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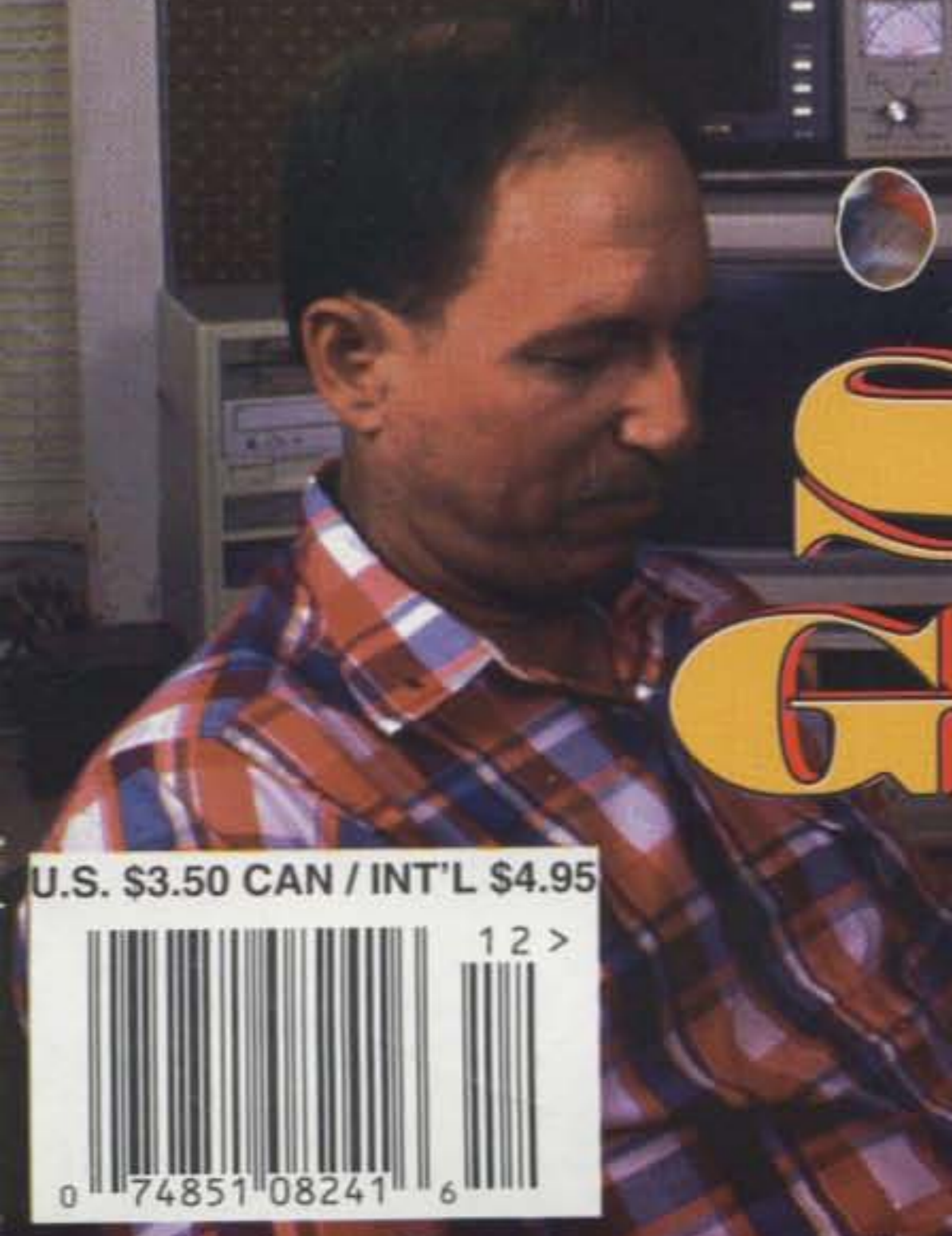
Amateur Radio

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THE RADIO AMATEUR'S JOURNAL

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• RELIABLE

New trap design is stable in all conditions

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"What a fantastic DXpedition antenna. Tnx for a quality product." NL7TB

SPECIFICATIONS

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10, 12, 15, 17, 20, 30, 40 M
(80 M with optional add-on)

HEIGHT

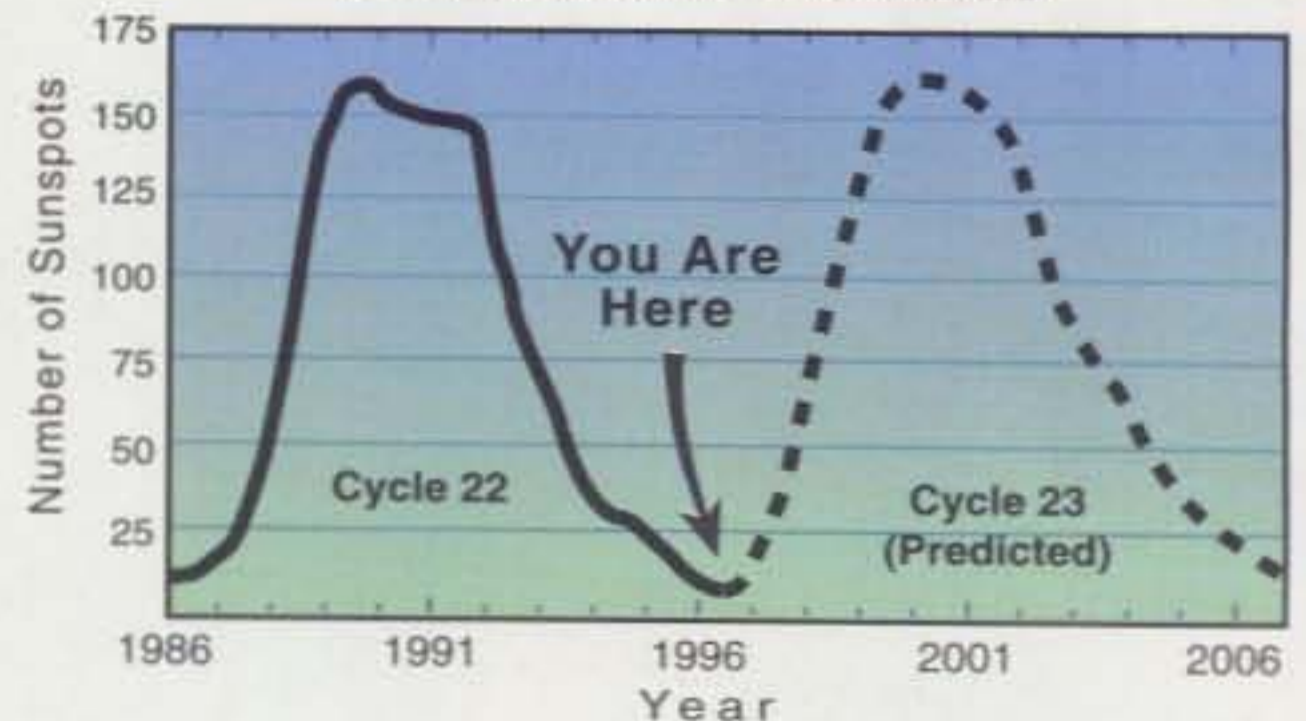
R7000 - 24 feet (7.3 M)
R7000+ - 32 feet (9.8 M)

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The cold winter of low sunspots is thawing. The solar flux will soon begin its steady climb. Cycle 23 begins Now - and Now is the time to start your station upgrades. As each month passes, DX will find its way from 20 to 17 to 15 to 12 to 10 meters. Don't miss the action. The best operating conditions are just ahead.

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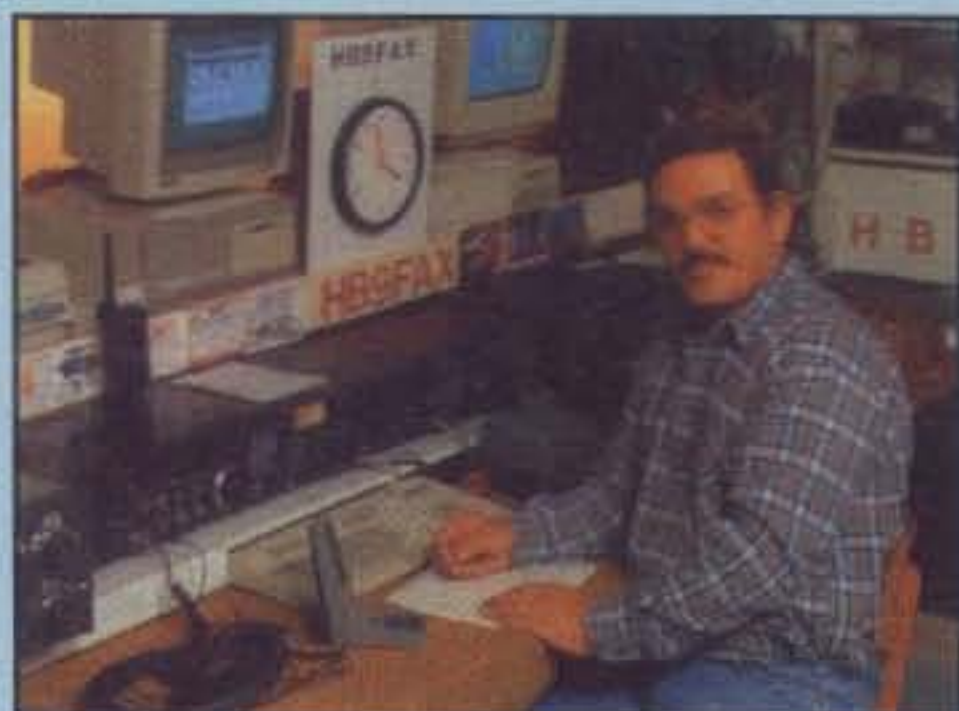
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ON THE COVER: Dreaming about the Jolly Elf in your life gracing you with a new rig this Christmas? Thanks to many hours of electronic image manipulation on the Macintosh 8500 computer by CQ's Electronic Composition Manager Ed Pesonen and Art Director Elizabeth Ryan, our cover this month is a composite of nine different 35 mm slide images by Larry Mulvehill, WB2ZPI. Larry scanned each slide in a Nikon CoolScan and e-mailed them to our Art Department. The initial cover concept was mocked-up by Larry and then was further developed in-house. It's getting so that we can't even trust the old adage "The camera doesn't lie."



Affordable DSP You Can Take Everywhere

NEW!

Kenwood introduces affordable Digital Signal Processing technology to everyone with the all-new TS-570D. Imagine a DSP radio that you can operate in the shack, the car, or on a remote DX island. The TS-570D is the first DSP rig that meets the needs of today's HF operator within a budget. From the first moment that you hear the incredibly clear and powerful audio and operate the new, common-sense ergonomic design, you will realize the TS-570D is the HF rig built for you.

The TS-570D offers the world's first CW AUTO TUNE feature which eliminates VFO adjustments during CW operation. The RCP2 Radio Control Program also allows the HF operator to design and program multiple radios with custom settings while conveniently saving them to a PC file for future use. Advanced Kenwood design and features coupled with traditional Kenwood HF performance make the TS-570D a masterpiece that you can proudly operate. If you have been waiting for a new DSP HF radio with performance at an affordable price, wait no more.

Large LCD display features a 4-stage dimmer while the **7-digit alphanumeric sub-display** provides menu mode guidance, split frequency display and digital filter selection options. Easy-to-read **S/PWR/COMP/SWR/ALC** meters and an operating guidance feature helps to greatly simplify operation.

16-bit DSP technology delivers superb audio quality on both transmit and receive. **Noise reduction** (line enhancer method and SPAC), **audio equalization** (voice/transmit equalizer and speech processor), **slope tuning** and **IF filter bandwidth selections** can be operated with a touch of a button.

Power output can be set between 5 ~ 100 watts in 5 watt increments. 5 watt setting is ideal for QRP operation.

World's first CW Auto Tune eliminates VFO adjustments during CW operation.

Preset auto antenna tuner

10-key direct frequency entry

Quick memory provides five channels for on-the-fly frequency control: **MIN** stores data, **MR** recalls it.

Electronic keyer provides speed settings of between 0 and 100 wpm and dual key inputs on the back – one for the paddle and one for the key.

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A wealth of scanning capabilities enhance operability. Scan speed is variable and can be set for time-based or carrier-based resume. Scanning can work across channels, groups of 10 channels, all except locked out channels, or it can be programmed to scan a frequency range between two channels.



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- CW message memories • CW reverse mode • Full break-in and semi break-in
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ZERO BIAS

AN EDITORIAL

Another year draws to a close and a season of hamfests is history. Next month we begin the promise of a new year and, with luck, all the wonderful things that a new year can bring. What's been interesting this past year is that I've met a number of amateurs who are re-entering the fold. For the most part, these are people who have kept up their licenses but have been inactive for a number of years because of school, marriage, career, family, divorce, and other social and economic pressures. Although there are many varied reasons for being inactive, there is a curious thread of universality among all of them.

Each amateur in his or her own way picks up the hobby with the same prior intensity and speaks in a frame of reference that coincides with the point in time when he or she left off. It's as if only one day had gone by instead of ten years, two years, or whatever. It's the hope of resuming a pleasant part of life, an anchor on personal control, and a return to simpler times. Sometimes, though, you have to explain that what they would like to return to no longer exists. The modes of operation are different, the gear is most certainly different, and the opportunities to do far more are greater. It becomes almost the same problem as explaining amateur radio to someone new.

Obviously, the first question you ask is "What is it you would like to do?" In the case of someone new to the concept of amateur radio, that question is usually met with a blank stare. He or she generally doesn't know what is available to choose from, or even what some of what you are talking about means in real life. The returning amateur at least has an overview of what used to be, and so the concepts of band, mode, and antennas and such do ring a familiar bell. You might have to explain the addition of a few more license classes and what they mean. And then there's the availability of a lot of sophisticated equipment that will do practically anything, and new prefixes and vanity callsigns. It's a lot to take in at one time, even if you can follow it in general terms.

The key, though, is the frame of reference built up over a period of time and experience. There are no stumbling blocks or hurdles to overcome, no Morse code tests to explain or rationalize, no impediment other than time and money to get them back to Nirvana. It's not that easy to do with someone who knows little or nothing about amateur radio. In that case there is no frame of reference to draw upon or logical answer that makes any sense. It takes the actual exposure and day-to-day experience to impart meaning to what we do.

Perhaps in 1997 some clubs might want to do a quick Zip Code sort of amateurs liv-

ing in an area and then do a simple mailing to invite them to a meeting or activity. It might reawaken an interest in amateur radio for a number of our silent majority. It seems to me to be a simpler and much easier way to increase amateur activity. With regard to increasing our ranks with new people, we first are going to have to resolve some of our petty squabbles with respect to requirements.

I know that a lot of you do not feel the ongoing Morse code debate is petty, but that's what it looks like to outsiders and people looking at our hobby. Recently there were some pro-Morse comments written whereby continuation of the requirement was substantiated by the actions of a fictionalized character in a motion picture. I guess that makes about as much sense as anything else. In October when the MARS system gave up Morse there were rumors of mass resignation over the policy. That's pretty strong emotion on display, to value a mode to that extent and be willing to leave not only the activity, but our servicemen and women in a lurch over that belief. I guess from that we are to believe that the mode is far more important than the assigned task. It doesn't help make us very attractive.

If we're going to continue to have Morse code as a requirement, so be it. However, if it's going to die, we should at least be merciful and do it quickly with compassion and sensitivity. We have shared our lives with this requirement/ mode, and it's certainly worthy of respect and honor. That it will pass as a requirement is a certainty, but when is anyone's guess. At that time we all will miss the requirement—those who loved it and those who hated it—and we'll continue to talk about it for years to come. The mode will go on, and new people will be attracted to it, while others will still grumble and reminisce about the good old days.

Nobody likes to lose anything, especially if he or she had to work hard to achieve it. Those of us who are old enough remember the Incentive Licensing debacle and what it did to the hobby. On the other hand, nobody gets too upset when someone can sit down and take all the exams through Extra at one sitting. It wasn't that long ago (maybe it was, but I still remember the requirement) when you had to wait two years plus produce a valid log for that period to go from General to Extra. Those who invested the two years may feel cheated.

Maybe we can resolve everyone's sense of loss by a few quick changes in the licensing system. With these changes nobody would lose anything. First we would freeze the existing license classes that require code. Those who have them would continue to have them, but no new ones would be issued. New parallel license classes, with

new names (these would indicate the non-code requirement) would be issued. The name difference could carry the social and emotional stigma that some of us require to feel better and more real than someone else. Eventually, with time, the one would phase out in favor of the other. People who care could enjoy the status throughout their lifetime. "I've got mine" would stay with you right through to Silent Key. Anyway, it's just a thought, and not a proposal.

A Last Look At '96 and On To '97

How did you fare in 1996? I fared pretty well. My shack is virtually complete, and I finally cleaned up the rat's nest of cables coming into the house. A bit more to go in '97, and it all should be finished. Most of the weird hardware, brackets, and fittings that some of you have seen me buy at hamfests has at long last been put to good use, so by next year's hamfests I will be looking for replacements for at least some of it, plus new "good stuff," of course.

I hope we all get at least some of the things we'd like for the holidays. One great item we have this year, courtesy of Lew Ozimek, N2OZ, is an annual index (see page 116). It's been 17 years since the last one, and we all would like to thank Lew for this one.

This year, if you're looking for a few holiday gifts for some new amateurs, why not consider an investment of your time? A lot of us help get people interested in amateur radio, get them through the licensing process, and then leave them to fend for themselves. Why not consider "giving" them a few hours of your time and expertise to get them going? If the hobby has been good to you, and you enjoy it, why not share that with someone else? It's a way of giving back what someone else did for you, probably a long time ago. It doesn't cost anything but time, and it will be remembered a lot longer than a token gift. Even if you don't have all of the answers (and most of us don't), you do have a frame of reference and should know where to look it up.

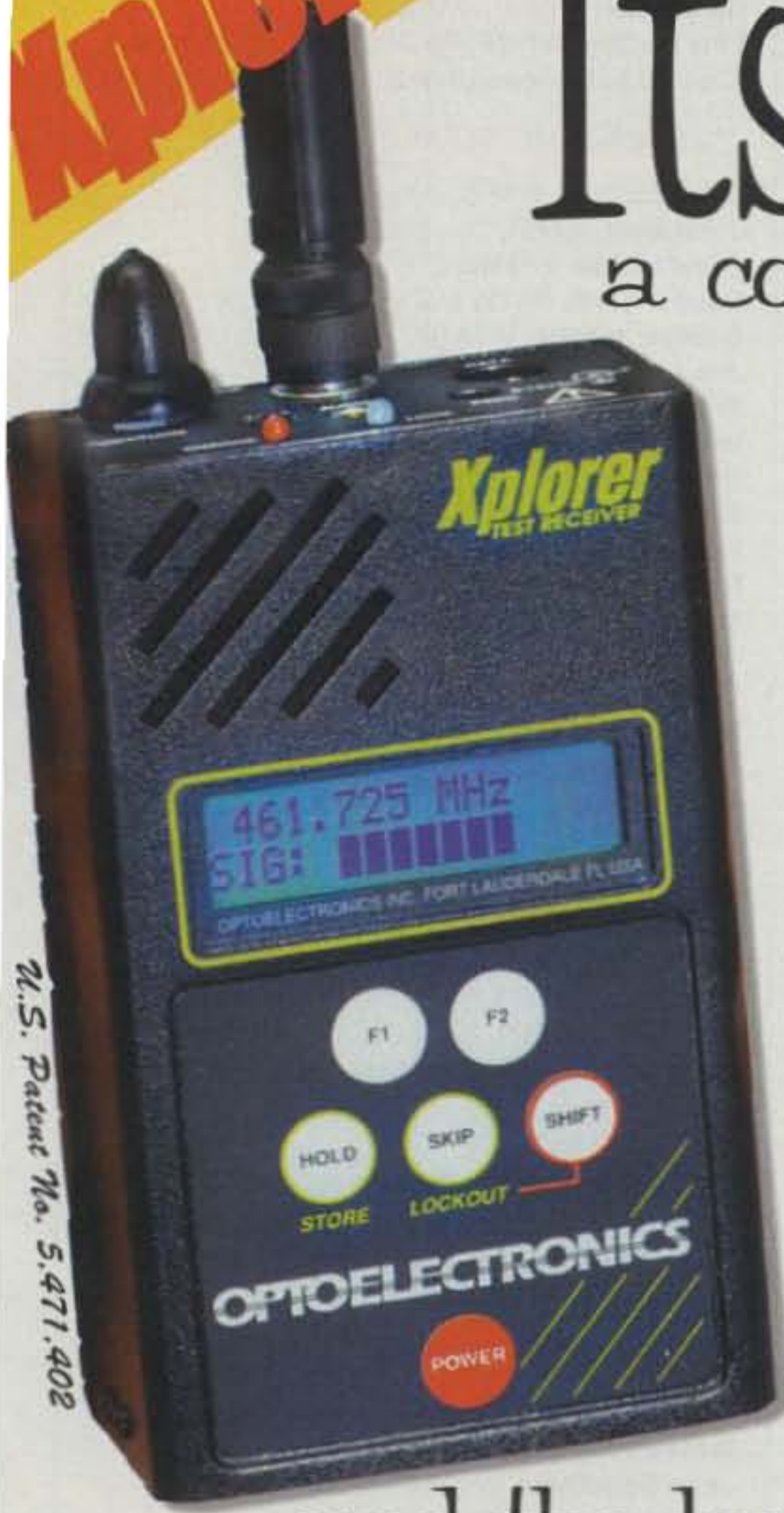
What about you? Do you still have the capacity for awe and wonder at all the great things our hobby has to offer? Do you still say "Wow!" when you see something new and intriguing? I hope so, because I do, and it's a marvelous feeling to remain excited about a hobby after 43 years. This holiday season take a look around at all the terrific things that amateur radio has provided you with and hang on to that feeling.

All of us here at CQ wish you the very best holiday season ever, and a great new year. We're all going to bask in sunspots soon.

73, Alan, K2EEK

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- High speed FM Communications Nearfield Receiver, sweeps 30MHz - 2GHz in less than 1 second
- Two line LCD displays Frequency and either CTCSS, DCS, DTMF, Deviation or Signal Strength
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OUR READERS SAY

A Chance For Everyone

Editor, CQ:

Many thanks for offering the CQ VHF Contest (in July), which gives the small guys a chance against the big guns and is easy on us newcomers. Also, I will be sending in a subscription for CQ VHF magazine. I have purchased as many editions as possible from the local newsstands, but they are not always available and are about two weeks late. Thanks again for an outstanding magazine and for coming up with a contest for the newcomer and small gun.

Barry Sampson, KE4PZT
Louisville, KY

Looking For A "Sea of Sparks"

Editor, CQ:

About a year ago I heard a radio program about a book called, I believe, *Sea of Sparks* about a female CW operator on board a ship in WW II. I have not been able to track down this book and wonder if anyone at CQ could be of help! I have even called the Library of Congress, but they couldn't help.

I am a British citizen currently in Haiti (with the UN). Due to regular black-outs (electricity shortages) I operate a Yaesu FT-80 barefoot to a dipole off a set of car batteries, and use a candle to illuminate my log. Nonetheless, working CW on 20 meters is a pleasure, as is moving to some of the SSB nets for DX contacts. I am usually quite busy, as there aren't many HH callsigns out there actively working.

Hope you can give me some guidance on this book. I'd really appreciate it.

David Meadows, HH2MED
P.O. Box 1095
Port-Au-Prince, Haiti, W.I.

CQ More Readable

Editor, CQ:

I noted that you were convinced to make the print in CQ a little heavier so we can read it! The fine print on the glossy paper was difficult for some of us.

And by the way, whatever happened to the photo of my friend Fred Lass's (K2TR) shack and beautiful antenna farm in Altamont, New York? I guess it was last year when I was up there to visit and a CQ photographer was supposed to show up the next day. (See the cover of our August issue of CQ.—ed.)

Nice that you mentioned Joe Fairlough [of WB2JKJ Junior High School 22 fame]. I am one of his supporters. I was born in the Bronx, but when I got out of the Army (Sig C) I went to work at the Pentagon (31 years with the Sig C). However, I still love the small town in the Catskills where I grew up as a teenager and where my high school teacher got me into ham radio.

It's also nice that you mentioned Bob Cox, K3EST, a fellow PVRer (I am a charter member of the PVRC).

Bill Schuchman, W7YS
Flagstaff, AZ

From A Septuagenarian

Editor, CQ:

THANK YOU! The heavier type is much easier to read. My septuagenarian eyes appreciate the change. Also, W6SAI's HF Antenna Hand-

book (published by CQ—ed.) is a real winner. Thanks for that, too.

Bob Hickman, AA5WE
Copperas Cove, TX

VHF/UHF/Microwave Enthusiasts

Editor, CQ:

On behalf of the Eastern VHF/UHF Society, I extend our sincere thanks for your most generous donations of door prizes for our 1996 conference. Our group is a non-profit organization that is dedicated to the proliferation of helpful information and components applicable to the state-of-the-art VHF, UHF, and Microwave radio communication techniques.

Once again this year our conference, held near Hartford, Connecticut, had an attendance in excess of 125 people from Virginia to Canada to Ohio. Our door-prize drawing is just one of the activities that our attendees look forward to. Our goal is to provide enough material so that everyone is able to win something. Through your generosity we were able to meet our goal.

Each year we try to increase our attendance by about 10% and keep the experimentation side of ham radio alive, as VHF/UHF/SHF is still a new frontier for many technically oriented people. Again, our heartfelt thanks for helping make this part of our conference a huge success!

Fred Stefanik, N1DPM
Feeding Hills, MA

Wake Up; Keep Pace

Editor, CQ:

I have been giving the subject of CW a lot of thought. The WRC-99 Survey prompted me to put some of them down on paper. It is time we pulled our heads out of the sand, instead of being ostriches about it. We are in a high-tech, fast-developing electronics world. I am hearing reports that phones will be as common in automobiles as they are in our homes. Laptop computers are being used from autos. The baud rate on other types of communication makes our human capabilities void and useless. Even television science talks of CW as an archaic means of communication. I could go on and make more suggestions, but I do not want to take up your time.

CW will not change a person's character or morality. If a person's character and morality are bad before learning code, they will be bad after. Learning the code should be up to the individual. For those who want to use CW, let them, but not as a requirement for an amateur radio license. Set aside portions of each band for CW. Add to the tests more questions about being a good, considerate operator; maybe more questions in the technical and regulatory categories.

I feel that if we don't wake up now and keep pace with electronic advancements, we soon will be an archaic part of communications past. Many of the Generals, Advanced, and Extras after a period of time are just barely be able to send 5 wpm. They pass the code to upgrade to the class of license and stop. Take a census of Generals, Advanced, and Extras and ask them how often they use code, and what their rate of copy is now? The other day an Extra friend of mine told me he doubted if he could copy 5 wpm. I think you will be surprised at the results of the census.

Frank P. Wilson, KA8ITA
Flushing, MI

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A publication of



CQ Communications, Inc.
76 North Broadway
Hicksville, NY 11801-2953 USA.

Offices: 76 North Broadway, Hicksville, NY 11801.
Telephone: (516) 681-2922. FAX: (516) 681-2926. CQ (ISSN 007-893X) is published monthly by CQ Communications Inc. Second Class postage paid at Hicksville, NY and additional offices. Subscription prices (all in U.S. dollars): Domestic—one year \$24.95, two years \$44.95, three years \$64.95; Canada/Mexico—one year \$37.95, two years \$70.95, three years \$103.95; Foreign—one year \$39.95, two years \$74.95, three years \$109.95; Foreign Air Mail—one year \$84.95, two years \$164.95, three years \$244.95. U.S. Government Agencies: Subscriptions to CQ are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed. Entire contents copyrighted CQ Communications Inc. 1996. CQ does not assume responsibility for unsolicited manuscripts. Allow six weeks for change of address. Printed in the United States of America. Postmaster: Please send change of address to CQ Magazine, 76 North Broadway, Hicksville, NY 11801.



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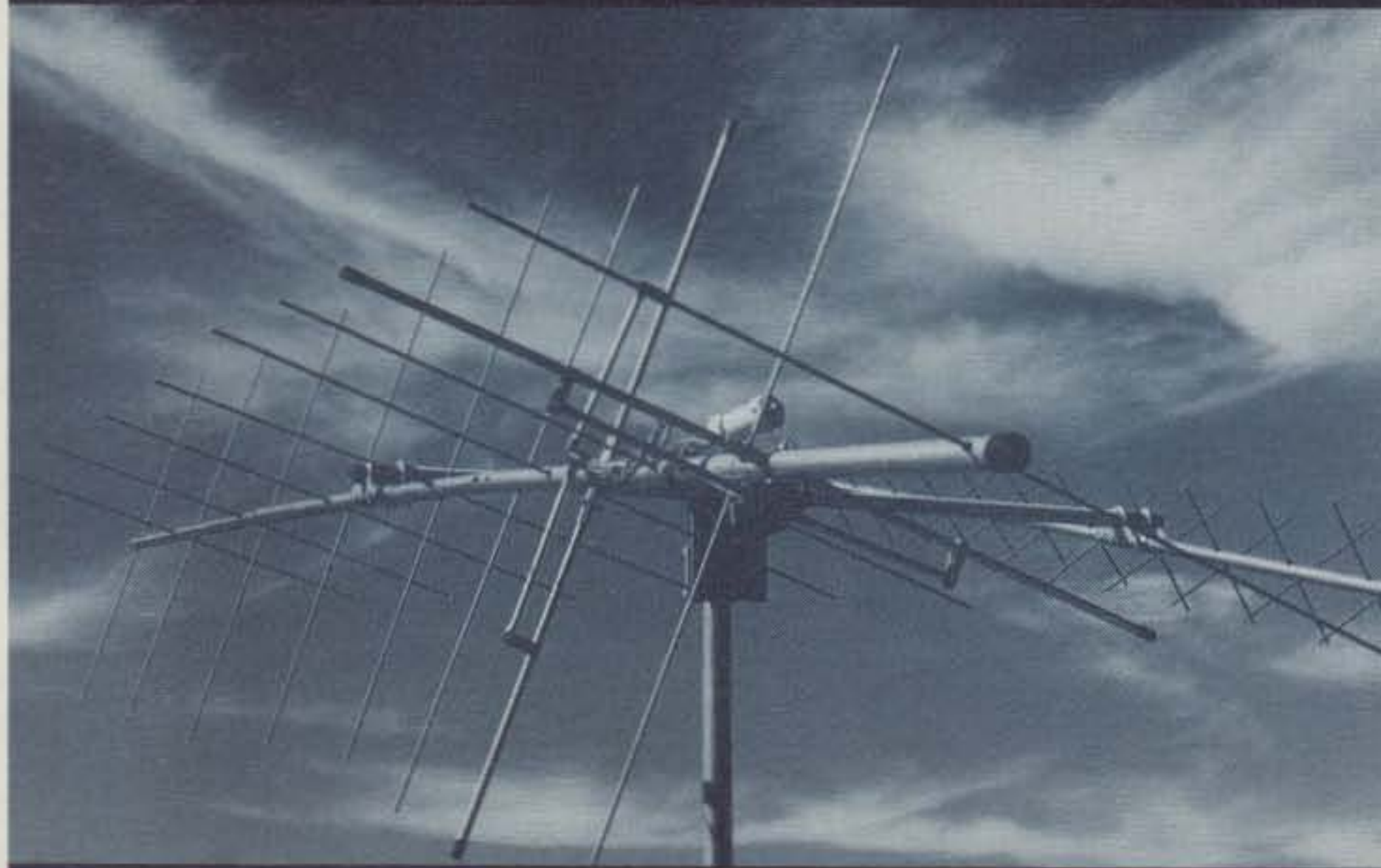
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ANNOUNCEMENTS

• The following Special Events are scheduled for December:

W1BCG, from Greenwich, Connecticut; SARA; 75th anniversary of the Transatlantic Tests of 1BCG; 2200Z Dec. 11 to 2400Z Dec. 15, on 1815 kHz CW only, using an exact replica of the original transmitter. Also, Dec. 13 through 15 on 80-10 meters, all modes. QSL to SARA, P.O. Box 4225, Stamford, CT 06907-0225. Send 9 x 12 SASE for certificate.

W3OK (possibly WX3MAS), from the twin Christmas Cities of Nazareth and Bethlehem, Pennsylvania; The Delaware-Lehigh ARC; to celebrate the Christmas Season; 1400-0200Z Dec. 14 and 15; operation on 3.965, 7.265, 14.265, 21.365, 28.365. For certificate, send QSL and 9 x 12 SASE to DLARC, RR 4, Grey-stone Building, Nazareth, PA 18064.

KE4AG, from Ft. Christmas, Florida; The Coronado Wireless Association ARC; to commemorate Christmas at Ft. Christmas, FL; 1400-2200Z, Dec. 14 and 15; 25 kHz from the bottom of the General phone subbands on 40, 20, 15, and Novice 10 meter phone sub-band. For QSL send QSL and SASE to Coronado Wireless Assoc., Ft. Christmas Special Event, 316 South Ridgewood Ave., #35, Edgewater, FL 32141, Attn: Don Benham.

5-land, from Houston, Texas area; Clear Lake ARC; to celebrate the end of hurricane season in the Gulf of Mexico and to promote hurricane awareness; 0000-0000 UTC, Nov. 30 through Dec. 2; operation on the General portions of the HF bands plus KA5GLX repeater (442.75 MHz, tone 103.5). For certificate, send QSL and 9 x 12 SASE to member station worked.

WA7USA, from Mesa, Arizona; East Valley Amateur Radio Group; to commemorate the battleship *USS Arizona*; 1500-2400Z; Dec. 6 and 7; on 14.240 and 21.340 MHz. For a certificate send QSL and 9 x 12 SASE to EVARG, 3264 E. Carol Ave., Mesa, AZ 85204-3245.

•The following hamfests, etc., are slated for December:

Dec. 1, **30th Annual Swap & Shop**, Hazel Park High School, Hazel Park, Michigan. Contact HPARC, Box 368, Hazel Park, MI 48030.

Dec. 8, **Ham Radio & Computer Fleamarket**, Ashwaubenon High School, Green Bay, Wisconsin. Contact Scott Cole, KB9AMM, P.O. Box 12631, Green Bay, WI 54307; exam info contact Keith Summers, N9NOF, 918 Bluebird St., De Pere, WI 54115 (414-336-6087); e-mail <n9pay@sparknet.net>; packet <N9PAY@KB9ALN-5.#GRB.WI.USA.NOAM>; or on Web <<http://www.sparknet.net/~n9pay/fest.html>>. (Exams.)

Dec. 14, **Central Illinois Winter Superfest**, Turner Jr. High School, Jacksonville, Illinois. For more information contact Tim Childers, KB9FBI, 773 E. College, Jacksonville, IL 62650 (217-245-2061). (Exams.)

Dec. 14, **Columbia ARS 2nd Annual Hamfest/Tailgate**, Florida National Guard Armory, Lake City, Florida. For more information, call 904-755-7969.

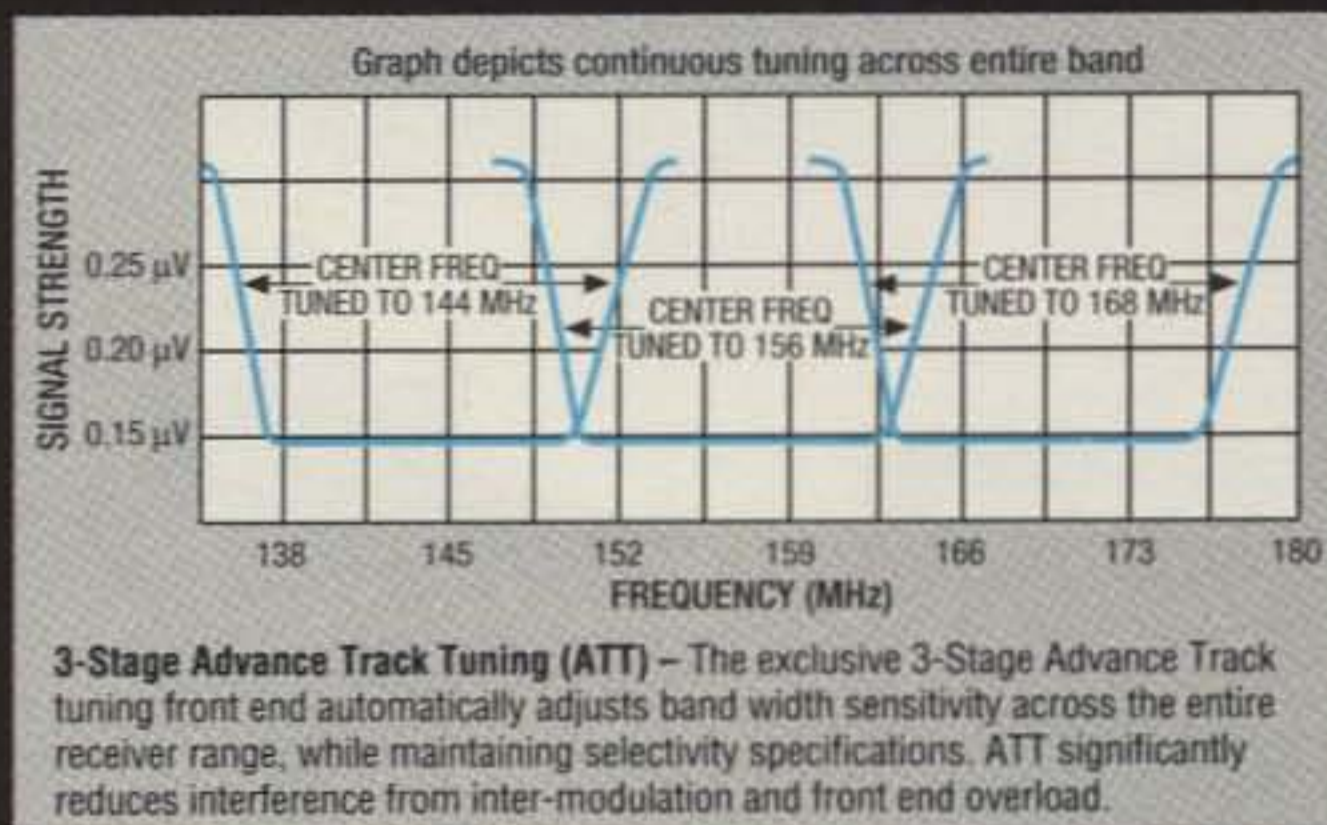
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Results of the 1996 CQ WW DX 160 Meter Contests

BY DAVID L. THOMPSON*, K4JRB

This was the year of the million-plus score! The past several years we were only a couple of QSOs or a multiplier away, but in 1996 four stations burst through the million mark. Led by P40WA's 1.276 million points, there were three CW single operator stations (P40WA, VP9AD, and ON4UN) and one CW multi-operator (PJ9Z). Mike at P49I was again within earshot of the million mark, and he had to borrow P40V's transceiver to operate.

In spite of the big scores activity was down, with 4269 CW stations and 5062 SSB stations in the master log. This is a slight increase over 1995, but still a healthy total for a band almost given up as useless just two dozen years ago. Over 90 contestants worked all 50 states, and over 100 stations worked 50 or more countries on CW. Even on SSB, 23 stations worked over 50 countries. The number of logs dropped about 10% on CW and 16% on SSB. Many who did not send in logs would have won a certificate, too.

The master log shows 4301 CW and 5212 SSB stations active, or an increase of 203 stations. While not as dramatic an increase as 1994, this shows that 160 can support a large volume of contest stations. There were 127 countries logged on CW with goodies such as XV7SW, and 119 countries logged on SSB with goodies such as H44MS. Contesters on all continents are building better antennas for both transmit and receive, so if you are looking for states or countries, this is the place!

The biggest drawback to working transcontinental DX is the wall-to-wall QRM. 5N0MVE and PT7BZ say that North America and Europe forget about stations to the south. This is the reason for the DX Window. The CQ Contest Committee is again asking that stations stay out of the window (1.830 to 1.835 MHz) from dusk to dawn local time. Please remember this is a DX contest with a fringe benefit of WAS and WAE thrown in. *Please do not park your CQ machine in the window, and have the courtesy to allow others to have a crack at the DX.* Too many DX stations in Asia, Africa, and South America don't participate because they can't be heard. Let's make the window work and bring these stations back.

VP9AD set the CW single operator QSO record with 1 630 QSOs. Other CW entries topping 1400 QSOs included W2GD (1514) and WW2Y (1437). Twenty-four CW stations broke the 1000 QSO barrier. WB9Z made 1643 SSB QSOs for a new single operator record, and only fell a dozen short of his all-time QSO mark made in 1995 as a multi-operator. Five SSB stations broke 1400 QSOs, and 14 made 1000 or more QSOs. These were unheard of just a

*4166 Mill Stone Court, Norcross, GA 30092



HB9FAX and his neat shack. Must be before the contest!

few short years ago. ON4UN operating his own station worked 79 countries on CW, followed by W2GD and 9A1A with 70. IR4T led SSB with 68 countries. ON4UN (64), GI0UJG (63), and IV3TAN (61) all topped 60 countries on SSB. The top USA/VE on CW was W2GD with 70 countries, and VE1/KA1BQ with 51 on SSB. European stations dominated the DXCC count again, but 12 W/VE topped 50 countries on CW.

Next year (1997) is expected to be another year of very low sunspot counts, and the experts aren't sure if the new cycle has started. With the solar flux lower than 70 most days, this spells excellent worldwide openings on both modes. Get those transmitting and receiving antennas ready for what could be the most exciting set of contests ever! And remember to obey the rules, properly submit your logs, and have fun!

Correct Logging is A Skill

Did you know that correct logging is a skill? It entails making sure all the calls are logged correctly, your time and date are precise, and every contact has the points and location correct. The major logging programs can cause errors that cost you points. Remember to check your log and correct all errors before submission. If you print or hand-write your log, make sure it's readable and multipliers well marked. Total each page and include a summary sheet at the front of the log with total QSOs, points,

W/VE, and DXCC +WAE multipliers all well marked. Make sure the claimed score is highlighted, and if you want the log to count for a club, put that in the competition line between the score summary and the signature. A pre-printed club listing at the top will be ignored. Logs can either be done by hand or by computer. Computer logs must be printed completely unless a diskette is attached. For logs on diskette, all that need be printed is the summary sheet and the complete dupe list. Make sure the dupe list does not run off the page, and send the log to me on time to assure proper credit.

Understand that either hand or computer logs are encouraged and accepted. All logs are checked the same way. There is an automatic penalty for logs without dupe lists or the proper paperwork. The contestant must score the log and not leave that to the committee. Remember: The log reflects on your professionalism, so do your best!

CW Contest January

The top single operator score came from P40WA, operated by K9UWA. The 1.276 million is a new all-time CQ 160 record. N3RD at VP9AD had the most QSOs to finish second with 1.22 million points. ON4UN manned his own station to 1.124 million and third place. Mike, P49I, was third with 974K, and VE3EJ with 742K rounded out the top five.

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PLAQUE WINNERS AND DONORS SINGLE OPERATOR

CW

WORLD BY K5AAD (W5MBB Memorial): Winner John Goller, P4ØWA (K9UWA).
USA BY K4TEA: Winner Andrew Blank, N2NT (W2RQ Operator).
CANADA BY K2UFT: Winner John Sluymmer, VE3EJ.
ZONE 3 BY SEDXC (KM4MG Memorial): Winner Preston Smith, N6SS.
ZONE 4 BY KR4DL: Winner Jerry Rosalius, WB9Z.
ZONE 5 BY WA4CUG: Winner Jon Zaines, AA1K.
AFRICA BY K4MZW: Winner Marc Vanoverbeke, 5NØMVE.
ASIA BY NE4S: Winner Riki Kline, 4X4NJ.
EUROPE BY W8UVZ, WØCD, and K8GG: Winner John Devoldere, ON4UN.
OCEANIA BY K9UWA: Winner Jack Wheeler, KH6CC.
SOUTH AMERICA BY K4JAG: Winner Mike Greenway, P49I (K4PI).
JAPAN BY WØZV: Winner Kei Hara, JH5FXP.
NORTH AMERICA* by CQ (N4IN Memorial): Winner David Hawes, N3RD, operating VP9AD.

SSB

WORLD BY K5AAD (W5MBB Memorial): Winner John Sluymmer, CF3EJ (VE3EJ).
USA BY K4JRB: Winner Jerry Rosalius, WB9Z.
CANADA by VE3AQH: Winner Pier L. Iovino, VE1/KA1BQ.
ZONE 3 BY N4TMW: Winner Bob Wending, NW6N.
ZONE 4 BY N4UCK: Winner Jon A. Barclay, AA5BL.
ZONE 5 BY K4ODL: Winner Peter Hutter, WW2Y (AA5B Operator).
AFRICA BY WB4ZNH: Winner Juan Salvador P. Rodriguez, EA8PP.
ASIA BY SEDXC (W4LVM Memorial): Winner Sheridan Street, A92BE.
EUROPE BY N4NX: Winner John Devoldere, ON4UN (ON4AFZ Operator).
OCEANIA BY KM4FV: Winner Jack Wheeler, KH6CC.
SOUTH AMERICA BY AE6E: Winner Carl Cook, P4ØV (AI6V).
NORTH AMERICA* by CQ (N4IN Memorial): Winner Richard Zalewski, XE2DV.

MULTI-OPERATOR

CW

WORLD BY N4RJ: Winner PJ9Z (W8UVZ, K8GG, WØCD Operators).
USA BY WS9V: Winner John M. Crovelli, W2GD.

SSB

WORLD BY SOUTHEASTERN DX CLUB: Winner John M. Crovelli, W2GD.
USA BY WB9Z: Winner Ron Hooper, AB4RU.

*North America outside USA and Canada.

W8UVZ and gang hit the multi-op trail again this year and scorched 1.075 million for first place and a new all-time multi-op score as PJ9Z. The PA6A group followed in second place, and led Europe with 880K. The USA took positions three to five, with W2GD, WW2Y, and W1KM burning the band for 4329 total QSOs! N2NT was the top USA score, and 8P9DX and T11C both made impressive North America scores. AA1K is making a habit of being the number two USA score, and AA5BL's log is starting to look like an effort from New Jersey rather than Texas. KC8MK, K4VX, K8CC, and KVØQ all made impressive scores away from the East Coast.

Outside the top five multi-operator scores, RK2FWA made 1183 QSOs and worked all the way to the West Coast. XE2/WA7UQV could only get 20 to 80 watts into the antenna, but still made nearly 350K. AB4RU, KD9SV, AAØRS, N4RJ, WD9INF, N6DX, and N7JW (Nevada) all made impressive multi-op showings.

There were numerous close races on CW. N2NT and N2LT in New Jersey, W3BGN and W3GH in Pennsylvania, KJ5WX and W5KL in Arkansas, K6NA and NW6N in California (NW6N has moved to Arizona), K9JF/7 and K7FR in Washington, JH5FXP and JA5BJC in Japan, and SP5GRM and SN3A in Poland were close in the single operator category. W2GD and WW2Y were the top stateside local

multi-operator battle, and LY3BS and LY7A virtually tied in Lithuania. Switzerland was close in both single and multi-operator categories.

Tight CW single operator races in New York, Florida, West Virginia, Indiana, Japan, Finland, Germany, Romania, Russia, and Sweden—plus multi-op races in New Jersey, Michigan, Colorado, and Germany—highlighted the certificate hunt. Often only a few contacts or an extra multiplier mean the difference.

N4ROA was the top QRP score with nearly 52K and 429 QSOs. Thirty-one hardy contestants entered the QRP division. YU7BJ narrowly nudged out HA8BE for the top low power score. K7SV was third and the top USA low power scorer. Thirty-four low power contestants scored better than 100K. There was some sharp QRP and low power operating to make these scores. All of the top ten and individual state/province/country winners get certificates if the QRP score is over 1000 points or the low power is over 5K.

SSB Contest February

For the second year in a row John, CF3EJ (VE3EJ), scored the world high single operator score by racking up 1500 QSOs and overcoming second-place VE1/KA1BQ's big lead in DXCC multiplier. Another Aruba station, P4ØV, edged out ON4UN operated by

ON6XXX by less than 1000 points. WB9Z (378K) blasted into fifth place with 1643 QSOs and bested AA5BL (360K) for USA high. AA5BL's log looked closer to a VE1 log than one from Texas. WW2Y came in third in the USA with a third score over 300K, at 313K. These scores were impressive enough, but also were sixth and seventh world high.

Ever-present KH6CC finished in eighth place, GIØUJG placed second in Europe and ninth in the world, and VE3DXV provided another fine Canadian score for tenth place. The difference between eighth and tenth place was a mere 2215 points. W3GH pushed passed the 200K mark and just missed the top 10 from Western Pennsylvania.

There were 19 QRP entries, with WT3W again taking the top spot and USA high. YU1EA was the top DX QRP score. All winning entries over 1000 points get certificates again this year. Low power was hotly contested, and GIØUJG (ninth world overall) took the top slot. YU7BJ came in second, while N5IA bested K1HTV for USA high.

ON4UN worked 64 countries for the top DXCC worked, barely nudging out GIØUJG with 63. VE1/KA1BQ with 51 was tops on the VE/USA side, while AA5BL worked 44 countries from his Texas site for top USA. Eleven stations worked 50 or more countries on SSB.

Six stations topped 1000 QSOs in the SSB single operator category, led by WB9Z (1643), CF3EJ (1500), AA5BL (1421), WW2Y (1237), W3GH (1067), and KVØQ (1012). KVØQ, KD9SV, and AAØRS made impressive scores away from the East Coast.

W2GD ran up 1412 QSOs to lead the multi-operator stations. AB4RU was a strong second, with IR8T leading the DX and European contingent into third place. Midwest powerhouses AA8U and WR8C placed fourth and fifth. XE1RCS just missed the top five, and according to Vic, XE1VIC, this was the first all Mexican multi-operator effort on SSB. They finished sixth and logged 27 countries. Come back again!

Close single operator races occurred in New Hampshire, New York, Mississippi, Ohio, Wisconsin, Russia, and Sweden, with close multi-op races in Pennsylvania, Texas, and England. The Mississippi race had three contestants within an eyelash of each other. Didn't hear much of that "Where was Mississippi?" this year on SSB.

Club Competition

The Frankford Radio Club scored just over 9.5 million points to beat out runner-up Southeastern DX Club by 5.7 million. The Yankee Clipper Contest Club scored a strong third with 3.72 million points, and the Slovenian Contest Club dropped slightly to fourth place with just over 3 million points on single operator scores alone. Fifth place was a dog fight, with the Mad River Radio Club edging the Rhine Ruhr DX Association and the North Coast Contesters. Again an impressive number of clubs scored over 1 million points. Set your goal at 500K or 1 million and watch your operators grow in skill and confidence.

Club competition is a "for fun" category that fosters higher scores and more entries. Remember that three logs are required for a club to be listed. Please try to keep the club name or abbreviation the same for all entries. If the clubs send me a list of members, I'll make sure



IK2VJF's location was inside a partially constructed TV antenna structure. He said it was cold in the elevator control room shack. This photo shows the outside of the tower and TV building.

you get every possible credit (unless the competitor has clearly marked another club). Make sure the club is clearly noted under Club Competition, or the score may not be included. A club or group pre-printed at the top of the log is not sufficient for entry in the club score.

Helpers

Our thanks to two PCs (a 386 laptop and a 486); Helen, (N4IN's XYL); my XYL; Jean; and Gail and the CQ staff for their help and assistance. Every year logs are still sent to N4IN's XYL. Please pass the word to send them to me. K4ODL and NK4U are helping with the plaques. We still need sponsors, so if you would like to sponsor a plaque, let me know.

Errata

Over the past few years there have been a number of requests for changes in areas such as contest exchange, hours the contest runs, topics related to the DX Window, adding more classifications, and making the USA District of Columbia as a multiplier. Several of these are under consideration. For 1996 the contest committee decided to give a District of Columbia (DC) entry a certificate, but no decision has been made regarding a separate multiplier for

DC. For 1997 DC is another Maryland contact.

