval Electronics HTS-2 Audio Boosted Speaker is very impressive. You can use it as an external speaker without the amplifier for mobiling or home use, or switch in the amplifier to make your handheld sound like a big rig. The unit's automatic switch for controlling an external tape recorder is a nice touch, and its no-audio-sensing battery-saver mode is good for forgetful owners.

Does your handheld or QRP transceiver need an audio boost? Check out the HTS-2. It definitely eliminates shortcomings of low volume! It is priced at \$29.95. For more information on the HTS-2, contact Naval Electronics, Inc., 5417 Jetview Circle, Tampa, FL 33634 (telephone 813-885-6091).

Recently the FCC sort of went through a Catch-22 situation with their Compliance Branch by moving it from Washington, DC to Gettysburg. However, if you go to Gettysburg trying to find it, you'll probably have more luck finding Judge Crater.

Currents As the Branch is bent, so goes—?

BY RAY KOWALSKI*

ow many times have you heard it said that there are three things you don't talk about on the air: sex, politics, and religion. That's good advice for amateur radio operators, but in Washington it seems we hardly talk about anything else! This month's article illustrates how politics can affect the Amateur Radio Service.

October 1, 1992 was a particularly difficult day for me. October 1, 1992 was the first day of the federal government's new fiscal year.

While the first day of a new fiscal year can be significant within the government, it ordinarily commands little attention outside of government. Within the government it means replenished funding for the continuation of important programs, for travel that had been put off, and for equipment procurement that had been delayed. Outside of government it has little significance, unless you are a vendor of the goods or services that the government had postponed buying.

This particular October 1, however, was the day that a little-noticed reorganization of the FCC went into effect.

The Public Notice had been inconspicuous. It announced that the Private Radio Bureau's Compliance Branch functions were being transferred to its Licensing Division in Gettysburg, Pennsylvania. Furthermore, responsibility for handling interference complaints was being transferred to the Commission's Field Operations Bureau.

There is no Compliance Branch in the Licensing Division. The functions were transferred, but not the organizational unit. So now there is no organizational unit within the Private Radio Bureau with the

word "compliance," as in "rule compliance," in its title. This hit home with me because in 1979 I had been Chief of the Private Radio Bureau's Compliance Division.

In the FCC a "bureau" is a large organizational unit that may comprise a couple of hundred people. A bureau may have several "divisions," each of which may have 30 or more people. A division may be subdivided into 3 or 4 "branches," which normally have between 10 and 20 people. So in descending order of personnel strength, the FCC is organized into bureaus, divisions, and branches.

Thirteen years ago the Private Radio Bureau's rule compliance program was carried out by an entire division located at the FCC's headquarters in Washington. We had about 30 people in the division. There were eight or nine lawyers, four or five public information specialists, three or four paralegals, and clerical support and supervisors. In 1981 there was a reorganization, and compliance became a branch-level function. Today, as a result of the most recent reorganization, the program is carried out as part of the duties of two attorneys in the Licensing Division in Gettysburg, Pennsylvania.

The mission of the Compliance Division in 1979 was to promote compliance with the rules that govern the Private Radio Service, the Private Radio Service includes all of the country's private, two-way dispatch services, as well as private paging systems, private microwave services, and maritime ship and coast stations. In 1979 they also included the Citizens Band and Radio Control radio services, which at that time were required to be licensed.

The rules for the Private Radio Services are very complex and elaborate. The land mobile rules, for example, set aside large chunks of spectrum for use by companies

engaged in particular industries. Within those allocations, most licensees are required to share their assigned frequencies with other users in the same industry. In order for the system to function properly, it is essential for all users to be licensed, to use only the frequencies they are licensed to use, to confine their use of the frequencies only to business communications, and to cooperate in frequency sharing procedures.

The Compliance Division sought to achieve compliance with these rules in two ways: by educating the public as to the requirements of rules and by imposing sanctions on those licensees who wilfully or repeatedly violated the rules. The sanctions took one of two forms: license revocation and monetary forfeitures (fines). Where an operator's license was involved, as was (and still is) the case in the Amateur Radio Service, there was a third sanction available to us: suspension of the operator's license.

In running the Compliance Division I always felt that we were performing one of the core functions of the FCC. After all, the FCC (and its predecessor, the Federal Radio Commission) had been created to bring order out of chaos. As radio technology was becoming more popular early in this century, people were establishing stations on whatever frequency worked. Congress realized early on that there had to be some plan for the orderly use of the radio spectrum or the interference from one station to the next would be intolerable. So a system of licensing was created as the way to minimize interference and to maximize efficient use of the spectrum. A compliance program thus became necessary to make sure that licensed stations, and only licensed stations, were transmitting and that the licensed stations were operated on their prescribed frequencies, at their

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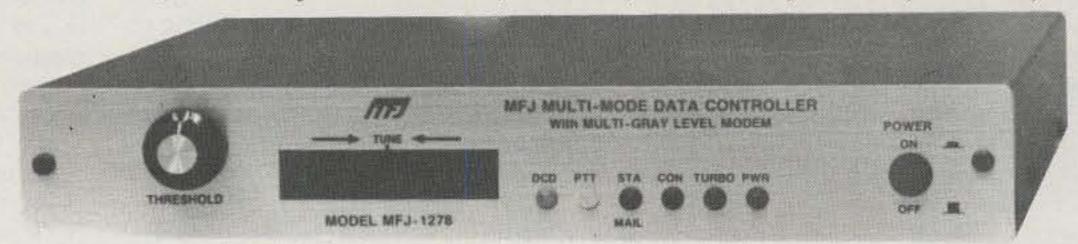
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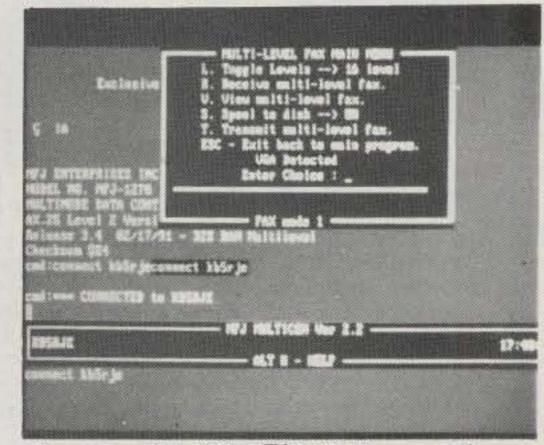
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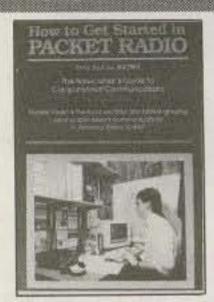
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prescribed locations, and with their prescribed power, in accordance with the rules.

Amateurs may have a difficult time relating to these concepts for several reasons. First, amateurs are not individually restricted to specific frequencies, locations, or power. Within license classes there is a great deal of operating flexibility. Second, self-policing has long been a tradition in the Amateur Radio Service. The Service has long realized that it must avoid being an enforcement problem for the FCC, or the FCC might be inclined to reduce the scope of the problem by reducing the size of the spectrum allocated to the Service. Third, the Amateur license, by definition, has no value to the licensee, the way, for example, a broadcast license has value to its licensee. But the amateur licensee might not see the loss of his or her license as an economic threat.

Nevertheless, in the Compliance Division we had our share of amateur radio cases. Two of the most common types of cases were deliberate interference and examination fraud. We vigorously pursued such cases because these were, in our view, the most serious violations that could be committed by amateurs. The Communications Act itself specifies that these two types of misconduct are grounds for license revocation.

Few amateurs seem to realize that the FCC can and does perform close-range monitoring. They seem to think that FCC monitoring is performed from distant monitoring stations, using long-range triangulation techniques to identify the origin of the signals. In actuality, if the FCC has an enforcement case working on a particular operator, engineers and technicians from the FCC's Field Operations Bureau are likely to be parked in front of the operator's residence.

Amateurs also seem to think that if the FCC is in the neighborhood, they will be driving some kind of van which can be easily spotted. In actuality, the FCC vehicle is more likely to be an ordinary automobile. But do not waste your time trying to pick it out. The electronic equipment is disguised. Even the antennas are not visible.

The FCC's equipment is good enough to positively determine a particular radiating antenna. Thus, if the subject operator transmits a signal to deliberately interfere with another operator, the FCC can identify the antenna which is transmitting the interfering signal. For this reason, it makes no difference whether the subject station transmits voice information or just mechanical or electronic noise. While a voice identification of the subject operator is often an element of proof in an interference case, it is not critical to the case. The FCC engineers can establish with certainty that a particular antenna was in use, regardless of what was transmitted.

Following a successful direction-finding session, the FCC engineers usually perform a station inspection. Such inspections ordinarily produce further damaging evidence, such as tape recordings of sound effects that were transmitted only moments before, transceivers still tuned to the monitored frequency, and the presence or absence of other potential operators of the station. If the subject licensee refuses to allow a station inspection, that in itself is grounds for a sanction.

Often the subject of the enforcement case will try to claim that the interference was inadvertent because he or she could not hear the victim station in operation. However, if the FCC's engineers in the car outside the residence could hear the victim station, the operator of the station in the residence assuredly could hear the victim station. Furthermore, if the victim station changed frequencies and the subject station followed and continued the interference, there is no way the subject operator could convincingly claim that the interference was accidental.

Examination fraud is serious because it is an indication that the person who took the test for someone else and the person for whom the test was taken do not possess the requisite character qualifications to be or remain an FCC licensee. It is an indication of "moral turpitude," in the parlance of communications law.

Back in the days when applicants took their tests at an FCC field office, it was very brazen for one person to take the test for another, right under the nose of the Engineer-in-Charge. It required the use of falsified identification and other deceitful actions. However, once one of these cases comes to light, the evidence quickly mounts and judges rarely fail to revoke both licenses.

By its nature, examination fraud takes place in secret. Sooner or later, however, somebody learns or suspects the truth. I recall one case which originated from a vendor of amateur radio gear who was himself a ham. When he delivered and installed a complete station—transceiver, tower, antenna, the works-the purchaser never once took an interest in or participated in the setup of the equipment. Although the purchaser had shown the vendor a valid amateur license, his behavior was so uncharacteristic of true hams that the vendor became suspicious. This led to the discovery that the purchaser had paid someone else to take the examination for him.

The upshot of all of this is to demonstrate that a compliance program plays an important regulatory role even in the nonpecuniary and self-policing Amateur Radio Service. In 1980, however, something happened that would eventually result in the termination of the Private Radio Bureau's compliance program twelve years later. That something was the inception of the Republican philosophy of government.

Now this article is not about the pros and cons of the two major political parties. But as I said when I started this series, we are

MFJ halfwave vertical Antenna 6 bands: 40, 20, 15, 10, 6, 2 Meters . . . No radials or ground needed!

Operate 40, 20, 15, 10, 6, 2 Meters with this MFJ-1796 ground independent halfwave vertical antenna -- no radials or ground ever needed!

It's only 12 feet high and has a tiny 24 inch footprint! You can mount it anywhere from ground level to the top of a tower -- on apartments, condos, small lots, even on a motorhome. You can take it anywhere -- vacations, field day, DX-pedition, camping, nearly anywhere you go.

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It's so easy to put together that you can have it on the air in an afternoon.

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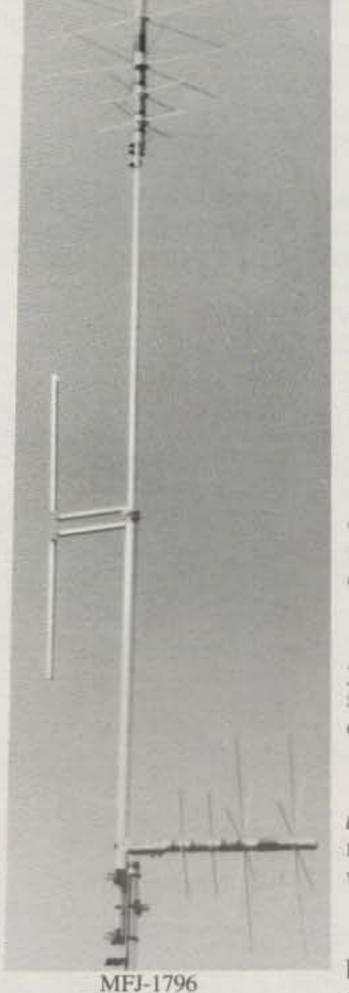
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The feedline is further decoupled and isolated from the



antenna with a highly efficient air-wound choke balun. This decoupling attentuates RF on the outside of the coax and minimizes feedline radiation that waste useful power.

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You get an antenna built with heavy duty, extra thick wall aluminum radiators, machined aluminum parts and stainless steel hardware.

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CIRCLE 3 ON READER SERVICE CARD

talking about Washington. One cannot deal with the Washington scene without dealing with politics. The important thing to remember is that there is no right or wrong approach to telecommunications regulation. There are just differing ways to go about it.

The voters express their preferences every four years, but they may not understand how their vote gets translated into reality. The compliance function that I am discussing here is an illustration of how the abstract expression at the ballot box becomes a concrete manifestation in a major Washington agency.

The Republican philosophy as it applied to communications regulation was that marketplace mechanisms could substitute for governmental regulations and enforcement programs. For example, why should the FCC specify and enforce signal quality standards for broadcast stations? If a station broadcasts an inferior signal, sooner or later the audience will turn to another station. So a station with an inferior signal will either improve its quality of its own accord or will eventually go belly up. Its channel can then be awarded to another licensee, who presumably will be motivated

to do a better job.

Although this concept is known by the short term, "deregulation," it does not connote a total absence of regulation. It merely means a different regulator mechanism—the replacement of rules promulgated by the FCC with economic principles of competition. The marketplace substitutes for government regulation.

In order to work, then, deregulation depends upon equivalent marketplace forces to achieve the goal of proper operation of licensed radio facilities. But what about amateur radio, where there are no economic forces that operate as equivalent regulatory mechanisms? Is amateur radio headed for anarchy?

No, and here's why. Whether it was by design or by happenstance, while the Republicans were deregulating the telecommunications industry, they were also looking around for ways to increase government revenues without raising taxes. It was called "revenue enhancement." Remember the "no new taxes" pledge? In order to live up to that pledge and still fund the government, the Republicans had to come up with new ways to increase revenues. Three ideas they hit upon in the tel-

ecommunications area were spectrum auctions (not yet authorized), spectrum user fees (not yet authorized), and increased sanction levels.

When I refer to increased sanction levels, I am talking about the monetary forfeitures mentioned earlier. The Omnibus Budget Reconciliation Act of 1989 raised the maximum amount of the monetary forfeiture that the FCC could impose on Private Radio licensees (including amateur radio operators) from \$5,000 to \$75,000. Then in August of 1991 the FCC released a schedule of standard amounts that it would assess for particular rule violations. The fine, for example, in a malicious interference case is \$7,000.

Now they have streamlined the process for imposing these forfeitures by giving the forfeiture authority to the Field Operations Bureau directly, eliminating the referral of the case to the Private Radio Bureau. In addition, there is a real incentive for a vigorous sanction program, since a percentage of the FCC's operating budget must be recovered through the sanction program.

When I was the Chief of the Compliance Division, I always felt that the hams who were the subjects of our cases cared more about possible fines than they did about losing their licenses. The license was virtually free, and if it was revoked they still had their day job. But if they were fined, it could cost them some real money. Five hundred dollars would have been a very large fine in those days. So even though we considered license revocation to be a more serious sanction than a monetary forfeiture, we thought the amateurs viewed it the other way around.

Now, however, things have changed. With the reorganization of the Private Radio Bureau there will not likely be many revocation cases. But with the transfer of the interference responsibility to the Field Operations Bureau, we are likely to see some hefty fines imposed against amateurs, because interference, especially malicious interference, remains a serious violation.

Go back to the FCC engineers sitting in their unmarked car in front of the subject licensee's residence. Formerly, after completing their monitoring and station inspection, they would have issued a violation notice to the licensee and referred the case to the Private Radio Bureau for possible license revocation. Now they will issue a violation notice and a notice of apparent liability to a monetary forfeiture. When the licensees see the amount of the fine, I suspect that several may try to surrender their license instead.

To sum up, then, although the Compliance Division and the Compliance Branch of the Private Radio Bureau are now history, the Republican policies of deregulation and revenue enhancement have combined to create a potent new enforcement program. What will be the effect of the new Democratic administrations? Stay tuned

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

MFJ-1784

Only 36" diameter but covers 10-30 MHz

· Round conductor more efficient than flat strip

No control cable needed

All welded construction

Welded butterfly capacitor, no rotating contacts

Automatic Band Selection™, SWR/Wattmeter

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

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

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

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

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

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

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

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

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

10 reasons why the MFJ Super Hi-Q Loop™ beats the competition

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

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

welded butterfly capacitor with no rotating contacts.

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

(balun) so the feedline does not radiate. Reason 4. MFJ's exclusive Automatic Band Selection™ auto-tunes to your desired band and lets you know with a beep.

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

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

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

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

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

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

and waste less as heat.

How can MFJ make the Super Hi-Q Loop™ so affordable?

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

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

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By doing as much as possible in-

the electronics.

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

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

It's extra portable because . . .

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

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

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Round conductor has less RF resistance than flat conductor

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

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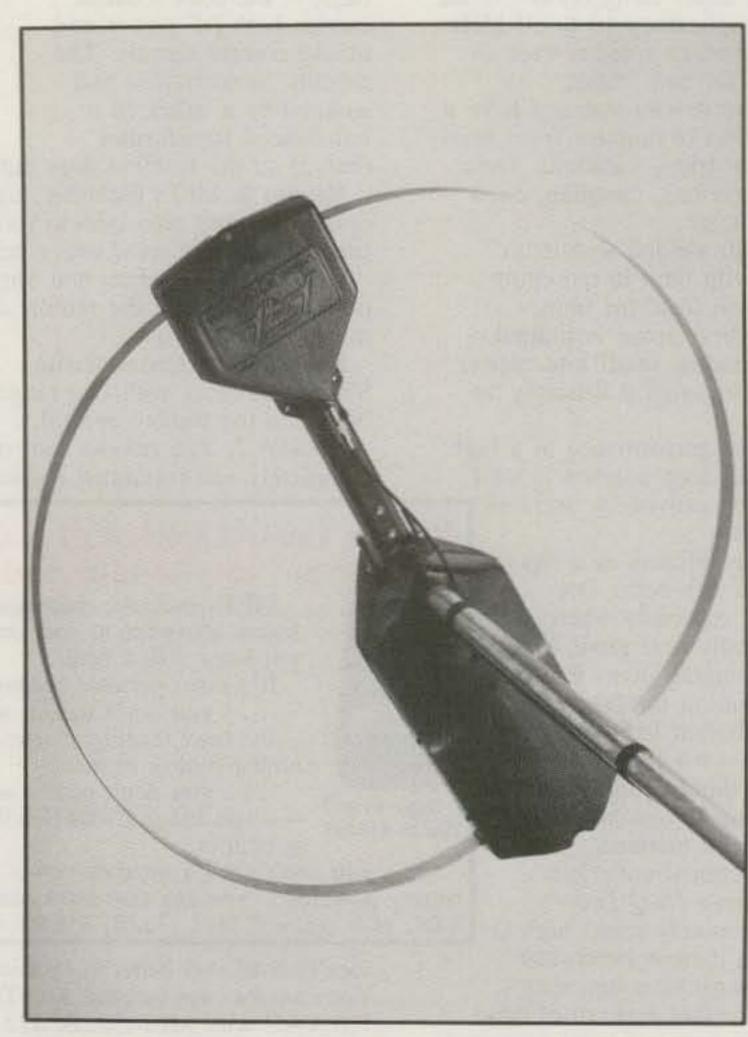
The AEA Isoloop Antenna

BY LEW McCOY*, W1ICP

Some time back Buck Rogers, K4ABT, CQ's Packet Radio Editor, reviewed the first version of the AEA's Isoloop antenna (July 1990 CQ, p. 18). Since then a new, improved version of the antenna has been made and is now marketed by AEA. This review covers this latest version.

I grew up in a school that taught that small antennas, physically small antennas for a given frequency, in no way can compare to full-size antennas as far as gain is concerned. Basically, and I'll try to keep this simple, the feed point impedance of an antenna drops as a resonant antenna is made physically smaller. For example, an 80 meter half-wavelength dipole has an impedance of approximately 70 ohms. Of this impedance, the useful resistance (radiation resistance) is on the order of 68 ohms, while the ohmic resistance is 2 to 3 ohms. If we feed 70 watts to this antenna, 68 watts will be radiated and 2 watts will be dissipated as heat (lost power). If we reduce the physical size of this antennafor example, an 80 meter mobile whip 8 feet long-the impedance drops drastically. In fact, an 80 meter whip can have an impedance of less than one ohm radiation resistance and two or more ohms ohmic resistance. If we feed 70 watts to this antenna, we can expect to lose about 69 watts or so as heat with only a watt or so to be radiated. As one can see, the ratio of lost power as heat rises dramatically. Before some high-power engineers jump down my throat, this is a general example for the purpose of showing the losses of an antenna that has a very small effective aperture.

How do you get around this problem? Keep in mind that a physically small antenna could be as efficient as a full-size one if we could keep the feed impedance within reasonable tolerances. In other words, keep the ohmic resistance portion as low as possible. This means extremely good connections in the antenna, large components to reduce ohmic losses, etc. We



The Isoloop makes a neat antenna installation. It will accommodate mast sizes up to 2 inches in diameter.

are aiming here to keep the loss ratios from radiation resistance to ohmic resistance as good as we can make them.

The AEA Isoloop is a very good approach to answering this problem. This is an antenna that covers 10 through 30 meters (continuous) with a power rating of 150 watts input. The SWR is less than 1.5 to 1 with a matched feed impedance of 50 ohms. How does the Isoloop overcome the technical disadvantages I just pointed out? This is accomplished by using extremely high-quality connections and a very large

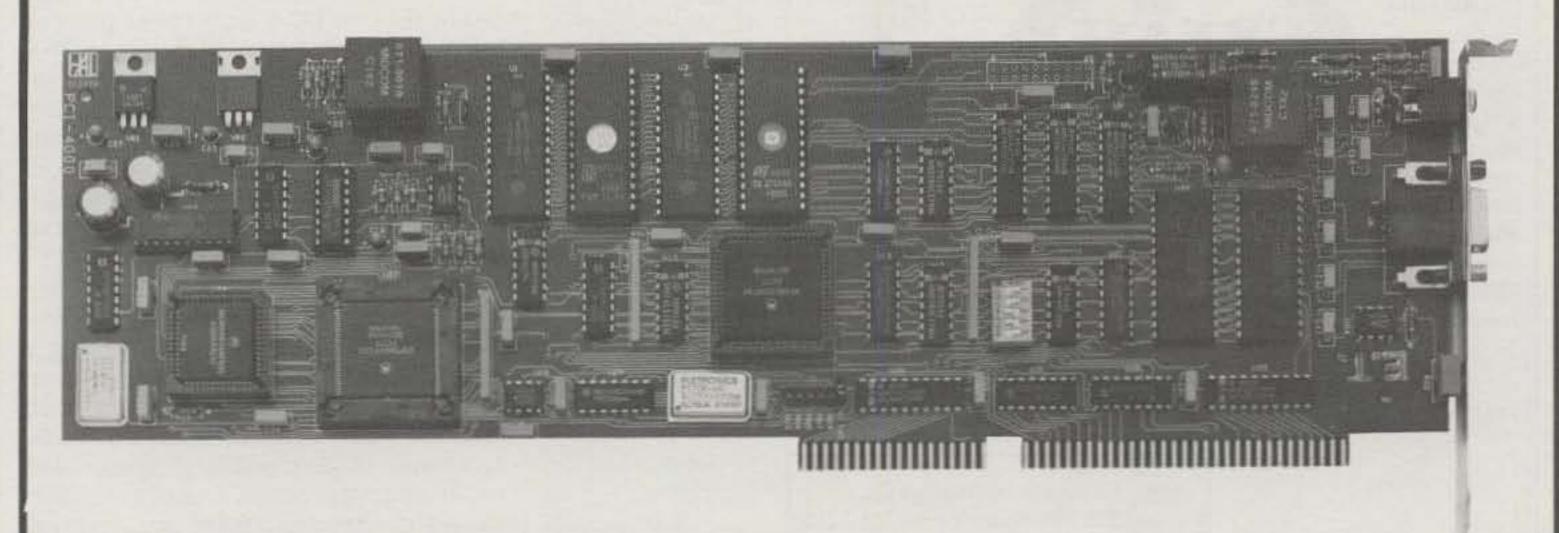
and efficient variable capacitor (see photos).

The capacitor is used to tune (resonate) the loop to frequency, and it is tuned remotely (at the operating position) via what is called the LC-2 Controller—more on this in a moment. The main loop is 43 inches in diameter and is constructed of a wide strip of Iridited aluminum which is welded to the variable capacitor. (Remember, this keeps ohmic losses down.) The main loop is an inductor, which with the variable capacitor forms a very high Q circuit. This

^{*}Technical Editor, CQ, 1500 West Idaho Street, Silver City, NM 88061

HAL Announces the PCI-4000 PC-CLOVER System

For Fast, Bandwidth-Efficient HF Data



The PCI-4000 uses the latest development in HF data transfer methods—CLOVER-II. CLOVER-II is designed to maximize the amount of data which can be transferred in a narrow bandwidth over HF radio frequencies. It uses a combination of four tone frequencies with phase and amplitude modulation to achieve data transfer rates as high as 60 characters per second—about ten times faster than AMTOR. The PC-CLOVER system incorporates Reed-Solomon error correction, not simply a retransmission scheme. The PCI-4000 is a full-sized PC card which operates in a 80286-based PC or higher.

The PCI-4000 PC CLOVER system features:

- Higher throughput than RTTY, AMTOR, Packet, or PACTOR on similar HF channel
- Simple pull-down menu operation
- Signal bandwidth of 500 Hz (@50 dB down)
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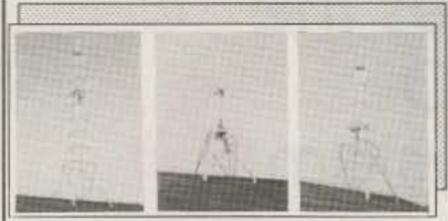


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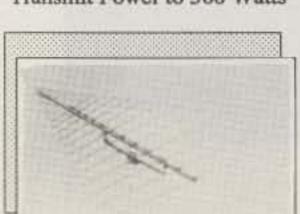
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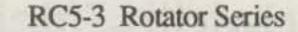


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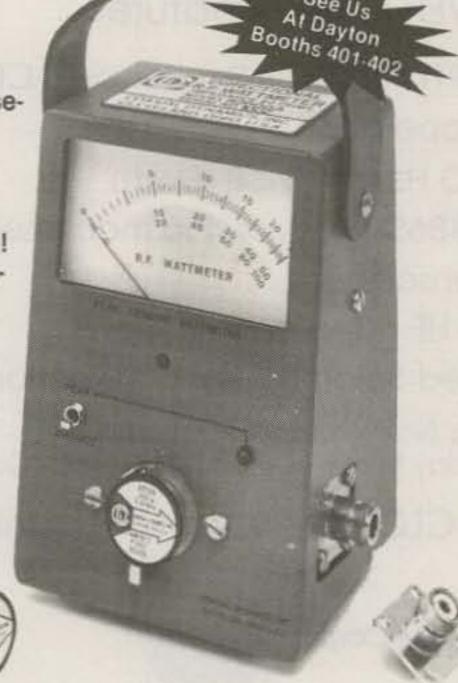
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means at 150 watts you can have very high RF voltages develop across the capacitor. However, this is protected by the plate spacings of the variable capacitor, which are rated at 10,000 volts!

Everything that should be done to make this small antenna efficient was done by AEA. They rate the efficiency of the loop at 72 percent on 20 (a half-dipole on 20 would be on the order of 98 percent). On 10 the loop's efficiency goes to 96 percent. Keep in mind that this is not a "small" antenna on 10 meters. It closely approaches a quarter-wave dipole on 10.

The loop is provided with a 50 foot long cable for the LC-2 controller (longer lengths are available). A standard UHF coax connector is used on the antenna. The LC-2 is to be set near your transceiver, and the controls are extremely simple. They consist of a speed and direction control for the variable up in the antenna. There is a stepper motor on the variable to accomplish rotation.

Okay, so how good is the Isoloop compared to full-size antennas? I mounted the Isoloop 30 feet above ground, and some distance away I installed a 20 meter dipole, also at 30 feet. Last but by no means least, I had my 3-element 20 meter beam on a 60 foot tower. I should add for this report that my location is probably one of the best in the world. I am 6400 feet above sea level, almost smack on the Continental Divide. and my QTH sits over an old copper and silver mine.

I made many, many tests on 20 meters. These were simple A-B tests: "Compare my signal-now and now." I found that while the dipole was slightly better in most cases, there really wasn't that much difference. In fact, in many instances the loop did a better job on DX. I know the reason for this is because the loop inherently has a lower angle of radiation for the same height as the dipole, in this case. The 20 meter dipole at 30 feet has more higher angle radiation than the loop.

suppose it isn't fair to compare the loop to the beam. However, truth must be told. I found that in all instances the beam outperformed the loop, usually on the order of two S-units. But heck, this was expected. The problem, if it could be called a problem, was that with 150 watts I usually had a signal that was well over S9 on the beam. In all fairness, the loop brought in many S9-plus reports also, but what is important is that in no case was the loop inaudible when compared to the beam. Or simply put, I could have made the same contact with the loop.

Some conclusions are in order. Many amateurs find that they cannot get up dipoles or beams. The Isoloop could well be the answer for these amateurs. In fact, it could well pass for a "special" type of TV antenna. Or it is small enough not to be noticed by complaining neighbors. It certain-

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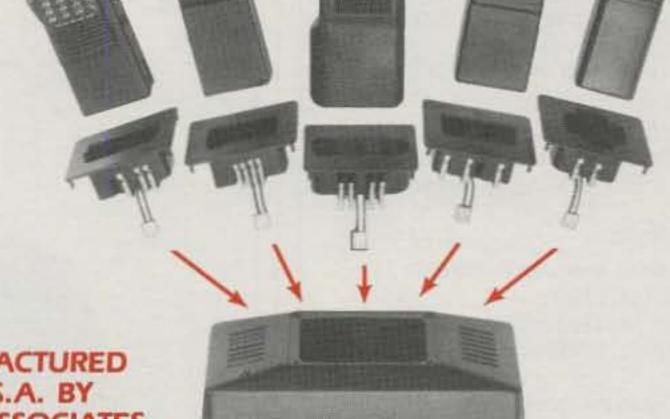
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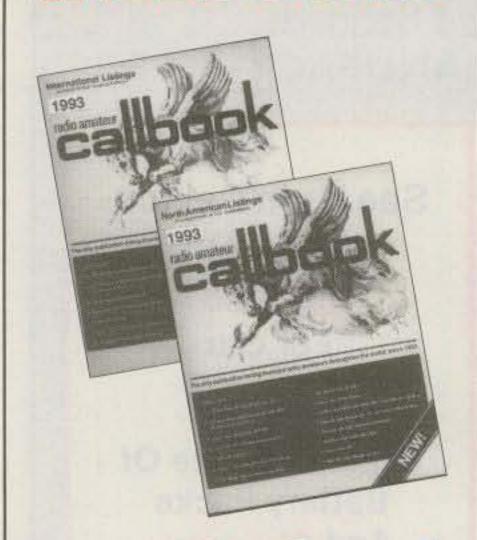
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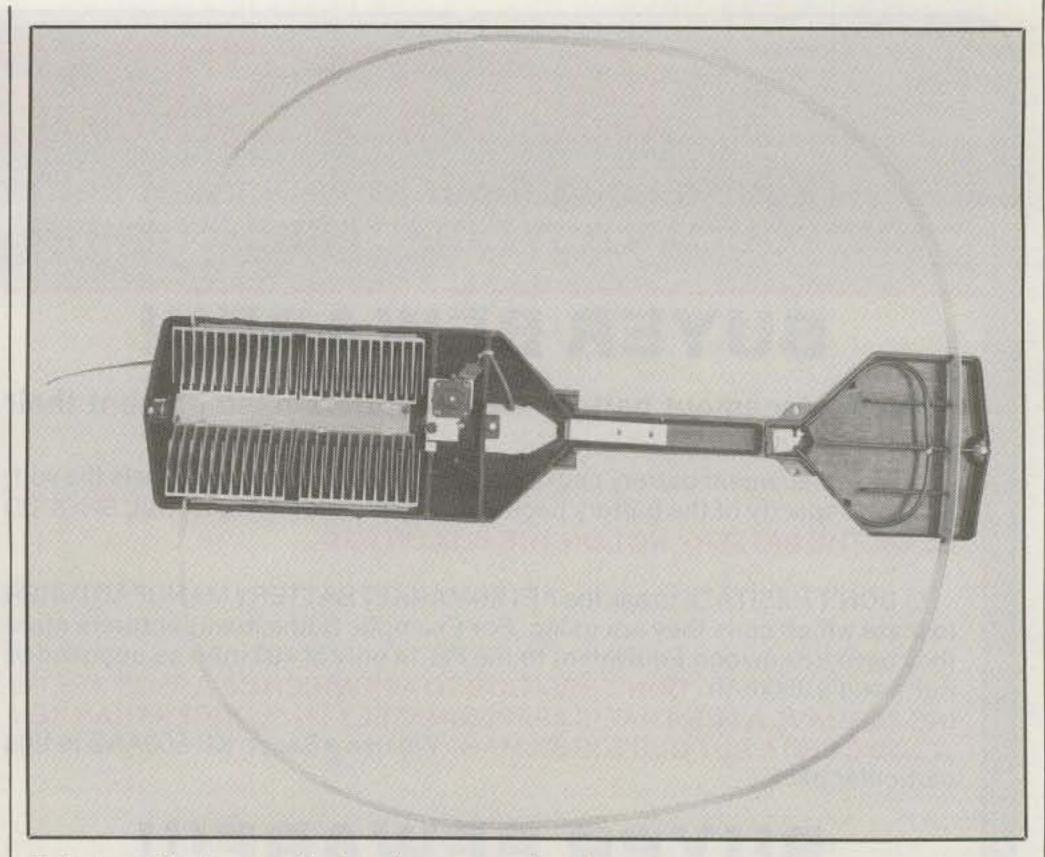
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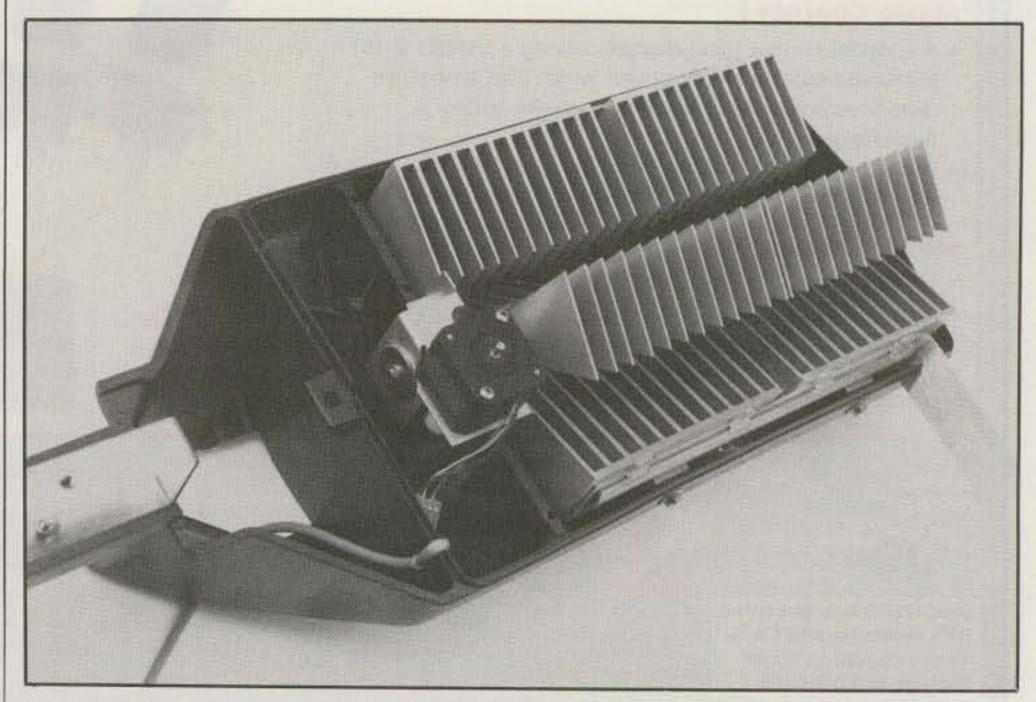
This shows the loop and its interior construction. A small matching loop is used to match from the low-impedance feed to 50 ohms. The variable capacitor is at the opposite side.

Note the size of the capacitor.

ly is a respectable antenna, and I could recommend it for amateurs in tough antenna situations.

Last, I put up a 10 meter dipole to compare the loop on 10. As I expected, the loop at times outperformed the dipole and vice versa. One thing I really liked was switching to a band, tuning the LC-2, and hearing the band become "hot." Naturally, I tried the WARC bands and 15, comparing results to the beam . . . same results as on 20.

The AEA Isoloop lists for \$389.00. It is manufactured by Advanced Electronic Applications, Inc. P.O. Box C2160, 2006 196th St. SW, Lynnwood, WA 98036.



Here is a close-up view of the variable. The stepping motor is mounted at the left side.

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CQ REVIEWS:

Buckmaster Publishing's HamCall BBS Service

BY JOE LYNCH*, N6CL

wanted to send a QSL card to every one of those two or three contacts a week that I made. As a struggling young and not too rich Novice licensee, I could barely afford a copy of the Callbook. Nevertheless, when I got my first copy, I looked up my callsign—not once but many times. I guess it was a bit of disbelief in seeing my name in print in an international publication.

Now, more than thirty years later, my eyesight has faded a bit, and during a contest weekend (such as CQ's World-Wide VHF WPX Contest) I can make two or three hundred contacts. Even so, I still want to send a QSL card to every one of those contacts. Well, sad to say, the print in the Call-book is now out of focus, except when I am wearing those very powerful dime store glasses.

However, relief from eyestrain and the drudgery of looking up all those callsigns is here in the form of Buckmaster Publishing's HamCall BBS Service.

Buckmaster has made available, for a small annual subscription service plus the cost of a long-distance call to Mineral, Virginia, the ability to look up every licensee in the country. Additionally, they also maintain over 100,000 former callsigns in a cross-reference data base.

As a writer, one of my tools includes a computer equipped with a modem and a word-processing program (my preference is WordPerfect 5.1). The modem is handy in transmitting my copy to my publishers. It is also the most important ingredient for the HamCall service.

Here is how the service works. As stated, you will need a modem. Theirs can accommodate speeds of 300, 1200, and 2400 baud rates. It will automatically adjust to your speed. Their software is set up to use eight data bits, one stop bit, and no parity. The system uses the full duplex mode, and it will time out after a period of inactivity (it will give you a 30 second warning before dropping you).

After you subscribe, they send you a

password. You call up the service access number, enter your password and your callsign, with carriage returns, at the prompts. You will receive a prompt that says, "ENTER CALL SIGN-." You are now ready to look up as many as 50 callsigns per session.

The information supplied with each lookup is the license class (no distinction between Tech and Tech-plus), the license expiration date, street address, city, state, and five-digit zip code. If the callsign is not in the data base, you will be given the message "NO MATCH," followed by a carriage return and the name of the country of the callsign you just looked up. When you are finished looking up callsigns, simply type "BYE" at the prompt and you are exited from the service.

Now here are some of the secrets of using the service. Since you can look up as many as 50 callsigns at one time, why not do it all at once? Well, with a little experimentation, I figured out how to enter everything at once. I create an ASCII file with my password and my callsign as the first two lines followed by the 50 callsigns (including a carriage return after each callsign) I want to look up. Once in my modem program, I open the screen capture file. I then upload the callsign file as soon as I access the service. After the 50 look-ups the service automatically logs me off. I close the capture file and exit the modem software.

Next I enter WordPerfect and import the capture file. I use macros to strip off the disclaimer paragraph, look up any "NO MATCH" responses and delete them, and set up each address as an address label. In less than 20 minutes I have 50 address labels printed and ready to peal and stick on the envelopes. Gone are the eyestrain and the effort of finding the callsign two or three times as I grapple with writing the information on the envelope while balancing the Callbook in my lap.

I do not like to keep my computer on all the time. However, if I did, I would take advantage of using the modem software for timed access to the service when the overnight rates are in effect. As it is, I am often up past 11 PM anyway. The data are updated once a month around the end of the month from tapes received from the FCC. So if that new amateur's call is not yet in the data base, wait a month and call back.

While their specialty is U.S. callsigns, they are adding foreign callsigns to the data base. Presently they have data from over 60 other countries. If you are unsure of the availability of data from a particular country, enter the callsign anyway. After the look-up, if the NO MATCH message appears followed by an asterisk in front of the country name, then data on that country are currently not available.

I mentioned my eyesight as a problem with using the Callbook. I must also mention that with the voice card in the computer, my fiancee, Carol King, K5CPZ, who is totally blind, can also use the service to look up addresses of stations that she has worked. Thanks to this service, access to callsign information that has been previously restricted to the visually impaired is now made available. With her skills in word processing, she too can create address labels.

What is in the future? While some have suggested to Buckmaster that other types of data (such as cross-referencing by name or zip code) should be included on the service, they have resisted making such additions. I think that this decision is wise. The ardent users of the service recognize that this is a specialty bulletin board and that the purpose is clearly defined. Additionally, accessing this service for data other than callsign look-up would tie it up and deny access to others who want to use it for its intended purpose.

Other items being considered are increasing the number of look-ups per call and going to a faster modem speed. There are pros and cons for looking up more than the present 50 calls. I personally look up two to three hundred calls at a time (I get that far behind in my QSL chores). It is a bit of a bother for me to break out my list in groups of 50 (for each ASCII file) and to call back after each 50 callsigns. However, to be fair to the next person using the service, I need to be off line for awhile. Per-

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

haps when the increased modem speed is added, more look-ups can also be added.

Would you like to see anything different? Once you are using the service, if you have any suggestions on how to improve it, contact Jack Speer, N1BIC, at Buckmaster, and let him know what you think.

In addition to this service, Buckmaster has a wide range of services available to us amateurs. They have all of this data base on microfiche (it is cross-referenced by callsign, name, and geographic sequences). These data are also available on CD-ROM along with nearly 5000 publicdomain software programs. Additionally, they have a commercial (amateur radio licensees) mailing list service. Finally, they have every issue of CQ, QST, Ham Radio, 73, and Digital Digest on microfiche.

For your subscription to the HamCall BBS service, contact Buckmaster Publishing, Rte. 3, Box 56, Mineral, VA 23117. Their telephone numbers are 703-894-5777 and FAX 703-894-9141. The price of the service is \$29.95 per year, with special rates for clubs, groups, and companies.

Have I given up my Callbook? No, because I do like the convenience of picking up the book and looking up the callsign without having to turn on the computer and access the bulletin board—even if it is just looking up my own callsign once again.

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The Joys and Sorrows Of Ladder Line

BY DOUG DeMAW*, W1FB

The popularity of dipoles and large loop antennas that are fed with balanced transmission line seems to be at an all-time high. But open-wire and ladder line feed systems cause problems that are not common to coaxial feeders and solid TV ribbon line. Breakage and twisted feed lines head the list of unwanted ailments. This article describes some advantages associated with tuned feeders and highlights some methods for solving the common maladies that accompany the use of balanced feed lines.

Some Advantages

Transmitting dipoles and loops offer the advantage of multiband operation. For several years I used a 160 meter square loop, 50 feet above ground and parallel to earth, as an effective antenna for 1.8 through 29 MHz. It was fed with commercial 450 ohm ladder line. Just outside the ham shack I used a 4:1 balun transformer which was followed by 10 feet of RG-8 coax to the Transmatch in the shack. This system worked well, even on the WARC bands. Owing to some fairly high reflected feed impedances, the balun was taxed to the limit in its sometimes hostile environment during high-power operation (core saturation). This occurred only on two of the HF bands. This offers clear evidence that the balun-coax method is only a means to an end for multiband work and has its limita-

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

'A. Roehm, W2OBJ. "Some Additional Aspects of the Balun Problem," p. 172, ARRL Antenna Compendium, volume 2.

tions. The same is true of any system that employs a balun for multiband use with a tuned-feeder system.

I have since adopted a more suitable method for using balanced line. It was inspired by an article that appeared in the 2nd edition of the ARRL Antenna Compendium, in which the author illustrated how to use a single-ended antenna tuner to match balanced feeders to the 50 ohm station system.1 It involves floating the tuner at RF and isolating it from the transmitter, SWR bridge, and receiver by means of a decoupling choke. The author used a length of RG-8 coax with several ferrite beads or sleeves over the outside of the cable. It is used between the tuner and the rest of the station gear. I had a 6 inch diameter 850 µi ferrite toroid (Indiana General brand) through which I wound 10 turns of RG-8X to form a similar decoupling choke. It works well from 160 through 10 meters. The tuner does not have a ground attached to it under these conditions. One side of the 450 ohm line attaches to the usual "hot" terminal of the tuner. The remaining feeder wire is connected to the chassis of the floating tuner. This eliminates the need for a balun transformer in the critical part of the antenna system. I have yet to get an RF burn or bite from the tuner, even at 600 watts of transmitter output power.

I use the same system with my 160 meter inverted-V dipole, which is fed also with 450 ohm ladder line. This antenna works nicely from 160 through 10 meters too. Stray RF energy has yet to affect the performance of any of my radio gear (keyer included) despite 8 feet of the balanced feeder being in the shack.

Problems with Balanced Feeders

Anyone who has used home-made openwire or ladder line knows that the conductors tend to stress and break at the antenna feed point. There is no visual evidence of this when we use ladder line. The single-strand no. 18 Copperweld wire breaks inside the polyethylene insulation, but the integrity of the line appears okay. An ohmmeter check across the shack end of the feeder reveals that an open condition exists when feeding a loop. But with a dipole we have no simple way to check for an open feedline.

Fig. 1 shows two methods I use to prevent breakage of the ladder line conductors. A parallel section of ladder line about 1 1/2 feet long is added at the feed point on the junction-block insulator. The feed point has a clamp that holds the feed line firmly against the block. The remaining parallel sections are taped together as shown in the diagram. I have not experienced breakage since adopting this method. Also, the feeder is stabilized in free space by the addition of nylon-cord guy lines, as shown. This prevents whipping of the feeder when the wind is blowing. Whipping is the primary cause of feeder stress. For many years I wished for a 450 ohm ladder line that used stranded copper wire. My prayers were answered by Radio Works in Portsmouth, Virginia when they came out with a ladder line that contains 19-strand no. 16 copper wire for the conductors. This more rugged ladder line sustains stress much better than the cheaper line. The price differential is 13¢ versus 18¢ per foot. Radio Works also sells KW-rated 300 ohm ladder line. Either type of line is suitable for

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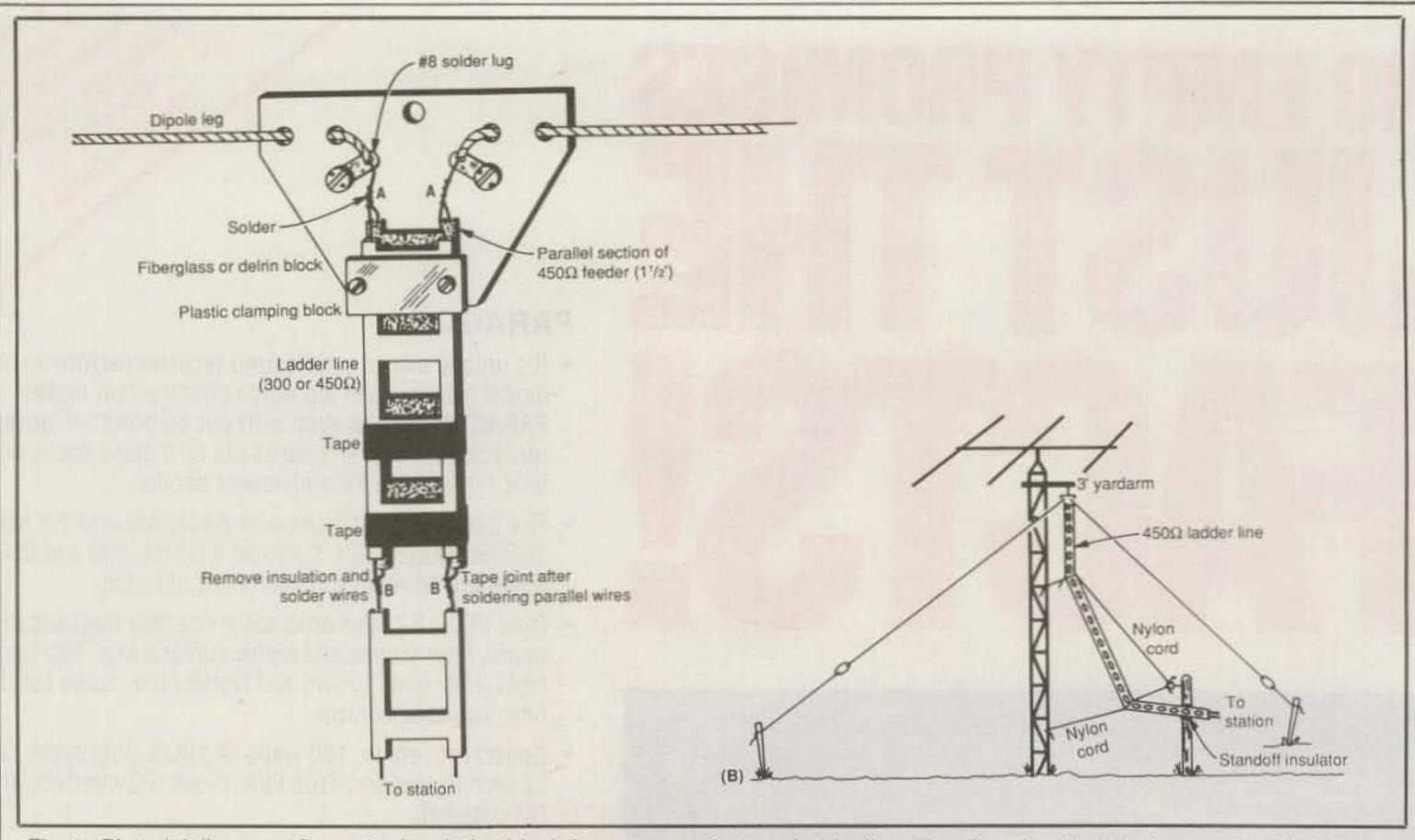


Fig. 1—Pictorial diagram of a center insulating block for antennas that use ladder line. The clamping block helps to prevent breakage of the ladder line conductors. The feeder can be strengthened considerably by using a parallel section of ladder line between points A and B of illustration (A). The extra section of ladder line should be 1½ feet long. The conductors of the main feed line and the reinforcing section are soldered together. Electrical tape is used to tie the parallel piece to the main feed line. Drawing (B) shows how the author uses nylon cord to stabilize the ladder line in order to minimize stress from the wind.

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most systems that use tuned feeders.

Open-wire feed line is subjected not only to the foregoing problems, but it can transpose in the wind and cause a feed-line short circuit. Nylon guy lines at points along the span of feed system can prevent this annoyance from occurring. It seems, invariably, to happen in the dead of winter when there is two feet of snow on the ground and the temperature is below zero! This certainly discourages me from correcting the fault!

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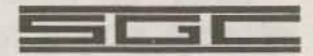




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Closing Comments

It was not my desire in this article to imply that everyone should use balanced feeders. Certainly, those who only have the space for one antenna for multiband operation will want to consider tuned feeders. While they minimize losses, they do require the use of an antenna tuner, balun transformer, or decoupling choke. I prefer multiband tuned-feeder dipoles and loops to trap antennas, G5RVs, and other compromise antennas. However, coax-fed systems do not suffer from changes in SWR when the feed line becomes wet or has ice or snow on it. Ladder line is affected by the elements and it is necessary to readjust the tuner in order to obtain an SWR of 1:1 under these conditions.

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CQ REVIEWS:

The Lightning Bolt Five-Band Quad

BY LEW McCOY*, W1ICP

Since the advent of the WARC bands, several beams for the two highest WARC bands have been manufactured. They all are excellent, but one of the problems encountered is that of adding another beam to one already on the tower. Pattern changes are certain to occur. Because of this and the mechanical problems, many amateurs balk at the idea of two beams on a single tower.

Lightning Bolt Quads has come up with another approach to the problem of covering all five bands, 20 through 10, in a reasonable fashion. It is their new five-band, two-element quad. The antenna consists of two elements on each band, a reflector and driven element, all with a common feed point.

In my history with antennas I have used both single and stacked Yagis. Several different quads and Delta loops in multiband combinations have been tried, plus a variety of other beams. Frankly and honestly, I have always been impressed with the performance of quads, clear back to their inception by Clarence Moore in the late 1940s.

The quad is an antenna that performs on a par with a Yagi under certain parameters. For example, a two-element quad has about the same gain, front-to-back, etc., as a three-element Yagi. There are slight advantages of one type of antenna over the other and they are worth noting.

The quad can be noted as a "low Q" antenna, while the Yagi is a "high Q" antenna. For the uninitiated, this means that the quad is not nearly as critical with respect to element spacing as is the Yagi. Also, the quad is a lower "noise" antenna than the Yagi as evidenced by its rejection of rain and snow static. They are very nearly equal for the two-element quad versus a three-element Yagi. Much more important, while the quad requires separate elements for

Here is Dean, W5LAJ, checking the shipment. He is holding one of the fiberglass support fittings. Note that Dean is wearing gloves. Handling new fiberglass requires care, or you will be picking fiberglass slivers out of your hands for days.

each band, these elements do not contribute to the losses that are present in multiband trap Yagis. That is an important point. Additionally, in our world of modern transceivers, a multiband antenna must present a very low SWR (less than 2 to 1) in order for the transceiver to operate properly.

Over the years it has been said that quads are not as rugged as Yagis. This is a subject that should be addressed. In the early days of quads, the common type of spreader used was bamboo rods. When an ice or strong wind storm came along, the bamboo spreaders broke or cracked. However, since the advent of fiberglass support rods, this is no longer the case. In actual results, aluminum antennas in an ice storm will have the elements bending and taking

a "set." Well-made fiberglass rods will bend, but not set. In the tremendous hurricane in Florida last year, several quads we know of made it through the storm, but the towers they were on bent or collapsed. Therefore, I think the time has come to set the record straight.

Obtaining a relatively flat multiband beam is a very, very difficult task for a five-band trap Yagi. It cannot be done without some sacrifice in performance. In order to maintain that 50 ohm impedance on all five bands you must juggle element spacing and lengths, resulting in loss of gain, front-to-back and pattern distortion.

On the other hand, full-wavelength quad elements in a five-band configuration do have tricky matching techniques. The feed impedance of a two-element quad is on the order of 100 ohms, and these are easily fed with a 2-to-1 Sevick-type transformer/bal-un to provide a very flat SWR across the bands being used. More about this in a moment.