Seven stations were sent warnings covering areas such as unverified contacts, not scoring their logs, and excessive "not in the log" contacts. A second warning could mean a heavy penalty or disqualification. One station had their score reduced 42% and through negotiation decided to withdraw their log and not enter the CQ WW 160 contests for three years.

Next Time

The 160 Meter CW Contest will be held the last full weekend in January 1997 (January 24 to 26). The SSB Contest is the last full weekend of February 1997 (February 21 to 23). Times for both contests are 2200Z Friday start and 1600Z Sunday end. You penalize yourself if you miss the 2200Z start, as up to 60% of the winning scores are made in the first 6 to 9 hours. Contacts made after 1600Z on Sunday carry a double penalty.

If you need a paper log or summary sheet, send a business-size SASE or SAE with 1 IRC to CQ 160 Contest, CQ Magazine, 76 North Broadway, Hicksville, NY 11801 USA. Make sure your computer log program puts 40 or 50 QSOs per page and provides totals for QSOs, points, and multipliers on *each page!* Every contact should include a location, such as 599GA or 59GW. Multi-operators should either list the operator on each page or provide a summary of operator/hours. There are only two classifications—single operator or multi-operator. Using packet or spotting net makes an entry multi-operator. Low power and QRP will be noted as per the complete rules. Multi-operator stations are all listed as high power!

The CW mailing deadline is February 28, 1997, and the SSB deadline is March 31, 1997. The only exception is both logs can be sent at the same time to arrive no later than the SSB deadline. Logs with postmarks after the deadline or that arrive after May 1, 1997 are subject to being labeled "checklogs." I prefer a self-addressed envelope or postcard or SAE with an IRC if you want a confirmation. I will also confirm via e-mail if you list your address. **Please no e-mail logs!** Send all logs to 160 Contest Director David L. Thompson, K4JRB, 4166 Mill Stone Court, Norcross, Georgia 30092 USA. Please indicate CW, SSB, or both on the envelope and send along photos. Good luck to all!

73, Dave, K4JRB

Soapbox CW DX

Thanks to LA7SL for loan of QTH and antennas . . . LA9VDA. A decent contest this year . . . ES5MC. Too much QRN the first night. Stopped at 0400Z . . . TO5T. My first attempt at the CW section. Pump-up mast froze at 45 feet. Loads of fun anyway . . . G3SVL. To beat P40WA I would need to work 70 more W/VE or 5 more countries . . . VP9AD (N3RD Op). First time participating. Amazing how much DX there is on top band . . . OH8SR. Hard to work DX outside EU as I run low power and there are big mountains all around . . . I8SAT. Thanks to AI6V for the transceiver loan . . . P49I. Heard the DX. Next year will try to get the DX to hear me . . . YO6OBH. Only worked 20 hours, as I went stag/deer hunting all day Sunday . . . OZ7YY (Where are your priorities, Finn?—K4JRB). Got food poisoning on Thursday, so plans for multi-op with a big balloon antenna fell through . . . VS6BG.

More power than 25 to 80 watts is needed to be competitive . . . XE2WA7UQV. Terrible weather . . . PA6A. Long-haul conditions poor to W/VE this year . . . 4X4NJ. I enjoy 160 contests from 6Y5. Much better than from Japan . . . JG3KIV/6Y5. My first contest

TOP 10 SCORES

SINGLE OPERATOR

USA CW	USA PHONE
N2NT.....517,990	WB9Z.....377,952
AA1K.....496,225	AA5BL.....360,100
N2LT.....461,316	WW2Y.....312,930
WB9Z.....429,438	W3GH.....201,608
AA5BL.....410,773	KV0Q.....164,081
KC8MK.....410,256	KD9SV.....160,050
W3BGN.....388,278	AA0RS.....143,883
W3GH.....351,648	WA4SVO.....143,582
K4VX.....318,257	N3MKZ.....133,200
K5ZD.....308,832	W3TS.....131,716

VE CW (TOP 5)

VE3EJ.....742,366
VE9AA.....443,515
VE3DO.....371,260
VE3RM.....222,200
VE3ABG.....211,816

VE PHONE (TOP 5)

CF3EJ.....614,864
VE1/
KA1BQ.....516,776
VE3DXV.....217,442
VE3RM.....180,422
CF7SBO.....59,878

DX CW

P40WA.....1,276,456
VP9AD.....1,219,680
ON4UN.....1,124,375
P49I.....973,940
8P9DX.....659,146
OZ1LO.....565,440
TI1C.....540,858
SP5GRM.....535,909
G0IVZ.....535,420
SN3A.....515,136

DX PHONE

P40V.....397,024
ON4UN.....396,245
KH6CC.....219,657
GI0UJG.....218,868
UA2FJ.....193,038
YU7BJ.....150,670
YV2IF.....147,832
S58AB.....144,832
T93M.....143,584
UR0D.....141,984

MULTI-OPERATOR

CW (WW)

PJ9Z.....1,075,534
PA6A.....880,210
W2GD.....834,688
WW2Y.....816,105
W1KM.....783,756
RK2FWA.....780,372
9A1A.....677,560
KY1H.....545,560
OM7M.....528,736
DK1NO.....476,442

PHONE (WW)

W2GD.....353,280
AB4RU.....315,180
IR4T.....280,007
AA8U.....262,902
WR8C.....258,720
XE1RCS.....255,600
W7XU.....207,225
WD9INF.....204,294
RW2F.....201,292
K8XX.....194,545

QRP

TOP 5 CW QRP

N4ROA.....51,736
W4TMR.....45,530
K0GU.....41,846
UR5QU.....34,359
KA1CZF.....34,017

TOP 5 SSB QRP

WT3W.....35,376
N3ADL.....31,108
KA1CZF.....21,460
AA1EY.....17,100
KV8S.....9,042

LOW POWER

TOP 10 World CW Low Power

YU7BJ.....296,244
HA8BE.....268,837
K7SV.....217,158
HA8EK.....216,755
K1BNQ.....215,469
DL9YX.....203,931
WA1LNP.....200,552
UA4WCU.....190,848
DL2ZAR.....183,888
KM9P.....179,307

TOP 10 World SSB Low Power

GI0UJG.....218,868
YU7BJ.....150,670
N5IA.....125,188
K1HTV.....123,968
K4JYO.....116,280
K1BNQ.....103,726
W2CRS.....87,120
SQ5O.....84,330
S50R.....79,560
VE2DV.....74,560

TOP 5 CW USA Low Power

K7SV.....217,158
K1BNQ.....215,459
WA1LNP.....200,552
K1HTV.....170,150
K4TO.....123,525

TOP 3 DX SSB Low Power

YU1EA.....6,040
YL3GHD.....5,786
F5BEG.....3,363

AGGREGATE CW AND SSB CLUB SCORES

Minimum of three entries required for listing.

Club	Score	CW	SSB	Club	Score	Club	Score
FRANKFORD RADIO CLUB	9,503,653	VP9AD	W2GD	WILLIAMETTE VALLEY DX CLUB	296,734	K9JF/7	XE2DV
SOUTHEASTERN DX CLUB	3,853,952	P49I	AB4RU	KENTUCKY CONTEST GROUP	289,272	NJ9C	NJ9C
YANKEE CLIPPER CONTEST CLUB	3,721,140	W1KM	VE1/KA1BQ	PDXC (ITALY)	282,162	I5NSR	—
SLOVENIAN CONTEST CLUB	3,004,848	S50A	S58AB	KIEV CONTEST GROUP	280,952	UT4UZ	—
MAD RIVER RADIO CLUB	2,571,017	KC8MK	AA8U	UKRAINIAN CONTEST CLUB	276,588	UT7ND	UR5E
RHEIN RUHR DX ASSN.	2,511,848	ON4UN	ON4UN	ROCHESTER DX ASSN.	276,481	K8FC	KA2PHQ
NORTH COAST CONTESTERS	2,501,730	VE3EJ	CF3EJ	KANSAS CITY DX CLUB	243,237	N0TT	—
POTOMAC VALLEY RADIO CLUB	2,058,026	K7SV	K1HTV	REF (FRANCE)	208,224	F5GHP	F5GTR
SP DX CLUB	1,938,518	SP5GRM	—	FLORIDA CONTEST GROUP	206,804	N4BP	AC4NJ
SOCIETY MIDWEST CONTESTERS	1,630,670	WB9Z	WB9Z	NEWDXA	179,212	ND9O	ND9O
BAVARIAN CONTEST CLUB	1,848,068	DK6WL	DF7RX	KARS	165,590	N2CS	—
H.I.C.K.S.	1,286,724	P40WA	WA2KVX/9	OKLAHOMA DX ASSN.	160,838	WV5S	—
SOUTHERN CALIF. CONTEST CLUB	954,514	N6DX	N6LL	NO. SHENANDOAH DX ASSN.	152,612	K8OQL	K2UOP/8
MCC (ITALY)	921,131	I4JMY	IR4T	MILE HIGH DX ASSN.	150,980	W2CRS	W2CRS
NORTH TEXAS CONTEST CLUB	915,051	AA5BL	AA5BL	TEXAS DX SOCIETY	148,017	W5ASP	KE5FI
CDXC (ENGLAND)	911,764	G0IVZ	G0KRL	3M ARC	145,422	KN0Z	W0SEI
TENNESSEE CONTEST GROUP	853,637	N4ZZ	KQ4HC	LYNX (SPAIN)	131,962	EA4AV	EA3KU
DANISH DX GROUP	700,342	OZ1LO	—	ARI (ITALY)	126,871	I2OKW	I6FLD
9A CW GROUP	656,385	9A7V	9A2AJ	SP DX CLUB	126,016	SP2QCH	—
CAROLINA DX ASSN.	635,367	WZ3Q	KC4YM	NORTHERN ARIZONA DX ASSN.	103,799	W7YS	NF7E
KTU RADIO CLUB	632,324	LY7A	LY7A	LNDX (FRANCE)	91,473	F6CWA	F6CWA
HUDSON VALLEY CONTESTERS	613,753	N2NFG	WA2UKP	CENTRAL VIRGINIA CONTEST CLUB	72,471	W4XD	—
YU CW CLUB	535,182	YT1AD9	—	UKRAINE (UARL)	68,750	UX5EF	—
LITHUANIAN DX GROUP	648,829	LY2ZZ	LY6M	MDXC (Mississippi)	68,547	—	N5ASO
NORTHERN CALIF. CONTEST CLUB	508,664	K6MO	P40V	WEST PARK RADIO OPS	56,280	W8PN	W8IDM
CENTRAL ARIZONA DX ASSN.	465,188	N6SS	—	SALT CITY DX ASSN.	55,111	NA2Q	NA2A
CENTRAL FLORIDA DX ASSN.	402,364	N6AR	AA4MM	HAMFESTERS RADIO CLUB	52,177	W9LNQ	N9RIT
MINNESOTA WIRELESS ASSN.	367,802	W0AIH	N0AXL	MDXC (ILLINOIS)	35,599	W9TY	—
BAVARIAN DX GROUP	310,755	DL7UBA	DL7MAE	NGRC (CALIFORNIA)	9,769	N6GL	K6HRT
				SOUTH JERSEY RADIO ASSN.	334	—	WA2YSW

with new Croatian call. Was 5B4ADA last time. is the CO7EH log. Mail is almost non-existent for Eduardo ... AD4IL (Tnx, Julio—9A3A/4U [Haiti]). A new chemical plant nearby generated much QRN ... ON4UN. Please listen for SA DX. We call and no one listens ... PY0FF. Sorry that I have no signal ... YU1GN/QRP. First time I have worked outside the UK on 160 ... G0VQR/QRP. Confusing, TA1 is Europe and rest of TA is Asia ... TA2DS. Keyer battery failed after only 2 hours ... GM3VLB. First multi-op with my friend Henk (ON4AUC). We will do it again ... OT6A (Marc, ON4MA).

Glad you finally got the log ... RK9CWW (UA9CDC Op). I am dreaming of an alpha amp and lots of real estate to make a "big" score ... WP4IIV. What happened to Central America? ... TI4CF. Only permitted to operate on 1827 kHz. EU needs to spend more time listening ... XV7SW. No QRN, but wall to wall stations ... KH6CC. Great fun; the pile-up never quits ... PJ9Z. We have only 1830 to 1850 kHz here in the Netherlands, but hope to have 1810 to 1850 kHz for next year ... PA0LOU. Excellent "JA" signals for 30 minutes ... F6CWA. Hear PY working W but no go from here. Frustrating when receiving is better than transmitting ... UA3AB.

Soapbox CW W/VE

WE NEED THE WINDOW, and it worked better this year. Many W/VE stations. First real effort in many years. Got a kick out of working XV7SW ... K6NA. First 160 antenna on 160 after 39 years as a ham ... K5IID. It's a little different using a 2X3 call sign in a contest ... KB9LKO (Green River Valley ARS). The Gentleman's Band? Somebody must be mistaken ... W3GH (W9XR Op). Nice to have so many EU call me ... K3ZO. First time to work all 48 continental USA states in the contest ... K4TO. QRN and snow static the first night ... WB9Z. Aurora over the arctic. Seldom could be heard ... KL7RA. Eastern USA stations still can't hear me ... VY1JA. Worked all 50 states plus a good opening to JA, but missed VK/ZL ... VE3DO. Had to do some creative prefixing to make KH6DX/M, WL7WO, and 9A3A/4U to score correctly. Conditions were super ... AA1K.

First time to run JA's on 160 ... K4VX. Connected on packet the second day. Forgot it would make me a multi-op ... KP4XS/W4. Got a bad deal on the weather the CW weekend ... AB4RU. Rain and snow static hit 40+ dB ... NX1G. It was "Deutschland uber

Alles" for EU DX—they never stopped ... W1OP. Unlike the ARRL 160, the guys stayed out of the window ... K8FC. My old Drake gear survived to make a personal high ... K1IK (Vermont!!). Balloon vertical worked virtually everything heard ... AB6FO. What better way to spend a stormy weekend ... VA3NN. Lost the first 28Q's due to a computer crash ... VE6SF. Tough contest with low power ... WX9E. First try using CT. Did okay after messing up the first three Q's ... W1PL. Lost both antennas early Saturday morning. Repaired the G5RV to finish the contest ... W4XD.

My first try at 160. Now to put a 160 antenna ... W6RFF. Ran 100W to a TS450S with a homebrew keyer mounted between the seats. Antenna was a W6AAQ screwdriver antenna. Had to work to get the add-on coil to go down to 1.8 MHz ... KH6DX/M (CA). I tried two dipoles and neither worked very well ... K6HRT. Enjoy the CQ 160 more than any other contest ... WA4DAI. Why did we have a lightning storm in January? ... W4GTS. I found that the computer added the pages totals incorrectly even though the

points were correct on the page ... KB5UL. Still looking for Maine for #50 ... WK5K. Hard to work the contest and host a family reunion ... WA5TWL. 10 watts isn't low power in craziness on 160 ... KE5FI. K5NA is finally in Texas. He has been logged as Texas for years by over-avid DX ... K4JRB. Clock in the computer stayed screwed up ... K6VI.

Overslept and missed the JA opening ... W8FN. Surprised what 5 watts from a city lot will do ... W8WEJ. Amp blew fuses then blew up itself ... W8ROS. Still like hand-logging best ... K8OT. I need QSLs. Everyone I work is new ... AA8RR/QRP. Ounces of score, pounds of enjoyment ... K3EI. Totally missed Saturday morning. Working JA's is our only saving grace against the East Coast ... WB2ULI/5.

Soapbox SSB DX

Poor conditions and heavy QRM. Must be the CQ 160 SSB contest ... DL8PC. Please QSL to ON7LX not direct ... 5N0MVE. Poor conditions and the mullets



W2GD Contest team with W2GD at the controls.

GUEST/VISITING OPERATORS

CW

Call	Guest/Visiting Op	OL3Z	OK2HI
DL0KB	DL2GBB	P40WA	K9UWA
K4VX	N9JF	P49I	K4PI
K8CC	AA8AV	RK9CWY	RX9CAZ
KC8MK	NZ4K	SN3A	SP9NR
LY2ZZ	LY2IJ	TI1C	TI4CF
LY6M	LY1DS	TO5T	FM5BH
LZ1KAZ	Iia (name)	SN3A	SP8NR
N2NT	W2RQ	UR5E	UR5EDX
N5IA	WA5CDR	UX3M	UR3MP
OEM8CIQ	OE8CIQ	VP9AD	N3RD
OI6YF	OH6YF	W0AIH	N0AXL
OK2KDS	OK2HIJ	W3GH	W9XR

SSB

Call	Guest/Visiting Op	PJ9JT	W1BIH
CF3EJ	VE3EJ	SK6NL	SM6HRR
CF7SBO	VE7SBO	SQ5O	SP5SSN
H44MS	DL2GAC	UT0D	UT7DX
LY6M	LY1DS	VE7RCN	VE7CYT
LZ7M	LZ3FNF	W3USS	K3ZJ
OM5R	OM5AW	WW2Y	AA5B
ON4UN	ON4AFZ		



Nick, UA2FJ, and second harmonic. Nick is holding the controls for his four beverage antennas.

stayed away in droves . . . G3NAS. Good W/VE pile-ups the first day, good DX the second . . . XE1RCS. Tried a square loop and two beverages for receive . . . F5GTR. Nice to work some states this year . . . LX4A. We also did the UBA contest this weekend so not much sleep . . . OT6L. My computer is caput/bad! Excuse me . . . OM5R. Conditions not too bad . . . YV2IF. I was at 70 meters in the elevator room of a

new TV communications tower that was still under construction . . . IK2VJF. I only gave out points . . . 9A2EU. Ran a 2el Yagi at 70 meters . . . IR4T. How did LA7JO show up at OA4O for the contest? . . . K4JRB. Poor conditions to USA. Had strong broadcast QRM as I worked the contest from the city . . . S50R.

Just got on to make a few contestants happy . . . PJ9JT. Only heard a few USA stations and they had

big signals. Where were the other W's? . . . EA5GRC. Third try from Solomon Islands and first trans-Pacific QSOs made. Not satisfied yet so will try again in 1997 . . . H44MS (DL2GAC). Only got on for a short while and did not even work my own country for a multiplier . . . GW4BLE. One of the best CQ 160's from here. Was using a long wire for transmitting that had 22 volts to ground from local BC station . . . A92BE. Freddy, ON4AFZ, did well for his first 160 contest . . . ON4UN. Snow almost postponed our operation. Then too much ale as we struggled to get the antennas up. But we were pleased with the result . . . G0SAH/P. Conditions from GI were magic. PY0FF, P40V, and A92BE all called me. CU next year . . . GI0UJG. Still no W/VE contacts on SSB . . . ZA1AJ. They seemed to hear my low power OK . . . XE2DV. Seven inches of rain the second night brought water through the walls . . . KH6CC.

Soapbox SSB W/VE

Most exciting moment was working W7HS for my last state on 160. Worked more DX thanks to the DX window . . . KC4YM. My first contacts ever on 160 . . . N4EUK/QRP. Conditions from the Pacific NW were interesting. Had better luck working the weaker Esaterm USA stations than the loud ones . . . K9JF/7. Washout Saturday evening due to aurora . . . N9ITX/7. Several of the big guns were again calling CQ in or right next to the DX Window. Please start enforcing the Window . . . A48U. Better conditions Saturday night (How far is it from Nebraska to Montana?) . . . WA0DEY. Heard many big guns stand by so little pistols could work each other . . . VE4OV. Sure is a challenge with 100 watts but will be back next year . . . NY3C. Thunderboomers drove me off the air . . . KA2PHQ. Thankful to borrow KO4EW's shack this time. Amazing what you can hear with beverages and working from a real 160 station . . . KQ4HC.

Only a short effort on SSB this year . . . K0LIR. Made sure I ran less than 5 watts out at all times . . . KV8S. NK7U has a serious 160 station . . . AA7TF (at NK7U). Used a T2FD antenna that worked great . . . N8GZE. Started out as a lark, but stayed in the contest for some time and had a ball . . . VE1CZ. My first contest ever! Need a computer, however . . . VE3DXV. Thanks to K8AQM for the use of his station . . . KG8PE. IR4T, HK3MKQ, and KH6CC all almost on the same frequency and all 5/9 . . . K4JRB. My first 160 contest. How do I make CT show SSB as the mode rather than CW? . . . KB0WY. Tough going as QRP . . . WD9IAB. Took a lightning hit at 0600Z Saturday and had to get a replacement transceiver. Then the antenna would

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1.5 KW, feed with 50 ohm coax, transmatch needed.	
CW 40	40-10, 66' horiz & 10' vertical Radiator \$79.95
CW 80	80-10, 132' horiz & 22' Vertical Radiator \$79.95
CW 160	160-10, 252' horiz & 22' Vertical Radiator \$109.05

Current Baluns

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B1-5K	1:1 5 KW	160-10 m	Precision	\$29.95
C1-2K	1:1 2KW	160-10m	Retrofit any ant.	\$20.95
Y1-5K	1:1 5 KW	160-10 m	The YagiBalun™	\$29.95
B4-1.5K	4:1 1.5KW	80-10 m	General Purpose	\$22.95
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For really tough RFI and RF feedback problems, you can't beat the new T-4 and T-4G Ultra Line Isolators. The T-4 replaces the T-3, 4KRF-LI and 4KV-LI by combining the best features of each line isolator into one super device - and, the isolation factor is 50% higher. The T-4G goes even further with a built-in ground strap for direct line isolator grounding. Before coax enters your station, stray RF is shunted directly to ground. Stray RF hasn't got a chance, yet signal attenuation is zero! Use the T-4 when a direct ground path is not possible. Use with Vertical antennas. Install between transmitter and linear and between linear and tuner to break up ground loops. Enhance your beam's F/B ratio. Use the T-4 with any antenna to reduce feedline radiation. This is the Big GUN weapon in the fight against RFI.

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DEC. Specials all sale prices, Dec. only

PL-259 Silver/Teflon, made in U.S.A	95¢
T-4G High isolation Line Isolator	\$29.95

NEW! SuperLoop 40 40-10, only 56' long. Great 2 dB gain, low angle signal on 40 and 4dB gain on 20 and up. Intro. \$79.95

Antenna Wire and Parts

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RG-8X	Premium grade, 95% braid, 1500 w	SALE 14¢
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RG-213	Top Quality, 95%	35¢
ExtraFlex	Flexible, 9913 type	59¢
R1 Rotator	8 conductor (2 x #18, 6 x #24)	SALE 20¢
R2 Rotator	8 conductor (2 x #16, 6 x #18)	SALE 35¢
R4 Rotator	8 conductor (2 x #14, 6 x #18)	SALE 47¢
#14 HD	Stranded, 7 x 22 hard-drawn	8¢
#13 CW	19-strand, copper-clad, insulated	16¢
#14 FlexWeave™	168-strand, bare for any wire ant.	12¢
#12 FlexWeave™	259-strand, excellent for longer runs	19¢
450 Ladder	#16 stranded cond, poly, windows	18¢
450 Ladder	New! #14 stranded cond, poly, windows	28¢
1/2" Braid	Tinned copper, for ground systems	65¢

Coax & cable must be in 50-foot multiples for ad prices. Quantity pricing, too!

Antenna Support Line MilSpec Dacron, single braid, solid, fungus & sun resistant line. 3/16" 700# test. 100' hanks \$8
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MIRAGE... 100 Watts... \$199

Boost your 2 Meter handheld or multimode (like ICOM 706) to a super powerful 100 watts... All modes: FM, SSB, CW... 18 dB GaAsFET receive preamp... Reverse polarity protection... Silent cooling fan... Free HT-to-amp coax and mobile bracket

In Stock at ham dealers everywhere!

Call your dealer for your best price

\$199

B-310-G Suggested Retail



MIRAGE RUGGED!

Polarity Protection can save your amp if you connect power backwards.

Compact but Powerful

Mirage's integrated HeatsinkCabinet™ and whisper quiet fan gets heat out fast!

The results? An ultra-compact 4³/₄x1³/₄x7³/₄ inch 2¹/₂ pound amplifier that delivers a super powerful 100 watts.

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Free 3 foot handheld to B-310-G coax cable -- just plug and play! Free mobile bracket! Free rubber mounting feet for home use!

Plus more...

Automatic RF sense Transmit/Receive switch. Remote keying jack. LEDs monitor "On Air", high SWR, pre-amp, power. Push buttons select SSB/FM, pre-amp, power. Draws 15 amps at 12-15 VDC.

Full one year MIRAGE warranty

With Mirage's legendary ruggedness, you may never need our superb warranty.

Power Curve -- typical B-310-G output power

Watts Out	25	50	75	95	100	100+	100+
Watts In	1/4	1/2	1	2	4	6	8

For an incredibly low \$199, you can boost your 2 Meter handheld to a super powerful 100 watt mobile or base!

Turn "You're breaking up... Can't copy" into "Solid Copy... Go ahead."

Talk further... Reach distant repeaters... Log onto faraway packet bulletin boards.

This rugged Mirage B-310-G amplifier

operates all modes: FM, SSB and CW. It's perfect for all handhelds up to 8 watts and multi-mode SSB/CW/FM 2 Meter rigs.

It's great for the ICOM IC-706 -- you'll get 100 blockbuster watts on 2 Meters!

Low noise GaAsFET pre-amp

A built-in low noise GaAsFET receive pre-amp gives you 18 dB gain -- lets you dig out weak signals.

Fully Protected

SWR Protection prevents damage from antennas whipping in the wind. Reverse

Dual Band 144/440 MHz Amp



\$199 BD-35 Suggested Retail

MIRAGE RUGGED!

Power Curve -- typical BD-35 output power

Watts Out (2Meters)	30	40	45	45+	45+	45+	45+
Watts Out (440 MHz)	16	26	32	35+	35+	35+	35+
Watts In	1	2	3	4	5	6	7

Add this Mirage dual band amp and boost your handheld to 45 watts on 2 Meters or 35 watts on 440 MHz!

Works with all FM handhelds up to 7 watts. Power Curve chart shows typical output power.

Full Duplex Operation

Mirage's exclusive FullDuplexAmp™ lets you talk on one band and listen on the other band

at the same time -- just like a telephone conversation! (Requires compatible HT)

Mirage is the Best! Here's why...

- Automatic frequency band selection -- you'll never forget to switch bands
- Single input connector and single output connector for both bands -- easy to use with dual band radios and antennas
- First-class strip-line techniques -- superb RF performance and reliability
- Custom wrap-around heatsink -- runs cool
- Reverse Polarity Protection -- saves your amp if you connect power backward
- Automatic RF sense Transmit/Receive switch -- makes operation easy
- Low input SWR -- keeps your handheld safe from overheating
- "On Air" LEDs -- for each band
- Free mobile mounting bracket
- Free 3 foot handheld-to-BD-35 coax cable
- Small size: just 5x1³/₄x5 inches
- Full one year MIRAGE warranty
- Legendary MIRAGE ruggedness

Call your dealer today for your best price!

35 Watts for 2 Meter HTs

B-34-G

\$99

Suggested Retail



Power Curve -- typical B-34-G output power

Watts Out	18	30	33	35+	35+	35+	35+	35+
Watts In	1	2	3	4	5	6	7	8

- 35 Watts Output on 2 Meters
- All modes: FM, SSB, CW
- 18 dB GaAsFET preamp
- Reverse polarity protection
- Includes mobile bracket
- Auto RF sense T/R switch
- Custom heatsink, runs cool
- Works with handhelds up to 8 watts
- One year MIRAGE warranty

35 watts, FM only... \$79

B-34, \$79. 35 watts out for 2 watts in. Like B-34-G, FM only, less preamp, mobile bracket. 3¹/₈x1³/₄x4¹/₄ inches.

MIRAGE RUGGED!

160 Watts on 2 Meters!

B-5016-G **\$299** Suggested Retail



MIRAGE RUGGED!

Power Curve -- typical B-5016-G output power

Watts Out	130	135	140	145	150	155	160	165
Watts In	20	25	30	35	40	45	50	55

The MIRAGE B-5016-G gives you 160 watts of brute power for 50 watts input on all modes -- FM, SSB or CW!

Ideal for 20 to 60 watt 2 Meter mobile or base. Power Curve chart shows typical output power.

Hear weak signals -- low noise GaAsFET preamp gives you excellent 0.6 dB noise figure. Select 15 or 20 dB gain.

B-5016-G has legendary ruggedness. We know of one that has been in constant use since 1979!

Heavy-duty heatsink spans entire length of cabinet -- prevents overheating. Power transistors protected by MIRAGE's Therm-O-Guard™.

Fully protected from high SWR and excessive input power. Has warning LED.

Has smooth adjustable Transmit/Receive switching with remote external keying.

RC-1, \$45, Remote Control. On/Off, pre-amp On/Off, selects SSB/FM. With 18-ft cable.

Draws 17-22 amps at 13.8 VDC. 12x3x5¹/₂ in.

More 160 Watt, 2 Meter Amplifiers...

B-2516-G, \$299. For 10 to 35 watt mobile or base stations. 160 watts out for 25 watts in.

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B-215-G, \$379. MIRAGE's most popular handheld amp. 150 watts out/2 watts in; 160 watts out/3¹/₂ W in. For 0.25 to 5 watt handhelds.

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not load. Guess Murphy wins this time . . . KF8UM. Every year I say this will be my last year for CQ 160 SSB, but each year I keep coming back (and the plaques stack up) . . . CF3EJ (VE3EJ).

Most activity ever, but lost of intermod . . . KD9SV. Wish the SSB contest was in December to get away from the aurora . . . VY1JA. Too many own their own frequency. I got brusied elbows from trying to find a spot . . . NTØV. The older I get the more fun contesting is and the harder it is to stay up all night . . . W2CRS/O. First 160 test in 10 years for me. Pleased to work all 50 states . . . WA4SVO. First 160 QSO's for 3 of our members . . . KC5NTN. Had 30 minutes of EU propagation the second night that I've never had before . . . AA5BL. Thanks to Peter for letting me use his station . . . AA5B (guest operator at WW2Y). Can't wait until next year. The W4IY Multi Op team is going to add this contest to our list . . . WB4RMJ (operator at W4IY). First 160 contest and love it. See I have some antenna work to do for next year . . . WA4ZXA. Murphy was here this year . . . NW6N (now in Arizona!).

Station Operators CW Multi-Op

9A1A: 9A5W, 9A3GW, 9A6A, 9A6D, 9A2R, 9A7R, 9A9A. 9A5D: 9A2FK, 9A2TL, 9A3VM, 9A4SC. AA8RS & KØRF. AA2MF & AA3BG, NT2X, WJ1R, KB2WBQ/RX3QA, WB2BXO. AA3B & packet. AB4RU & AA4GA. **AB6FO** & packet. **AB7GM** & WØMHS/7. **DFØBV**: DL1MAJ, DJ5CL, DL6RAI. **DKØEE**: DF4IJ, DL4MCF, DL4MDO, DL4MEH. **DKØFFO**: DL7UGN, DL2BUM, DL2BWM, DJ3RA. **DKØIW**: DL6KO, DK7FK, DJ9WH. **DK1II** & DJ7MG. **DK1NO** & DL1IAO, DL2MEH. **DK2OY** & packet. **DK7YY** & packet. **DLØAD**: DJ3TF, DJ5RE, DJ6RN, DK1RP, DL1RAS, DL2RDT. **DLØKF**: DJ6TN, DJ3UL, DK8LV, DF4PA. **DL7URH** & DL7IO. **DLØBC** & DL4OCL. **EA3CWK** & EA3GFA, EA3ALV, EA3AJW. **EA5BY** & EA5CZ, EA5EU, EA5KW. **G3VGG** & G4IVJ, Ops. **G1ØKW** & packet. **HØ9CGL** & HØ9AFI, HØ9DBC.

HØ9TA: HØ9FAN, HØ9FAE, HØ9ALM, HØ9Y, HØ9CXZ. **HG1G**: HA1TJ, HA1AH, HA1AV, HA1DAC, HA1AR, HA1DAE. **HG5A**: HA5IW, HA7VB, HA5OM, HA5BSW, HA5UA, HA5FM, HG5CNC. **HG6V**: Bak Zsolt, Bota Korner, Fulop Peter, Korepta Gyorgypapp Denes, Suszter Laszlo. **I2OKW** & IK2NDF, IK2NCF, IW2INY. **I4JMY** & I4UFH, I4YSS, IK4IEE, IK2OHG, IK2QEI, I2VXJ, IK2HDG, I2FOT, IK2QGC. **J1YDU**: JHØNZN, JF7TFK. **J1YXP**: JM1UWB, packet. **JA3ZOH**: JG3MRT, JG3WDN, JH3PRR. **KØLIR**: NØIS, WAØIYY, AAØA, NØLIK. **WØØDHW** & NØZØV, NØKFE, NØQEZ, WØØIUN, KØGPF. **K1KI** & packet. **K2BU** & packet. **K2QMF** & packet. **K2SB** & packet. **K3ANS** & WF3H, packet. **K3JGJ** & packet. **K3KO** & packet. **K3WW** & packet. **K4UEE** & packet. **K6XO/7** & N5CT, KØFX. **K7OX** & packet.

K8GM & K8XX, K18W, WAØAF. **KA2DRH** & N4YOS, AB4KK, KN4QS. **KBØLFV** & KGØZU, WØØQPO. **KB9LKO** & K9WA, KB9IUA, NN9K. **KC4ZV** & packet. **KC7KUH** & N7VMV, KB7N. **KC7V** & packet. **KD9SV** & KA9A, K9LA, KC9LA. **KEØFT** & N9ZQH, WØØOLX, NØRWS. **KK9I** & N29R, WA2KVX, W9VP. **KNØZ** & W3FAF, WØ5EMX, KD9NO, WAØQPO, KBØRCS, KBØROA, WØSEI. **KP4XS/W4** & packet. **KY1H** & KB1W, NS1M, WM1K. **LA8G**: LA4PHA, LA5IIA. **LY3BS** & LYR-728.

LY7A: LY2BMX, LY4AA, LYR346. **N2VW** & packet. **N3BNA** & packet. **N3MKZ** & packet. **N4RJ** & K4BAI. **N4XMX** & packet. **N6DX** & AD6C, KØDI, N6RVZ, N8SR, N6VR. **N7JW** & K7CA. **NE1I** & WA1Z. **NG8D** & packet. **NJ9C** & AA9AX, KR4KL. **NS7B** & NS7K, K7OA. **NX1G** & packet. **OE6U**: OE6EFG, OE6PN, OE6ESD, OE6ASG. **OH2BCI** & OH2BVF.



SP9KRT's colorful location in Piekary, Poland.

OH2BYS/6 & packet. **OH3ES** & OH3LOK, OH3MEP. **OK1IW** & OK1IF, OK1IR. **OK1KJV**: OK1HRA, OK1FLC, OK1FJB. **OK1KUO**: OK1UG, OK1FFC. **OK5TOP**: OK1CW, OK1DF, OK1DIX, OK1FF, DL5X: OK1DUT, OK1FUT, OK1VBA, OK1TN. **OM2I**: OM1KW, OM2KW, OM1MW, OM1RW. **OM3RNI/P** & OM3WHO. **OM5M**: OM2KI, OM2IB, OM2XW, OM3BH, OM3RG.

OM7A: OM3GI, OM8AU, OM8CW. **OM7M**: OM5ZW, OM3PA, OM3LL, OM3TPV, OM3TZQ, OM3TQM, OM3TRF. **OT6A**: ON4MA, ON4AUC. **PA6A**: PA3DFT, PA3CWM. **PA6Z**: PAØERA, PAØSHY, PA3BFM, PA3DUA, PA3FCD, PA3FNE, PA3FQK. **PJ9Z**: WØUVZ, WØCD, W1BIH, K8GG. **RK2FWA**: RA2FA, UA2FB, UA2FBA, UA2FF, UA2FM, UA2FX, UA2FZ. **RK9CWW**: UA9CDC, RA9CMO, UA9FOY. **RU1A**: RV1AW, RW1AC, RN1AM. **SK1BL**: SM1ALH, SM1IRS, SM1OIL. **SK6NL**: SM6HRR, SM6VWG, SM6EWA. **SL3ZV**: SM3BDZ, SM3CVM, SM3PXG, SM3VDX. **SM5HJZ** & SMØGNS, SMØAJV. **SP9KRT**: SP9ØXL, SØ9CAM, SP91753. **UA3AB** & KF2ØX. **URØI**: UR6IM, UT7IY, UR7ICT. **UR4QWW**: UR5ØN, UR4ØFE. **UT7L**: UR4LRO, UR4LSB, UR4LQA. **VE6AO**: VE6KZ, VE6KC, VE6JO, VE6CIZ, VE6RVW, VE6AMR, VE6EPK, VE6NJK, VE6RAJ.

WØSEI & KNØZ, KBØJDJ, KBØROA, W3FAF, WAØRKE, KBØRCS, KD9NO, NØPEY, WØ5EMX. **W1KM** & K1JKS, W1FJ. **W1ØP**: W1GS, N1AKO, K1JNJ. **W2GØ** & WA2SRØ, K2TW, N2AA, KU2C, NS2K, WU3A, WA2MKM. **W2SEX**: AA2YW, AA2VN, AA2ØT, K2ZR, KA2WCM, N2AWR. **W3MM** & packet. **W3ØV** & packet. **W6GO** & packet. **W6YRA**: KØ6LDO, WA6AYI, WA7WYE, KU6T. **W8WA** & N4AR, AF8T. **W9NGA** & KF5FK. **W9RE** & packet. **WAØØDA** & packet. **WA2UKP** & WA2JØK. **WA2WYR** & packet. **WA3WJD** & WV3B. **WA6RKE**: AA6DT, AC6DD, WØ6ITM, N6NL, W6HDO. **WA7FAB** & AB7ØD, W7LNG. **WD9INF** &

WD9INF, WØIQ, N8AAT, K8AQM, NU8Z, KG8CO, WA8SAE, N8HTT, N8ABL. **WS7W** & N7NG, KØPP. **WW2Y** & K2WI, K2ZS, N2NT, N2NU. **WXØB** & KN5E. **WY3T** & KA3PVA, N3KGL, N3DSR, K3AI. **XE2/WA7UQV** & W7WA, AA7IE. **YT1R**: YU1ZZ, YU1JW, Y2IEB, YT1EA.

Station Operators SSB Multi-Op

AA1K & packet. **AA2MF** & NT2X, KB2UEV, KF2KT, KB2UCS, N2VNW, N2YIB. **AA3B** & packet. **AA4V** & packet. **AA8U** & AA8AV, KBØMJZ, KT8X. **AB4RU** & AA4GA, N9HZØ. **AC4HJ** & K1KNO. **DKØIW**: DL5MFL, DJ2CE, DLØMI: DL5YDD, DL2YBW, DL9YEN, DG5YHA, DG6YHA, DG2YIC, DL9YEK. **EA3CWK** & EA3GFA, EA3ALD. **EA3KU** & EA3AIR. **EA6ARM**: EA6MS, EA6YP, EA6AXZ, EC6SM. **ES5Q**: ES5MC, ES5RY, ES5MG, ES5RN. **EW4A**: EU4EU, EU4-ØØ1. **F5GTR** & F5GHP. **GØSAH/P** & GØDYW, GØNSH, GØWAT, GØWTF, G1LLW, G1GJK, G8AWØ, G8LOC, G6PWS. **G3SVL** & G3UEG, G7TAJ. **HØ9CXZ** & HØ9ØLØ, HØ9OCR, HØ9STL, HØ9ØBØ. **HK6LRP**: HJ6VKH, HJ6WQH, HK6AUG, HK6FIP, HK6ISX, HK6MCK, HK6FSG. **IØSNY** & IKØFUX, IKØAZG, IKØSHF, IKØVSY, IKØVSW. **IR4T**: I4JMY, I4UFH, I4YSS, IK4IEE. **IV3TAN** & IK2NØJ, IV3SHF, IV3TMV. **KØLIR**: NØIS, AAØA, NØZØV, KGØKP, K2ØMF, packet. **K3ANS** & packet. **K3IPK** & packet. **K3IXD** & packet. **K3KO** & packet. **K3MD** & N3PUR. **K3WW** & packet.

K8XX & K18W, K8GM, WAØAF, WØSGR, NØQVP, K68AØ, NØLUZ, WØKQP. **KA2DRH** & N4YOS, KR4ØI. **KA5ØQH** & packet. **KBØKRO** & G3WJW/WØ, NN9K. **KBØWY** & packet. **KB7WØN** & KB7WØN, WS7W, NA7R, W7TSM, KB7FGN, KC7MJI, KC7MJH, KA7PNH. **KØ4HW** & packet. **KC5NTN** & WA3PAY, KC5BJI, KJ5ØB, N15S, N5RYE. **KEØFT** & NØRWS, N9ZQH, KBØRUW, KF9TL, KØØWY. **KE4TV** & W4VZB, AF4Y, KS4XR. **KF8UM** & N8FMD, N8VCF. **KN2T** & KØ2CI, KØ2I, N2ØRM, KN2L, KB2WAJ, N2RHM. **KØ4GC** & packet. **LA7G**: LA5FJA, LA6EIA, LA7IJA. **LX4A**: LX1AQ, LX1JH, LX1KC, LX1NØ, LX1UN. **LY2BWJ** & LY3DA, LY-B-26, A. Toleikis, D. Jasiulis. **LY7A**: LY2KZ, LY4AA, LYR 346. **NØAXL** & packet. **NØRWB** & NØKØV, WØØZLV, WØØSRP, NØUJØ. **N2KJM** & packet. **N2VW** & packet. **N3BNA** & packet. **N4XMX** & packet. **N5RP** & packet. **N8ATR** & WØ8K, WA8BIN, N8ØMM. **N8JSK** & WØWEN, N18L, KØ8JN, A8BY, N8ØZA, N8ZXB. **NØØP** & WAØFLS, KØØXX, WAØETC. **NG8D** & packet. **NJ9C** & AD4NM, K14DC, KR4KL.

ØA4Ø: ØA4ØV, ØA4ØPI, ØA4ØHY, LA7JØ. **ØH1ØU** & packet. **ØK1KØ**: ØK1UG, ØK1FFC. **ØM2I**: ØM3WM, ØM3TA, ØM1KW, ØM1RW, ØM1MW, ØM1IØ, ØM2KW. **ØM5AHI** & Ops. **ØM7M**: ØM5ZW, ØM3PA, ØM5RM, ØM3TPF, ØM3TQM. **ØT6L** & ON4AEK, ØN6NL, ON6ZX. **RW2F**: RA2FA, UA2FB, UA2FF, UA2FM, UA2FX, UA2FZ. **S53M** & Ops. **SL3ZV**: SM3PXØ, SM3BDZ, SM3CVM, SM3ØJ, SM3SØZ. **T7ØA**: IK6BMØ, IK6RUM, T7ØC, T7ØD, T7ØF, T7ØM, T7ØW. **VA2AM** & packet. **VE2ØMS**: VE2FAB, VE2WJW. **VE3ØC**: VE3AØ, VE3FØØ, VE3ØZY, VE3RYI, VE3ØCY, VE3SS, VE3VMØ. **VE5RI**: VE5FD, VE5FF, VE5FN, VE5WI. **VE6AO** & VE6AMR, VE6NJK, VE6KKR, VE6JAZ, VE6KC, VE6CIZ, VE6RAJ. **WØSEI** & KBØROA, W3FAF, WAØRKE, KBØRCS, KD9NO, NØPEY, KNØZ, KBØJDJ, WØ5EMX. **W2GØ** & N2AA, NS2K, K2TW, WU3A, KF5FK. **W3MM** & packet. **W4IY**: WØ4RMJ, KA4RRU, WØ4NFS, KU3M, KJ4VG, N1TXI, KE4SJR, AE4ØG, KØ4FM. **W4NZJ** & K4AEK, AE4ØC, KE4ØYX. **W6GO** & packet. **W6TER** & packet. **W6YRA** & KU6T, WA6AYI, KØ6ØW.

W7XU & NØJØE, NØGXA, WØØTEM. **WØCY** & packet. **W9NGA** & KF5FK. **W9RE** & packet. **WA2UKP** & WA2JØK. **WA2ZØG** & packet. **WD9INF** & N8AAT, KG8CW, KN8R. **WR8C** & KØ8MK, N24K, KU8E. **WY3T** & WØ3AAL, WØ3EVL, KA3ØSX, N3IØZ, N3KGL, W13L. **XE1RCS**: XE1JØ, XE1KK, XE1VIC, XE1ME, XE1YJY.

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18

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(Continued on page 101)

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The Ten-Tec Model 411 Centaur Linear Amplifier

BY DOUG DeMAW*, W1FB

It is refreshing to see a price-competitive linear amplifier introduced in the amateur market. The Ten-Tec Centaur is aimed at those buyers who desire fine performance, versatility, easy servicing, and a price that is in keeping with a modest hobby budget. I had the good fortune of being one of those who were privileged to use and test a Centaur several months before it was released to the consumers. Reliable operation and trouble-free performance has been my experience. The Centaur enabled me to retire my commercially made 3-500Z amplifier during the evaluation period. The Centaur has a quieter fan and a lower vertical height. For me, these are plus factors.

Three Svetlana 811-A tubes are used in parallel to generate 600 watts of CW or SSB output power on 80 through 15 meters. Power output on 160 and 10 meters for CW and SSB is derated to 500 watts. If you operate RTTY or SSTV, the amplifier output power must be limited to 350-400 watts.

The Centaur operates from 160 through 10 meters. In accordance with FCC regulations, preventive measures defeat operation on 12 and 10 meters. However, a copy of your amateur license may be sent to Ten-Tec with a request for the modification kit that permits 10 and 12 meter operation. An experienced technician can quickly determine how to make the amplifier operational on 10 and 12 meters without contacting the manufacturer.

Other Features

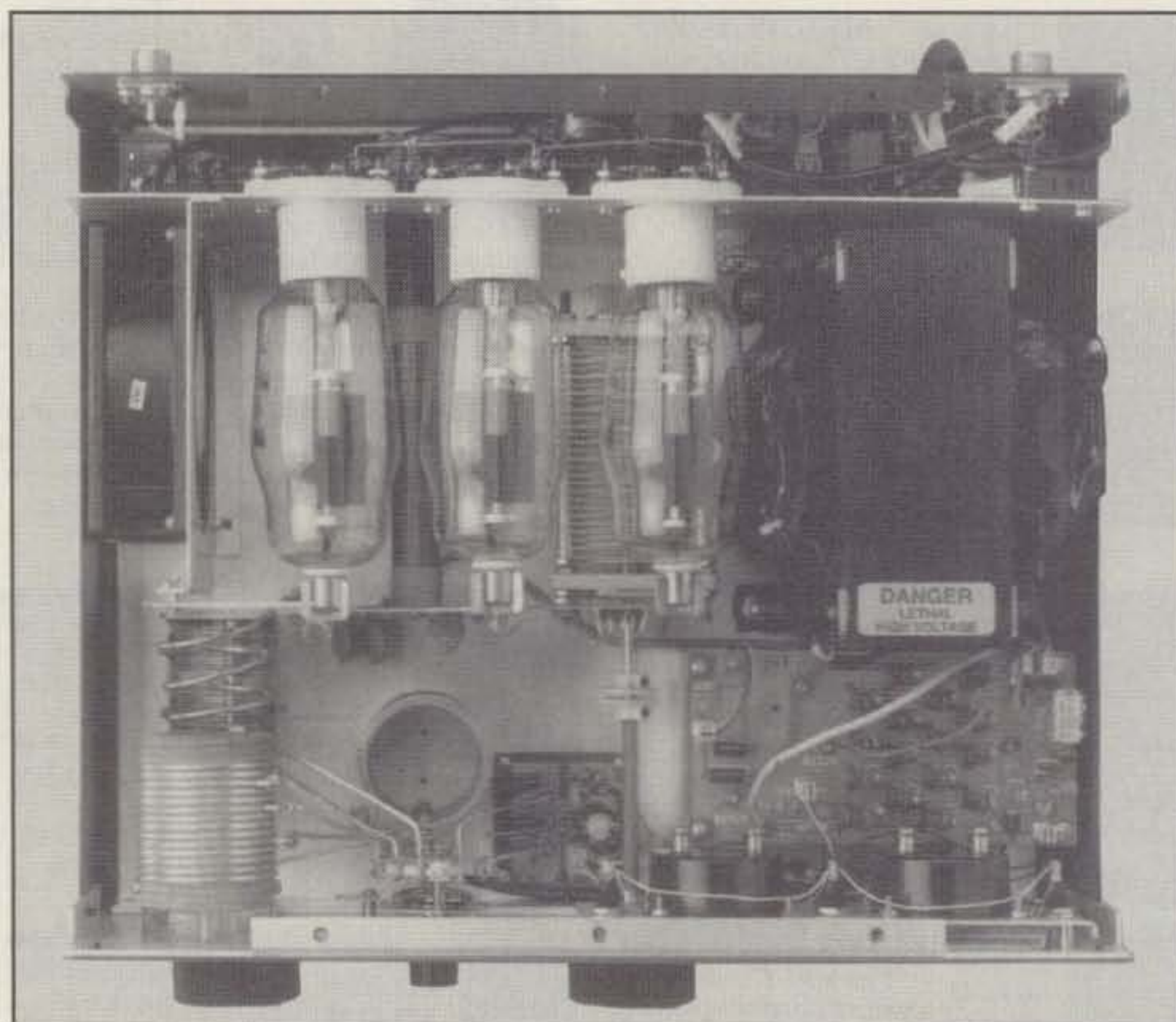
The amateur has his or her choice of full QSK or PTT operation at the flick of a front-panel toggle switch. CW enthusiasts who own Ten-Tec Model 411 or Omni-VI transceivers, or any other full break-in transceiver, will appreciate the Centaur QSK function. Relays and well-designed relay logic prevent hot-switching when the amplifier is keyed.

The plate tuning and loading controls are equipped with vernier drives to make adjustment smooth and easy. The knobs require $2\frac{1}{2}$ rotations to move from one end of each capacitor tuning range to the other.

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



The Ten-Tec 411 Centaur linear amplifier.



Interior view of the Centaur amplifier. Three 811-A tubes are mounted horizontally at the upper rear of the cabinet. A 100 cfm fan provides cooling. The spacious, uncrowded interior makes home servicing easy. The high-Q plate-tank inductors are visible at the lower left. The HV power supply can be seen at the far right of the photograph.

The low-cost Svetlana tubes (another plus!) are installed horizontally in the cabinet. This accounts for the low 6 inch height of the amplifier. Matched sets of Svetlana tubes are available from Ten-Tec and RF Parts for a modest price. A Centaur owner need not fret over paying \$500 or more for tube replacements, as is necessary with some amplifiers.

I am particularly impressed with the accessibility of the inner workings of the amplifier. Home servicing is easy to accomplish because of the roomy, uncluttered layout.

Circuit Highlights

There are no input tuned circuits that require tedious band-by-band adjustment to ensure a low input SWR. An effective matching network utilizes a loading resistor and a capacitive divider at the amplifier input port to ensure an SWR of less than 2:1 on each band of operation. I found the SWR to be 1.5:1 or lower during my tests on various amateur bands.

The key-up plate voltage during operation from the 240 volt mains is 1800. This value declines to 1650 volts (key down) at 500 mA of plate current. Ten-Tec rates the plate voltage at 1800 (key up) and 1500 (key down). Operation from the 120 volt AC line may result in a greater voltage drop, depending upon how "stiff" the AC line to the shack may be. I observed that approximately 80 watts of driving power is required to attain maximum safe amplifier output power. Maximum operating levels are 1800 plate volts, 550 mA of plate current (single tone), and 150 mA of grid current. Maximum plate dissipation is rated at 195 watts.

Jumper terminals are easily accessible behind a removable rear-panel plate for changing the AC input from 120 to 240 volts, or vice-versa. A pictorial drawing illustrates clearly which terminals to select for making these changes.

The Operator's Manual

Some manufacturers fall short of providing the user with clearly written and detailed operating manuals. Ten-Tec has produced an excellent plain-language booklet that even a beginner can comprehend. The book contains a master schematic diagram of the circuit in which the small modules are shown as blocks. Elsewhere in the manual are circuit diagrams, PC-board layouts, and photographs of the individual modules. Page 2-7 lists the **Tuning** and **Loading** control settings for each band when the amplifier is terminated with a 50 ohm load. Slight readjustment from the suggested settings is sometimes necessary. Chapter 4 contains data for doing one's own troubleshooting of the Centaur. Preventive maintenance procedures are contained in that section.

Summary Comments

Ten-Tec warranties pertain to only the original equipment owner. The Centaur is warranted against defects and materials for one year after the date of purchase. The 811-As are guaranteed by Svetlana, USA. Full replacement is offered for up to 100 hours of service. The tubes are prorated from 101 to 1000 hours of operation. Maximum coverage is 1000 hours or 1 year, whichever occurs first.

IMD measurements revealed that all spurious responses are 40 dB or greater below peak signal at 600 watts of output power.

The only performance anomaly I observed was a tendency for arcing in the plate tuning capacitor on very damp days when the ham shack window was open (near the amplifier). The condition vanished after a three minute amplifier warm-up. The arcing under those conditions was especially prevalent on 160 meters. Tight

coupling to the load (**Load** control), consistent with maximum power output, is essential toward preventing arcs in any amplifier. I found that tighter coupling to the antenna, at a slight sacrifice of output power, cured the arcing problem on damp days. Carefully removing accumulated dust from within an amplifier is recommended as part of any preventive maintenance program. Cleaning should be done at three month intervals. This will help to prevent arcing during times of high indoor humidity.

The Centaur has an attractive, functional appearance. The cabinet is dark gray. Control labels are printed in white. The amplifier dimensions are 6"H x 15.5"W x 13"D (15.2 x 39.4 x 33 cm). The weight is 40 pounds (18.14 kg).

I have saved the best for last: The price class of the Centaur is \$749! The manufacturer is Ten-Tec, Inc., 1185 Dolly Parton Pkwy., Sevierville, TN 37862-3710 (423-453-7172). ■

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CIRCLE 87 ON READER SERVICE CARD

I couldn't find any North Pole stories for the December issue, but this excellent article shares all the cold, ice, and snow one could want.—K2EEK

Living, Working, and Amateur Radio On An Antarctic Base

BY JAMES MILLNER*, WB2REM, AND ANDRE PHILLIPS, VP8MAP, ZL3AW

Life on an Antarctic base, to outside eyes at least, is viewed as being harsh and isolated. The cold, dark winter nights are foreboding. André, VP8MAP, however, enjoys both the surroundings of his two-year home at Halley Base, Antarctica, as well as the company he keeps. André is employed as an electronics engineer and is part of a scientific team responsible for maintaining ongoing geophysical experiments on base.

There are many talented people who work at Halley Base. For recreation, some play musical instruments, while others pursue the fine arts. André is an avid photographer and an innovative amateur radio operator.

During André's time at Halley Base, amateur radio has provided a crucial link between him and the outside world. André's communication with other amateurs, such as myself, has given us a view of what life is like living on an Antarctic base. His operations on PACSATs (packet satellites) provided both the text and the photography upon which this article is based.

Halley Base, Antarctica (75°35'S, 26°24'W) was named after the English astronomer Edmund Halley (1656–1742), who also discovered the periodicity of Halley's Comet. The United Kingdom currently operates several scientific bases in the South Atlantic and on the Antarctic Peninsula, including Bird Island (South Georgia), Signy (South Orkney Islands), Faraday, and Rothera (on the Antarctic Peninsula). During the Antarctic summer a number of other temporary field bases are also established.

Halley is the most southerly and coldest UK Antarctic base. In fact, the station is located on the Brunt Ice Shelf at a point where the ice is about 600 feet (200 meters) thick. The ice shelf itself is floating on about 1500 feet (500 meters) of sea water, and at the location of Halley Base, the whole ice shelf is moving approximately 6 feet (2 meters) westward per day. In about 15 years the ice on which the base is currently built will have moved to the coast, and ultimately it will "calve" off to form an iceberg.

Because the temperatures at Halley remain below freezing all year, there is no melting of the snow in the summertime. Therefore, the snowfall accumulates, raising the surface level by about 6 feet (2 meters) per year. The snow packs down to nearly the density of water, so it doesn't take long for the pressures on buried



Here is André Phillips, VP8MAP, in his Antarctic gear. Check out the icicles on his beard and mustache. It must be perfect antenna weather at Halley Base.

structures to become enormous. Coupled with an approximate (annual) 1:1000 shear in the ice, buried stations are crushed and torn apart after a few years. Therefore, to keep a base operational in this area of the Brunt Ice Shelf, Halley needs to constantly be rebuilt.

The current structure, built in the early 1990s, is actually the fifth Halley Base to be built in the area. (The first was built in the late 1950s for IGY, the International Geophysical Year.) The four previous Halley Bases were under-ice bases, and Halley's one and two have completely disappeared, now probably encased in a giant iceberg. The buried remains of Halley three are currently protruding from an ice cliff at the edge of the Brunt Ice Shelf and probably will break off and float away within the next year or so.

Halley 5 is different from earlier bases in that it is built above the snow surface. The three main buildings at Halley (accommodation, space science, and meteorology) are built on steel legs. Each summer the buildings need to be jacked up approximately 6 feet (2 meters) to allow for the rising snow surface. The main Accommodation Building (the "ACB") is supported on 20 steel legs and weighs approximately 350 tons. During the summertime a two-person, hand-operated jack is placed on each leg of the ACB, and over a period of three to four days the entire structure is raised by human muscle alone. As you can imagine, there are a lot of people involved. It's quite a spectacle to watch 40 people pumping their

hardest, raising the large building millimeter by slow millimeter.

In addition to the above-ground buildings, deep under the snow surface there are extensive "tunnels"—large, steel-clad tubes that house the fuel and stored water. Making water is a daily chore. Teams of five to six people spend about 20 minutes shoveling snow into the Snow Melter. During blizzards and total darkness this can be a demanding job, but one which has to be done daily, as the base consumes about 2 tons of water per day.

You may not have heard of Halley Base, but you probably have heard of Halley's greatest claim to fame, the discovery of the Antarctic Ozone Hole. During the 1980s ultraviolet (UV) flux observations from Halley were compared with satellite observations and confirmed the existence of substantially reduced amounts of stratospheric ozone over Antarctica, especially in the Austral springtime. The discovery of the ozone hole is an interesting story, as it highlights the danger of dismissing scientific data which don't fit expected observations. For several years satellite observations had shown a significant decrease in the total ozone thickness over Antarctica, especially in the local springtime. Unfortunately, the large "hole" over Antarctica was attributed to a problem with the satellite's detector (at high latitudes), and the data were ignored. However, eventually these "false" data were matched with ground-based observations from Halley, and the rest of the story is history.

A UV-measuring Dobson Spectrophotometer is still operated at Halley, although this year probably will mark a significant improvement in ground-based measurements of UV flux. Last summer a new type of UV photometer was installed (named "UVIZ," run by Jon, VP8CRV), one which can use starlight to measure the absorption of UV in the stratosphere. At the latitude of Halley, the sun slips below the horizon for the winter at the beginning May, and it doesn't return until mid-August. Using conventional techniques it is difficult to measure UV transmission through the atmosphere during total darkness, so this new instrument will greatly increase our knowledge of stratospheric ozone levels during the winter months. The most recent measurements (*Nature*, 1995) suggest that the ozone layer over Antarctica continues to thin, and that the ozone "hole" is enlarging northwards to have effects in more

*7 Winnipeg Lane, Lawrenceville, NJ 08648



This is a photo of the Accommodation Building at Halley Base, Antarctica. The legs of the building need to constantly be jacked up to keep the building above the rising snow level. The amateur radio station is located in a smaller but similar building known as the Space Science Building, or SSB—an apt place to be. In this view you can see the sun's rays forming a mystical effect around the building.

populated regions. In 1994 the thickness of the ozone layer continued its downward trend, and the October ozone-thickness measurements fell to about one third of those measured in the late 1950s.

There are seventeen people wintering at Halley Base, eight of whom have their VP8 (Falkland Island) calls. Wintering base personnel include a doctor, plumber, electrician, diesel generator mechanic (Joe, VP8CRW), vehicle mechanic (Martin, VP8CRX), cook, steel erector (Richard, VP8CRI), three met observers (including Jon, VP8CRV, and Barry, VP8CRF), general assistant², radio operator (John, VP8CRD), two scientists, and three engineers (including André, VP8MAP). 1995 was the last year that there were no women wintering at Halley, a welcome policy change!

The food served at Halley Base is the ordinary type that one might eat at home in the UK, although there is of course nothing in the way of fresh fruit and vegetables. Some Antarctic bases have hydroponics facilities, but not Halley. At one time many Antarctic bases had these facilities and grew tomatoes, cucumbers, and even carnations. These days, as part of an international agreement not to import foreign plant and animal species into Antarctica, home-grown hydroponics is banned, or at least frowned upon. André thinks that some aspects of this ruling are mildly ridiculous, as he thinks there is little chance that cucumbers will escape the glasshouse and colonize the continent!

In their spare time Halley base personnel have a number of hobbies and interests to keep themselves amused. High on the list are photography, reading, playing musical instruments, and working-out in the gym. Perhaps even higher are watching movies and playing computer games.

During midwinter darkness the opportunities for traveling off-base are limited. However, as soon as the sun returns, there are expeditions mounted to visit penguin colonies and ice formations. André is hoping to visit the buried remains of Halley Base number three before it breaks off and becomes part of an iceberg.

André's main private activity this year has been writing a chronology of his father's life and career, and one of the reasons he journeyed south was to have some (relatively) interruption-free time to complete this task. Also, chatting with people on the amateur PACSAT satellites absorbs much of his spare time.

The local animal life consists of penguins, seals, and birds. During the winter cold most of the animals, except for the incredibly hardy Emperor penguins, head north. The Emperor penguins (which are up to 3 feet [1 meter] tall) breed in April and lay their eggs in July when there is almost complete darkness and the temperatures hover around -40°F (-40°C). In the Austral summer the smaller Adele penguins (1 foot [.3 meter] tall) hatch their chicks. During the late summer a few adult Adeles walk the 10 miles (16 kilometers) from the coast to the base, where they congregate to molt. During that time they look quite bedraggled and sorry for themselves and there are feathers everywhere!

During the Antarctic spring the Weddell seals return from the sea to have their pups on the vast sea of ice. Like most Antarctic wildlife, Weddell seals have never seen humans before, and they are normally quite approachable. At Halley base, mainly two types of bird are seen: the big Skua birds (which look like dirty seagulls) and the pearly white Snow Petrels.

André has also wintered on the Australian Antarctic base of Mawson ($67^{\circ}36'\text{S}$, $62^{\circ}52'\text{E}$) and has spent some time in Alaska and the Canadian Arctic. For the last few years he had been living in VE5-land, Saskatoon, Saskatchewan, Canada. He found that living on the Prairies was good practice for Antarctica, as the Prairies in the wintertime look much the same as the terrain around Halley, although the temperatures and winds in Antarctica are much more severe. Wintertime temperatures at Halley are typically in the range -20° to -40°F (-30° to -40°C), with occasional rare descents into the -50°C range. During 1995 the coolest temperature was -65.7°F (-54.2°C).

The clothing worn at Halley is mostly fairly standard equipment that can be bought in out-

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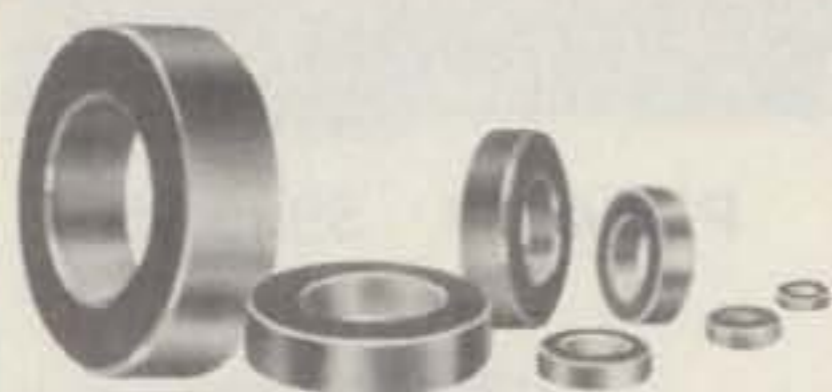
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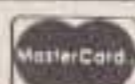
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A group shot of the amateurs stationed at Halley Base. Left to right in the back row are Joe Nemeth, VP8CRW, generator mechanic; Martin Bell, VP8CRX, vehicle mechanic; John O'Sullivan, VP8CRD, radio operator; Jon Evans, VP8CRV, met observer; and André Phillips, VP8MAP, engineer. Seated in the front row on the left is Barry Morton, VP8CRF, met observer/engineer, and on the right Richard Parsley, VP8CRI, cook and steel erector.

doors shops back home. Some items are traditional and have been worn on bases for many years—in particular the outer garments known as "Windies" (on British bases). These are a loosely fitting pair of pants and a hooded jacket made of a tightly woven, windproof cotton fabric known as "Ventile."

Having lived in cold climates for some time, André brought some of his own clothing down with him, including his very photogenic Eskimo parka. This garment was handmade for him by his amateur friend Julie Ewing, VE8JE. Julie is now living at virtually the opposite side of the world from André, in the Inuit (Eskimo) village of Paulatuk in Canada's North West Territory. One of the great attractions of amateur PACSAT communications is that distance is of no importance. Julie and André regularly communicate with each other via their relay in eastern Canada, Darrell, VE1ALQ. They exchange letters as well as images showing life at the opposite poles of the earth.

Halley is isolated. The resupply ship calls twice in the summer (Christmas and March). There is a fixed-wing aircraft operating here during the summer season, but it departs shortly before the last ship leaves. After that the base is very much on its own. The main communication link is an INMARSAT (International Maritime Satellite) ground station. Unfortunately, this equipment is very expensive to use and at \$8US (UK£5) per minute, people aren't exactly queuing up to use it. There is a fax machine connected to it, but the low baud rate of the link makes fax transmission fairly slow. HF radio is also used, but generally long-range propagation is poor because of Halley's high geomagnetic latitude, and also because of the decreased reflectivity of the ionosphere (during the wintertime the F-region of the ionosphere is in total darkness).

Halley Base is one of the most isolated places left in the world, and that's why the advent of reliable amateur digital satellite links represents quite a breakthrough for personal communications. Through the kindness of a few amateurs, during the year Halley was amply supplied with football and other sports results.

Vehicles at Halley include several Tucker "Snowcats" (manufactured in Medford, Oregon), two Caterpillar D4 bulldozers, and numerous Bombardier Skidoos. During the 1970s there were husky dogs living at Halley, but they were removed, as Halley is perhaps a little too cold and dark to utilize them to their full potential. During the worst of the winter darkness and cold the Halley huskies were lowered by rope to deep under the snow surface, and they spent the winter in the relative warmth of the "tunnels." André was lucky enough to work with huskies in Antarctica when he was living at Mawson. Now all the huskies of Antarctica have been removed to comply with an international agreement restricting the importation of foreign animal species onto the continent. This is perhaps understandable, but the dogs are sorely missed, and Mawson's famous huskies are now in retirement at an outdoor education center in Minnesota. There is still one "Nansen" dog sled at Halley, a relic of when the dogs were there. There are also many other Nansen sleds which have been slightly modified to be pulled by Ski-doo.

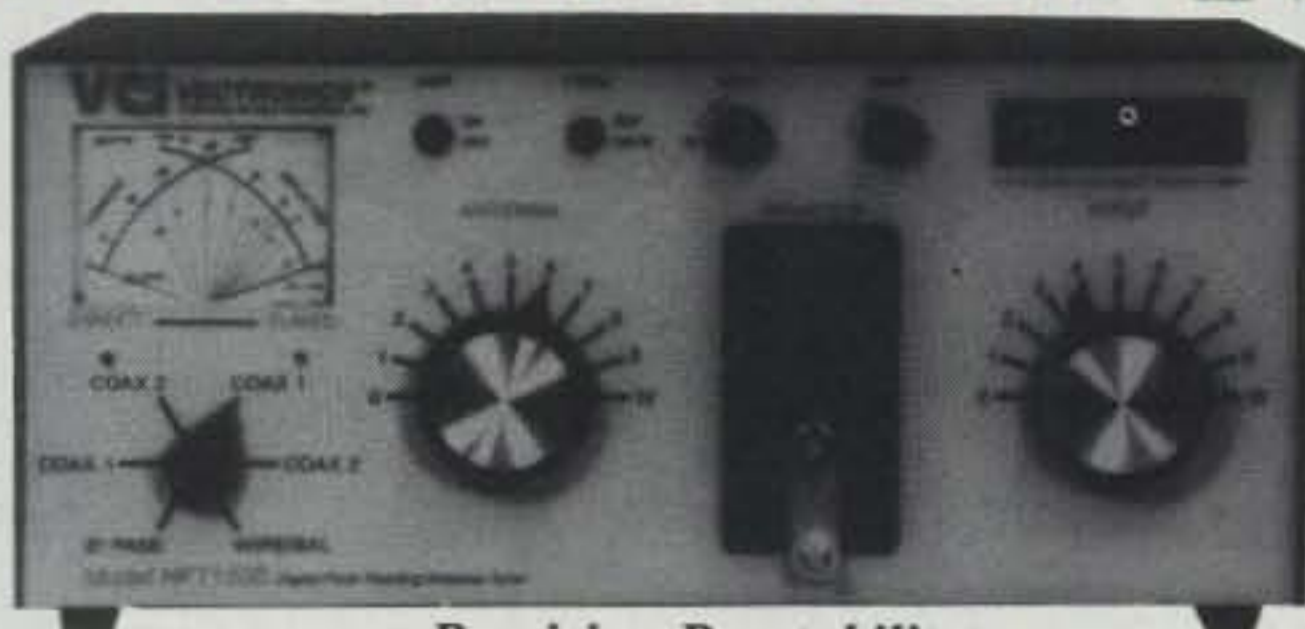
One way to keep fit on base is to try towing the sleds by man power, the way it used to be done. There are special hauling harnesses for the purpose, and Steve (our Wintering Base Commander) can occasionally be seen towing a sled loaded with 150 lbs. (70 kg) of flour, trekking around the base.

Over the last few years André has held several amateur calls. He lived in New Zealand

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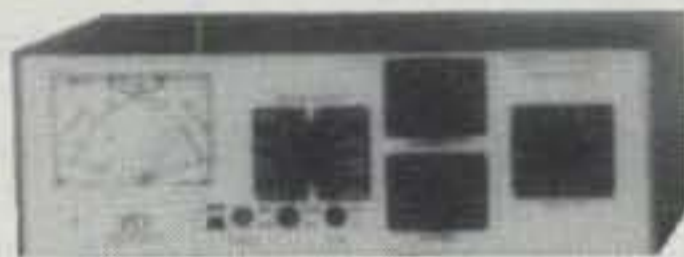
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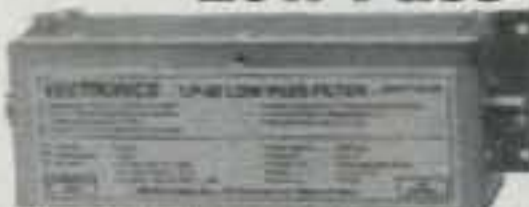
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(Christchurch, call ZL3AW), as well as Australia (Adelaide, VK5AAP) and Canada (Saskatoon, ZL3AW/VE5). André's satellite station consists of a Kenwood TS790A, PacComm Tiny-2/ NB96 modem, homebrew three-element vertically-pointing "quagis," an IBM laptop computer, and of course, WiSP (the Windows Satellite Program, written by Chris, ZL2TPO/G7UPN). Things are still not working as well as André would like, but development of better antennas will have to wait for warmer summer temperatures. His satellite antennas are fairly simple, but they have to survive there. The "quagis" (loop antenna Yagis) are made of heavy steel wire firmly secured onto a frame of thick timber (glued and screwed construction and roped down to the roof). The equipment stays warm inside, but the outside antennas require a little attention. Antennas can often go out of tune due to the buildup of "rime" ice on the elements. This ice has a dielectric constant of approximately 2, so not much of it is needed to start changing the electrical characteristics of an antenna. The high winds, cold, and accumulation of ice are one reason why any sort of large or mechanically-driven antenna is not very practical in the Antarctic environment.

Communication with André in 1995 showed the power of amateur PACSAT satellites in

maintaining a reliable communication link with a remote part of the world which is normally very difficult to contact via HF techniques. The ability to transmit images, computer programs, data, and even sound via digital techniques has meant that a reliable and quite educational dialogue has been possible between André, myself, and many others. DXpeditioners and others wishing to operate from remote sites should be aware of this power. And for those intending to operate from high-latitude sites, André has written some notes that were presented in the *AMSAT-UK Oscar News*, August 1995.

It takes an unusual person to live happily under the conditions that André and his colleagues encounter daily. Their dedication to their work assists the gathering of scientific data, which increases our knowledge of the Antarctic continent. André can be contacted anytime on the satellites KO-25 or UO-22 (VP8MAP) and will be happy to answer any further questions you might have about life on an Antarctic base.

About The Authors

André, VP8MAP (ZL3AW), has been a licensed amateur since the age of 14. He has been working at Halley Base since December 1994 and



A story of Antarctica just wouldn't be complete without a cute shot of a mother and baby Emperor Penguin.

will likely remain there until March 1997. André enjoys both cold and warm weather activities. He is a keen scuba diver as well as a private pilot. André has also wintered at the Australian Antarctic base of Mawson and has lived in Canada. Although trained as a scientist, his current work title is "engineer," and his job is to maintain and operate several geophysical monitoring experiments at Halley. He has only operated his 9600 baud amateur PACSAT station from Antarctica.

Jim, WB2REM, has been licensed since he was 11 years old. He is a child psychologist and an avid satellite operator. Jim met André in April 1995 on the Korean satellite, KO-25. Through numerous communications between him and André, this article was written. In January 1995 Jim published an article in *QST* entitled "The WB2 'REMOte Link.'" This is one of the first articles totally conceived of and written through the use of amateur satellites. The pictures in the article were also transmitted via KO-25 and UO-22 satellites.

Footnotes

1. Faraday is to be handed over to the Ukraine in early 1996.
2. The General Assistant position is a mountaineer, or someone with considerable outdoors and guiding experience. It is this person's job to look after the field gear and accompany groups into the field, especially during the summertime.
3. A De Havilland "Twin Otter" aircraft.

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- Jones, A.E., and Shanklin J.D., "Continued decline of total ozone over Halley, Antarctica, since 1985," *Nature* 376, pp. 409-411 (1995).
- Phillips, A., "Communications utilizing low earth orbit Amateur satellites from a high latitude site, Communications utilizing low earth orbit amateur satellites from a high latitude site," *AMSAT-UK Oscar News*, no. 114, pp. 26-31 (August 1995).

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The fast custom T/R (transmit/receive) relay in the AL-80B switches nearly as fast as some vacuum relay QSK T/R switches.

For lightning fast QSK operation use the optional external Ameritron *electronic PIN diode* QSK-5 T/R switch or the internal QSK-5PC. Please contact Ameritron for details.

Plus more . . .
An *Standby* switch lets you run barefoot, but you can instantly switch to full power if you need it.

Has transmit LED; 12 VDC, 200 mA jack; 12 VDC keying relay for solid state and tube rigs; tough, nearly indestructible Lexan-over-aluminum front panel. Two year limited warranty.

AMERITRON offers the best selection of legal limit linears!

These 3 rugged linears all use a super heavy duty hypersil power supply capable of 2500 watts!

Ameritron's most powerful amplifier

Ameritron's Dual 3-500Z linear

Ameritron's 3CX1200A7 linear

AL-1500
\$2695⁰⁰
Suggested Retail



Ameritron super power amplifier uses the herculean Eimac® 8877 ceramic tube.

It's so powerful that 65 watts drive gives you full legal output—and it's just loafing because the power supply is capable of 2500 watts PEP.

AL-82
\$2095⁰⁰
Suggested Retail



This linear gives you full legal output using a pair of Eimac® 3-500Zs. Some competing linears using dual 3-500Zs don't give you 1500 watts because their lightweight power supplies can't use the tubes to their full potential.

AL-1200
\$2195⁰⁰
Suggested Retail



Get ham radio's toughest tube with the Ameritron AL-1200—the Eimac 3CX1200A7. It has a 50 watt control grid dissipation—12 times tougher than the 4 watt rating of the 3CX800A7—yet you get the same full legal output as you get from a pair of 3CX800A7s.

AMERITRON brings you the finest high power accessories!

Legal limit antenna tuner

Remote Coax Switches

QSK-5 Pin Diode T/R Switch

ATR-15
\$399
Suggested Retail



Ameritron — the high power specialist — brings you the ATR-15 antenna tuner that's designed for legal limit amplifiers. Heavy duty silver plated bandswitch virtually eliminates switch failure. High power transmitting capacitors. 1.8-30 MHz. Peak reading SWR/wattmeter. 6 position antenna switch. Selectable 1:1 or 4:1 balun. 5¼ x 13¼ x 13½ inches. Meter lamps uses 12 VDC.

RCS-8V
\$149
Suggested Retail



RCS-8V, DC-UHF 5 KW Coax Switch. Replace 5 coax feedlines with one with this Remote Coax switch. Weatherproof box mounts outdoors on your tower or mast. Attractive control unit sits on your operating desk. Low SWR to 250 MHz. Usable to 450 MHz. Low loss. Rated at 5 KW to 30 MHz, 1 KW at 150 MHz. RCS-8VN, \$159.00 with "N" connectors.

QSK-5
\$349
Suggested Retail



Self-contained, connects externally to most HF amplifiers. Handles 2.5 KW PEP, 2 KW CW. Six times faster than vacuum relay. 6x4x9½ inches.

Legal Limit Dummy Load

RCS-4, \$134.00, 4 position HF switch. Similar to RCS-8V. No control cable needed. Handles 1500 watts continuous. RCS-4



Step-Start Inrush Current Protector

Stops power up inrush current and absorbs momentary high voltage spikes to your amplifier. ICP-120 for 110-120V or ICP-240 for 220-240 VAC.



ICP120/240
\$79
Suggested Retail

Oil cooled 50 ohm dummy load. Handle 1500 W for 5 min. SWR under 1.2 up to 30 MHz. Low SWR to 400 MHz. 7½" H x 6 5/8" D. ADL-1500X without oil, \$39.95. ADL-1500 with oil, \$59.95

ADL-1500X
\$39.95
Suggested Retail



\$139
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The International Antenna Corp. Double Bazooka Antenna

BY PAUL CARR*, N4PC

You've never heard of a Double Bazooka antenna? I'm not surprised. The Double Bazooka had its origin in the 1940s as a broad-band, half-wave antenna for use in radar installations. It subsequently was introduced to the amateur community in the 1950s.

The antenna never gained widespread use in the amateur world because of difficulties in construction. Rarely could an amateur build a Double Bazooka that could and would withstand the harsh wind and ice loading that we encounter in our everyday environments. I believe that the construction problem has been solved in this antenna.

The antenna construction begins with a length of 50 ohm coax. The shield is split in the middle, but the center conductor and its insulation are left intact. The shield becomes the radiating element of the dipole. The 50 ohm feed line is attached to the center braid of the coax through a proprietary design connector. This connector has an eye hook for mounting the antenna in an inverted-Vee configuration. It also has an SO-239 coax connector, and the entire center connector is enclosed in high-shear, UV-resistant potting compound.

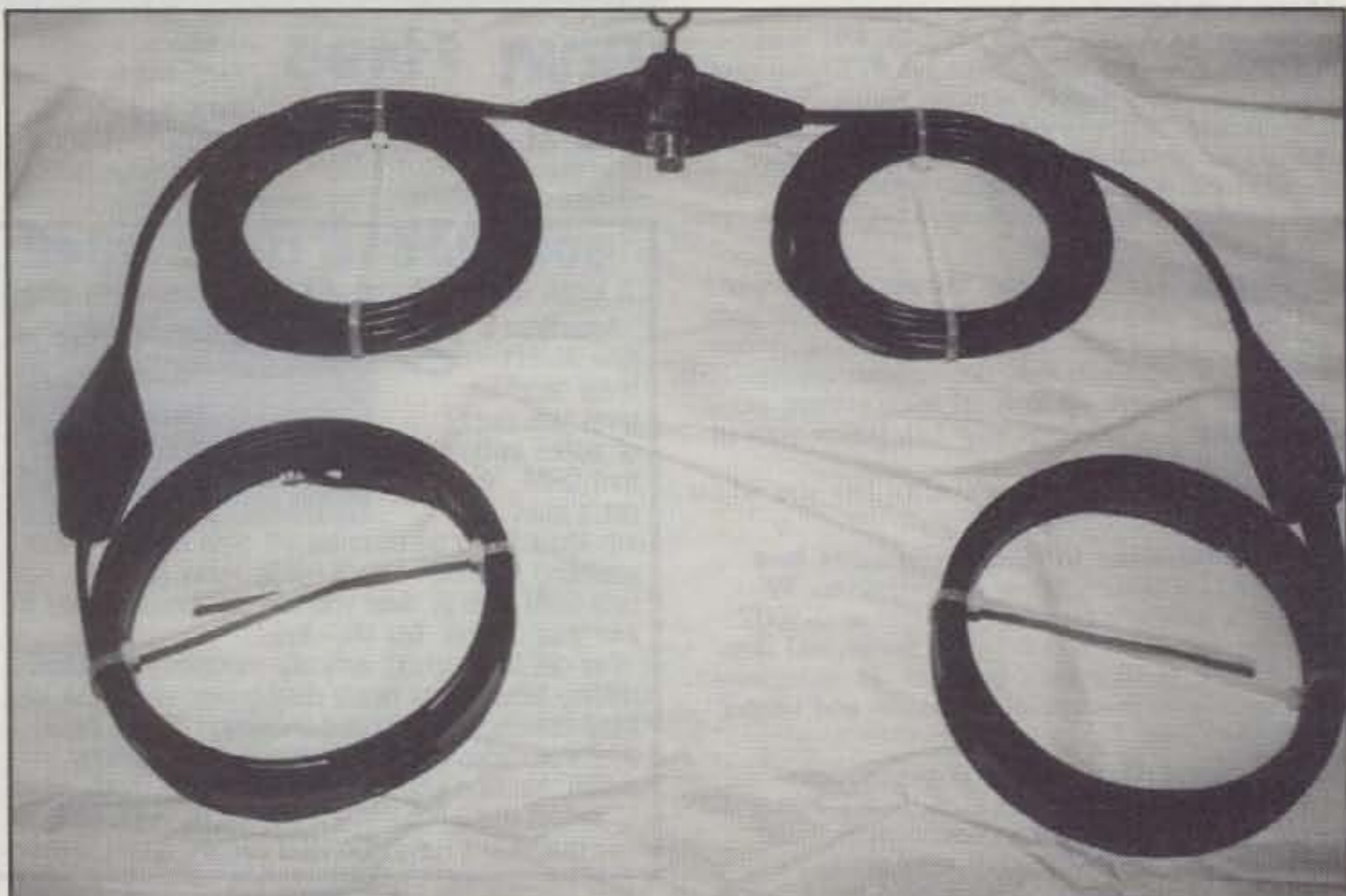
At the ends of the coax, the center conductor is shorted to the braid, and this end is extended through industrial-grade 300 ohm twinlead. The coax is bonded to the twinlead with mil-spec heat-shrink tubing. This assembly technique ensures a high-strength, UV-resistant antenna.

The antenna has no exposed metal wire. This feature should reduce static buildup on the antenna. Those of you who have antennas that suffer from rain and snow static can appreciate this advantage.

The antenna will handle the full legal limit. The company recommends that the antenna be mounted in an inverted-Vee configuration. I have tested the antenna in the inverted-Vee and horizontal configurations. Measurements were made using an MFJ 259 SWR analyzer at the end of approximately 90 feet of RG8X coax.

I first installed the antenna as a horizontal dipole at a height of about 55 feet.

*97 West Point Road, Jacksonville, AL 36265



This is how the antenna looks when you take it out of the box prior to putting it up.

The SWR was 1.4 to 1 at resonance, and it rose to about 1.6 to 1 at the band edges. I next installed the antenna as an inverted Vee (the recommended installation) with the center at about 35 feet. With this installation the SWR was 1 to 1 at resonance and about 1.4 to 1 at the band edges. In either case, the antenna produced many solid contacts even when I was running QRP.

For those of you who may want more

gain from your antenna system, the company offers an option for phasing two of these antennas. They predict a forward gain of approximately 5.5 dBd and a front-to-back ratio of about 20 dB.

The company offers antennas for 17, 20, 40, and 80 meters. The price of the 40 meter antenna is \$115. For more information, contact International Antenna Corporation, 4841 Fayann St., Orlando, FL 32812 (407-380-6270). ■

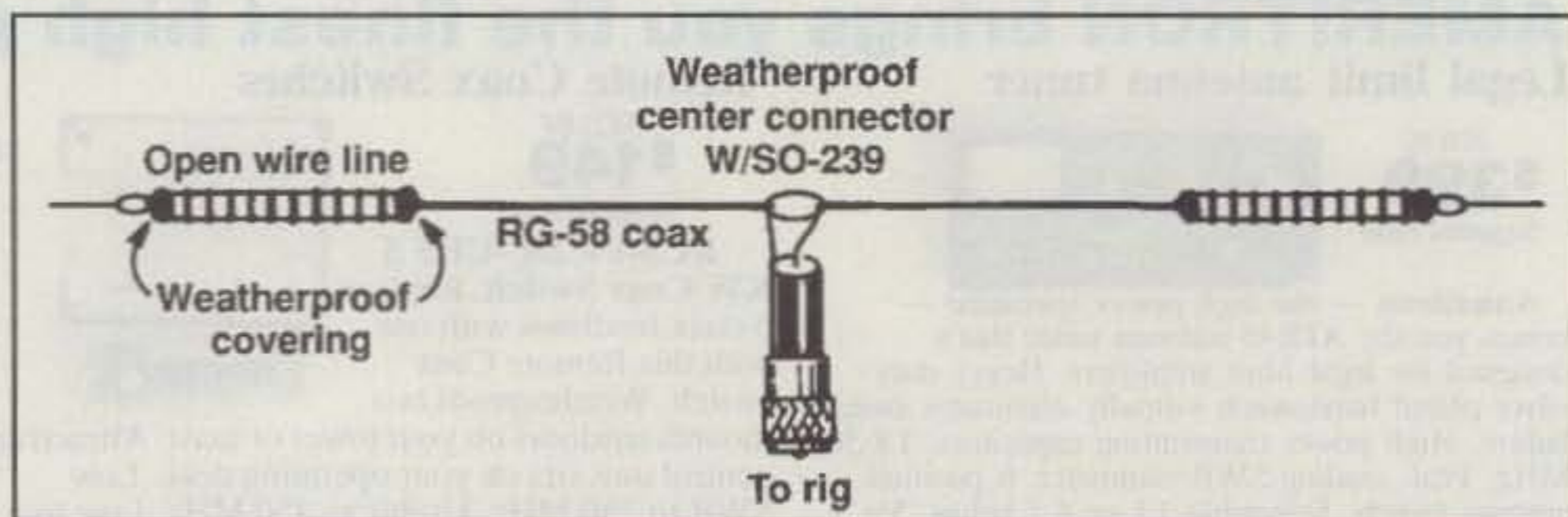


Fig. 1— The basic configuration of a broad-band dipole, once commonly called a "double bazooka." The original antenna used open wire or ladder line at the ends. In the International Antenna Corp. version the ladder line has been replaced with an industrial-grade 300 ohm twinlead. This increases the bandwidth on 80 and 160 meters and at the same time increases mechanical strength.

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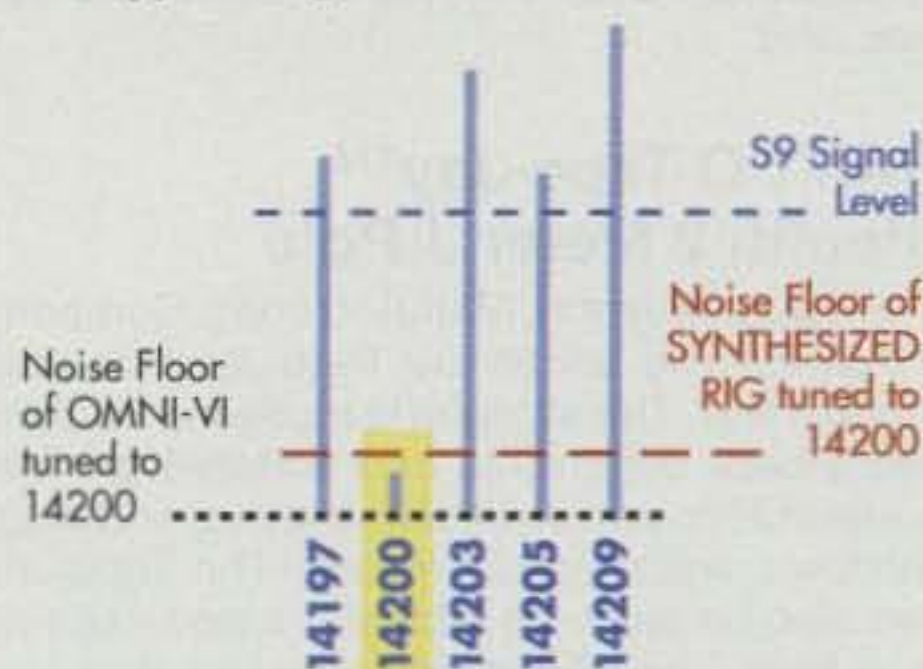
Work signals the competition can't even hear. Low phase noise makes it possible.

Hams frequently ask

"How often will I notice the difference in my shack?" The answer depends on your operating interests. A DXer who chases the rare ones may enjoy the OMNI-VI advantage in over half his contacts. If you chase DX on the noisy 80 and 40 meter bands, you may enjoy the advantage 80% of the time. A Contester has the competitive edge for the entire contest weekend.

Let's compare the OMNI-VI to any competitor's synthesized rig with both tuned to the same frequency.

5 Typical Signals on a Crowded Band



Noise floor doesn't change in the presence of nearby strong signals. Work the weak one at 14200 just over the noise.

Noise floor increased in presence of nearby strong signals. Can't even hear weak signal at 14200.

Phase noise causes the noise floor to temporarily increase covering weak signals inside your passband especially when

strong signals *outside* your passband are within a few KHz of where you'd like to listen.

Crystal mixing

OMNI-VI is the only modern high performance amateur transceiver to use crystal mixing—chosen over a synthesizer



OMNI-VI virtually eliminates phase noise as a factor in receiver performance.

because it provides the very best phase noise performance of any technology. Phase noise is essentially eliminated as a factor in receiver performance. Treat yourself to the best on HF.

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Signal Cube® Digital S-Meter From Nye Engineering

The Nye Engineering Signal Cube® is designed as a digital repeater of the receiver's S-meter (model FS73C2). The 2.5 inch cube is connected to the terminals of the receiver's analog S-meter and is powered by a built-in 9 volt battery, which will supply the unit continuously, when the on/off switch is left on, for two months. The unit can be used with hundreds of feet of cable if required.



The digital readings are in S-units 0 through 9 and in dB above S9 to 40 dB, exactly following the analog S-meter. Price of the unit is \$189. For more information, contact Nye Engineering Co. Inc., 4020 Galt Ocean Drive, Suite 606, Fort Lauderdale, FL 33308 (phone 954-566-3997; fax 954-537-3534), or circle number 107 on the reader service card.

K-Six Company's Booklets, Information Files, & Software

K-Six is a new company that offers information booklets and software for amateur radio operators. Their information and how-to booklets include "Improve Scanner/FM Radio Reception," "HF/VHF/UHF Antenna Designs," "Good Ham Station RF Grounding Plans," and "Kuby's Komputer Knowledge." The K-Six information files and software programs include: Ham/CW/T-Hunt Programs disk, Packet Programs & Info disk, QuickBasic/Basic Programs/files disk, and N6JSX PC Based Seismic Monitoring System disk.

For more information, contact K-Six Company, P.O. Box 2174, Manitowoc, WI 54221-2174 (phone 414-684-5237), or circle number 108 on the reader service card.

LDG Electronics Assembled AT-11 Automatic Antenna Tuner

LDG Electronics now has available an assembled version of their AT-11 Automatic Antenna Tuner. The tuner is a microprocessor-controlled, switched "L" network designed to work with dipoles, verticals, inverted Vees, beams, or any coax-fed antenna. It features front-panel SWR and status LED indicators. Operation of the AT-11 can be fully or semi-automatic. In full automatic, the tuner will seek a match if the SWR exceeds 3.0:1. In semi, a front-panel pushbutton will initiate the tune. Manual up and down pushbuttons are provided for capacitor and inductor fine tuning. The tuner requires 2 watts for tuning and is rated for 100 watts during operation. Power requirements are 11-14 VDC at 500 mA maximum.

The assembled AT-11 retails for \$219. The AT-11 kit is also available for \$150 without the



matching enclosure and \$180 with enclosure. For more information, contact LDG Electronics, 1445 Parran Road, St. Leonard, MD 20685 (phone 410-586-2177; fax 410-586-8475; e-mail <ldg@radix.net>; web site <<http://www.radix.net/~ldg>>; or circle number 104 on the reader service card.

MFJ-914 AutoTunerExtender™

The MFJ-914 AutoTunerExtender™ for automatic tuners extends the matching range of automatic tuners and can also extend manual antenna tuners. The MFJ-914 can be used with any transceiver from 160 through 10 meters at up to 300 watts. It connects between the transmitter and antenna with supplied SO-239 connectors. There is an Off/Dummy Load position on the Extender to help protect the transceiver by connecting it to an external dummy load and providing ground to the antenna.



The MFJ-914, which is priced at \$59.95, comes with MFJ's "No Matter What" one-year unconditional warranty. Technical assistance is also available by calling 1-800-647-8324. For further information, contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (phone 601-323-5869; fax 601-323-6551; or order toll-free 1-800-647-1800), or circle number 102 on the reader service card.

HAMCO Tape-Jay™ Stealth 2 Meter J-Pole

Hidden Antenna Manufacturing Company (HAMCO) has added the Tape-Jay™ to their product line. The antenna is made from 3.5 mil sticky-back copper foil and adheres to most household materials (inside and out), including windows, walls, and chimneys. The Tape-Jay can also be stuck on fabric for a portable roll-up J-Pole. The kit includes pre-cut J-Pole elements, a coax connector, cable clips, and assembly instructions. Soldering is not needed and no special tools are required for assembly. To create a stealth antenna, just paint the antenna to match the mounting surface.

The J-Pole is priced at \$19 plus \$4 s&h (check or MO). For more information, contact HAMCO, Dept. A4, P.O. Box 25, Woodland Park, CO 80866; or circle number 103 on the reader service card.

Say You Saw It In CQ

GAP: THE PERFECT ANTENNA

We at GAP realize there isn't a perfect antenna. No singular antenna will scream DX on 80 and be the best for local nets on 10. If anyone tells you there is, beware! The perfect antenna does not exist, but the right one for you may. If you want something to bust the pile on the low bands, then consider the Voyager. Just starting out in ham radio and need a great general coverage antenna, the Challenger is easy to assemble and for little effort will yield superior performance, especially on DX. Maybe you knowingly or unknowingly moved into one of those "restricted areas" where the Eagle's limited visibility, but unlimited ability is desired.



Voyager DX



Challenger DX



Eagle DX

This chart helps you select the right GAP antenna. When comparing GAPs, bandwidth is not a concern. With few exceptions, a GAP yields continuous coverage under 2:1 for the **ENTIRE BAND**.

All antennas utilize a GAP elevated asymmetric feed. A major benefit is the virtual elimination of the earth loss, so more RF radiates into the air instead of the ground. This feed is why a GAP requires **NO RADIALS**. Just as elevating a GAP offers no significant improvement to its performance, adding radials won't either, making set up a breeze.

A GAP antenna has no traps, coils or transformers. This is important. The greatest sources of failure in multiband antennas are these devices. Perhaps you heard someone discuss a trap that had melted, arced or became full of water. Improvements to these inherent problems are the focus of the antenna manufacturer, while the basic design of the antenna remains unchanged. **GAP improved the trap by eliminating it!** Removing these devices means they don't have to be tuned and, more importantly, won't be detuned by the first ice or rain. The absence of these devices improves antenna reliability, stability and increases bandwidth.

Another major advantage to a GAP antenna is its **NO TUNE** feature. Screws are simply inserted into predrilled holes with a supplied nutdriver.

The secret is out and people in the know say:

CQ—The GAP consistently outperformed base-fed antennas...and was quieter."

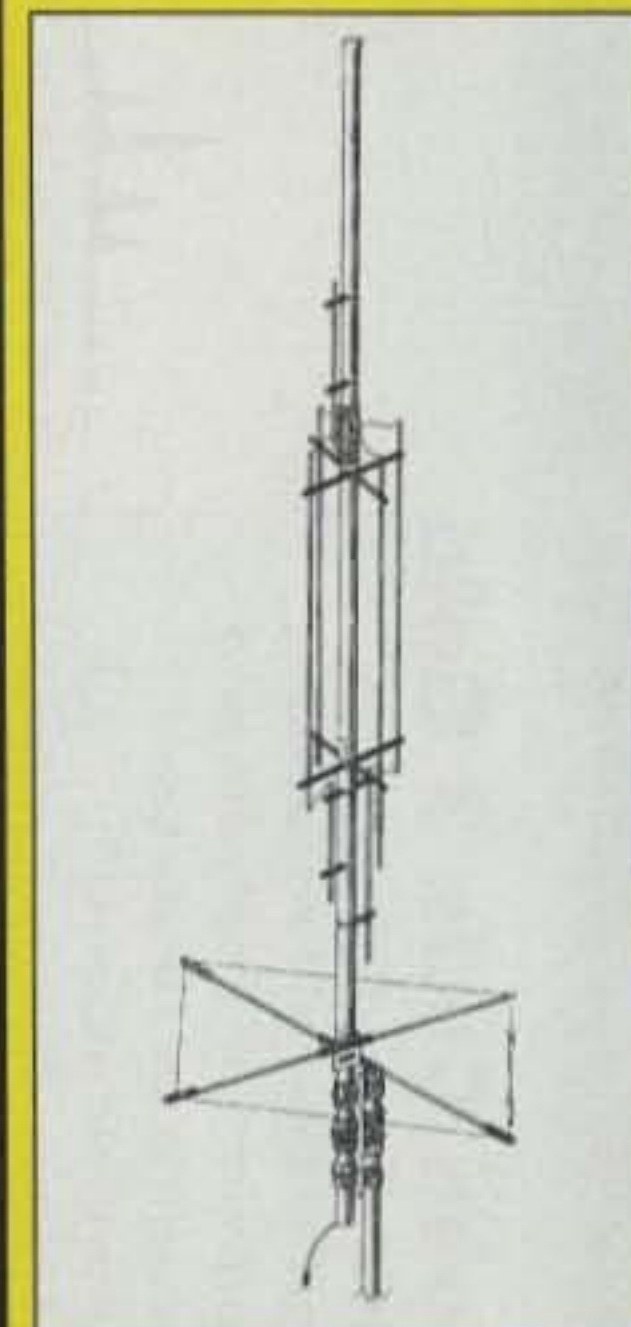
73—This is a real DX antenna, much quieter than other verticals."

RF—To say this antenna is effective would be a real understatement. Switching back and forth on 40m between another multiband HF vertical and the GAP, there was no comparison. Signals were always stronger on the GAP, sometimes by 5 units, not just DB's."

Worldradio — "These guys have solved the problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound. A half-wave vertical does need radials if it is end fed (at the bottom). But the same half-wave vertical does not (as much, hardly at all) if it is fed in the center."

IEEE—"Near field and power density analyses show another advantage of this antenna (asymmetric vertical dipole): it decreases the power density close to the ground, and so avoids power dissipation in the soil below it. The input impedance is very stable and almost independent of ground conductivity. This antenna can operate with high radiation efficiency in the MF AM standard broadcast band, without the classical buried ground plane, so as to yield easier installation and maintenance."

New Release: **TITAN DX**



This all purpose antenna is designed to operate 10m-80m, WARC bands included. It sits on a 1-1/4" pipe and can be mounted close to the ground or up on a roof. Its bandwidth and no tune feature make it an ideal antenna for the limited space environment as well as a terrific addition to the antenna farm.

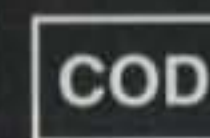
MODEL	BANDS OF OPERATION											HT	WT	MOUNT	COUNTER-POISE	COST
	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m					
Challenger DX	■	■	■	■	■		■		■	■		31.5'	21 lbs	Drop In Ground Mount	3 Wires @ 25'	\$259
Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	\$269
Titan DX			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	\$289
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	\$399

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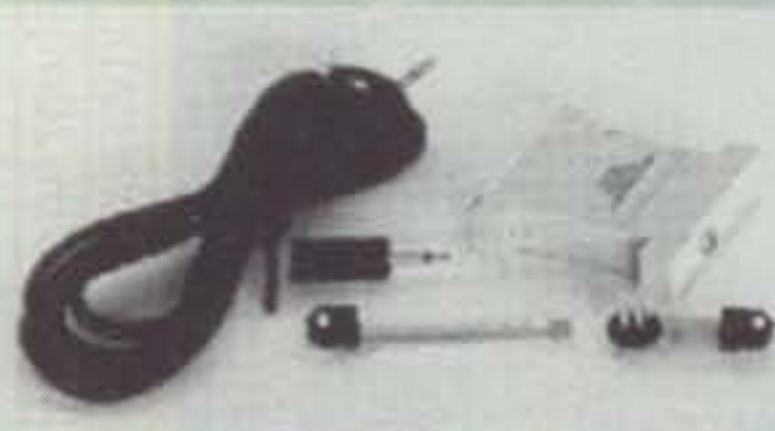
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Computer Interface by Scancat

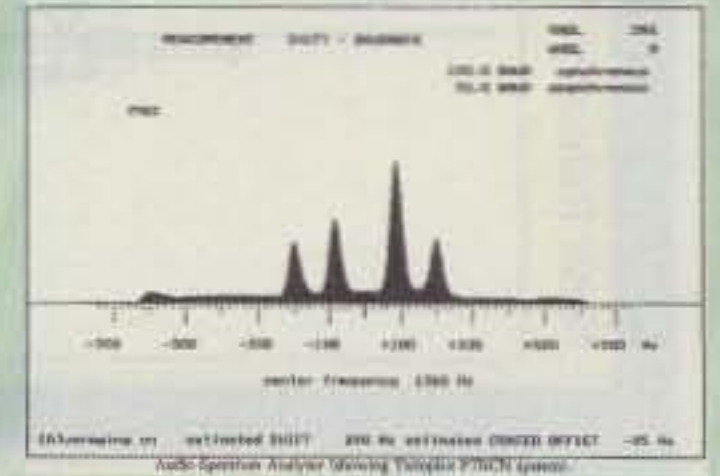
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Hoka Code 3 Gold

"The most advanced Digital Signal Processing program for analysis and decoding of HF data communications!"