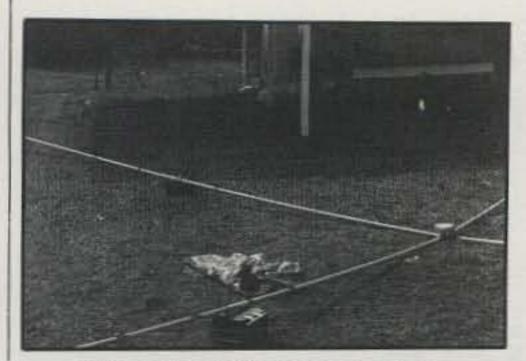
This is some basic information that every amateur should have when thinking of beam antennas. There is much to be said for all three types—Yagi, deltas, and the quad.

The Lightning Bold Quad consists of five two-element beams, proportionally spaced, and fed with a common feed 50 ohm coaxial feed line. The beam is shipped via UPS and weighs in at 25 pounds. A boom length of 8 feet is used, but the actual spacing of the 20 meter elements is 10 feet. This is accomplished by a "bowing" of the fiberglass support rods. This quad is constructed in a square (versus a diamond) configuration. Wire for the elements is a special heavy-duty aluminum wire that is very rugged and has been through severe testing by the quad manufacturer.

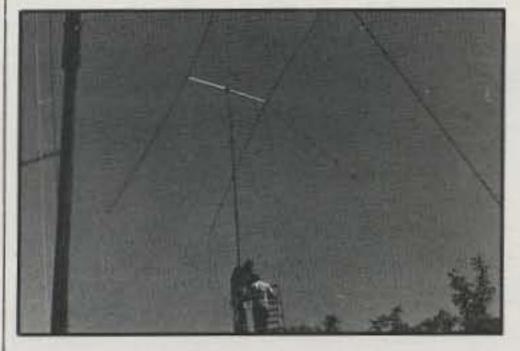
Getting back to element spacing, on 10 meters spacing is 8 feet and each element moves out to the 10 foot dimension for 20 meters.

All the material (not only the wire) is ex-

^{*}Technical Editor, CQ, 1500 West Idaho Street, Silver City, NM 88061



This is the reflector assembly.



DX, here we come!

ed and was slightly less than this figure on the five bands. You must bear in mind that this was line of sight, at zero angle. I would rate the antenna as more than satisfactory for the manufacturer's rating.

We are not equipped to measure gain, but on-the-air tests against a three-element no-trap Yagi showed little if any difference between the two antennas. I know my Yagi has the typical 7 dB gain, so it is safe to assume the quad is in this same realm.

Measurements on the all-important matching and bandwidth were frankly startling. We used three different high-quality SWR measuring devices, which incidentally all agreed in their readings. Bear in mind that we have five quads, all tied together and fed with a common line. All of these individual quads have an impedance of 100 ohms. Feeding them all together is in essence putting five 100 ohm impedances in parallel. You could expect some strange results. However, the SWR, as I said, was very surprising. On 20 meters the SWR never went over 1.4 to 1 and was perfectly flat, 1 to 1, across most of the band. I expected the SWR to go over 2 to 1 on some part of 10 meters. After all, we have 1700

kHz to cover here. The highest SWR was 1.7 to 1 (near the very high end of 10). The other bands were very flat, with the exception of 18 MHz, where the SWR went to 1.6 to 1 (big deal!). Obviously, the quad, when fed on a given band, causes the impedances of the other bands to flatten out the SWR curve.

The quad is rated at 1500 watts. W5LAJ and I received several comparison reports on the various bands. I am using a non-trap multiband Yagi, and as I said earlier, our locations are almost identical. Both running the same power, we found that in most cases reports were identical. Frankly, considering the cost of less than \$300 and its performance, I would not hesitate to recommend this fine beam.

A few more specs: The turning radius is 10 feet 6 inches. The length from the boom down is 9 feet, 6 inches. The arm/rod lengths are 12 feet 9 inches. The model is the 32mcq/wb and the cost is \$289.00. A model with heavy-duty spreaders is also available.

The antenna is manufactured by Lightning Bolt Quads, RD #2, Rt. 19, Dept. Q, Volant, PA 16156 (1-412-530-7396).

tremely rugged. Lightning Bolt manufactures their own fiberglass using a spiralwrap technique which provides a much stronger support than "cloth wrap" fiberglass. The fixture for supporting the rods is a heavy-duty welded aluminum unit (see photo).

The instruction manual is very detailed and easy to follow. However, the antenna is not one which can be put together in a few hours. It took about two days of intermittent work to assemble the quad. I realize that the user is usually anxious to get an antenna up and operating, but this is a project, regardless of the type of antenna, that should be given time and thought. You are going to be depending on your antenna, so do the job right.

I live almost smack on the Continental Divide, at 6400 feet above sea level. I hear lots of amateurs tell me about their windy locations, but I'm afraid none of them experience the winds we get up here at this altitude. Winds of 50 to 60 miles per hour are common. Consequently, antennas get a good workout. This antenna was installed and tested at W5LAJ's location, which is on a knoll, really exposed to the weather.

Performance

W5LAJ's house is in a direct line of sight to my location, about a mile away. He is on a knoll, as am I. Consequently, it was easy to check front-to-back in an empirical manner (using very reliable equipment). The manufacturer rates the antenna at 26 dB front to back on the five bands. We found in our tests that the antenna both exceed-



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Perhaps during the next big DX pileup we should call on these amateur radio policemen rather than the one we have.

Cops With Rigs

The Suffolk Police Amateur Radio Club

BY JEFF SAVASTA*, KB4JKL

mateur radio in and of itself is a most interesting hobby. Through the service it provides it has also proven to be a most important aspect of public service and safety.

I have been a police officer with the Suffolk County Police Department here on Long Island, New York for approximately 8 years and in law enforcement for some 15 years. I have held my amateur radio ticket since 1984, and in that time have witnessed the worthwhile public assistance that this service performs. I am extremely impressed with the professional manner in which radio amateurs perform their tasks in emergency situations. From motor vehicle accidents to hurricane relief, amateurs have always handled the situation, relaying pertinent information to the proper authorities so that professional assistance could arrive. I am proud to be a member of these ranks.

Approximately 3 years ago Long Island had a major air crash when an Avianca air-liner crashed just outside of Suffolk County in its neighboring county of Nassau. As with all incidents of this nature, radio amateurs rushed to the scene to assist in communications in and out of the affected area. As it turned out there was a real need for amateurs to respond to local hospitals, as they did, to assist in coordination with ambulances arriving at nearby hospitals.

I listened to the communications being carried out by these operators and after the incident spoke to many of the stations involved in the incident. They all agreed that the biggest problem they had had to contend with was access to the affected area. Police officers assigned to the area did not admit amateurs to the crash site because they knew nothing about this service, despite their official civil defense



On the left is John Evans, K2QCE, New York State Office of Mental Hygiene Public Safety Dept. On the right is the author, Jeff Savasta, KB4JKL, a member of the Suffolk County Police Dept.

identifications. One amateur operator at the scene conveyed to me that the only way he was able to get to the scene was to show his press pass, as he worked professionally in this field.

Amateur radio proved to be a major asset in coordinating transporting crash victims to area hospitals. I recognized that there was a problem and that this problem stemmed from the lack of education of the law enforcement professionals about what amateur radio is and the great benefit this service renders. I thought to myself, "How can I let those in my field of work know exactly what amateur radio is?" This definite-

ly was a task that would not be easy to achieve by one person.

I started to go through a list of my contacts and acquaintances to see just how many police officers and law enforcement personnel were involved in amateur radio in my department and in neighboring outside agencies. It was nice to see how amateur radio is alive and well in this fraternal atmosphere of my peers.

I began to think that an amateur radio club consisting of law enforcement personnel might be a most appealing project to undertake. There is an old saying "The only person who can understand what a

^{*9} Peppermint Rd., Commack, NY 11725

cop goes through and the job that he does is another cop." I think that this is why police in many cases tend to fraternize with those in the same field of work. I knew that an organization such as this would serve the needs of its law enforcement membership, while also assisting the amateur population in general, and the advancement of the amateur service within the public sector.

Starting an organization such as the Suffolk Police Amateur Radio Club (SPARC) was not an easy task to accomplish. Unfortunately, the general law enforcement population does not have the luxury of working a 9 to 5 day, as most people do. I knew that the hurdles in starting this would be great. How to go about it was another question.

At the time I was fortunate to meet my good friend Doug Lotten, N2JHO. Doug is a detective with the Suffolk County Police Arson Squad. I met him when I noticed him speaking into his amateur radio transceiver while I was walking to my car in my precinct parking lot. An instant bond occurred as it does when any two amateurs get within 50 feet of one another.

With Doug's help I was able to get this whole idea off the ground. We had SPARC sanctioned by both the ARRL and the Suffolk County Police Department. This took some time, as the higher-ups within the department were not really familiar with what amateur radio is and how it works.

Several months passed before we got our approval from the department. We got the ball rolling in November 1989. I must admit that at first I expected this to be an organization of just Suffolk County Police employees. However, I realized that I had underestimated, when I started receiving inquiries from other agency employees. I was delighted with this, and so began the organization.

We have come a long way since those early days of the organization. Presently SPARC has over 50 members representing over 13 different agencies. The membership consists of sworn officers and civilian employees from the Suffolk County Police Department, the Suffolk County Sheriff's Department, the Northport Village Police Department, the Sag Harbor Village Police Department, the New York State Court Officers, the Suffolk County Auxiliary Police Department, the New York State Mental Hygiene Police Department, and the Port Authority of New York and New Jersey Police Department. We also have retired members from the New York City Police Department, the Long Island State Parkway Police, the Nassau County Police Department, and even a retired member from the Baltimore, Maryland Police Department. SPARC has truly become a multiagency organization.

Since its inception the club has come up with some very innovative procedures due

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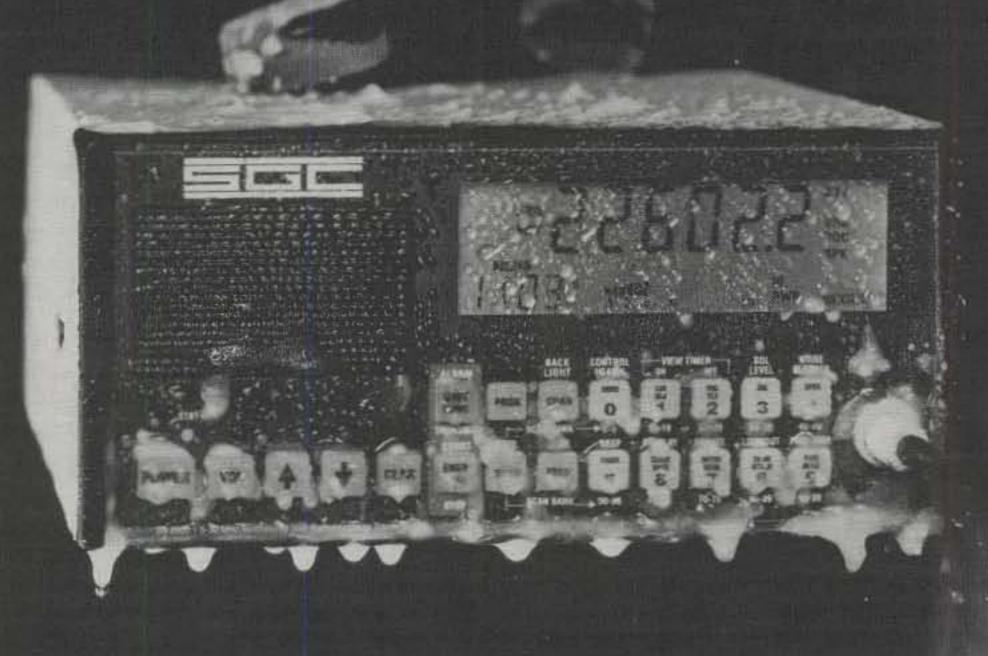
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From left to right: Robert Giglio, N2JJM, Suffolk County Sheriff's Dept.; Dave Bloom, N2NWS, Suffolk County Police Dept.; John Schneider, N2LPM, Northport Village Police Dept.; Anthony Frontino, KB2HRB, Suffolk County Sheriff's Dept.; William Savarese, N2HII, Port Authority of New York & New Jersey Police Dept.; Jeff Savasta, KB4JKL, Suffolk County Police Dept.

to the vast array of work schedules of our members. It is extremely difficult for our membership to get together for meetings on a monthly basis. We therefore knew that our newsletter would be essential in informing our membership of club events and news of common interest. SPARC also co-sponsors a repeater, and we utilize this repeater to pass on our club information to our membership.

I realized early on that it would be difficult to assemble the membership at a single location to pass club traffic, so the answer was to do it on the air, where it would be possible for even those who are working to check-in via their handhelds. This was the beginning of the SPARC Net, which meets every Monday night at 8 PM on the 145.310 MHz repeater system located in Farmingville, New York. This has been the answer to the needs of the organization and its members, as well as a popular net for the general amateur population, as we allow and encourage check-ins. This public interaction has strengthened the relationship between SPARC and the amateur public in general. SPARC has been well received by the amateurs in the area and is an extremely respected organization.

Our newest endeavor has been instructing youths in basic amateur radio. Our educational chairman, Anthony Frontino, KB2HRB, is responsible for this project and has been quite successful in recruiting amateurs to assist him in teaching the entry-level license theory to youngsters in his class. The youth population in general is normally very impressionable, and what better way for these kids to acquire a positive attitude toward law enforcement officers than through amateur radio.

SPARC hopes to benefit amateur radio by educating the law enforcement community as well as the public about the service this communications mode can provide, so that should an unfortunate disaster such as the Avianca airliner crash occur again, amateur radio will be recognized as a reliable, valuable communications system by all involved. It has been a long road for us, but it has been worth every effort that we have put into this organization.

If you happen to travel through Long Island, why not give us a call on the 145.310 repeater, or better yet check into the SPARC net on Monday nights. We will be glad to hear from you. Should you wish any information or communication with SPARC, feel free to drop us a letter by writing to SPARC, c/o Police Department, County of Suffolk, 30 Yaphank Ave., Yaphank, NY 11980.

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M-F: 9AM-5PM SAT.: 9AM-1PM Fessenden might not be a name you're familiar with, but after reading W9IWI's article you will be. He, as with the others in this series, helped to form modern electronics.

A Page Out Of History Reginald Fessenden Years Ahead of the World

BY JULIAN N. JABLIN*, W9IWI

In 1899 Reginald Fessenden told a meeting of the American Institute of Electrical Engineers "I consider myself proof against the seduction . . . of wireless telegraphy." He had "lost too much time" on fruitless projects in other areas to be lured by the mysteries of wireless. Yet by 1902 he was an acknowledged leader in the field of wireless signaling.

Fessenden's accomplishments over his lifetime include a form of continuous-wave (CW) transmission, the first two-way transatlantic wireless service, the first long-distance (1600 miles) wireless transmissions over land; an electrolytic detector, the wireless telephone, a heterodyne receiver, and a number of submarine signalling devices. These represented only some of his work. In all, he was awarded more than 500 patents.

Reginald Aubery Fessenden was born in 1866 in East Bolton, Quebec. When he was nine years old the family moved to Niagara Falls, New York to take advantage of a scholarship offered him at DeVaux Military College. His further education continued in Canada.

At the age of 20 he became principal (and the entire teaching staff) of the Whitney Institute in Bermuda. They started early in those days! Recognizing that the institute offered only a dead-end job, he returned after two years to the U.S. for greater challenges.

Fessenden's interest in mathematics led him into electricity, and he sought work with Thomas A. Edison. After a time as an assistant tester on telephone lines which Edison was installing in New York City, he was given the choice of a job at the Edison

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Machine Works in Schenectady or at Edison's Llewellyn Park Laboratory. Fessenden chose to work directly under Edison, who encouraged him to specialize in chemistry, since so many electrical problems were linked to chemical reactions. Less than two years later he was Chief Chemist at the Lab. He stayed there until 1889 and then left for private consulting work. In 1892 he joined the faculty of Perdue University and later of the Western University of Pennsylvania. Fessenden was later always known to his associates as "the Professor."

Both teaching positions involved lecturing on electrical engineering, Hertzian waves, and experimental wireless. His studies convinced him that previous developments in wireless had been unscientific and had taken the wrong direction. To prove his theories he left the class-room and the laboratory for the inventor's workshop.

Fessenden soon became recognized as a major figure in the science of communications. The U.S. Department of Agriculture approached him to develop a system for transmitting Weather Bureau forecasts. He set up an experimental station at Cobb Island, Maryland. Two 50 foot wooden towers a mile apart, with other equipment, were used for quantitative measurements of transmissions. A "long distance" test was made with a receiving station in Arlington, Virginia, 50 miles away. A crude form of speech transmission between the two towers was also tried; it worked, although "it was accompanied by an extremely loud and disagreeable noise" from the spark transmitter according to his wife, Helen Fessenden.

Operations were so successful that the Weather Bureau enlarged the program with stations at Roanoke Island, Hatteras, and Cape Henry, all in Virginia. Experiments in wireless telephony and in an early form of continuous-wave (CW) transmission continued at Roanoke.

One shortcoming in the reception of wireless signals was the very inefficient coherer. It limited the range of Fessenden's "long distance" transmission on Cobb Island and was useless for wireless telephony. In fact, a race was on to find an improved detector. Marconi, who had used the coherer in his historic transatlantic test, developed "Maggie"—a magnetic detector. Lee De Forest was experimenting with an electric arc in a gas flame. Later, Greenleaf Whittier Pickard found that some minerals could act as rectifiers, and this led to the development of the crystal detector.

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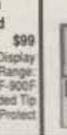
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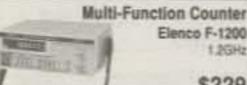
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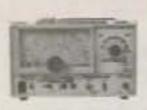
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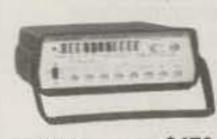
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Fessenden had secured a number of patents over several years, and using proceeds from these he set up the National Electric Signaling Company in 1902. Three vears later he moved his base to Brant Rock, Massachusetts. It was from this site that he established the first two-way transatlantic wireless telegraph service in 1906. In December of that same year he broadcast phonograph music and speech, with reception as far south along the Atlantic as Cuba.

The transmission of these wireless telephone signals required a much more stable source of oscillations than the spark gaps of those days could provide. A Swedish electrical engineer on the staff of General Electric, Ernst Alexanderson, was designing special generators and Fessenden encouraged Alexanderson to tackle the problem. Fessenden wanted a 100,000cycle alternator; working closely with Fessenden. GE delivered one that produced 50,000-cycle current. This was the machine that powered the Brant Rock transatlantic phone signals.

Development piled on development. Fessenden set up overland wireless systems. His equipment and systems were adopted by the Navy, and commercial shipping firms used his apparatus. He found, however, that technical ingenuity was no help in coping with corporate complexities. "In wireless work, patent interferences were constant, long drawnout, irksome, very vexatious, exhausting, and expensive," his wife wrote.

He had a long struggle for control of his patents held by the National Electric Signaling Company, fighting corporate giants such as RCA and Westinghouse all the way, and eventually came to a settlement with them. In 1928 Fessenden retired to Bermuda, where he spent his remaining few years in the pleasant company of family and visiting friends.

Along the way Fessenden received the Medal of Honor of the Institute of Radio Engineers in 1921; the John Scott Medal of the City of Philadelphia in 1974; and the Scientific American Medal in 1929. In 1987, remembering his origins, Canada honored him on a commemorative postage stamp in its "Inventors and Communicators" series. CO

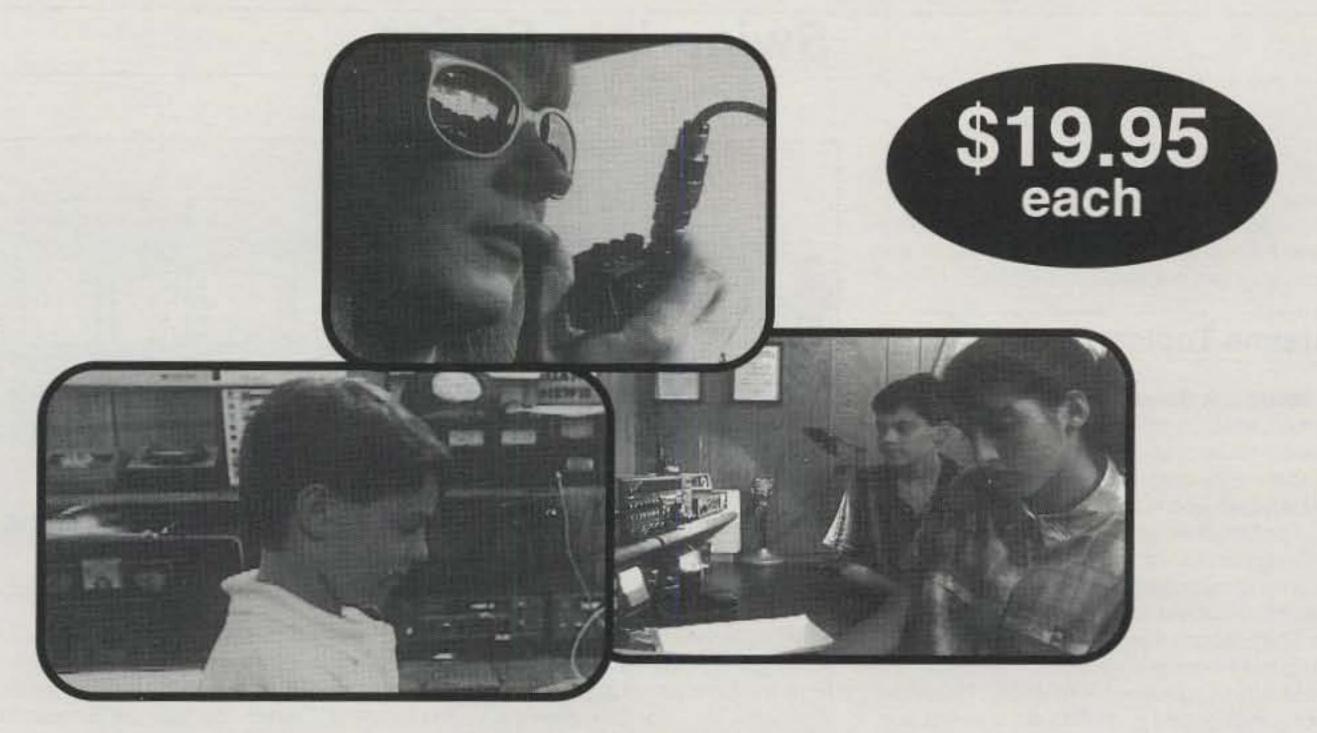
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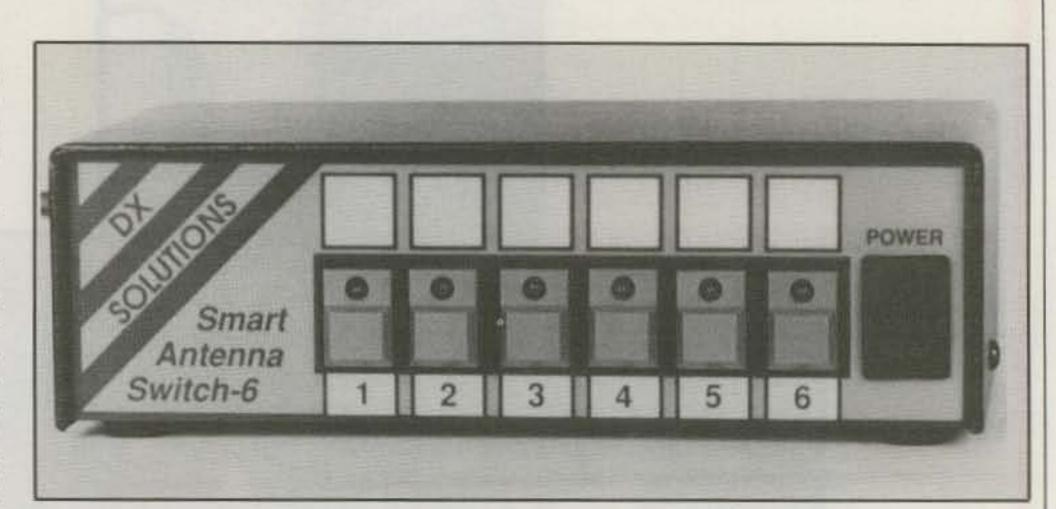
Antenna Topics

DX Solutions Smart Antenna Switch. Tim Pearson, KU4J, and Ed Blalack, WA4DPU, previewed their innovative, new, electronically controlled antenna switch at last summer's Huntsville Hamfest, and the unit now is in full production. The SAS-6 Smart Antenna Switch is an RF switching control unit that automatically selects one of up to six predesignated antennas based on your transceiver or receiver's band of operation. The antenna selections are programmed and edited from the switchbox front panel and are stored in its nonvolatile memory. The SAS-6 handles monoband or multiband antenna configurations, and it has a Lexan® front panel for antenna labeling as well as built-in self-test facilities. The unit also has a convenient manual override mode.

The SAS-6 requires no PC software for control. An outdoor relay unit, sold separately, is required for operation, and the SAS-6 is compatible with most remote coax switches to directly replace the manual switching unit. The SAS-6, which is priced at \$229.95, is compatible with most ICOM, Kenwood, and Ten-Tec transceivers that have a serial port interface, through the firm's CT-232 computer-control interface; control of Yaesu radios is by the "band data" port. The firm also packages the SAS-6 with DX Engineering's six-position outdoor relay unit for \$349.95. In addition, you can use the SAS-6 with the Ameritron RCS-8V, Heathkit SA-1480 and SA-1481, Drake RCS-4, and Antenna Mart Remote Coax Switch, if you so choose.

The companion CT-232 interface (\$54.95) is a hardware interface that allows most modern transceivers to be computer controlled via a serial data link. It's designed to be a cost-effective alternative to interfaces such as the Kenwood IF-232C, ICOM CT-17, Ten-Tec 305, and Yaesu FIF-232C. The CT-232 can also be used with most rig control software, and in fact, lets the SAS-6 and such software be used together. The interface is connected in series with the SAS-6, thus eliminating the need for an extra COM port on your PC. Custom configurations, such as cascaded architectures for control of a large number of antennas, and special arrangements to support multiple transmitters for contest operations, are available upon request.

For more information, contact DX Solutions, 147 South View Drive, Huntsville, AL 35806, or call 205-922-1724. Fig. 1 shows a typical SAS-6 hamshack installation.



The SAS-6 Smart Antenna Switch automatically selects one of up to six predesignated antennas based on the transceiver's band of operation. The antenna selections are programmed and edited from the front panel and stored in its nonvolatile memory. The SAS-6 has a Lexan® front panel for convenient antenna labeling. (Photo courtesy DX Solutions)



A companion to the SAS-6 is the CT-232 interface, a hardware interface to allow most transceivers to be computer controlled via a serial data link. It can be used together with most rig control software, in addition to the SAS-6 switch. The CT-232 interface is connected in series with the SAS-6; there's no need for an extra COM port on your PC. (Photo courtesy DX Solutions)

Swiech Communication Antennas. Gene Swiech, WB9COY, of Swiech Communication Systems, has begun to manufacture a new, computer-assisted-design line of VHF and UHF antennas for the amateur community. His antenna kits boast high-quality materials throughout: the mounting hardware is of stainless steel, the T-match is constructed of Chemfilm treated aluminum, and the coax balun is of silver-plated RG-142/BU cable that is potted to resist moisture entry. Black Delrin insulators are used.

As this is written, Gene offers only four carefully designed models. There is a 4-element 2 meter Yagi for packet radio and FM work, a 5-element 223 MHz optimized Yagi, a 7-element 440–450 MHz optimized Yagi, and a 420–440 MHz Yagi for repeater link and amateur television (ATV) use.

For pricing and more information, contact Swiech Communication Systems, 12218 Greentree Rd., Poway, CA 92064 (619-748-2286).

MLB-1 Magnetic Longwire BalunTM. A special-purpose, high-impedance receiving balun, designed with SWLs in mind, is offered by Palomar Engineers. It is the MLB-1 Magnetic Longwire Balun, which connects at the end of a longwire antenna to facilitate using coaxial cable from this point to the radio, thereby minimizing stray signal and local interference pickup.

The MLB-1 has a SO-239 type connector to accept coaxial cable and a single wire lead to connect to the antenna flattop. There is also an eyebolt on top of the balun for mounting to the antenna insulator or support wire. The coaxial cable connects the balun to the radio and can be of any length up to about 200 ft.; RG-58/U cable is suggested for most installations. The balun works over the range 500 kHz to 30 MHz. Proprietor Jack Althouse, K6NY, cautions that the balun is for receiving antennas only; you should not transmit through it. It is priced at \$39.95.

For SWLs, Palomar Engineers also offers a complete, fully assembled longwire antenna packaged with an MLB-1 balun, two ceramic insulators, 40 ft. of copper antenna wire, nylon support cord, and complete instructions. Known as The WHITE BOXTM, it is \$59.95. For a catalog and spec sheets, contact Palomar Engineers, P.O. Box 462222, Escondido, CA 92046 (619-747-3343).

Antenna Tips de WAØKKC. From time to time Richard Mollentine, WAØKKC, barrages the CQ offices with lots of "hints and kinks" type antenna tips. Dick usually sends more than we can use, but here are a few tips that we do have room to pass along.

 It appears that all antenna rotors, regardless of brand, should have a small "weep hole" in the bottom to drain condensation and moisture, to prevent ultimate damage to internal

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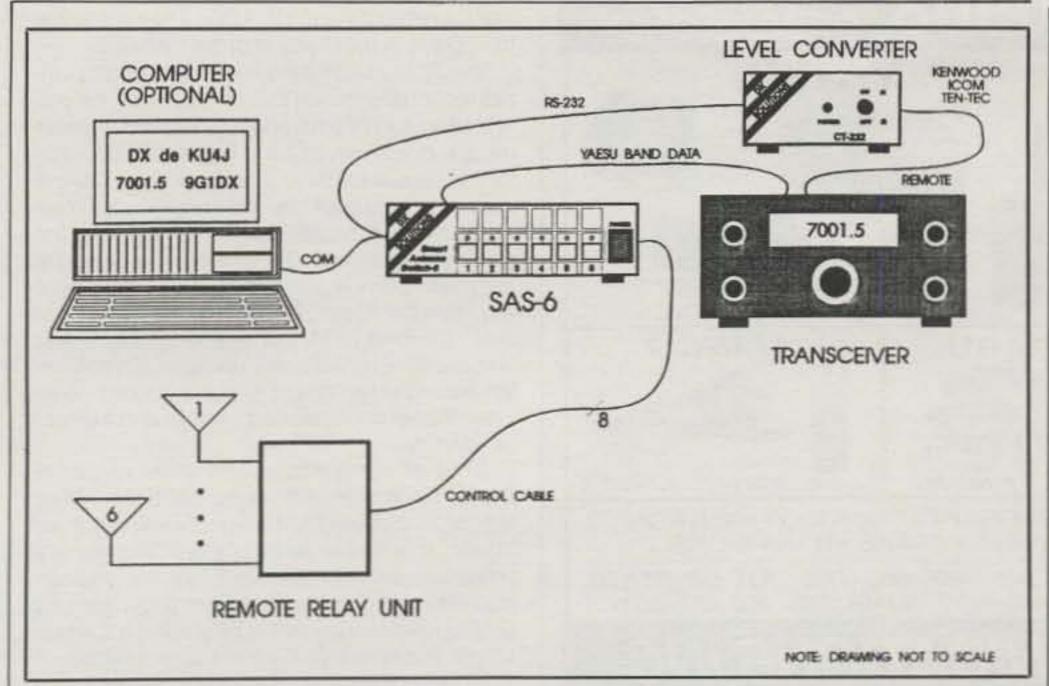


Fig. 1– Shown here is a typical SAS-6 Smart Antenna Switch hamshack installation. The SAS-6 is an antenna switching control unit that automatically selects one of up to six predesignated antennas based on the transceiver's band of operation. The companion CT-232 computer-transceiver interface and a remote relay switchbox complete the installation. A computer is not required for the basic configuration. (Diagram is from the DX Solutions SAS-6 user's manual)

components. If your rotor doesn't have a weep hole, drill a small hole in the bottom plate; a ½ inch diameter hole should suffice. Naturally, you do this at your own risk, as you must be very careful not to hit any internal components with the drill.

• When inserting additional pipes inside a mast to strengthen it, don't assume that if the outside mast moves, the inside ones will also move. Also, the pipes can bind together where they "butt up" against each other, as when driven by an antenna rotor. Dick suggests running bolts at regular intervals through all the mast pipes to positively prevent them from binding and slipping, especially when rotated.

· Take a cue from high-cost but effective commercial broadcast station grounding systems to achieve low-resistance station and antenna grounding. Obtain a steel gas pipe as long as you can handle—the longer the better. Cut an angled, tapered point on the end of the pipe using a metal saw. Drill numerous holes along the pipe. Drive the pipe into the ground and attach a heavy copper ground wire to it. Pour water and a saline (Epsom salt or hydrated magnesium sulfate) solution into the top of the pipe through a funnel. Add more of the solution every day for a few days. The result should be a very low-resistance ground connection. Of course, the more rods that you can connect together to form the ground system, the better.

Thanks for the tips, Dick!

Phase Two Accessories. Phase Two claims to have come up with an easier way to strip coaxial cables than using a knife, pliers, and other hand tools. They offer the E-Z Stripper, said to be the fastest and easiest-to-use coaxial wire stripper you can find. With it, in two motions (a twist and a pull) your coax is stripped and ready to accept many popular RF connectors.

The strippers are offered in a variety of sizes and styles. The original E-Z stripper (\$15.95) comes preconfigured for RG-58, RG-59, RG-62, and other popular small cables; larger strippers (\$21.95) are available to handle RG-8 and



A special-purpose receive-only balun of interest to the SWL is the Palomar Engineers MLB-1 Magnetic Longwire Balun™, which connects at the end of a longwire antenna and allows coaxial cable to be used from this point to the radio. The MLB-1 has a SO-239 type connector to accept coax and a single-wire lead to connect to the antenna flattop. (Photo courtesy Palomar Engineers)

RG-213 cables. Interchangeable cutting blades handle virtually any type RF connector, including PL-259 (UHF), BNC, TNC, and N types. Phase Two also offers several cam- and ratchet-operated cable crimpers that are sold separately or in combination with the strippers.

For more information, contact Phase Two Industries, Inc., P.O. Box 971, Media, PA 19063 (215-891-8822).

Olde Antenna Lab Update. In the February 1992 column we highlighted the antenna products of David A. Clingerman, W6OAL, who operates the Olde Antenna Lab (OAL). Dave produces a number of different antennas in his lab. His antennas, some of which are unusual de-



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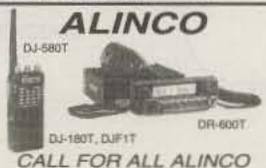












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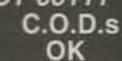
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signs, are mostly for VHF, UHF, and microwave use. Dave is most proud of his "wheels."

The 70 cm Little Wheel is a lightweight, omnidirectional antenna that offers horizontal polarization and has its origins in 1950s 2 meter mobile operation in New England. The Little Wheel consists of three broadband quarterwave elements in parallel that are arranged in a cloverleaf pattern. A capacitive stub is used at the feedpoint to balance the inductance and drive the terminal impedance toward 50 ohms. Dave says that the 70 cm Little Wheels worked so well that he created a Mini Wheel for 23/24 cm and a Micro Wheel for 13 cm. There is also a Nano-Wheel and a New Wheel, the latter a more robust Little Wheel that is placed at the end of a length of hardline.

Dave recently introduced another version of the Little Wheel, which he calls the "Mag Wheel"-essentially a magnetically mounted 70 cm Little Wheel for mobile use. The new antenna takes advantage of the fact that you can squeeze out a slight gain from a horizontally polarized antenna system by placing it % wavelength above the surface of the ground plane. The resultant mobile antenna is mounted on the end of a 191/2 inch length of 1/4 inch hardline; some judicious bending of the hardline places the antenna at the proper point above the groundplane. Dave uses a bulkhead-type female type-N connector that is compression-fit on the 1/4 inch hardline. The connector is mounted on a brass L-bracket that has a hole in one end for the connector and another hole in the other end for mounting to the mag mount. Dave sells the complete Mag Wheel assembly for \$39.95 plus \$5 shipping.

For more information and specs on the various Wheels and other OAL antenna products, contact Dave at The Olde Antenna Lab, 4725 W. Quincy #1014, Denver, CO 80236 (303-798-5926).

Soft Topix

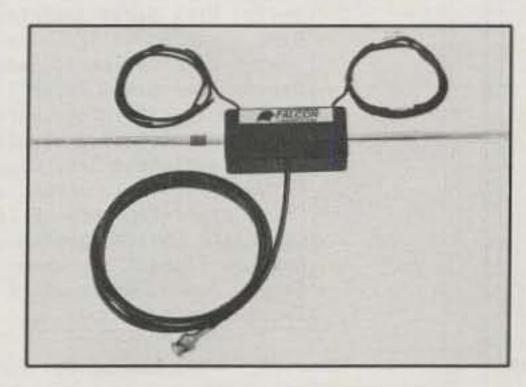
Two from Austin Antenna. Dick Austin, K1QIZ, who is well known in antenna manufacturing circles as the proprietor of Austin Antenna, has begun distributing radio-electronic circuit and RF calculation software. Two recently introduced software products are of interest to us.

One of these is dB Comp, an antenna gain calculation program for vertical omnidirectional designs. It also effectively serves as a sort of "truth in antenna advertising" program that lets the user check out the sometimes inflated gain and performance claims made for these antennas. To do this, the program calculates the maximum theoretical gain capability of an antenna based on its frequency and physical characteristics. Amateurs who are interested in knowing the real, no-hype capabilities of a contemplated antenna before purchase should find the program worthwhile. It is "free," but Dick asks \$5 to cover his costs.

Shortly after releasing dB Comp, Dick introduced the R.F. Designs & Calculations software. It is a more extensive radio-electronic design program with 21 functions. The program facilitates the design of many inductors, including airwound chokes; self-resonant, flat-strip, and round wire inductors; and ferrite toroids. Coaxial-line capacitors, inductors, and chokes are covered also, and the software will "design to" a known inductance or LC resonance. The program also computes parameters for short loaded dipoles and dual-band trap dipoles, and it per-

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Fig. 2- Shown here is the main menu of dB Comp: Austin Antenna Vertical Antenna Comparison Software, an antenna gain calculation program for vertical omnidirectional designs. It also serves as a sort of "truth in antenna advertising" program that lets you check out manufacturers' gain and performance claims. The program calculates the maximum theoretical gain capability of an antenna based on its frequency and physical characteristics. (See the text of this month's column for details.)

. R. F. Designs & Calculations . Design Inductor from Known Inductance or LC Resonance Design Straight Round Wire Inductor Design Flat Strip Inductor Design Air Wound RF Choke / Self Resonant Inductor Design Ferrite Toroid Inductor Design Coax line, Capacitors & Inductors Design Capacitor Constructed with Double Sided PCB Design Short Loaded Dipole Design Dual Band Trap Dipole Calculate Inductor from Turns, Diameter and Coil Length Calculate Inductance or Capacitance from Reactance Value Calculate Series Reactance of Parallel L & C Antenna Element Frequency Scaling Calculations >>-> Shop - Tools, Materials & Calculations Company Information Hit Escape to Quit Registered To: Karl Thurber M8FX fustin Antenna Consultants and Innovators of Antenna Concepts

Fig. 3- Shown here is the main menu of Austin Antenna's R.F. Designs & Calculations. It is a comprehensive radio-electronic design program that features 21 functions that facilitate the design and evaluation of a variety of inductors and antennas. The arrow points to the "shop tools" section of the program, which includes wire-gauge tables, dielectric constants, drill sizes, metricunit conversions, and wind-load calculations. The shop section also incorporates the features of dB Comp, Austin Antenna's other new software offering.

forms antenna-element frequency-scaling calculations. A "shop tools" section includes wiregauge tables, dielectric constants, drill sizes, metric-unit conversions, and wind-load calculations. The R.F. Designs & Calculations program also incorporates the features of dB Comp, described above, which is a part of the shop tools section of the larger program. It's \$30 postpaid.

Both are offered by Austin Antenna, 10 Main St., Gonic, NH 03839 (603-335-6339). They are shown in figs. 2 and 3.

RF Design Software Service. A very specialized software distributor is the noncommercial RF Design Software Service, which offers the IBM PC compatible RF engineering programs that appear in RF Design magazine. The purpose of the service is to distribute the programs from articles published in the magazine to promote the exchange of ideas among engineers. The service does not provide technical support for the magazine programs.

Generally, the program disks are \$15 each and coincide with a given month in the magazine. Each disk also includes copies of the article in which the programs appear, along with any author's notes. Full-year sets are available back to 1989 for \$110 a year. Both 51/4 and 31/2 inch diskettes are available, and there's one program diskette for the Apple Macintosh.

For more information, contact the RF Design Software Service, P.O. Box 3702, Littleton, CO 80161-3702 (303-770-4709).

DX LUMBERJACK. Greg Snellgrove, KN4NO, has come up with still another logging program in this very competitive software classification. Greg has been using earlier versions of DX LUMBERJACK for his own purposes for three years; he originally wrote it because many of the things he wanted from a logging program

forms antenna-element frequency-scaling calculations. A "shop tools" section includes wirehe evaluated.

> While I can't say if it's "the ultimate DX logger" as Greg claims, DX LUMBERJACK does have some solid, Paul Bunyan style features. Some of its main features include automatic country and zone determination, a "DX scoreboard," a powerful log report generator, and QSL and envelope printing that works with reports from the log report generator. Other program highlights are calculation of beam headings and distances, generation of "need lists" for most DXCC awards, tracking of 10-X numbers for 10 meter contacts and states/counties for stateside contacts, a comprehensive QSL manager, and integration with the SAM callsign database from RT Systems. Something I noticed right away is the professionally printed user's manual

DX LUMBERJACK is \$39.95 plus \$3.50 shipping and handling. A demo, creditable toward purchase, is \$5. For more details, contact VALTEK Software, P.O. Box 1266, Smiths, AL 36877 (205-480-9494). Fig. 4 shows the main menu.

Design Tool A.S.P. C.H. Reichert, KD9JQ, offers through his S.W.I.F.T. (Software Innovations for Technology) Enterprises a new version of Design Tool ASP, the Amplifier Simulation Program.

The program is for interactive development of weak-signal solid-state amplifiers. Included are various automatic and manual calculation routines which allow you to optimize for noise, gain, or output VSWR; the plotting routine displays gain, noise figure, and VSWR. Variations of final matching circuit values and circuit "Q" provide additional design flexibility. The \$85 program is for the IBM PC and is available from

S.W.I.F.T. Enterprises, 955 Concord Lane, Hoff-man Estates, IL 60195 (708-776-2119).

Amateur Radio Station One. Lonnie Butler, N5HWP, has introduced a versatile, multi-purpose application program for the ham shack. When used with an IBM PC or compatible, your PC can act as a Morse code sender and packet controller. You can store an almost endless number of messages to be sent by either the packet controller or the Morse code sender. The program allows you to input the latitude and longitude of your QTH; in response, the program shows you the direction to point your antenna from anywhere as close as 6 miles away to points around the globe.

Major program features include a logbook with dupe checking; a packet split- and full-screen interface with "unlimited autosend" and simultaneous receive while accomplishing other tasks; Morse code keyboard and paddle senders; a local/DX beam-heading calculator, a station ID reminder; dual schedule alarms; printout of QSL cards, the logbook, and packet QSOs; a license-mode frequency chart; and a world time clock.

The program is priced at \$69.95 plus \$4 shipping and handling from Amateur Radio Station One, 10755 Meadowglen Lane #280, Houston, TX 77042 (713-974-7838).

Log View Update. In the January 1992 column we profiled Log View, by Paul Keezer, NX1P, reportedly the first Microsoft WindowsTM amateur radio application. To recall, Paul's graphical user interface (GUI) based program ntegrates fast, real-time logging, awards tracking, contesting, keyboard keying, and QSL management capabilities. Log View features include multiple interactive windows, contacts limited only by disk space, tracking of hundreds of



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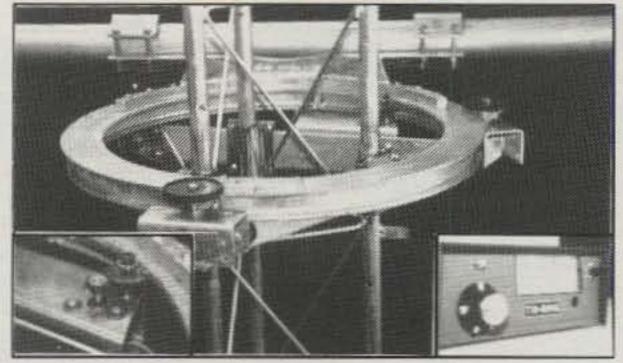
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Even if I had not run out of real estate, the ring rotors are a very good investment because they cost much less than an additional tower and rotor!

Also, I appreciate your friendly help and advice via telephone during the erection of the rotors.

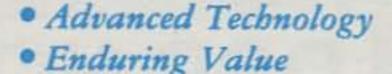
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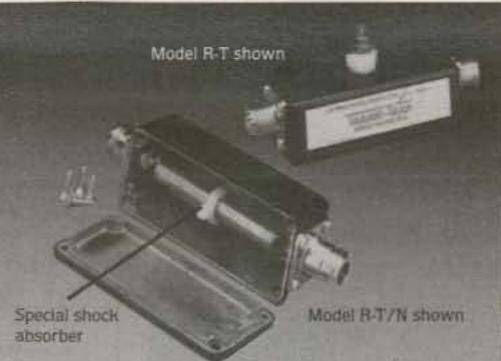
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awards, predefined award and contest files, customizable QSO reports and QSL formats, log sorting, automatic bearing/distance calculations, contest-mode dupe checking, and integrated packet DX spotting and operator-configurable rig control options. Log View is \$85.

Since we profiled Log View, Paul has added two new associated programs. Now available are Pack View (\$35), which ties packet DX spotalerting systems to Log View; and Rig View (also \$35), for PC control of Yaesu, Kenwood, and ICOM radios by Log View. Paul writes of the relationships existing between the three programs and Microsoft Windows:

"One of the advantages of Windows is that you can break major functions into separate programs and have the programs either work apart or act as one program. This allowed me to create customized Rig View programs for Yaesu, Kenwood, and ICOM while keeping Pack View and Log View as standard products. This method allows more freedom in the user interface style chosen for the particular kind of application. Log View, as a database application, is designed with list box windows for the database and data entry windows to enter and edit items in the database. Pack View has the look and feel of a terminal program with special features for DX Cluster data. Rig View emulates the look and controls of a radio front panel."

We also note that Paul operates a full-service BBS for support similar to K1EA's CT BBS. Over the past year he has provided several program revisions that are downloadable by registered users from the BBS. For more information, contact the PDK Company, 46 Oak St., Dunstable, MA 01827 (BBS 508-649-4360). A Log View demo is \$15. (Also see figs. 5 and 6.)

BMK-MULTY Update. In the November 1991 column we took note of BMK-MULTY by M. J. Kerry, G4BMK. His software is a sophisticated but economical multimode amateur radio software package of up to six modules. The modules include: (1) AMTOR, which allows the PC to run AMTOR transceive using a "dumb" terminal; (2) CW, for high-speed Morse transceive or code practice; (3) RTTY, for RTTY transceive at 45 to 110 baud; (4) FAX, for reception of weather satellite (WEFAX) pictures and charts; (5) SSTV, which decodes most black-and-white slow-scan television (SSTV) picture standards; and (6) TUN-ER, an audio spectrum analyzer. The AMTOR/ RTTY modules are highly advanced in that they enable you to receive and send with just a simple dumb terminal unit between the PC and the transceiver; the AMTOR algorithm has rapid synchronization and automatic mode selection.

What has changed since we last turned to BMK-MULTY? Well, you probably still can obtain the modules as a package, individually, or in several combinations, directly from G4BMK at Grosvenor Software, 2 Beacon Close, Seaford, East Sussex, BN25 2JZ, England. Now, however, you can conveniently obtain the software from a U.S. distributor, Steven C. Schned-Ier, AC4IW. The base package (AMTOR, RTTY, CW, and audio spectrum analyzer modules) is \$95. The extended version (\$125) adds SSTV and WEFAX reception to the package. Contact Schnedler Systems AC4IW, 25 Eastwood Rd., P.O. Box 5964, Asheville, NC 28813 (704-274-4646).

R&R Callsign Database Update. In the November 1992 column we took note of an innovative callsign database from behind the former Iron Curtain. The disk-based R&R, introduced by Valery A. Kharchenko, RA6YR, is especially designed for "oblast chasers."

Say You Saw It In CQ

As we noted, R&R is the computer version of the Russian and Independent Republics Callbook, 3rd Edition (1992), published annually since 1989 by the Octavia Company, Ltd., P.O. Box 40, 352700, Maikop, Russia. R&R provides all necessary information for you to get cards to the many former Soviet republics. The computerized database contains more than 30,000 callsigns and addresses, "then-and-now" callsign changes, and internal QSL bureaus. The program also prints mailing labels. The copyrighted program is offered as shareware; registration is \$15 (U.S.).

As we noted last November, you can obtain the program, which now is up to V1.2 or higher, from the distributor postpaid for the initial \$15 registration fee. He's Giuseppe lannuzzi, I8IYW, P.O. Box 5083, I-80144, Naples, Italy.

However, recognizing that for U.S. amateurs to obtain the program from an overseas source is inconvenient and time-consuming, Peter Jennings of J-Com has stepped in to bridge the gap. Peter tells us that he has made arrangements to act as a distributor for Valery. If you can't access CompuServe's HamNet or can't locate the program on various amateur radio oriented BBSes, remit \$5.95 to cover disk handling and mailing costs to Peter Jennings at J-Com, Box 194, Ben Lomond, CA 95005 (408-335-9120); he's also incorporating the R&R data in the HamBase DX and QSL Manager Database supplemental disk. You can contact Peter on CompuServe; his ID is 72470,3171.

You also can obtain R&R through other U.S. disk vendors that specialize in amateur radio software. One I know that offers the disk is K-Quest, P.O. Box 92877, Southlake, TX 76092 (817-421-0560). Of course, since the program is shareware, regardless of how you obtain it you

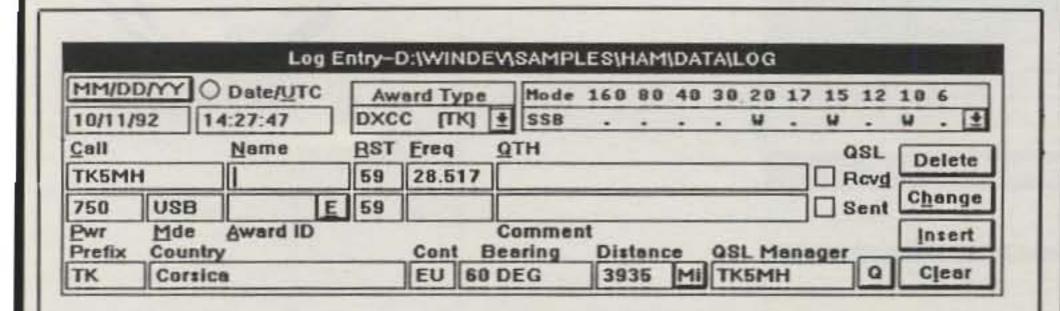
DX	LUMBERJACK	MAIN MENU	by KN4NO
	Logging M View/Edit Mark a QS DX ScoreB Reports File Main Setup Uti	Mode Log Entries L Received. oard tenance	(2) s.(3) (4) (5) (6) (7)

Fig. 4- DX LUMBERJACK by Greg Snellgrove, KN4NO, is a heavy-duty DX logging system for the IBM PC and compatibles. Its main menu is shown here. One of its strongest features is its highly customizable log report generator. Greg has been using earlier versions of the program for about three years, but only last fall decided to "go commercial" with it after being encouraged by friends to do so.

still should remit the registration fee overseas (\$10 is the registration fee if you already have registered an older version of R&R).

MorseMan Plus Update. We've mentioned MorseMan Plus several times previously in the column as its Alabama developer, Robin Gist, NE4L, has progressively improved his very competent IBM PC Morse Code trainer. Robin has upgraded MorseMan Plus to Version 4 and has offered a host of new features.

The latest version lets you choose your meth-



Standard View Log Entry Window (Log View)

					Log	Entry -										1.05
10/13/9	12 1:	51:32		O Date/UT	гс	Mode	160	80	40	30	20	17	15	12	10	6
Call	GOOD	BST		Ereq	Mode	CM										. ±
HC78K		59		7.0060	cw	Cles		Pnts	lo.	-			0	: 1		-
Prefix	Count	ry		QSL Mn	g	CIE	-	Pilts	10	_						
HC	Ecuad	ior		CX5BW		Chan	ge						Rat	е		R
Cont	Beari	ng	Pnt	E C mult		Dele	te	MxCr	0			Ele	pse	d 0	:3	B
SA	178	DEG	3	Z mult	1	Inse	rt	MIt	0		司	-	Scor	e 0		

Contest View Log Entry Window (Log View)

Fig. 5– Log View has been under development as a Microsoft Windows™ application by Paul Keezer, NX1P, since 1988—yes, an early version of Windows was around then, but it hadn't caught on yet. Paul claims that Log View deserves honors as the first Windows-based amateur radio software application. Depicted here are the standard and contest-view log entry windows. Two other applications, Rig View and Pack View, are associated with the program (details are in the text of this month's column).



MODERN, MULTI-BAND ANTENNA SYSTEMS

COMET Customer Service (714) 630-4541

COMET developed the Super Linear Converter (SLC) System to increase the actual gain of Dual/Triband antennas.

- A completely pre-formed phasing coil and phosphorus copper element eliminates additional components and gain loss. (Photo B)
- The SLC is electrically very efficient, providing a low angle of radiation directly to the horizon, for maximum performance. (Photo B)
- COMET sectional antennas use ABS (Transparent to RF) connecting joints for the finest pattern and easiest assembly. (Photo A)

COMET DUALBAND ANTENNAS

MODEL#	BANDS	GAIN	MAX PWR Watts	CONN	WEIGHT Lbs' oz"	LENGTH Ft' In"	MAX WIND SPEED MPH
- WAYER	Duali	Band Base S	tation/Rep	eater An	tennas		
GPX-2010	2M/70cm Nylon G	9.5/13.2 uys Included. I	200 Highest Gain	SO-239 Dualbande	7'14" r in the Wor	23'4" ridi	65 w/o guys 90 w/guys
CA-2x4MAX	2M/70cm	8.5/11.9	200	SO-239	5'11"	17'8"	90
CA-2x4WX	2M/70cm	6.5/9.0	200	SO-239	3'8"	10'5"	90
CA-2x4FX	2M/70cm	4.5/7.2	200	SO-239	2'12"	5'11"	112
CMR-241	2M/70cm	4.5/7.2	200	SO-239	3'8"	6'10"	135
CA-350DB	10M/6M	2.15/6.5	100 FM	SO-239	7'8"	22'7"	65
CA-1243Z	70cm/23cm	9.4/12.8	150/50	N-Female	3'8"	7'5"	90
CA-1243E	70cm/23cm	6.0/8.4	150/50	N-Female	1'13"	3'4"	112
B-10	NEW B-Se 2M/70cm	ries BLACK	d Mobile A ANODIZED		STATE OF TAXABLE PARTY.	nce 12"	
		-/2.15			7.		-
B10NMO	2M/70cm	-/2.15	50	NMO Ot aco	- 7	12°	-
B-20	2M/70cm	2.15/5.0	50	PL-259	-		-
B20NMO	2M/70cm	2.15/5.0	50	NMO	Total Control	30"	
NE	W F Series: Th	ie Highest Q	uality Dual	Band An	tenna You	I Can Buy	/!
FL-62S	2M/70cm	3.6/6.0	150	PL-259	-	3'5"	-
FL-67S	2M/70cm	4.5/7.2	150	PL-259	2	4'11"	-
CA-2x4MB	2M/70cm	4.5/7.0	150	PL-259	-	4'11"	
CA-2x4SR	2M/70cm	3.8/6.2	150	PL-259	-	3'4"	-
CHL-23J	2M/70cm	2.15/3.8	100	PL-259	15	20"	-
CHL-21J	2M/70cm	-/2.15	100	PL-259	-	12*	+
NCG-1422M	2M/220MHz	2.15/3.4	100	PL-259	=	3'0"	-
CHL-350	10M/6M	-/2.15	200	PL-259	-	7'0"	-

COMET TRIBAND ANTENNAS

MODEL#	BANDS	GAIN	MAX PWR Watts	CONN	WEIGHT Lbs' oz"	LENGTH Ft' In"	MAX WIND SPEED MPH
	TriBa	and Base Sta	ation/Rep	eater Ant	ennas	100	The last
CX-725	6M/2M/70cm	2.15/6.2/8.4	200	SO-239	2'15"	7'11"	90
CX-333	2M/220/70cm	6.5/7.8/9.0	120FM	SO-239	2*	10'4"	112
CX-902	2M/70cm/23cm	6.5/9.0/9.0	200	N-Female	3'3"	10'0"	90
CX-903	2M/70cm/23cm	6.5/9.0/13.5	100	N-Female	3'6"	9'8"	90+
		TriBand	Mobile An	tennas	1		III Is I
CX-702	6M/2M/70cm	2.15/6.0/8.4	120	PL-259	-	6'10"	-
CX-801	2M/70cm/23cm	3.0/6.8/9.6	100	N-Male	77.	3'3"	F
FL-95SN	2M/70cm/23cm	2.8/6.0/B.4	80	N-Male		2'7"	_
NEW! The h	fighest Gain 2M/2	20/440MHz Mo	obile in The	World! Ava	liable from	COMET,	Of Course!
CX-224	2M/220/70cm	2.15/3.6/6.0	150	PL-259	-	3'1"	-
CX-224NMO	2M/220/70cm	2.15/3.6/6.0	150	NMO	=	3'1"	-
NEW! QUAD	BAND Mobile Ant By Adding HF C						e Constant.
CA-HV	40/(20)/15/ 10/6/2Meters	HF -/2.15/3.4	120SSB	PL-259	MAX 1'3"	MAX 6'3"	2 -
L-14	Optional 20M load	fing coil for the C	A-HV.				





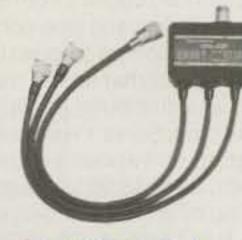
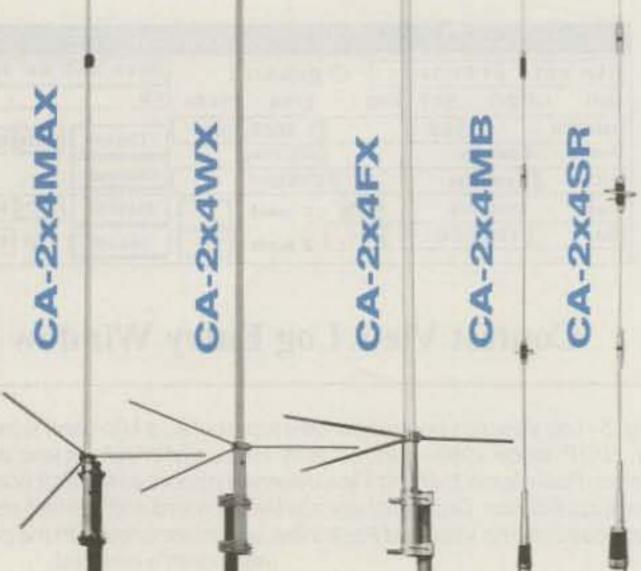


PHOTO A

CFX-431



CF-416



RS-80 RS-81 RS-820 RS-21 RS-850 RS-9 3D4M Standard CK-5M Deluxe cable assembly. cable assembly. FL-67

COMET HIGH-POWER DUPLEXERS AND TRIPLEXERS

MODEL#	PORT	Freq MHz	CW Watts	PEP Watts	Loss dB	Isol dB	Mix Conn	Port Conn
CF-416A (2M/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.15 0.25	60dB 60dB	SO-239	PL-259 w/leads PL-259 w/leads
CF-416C (2M/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.15 0.25	60dB 60dB	N-Female	PL-259 w/leads N-Male w/leads
CF-41601 (2M/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.1	60d8 60d8	SO-239	PL-259 w/o leads N-Male w/o leads
CF-4160K (2M/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.1	60dB 60dB	SO-239	PL-259 w/o leads PL-259 w/o leads
CF-413OA (70cm/1.2GHz)	LPF	1.3-150MHz 350-500MHz 840-1.4GHz	450 300 100	800 500 200	0.2 0.2 0.3	55dB 55dB 55dB	N-Female	N-Male w/o leads N-Male w/o leads
CF-360A (HF/6M-450MHz)	LPF	1.3-30MHz 49-470MHz	350 350	600 600	0.2 0.25	45dB 45dB	SO-239	PL-259 w/leads PL-259 w/leads
NCG-1422D (2m/220MHz)	LPF HPF	144-148MHz 220-225MHz	50 50	100 100	0.5 0.5	40dB 40dB	SO-239	PL-259 w/leads PL-259 w/leads
CFX-431A (2m/70cm/1.2)	LPF BPF HPF	1.6-60MHz 100-150MHz 350-500MHz 840-1.4GHz	600 450 300 100	1KW 800 500 200	0.2 0.2 0.3 0.4	50dB 50dB 50dB 50dB	N-Female	PL-259 w/leads N-Male w/leads N-Male w/leads
CFX-4310C (2m/70cm/1.2)	LPF BPF HPF	1.6-60MHz 100-150MHz 350-500MHz 840-1.4GHz	600 450 300 100	1KW 800 500 200	0.15 0.25 0.25 0.3	50dB 50dB 50dB 50dB	N-Female	PL-259 w/o leads PL-259 w/o leads N-Male w/o leads
CFX-514 (6m/2m/70cm)	LPF BPF HPF	1.3-90MHz 130-200MHz 380-500MHz	450 450 300	800 800 500	0.2 0.25 0.3	55dB 55dB 55dB	SO-239	PL-259 w/leads PL-259 w/leads PL-259 w/leads
CFX-514J (6m/2m/70cm)	LPF BPF HPF	1.3-90MHz 130-200MHz 380-500MHz	450 450 300	800 800 500	0.15 0.2 0.25	55dB 55dB 55dB	SO-239	SO-239 w/o leads SO-239 w/o leads SO-239 w/o leads
CFX-324A (2m/220/70cm)	LPF BPF HPF	1.3-150MHz 200-320MHz 390-500MHz	350 350 350	600 600 600	0.2 0.25 0.3	40dB 40dB 40dB	SO-239	PL-259 w/leads PL-259 w/leads PL-259 w/leads
CFX-324B	LPF BPF	1.3-150MHz 200-320MHz	350 350	600 600	0.2 0.25	40dB 40dB	SO-239	PL-259 w/o leads PL-259 w/o leads
(2m/220/70cm)	HPF	390-500MHz	350	600	0.3	40dB		PL-259 w/o leads

COMET MOBILE MOUNTING SYSTEMS

COMET has a wide selection of mobile mounts. All COMET cables have detachable connectors.

MODEL#	DESCRIPTION
3D4M 3D5M 3D4N	Standard coax assembly, 13ft low loss coax w/UHF connectors. Standard coax assembly, 16.5ft low loss coax w/UHF connectors. Standard coax assembly, 13ft low loss coax w/N-connectors. Recommended to 900MHz.
CK-5M5 CK-5N	Deluxe coax assembly, 13ft VERY low loss coax + RG-188 UHF connectors. Avoids cable damage upon vehicle entry. Deluxe coax assembly, 16.5ft VERY low loss coax + RG-188 UHF connectors. Avoids coax damage upon vehicle entry. Deluxe coax assembly, 13ft VERY low loss coax + RG-188, N-connectors. Avoids cable damage upon vehicle entry.
5D4N	13ft VERY low loss cable assy. For 1.2GHz N-Connectors
Th	e Following Mounts are w/o Coax. Choose from the Cable Assemblies Above.
RS-20 RS-80 RS-81 RS-820 RS-21 RS-850 RS-9	Medium-Duty Gutter Mount, Black w/Dial lock. Heavy-Duty Trunk Lip Mount, Black w/Dial lock. Heavy-Duty Trunk Lip Mount, Black w/Dial lock. Heavy-Duty, low-profile Trunk lip mount. Black w/Dial lock. Multi-Purpose Mount, Trunk-Lip/Hatch-Back, Black, Adj. to any position. Heavy-Duty Pipe/Luggage Rack Mount 1.75" max width/diameter. Black w/Dial lock. Trunk Lip Mount, Black. For small antennas. (B-10, B-20, CHL-23J, etc.)
MS-3FVMM	Mag Mount, 13ft low-loss cable. 12 pole magnet. UHF Connectors
MS-5LXMM MS-5LXNN	Mag Mount, 13ft low loss cable + 10" RG-188 to avoid water leak/cable damage, Mag Mount, 13ft low loss cable + 10" RG-188, N-Connectors
TS-1M TS-5M	Low profile trunk lip mount, w/3D5M coax assembly, UHF connectors Low profile trunk lip mount, w/deluxe CK-5M5 coax assembly, UHF connectors.

COMET SINGLE BAND AND HT ANTENNAS

MODEL#	BANDS	GAIN	MAX PWR Watts	CONN	WEIGHT Lbs' oz"	LENGTH Ft' In"
12.	N	ew Single	Band Antenr	nas		
CHL-185	2m	4.1	200	PL-259	-	4'8"
CA-430HG	70cm	5.0	100	PL-259		2'5"
		New HT	Antennas			
CH-32 MINI Ant	2m/70cm	-	10	BNC		1.75"
CH-72S	2m/70cm	-3.2	50	BNC	=	15"
SH-95	2m/70/23cm	1.5/2/5.5	10	BNC	- 1	15"

ML-7 Micless Microphone

A Dynamic One-Piece Earphone/Microphone. • Cordless mic is especially useful when An ultra-mini microphone located within the ear-piece picks up sound from the inner ear. Clear voice is transmitted, with less influence . Earphone provides privacy and security. from outside noises.

The ML-7 is not a conventional Speaker/ Microphone. Receive is completely hands free.

- · Especially effective in noisy situations: Parades, airports, factories, etc.
- activity is taking place: bike riding, skiing, " hunting, driving, etc.
- . Excellent TX and RX quality!

ML-71: For Icom, Yaesu, Standard, Alinco ML-7K: For Kenwood

Note: Please check for compatibility with your particular radio.



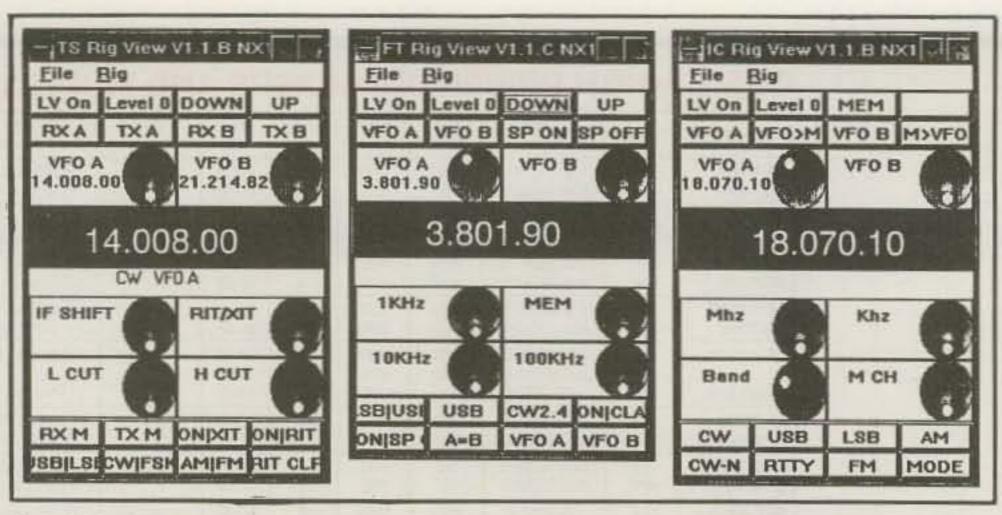


Fig. 6– Rig View, one of two associated Log View applications, ties Kenwood, ICOM, and Yaesu rigs into Log View and Pack View. Rig View features include 48 operator-configurable "buttons" that you can program with manufacturer-defined commands, six control knobs that turn your mouse or trackball into a tuner encoder, and a large frequency and status display. Demonstration copies of both Rig View and Pack View are furnished with Log View.

od of instruction: random characters, words, or callsigns, for variation in presentation style. Features include random characters and words from 5 to 99 wpm; a built-in callsign generator; a keyboard sending mode; an ability to generate ASCII text files; step-by-step character instruction; and interactive word and character modes.

Especially noteworthy features include the random callsign generator, which allows the program to generate realistic callsigns. The QSO/FCC test feature provides help for those going for FCC exams. With this option selected, the program randomly builds one side of a test-style

QSO, with abbreviations, prosigns, callsigns, and Q-signals. Also, the QSO monitor lets you listen in on simulated QSOs; the program generates both sides of the conversation but lets you choose the speed and frequency range to use. The program is \$34.95 from Renaissance Development, Box 640, Killen, AL 35645 (1-800-525-7235).

Although Version 4 is an excellent one, I must confess that I had some problems with it on my PC, an aging Gateway 2000 386SX, mainly on program exit—possibly because I have it loaded down with lots of memory-conflicting TSRs,

memory caches, and other assorted utilities. I pointed out these conflicts to Robin, who should have made any corrections to the program, if needed, by the time this appears in print.

Incidentally, Robin also operates the Renaissance Software Library, which offers a good selection of top-rated shareware and public-domain software for the IBM PC and compatibles. Included in the library are about 60 disks related to amateur radio. A catalog is available from the above address.

QQSL Update. If you turn to the January 1992 column, you'll see our most recent mention of QQSL, the "Quick" QSL Label program by Bill Mullin, AA4M/6. As a "software survivor," it is a mature program that by now is well-scrubbed of program bugs, and it sports many new features that have helped make it what Bill optimistically describes as "the ultimate QSL label program."

To recap, QQSL is a shareware program written expressly for the contester, DXpeditioner, award hunter, and anyone else who sends a lot of QSL cards. It is a complete, stand-alone QSL database tracker that does just one thing: print QSL labels fast and easily. The program boasts a user-friendly interface, rapid keyboard entry, a file import capability, the ability to create responses to SWL QSL cards received, a variety of input entry forms, alphabetical sorting, and a batch printing mode.

Recent versions of QQSL have included QQSLCD, also a shareware program, by Tom Palko, WB5ASD. With QQSL, this module, a CD-ROM disc drive, and the Buckmaster HamCall CD callsign database, you can automatically produce matching address labels along with your own return labels. QQSL is shareware, and registration is \$19.95 from Bill Mullin, AA4M/6, 3042 Larkin Place, San Diego, CA 92123-3026 (619-292-7227). You also can download a QQSL demo from CompuServe's HamNet.

THE ORIGINAL WD4BUM

HAM STICK ANTENNAS

MADE IN USA

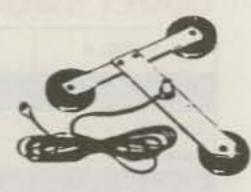
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Cat. #	Band	Cat. #	Band
9175	75 meters	9115	15 meters
9140	40 meters	9112	12 meters
9130	30 meters	9110	10 meters
9120	20 meters	9106	6 meters
9117	17 meters		

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- Holds All Hamstick Antenna's and Many Others
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Short Bursts

A Help Request de DY9CKQ. Rainier R. Bautista, DY9CKQ, is the 21-year-old vice-president of the Organization of South Cotabato Amateur Radio, Inc., in the southern Philippines. Rainier recently wrote me asking for assistance for his struggling amateur radio club, which is trying, with severely limited resources, to promote amateur radio among the youths in his area.

The main thrust of Rainier's letter was not to request monetary contributions. Rather, it was to solicit training and radio club management assistance and advice. They would also be appreciative of any donations of operating and Morse code training materials, copies of radio club newsletters, video tapes, and old amateur radio magazines and books.

If you can help in any way, contact Rainier R. Bautista, DY9CKQ, Vice-President, Organization of South Cotabato Amateur Radio, Inc. (OS-CAR-MARBEL), c/o Marbel Peterpan, Koronadal, 9506 South Cotabato, Philippines.

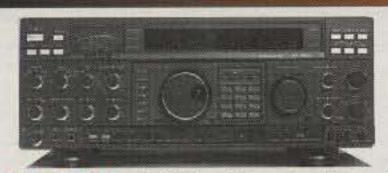
Wrap-Up

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

Overheard: Computers may be unreliable, but when it comes down to it, humans are even more unreliable.

73, Karl, W8FX

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YAESU FT-1000 • 200W - 9-band, all-mode HF transceiver with 100kHz-30MHz receive, 99 memories, built-in antenna tuner with memories. Built-in AC ps. 6"h x 16"w x 15"d, 58 lbs...... LIST \$3599.00 YAESU FT-1000D • Deluxe version with dual bandpass filter for crossband receive, temperature compensated crystal oscillator, 2.4kHz/2KHz SSB filters and 500Hz CW xtal filter LIST \$4599.00



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YAESU FT-767GX • All-mode, 160-10M transceiver with 100kHz-30MHz receiver. Opt. modules for 6M, 2M & 70cm 100W out to 30MHz, 10W above. Built-in AC ps. 5½"h x 14½"w x 11½"d, 30 lbs.. LIST \$2199.00

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ALL ABOUT THE WORLD ABOVE HF

The Southeast Packet Cluster A Great Way To Shop For VHF + DX

any of you are aware of the benefits of DX packet spotting. However, in recent years VHF DX packet spotting has come into its own. What follows is an example of one such successful VHF spotting network.

For several years the Southeast Packet Cluster system has provided opportunities for DX spotting for operators in Alabama, Georgia, North Carolina, South Carolina, Tennessee, and parts of Kentucky. There are around 400 users in 23 nodes who have worked many a DX station thanks to the spotting provided by the packet cluster.

As interest in VHF + DXing has increased so has the spotting of VHF DX on the network. With increased spotting came overload to the system. The increased workload would bog down the system so that at times it would take upwards of 20 minutes to span the cluster. Clearly, a solution had to be forthcoming.

Two years ago Bart Fay, K4CEF, discovered that a (then) new distribution list (or DISTRO) feature could be used to send mail or announcements to cluster users who were interested in a particular topic without using the commands "S ALL" or "ANN/FULL" to send it to everyone. Bart mentioned this find to Bob Striegl, KA2DRH, who is an avid VHF + operator.

At once they could see the potential for providing announcements for VHF + DX for those interested without imposing these spots on the whole system. Bob contacted the stations that frequently showed VHF spots and asked if they were interested. A list was developed and ultimately it grew to 75 members. At the same time Bart set up a DISTRO list named "VHF" on their node.

Now if someone wants to identify DX on the VHF+ frequencies, that person would type ANN/VHF (message) and the message only goes to the other VHF+ users.

As the system was refined the requirement that each node have the entire list was eliminated. Thanks to advances in the software package, this was accomplished by having stations that define a particular node as their home node to be on the VHF DISTRO list indicating that particular node. Bart now remotely edits the VHF DISTRO list at each node when a new station wants to be added or an old station drops off.

Bob maintains a backup file and hard copies of the list and occasionally solicits new members, as well as disperses user directions. As new nodes joins the cluster they are given information on the list and the opportunity to form and edit their own lists. Additionally, they are advised that they must keep Bob and Bart informed so that the master list can be maintained.

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

One further refinement that has been made has to do with mail distribution. They found that with more than 75 members, doing an "S VHF" command was generating too many mail messages, thereby clogging the mail distribution throughout the cluster. To solve this problem Bart created a dummy user at his node and named it "VHFMAIL." Now all mail for the group is sent to that dummy user first. A distribution list with embedded mail routing is appended to the message that routes one copy to each node. There the message is recopied as many times as necessary and then routed to all the users on that node.

Bob comments, "Bart's intimate knowledge of the topography of the cluster and inventive mind made the VHFMAIL a viable way of communicating information on grid expeditions, equipment buy/sell messages, and a great way for me to reach everyone on the list when I need to." Bob adds that he is constantly updating the list of the group and passing that information along to Bart to incorporate.

Bob and others have found the list to be very helpful for adding to their grid, state, and even country totals. Bob also reports that he has made many contest and even a few meteor skeds from the list. He adds that to date he has worked nearly everyone on the list. If you are interested in getting on the list (or working Bob) contact him at Rt. 10 Box 161A, Athens, AL 35611, or call him at 205-729-1429.

Your editor is interested in hearing about other successful networks. Please let me know about yours and how it works.

The British Have Come To 10 GHz EME

While many of us were preparing to watch the Super Bowl Sunday afternoon 30 January, Charles Suckling, G3WDG, with assistance from his wife Patra, G4KGC, was preparing to be the first English station on 10 GHz EME. Using a 10 foot dish and a 28 watt TWT, Charles ran a sked with Jim Vogler, WA7CJO, who was using a 300 watt TWT, feeding a 4.8 meter Ku band parabolic reflector. At 2230 UTC they completed a QSO. To add icing to the cake, a half hour later Charles worked Lars Karlsson, SM4DHN, who is using a 6 meter dish and a 70 watt TWT. The reports between Charles and Jim were M/O and the reports between Charles and Lars were O/O. Following the QSOs Charles experimented with hearing his own echoes. He was successful, receiving them at an "M" level. Charles used a moon noise tracking program to follow the moon. He was able to observe a 1.5 dB moon noise while tracking it. All three operators observed the predicted 14 kHz Doppler shift.

Aside from the significance of Charles being the first English station on the moon, his station

was considered to be marginal for making such successful contacts. The definition of "marginal" will probably be re-evaluated as even smaller stations are challenged to complete contacts via 10 GHz EME. (Thanks to Kent Britain, WA5VJB, for this report.)

ARRL January VHF Sweepstakes Contest

The Rover Story: One of the big stories of the January contest is the big scores attained by four different Rover teams. Scott Cohen, KA1QAS, Bob Cohen, K1CPJ, Kevin Hilinski, NR1L, and Stan Hilinski, KA1ZE, all achieved scores in excess of 1.2 million, while operating mobile from eight different grids. Perhaps the big story is not that they did it, but why they did it. For several years Stan has been concerned about the potential for abuse by operators in the Rover category. He has voiced his concern to members of ARRL's Contest Advisory Committee (CAC) and others, most of the time feeling that his convictions were falling on deaf ears.

However, when last December a winter storm devastated Stan's antenna farm, thereby knocking him off the air from home for the January contest, he decided that this would be the year that he challenged the rules by showing how they could be abused.

All four of the Rover teams each built nine band stations that could fairly easily be operated from their automobiles. For 50, 144, 220, and 440 MHz they used conventional radios. For most of the microwave bands they built no-tune transverters and used the 2 meter radio as an IF. For 10 GHz they used the Advanced Radio Research 10 GHz transceiver that is complete with its own horn antenna. For 50 MHz they used an inverted-V antenna. For 2 meters SSB they used the back five elements of an M² Yagi. For 144, 220, and 440 MHz FM they used a triband vertical whip. For 903 and 1296 MHz they used loop Yagis, and for 2304 and 3456 MHz they used coffee-can antennas.

Their objective was to move to the intersection of four grid squares and have one Rover at a time act as a stationary station while the other three would move through the various grid squares, thereby giving that stationary station a number of multipliers. After making all the contacts possible from one group of grid squares, the combo would move on to the next group.

Stan reported that each Rover made in excess of 900 QSOs over the course of the contest. He stated that in the first group of squares it took them 6 hours to make all the possible contacts. Because they were circling blocks in a residential neighborhood and stopping and pointing antennas at each other, they were visited by a highly agitated police officer who in-

VHF PLUS CALENDAR

March 31	First quarter moon.
April 3-4	Second weekend of REF contest. See text for details. Excellent EME conditions.
April 5	144 MHz Sprint. See text for details.
April 6	Perigee and full moon. Excellent EME conditions.
April 13	222 MHz Sprint. See text for details.
April 11	Very poor EME conditions.
April 13	Last quarter moon.
April 18	Apogee. Fair to good EME conditions.
April 21	432 MHz Sprint. See text for details.
April 22	Scheduled peak of the Lyrids meteor shower at around 0309 UTC. See text for details.
April 22-25	Dayton Hamvention. See you at the CQ booth and the VHF seminars.
April 22	New moon. Moderate EME conditions.
April 28	Moderate EME conditions.
April 29	First quarter moon.
May 1	ARRL UHF Sprints. See text for details.

formed them that they may be kicked out of the area if they did not hurry up and complete their mission. (Hams are not strange; just their behaviors.) He also disclosed that while driving back from another location they were disoriented and each drove through a stop sign. They were simultaneously pulled over and detained for a half hour while their driver's licenses and car registrations were checked. Stan explained that it took so long because part of the computer system was down, thereby requiring the police department to use a computer in Dallas, Texas.

Nevertheless, they returned home safely and with their goals accomplished.

Dave Hallidy, KD5RO, a member of a Rover team consisting of himself and Steve Woodard, KD2KQ, operated a conventional Rover station. They scored around 404,000 points. Dave expressed disappointment in having been beaten by the Connecticut teams, but concedes that they were beaten by teams that were adhering to the rules. Dave has also had long-time concerns about the present rules. He has recently been appointed to the CAC and indicates a strong desire to solicit Stan's and other's views on how the rules should be changed.

Because the CQWW VHF WPX Contest also has a Rover class, the rules covering that class definitely need to be reassessed. One proposed change to the ARRL contests would prohibit Rovers from working Rovers. This change would be difficult to implement by the Rover because he or she would constantly have to determine if a station he or she is working is also a Rover. Another change being considered would be to prohibit counting the same multipliers as they are worked from successive grid squares. Stan revealed that if that had been the case, his score would be reduced to somewhere around 200,000 to 250,000 points.

Yet another suggestion that has been put forward is restricting the number of grid squares from which the Rover can operate. From a practical and safety standpoint it is nearly impossible to operate from more than 16 grid squares during the contest period, unless of course you live at the North or South Pole, in which case you can run around in circles all day (or night) and operate from at least 360 grid squares (before you freeze).

Because the rules for this year's CQWW VHF WPX Contest are already prepared, there will be no change for this year. However, next year will probably see a modification of the rules.

What do you think the change(s) should be? Please let me know.

Rumored Scores: The following are unofficial scores reported to your editor: KD2KQ/R (and KD5RO), 404 k (including several light QSOs and probably the first 24 GHz SSB QSOs in WNY); N2WK (multi), 355 k; W2HPF (single op), 129 k; KA2RDO (single op), 119 k (these two swapped first and second place from last year); NJ2L (and W3EP and AA2Z, limited multi), 104 k; K4LVV (and WA4VCC and others, limited multi), 102 k; KB3PW/R (and K2DB), 260 k (including over 20 light QSOs); N2HKD/R (and K1JUL), 200 k; AA5C (multi), 86 k (including 7 light QSOs, a long-haul 5.6 GHz QSO with Tulsa, and a near miss on 10 GHz, also with Tulsa); NOLL (single op) 25 k; WQ@P (single op), 37 k (Greg had 200-plus QSOs, over 30 of them with AJ0E/R, to beat Larry for the first time in that division); WZ1V (single op), 100 k; NØKV (and KØRI, multi), 19 k; WA8NJR (single op), 148 k; WB4JEM (single op), 12 k; AJ0E/R (and K0TLM), 78 k (Denise and Tom made it to 11 grids!); KA2DRH (single op), 23 k; W1NY (multi), 314 k; WA2TEO (multi), 204 k; N2CEI (single op), 213 k; N6RMJ (and WB2ODH and K2LCT, limited multi), 34 k; WZ8D (single op), 48 k; VE3KDH (single op), 450 QSOs in 51 grids on 2 meters; W1RIC (single op), 119 k; N1DPM (single op), 100 k; K1FO (single op), 212 QSOs in 30 grids on 70 cm; KA1TBS/R, 41 k; N2DSY (limited multi), 103 k; WB2PSI (limited multi), 110 k; and N3CX (single op), 103 k.

George Anderson, KB3PW, the score keeper for the Rochester VHF Group, noted that many stations doubled or tripled their scores from last year. He attributes this increase to the growth in 903 and 1296 MHz activity. He estimates that there are between 18 and 20 stations now active on 903 MHz, using the Down East Microwave kit and either surplus cellular telephone amps or class C bricks. George observed that there were random QSOs taking place on 903.100 MHz just prior to the start of the contest.

Phil Miguelez, WA3NUF, the score keeper for the Pack Rats, also observed a comparable increase in scores from last year. He stated that many stations were reporting increases of 20 to 50 percent, with some of the traditionally lower scoring stations claiming increases of two to three times previous scores.

On The Air

6 Meters: The big news of the month was the

brief opening to New Zealand on 5 January between 0100 and 0230 UTC. Around 0100 Martin Ellis, ZL1ANJ, reported hearing beacons from Arizona. Shortly after that stations on the west coast and Arizona began to hear Martin. Then a sporadic-E hookup from Arizona enabled Larry Lambert, NØLL (EM09), to work Martin. Larry's contact was followed by ones made with Martin by Duane Angles, KA5WRG (EM15), Al Ward, WB5LUA, and his son, Bryan, N5QGH (both EM12). Larry in turn made contacts with ZL1AXB, and Bob Cooper, ZL4AAA.

On a note of curiosity, some are wondering if the contacts were the last vestiges of F2 propagation to the states for this cycle or were the signals propagated by multiple-hop sporadic-E? One bit of the puzzle is the fact that the XE2HWB beacon in La Paz was being copied by both Martin and stateside stations. Your editor finally lost reception of it around 0230 UTC.

After the XE2HWB beacon faded, sporadic-E propagation continued until around 0330, with your editor working stations in San Diego and the San Francisco bay area (and being heard in the Los Angeles area). Additionally, stations in Arizona worked as far east as Alabama (W7GZ to KA2DRH).

On 13 January at 0115 UTC Martin again reported hearing the Arizona beacons. However, this time there was no sporadic-E link up to the southwest or western midwest.

2 Meters and Above: On the days between 6-8 January operators of 2 meters and above in the southeast and parts of the southwest and midwest were entertained by a massive tropo opening. An excerpt from the log of Bob Striegl, KA2DRH, indicates the extent of the opening. On that day he worked the following: 6 January, 144 MHz, 0207, N5KDA (EM41); 0210, K4TQP (EM63); 0229, KA5ULI (EM30); 0302, KB5WCK (EM42); 0302, KB5FPW (EM42); 0418, KB4WN (EM63); 2340, KF5NN (EM10); 2344, WV3X (EL09); 432 MHz, 0252, WB4CTW (EM76); 0403, W5VY (EL09); 7 January, 50 MHz, 0503, KB5DRD (EM54); 0554, WØDFK (EM47); 0000, W5FYZ (EM32); 0003, K5OGE (EM21); 0014, KF4GC (EM75); 0016, WA5CHK (EL29); 0020, K5UR (EM35); 0030, KB5RKO (EM30); 0034, KF5IU (EM31); 0038, N5TYV (EL29); 0046, WB5UOD (EM20); 0049, KF5FZ (EL29); 0059, N5BRW (EM44); 0105, W5RCI (EM44); 0115, WV0P (EM75); 0140, WA8MZQ (EN80); 0142, KB8JHV (EN80); 0149, WB8AUK (EN80); 0219, W9/G4FDX (EN60); 0320, K9MRI (EN70); 0340, W5VAE (EM45); 0341, N5HTY (EM46); 0453, KB5DRD (EM54); 0514, KD4MZV (EM73); 0516, KB5TLB (EM32); 0517, N5JBZ (EM31); 0519, KB5RKO (EM30); 0542, W0DFK (EM47); 0551, WB8LEM (EM67); 1130, WB8AUK (EN80); 1211, KB9GLS (EM69); 1236, KQ4JP (EM77); 1239, KA9IJW (EM67); 1243, WØDFK (EM47); 1250, WAØSJR (EM56); 1311, N5YME (EM45); 1421, WB90JR (EN50); 1442, WA4VCC (EM94); 1536. KA9ADD (EM68); 1537, N9GXC (EM68); 1538, AC4VM (EM78); 1539, K8RZB (EN70); 1551, WØDQY (EM48); 1606, N4OOT (EM84); 1610, KB4EBP (EM78); 1615, WA8MZQ/M (EN80, at the highest point in Ohio, 1550 ft. ASL); 1629, N9RDZ (EN71); 1635, N8OTO (EM79); 1636, N9MXY/M (EM69); 1705, K7VAY/8 (EM79); 2238, N4KYN (EM78); 2248, N8ENW (EM86); 2259, WB4TWX (EM95); 2300, K4EJQ (EM86); 0006, K5LLL (EL29); 0052, KF5FZ (EL29); 0113, WV0P (EM75); 0138, WA8MZQ (EN80); 0151, WB8AUK (EN80); 0153, WD8AML (EN80); 0227, W9/G4FDX (EN60); 0240, WD4MBK (EM73); 0309, NOIS (EM48); 0322, K9MRI (EN70); 0348, WA4III (EM64); 0551, W0DFK (EM47); 1424,

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Meteors

The shower for this month is the *Lyrids*, which is scheduled to peak on 22 April around 0309 UTC. The best paths are north-south. It is a minor shower. Nevertheless, on 21 April 1982 at 0650 UTC American astronomers observed a peak that averaged three to five rocks per minute. However, the spike was over in an hour.

Larry Jones, WB5KYK, passes along this report of his activity. For the *Ursids*, on 6 meters he worked N2WK, (FN03), KB4FQ (FM04), WA8GMT (EN91), N2NGU (FN20), and W2ZO (FN30). On 2 meters he worked KA5YUT (EM46), KA0YSQ (EN42), W0HP (EN34), and VE1MQ (FN65) over a 1550 mile path accomplished on CW, at around 50 WPM. (Gosh, Mike, I didn't know either of you could copy that fast, hi!) During the Quads Larry worked WB4WTC (EM95), N2WK (FN03), N0EKT (EN21), WA0NTT (EN35), and N0LL (EM09), all on 2 meters.

Hawaii To California A Year-End Summary

Russ Sakai, KH6FOO, sends this year-end summary of activity through the tropo duct between Hawaii and California. All times are UTC and comments by your editor are in parenthesis. 14 April 2000, 144 MHz: KJ6RE reports receiving beacon in San Diego. 15 April 2000, 144 MHz: KJ6RE still receiving beacon, peaking S9 + 30. K6STI also reports receiving beacon on his vertically polarized antenna. 1 June 2100, 144 MHz: Beacon reported being heard from Long Beach to San Diego. 2 June 2040, 144 MHz: N6XQ receiving beacon in San Diego. N6CW reports beacon peaking at S9. 2103: First station worked this year was N6CW on SSB. Signals were 5/3. 2300, 432 MHz: K6ODV reports receiving beacon. 2341: Worked WB6NOA with 5/8 signals. Strongest signal this day.

3 June 0255, 144 MHz: Last station worked was K5KT/6 in Palos Verdes, in the Los Angeles area. Signals peaking 5/3 on SSB. 1751, 50 MHz: K6QXY reports hearing this beacon. Do not know if path is ducting or sporadic-E. K6QXY also reports receiving the 144, 432, and 1296 MHz beacons. 432 MHz beacon running 7 watts; 1296 MHz beacon running 1 watt. 4 June 0500, 144 and 432 MHz beacons S1-S4 at K6QXY. KH6IAA goes up Mauna Loa and works numerous stations on the Catalina Island FM repeater. KH6IAA also reports that the only FM broadcast stations to be heard were from central California. 23 June 1500, 144 MHz: K6QXY receiving beacon S1-2. 24 June 1650, 144 MHz: Beacon S1-4 at K6QXY's QTH.

25 June 0600, 144 MHz: Beacon S1-2 at K6QXY's QTH. 2 August 0430, 144 MHz: Received telephone call from N6XQ reporting that the beacon is being received at his QTH. 0510: First station worked is KD6EVV, in Chula Vista. Signals only peaking S2. (Your editor hears KD6EVV working Russ while mobiling back to my brother's home from Jack's QTH.) Also work N6XQ with very weak signal. (Your editor then hears Jack work Russ while pulling into my brother's driveway. My heart is pounding! I run into the house and call Jack. He tells me to get back out to his QTH if I want to work Hawaii

tonight. A long half hour later I pull into Jack's driveway and Jack runs out to meet me. He advises me to get inside immediately and call Russ on CW.) 0607: Worked N6CL on CW and SSB with signals peaking S5. Strongest signals during this opening. 0610: Last station heard and worked was N6CL. (Jack called me at my sister's house, where I was having dinner around 0200 to first report hearing the beacon. I cut short my dinner with my sister and drive over to Jack's QTH and wait . . . and wait . . . and wait. After Jack calls Russ at 0430 the beacon suddenly fades out to almost nothing. I decide to give up go home, only to return a little over an hour later to make the successful contacts.)

3 August 2000, 144 MHz: N6XQ reports that the beacon is very weak now. (Jack maintained some reception of the beacon throughout the night following our contacts.) 24 August 2100: Received telephone call from KH6HME that the 2 meter beacon is being heard in northern California. K6QXY reports hearing all three beacons, S1–5. 25 August 2000: KH6HME reports working N6CA, N6CW, and K6QXY from the beacon site. Very short opening. No other stations worked. 27 August 0200, 144 MHz: K6QXY reports receiving 2 meter beacon. 28 August 1500: K6QXY receiving 2 meter and 432 MHz beacons all night. All beacons gone at 1800. No more reports of any beacons being heard.

7 November, 144 MHz: W6OT reports receiving the beacon. 8 November, 0100, 144 MHz: Worked KD6EVV and N6XQ, while running 20 watts. 1 December, 1900, 144 MHz: K6QXY starts to receive beacon. 2000: Beacon peaking at S-5. 2030: 2 meter beacon barely being heard.

This summer expect to see Paul Lieb, KH6HME, and Chip Angle, N6CA, mount an all-out assault on the 10 GHz record. When successful, your editor will report on it in this column.

EME Conditions and Reports

We have one more month of excellent EME conditions. The weekend date for this month is 4 April. Perigee and the Full Moon are both on 6 April. Days before and after this date should be very good, as well. Additionally, the weekend of 18 April is good and the weekend of 25 April is moderate.

AH1A: This station was principally operated by Arie Nugteren, PA3DUU, who also worked the satellite station. It appears that the only completed EME contact was with Dave Blaschke, W5UN. Attempts with other stations resulted in no completions, including an attempt with Bob Magnani, K6QXY, on 6 meters.

VP2MBM: Gerald Williamson, K5GW, operated this station on 2 meters on 30 and 31 January. He blew two preamps, but did work W5UN, KB8RQ, WB5LBT, VE7BQH, I2FAK, SM5FRH, and SM7BAE. It is reported that the equipment was left with VP2MR, who was supposed to be active during the February sked weekend.

FR5DN: Felippe Mondon, FR5DN, is running four 17-element Yagis and 300 watts on 2 meters. He has had trouble with the 2 meter station, but has managed some activity. Additionally, he has some scheduling conflicts with the 432 MHz station. On 432 MHz he worked Steve Powlishen, K1FO, on random on 9 January. (Just after moonrise at Steve's QTH he was demonstrating his new amp to Frank Potts, NC1I, by calling CQ when Felippe came back to him. Frank was ready to have Steve build him an amp on

the spot!) Lionel Edwards, VE7BQH, is maintaining Felippe's 2 meter skeds.

Romania: By the time you read this club station YO9AFV should be on the air on 2 meters with four Yagis and a KW, according to Jurgen Fiedler, DL3BWW. Additionally, Jurgen says Szigy, YO2IS, is gearing up for 2 meters.

Peru: The OA4O DXpedition that was due on the air in late January ran into plenty of troubles. Principally, the dish elevation drive was not working, and thus they were not able to make any skeds on 23–24 January. Al Katz, K2UYH, reports that repairs are still several months away.

Malaysia: Mart Sakalov, 9M2CV (SM0ERR), reports that he and Charles Symons, 9M2CS, are on 432 MHz EME most weekends, and can be contacted at + (60-3)255-7320 or + (60-10)330-177 or via FAX at + (60-3)254-4453. They are using four FO 22-element Yagis, 10 meters of 7/8 inch feedline, a pair of 4CX250's, running 1 KW, and a 0.34 dB noise figure MGF 4915 cavity preamp. Their only window constraint is blockage from a large apartment house which limits their moonset to elevation below 10 degrees. Their best frequency for operation is 432.025 MHz, plus or minus 1 kHz, from a birdie. Future plans include operation on 23 cm and activity from 9M6 and 9M8. There was also a possibility of operation from the Spratley Islands in March! A future column will report on any such activity.

Alabama: Just as this column was about to go to press, Bob Striegl, KA2DRH, called me to tell me that he had just completed his first EME contact. He worked Ron Ogren, WA6PEV, on 7 February at 1213 UTC. Bob is using a minimal station consisting of an FT-726R driving a Henry 2002. He uses an SSB Engineering mast mounted preamp and two Cushcraft 13B2 antennas. If you need Alabama, call Bob. His phone number is listed elsewhere in this column.

Other DXpeditions and Countries: A group from Germany using the call DF0NA is planning a DXpedition to include EA8, CN8, and ZB this summer. After a successful DXpedition to Panama late last fall, Louis Anciaux, KG6UH, should be QRV from Korea as HL9UH on 70 cm EME in two or three months. Eduardo Ooteghem, LU7DZ, is expected on 70 cm EME with four 10 wavelength BV Yagis and 1 KW this month. Hal Lund, ZS6WB, is reportedly working on a 6 meter EME array. Hal advised me of his interest when he called me during his stateside vacation over the Christmas holidays. Arnie Coro, CO2KK, is working on 70 cm EME.

6 Meters: According to Jimmy Treybig, W6JKV, and others, the following stations are active on 6 meters EME: AA6TT/0 (presently horizon only), K1WHS, K5FF, K6MYC, K6MYC /KH6 (when Mike is on vacation), K6QXY, K7KV, K8WKZ, KH6HI, KN5S, N5JHV, OH2BC, VE6JW, W5FF, W5OZI, W6JKV, W7HAH (horizon only), WA4NJP, WA6BYA (horizon only), WB0QMW, WW4T (horizon only), ZL2BGJ (with a rhombic), and ZS6WB (soon). Following a complete rebuilding of his array, on 8 January Jimmy completed an SSB contact with OH2BC (a first?). Fred Fish, W5FF, is now using an 8877 for his 6 meter amp. On 7 February he worked OH2BC and K6QXY on random. He reports that his wife Lee, K5FF, has now completed her fourth initial, having worked K6QXY on 7 February.

Storms: According to John Carter, KOIFL, winter storms severely damaged several EME arrays in Europe. He reports that on 14 January the array of Tobbe Kihlgren, SM5FRF, was heavily damaged. John adds that on 24 January



the 2 meter array of Jurgen Fiedler, DL3BWW, was destroyed and the 70 cm array was all but destroyed.

Conventions and Contests

This Month: The biggie, the Dayton Hamvention, is scheduled for 22-25 April. Among the forums will be VHF sessions. Your editor is scheduled to be at the CQ booth. The second weekend of the REF contest is 3-4 April. This month's bands include 432 MHz and 2300 MHz and above. The scoring for this contest is similar to the ARRL contest, except that U.S. and Canadian call areas do not count as separate multipliers. This month's contests also include several of the ARRL Sprints. The 144 MHz Sprint is on 5 April. The 222 MHz Sprint is on 13 April. The 432 MHz Sprint is on 21 April. Contests are scheduled for 7 PM to 11 PM local time. Complete rules and results are normally found in the National Contest Journal, a League publication.

Next Month: The West Coast VHF conference is scheduled for 21-23 May, again at the Holiday Inn on the Beach in Ventura, California. Your editor is scheduled to make a presentation on the Perseids meteor shower. If you are interested in making a presentation or submitting a paper for this conference, contact Steve Noll, WA6EJO, 1288 Winford Ave., Ventura, CA 93004-2504, or call him at 805-484-2884, ext. 243, days, or 805-647-4294 evenings. You need to do so immediately because his closing date is 27 March. The East Coast VHF conference is also scheduled for this month. However, exact dates are not yet available. The ARRL VHF Sprints conclude this month. The 902-2304 MHz Sprints are on 1 May, again from 7-11 PM, local time. The 50 MHz Sprint is from 2300 UTC 21 May to 0300 22 May.

Technical Topics

From time to time I will include in this column technical information pertinent to the VHF+ frequencies. This month I include a modification developed by Tom Moore, K5ZXE, that adds a separate port for 6 meters to the Kenwood TS-680 transceiver.

A Separate 6 Meter Port For The Kenwood TS-680

By Tom Moore, K5ZXE

After more than four years of ownership and many on-the-air comments from other users, I decided to correct the number one objection to the Kenwood TS-680 multiband transceiver, that being the lack of a separate antenna terminal for 6 meters.

Procedure: The parts needed are a sub-miniature 12 VDC relay (Kenwood part number S51-1432-05, used in the Kenwood TS-440 transceiver), a length of #24 insulated wire (1 foot will do quite adequately), a 0.01 uFd, 100 VDC disk capacitor, a 5 inch length of RG-174 type coax, and a BNC-type bulkhead jack (Radio Shack part number 278-105), or your preference for a bulkhead-type female coax connector. The tools needed are a low-wattage soldering iron, solder, a needle-nose pliers, a pair of wire cutters, Phillips™ and slot-head screw drivers, Silicone™ glue, a drill, a drill bit for the size chassis punch you will use, a chassis punch the size needed for the coax connector you will use, and an XactoTM knife.

First follow the owner's manual for removal

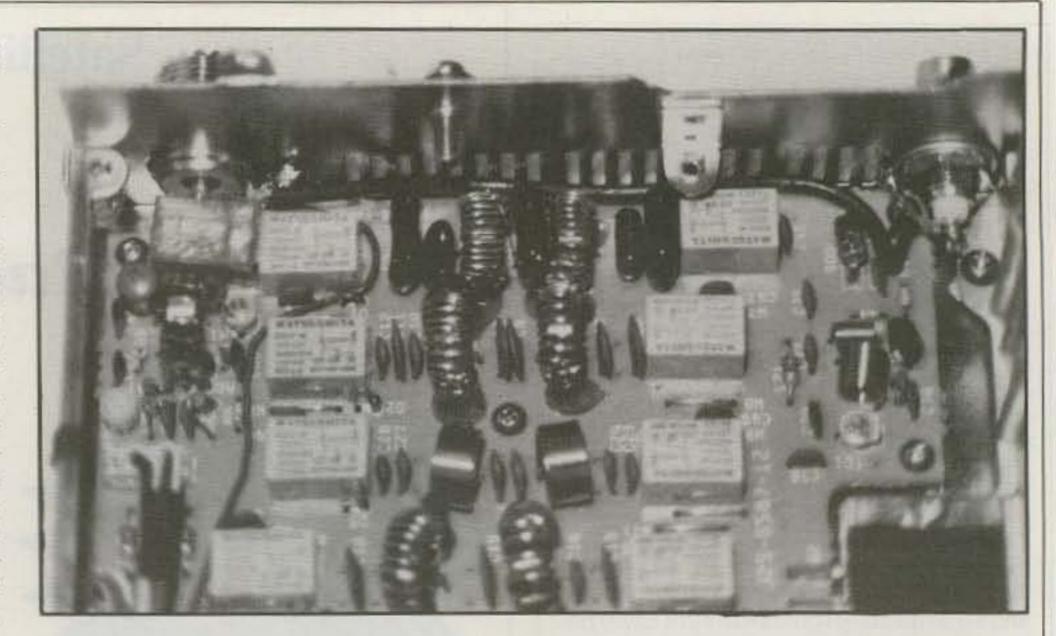


Photo 1- View of the filter board of the Kenwood TS-680. The new relay is installed at the upper left corner of the board, just down from the existing coax connector. (Photo courtesy K5ZXE.)

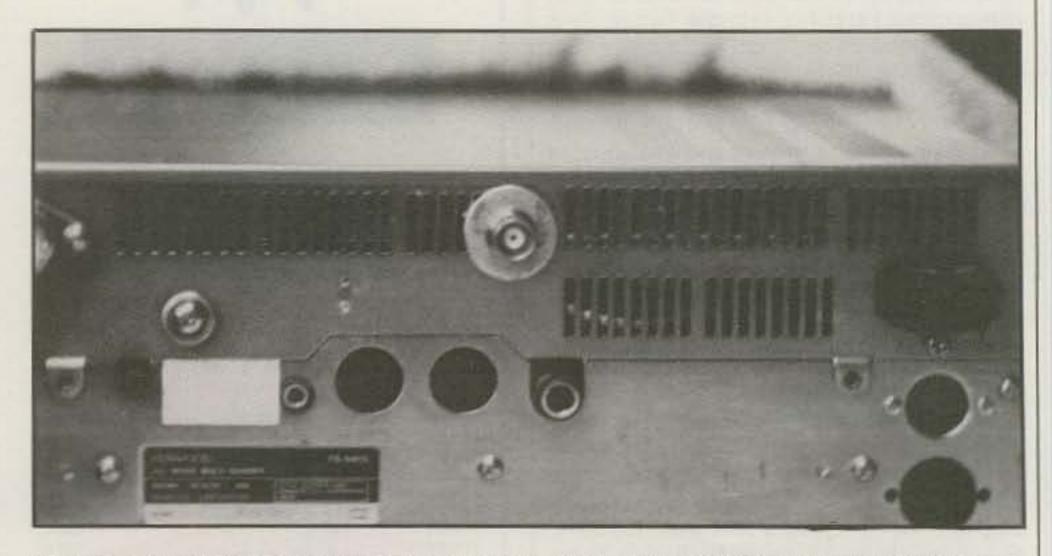


Photo 2- View of the rear of the Kenwood TS-680. The location of the new 6 meter antenna connector is at the top center of the rear of the case. (Photo courtesy K5ZXE.)

of the top and bottom covers of the TS-680. You must also remove the air deflector shield covering the filter board. Next remove the filter board. In so doing, you must unsolder the antenna and ground leads from where they are attached to the existing SO-239 type coax connector.

Now that you have the filter board on the work bench, remove the antenna and ground leads from the board. Replace them with slightly longer (% to ½ inch) #24 insulated wire. Note: These new wires are to be installed on the opposite side of the board and curled back around the board in the area of the cut-out portion of it. You will eventually attach them to the new relay. However, for the moment leave them free. Once these wires are installed, cut off any part of them that is protruding from the circuit-board holes.

Now you will make room for and mount the new relay on the component side surface of the board. The relay will be glued to the surface longways between relay K1 and the corner screw hole. First locate the toroid coil W17 and use the knife to trim the excess glue holding it to the board. Be careful not to nick the coil wires. Once satisfied that there is sufficient room for the relay, use the glue and attach it on its side with the

terminals facing out toward the cut-out portion of the board. Look at photo 1 and find the existing coax connector. Notice the proximity of the new relay to the existing coax connector. Notice also the necessity for clearance between the relay and the center conductor of the existing coax connector.

You are now ready to connect the new relay. First reinstall the filter board in its appropriate position. Connect the wire you installed in the "ant" hole to the "common" terminal of the relay. Use a short piece of #24 insulated wire to connect the "normally closed" terminal to the center conductor of the existing coax connector. Connect the new ground lead to the ground lug secured by the mounting screws of the existing coax connector. Do not solder this terminal at this time. Connect the center conductor of the RG-174 type coax to the "normally open" terminal of the relay. Connect the shield conductor of the coax to the same ground lug. Connect a short lead from one side of the coil to the same ground lug. Now solder all the leads on the ground lug. Connect the other side of the coil to the cathode (top) end of diode D7. Finally, connect the capacitor across the relay coil.

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Make sure all connections are properly soldered.

Next install the new-coax connector in the middle, top part of the back cover of the TS-680 by drilling and punching out the appropriate size hole. Once the hole has been formed, be sure to remove all burrs from the interior of the TS-680. Note photo 2 for the position of this coax connector. Allow adequate space for the coax to clear the top cover of the TS-680. When you install the connector, make sure that the groundlug ring is assembled with the connector. Once the connector is installed, connect the center conductor and the shield conductor to the RG-174 type coax to the center conductor and ground lug of the new connector.

Make sure that the interior of the TS-680 is clear of solder droppings and metal shavings. Reinstall the air deflector shield and the top and bottom covers of the TS-680 according to the directions in the owner's manual.

Operation: When the TS-680 is operating on any of the HF amateur bands, the signal is fed to the "common" terminal, through the relay, to the "normally closed" terminal of the relay, and ultimately to the existing coax connector. However, when the TS-680 is operated on any frequency above 45 MHz, 12 VDC is present at the cathode of the diode D7, thereby energizing the new relay and diverting the signal to the new coax connector.

If you have any questions or comments concerning the modification, contact Tom at P.O. Box 1225, Pauls Valley, OK 73075, or phone him at 405-238-7295. If you have some small item that you would like to see appear in this column, contact me at the address shown on the first page of this column.

News About Newsletters

"220 Notes" Looking for a New Home: The editor and publisher of the "220 Notes" have announced that they are looking for someone to take over the publication, preferably someone who operates on that band. Art Reis, K9XI, and Walt Altus, AA9AW, assumed ownership of the newsletter in January 1982. After 11 years they are ready to pass it on to someone else. The newsletter was started in December 1977 by Lee Knirko, W9MOL, and Julian Jablin, W9IWI. It has been one of the more successful amateur radio newsletters, having been published for over 15 years. Hopefully, someone will step forward and take on the responsibility of continuing to produce this highly informative newsletter. If you are that "someone," then contact Walt at W6539 Birch St., Onalaska, WI 54650.

"50 MHz DX Bulletin" Deep Sixed? In an unusual move, the publisher of the "50 MHz DX Bulletin," Victor Frank, K6FV, used editorial space in the most recent issue (15 January 1993) of the newsletter to criticize the editor, Shel Remington, NI6E/KH6, for failing to produce regular copy and for failing to reimburse Victor for the expenses he has incurred in publishing it. Victor warns the readers not to send in any more subscriptions and advises that there is no money to pay for refunds, should anyone request one. He states that he is committed to publishing (at his own expense) any further copy that comes in through the end of this year.

To his credit, Shel also uses editorial space to apologize for the long delays between issues and advise his readers that he has had personal problems that included a lightning strike which caused destruction of his photovoltaic cells and a subsequent failure of a gas alternator, which has kept him from producing any copy.

However, because of the controversy surrounding the future of this newsletter, it appears that its publishing days are about over.