Code 3 Gold makes decoding easy for the novice and expert. Unlike the CW/RTTY decoders, Code 3 is an exclusive auto classification that tells you what you are listening to (30+ modes) and automatically sets you up to start decoding. Automatic analysis and oscilloscope functions are both selectable from almost anywhere in the program. The six Main Menu screens make moving around the Code 3 Gold program a snap. Code 3 is the most sophisticated and encompassing decoder available. The 26 standard modes include:

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- FEC-S • FEC1000 Simplex • Sitor CCIR 625/476-4 • SWED-ARQ-ARQ-SWE
- Sports info 300 baud • ARQ-Navtex • ARQ-E/ARQ1000 Duplex • AX25 Packet
- ARQ-N-ARQ1000 • Hellsreiber-Synch/Asynch • Facsimile all RPM (up to Duplex Variant)
- Sitor • RAW (Normal Sitor 16 gray shades at 1024 x
- ARQ-E3-CCIR519 but without Synch. 768 pixels Variant • ARQ6-70 • Autospec - Mk's I and II
- POL-ARQ 100 Baud • Baudot F788N • DUP-ARQ Artrac Duplex ARQ • Pacto • Twinplex
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- Option 5 4 special
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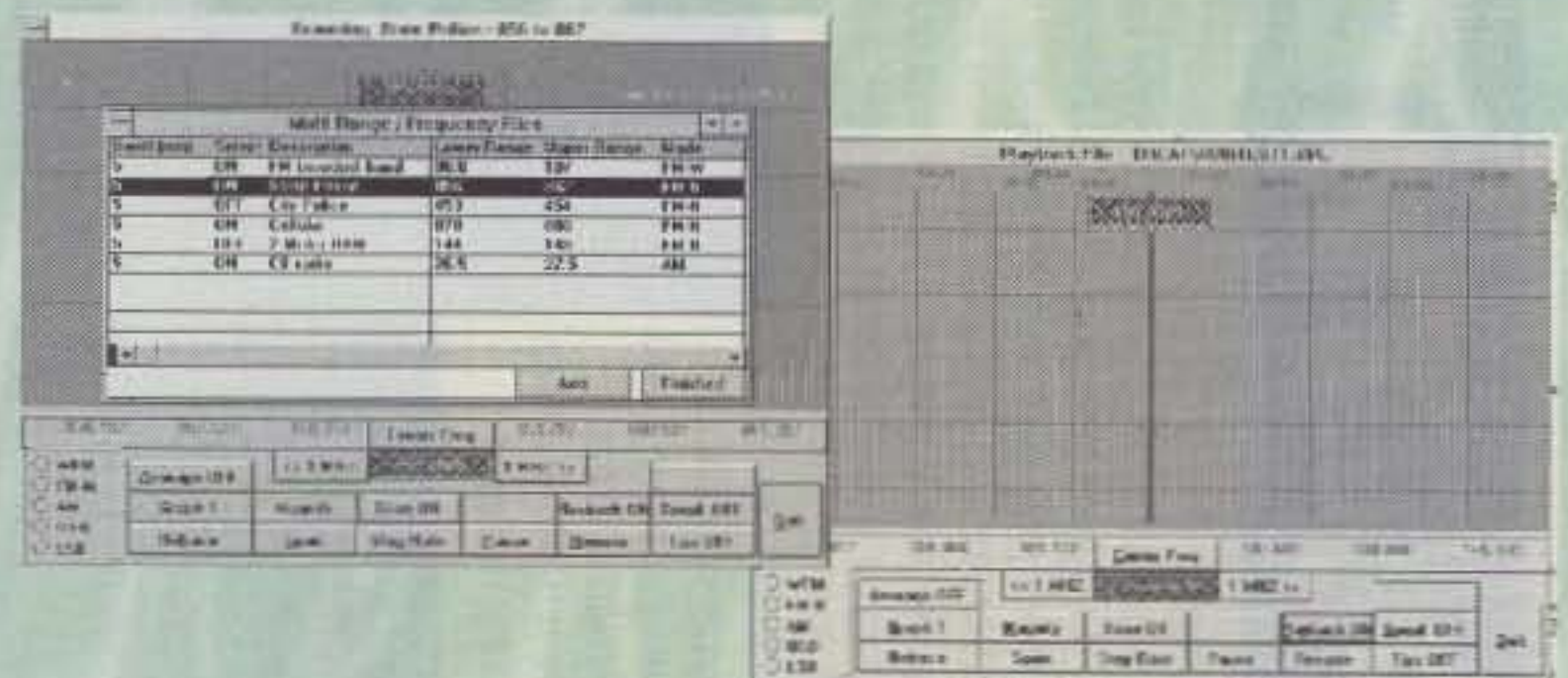


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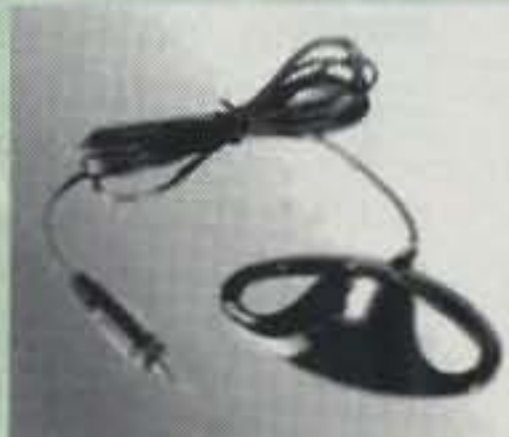
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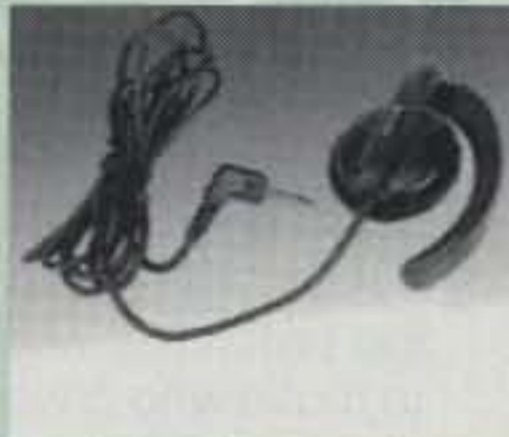
WEP-300K

8 Ohm - Kenwood connector, fits firmly over ear. Lead length 1.5M



WEP-400

Adjustable and removable soft pad. 3.15M lead - 3.5mm plug. K model has 2.5mm plug.



WINRADIO World Station Database Manager

The WINRADIO World Station Database Manager (WINDATA), is an add-on utility for any version of WINRADIO. It contains a database of over 300,000 radio stations worldwide, operating between 500kHz and 1.3GHz, which are suitable for reception by the WINRADIO receiver.

The Database Manager includes a powerful program which allows its user to:

- display the database records within a window when running WINRADIO.
- choose from a wide variety of display formats, to customize it to his or her own preference
- sort on any field, in forward or reverse order
- confine a list of displayed records to those which match the user's own criteria, with the added flexibility provided by wildcards.
- manually add, delete and edit records
- import WINRADIO memory files
- import third part. databases of stations, frequencies, callsigns etc
- instantly tune the WINRADIO receiver to a station by clicking on records in the database
- protect the database integrity with a special re-indexing option.

The Database Manager relies on a custom database engine, which has been specially written and optimized for this application. As such, it offers unparalleled speed of operation, despite the large amount of data held in the database. Full on-line help is included, as is multi-lingual support.

System Requirements:

- IBM PC with a 386 or higher processor (486 or higher is recommended)
- at least 4 megabytes of RAM (8MB or more is recommended)
- 30MB or more of free hard disk space
- Microsoft Windows 3.1 or later (including WINDOWS 95)

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Without a doubt LOWE's Airmaster 2 ACARS software and interface caused quite a stir in the world of airband listening. Hundreds of aviation enthusiasts are now using LOWE's ACARS software to supplement their monitoring activities.

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CONSTRUCTION PROJECTS, TECHNIQUES, AND THEORY

Curing QRN Squasher MK-II Overloading

The popularity of W1FB's "QRN Squasher MK-II," which appeared in the June 1996 issue of *CQ*, brought interesting comments from builders. It is comforting to know that those who constructed the project have had no problems making it work. One U.S. manufacturer tried the circuit and is producing a commercial version of the Squasher. Another well-known U.S. manufacturer of amateur equipment is working on a kit model of the unit.

I have received scattered reports from users who say that overloading by nearby powerful AM BC-band stations is causing problems with reception. I apologize to those who have experienced "trashing" of reception from that cause. I suffer from a "blind spot" with respect to AM BC-band signals: The broadcaster nearest to this QTH is WATT, some 30 miles distant. It operates on 1240 kHz and runs a modest 1 kW. It's no wonder I have no intermod or overloading difficulties on the amateur frequencies!

This month's article describes a simple high-pass filter that can be used at the MAIN antenna input port of the Squasher to prevent overloading from stations that operate from 550 to 1600 kHz. The filter can be used with any 50 ohm receiver to minimize or eliminate BC-band interference.

How Does The Filter Operate?

A high-pass filter allows signals above a predetermined cutoff frequency (f_{CO}) to pass with little attenuation or loss. A well-designed filter should have a 50 ohm bilateral characteristic over the range of frequencies it will allow to pass. Frequencies below the f_{CO} are attenuated progressively as the frequency is lowered. An ideal high- or low-pass filter would present a pure 50 ohm resistance to the antenna and receiver, and there would be no attenuation at the desired frequencies. Unfortunately, some attenuation must occur through what is called "insertion loss," as is true of all passive filters. The losses through the fig. 1 filter are minimal, and are greatest in the 160 meter band.

VHF high-pass filters are used at the input of many TV receivers to prevent fundamental overloading from amateur and other strong signals below channel 2. The

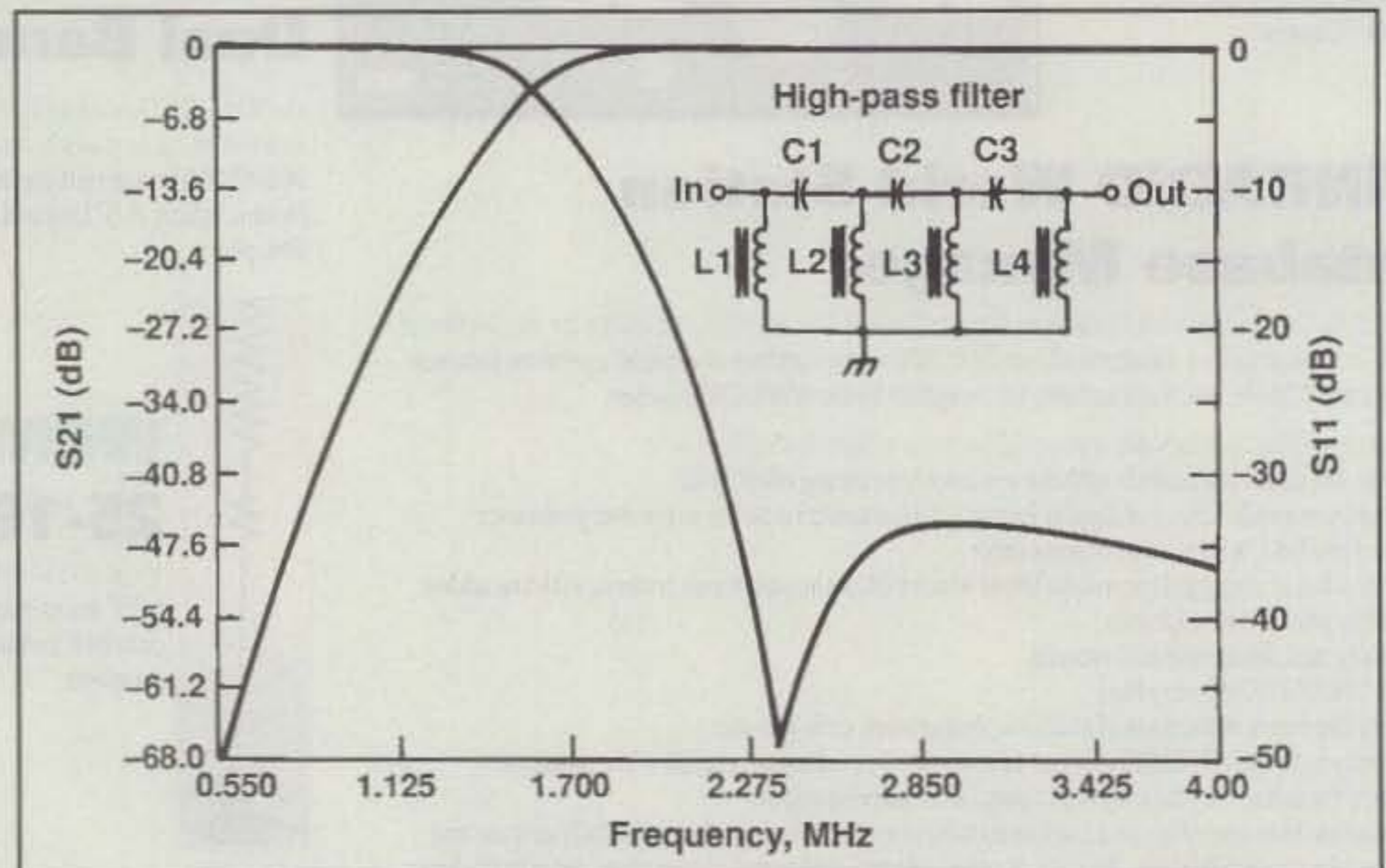


Fig. 1— Response curves and a circuit diagram for the high-pass filter (see text). C1, C2, and C3 are polystyrene or silver-mica capacitors. L1 and L4 (10.83 μ H) have 47 turns of no. 28 enam. wire on a T50-2 toroid core. L2 and L3 (2.67 μ H) have 23 turns of no. 28 enam. wire on a T50-2 toroid core. The darker curve shows the filter response. The lighter curve illustrates the return-loss characteristics.

principle of operation is the same for the fig. 1 circuit, except the unit passes signals in the MF and HF spectrums.

By comparison, a low-pass filter permits signals below its f_{CO} to pass, but attenuates those signals above the f_{CO} . A band-pass filter attenuates signals above and below the desired range of frequencies. It has an upper and a lower cutoff frequency. A band-reject filter is the flip-flop of a bandpass filter. It also has an upper and lower cutoff frequency, but does not attenuate signals above or below the cutoff frequencies. Attenuation occurs within the limits of the cutoff frequencies. Thus, we could design a band-reject filter that knocks down the signal levels between, say, 550 and 1600 kHz.

Construction and Performance

Fig. 1 shows the response plot of the high-pass filter. A schematic diagram of the 7-element filter is included. The darker of the two curves shows the filter response and the roll-off of the filter at 1.6 MHz and downward. The curve levels off, and there is minimal loss commencing at 1.8 MHz and extending to 4 MHz and above. The

flat part of the curve remains essentially unchanged through 30 MHz. Attenuation in dB is seen at the left of the figure. The curve with the thinner line shows the return-loss characteristics, which are related to the dB column at the right.

The fig. 1 filter was designed from data contained in *The ARRL Handbook*, then tweaked via NOVA software for the performance characteristics discussed in this article. The design values for C1, C2, and C3 are 1547 pF, 964.5 pF, and 1547 pF, respectively. Optimum performance will occur with those values. However, I chose to use the nearest standard capacitor values of 1500 pF, 1000 pF, and 1500 pF, respectively. These variations have a minimal effect on the filter performance. The curves seen in this article were developed with the standard capacitor values just mentioned.

Fig. 2 shows a blow-up, so to speak, of the fig. 1 filter response, from 550 to 1600 kHz, with the attenuation numbers in dB. Additional data are listed for those who have an academic interest in the filter performance.

It is important to use high-Q, stable capacitors in the fig. 1 circuit. Polystyrene

Introduction to High Speed Packet

High speed packet is typically defined as the transmission of packet data at speeds of 9600 baud or greater. While interest within the amateur community seems directed at higher speeds such as 9600 and 19,200, dramatic changes in packet activity are unlikely since popular 1200 baud units such as the KPC-3 have permeated

the market. This situation puts new purchasers in an awkward position. Which unit should they purchase, 1200 or 9600? Kantronics has solved this dilemma by developing the KPC-9612-Plus, featuring two simultaneously-operating radio ports, one at 1200 baud and one at 9600 baud (configurable for 4800 or 19,200 also).

KPC-9612-Plus

9600 and 1200 baud at the same time

The KPC-9612-Plus is an updated version of the first 9600/1200 dual-port introduced to amateur radio by Kantronics. The new HC11-based 9612-Plus retains the features of the



KPC-9612-Plus

9612 and adds additional capabilities: two A/D signal inputs for data acquisition, a 4,800 to 38,400 baud high speed modem (standard in port 2), digital potentiometers for adjusting data drive and receive equalization levels via the keyboard, and disconnect header for adding a third modem (baby pcb within the case). The KPC-9612-Plus is capable of operating high-speed packet and 1200 baud packet at the same time. With this flexibility, it's the perfect packet choice. Off the-shelf, the KPC-9612-Plus is ready for 9600 and 1200 activity and can be cabled to either one or two radios. Regardless of the speed you choose, the KPC-9612-Plus is equipped with all the features typical of Kantronics' industry-leading TNCs: packet mailbox, GPS compatibility (NMEA-0183 standard interface), APRS compatible, KANode networking (and optional K-Net networking firmware – NET/ROM compatible.) In addition, the unit supports amateur paging, the transmission and monitoring of 512, 1200, and 2400 baud Radiopaging Code No. 1 (POCSAG) messages. Nine keyboard paging commands have been added to the firmware in addition to a paging server. Via the server, amateurs may connect to the KPC-9612-Plus and send a page, view a log of pages sent, or list a directory of call-sign-page IDs.

KPC-9612-Plus Features

- > Separate radio ports capable of simultaneous operation
- > Disconnect header, allowing the addition of a third radio modem
- > 9600 baud port, also configurable to 4800; 19,200; or 38,400 baud
- > port 1 and 2 digital pots: radio drive levels set via your keyboard
- > two A/D data acquisition ports and two TTL output control lines
- > APRS and NMEA-0183 GPS compatible
- > Runs Newuser, Terminal Host, GPS, BBS, paging, KISS and ext-KISS modes
- > 32K RAM (20K mailbox) or 128K RAM (100K mailbox)

More on Amateur Digital Paging: The digital paging transmission and reception formats adhere to the POC-SAG commercial standard. Hence pagers sold by resellers are readily available for conversion to amateur use. We offer pager crystals, a recrystalling service, and refurbished Bravo Plus™ pagers recrystalled for 2 meters and 70 cm. For an up-to-date list of crystals (frequencies) view our internet webpage, <http://www.kantronics.com/>. We also offer the *Pager Handbook for the Radio Amateur*, by WØXI. This "tell-it-all" handbook includes a description of the POC-SAG standard and instructions for do-it-yourself recrystalling of pagers for amateur use.

QuickCheck *A quick reference guide to Kantronics products*

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KPC-9612-Plus	✓	✓	✓		✓	✓	✓	✓	✓
KAM Plus		✓	✓	✓		✓	✓		

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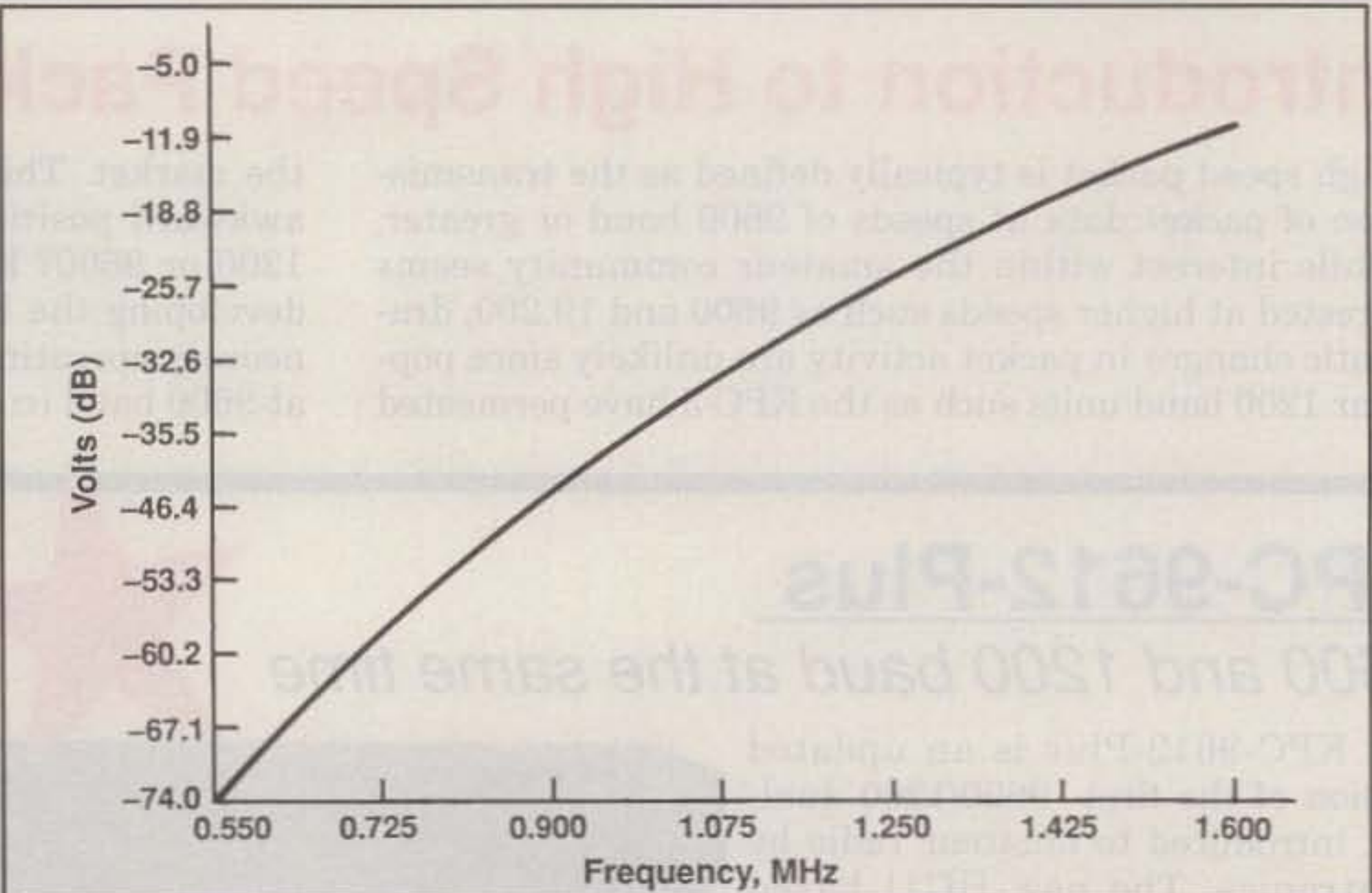
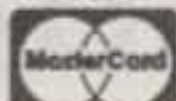
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						R	± J
550.0 kHz	-67.24	-177.8	0.1	93.7		0.384	+j 46.86
650.0 kHz	-57.11	166.1	0.1	77.6	0.4464	0.588	+j 62.17
750.0 kHz	-48.43	149.7	0.1	61.2	0.4538	0.978	+j 84.46
850.0 kHz	-40.82	133.0	0.1	44.5	0.4639	1.916	+j 122.1
950.0 kHz	-34.05	115.8	0.1	27.3	0.4778	5.362	+j 205.8
1.050 MHz	-27.93	97.9	0.1	9.4	0.4973	50.00	+j 605.8
1.150 MHz	-22.35	79.0	0.1	-9.5	0.5250	60.23	-j 594.2
1.250 MHz	-17.24	58.7	0.2	-29.8	0.5646	9.531	-j 187.3
1.350 MHz	-12.59	36.4	0.4	-52.1	0.6203	6.138	-j 101.9
1.450 MHz	-8.49	11.5	0.9	-76.9	0.6914	6.543	-j 62.50
1.550 MHz	-5.15	-15.9	1.9	-104.2	0.7603	8.718	-j 38.17
1.650 MHz	-2.80	-44.1	3.8	-132.4	0.7854	12.62	-j 20.89

Fig. 2— Filter response curve within the range of attenuation from 550 to 1600 kHz. The chart provides attenuation data in dB along with other information concerning the filter performance.

or dipped silver-mica capacitors are best. L1 through L4 must exhibit high Q also. Powdered-iron toroids are used for this reason.

The filter should be enclosed in a shielded box if it is used outboard from the QRN Squasher or a receiver. This will prevent unwanted direct pickup of BC-band signals. The filter may be installed inside the QRN Squasher cabinet if the housing is made from metal. The filter should be used in series with and near the MAIN antenna jack.

The filter can be assembled on a piece of perforated board, or on a small section of PC board with isolated squares cut with a hacksaw or motor tool and cutting bit. Use in-line construction. Separate the toroids by at least 3/4 inch to prevent capacitive coupling between them. A shield partition between the filter sections will help to isolate the input and output ports from one another (desirable). Shield partitions are not imperative if the prescribed layout is adopted.

Summary

The toroid cores for this project may be purchased from Amidon Associates, Inc., Palomar Engineers, and other mail-order suppliers.¹ Polystyrene and silver-mica capacitors are available from Mouser Electronics.²

A high-pass filter of the type described here is worth having available even if you don't use a QRN Squasher. Portable operation often occurs in an environment where a powerful BC-band station may be nearby. It is prudent to be prepared for the onslaught of medium-frequency RF energy.

Footnotes

1. Amidon Associates, Inc., 3122 Alpine Ave., Santa Ana, CA 92704 (phone 714-850-4660 for catalog or ordering). Palomar Engineers, Box 462222, Escondido, CA 92046 (phone 619-747-3343).

2. Mouser Electronics, Inc. (phone 1-800-346-6873 for catalog or ordering).
 73, Doug, W1FB

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- ◆ The element-to-boom brackets are pre-aligned on the boom, so every element is straight and will not move.
- ◆ The C-4 maintains the same turning radius, weighs about 40 pounds, with separate feedline so that the C-3 remains intact.
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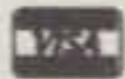
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BY IRWIN MATH, WA2NDM

MATH'S NOTES

WHAT'S NEW AND HOW TO USE IT

End of Year Observations

At this time, just as we are about to close one of the few remaining years of the 20th century and get ready for the 21st, I feel a need to once again "get on the soapbox" and sing my old "homebrew" song, as well as make a few other pertinent statements.

As we all are well aware, the 1900s began with the fundamental inventions that were destined to shape the future of the entire world. The telephone, telegraph, electric light, etc., were all American developments, and as the century progressed and commercial radio, television, LP records, the transistor, integrated circuits, lasers, and a host of other developments followed, there was no doubt in most minds that "Yankee Ingenuity" was capable of almost anything. Formally trained engineers as well as a host of untrained experimenters had a lot to do with these developments either directly or indirectly.

In the latter group, everyone is well aware of the tremendous contribution amateur radio operators and experimenters made in the "useless 200 meters and down" region of the radio spectrum at the beginning of the century, not to mention the pioneering efforts at the dawn of the VHF/UHF region. I wonder how many contributions are being made by this group today, however! From the gradual change in the content of the mail I have received since my first beginning "Math's Notes" in the early 1970s, it seems that most of the pioneering spirit is gone. I am saddened by that fact.

I know all of the typical, stock answers: the ease in purchasing ready-to-operate equipment from a cost and availability issue, the advanced state of the technology making it difficult for the novice to even understand what is really going on, the demise of the kit manufacturers (such as Heath), and even the overwhelming draw of the Internet, which promises all of the same features as amateur radio without the interference. But how about the satisfaction aspect of communicating with someone via equipment you (and no one else) built from scratch? How about the feeling of sending and receiving signals

through an antenna that you erected yourself, on top of that terrible sloping roof of your house, while totally scared stiff all the way through the installation? How about the thrill of discovering something that might actually be unique (and even ultimately make you some money as well)? How about the entire amateur radio experience, for that matter, as differentiated from the amateur-operating-commercially-built-radio experience?

I have a friend who could be thought of as a fanatic, religious audiophile. He swears by the merits of vacuum tubes versus solid-state devices (in audio amplifiers) and will only build his own equipment (using 2A3's in a single-ended Class A configuration, for example). The result is (in his mind) perfect sound, infinitesimally low distortion, etc. Needless to say, we have had many arguments over this issue. However, the statement he made recently about the feeling of sitting down in his living room in a comfortable chair, listening to a favorite composition (on a 33 $\frac{1}{3}$ rpm record, of course), and "basking in the orange glow of the filaments" from the tubes in his amplifier made me realize that there is an entire level of enjoyment that goes far beyond "plugging it in and watching it work."

How many of you even realize that such a level exists? There is an old saying that goes, "If you haven't tasted something, how can you even judge whether you will like it or not?" I suggest that you take steps to attempt to acquire "gourmet tastes."

I know it may be difficult to figure out how to even begin to experiment at hundreds of GHz, or to develop new modulation methods, but remember that it wasn't easy for Heinrich Hertz to convert Maxwell's complex mathematical formulas into a spark coil transmitter either. It certainly wasn't easy to conceive and build rotating disks, hook up selenium photo-electric cells and neon lamps, and transmit crude pictures over wire decades before commercial television made its appearance. It took "dumb experimentation" to remove the bakelite bases from type 30 vacuum tubes and solder components directly to the leads coming out of the glass envelope to boost operation to the "ultra-high" frequency of 10 to 15 Megacycles, when everyone said it could-

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n't be done. It also wasn't easy to collect a bunch of logic gates, flip-flops, and multi-vibrators and develop today's microprocessor-based computers. In fact, it wasn't easy to accomplish any of the amazing technological feats of the 20th Century, but there was a desire and indeed a spirit to experiment that allowed it to be done. Today it sometimes seems to me that to some people simply heating up a soldering iron is too much trouble.

I have been an avid experimenter for as long as I can remember. Although I do have a "formal" college-based education in electrical engineering, which is also my profession, I can honestly say that most of what I have learned, retained, and, yes, enjoyed has come from direct experimentation. In my opinion there is nothing that can compare to "hands-on" experience and the desire to accomplish something.

In 1977 I started and still continue to run a company that manufactures point-to-point fiber-optic transmission systems. In fact, we were one of the very first to do so. When I started, there were no commercial LEDs designed to "launch" modulated light into tiny optical fibers a few thousandths of an inch in diameter, so we had to build them. We did not have a sophisticated laboratory with vacuum deposition equipment or micro-manipulators; we simply used "Yankee Ingenuity." We took plastic infrared LEDs and ground them down on #200, #400, and #600 emery paper glued to a homemade rotating turntable until we reached the point where the light-emitting surface of the LED was only a few thousandths of an inch away from the end of the optical fiber, which in turn was mounted in a homemade connector. Not only did it work, we made and sold a couple of thousand fiber-optic links for the transmission of digital, audio, and video signals. Some of these are still in operation today and occasionally come back for upgrading.

I relate this story to try to rekindle the wonderful spirit that once did exist and to illustrate how it still applies, even with state-of-the-art technology. If even a few readers agree with me, then I urge you to support whatever facility exists in your local area, be it a school, amateur radio club, youth group, or even an eager youngster of whom you may be aware who may be capable of capturing that spirit. Make it your New Year's resolution to become an "Elmer" and to inspire others (and yourself along the way) to resurrect "Yankee Ingenuity" and to bring that elusive plane of enjoyment that exists to within our collective reach. I believe our future depends on it!

The very best to all of my readers for a happy and healthy holiday season.

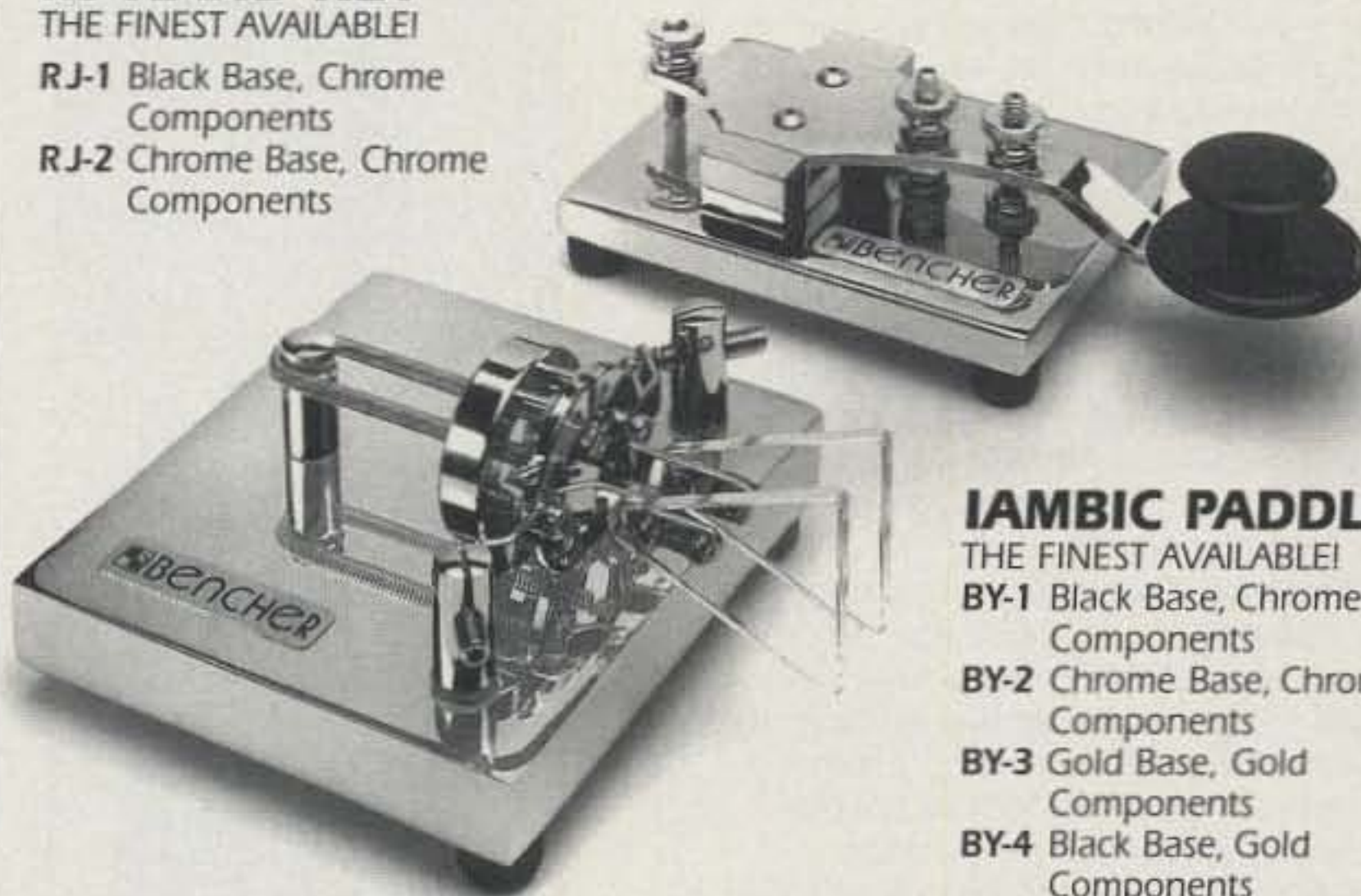
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WORLD OF IDEAS

A LOOK AT THE WORLD AROUND US

Holiday Cheer—Amateur Radio Style

Super Season's Greetings and Happy Ham Holidays, gang! December returns, and it's once again time for our traditional shift in focus to feature neat radio goodies for everyone. We have brought together a captivating variety of items to fit all interests, budgets, and license classes. We will continue with more traditional views in future columns (and some of the most exciting ones yet are taking shape right now). Meanwhile, sit back and enjoy our "window shopping tour" of new and/or occasionally overlooked delights debuting this holiday season. Need I mention that gems with special appeal should be ordered early to avoid holiday shipping delays and sold-out dilemmas. (Order directly from the listed supplier, not from me. I am simply your tour guide.) Remember, too, our whirlwind tour is a mere peek preview of all the treats available this year. The views continue throughout the pages here in CQ. Check out each one carefully!

I sincerely hope everyone enjoyed some great times during 1996, and I wish you the best of everything during the coming year. The sunspots are rising, so at least that much is in our favor. Who knows? Maybe the economy will even improve. So much for the soapbox. Now let's check out some of the goodies!

Leading this year's parade of holiday delights is ADI's brand-new AT-600 2 meter/70 cm FM talkie shown in photo 1. This palm-size treat has a lot going for it: simultaneous dual-band receive or single-band operation, cross-band repeat, 120 full storage memories, and 10 DTMF autodialer memories. Is there more? Of course. It also sports separate volume and squelch controls for each band, selectable scan limits for 2 meters and 70 cm, CTCSS encode and decode, DTMF paging, and 2.5 or 5 watts output. Receiver coverage is also keypad expandable to include aircraft, NOAA weather, and VHF/UHF public-service bands. Look closely at the photo of the AT-600, and you can see its speaker grill horizontally above the frequency display (which, like the keypad, is well backlit for night use). ADI handhelds are being imported by Premier Communications, 20277 Valley Blvd. #J, Walnut, CA 91789 (phone 909-869-5711), and are available from amateur radio dealers nationwide. Check out one. The AT-600 is quite a deluxe unit with a bare-bones price tag.

So how do you follow up a fancy, new FM handheld transceiver? By adding a few select accessories to the rig, naturally! Yes, and some of the neatest ones I have seen recently include Premier Communications' new SPM-400 earphone/boom microphone combo and range-boosting AL-800 dual-band antenna shown in photo 2. The SPM-400's "business end" consists of an earbud and ultralight sound tube fitted to a tiny electret mic element. You just slip the bud in your ear, adjust the tube for comfort, and talk. Audio quality is exceptionally good.

4941 Scenic View Dr., Birmingham, AL 35210



Photo 1— ADI's brand-new AT-600 dual-band FM talkie turns on the holiday hamming fun with smooth operation and features galore. It is quite deluxe, yet surprisingly affordable.

Indeed, this is the best-sounding speaker mic I've heard—on both receive and transmit. The ear mic combo's cable routes to a small PTT switchbox with a clip for your shirt, then continues on to a molded earphone/mic plug to fit Standard, ICOM, Yaesu, Alinco, and ADI talkies. Another model, the SPM-400 KF-3K, is available for Kenwoods.

The AL-800 is a real little romper in dual-band pull-up antennas for talkies. In fact, its 2 meter and 70 cm gain figures are comparable to a good through-glass mobile antenna. If you spend much time away from home or live in a restricted condo, the AL-800 is a lifesaver. It's the next best thing to an outdoor antenna. The AL-800 is ultralight, black with gold-plated fittings, and extends to 34 inches and retracts to 9.5 inches for carrying.

If you prefer something more unique in a talkie antenna, check out Premier's new RD-

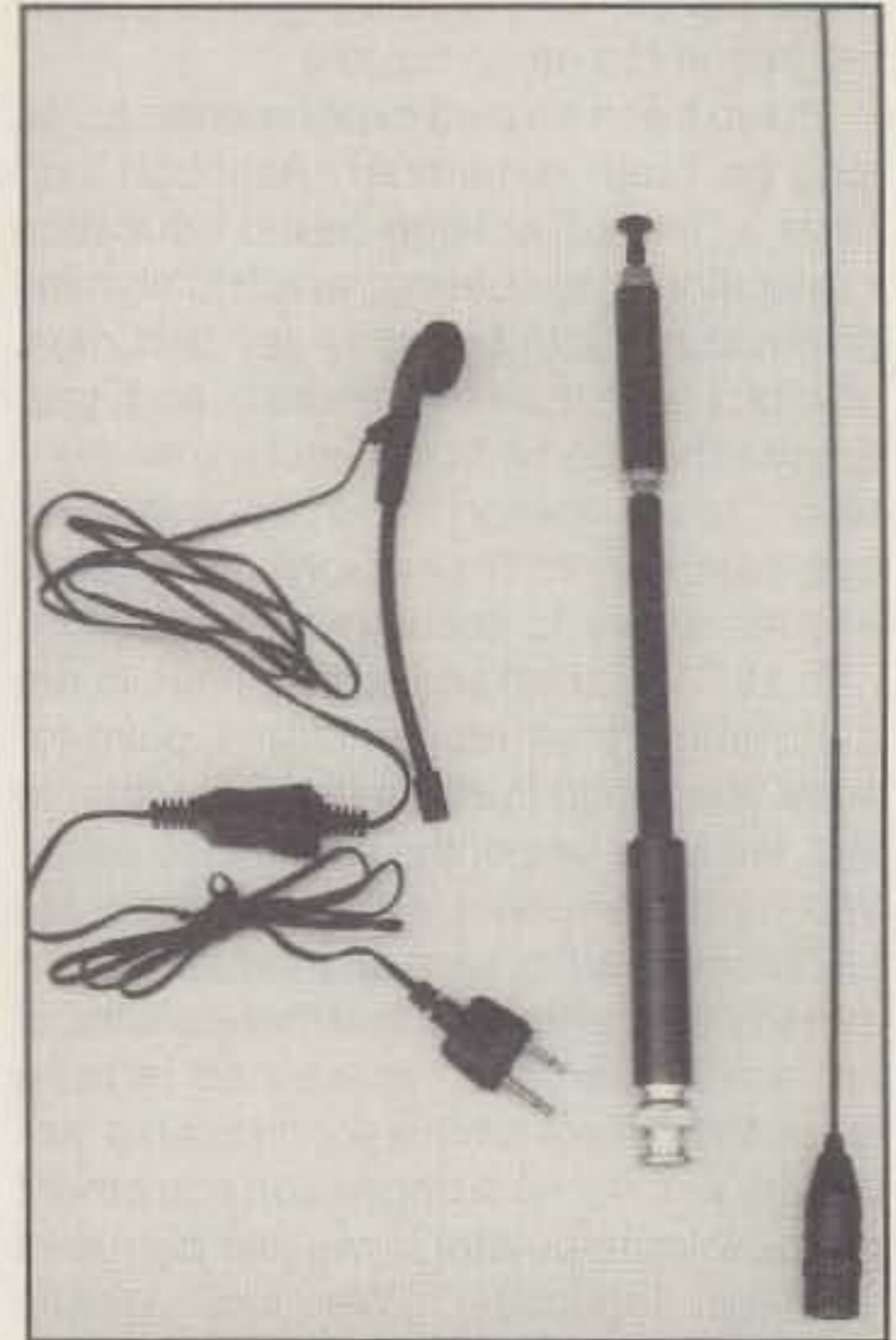


Photo 2— Want to expand your talkie's range and your enjoyment? Adding a few "personalizing accessories" does the trick. Shown here (left to right) are Premier's new SPM-400 earphone and boom mic combo, super-gain AL-800 pull-up antenna, and ultra-thin RD-98 "flexwhip." (Details in text.)



Photo 3— Still preferred for protecting talkies both during the holidays and throughout the year is the original "Pouch." The version on the left is the seven-year-old mid-size model holding an ADI rig. The Pouch on the right is a new super-small version holding a Standard C108A tiny talkie. The tiny Standard C508A dual-band transceiver between the pouches gives size reference.



Photo 4—BayGen's wind-up shortwave radio covers AM, FM bands, plus 3 to 12 MHz, and plays for 30 minutes after a single cranking.

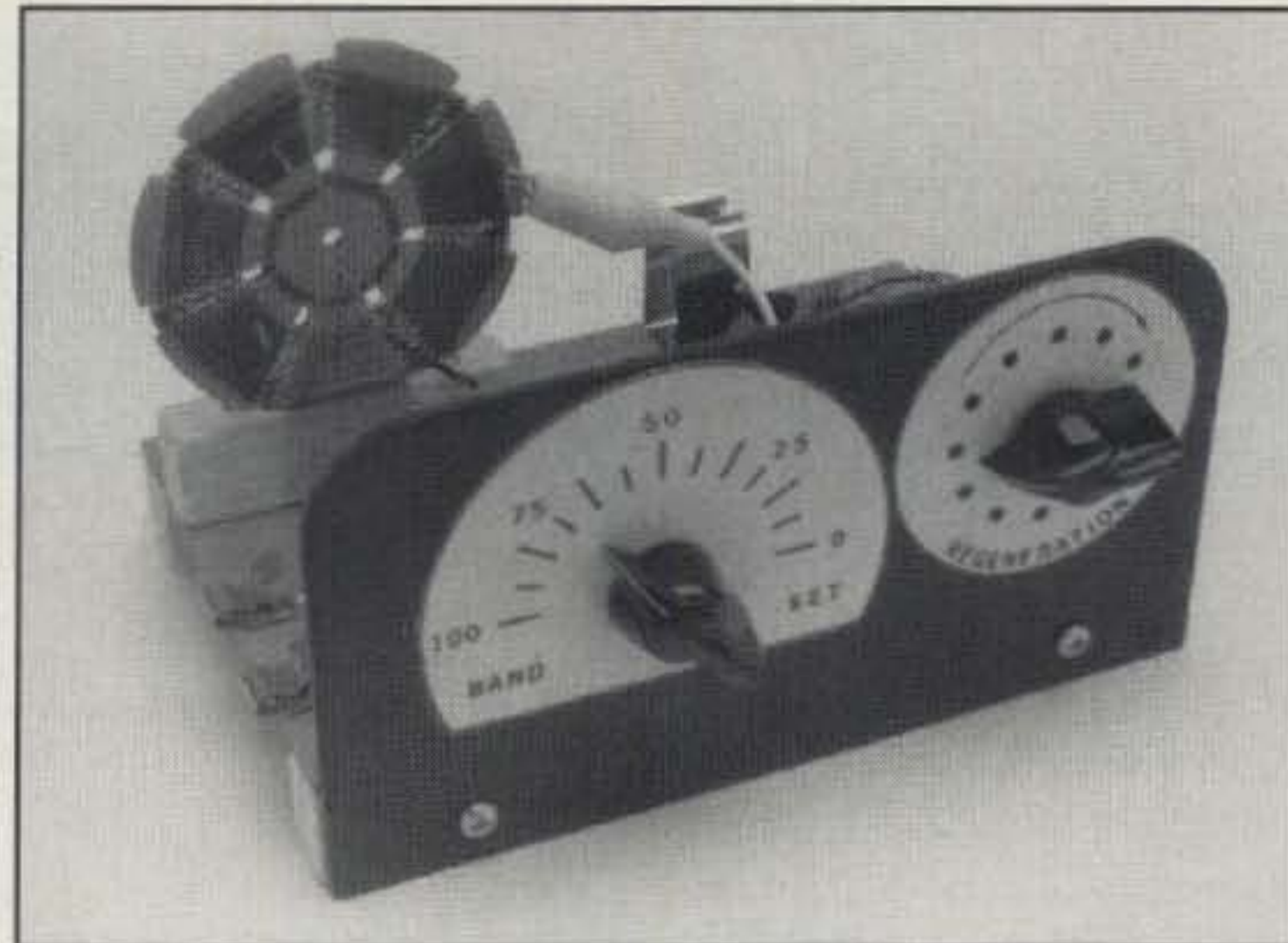


Photo 5—Antique Electronic Supply's K-406 one-tube shortwave receiver kit represents a part of radio history every amateur can appreciate. It is regenerative, too—a neat CW radio!

98 also shown in photo 2. This super-thin antenna flexes rather than retracts. How much? I can carry it curled around double in my car's glove box, and it springs back perfectly straight when snapped on my talkie. Gain is also good on both 2 meters and 70 cm. Premier's speaker mics and antennas are also available from amateur radio dealers nationwide. Ring up one of the "800 gang," exercise your plastic, and give them a go!

Another neat accessory (necessity?) everyone appreciates is a protective carrying case for their prized talkie(s), and the "Pouches" shown in photo 3 handle that requirement in high style. As you may recall, the original Pouch was first introduced to CQ readers right here in 1989. Since that time more than 120,000 of the bouncy little carrying cases have proved their worth in protecting talkies everywhere. The man behind their soft-coddling and water-resis-

tant design is Phil Richardson, K7OBS, a real stand-up guy. With the exception of shifting from a belt loop to a snap-out buckle on the backside for quick removal, Phil has changed the Pouch very little in its six years running (why spoil perfection?). Phil does, however, continue to make them in smaller and smaller sizes to fit today's smaller radios. A total of 12 sizes is now available. The "Pouch" on the left in photo 3 is my 1989 version holding a new ADI

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Photo 6— Ten-Tec's new monoband QRP transceiver kit is guaranteed to put some real excitement and operating fun in any amateur's life. The unit measures only 2.5"H x 6.0"H x 5.5"D, and works like a champ.

talkie. As you can see, it's still like new. The Pouch on the right is one of Phil's new super-small models holding a tiny Standard C108A 2 meter talkie. A micro Standard C508A dual-bander is included between the Pouches for size reference. Pouches are available from amateur radio "800 dealers" nationwide.

Most of you know this column's main focus is special interests, so I brought in that aspect this month by highlighting a unique trio of items. First, I invite everyone to experience the world of SWLing with BayGen's new "wind-up radio" shown in photo 4. That's right—a battery-free radio. You simply wind it up for about 20 seconds; tune to international shortwave broadcast bands such as 60, 49, or 31 meters; and the radio pumps out direct-from-the-source information and native-land music for about 30 minutes. This little radio is more than just a novelty. It could be the perfect ticket for camping and emergency preparedness.

Inside the BayGen's case is a music-box mechanism driving a small generator, which in turn powers the radio. It is nothing elaborate, but it works. The receiver covers the AM/520-1600 kHz and FM/88-108 MHz bands, plus the 3-12 MHz shortwave range on AM (no BFO for SSB or CW). It is available from the good guys



Photo 7— Who would want a Rolex when they could go first class with a CQ 50th Anniversary watch? You must jump quickly, however. The remaining stock is low, and when they're gone, they're gone!

at Universal Radio, Inc., 6830 Americana Parkway, Reynoldsburg, OH 43068 (phone 1-800-431-3939).

Our second special-interest goodie is a real heart throb: Antique Electronic Supplies' new one-tube regenerative shortwave receiver kit



Photo 8— Three perfect gifts that keep on giving throughout the year are CQ, CQ VHF, and CQ Contest magazines. Order all three and enjoy a by-mail hamfest right in your shack every month!

shown in photo 5. Is there a true red-blooded amateur among us who could resist building such a sweet little treat? I seriously doubt it. Just visualize winding that authentic spider-web coil or the soft glow from that vacuum-tube assembly. Sheer bliss for sure! Homebrew a matching one-tube transmitter to go with the receiver, and you have a genuine novice rig that would be a gas to use on the air today.

The K-406 kit is supplied complete with all the bits, including coil form and wire, chassis and panel, dial decals, and knobs. You just add earphones (2K ohms or higher), batteries (1.5V plus 36-45V), and antenna. The receiver covers 455 kHz to 8 MHz, and its regeneration control permits copying both AM and CW signals. The radio kit is available from Antique Electronic Supply, 6221 South Maple Avenue, Tempe, AZ 85283 (phone 602-820-5411).

Next in our special-interest spotlight is Ten-Tec's exciting new QRP CW transceiver kit shown assembled and ready for operation in photo 6. The kit is quite reasonably priced, easy to build, and covers any selected 50 kHz range of 80, 40, 30, or 20 meters. It sports a varactor-tuned and temperature-compensated VFO, sensitive receiver with 1 kHz bandwidth, 4-pole IF crystal filter, audio-derived AGC, RIT, and a built-in speaker. The rig pumps out a clean 3 watt signal, and includes a sidetone plus Ten-Tec's famous solid-state T/R switching. Power requirements are 12-14 volts at only 30 ma receive and 800 ma transmit, making it an ideal camping or portable unit. This new transceiver promises to be a winner, and you can get it delivered right to your door by calling Ten-Tec at 1-800-833-7373.

Now a brief test on how carefully you read this column. By the time this appears in print, I should have a big batch of Micronaut PC boards and components ready to supply to everyone who missed out on them a few months ago. The price is quite low, and the Micronaut is a fun project. Drop me an SASE for details.

Rounding out our holiday showcase are some "all year" treats from CQ Communications (photos 7 and 8). First, a very small number of CQ's destined-to-be-collectible 50th Anniversary wrist watches are still available on a first-come, first-serve basis. (Remember how fast Micronaut kits sold out! Call CQ at 516-681-2922 quickly to order.). Anyone can wear a watch with diamonds and jewels, but this one is special—very special. It tells others you are an amateur radio operator and proud of it, even if you're not wearing your prized talkie. Class all the way!