Newsletters that cater to a segmented community are often produced "out of love." Indeed, when Harry Schools, KA3B, the founder of the "50 MHz DX Bulletin," was forced to retire because of increased job and family responsibilities the 6 meter community was hard pressed to find anyone willing to take on the burden. Because Shel loves 6 meters so intensely, he thought that he could give it a go. Some measured his potential for success at best to be a "long shot." Nevertheless, he did try.

What about other newsletters? As reported above, "220 Notes" is facing an uncertain future. Other newsletters have come and gone over the past few years. Still others currently being published exist at the whim of their editors.

So what can be done? Perhaps one newsletter that encompasses the entire VHF+ spectrum, published monthly, with segmented editions and sufficient advertising revenue might have some chance at success. Most important, if it were to succeed it would have to be supported with an adequate subscription base.

Regarding that adequate base, one problem publishers face is the unauthorized reproduction of the newsletter. For example, a subscriber receives his or her copy, takes it to work, makes a dozen copies on the office copier, and passes these "free" copies out to his or her friends. While usually no harm is intended, it does represent a dozen lost subscriptions, and the subsequent loss of revenue to the publisher.

Nevertheless, there is a niche to be filled. Do you have any suggestions on how to fill it? Please let me know.

New VHF Titles

Beyond Line of Sight is the title of a new book edited by Emil Pocock, W3EP, and published by the League. It is a compilation of a number of articles on the VHF + frequencies, plus commentary by the new VHF editor for QST. For your copy send \$12.00 plus \$3.50 shipping to the League. A full review of this excellent historical reference book will be forthcoming.

The VHF/UHF DX Book is the title of a new book published in England especially for the VHFer DXer. It is 452 pages long and contains 122 pages devoted to antennas, feed lines, and propagation. The price is 18.00 pounds, plus airmail shipping to your QTH. You may inquire about your copy by writing to DIR Publishing Ltd., P.O. Box 771, Buckingham, MK 18 4HH, England.

A BBS For VHFers

Are you looking for some shareware software for use on the VHF + frequencies? You can find many programs on the East Coast Atlantic BBS (704-284-4854). You can also find the current issue of the "432 AND ABOVE EME NEWS," plus directories of operators for terrestrial, 2 meters, and 432 MHz and above EME. Access is 2400, 8, N, and 1. It is a free BBS, with you paying the long-distance charge. While on, tell the SYSOP, Scott Hedspeth, how much you appreciate the service provided by the BBS. And say you saw it in CQ.

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CQ • April 1993 Say You Saw It In CQ

Jon K. Jones, NOOY, New VHF Editor At NCJ

Jon K. Jones, NOØY, is the new VHF editor for the National Contest Journal. Jon is scheduled to take on the "VHF-UHF Contesting!" column beginning with the July-August 1993 issue. His first topic: The CQWW VHF WPX Contest. You might want to get a copy and see what kind things Jon says about our contest.

Following Emil Pocock, W3EP's promotion to
"The World Above 50 MHz" column, the other
two members of the team, Mike Owen, W9IP,
and Curt Roseman, K9AKS, decided to retire.
The "Terrific Three" provided nearly five years
worth of insight in VHF and above contesting.
Among their accomplishments was the inclusion of the "Limited Multi-op" category in the
ARRL major contests (and the subsequent influence of this editor to adopt a similar category
in the CQWW VHF WPX Contest). Their contributions have been appreciated very much by the
VHF contesting community and will certainly be
missed.

must reside within 175 miles of the club's center." Additionally, the rule states, "Members living outside of 175 miles and/or members operating stations outside 175 miles may not compete in the club competition."

The team of George Anderson, KB3PW, and Paul Mackanos, K2DB (using George's call), the team of Curtis Braun, N2HKD, and Vic Gauvin, K1JUL (using Curtis' call), and Chris Shalvoy, N2PEB, all of them competing for the Rochester VHF Group, found the scores that they were to submit for club competition reduced considerably because while roving they strayed out of the 175 mile radius by just a few miles. They were faced with a dilemma. Should they submit their scores individually and compete on the national level for one of the top ten spots or should they carve out of their logs contacts made from outside the 175 mile limit and submit their scores for club competition credit? The third alternative was to "say nothing" and act as though they did not do anything wrong.

The integrity that governs the consciences of the vast majority of us in the hobby ruled out the third choice. While arguments can be made

to exempt Rovers from this rule, the rule is still in effect. While the consequences were not what they wanted, the choice was clear. They would rescore their logs and submit them under the club competition rules.

I focus attention to this episode not to bring glory to these fellows (none of them are out to toot their own horns), but to show that here is a positive example that we in the hobby can emulate. Whatever the rules, abide by them and you are a winner, even if it is only in your own heart.

Once again I have run out of room. I would like to thank AI Katz, K2UYH, the "432 EME and Above" newsletter, Jan O'Brien, K6HHD, "The W6GO/K6HHD QSL Manager List," Paul Kelley, N1BUG, "The 50 MHZ DX Bulletin," John Carter, KØIFL, "The VHFer" newsletter, the East Coast Atlantic BBS (704-284-4854), and all of you who have become very supportive of my attempts to bring the best VHF + reporting in the country. I hope to see many of you at the CQ booth at the Dayton Hamvention. If you don't see me there and you have hot news, call me at 405-528-6625. Until next month . . .

73, Joe, N6CL

Aurora—On The Computer

AURORA is a new aurora modeling program that has been released by Solar Terrestrial Dispatch. The software is an aurora activity predictor and a dynamic auroral oval simulator. Among other things, you can use it to predict the contours of the auroral oval. The regular price is \$149.95. However, the price to us amateurs is \$99.95 (plus \$5.00, shipping and handling and, if in Canada, GST). This price is good through 31 May 1993. Send for yours by writing to the company at P.O. Box 357, Stirling, Alberta, Canada TOK 2E0. When ordering, be sure to indicate your callsign on the order and specify which high density (3.5 inch or 5.25 inch) disk you wish. At a future date your editor hopes to have a full-scale review of the package.

QSL Routes

YX0AI: For those of you who worked this DX-pedition last fall and still need a card, "The W6GO/K6HHD QSL Manager List" gives the following information: QSL to 3180 Leewood Terrace, L-208, Boca Raton, FL 33431. Because your card will be mailed from Venezuela, please include sufficient postage for its return. Please note that a U.S. SASE is not usable.

FOOCI: Have you confirmed your 6 meter contact yet? Issue 154 of "The Go List" shows Peter Meyer, NOAFW, 13647 Sunset Dr., Whittier, CA 90602, as the new QSL route.

And Finally

Playing by the Rules: While the Hampden County Radio Association Rover stations were playing by the rules to prove a point, three other Rover stations playing by the rules found it very costly to their scores.

The ARRL January VHF Sweepstakes contest is the only VHF contest that allows club competition. Because of this practice, considerable effort is directed toward having the best club score. As with every competition there are rules. As explained in January *QST*, one of the rules states, in part, "All stations and all operators

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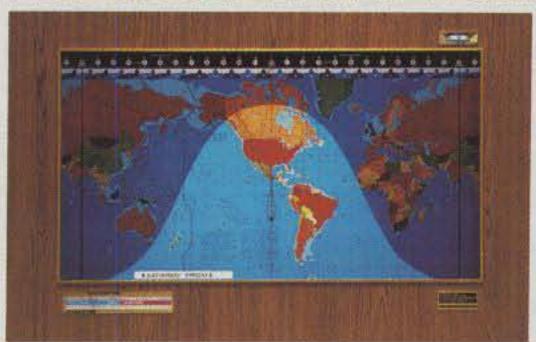
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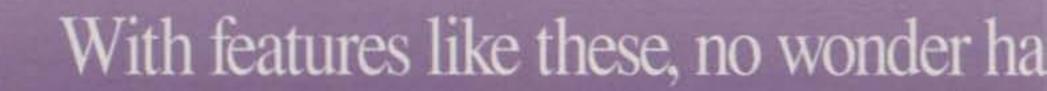
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1937 the standard broadcast channels (550–1500 kHz) were hopelessly crowded in urban areas. The radio broadcasting industry, confronted with the overcrowded spectrum, looked with hungry eyes to the ultra-high-frequency band above 10 meters. The empty wavelengths above this jumping-off point were an unknown quantity in those days and of doubtful commercial worth. Or were they an untapped gold mine?

In the late 1930s the Federal Communications Commission issued police radio and relay broadcasting licenses on a temporary basis for use in this region, in the hope that this more or less worthless radio territory would prove adaptable for short-range point-to-point service. It seemed as if a 50 mile service range was possible. It also seemed this might fit in nicely with the broadcasters' needs and get them off the back of the FCC!

Radio amateurs had already proven that the 5 meter band could be used to provide satisfactory local radio coverage, even in thickly populated areas. The 10 meter band was ambivalent. Occasionally open for DX, it was usually employed for short-range communication. Obviously, it was much like 5 meters! There was not much amateur interest in this part of the spectrum. Why could not this useless portion of the HF region be used for local broadcasting?

The Problems to Overcome

Good broadcasting service demanded more than simple, reliable communication. Amateurs and police radio circuits only required sufficient signal strength to afford intelligible communication. Reception of clear voice and music, on the other hand, meant that the signal must override radio noise and interference. On these ultra-high frequencies static, which bedeviled the broadcast band during the hot summer months, was virtually nonexistent. This was a great advantage. Man-made noise, such as auto-ignition, was particularly

strong. This was a great disadvantage! Was it possible to radiate a high-power, high-fidelity broadcast signal that would overcome the noise? Was it possible to develop a noise limiter for the receiver? Was it possible to limit noise at the source? These were the questions that faced the ultra-high-frequency broadcast enthusiasts.

The APEX Broadcast System

The FCC looked with approval on the idea of ultra-high-frequency broadcasting. It would provide many broadcasting channels for smaller communities deprived of local radio service, plus additional channels for a new concept: educational, non-profit broadcasting. It could also provide channels for the new experimental frequency-modulation broadcast service.

No one knew just what the operation of these stations would prove, but if their operation were a success, and it was found that good signals could be delivered over a limited area, the demand for additional broadcast channels might be relieved.

In late 1938 the FCC acted. APEX channels were authorized for use. (The meaning of the name APEX seems to be lost in antiquity.) Broadly speaking, the channels were arranged in four groups. The first group consisted of four channels at 25.95, 26.05, 26.1, and 26.15 MHz utilizing 50 kHz channel separation. The second group consisted of four channels at 26.4, 26.45, 26.5, and 26.55 MHz, with 50 kHz channel separation. The third group consisted of four channels at 31.6, 35.6, 38.6, and 41.0. MHz. The fourth group consisted of channels at 40.3, 41.2, 41.6, and 41.8 MHz. Groups 1 and 2 could be used for amplitude (AM) modulation only, with a maximum allowable range of audio frequencies up to 15,000 Hz. Either amplitude or frequency modulation could be used above 40.3 MHz. Experimental television was assigned the range of 42 to 56 MHz.

Seen from present day, the license situation was confusing. Stations could be classified experimental or nonexperimental, but also noncommercial, commercial broadcasting AM, or FM, or educational. Maximum power output was to be one kilowatt, except when permission was granted for higher power. The whole thing sounded like a lawyer's dream! No doubt some publication exists which explains the APEX concept in detail, but I have not been able to locate it.

Records exist, however, of three APEX broadcast stations: W2XDV (31.6 MHz), owned by the Columbia Broadcasting System; W9XA, owned by Commercial Radio Equipment Co., of Kansas City, Missouri; and W8XWJ owned by the Detroit Daily News, Detroit, Michigan.

Information is sketchy. W8XWJ had 500 watts power with a vertical antenna atop the Penobscot Building, then the tallest building in Detroit. It was on the air 14 hours a day rebroadcasting WWJ.

W2XDV had a carrier power of 50 watts and rebroadcast regular CBS network programs. The antenna was atop the CBS building at 485 Madison Avenue, New York City.

Little is known about W9XA other than that the Chief Engineer was one Everett L. Dillard. The rest is lost in time.

Just Prior To The War

By 1941 APEX took on some semblence of regularity. The low-power AM broadcasters gradually diminished. They offered little to the listener. However, the FM stations grew in power and popularity. Here indeed was noise-free, high-quality broadcasting. High-power FM stations were popping up all over the country, and special receivers and converters were available for this service.

Television, too, had a mild upswing. Earlier, in 1939, the first TV receivers became generally available. These ranged from 3 inch to 10 inch screens. Some produced sight but no sound, others included sound with sight. Pilot, DuMont, General Electric, Westinghouse, RCA, Stewart-Warner, Philco, and FADA all had models ready for sale, and several other manufacturers produced television kits. Mr. and Mrs. America were ready for television!

Alas, the start of World War II brought the APEX scheme to a quick end. Manufacturers turned to war production, and the APEX channels were gradually turned over

48 Campbell Lane, Menlo Park, CA 94025

to the military for short-range FM work. At the end of the war it was decided to eliminate AM broadcasting from the "VHF" region and to move FM and television to higher frequency bands.

The APEX system never achieved its maximum potential. War and advances in communication doomed it. But it paved the way for today's VHF and UHF entertainment systems. That's another story!

Looking Back At Some Multiband Antenna Systems

During the past few months I have discussed some interesting multiband antennas. All of them work and indeed produce good results. The common factor that puzzles me about the antennas is the seemingly broadband characteristics they exhibit. The range of relatively low SWR seemed always much greater than theory. This is nice, but what brings about this wideband characteristic?

The jury is still out on this puzzle, but it is beginning to look as if the matching balun used in each antenna system is the culprit.

The broadband phenomenon seems to be brought about by the fact that balun losses increase rapidly when it is operated in a high SWR condition. That's equivalent to adding a resistor in series with the antenna at the feedpoint.

Little quantitative information exists on balun operation into high SWR loads. Preliminary studies indicate that loss rises rapidly, and as much as half the transmitter output power may be converted into heat loss when the balun operates in a high SWR mode. This may be no big deal at the 100 watt power level. After all, half power is only 3 dB and this is less than one S-unit. Running high power into an unmatched balun having a 3 dB loss is another matter! At 1 kW output, balun loss is 500 watts! This can fry the best-made balun. An unpleasant thought, but the reward is the lossy balun makes the input SWR to the antenna system look better than it should be. This is a real dilemma—a tradeoff of power for bandwidth. But how much power is traded? Unknown at this writing, but the answer is sure to appear later this year. Meanwhile, enjoy your multiband antenna. I do.

More On The G5RV Antenna

The G5RV, in spite of its drawbacks, continues to attract interest. It has been proposed as a solution to the problems of tactical HF one-hop communication by Dr. Brian Austin, GOGSF, as outlined in "Technical Topics." The article proposes that the G5RV-type antenna is a configuration which achieves multiband performance at high radiation efficiency and is useful where seasonal and sunspot-cycle varia-

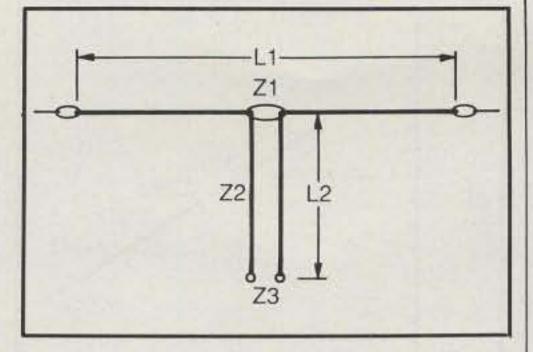


Fig. 1- The basic G5RV antenna adapted for 50 ohm feed by GØGSF (ZS6BKW). (See text for details.)

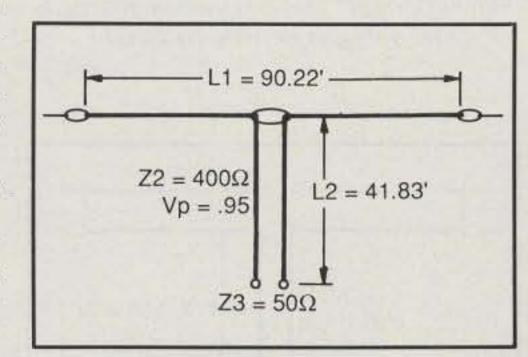


Fig. 2-GOGSF design for multiband antenna. Design frequency is 7.32 MHz.

tions make multi-frequency operation obligatory if 24-hour contact is required over any given path.

The IEEE (Institute of Electrical and Electronic Engineers) colloquium digest No. 1992/181 (Great Britain) presents a simple method of analyzing the performance of the G5RV antenna. Fig. 1 is a drawing of the generic antenna. Dr. Austin claims that when Z2 is greater than 275 ohms and less than 450 ohms, an acceptable impedance match will occur at a number of frequencies in the HF range. The optimum value of Z2 lies between 325 and 400 ohms.

Dr. Austin further states that for any minimum operating frequency and a given value of Z2, there are specific lengths for the flattop (L1) and the transformer-line (L2) which provide the best impedance match. The frequencies which provide the best match are related by the following series (which varies slightly for different values of Z2): 1, 1.99, 2.53, 3.49, 4.07, 5.62, and 7.18. That is, if the fundamental frequency is taken as 3.6 MHz, the next resonance point is

 $3.6 \times 1.99 = 7.164 \text{ MHz}$ followed by

 $3.6 \times 2.53 = 9.108 \, \text{MHz}$

 $3.6 \times 3.49 = 12.564 \text{ MHz}$

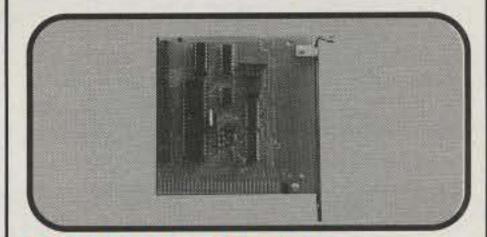
 $3.6 \times 4.07 = 14.652 \, \text{MHz}$

 $3.6 \times 5.62 = 20.232$ MHz and

 $3.6 \times 7.18 = 25.848 \, \text{MHz}$

(I'll call this antenna design #1.)

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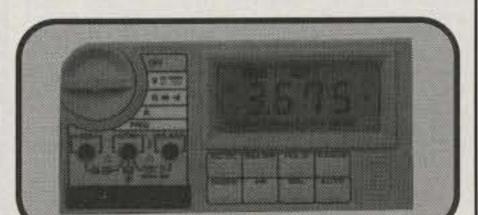
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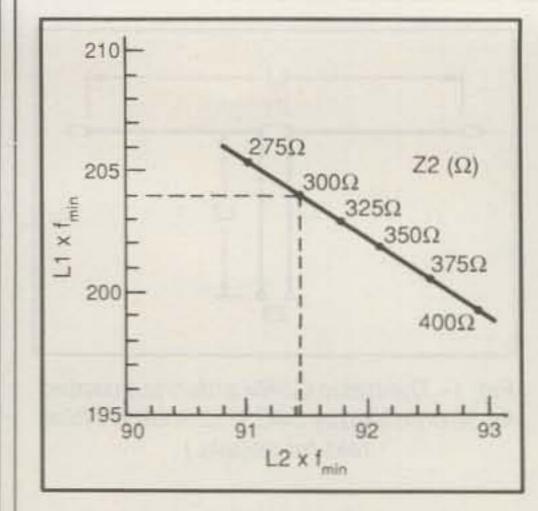


Fig. 3- Copy of "Design Line" for the multiband antenna derived by GØGSF.

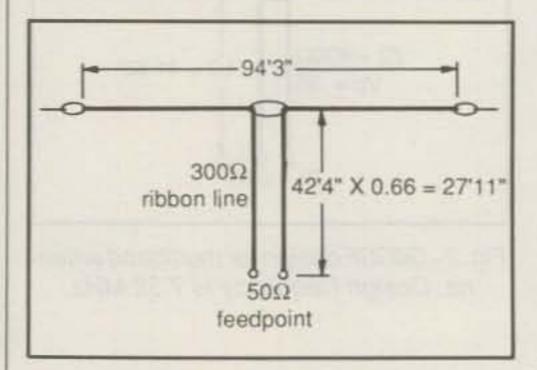


Fig. 4- Final design of multiband antenna for 40, 20, 17, 12, and 10 meters. The 300 ohm line is cut short to compensate for velocity factor (0.66).

Dr. Austin built and tested a number of G5RV-type antennas. One design, of interest to amateurs, provided resonant frequencies just outside amateur bands, with the dimensions shown in fig. 2. The design frequency was 7.32 MHz, and the theoretical harmonic resonance series was 1, 2.01, 2.55, 3.54, and 4.10. Measured resonance with VSWR less than 2:1 was achieved at 7.32 MHz, 14.68 MHz, 18.63 MHz, 25.88 MHz, and 30.027 MHz. (I'll call this antenna design #2.)

A ferrite-sleeve balun (W2DU-type) consisting of 40 ferrite beads (73 material) was used between L2 and the 50 ohm coax line. and the effect on the SWR was minimal. Dr. Austin concluded that the use of a balun was not justified.

A G5RV Antenna For The Amateur Bands

The Austin design #2 provides resonance points just outside the high-frequency ends of the 40, 20, 17, 12, and 10 meter bands. The first design (#1) provided resonance in the 80, 40, and 20 meter bands, with close-resonance near the 30, 15, and 12 meter bands. As-is, either design would seem to work well with a transceiver equipped with an antenna tuner. Indeed, design #1 seems to be the long-desired "all-band" antenna if higher values of SWR are accepted for operation on the 30, 15, and 12 meter bands.

Dr. Austin provided a chart that would assist in designing a particular multiband antenna (fig. 3). The variables are L1, L2, the minimum operating frequency, fmin. and the impedance of the transformer-line, Z2, which is limited in impedance to the range between 275 to 400 ohms. For any given values of f_{min} and Z2, there are specific lengths of L1 and L2 which satisfy the impedance match. Note that dimensions are in meters.

To design a specific antenna using the chart, it is necessary to first choose the impedance of Z2. A convenient value is 300 ohms, as transmitting-type ribbon line is readily available in this impedance. Velocity factor of this line is about 0.66.

From the 300 ohm point on the chart, draw a horizontal line to the y-axis to determine the quantity (L1.fmin). This is about 204. Choose the minimum operating frequency, say 7.1 MHz. Dividing 204 by 7.1 gives an L1 value of 28.732 meters, or 94.26 feet. (Meters divided by .3048 gives feet.) This is rounded off to 94 ft. 3 in.

Now, from the 300 ohm point on the chart, drop vertically down to the x-axis to find the product (L2.fmin). This is approximately 91.5. Divide this by f_{min}(7.1 MHz) which gives an L2 value of 12.887 meters, or 42.28 feet. This is rounded off to 42 ft. 4 in.

This completes the antenna design which is shown in fig. 4. The theoretical resonant frequencies are 7.1 MHz, 14.13 MHz, 17.96 MHz, 24.78 MHz, and 28.9 MHz. Band coverage is 40, 20, 17, 12, and 10 meters. Missing are the 30 and 15 meter bands.

The Dead Band Quiz

The February Quiz concerned Eric Blair, better known to the public under his "pen name" of George Orwell. The quotation was from his famous novel 1984. I'm sure you all guessed that little puzzle.

My thanks to the following for their kind and helpful letters regarding this column: K2PH, W2FMI, WA4BNO, W1FPZ, W6WHM, W4WFL, W1NTE, W1DX, WU2J, ZS6BBV, W4BW, KD6JUI, W0MFI, and W5QJM.

Footnote

1. This material is extracted from "Technical Topics," a monthly column of general interest edited by Pat Hawker. It appears in Radio Communication, a publication of the Radio Society of Great Britain, Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JE England.

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A LOOK AT THE WORLD AROUND US

Another World-Class Keys Special - Part I

ush back those impersonal computers and CW keyboards, gang. We're back with another double-feature special highlighting custom Morse instruments, and the upcoming views are simply incredible. Our featured goodies range from old-time classics to brand new marvels, and they are all so breathtaking we had to separate them into two columns to avoid a visual overload.

This month's column thus focuses on bugs and paddles, and next month's column narrows in on hand keys and miniatures. We thank all the CW devotees sending photos of favorite keys they wish to see recognized herein, and also invite each of you to send pictures of your own CW delight for inclusion in future columns.

These keys special columns, incidentally, seem to be accomplishing several worthwhile purposes. In addition to inspiring amateurs to save (and cherish) rather than discard old keys, they are good insight into those beautiful bugs of yesteryear. Additionally, the columns are a good "neutral zone" for informing you about new keys and paddles available for sale today. If your interest in CW has waned during recent

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times, I heartily suggest rediscovering the fun with a new key or paddle of your choice. You know (or remember from "good old day experiences") how a new car made traveling fun. Well, keys turn the same joy for amateur radio, and at much lower cost. Likewise, we have the advantage of enjoying several flashy keys, whereas owning and maintaining more than one car is both expensive and time-consuming.

That's enough soapboxing for this month. Our upcoming views are overflowing available space, so I will divert additional comments until later. Now let's look at some super keys compliments of our special guests: Drew Diamond, VK3XU; Gordon Crowhurst, G4ZPY; Warren Strong, ZL3TX; Mike Zbrozek, K8XF; Bill Everett, K7RIE; Robert Butt, N1KPR; and John Bipes, KØYQX.

Photo 1. Gordon Crowhurst, G4ZPY, recently made this one-of-a-kind miniature paddle for my XYL, WB40EE, and it is one of Sandy's favorite ham goodies. When viewed from the binding post end, the combination of brass mechanism, chrome screws, and dual-lever adjustment tubes looks like a miniature Gatling gun. The fingerpieces are translucent royal blue, and the paddle handles great. This little delight is sitting atop a pad of historic

Night-Radiogram forms that Mike, WA8TXT (401 W. Bogart Road, Sandusky, OH 44870) secured from the files of the now defunct SS American Lancer ship. Mike reproduced a number of these pads for CW devotees, and they are available at two for \$10 (including Priority Mailing in U.S.) while supplies last.

Photo 2. Looking for a new miniature paddle to spice up your CW life? Check out this new treat available from Gordon Crowhurst, G4ZPY (41 Mill Dam Lane, Burscough, Ormskirk, Lancs England L40 7TG). The paddle looks like jewelry with highly polished brass mechanism and chrome screws set on a glazed black base. Adjustment tubes on the rear set tension for each lever, while travel for each is adjustable via front screws with locknuts. A wide rubber magnet is affixed to the base for quick-attaching the paddle to a transceiver's medal cabinet, and G4ZPY has each owner's call engraved atop the yoke.

I use this miniature paddle on the air quite often, and it is a real gem. Since it is small enough to tuck into a shirt pocket, I also take it mobile. In the latter case, I use a velcro-equipped strap supplied with the paddle to hold it in place on my leg. Considering the wide popularity of miniature keys, this palm-size paddle should prove extremely popular.

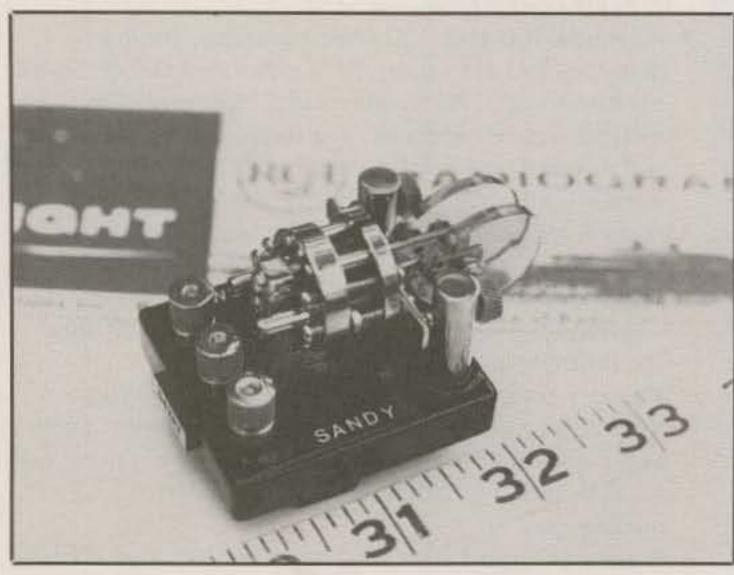


Photo 1- Custom iambic paddle made by G4ZPY for my XYL, WB4OEE. This marvelous item looks like a miniature version of Gordon's famous "VHS iambic" paddle. Round upper mechanism looks like jewelry.

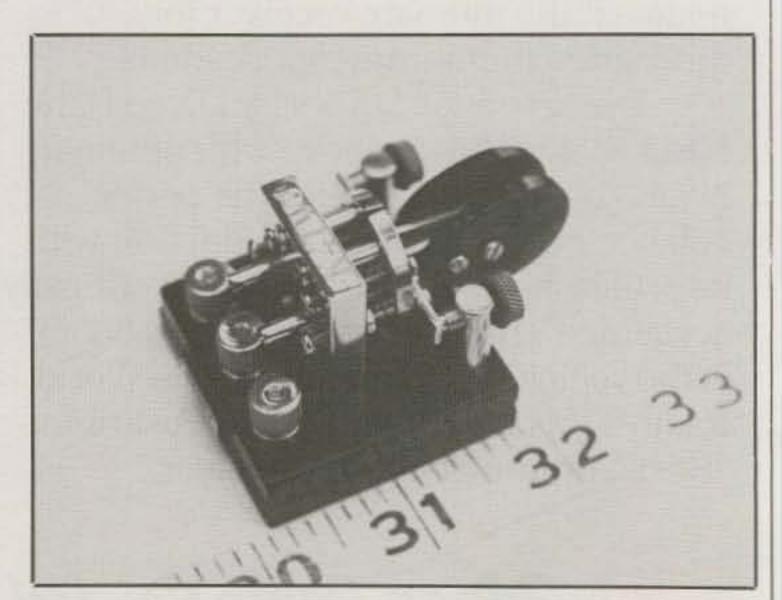


Photo 2- G4ZPY's new miniature iambic paddle is hand-made, and a true work of art. Item is less than 2 inches square, has very precise adjustments, and includes a bottom rubber magnet for quick-attaching to a rig's cabinet.

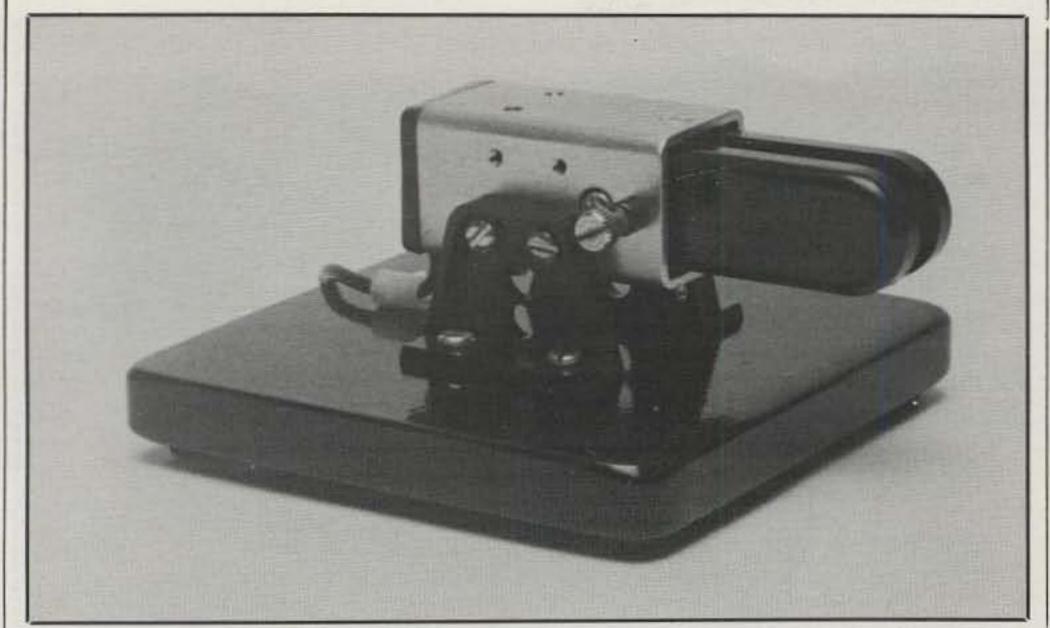


Photo 3- The new Galbraith GK-11 paddle from New Zealand. Mechanism is fully enclosed, with usual adjustments on left side. Paddle is available in stand-alone form, or with optional black base.

Photo 3. Here is another interesting item you can purchase by mail and enjoy using today: the Galbraith GK-11 paddle from New Zealand. The mechanism is fully enclosed with only fingerpieces protruding. Adjustment screws on the left side set gap and travel, while a spring between the two fingerpieces sets tension. Internal works are precision-engineered for reli-

able operation, and the paddle can be mounted in a variety of ways. It is shown here on its deluxe steel base, although only the upper section can be purchased separately for mounting on or in a homebrew rig. In fact, tapped screw holes are included to make adaptation to custom mounts easy. I have not used this paddle personally, but it looks like a nice item for mobiling.

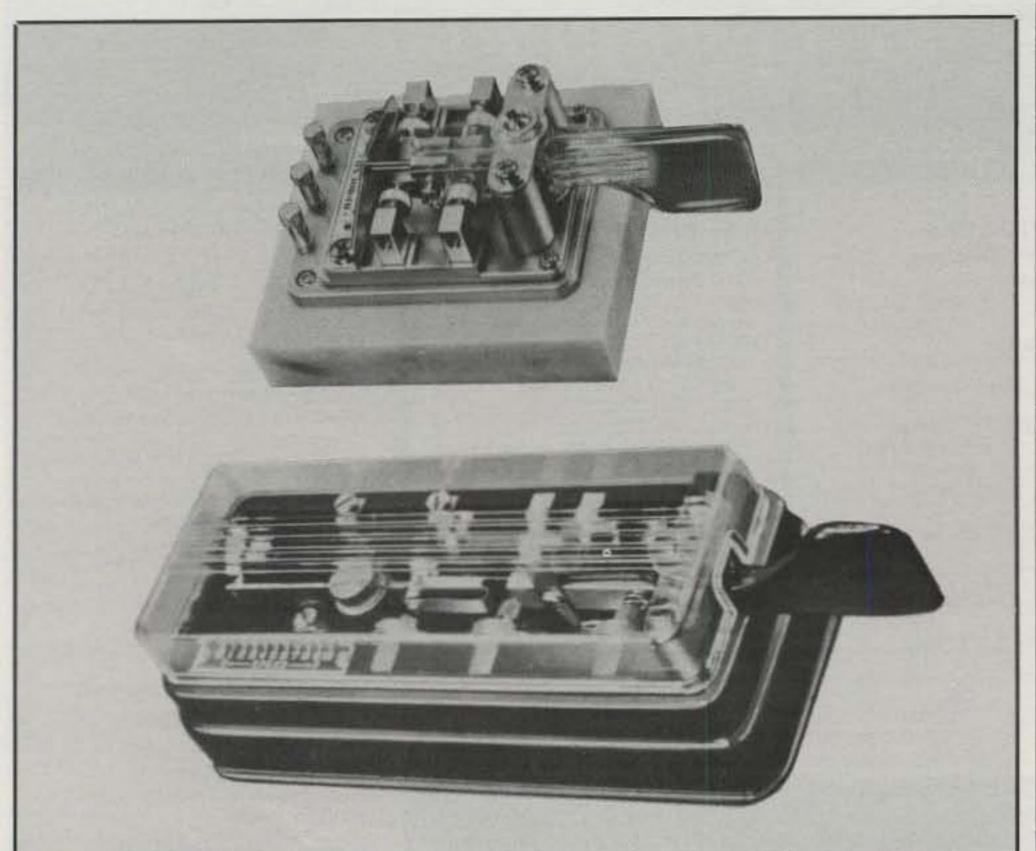


Photo 4– Hi-Mound MK-705 iambic paddle and BK-100 bug presently available from importer, K8XF. Paddle sits on heavy marble base and includes dust cover (removed for photo). Bug is a genuine classic, and has fully enclosed mechanism with single finger-piece. Both items look and handle great.





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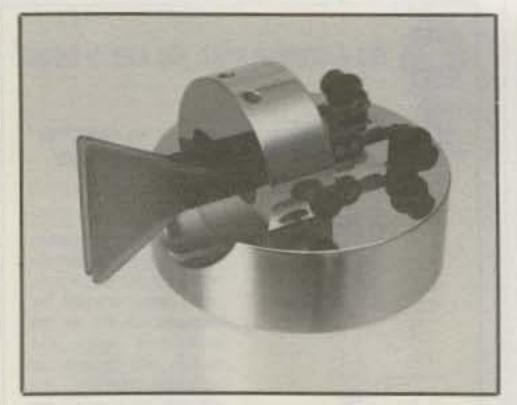


Photo 5- The new ARE-90 iambic paddle made in Russia and distributed in the U.S. by Amateur Radio Engineering of Washington state. (Photo courtesy K7RIE)

For more information, contact Warren Strong, ZL3TX, c/o NZART, P.O. Box 1733, Christchurch, New Zealand.

Photo 4. Mike Zbrozek, K8XF, is presently importing this Hi-Mound MK-705 paddle and BK-100 bug from Japan, and both items are really sharp. The MK-705 is an iambic/dual-lever paddle with a silver and chrome mechanism sitting on a solid-marble base. Very nice! The four adjustments for tension and gap face inward (toward the levers), so the included clear-plastic dust cover (removed for photo) protects everything while leaving fingerpieces ac-



Photo 6- Australian-made Buzza and Simplex Auto bugs used daily by VK3XU. Right-angle bug is a real heart-throb. Drew works 30 meters, and his "CW fist" is outstanding.

cessible. This paddle would make an attractive addition to any shack.

The BK-100 is a modern version of the classic Swallow featured in a previous column. Its mechanism (and adjustments) are also protected by a dust cover. I have a well-used BK-100, and it handles great.

Write Mike directly (9929 Fox Squirrel Dr., New Port Richey, FL 34654) for more info and prices on these goodies.

Photo 5. We now introduce another "new kid on the block: the ARE-90 lambic paddle. This item is made in Russia for Novosibirsk-Seattle International, and dis-

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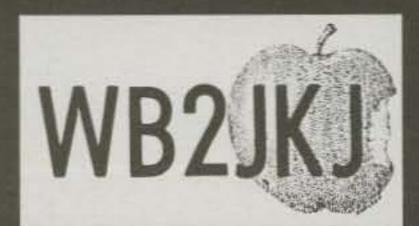
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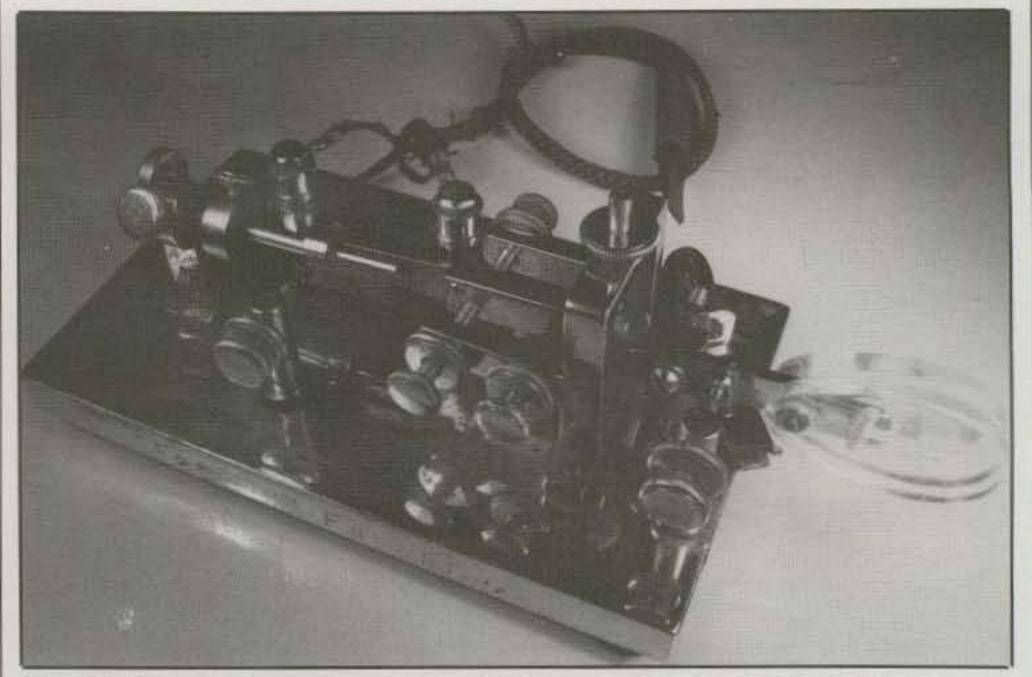


Photo 7- Bug of unknown type which KOYQX rescued from extinction. This photo was shot before restoration.

tributed in the U.S.A. by Amateur Radio Engineering. It should be available from dealers nationwide by the time this column appears in print. The paddle weighs 2.6 pounds and is brilliantly chrome plated, and its circular yoke sits atop a round base. Vertical rods inside the yoke support dual levers. Travel of each is set by screws at 9 and 3 o'clock positions on the yoke, while contact spacing is adjustable by the rear screws. This unique paddle promises to be a really hot item. Additional information on this little gem is available from A.R.E., P.O. Box 169, Redmond, WA 98073.

Photo 6. These two Australian-made bugs belong to VK3XU, and Drew uses them on the air daily. The left item is a Mod-

el 100 made by Buzza Products, and bears a slight resemblance to the Vibroplex Champion. Notice the inclusion of a round weight on a square pendulum and adjustable rubber damper attached to the rear binding post. Look close, and you will also see the bug's main arm mounts between dual vertical posts with top adjustments. We have seen photos of other Buzza bugs (say what?) and since they were in rough condition, we assumed the round weight was salvaged from another bug. Not so. The critter was made that way.

The right-angle bug was made by TME Simplex Auto in Melbourne, Australia, and it reminds me of the early model Boulter angled bug. Notice the bug's mechanism

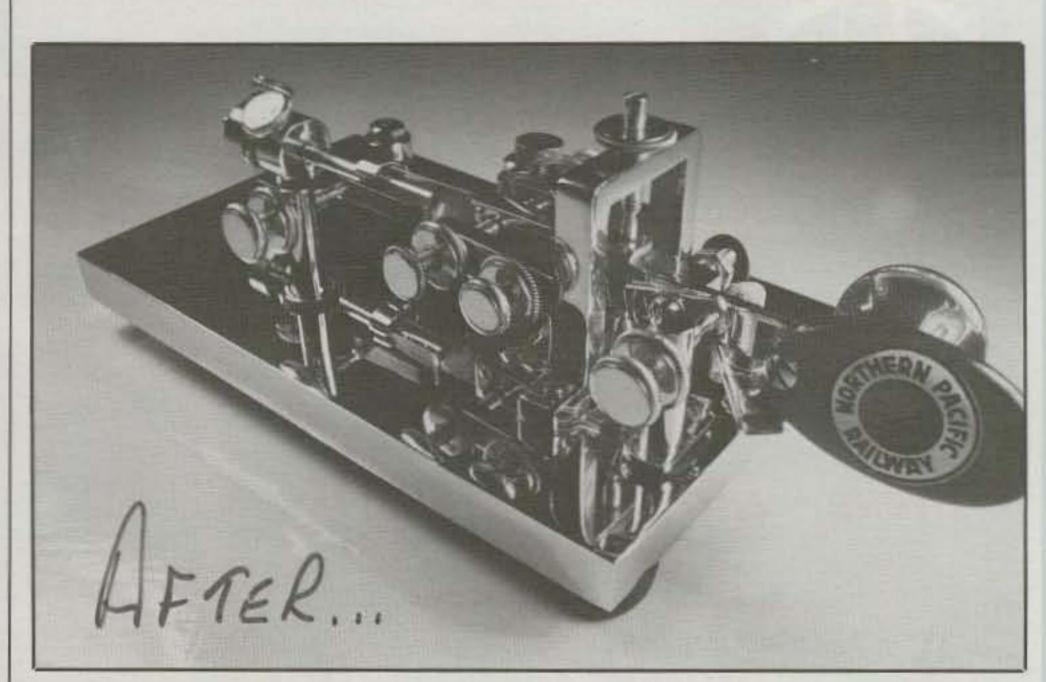


Photo 8– After-restoration view of bug K0YQX refurbished to better-than-new condition. Several new parts including a steel base were added and chrome plated. A truly outstanding achievement!

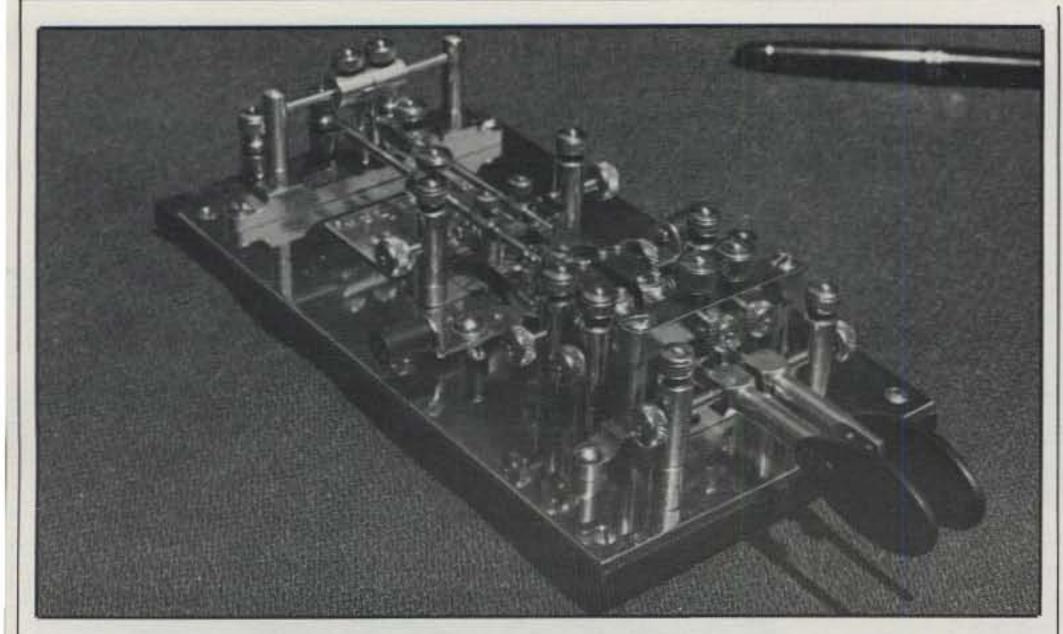


Photo 9- N1KPR's incredible reproduction of the famous Mellihan Valiant fully automatic bug. This masterpiece has 20 adjustments, weighs 8 pounds, and is in a class all its own!

is protected by the top cover, yet primary adjustments are readily accessible. Now this is the way to really enjoy CW operating. Drew echos my own thoughts of bug sending: in the hands of a skilled operator it is closely akin to beautiful music. He also notes that letters such as L, C, G, and Q often become distinctive of one CW fist and weighting can be varied to overcome adverse band conditions. More truer words were never spoken! Congratulations on your classics, Drew!

Photos 7 and 8. These "before" and "after" pictures illustrate the devotion of John Bipes, KØYQX, in restoring a bug of unknown origin to better-than-original condition. The bug was rescued from a railroad coffee shop. It had homemade finger-

pieces, a heavily pitted base, and the previous owner's name scratched into the side. After checking the telephone book, John talked with the past owner and found the bug came from the Northern Pacific Telegrapher's School. John cleaned and rechromed the bug, then made a new base from steel and had it chrome plated to replace the original base. Vibroplex fingerpieces did not align with the arms holes, so he made new fingerpieces from polystyrene. As you can see in photo 8, KOYQX's finished product is as delightful to view as it is to operate. Our hearty congratulations to John for a beautiful restoration job. We are still unsure of this key's manufacturer; possibly it is a Western Union item. Any opinions?

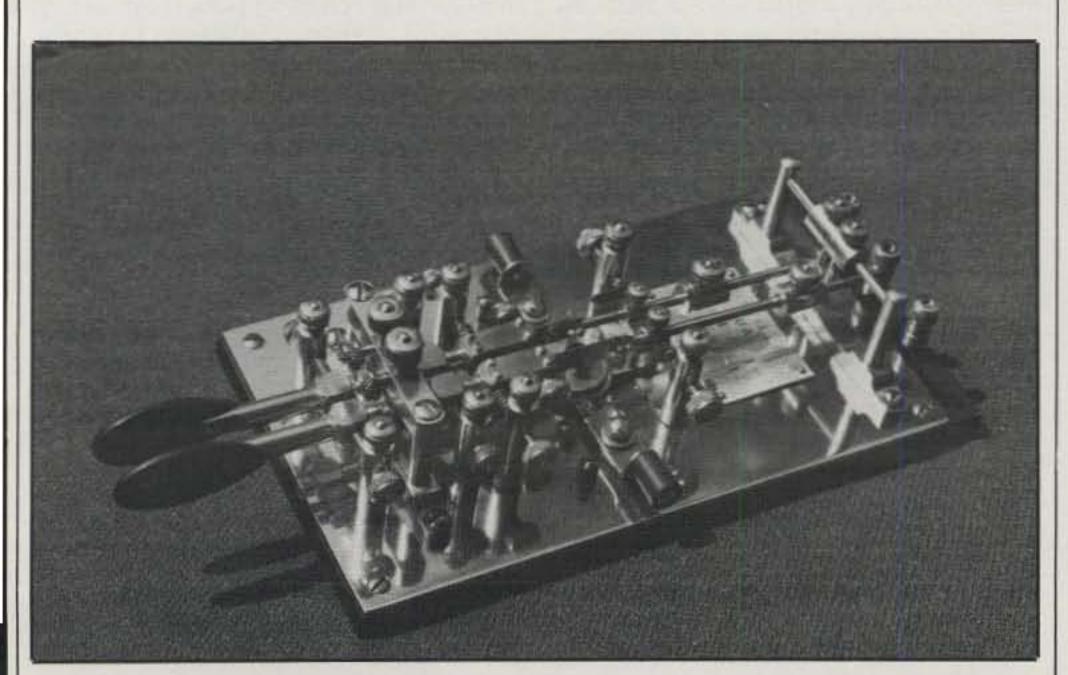
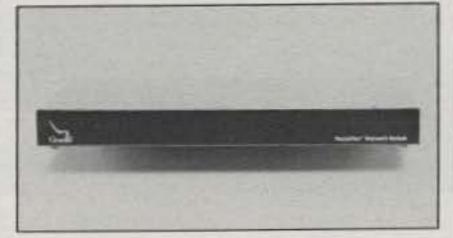


Photo 10- Opposite angle view of N1KPR's fully automatic bug. Note dual pendulums and weights, and separate rear damper adjustments for each. Levers may be locked and operated as a single fingerpiece or unlocked for iambic action. A labor of love!

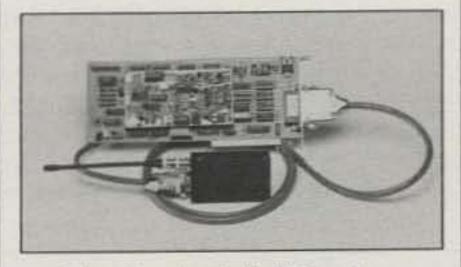
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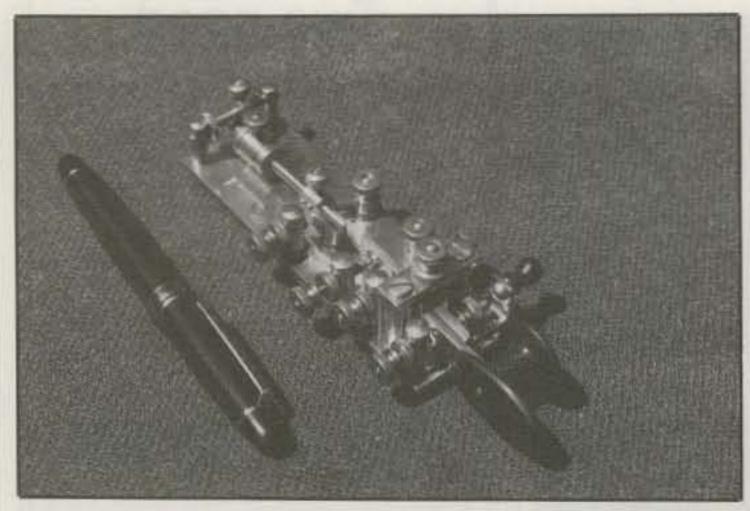
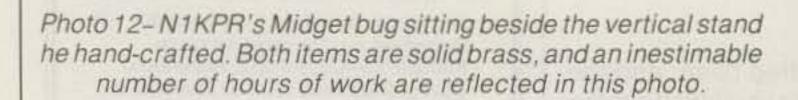


Photo 11- Hand-crafted reproduction of the classic Martin Midget bug. N1KPR added some clever designs of his own to this delight such as a full yoke and adjustable damper bar. Imagine using this gem with a QRP rig on portable expedition!



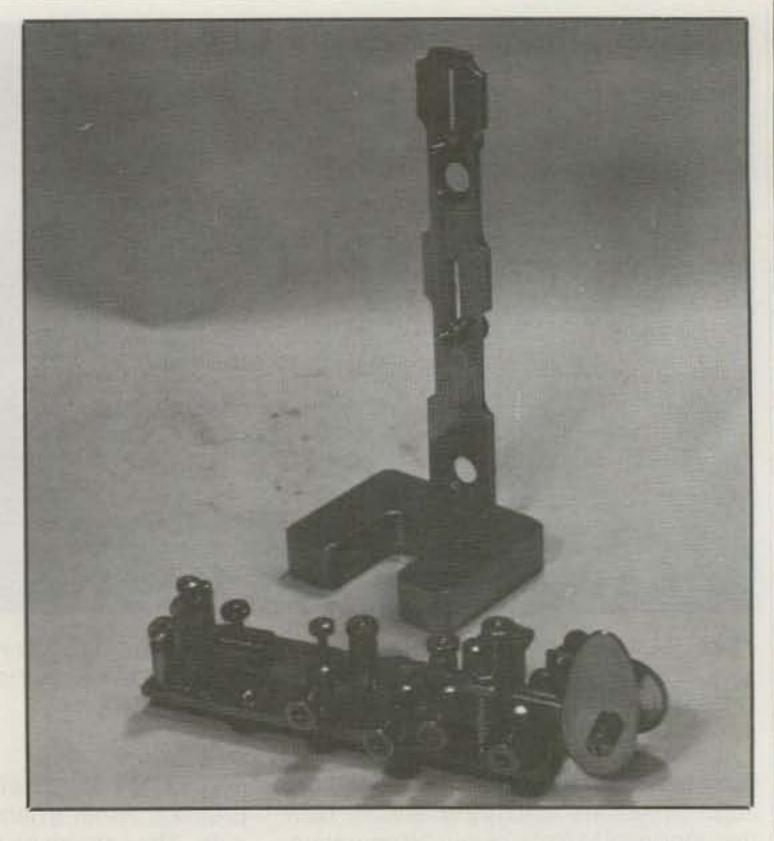


Photo 9. We now shift direction to visually tour the unique keys of Robert Butt, N1KPR, and begin with some background information concerning this remarkable chap. Robert is an electro-mechanical designer and machinist, and his sincere dedication to CW inspired home-production of keys in the following photos. These gems

Photo 13- N1KPR's Midget bug fits into awaiting slots of upright assembly to make a beautiful reproduction of the classic "Wirechief's Key." As N1KPR says, some items are so rare the only way to have one is to build your own reproduction.

are only part of N1KPR's key collection. Several of his handkeys and miniatures are upcoming in next month's column, and other photos will appear in future columns. All of N1KPR's keys are homebrewed prototypes and not for sale. He may consider making a limited number on a per-order basis for friends if enough interest is apparent, however. Now hold your breath as we look at reproductions of the most famous bugs in amateur radio.

Robert named the item shown in photo 9 a "Multiplex," and it is an expanded replica of the Mellihan Valiant. Notice this delight has dual levers and pendulums for making both dots and dashes automatically. That's right—a mechanical equivalent to the modern electronic keyer. The fingerpieces can be locked together to operate as a single lever or unlocked for iambic operation. There are 20 adjustments on this brass jungle, and it also has adjustable main springs like the Vibroplex Presentation. The mechanism is brass and stainless steel mounted on an iron base. Is this not incredible? Can you imagine using this super key with your rig on the air? Ham heaven for sure!

Photo 10. Other side view of N1KPR's "Multiplex" reveals fantastic workmanship and quality. Travel and speed of dot and dash levers are independently adjustable. Also notice dual rear damper stops, which can be set separately according to position on damper bar. Viewing this masterpiece is similar to studying a classic hot rod, and twice as exciting! Unquestionably, this is the ultimate key for the dedicated CW enthusiast!

Photo 11. N1KPR's all-brass version of the classic Martin Midget bug. This masterpiece measures only 43/4 " x 11/2" and is even smaller than its original 1918 version. Full adjustments are included on the little bug, and it has a non-skid rubber bottom. Sharp-eyed viewers will notice some differences (indeed, improvements!) compared to Martin's original key. The rear damper is adjustable by a knurled nut, for example, and a full yoke rather than a pinion rod supports the main arm. A front swing-out stabilizing arm has also been deleted, and the reason will become apparent as we view upcoming photos. Robert produced a real work of art in making this key; it is almost akin to a better-than-original Mona Lisa painting. Robert did not say where he received inspiration to reproduce the Midget, but he must have read page 6 of my book Keys, Keys, Keys (which incidentally is still available via CQ).

Photos 12 and 13. Watch closely, friends, and you will see N1KPR's midget become a vertical bug. The thumb piece is first tilted up 90 degrees, and then the full assembly mounts directly on its mating upright stand. Bingo! A classic Wirechief's key evolves. The extra hole in the bottom of the vertical mount provides high or low positioning of the key to fit an operator's preference—absolutely fantastic! New key collectors may be asking why you would use a vertical bug. The true answer is it requires minimum room on a busy telegrapher's desk, but the amateur's answer is its totally unique concept. N1KPR definitely deserves congratulations on reproducing this marvel from eras past.

Photo 14. This Original model Vibroplex is more than a supreme work of restoration. N1KPR changed its base to a Japanned finish and added carriage trim in-

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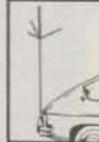
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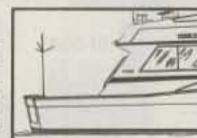
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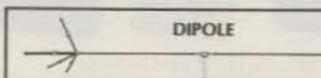




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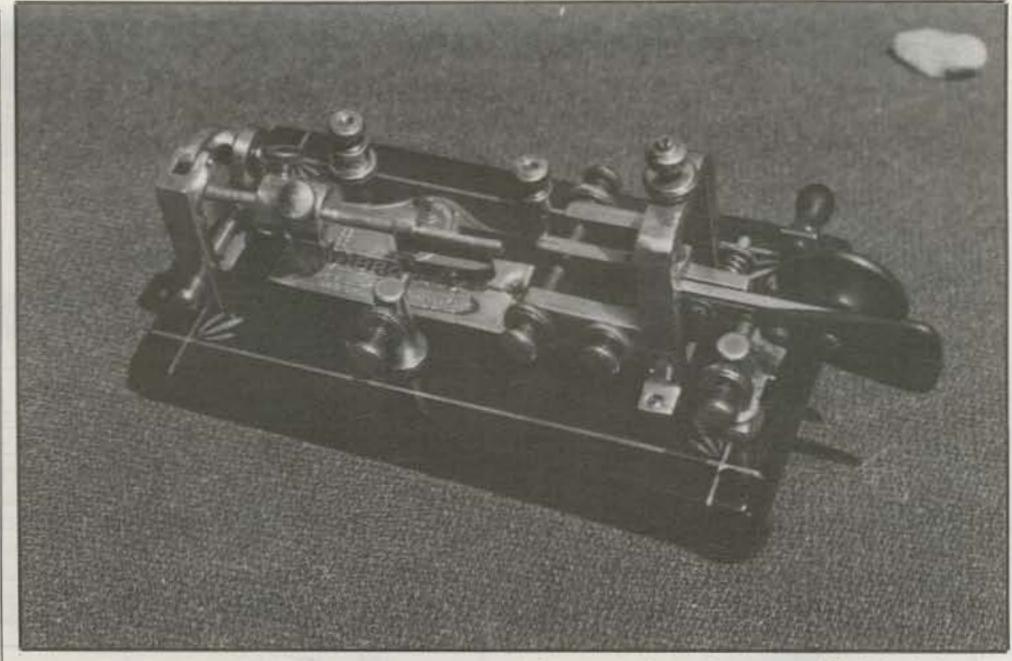


Photo 14- Notice N1KPR's meticulous work in producing a Japanned finish with goldleaf carriage trim on this vintage Vibroplex bug. It might look simple, but numerous hours are involved in the process.

to the metal. The wrinkled finish has been completely eliminated, and many hours of painstaking work are reflected in the finished product. All materials he used were lacquer; no enamels or polyurethanes were employed. We are talking big-time, serious restoration for sure!

Photo 15. Perchance you cannot read the nameplate. This is N1KPR's "Baby Bug." It measures 6" × 2½" and looks like a Blue Racer in general design. The most noticeable difference is its tripod-type yoke and adjustable damper on the rear bar. Although not apparent in this black-and-white photo, the key's base is very dark (cobalt) blue, quite similar to the

original style of Blue Racer. Imagine using this delight on the air today!

Once again we have squeezed information all the way to column's end, and it is time for a quick sign-off. Stay tuned for next month's column when we feature some truly magnificent handkeys and miniatures, including one small enough to fit in a pocket-watch case. Future keys columns are also looking very good at this point, and we hopefully will be highlighting items from Gil, K9WDY, and Claude, 3A2LF, two of the world's top key collectors. Meanwhile, we look forward to exchanging key notes with you on 30 meters CW one week night soon.

73, Dave, K4TWJ

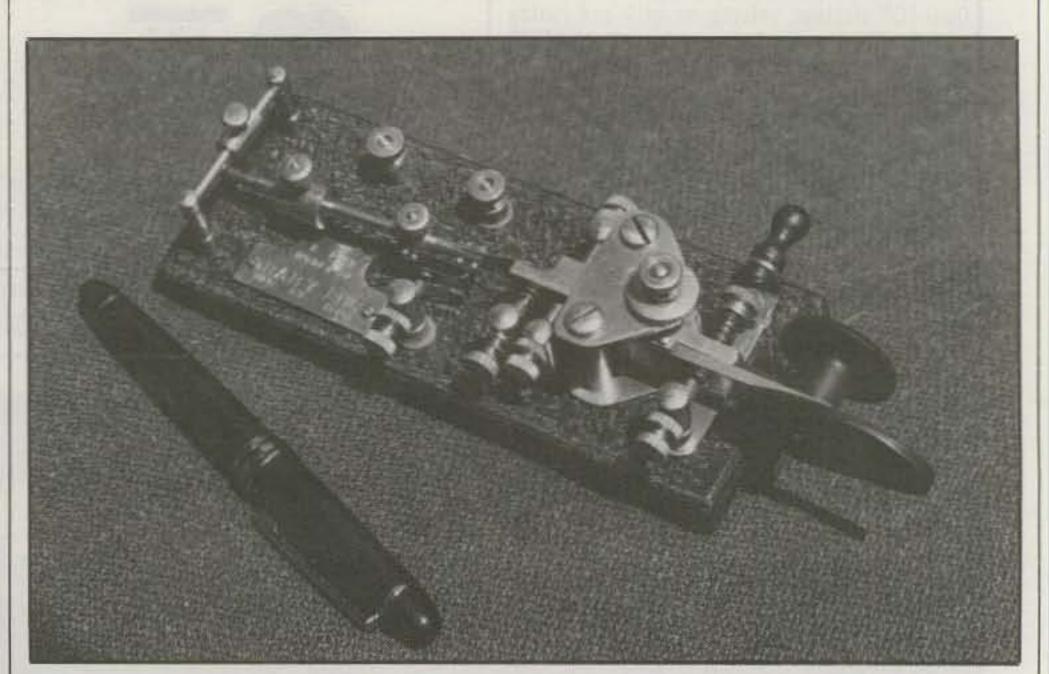


Photo 15- Another "If you can't find an original, build a replica" N1KPR bug. This item is similar to the Blue Racer, and even has a rare cobalt-blue base. Modification of yoke and damper design allow key to work even better than its original counterpart.

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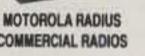
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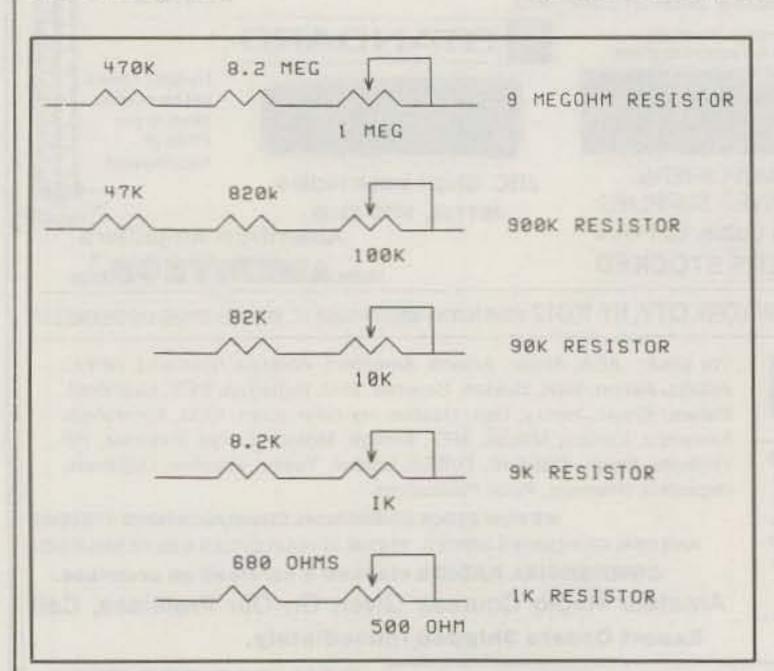
WHAT'S NEW AND HOW TO USE IT

A Modified DPM

am always amazed at just how much the digital world has encroached on the analog world. In the old days a Simpson model 260 VOM was the standard, and measurements to a tenth of a volt were more than adequate. Who really cared if the actual plate voltage to an 807 was 450, 475, or 500 volts? Transmitter plate currents and voltage were measured by 3% to 5% accurate panel meters, and as long as you could see a dip in plate current and the band was open, you could contact anyone in the world. Today, however, God help us if the SN7400 Vcc power supply goes even 50 millivolts above or below the specified 5.0 volts. As a result, I thought it would be a good idea to see how accurate measurement can be brought to our various projects by examining the way in which a standard, inexpensve 200 millivolt (full scale) digital panel meter (DPM) can be modified to measure other voltages and also current. Such low-cost DPMs are easily found on the market (even the surplus market) these days. Best of all, the cost of these devices is often as low as \$5 to \$10 each.

Most DPMs have a very high input impedance and a basic sensitivity of 200 millivolts. Input impedance is usually on the order of 100 megohms or more, which means that loading is negligible and we are free to add almost any external components we wish without sacrificing accuracy. Fig. 1 shows a way to convert the 200

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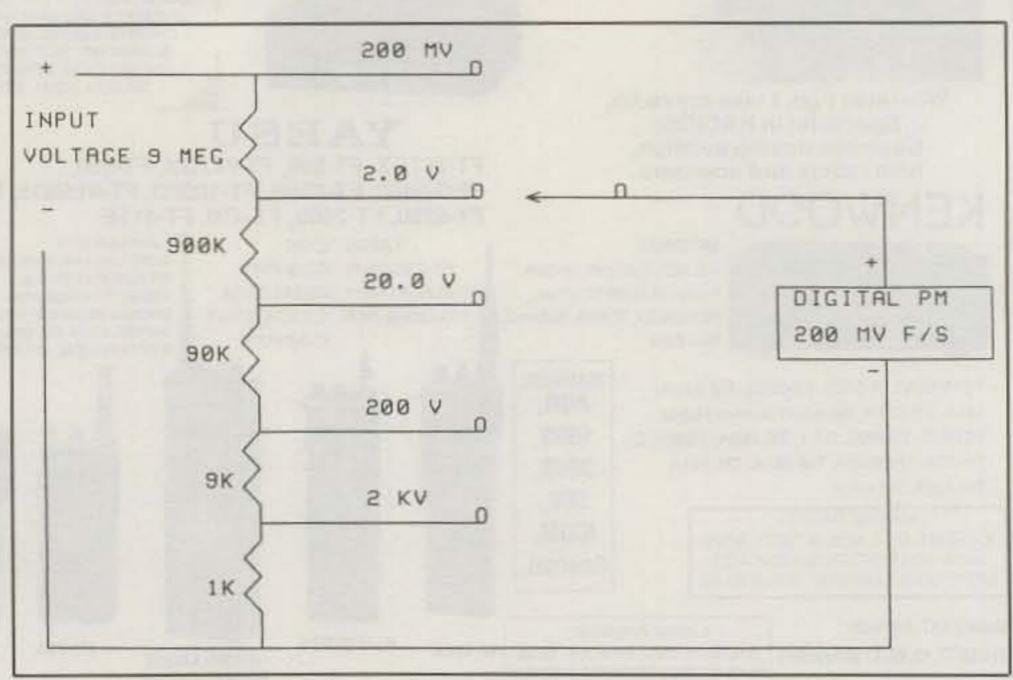


Fig. 1- Divider for DPM voltmeter.

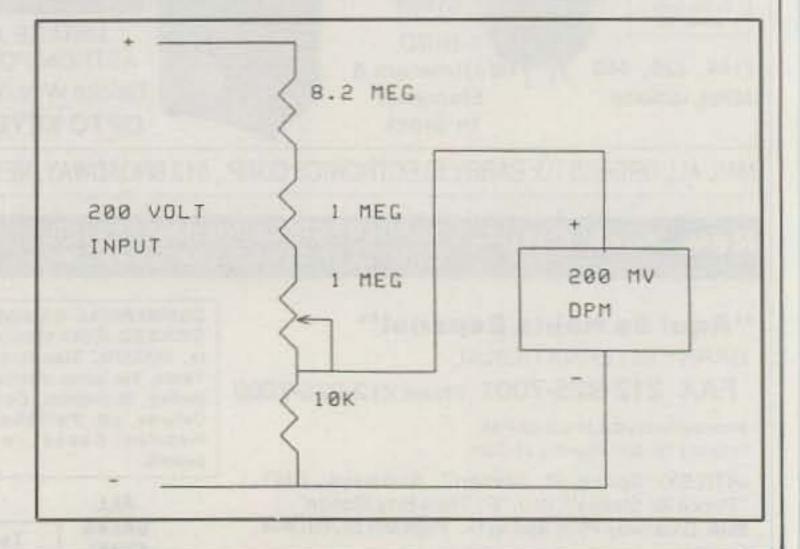
millivolt unit to measure DC up to 2 KV. Using the resistors shown, input impedance is 10 megohms, the same as the old VTVMs, and should not load down anything short of a FET electrometer circuit. The accuracy of the various ranges will be as good as the accuracy of the resistors, so use 1% units if you can. If not, try to trim each value as per fig. 2. Keep in mind that you can use only as much of the circuit as you need for a particular application. Fig.

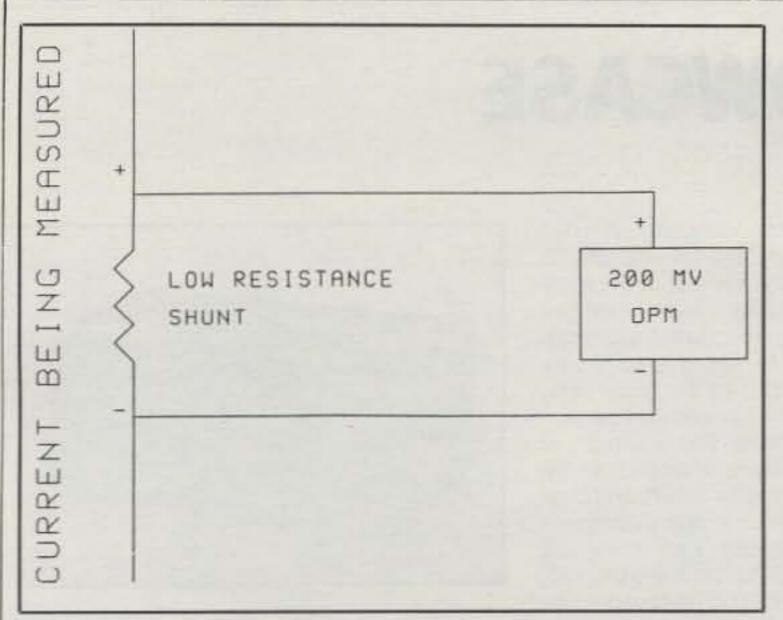
3 shows a 200 volt meter as an example.

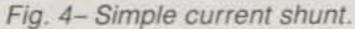
For current measurements, the circuit of fig. 4 should suffice. Here the DVM is measuring the voltage developed across a shunt resistor in series with the current flow. A 2 amp meter of this type would require a .1 ohm resistor. This can easily be fabricated from a short length of resistance wire salvaged from an old wirewound resistor. Lower current ranges can use standard resistors. A 10 ohm resistor.

Fig. 2- Precision dividers.

Fig. 3- Values for 200 volt DPM.







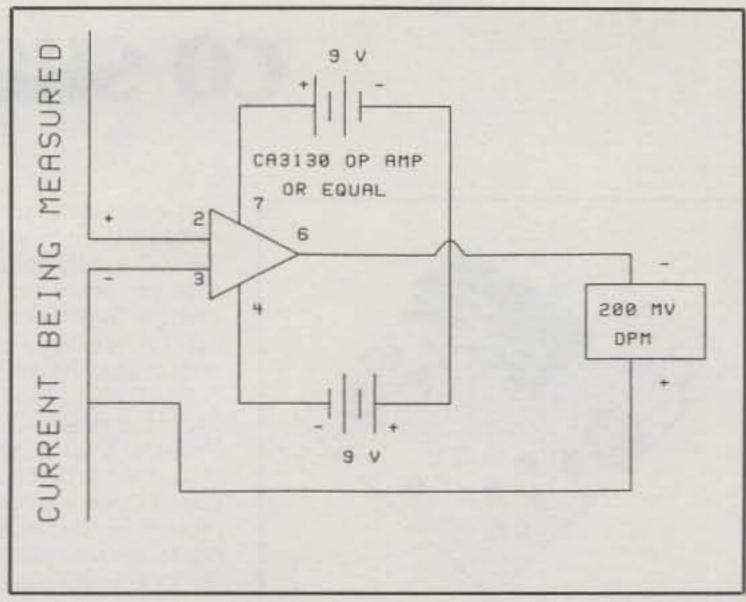


Fig. 5- Low current hookup.

for example, will give a full-scale range of 20 milliamps, and a 1 ohm resistor will give 200 milliamps. To measure even lower currents without using higher resistors, try the operational amplifier based current to voltage converter of fig. 5. This circuit offers a very low input impedance and a gain that is a function of the feedback resistor. The example shows a 200 microamp full-scale configuration. When configuring this circuit for measuring even lower currents, be aware of the leakage currents of the opamp you plan to use, as well as its overall temperature and power supply voltage stability. The formula for calculating the feedback resistor is:

Since the DPM reads in units of 200 fullscale, it is a good idea to adjust values so that the "200" refers to volts, millivolts, amps, microamps, etc.

Although the previous is a simplified discussion of the applications of readily available DPMs, it should serve to allow experimenters on a budget to bring a high degree of accuracy to their projects.

73, Irwin, WA2NDM

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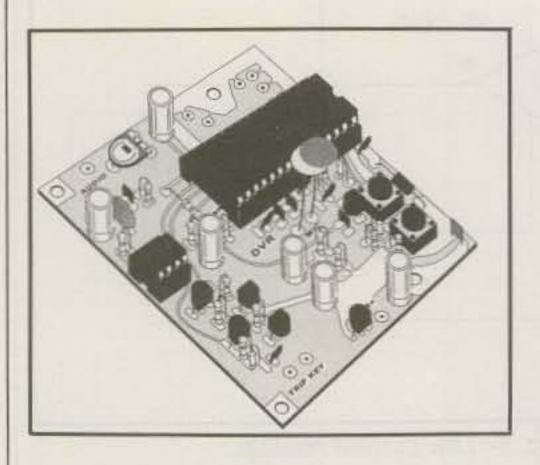
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The DVR-1 module PC board can be purchased in either kit form for \$89 or wired and tested for \$139. It includes a small electret microphone and pushbuttons for record and playback. For more information and/or a complete catalog, contact Hamtronics, Inc., 65-Q Moul Rd., Hilton, NY 14468-9535 (716-392-9430; FAX -9420), or circle number 101 on the reader service card.



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Falcon Audio Distribution Amplifiers

Falcon Communications has announced the new F251A and F252A Audio Distribution Amplifiers. The F251A is a compact unit featuring a low distortion 3 watt amplifier that connects between one of seven rigs or homebrew projects and one of four (or more) speakers via front-panel switches. It is a way to minimize entangled station cables and is suited for multi-band setups

or larger shortwave monitoring systems. The unit also features low input and low output impedance so that volume at any given speaker does noticeably change as outputs are added or removed. It is equipped with standard RCA phono jacks on inputs and screw terminals on outputs. It requires 13.8 volt DC supply. Also available is Model F252A with dual amplifiers and 7 input/8 output channels.

Suggested list price of the F251A is \$54; the F252A \$84. For more information, contact Falcon Communications, P.O. Box 8979, Newport Beach, CA 926558 (714-760-0340), or circle number 100 on the reader service card.

(continued on p. 104)

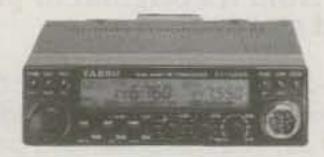
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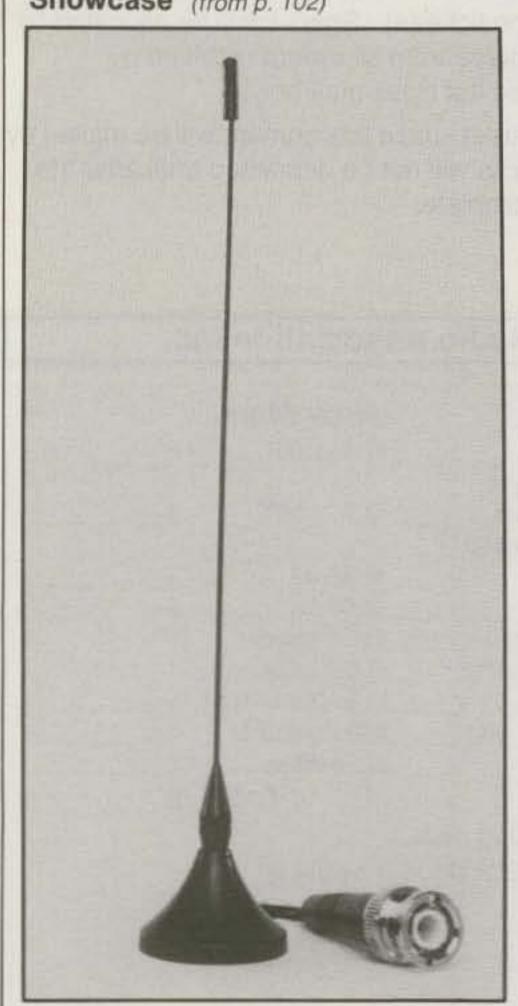
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Showcase (from p. 102)



Valor/PRO•AM VHF/UHF Mobile Antennas

The PRO•AM division of Valor Enterprises has announced a trio of VHF/UHF mobile antennas: the 2 meter MM144, 70cm MM450, and 2m/70cm dual-band MM240. These antennas are barely visible of the car roof, and are supplied fully assembled and pretuned, complete with 8 feet of RG-174 coax, and are fitted with a BNC connector. All models consist of an ultraslim, short, black, chrome ¼-wave whip and small 1½ inch diameter base. The MM144 covers 144–148 MHz; MM450 covers 430–470 MHz, and the MM240 covers 144–148 and 430–470 MHz.

For more information, contact PRO•AM, Division of Valor, 185 West Hamilton St., West Milton, OH 45383 (513-698-4194), or circle number 103 on the reader service card.

Luke Co. High Current Power Supplies

Luke Company has announced linear-type, high-current power supplies for meeting the demands of high-power, solid-state RF amplifiers. The S60, S80, and S100 are rated at 60, 80, 100 amps at 13.8 volts DC. The S35H and S55H are rated at 35 and 55 amps at 28 volts DC. The S25VH, S50VH, and S75VH are rated at 25, 50, and 75 amps at 50 volts DC. The power supplied include lighted volt/amp meter, over temperature, current limit fold back, and dual crowbar protection. Electronic regulation, input surge protection, and output RF filtering provide quiet,

low-noise operation for 100% duty cycle operation. Optional fan cooling is available.

Most models include soft start and operate from either 120 or 240 volts AC. All power supplies include one-year warranty. For more information, contact Luke Company, 7113 North 9 Mile Road, Lake City, MI 49651 (616-229-4593), or circle number 105 on the reader service card.

Electrosoft Field Day Program

Electrosoft has released a Field day program for IBM compatible MS DOS computers. The program logs contacts and sends/receives CW. The screen layout has separate windows for logging QSOs, operating CW, changing band and mode selections, and viewing eight help screens, which display all commands, the ARRL section abbreviations, and a score summary by band and mode. The CW messages are displayed on a split screen and status lines at the top and bottom display all settings. The CW speed can be adjusted from 5–100 wpm in 10% increments, and the weighting can be adjusted from 21–45% in 9 steps.

The interface circuit can either be built from the schematic included in the program documentation or ordered in kit form with the program. The battery operated kit takes approximately one hour to build and includes all parts plus cables, except for the speaker and key connectors. The program and interface kit costs \$50; the program alone is \$20. (Specify 5 ¼ "or 3½" disk.) For more information, contact Electrosoft, P.O. Box 1462, Loveland, CO 80539, or circle number 109 on the reader service card.

(continued on p. 105)



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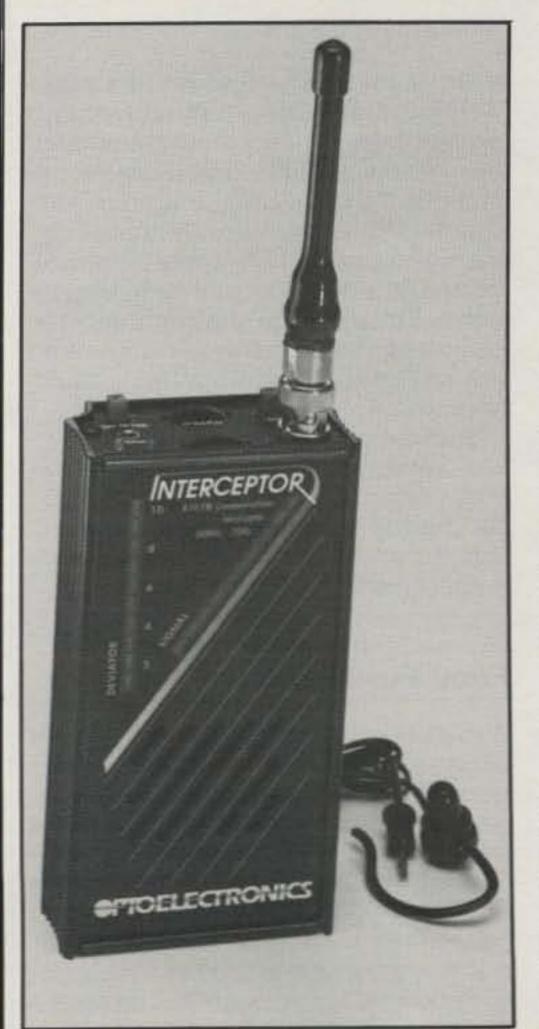
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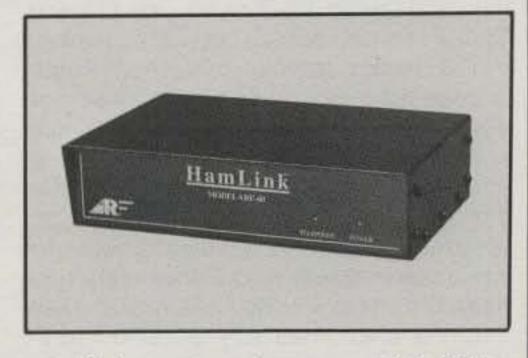
The Interceptor is classified by the FCC as a communications test instrument to measure deviation (wide and narrow band), relative signal strength, signaling tones (CTCSS), and any measurement requiring demodulated FM. The R10 is useful for testing VHF, UHF, and cellular transmitters and can be a portable substitute for a service monitor in some cases.

The Interceptor responds to any strong signal present and is stabilized by the signal it is receiving. It does not have to be tuned to a frequency in order for it to receive a signal. Any FM signal from 30 MHz to over 2 GHz can be intercepted without any gaps in coverage. It is completely automatic.

The unit is $5.1" \times 2.8" \times 1.5"$ and is priced at \$359 (includes nickel-cadmium battery pack and AC wall plug charger). For more information, contact Optoelectronics Inc., 5821 NE 14th Ave., Fort Lauderdale, FL 33334 (305-771-2050), or circle number 107 on the reader service card.

A.R.E. HamLink™ Telephone Interface

Amateur Radio Engineering, Inc. has introduced HamLink, an interface that goes between the telephone line and the computer port of a transceiver or receiver. HamLink can control the frequency of a radio, mode, band, scan memories, and operate split-mode. With HamLink you can control your transceiver from a Touch Tone phone anywhere in the world. The unit has a synthesized voice to announce frequency and mode. You can command your radio to go to a



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HamLink is housed in an 8" × 5" × 2" metal case and is priced at \$269. For more information, contact Amateur Radio Engineering, Inc., P.O. Box 169, Redmond, WA 98073 (206-882-2837), or circle number 106 on the reader service card.

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PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

A Return To The Basics

ith so many innovations taking place in our hobby of packet radio, I've found there is a never-ending array of topics to write about. In addition to the many new devices, features, and enhancements being added to the packet radio hobby, the number of new packeteers is also increasing at a very high rate.

Although the new device, feature, and enhancement topics are plentiful, there are some subjects that must be reviewed occasionally in order for this column to be beneficial to all readers, both new and seasoned. We'll cover these topics in greater detail later in this month's edition of the "Packet User's Notebook."

Lightning Never Strikes Twice

Lightning never strikes twice in the same place. Famous last words! I'll never forget that awful day in November 1991 when my station was zapped by a bolt of souped up nuclear fusion. The loss was near devastation, and the amateur radio gear that the State Farm folks tossed out was sickening.

The reason I mention this dreadful time is because today I was just reminded of that day. Pete Nicholls, N4BHB, has just sent me a device that he is manufacturing and distributing. It is called the AAD2. It is a product that automatically disconnects the antenna from the radio or transceiver when power is removed. (I sure wish I had had a dozen of these devices in 1991.) The antenna is automatically reconnected to the receiver or transmitter when power is restored.

The AAD2 can be ordered with several types of antenna connectors installed. For more information about the AAD2, write to or call LPS Marketing, 308 Sterling Drive, Warner Robins, GA 31088 (912-929-9416).

Long-Haul VHF, UHF, Microwave Contact

Remember a few years back when I wrote about a connect from Bob James, VE8DX, at Pond Inlet near Baffin Island in the Northwest Territories (that's getting close to the North Pole)? That packet connect was via 10 meters from Bob to the HF port of an HF/VHF gateway.

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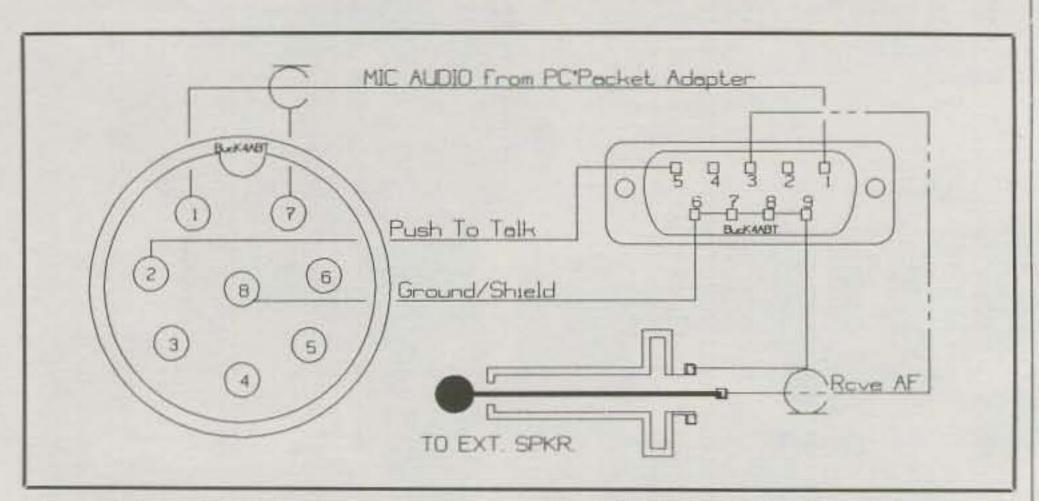


Fig. 1- Alinco DR-600 twin-band transceiver to DRSI DPK-2 TNC. Note: The receive AF may be taken from either the VHF or UHF external speaker jacks of the DR-600.

Bob and I had had a QSO on 10 meters earlier that day, and I had passed along the path to use to access the HF to VHF gateway at Warner Robins, Georgia. On the VHF side of the gateway was a CONFERENCE node, and some of us were in a round-table QSO when Bob came through via the HF port.

I won't forget how the QSO halted when Alan Shaw, WD4DKA, and Bruce, WB4OLD, asked Bob where his QTH was, and Bob answered, "Near the Polar Cap, in the Northwest Territories." Alan was using a 25 watt transceiver, and Bruce was into the VHF CONFERENCE node using a 10 watt radio. Both had just found themselves in a QSO with a station that was almost 8000 miles away. I suppose that is one of the times when I truly understood the meaning of "silence is golden."

A short time ago I had occasion to experience another one of these fun moments when reading the following message from one of our local BBSes:

From: KF6CJ
To: K4ABT
Type/status: PN
Date/time: 10 Jan 17:00
BID (MID): 1497-WD4ELJ
Title: Packet DX

Hello Buck,

It is 17:00 on 10 Jan (GMT). I just saw you connected to WD4ELJ and tried to connect, but I got a "busy." I am connected to my machine through the (fibers, satellites, VHF, UHF, Microwave, etc.) and am still in London (until Thursday). See you later. (I wonder, if we had con-

nected would it be a distance record?)
73 de Don

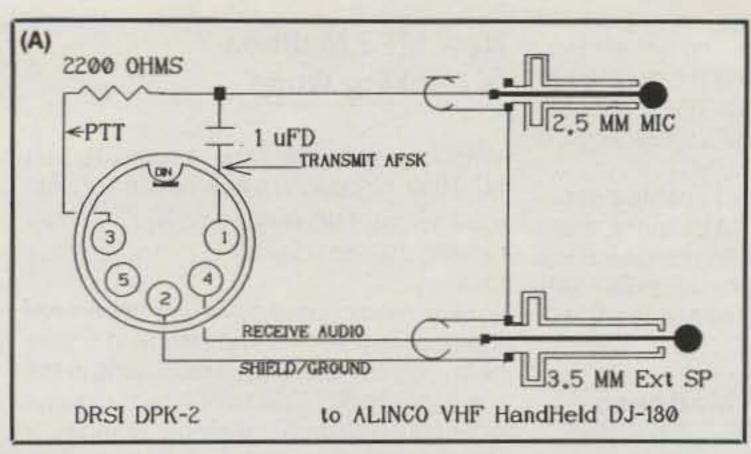
-End of message to K4ABT from KF6CJ-

When I read this message from Nick's BBS (WD4ELJ) the following morning, I recalled having seen a connect request from Don the night before. Little did I realize at the time that Don was still in England on assignment. Don and I are Systems Engineers with Ericsson/GE Mobile Communications based at the Lynchburg, Virginia facility. This message reminded me of the QSO we had had with Bob James between Warner Robins, Georgia and Baffin Island, Northwest Territories.

With the help of the AMSAT and PAC-SATs we may soon see more connects into our local area networks (LANs) at VHF. DX chasing is one thing at HF, but pathfinding through a maze of "worm-holes" is novel also.

Food For Thought

With more and more forwarding between BBSes and other packet systems taking place on unused microwave service channels and unused time-share after-hours landlines, it may not be long before we can talk (packet) coast to coast beginning and ending with a VHF or UHF low-powered transceiver. It's not how you get there. It is that you are able to QSO with a DX station and have fun doing so. It is an adventure, and moreover, it has the same mys-



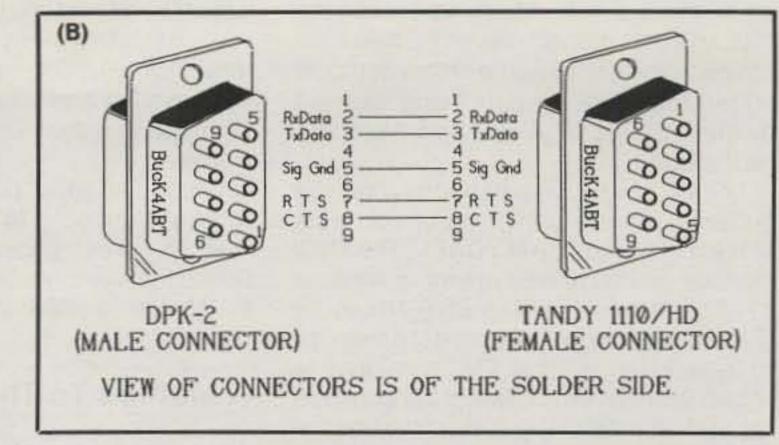


Fig. 2– (A) DRSI DPK-2 connected to Alinco VHF handheld DJ-180. (B) Solder side of the DPK-2 male connector and Tandy 1110/HD female connector.

tique as my first CW contact with an Ohio station on 80 meters some 40 years ago.

With the addressing scheme (CCITT addressing) of the ROSE switched network, the next step in packet radio may afford us the means to do just that: QSO coast to coast by entering only the call of the station you wish to connect with, the call of the local ROSE switch, and the address of the destination ROSE switch. With the SYSOP's advantage of being able to configure the ROSE routing, we are able to use any number of routes, including alternate routing which will access these other services and render the world of communications unto Caesar.

When the path is complete, a connect from my QTH at Evington, Virginia to Lane's (KC6AST) QTH at San Deigo, California will be a simple input to the ROSE network as follows:

C KC6AST V KD4HVZ-3,619788

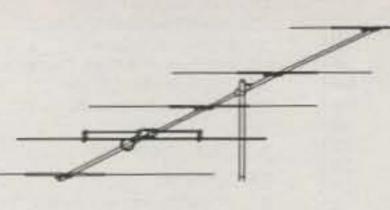
The period that it takes the connect to happen, and the time it takes a packet of text to traverse the distance, is another story, but it will be fun watching it happen.

MON OFF

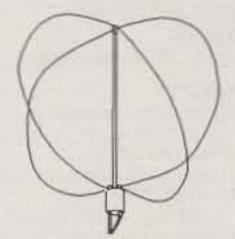
Now that most TNCs have mailboxes, and

most have the capability of having a mailbox callsign different from the MYCALL callsign given many of us, we have a vehicle to receive messages from distant connects by leaving the transceiver and TNC ON around the clock. While on the subject of leaving the TNC mailbox ON around the clock, it should be noted that your PC or terminal can be turned OFF or used OFF-LINE for other uses. However, please make certain your MONitor command is set to OFF, and the FIRMRNR is set to ON. Taking the terminal OFF-LINE and leaving the MONitor command ON can allow the TNC buffer to fill and reach overflow. The reason for the TNC buffer overflow is be-

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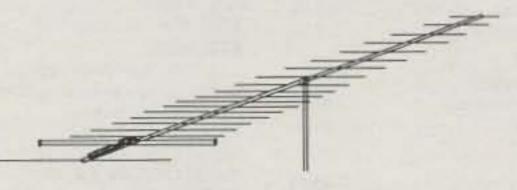
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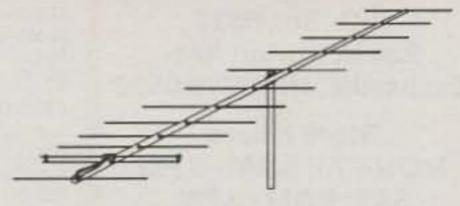


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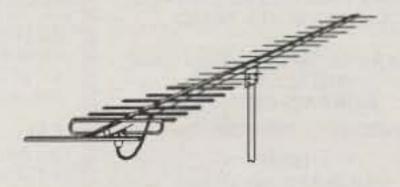


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cause there is no handshake between the TNC and the comport. Thus, the data cannot go to the computer/terminal comport buffer. Therefore, the data being received by the TNC has no place to go, except to fill the buffer.

Let's consider what happens when the buffer is full and another station connects to the mailbox, or the MYCALL. The TNC/ mailbox cannot handle anymore data, so it returns a receive-not-ready (RNR) to the connecting station. The connect continues to try, and the mailbox TNC continues to return the RNR. After awhile the connecting station tires of the tries and turns the TNC OFF.

In the meantime, at the mailbox end of the connect the TNC continues to send RNR's because it doesn't have enough free buffer left to acknowledge the other station's disconnect. The RNRs can go for as long as the TNC buffer is in the overflow state, until it is turned OFF, or until its owner returns the computer or terminal to ON-LINE status, and the terminal handshakes and receives the data into the terminal comport. The mailbox TNC owner has no knowledge of the hours or days of RNRs that have been streaming from his/ her TNC through the nodes, digis, or switches and disrupting packet communications.

Equate this feeling to the time you went to dinner and accidentally dropped the logbook on the mic transmit switch. The world heard every word you said-who and what you talked about while having dinner! Horrors! Painfully, you called the only friend you have left and asked, "Were you able to hear all we said, or did anyone know it was me?

Of the TNCs that do not enable a separate callsign to the MYCALL entry, there is an on-screen prompt in the new DRSI DPK-2 that identifies the mailbox ON mode by displaying PMS: instead of the CMD: prompt.

A Method To The Madness

At one time many of us set aside our call with an SSID of dash ten (-10) as the mailbox call. With the entry of some of the pseudo-TNCs, we are unable to enter the accepted -10 as the mailbox SSID. For that matter, we cannot use an SSID (above -9) that has more than one digit in any mailbox call. This has presented some problems (e.g., K4ABT-10) to long-haul messaging, as we no longer have the correct connect string that might enable a connect to a friend's mailbox.

In order to create some method to the madness, maybe we should consider using an SSID of one (-1) so that we can enter a usable mailbox call/SSID. By using the same mailbox or PBBS SSID across the country, we may have some notion as to what the mailbox callsign at the target station might be (e.g., K4ABT-1).

New MFJ Mailbox Is Looking Good

Without any big fanfare, it appears that MFJ has introduced a new version of firmware in their TNC series which goes a step beyond the separate SSID for the mailbox idea.

How many times have you been near the packet terminal and received a connect, only to realize the TNC was/is in the mailbox mode? You panic because the connecting station is a friend, relative, or DX connect with whom you've been wanting to QSO for a long time. Now at last he/ she is connected, and all you can do is watch while the station looks at your mailbox commands. Well, the "force" is with you now. With the new firmware in the MFJ, there is a T command that allows the connecting station to send you the TALK command. This sends you the bells or ring alarm to get your attention if you are away from the terminal. You then enter into a QSO simply by typing: CHAT < Enter >. Even if the connecting station doesn't send you the T, you can enter the word CHAT and continue a QSO with the connected station.

There is also a new clock chip in addition to these new features in the MFJ TNCs, making for a well-rounded TNC. What? You hadn't heard about the new

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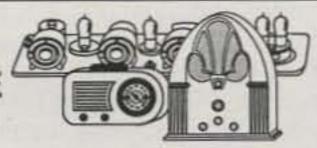
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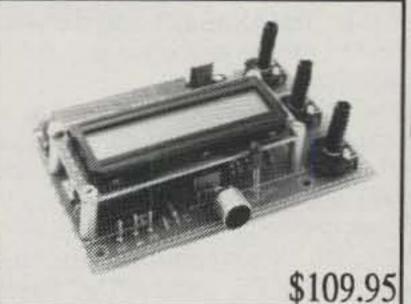
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clock chip addition? Well, neither had I until a few weeks ago when Steven Pan, vicepresident of MFJ, just happened to mention it.

The clock module is easy to install. Just pop out the RAM, insert the clock module, replace the RAM into the top of it, and you won't have to set the day and time with the DAy command for a long time to come. The date and time will be there, running even while the TNC is OFF. Oh, yes. I installed it into the TNCs I'm running. It sure is nice to type the DA command and press <enter> and have the TNC tell me the time and date. Three months after I put the clock chips in, the clock has not gained or lost more than 30 seconds.

How About Those "Ears"!

Finally! I have my new Alinco DR-600 twinband transceiver. If they make receivers any hotter at UHF, we may soon be setting new DX records for UHF. I'm not slighting the VHF section of the Alinco DR-600, as it is just as good. I'll talk more about how the DR-600 can be used as a VHF/UHF gateway (without a TNC) for packet in a future column. For now, however, we can interface it to the DRSI DPK-2 as shown in fig. 1.

While I was at it, I then ordered the Alinco DJ-180 to 'marry' with the Tandy 1110/HD 'notebook' computer and the DRSI DPK-2. The DRSI DPK-2 draws under 40 MA and is compact enough to fit into the briefcase with the Alinco DJ-180 and the Tandy 1110/HD notebook computer. The DRSI interface to the DJ-180 and the DPK-2 to the 1110/HD are shown in figs. 2(A) and (B).

Disk Operating System (DOS)

Many of the newcomers entering the ranks of the packet hobby are new to the use of computers and are unfamiliar with the term **DOS**. For the balance of this month's column I am going to cover some areas

that may interest even the seasoned packeteer.

It has become necessary to address some of the terms many of us take for granted. A number of the letters I receive from readers ask for help in this area. I will not go into the subject of Windows™. Although I use the Windows environment, a great number of users are only at the novice level with personal computers and DOS.

DOS is the Disk Operating System used in the IBM PC and compatibles. There are several disk operating systems for the PC, such as MS/DOS™, DR/DOS™, and PC/DOS™, to mention a few. Each brand may have features that the other does not have, but by and large they all accomplish similar tasks.

When you first apply power to your computer, DOS is the first application that is automatically booted into your computer's Random Access Memory (RAM). The purpose of DOS is to perform the role of an interpreter. This function enables various components and devices to interface with other programs and devices connected to the PC. This interpreter (DOS) is the interface between the connected hardware and the Central Processing Unit (CPU) of the PC.

The first function of DOS is to look for and identify the number and placement of various necessities that are called for by the Read Only Memory (ROM), often referred to as the ROMBIOS. Some of these necessities are the keyboard, disk drives, and monitor.

When software (programs) such as the terminal software used to communicate with the packet controller (TNC) is loaded (booted) into the PC, DOS becomes the manager, or director of operations, within the PC. DOS allows commands between the CPU of the PC and the TNC to take place by reading the instructions that are (executed) within the software (program) that was written for this application.

DOS is constantly looking at all attach-

ments and functions that are being performed, and at a lightning pace. The faster the CPU, the faster DOS is looking. For instance, DOS is looking for input from the keyboard at speeds faster than 19,200 times a second, and in some applications it can be even faster.

The CPU and clock (oscillator) speed is measured in megaHertz (MHz) and determines the rate of device and comport input and output (I/O) scanning per second. This scan (polling) is extended to any device that may be attached to a communications port (comport, such a packet TNC, a serial mouse, or a telephone modem). With the demand for both an attached serial mouse and a TNC or telephone modem, many modern personal computers are now supplied with two or more comports as standard equipment.

Other devices that are being watched (polled) by the CPU via DOS are the keyboard, printer (strobe), video digitizers (hand-scanner), and peripherals. All are polled for activity by DOS, while the program (software) establishes what action is to be performed when a communication is directed to or from (I/O) any one or more of these sources.

Working With The "Big Three"

There are three main elements in DOS that we must learn to use effectively. These three commands are the keys to success with DOS, and therefore we must learn to deal with them in an effective manner. Here are the three main elements, or commands:

- Discs (or disks)—floppy, firm, and hard.
 - 2. Files, or programs (text data, etc.).
- Directories—The directory can best be explained as "the logbook," or index of information contained on the disk. This information can be in the form of ASCII text, binary programs, or either ASCII or binary data and text.

If the data is in the form of an executable program, we refer to it as "software."

As you become familiar with the terms and applications within DOS, you will quickly find that all the rumors you've heard about how difficult DOS is to use will all go away. DOS has a lot of power, and it will manifest itself as you need it.

In coming months we will cover more and more of the DOS commands and discuss how they can be used to make your computer activities easier. We will also show you how you can effectively use packet radio to transfer any file from your disks (hard or floppy), station to station, PC to PC, drive to drive.

Many seasoned packeteers are already enjoying the fun of sending and receiving binary files and pictures via packet radio. This same level of fun can be yours, too.

Until next month . . . 73 de BucK4ABT @ WD4ELJ.VA.USA.NA



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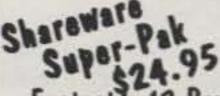
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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Amateur Radio Callsign License Plates

mateurs frequently move from state to state. Such moves may be by choice, but many of these relocations are due to job changes. Many of us like to have callsign license plates on our vehicles. Consequently, it is useful to have information about each state's requirements to obtain such plates. This three-part article contains as much information as I have been able to obtain regarding this subject. This data is arranged in the alphabetical sequence of state names, which makes it easy for the reader to locate the data that applies to a specific state. It is interesting to compare related facts between states. If specific information is not listed, that is because it was not supplied by that state's plate-issuing agency. No attempt has been made to cover any amateur radio callsign license plates that may be available to amateurs living in American protectorates or territories, but I would like to receive that information for possible future use.

Agency Data. The data herein includes the address, facsimile number, name, and telephone number for each state's agency.

Fees. Fee data is listed. Our callsign plates usually involve a fee in addition to the regular plate charge. A one-time charge and/or a yearly fee may also be involved, plus service and postage fees. Senior citizens may be eligible to obtain license plates at reduced prices in some states.

Perks. Some states make special dispensations to allow amateurs (with callsign plates on their vehicles) to wear headsets while driving, and/or to monitor police (utility) transmissions. Words such as AMATEUR RADIO, EMERGENCY, or HAM RADIO appear on such plates in some states. A few states allow variations of the same basic callsign to be used on more than one vehicle, such as W6JEP-2 and W6JEP-3.

Requirements. Most states require each applicant to provide a copy of his/her valid amateur radio license, plus proof that any required tax/fee has been paid for the vehicle to which the requested plates are to be attached. Also, the applicant usually has to own the vehicle. Some states do not issue callsign plates to Novice or Technician operators. Some states require equipment to remain in the vehicle bear-

Here is 33-year-old George Osier, N2JNX

Here is 33-year-old George Osier, N2JNX, of Ogdensburg, New York. He has contacted amateurs in 153 countries since March 1989. His station includes a Uniden HR-2510 transceiver with a Cushcraft AR-10 vertical antenna.

ing the plates. Wherever information is known to me, I have included it here.

Time. It usually takes four to nine weeks to receive a callsign license plate after the applicant has requested it. Expiration dates vary from one state to another.

Vehicles. States differ with regard to the types of vehicles to which amateur radio callsign license plates may be attached. They may be mounted on passenger cars in all states, and some states allow the use of them on campers, motorcycles, and trucks. The callsign plate follows the amateur when a vehicle is sold; it does not stay with the vehicle.

Following is the first group of states and their specific requirements.

Alabama: State Department of Revenue, Motor Vehicle Division, P.O. Box 327630, Montgomery, AL 36132-7630. Standard fee, plus \$3 (proratable). There is no charge for the 60-day temporary tag that is issued to plate applicants. A \$2 fee is charged if plate replacement becomes necessary. Valid FCC license required and it must be shown each year to re-register. Licensee must own vehicle, not just lease

it. Application must be completed for the county's issuing official, along with required fee payments. MVD then orders a single (one) callsign plate from the Department of Corrections and the plate is subsequently mailed to the amateur by the MVD. Plates are not issued for use on motorcycles.

Alaska: Department of Public Safety, Division of Motor Vehicles, 2150 East Dowling Road, Anchorage, AK 99507-1997 (phone 563-8270). Certificate of Eligibility Form 12-830 must accompany each application. All applicable lien, tax, and title fees must be paid. Applicant must hold a valid FCC license, and a copy of it must be submitted with every original, renewal, or transfer application. An amateur may have only one set of current callsign plates during a registration period. A Form 12-803 Application for Personalized Plates must accompany original and replacement applications for amateur radio plates. However, the amateur is not charged a personalized plate fee. Vehicle must contain an amateur transmitter to be allowed to display callsign plates. Renewals and transfers may be completed at any field office.

Arizona: Department of Transportation, Motor Vehicle Division (1801 West Jefferson Street), P.O. Box 2100, Maildrop 506M, Phoenix, AZ 85001-2100 (602-255-7520). The initial additional plate fee is \$15, the annual additional renewal fee is \$5, and the remake fee is \$5. The applicant must present a valid FCC license, and a copy of it must accompany the application. The applicant must be an Arizona resident, and must be the owner or co-owner of vehicle. One must notify the MVD of plans to transfer such plates to another vehicle. If a vehicle is to be sold or transferred, without transferring the plates to another vehicle owned by the amateur, the callsign plates must be returned to the MVD. If an FCC license is revoked, suspended, or expired, the callsign plates must be returned to the MVD. In such a case, the MVD usually allows the amateur to keep one plate (without validating tabs). Vehicles (such as motorcycles and trailers), which require smaller plates, are not issued amateur radio plates.

Arkansas: Department of Finance and Administration, P.O. Box 1272, Little Rock, AR 72203. Fees include 20 cents for postage (\$1.25 if plate is to be mailed), 50 cents

45527 Third Street East, Lancaster, CA 93535-1802 for lien filing, \$2 special (amateur plate) fee, \$5 title fee, and \$1 transfer fee, plus the regular license fee. Application Form 10-339 must be accompanied by a copy of the current FCC license. Original plate applications are only handled at the Little Rock office, whereas renewals can be processed at all revenue offices, or by mail. October 1st is the filing deadline and the yearly renewal date. Plates are only for private passenger vehicles and pickup trucks no larger than three-quarters of a ton. AMATEUR RADIO is imprinted on these plates.