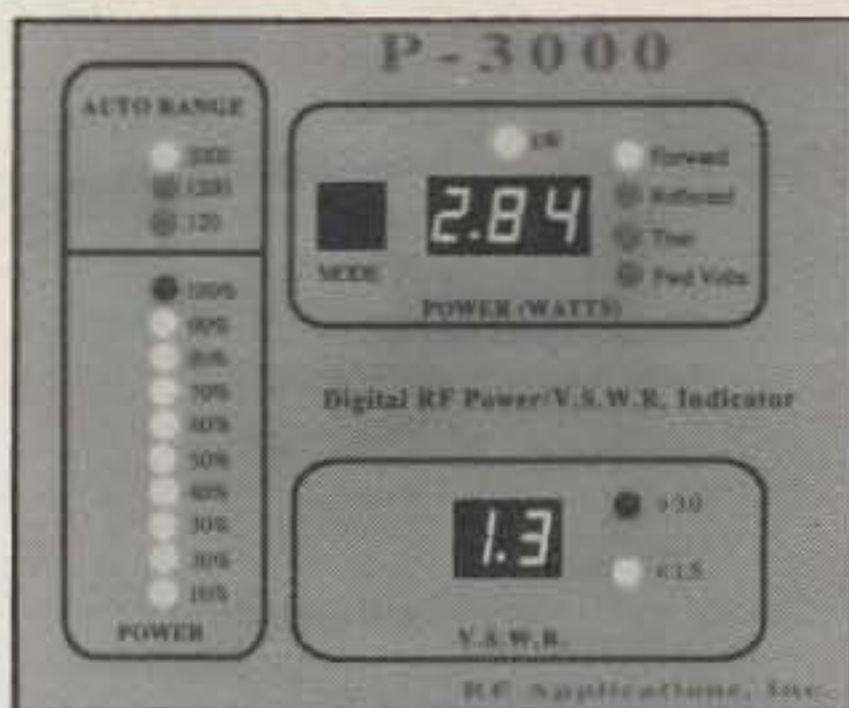
Second, I recommend a triple subscription to CQ Communications' magazines to make your new year bright and exciting and to keep you abreast of the latest happenings in amateur radio. There is CQ "the original" (always chock full of terrific articles and information), CQ VHF (loaded with great details on 6 meters, 2 meters, and above), and CQ Contest (a complete world of competitive fun described by the pros). Concerned about an enjoyment overload? No problem. You can subscribe to only one of the trio (call 516-681-2922 for details, or check the ads in this issue). Just subscribe and keep on hamming!

Having filled our available space this month, I now wish everyone all the best holiday cheer, invite you for a quick holiday QSO on 30 or 20 meters, and urge you to stay tuned right here for more super columns in 1997.

73, Dave, K4TWJ

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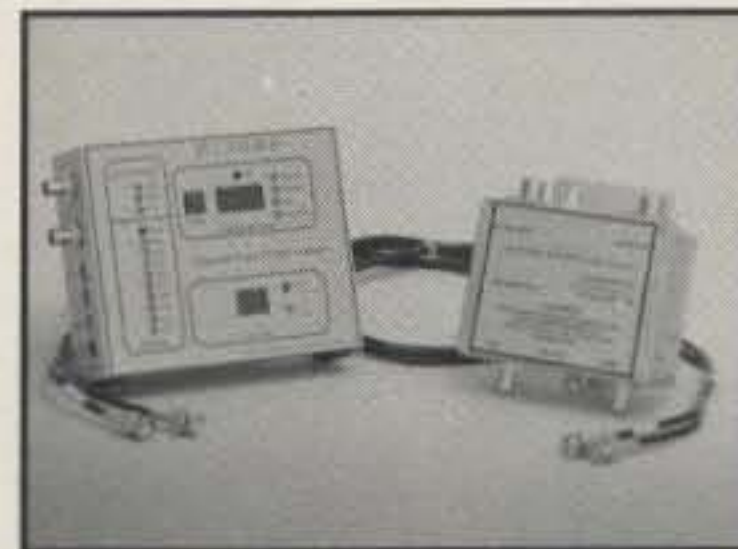
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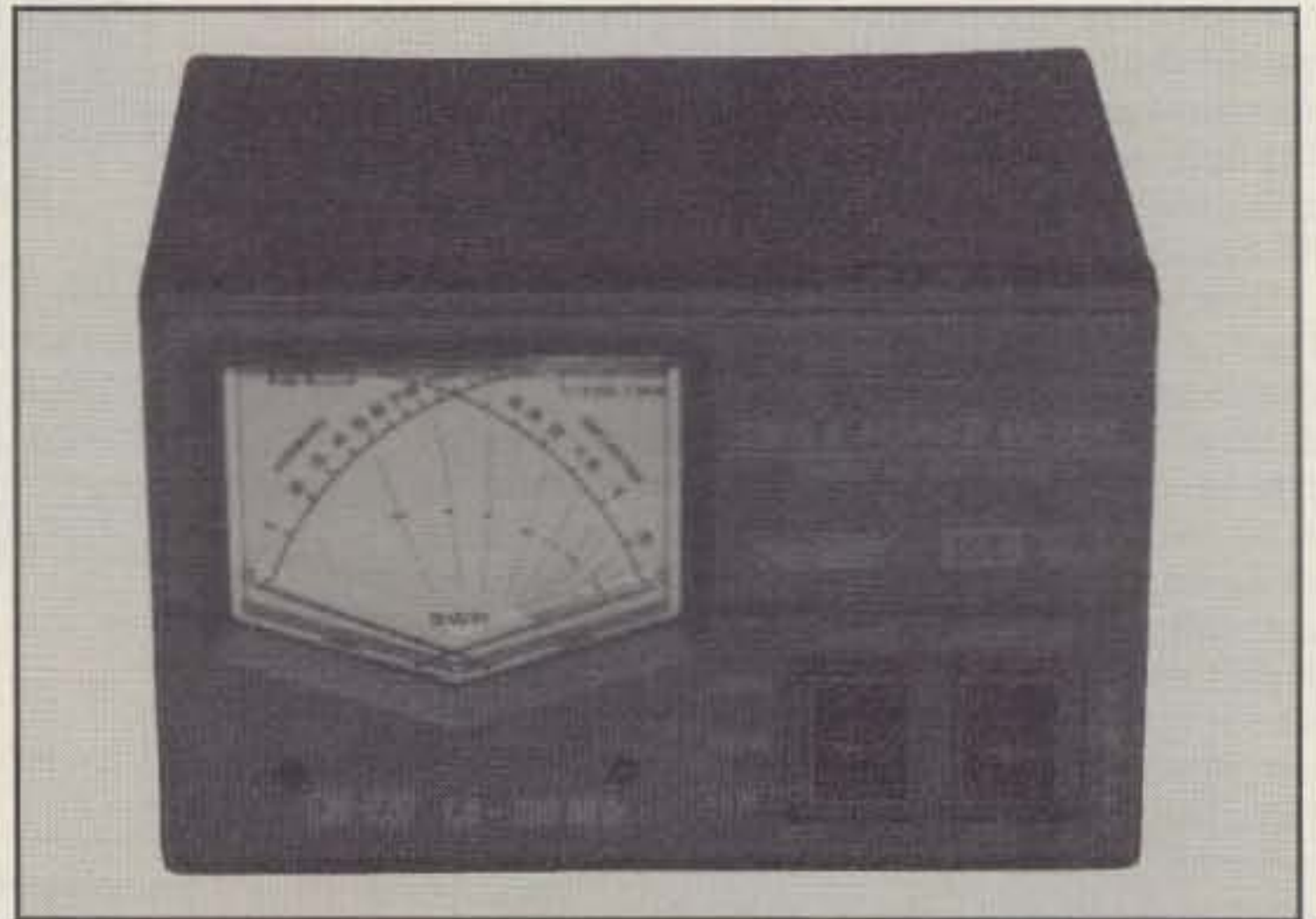
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CQ REVIEWS

The RMS CN-220 Power/SWR Meter

BY PAUL CARR*, N4PC



The RMS CN-220 Power/SWR Meter provides both power and SWR information in a small, handy format.

Two pieces of equipment that are almost universal in any amateur radio shack are a multimeter and an SWR device of some type. One of the early SWR devices, the moni-match, was invented by my friend Lew McCoy, W1ICP. It made its appearance in the 1950s, and subsequently found its way into almost all the amateur stations around the world. It was an inexpensive way to determine some important parameters about the station antenna, and to tell how well the transmitter was matched to the feed line. Since its invention many variations have appeared, and today's amateur finds that his or her station is ill-equipped without such a device. Modern units also provide much more information about the operating conditions than did the original equipment.

Advanced Specialties of Lodi, New Jersey is marketing a unit from a manufacturer in Italy. The RMS CN-220 Power/ SWR Meter is a unit that provides both power and SWR information in a very handy format. First, the unit is small (5"W x 3 3/4"H x 5"D), so it does not require much space on the operating desk. The unit has a wide frequency response. It covers all frequencies from 1.8 MHz through 225 MHz. There are three power levels (15, 150, and 1500 watts—average for CW and FM and PEP for sideband) that are switch selectable from the front panel. The information concerning power and SWR can be read simultaneously on a dual cross-needle meter. The equipment will display accurately the power output if the SWR is 1:1 (zero reflected power). If the reflected power is not zero, the SWR can be determined by noting the place on the calibrated meter face where the needles cross. The unit is ruggedly built and should give years of dependable service.

The suggested retail price of the RMS CN-220 Power/SWR Meter is \$139. It is imported and distributed by Advanced Specialties, P.O. Box 1099R, Lodi, NJ 07644 (201-843-2067).

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	Gray	Black				
SL-11A	•	•	7	11	2 ⁵ / ₈ x 7 ⁵ / ₈ x 9 ³ / ₄	12
SL-11R	•	•	7	11	2 ⁵ / ₈ x 7 x 9 ³ / ₄	12
SL-11R-MC		•	7	11	5 ³ / ₄ x 7 ¹ / ₄ x 9 ³ / ₄	13
SL-11R-GE	•		7	11	5 ³ / ₄ x 7 x 9 ³ / ₄	13
SL-11R-RA		•	7	11	4 ³ / ₄ x 7 x 9 ³ / ₄	13
SL-11R-EFJ		•	7	11	5 ¹ / ₈ x 7 ¹ / ₄ x 9 ³ / ₄	13
SL-11MG		•	7	11	5 ¹ / ₈ x 7 ¹ / ₈ x 9 ³ / ₄	13
SL-15R	•		12	15	2 ⁵ / ₈ x 7 x 9 ³ / ₄	13
SL-15R-GE	•		12	15	5 ¹ / ₈ x 7 ⁵ / ₈ x 9 ³ / ₄	14
SL-15R-RA		•	12	15	4 ³ / ₄ x 7 ¹ / ₄ x 9 ³ / ₄	14
SL-15R-EFJ		•	12	15	5 ¹ / ₈ x 7 ¹ / ₈ x 9 ³ / ₄	14

RS-L SERIES



- POWER SUPPLIES WITH BUILT IN CIGARETTE LIGHTER RECEPTACLE

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

RM SERIES



MODEL RM-35M

- 19" RACK MOUNT POWER SUPPLIES

MODEL	Continuous Duty [Amps]	ICS* [Amps]	Size [IN] H x W x D	Shipping Wt. [lbs]
RM-12A	9	12	5 ¹ / ₄ x 19 x 8 ¹ / ₄	16
RM-35A	25	35	5 ¹ / ₄ x 19 x 12 ¹ / ₂	38
RM-50A	37	50	5 ¹ / ₄ x 19 x 12 ¹ / ₂	50
RM-60A	50	55	7 x 19 x 12 ¹ / ₂	60
• Separate Volt and Amp Meters				
RM-12M	9	12	5 ¹ / ₄ x 19 x 8 ¹ / ₄	16
RM-35M	25	35	5 ¹ / ₄ x 19 x 12 ¹ / ₂	38
RM-50M	37	50	5 ¹ / ₄ x 19 x 12 ¹ / ₂	50
RM-60M	50	55	7 x 19 x 12 ¹ / ₂	60

RS-A SERIES



MODEL RS-7A

MODEL	Colors		Continuous Duty [Amps]	ICS* [Amps]	Size [IN] H x W x D	Shipping Wt. [lbs]
	Gray	Black				
RS-3A		•	2.5	3	3 x 4 ³ / ₄ x 5 ³ / ₄	4
RS-4A	•		3	4	3 ³ / ₄ x 6 ¹ / ₂ x 9	5
RS-5A		•	4	5	3 ¹ / ₂ x 6 ¹ / ₈ x 7 ¹ / ₄	7
RS-7A	•		5	7	3 ³ / ₄ x 6 ¹ / ₂ x 9	9
RS-10A	•		7.5	10	4 x 7 ¹ / ₂ x 10 ³ / ₄	11
RS-12A	•		9	12	4 ¹ / ₂ x 8 x 9	13
RS-12B		•	9	12	4 x 7 ¹ / ₂ x 10 ³ / ₄	13
RS-20A	•		16	20	5 x 9 x 10 ¹ / ₂	18
RS-35A	•		25	35	5 x 11 x 11	27
RS-50A	•		37	50	6 x 13 ³ / ₄ x 11	46
RS-70A	•		57	70	6 x 13 ³ / ₄ x 12 ¹ / ₈	48

RS-M SERIES



MODEL RS-35M

MODEL	Continuous Duty [Amps]	ICS* [Amps]	Size [IN] H x W x D	Shipping Wt. [lbs]
RS-12M	9	12	4 ¹ / ₂ x 8 x 9	13
RS-20M	16	20	5 x 9 x 10 ¹ / ₂	18
RS-35M	25	35	5 x 11 x 11	27
RS-50M	37	50	6 x 13 ³ / ₄ x 11	46
RS-70M	57	70	6 x 13 ³ / ₄ x 12 ¹ / ₈	48

VS-M AND VRM-M SERIES



MODEL VS-35M

- Separate Volt and Amp Meters • Output Voltage adjustable from 2-15 volts • Current limit adjustable from 1.5 amps to Full Load

MODEL	Continuous Duty [Amps]			ICS* [Amps]	Size [IN] H x W x D	Shipping Wt. [lbs]
	@13.8VDC	@10VDC	@5VDC			
VS-12M	9	5	2	12	4 ¹ / ₂ x 8 x 9	13
VS-20M	16	9	4	20	5 x 9 x 10 ¹ / ₂	20
VS-35M	25	15	7	35	5 x 11 x 11	29
VS-50M	37	22	10	50	6 x 13 ³ / ₄ x 11	46
VS-70M	57	34	16	70	6 x 13 ³ / ₄ x 12 ¹ / ₂	48
• Variable rack mount power supplies						
VRM-35M	25	15	7	35	5 ¹ / ₄ x 19 x 12 ¹ / ₂	38
VRM-50M	37	22	10	50	5 ¹ / ₄ x 19 x 12 ¹ / ₂	50

PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

The Best Gets Better—Just in Time for The Holidays!

Normally we don't like to break up discussions on software into two parts. This month's topic is especially interesting, though, and rather than condense it down to a more manageable size in terms of space, we decided to cover it in two parts. Be sure to read the concluding part in next month's issue. Thanks for bearing with us; it will be worth the wait!—K2EEK

How many times have we heard the "pitchman" utter these words: "Just in time for Christmas!" There are times when we should listen and read beyond that phrase to see what really is so great that it warrants such attention. This is one of those times!

When MFJ first released the Bob Slomka (WD4MNT) DOS-based version of MultiCom* in 1988, it made packet radio inroads that had never been seen before. MFJ's MultiCom allowed us to transfer binary files station to station via packet radio. Even better, though, it let us capture a video picture from our video camera, or any other graphic source for that matter, into the computer's RAM, and then send it to a connected packet station. As the still color picture was being sent, the receiving station was seeing it appear on the screen as it was being received. At the same time, or in a simultaneous operation, the picture data was being stored to disk. That was MFJ MultiCom—then.

And Along Came Windows

Now there's a new kid on the block. Bob Rusby, VE3GLA, has built MFJ MultiCom for Windows™, launching packet radio operating into a new dimension. When I first beta-tested MultiCom for Windows™ in the spring of 1996, it had the makings of a "real" competitor as a Windows-based packet terminal program. There were still some refinements that needed to be put in place. Bob Rusby listened to our input and made the changes.

This time there were more beta testers using this program than I have room to mention here. Being one of the early beta-testers, I had the opportunity to see the evolution of this caterpillar as it emerged from the cocoon as a beautiful multi-colored, multi-purpose, powerhouse for the packet radio user. This is sheer excitement, and that's just for openers.

This MultiCom is for everyone who uses packet radio with the MFJ packet controllers. Although MultiCom for Windows™ is designed to support the MFJ-1278, MFJ-1278B, and



MultiCom for Windows™ is designed to support the MFJ-1278, MFJ-1278B, and MFJ-1278B/DSP (shown here) family of multi-mode controllers.

MFJ-1278B/DSP family of multi-mode controllers, it supports the rest of the MFJ terminal node controllers quite well.

For Openers

MultiCom for Windows™ is a software tool that simplifies the use of your 1278 multi-mode controller. Instead of requiring you to memorize a large number of commands, all you need to do is "point and click" on easy-to-use icons and buttons on the screen. MultiCom for Windows™ does all the rest. If you need to enter more information, MultiCom for Windows™ displays sim-

ple "menus" for easy entry of information.

MultiCom for Windows™ lets you control your 1278 in the way that's easiest for you—"point and click" or keystrokes. There's no need to use a mouse if you don't want to, but you can take full advantage of the Windows™ interface if you want. You can choose to have all controls displayed, ready for you to use, or you can have a clean, simple, uncluttered display if you want. It only gets easier from there.

A contester's dream, the DX Spotter's favorite gadget, and the BBS operator's support tool, MultiCom for Windows™ provides the user with "on-line" help at the click of a button. In fact,

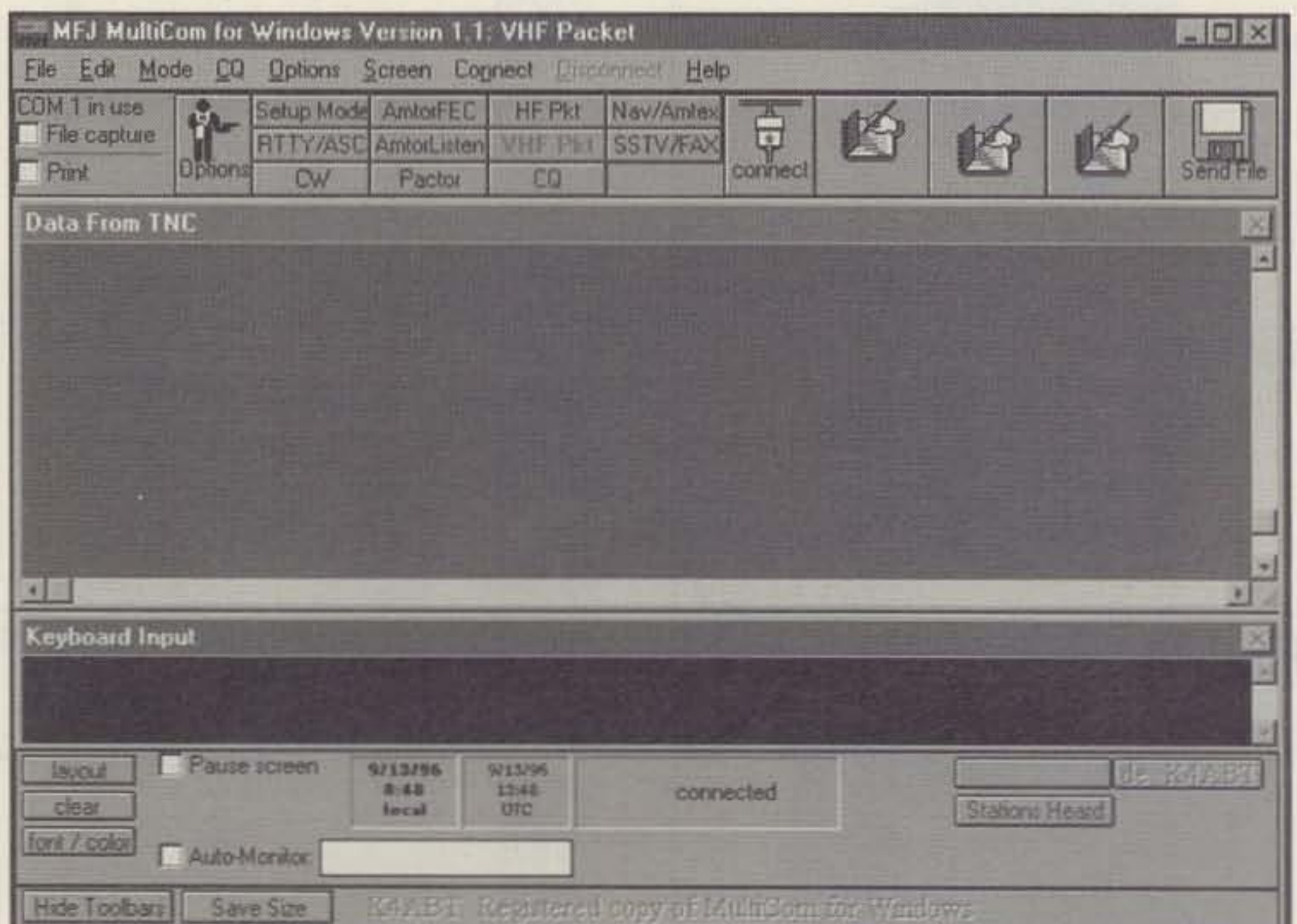


Fig. 1— When you run MultiCom for Windows™, you will see the "main window," which looks much like this.

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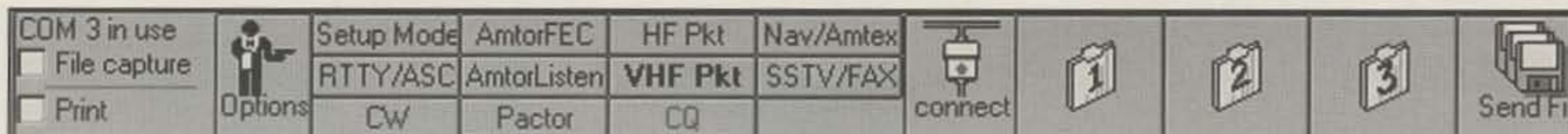


Fig. 2- The Upper Tool Bar is located just above the Data From TNC window. It is used mostly to select operating modes, establish and break links, and manage text "brag" files, and for data capture.

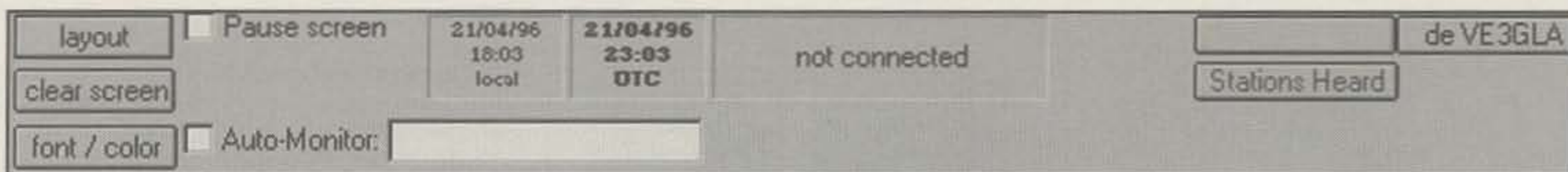


Fig. 3- The Lower Tool Bar is located just below the Keyboard Input window. Its functions include control of screen, time display, entry and sending of callsigns, plus functions that depend on which mode you are in.

the well-documented manual is the basic structure of the on-line "help" screens. Click on the topic you need help with, and it's there in a flash.

The Documentation

This MultiCom has a well-defined and easy to read and understand manual. Completely illustrated with the actual on-screen displays that you will be using, the documentation walks you smoothly from one mode or feature to the next with the greatest of ease.

When you pick up this manual and begin to read, you quickly discover that careful thought was given to the design and flow of the information within. This is so the new user can install

MultiCom for Windows™ with minimum effort or delay. Once the new user has the program installed on the PC with Windows 3.1™* or higher, a new dimension of packet operating is about to occur. I don't have a lot of room in this month's column, but nevertheless we'll look at a few of the MultiCom for Windows™ features.

The Features of MultiCom for Windows™

The multiple modes of the MFJ-1278 are fully supported: Pactor (FEC and ARQ modes), Amtor (FEC and ARQ modes), packet (HF and VHF), packet video (still pictures transferred in .BMP and RLE. formats), RTTY and ASCII,

CW, Navtex, SSTV (transmit and receive), and fax (receive).

The Main Window. When you run MultiCom for Windows™, you will see the "main window." It looks much like fig. 1.

Because you are using Windows, you will be able to switch to other Windows programs, resize the MultiCom for Windows™ window, shrink the MultiCom for Windows™ window to an icon, and do anything else you can do in Windows.

The MultiCom for Windows™ window has several important parts. The "Data From TNC" subwindow shows the data received from your 1278. This includes information received "off the air" and command responses from the 1278

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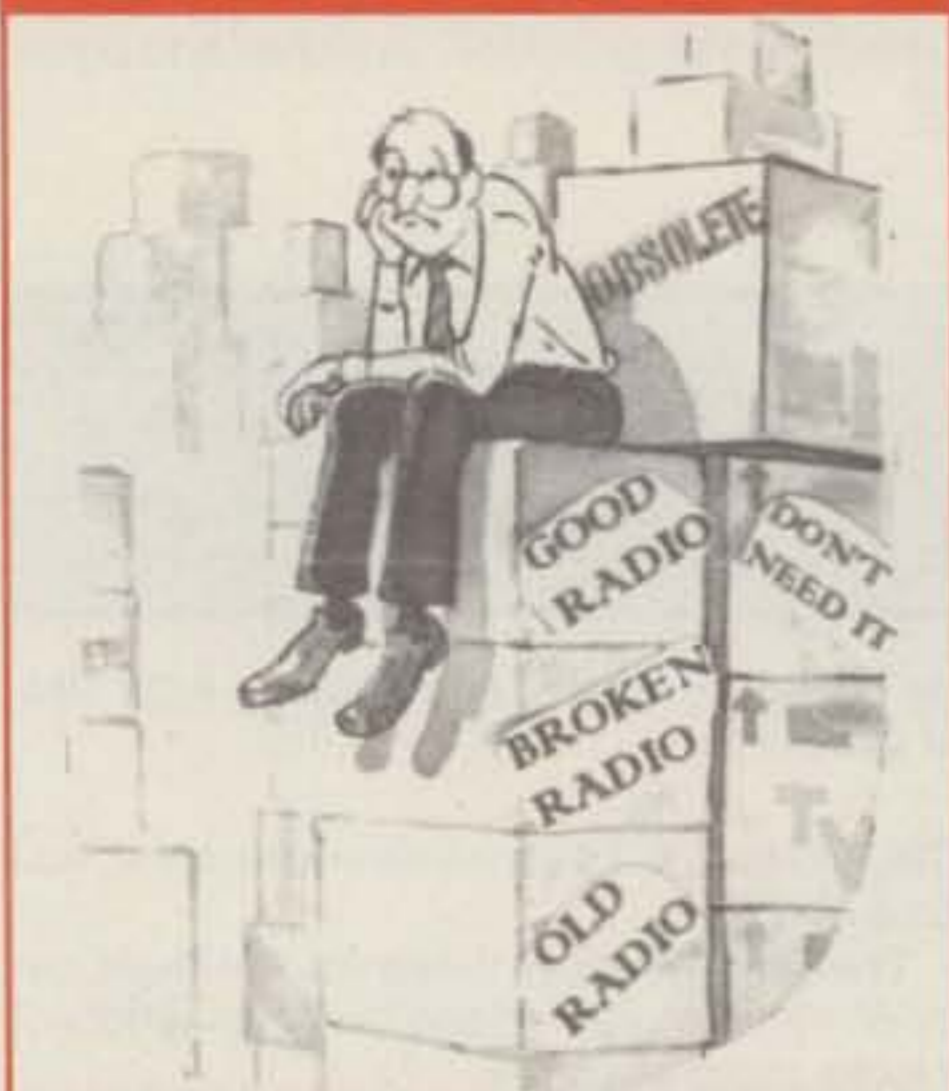
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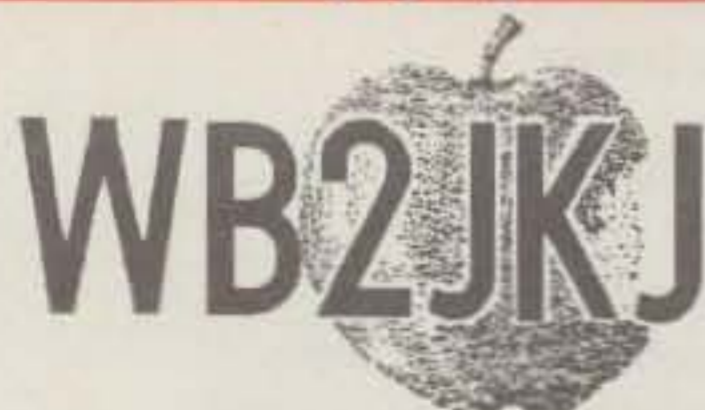
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Fig. 4- The operating mode buttons are used to select the communications mode and to enter the "setup" mode.

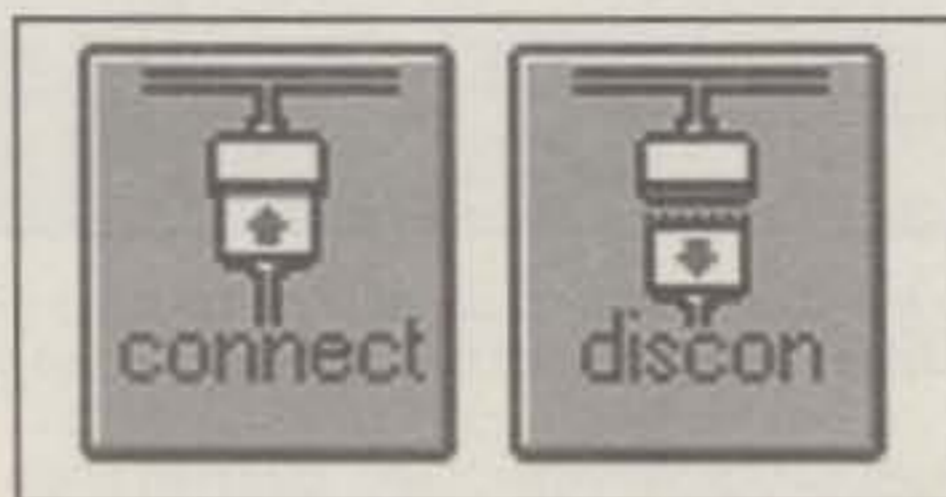


Fig. 5- The Connect/Disconnect buttons are only displayed in the Pactor, packet, and Amtor modes.

(i.e., what it sends back in response to commands sent to it by MultiCom for Windows™).

The Data From TNC window stores the last (approximately) 300 lines of data received. You can scroll back by clicking on the scroll bar at the right side of the window. When new data is received, the Data From TNC window scrolls back to the last line. You can prevent this by clicking on the Pause Screen button on the lower left of the MultiCom for Windows™ window. Data from the 1278 will not cause scrolling when the Pause Screen button is checked.

The Keyboard Input Subwindow. This window echoes your keystrokes and keeps a record of what you entered. It also echoes any data sent when calling CQ automatically, or when text ("brag") or ASCII files are sent.

The Upper Tool Bar. The Upper Tool Bar (fig. 2) is located just above the Data From TNC window. You mostly use it to select operating modes, establish and break links (Pactor, packet, Amtor), manage text "brag" files, and for data (printing and file) capture.

The Lower Tool Bar. The Lower Tool Bar (fig. 3) is located just below the Keyboard Input window. It has a variety of functions: control of the screen, time display, entry and sending of call- signs, as well as functions that depend on which mode you are in.

The functions of the Upper Tool Bar are the "Data Capture" check boxes that control capturing received data and sending to the printer and/or the disk. Clicking on the appropriate box causes an "x" to be displayed. That means the function is enabled. Clicking again on the box causes the function to be disabled, and the "x" will disappear.

Operating Mode Buttons. The Operating Mode buttons (fig. 4) are used to select the communication mode and to enter the "setup" mode. The mode you are currently using is shown in two ways: (1) by the text in the main Title Bar at the top of the MultiCom for Windows™ window, and (2) by the "mode" buttons in the tool bar at the top of the MultiCom for Windows™ window. You can easily change from one mode to another by pressing the mode buttons or from the menus.

Connect/Disconnect Buttons. These are only displayed in Pactor, packet, and Amtor

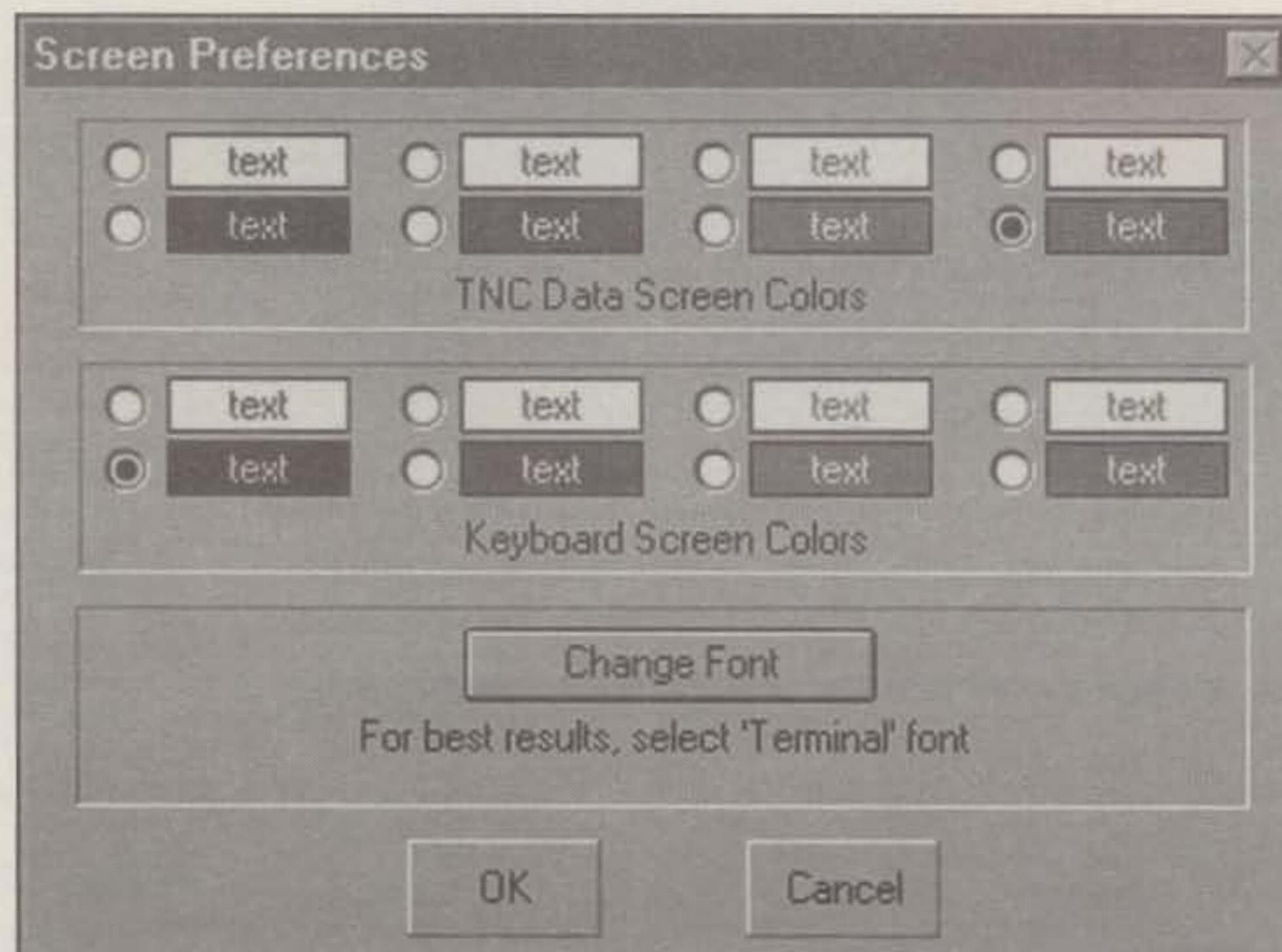


Fig. 6- By clicking on the Font/Color button, MultiCom for Windows™ will display this menu form shown above.

Fig. 7—The menu bar at the top of the MultiCom for Windows™ window allows you to perform almost all functions with keystrokes instead of mouse clicks.

modes (see fig. 5). When you are not connected to another station, the Connect button is displayed. Move the mouse/cursor to it and click to connect to another station. A menu will appear to prompt you for more information.

When you are connected, or attempting to connect, to another station, the Disconnect button will replace the Connect button on the toolbar. Click on the Disconnect button to disconnect ("drop") the connection or to abandon an attempted connection.

Text "Brag file" Buttons. The three Text buttons are used to enter and send short files of text (up to 1500 characters) that you create using the MultiCom for Windows™ built-in editor. Each mode (except Navtex and SSTV/Fax) has a different set of buttons. Graphics characters are supported in the packet and Pactor modes.

Send File Button. The Send File button is used to send text from a file that you created with Notepad or a similar editor. Each mode (except Navtex and SSTV/Fax) has a text button. You can have as many ASCII files as you want, and you can use this button for longer files.

Lower Tool Bar. The Layout button is a "click on" button to re-arrange the Keyboard Entry and Data from TNC windows. Each click

Key	Purpose (normal)	Purpose ('switched')
F1	access "Help"	enter command mode
F2	enter converse mode	enter converse mode
F3	enter command mode	access "Help"

Table 1—MultiCom for Windows™ lets you switch the meanings of F1 and F3 using the Options menu in Setup mode (see text).

will cause the change to a different format—either overlapped, vertical tiled, or horizontal tiled (the default, startup, format). Once you are up and running, click until you find the format you prefer.

The Clear button does just that—clears the screen. MultiCom for Windows™ will ask you to confirm this just to make sure you don't clear the screen by accident.

The Font/Color button lets you choose the colors and font for the Keyboard Input and Data from TNC subwindows. By clicking on the Font/Color button (as an alternative, you can use the Screen menu, and click on Color), MultiCom for Windows™ will show the menu form at fig. 6.

The "click-on" selections in the menu are in color and are the selectable colors for the backgrounds and text displays. Simply click on your

color choice for each window. Click on Change Font to change the font. A menu will appear to let you choose a new font. Select OK to enable your choices, or Cancel if you do not wish to use your choices.

The Pause Screen check box will temporarily stop new data from being displayed in the Data From TNC window. An "x" will appear in the box when the screen is paused. Click again to display all characters received while the screen was paused and all new characters (the "x" will disappear). Use this function when you want to scroll through the Data From TNC window and you don't want the display to bounce around with incoming data.

Time Display lets you see the Local and UTC (GMT) times and dates display.

The Call Sign—"de (callsign)"—button will

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Setup Mode	AmtorFEC	HF Pkt	Nav/Amtex
RTTY/ASC	AmtorListen	VHF Pkt	SSTV/FAX
CW	Factor	Custom Mode	

Fig. 8— Using the Mode button method you can select the desired new mode from the tool bar at the top of the MultiCom for Windows™ window, or you can select the mode by using the Menu method.

send "de " followed by your callsign when clicked on.

The *Enter Call* button will prompt you to enter a call in the button immediately to its right. You don't normally need to do this in Factor or packet modes, since MultiCom for Windows™ automatically can determine the call of the station you are connecting to or connected with.

The *Callsign* button will send the callsign that is displayed on it. If no callsign is displayed, nothing will be sent. If necessary, use the *Enter Call* button to enter and display a callsign.

Send / Receive Control Transmit, Receive, "Over" buttons. In some modes, buttons will appear to alternate between transmitting and receiving. In Factor, an "Over" button will appear instead, which allows you to switch from sending to receiving. It also will allow you to "seize" the link from the other station if you wish.

Menu Bar Description (or, when you don't have a mouse). Some users don't care for the mouse, or do not have available a serial port

for a mouse. This is not a problem. However, for those of us who are accustomed to the mouse, it takes a bit of getting used to.

The menu bar (fig. 7) at the top of the MultiCom for Windows™ window allows you to perform almost all MultiCom for Windows™ functions with keystrokes instead of mouse clicks. Experienced users may find this a faster way to control MultiCom for Windows™. To select a Menu bar item, either click on it with the mouse, hit the ALT key, or enter the underlined letter of the desired menu. The desired menu will be displayed.

You can choose items from the menu by clicking on them or by using the ALT key/underlined-character method described above.

The toolbars of MultiCom for Windows™ help make it easy to use, but they take up screen space. You can hide the toolbars to make more screen space available to you. Simply click on the Hide Toolbars button to make them disappear (the button will change

to Show Toolbars). Almost all commands are available with menu commands, so you can have full control over MultiCom for Windows™ even with the toolbars hidden. If you want the toolbars to reappear, simply click on the Show Toolbars button.

About The "Help" Key

Most Windows applications use F1 to go to the Help menu. However, up until now I was a DOS MultiCom user accustomed to using F3 for help and the F1 key to enter, and the "command" mode. The F1 key made it especially easy to get in and out of the transparent mode. With the new MultiCom for Windows™ I can select my preference.

The Use/Cancel buttons let me click on Use if I want the menu settings to be used. I click on Cancel if I want to use the previous settings (i.e., cancel the changes I made on the menu).

Three keys on our keyboards are especially important: F1, F2, and F3. Through single keystrokes you can access on-line Help, go to "converse mode" (in packet modes only), or go to "command mode" for the TNC. F1 is normally the "help" key. If you press F1, you will enter the on-line help system. Use this function to look up techniques, tips, or answers to your questions. F2 is the "converse" key. If you are in the VHF or HF packet mode, just hit F2 and you will be in the converse mode. Everything you type will be transmitted. F3 is normally the "command" key. Hit F3 and you will enter the TNC's command mode. This is useful in packet to exit converse mode. It is also useful if your TNC gets into the wrong state for some reason.

MultiCom for Windows™ lets you switch the meanings of F1 and F3. This allows F1 to have the same function as the DOS version of MultiCom. You can switch meanings by using the Options menu in Setup mode. Table I summarizes the three function keys uses.

Selecting Modes of Operation

Our current mode of operation may be displayed in two ways: (1) by the text in the main Title Bar at the top of the MultiCom for Windows™ window, and (2) by the "mode" buttons in the tool bar at the top of the window. The caption for the current mode will be displayed in light gray. You can easily change from one mode to another by pressing the mode buttons or from the menus.

Mode Button Method of Selecting Modes (fig. 8). Press the button for the desired new mode from the tool bar at the top of the MultiCom for Windows™ window, or select the mode by using the menu method. You can either press ALT-M; press the letter for your desired mode, as shown in the mode menu (e.g., "R" for RTTY, "V" for VHF packet, etc.); or click on the desired "Mode" menu item from the menu bar at the top of the window.

Summary

Next month we'll conclude this discussion by getting right into the "good stuff" and all the great things you can do with this new product.

Until next year, 73 es Have fun Packeting, visit the SEDAN Packet Radio home pages at <<http://www.sedan.org>>, and have the most joyous of holidays.

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Band Coverage: 160,80,40,20,17,15 (12 & 10 export; also usable in U.S.A. with license)
Output Power: 1000 W SSB, 800 W CW
Drive Power: 90 watts for 1,000 watts output
Tube: Pride 3-500C triode (1)
QSK: \$100 USD extra cost (Vacuum Relay)
Line Voltage Requirement: 100/120/200/240V, 50/60Hz
Cabinet Size: 18" w x 15" d x 8-1/2" h
Shipping Wt: 65 lbs. UPS three cartons

QRO HF-2000

Price: \$1,795 US Dollars FOB Bryan, Ohio USA
Band Coverage: 160,80,40,20,17,15 (12 & 10 export; also usable in U.S.A. with license)
Output Power: 1500 W SSB, 1200 W CW
Drive Power: 130 watts for 1,500 watts output
Tubes: Pride 3-500C triodes (2)
QSK: \$100 USD extra cost (Vacuum Relay)
Line Voltage Requirement: 100/120/200/240V, 50/60Hz
Cabinet Size: 18" w x 15" d x 8-1/2" h
Shipping Wt: 76 lbs. UPS three cartons

QRO HF-2500DX

Price: \$2,595 US Dollars FOB Bryan, Ohio USA
Band Coverage: 160,80,40,20,17,15 (12 & 10 export; also usable in U.S.A. with license)
Output Power: 1500 W Continuous Carrier
Drive Power: 50 watts for 1,500 watts output
Tube: Svetlana 4CX800A Tetrode (2)
QSK: Standard Feature
Line Voltage Requirement: 200/240V, 50/60Hz
Cabinet Size: 20" w x 19" d x 8" h
Shipping Wt: 100 lbs. UPS four cartons



QRO HF-3KDX (COMING FEB. 97)

Price: To Be Announced Later
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Drive Power: 50 watts for 1,500 watts output
Tube: Svetlana 4CX1600B Tetrode (1)
QSK: Standard Feature
Line Voltage Requirement: 200/240V, 50/60Hz
Cabinet Size: To be announced later
Shipping Wt: To be announced later

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Goodies—Part II, Conclusion

Here is the concluding portion of this two-part article. The first part covered backpacks, badges, calendars, clocks, clothing, code items, cups, decals, desk signs, direction finders, DX aids, HT holders, insurance, key rings, license-plate items, lighters, lights, magnets, maps, mouse/key pads, patches, pendants, pennants, pens, pins, and plaques and trophies.

Publications. CQ Communications offers an assortment of magazines and books. In addition to *CQ*, their magazines include *Communications Quarterly*, *Popular Communications*, *CQ VHF*, and *CQ Contest*. Books include *The W6SAI HF Antenna Handbook*; *The NEW Shortwave Propagation Handbook*; *Lew McCoy on Antennas*; *The Packet Radio Operator's Manual*; *The Quad Antenna*; *Building and Using Baluns and Ununs*; *The VHF "How To" Book*; *Keys, Keys, Keys!*; and more. For more information and pricing, see CQ Communication's ads in this issue.

The American Radio Relay League (ARRL) has a nice assortment of items. Most of the League items are only available to members. Amateur Radio Emergency Service (ARES) items are available as follows: (a) black and gold stickers or red, white, and blue stickers at \$1 each. Black and gold decals or red, white, and blue decals at \$1 each. Black and gold patches, or red, white, and blue patches, at \$3 each. The 5 inch member (diamond) decals at \$1. Life-member decals (5 per package) at \$1. ARRL flag license plate at \$5. Cloth ARRL flag patch at \$5, 4 inch ARRL diamond patch \$2, and life-member 4 inch diamond patch \$1.25. ARRL flag pin at \$5, membership pin \$3, and life-membership (replacement) pin \$3. Life-membership plaque \$25. Set of 50 ARRL member letterhead stationery sheets with 50 matching business-size (#10) envelopes at \$8. Fifty pieces of stationery \$4, or 50 envelopes (separately) \$5. Spark to Space items are available as follows: hats \$7 and patches \$3. Details can be requested from ARRL, Publications Sales, 225 Main St., Newington, CT 06111 (phone 203-594-0215; fax 203-594-0303).

"The ARRL Letter" is issued biweekly for ARRL members. A sample copy is available to any member who sends an SASE with his/her request. One-year subscription rate is \$19.50 (see above for address and phone number).

AntennasWest offers their "Radio Adventure" publication at \$1. This booklet covers wire antennas in detail, using easily understood explanations. HT 2 meter Pico-J, tiger tail, walking stick, and whip antennas are included in this manual. Dipole coverage includes BumbleBee, folded, Kansas, quietflex, quietflex fan, and today's no-tune (TNT) antennas. Loop-antenna coverage includes compact distributed capacity (DC), G4EZG, multiband, notch, omni, random, sandwich, Swiss, and UniLoop antennas.

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Nine-year-old Ved Kamat, VK2LAD, lives in Sydney, Australia. He is the son of Gopal, VK2WAY. Ved reads, writes, and speaks several languages. He holds a green belt in karate, and his other hobbies include cartooning and swimming.

Corner beam, gap, G5RV, half-square, slinky, and Windom antennas are also detailed in this booklet. Directivity, gain, height, HFDX, and radiation angle factors are explained in simple language. Baluns, masts, QSL cards, solar power, support line, and wire antenna erection gear are also covered. The address is AntennasWest, Box 50062, Provo, UT 84605-0062.

Antique Electronic Supply offers a catalog which contains many unique items that should be of interest to amateurs. It is particularly helpful to people who are involved with old radios. This company buys and sells vacuum tubes. In addition to hard-to-find older components, it offers many kits, headsets, and T-shirts, plus stationery, mugs, clocks, magnets, decals, books, and VHS cassettes. Their address is 6221 South Maple Avenue, Tempe, AZ 85283 (phone 602-820-5411; fax 602-820-4643).

The Antique Radio Classified is a monthly magazine with more than 8000 subscribers. It includes articles, classified advertisements, book data, early radio ('40s and '50s data), and a lot more. A 6-month trial subscription costs \$16.95, whereas \$38.95 pays a full year's subscription. Subscribers are entitled to a 20-word advertisement at no extra charge. A free copy can be requested. Their address is P.O. Box 802-N11, Carlisle, MA 01741 (phone 508-371-0512; fax 508-371-7129).

Buckmaster Publishing offers every issue of 73 on microfiche from October 1960 through the end of 1995 at \$285. Every issue of *QST* from December 1915 through the end of 1995 is available on microfiche at \$490. Every issue of *CQ* from 1945 through the end of 1995 sells on microfiche at \$360. Every issue of *Ham Radio* from 1968 to 1990 (plus 1977-1980 *Ham*

Radio Horizons) sells on microfiche at \$225. Shipping and handling costs vary with microfiche quantities. Annual updates cost \$10. They also sell their U.S./International Ham Call CD-ROM at \$55, including s&h; it provides quick references to domestic and foreign callsign data for 113 countries, with almost 1,290,000 listings. Buckmaster also publishes a Digits-to-Go CD-ROM with more than 600,000,000 numbers, which can be used to create cryptographic messages and systems, plus provide a large base of random numbers that can be used in other mathematical applications. The price is \$25, including s&h fees. This company publishes several CD-ROM items. Their address is Route 4, Box 1630, Mineral, VA 23117 (phone 703-894-5777; fax 703-894-9141).

The Digital Journal is published monthly. The annual subscription rate is \$25. The address is IDRA, P.O. Box 2550, Goldenrod, FL 32733-2550.

Electric Radio is published monthly by Barry Wiseman, N6CSW. If you are interested in the history of manufacturers and antique radio equipment, this publication should appeal to you. The domestic yearly subscription rates are \$28 for second-class and \$38 for first-class mailing. A sample copy is \$3. Their address is P.O. Box 57, Hesperus, CO 81326 (phone/fax 970-247-4935).

Ham Traders Express provides opportunities to buy, sell, and trade amateur radio accessories and equipment at low cost. Issues are mailed first class 24 times per year. The annual U.S.A. subscription rate is \$15, with a 3-month trial subscription available at \$5. A free sample copy can be requested. Don Roberts, KA4ETR, edits this publication. The address is

P.O. Box 1693, Byron, GA 31008 (phone 912-956-1609).

A one-year subscription to *Ham Trader Yellow Sheets* costs \$18. This publication is issued twice per month and is mailed first class. It advertises amateur radio equipment and accessories which are for sale or wanted. The address is P.O. Box 2057, Glen Ellyn, IL 60138-2057. A sample copy is available to anyone who requests one and sends an SASE.

A copy of the *Island News* publication is available to anyone who requests it and sends an SASE to Vance LePierre, W5IJU, P.O. Box 701, Fernandina Beach, FL 32035-0701.

JWO Services offers amateur radio books, software, and video items at discount prices. The address is 12 Hickory Place, Camp Hill, PA 17011 (phone 717-731-4747; fax 717-730-9373). John W. Obradovich, W3IS, owns this company. He provides 30-day payment terms to clubs and instructors ordering licensing course supplies, and all unused material can be returned to him at his stated purchase prices.

KDC Sound markets their 208-page *Ultimate Modification Bible, Volume V* at a cover price of \$29.95. It shows microphone connections to more than 1000 rigs, equipment modifications, crystal charts, scanner modifications, and much more. Their address is P.O. Box 8622, Grangerland, TX 77302 (phone 409-231-3753; orders only 1-800-256-9895).

The *Radio Amateur Callbook* is sold in two versions. The North American and International issues are priced at \$35 each. Their CD-ROM is sold at \$49.95. The address is P.O. Box 2013, 1695 Oak Street, Lakewood, NJ 08701 (phone 1-908-905-2961; fax 1-908-363-0338). Your local radio store probably has these books.