California: Business, Transportation, and Housing Agency, Department of Motor Vehicles, Office of Communications, P.O. Box 932382, Sacramento, CA 94232-3820. In addition to the normal registration fee, there is a \$21 special fee. No extra fee for annual renewal of callsign plates. Transfer fee is \$12. Valid FCC license required and a copy of it must accompany application. These plates may be attached to an amateur's automobile or motorcycle, with only one set per amateur. They may not be attached to a trailer.

Colorado: Department of Revenue, 140 West 6th Avenue, Denver, CO 80204-5195. The application fee is \$2 and the additional renewal fee is also \$2. Applicant must have a valid FCC license, and must include a copy of it with the application. Applicant must have a legal Colorado address. Plates may be used on passenger vehicles and trucks with an empty weight that does not exceed 16,000 pounds.

Connecticut: Department of Motor Vehicles, Vanity Plate Unit, 60 State Street, Wethersfield, CT 06161 (203-566-3138). A plate fee of \$12 is assessed to the applicant when the DMV receives the callsign plate. The applicant must own the vehicle to which the plates are to be attached. These plates may only be attached to camper, combination, commercial, motorcycle, and passenger vehicles. A copy of the valid FCC amateur radio license must accompany the application. Minimum manufacturing time is nine weeks.

Delaware: Department of Public Safety, Motor Vehicle Division, P.O. Box 698, Dover, DE 19903 (302-739-4459). Tendollar additional fee over \$20 annual registration fee. The \$10 extra fee is a one-time fee. One plate per applicant. Applicant must own vehicle. Valid amateur license required, and a copy of it must accompany application. Application may be made at any motor vehicle office. Callsign plates may be attached to any type of registered vehicle, except motorcycles and trailers.

Florida: Department of Highway Safety and Motor Vehicles, State Office Tag Agency, Bureau of Titles and Registrations, Division of Motor Vehicles, Neil Kirkman Building, Tallahassee, FL 32399-0500 (904-488-4127). The initial amateur radio plate application fee is \$5, plus a \$2.50 service fee and a \$1.45 mail fee. These fees

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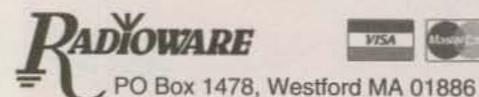
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are in addition to the original plate issue fee of \$10 and the regular registration tax. Applicant must own vehicle to which these plates are to be attached. Applicant must hold a valid FCC license. Corrections, renewals, and transfers can be processed through any county's tax office or tag agency. Callsign plates may only be attached to private automobiles, trucks weighing no more than 5000 pounds, and motor homes or truck campers which are not used for hire or for commercial use.

Georgia: Department of Revenue, Motor Vehicle Division, Trinity-Washington Building, Atlanta, GA 30334. Additional fee of \$25; same as vanity plates. Applicant must be Georgia resident and must own vehicle to which plates are to be attached. Applicant must possess a valid FCC license. The sheriff of each county maintains an alphabetical list of the names, addresses, and callsigns of amateurs with callsign plates in her/his county. This list is updated by 1 March each year. These special plates cannot be transferred. Callsign plates can only be used on private passenger vehicles. AMATEUR RADIO is imprinted on plates. May-to-July ordering period. Five-year plate term.

Hawaii: Department of Defense, Office of the Director of Civil Defense, 3949 Diamond Head Road, Honolulu, HI 96816-4495. Fee is \$10 initially with \$5 additional annual renewal fee. Applicant must be a Hawaii resident and must own the vehicle to which the plates are to be attached. Application must be filed through local county Civil Defense office. Applicant must possess a valid FCC license and must present it with the application. These plates may only be used on private passenger vehicles. Four to eight week plate manufacture time.

Idaho: Transportation Department, P.O. Box 7129, Boise, ID 83707-1129 (208-334-8000). Initial fee is \$5 in addition to regular fee. Applicant must be an Idaho resident and must own the vehicle to which the plates are to be attached. Applicant must possess a valid FCC license and must provide a copy of it with the application. If the amateur license becomes invalid, the special plates must be turned in to the Transportation Department. If the amateur's vehicle is sold or transferred, the special plates must be removed from it. These plates may be retained (without being used) pending the amateur acquiring another vehicle. RADIO AMATEUR is imprinted on these plates.

Illinois: Secretary of State, Non-Standard Plates Section, Centennial Building, Room 539, Springfield, IL 62756 (217-524-1560). One-time-only additional fee of \$3. Amateurs who upgrade and change their callsigns may obtain different plates at a replacement fee of \$11. The old callsign plates are turned in when the new ones have been received. Applicant must own the vehicle. Applicant must possess a valid FCC license, and must provide a copy of it with the application. These special plates may be attached to passenger cars, motorcycles, and second division vehicles weighing no more than 8000 pounds. AMATEUR RADIO is imprinted vertically beside one's callsign. If callsign plates are on the vehicle, the driver is legally allowed to wear a headset.

Indiana: Bureau of Motor Vehicles, 100 North Senate Avenue, Indianapolis, IN 46204 (317-232-2816). Two dollar additional initial fee, and \$2 additional annual renewal fee. Applicant must be an Indiana resident and must own the vehicle. Applicant must possess a valid FCC license, and must provide proof that she/he owns an amateur radio station. Proof that both of these conditions are met must accompany the application. Amateur plates may be used on passenger cars and personal trucks, but they may not be used on motorcycles.

This completes the first part of this three-part article. The next segment provides callsign plate data for lowa through North Dakota.

Amateur Radio Mail-Order Catalog and Resource Directory

John Hart, NOOCF, has updated his amateur radio mail-order catalog and resource directory. It includes more than 1650 listings grouped in 216 categories. A 42-page Ham-Soft shareware catalog is an interesting portion of this book. Seven of my (W6DDB) most interesting articles are reprinted on 18 of the 260 pages in John's book. The single issue price is \$17.95, which includes the cost of first-class priority-mail postage. The price per book being shipped by first-class surface postage to foreign destinations is \$20.95. The table of contents contains 223 listings and the index is 14 pages long, making it easy to locate desired information. An appealing feature of this manual is that it is mounted in a large plastic comb binder which enables one to leave it open to any page without having to hold it open. The July updating supplement is available at the additional cost of \$50. The address is Hart Publishing, 767 South Xenon Court, Lakewood, CO 80228.

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.

73, Bill, W6DDB



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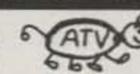
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NEWS OF CERTIFICATE AND AWARD COLLECTING

his month we are pleased to present the story of:

Pat Sligh, KA5VWD USA-CA All Counties #718 June 20, 1991

"This is KA5VWD, St. Clair, Alabama. QRZ.' The mass of voices that I heard in return almost made me panic. Slowly but surely I made 13 contacts with coaching from my OM, W5RJH. I reached for a fan and took a deep breath. I was hooked on County Hunting!

"Three years after I married Slick, W5RJH, he announced that he needed to get back into amateur radio before retiring. That was news to me! I didn't know that he was a ham. I knew what amateur radio was, but that was all. As I kept asking questions, he explained the different classes of radio licensing. I made the decision: I would be a Novice Amateur Radio Operator.

"You can teach an old dog new tricks. At 51 years of age, on a cold day in March 1984, I took my Novice test. The room was cold, I was nervous, and by the time I finished the test both my knees and teeth were chattering. But I did it! Then I was too 'chicken' to get my key on the air, so the only thing to do was to go for General.

"In April 1986, after a couple of tries, I finally made 13 WPM to pass the General class code. My first QSO was on 14.336 with our good friends Mel, W5AWT, and Geneva Boatman. Slick and I checked into the Century Club frequently, but the fast pace on the County Hunter's Net was very intimidating.

"In Asheville, North Carolina at the County Hunter's National Convention I met some great people. They all encouraged me to 'get on there and run counties.' As we were on our way home, Slick kept urging me to run a county. My standard reply was 'No, not now.' (But I was really too nervous.) We pulled our vehicle into a rest area in St. Clair County, Alabama, and they called, 'W5JRH, are you ready to run?' His decisive reply bolted me from laziness. 'We are in St. Clair, Alabama and my XYL, Pat, KA5VWD, is going to run.' He handed me the mic and headed back to the bathroom. What could I say? I was on my own and he hasn't had a chance since!

"Every age has its rewards, and I am especially enjoying the rewards of being at home. After raising four daughters alone



Pat Sligh, KA5VWD, USA-CA #718.



Here's county hunter Fred Lindsey, NØXA, Johnson County, Kansas. Fred also holds a 160 meter DXCC and 5B WAZ.

and working 18-plus years, I treasure the moments I share with Slick. Sewing, crafting, amateur radio, music, and teaching a Bible study class keep my days full. No sleeping late—I've too much to do!

"That decision to become an amateur radio operator has brought a lot of fun. The friendships we have formed are unique. Many of these friends we have never met, but they helped me attain my USA-CA goal.

"Thanks to the mobiles who have patiently sat on county lines waiting to run. Thanks to the net control operators who have unselfishly spent their time to control the list of mobiles. Thanks to all my new friends who have given of themselves. Thanks to amateur radio, the window to the world. And thanks to my sweetheart for making me believe I could do it.

-73, Pat, KA5VWD"

Awards Issued

Hans Rudolph Lauber, HB9RG, Hirzel, Switzerland, submitted his complete book through his QSL Manager Paul Bugen, WA3TUC, for USA-CA All Counties #791. He was also awarded: USA-CA 500 #2647, USA-CA 1000 #1257, USA-CA 1500 #1057, USA-CA 2000 #968, USA-CA 2500 #895, USA-CA 3000 #816. It was a pleasure awarding my first USA-CA All Counties award. Congratulations, Ruddy!

Also obtaining their USA-CA numbers were:

George M. Gaydos, KS3I, USA-CA #792, USA-CA 500 #2650, USA-CA 1000 #1259, USA-CA 1500 #1060, USA-CA 2000 #971, USA-CA 2500 #898, and USA-CA 3000 #817.

John McLernon, NV6I, USA-CA #793, USA-CA 500 #2651, USA-CA 1000 #1260,

USA-CA 1500 #1061, USA-CA 2000 #972, USA-CA 2500 #896, and USA-CA 3000 #818. Jack's XYL Jan, NV6L, USA-CA All Counties #704, was featured in our November 1992 story of the month. Not to be outdone, Jan received her endorsement for contacting mobiles on 20 meters in all 3076 counties. Now there is a real county-hunting marriage.

Stanley Ralph Elliott, WA4HXG, USA-CA #794, USA-CA 500 #2657, USA-CA 1000 #1265, USA-CA 1500 #1064, USA-CA 2000 #974, USA-CA 2500 #897, and USA-CA 3000 #819.

Carol J. Morkrid, NØLDT, completed this month's honor roll by submitting her certification for the last 76 counties to receive USA-CA #795 All 20 Meter SSB Mobile.

Robert C. Bruno, WA2ITJ, Auburn, New York, submitted his book for USA-CA 1500 #1059 and USA-CA 2000 #969.

Andy Rugg, VE2EM, Cornwall, Ontario. Canada, joined in with USA-CA 500 #2652, USA-CA 1000 #1261, USA-CA 1500 #1062, and USA-CA 2000 #973.

USA-CA Special Honor Roll

Hans Rudolph Lauber, HB9RG USA-CA All Counties #791, Mixed 12-22-92

George M. Gaydos, Jr., KS3I USA-CA All Counties #792, Mixed 1-1-93

Jack McLernon, NV6I USA-CA All Counties #793, Mixed 1-8-93

S. Ralph Elliott, WA4HXG USA-CA All Counties #794, Mixed 1-8-93

> Carol J. Morkrid, NØLDT USA-CA All Counties #795 All Mobile 20 Meter SSB 1-27-93

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3000		WK5A	1063
HB9RG	816	WA4HXG	1064
KS3I	817		
NV6I	818	1000	
WA4HXG	819	HB9RG	1257
		WA7ZGF	1258
2500		KS3I	1259
HB9RG	895	NV6I	1260
NV6I	896	VE2EM	1261
WA4HXG	897	F6IGF	1262
KS3I	898	KM6GF	1263
		WK5A	1264
2000		WA4HXG	1265
HB9RG	968		
WA2ITJ	969	500	
WA7ZGF	970	HB9RG	2647
KS3I	971	SM4CTI	2648
NV6I	972	WA7ZGF	2649
VE2EM	973	KS3I	2650
WA4HXG	974	NV6I	2651
		VE2EM	2652
1500		IK1GPG	2653
HB9RG	1057	RZ3DZ	2654
WAZITJ	1058	F6IGF	2655
WA7ZGF	1059	W1KBV	2656
KS3I	1060	WA4HXG	2657
NV6I	1061	IK2DUW	2658
VE2EM	1062	OE6CLD	2659

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 nonsubscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book, which may be obtained from CQ Communications, 76 North Broadway, Hicksville, NY 11801 USA for \$2.00. To qualify for the special subscriber rate please send a recent CQ mailing label with your application. To be eligible for the USA-CA, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 15, 1991. A complete copy of the rules may be obtained by sending an SASE to Norm Van Raay, WA3RTY, USA-CA Custodian, Star Rt. 40, Box 76, Pleasant Mount, PA 18453-0076 USA. DX stations must include extra postage for airmail reply.

Gordon Kennett, WK5A, upgraded with USA-CA 1000 #1264 and USA-CA 1500 #1063.

Robert W. Roehm, KM6GF, qualified for USA-CA 1000 #1263.

Jerry T. Foard, WA7GF, Tucson, Arizona, submitted his record book for USA-CA 2000 #970, obtaining USA-CA 500 #2649, USA-CA 1000 #1259, and USA-CA 1500 #1058 in the process.

Earle R. Drake, W1KBV, received USA-CA 500 #2656 to start his quest.

The following amateur radio operators from France, Italy, Russia, and Sweden submitted first-time applications:

Yves Viseur, F6IGF, USA-CA 500 #2655 and USA-CA 1000 #1262.

Balsamo Massimo, IK1GPG, USA-CA 500 #2653.

Antonello Passarella, IK2DUW, USA-CA 500 #2658.

Slav V. Nickon, RZ3DZ, USA-CA 500 #2654.

Sten Tegfors, SM4CTI, USA-CA 500 #2648.

Congratulations to all these amateurs for substantial achievements.

Silent Key WB6TJW USA-CA #573

The family of silent key Oscar Reimer,

WB6TJW, USA-CA #573, wrote to thank all those who helped "... enhance the quality of his life and helped him see the world through their eyes...." Oscar was injured in an industrial accident and was confined to a wheelchair for the past 21 years. Farewell, Oscar, 73 SK.

Awards Available

Worked All Winnipeg Award. The third annual Worked All Winnipeg Award QSO Party will be held Saturday, April 3, 1993, between 1500Z and 2300Z. Amateur stations can be found on the following frequencies: 20 meters 14.165 and 14.240 MHz, 15 meters 21.330 MHz, 10 meters



The Worked All Winnipeg award sponsored by the Winnipeg ARC.

28.300 MHz, all plus or minus QRM.

The Worked All Winnipeg Award is sponsored by the Winnipeg Amateur Radio Club Inc. and is awarded to an amateur radio operator in recognition of his/her outstanding achievement in having accomplished two-way radio communications with the required number of VE4 radio stations located within the City of Winnipeg, Manitoba, Canada. The certificate is two-color, printed on parchment paper, with drawings along the borders showing many of the attractions of the City of Winnipeg, along with provincial emblems. The rules are as follows.

Stations within Manitoba, including the City of Winnipeg, must work at least 25 difference Winnipeg stations. Stations outside Manitoba, but within the North American continent, must work at least 15 different Winnipeg stations. Stations outside the North American continent must work a minimum of 10 different Winnipeg stations to qualify. Any band or mode may be used, but all contacts between two individual stations must be direct contacts. (Repeater contacts are not allowed.) If a single mode and/or single band is used for all the qualifying contacts, it will be noted on the award.

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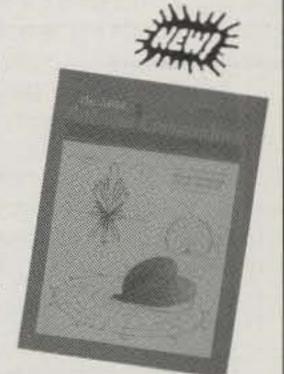
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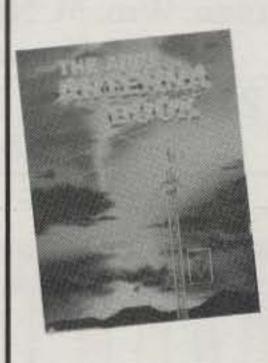
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natures of two other amateurs who have checked your log) is all that is necessary. This copy should be mailed, together with \$2.00 or 6 IRCs to cover the cost of the certificate and postage, to Worked All Winnipeg Award Custodian, c/o Dick Maquire, VE4HK, 598 St. Marys Road, Winnipeg, MB R2M 3L5.

Golden Antenna Award. Every year, on the occasion of the German-Dutch Amateur Festival (DNAT), the town of Bad Bentheim awards the "Golden Antenna" to radio amateurs for exceptional humanitarian deeds in the field of amateur radio broadcasting.

Amateur radio organizations all over the world, as well as every radio amateur and every individual who has been helped in any way by radio amateurs, are called to submit nominations for individuals or groups of radio amateurs. Send in detailed documents substantiating the individual's nomination by May 15, 1993 to Stadt Bad Bentheim, P.O. Box 1452, D 4444 Bad Ben-

theim. The jury is comprised of the mayor of Bad Bentheim (Patron of the Festival), the president of the International Amateur Radio Union Region One, and the presidents of VERON, VRZA, DARC, and VFDB.

Eligible for the award are individuals as well as groups of licensed radio amateurs who, in emergency situations, rendered their services to other people, sacrificing of themselves. The services may have been rendered in the humanitarian field or in connection with rescue operations on the occasion of military conflicts, disasters, and catastrophes. The only important criteria is that amateur radio played an important part in the rendering of the humanitarian deed.

The town of Bad Bentheim will invite the award winner to attend the festival, defraying the cost of travel as well as accommodations. Recent winners of the Golden Antenna Award and their contributions are as follows:

Karl-Heinz Steigmann, DL2BE, for sup-



The Golden Antenna Award from the town of Bad Bentheim, Germany.

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porting a jungle doctor with his work in the Bolivian/Brasilian border territory, as well as raising funds for a pediatric hospital.

Lothar Schwarz, DL3FC, for rescuing and transporting home a German mechanic who had been severely injured while in Mogadishu, Somalia, when treatment in Africa was impossible.

Prof. Julio Nadone, IOLL, for rendering services during an earthquake in Italy. Prof. Nadone operated his amateur radio station for 60 hours, initiating and coordinating rescue activities in the affected area.

Dr. Wilfried Ruppert, DJ5RT, for operating amateur radio station DL0MAR (Medical Assistance Radio) for Africa.

Summary

As this is my inaugural column as your new USA-CA Custodian and Awards Editor, I feel it is worthwhile to acknowledge my predecessors. The founder of the USA-CA Award was Cliff Evans, K6BX, followed by Ed Hopper, W2GT, now Silent Keys. Dorothy Johnson, WB9RCY, was CQ's USA-CA Custodian and Awards editor for ten years. These three amateurs were responsible for administering one of the most prestigious awards since the late 1950s.

At the present time only 791 amateur radio operators have made it to the USA-CA All Counties Award—a truly elite group of amateurs. My goal is to maintain the high level of integrity set by Cliff, Ed, and Dorothy.

As Dorothy leaves, we send our best wishes for a long and healthy retirement. Dorothy, 73 and 88. Enjoy!

73, Norm, WA3RTY

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CONTEST CALENDAR

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Contesting's Incentives—A Different View

As most of you know by now, I have recently relocated to New York to work full time at CQ. The Long Island, New York area is not known for its friendliness to amateurs in general and towers in particular. For this reason and in anticipation of the impending firestorm in my neighborhood, I have been taking a low-key approach, operating with wires and strategically placed verticals in the back woods. Of course, running only 100 watts is the obvious and prudent thing to do.

Adjusting to this new mode of operating has given me new insight into some of the issues I want to raise this month. I now have a better appreciation of the realities of operating a contest and working DX from a small (and I mean small!) station. For the moment, the days of breaking pileups at will are temporarily suspended. Operating finesse is the order of the day, and large pile-ups now have the appeal of an acre of unmowed grass on Saturday morning. Nevertheless, it is still fun for me, and I suspect there are scores of people who are as crazy as me about this hobby and who can adjust, as I have, to any situation.

In my case, however, the difference is self-initiation and an unabashed desire to enjoy my hobby—especially contest operating. The reality is that this is unique and not shared by every contester. For this reason a gap is being generated that was superbly addressed in a letter I received recently. This contester, who asked to remain anonymous, raised some interesting issues about the lack of incentives to draw the uninitiated into and keep them involved with contesting. Written somewhat tongue in cheek, he attempted to rationalize why contesting has lost its appeal to him, so much so that he is dropping out.

My feeling is that this scenario is not unique to this one individual. I would love to hear your thoughts on the subject, but for the next few moments, read on and think of someone you know (including yourself?) who could have written the following thoughts.

Requiem for a Contester

We are gathered here today to bid farewell to another contester who has decided to

c/o CQ magazine

Cal	end	lar	of	Eve	ents
	-				

Mar.	27-28	CQ WW WPX SSB Contest
Apr.	1	Poisson d'Avril Contest
100000000000000000000000000000000000000	3-4	SP DX Contest
Apr.	3-4	Italian YLRC Int'l Contest
	10-11	JA Int'l CW Contest (High Bands
Apr.	10-11	Holyland DX Contest
	14-15	The first term of the first te
Apr.	17-18	Connecticut QSO Party
Apr.	17-18	MARAC County Hunters SSB
Apr.	24-25	Swiss Helvetia Contest
Apr.	28-29	DX-YL to NA-YL YLRL SSB
May	1-2	Texas QSO Party
May	15-17	Michigan QSO Party
May	29-30	CQ WW WPX CW Contest
June	12-13	ANARTS WW RTTY Contest
June	12-14	ARRL June VHF QSO Party
June	19-20	All Asian CW DX Contest
June	26-27	ARRL Field Day
July	10-11	CQ WPX VHF Contest

hang up his earphones and read books instead of fighting the pile-ups for Zone 23 on 40 Meter CW.

He was not a Contester. He was more of a Participant, but a participant with a capital "P." If, indeed, he was a contester, it would be with an uncapitalized "C." Let us look at his career, and see where he went "bad."

He was almost the archetypal ham. First licensed in the early '60s as a teenager, he tried contesting with some friends to see what it was all about. All being new at the game, the interest died quickly because there were no experienced contesters to encourage him; even Field Day lost its allure after a couple of tries.

College, a career, unsympathetic landlords, and marriage conspired to keep this ham off the air for a couple of years, but the interest in ham radio, especially on CW, never completely died. Finally, Lady Luck pulled his name out of the hat, and a Kenwood TS520S and Hy-Gain 18AVT vertical soon adorned his house. A few QSOs with foreign stations piqued his interest in getting DXCC in addition to the WAS he had set as his second goal (his first was obtaining an upgrade to Extra Class). Having set up his station in early February, he realized the ARRL DX Contests were nigh and decided to enter with the sole purpose of working new countries. DXCC (and WAS/ WAC) was accomplished within a year (as was the upgrade to Extra), and ever so slowly, contesting became the end rather

than merely the means. Contesting was now an experiment to see what would happen if the primary goal became making QSOs and working new band countries rather than only totally new countries. Later it moved up a notch to compete against friends, whether or not the stations were equivalent. Finally, the goal was to get the best score possible. Contest programs and a PC were purchased and arrangements were made to create a full "lost weekend." Even if every plan didn't take place, fun was being had—or so it seemed.

There was a void, however. Although he became fairly good at search and pounce. runs were quite unsuccessful. He realized that 500 watts to a vertical wasn't a "contest king" station, but believed that if he could work most of the stations he pounced on by the third call, he ought to be loud enough to run stations. He sought advice from nearby big-name contesters, but most offered only sympathy and suggestions he couldn't implement; beams and towers were beyond his means. Most of the worthwhile suggestions, such as calling higher up the band, were tried, but success, or at least his definition of success, eluded him. Ever so slowly he began to lose interest. Letters to local big-gun stations went unanswered. Apparently, they were more interested in winning than in helping "disadvantaged" contesters-understandable, but short-sighted

A move from W2-to W0-land, with a consequent change in callsign, transpired. In non-contest situations, a CQ would engender a small pile-up-at least until the crowd found out he was in Colorado and not North Dakota! Nevertheless, some success was generated in contest running. especially if the final score became a low priority. His attempts at running stations reached its zenith with the 1992 Ten Meter contest. He waited until Sunday afternoon, and only called CQ after working a couple of QSOs to make sure he was getting out. While the bulk of the stations calling were Ws, there were a few VEs and even an XE. His 10-minute rate approached 200! But of course there was no way to get a good score this way, and it would never happen in a "real" DX contest.

So, can this participant be saved? Would more certificates or operating classes help? Would a coffee mug for "almost-a-clean-sweep" be an incentive? Would be-

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Mail to: CQ Communications, Inc. 76 North Broadway, Hicksville, NY 11801 Phone: 516-681-2922/ FAX: 516-681-2926 ing P40V provide comfort? Can Europeans and Africans be convinced to create a pileup and answer his CQs?

The answers to these questions are not yet known. Perhaps several weeks or months of serious contest deprivation will tell the final story.

Some Other Thoughts

Hopefully our anonymous friend represents the minority. In all cases, though, it raises one aspect of contest recruitment that the self-initiated need to keep in mind. Not everyone shares the frenetic commitment to contesting that the high-profile winners enjoy. There are the vast majority of contest participants who would just as soon play golf as they would work the contest. Yet the future of contesting depends on our ability to maintain interest and growth within the amateur radio community. Sure, our friend is conveying a measure of sour grapes, but the time is now to begin doing a better job of recognizing the average contester! What do you think?

G3FXB-A Personal Reflection

Much has been written about Al Slater, G3FXB, since his premature death late last year. At the risk of stating the obvious, Al was a legend in his own time. Rather than restating his accomplishments for the tenth time, I want to share a personal view of my friend.

I first met Al many years ago at a Dayton Hamvention. G3FXB was one of those fellows who always had a pile-up calling him, whether it be on the air or in person at a hamfest. However, as much as Al accomplished in the world of contesting (and it was an incredible run, as the early results of the CQ WW demonstrate), he always had time for his fellow contester. In conversation Al would much rather have talked about your personal triumphs and goals than his own.

I also had the joy of knowing Al through my association with the FOC (First Operators Club). Beginning many years ago, Al realized that the future of quality CW operators lay in the hands (and fingers!) of the young. He was instrumental in filling out the ranks of his beloved FOC with young and enthusiast operators who complemented the experience and wisdom of the older members.

And who could not resist the temptation to brag about Al's stamina and uncompromising operating ability. I have personally felt a slight decline in operating endurance over the past couple of years, and I'm only 37 years old. Al was well into his 60s and was still operating with the skill and savoirfaire of a 20 year old. All of my contest QSOs with G3FXB (and there were hundreds) began with a hearty "Hello, John ... you're 59xxx or Hlo Jn, 599xx." His per-

sonal charm and wit were conveyed even with the mundane passing of a contest exchange.

To those who never met AI, you missed encountering one of amateur radio's greats. To those of you who knew him, try to use what you learned from that relationship in your own contributions to our hobby. We all know AI would want it that way. 73 my friend!

1992 Poisson d'Avril Contest Final Results

By Doug Grant, K1DG

Numerous entries were received this year, with foreign participation far outpacing domestic entries. The results were quite surprising—a nine-way tie for first place and two disqualifications. The winners were as follows:

 ZS6EZ (Tied for World Record, and once again African Continental Champion). Log entry received on 8-inch floppy disk as required in 1992 rules.

 BV/K1AR (Operating from a hotel room in Taipei). John reported hearing several commercial stations and a long-delayed echo of the K1DG 15M SSB signal from the ARRL DX Test a month earlier.

 FG5ED (First Entry from the Caribbean Area). Sam claimed Aeronautical Mobile credit for reading the rules in Juliana Airport in St. Martin.

4. N8QBZ (Bill "Insanity" Lutz). His entry indicated numerous QSOs made at the local grocery store, primarily in the poultry section and the checkout line National Enquirer. A fine entry from this 14-year-old. Who says there aren't any youngsters in contesting?

5. W5TTE (Multi-Operator Champion). This log was engraved on the head of a pin by one of the operators, who learned this skill during an extended stay at a Federal Prison. The threat of bodily harm to the contest organizer by the operators (self-described in the entry as "homicidal maniacs") had absolutely nothing to do with their tie for first place, or with the increased security at P d'A headquarters.

6. WA1GUV/KZ5 (First Entry from a deleted country). He lost his claimed bonus points for cholesterol over 300 (most hams appear to have cholesterol over 300), but the early-bird bonus (he sent his log in before the actual contest) pulled him even with the leaders. He was also the high scorer from the Quality Paperback Book Club.

7. G4CLF (Repeat European Champion). His entry included birthday presents for all the committee members, so of course he wins.

8. VE3CK (First Canadian Entry ever). This log included a tape of a QSO between VE3CK operating CJSD-FM 94.3, proving his claimed QSO with the airplane carrying the Bon Jovi Rock Band. It was a unique

QSO, but Bon Jovi himself verified the QSO.

K1DG (Repeat World Champion).
 What can we say? This guy's good!
 Disqualifications:

1. NW1U (Multi-Operator). This log entry was, as usual, one of the most creative, including items such as the TV set used for ATV contacts, a Dayton phone book, a toilet seat, and a cement-block QSL card. Unfortunately, the committee found something fishy in the entry. Actually, it was a mackerel in an advanced state of decomposition. The committee also was not amused by the wrapper for the mackerel (the obituary pages of a local newspaper).

2. VE3HJS (Great White North Amateur Radio Club). While the bribe was tempting (Canadian Tire Company discount coupons totalling 40 cents), the club members (by their own admission) "are not worthy." We agree. However, they are still eligible for the CQ Wayne's World Contest (rules in September CQ).

1991/1992 CQ WW 160 Meter Contest Errata

1991 CW: Only AA4S is a certificate winner in North Carolina. All other North Carolina calls listed in bold type are in error.

1991 Phone: VE3DC, listed as Single Operator, should be the Multi-Operator winner for Ontario. AA4M should be listed as AA4MM.

1992 CW: N2BA, listed as the Multi-Operator winner for Connecticut, was actually in New York. The N2BA score places second to New York winner, K5NA.

1992 Phone: NQ4I's score is incorrect in the Top Ten Box Scores. The correct score—105,896—is shown in the Georgia listing.

The 160 Meter Contest Director has a limited supply of certificates from 1989 to 1992. Missing or replacement requests will be handled on a first come basis. The Director needs the complete address for UO5OAD, RB5SJ, and YU3QI for awards. Please contact David Thompson, K4JRB, at 4166 Mill Stone Court, Norcross, GA 30092 USA.

Final Comments

It's been a while since I've dragged out my calculator and uncovered some more contest trivia and statistics to include in your next letter to President Clinton. Don't lose sleep, because I've been busy at work. If all goes well (and it rarely does in the editorial world!), I'll share some new and interesting data with you next month.

As always, please remember that the deadline for the August issue is June 1st. Most of you have realized that the best place to send your contest announcements is directly to CQ. In addition, please

April's Contest Tip

I'm sure you recall the technique entered during a contest when you are "looking for multipliers?" As you tune up and down the bands, don't forget to call ANY needed station-even if he's not a new multiplier. Maybe I'm the only guy who does this (although I doubt it), but it is easy to get into multiplier mode and skip calling the easily workable stations. The extra effort could mean an additional 20 to 30 QSOs in your log!

feel free to send them on diskette (ASCII or WordPerfect 5.1 formats are fine). Obviously, this saves a great deal of time rekeying your information. Finally, CQ is now a registered user on Internet. You can send any information to me via my address as follows: p00259@psilink.com. Until next month . . .

73, John, K1AR

41st Annual Poisson d'Avril Contest

0001-1954Z Thurs., April 1

Sponsored by the Legion International des Radio Poissons d'Avril et Les Ondes Ouverte comme Fenetres, the purpose of this contest is to promote the use of amateur radio contesting for a few good laughs.

Eligibility: All amateurs, SWLs, freebanders, freeloaders, and CQ employees.

Classes: A wide range of categories is available, including single operator unassisted, single operator assisted, single operator partially assisted, single operator mostly unassisted no kidding I didn't look at the packet spots, single operator irrational, multi-operator single transmitter, multi-operator single receiver, multi-operator multi-everything, and just in it for the certificate.

Exchange: RS(T), serial (or other arbitrary) number, QTH (be as specific or general as you choose), and birthday (your own). Sample exchanges: 59 007 Basement September 31; 599 123456 South Africa Wednesday, etc. You get the idea.

Scoring: Stations may be heard or worked once per QSO per band per mode per callsign per chance to dream. Count one QSO point per station heard or worked or almost heard or worked. Bonus points may be claimed as desired.

Multipliers: Every station heard or worked or almost heard or worked counts as a multiplier, but only once per QSO per band per mode per callsign per hour. The District of Columbia does not count as a separate multiplier; however, it does count as Arkansas if the station contacted is a member of the Clinton Cabinet; otherwise, subtract one multiplier for each DC station worked.

Frequencies: As usual, most activity is

expected on 20 CW and 75 SSB. Suggested frequencies-CW 1825, 3579.545, 7025, 10025, 14025, 18025, 21025, 24025, 28025, 29025, and the entire 10 meter phone band; SSB 1825, 3753, 3799, 3830, 7095, 7255, 7335, 14220, 14256, 14313, 21200.5, 94.3 FM, and the entire 10 meter phone band; SSTV, RTTY, FAX, WEFAX, JUSTHEFAXMAAM, PACKET, AMTOR, and all those other TORs, usual frequencies plus the entire 10 meter phone band. INTERNET and virtual-reality QSOs are allowed. Severe interference to all nets and phone patches is expected; after all, this is a contest.

Club Competition: Clubs may submit an aggregate score (coarse or fine). Members must comply with the meeting attendance requirements established for that club. Meeting is not required for members living within a 2500 km radius of the Earth's center.

Awards: You may already have won . . . oops, that's another contest. Certificates, mostly, actually printed on genuine paper. Winners in various categories will see their callsigns in actual print a year or so after the contest. Members of the Pd'A Committee are ineligible for awards unless they actually win, which they usually do.

Logs must be postmarked or otherwise submitted by April 15, 1993. Logs may be submitted on paper, papyrus, disk, E-Mail, or word of mouth. Send E-Mail entries via

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April 1993 CQ Say You Saw It In CQ 123 Internet to "pdacontest.spam@who.what .when.where.how.why.edu." Disks must be accompanied by a computer capable of reading the disk. You don't expect us to do everything, do you? Notice: Any entry containing an odor-bearing animal or vegetable matter will be returned unopened by third-class or slower mail. Mailing address is P d'A Contest Committee, 144 Kendall Pond Road, Windham, NH 03087. Include an SASE or payment for a CQ subscription for results.

Polish "SP" DX Contest

1500Z Apr. 3 to 1500Z Apr. 4

Sponsored by the Polski Zwiagek Krotkofalowcow (PZK), this one is held the first weekend of April, and generates a good level of activity by the SPs.

Classes: Single operator, single and all band. Multi-operator, single transmitter (all band only), and SWL; CW only.

Exchange: Signal report plus a threedigit serial number. SP stations will include a two-letter province abbreviation.

Multiplier: Polish provinces (total of 49). Scoring: 3 points per QSO times the number of Polish provinces worked (maximum 49).

Bands: 160-10 meters (no WARC bands).

Awards: Certificates to winning stations in each class in each country.

Mailing deadline for logs is 30 days after the end of contest. Mail to Polski Zwiazek Krotkofalowcow, Contest Committee, P.O. Box 98, 59-220, Legnica 2, Poland.

1993 Holyland DX Contest

1800Z Sat. to 1800Z Sun., Apr. 10-11

This is a fairly new contest sponsored by Israel Amateur Radio Club and is designed to promote contacts between stations around the world and Israeli amateurs all SSB and CW.

Classes: Single operator all bands, multi-operator single transmitter, and SWL.

Exchange: Worldwide stations send RS(T) and serial number. Israel stations add their "area" to the exchange.

Frequencies: Use IARU Region I recommended frequencies (e.g., 14.00-14.06 MHz) on 160-10 meters (no WARC bands).

Scoring: Credit 2 points for each QSO on 160-40 meters and 1 point for all other QSOs. Stations may be worked once per mode and band. Multipliers are each distinct Israeli "area" per band worked. Final score is total QSO points times multiplier.

Awards: A trophy will be awarded to the overall winner in each category. In addition, plaques will be provided to each continental winner. Certificates will be sent to the top scorers in each country (minimum of 50 QSO points).

Entries must be postmarked no later than May 31, 1993 and sent to: Contest Manager, Israel Amateur Radio Club, Box 17600, Tel Aviv 61176, Israel.

Japan International DX Contest

2300Z Fri. to 2300Z Sun., Apr. 10-11

This is the high band CW edition of the Japan International DX Contest sponsored by Five Nine Magazine. It is open to participants worldwide on 14, 21, and 28 MHz.

Classes: Single operator, all bands and single band, and Multi-Single. Only 30 hours may be used as a single operator entry. Off periods must be a minimum of 60 minutes. Multi-operator stations may operate the full 48 hour period.

Exchange: Signal report and serial number for DX stations; JAs send their prefecture in place of the serial number (number 01 to 50).

Scoring: DX stations contact Japan only. QSOs on 10 meters count 2 points. All other QSOs are 1 point.

Multipliers: Japanese Prefectures and Ogasawara, Minami-Torishima, and Okino-Torishima Islands (JD1) worked per band.

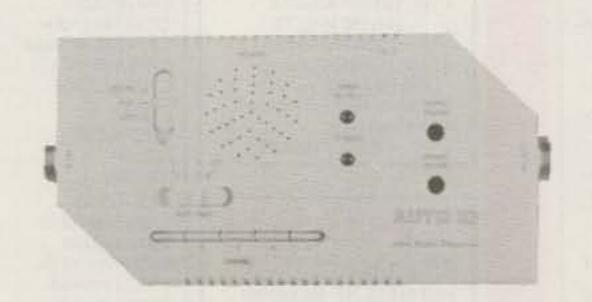
Final Score: Multiply total QSO points times multiplier.

Awards: The top scorer in each category on each continent will receive a winner's plaque. Additional plaques may be awarded based on merit. In addition, cer-

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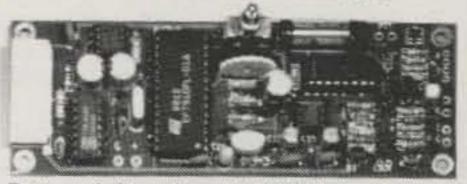
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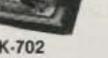
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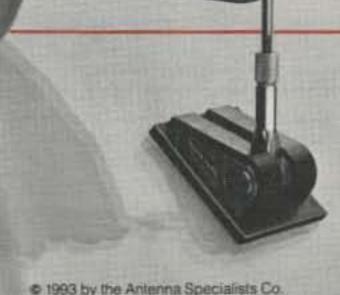
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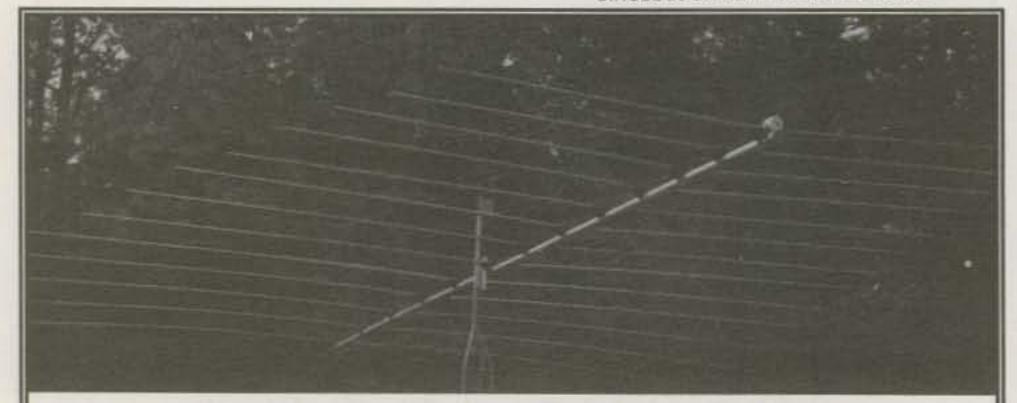
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tificates will be awarded to the top three entries (participation pending) in each country and USA call area. Entrants who work all Japanese prefectures during the contest period can request a special contest award with their entry.

Send your entries to: Five Nine Magazine, Box 59, Kamata, Tokyo 144, Japan. The mailing deadline for entries is May 10,

1993.

YLRL DX to North America YL Contest

CW: Apr. 14-15 SSB: Apr. 28-29 1400Z Wednesday to 1700Z Thursday

This is another popular YLRL sponsored contest open only to licensed women operators around the world.

Classes: Single operator. Only 24 consecutive hours of operation may be used.

Exchange: QSO number, RS(T), and ARRL section/country. Entries in log must also show time, band, date, and transmitter power.

Frequencies: CW 3540-3570, 7040-7070, 14040-14070, 21120-21150, 28180-28210 kHz. SSB 3940-3970, 7240-7290, 14250-14280, 21380-21410, 28280-28510.

Scoring: Phone and CW will be different contests for scoring. DX YLs, including Alaska and Hawaii, may contact the North American continent. A station may be counted as one point and worked once per band for credit. Multiply the number of QSOs by your total multiplier (sections/countries) for final score. You may apply a bonus multiplier of 1.5 if less than 150 watts is used at all times during the contest.

Awards: Various cups and plaques will be awarded to the category winners. In addition, certificates will be provided to all second- and third-place winners.

Logs are due 30 days after the conclusion of each contest. Mail all logs to: Carla Watson, WO6X, 473 Palo Verde Drive, Sunnyvale, CA 94086.

MARAC County Hunters SSB Contest

0001Z Sat. Apr. 17 to 2400Z Sun., Apr. 18

The Mobile Amateur Radio Awards Club is sponsoring the 21st running of this event. Mobile and fixed operation from every county in the United States is welcome. Mobiles and portables may be worked each time they change counties or bands.

Exchange: RS(T), U.S. county and state (province/country for others).

Scoring: 1 point for fixed stations; 15 points for mobiles; US/VE contacts with DX countries are worth 5 points. Final score is computed by the total QSO points times U.S. counties worked.

Frequencies: 3880, 7240, 14270, 21340, 28340. Fixed stations should operate above the suggested frequencies and allow mobiles to operate below.

Awards: Certificates will be awarded to winning fixed stations in each state/province/country (with 1000 or more points); mobiles in each state operating in 3 or more counties with a minimum of 10 QSOs per county. MARAC plaques to the highest scoring first- and second-place mobile stations in the U.S., North American fixed station, and DX station who scores at least 50,000 points.

Completed logs, summary sheets, and check sheets must be received by May 22, 1993 and go to: WA5DTK, Barry Brewer, 1504 McCann Road, Longview, TX 75601-3853.

Connecticut QSO Party

2000-0400Z Sat., Apr. 17 to Sun., Apr. 18 1200-2000Z Sun., Apr. 18

This is the annual running of the Connecticut classic sponsored by the Candlewood Amateur Radio Association. Each station can be worked once per band and mode, and may be worked again in different counties.

Exchange: RS(T) and QTH (CT county, state/province, DXCC country).

Scoring: Count 1 point for SSB QSOs; 2 points for CW, RTTY, AMTOR, Packet, and 2-way ATV; and 5 points for working the CARA club station, W1QI and W1AW.

Multipliers: CT counties for stations outside of Connecticut. Inside Connecticut, use CT counties, states/provinces, and a single DX multipler credit (regardless of the number of DXCC countries you work).

Frequencies: SSB—1860, 3915, 7280, 14280, 21380, 28380, 50150, 146580; CW—band edge plus 40 kHz; Novices use their band edge plus 25 kHz.

Awards: Certificates will be awarded to the high scorers in each state/CT county. In addition, certificates are available to the highest CT club and participating member. A special certificate will be awarded to any station working all Connecticut counties.

Logs must be postmarked no later than May 31, 1993. Please send your results to: Candlewood Amateur Radio Association, P.O. Box 3441, Danbury, CT 06813-3441.

Swiss Helvetia Contest

1300Z Apr. 24 to 1300Z Apr. 25

This is a good chance to build up your Canton total for the Swiss Helvetia Award which requires confirmation of all 26 Cantons.

Frequencies: 1.8–28 MHz (no WARC bands). Phone and CW.

Exchange: RS(T) plus a 3-digit serial number. Swiss stations will also include a two letter abbreviation for their Canton.

Scoring: Only contacts with Swiss stations count. Each contact with an HB station is worth 3 points. You may only work a station once per band regardless of the mode.

Multiplier: The sum of the Cantons worked on each band (26 per band).

Final Score: Total QSO points multiplied by the sum of Cantons worked.

Awards: Certificates to the top scorers in each country and each USA and VE call area.

Logging: Indicate a Canton in a separate column for each band the first time it is worked. Check your log for duplicates and include a summary sheet showing the scoring and your name and mailing address in block letters. Also include the usual signed declaration.

Mailing deadline for contest logs is June 1, 1993. All logs to: USKA Traffic Manager, Michel Berger, HB9BOI, Case Postale 4, CH-1543, Grandcour, Switzerland.

Texas QSO Party

1600Z Sat. to 2400Z Sun., May 1-2

This is the annual Texas QSO Party sponsored by the Texas DX Society. Participation is open to all licensed radio amateurs worldwide on 80–10 meters.

Classes: Class I—Single Operator/ Fixed Station; Class II—Single Operator/ Mobile Station (Texas only); Class III—Multi-Operator Single Transmitter, Fixed Station; Class IV—Multi-Operator, Mobile (Texas only). Stations operate a maximum of 24 hours with minimum off periods of 30 minutes.

Exchange: Texas stations send serial number, name, and county (254 total). Others replace county with state (non-USA stations just send name only). All TDXS members include their membership number in the exchange.

Frequencies: Phone—3850, 7230, 14250, 21350, 28350 and 28450 kHz. CW—50 kHz up from the bottom edge of the bands and 10 kHz up from the bottom of Novice portions.

Scoring: Non-Texas stations credit 1 point per phone QSO and 2 points for CW. Also, credit 5 points for Texas SSB mobile and 7 points for Texas CW mobile QSOs. Texas stations credit 1 point for phone and 2 points for CW contacts (fixed or mobile). Texans may work other Texas stations for QSO and multiplier credit.

Stations can be worked on each band and mode.

Multiplier: Texans use Texas counties, states, Canadian call areas, and DXCC countries. Non-Texas stations use Texas counties only. Final score is total QSOs points times the total number of multipliers.

Awards: Non-Texas stations will compete for awards separately from Texas stations. First place in each class will receive a Texas Armadillo plaque. The first three places in each class will receive an award with a unique Texas flavor. All top ten scores in each class will receive certificates. Special awards will be made to stations working all 254 Texas counties. Send your postmarked entries no later than June 1, 1993 to: TDXS, P.O. Box 540291, Houston, TX 77254-0291.

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WASHINGTON READOUT

REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

Restructuring The Amateur Service

This is our third (and last) episode on the possible need to simplify amateur radio licensing. Several months have passed since we first wrote about the matter, and a carton-full of responses poured in from readers. They came from everywhere—by "snail" mail, electronic mail, FAX, telephone, packet, and even from wireline digital services such as CompuServe, Internet, and Prodigy. For those of you who did not see the original article, let's recap.

In our November column we floated an idea which would simplify and restructure the amateur bands. Essentially, we suggested combining the Novice and Technician classes into a "Basic" Class, renaming the General Class "Intermediate," and combining the Advanced and Extra Classes into an "Expert" Class. This would reduce the current six classes (Novice, Technician, Tech Plus, General, Advanced, and Amateur Extra) to three.

Each of the three classes would require passing a 50-question, multiple-choice, written examination on rules, operating procedures, and electronic theory. The Basic Class would be "no code," with 5 and 13 words-per-minute telegraphy knowledge being required for the Intermediate and Expert Classes. No presently licensed amateur would lose any current privileges; they would be "grandfathered" indefinitely.

The Basic Class would have all privileges above 30 MHz, the General (Intermediate) Class would maintain current privileges, with the Expert obtaining all available amateur privileges. Current Novices and Tech Plus (with 5 wpm code credit) would upgrade by passing the Intermediate written exam. The Advanced Class would only have to pass the Expert written test to upgrade. Even though current Advanced Class amateurs would become Intermediate, they would retain all current Advanced privileges until they passed the Expert written exam.

We had several readers say that they thought the classes should be called "A", "B," and "C" instead of Expert, Intermediate, and Basic. And there is merit to that idea! For one thing, it would eliminate the

"class distinction," and each level would more or less stand on its own. Predictably, the biggest reaction came at the suggestion of only having two telegraphy speeds, 5 and 13, instead of three (5, 13, and 20 wpm). People who had already passed 20 wpm thought that everyone else should have to also!

Favoring Restructuring

We read every response received and then categorized each into one of four classifications—those for simplification (with and without arguments) and those opposed (again with and without arguments).

We found the greater majority of the more than a thousand responses in favor of some sort of Amateur Service license class restructuring.

We then attempted to establish all of the arguments for and against a change in the current six amateur license levels. The following is a representative of the responses favoring reducing the number of license classes from six to three.

"We need to address the license structure to the needs of the persons interested in the hobby. If we get some individuals interested in radio at an early age they may go on and study electronics and become experts... Let's leave it to the academicians to provide the environment for developing the electronic experts." W8FLX (age 71, licensed 54 years)

"What we have today is a hodge-podge of several decades of changes. Five words-per-minute is adequate for the majority of operation on our HF frequencies.
... I wonder how much of the higher speed CW we hear is actually computer assisted " NAUOW

"The FCC and ARRL really goofed when they moved from the simple license procedures of the '30s with the 10 wpm CW requirements. Instead of making an 'Elite' Club, we should have encouraged the young people to join in the amateur activity. Now in the '90s we are finally moving (we are not there yet) in the right direction. We need new blood and lots of it to use and expand our frequencies. This will allow the individual amateur to grow in the direction which satisfies his interests and expand our hobby in new directions." WB6NFO

"The purpose and use of CW has waned.

Technology has progressed. Let the service show it. If all those 'Old Coots' bemoan the demise of the hallowed tradition of CW as a rite of passage and prophesize the waxing of 'CB mentality,' why are the most talked about 'Bad Boys' on HF and not on VHF?'' KA3ECQ

"Incentive licensing has been a dismal failure. It has . . . (1) Created class warfare based on CW ability, (2) Overburdened the FCC and added to their work load, (3) Propagated a false sense of technical expertise, and (4) Created an unbelievable nightmare of sub-band within sub-bands. People need to understand the current state and value of CW. If 'CW can get through when no other mode can!'then why is it never used during national disasters? Higher speed error-correcting modes have taken over. Our code requirements are used to keep people out! Out of ham radio and off of someone's special frequencies." KD9HT (age 46, licensed 27 years)

"The main concept should be making upgrading relevant to the technology of today rather than nostalgia for what existed 50 years ago. Five wpm code skill is adequate for operation on today's HF bands which are dominated by voice and digital modes. Individuals who choose to operate more CW than the average will naturally acquire higher code speeds by consistent use of the mode. . . . computerized CW makes the issue a moot point anyway." WB4WNV

"Sooner or later we must all face the fact that high-speed code proficiency is of little importance in today's world. It seems more logical that time spent studying for an upgrade should be devoted mainly to theory and technical understanding rather than overcoming some unnecessary 'hump' in Morse code speed." KI4LZ

"Only amateurs whose minds are fossilized are against any kind of change. I believe that CW should be replaced by proficiency examinations where aspiring amateurs would have to demonstrate, in a practical way, the proper and safe use of today's electronic tools." N2GKI

"I am a well-educated American citizen who works for the government in the tele-communications field. Why should I be held to the assumption that I will only be a good operator if I learn the Morse code? How many Advanced or Extra Class Ii-

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (817-461-6443) censed individuals out there can honestly say they can repair the latest Yaesu FT890? How many are computer literate?" KD4KHX

"Change is inevitable in the amateur radio community. The new no-code Techs are going to want more privileges, and if their ranks keep increasing at present rates, they will soon have the clout (i.e., numbers) to get what they want. The recent growth in numbers in our hobby is good. But we need to prepare for the changes it will bring . . . " KJ6GR

"Our present system is cumbersome to administer, is difficult to explain to someone asking about getting into the hobby, and offers unnecessary barriers to getting into the upper level classes. These should not be without some demands, but at present the demands really do not fit the uses that are made of the frequencies." KB9YY

"Finally a voice of reason! . . . other good reasons for simplifying our licensing structure include the following (1) bringing U.S. licensing in line with Canada, Europe, and the rest of the world; (2) recognition that the imposed requirements for proficiency in Morse code are obsolete; (3) recognition of the changing spectrum of individuals who are attracted to amateur radio; and (4) recognition that the present incentive licensing frequency allocations are unenforceable, which renders the concept of incentive licensing totally meaningless. The amateur radio examination questions should be modified to deemphasize technical issues and place heavier weight on proper operating procedures and regulatory issues. Let's face it: very few of our members homebrew anything anymore and formulas for calculating wavelength can easily be looked up in any technical book. On the other hand, it is essential that all HF operators know what frequency allocations are legal for the U.S., what constitutes legal third-party traffic, and other related issues, including obscenity. Hams on repeaters should understand what transmissions are illegal because of their business content. I believe demonstrating competence in these matters is far more important to the quality of amateur radio operations than demonstrating technical proficiency by drawing a Colpitts oscillator circuit schematic or something equally meaningless. My feeling is that testing should comply with international regulations. A 5 wpm code test is sufficient. For those of us who would argue that simplifying our licensing structure would dilute the 'purity' of amateur radio or alternatively, feel that ' . . . if I suffered through this, why shouldn't the next guy?', let me suggest you listen to the HF bands and the bad operating practices, deliberate interference, and obscene language used by our 'mainstream' brethren. Remember, these are not fresh No-Code Technicians." K2ONP (a CW operator licensed 37 years)

"Please pursue this idea with all vigor,

overcome all the complainers who forever whine 'we had to do it, you should, too!' and simplify this administrative nightmare which long ago left me in a daze in the sense that I don't even bother anymore trying to remember which class operates where and how. This is a blatantly silly and ridiculous situation, no matter what 'they' say." WA6PGA

"Novice, Tech, and General class hams overwhelmingly agree with streamlining. Advanced, and especially the Extra, Class hams reject it with extreme prejudice. The Advanced Class should be the top class. Anything beyond that is exactly what it is titled, 'Extra' and unnecessary."

"Why must we require knowledge and

skill only in what some would characterize as the slowest and most error-prone method of communication? I doubt that some of the 'old timers' would want to sit for a proficiency test on packet commands.

kept the jerks out of law, medicine, or radio. And no one has ever shown that knowledge of Morse code is any measure of good taste and character. In our interest as amateurs, we must encourage the maximum usage of our frequencies (and) continue to reform a license structure that appears to have no real foundation in present technology." N3LHY

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9

ment. Amateur radio today is a collection of many varied specialties and I think they are all very vital and important. . . . admittedly CW is fast becoming an archaic phase of our hobby, and I think as time goes by it should be de-emphasized in advancement requirements. Maybe computer expertise, or some other phase of the hobby that is more relevant to all phases of the hobby, should be the governing criteria in determining eligibility for higher grade licenses." WA4FTM

"CW is like driving a stick-shift car in a world of automatic transmissions. Who needs a code key when my computer can send and receive perfect code? The rules and testing requirements are geared toward practices that were valid 50 years ago." N2LDU

"I think your proposal is a quite sound approach to simplifying the licensing structure and its adoption would make it easier for applicants to advance through the classes of licenses and it would ease the workload of VEs, VECs, and the FCC. Morse code is being superseded by efficient digital means of communications. Why continue to cram code speeds beyond the international requirement down the amateurs' throats when it is an optional mode of operation? . . . " W4IGW

"CW is obsolete. The maritime industry will abandon the code within five years in favor of the IMARSAT system. There will be no more heroic operators pounding out

that SOS while the ship goes down. Someone will push a button and the nearest coastal station will instantly have all the particulars via satellite, including the exact position. We need a change. We must streamline and update amateur licensing." KB7QQO

"After 29 years as an active ham, I still cannot pass the 13 wpm code test. I have more knowledge than most other operators and have always operated courteously. That's more than I can say for some of the appliance operators I've heard on 20 meters. I have forgotten more about amateur radio than some of the new Advanced and Extra Class license holders I know!" N4MMI

Those Opposed To Restructuring

The following points were made by those individuals who opposed any form of Amateur Service license class simplification.

"The present-day General Class licensee may lose his sanity because of the influx of 'Intermediate' operators in the General portion of the bands . . . "AB5DY

"I do support the continuance of honoring hams who have reached milestones, but those milestones need to be ever-increasing in difficulty." N8MCF

"It is very important to keep the standards of entry into ham radio high. We already have the CB band and we don't need any more." W2HLI

"The Morse code requirement is there because CW is the most reliable form of communications that we currently use. In emergency situations, CW is clearer than voice communications especially when stressful situations are encountered. Any reduction of license class requirements would lead to the Amateur Service becoming like the CB 11-meter system." N2QHF

"I like the tough requirements to get to the top and I want the system to remain the same. If the requirements for me to become a doctor are too hard, should the medical association lower them?" N2OHT (Extra)

"I was licensed a good while before incentive licensing went into effect, but I'll freely admit that policy prodded me into learning more electronic theory and code so as to qualify me for the higher classes of license and their concomitant privileges. I am a better ham because of it." W4YZT

"Why try to fix something that isn't broken? The code did not come easy for me, but I learned the language. The lazy nocode amateurs cry the code is too hard. Why don't they put forth the same effort they put into complaining into learning? The majority of the people who will respond to you will be the ones who want something for nothing . . . " WT3W

"I have not owned a microphone in over 20 years, nor am linterested in computer-





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oriented communications as a hobby—it's just too much like my work. I operate CW exclusively. From a technical or operating perspective there is no defensible argument for requiring CW ability to permit hams to use HF phone or computer-oriented communications. But from a human perspective, however, I do believe a (restructuring) move such as this will bring us closer to a CB mentality. I'm often embarrassed to hear some hams on the SSB bands now. It will only get worse." K3WA

"My Dad is an Advanced and is about to upgrade to Extra. You will take away his satisfaction of upgrading. The harder you work for something, the more you appreciate it, is what my Dad has always told me." (Unsigned)

"To combine my operating privileges and other 'perks' with any lower class license would be an insult. We as Extra Class licensees have worked hard and deserve the proper level of respect that goes

with the license." AC4GM

"The problem with the people of today is that they want things the easy way. They want things given to them. People don't respect things that they have been given! The more sweat they put into something the more worthwhile it is!" KB9KC ("Ex-

tra and proud of it!")

"My age is 34 and I am celebrating my 20th year of Amateur Radio. The licensing structure does not require simplification. Any easing of requirements will cheapen the high standards that we all should be aspiring to. Nothing will ever lessen my pride in teaching myself the necessary electronics using only an ARRL license manual and handbook. Somewhere along the way, America has combined quality with quantity." ND1H

"The 20 wpm code requirement has little to do with communications. . . . it has to do with commitment. The study guides publish all the questions and answers. There can be no surprises on the tests. Code is different. It requires a definite commitment on the part of the amateur . . . to ass the 20 wpm code test there is no easy way. You are going to have to work for it." N6ZAE

"I believe that this country has become lost in a spiral of greed, lust, and lack of respect for anything which requires a true effort to attain. My main concern is the well being of ham radio. Today when I have visitors to my home . . . I cringe when I turn on the rig to demonstrate it in fear of hearing the indecencies that have become all too commonplace." KF4R

"As it stands now, we are only one step away from giving away licenses much the same way as the FCC did with the CB licenses. Streamlining, yes. Requiring less knowledge, no way! The idea of streamlining is not unlike a mine field. If we make it across, fine, but one wrong step and we lose everything!" WA4NUZ

"Do you really believe that those who are unwilling to put forth the effort to earn the privilege to operate are going to help Amateur Radio progress, and along the way set new standards of operating excellence? As for the written exams, I can't think of any other exams I have even taken in my life where I had a copy of all the possible questions and answers before I took the test. Just how much easier does it need to be?" AA5ZT

"The CW requirement is not the issue here, nor is the cumbersome licensing structure a problem. More at the heart of the issue is a small nucleus of hams who would want all of the benefits of incentive licensing with none of the effort associated with them. Amateur Radio has more immediate problems that need to be addressed: conduct on the bands, abusive and obnoxious language, net jamming and out-ofband operation to name a few." NT11

"Why is it so difficult to see that this continuing effort to reduce the amateur licensing standards is going to result in a decline in the quality of the amateur service? Amateur radio is a hobby, . . . but a specialized hobby. It was not intended to be a personal communications service. We have cellular phones and CB for that." N2PD

"To me, code is a tradition as well as an absolute necessity . . . like a fraternal secret handshake that has bound its members together over the years. Most institutions fail when traditions fall by the wayside. Code is also the simplest form of communications in times of emergency when all else fails." WB6ORJ

"I had to earn my privileges. I don't want them watered down or given away." WA8RZR

"The written tests are already too easy; all you need is a Q&A study guide and a good memory. The code tests are not an unreasonable requirement and may well be the only thing that is keeping the HF bands from turning into a giant CB arena." WB4GEC

"The truth of the matter is that because of the diversity of amateur radio interests, there is no standard of performance that will perfectly fit all.... But competence in Morse code comes closer than any other, since it is the foundation of all of the emerging digital forms of communication. What a graduated series of licenses does do is separate those with drive, ambition, and persistence in achievement-with a desire to reach the top and to meet the requirements—from the common herd. To the 'cry babies' who want no-code licensing with no sub-band restrictions, I say: 'Take up finger painting. No license, easy to learn, great potential for admiration, a means of communication perfectly fitted to your ambition and/or your IQ ... and an unlimited spectrum on every wall and fence in the country!" KJ9N

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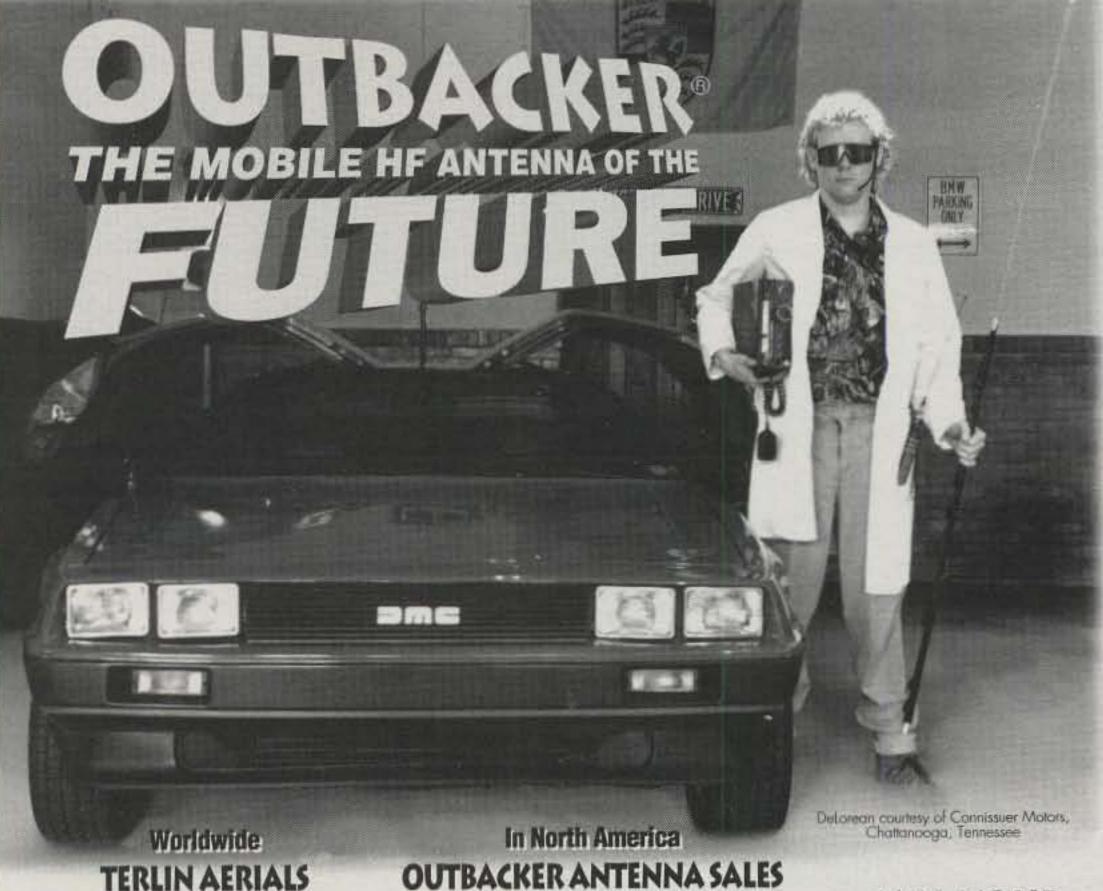
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teur equipment and load ham magazines with advertisements. It has grown into a big business. Lowering standards is not the way to go. We should have learned this from our school systems by now." K4PTU

So There You Have It

Restructuring the Amateur Service from six classes to three, pro and con! It has been an interesting straw poll—one with unbelievably strong feelings on both sides. To summarize, those readers in favor of simplifying and restructuring the Amateur Service contend:

- The current Amateur Service licensing requirements do not reflect current technology, needed knowledge, or planned operation.
- Incentive licensing has created an unnecessary aristocracy.
- Incentive licensing has created a very complex tangle of licensing requirements, license classes, frequency sub-bands, and privileges.
- Morse code is becoming archaic and manual telegraphy knowledge should not be the primary method used in determining amateur privileges.
- High-speed Morse code should not be required for phone operation.

136

- Morse code proficiency is not related to operator knowledge, quality, and desirability and serves as an unnecessary barrier to higher license class operation.
- Two telegraphy speeds, rather than three, would more closely align our licensing requirements with those of the rest of the world.
- Morse code is never used during emergencies, only as a hobby art form.
- The workload associated with administering six amateur classes is excessive, especially when two or three classes will suffice.
- 10. Simplification will facilitate entry into amateur radio of more newcomers, especially youngsters, some of whom may go on to technical careers.
- It will increase the number of amateur radio operators and could protect our spectrum from reallocation.

On the other hand, those opposed to any form of restructuring maintain that

- Any simplification of the Amateur Service will be accompanied by an increase in amateur band congestion.
- It is not appropriate to reduce Amateur Service licensing standards.
- Most people want something for nothing.

- Everyone should be compelled to complete the same difficult examination that was required of me.
- A graduated licensing system motivates amateurs to improve their knowledge.
- Simplification could lead to an influx of undesirable operators.
- A reduction to three classes is comparable to diluting or giving away the privileges I had to earn.
- Morse code proficiency is a ham radio tradition which should not be diminished.
- A difficult licensing scheme is important to recruit quality operators.
- Amateur band restructuring will contribute to another chaotic CB situation.
- 11. The 20 wpm code speed should remain as a milestone for amateurs to conquer.
- 12. Those in favor of lowering standards do so for business reasons so they can sell more amateur-related products.

Petition Filed With FCC

A Petition for Rule Making seeking restructuring with a different twist was filed with the FCC last year by Ohio amateur William C. Wells, WA8HSU. He wants the Commission to reduce the amateur license classes to just Novice, Technician, and General. While we don't plan to file a petition with the FCC on the matter, it certainly appears that the licensing structure can and should be simplified.

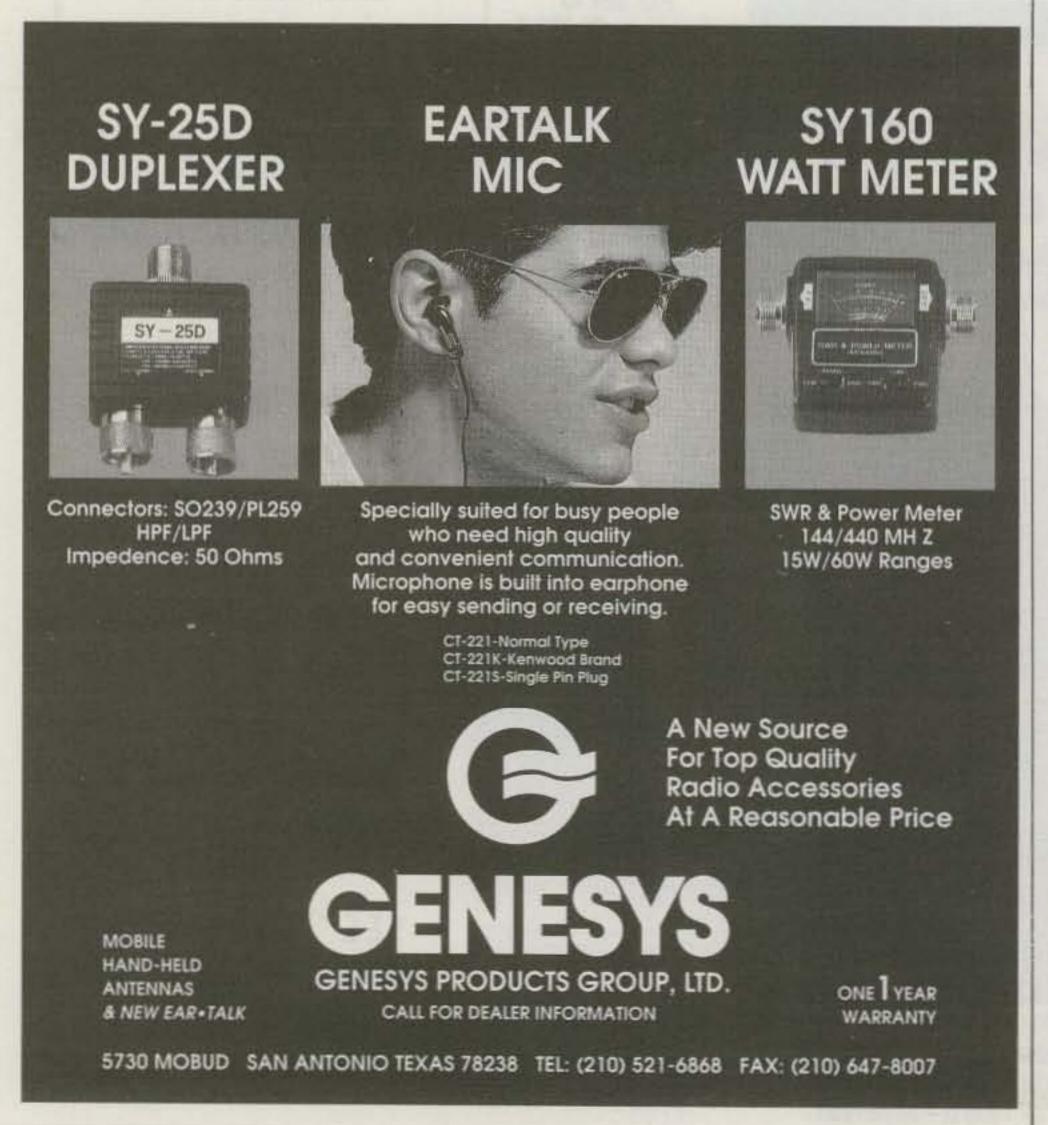
Technician license classes will be moving closer together shortly. Acting on a couple of other petitions, the FCC has recently proposed to allow Novices expanded frequency VHF privileges at 222 MHz and to be repeater control operators. There doesn't seem to be enough distinction to warrant the continued expenditure of FCC and VEC resources to maintain two license classes and what amounts to a third class, the Technician Plus.

By the simple expedient of transferring the 5 wpm telegraphy requirement to the "Intermediate" Class, the Novice and Technician Class licenses could easily be merged.

Instead of regarding the respective license classes as a progression of privileges to which every licensee should aspire, the view should be that each class offers a particular array of privileges, which are useful in their own right.

In other words, as a practical matter, individual licensees choose and qualify for the license that matches their interests and the licensing structure should reflect that fact. The arrangements of licenses in a hierarchy is outmoded and needlessly consumes resources to perpetuate it. The time has come for a re-thinking of the nature of license classes.

73, Fred, W5YI







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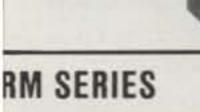
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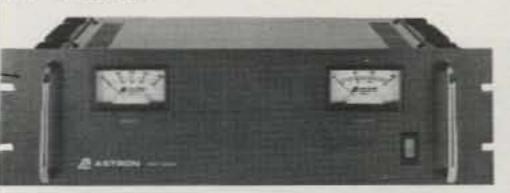


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	MODEL			Continuous Duty (Amps)	(Amps)	Size (IN) H × W × D	Shipping Wt. (lbs.)
•	POWER SUP	PLIES W	тн в	JILT IN CIGA	ARETTE LIGH	HTER RECEPTACLE	
	SL-11R-RA			7	11	4 ³ / ₄ × 7 × 9 ³ / ₄	13
	SL-11S			7	11	25/8 × 75/8 × 93/4	12
	SL-11R			7	11	25/8 × 7 × 93/4	12
	SL-11A			7	11	25/8 × 75/8 × 93/4	12

Continuous

ICS*

(Amps)



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MODEL HIM-22IM	MA	DEL	DM	25M
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19" RACK MOUNT POW MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H × W × D	Shipping Wt. (lbs.)
RM-12A	Q Q	12	51/4 × 19 × 81/4	16
RM-35A	25	35	51/4 × 19 × 121/2	
RM-50A	37	50	5½ × 19 × 12½	38 50 60
RM-60A	50	55	$7 \times 19 \times 12 \%$	60
 Separate Volt and Amp Mete 	ers			
RM-12M	9	12	$5\% \times 19 \times 8\%$	16
RM-35M	25	35	5¼ × 19 × 12½	38
RM-50M	37	50	$5\% \times 19 \times 12\%$	38 50
RM-60M	50	55	7 × 19 × 12½	60



MODEL RS-7A

				57.			
- Contractor		Colors		Continuous	ICS.	Size (IN)	Shipping
	MODEL	Gray	Black	Duty (Amps)	(Amps)	$H \times W \times D$	Wt. (lbs.)
	RS-3A			2.5	3	$3 \times 4\% \times 5\%$	4
	RS-4A			3	4	$3\% \times 6\% \times 9$	5
	RS-5A			4	5	$3\frac{1}{2} \times 6\frac{1}{8} \times 7\frac{1}{4}$	7
	RS-7A			5	7	$3\% \times 6\% \times 9$	9
	RS-7B			5	7	$4 \times 7 \frac{1}{2} \times 10 \frac{3}{4}$	10
	RS-10A			7.5	10	$4 \times 7 \% \times 10 \%$	11
	RS-12A			9	12	$4\frac{1}{2} \times 8 \times 9$	13
	RS-12B			9	12	$4 \times 7\frac{1}{2} \times 10^{3}$	13
	RS-20A			16	20	$5 \times 9 \times 10\frac{1}{2}$	18
	RS-35A			25	35	5 × 11 × 11	27
	RS-50A			37	50 70	$6 \times 13^{3/4} \times 11$	46 48
	RS-70A	•		57		6 × 13 ³ / ₄ × 12 ¹ / ₈	
				Cantinuaua	100+	Pive (IM)	Chinnles



MODEL	RS-35M

HS-7UA •	5/	/0	b × 13% × 12%	48
MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H × W × D	Shipping Wt. (lbs.)
Switchable volt and Amp meter RS-12M	9	12	4½ × 8 × 9	13
 Separate volt and Amp meters RS-20M 	16	20	5 × 9 × 10½	18
RS-35M RS-50M	25 37	35	5 × 11 × 11 6 × 13% × 11	27
RS-70M	57	50 70	6 × 13¾ × 12½	46 48

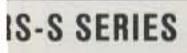




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	Continuous		ICS.	Size (IN)	Shipping	
MODEL		July (Amps	Electronic and the second	(Amps)	$H \times W \times D$	Wt. (lbs.)
	@13.8VD	C @10VD	C @5VDC	@13.8V		
VS-12M	9	5	2	12	$4\frac{1}{2} \times 8 \times 9$	13
VS-20M	16	9	4	20	5 × 9 × 10½	20
VS-35M	25	15	7	35	5 × 11 × 11	29
VS-50M	37	22	10	50	6 × 13¾ × 11	46
· Variable rack moun	t power supplie	s				
VRM-35M	25	15	7	35	51/4 × 19 × 121/2	38
VRM-50M	37	22	10	50	5¼ × 19 × 12½	50





Built in spea	aker Co	lors	Continuous	ICS.	Size (IN)	Shipping
MODEL	Gray	Black	Duty (Amps)	Amps	$H \times W \times D$	Wt. (lbs.)
RS-7S			5	7	$4 \times 7 \% \times 10 \%$	10
RS-10S			7.5	10	$4 \times 7 \frac{1}{2} \times 10^{3/4}$	12
RS-12S			9	12	$4\frac{1}{2} \times 8 \times 9$	13
RS-20S			16	20	5 × 9 × 10½	18
SL-11S			7	11	23/4 x 75/6 x 93/4	12



NEWS OF COMMUNICATION AROUND THE WORLD

QSLing Practices

he ARRL DX Advisory Committee (DXAC) is studying QSLing practices, with the aim of recommending changes to the DXCC rules to address QSLing abuses by certain individuals and DXpeditions. The DXAC has decided to make this an "external" agenda item. That is, rather than limit discussion on this subject to within the DXAC, they invite comments and suggestions from DXers around the world. Every DXer has run into QSLing abuses at some time, and (almost) all DXers would like to see improvement in this all-important aspect of DXing. Let's look at some of the QSLing practices that may constitute "abuse" and at some of the suggestions offered to eliminate same.

There are two types of QSLing abuses. The first is "intentional." That is, the DX station or QSL manager is up-front and open with a given QSL policy, but that policy is considered abusive by most DXers. A good example of this is Antoine, F6FNU's demand for a "tip" in addition to return postage for a QSL card. Antoine makes no bones about his demand, and those DXers who send the "little extra" required are very pleased with F6FNU's QSLing habits. However, the French amateur radio society, the REF, found this demand so far out of line of standard practices that they have refused to accept cards from stations managed by F6FNU for any REF awards.

Another controversial QSLer is Baldur, DJ6SI. Baldur won't answer cards supplied with sufficient German postage for return, won't accept cards for more than one operation in a single envelope, and won't QSL more than six months after his DXpedition. Again, those DXers who send DJ6SI one card at a time, with a minimum of US\$2, within six months of their contact, are pleased to get their card back promptly.

A third DXer whose QSLing practices are at odds with the majority of DXers is Jim Smith, VK9NS. Like Baldur, Jim doesn't like to get cards for more than one of his operations at one time. He also doesn't QSL most contacts via the bureau. (He makes an exception for those of his DXpeditions funded with help from the Northern California DX Foundation, NCDXF, which requires response to bureau cards.) Jim has also incurred the



W7LR keeps up to date with the latest DX news with "The DX Bulletin."



WA8YTM keeps a copy of CQ magazine handy in his award-studded shack.

wrath of DXers by refusing to respond to direct requests for QSLs by a station he claims worked him more than once on a given band, despite not announcing this "no insurance contacts" policy ahead of time, as some DXpeditioners do. (In at least one case, Jim had the callsign of the station incorrect, and failed to acknowledge the correction when sent. The DXer, not hearing Jim repeat his correct call, had no choice but to work him again.) Again, DXers who follow VK9NS's rules are pleased with his QSLing practices.

Are these "QSLing abuses"? The delegates to the International Amateur Radio Union's Region (IARU) 2 Conference last year felt so. That conference, of amateur radio societies in North and South America, adopted the Radio Society of Great Britain's (RSGB) proposals for QSLing ethics. These proposals state that a DX station or QSL manager must respond to cards received via the bureau system, must respond directly to cards received with sufficient postage for return (including by airmail, if enough postage for airmail return is enclosed), must devise their own methods of handling multiple QSL requests, and must not impose any time limit on QSLing. Obviously, the above-mentioned practices by these well-known DX operators and managers directly violate these standards.

F6FNU, DJ6SI, VK9NS, and others claim that they cannot handle the volume of cards without imposing their restrictions. Fortunately, the DX community has plenty of examples of how QSLing can (and should?) be handled. These positive examples sharpen the contrast with abusive QSLing practices, by showing what can be done, and without unreasonable effort or expense.



Mike, TJ1MW's clock is clearly set to UTC. (KF7E photo)



This is Rock Mikalauskas, LY2BQJ. Rock also signs /RR5B from Ternopol and /UT6U from Kiev for prefix hunters.

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350 YU1AB, EA5YJ, VE2FSU, IK8LWA. 400 YU1AB, EA5YJ, VE2FSU, IK8LWA, 450 YU1AB, EA5YJ, VE2FSU, IKBLWA, 500 YU1AB, EA5YJ, DL8AAV, KA1TY, VE2FSU, IK8LWA, 550 YU1AB, EA5VJ, KA1TY, VE2FSU, IK8LWA, 600 YU1AB, EA5YJ, KA1TY, VE2FSU, IK8LWA, 650 IKØAPR, KA1TY, VE2FSO, IK8LWA, 700 IK@APR, IK8LWA 750 IK@APR, IK8LWA, 800 IK@APR, IK8LWA, 850 IK@APR, IK8LWA, 1150 K3ZPG, 1200 K3ZPG, N2AIF, IT9JKY, 1250 N2AIF, 1300 N2AIF, 1350 N2AIF. 1450 WA1JMP, KF7RU. 1500 WA1JMP. 2100 WF4V 2150 WF4V 2400 I2JSB 2450 11EEW, 12JSB, 2500 12JSB, 2850 W2FXA

350 YU1AB, KA1RJI, VE2ABO, K2LUQ, DL1GPG. 400 YU1AB, KA1RJI, DL1GPG. 450 YU1AB, EA2CKP, 500 YU1AB, 550 YU1AB, 600 YU1AB, 650 N3KR. 1050 NEBQ. 1350 N2AIF, ITEEW 1400 N2AIF. 1450 N2AIF. 1500 N2AIF, I7PXV 3200 N6JV

YU1AB, KA1NCN, HP2CWB, IK8LWA 15 Meters: 20 Meters: YU1AB, IK8LWA 40 Meters: YU1AB, N1IR, VE1YX 80 Meters: YU1AB, N1IR, TF5BW, KF7RU

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Africa:

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Award of Excellence Plaque Holders: IBYRK, W4CRW, SMØAJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, IZUIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE@DXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, W4BQY, IØJX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, HIBLC, KASW, KØJN, W4VQ, KF2O, K3UA, HA8XX, HABUB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TOH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YL/W4, NN4Q, KA3A, YBØTK, VE7WJ, VE7IG, K9QRF, YU2NA, N2AC, W4UW, NX0I, W9NUF, N4NX, SMODJZ, DK5AD, WB4RUA, DK5AD, WD9IIC, W3ARK, 16DQE, LA7JO, VK4SS, K6JG, I1EEW, I8RFD, I3CRW, VE3FXR, N4MM, KC7EM, ZS6BCR, CT1YH, IV3PVD, KA5RNH, ZP5JCY, F1HWB, KC8PG, NE4F, VE3MS, K9LJN.

Award of Excellence Plaque Holders with 160 Meter Endorsement: FM5WD, SM@DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, HIBLC, KA5W, UR2QD, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SMØAJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KBOG, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YB@TK, W8ILC, W1BWS, VE7WJ, K9QFR, NN4Q, W4UW, K9QFR, NXØI, G4BUE, LU3YL/W4, I4EAT, WB4RUA, VE7WJ, N4NX, DEØDXM, VE7IG, K9BG, I1EEW, AB9O, CT1YH, IV3PVD, KA5RNH, ZP5JCV.

Complete rules and application forms may be obtained by sending a business-size self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to: "CQ WPX Awards," 880, CR13, Clovis, NM 88101-9511 USA.

The best example has to be the NCDXF's excellent job with QSLing the first ZA1A Albania operation. With tremendous organization, and the help of dozens of volunteers, QSLs from the ZA1A operation began going into the mail within 10 days of the first contact, while the operation was still on the air from Albania. Admittedly, this was a special case, as the relay teams of instructor/operators could ferry logs out of Albania while ZA1A remained on the air, something that can't be done with most DXpeditions. Organizing teams of volunteers to open and sort the incoming mail, type the thousands of contacts into a computer data base, and manually search for many hundreds of "not-inlog" contacts is not something that every DXpedition feels capable of attempting. However, it clearly demonstrates what can be done with planning and forethought.

Many active QSL managers have no problem handling cards for dozens of different callsigns. WA6AHF, for example, sorts in-coming cards by the DX callsign. If he gets requests for more than one DX station with a single return envelope, he

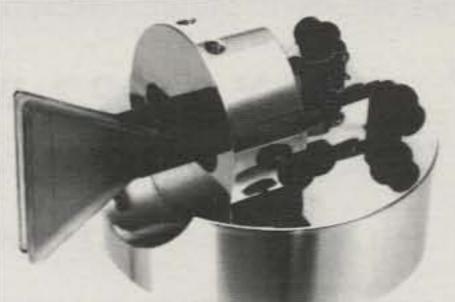
simply puts that envelope with the already answered cards in the back of the stack of the next callsign to be processed. It may take a few weeks (or even months, if logs are slow in arriving), but the DXer will eventually get all his or her cards, with but one return envelope.

Even Ron Wright, ZL1AMO, who is no fan of bureau cards, will respond (in a fashion) to cards received via the bureau. He does so by stamping an obnoxious note to the effect that "bureau cards don't pay for future DXpeditions" on your card, and returning it via the bureau. He doesn't state that this is a confirmation of your contact, but the DXCC desk does accept these as "confirmation" of ZL1AMO's QSOs. It may not be pretty, but it counts. (Most DX stations that use this method use a stamp that clearly states that the QSO is hereby verified. Maybe some DXer will spring for a new stamp for Ron that carries both this wording, and echoes his request for funding for his future DX operations.)

Finally, many amateur radio clubs would be pleased to take over QSLing for longpast DXpeditions and DX operations so



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Neatness counts at YV2EJU's operating position.

that DXers can get cards (or replace lost ones) even years after the event. There is no excuse for refusing to answer QSL requests merely because a few months or years have passed since the operation.

In addition to the above "intentional" QSLing abuses, there are numerous examples of what might be called "accidental" abuse. The prime example of this is when a DXpedition uses a QSLing address in a country where mail theft is a serious problem. The two most notorious examples of this problem are the first operations by Romeo Stepanenko, 3W3RR, and the YX0AI Aves Island operation. In some cases, as much as 80% of the mail destined for the QSL addresses of these stations failed to reach its destination. What little mail did get through was usually stripped of any contents of value, including US\$1, IRCs. and return postage stamps. As a result, many thousands of DXers had to try again (and again, and again) via alternate routes, hoping that the problem was lost mail and not the dreaded "not-in-log."

Again, there are reasonable procedures to prevent this type of QSLing abuse. The simplest is to use a mail drop in a country with secure mail service. For example, the YX0Al group could set up a post office box in Florida, where the mail would be occasionally forwarded by safe means to South America. Romeo learned quickly from his early mistakes, and used this approach for his 9D0RR Iranian operation. DXpeditioners know (or should make it their business to know) the state of mail security in their home country. If there is any doubt that the in-coming QSLs might not arrive safely, they should seek an alternate mail route. The DX foundations would be happy to help, as funds stolen from QSL requests is lost forever to the DX world.

Another "accidental" QSLing abuse is a simple failure to communicate, certainly a cardinal sin in the DX world of communications and communicators. Most DXers send their QSL requests soon after their DX contact. Then they wait. And wait. And wait. In many cases, it takes several months to produce the QSL cards for a given DXpedition, especially the fancy folded color cards with acknowledgement for all those who make the trip possible. Often



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CIRCLE 65 ON READER SERVICE CARD





CIRCLE 53 ON READER SERVICE CARD



CIRCLE 127 ON READER SERVICE CARD

5 Band WAZ

As of December 31, 1992, 350 stations have attained the 200 zone level.

New recipients of 5 Band WAZ Award with all 200 zones confirmed:

> RT5UO Y22JD PAØCLN

The top contenders for 5 Band WAZ are:

N4WW, 199 SP9PT, 199 K6YRA, 199 PY7ZZ, 199 DL9WW, 199 K0CS, 199 K80G, 199 K7UR, 199 K7UR, 199 K9EL, 199 NA0Y, 199 VE7DX, 199 W0PGI, 199 W2YY, 199 W9WAQ, 199	IK8CNT, 199 W1JR, 199 W8SEY, 199 N7RT, 199 VE7AHA, 199 W1FZ, 199 IK2GNW, 199 IK2GNW, 199 ISIGS, 198 SM6AHS, 198 K1ST, 198 4X4DK, 198 UA3AGW, 198 KL7Y, 198 VO1FB, 198
K6EID, 199	S59VM, 198 W6TC, 198

The following have qualified for the basic 5 Band WAZ Award:

W6TC, 196 Zones I2DMK, 179 Zones IN3QCI, 151 Zones Y22JD, 200 Zones PAØCLN, 200 Zones

809 Stations have attained the 150 zone level as of December 31, 1992.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 41/2 x 91/2 to the WAZ Manager, Jim Dionne, K1 MEM. 31 De Marco Rd., Sudbury, MA 01776. Applicants should include sufficient postage for safe return of their OSL 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 CO mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).

the QSL printing is donated, and the DXpeditioner has little control over timing. Sometimes the expense of shipping the printed cards by air is too high to justify, and they travel by ship from one continent to another, before meeting up with the persons actually processing the cards. Most DXers are willing to be patient, if (and that's a big if) they know that they will eventually get their cards. The failure to communicate occurs when the person(s) responsible for QSLing doesn't tell the DX community the status of the QSLing process. A simple postcard or call to one of the DX newsletters as to the expected date of QSLing can virtually eliminate anxiety among DXers, reduce duplicate QSL requests, and actually speed QSLing. This is not too much to ask of an individual or organization that has undertaken the task of answering thousands of QSL cards.

The RSGB's proposals are an excellent description of what most DXers feel are reasonable QSLing practices. Given the

	The WAZ Single Ba	and WAZ	1
448	YC3OSE	449	HB9RB
1	15 Met	er SSB	
435	JR1WCT	436	JG2CMJ
CRI	20 Met	er SSB	
907 908	WT3W WB2RAJ		N4KW KG6VI
-	15 Met	ter CW	
239	WF9K	240	KA1CLV
157	40 Met		JE1GWO
615	I4MFA	hone	
20	WB8HIW	OW	
-17/4	RT	TY	
78—Mixed	ZL3G0		
	100000000000000000000000000000000000000	d WAZ	
4019 4020 4021 4022 4023	KK4TR WA3KKO PY3JZ YV5MRR WBØYQT	4025 4026 4027	IK7CNX KE2UV IK5IIU KD1CT KA4RAW
7303 7304	CW/F FE1JUD (CW) AA5ZX		SP6RYB K6ASB (CW)

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NZ9Z

7305

endorsement of the IARU Region 2 conference, these ideas may well form the basis for the DXAC's rules for QSLing. Certainly no DXer (with the exception of the above mentioned, and their like-thinking brethren) can find fault in the RSGB proposals. A more difficult question is what to do about those DX stations and QSL managers who refuse to adhere to the guidelines.

The current DXCC rules provide for two sanctions against "continued poor operating ethics," where "operating" specifically includes the confirmation process. First, the individual guilty of the continued poor ethics can be disqualified from the DXCC program, by action of the ARRL Awards Committee at ARRL Headquarters. Second, and more important for DXers, credit for contacts with individuals who have displayed continued poor oper-

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.

	, additions.			MIXED			
4409 3991	9N2AA K2VV	2801 KØBLT 2797 ZP5JCY	2339 UA3FT 2301 KF2O	1911 WB2YQH 1905 DK5AD	1648 KBØG 1640 W3KH	1342 KA5TQF 1335 AI6Z	1118 G4SDJ 1094 KØIFL
200000000000000000000000000000000000000	EA2IA	2762 KA5W	2281 N4UU	1868 N2AIF	1638 VE1RJ	1325 KC7V	1061 HB9DDZ
3275	K6JG	2752 I1EEW	2274 SM6DHU	1856 YU1GR	1632 W8CNL	1323 YU1PJ	1032 I1ZQD
3231	VE3XN	2722 PAØSNG 2709 IN3ANE	2205 SMØAJU	1855 W8UMR	1628 WB8ZRL	1298 KI3L	1025 NH6T
3175	K6XP N6JV	2709 IN3ANE 2707 IT9TQH	2203 HAØIT 2202 HAØHW	1835 WE2L 1819 W6OUL	1626 SM6CST 1624 WB2ABD	1282 LU8DY 1266 I2EAY	963 HP2CWB 920 WB2PCF
THE PERSON NAMED IN COLUMN TWO	N4NO	2704 W1BWS	2163 K2POF	1812 K2OLG	1589 K5DB	1241 TF1MM	915 W4USW
2996	N9AF	2674 YU7SF	2147 K5UR	1797 VE3MS	1555	1229 KS0Z	904 WKØB
I PARTICIPATE OF THE PARTICIPATE	W4BQY	2628 9A2NA	2141 YU4EXA	1793 YT7WW	1548 LA7JO	1178 K7LAY	813 WT3W
2965	PY1APS CM2EVP	2609 YT7DX 2549 N2AC	2133 3A2LF	1789 YU7RU 1785 DF6EX	1532 CT1YH	1165 K9BQL	788 VE6BMX
2927	SM3EVR I2UIY	2549 N2AC 2546 YU7BCD	2123 K9QFR 2097 S53EO	1785 DF6EX 1768 HA5NK	1504 CT1QF 1499 IK2ILH	1164 W9IAL 1164 CT3CU	778 VE3OMM 770 N3KR
2904	12PJA	2530 HAØDU	2075 I2EOW	1740 WA1JMP	1485 YB0TK	1149 NJ1T	755 CT1EEB
D11997150AACE711	YU1AB	2498 SM7TV	2052 KL7AF	1709 G40BK	1483 PY2DBU	1146 N7JXS	750 JN3SAC
2876 .	N4MM	2470 K9BG	2051 W4UW	1701 NV9S	1417 IØAOF	1132 N6IBP	720 EA3CWK
1 - 1 - 3 ALTO	WA8YTM	2449 IT9QDS	1956 K8LJG	1668 W9IL	1405 DF4ZL	1125 W0IZV	670 WK3Z
2810	W2FXA	2435 K9AGB	1945 N6JM	1662 WB4RUA	1375 WB3DNA	1122 K7KBN	640 JR3TOE 635 JA4DUD
SSB							
3780	IØZV	2405 F2VX	1883 HR1KAS	1536 K2POF	1267 G4MVA	1062 NG9L	885 EA3BOX
3354	K2VV	2403 I8YZP	1871 PY40Y	1509 YU7SF	1258 I8WYD	1054 K8MDU	869 DK7NP
3339	ZL3NS	2395 PAØSNG	1858 I2EOW	1456 KF7RU	1252 K2EEK	1050 KB2DE	831 NH6T
DOCTOR SPORTS IN	VETYX	2370 KA5W	1850 K5RPC	1443 KAØZFX	1239 DK5WQ	1048 IK2AEQ	831 IT9JPK
2980	K6JG WD8MGQ	2337 I4CSP 2303 EA8AKN	1840 K5UR 1811 KD9OT	1392 IT9JKY 1392 KE6KT	1227 KB0C 1226 IK0EIM	1044 WB6SRK 1038 WB6GFJ	814 KE7UH 806 I6KYL
10 W 20 U I	12PJA	2282 W4BQY	1794 CT1AHU	1392 KE6KI 1367 LA7JO	1226 IKØEIM 1206 W5ILR	1038 WB6GFJ 1036 K9BQL	791 KA9MOM
LAINSON CONT.	K6XP	2250 WA8YTM	1758 4X6DK	1367 N2AC	1200 ZS6AOO	1035 . IT9SVJ	764 WT3W
2676	ZP5JCY	2159	1747 SMØAJU	1360 K8LJG	1199 K3IXD	1034 HA5NK	755 CT1EEB
2612	IT9TQH CT4NH	2105 WA4QMQ	1703 WE2L	1350 LU8DY	1162 HP6AYV	1019 KC7V	751 EA3EQT
2608 2563	CT4NH N4MM	2065 WF4V 2046 9A2NA	1700 EA2AOM 1689 CT1BY	1335 EA1AK 1327 CT1DIZ	1152 W5AWT 1151 G40BK	1016 5Z4BP 1003 DF4ZL	750 NM5Y 736 EA1IF
100000000000000000000000000000000000000	I2UIY	2004 EA3AQC	1686 SM6DHU	1317 N2AIF	1141 W6OUL	976	728 YU1PJ
2494	EA2IA	1994 YU7BCD	1654 IK5ACO	1315 CT1UE	1135 OE2EGL	962 VE3MS	728 CT1ZW
200000000000	I6ZJC	1971 K9QFR	1645 IK8GCS	1310 LU7HJM	1117 FE6FNA	958 IK2DUW	693 CE5FSB
2466 2460	IØAMU OZ5EV	1969 KF2O	1600 KL7AF 1586 HAØIT	1305 WN5MBS	1116 CT1BWW	951 KB0G	664 SM6CST
TO 100 TO	NJØC	1920 I8KCI 1887 W3ARK	1586 HAØIT 1581 IN3QCI	1288 WB8ZRL 1286 IK7DBB	1112 WA2FKF 1092 KA5TQF	951 KB4HU 917 KK5P	643 JR3TOE 612 JA4DUD
CATTER CONTRACTOR	N4NO	1892 LU8ESU	1580 CX6BZ	1285 EA3FHT	1091 TF1MM	913 HP2CWB	610 KI6PG
	WØYDB	1886 W4UW	1562 N4UU	1278 IK2DUU	1090 13ZSX	899 AI6Z	603 HB9DDZ
2407	ITEEW	1885 CT4UW	1545 N6FX	1274 OE6CLD			
CW							
3399	K2VV	2147 WA8YTM	1681 SM6DHU	1506 N2AIF	1306 LA9XG	1019 IK2ECP	787 PY4WS
3244	WA2HZR	2128 LZ1XL	1678 TI4SU	1504 17PXV	1305 W5AWT	1013 WB8ZRL	760 EA2CIN
3084	N6JV	2054 KA5W	1668 HAØIT	1490 OZ5UR	1304 VE3MS	1010 YU1PJ	758 4X6DK
	VE7CNE N4NO	2042 YU7BCD 1940 I2UIY	1627 I2DMK 1623 G4SSH	1461 ZS6EZ 1442 K8LJG	1280 IK3GER	1004 AH6JF	754 KA5TQF 749 W8LRY
	IT9TQH	1938 N4MM	1618 K2POF	1442 K8LJG 1408 HA5NK	1244 DL2HBX 1163 NJ1T	954 W9IAL 949 ISØFIC	710 HB9DDZ
	W3ARK	1928 N4UU	1608 N6FX	1405 CT1YH	1151 ZP5JCY	923 DF4ZL	700 EA1MV
2473	EA2IA	1866 G4UOL	1599 KL7AF	1398 VS6UW	1141 LU2YA	908 KC7V	700 VE30MM
	K6JG	1790 EA7AZA	1567 VE1RJ	1362	1138 I2EAY	900 3A2LFL	699 JN3SAC
	YU7LS YU7SF	1759 KA7T	1556 SMØAJU	1357 W6OUL	1133 JA9CWJ	883 K9QFR	659 TF1MM 630 AA6WJ
	K6XP	1745 9A2NA 1721 IT9VDQ	1555 W9PWM 1536 KF2O	1341 I1EEW 1330 KB@G	1063 KS4S 1059 Al6Z	864 W4UW 862 EA6AAK	617 DK7NP
	W4BQY	1715 W8IQ	1523 G3VQO	1327 DJ1YH	1036 KA1CLV	794 LA7JO	606 I5OQV
	N2AC	1700 K5UR	1511 W1WAI			Allegan Samuel Commission Commiss	THERE !

ating ethics may be disallowed, again by the Awards Committee. This strikes fear in the hearts of all DXers.

If DJ6SI persists in his requirements for separate envelopes for each contact, money over and above return postage, and closes his logs after six months, will his contacts no longer count for DXCC credit? Obviously, the DXCC desk won't go back into the files to delete previously credited DJ6SI operations. However, Baldur might simply declare that he won't go on any more DXpeditions to rare places. While this will please the Greeks, who still haven't gotten over Baldur's coup in getting his

SY/DJ6SI Mount Athos operation accredited, those thousands of DXers who look forward to working him from rare places will be disappointed. As mentioned above, many DXers are willing to accede to Baldur's strict rules, in return for the certain card.

one bit when the REF stopped accepting his cards for their award program. He has been severely criticized in the past for his unreasonable approach to QSLing, but has never been the least bit apologetic, nor has he shown any indication that he will ever change. Even if all of his "clients" desert

him for an ethical manager, and he loses the more than US\$10,000 a year he currently makes off his QSLing "business," it is difficult to imagine Antoine admitting he was wrong.

Certainly the DX community would be better off without these abusive QSLing practices. However, DXers must understand that they will probably lose the services of these and other "unethical" DX operators and QSL managers in the process. Is this a reasonable price to pay for better QSLing practices worldwide? DXers are invited to send their written comments on this question to the DX Advisory Com-

mittee, c/o ARRL Headquarters, 225 Main St., Newington, CT 06111.

Up-Coming DX Conventions

QSLing practices and what to do about repeated offenses are sure to be topics of discussion among DXers at various DX gatherings. The two biggest of the year are this month. The International DX Convention in Visalia is the largest pure DX gathering anywhere. This year it is the weekend before Dayton, April 16-18, at the Holiday Inn at the Visalia airport. Registration, including the Saturday banquet and Sunday breakfast meetings, is \$50. Send your check made out to International DX Convention to Louese Bloom, KA6ING, 2520 Heather Lane, San Bruno, CA 94066. Don't miss the Friday evening cocktail party, cohosted by yours truly and the Northern California DX Club.

One week later is the Dayton Hamvention, where 30,000-plus amateurs, including a few thousand DXers from around the world, converge on southern Ohio. Among the popular DX events are the DX forum at the Hara Arena on Saturday, the hospitality suites at Stouffers on Friday and Saturday nights, and the annual DX Dinner. The eighth annual DX Dinner, sponsored by the Southwest Ohio DX Association, will be held on Friday, April 23, 1993, at the Stouffers Center Plaza Hotel. Cash bar begins at 6:30 PM, doors open at 6:45, and dinner is at 7:15 PM. Tickets are \$26.50, in advance only. This year, to prevent the crush and race for tables, seats will be assigned in order of requests received. If you desire group seating, please request tickets as a group. Include an SASE with your check made out to the SWODXA, and send both to SWODXA, c/o Scott Lehman, N9AG, P.O. Box 803, Greenville, OH 45331. Keynote speaker has not yet been announced, but this dinner is one of the DX highlights of the Dayton Hamvention experience!

Looking farther forward, and a ways east, the Islands On The Air award program convention is May 15-16 in Torremolinos, Spain, at the four-star Don Pable Hotel, Paseo Maritimo S/N, 29620 Torremolinos, Spain. For a copy of the reservation information, prices, and payment method. send a business-sized SASE to P.O. Box 50, Fulton, CA 95439; ask for the IOTA Convention flyer.

Still farther forward in time, but closer to home, is the second New Orleans International DX Convention, August 27-29. This luxury convention returns to the Royal Sonesta Hotel right on Bourbon Street in the historic French Quarter. They put on a super program last year, and the location makes this an ideal opportunity to placate your spouse after going off on your own to scenic Visalia and Dayton. (My wife accompanied me to Dayton one year; she has never suggested a return visit.) For

QSL Information

3X8HLU to IK2OPZ 3X8HNU to F6FNU 3Y2GV to LA6ZH 4J1FM to OH2LVG 4N4ANT to KA9WON 4N4CQ to YU4CQ 4N4DB to 9A2GU 4N4ELD to YU4ELD 4N4XA to KASWON 4N4XX to YU4XX 4N5CEF to YUSCEF 4N5EK to YU5XVD 4N5GX to YU5GBC 4N5RB to YU5XTC 4N7ZZ to YU4FIJ 4U1UN to W8CZN 5H3/N4QQL to W3HCW 5L2PP to EL2PP 5NBZKJ to OK3WM 5R8DG to F6FNU 5T5CJ to W4BAA 5V7DP to N6MMR 6W6/K3IPK to K3IPK 7P8FE to OH3GZ 707JL to GØIAS 707RM to GOIAS 707TA to JH10GC 707XX to JH3RRA 8P9DF to OH3RB 8P9EM to G3VBL 9A2AJ to YU2AJ 9A4AA to 4N2AA 9F2CW to DK7PE 9J2B0 to W6ORD 9J2EG to DL3SAK 9K2MU to 9K2AR 9K2ZR to K8EFS 9K2ZZ to W8CNL 9Y4H to K6NA A228W to DK3KD A22JP to KC4UCE A22MN to WABJOC A35ZY to SMONZY AH9B/V02 to AD1S

C31LL to C31LBB

C56/SMBJHF to SMOJHF C9RJJ to W8GIO CN8RS to Pirate CP4BT to DL9OT DP#GVN to DL1JCW EAGUK to EAGLZ ET3RA to HB9CVB EU80 to DL1GWS EU50 to DL1GWS FG4FR to FG5BG FG5FZ to F6FNU FM5GC to F6BHK FM5WD to W3HNK FY5EW to F6BFH HA92ITU to HA5NK HC7SK to SM6DYC HF@POL to SP9DWT **HG3CW** to HA3KNA HH2Z to KA9RLJ HP2CWB to N4YWY HV3SJ to IDDUD HV4NAC to IK@FVC **IUBPAW** to IKOSHF J37V to K8CV J68ZR to W7ZR J79MAE to DL5MAE J8/WG8R to WG8R JT1/KB9IBZ to N9JXU JU838C to JT1KAA JWBF to SP2GOW JX3EX to LA5NM JX7DFA to LA7DFA JY8VJ to DL1VJ KHBAU to WH@AAS KH4/W3HUV to W3HUV KW2P/KP5 to NOTG LW2DFM to LU2DLP 005PL to HB9CRV **OHEMEP** to OH3MEP **OHBNLP** to OH3NLP OM3CBU to OK3CBU OM3LO to OK3LO 0M3WW to OK3WW P290K to N4EOF P48CW to NA5U

P4BP to NX1L P48W to N2MM P5RS7 to JA1HGY PYBFF to W9VA RA4HT to DB3FH **RLSP** to UL7PAE RT5U0 to PA3BUD RW90/UL8PM to UL8PC RYBU to K8YSE RY78 to RB5BA RY81 to UY5EG \$21ZG to W4FRU \$53E0 to YUSEO \$55AA to YU3AI \$59CW to YU3XS S03KE to DL3BUM SQ1B to SP1AEN T32VU to DJ3TF T434B to CO2MA T55C to WA6CDR TIZIDX to WA9BXB TI4CF to TI2CF TI4SU/5 to SMØRBO TN1AT to F6FNU TR8YA to F6FNU TU20W to F6EXQ TU2VZ to IØWDX TZ6RM to K5UK TZ6VV to NØBLD UC2AKP to DL10Y UJ8JI to IK3HHX U050LW to SP7LZD USBU to K8YSE UX1A to KC1WY UZ4WW0 to AA4NU V2/VE3BW to VE3CPU V51JM to NK2T V73C to OKDXA VA1S to VE1AL VP2MLD to KC4DWI VP2V/KG6WI to N9DRU VPSP to WN5A VP8CFM to GM4KLO VP8CMP to G4LGZ VP8VN to G4LGZ

VP9/WA1AWJ to WB2YOH VU2/SP6WM to SP6ECF VU2NBT to WA4FVT W#RJU/KP5 to NOTG WA4DAN/KP5 to NØTG XE2MX to K6VNX XF4JC to XE1ECR XU3UN to SP5AAS XU6TO to PA3BTO XU7VK to HARHW XX9AS to KU9C Y830SE to W7TSQ YB6AVE to DJ5CO YJEC to SM4DHF YNBYN to KN9P YS1XS to WD4AVP Z21HT to OZ1EQH ZB2/N50KR to KU6E ZF2MB to W0LSD ZF2NE to W5ASP ZF2NG to K9WYI ZF2NM to K1MD ZF2RH to KJ6BK ZF2RT to N6DEC ZS6/G3SGQ to G3SGQ 3DABBK to P.O. Box 122, Veni, Swaziland 3W4VL to Slava, P.O. Box 44, Bratislava 1, Czech Republic 4LBFXC to P.O. Box 16, Tbillsi, 380002 FW/Y58I0 to P.O. Box 73, Berlin 1020, Germany J28F0 to P.O. Box 2417, Dji-P43MD to Brandaris Weg 15. San Nicolas, Aruba PJ8AD to P.O. Box 518, Saba, Netherland Antilles T2810 to P.O. Box 73, Berlin, Germany XF30Z to P.O. Box 25, Cancun CP77500, Mexico ZD7CRC to P.O. Box 126, St. Helena, South Atlantic

tact Wes Strauch, 2238 Lake Oaks Parkway, New Orleans, LA 70122.

April DX Operations

Not much news for this month, after the flurry of major island DXpeditions earlier in the year. However, the Radio Club Del Sur of Argentina reports that L1DSR will operate from Bermejo Island (SA-021) April 2-4, 10 kHz up on CW, and 3690, 7090, 14190, 21290, and 28590 kHz on SSB. QSL via Radio Club del Sur LW3DSR, Box 265, 7600 Mar Del Plata, Argentina. Also CW DXpeditioner Luc Glarey, I1YRL, will operate the 4U1ITU Geneva ITU station in April and May. He'll use the special call 4U8ITU as well. QSL this 4U1ITU operation direct to Luc at Via San Marino 11, 10091 Alpignano (To) Italy.

Notes From All Over

Norm Koch, K6ZDL, CQ's WPX Award Manager, lost his QSL collection in his recent move from Los Angeles to New Mexico. He would very much appreciate replacing some of his rarer cards. If you worked Norm, please send your card to him at his new address: 880 CR 13, Clovis, NM 88101.

Vincent Paul of the Post-a-Holiday Trav-

more information on this convention, con- el agency guarantees a Maldives 8Q7 license with accommodation within three days of arriving in the Maldives. He can also help with the application for a Sri Lanka 4S7 license when you book your holiday through him. He offers a range of low-cost but good Tourist-Board-approved accommodations. Write him at 13 Dalcross Road, Hounslow, Middx, England TW4 7RA, or phone or FAX to 0044 81 570 9322, 07-2100Z.