The "Radio Works Catalog" shows a \$4 cover price, but Jim Thompson, W4THU, will send one free to any reader who requests it. This catalog covers the Big Sig Loop, Carolina Beam, G5RV-Plus, inverted-L, and many other types of antennas. Antenna wire, coaxial cable, filters, and insulators are also advertised in this catalog. His 128-page "Reference Catalog" is very useful to amateurs who are unfamiliar with wire antennas. It provides easily understood explanations at a cost of \$4. The address is Box 6159, Portsmouth, VA 23703.

The *Vail Correspondent* is a quarterly journal devoted to bugs, keys, and other telegraph apparatus. A sample copy costs \$2. The yearly subscription rate is \$10. The address is Box 88, Maynard, MA 01754.

Paul Washa, W0TOK, markets 170 books about electricity, electronics, and radio. To request his current book list, include an SASE. Paul also sells pins (\$5), key chains (\$6), and money clips (\$6) featuring the 5-cent amateur radio stamp. The address is 4916 Three Points Blvd., Mound, MN 55364-1245 (612-472-3389).

Worldradio offers navy-blue poplin caps featuring the *Worldradio* logo imprinted on it in light blue. The price is \$9, including s&h fees. These adjustable caps have decorative braid across the front side and kelly green on the bottom side of the bill. Armond is also selling an 11-ounce cobalt-blue ceramic mug which shows *Worldradio* and the *Worldradio* logo in light blue. Each mug costs \$10, which includes s&h. Californians should include 54 cents for the cap and 56 cents for the mug extra to pay applicable sales taxes. The address is *Worldradio*, 2120 28th Street, Sacramento, CA 95818.

The "59(9) DX Report" is a weekly DX and contest newsletter. A sample is available to

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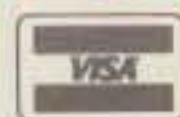
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7-Mike Hamstuff offers QSL storage boxes and index dividers.

anyone who sends an SASE with his/her request to Box 73, Spring Brook, NY 14140.

(Also see: *CQ/Backpacks; Vibroplex/Pennants; Paul Washa/Money Clips.*)

QSL Aids. Wayne Carroll, W4MPY, offers 250 eyeball QSL cards (2 by 3.5 inches) at \$20. He also sells 4.5 by 6.5 inch airmail envelopes you can send to DX amateurs for their use in sending cards back to you without having to bend them. These envelopes are priced at \$6 for 50, including the cost of first-class mailing. Wayne also sells the 5 by 7.5 inch brown kraft-paper envelopes which are preferred by several ARRL incoming DX regional QSL bureaus. These envelopes include the clasp closure. They are priced at 10 for \$3 and 20 for \$5, including the cost of first-class mailing. The address is 682 Mt. Pleasant Road, Monetta, SC 29105 (803-685-7117).

William J. Plum offers several interesting items. His QSL card album includes 50 two-pocket pages which can be used to display up to 200 QSL cards (4 by 6 inch) in a green 3-ring binder with white lettering on the spine and front side. A world map is shown on the binder's front cover. Description inserts are provided to allow cards to be catalogued and sheet lifters are included in the binder. A single album is priced at \$21, plus shipping costs. A pair of albums costs \$40. Additional packs of 20 insert pages are priced at \$5 each, plus shipping costs. The album can hold up to 360 cards. Eyeball QSL cards are sold with raised-letter printing, with 1000 priced at \$26 to \$39.50, depending on the style. Personalized note sheets are included in the product line.

Attaching foreign airmail postage to your SASE greatly improves your chances of receiving a desired DX QSL card without delay. Top DX amateurs report better than a 90% return ratio when this system is used. Airmail stamps are available from William Plum for 167 DX countries. He sells a combination of a European airmail envelope (4.75 by 6.5 inches) and a European airmail return envelope (4.5 by 6.25 inches) which augments his DX airmail postage program very well. Simply address the smaller

envelope to yourself and attach the correct DX airmail postage stamp to it. Insert your SASE and QSL in the larger envelope, address it per the callbook address, and mail it to the DX amateur. These envelopes are also available with your name, callsign, and address printed on them. Five hundred each of the unprinted outgoing and return envelopes are priced at \$80; 500 each of the printed outgoing and return envelopes are priced at \$120. Stateside QSL envelopes are also available in two other sizes. The address is 12 Glenn Road, Flemington, NJ 08822-3322 (phone 908-788-1020; fax 908-782-2612).

QSLs by WX9X offers QSLs from \$18.95 up. You can write or call them for free samples (55 cent SASE appreciated). Contact them at 354 West St., Valparaiso, IN 46383 (phone 219-465-7128; fax 219-464-7333).

QSL Cards Wall Display. Joe Saunders, K3UAL, has clear plastic QSL card holders which enable an amateur to display received cards without having to damage them with tape or thumb tacks. I have used this type of QSL display for many years. It has the added flexibility of allowing you to quickly and easily change the cards displayed. These plastic display holders sell at \$6 for a package of 3, plus \$2 s&h. Each holder can be used to display up to 20 QSL cards. Joe also prints regular QSL cards and eyeball QSL cards. His address is Club Printers, 1520 Jutewood Ave., Hyattsville, MD 20785 (phone 301-773-9383 and 301-773-5074). If you want samples of his cards, send 50 cents (stamps or cash) with your request.

Datamatrix sells their QSL Route Database (\$23) and their Logging Program (entitled Prolog; \$49). Their address is 5560 Jackson Loop N.E., Rio Rancho, NM 87124 (phone 505-892-5669; toll-free orders 1-800-373-6564).

7-Mike Hamstuff is run by Lee Finkel, KY7M, who sells QSL storage boxes and index dividers. The sets of dividers are for all 50 states, all DXCC countries, 1-0, A-Z, 10-160 meters (including the WARC bands), and a set of do-it-yourself dividers. Contact 7-Mike Hamstuff, P.O. Box 14455, Scottsdale, AZ 85267-4455.

(Also see: MFJ/Clocks, Personalized Photo/Clothing, Rusprint/Clothing.)

Rubber Stamps. Doug Reid, WB8MKV, sells a variety of rubber stamps for use by amateur radio operators. These stamps can be used to imprint envelopes, QSL cards, stationery, etc. His style M-4 stamp shows an elephant and "Don't Forget To QSL." Style M-8 has "Amateur Radio" (plus your callsign) enclosed in a circle. Style M-10 shows "TEN-TEN" (plus your number). Style M-20 has the outline of a telegraph key. The M-4, M-10, and M-20 stamps are \$4.95 each. The M-8 stamp is \$10.95, which includes s&h. Contact Reid Associates, 6680 Mellow Wood Lane, West Bloomfield, MI 48322-3765 (810-851-0260).

(Also see: Blue Ridge Stamp & Sign/Badges.)

Safety Items. Harry Clinton, NI4P, markets an electric static discharger which is intended to provide an ionization discharge path at a suitable stress point on a mast, tower, or antenna system before the electrical potential between a nearby charged cloud and some part of the antenna becomes excessive. The address is 3236 Walter Rd., Robards, KY 42452 (502-830-6206). It is priced at \$24.45, including s&h.

Lynics International Corp. sells a wide assortment of lightning/surge protectors and radio frequency connectors. The president of the corporation is Kiyoshi Endo, JA0BSL/AE4EZ. Their address is 8 Amlajack Blvd., Suite 362, Newnan, GA 30265 (phone 770-251-2235; fax 770-502-9827).

J. Martin Systems offers an inexpensive accessory bus which makes it easy to properly ground your station. "GROUND IT" features a solid-copper bus bar that is 0.125 by 0.5 inch

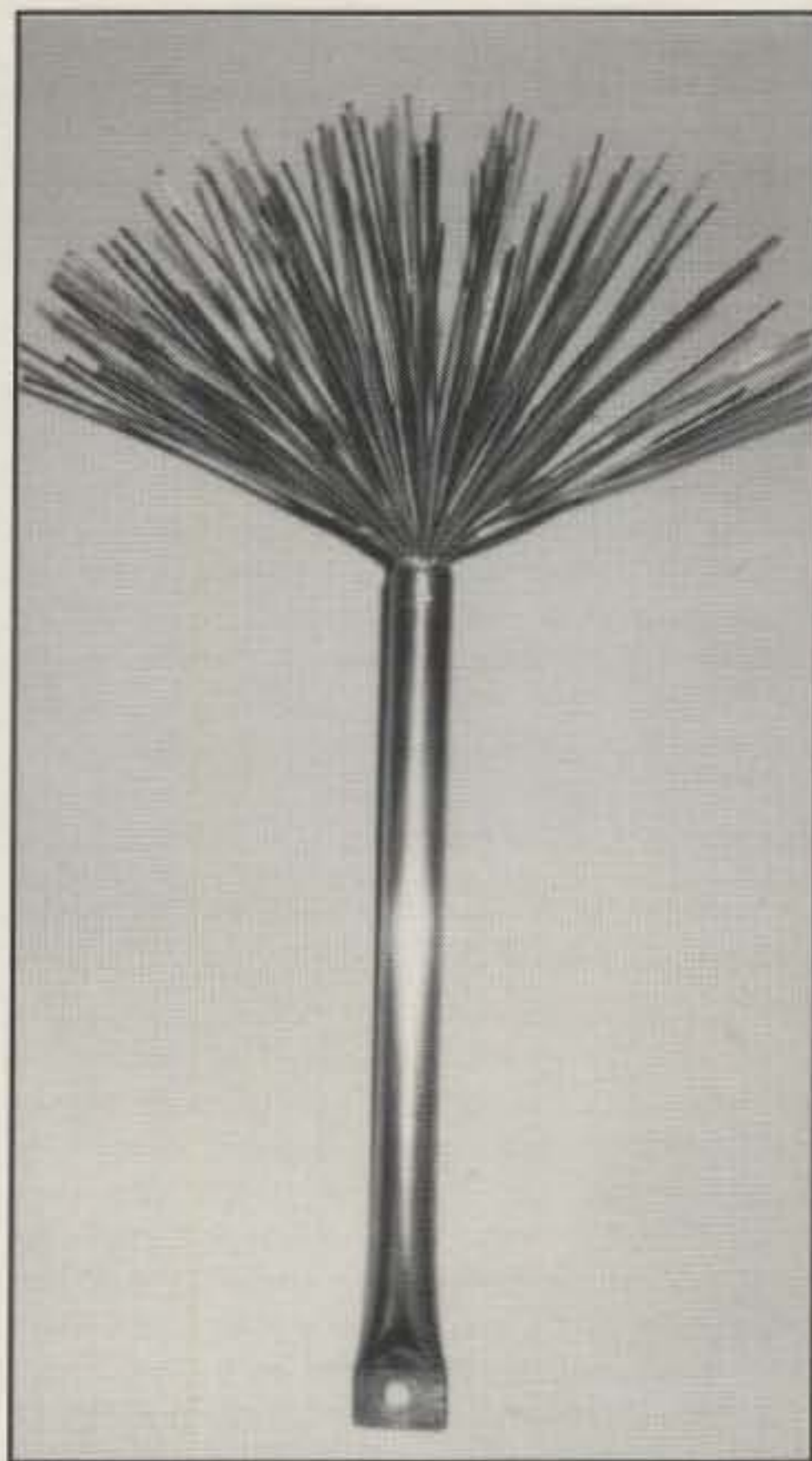
at four standard lengths between 2 to 6 feet, with other lengths available on special request. This bus is only intended to be used to ground station equipment; it is *not* intended to provide an AC power or coaxial-cable shield ground. Stainless-steel grounding studs are spaced 6 inches apart along each bus bar. Prices range from \$21.95 to \$34.95, including s&h. Flexible-rope copper grounding straps with end terminals are sold at \$2.50 per foot. The address is 35 Hilltop Ave., Stamford, CT 06907 (203-461-8768).

The North Marietta Amateur Radio Club offers a VHF tape covering lightning protection. It covers concerns in regard to amateur equipment, antennas, coax, computers, home AC systems, and telephones. The postpaid price is just \$7, with priority mailing costing \$3 more. The address is 515 Wood Forest Court N.E., Marietta, GA 30066 (770-428-7257).

The ONV Safety Belt Company sells a combination safety belt and seat harness at \$95.95, which includes s&h. A seat belt without the seat harness costs \$80.95. A tool pouch is offered at \$19.95, including s&h. Their address is P.O. Box 404, Ramsey, NJ 07446 (phone/fax 201-327-2462).

Shelters. Lockerbie Canopy markets a variety of E-Z Up shelters in an assortment of colors. Their address is 427 East Greensboro Court, Claremont, CA 91711 (phone 909-626-4559; toll-free 1-888-562-5373).

Signs. PBB Engraving is owned by Ron Van Horn, KA8PBB. The address is 24 Hitching Post Road, Union, OH 45322-3137 (phone 513-836-2932; fax 513-836-8225). His product line includes desk nameplates (aluminum and



Harry Clinton, NI4P, markets an electric static discharger to provide an ionization discharge path at a suitable stress point.

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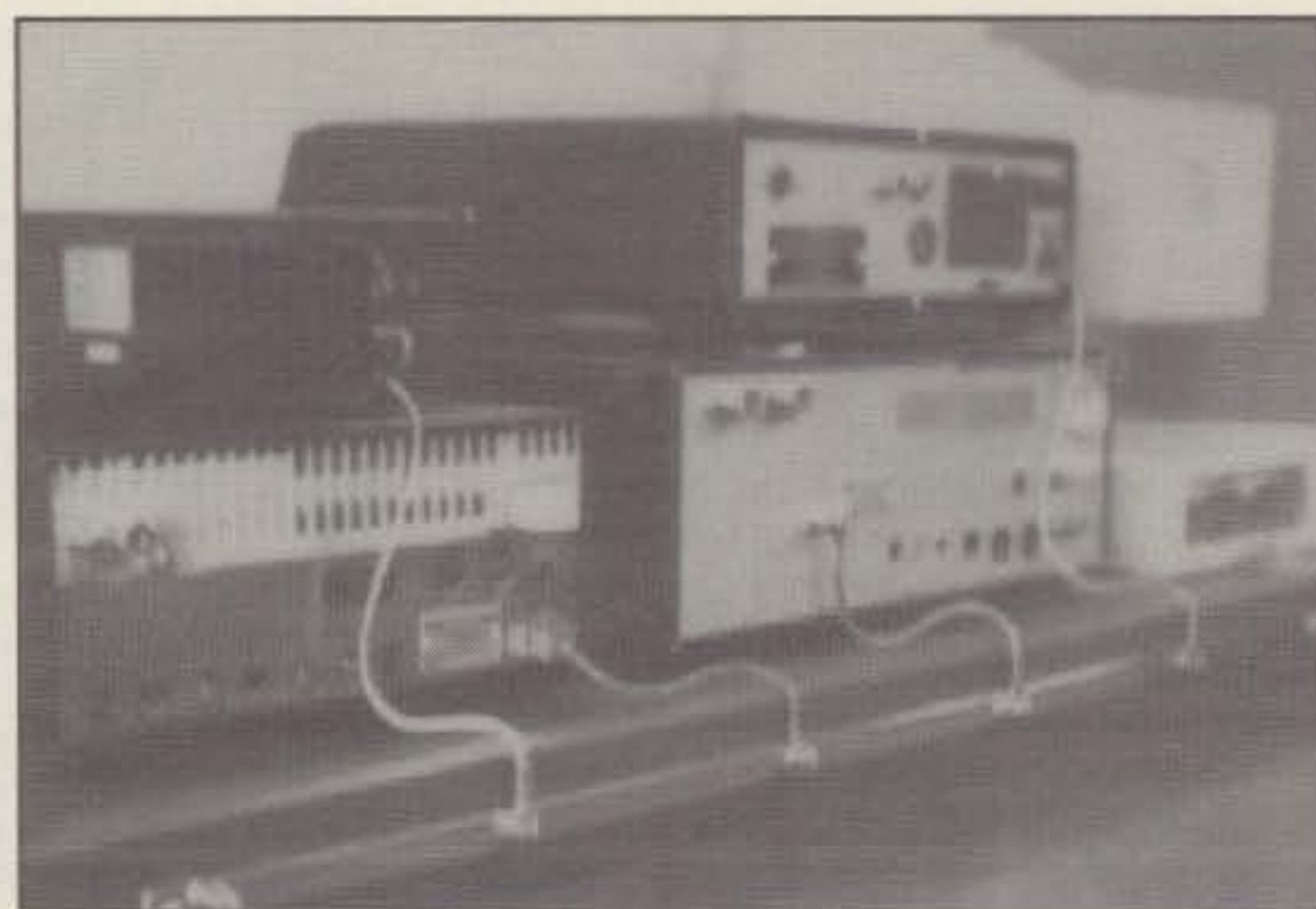
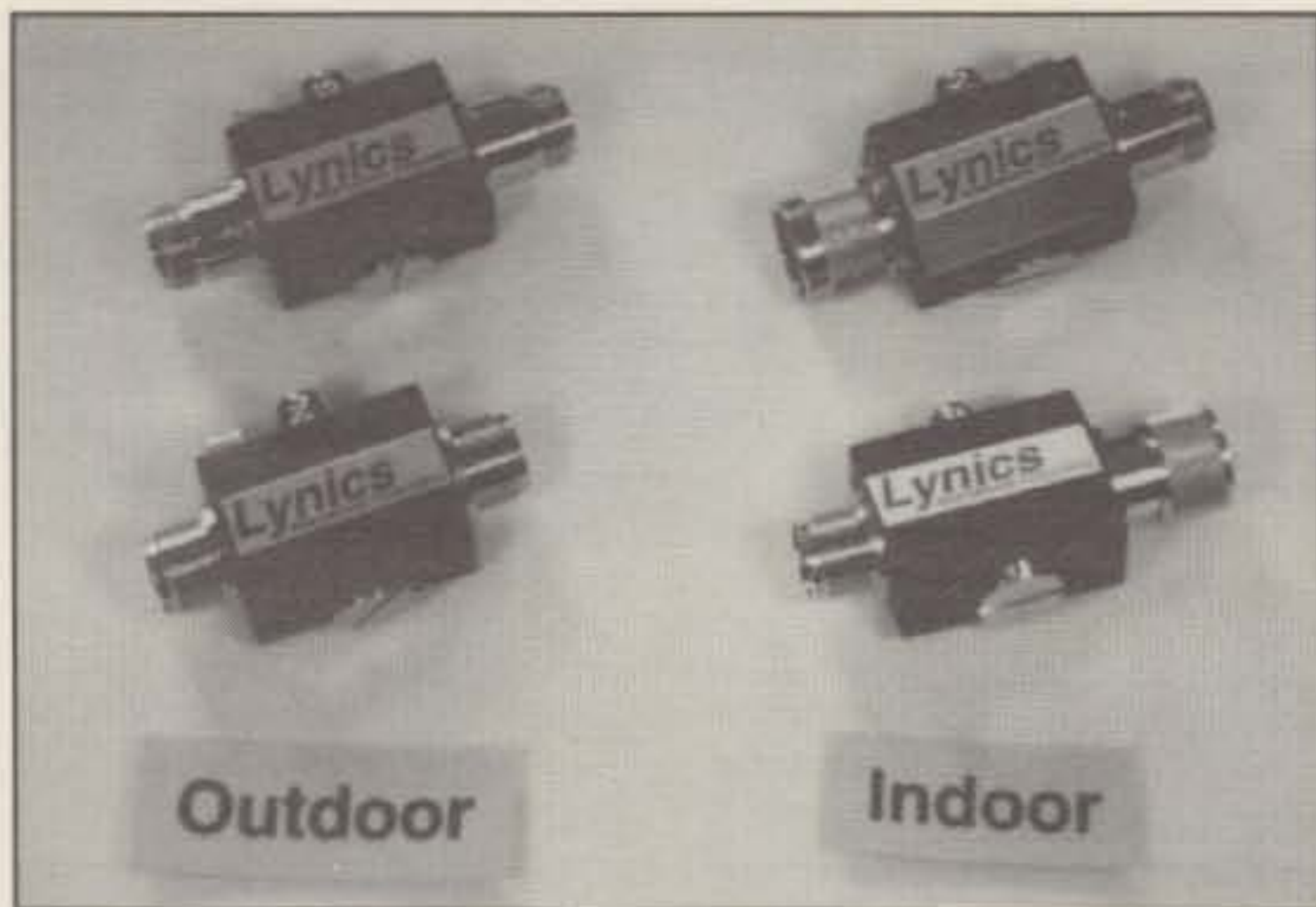
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J. Martin Systems' inexpensive accessory bus makes it easy to ground a station.

walnut), desk nameplate inserts, door signs, hall/corridor signs, hot foil stampings, identification badges, key tags, magnetic signs, pen sets, and plaques. His name and callsign badges feature the purchaser's choice of the emblem of any MLB, NBA, or NFL team. Ron uses computerized controlled engraving.

Loram Productions, Inc. markets their line of Zachary Bear specialty items. Zach is the male bear and Sara is their female bear. Either is shown seated at an amateur radio station with

one's name and callsign highlighted at the bottom of the color drawing. Wall-plaque pictures are available in two sizes. The 8 by 10 inch matted and framed versions cost \$12.95 and \$22.95 each, respectively. The 11 by 14 inch matted and framed room plaques are priced at \$19.95 and \$32.95 each, respectively. A wood or gold tone frame (or no frame) is available. The same picture is available on sweatshirts (\$26.95), tote bags (\$17.95), and T-shirts (\$16.95). S&h charges are not included in these

stated prices. The address is 263 North Ave., Webster, NY 14580 (phone 716-872-6650; fax 716-872-5098; toll-free orders 1-800-801-3992).

Signs by Ron markets a 3 by 12 inch magnetic sign with large black lettering against a white background. It is easily attached to (or removed from) any suitable metal surface. The price is \$6.50 each, including s&h. Callsign, name, repeater/simplex frequency, etc., can boldly be displayed on these signs. The address is 64 Neal Court, Microdyne Building, Plainville, CT 06062 (860-632-1070).

Whiterook Products Company sells an RF-actuated callsign display (Model CSD-1) which lights up to display your callsign while you are transmitting 5 watts (or more) on any HF, VHF, or UHF frequency. The price is \$55.95. A 12 VDC adapter (Model DC-1) is included. A delay is built in to eliminate flickering during transmissions. If you prefer "On The Air" in large lettering instead of having your callsign displayed in large letters with "on the air" displayed in smaller letters below your callsign, you can order their Model CSD-2 at the same price. The CSD-10 and CSD-20 are larger versions (5.0 x 1.5 x 5.25 inches) of the CSD-1 and CSD-2, respectively. These displays are easy to mount on walls (size 11.25 x 7.25 x 2.0 inches). Each model sells at \$85.95. Their Model CK-1 is 5 x 1.5 x 5.25 inches; it provides UTC time in a bright-red LED display featuring 6-digit (hours, minutes, and seconds) time. The CK-1 price is \$85.95. The Model CK-1P plain clock also sells at \$85.95. The Model CK-2 is a dual UTC and local six-digit clock. Its size is 6.1 x 2.5 x 6.2 inches and the cost is \$130.95. The model CK-100 includes the 6-digit UTC clock with unlit callsign above it. The CK-100 price is \$85.95. The size of the CK-100 is 6.25 x 3.75 x 2.0 inches, and it is easy to mount on a wall. The CK-1 and CK-100 operate accurately from AC house power, eliminating the need for batteries. The BC-10 binary clock costs \$75.95; it displays 12 or 24 hour time in the binary format. The Model CK-1000 clock features a 2.5 inch 6-digit display (15 x 6 x 2 inches; \$175.95). Each clock price includes the \$6 s&h fee. House power adapters are included for use with all the clocks. A free catalog is available. The address is 309 South Brookshire Ave., Ventura, CA 93003-4413 (phone/fax 805-339-0702).

(Also see: LQV Engraving/Badges; Blaine Watkins/HT Holders.)

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"Easy to operate, small, great price!"

"Yaesu did it again!"

For the foremost in top-performing, durable, dual band handhelds there is one choice. The FT-50R. Manufactured to rigid commercial grade standards, the FT-50R is the only amateur dual band HT to achieve a MIL-STD 810 rating. Water-resistant construction uses weather-proof gaskets to seal major internal components against the corrosive action of dust and moisture. And, the rugged FT-50R withstands shock and vibration, so throw it in with your gear!

Dynamic and exclusive features set the FT-50R apart, too. Wide Band Receive includes 76-200 MHz (VHF), 300-540 (UHF), and 590-999 MHz*. Dual Watch checks sub-band activity while receiving on another frequency, then when a signal is detected, shifts operation to that frequency. Digital

Battery Voltage displays current operating battery voltage. Digital Coded Squelch (DCS) silently monitors busy channels. Auto Range Transpond System™ (ARTS™) uses DCS to allow two radios to track one another. And, the FT-50R is ADMS-1C Windows™ PC programming compatible, too. To round out the FT-50R, it has four battery savers, and super loud audio—remarkable in an HT this size.

A reliable companion where ever you go, the FT-50R is one tough little dual bander with all the features you want!

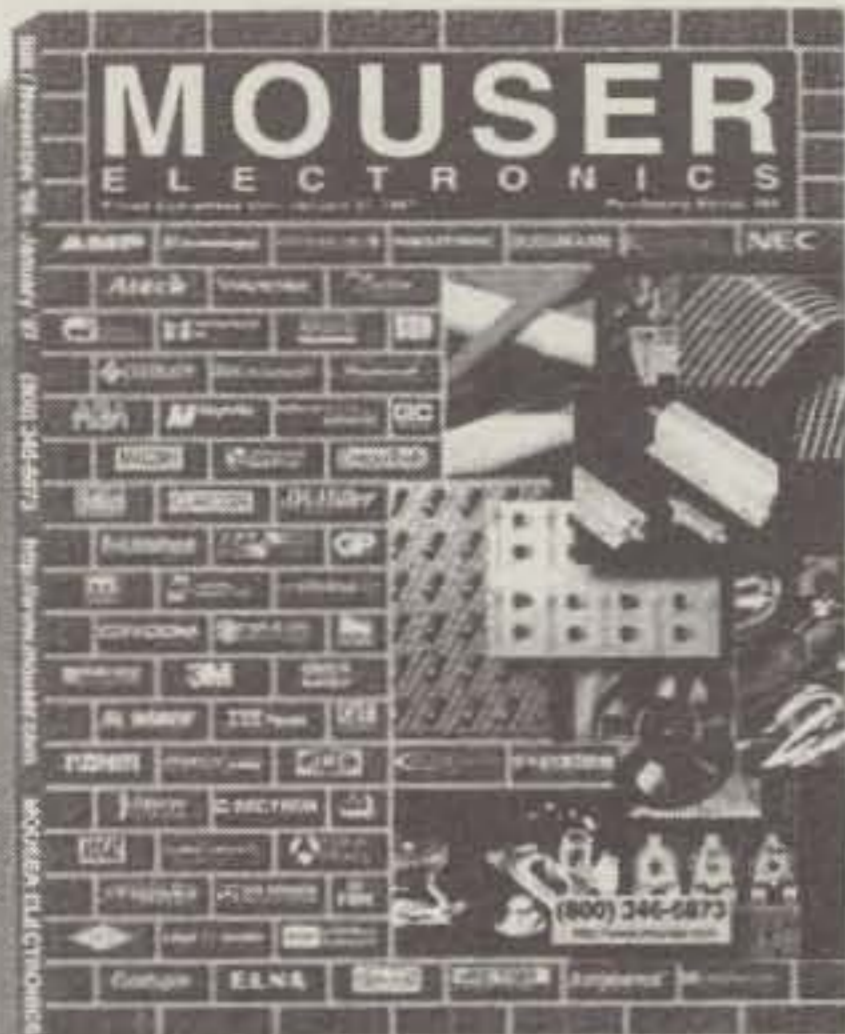
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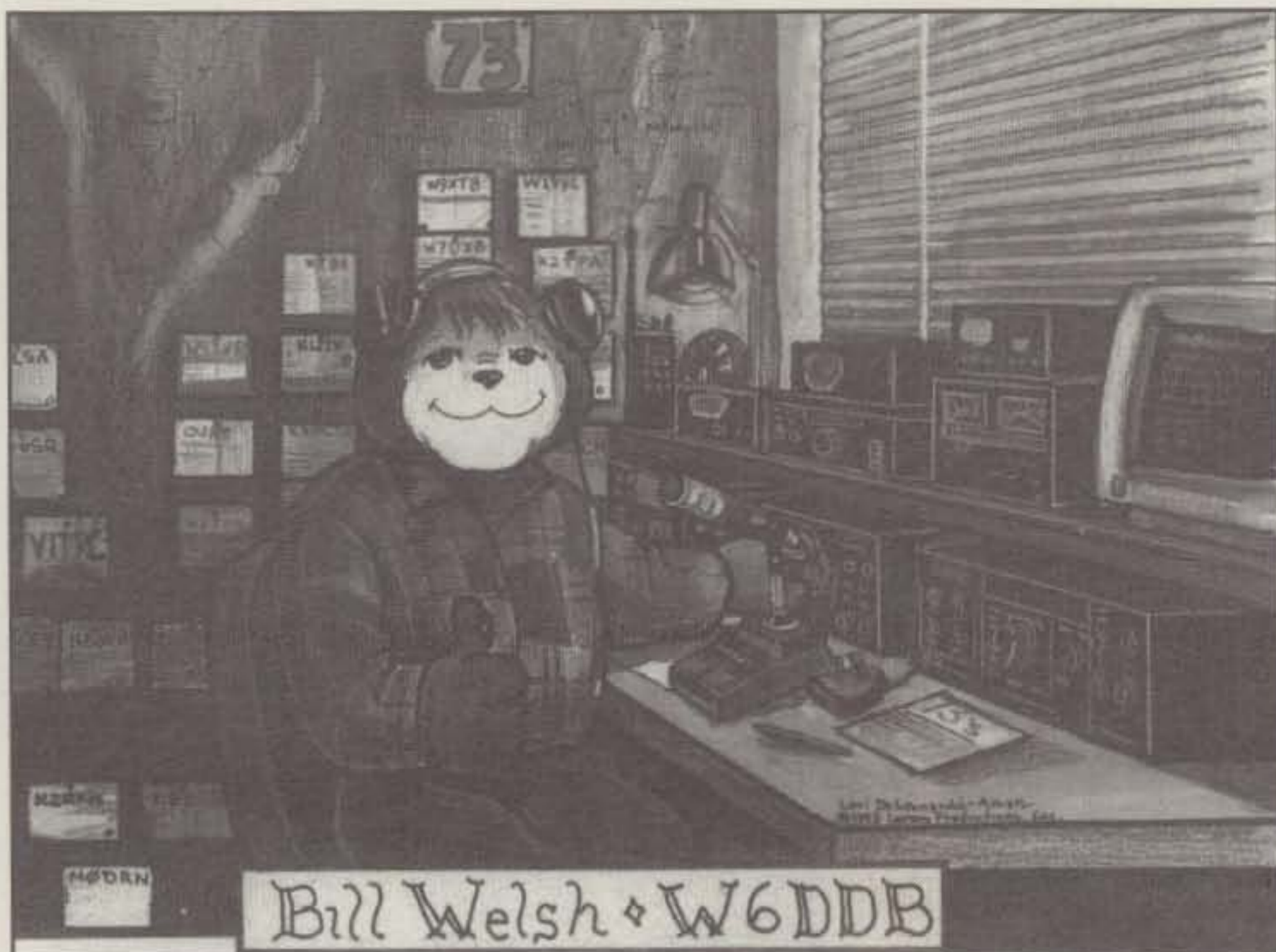
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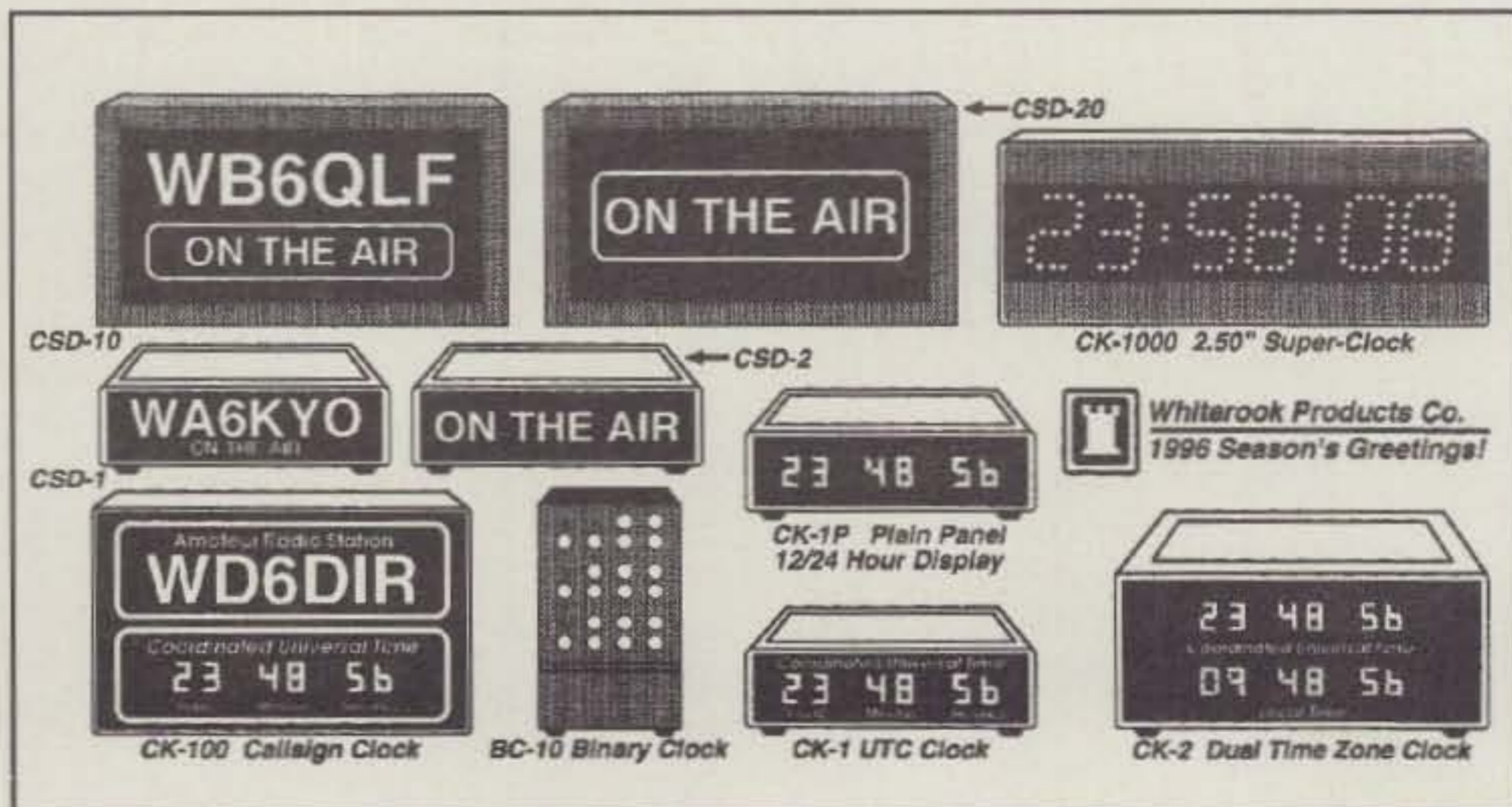
Software. Forest L. Addis, K4UAR, offers a 25-page alphanumeric list showing beam headings to 568 DX locations in the 327 ARRL DXCC countries and 707 domestic locations, relative to one's home station location. His list includes prefixes, locations, short-path headings, long-path headings, beam return headings, intervening distances, latitudes, and longitudes. The price is \$10 and the address is 2291 Midvale Circle, Tucker, GA 30084-4218 (770-938-6816).

Amsoft sells a CD-ROM amateur radio call-sign tri-annual (Jan.-May-Sept.) database at \$23, including s&h. A 3-issue annual subscription costs \$99 plus s&h. Their address is P.O. Box 666, New Cumberland, PA 17070-0666 (phone 717-938-8249; fax 717-938-6767).

Paul Cooper, K6PY, sells software which enables you to quickly determine short- and

long-path headings between any two points on Earth, plus related distances in kilometers, meters, nautical miles, and statute miles. The price is \$14.95 plus s&h. His address is 9845 Oakdale Avenue, Chatsworth, CA 91311-5361 (phone 818-341-3499; fax 818-772-8863).

Dave Farnsworth, WJ2O, offers a versatile software logging program, which is much more than its name implies. It features color and monochrome monitor compatibility, DXCC country identification (including CQ and ITU zones), 50-page instruction manual, 14 choices of QSO printouts, QSOs logged in a single main database, customized or standard printing of QSL cards and labels, QSL tracking, simple step-by-step menus, hand net operation format, and much more. The domestic (U.S.A. and Canada) and foreign prices for the logging program, including the manual, are \$59.95 and



Whiterook Products Company sells a variety of call sign displays and clocks.



Peet Brothers Company sells three models of home weather stations.

\$69.95, respectively. Their domestic address is WJ20 Master QSO Logging Program, P.O. Box 16, McConnellsville, NY 13401 (phone 315-245-1010; fax 315-245-1336).

Interflex Systems Design Corporation offers performance software that is powerful and easy to operate. It can be used to provide advanced test handling, callsign data, automatic QTH/QSL exchange, background file transfers, conferencing, logging, macro files, quick reference guide, and robot CQs. Prices vary from \$60 to \$100. The address is Box 6418, Laguna Niguel, CA 92607-6418 (phone 714-496-6639; fax 714-496-8041). Jeff Towle, WA4EGT, runs the outfit.

If you like contesting, you should investigate the software being offered by K1EA Software, distributed by XX Towers, Inc., 814 Hurricane Hill Road, Mason, NH 03048 (phone 603-878-4600; fax 603-878-1102).

RT Systems markets an amateur radio database which enables you to quickly and easily locate amateurs by name or callsign. You can search for a specified city, state, or ZIP code. This database is available in disk form at \$54.95 each, including s&h. The CD-ROM is priced at \$35, including s&h. Search filters allow searches by address, age, callsign area, callsign prefix, callsign suffix, first name, and license class. Options (\$7.50 each) provide county cross-reference, data first licensed, date of birth, license expiration date, and previous callsign data. Their address is 8207 Stephanie Drive, Huntsville, AL 35802 (phone 1-800-723-6922 and 1-205-882-9292).

Shadow Software offers vanity callsign disks showing all callsigns available for reassignment. Each callsign area is covered, listing about 85,000 callsigns. The VANITY4 version shows all unassigned 1 by 2 and 2 by 1 callsigns, except KH6 and KL7. The VANITY5 version shows available 1 by 3 and 2 by 2 callsigns. Printouts of these disks are available. Their address is 3496 Velma Drive S.W., Powder Springs, GA 30073 (770-943-3223).

Sheldon Shallon is W6EL. W6EL Software offers the Miniprop Plus propagation prediction program for IBM and IBM-compatible computers. Miniprop Plus predicts signal levels and signal-to-noise ratios for every half hour of the day on any path and on any frequency between 3 and 30 MHz. World maps show the great-circle path and day/night regions for any date and time, plus the best frequency to use to contact each of 57 areas of the world. Also, MUFs, beam headings, sunrise/sunset times, and more are included. All screens are in full color on suitably equipped computers. A printed manual contains detailed instructions. Miniprop

Plus is priced at \$60. W6EL Software's address is 11058 Queensland Street, Los Angeles, CA 90034-3029.

Xantec, Inc. offers the DX Edge (\$24.95) and the Super DX Edge (\$29.95) in colored plastic for use with DOS computers. These operating aids show gray-line propagation possibilities between any two locations on Earth without involving the use of tables or calculations. They are particularly useful on the 40, 80, and 160 meter bands at all stages of the sunspot cycle. They are intended to improve DX operating results. Tony Japha, N2UN, sells these operating aids. The Xantec address is P.O. Box 834, Madison Square Station, New York, NY 10159 (212-673-7646).

(Also see: *Buckmaster Publishing/Publications; Datamatrix/QSL Aids; JWO Services/Publications.*)

Stationery. See: *Antique Electronic Supply/Publications; ARRL/Publications.*

Tote Bags. See *Loran Productions/Signs.*

Videos. See: *Antique Electronic Supply/Publications; CQ/Backpacks; JWO Services/Publications.*

Weather Items. Peet Brothers Company sells three models of home weather stations plus their accessories. The Ultimeter II costs \$199, plus s&h. It includes an AC adapter, ane-

nometer/wind vane, desk stand, junction box, keyboard/display unit, operation/installation manual, and remote temperature sensor. The Ultimeter 2000 System essentially has all of the same parts, but it also includes indoor and outdoor temperature sensors, a pressure sensor, and a wind sensor. The Ultimeter 2000 is priced at \$379, plus s&h. The Ultimeter 2000 Upgrade Kit is priced at \$249. Basically, it enables you to use an Ultimeter II as an Ultimeter 2000 remote. The Ultimeter 500 sells at \$239, plus s&h fees. Except for the pressure sensor, this model essentially consists of the components which are included in the Ultimeter 2000 System. Available accessories include cables, cigar lighter power adapter, humidity sensors, printed circuit data logger, rain gauges, radio frequency filter, signal splitter box, and temperature sensors. The address is 1308 Doris Ave., Ocean, NJ 07712 (phone 1-800-872-7338; fax 1-908-517-0669).

Conclusion

It is hoped that this article introduced you to several items which can enhance your enjoyment of our Amateur Radio Service. Please support our hobby's suppliers!

73, Bill, W6DDB

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EDSP
RX/TX

All-Mode HF Transceiver FT-1000MP



The year was 1956. Electronic communication throughout the world was on the threshold of significant and remarkable change. Intrigued by the development of single-sideband radio theory, a young engineer and amateur radio experimenter painstakingly assembled an SSB transmitter. Word of his successful efforts spread quickly among his friends, and soon radio amateurs from all over the country were requesting transmitters just like it. Thus was born the first invention of JA1MP, founder of Yaesu. Though his key is now silent, in tribute to his leadership and exceptional contributions to the radio art, the FT-1000MP carries the memory of his call sign.

An HF Masterpiece, Combining the Best of Digital and RF design technology. The FT-1000MP.



Specifications

- EDSP (Enhanced Digital Signal Processing)
- Shuttle-jog Rapid Tuning Enhancement
- Directional Tuning Scale for CW/Digital mode and clarifier offset display
- Dual In-Band Receive w/ Separate S-Meters
- Selectable Antenna Jacks
- Collins SSB Mechanical Filter built-in, 500 Hz CW Collins filter plug-in, optional
- Selectable Cascaded Crystal and Mechanical IF Filtering (2nd and 3rd IF Filters)
- User-programmable Tuning Steps w/0.625 Hz High Resolution Low-Noise DDS Circuit
- Custom Feature Set-up via New Menu System
- Adjustable TX Output Power: 5-100W (5-25W AM)
- True Base Station: Both 100-117 or 200-234± VAC 10%, 50/60 Hz and 13.5 VDC Power Inputs

Blending digital and RF technology, the FT-1000MP features a Yaesu exclusive: Enhanced Digital Signal Processing (EDSP). Beginning on the receive side with Yaesu's industry-standard high-intercept front end design, the RF signal is then fed to the IF stages, where an impressive array of 8.2 MHz and 455 kHz IF filters (including a built-in Collins SSB Mechanical Filter) establish the tight shape factor so important in obtaining high dynamic range and low noise figure. Finally, the EDSP system provides specially-designed filter selections and response contours for maximum intelligence recovery.

Only with this combination of EDSP, independently selectable 8.2 MHz and 455 kHz IF filters, and a low-noise DDS local oscillator system can receiver performance without compromise be obtained. You can customize your FT-1000MP by choosing from 20 kHz, 500 Hz, and 250 Hz optional, cascaded IF filters, then zero in on weak signals using Yaesu's exclusive Shuttle-jog Rapid Tuning Enhancement and high-resolution (0.625 Hz) DDS VFO. Without question, the FT-1000MP is the most technologically advanced HF rig today.

EDSP operates in both transmit and receive modes. On receive, the EDSP produces enhanced signal-to-noise ratio and significantly improved intelligence recovery during difficult situations involving noise and/or interference. The result of hundreds of hours of laboratory and real-world experimentation, EDSP's 4 preset random noise reduction protocols and 4 digital filtering selections are controlled by easy-to-use concentric controls on the front panel of the transceiver. High, low, and mid-range cuts for voice work are teamed with razor-sharp CW bandpass filters and an automatic notch filter which identifies and attenuates undesired carriers or heterodynes. Also operational in the transmit mode, EDSP provides 4 performance-enhancement pattern selections for different operating circumstances, ensuring best readability of your signal on the other end of the path.

Once again, Yaesu's engineers have reaffirmed the vision and dedication of JA1MP which began nearly 40 years ago. See the incomparable FT-1000MP today.

FT-1000/D
Legendary 200W
All Mode HF Transceiver
"The Dream Station"



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High Powered 2-m FM Transceiver FT-3000M

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Like the 50-Watt FT-2500M, the FT-3000M is rated MIL-STD 810. And, both let you take the back roads with confidence. Built to resist jolts, bumps and the corrosive affects of dust, mist, and rain, the new FT-3000M, and popular FT-2500M take abuse and perform like

champs. Plus, the FT-3000M is a great base, too.

The new FT-3000M comes equipped with some sensational exclusive features!

- WIDE BAND RECEIVE! From 110-180 MHz, VHF, and 300-520 MHz UHF to 800-999 MHz*. And, AM aircraft receive!
- TWIN COOLING FANS! Unique, twin fans keep the FT-3000M running cool without a problem! So, don't worry about long transmission keydowns.
- SELECTABLE POWER OUTPUT! An awesome 70 watts, plus 50, 25, and 10 Watts.
- TRUE FM! Voice clarity has never been better.

- INTERACTIVE PROGRAMMING! Continual scrolling menu guides you through 50 settings—and won't let you forget the next step!
- SIMPLIFIED FRONT PANEL! New Quick-Touch™ dual-concentric knob controls menu programming and adjustments.
- PC PROGRAMMABLE! Optional ADMS-2B Windows™ Programming Software programs your FT-3000M in seconds!

The FT-3000M is feature-rich just like the FT-2500M, 50-Watt mobile, and built to the tough performance standards you've come to expect from Yaesu. We think you should have at least one, don't you?

"This is true Wide Band receive! VHF, UHF, and 800-999 MHz!"*

"Digital Code Squelch gives me more privacy than CTCSS."



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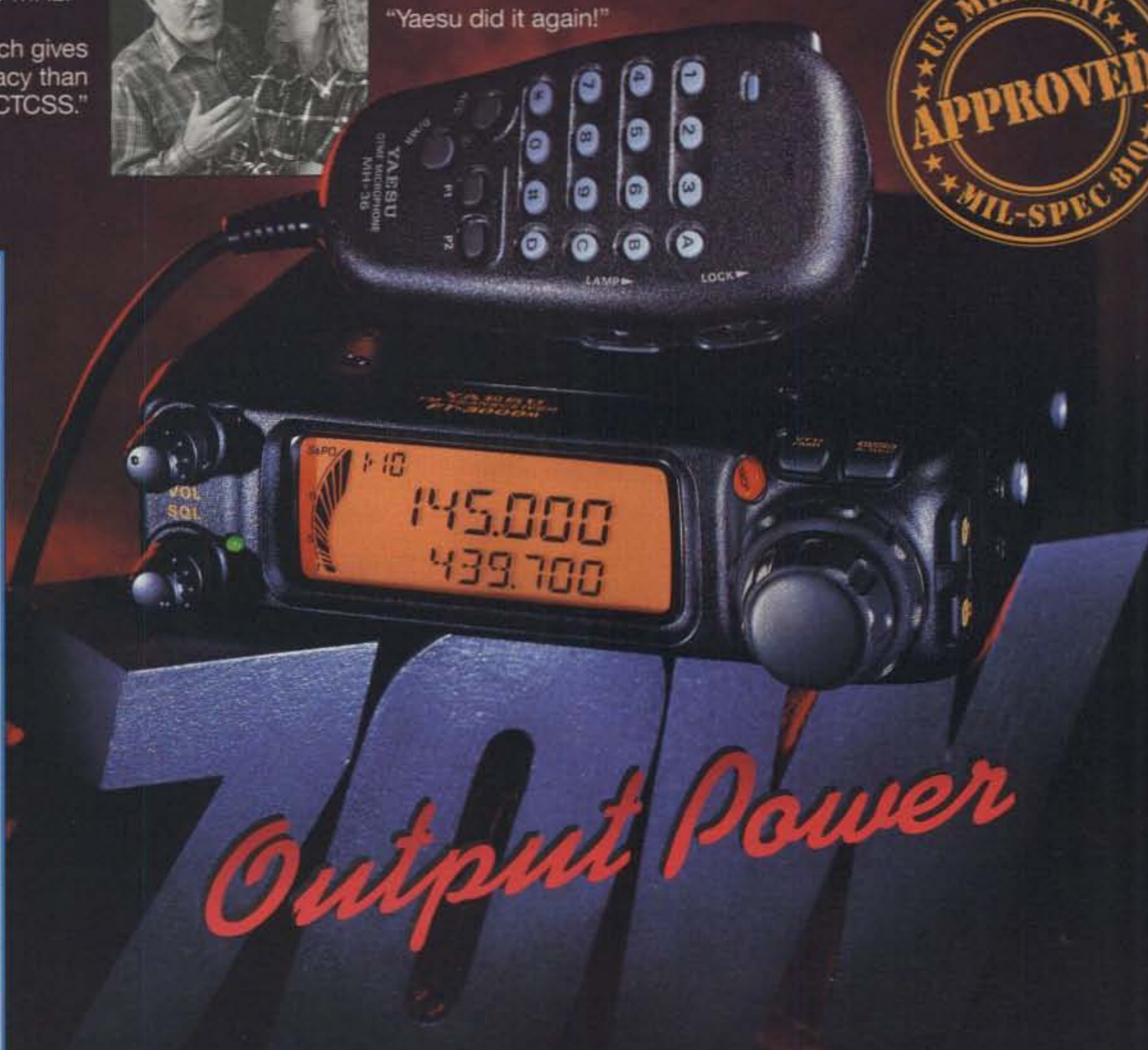
"Yaesu did it again!"



Features

- Frequency Coverage
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- Interactive Programming
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ALL ABOUT THE WORLD ABOVE HF

What is Phase 3-D?

For several years now we have been seeing copy about Phase 3-D in publications. Below are a series of press releases from AMSAT, the Amateur Satellite Corporation, which will give some detailed explanation about the most ambitious amateur radio satellite launch ever. As one of the press releases indicates, this satellite could be part of the amateur radio hobby as early as late next spring, so we had better become educated about what it can do for the hobby. The following paragraphs are what AMSAT has to say about its "big bird." (All photos in this month's column were taken by Keith Baker, KB1SF, and are courtesy AMSAT-NA.)

"Phase 3-D" is the term now being used to identify Amateur Radio's next major satellite effort. It will be the largest, most complex, and most expensive Amateur Radio satellite ever built. An international team of volunteers, from over a dozen countries on five continents, has been assembled and is now laboring diligently to complete the new satellite in time for its launch on the second test flight of the European Space Agency's new Ariane 5 launch vehicle in 1997. While the individuals on the Phase 3-D International Development Team come from diverse technical and managerial backgrounds, they share a single tie that binds them all together: Each has an avid interest in the future of space communications.

The very first Amateur Radio satellites launched in the early 1960s made up the "Phase 1" group and were typified by OSCARs 1 and 2. These satellites carried only low power beacons designed to last just a few weeks. The "OSCAR" designation (short for Orbiting Satellite Carrying Amateur Radio) is only given to Amateur Radio satellites that successfully achieve orbit.

Later AMSAT spacecraft such as OSCARs 6, 7, and 8 carried the "Phase 2" designation. These satellites were built to last for a period of a year or more. Several Phase 2 satellites have since been built and launched, including a number of digital packet radio satellites. These satellites (often called "PACSATS") are designed to receive non-commercial computer messages uploaded by Amateur Radio Operators for storage and later downloading by operators in other parts of the world. A distinguishing characteristic of the Phase 2 satellites, however, is their relatively low Earth orbit, allowing amateurs only limited satellite access time and greatly restricted real-time communications distance capabilities.