The ARRL DXCC desk announced January 22, 1993 that the start date for 5-Band DXCC has been changed from January 1, 1969 to November 15, 1945. This change is effective immediately. ARRL management made this decision, in consultation with the Membership Services Committee of the ARRL Board of Directors, in order to simplify the program. Now that all DXCC band awards have the same requirements, anyone who has a 10, 40, or 80 meter DXCC will automatically be granted credit toward 5-band DXCC. Likewise, a 160, 6, or 2 meter DXCC is sufficient for a band endorsement to the 5-band DXCC certificate.

A change in the start date of CW DXCC is not planned for the foreseeable future.

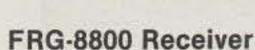
Finally, there were a couple of errors in the February column. First, the zeros disappeared from some of the callsigns of the AH1A Howland Island operator list. The correct calls are WORLX, WOCP, and KØEU. Also, the AH1A callsign, the only





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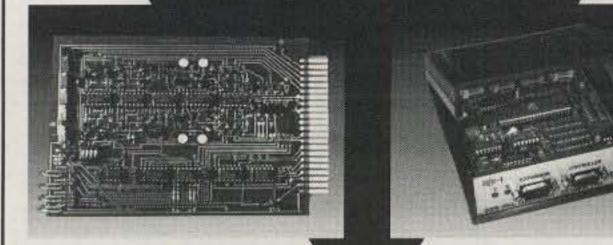
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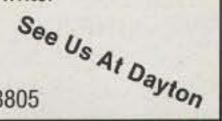
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N1EJF in a review about our XP 706 in 73 magazine, 4/1987

April 1993

one ever issued to KH1, was obtained by Bill Poellmitz, K1MM, for a planned operation from Canton. When Eric, SM0AGD, went to Canton, Bill and CQ's WAZ Award Manager Jim Dionne, K1MEM, canceled their planned trip. They have held on to the callsign, which is actually issued as the US call of I8ULL, ever since. The Northern California crew that planned to operate from Howland if it became a new country obtained the use of the AH1A call, not the callsign itself.

73, Chod, VP2ML

QSL Information

The YXOAI QSL cards are coming out, but many QSL requests were never received. DXers who haven't received their cards now may send a US SASE to Mike Manato, K3UOC, E.C.A. SA M-314, Jet Cargo International, P.O. Box 020010, Miami, FL 33102-0010. Mike is not the QSL manager, but can help QSLing by by-passing the Venezuela mails. Please don't abuse this offer with multiple band requests, but for those who really need the Aves QSL, Mike offers this alternate route.

Another possible YX0AI QSL route comes from Ramon Perez Brett, YV5EED, who says that all QSLs received with sufficient return postage have been mailed from Venezuela. If you haven't received yours in a couple of weeks, try again via

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3180 Leewood Terrace L-208, Boca Raton, FL 33431. These cards will be mailed from Venezuela, so don't use US stamps. Cards for the 1987 4M0ARV operation may be confirmed via the same address.

QSL Hartmut Gumpert, **9X5HG**, direct to P.O. Box 420, Kigali, Rwanda, with a standard-sized SAE and US\$1, not IRCs, please. And Hartmut passes along Season's Greetings to all DXers.

QSL 9X5AB via Harry Wismath, DL6NA, Anne Frankstr. 101, D-6000 Frankfurt 50, Germany. Note that US\$1 or one IRC is sufficient for surface-mail return, or a 5-gram airmail letter, but not for most airmail letters to the US.

QSL JW9VDA's Svalbard Island expedition February 17–24, 1993 via LA9VDA.

QSL QRPer KA20IG/HR3 via 161 W. Norwalk Road, Norwalk, CT 06850.

QSL Tom Ewing, **VR2GO**, direct to GPO Box 9887, Hong Kong, and not via any UK station.

QSL OD5PL, OD5VT, XX3JP, CR3R, CQ3B, CT3FN, CT3M, and CT3BX via Hermann Stein, HB9CRV/CT3FN, Bruelmatten 13, CH 4410 Liestal, Switzerland.

QSL **ZS1DAS** via P.O. Box 15788, Vlaeburg, 8010 Cape Town, Republic of South Africa.

QSL W1/G4DZC, FW/G4DZC, and 3D2ZC via operator Martin Bayes, P.O. Box 620674, Newton, MA 02162.

QSL 8P9DI via LA9GY.

QSL **3X0HLU** via Carlo Mancuso, IK2OPZ, P.O. Box 87, Gorla Minore 21055, Italy.

QSL VO2AC, VO2AC/1, XL2AC/1, VO5AC, VO8AC, and CY2AC via Bay Baybeck, KA8SOF, 1225 Banbury Road, Kalamazoo, MI 49001. Bay apologizes for the previous delays in QSLing, but is now up to date.

QSL WA1AWJ/VP9, N4ZDA/VP9, and XT2BW via WB2YQH.

QSL YI1MH via Majid Abdul Hamid, P.O. Box 5864, Baghdad, Iraq.

QSL VKOML c/o Post Office, Kingston, Tasmania, Australia. VK6NE is the Wireless Institute of Australia's VK9/VK0 QSL bureau manager, and is not an individual QSL manager.

HC8U cards are in the mail for all direct requests. Anyone still needing a QSL should send an SASE to Mark Beckwith, WA6OTU, P. O. Box 4, Sierra Madre, CA 91025 (new address). Mark also handles cards for 8P6J, N6TJ/EA9, and EA9KF for 1984 CQWW only, and N6TJ/T12 and 9K2DX for 1981 and 1982 CQWW only.

The 1992 AHO/AC8W operation has been QSLed 100% either direct or via the bureau. Stan Arnett, AC8W, has a new address for anyone too impatient to await their card via the bureau: 801 Range Road, Marysville, MI 48040.

VP2VE reports that his Callbook address is incorrect. QSL VP2VE and NP2CG via WA2NHA only.

Note the **S79S** is a re-issued call. QSL the 1992 S79S operation via Charlotte

	CQ DX Awa	rds Pro	gram						
	SS	SB							
1986 1987 1988	K6TLA IK5MDF W2EBM	1989 1990	IK5IIU AB4PY						
CW									
867	W7IIT								
	SSB Endorsements								
320 320 320 320 310 310 310 300 300 300	K2JF/323 I2QMU/323 AA5NK/323 OA4ED/322 WD@DMN/314 KB7VD/312 I8IYW/310 PY2DBU/309 CE7ZK/309 W8URM/308	300 300 275 275 275 200 200 200 200 150	K3NEE/308 AB4PY/303 KB7IVU/285 YC3OSE/282 DK5WQ/275 K6TLA/223 OA4DX/228 HP2CWB/208 IK5IIU/208 IK5MDF/186						
	CW Endorsements								
320 320 310 310 310 310	K9BWQ/323 W0HZ/320 WA4IUM/319 KZ4V/319 WA4JTI/319 N7RO/313	310 310 300 275 275 250	I2QMU/313 K2JF/310 W8URM/305 IK2ILH/293 W7IIT/287 WD@DMN/253						

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.

Richardson, KQ1F, 11 Michigan Drive, Hudson, MA 01749. QSL the S79S operations prior to 1992 via John Browning, W6SP.

Canadian postage rates increased again. Mail to the US from Canada is now 49; mail overseas is 86; and mail within Canada is now 43.

F6FNU's address in the 1993 Callbook is his summer home; do not send QSLs to that address. QSL to Box 14, F-91291 Arpajon Cedex, France.

QSL PJ7JC and PA3DWY/FS7 via Box 26, Kontich B-2550, Belgium.

The National Capitol DX Association has voted to help some Russian/CIS stations with QSLing. Any interested CIS station should contact N4MM for details.

QSL 4N4XA via KA9WON, with the name of the net control operator on the outside of the envelope, to help locate the QSO.

When sending cards to the **Baltic** states (Lithuania LY, Estonia ES, and Latvia YL), add "Via Sweden" or "Via Finland" to the envelope to avoid long delays via Russia.

The 1992 CQWW CW operation of 4U1ITU will be confirmed via the bureau, by operator DL5XX.

QSL the 1992 ARRL 10-Meter contest operation of **OT2T** via Peter Casier, ON6TT, P.O. Box 1, B-9090 Melle, Belgium.

QSL Slavko Celarc, **S57DX** (ex-YU3BQ) at Ob Igriscu 8, 61360 Vrhnika, Slovenia.

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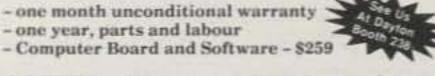
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PROPAGATION

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Solar Cycle Progress

Sunspot Cycle 22 continues to decline steadily towards its minimum. The Royal Observatory of Belgium, the world's official keeper of solar records, reports a mean sunspot number of 83.3 for December 1992. This results in a smoothed sunspot number of 97 centered on June 1992. This is a drop of three points from the previous month's level. The sunspot cycle is measured by the value of smoothed sunspot number, which is derived by averaging twelve consecutive monthly mean levels.

A smoothed sunspot number of 68 is forecast for April 1993. The smoothed sunspot count for last April (1992) was 103. This drop in solar activity is expected to have corresponding changes in HF propagation conditions this April, when compared to conditions last year.

The Dominion Radio Astrophysical Observatory of Canada reports a corresponding drop in 10.7 cm solar flux levels, with a mean value of 135 reported for December 1992. The December level results in a smoothed value of 154 centered on June 1992. A smoothed level in the mid-120's is forecast for April 1992.

April DX Conditions

The combination of lower solar activity and the onset of summertime propagation conditions in the northern hemisphere is expected to result in considerably fewer openings on 10 and 12 meters during April when compared to the winter months. This should be more noticeable on east-west paths, and less so on north-south openings. Look for openings on 10 and 17 meters towards Central and South America, and the Caribbean area during most of the day, and towards Africa and the South Pacific area during the late afternoon and early evening, particularly when conditions are Above to High Normal.

Although the bands are not expected to open as frequently as during winter, DX openings should be possible to many areas of the world on 15 and 17 meters during much of the daylight hours and into the early evening.

Twenty meters should be the optimum band for DX openings to most areas of the

11307 Clara Street, Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for April 1993

	Expected Signal Quality				
Propagation Index	(4)	(3)	(2)	(1)	
Above Normal: 7, 13-14, 19-20	A	A	В	С	
High Normal: 4, 8-9, 11-12, 15, 26	A	В	c	C-D	
Low Normal: 3, 5-6, 10, 16, 18, 21, 24-25, 27, 30	В	С	D	D-E	
Below Normal: 2, 17, 23, 28-29	С	C-D	D-E	E	
Disturbed: 1, 22	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

- Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.
- 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 poor or worse (D-E) on April 1, fair-to-poor (C-D) on the 2nd, good-to-fair (B-C) on the 3rd, good (B) on the 4th, fairto-good (C-B) on the 5th, excellent (A) on the 6th, etc.

world during April. The band should open shortly after sunrise, weaken a bit by midday, but return with exceptionally strong DX signals during the late afternoon and early evening hours. When conditions are Above or High Normal, 20 meters is likely to remain open during much of the hours of darkness as well, peaking near local midnight.

Good DX openings on 30, 40, and 80 meters should continue during April. With decreasing hours of darkness in the northern hemisphere, the window for most openings will be shorter than it was during the winter months. Expect these bands to remain open for DX from shortly before sundown, through the hours of darkness, and into the sunrise period. Some DX may also be possible on 160 meters during this same period.

lonospheric absorption should continue to increase in the northern hemisphere during April as the sun rises higher in the northern sky. This should result in somewhat weaker DX signal levels during day-time openings compared to the winter months. Static levels are also expected to increase noticeably during April as thunderstorms become more numerous. This should result in higher noise levels, particularly on 30, 40, 80, and 160 meters.

Seasonably favorable equinoctial propagation conditions should continue during April for openings between the northern and southern hemispheres. Be sure to check during the sunrise and sunset twilight periods for some exceptionally good openings on 20 meters from the USA to areas in the southern hemisphere such as Australasia, South America, southern Africa, etc. These inter-hemispheric openings can take place at other times and on other bands as well, as shown in the DX Propagation Charts.

Short-Skip Propagation

For openings between 50 and 250 miles the best band should be 80 meters during the day and 160 meters at night. Between 250 and 750 miles 40 meters should be best during the day, 80 meters for an hour or two after sunrise and again from sunset to midnight, and 160 meters from midnight to sunrise. For openings between 750 miles and the one-hop, short-skip limit of 2300 miles, use 20 meters during the day, 30 and 40 meters for an hour or so at sunrise and again from sunset to midnight, and 80 meters from midnight to sunrise. Look for 15 and 17 meter short-skip openings from about 10 AM to sundown, ranging between approximately 1300 and 2300 miles, although at times openings may be as short as 500 miles. There is also the possibility for some 10 and 12 meter short-skip openings during the daylight hours over similar distances.

The DX Propagation Charts in this month's column contain DX propagation predictions for each amateur band between 10 and 160 meters for the period April 15 through June 15, 1993. Beginning this month and continuing through the summer and fall, the times shown in the charts will be local daylight time (EDT, CDT, MDT, and PDT).

For more detailed predictions of shortskip openings between distances of 50 and 2300 miles, refer to the Short-Skip Charts, which appeared in last month's column.

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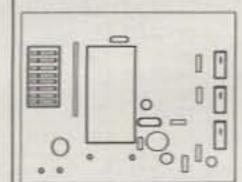
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TS-690S HF Plus 6m Xcvr	1549.95	Call \$
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RZ-1 Compact Scanning Recv.	599.95	Call
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TH-78A New 2m/79cm HT	599.00	Call \$
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	FT-23 R/17 Mini HT	351.00	Call \$
	FT-2400 50 Watt, Mobile	419.00	Call \$
	FT-290R/690R-6M, All Mode Portable	610.00	Call \$
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	FT-790 R/II 70cm/25w Mobile	681.00	Call \$
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	VHF/UHF Full Duplex		
	FT-736R, New All Mode, 2m/70cm	2025.00	Call \$
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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.

 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.

 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.

April 15-June 15, 1993 Time Zone: EDT (24-Hour Time) EASTERN USA TO:

	10 Meters	15 Meters	20 Meters	40-80 Meters
Western & Central Europe & North Africa	Nii	09-14 (1) 14-18 (2) 18-19 (1)	05-06 (1) 06-10 (2) 10-12 (1) 12-14 (2) 14-17 (3) 17-20 (4) 20-21 (3) 21-22 (2) 22-01 (1)	19-20 (1) 20-21 (2) 21-00 (3) 00-02 (2) 02-03 (1) 20-21 (1)* 21-22 (2)* 22-00 (3)* 00-01 (2)* 01-02 (1)*
Northern Europe & Euro- pean USSR	NII	10-13 (1) 13-15 (2) 15-17 (1)	06-09 (2) 09-13 (1) 13-15 (2) 15-17 (3) 17-19 (2) 19-23 (1) 23-01 (2) 01-06 (1)	19-20 (1) 20-23 (2) 23-01 (1) 20-00 (1)
Eastern Mediter- ranean & Middle East	Nil	11-15 (1) 15-17 (2) 17-19 (1)	06-08 (1) 13-16 (1) 16-19 (2) 19-23 (3) 23-00 (2) 00-02 (1)	19-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Western Africa	14-18 (1)	08-13 (1) 13-14 (2) 14-15 (3) 15-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	08-14 (1) 14-17 (2) 17-18 (3) 18-20 (4) 20-22 (3) 22-01 (2) 01-06 (1)	20-22 (1) 22-02 (2) 02-03 (1) 00-02 (1)
Eastern & Central Africa	16-18 (1)	09-11 (1) 11-14 (2) 14-17 (3) 17-18 (2) 18-19 (1)	05-06 (1) 06-08 (2) 08-09 (1) 14-16 (1) 16-18 (2) 18-21 (3) 21-23 (2) 23-01 (1)	21-01 (1) 22-00 (1)
Southern Africa	Nil	08-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-19 (1) 23-01 (1)	21-22 (1) 22-00 (2) 00-02 (1) 22-01 (1)

Central & South Asia	Nii	10-12 (1) 18-20 (1)	07-10 (1) 14-16 (1) 19-22 (1)	05-07 (1) 19-21 (1)
South- east Asia	NII	10-12 (1) 18-20 (1)	07-08 (1) 08-09 (2) 09-11 (1) 19-22 (1)	Nil
Far East	Nil	18-21 (1)	07-08 (1) 08-10 (2) 10-12 (1) 22-00 (1) 00-02 (2) 02-04 (1)	04-06 (1)
South Pacific & New Zealand	17-20 (1)	08-09 (1) 09-11 (2) 11-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-22 (1)	04-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-04 (2)	02-03 (1) 03-04 (2) 04-06 (3) 06-07 (1) 02-03 (1)* 03-05 (2)* 05-06 (1)*
Austral- asia	18-20 (1)	17-19 (1) 19-21 (2) 21-22 (1)	07-08 (1) 08-10 (2) 10-11 (1) 15-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-01 (3) 01-03 (2) 03-04 (1)	03-05 (1) 05-07 (2) 07-08 (1) 04-07 (1)*
Carib- bean, Central America & Northern Countries of South America	10-14 (1) 14-17 (2) 17-19 (1)	08-10 (1) 10-11 (2) 11-14 (3) 14-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	04-06 (1) 06-07 (2) 07-08 (3) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-22 (4) 22-00 (3) 00-04 (2)	19-20 (1) 20-21 (2) 21-04 (3) 04-06 (2) 06-07 (1) 21-02 (1)* 02-05 (2)* 05-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-16 (2) 16-17 (3) 17-19 (1)	07-08 (1) 08-11 (2) 11-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (2) 19-21 (1)	04-06 (1) 06-09 (2) 09-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-01 (3) 01-04 (2)	20-21 (1) 21-04 (2) 04-06 (1) 23-03 (1)* 03-04 (2)* 04-06 (1)*
McMurdo Sound, Antarc- tica	Nil	14-15 (1) 15-17 (2) 17-19 (1)	07-08 (1) 08-09 (2) 09-10 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	01-05 (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	14-18 (1)	06-08 (1) 08-10 (2) 10-13 (1) 13-15 (2) 15-17 (3) 17-18 (4) 18-19 (3) 19-21 (2) 21-22 (1) 22-00 (2) 00-02 (1)	19-21 (1) 21-23 (2) 23-01 (1) 21-00 (1)
Northern & Central Europe & European USSR	Nil	13-15 (1)	06-07 (1) 07-10 (2) 10-14 (1) 14-17 (2) 17-19 (1) 22-00 (2)	20-00 (1)
Eastern Mediter- ranean & Middle East	Nil	15-17 (1)	07-09 (1) 13-16 (1) 16-22 (2) 22-00 (1)	20-00 (1)
Western Africa	13-17 (1)	12-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	05-06 (1) J6-08 (2) 08-09 (1) 12-15 (1) 15-17 (2) 17-18 (3) 18-20 (4) 20-21 (3) 21-23 (2) 23-00 (1)	20-01 (1)
Eastern & Central Africa	14-17 (1)	10-14 (1) 14-16 (2) 16-18 (1)	06-08 (1) 13-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	21-00 (1)

Southern Africa	Nii	08-10 (1) 10-12 (2) 12-13 (3) 13-14 (2) 14-15 (1)	14-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 22-23 (1) 23-01 (2) 01-02 (1)	20-22 (1) 22-00 (2) 00-01 (1) 23-01 (1)*
Central & South Asia	NII	09-11 (1) 18-21 (1)	07-10 (1) 18-20 (1) 20-22 (2) 22-23 (1)	05-07 (1) 19-21 (1)
South- east Asia	NII	08-10 (1) 19-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-22 (1)	05-07 (1)
Far East	Nil	18-21 (1)	20-00 (1) 00-04 (2) 04-06 (1) 06-07 (2) 07-08 (3) 08-09 (2) 09-11 (1) 15-18 (1)	03-05 (1) 05-06 (2) 06-07 (1) 05-06 (1)*
South Pacific & New Zealand	14-16 (1) 16-18 (2) 18-20 (1)	07-09 (1) 11-14 (1) 14-17 (2) 17-19 (3) 19-21 (2) 21-22 (1)	16-19 (1) 19-21 (2) 21-23 (3) 23-01 (4) 01-03 (3) 03-07 (2) 07-10 (3) 10-11 (2) 11-12 (1)	00-02 (1) 02-04 (2) 04-05 (3) 05-06 (2) 06-07 (1) 02-04 (1)* 04-05 (2)* 05-06 (1)*
Austral- asia	17-20 (1)	09-11 (1) 16-18 (1) 18-21 (2) 21-22 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-15 (1) 15-18 (2) 18-21 (1) 21-23 (2) 23-01 (3) 01-03 (2) 03-06 (1)	02-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Carib- bean, Central America & Northern Countries of South America	10-14 (1) 14-17 (2) 17-19 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	00-04 (2) 04-06 (1) 06-08 (2) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-22 (4) 22-00 (3)	19-21 (1) 21-22 (2) 22-03-(3) 03-05 (2) 05-07 (1) 21-23 (1)* 23-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-15 (2) 15-16 (3) 16-17 (2) 17-19 (1)	07-08 (1) 08-12 (2) 12-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	05-06 (1) 06-10 (2) 10-16 (1) 16-18 (2) 18-19 (3) 19-23 (4) 23-01 (3) 01-02 (3) 02-04 (2) 04-05 (1)	21-22 (1) 22-00 (2) 00-02 (1) 02-04 (2) 04-06 (1) 00-04 (1)*
McMurdo Sound, Antarc- tica	Nil	13-15 (1) 15-18 (2) 18-19 (1)	06-09 (1) 17-18 (1) 18-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	00-06 (1)

Time Zone: PDT (24-Hour Time) WESTERN USA TO:

	10 Meters	15 Meters	20 Meters	40-80 Meters
Western & Soutthern Europe & North Africa	Nil	12-16 (1)	06-08 (1) 08-11 (2) 11-13 (1) 13-17 (2) 17-19 (1) 20-22 (1)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Central & Northern Europe & European USSR	Nil	Nil	07-08 (1) 08-10 (2) 10-12 (1) 12-15 (2) 15-17 (1) 20-22 (1)	20-23 (1) 21-22 (1)*
Eastern Mediter- ranean & Middle East	Nil	13-15 (1)	07-10 (1) 10-12 (2) 12-13 (1) 13-15 (2) 15-17 (1) 20-22 (1)	20-23 (1)
Western Africa	13-15 (1)	09-12 (1) 12-15 (2) 15-17 (1)	05-06 (1) 06-08 (2) 08-15 (1) 15-18 (3) 18-20 (2) 20-22 (1)	20-23 (1)
Eastern & Central Africa	Nil	10-14 (1)	07-09 (1) 12-14 (1) 14-16 (2) 16-18 (1)	20-22 (1)

Southern Africa	Nil	10-12 (1) 12-14 (2) 14-15 (1)	13-14 (1)	19-21 (1) 21-22 (2) 22-23 (1) 20-22 (1)*
Central & South Asia	Nil	09-11 (1) 19-21 (1)		04-07 (1)
South- east Asia	Nil	09-11 (1) 16-19 (1) 19-21 (2) 21-22 (1)		04-07 (1) 05-06 (1)*
Far East	Nil	14-17 (1) 17-20 (2) 20-22 (1)	04-07 (1) 07-08 (2) 08-09 (3) 09-10 (2) 10-12 (1) 12-14 (2) 14-21 (1) 21-23 (2) 23-00 (3) 00-02 (4) 02-03 (3) 03-04 (2)	02-03 (1) 03-06 (2) 06-08 (1) 03-06 (1)*
South Pacific & New Zealand	13-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1)	10-12 (1) 12-16 (2) 16-17 (3) 17-19 (4) 19-20 (3) 20-21 (2) 21-23 (1)	05-08 (1) 08-12 (2) 12-17 (1) 17-19 (2) 19-21 (3) 21-23 (4) 23-01 (3) 01-05 (2)	23-01 (1) 01-02 (2) 02-06 (3) 06-07 (2) 07-08 (1) 01-02 (1)* 02-05 (2)* 05-06 (1)
Austral- asia	15-17 (1) 17-19 (2) 19-20 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (2) 22-23 (1)	05-08 (1) 08-10 (3) 10-12 (1) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-03 (3) 03-05 (2)	01-02 (1) 02-04 (2) 04-06 (3) 06-07 (2) 07-08 (1) 02-03 (1)* 03-05 (2)* 05-06 (1)*
Carib- bean. Central America & Northern Countries of South America	10-14 (1) 14-17 (2) 17-18 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	00-03 (2) 03-05 (1) 05-06 (2) 06-08 (3) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-20 (4) 20-00 (3)	19-20 (1) 20-21 (2) 21-02 (3) 02-04 (2) 04-06 (1) 21-00 (1)* 00-03 (2)* 03-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	13-15 (1) 15-17 (2) 17-18 (1)	07-08 (1) 08-12 (2) 12-14 (1) 14-15 (2) 15-16 (3) 16-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	00-02 (2) 02-06 (1) 06-10 (2) 10-15 (1) 15-17 (2) 17-18 (3) 18-23 (4) 23-00 (3)	20-22 (1) 22-02 (2) 02-04 (1) 21-03 (1)*
McMurdo Sound, Antarctica	15-17 (1)	15-16 (1) 16-18 (2) 18-19 (1)	16-18 (1) 18-19 (2) 19-21 (3) 21-23 (2) 23-01 (1) 04-06 (1) 07-09 (1)	23-03 (1) 03-06 (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

For 12 meter openings interpolate between 10 and 15 meter openings.

For 17 meter openings interpolate between 15 and 20 meter openings.

For 30 meter openings interpolate between 40 and 20 meter openings.

VHF Ionospheric Openings

April looks like it should be a good month for VHF ionospheric openings. Lyrids, a major meteor shower, should take place between April 22-23, with a peak expected during the late afternoon of April 22. During the shower's peak, at least 15 goodsize meteors should enter the earth's atmosphere hourly, permitting fairly good meteor-scatter-type openings on the VHF bands.

A seasonal increase in sporadic-E ionization usually begins during April and continues through the spring and summer months. This should result in an increased number of short-skip openings on 10, 12, 15, and 17 meters during April, as well as occasional openings on 6 meters. HF openings will range between approximately 400 and 1300 miles, while those on 6 meters will usually be between 750 and 1300 miles. While sporadic-E ionization can occur at just about any time, there is a tendency for it to peak between 8 AM and noon and again between 5 and 9 PM local time.

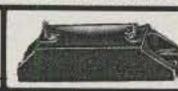
Unusual ionospheric openings on the VHF bands can also occur during April from widespread auroral activity. The best times to check for such openings are during periods of radio storminess on the HF bands. Check the Last Minute Forecast at the beginning of this column for those days during April that are expected to be Below Normal or Disturbed.

For the very patient, some trans-equatorial (TE) propagation may be possible during April. This type of propagation tends to peak during the equinoctial seasons. Openings are most likely to occur 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 towards South America from the United States favor locations in the southern tier states and Caribbean area, but some openings may also be possible to more northerly locations. TE openings are more likely to occur on 6 meters, but they can occur on 2 meters as well. Openings can be expected to be very weak with considerable flutter fading.

73, George, W3ASK

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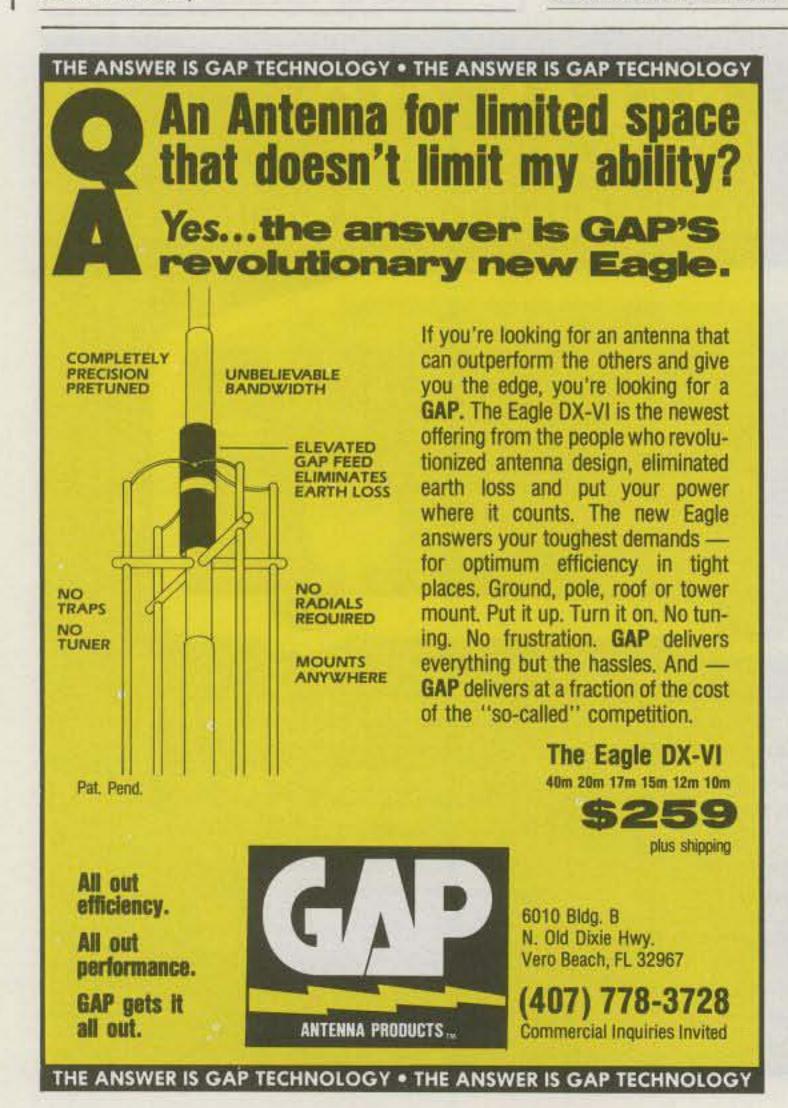
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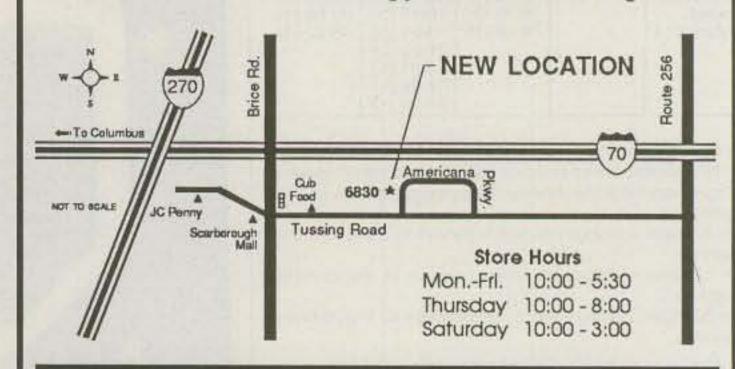
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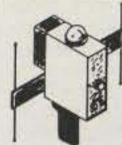


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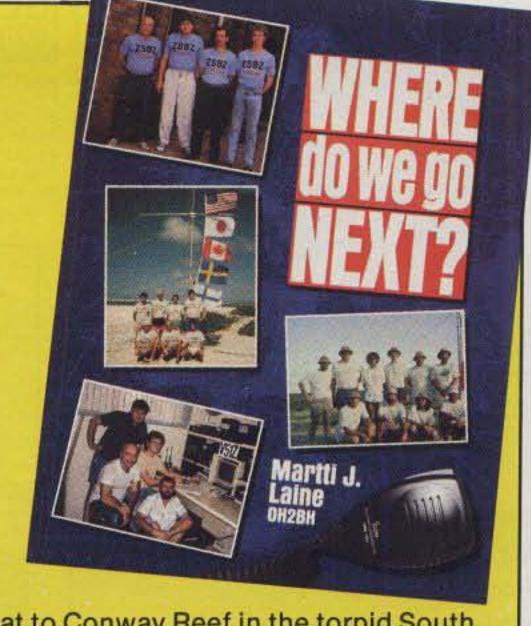
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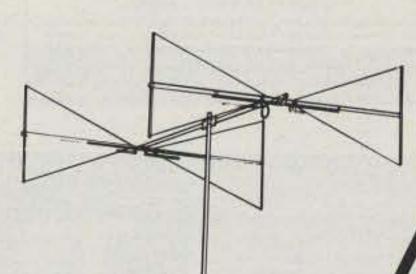
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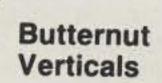


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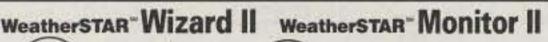
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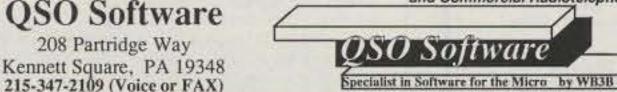
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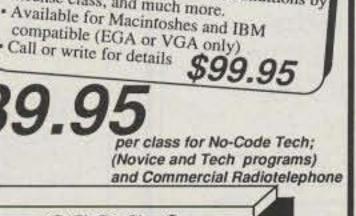
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THERMOGRAPHED CARDS! Raised-print QSLs at flat printing prices. Samples: Phone 817-461-6443 or write: W5Yl Group. Box 565101, Dallas, TX 75356.

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LOW POWER COMMUNICATIONS, Vol. 1—Basic QRP, by Rich Arland, K7YHA. A great A to Z how-to guide! Contesting, digital, computers, antennas, solar power, milliwatting, etc. \$14.95 + \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. Visa/Mastercard welcome. US \$ only.

COMPUTER SOFTWARE as low as \$2.00 per disk. Hundreds of IBM and Commodore 64 disk titles available for immediate shipment, Ham Radio, Games, Education, Business, Graphics, Windows, More. Free catalog: Dayton Shareware, 3917 Leonora Drive, Kettering, OH 45420 (513-294-5828).

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RTTY JOURNAL published ten times per year for those interested in the Digital modes. Timely information on RTTY, AMTOR, PACKET, PACTOR, CLOVER, MSOs, Contesting, Hardware/Software for the digital modes, plus technical articles. This is a Digital operators magazine. \$16 per year (foreign higher). RTTY JOURNAL, 1904 Carolton Ln., Fallbrook, CA 92028-4614.

FOR SALE: "Sparks" (lone radio officer on ships) is fading away with the 20th century. Book *QTC* (I have a message for you) is a nostalgic salute to him. His SOS's saved a million lives. Fellow-Sparks enthusiastically applaud: "Outstanding" Kemp Richter/K7UQH. "Complaint—can't put book down" Ken Johnson/W6NKE. "Best book ever written about marine operator" Doug Stivison/NR1A. Reviewers too: "Nostalgic spirit surrounds tales told" Popular Electronics: "Fascinating book" Radio Bygones, U.K. "You just have to see QTC" Amateur Radio Action, Australia. SORRY, HARDCOVERS ALL SOLD! BUT 80 PAPERBACKS STILL AVAILABLE, NOVEMBER 1. \$11.00 postpaid. Write SEQUOIA/KA5HCX, 2502 W. Cockburn, Austin, TX 78745 or call 512-442-1311. Hams—want a personal inscription? Give your callsign!

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CALL SIGN DECAL: 1 1/4 characters. Mounts inside auto window. \$4.00. DCALL, 2102 Waterbury Dr., Uniontown, OH 44685.

FOR SALE: Flameproof Keys, NOS 1955, \$60.00 shipped. List telegraph things, others, \$1.00 plus SASE. Dr. Jacobs, 60 Seaview Terrace, Northport, NY 11768.

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FM5WD Looking for Drake RV7 or RV7S, SP75, and Heathkit HW9 and accessories. Write to Callbook address or KM1H.

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New hams—Novices, Techs, Generals or whatever ticket you start with—have questions. What do I look for in an HT? How should I operate on the local repeaters? What's it like to get on HF? How do I set up a station? How do I use an SWR bridge? These questions and a hundred more. As important as these problems are, there's one other question that's more important: Where can I go to find the answers?

CQ's 1993 Guide To Amateur Radio

will answer these questions and hundreds of others. This new guide is chock-full of arti-

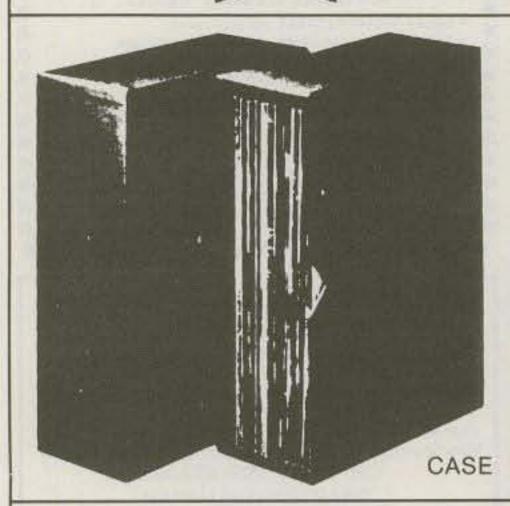
cles written strictly for the newcomer by some of the best writers in Ham Radio. Bill Orr, W6SAI, shows you how to efficiently set up your first station. Lew McCoy, W1ICP, takes you on a tour of repeater operating practices and etiquette. McCoy also tells you what an SWR bridge is and how to use it, as well as recommending the best type of SWR indicator for newcomers. Ed Juge, W5TOO, gives you a concise guide to the common and not-so-common functions and capabilities found in today's handhelds. Famous ham educator Gordon West, WB6NOA, guides you through the licensing and upgrading maze. John Dorr, K1AR, shows you how to set up your first packet station and make that first connect. There's even an article that gives you the secrets of successfully installing PL-259s—no small task even for old timers. You'll find many, many more articles that you'll want to refer to often. Also, you'll find detailed information on many of the most popular rigs plus an explanation of what everything means—a mini buyer's guide of sorts. Plus, you'll find an up-to-date listing of all the Ham Radio manufacturers and dealers. You'll want to keep this book handy for day-in-dayout operation. It will pay for itself with every article you read.

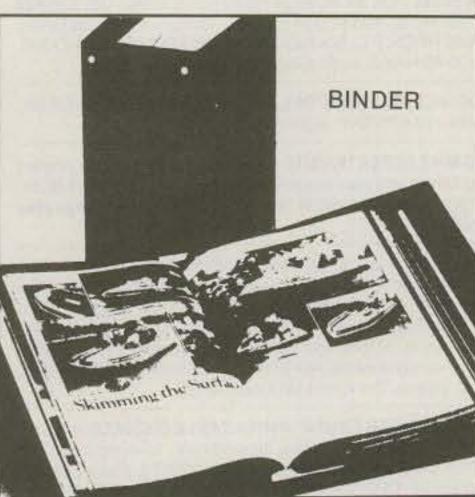
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SELL: CQ/HR/QST/73 Magazines. Send SASE for list. KA1VY, E. Guimares, 401 Bedford St., Lakeville, MA 02347.

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2 meter HT SIGNAL BOOSTER. Boosts signals on both xmit and receive for rubber ducky antennas. See and hear the difference. Easy to make and install! For details send \$1.00 and SASE to SIGNAL BOOSTER, 740 Adams St., Cleveland, OH 44146-3751.

WANTED: HW-16, also xtals 3502 to 3575 kHz and 7002 to 7075 kHz. Trade for 13 VDC 6 amp supply? I pay shipping. KC8HF, 5354 Fox Ridge Dr., W. Bloomfield, MI 48322.

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BENJAMIN MICHAEL 973A 12 inch 24-HOUR WALL CLOCK. \$20.00. Walt Grosch, KZ9F, 1735 Stoneway Ct., Richfield, WI 53076.

WANTED: Filters for my TS930. YG455C-1 and YK88C-1. Jim Fleming, W9TM, 521 Rumple Lane, Addison, IL 60101.

BUSTED RIGS: Looking for solid-state ham rigs with a problem, and priced right! Mark, WB2NQT, 804-525-2921.

CLIPPERTON-L TRANSFORMER WANTED, or, as an alternative a busted Clipperton with a good transformer. Mark, WB2NQT, 804-525-2921.

TELEGRAPH EQUIPMENT BID LIST for an SASE. Dick Randall, K6ARE, 1263 Lakehurst Rd., Livermore, CA 94550-1851.

SELL: CQ/QST and other magazines. Send SASE for list. Ed, K2MFY, 2 Nutley Court, Plainview, NY 11803.

YL CLUB seeks help in obtaining an inexpensive or donated HF transceiver. TNX! Write to A.N. Koval, Box 322, Cherkassy, 257000, Ukraine, Eastern Europe.

RECEIVERS WANTED: I am looking for several older receivers such as the Hammarlund HQ-180A, Collins 75A-4, etc. If you have one and would like to sell it, please contact me at 404-396-0276, or write to me at 1968 Huntington Hall Ct., Atlanta, GA 30338. Charlie, KD4AJ, All inquiries will be answered.

OLD CALLBOOKS: \$3.00 each plus postage. Summer '51, '60, '66, '67; Spring '59, '65, '71, '79 US. D. Heise, AA6EE, 16832 Whirlwind, Ramona, CA 92065 (619-789-3674).

AL80A 10–160M Lin. \$725, MFJCW, SBAF \$25 ea., SB650 Freq. Readout, Kaypro Computer, Brimstone 2M FM \$125 ea. All mint. List \$1 and SASE. Joe Bedlovies, P.O. Box 139, Stratford, CT 06497.

KENWOOD FOR SALE: My like new TS440SAT \$950. I will pack and pay shipping. Hilary, N5AX, 619-253-7710, after 02:00 UTC.

FOR SALE: Yaesu FT-7 HF transceiver, 20 watts, 10–80 meters, \$CALL \$. Drake R-8 general-coverage receiver, "mint," \$850. ICOM IC-751 HF transceiver w/general coverage, "EXCL," \$799. ICOM IC-37A 220 MHz, mobile, "mint," \$300. Other items available, call 215-271-8898, Tony Musero, K3UKW, 1609 S. Iseminger Street, Philadelphia, PA 19148-1010.

WANTED: KENWOOD TR-2500 battery pack, any condition. Also case for this 2M HT. Call 606-236-6510. WQ4Z, George Griebe, 650 Chestnut, Parksville, KY 40464-9624.

WANTED: Workshop manual w/circuit diagram for H.P. 1700B Osc., Opt. 300, Ser. 1233A/72, VE7EHD, 604-265-3175.

WANTED: Palomar P-408 preamplifier; PT-340 Tuner-Tuner. Also want four cheap (\$50 each plus shipping) 40/80 meter wide-bandwidth verticals. WY@J, 12 Parkway Drive, Englewood, CO 80110 (303-782-9084).

KENWOOD TS850S/AT with 1.8 kHz SSB filter for sale. Mint condition, \$1450 OBO. Call Larry, AJ2W, at 619-576-1513.

PADDLES WANTED: Especially looking for Brown Brothers, W8FYO, and the PERMAFLEX Key. WB4FLB, 502-781-8171.

COLLINS R390/A (Stewart Warner), near-mint, \$280; CV-157 SSB converter for R390/A, excellent, \$255; Kenwood R-1000, excellent, \$265; Nationals HRO-7, excellent, \$275; NC-300, poor, \$50. Offers welcome. Don, 412-344-0956 (7 PM to 11 PM EST).

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ANNOUNCEMENTS

(from p. 6)

comb Chapter ARC; 1700-0400Z April 29, 30 and May 1; General 40, 20, 15, and Novice portion of 10 meters. For certificate send QSL and 9 x 12 SASE to ECV ARC, 1458 Albright Ave., Upland, CA 91786.

KB7PIY, from Astronomy Week, Snowflake, Arizona; Pleasant Valley ARC; 1500-2300Z April 24; 10 meters Novice phone. For astrophoto certificate send QSL and 9×12 SASE (2 units postage) to ARS KB7PIY, Bill Wood, 14246 N. Westminster Pl., Fountain Hills, AZ 85268-2706.

K9IU, from 175th anniversary of Bloomington and Monroe County, Indiana; Indiana University ARC; April 10–11; near bottom of General 40, 20, 15, and Novice 10 meters phone. For certificate send QSL and SASE to Chris Bobbitt, Monroe County Historical Museum, 202 E. Sixth St., Bloomington, IN 47408.

KA9NLX, from Earth Day celebration, Chicago metropolitan area, Illinois; U.S. Environmental Protection Agency Region 5 ARC; 1500-2200Z weekends in April; lower portion of General CW and phone subbands and CW in Novice portion of 40/15 meters. Send QSL to John Paskevicz, KA9NLX, 1423 N. Ridge Ave., Arlington Heights, IL 60004.

CI2QK, from the Canadian Postal Employees Curling Classic, Trois-Rivieres, PQ, Canada; April 3-11 (no times given); 10, 15, 20 meters CW and SSB. For a special QSL send QSL and SAE with one green stamp or one IRC to QSL manager: VE2QK, Jacques Dube, 875 St-Severe, Trois-Rivieres, PQ G9A 4G4 Canada. QSL Bureau also okay. For certificate send QSL and 3 IRCs to same address.

 The following hamfests, etc., are slated for April and late March:

Mar. 27, Portland, Maine Amateur Wireless Assn. Hamfest, Stevens Avenue Armory, Portland, Maine. Contact Marty Feeney, K10YB, 207-772-1682. (Exams registration 10 AM.)

Apr. 3, Rochester, Minnesota ARC Hamfest, John Adams Jr. High School, Rochester, Minnesota. Contact Joe Fishburn, KOTS, 2514 NW 4th Ave., Rochester, MN 55901-2324.

Apr. 3, Twelfth Annual Durham Region Amateur Radio and Computer Fleamarket, Pickering High School, Pickering Village, Town of Ajax, Ontario, Canada. Contact Ron Brown, VE3WZ, 416-839-3711.

Apr. 3, Columbus, Indiana ARC Hamfest, Bartholomew County 4-H Fairgrounds, Women's Building, Columbus, Indiana, Contact Marion Winterberg, WD9HTN, 11941 W. Sawmill Rd., Columbus, IN 47201 (812-342-4670).

Apr. 3, Chestnut Ridge Radio Club Fleamarket, Saddle River Reformed Church, Upper Saddle River, New Jersey. Contact Jack Meagher, W2EHD, 201-768-8360.

Apr. 3, 47th Annual Lawton Ft. Sill ARC Hamfest, Comanche County Fairgrounds, Lawton, Oklahoma. Contact Bob Morford, KA5YED, 1415 NW 33rd St., Lawton, OK 73505 (405-355-6120).

Apr. 3, Chesapeake "SpringFest '93," Virginia Beach Pavilion, Virginia Beach, Virginia. Contact Preston P. Ipock, N4SHI, 1026 Calloway Ave., Chesapeake, VA 23324 (804-543-4610). (Exams, call for cost.) (Please note that this event is not associated with the Virginia Beach Hamfest.—ed.)

Apr. 3-4, Sixteenth Annual Inland Empire Hamfest & Computer Show, Spokane Youth Sports Assn. Bldg., Spokane, Washington. Contact Ivan Brown, KF7PU, East 537 Nebraska Ave., Spokane, WA 99207 (509-459-2667). (Exams Apr. 3.)

Apr. 3-4, Great Plains ARC Hamfest, Mooreland, Oklahoma. Contact Gerald Bowman, WG5Z, Box 356, Mooreland, OK 73852 (405-994-5453). (Exams 2 PM Saturday.)

Apr. 4. Raleigh NC ARS 21st Hamfest & Computer Fair, Jim Graham Bldg., NCS Fairgrounds, Raleigh, North Carolina, Contact Rollin Ransom, NF4P, 1421 Parks Village Rd., Zebulon, NC 27597 (919-269-4406). (Exams, preregistration AA4MY 919-847-8512; wheelchair accessible.)

Apr. 4, Southington CT ARA 10th Annual Fleamarket, Southington High School, Southington, Connecticut. Contact Steve, N1GCV, 203-621-6191. (Exams preregistration only SASE to Southington ARA, P.O. Box 873, Southington, CT 06489.)

Apr. 4, LARCFEST 1993, Boulder County Fairgrounds, Longmont, Colorado, Contact Randy Stevens, NØNMD, 5280 Cypress Dr., Boulder, CO 80303. (Exams 1 PM, info 303-499-1106.)

Apr. 4, 1993 SEMARA Hamfest, Grosse Points North High School, Grosse Pointe Woods, Michigan. Contact 1993 SEMARA Hamfest, P.O. Box 646, St. Clair Shores, MI 48080-0646 (313-881-3065). (Exams.)

Apr. 4, 21st Annual Madison WI Swapfest, Dane County Exposition Center Forum Bldg., Madison, Wisconsin. Contact Madison Area Repeater Assn., P.O. Box 8890, Madison, WI 53708-8890, or call Jim Waldorf, KB9AQQ, 608-249-7579.

Apr. 10, Los Altos Hills CA Fleamarket, Foothill College, Los Altos Hills, California. Call 408-734-4453. (This event is held the second Saturday of every month, March through September 1993.) (Exams at Sunnyvale; info 408-255-9000.)

Apr. 10, Oak Ridge Hamfest '93, National Guard Armory, Clinton, Tennessee. Contact Gene Muncy, KB4UMM, 615-435-1588. (Exams 10 AM, preregistration—\$5.60 check payable to WCARS/VEC, form 610, copy of license—mail to Ray Adams, N4BAQ, 4325 Felty Dr., Knoxville, TN 37918. Bring original license and two IDs to exam.)

Apr. 10, Lake Region ARC Hamfest, Hockey Arena, Otter Tail County Fairgrounds, Fergus Falls, Minnesota. Contact Keith McKay, NØFKF, 218-826-6274. (Exams.)

Apr. 16-18, 1993 International DX Convention, Holiday Inn, Visalia, California. Contact Louese Bloom, KA6ING, 2520 Heather Lane, San Bruno, CA 94066-2643.

Apr. 17, Talladega RAC Old-Fashioned Hamfest, Comer Memorial School, Sylacauga, Alabama. Contact Jim Green, KD4BHH, 205-245-7825. (Exams.)

Apr. 17, Sixth Annual Poorman's Hamfest, Alachua County Fairgrounds, Gainesville, Florida, Contact Bill Wells, K4RDP, 1-904-454-3105.

Apr. 17, Kentucky Colonels ARC Hamfest/Com-

puterfest, National Guard Armory, Bowling Green, Kentucky, Contact Denver, 1-502-777-3681.

Apr. 17, Joplin MO ARC Hamfest, John Q. Hammons Trade Center, Joplin, Missouri, Contact JARC, P.O. Box 2983, Joplin, MO 64803 (417-623-3610 days, 417-782-5848 evenings). (Exams.)

Apr. 17-18, Trenton NJ Computerfest/Hamfest. Mercer County Community College, West Windsor, New Jersey. Call 609-655-4999. (All-day Packet Conference Saturday.)

Apr. 18, Ak-Sar-Ben ARC Auction, Millard Social Hall, Omaha, Nebraska. Contact Ken Noel, AJØA, 6730 S. 73rd St. Circle, Ralston, NE 68127 (402-592-2338) after 6 PM; PBBS 145.01 AJØA @ KØBOY.NE).

Apr. 18, Northeastern Connecticut ARA Hamfest, Point Breeze Restaurant, Webster, Massachusetts. Contact Chuck Weimer, WB1AOC, 3 Plainview Dr., Danielson, CT 06239 (203-774-1723).

Apr. 18, Wareham MA ARC Hamfest, Wareham/ Buzzards Bay, Massachusetts. Contact Barry Kennedy, N1EZH, 24 Bungalow Lane, Buzzards Bay, MA 02532.

Apr. 18, Hampden County RA Fleamarket, Southwick Recreational Center, Southwick, Massachusetts. Contact Paul Geng, KA1WER, 114 Riviera Dr., Agawam, MA 01001 (413-789-2334). (Exams 10 AM, contact Yorke Phillips, K1BXE, 413-566-3010 for preregistration.)

Apr. 18, MIT and Harvard Tailgate Electronics, Computer and Amateur Radio Fleamarket, Albany & Main St., Cambridge, Massachusetts. Contact W1GSL, P.O. Box 82, MIT Br., Cambridge, MA 02139. (Future fleamarkets include May 16, June 20, July 18, August 15, September 19, and October 17.—ed.)

Apr. 18, Moultrie ARK 32nd Annual Hamfest, Moultrie County 4-H Fairgrounds, east of Sullivan, IIlinois. Contact Dave Duggins, N9MPM, 217-234-3283. (Exams 9 AM to 12 noon, preregistration only with \$5.60 check payable to ARRL/VEC to M.A.R.K., P.O. Box 91, Lovington, IL 61937.)

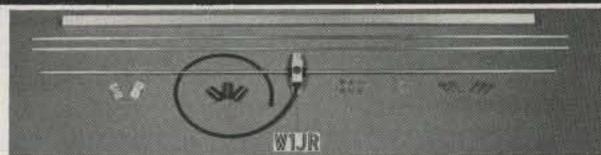
Apr. 18, Suffolk County NY RC Hamfest, St. James Lutheran School, St. James, Long Island, New York. Contact Dr. Ralph Thorn, N2KEA, 516-472-8348. (Handicapped accessible; exams.)

Apr. 23, Southwest Ohio DX Assn. DX Dinner, the weekend of the Dayton Hamvention, at Stouffer Center Plaza Hotel, Dayton, Ohio (cost \$26.50 per person, time 6:30 PM, reservations in advance only, SASE with checks made out to SWODXA). For reservations, contact Southwest Ohio DX Assn., Scott Lehman, N9AG, P.O. Box 803, Greenville, OH 45331 (513-548-6230).

Apr. 23, Southwest Ohio Chapter of QCWA Banquet, the weekend of the Dayton Hamvention, Neil's Heritage House, Dayton, Ohio (cost \$16 per person, time 6:30 PM, checks payable to Robert L. Dingle). For reservations, contact Robert L. Dingle, KA4LAU, 1117 Big Hill Rd., Kettering, OH 45429-1201.

Apr. 24, 1st Annual Dayton Contest Dinner, the weekend of the Dayton Hamvention, Stouffer Center Plaza Hotel, Dayton, Ohio (cost \$26 per person, time 6:30 PM, reservation deadline April 15). Send checks and/or inquiries to North Coast Contesters-Dayton Dinner, P.O. Box 59, New Bedford, PA 16140 (include SASE and put callsign on check).

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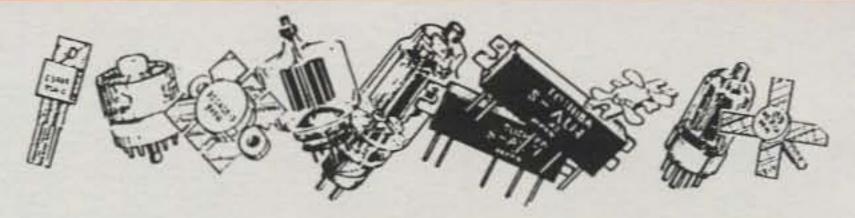


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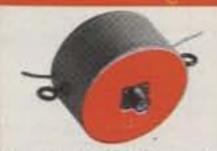
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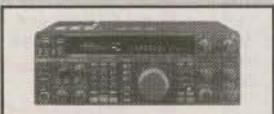
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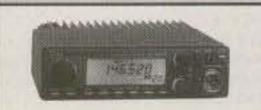


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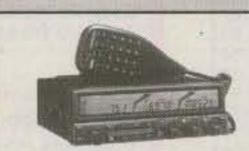
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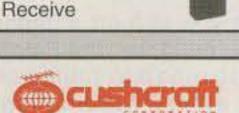


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