The "Phase 3" part of the Phase 3-D identifier puts it in the largest and latest class of Amateur Radio satellites. The Phase 3 program was begun in the mid-1970s to partially alleviate many of the orbital limitations of previous satellites. These satellites typically yield

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Dec. 2	Last Quarter Moon.
Dec. 8	Moderate EME conditions.
Dec. 10	New Moon.
Dec. 11	Lowest Moon declination.
Dec. 12	Moon perigee.
Dec. 13	Geminids meteor shower predicted peak.
Dec. 15	Moderate EME conditions.
Dec. 17	First quarter Moon.
Dec. 22	Ursids meteor shower predicted peak. Poor EME conditions.
Dec. 24	Full Moon. Highest Moon declination.
Dec. 29	Moon apogee. Moderate EME conditions.

EME conditions courtesy W5LUU.

real-time, worldwide voice coverage for their users by employing a highly elliptical, Molniya-style orbit first pioneered by the [former] Soviet Union. Phase 3 satellites appear to "park" over one spot on the Earth for up to several hours at a time. This orbital configuration virtually eliminates the "hurry up" style of satellite operation one needed to use the earlier Amateur Radio satellites.

The first Phase 3 satellite, Phase 3-A, was lost on launch due to a booster failure. Both Phase 3-B and Phase 3-C satellites were successfully launched and became OSCARs 10 and 13, respectively. Phase 3-D, however, will be much more than a mere replacement for OSCARs 10 and 13, both of which are now rapidly nearing the end of their useful lifetimes.

Phase 3-D will feature a combination of higher power transmitters as well as higher gain receivers and antennas. Also, unlike current Phase 3 satellites, Phase 3-D's antennas will always point Earthward. This means significantly stronger signals will come from the satellite, and lower transmit power and simpler antennas will be needed to get a usable signal to the satellite. These improvements are specifically aimed at bringing satellite operation easily within the reach of every Amateur Radio Operator on Earth.

Phase 3-D will contain receivers and transmitters for all Amateur Radio satellite frequency bands from 21 MHz to 24 GHz that are currently authorized for use by the International Telecommunications Union. Thus, Phase 3-D will help perpetuate the amateur's proven ability for both pioneering and perfecting new communications modes at ever higher frequencies.

Many of the communication technologies that are taken for granted today by the average consumer, such as AM and FM broadcasting, broadcast television, international shortwave and satellite communications, as well as cellular telephone services, can all trace their technical roots to experiments first done by Amateur Radio Operators. What's more, the birth of dependable international geosynchronous satellite communications as well as the work now being done by commercial companies experimenting with low-Earth, "PACSAT-style" communication technologies, can be

directly linked to the pioneering work first done by AMSAT's volunteers.

But, anything as capable as Phase 3-D doesn't come cheaply. Even with most of the labor donated by unpaid volunteers, present estimates place the final cost of building and launching the satellite at between four and five million US dollars. Worldwide efforts to raise contributions from Amateur Radio Operators have proceeded quite well. However, accumulating the necessary resources needed to complete and launch Phase 3-D has required significant funding from sources outside of Amateur Radio.

AMSAT is very proud of its tradition of excellence and the contributions it has made to the advancement of space communications, space education, and the space sciences. Phase 3-D will be Amateur Radio's premier vehicle to continue a quest that began with the very birth of radio . . . a search for new communications technologies for generations yet unborn.

Facts About the Phase 3-D Satellite. As currently designed, Phase 3-D will receive on the 15, 145, 436, 1270, 2400, and 5600 MHz bands. It will transmit on the 29, 145, 436, 2400, 10,500, and 24,000 MHz bands. Receive/transmit combinations will be programmable from Earth through the onboard computer and a unique RF matrix arrangement allowing one or more uplink receivers to be linked to one or more downlink transmitters. The satellite will weigh over 400 kg (880 pounds) fully loaded with propellants at launch. It will also be about 2.3 meters (7.5 feet) in diameter and about 1 meter (3 feet) high. With its solar panels extended, Phase 3-D's "wingspan" will be over 6 meters (20 feet). Phase 3-D's elliptical orbit will vary from a maximum height of 47,000 km (29,000 miles) above the Earth to a low of some 4000 km (2400 miles). On-board antennas will offer gains in the 4 to 19 dBic range which, because of the spacecraft's unique three-axis stabilization, will always point Earthward. When combined with on-board power capability approaching 600 watts, these high-gain antennas will produce effective downlink powers in the 10-20 kilowatt range.

As Phase 3-D's transmitters and receivers will be programmable, this concept will take the



Some flight electronic modules for the Phase 3-D International Satellite undergo final bench testing at the AMSAT-DL Laboratory in Marburg, Germany prior to their shipment to Orlando, Florida for integration into the satellite.



At the AMSAT-DL Phase 3-D Laboratory in Marburg, Germany AMSAT-NA's Dick Jansson, WD4FAB (right), holds a prototype L Band antenna feed that was constructed by Freddy de Guchteneire, ON6UG (left).

additional satellite mode designators that amateur satellite operators have become used to (such as Modes A, B, and J) virtually obsolete. For example, on Phase 3-D, a mode "U/VS" will be possible. That is, amateurs will be able to uplink to the satellite on U-Band (435 MHz) while the satellite transmits downlinks on both V-Band (145 MHz) and S-Band (2400 MHz). Simply looking at the frequency chart for Phase 3-D, it becomes apparent that a *myriad* of different combinations (like modes C/V, UL/S, and L/SC) could all be supported! Of course, the traditional Mode B, one of the most popular

modes on the current Phase 3 satellites, will become Mode U/V under this concept. It is expected this frequency pair will be one of the more active ones in the first years of Phase 3-D's lifetime. However, as commercially available equipment for the higher bands becomes more available and lower in cost, use of these higher frequency bands is expected to increase. When this happens, Phase 3-D's powerful receiver and transmitter sites for these bands will already be in orbit, available for use.

Other experiments planned for the new satellite include a Global Positioning System

(GPS) receiver that will allow the satellite to tell ground controllers where it's located at any time. Two Earthward-pointing digital cameras are also now slated to be included.

A Brief History of the Phase 3-D Satellite Project. Development of the Phase 3 series of Amateur Radio relay satellites was initiated in 1975 to provide a capability for longer range, more reliable communications than had been possible with the preceding series of low altitude Amateur Radio satellites initiated by the launch of OSCAR 1 in December 1961. The name OSCAR is short for Orbital Satellite



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AMSAT-NA Vice-President, Engineering Dick Jansson, WD4FAB (right), and AMSAT-DL's Konrad Mueller, DG7FDQ, perform a final inspection of Phase 3-D's 400 Newton kick motor in Konrad's well-equipped machine shop at AMSAT-DL prior to its shipment to Orlando, Florida for integration. The motor is of the same design that successfully powered both AO-10 and AO-13 to their final orbits.

Carrying Amateur Radio. The Phase 3 series of satellites were designed to fly in highly elliptical "Molniya" orbits pioneered by the Soviet Union, carrying multiple transponders and operating in frequency bands allocated to the Amateur Radio Service. While many of the worldwide, non-profit Radio Amateur Satellite Corporation (AMSAT) groups were involved in these projects, the most involved were Germany's AMSAT-DL and North America's AMSAT-NA organizations.

Three 150 kg class spacecraft of similar design were developed and launched between 1980 and 1988. Unfortunately (as mentioned above), the first, Phase 3-A, was lost due to a booster failure. Recovering from this setback, the second and third spacecraft were successfully launched to become AMSAT-OSCAR 10 and AMSAT-OSCAR 13 upon reaching orbit. One of these, OSCAR 10, continues to provide communications relay capability, although altitude control has been lost due to radiation damage. OSCAR 13 is due to re-enter the Earth's atmosphere in December 1996.

Following the launch of OSCAR 13, two design studies were initiated to define follow-on missions. AMSAT-DL chose to study a continuation of the Phase 3 series using a larger, more capable Phase 3-D spacecraft launched into an improved elliptical orbit. The orbit would be carefully selected to be more easily understood by most Amateur Radio Operators, allowing them both increased access time and more convenient availability than orbits afforded by the current Phase 3 spacecraft. At the same time, AMSAT-NA began study of a Phase 4 satellite that would operate in a geostationary orbit. The Phase 4 spacecraft would have provided a platform for vastly improved communications for those amateurs within range, but the concept would have required multiple satellites to provide worldwide coverage. Both studies assumed similar three-axis stabilized, 500 kg class

spacecraft carrying higher power transponders operating across more frequency bands and employing more advanced modulation techniques than the current Phase 3 satellites.

When it became clear that funding for the Phase 4 program would have had to come almost exclusively from the Amateur Radio community in North and South America for a single satellite, and would have required a much larger outlay of resources from the worldwide Amateur Radio community for a multiple satellite system, the decision was made, albeit reluctantly, to shelve the Phase 4 concept in favor of teaming with AMSAT-DL on the Phase 3-D program.

An added decision driver for this course of action was the fact that AMSAT-DL had been successful in securing a flight opportunity on one of the two test flights of the new Ariane 5 launch vehicle developed by the European Space Agency (ESA). The timing of this project was also critical. Soon after the Phase 3-D project commenced, it became known that orbital instabilities would cause the atmospheric re-entry of OSCAR 13 in late 1996. Without its replacement, the worldwide Amateur Radio community would be left without a reliable high altitude satellite for the first time in more than a decade.

Today, the International Phase 3-D Project Team also includes AMSAT groups from Great Britain, Japan, Finland, Canada, South Africa, Russia, Belgium, Czech Republic, Slovenia, France, New Zealand, and Hungary in addition to the groups from AMSAT-NA and AMSAT-DL. Recent advances in propulsion, materials, electronics, antennas, structures, orbital stability, and control, as well as computational finite element structural and thermal analyses, have now brought construction and launch of a Phase 3-D-like vehicle well within the technical expertise of the AMSAT community. Further, this project is being accomplished while still supporting all the stringent launch requirements of ESA for the Ariane 5.

While its primary focus is on improved worldwide satellite communications, the Phase 3-D project will also have a positive influence on the very future of Amateur Radio. Whenever the topic of Amateur Radio is discussed at international meetings, it is frequently the Amateur Radio space communications program that captures the attention and imagination of national officials. It's also the Amateur Radio community's continued willingness to support projects like Phase 3-D—projects that continue to expand the state of the art in communications—that garner praise by these officials and help justify the amateur's continued access to valuable radio spectrum.

In addition, as the leading showcase of expertise and talent for the Amateur Radio community, the Phase 3-D effort epitomizes perhaps the most unique managerial and technical approach to research and development of a space vehicle ever realized. There is nothing else quite like the Phase 3-D program anywhere in the world. The managerial and technical challenges and resulting "lessons learned" from an international team of volunteers working largely on their own time, in their own homes, and at their own pace, has been significant. This experience is already proving invaluable to corporate, government, and private institutions now searching for innovative ways to promote significantly lower cost access to space while still maintaining technical excellence.

While the vast majority of design, development, and fabrication needs for this project have been donated by private individuals and institutions, active fund raising efforts by AMSAT and other Amateur Radio organizations worldwide have also helped secure the approximate \$4 million out-of-pocket development and launch resources needed to make the Phase 3-D program a reality.

Phase 3-D Slated for Launch in April 1997 on Ariane 502. In a published report released Thursday, September 26 by the European Space Agency (ESA), Mr. Jean-Marie Luton, Director General of ESA, and Mr. Alain Bensoussan, Chairman of CNES (the French Space Agency) announced that the launch of Ariane 502 has now been tentatively set for mid-April 1997. It was also confirmed that the Phase 3-D International Amateur Radio Satellite will be on this flight. The other payloads are to be a pair of technological measurement packages for validation of the launch vehicle's ability to place two satellites into a geostationary transfer orbit (GTO).

These announcements came during a joint ESA-CNES press conference at ESA Headquarters in Paris called to outline the respective plans of the two agencies to correct identified deficiencies in the Ariane 5 launch vehicle. The actions are in direct response to a comprehensive report submitted in July by the Ariane 501 Inquiry Board that was chartered to investigate the loss on launch of the first Ariane 5 booster in early June.

During the press conference, it was also reported that ESA's Atmospheric Reentry Demonstrator (ARD), a technology demonstration capsule for a future European manned space transport vehicle, along with an as yet unspecified commercial payload, is to be flown on a subsequent Ariane 5 vehicle, Ariane 503, which has been made a part of the Ariane-5 qualification process. This flight could take place in September 1997. The ARD earlier had been slated to fly on Ariane 502 along with the AMSAT Phase 3-D satellite.

In today's announcement, Mr. Luton and Mr. Bensoussan outlined several specific actions that are now being taken by ESA and CNES to assure the correction of software contained in the Ariane 5 inertial reference system. Errors in this software were previously reported by ESA as being one of the primary causes of the Ariane 501 failure. Corrective actions include making changes to the Ariane 5 Functional Simulation Facility to make the qualification tests more representative of the flight environment, as well as performing a comprehensive review of all the embedded software contained in the launch vehicle.

ESA and CNES also announced that the industrial architect on the Ariane project will henceforth assume the role of "software architect." This change will allow not only for verification of all software incorporated in equipment but also will help ensure the overall functional integrity of the launcher. Mr. Luton and Mr. Bensoussan went on to note that this means that all of the launch vehicle's software will now become subject to qualification reviews in which outside experts will take part.

In addition, the joint ESA and CNES announcement reported that working methods used in the Launcher Qualification Review have now been modified to introduce specialized audits on the most complex launcher systems in order to provide closer analysis wherever this

is deemed necessary. A comprehensive review of the launcher's qualification is now also reported to be underway along with systematic efforts to identify "degraded" modes of operation that could affect launcher elements.

Extremely Rare October 2 Meter Sporadic-E Opening

Those between Cuba and South Florida on the east end, and Arkansas and Texas on the west end were treated to a very rare 2 meter opening on Wednesday, 9 October (10 October UTC). Stations operating 6 meters in these areas were tipped off to the possibility when the MUF just kept rising. Then Oscar Morales, CO2OJ, showed up and gave 15 lucky guys

and gals a rare contact on 2 meters, most of them for a new country, let alone a new grid. What follows are some of the reports that appeared on the VHF reflector.

Bill Tynan, W3XO/5 (EM00), wrote: "Tonight, Wednesday October 9 (October 10 UTC), we experienced some of the strangest 2 meter propagation I have ever heard. I worked the following, all on 2 meters. All times are UTC: 0010, KE4NJM, EL94, Florida Keys, S-5 (later S-9); 0018, CO2OJ, EL83, Havana, S-4 to 5; 0040, WB2QLP, EL96, Naples, FL, S-5, he gave me S-9; 0048, W4EMB, EL95, Miami, S-9; 0055, K2RTH, EL96, S-9.

"The strange thing about this was that because it lasted so long and was so widespread, at both ends of the path, that I was convinced

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Say You Saw It In CQ

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it was tropo. Although there was QSB, it wasn't the quick fading one expects of sporadic-E. It was also an odd time of year for sporadic-E on 2 meters, or 6 for that matter.

"Nevertheless, some—for example, KB5IUA near Houston (250 miles east of me, also in on it)—were sure it was sporadic-E. Six was open to the same area at the time for sporadic-E. I now believe that John was right. For one thing, I never heard any signals on 222 or 432. Also, after signals faded on 2 meters, about 0115, I worked KE4NJM again on 6 at 0130. He was later gone there as well. (As I write this) it is now 0300 and there are no more signals out of Texas on 2 meters, which would indicate that it was sporadic-E. The cross-Gulf tropo we get down here usually lasts into the evening and the next morning and generally gets better in the late hours of the evening. All in all, a very interesting session and one that netted a new

country on 2 meters, and of course a new grid as well. I think that EL94 may also be a new grid. It was a very rare October 2 meter sporadic-E opening that lasted an hour or more."

Pat, WA5IYX (EL09ql, near San Antonio), wrote: "On October 10 at 0036 UTC I had a 144 MHz sporadic-E contact with KE4NJM in EL94 (to approximately 0047). Some other locals were getting grids close to that (although it may have been due to some FAI effects as well). Anyway (this is) my first notice of any sporadic-E MUF this high in an October. This was the culmination of the sporadic-E first noted on the Ch 2 commencing at 2215 UTC, October 9, which reached 88-108 MHz by 2344 UTC."

Ed Stallman, N5BLZ (EL29), wrote: "Band opened to EL95/96/99/82. I must say (that) working CO2OJ (EL83) was great! He was country number 82; must get back on EME!"

Pete, WA5JCI (EM21), wrote: "At 0025 UTC

I had 2 meters sporadic-E into Florida. Worked KE4NJM EL 94 and WB2QLP EL 96. Heard a couple of other stations, including CO2OJ EL 83. Last sporadic-E heard at 0052."

The Lowells, George, N0EOQ, and Lisa, KA0NNO, wrote: "Cuba into Arkansas on 144.200. At 0018 UTC into EM24."

John Godwin, KB5IUA, wrote: "Wednesday night was a rare treat. Possibly once in a lifetime e-skip opening in October on 2 meters. I did detect what sounded like some FAI mixed in with the strong e-skip signals. Some nifty stuff to ponder on for the propagation wizards."

And finally, Oscar Morales, CO2OJ, wrote: "Hi everybody. Good 6 meter and 2 meter openings this evening (0000 UTC, October 10, 1996). I don't know if I got there too late or just in the right moment, but I turned on my rigs at 0010Z and signals in 6 meter were really very strong, but I was surprised by the almost always silent 2 meters.

"Signals were from Texas, so I turned my beam in that direction and started calling the first station I heard: W5YV in EM00. But who answered me was my good friend George, N\$SEOQ, and his wife (Lisa) KA0NNO in EM24 with a beautiful 59+ signal. We have been looking for this 2 meter QSO for a long time.

"In the next 45 minutes, I worked 15 station in EL09, EL17, EL29, EM00, EM12, EM20, EM34, and EM31. Almost all the signal reports were 59 and [Get this, guys!—ed.] most of the time I was running only 3.5 watts (because of TVI and trying to maintain good relations with the neighborhood)! I also made a try in 70 cm with W5UWB, EL17, but nothing heard on this band.

"For me, this was the first 2 meter opening to a place different than Florida this year. On 6 meters I only worked 2 or 3 stations (we have a TV channel 2 in Havana), but band is still open in this moment (02:30 UTC). From now on, I'll turn on the 2 meter rigs more often."

Silent Keys

These past few months have been very sad ones in that we have lost several VHF weak-signal operators. A couple of them have been via tragedy. What follows are reports of these Silent Keys.

Vern "Rip" Riportella, WA2LQQ. The third president of AMSAT-NA, "Rip," WA2LQQ, passed away on September 13th in Warwick, New York, of a heart attack at age 53. A former officer in the U.S. Air Force, he became active in AMSAT affairs in the late 1970s. He rose first to executive vice-president, and served as president from 1984-1987. Without his devotion to fund-raising, organizing, recruiting, and the encouragement of all involved, AMSAT OSCAR 10 and 13 may never have become realities. He also revitalized *The AMSAT Journal* and created *AMSAT Satellite Report* (now *OSCAR Satellite Report*). His enthusiasm will be missed.

Sadness Struck the Packrats Twice. The following is from "Cheese Bits," the newsletter of the Packrats and was written by Ernie Kenas, W3KKN.

John W. Allen, Jr. "A member of the Packrats since their early days, John grew up in the Glenside area and went to Abington High School. He was a member of the school radio club. It was here that many of us got our start in ham radio.

"John was an avid ham, which led to his electronics career. He was an Electronics Instructor in the Signal Corps during World War II. After

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the war, he worked at Barker & Williamson and then Narco as a design engineer on aircraft electronics.

"Early on, he was an antenna enthusiast. In the mid-thirties I heard him on 10 meters with a new novel antenna at that time—a Yagi beam—working the world. He experimented with many kinds of antennas and gave us practical engineering for loop Yagis which are now the vogue for UHF work. John had a loving family: his wife, Loretta, his daughters, Loretta and Carol. His other hobbies were playing the organ, fishing, and swimming. Many happy hours I spent with him trout fishing in northern Pennsylvania. He also loved animals and always had a pet dog or cat.

"John was a true Packrat and was helpful to all members of the club. We'll remember John for his smile, his kindness, and his expertise. He will be sorely missed.

Thom Gooding, W8HBN. The following is from Steve, KO0U, via the VHF Reflector.

"Word reached me late last Thursday night of the untimely death of Thom Gooding, ex-K4LHB, and most recently, W8HBN. Thom, holding hands with his YL friend, was crossing Rt. 611 in front of the Days Inn in Horsham, Pennsylvania when he was struck and instantly killed by a hit-and-run driver, Friday night, October 4, 1996. Thom and his YL friend had intended to attend the annual Packrats VHF Conference.

"Thom was a mainstay of 220 MHz activity in the mid-Atlantic states for many years. He was the second 'G' of G & G Electronics of Maryland, and lived for hamfests. Although he had not been very active recently on VHF due to a divorce, he was rebuilding and about to come back in a big way when he was killed. His funeral was held Tuesday, October 8, 1996."

Peter Linden, P29CW/VK3AMX/WA7VDF. The following is from "The 50 MHz DX Bulletin" and was written by Steve, VK3OT: "Peter Linden, P29CW, was tragically killed in a light aircraft crash on August 22 in southern California. Pete was due to return to New Guinea after successfully completing his licensed aviation exams in Melbourne this year. Pete was the anchor man for New Guinea 6 meter operation, and intended to build up a substantial station on his return to Ukarumpa in 1997. He will be sadly missed by all of us.

"A memorial service was held in Melbourne on September 13 which was attended by 300 people including several local amateurs. I am attempting to get hold of Pete's logs so that I may continue as his QSL manager until all cards for P29CW have been dispatched.

Editor's note: At the time of his death, Pete was serving as a missionary with the Wycliffe Bible Translators organization, also known as the Summer Institute of Linguistics. This organization works in tribal allocations around the world in literacy training, assisting tribes which previously have not had a written language, to develop one and learn to read and write from its development. Pete's religious convictions took him to the far corners of the earth. Along the way he also took his hobby of amateur radio and made it possible for so many of us to make contact with someplace that was rare in our favorite part of the spectrum. Pete was a true hero of the hobby.

Leroy May, W5HN. The following is from "Feed Point," the publication of the North Texas Microwave Society. "Leroy May, W5HN, a long-time pioneer in the north Texas area became a Silent Key over the summer. Leroy, who ini-



Dr. Andras (Bandi) Gschwindt, HA5WH, proudly displays Phase 3-D's Battery Charge Regulator (BCR) at the Marburg P3-D Lab. The BCR is a critical piece of Phase 3-D flight hardware that will control all the spacecraft's on-board power activity, such as regulating battery charging from the solar panels. The BCR was expertly built by bandi and his team at the Technical University of Budapest, Hungary.

tially held the call 5AJG, and later W5AJG, was one of the first in that area of the country to get on the VHF+ bands, pioneering work on 6 and 2 meters and 70, 23, and 13 cm. He was honored in 1987 by the Central States VHF Society with its prestigious John T. Chambers Award for his more than 50 years of contributions to the VHF+ community. He will be missed by all in the north Texas area and the VHF+ community as a whole.

Tom Kirby, W1EJ. I first met Tom at the Central States VHF Society conference in Wichita, Kansas. Even then the affable Tom was fighting cancer. Nevertheless, he surprised his doctors by hanging on as long as he did. Tom was active in the New England area, sponsoring the annual North East VHF conferences. Tom's most lasting contribution to the hobby was his computer-aided designs of long-boom Yagi antennas. These formed the backdrop for the development of the K1FO line of VHF antennas. As well as enjoying his hobby of amateur radio, Tom was a local politician of sorts, having been elected twice as a representative to the New Hampshire General Court from his home town of Pelham.

Slight Correction to The Sarajevo Siege Story

I had a very nice exchange of e-mail with Sharon Machlis Gartenberg, KC1YR, who helped her very good friend, Samir, T99S, translate his story, which appeared in October 1995 issue of QST. Sharon was in Sarajevo in April with a Jewish relief agency. She gave me a bit better understanding of the war. What follows is an excerpt from one of her e-mails to me:

"If I may, I would like to make one correction to your article, in which you wrote 'Slovenia escaped hostility because the Yugoslav military was bogged down in fighting in Croatia and could not cross it to get to Slovenia.' In fact,

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Slovenia was the first in what one journalist has called the 'wars of Yugoslav secession.'

"The war in Slovenia lasted 10 days—admittedly like nothing, if one compares that to the subsequent war in Croatia and the carnage in Bosnia. Nevertheless, if we talk about the 'Six-Day War' in the Middle East, I wouldn't dismiss 10 days of fighting in Slovenia as 'escaping hostilities,' even though casualties were relatively light and damage relatively minimal.

"I remember the war in Slovenia very well, since I have friends there and was worrying about them. It was the summer of 1991, and my husband and I were vacationing in London when the fighting broke out in Slovenia. This was the first time bombs were dropping and tanks were firing in Europe, aside from military training exercises, since World War II. Everyone was stunned. The fighting in Croatia happened shortly thereafter.

"The Yugoslav National Army (JNA) was *not* 'bogged down' in Croatia at the time. JNA forces did in fact roll through Croatia into Slovenia unimpeded, something that infuriated many Slovenes, since Slovenia and Croatia had agreed to a mutual defense pact after both declared independence.

"There are still many questions as to why Milosevic let Slovenia go relatively easily. The Slovene Territorial Defense Force put up unexpectedly stiff resistance when the JNA arrived. Slovenes were armed and ready, and had one advantage that Serb nationalists used to such brutal effectiveness in Bosnia: control of the mountains. The JNA was embarrassed by the Slovenes' effective resistance, but they never attempted to launch the kind of devastating

attacks on civilian centers that occurred in Croatia and Bosnia; there was no serious military counter effort mounted against the Slovene fighters.

"The best explanation I've heard is that given that the conquest of Slovenia would have been costly, Serb nationalists decided to let it go and concentrate their resources on the Greater Serbia they dreamed of, as opposed to holding all of Yugoslavia together. (Slovenia was about 95% ethnic Slovene at the time and there was no Serb population there to speak of. The Greater Serbia map the nationalists drew up and sought to conquer included a big piece of Croatia and large swathes of Bosnia, but the nationalists didn't consider Slovenia 'historically Serb.')

"At the time, one of my Slovene friends warned me that if the war spread to Bosnia, there would be casualties in six figures. Tragically, he was right."

Current Meteor Showers

Two showers occur this month. The first, the *Geminids*, is predicted to peak between 1300 and 1900 UTC, 13 December. It has a broad peak and is a good north-south shower, producing an average of 100-110 meteors per hour at its peak.

The second, the *Ursids*, is predicted to peak around 0640 UTC, 22 December. It is an east-west shower, producing an average of greater than 12 meteors per hour, with the possibility of upwards of 90 at its peak.

And Finally . . .

Did you see Dave Sumner, K1ZZ's editorial in November *QST*? In it he spoke of our hobby being a community. He reminded us that within our community there are many "sub-communities." We who operate in the VHF+ spectrum have several sub-communities operating within its confines. This month I have focused on AMSAT because of its impending launch of the Phase 3-D satellite. AMSAT is unique in that it somehow bridges the gap between communities. Those of us who enjoy weak-signal work like the idea of the ambitiousness of the Phase 3-D satellite including the 10 and 24 GHz bands as part of the bird. Similar weak-signal techniques have been used in the past to work the "birds." As they have become sophisticated, packet operations and even FM operators have been able to work into space. And as always there is DX. Amateur satellites have given us unique opportunities to work DX on these bands, which some people long ago said weren't good for much more than line-of-sight communications.

If you have or expect to benefit from AMSAT in the future, perhaps today you might want to send them a nice contribution, sort of "paying your dues." After all, you pay dues to your local club for the use of its repeater. Why not pay your dues for the use of those nice repeaters in the sky? Better yet, join AMSAT and start receiving their publications. What better way to keep informed of the latest in this part of our wonderful community called Amateur Radio.

If you have something to share with the rest of our community, then let me know. You know all the usual routing places.

My best to all of you, my friends, during this holiday season. May we all do our part to work for Peace on Earth, Good Will to All.

Until next month . . . 73, Joe, N6CL

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ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

Antenna Column Ramblings—Part III

We'd better say it first, lest we forget: Best of Season's Greetings to all our readers. That being said, this holiday month we'll again "ramble on" with our customary formula of antenna, software, and book notes. We'll begin where we should, with antennas. Stay with us. There's lots to come.

Antenna Ramblings

Diamon-X Antenna "Jewels." This Indiana firm offers several rugged but inexpensive amateur VHF antennas: two 2 meter quads and a gain-type vertical radiator, also for 2 meters. Each is creatively billed by the manufacturer as "a jewel of an antenna."

Looking first at a quad, the Diamon-X Model DX-3 is constructed using fiberglass tubing and PVC, contributing to its character as a sturdy but lightweight (1.25 lb.), low wind loading design. The quad is computer-optimized for "maximum gain and lowest SWR." It also sports a "tunable quad" (or "TQ") feature to let you easily adjust the antenna for lowest SWR. High forward gain and front-to-back (F/B) ratio are claimed. The antenna is attractively priced at \$29.95 plus s/h.

Also offered is the similarly structured but larger DX-5 quad. It has essentially the same features as the DX-3, but claims a moderate increase in both forward gain and F/B ratio. It's \$44.95 and it weighs in at 2.5 lbs.

Rounding out the Diamon-X product line is the Model DX-V1, a gain-type 2 meter vertical. This lightweight (1.75 lb.) antenna is constructed of PVC tubing, copper wire, and brass rod. The antenna's "electronics" are fully insulated from the environment to prevent the ill effects of rain, snow, and ice upon SWR and performance. It's \$24.95.

For details, contact Diamon-X Mfg., 518 Memorial Drive, P.O. Box 84, Beech Grove, IL 46107 (317-787-5560).

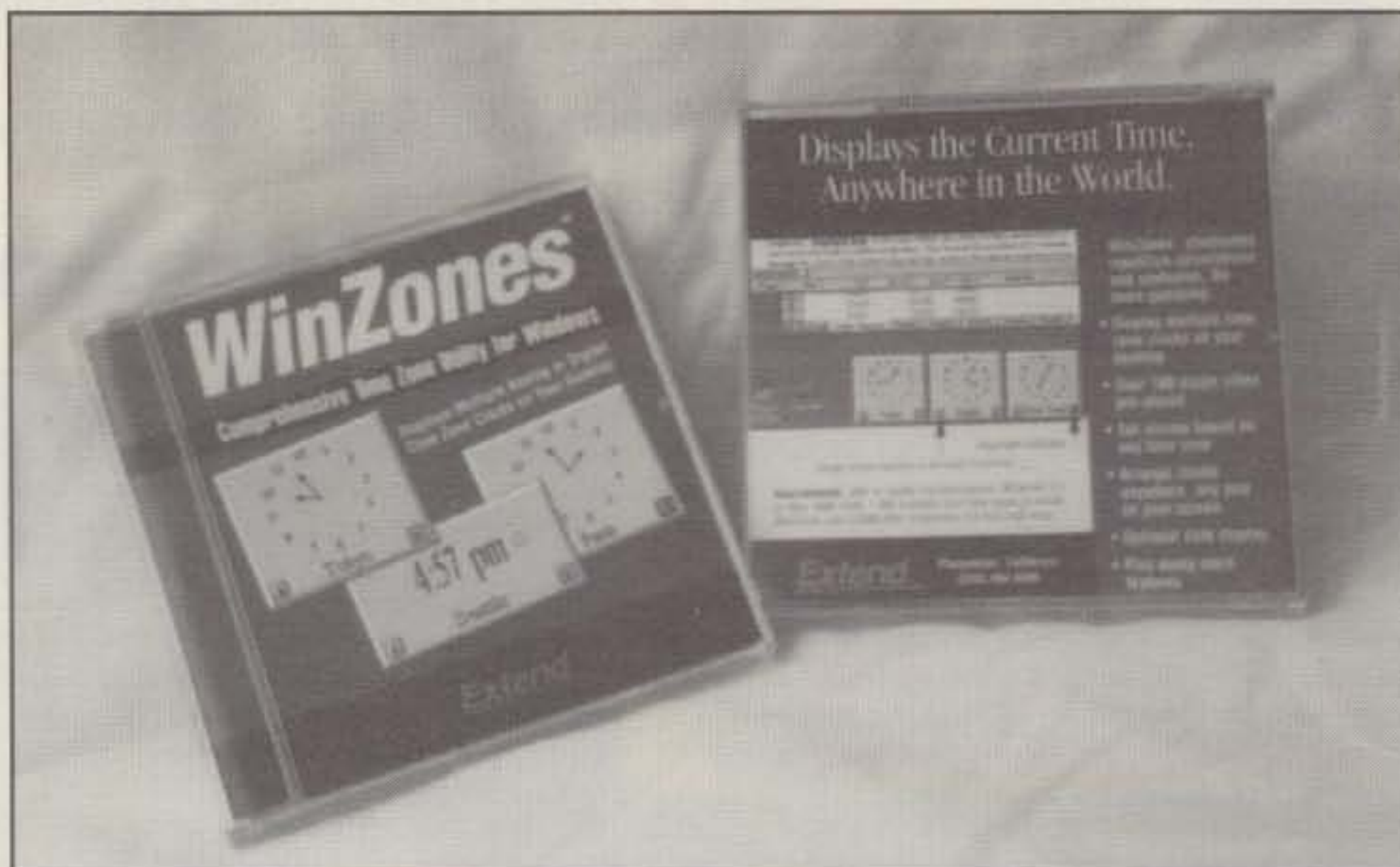
(Note: Diamon-X Mfg. has no relation to Diamond Antenna or RF Parts of San Marcos, California—ed.)

Tri-Ex Towers and Accessories Update. Tri-Ex, which we last visited in the June 1995 column, was founded in 1954 to manufacture crank-up towers for the amateur radio community. The company's stated policy is to make safe products and build the highest quality, most affordable crank-ups possible.

Their towers comply with Electronic Industries Association (EIA) or Uniform Building Code (UBC) requirements for steel antenna towers or antenna supporting structures. To facilitate compliance with local codes and calculations for building permits, Tri-Ex makes available with each tower prints and calculations designed to the 1991 UBC 70 mph requirements.

Tri-Ex policies include using high-yield steel tubing on legs; one-piece bracing for excellent compressive and torsional strength; AWS

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Extend, Inc.'s WinZones for Windows is a PC utility that displays up to nine active clocks simultaneously on a PC screen, showing the correct time for cities in other time zones. The clocks can be arranged anywhere, in any size, on the screen. The program is suitable for laptop and desktop PCs. (Photo via Extend, Inc.)

(American Welding Society) certified welding; and hot-dipped, galvanized steel components for maximum corrosion resistance. All towers come with the base and rotor plate.

Tri-Ex offers some 14 guyed, non-guyed, and extendible crank-up tower designs in their 26-page catalog, which includes a detailed wind-load comparison chart depicting all their towers and showing 50 and 70 mph wind loads. Towers offered range from the MW-25 (25 ft. when extended, 11 ft. when nested) general-purpose, extendible crank-up tower to the TM-5100C (100 ft. extended, 29.5 ft. nested) Sky Needle. The latter is an esthetically attractive, slender telescopic tower capable of supporting large loads (the tower's "dead load" is 950 lbs).

The newest (and tallest) tower, the DX-100, new for 1996, is a self-supporting, extendible crank-up tower with an extended height of 101.5 ft. and a nested height of 27.5 ft. The five-section tower weighs in at 2260 lbs.; its dead load is 250 lbs.

The company also offers various tower accessories, including masts, mounting plates, thrust bearings, standoff kits, fold-over bases, cable slings, gin poles, motor control kits, winches, and other hardware.

For a catalog, which includes complete technical specs and wind-loading information, contact Tri-Ex Tower Corporation, 7182 Rasmussen Ave., Visalia, CA 93291 (1-800-328-2393).

Software Ramblings

W8NX Multiband Dipole Software. Al Buxton, W8NX, offers the "Trap and Stub Dipole Anten-

nas for Radio Amateurs" antenna design software package. The DOS-based software, furnished on 3.5 inch diskette and priced at \$34.95 plus \$5 s/h, lets you create a variety of inexpensive multiband wire and tubing dipole antennas of your choosing, using traps and stubs arranged in both new and old configurations. Special design focus is on low-loss, high-Q, and high-power-handling traps with additional band coverage.

The W8NX "cookbook software" is intended to increase construction accuracy and eliminate various length factor errors. The software is for amateurs who like to design and homebrew their own inexpensive but effective antennas. Thus, the programs offered are written for the serious radio amateur who wants a design capability for trap and stub dipole antennas of various types, and they cover many types of trap and stub dipole antennas. Many user-friendly examples are included.

You can design five categories of traps with the software. These include (1) regular coaxial cable traps; (2) double coax cable traps with several times the power-handling capability of "regular" traps; (3) "supertraps" made of the core of coax cable, having a very high voltage breakdown capability; (4) various "enhanced" coax cable traps; and (5) your own designs consisting of open inductors and capacitors in the usual parallel connection. Several "W8NX Special" computational programs are included which creatively combine multiband trap and short capacitive stub technologies, along with programs for calculating reflected impedances and SWR along transmission lines.

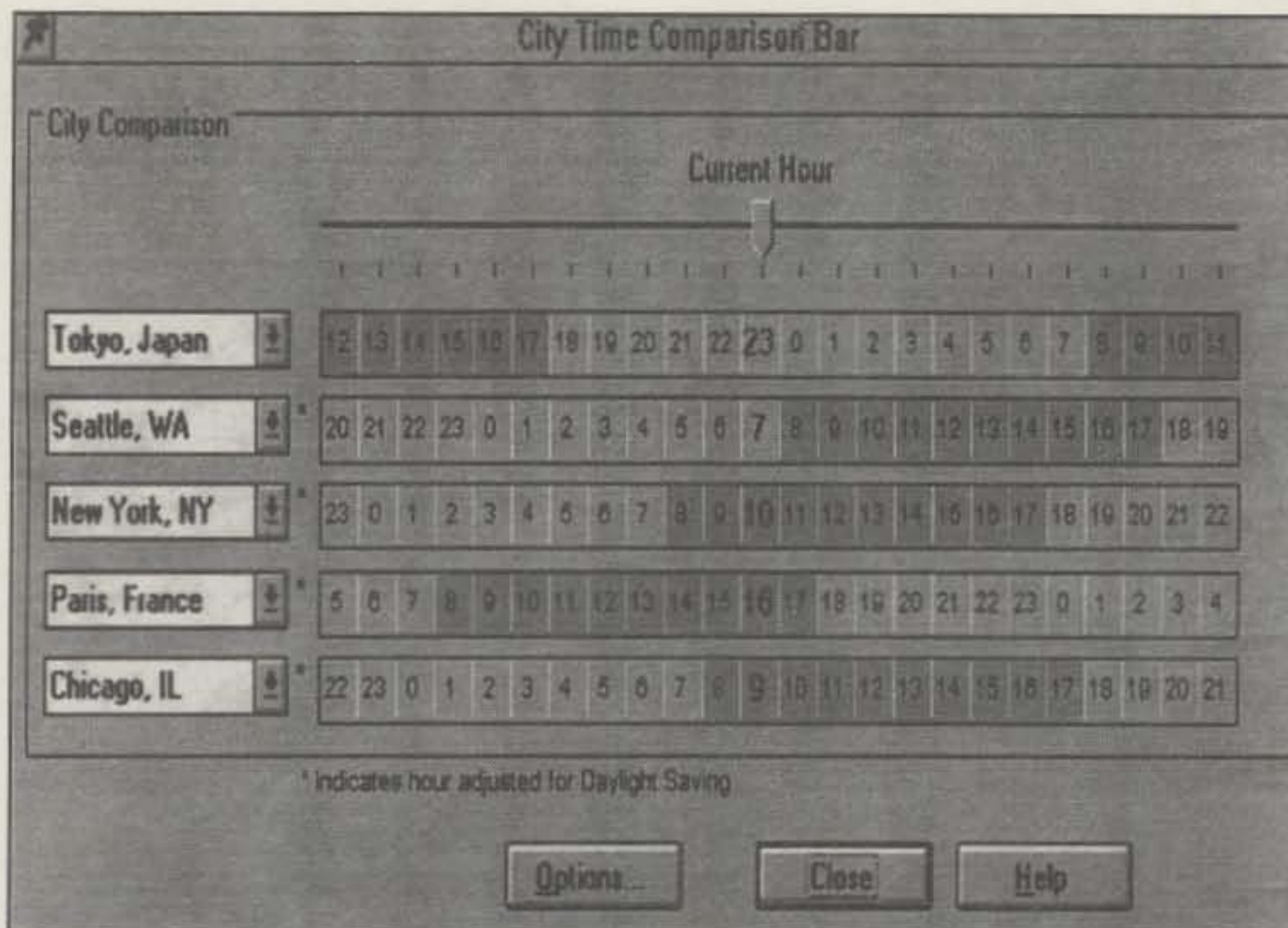


Fig. 1—The WinZones City Time Comparison Bar lets you compare the times in different cities at a glance. This feature can be useful when the band is open to multiple areas of the world. You also can highlight specific times of the day with different colors to indicate morning, day, and evening, if you so choose.

For more information, contact Al Buxton, W8NX, P.O. Box 174, Columbus, OH 43216-0174. (Postscript: An example of Al's trap designs is found in his recent article, "An Improved Multiband Trap Dipole," in July 96 QST.)

WinZones Global Time Zone Software. Are you one of those amateurs whose hamshack is graced with several wall clocks showing local time, UTC, and other times in the world's key DX zones? If so, you may be interested in a 1990s computer software implementation of the multiple-clock concept, to eliminate the need for multiple physical wall or desk clocks.

Extend, Inc.'s WinZones for Windows is a PC utility that displays up to nine active clocks simultaneously on your PC screen. The clocks show the correct time for cities in other time zones while you concurrently run other applications. You can arrange the clocks anywhere, in any size, on your screen. The program is suitable for both laptop and desktop PCs.

Some key features include automatic daylight savings time (DST) adjustments, so you don't have to remember when or if to make DST changes; 14-hour city comparison bars, which let you compare times in up to five cities simultaneously; and a city list browser, to view the current time in any city in the world.

Other features include the ability to define both digital and analog clocks; set custom alarms based on any time zone; depict 12 and 24 hour time; optionally display the date and seconds; select a variety of font and color display choices; include Greenwich time as a "city choice"; display a day/night indicator on the clock face; and indicate DST (as an asterisk) on the clock face.

WinZones is available in separate versions for Windows 3.x and above, and for Windows 95. Either program is \$34.95 plus \$3 s/h. Ten-day "tryout versions" are available in the software demo libraries of both the CompuServe

and America Online services, as well as at <http://www.susanville.com/technology/extend> on the World Wide Web.

For more information, contact Extend, Inc., 4847 Hopyard Road, Suite 3218, Pleasanton, CA 94588 (phone 510-484-0395; Internet <74024.3574@compuserve.com>).

DSP Blaster de K6STI. Just about everyone reading this column is aware of a very promising technology that can greatly enhance your hobby enjoyment, that technology being digital signal processing (DSP). DSP is a highly flexible, entirely digital approach to decoding, encoding, modulating, demodulating, and filtering signals for various operating modes.

Unlike regular analog communications processors, DSP units use software to encode and decode signals, so they are not dependent on specialized hardware. Under DSP, the incoming audio is converted into digital data for highly effective processing by the DSP software, which thoroughly rejects noise and interference according to the bandwidth you specify.

Most DSP applications have focused on receiver filtering, where DSP-based CW filters add very narrow selectivity characteristics to receivers that lack it. A real plus is that since DSP filters are virtual, existing only in microprocessors, they also can offer "adaptive filtering" to react to changing band conditions, automatically reduce noise or hiss on weak signals, and notch out severe interference.

Brian Beezley, K6STI, publishes respected PC antenna modeling software, much of which we have profiled in the column. But Brian also publishes other non-antenna related software. One such program he offers is the RITTY 1.0 DSP Radioteletype System, which we described in May. As we noted, RITTY combines a high-performance FSK modem with a terminal program to let you transmit radioteletype (RTTY) signals with your PC. Its DSP algorithms don't require DSP hardware. Instead,

DSP Software

DSP Blaster™ 1.0 replaces hardware DSP boxes. It uses your PC and sound card to provide high- and low-pass SSB filters, CW/DATA/SSTV bandpass filters, CW peaking filters, adaptive noise reduction, automatic notch filtering, and AGC. *DSP Blaster* displays the signal waveform and spectrum to provide insight about the signals you're hearing. It's fascinating to correlate the sound of a voice with its spectrum. A system block diagram makes the program simple to use. Pass your mouse over a filter block to display its properties. Click to alter them or to activate the filter. *DSP Blaster* can run in the background. Mouse required.

RITTY 1.0 is a high-performance software modem that uses a limitless front-end, optimal matched filters, ATC, numerical flywheel, and other advanced techniques to recover RTTY signals other modems can't. *RITTY* has an FFT spectral tuning indicator, variable mark/space frequencies, precision AFSK, FSK & PTT outputs, and supports WF1B's RTTY contest-logging program.

386/40+387, VGA, and Sound Blaster 16, Vibra 16, or AWE32 required (no "compatibles"). One program, \$100; both, \$170.

Antenna Software

AO 6.5 automatically optimizes antenna designs for best gain, pattern, impedance, SWR, and resonance. *AO* uses an enhanced, corrected MININEC for improved accuracy. *AO* features 3-D radiation patterns, 3-D geometry and wire-current displays, 2-D polar and rectangular plots with overlays, automatic wire segmentation, automatic frequency sweep, skin-effect modeling, symbolic dimensions, symbolic expressions, current sources, polarization analysis, near-field analysis, and pop-up menus.

NEC/Wires 2.0 accurately models true earth losses, surface waves, and huge arrays with the Numerical Electromagnetics Code. Best for elevated radials, Beverages, wire beams, giant quads, delta loops, LPDAs, local noise.

YO 6.5 automatically optimizes monoband Yagi designs for maximum forward gain, best pattern, minimum SWR, and adequate impedance. *YO* models stacked Yagis, dual driven elements, tapered elements, mounting brackets, matching networks, skin effect, ground reflection, and construction tolerances. *YO* optimizes Yagis with up to 50 elements and does it hundreds of times faster than NEC or MININEC.

NEC/Yagis 2.5 provides reference-accuracy modeling of individual Yagis and large arrays. Use *NEC/Yagis* to model big EME arrays.

TA 1.0 plots elevation patterns for HF antennas over irregular terrain. *TA* accounts for hills, valleys, slopes, diffraction, shadowing, focusing, compound ground reflection, and finite ground constants. Use *TA* to optimize antenna height and siting for your particular QTH.

One antenna program, \$70; three, \$120; five, \$200. 386+387 and VGA required. Visa, MasterCard, Discover, U.S. check, cash, or money order. Add \$5 overseas.

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DeLorme's Phone Search USA, which links directly to their popular Street Atlas USA 3.0 CD-ROM, lets both Macintosh and Windows users look up phone listings for residences or businesses anywhere in the country, and then in seconds see their addresses displayed on detailed street maps. See the text for details. (Photo courtesy DeLorme)

RITTY uses your Creative Labs SoundBlaster SB-16 sound card to work its magic.

Now Brian has introduced the DSP Blaster™ software. It provides DSP filtering without DSP hardware. It uses your PC and its Creative Labs sound card to replace still-expensive, hardware-based "DSP black boxes." The program sports a long list of features. It offers high- and low-pass SSB filters, CW/data bandpass filters,

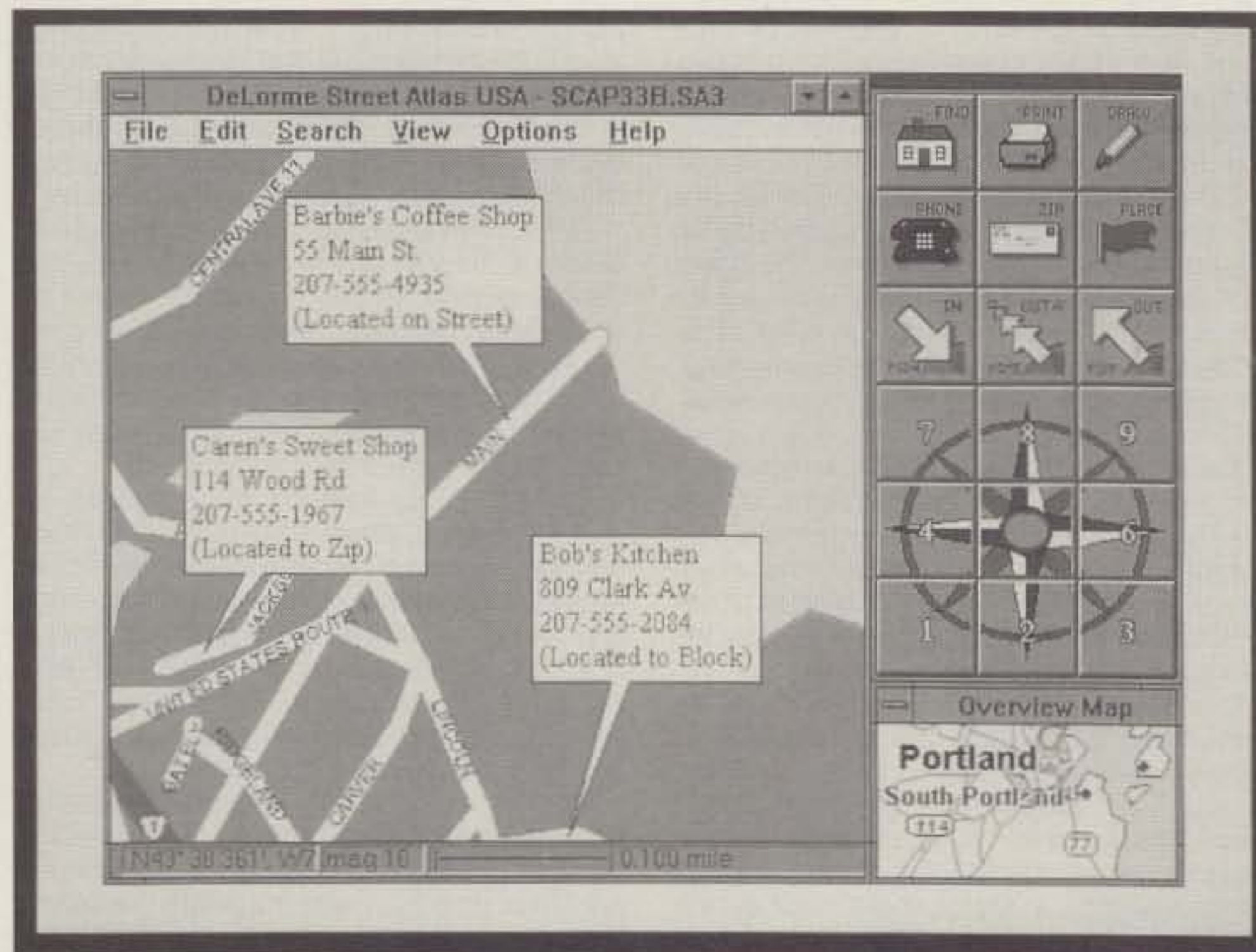
CW peaking filters, adaptive noise reduction, automatic notch filtering, and automatic gain control (AGC). Its DSP filters provide sharp cut-offs and low stopbands to eliminate adjacent-frequency QRM; adaptive noise reduction minimizes annoying background hiss, power-line noise, and audio distortion.

The program also displays the received-audio spectrum. You can use its display to select filter cutoffs, obtain insights into received signals you hear, correlate spectral features with voice sounds, investigate audio distortion problems, activate a filter and display its properties, and more. You can run the program by itself, pop it up over another application, or hotkey a new filter configuration without actually switching to it.

DSP Blaster (\$100) requires at least a 486/33 MHz processor, and a Creative Labs Sound Blaster 16, Vibra 16, or AWE32 sound card. (Sorry, so-called "compatible" cards won't work.) For more information, contact Brian Beezley, K6STI, 3532 Linda Vista Dr., San Marcos, CA 92069 (phone 619-599-4962; Internet <k6sti@n2.net>).

Pavillion DX-Cluster 5.4. In previous columns we described PacketCluster® DX spotting software for packet radio DXers. Pavillion Software's DX-Cluster, formerly PacketCluster, lets multiple stations connect to the DX-Cluster station or node, or connect to other nodes to form a network. It offers DX spotting and logging, real-time announcements, talk and mail, database access, and much more. Pavillion DX-Cluster is a multi-user, multi-node application that supports the interests of contesting and DXing enthusiasts, and it also has the potential to provide a great deal of fun for the general packet radio community.

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Phone Search USA helps you find suppliers, locate hotels or restaurants, verify phone bills, save money on directory assistance charges, look up friends, and more. Now the data has been updated with some 2.5 million more business and residential listings included. The program links and posts telephone numbers to DeLorme's popular Street Atlas USA program, which is shown here. (Photo courtesy DeLorme)

Some Famous Radio Amateurs

Most of us are aware that amateur radio is a hobby that has something for almost everyone, and perhaps that is one good reason for our participation. Indeed, people of all ages, races, colors, religions, and economic status are bitten by the "ham radio bug," and enthusiastic hobbyists are found in all walks of life. Radio amateurs include retirees, students, young people, mechanics, technicians, homemakers, doctors, engineers, military personnel, pilots—just about anyone you can think of.

A number of famous people are radio amateurs, although most are just "average people" who enjoy making new friends around the world. For whatever it's worth, listed here are some well-known personalities, past and present, who were, or are, active amateur radio enthusiasts. I used several sources to compile the list, and in doing so have made no attempt to identify "silent keys" (most of these are obvious) or to track callsign changes or upgrades.

King of Thailand Bhumiphol Adulayadej, HS1A
Country guitarist Chet Atkins, WA4CZD
Band leader Tex Beneke, K0HWY
Actor Marlon Brando ("Martin Brandeaux"), FO5GJ
NASA astronaut Ken Cameron, KB5AWP
King of Spain Juan Carlos, EA0JC
Broadcast newsman Walter Cronkite, KB2GSD
NASA astronaut Tony England, W0ORE
CNN newsman David French, N4KET
NASA astronaut Owen Garriott, W5LFL
Radio/TV entertainer Arthur Godfrey, K4LIB
Senator Barry Goldwater, K7UGA
Air Force General Francis "Butch" Griswold, K0DWC
Senior FCC official Ralph Haller, N4RH
Presidential offspring and former ARRL Pres. Herbert Hoover, Jr., W6ZH
King Hussein of Jordan, JY1, and Queen Noor, JY2
Astronomer and antenna expert John Kraus, W8JK
Air Force General Curtis Le May, W6EZV
CBS News President Bill Leonard, W2SKE
Cardinal Roger Mahony, W6QYI
President of Argentina Carlos Saul Menem, LU1SM
U.S. Ambassador to Japan Armin Meyer, W3ACE
Entertainer Ronnie Milsap, WB4KCG
Missionary Fr. Marshall Moran, 9N1MM
Husband-and-wife NASA astronaut team Steve Nagel, N5RAW, and Linda Godwin, N5RAX
Broadcast newsman Roy Neal (Hinkel), K6DUE
Entertainer Donnie Osmond, ex-KA7EVD
Entertainer Alvino Rey, W6UK
Baseball player Joe Rudi, NK7U
Voyager '86 pilot astronaut Dick Rutan, KB6LQS
Former Apple CEO John Sculley, ex-K2HEP
Comedian Garry Shandling, KD6OY
Author and humorist Jean Shepherd, K2ORS
Author and scientist Clifford Stoll, K7TA
NOAA Chief Scientist Kathy Sullivan, N5YYV
Voyager '86 Pilot Jeana Yeager, KB6LQR

terminal node controller (TNC), or the Kantronics KPC-2 or KPC-4 TNC, along with an IBM-compatible PC, the software links up to 64 users in a local cluster. With its excellent networking capabilities, the software allows multiple DX-Cluster nodes to link together to form one large network, thereby connecting potentially thousands of users into the system.

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- "...I was very surprised by the outstanding performance of my 2 element Raibeam..." ...W6TVW
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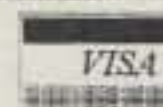


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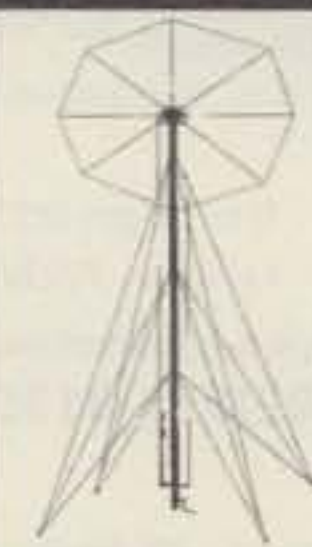
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wide mail and file forwarding; WWV propagation and general announcements; sunrise/sunset, MUF (maximum usable frequency), and beam-heading calculations; country needs databases; user-specified filtering of announcements; and critical weather announcements. Still other features include local time for DXCC countries, support of two TNCs per node, all traditional mail functions, and more.

The fully-supported V5 package is \$395 and includes a printed user's manual. A variation of the standard software, Pavillion DX-Cluster Limited, which allows unlimited node connections but only two user connections, is \$150.

Pavillion DX-Cluster is available from Pavillion Software and is distributed by XX Towers, Inc., 814 Hurricane Hill Road, Mason, NH 03048 (603-878-4200).

DeLorme Phone Search USA Update. In July we highlighted DeLorme's Street Atlas USA@3.0 and Phone Search USA™, CD-ROM based products, which are sold separately but can work closely together. Street Atlas 3.0 is mapping software which essentially is a detailed "street map" of the entire country. As we noted, it now comes with a link to Phone Search USA, a comprehensive digital phone book containing more than 80 million residential and business numbers. You can look up listed phone numbers with Phone Search USA, and then locate the corresponding address with Street Atlas USA. You also can link Phone Search USA with the new Map'n'Go 2.0 travel planning software, which we plan to highlight in an upcoming column.

With Phone Search USA, furnished on three CD-ROMs, you quickly can look up listings by name, phone number, or business type; and you can filter searches by state, city, and ZipCode. Mapping the locations for selected listings requires only a switch to the Street Atlas USA 3.0 CD-ROM; the addresses for the selected listings can be displayed on the maps. You can customize the maps and export Phone Search USA listings for use in wordprocessing, database, spreadsheet, or other applications.

Phone Search USA, originally released in September 1995, recently was updated with some 2.5 million more business and residential listings. Also new is compatibility with the Macintosh PC; the same CD-ROM runs on Mac system software version 7.0 or later, Windows 95, Windows 3.1, and Windows NT 3.51. The estimated retail price now is down to \$49.

For additional information contact DeLorme, P.O. Box 298, Lower Main Street, Freeport, ME 04032 (phone 1-800-452-5931; Internet <<http://www.delorme.com>>).

The Reference Shelf

Slow Scan TV News and Handbook. Recent years have witnessed the availability of inexpensive Multimode Communications Processors (MCPs) that offer a plethora of operating modes, including SSTV. You can use an MCP for SSTV, or you can use a dedicated SSTV adapter. Several firms—including Absolute Value Systems, operated by John W. Langner, WB2OSZ—offer dedicated SSTV hardware and/or software. John offers several slow scan television (SSTV) products, notably the Pasokon TV™ system and SSTV Explorer (see our July column).

We now note that John also publishes *Slow Scan TV News* free for customers and those who inquire about his SSTV products. It in-

cludes late-breaking news on his two major products, technical notes, software upgrade announcements, and similar information. A more complete SSTV info package is available for a large SASE with three stamps affixed.

John also offers a free "Slow Scan TV Handbook" which you can download from his Internet page. In posting the mini-handbook to the Web, he notes that finding up-to-date information on SSTV was very difficult in the past, but is becoming less of a problem with the opportunities presented through the Web.

The handbook includes sections on SSTV history, sample images, how to get started, scan converters, PC-based systems, homebrew projects, technical specs, questions and answers, a bibliography, and a glossary. He updates the handbook regularly with operating tips, new product announcements, and pointers to additional information. It's at <<http://www.ultranet.com/~sstv>>. Also available for Internet download is a "reduced functionality" working SSTV demo from the ftp (file transfer protocol) site <<ftp://ftp.ultranet.com/pub/sstv/ezsstv.zip>>.

For more information, contact Absolute Value Systems, 115 Stedman St., Chelmsford, MA 01824-1823 (508-256-6907).

Digital Journal. One publication I suggest to those who want to learn more about most all aspects of digital communications is the *Digital Journal*. Published and edited by Jim Mortensen, N2HOS, and Tom Arvo, WA8DXD, it serves a growing interest in digital techniques. It provides timely and useful information on all aspects of digital communications, computers, software, digital satellites, digital signal processing (DSP), and related technologies.

A one-year subscription is \$25 and includes membership in the not-for-profit International Digital Radio Association (IDRA), formerly the American Digital Radio Society (ADRS). IDRA's principal goal is to advance digital technology as it applies to amateur radio worldwide and promote the wisest use of the "digital portions" of the electromagnetic spectrum.

For more information, contact Digital Journal/International Digital Radio Association (IDRA), P.O. Box 2550, Goldenrod, FL 32733-2550 (phone 407-677-7000; Internet <<http://www.iea.com/~adrs>> or <adrs@iea.com>).

TAPR and "Packet Status Register." If you are really "into" packet radio, you might consider joining TAPR, the Tucson Amateur Packet Radio Corporation. Membership gets you its newsletter, "Packet Status Register" (PSR).

TAPR is one of the "home bases" of amateur packet radio. It's a nonprofit, scientific research and development corporation for designing and developing new systems for amateur packet radio communications, and for freely disseminating information developed during, and obtained from, this research.

The quarterly "Packet Status Register" is part of TAPR membership (\$15 per year, higher internationally). Contact Tucson Amateur Packet Radio Corporation (TAPR), 8987-309 E. Tanque Verde Rd. #337, Tucson, AZ 85749-9399 (phone 817-383-0000; Internet <tapr@tapr.org> or <<http://www.tapr.org>>).

TPRS and the "TPRS Quarterly Report." An active regional digital communications, research, and information dissemination organization is the educational and nonprofit Texas Packet Radio Society (TPRS), a scientific research corporation founded in 1985. Its goals are to design and research amateur radio pack-

Say You Saw It In CQ

et networks and to provide education in general packet usage. The "TPRS Quarterly Report" is the society's official newsletter, and it is published every three months; it's included with membership (\$12 per year). For membership and subscription details, contact Texas Packet Radio Society (TPRS), P.O. Box 50238, Denton, TX 76206-0238.

PCs for Busy People. With the publication of *PCs for Busy People*, Osborne/McGraw-Hill has addressed an important new trend in the "PC public"—that of busy users who are increasingly dependent on their PCs but don't have the time (and possibly not the interest) to become immersed in all the high-tech details. Written by David Einstein, the new book responds to this time-strapped audience by focusing squarely on the essentials.

The book is a one-stop guide to purchasing, owning, and making the most of a PC. Written for the rank beginner who needs to get up to speed quickly, as well as the more experienced user who seeks to stay abreast of PC advancements, the book begins with basic hardware and software options, focusing on Windows 95 applications. Full consideration is given to connecting to the online community, both the Internet and the commercial online services. The 304-page softcover is \$22.95.

Incidentally, I previously had the opportunity to preview two books in the series: *Windows 95 for Busy People*, by Ron Mansfield, and *The Internet for Busy People*, by Christian Crumlish. I reported on these in the June column. All three of these books and other books in the "Busy People" series include standardized-format time-saving features. The publisher labels these as fast forwards (quick reference sections), shortcuts (accelerated routes to completing a task), habits and strategies (tips and techniques), definitions (clever ways to remember the jargon), and cautions (pitfalls and problems to avoid).

PCs for Busy People can be found in bookstores, or you can contact Osborne/McGraw-Hill, 2600 Tenth Street, Berkeley, CA 94710 (phone 1-800-227-0900; Internet <<http://www.osborne.com>>).

QRP ARC International Update

Except perhaps for high-stakes DXing and serious contesting, nowhere does the importance of using a good antenna come into play more than when operating with "flea power," or QRP. When you're running 5 watts or less, a few dB on the S-meter attributable to a first-class antenna makes a difference in QSO numbers and quality.

So why operate QRP, especially if you don't have to do so? Isn't it something like competing in a prize ring with one hand tied behind your back? Possibly true, but many amateurs enjoy the added challenge. Some of the advantages QRP enthusiasts find, besides the important "challenge factor," include minimum expense, small equipment size and weight, easier emergency and portable operation, longer term battery life, and a respectable scoring advantage in many amateur radio contests.

There's a special-interest group (SIG) for QRPers. It's the QRP Amateur Radio Club International, Inc. (QRP ARCI), whose motto is "power is no substitute for skill." The organization, which we last profiled in September 1989, was founded in 1961. The club, which has as its purpose the joining together of that segment

of amateurs who enjoy running low power, encourages use of QRP through operating awards programs, activities, and contests. QRP ARCI also publishes a quarterly newsletter, "The QRP Quarterly," and holds regular QSO parties. New member dues is \$12 (DX \$14), while renewals are \$10 (DX \$12).

For more information, contact the membership chairman, Mike Bryce, WB8BGE, 2225 Mayflower NW, Massilon, OH 44647. QRP ARCI sends out a nice sign-up package that includes the interesting booklet, "High Adventure with Low Power." It describes the challenge of QRP, explains the organization, and details the active awards program. (An SASE would be appreciated when corresponding with club officers.)

Looking Back Five

Okay, so now you know what the column is like for December 1996. But what was "hot" in December 1991? That column was "Antenna Notes—Part II," another potpourri of antenna and accessories topics.

We described several M² Enterprises HF/VHF/UHF antennas; MAXRAD VHF/UHF fixed and mobile antennas; COMTELCO Enterprises mobile and base station antennas for 26–928 MHz; accessories from Antenna Mart; Wintenna communications antennas; Barker & Williamson antenna tuners and other compo-

nents and accessories; the KUBY Communications vehicle window antenna mount; DX Engineering HF Yagis; Garant HF Windoms; and tower and rotor suggestions from Dick Mollentine, WA0KKC.

Turning to software and computers, we examined the Antenna Arrays driven array design software, from A/V Technology International, Inc.; Total Ham Plus, a database management package, from Dick Miller, WD4AZG; QSL Record and Calculate, QSL card management and electronic formulas from Namlulu Communications; the GEMRADIO database and general-purpose logging system, from Dr. Antonio (Toni) Salvadori, VE3NXQ; the KT5X Contester, a specialized logger from Fred Mass; and Brooklyn Bridge, a PC file transfer program from Fifth Generation Systems. We highlighted Richard Skolnick, KB4CLS's *The Wonderful World of Ham Radio*, for introducing young people to amateur radio; and *Poor Hams Survival Guide*, from Electron Processing.

Wrap-Up

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

Overheard: Every time you drop a screw or nail in your garage, it immediately becomes invisible and "utterly unfindable."

73, Karl, W8FX

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CONTEST CALENDAR

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Contesting in 1997—A Wish List

December's Contest Tip of the Month

If you're like me, there are probably dozens of little problems in your shack. Here are a few examples: burned out lamps on your 930; Tailwister control box, and amp, an intermittent coax switch position; torn headphone pads; a sticky "A" on your keyboard. Like most procrastinators, after you fix these things (usually in minutes), you say, "Why didn't I do that two years ago?" Well, fixing the small problems in your contest shack won't make you a better operator, but it will make your comfort level rise—and so will your scores. Get out that soldering gun. Are you up to the challenge?

Unless you've been living on a deserted island for the past few years, it's no secret that amateur radio has been going through some major changes. Not all of them have been bad, but most certainly not all of them have been good, either.

I firmly believe that an active amateur can look at the state of our hobby (as well as life in general) and either view it as a glass that is a "half empty" or "half full." The same is true for contesting, in particular. From my perspective, I prefer to think of my glasses as being half full! I'm also sensitive about many of your situations, too. It's true that I personally enjoy the benefits of operating from the East Coast, and from one of the best stations. To further add salt to the wound, if K1EA's antennas fell down tomorrow, it would only be a 30-minute drive to the next nationally contending station down the road.

I still claim, however, that contesting has never been better! We enjoy the potential to use technology and hardware that was only wishful thinking a few short years ago. You may recall that a 40 meter beam was only a dream for most folks in the 1970s. It seems that almost every competitive station has one today. A four-square on 80 meters was about as unusual as a high 3-element wire beam was in 1980. Now they're popping up like weeds around the world. The list goes on.

Let me set my enthusiasm aside for a moment, because although contesting is an exciting part of amateur radio, it's not without its warts and blemishes. So as 1997 fast approaches, I've compiled my contesting wish list for you to consider. Some of you may think it sounds like a campaign speech, but rest assured I'm not promoting any "bridges to the 21st century" in this speech! In any event, I'm sure you'll have your own additions/deletions, but here's a good start:

- I want 1997 to be the year we celebrate the bottom and beginning of the road to recovery

8 Anchor Lane, Mt. Sinai, NY 11766-1200
e-mail K1AR@contesting.com
Compuserve ID: 71301,424

Calendar of Events

Nov. 23-24	CQ WW DX CW Contest
Dec. 6-8	ARRL 160 Meter Contest
Dec. 7-9	Telephone Pioneer QSO Party
Dec. 14-15	TARA RTTY Sprint
Dec. 14-15	ARRL 10 Meter Contest
Dec. 14-15	International Naval Contest
Dec. 21-22	Croatian CW Contest
Dec. 28-29	Stew Perry Topband Challenge
Dec. 29	RAC Canada Winter Contest
Jan. 1	ARRL Straight Key Night
Jan. 4-5	ARRL RTTY Roundup
Jan. 4-5	North American CW QSO Party
Jan. 10-12	Japan Int'l Low Band CW Contest
Jan. 11-12	Lions in the Air Contest
Jan. 11-12	HA DX Contest
Jan. 11-12	North American SSB QSO Party
Jan. 17-19	YL-ISSB CW QSAO Party
Jan. 18-19	ARRL VHF Sweepstakes
Jan. 24-26	CQ WW 160 Meter CW Contest
Feb. 8-9	PACC Contest
Feb. 14-16	YL-ISSB SSB QSO Party
Feb. 15-16	ARRL CW DX Contest
Feb. 21-23	CQ WW 160 Meter SSB Contest
Mar. 1-2	ARRL SSB DX Contest

for solar conditions. There's nothing like a few sunspots to mend the attitudes of the discouraged amateur. Even the most pessimistic forecaster is telling us that spots are on the way!

- Let's make a pledge that 1997 will be the "Year of Accuracy." Contesting is an unusual activity. Our success is measured most commonly by how accurately we copy each other, not how loud we are. In my book, the best log entry is the most accurate one, not the biggest!

- How about our dear friend packet radio? It's my hope that packet radio systems will fill the need for which they were designed. During 1997 let's use packet when we should and turn it off when our category disallows such use. Let's not forget that our ears are the vehicle for copying callsigns correctly, not what someone else has typed into their computer for you to work. And most important, let's not forget how to find and work DX on our own. Packet is a tremendous asset to contesting. It can also make one lazy and dependent on others. That's not what winners are made of!

- I hope that 1997 will be the year for you to learn and try something new in contesting. Whether it's attempting to operate a new contest or category, experimenting with new antennas, computer/antenna projects, or basic operating skill improvement, let's make 1997 a year of new adventure. Not only will you be better off, but so will those around you.

- Let's make 1997 the year of contribution. Many contesters have so much to offer to their peers. It seems, however, as with most aspects of life, few of us actually take the time to give something back. Whether it's writing an article for your local contest newsletter or national contest magazine, or giving a talk at a club, you

have something to offer other contesters. Find your niche and get to work in 1997!

- It's within our power to make next year the year of sharing contesting with others. Imagine the growth within our ranks if each of us encouraged only one new amateur to enjoy contesting the way we do. The Yankee Clipper Contest Club developed a terrific idea for contest growth this past year. Inexperienced, but interested contesters from all over the local New England area were invited to operate at some of the bigger, more established stations in some of last fall's contests (i.e., WAE, AA, SAC, NAQP, etc.). In some cases audio/video tapes were developed so that post-contest critiquing could take place in an attempt to improve each operator's skill set. I can't think of a better "ice-breaker" for you to invite a newer amateur/contester to get involved.

- Can 1997 be the year of the friendlier contest? Contest activity crammed into the 350 kHz of 20 meter SSB has brought out the worst in us at times. Frankly, the reputation that contesters maintain in the non-contest world is justified more often than not. I'd be willing to bet that if we just took a deep breath and thought rationally about an on-air conflict, it could be resolved amicably. We can and should be better citizens in 1997.

We all want contesting to thrive. As a year closes, the opportunity exists to think about all that was good and bad about contesting in the past 12 months. I, for one, love this hobby. And I love contesting in particular. Even though I'm working 60+ hours per week these days, I still find time to work a few hundred guys in the WAE or bounce around the band on an off-weekend looking for rare DX. Let's make 1997 the year when others find out how good we have it. What do you think?

Closing Comments

Some of you may have noticed that K1AR was silent during the 1996 CQ WW SSB Contest. Believe it or not (and few did before the contest), I had a work commitment at my new job that prevented me from operating. I think that was the first CQ WW I've missed in over 20 years. It did remind me that there is a whole world out there that misses it every year. Too bad they don't know what they're missing! Imagine, however, what 20 meters would be like if they did know!

Well, that's it for this month. As a reminder, keep sending me your 1996 CQ Contest Survey responses. You can either mail them to my home QTH at 8 Anchor Lane, Mt. Sinai, NY 11766-1200, or send them to me via e-mail c/o <K1AR@contesting.com>. Please note that for the moment, I'm not active on any of the popular contest e-mail reflectors. You will have to send your contest announcements to me directly for them to reliably reach me in time.

As always, I need to receive your contest calendar submissions for the March issue no later than January 3rd. To save additional time, send

1995 CQ WW Errata

It's with our sincere apologies that we report the following corrections to the recently reported 1995 CQ WW Contest results:

SSB

1. WZ4F was erroneously listed in Zone 5. He was actually the #5 winner in Zone 4.
2. The multi-single score of LW7EGO (Ops: LW7EGO, LU9AVV) was left out of the results. Their final score was 17,621 points.
3. The multi-single score of LR5C (Ops: LU1ARL, LU1WFA, LU2ANN, LU2AQO, LU2DKT, LU3DW, LU7DW, LU8EWD, LU9AQD, LW2DBM) was left out of the results. Their #2 Argentina score was 3,925,884 points, 2883 QSOs, 124 Zones, and 355 Countries.
4. These scores were mistakenly included with the WPX logs. They were actually CQ WW SSB logs and should have been included in the final results as follows:
AA2VN (Multi-Single, Ops: AA2VN & AA2OT) 85,701 points, 338 QSOs, 38 Zones, and 109 Countries.
YT7TY (Single Op, All Band) 114,450 points, 510 QSOs, 44 Zones, 174 Countries.
5. OH6KIT's SSB score was listed under CW. It was 2,176,416 points and #1 in Finland (certificate winner).
6. DL3ABL was an All Band entry, not 14 MHz.

CW

1. The Canadian 14 MHz trophy winner was Joel Weiner, VE6JY (VE6WQ).
2. The N4ZR Assisted entry should have been listed as N4ZR/8, second-place winner in his category.

3. JH7XGN should have been listed in the Single Operator, Assisted category with 1,165,056 points and the #1 score in Japan.
4. The JG3KCK listing should be corrected to JG3KCX.
5. WA3WJD was erroneously left out of the results. Brian's line score in the All-Band Assisted category was 669,180 points, 640 QSOs, 96 Zones, and 284 countries. His score should have been credited to the Potomac Valley Radio Club.
6. N3RR was erroneously left out of the results. Bill's score in the All-Band Assisted category was: 2,225,285 points, 1324 QSOs, 144 Zones, and 455 countries. His score should have been credited to the Potomac Valley Radio Club.
7. K2PH is a certificate winner and should have been listed in the 3rd call area.
8. JR0WZR was incorrectly listed twice in the SSB results. His CW score was 2,924 points, 32 QSOs, 16 Zones, and 18 Countries.
9. N0AX/7 was Single Operator, Assisted and winner in the 7th call area.
10. One of the KB1H Multi-Single operators was incorrectly listed as AA2CE. He should be correctly listed as AA1CE.
11. The N2SS operators were N2SS and W2GMA, not M2SS.
12. NA1R should be included in the 9th call area listings.
13. JR4CAU's score was calculated incorrectly. The Low Power winner in the 4th call area should have been JH4JNG.
14. The Team Contesting listings mistakenly listed VE2/N2AA. Gene stayed home this year with the correct call being VE2/N6AA!

your information to my home QTH rather than to CQ.

As is my custom for the last column of the year, I want to take this opportunity to wish each of you the best for the holidays and a prosperous 1997!

73, John, K1AR

ARRL 160 Meter CW Contest

2200Z Fri. to 1600Z Sun., Dec. 6-8

This is the 26th year for this "Top Band" activity. QSOs are between US, VE, and DX stations. DX-to-DX QSOs are not permitted for contest credit.

Classes: Single operator, high, low, and QRP; and multi-operator single transmitter.

Exchange: RST and ARRL section for W/VE. RST only for DX stations; ITU Region for maritime and aeronautical mobiles.

Scoring: Contacts between stations in ARRL sections count as 2 points, with DX stations 5 points.

Multiplier: Determined by number of ARRL sections and DX countries worked (for W/VE). DX use ARRL sections only.

Final Score: Total QSO points times the ARRL section and DX country multiplier.

Awards: Certificates to the top-scoring single operator station in each ARRL section and DXCC country. Also to the top-scoring multi-operator station in each ARRL Division and continent.

Entries with 200 or more QSOs are required

to include a dupe sheet. Official log forms are recommended and are available from the ARRL. A large SASE and 45 cents postage or 2 IRCs will get you a supply for more than 300 contacts.

The usual grounds for disqualification (violation of established rules, excessive duplicate contacts, etc.) will prevail.

Mailing deadline for logs is January 8th to: ARRL Communications Dept., 160 Contest, 225 Main Street, Newington, CT 06111.

ARRL 10 Meter Contest

0000Z Sat. to 2400Z Sun., Dec. 14-15

This is the 24th annual 10 Meter Contest organized by the ARRL. It's an extremely active competition (even with low solar activity) in which stations can work each other within their own country as well as around the world.

A maximum of 36 hours operating time is permitted out of the 48-hour contest period for all stations. The same station can be worked on SSB and again on CW for QSO points.

Categories: Single operator, mixed mode, SSB only and CW only. Multi-operator, single transmitter, mixed mode only.

Exchange: W/VE stations (including KH6 and KL7) send RS(T) and state or province. DX stations (including KH2, KP4, etc.) send RS(T) and QSO number starting with 001. Maritime or aeronautical mobile stations use RS(T) and ITU region. Novice/Tech stations must identify themselves with a /N or /T designator.

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BP-8 8.4 VDC, 800 mA, Ni-Cad Batt. Pack	87.00
CM-96 8.4 VDC, 1200 mA, Ni-Cad Batt. Pack	99.00
BP-160 7.2 VDC, 700 mA, Ni-Cad Batt. Pack	53.00
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Scoring: SSB QSOs are worth 2 points, CW 4 points, Novice/Tech CW QSOs 8 points.

Multiplier: U.S. states (50 plus District of Columbia), Canadian provinces (NB, PEI, NS, VE2-8, VY1, VO1, VO2), DXCC countries, and ITU regions (1, 2, 3).

Final Score: Total QSO points times the sum of U.S. states, Canadian provinces, DX countries, and ITU regions, per mode.

Awards: Certificates will be awarded to the top-scoring single operator station in each category (including /N and /T) for each ARRL section and DXCC country. Also, the top-scoring multi-operator station in each ARRL division and each continent will also receive certificates.

Indicate a new multiplier only the first time it is worked. Dupe sheets are required for logs with 500 or more QSOs. The usual disqualification criteria will be enforced. A large SASE will get you log and instruction forms. The standard ARRL policy for electronic logs applies to this contest (contact the ARRL Contest Branch if you have any questions).

Mailing deadline for all entries is January 15th to: ARRL 10 Meter Contest, 225 Main Street, Newington, CT 06111.

Croatian CW Contest

1400Z Sat. to 1400Z Sun., Dec. 21-22

This is another new one for December, sponsored by Hrvatski Radio Amaterski Savez of Croatia. December is typically a slow contest month, so this should add some excitement to the end of the year for many.

Classes: Single-operator and multi-single; CW-only on 160-10 meters.

Exchange: RST and ITU Zone.

Scoring: 10 points for QSOs with 9A stations (160-40 meters), 6 points on 20-10 meters; 6 points for QSOs in other continents (160-40 meters), 3 points on 20-10 meters; 2 points for QSOs in your own continent, including your own country (160-40 meters), 1 point for QSOs on 20-10 meters. Multipliers are DXCC and WAE countries per band. Final score is total QSO points times the sum of multipliers worked on each band.

Awards: Certificates will be awarded to the highest scoring station per category/DXCC

country. Plaques will be awarded to the first, second, and third highest scoring station in each category.

Logs must be mailed within 30 days of the end of the contest and should be sent to: Hrvatski Radio Amaterski Savez, Croatian CW Contest, Dalmatinska 12, 10000 Zagreb, Croatia.

Stew Perry Topband Distance Challenge

1500Z Sat. to 1500Z Sun., Dec. 28-29

This new one is a fine example of "grass roots" contesting. The idea, spawned by N6TR and KM9P (among others), was conceived to take advantage of winter activity on 160 meters, honor one of the band's heroes (W1BB), and most important—to have fun! Future sponsorship of this event will depend on interest and participation in this year's contest.

Operation is limited to 160 meters CW only. A maximum of 14 hours of operating time is permitted. Only one break may be taken between your first and last QSO and it must be at least 30 minutes in duration.

Classes: Single or multi-operator. Only one signal shall be transmitted at a time. Remote or packet spotting is not permitted.

Exchange: Grid square only. A RST report may be given, but it is not required for a complete QSO.

Scoring: There are no multipliers. QSO points are based on the distance between the two stations. Credit a minimum of one point per QSO and an additional point for every 500 km between you and the other station worked. Note that all of the major contest logging programs will support this calculation automatically (i.e., NA, TR, CT). Final score equals the total number of QSO points. Stations using less than 100 watts can multiply their score by 2. QRP stations (less than 5 watts) multiply their score by 4.

Awards were being designed at press time. Check the status of awards and other contest information at <<http://www.contesting.com>>. Your log can be sent electronically via the Internet to <tbdc@contesting.com> or via diskette in MS/DOS ASCII format. Logs may send via the mail to: Bill Fisher, KM9P, 1137 Charlie

A Quotable Quote for December

You may have run across this one, but as we're at the peak of the 1996-97 contest season, it only seemed appropriate to resurrect this famous quote one more time:

"When you are in any contest, you should work as if there were—to the very last minute—a chance to lose it. This is in battle, this is in politics, this is in anything."

Dwight D. Eisenhower

Lane, Lilburn, GA 30247-4203 and should be postmarked no later than January 29, 1997.

RAC Canada Winter Contest

0000Z to 2359Z, Sun., Dec. 29

This is a popular year-end affair sponsored by the Radio Amateurs of Canada. Amateurs all over the world are invited to participate.

Classes: Single operator (all bands, low power, single band) and multi-operator. Multi-operator stations may operate on multiple bands simultaneously.

Exchange: Canadians send RS(T) and province/territory. All others send RS(T) and serial number.

Frequencies: QSOs may take place on 160-2 meters (no WARC activity). Suggested operating frequencies are: CW—25 kHz up from the lower band edge; SSB—1850, 3775, 7075, 7225, 14175, 21250, 28500 kHz. Check for CW activity on the half-hour.

Scoring: QSOs with Canadian stations are worth 10 points. Contacts with stations outside of Canada are worth 2 points. QSOs with official RAC stations (i.e., VE3RAC) are worth 20 points. You may work stations once per band and mode. Multipliers are Canadian provinces/territories and may be counted once per band/mode. Final score is total QSOs points times your multiplier count from all bands.

Awards: A number of plaques will be awarded to winners of each category, including the top foreign entry, who will win the Jorge Bozzo, LU8DQ, memorial plaque sponsored by Alan Goodacre, VE3HX/VE2AEJ.

All entries must be postmarked by January 31st and should be sent to: RAC, 614 Norris Court - Unit 6, Kingston, ON K7P 2R9 Canada. Final results will be published in the November issue of *The Canadian Amateur*, which will be sent to all certificate winners.

ARRL Straight Key Night

0000Z to 2359Z, Jan. 1
(7 PM Tues. to 7 PM Wed., EST)

This is a friendly meeting on the air using a straight key only. Suggested frequencies on 80, 40, and 20 meters are 60 to 80 kHz up from lower band edges, 10 kHz from lower edge of Novice bands.

Use SKN instead of RST in the exchange to "clue-in" other stations. Include a list of stations worked plus your vote for the best fist heard during that period (not necessarily one you've worked). This is not a contest, so any additional chatter is encouraged.

Send your report, vote for "best fist," and "most interesting QSO" to ARRL SKN, 225 Main St., Newington, CT 06111 by Jan. 10th.

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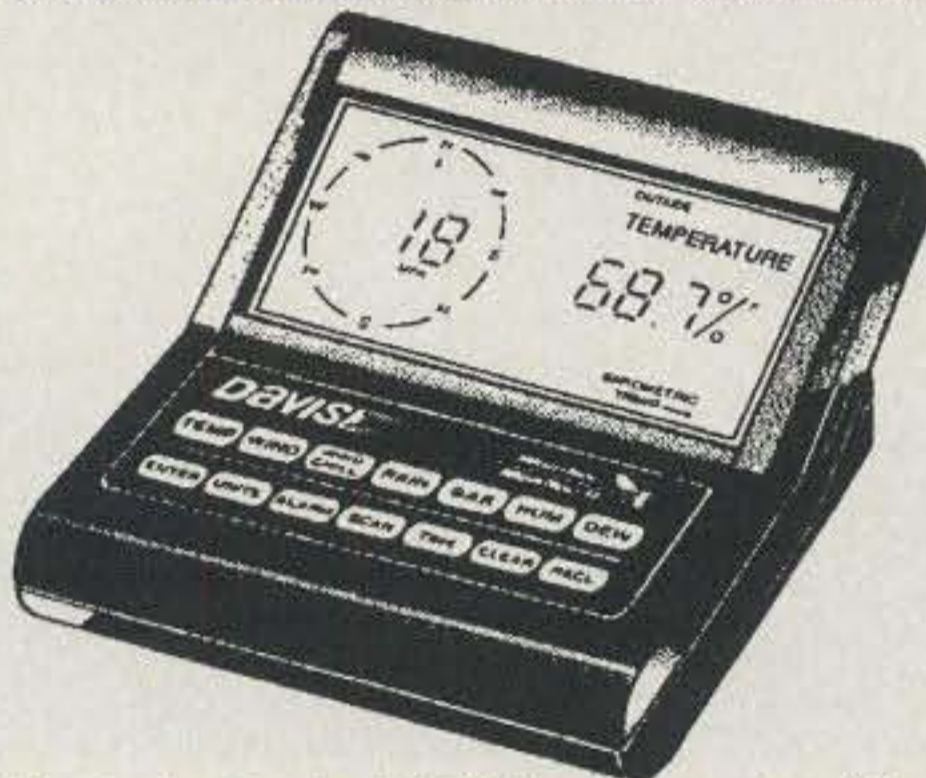
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NEWS OF COMMUNICATION AROUND THE WORLD

New Orleans International DX Convention

At the bottom of the sunspot cycle DXers find new countries are few and far between. Many DXpeditioners postpone travel plans, waiting for better propagation. With the higher bands devoid of interesting DX, DXers look for alternate outlets for their craving for News Ones. About the only thing that DXers like to do almost as much as working DX is talking about it. And where better to do so than at a gathering devoted solely to DX? The New Orleans International DX Convention is just such a place.

There are a handful of pure DX conventions each year. The biggest of these is the "Visalia" convention, more formally known as the joint meeting of the Northern and Southern California DX Clubs. (In 1997 that convention will be hosted by the Northern California DX Club at the Holiday Inn Centre Plaza in Fresno, California, April 4-6. Call the hotel at 209-268-1000 for reservations.) Other pure DX gatherings are held in the northwest, near Chicago, in New England, in west Texas, and at other locations. The largest single gathering of DXers is at the Dayton Hamvention, but DXing is but a small part of the Hamvention.

Five years ago a group of DXers in Louisiana decided that a high-class DX convention in a popular tourist location would be successful. Their efforts produced the New Orleans International DX Convention (NOIDXC). (The attractions of Dayton, Ohio and Visalia, California pale by comparison.) The convention is held at the end of August in the Royal Sonesta Hotel on historic Bourbon Street, in the French Quarter of New Orleans. In sharp contrast to Visalia and Dayton, the hotel is top notch, with a friendly, helpful staff.

As with other DX gatherings, NOIDXC begins with some informal activities on Friday afternoon. Slide shows and videos highlight several recent DXpeditions. In 1996, for example, the Friday program included YBØABV, 1AØKM, YKØAA, and the XRØY/XRØZ DXpedition. Dinner is on your own, but with dozens of excellent restaurants just steps away in the French Quarter.

Following dinner, DXers assemble in the hospitality room, which includes a balcony overlooking Bourbon Street. The street is closed to vehicles at night and is crowded with thousands of tourists. The balcony gives a perfect location to watch the varied Bourbon Street population.

The formal part of the program begins



Tony, W1ECK (left), visits the shack of Jon, LY2ZZ, in Lithuania.

on Saturday morning. One of the highlights of any DX gathering is the DXCC report. Everyone is interested in the latest news from the DXCC desk in Newington. This year, Mr. DXCC himself, Bill Kenamer, K5FUV, presented the report.

Bill noted that the DXCC backlog has disappeared, and most computerized

DXCC applications are turned around in less than a week. He also mentioned the DXCC 2000 program, emphasizing its goal to increase participation in the program. Other goals of the DXCC 2000 effort are to make the program more equitable, create better-understood country criteria, improve the add/delete process



Max, IK1GPG, and Beny, IK1QFM, share this spacious shack.



Worked any Nepal stations recently? Here are 9N1HA, 9N1AA, 9N1ARB, 9N1RHM, 9N1KY, SWL Hari, 9N1WU, and Knud.

for DXCC countries, and improve administrative efficiency. Bill said that the 4665 DXCC applications in 1995 represented only 3% of ARRL members, but used far more than 3% of the ARRL's resources. In 1995 the DXCC desk handled 16,400 new applications and endorsements with

more than a half-million QSL cards from 7700 DXers. Nearly 40% of the DXCC applications came from outside the US.

"New applications are the life blood of the DXCC program," Bill reported, noting that the trend of new applications has been downward for the past two years.

The WPX Program

SSB

2606LU4DFH 26089K2HN
2607I7PXV

CW

2927LU3FSP

Mixed

1754YU1AAV 1757I7PXV
1755IK8FLW 17589K2HN
1756JE1VJT

Mixed: 450 JE1VJT, I7PXV, 9K2HN. 500 I7PXV, 9K2HN, 550 I7PXV, 9K2HN. 600 I7PXV, 9K2HN. 650 I7PXV, 9K2HN. 700 9K2HN. 750 9K2HN. 800 9K2HN. 850 WA3FWA, 9K2HN. 900 WA3FWA, 9K2HN. 1150 IT9JPK. 1200 IT9JPK. 1250 IT9JPK. 1550 KC6X. 1600 KC6X. 1850 K9UQN.

SSB: 350 LU4DFH, I7PXV, 9K2HN, 400 LU4DFH, I7PXV, 9K2HN. 450 LU4DFH, I7PXV, 9K2HN. 500 I7PXV, 9K2HN. 600 I7PXV, 9K2HN. 650 I7PXV, 9K2HN. 850 DL8AAV. 900 DL8AAV. 950 DL8AAV. 1050 IT9JPK. 1100 IT9JPK. 1200 KC6X. 1250 KC6X.

CW: 350 LU3FSP. 1050 KC6X. 1100 KC6X. 1350 JN3SAC. 1400 JN3SAC. 1450 JN3SAC. 1500 JN3SAC.

10 Meters: K2LUQ
15 Meters: 9K2HN
20 Meters: 9K2HN
160 Meters: K5IID

Asia: 9K2HN
Africa: K5IID
No. Amer.: 9K2HN
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Award of Excellence Plaque Holders: I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT,

OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, KA5W, K8JN, W4VQ, KF2O, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YL/W4, NN4Q, KA3A, YB0TK, VE7WJ, VE7IG, K9QRF, YU2NA, N2AC, W4UW, NX0I, W9NUF, N4NX, SM0DJZ, DK5AD, WB4RUA, DK5AD, WD9IIC, W3ARK, I6DQE, LA7JO, VK4SS, K6JG, I1EEW, I8RFD, I3CRW, VEFXR, N4MM, KC7EM, ZS6BCR, CT1YH, IV3PVD, KA5RNH, ZP5JCY, F1HWB, KC8PG, NE4F, VE3MS, K9LJN, ZS6EZ, YU2AA, I1WXY, IK2ILH, DE0DAQ, LU1DOW, N1IR, IK4GME, WX3N, KC6X, N6IBP, W5ODD, I0RIZ, I2MQP, I5ZJK, JA0SU, S51NU, K9XR, W0ULU, HB9DDZ, F6HMJ, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, K0IFL, IN3NJB, WT3W, S50A, AA6WJ, W3AP, W9IL, OE1EMN, IK1GPG, K0DEQ, DL5ARS.

Award of Excellence Plaque Holders with 160 Meter Endorsement: CT1YH, IV3PVE, KA5RNH, ZP5JCY, AB9O, FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, H18LC, KA5W, UR2QD, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB0G, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YB0TK, W8ILC, W1BWS, VE7WJ, K9QRF, NN4Q, W4UW, NX0I, G4BUE, LU3YL/W4, I4EAT, WB4RUA, VE7WJ, N4NX, DE0DXM, VE7IG, K9BG, I1EEW, AB9O, CT1YH, IV3PVD, KA5RNH, ZP5JCY, I2MQP, I0RIZ, W5ODD, WX3N, IK4GME, HA8XX, YU1AB, F6HMJ, HB9DDZ, K9XR, K0JN, ZS6EZ, JA0SU, I5ZJK, I2EOW, KS4S, KA1CLV, K0IFL, K9LJN, WT3W, IN3NJB, S50A, AA6WJ, W3AP, K0DEQ.

Complete rules and application forms may be obtained by sending a business-size self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to: "CQ WPX Awards," P.O. Box 593, Clovis, NM 88101-9511 USA.

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ZS8IR, ZS6EZ, and OZ8RO in South Africa.

5 Band WAZ

As of August 31, 1996, 447 stations have attained the 200 Zone level.

New recipients of 5 Band WAZ Award with all 200 Zones confirmed:

S57DX

The top contenders for 5 Band WAZ (zones needed, 80 meters):

- | | |
|-----------------------|----------------------|
| N4WW, 199 (26) | OE6MKG, 199 (31) |
| AA4KT, 199 (26) | HA8IB, 199 (2, 15m) |
| K7UR, 199 (34) | DK1FW, 199 (31) |
| NA8Y, 199 (26) | OH2DW, 199 (1) |
| W0PGI, 199 (26) | IK1AOD, 199 (1) |
| W2YY, 199 (26) | DF3CB, 199 (1) |
| W9WAQ, 199 (26) | UA3AGW, 198 (1, 12) |
| W1JR, 199 (23) | VO1FB, 198 (19, 27) |
| VE7AHA, 199 (34) | EA5BCK, 198 (27, 39) |
| W1FZ, 199 (26) | KZ4V, 198 (22, 26) |
| IK2GNW, 199 (1) | K4PI, 198 (23, 26) |
| W9CH, 199 (26) | G3KDB, 198 (1, 12) |
| AC0M, 199 (34) | DK2GZ, 198 (1, 24) |
| IK8BQE, 199 (31) | KG9N, 198 (18, 22) |
| JA2IVK, 199 (34, 40m) | KM2P, 198 (22, 26) |
| K1ST, 199 (26) | GM3YOR, 198 (12, 31) |
| AB0P, 199 (23) | DK0EE, 198 (19, 31) |
| KL7Y, 199 (34) | K0SR, 198 (22, 23) |
| UY5XE, 199 (27) | K3NW, 198 (23, 26) |
| NN7X, 199 (34) | WB6OKK, 198 (22, 37) |
| DL3ZA, 199 (31) | S57J, 198 (2, 26) |

The following have qualified for the basic 5 Band WAZ Award:

- | | |
|------------------|------------------|
| S57DX, 200 Zones | ES1RA, 197 Zones |
| UA0FZ, 197 Zones | |

Endorsements:

- | | |
|------------------|-------------------|
| K2UVG, 160 Zones | HB9DDZ, 195 Zones |
|------------------|-------------------|

1019 Stations have attained the 150 Zone level as of August 31, 1996.

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all CQ awards is \$4.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

On the subject of North Korea, Bill defended the decision to accept Martti Laine, OH2BH's limited demonstration from North Korea for DXCC credit. He also said that Martti was unable to return to North Korea, due to the objections of South Korean authorities.

On Palestine's chances of becoming a new country, Bill said that he has copies

The WAZ Program Single Band WAZ

20 Meter SSB

990.....9K2HN

20 Meter CW

469.....SM5BRW

All CW

96.....N2TGT

160 Meter WAZ

71.....WB9Z—39 Zone Endorsement
 98.....KE9A—31 Zones, New
 99.....VA3DX—31 Zones, New
 100.....SM3EVR—40 Zones, New
 101.....G4BWP—35 Zones, New

All Band WAZ SSB

4346.....WA6POZ 4348.....IK8CVZ
 4347.....J73PB 4349.....9K2HN

CW/Phone

7702.....Z31CZ 7704.....9K2HN
 7703.....DL3NCR

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all CQ awards is \$4.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

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 updated annually by addition to, or confirmation of, present total. If no up-date, file will be made inactive. Lifetime Honor Roll fee is \$4.00 (U.S.) for each mode, with no fee for additions.

MIXED

4705.....9A2AA	3229.....SM3EVR	2981.....UA3FT	2601.....SM7TV	2200.....K5UR	1978.....S58MU	1563.....CT1YH	1222.....YV7QP	967.....JR3TOE
4682.....F8RN	3218.....N4UU	2948.....HA8XX	2601.....I2MQP	2141.....WA1JMP	1967.....W9IL	1550.....EA3CWK	1212.....CT3CU	953.....S52QM
3723.....EA2IA	3184.....I2PJA	2885.....PA0SNG	2542.....WB2YQH	2132.....DK5AD	1776.....W7OM	1532.....K0IFL	1197.....IT9JPK	874.....W2EZ
3696.....W2FXA	3165.....N4MM	2879.....YU7SF	2510.....4N7ZZ	2105.....N2AIF	1716.....WB3DNA	1516.....F5NBX	1177.....WT3W	850.....US1DX
3589.....K6JG	3141.....YU1AB	2866.....HA0DU	2491.....I2EZW	2070.....KS4S	1683.....LU8DY	1491.....I2EAY	1168.....Z32KV	835.....AA1KS
3451.....N4NO	3101.....I1EEW	2834.....YU7BCD	2455.....S53EO	2067.....W6OUL	1681.....I0AOF	1402.....I1-21171	1137.....YU7FW	801.....EA2BNU
3442.....W1BWS	3078.....ZP5JCY	2756.....K9BG	2416.....K8LJG	2054.....9A4RU	1669.....K5IID	1383.....OZ1ACB	1054.....VE6BMX	636.....9A2AJ
3415.....VE3XN	3063.....KA5W	2745.....KF2O	2375.....HA5NK	2053.....K0DEQ	1662.....PY2DBU	1383.....AI6Z	1013.....WB2PCF	
3394.....N6JV	3003.....9A2NA	2688.....K9AGB	2252.....S51NU	2049.....W8UMR	1589.....JN3SAC	1346.....WA3HUP	1003.....KB5OHT	
3299.....I2UIY	2990.....WA8YTM	2657.....N2AC	2249.....IK2ILH	2001.....G4OBK	1570.....KC6X	1265.....VE4ACY	999.....VE6FR	

SSB

4593.....F9RM	2798.....F2VX	2362.....I2MQP	2077.....N4UU	1636.....IK2DUU	1441.....W6OUL	1321.....I3ZSX	976.....WT3W	772.....LW2DBM
4025.....I0ZV	2777.....OZ5EV	2350.....WA8YTM	2050.....KF7RU	1633.....K8LJG	1439.....WN5MPS	1317.....K5IID	943.....S51NU	756.....AE4MJ
3620.....VE1YX	2754.....E8AKN	2330.....KF2O	2044.....K5RPC	1606.....YU7SF	1428.....CT1BWW	1225.....KC6X	939.....AI6Z	744.....N3DRO
3571.....ZL3NS	2708.....I1EEW	2294.....EA3AQC	2029.....KD9OT	1574.....KS4S	1419.....WB3CQN	1124.....W9IL	912.....ZS6Y	738.....EA1OT
3277.....K6JG	2678.....N4NO	2240.....I8KCI	2022.....CX6BZ	1567.....EA5CGU	1415.....HA5NK	1118.....EA5GKE	907.....KF7IO	724.....I2EAY
3192.....I2PJA	2677.....I4CSP	2237.....WA4QM	1948.....EA2AOM	1564.....N2AIF	1401.....W7OM	1115.....DF7HX	889.....W6RQQ	712.....DF1IC
3172.....WD8MGQ	2595.....KA5W	2220.....YU7BCD	1933.....W4UW	1533.....LU7HJM	1396.....K8MDU	1107.....WA2FKF	860.....IK4HPU	682.....US1DX
2966.....ZP5JCY	2588.....HA8XX	2206.....PY4OY	1906.....IN3QCI	1532.....OE2EGL	1393.....K3IXD	1106.....K0IFL	846.....JR3TOE	639.....VE4ROY
2903.....CT4NH	2525.....PA0SNG	2164.....I1EOW	1903.....K5UR	1527.....KB0C	1361.....IK2AEQ	1101.....KB4HU	832.....I6KYL	626.....VE6BMX
2834.....I2UIY	2447.....I5ZJK	2155.....CT1AHU	1754.....K2POF	1483.....N2AC	1355.....DK5WQ	1055.....IT9JPK	831.....LU3HBO	609.....JA2OCU
2812.....N4MM	2371.....9A2NA	2141.....EA5AT	1748.....LU8DY	1447.....AE5B	1332.....G4OBK	1053.....EABAG	821.....EA3EQT	604.....KZ5ZD
2811.....EA2IA	2370.....LUBESU	2133.....4X6DK	1638.....N6FX	1447.....K2EEK	1328.....W5ILR	1036.....IK0JMS	782.....YV7QP	601.....EA1MK

CW

3681.....WA2HZR	2318.....W9DWQ	2035.....9A2NA	1767.....K5UR	1608.....G4OBK	1342.....EA7TG	1102.....K5IID	914.....YV7QP	742.....9A3UF
3376.....N6JV	2283.....WA8YTM	1998.....S51NU	1742.....N6FX	1552.....W6OUL	1320.....I2EAY	1090.....AI6Z	899.....K2LUQ	729.....KF7JF
2993.....N4NO	2280.....KA5W	1954.....HA5NK	1741.....W1WAI	1542.....I1EEW	1300.....IK2ECP	1072.....KC6X	863.....PY4WS	701.....VE6BMX
2957.....YU7LS	2268.....G4UOL	1945.....KA7T	1740.....OZ5UR	1523.....DJ1YH	1278.....W7OM	1067.....EA2CIN	863.....KB5OHT	697.....K3WWP
2843.....N4UU	2264.....YU7BCD	1939.....EA7AZA	1722.....VR2UW	1504.....KS4S	1277.....KA1CLV	1066.....IK5TSS	844.....YU1TR	691.....K0IFL
2786.....EA2IA	2250.....I2UIY	1910.....KF2O	1707.....G4SSH	1480.....IK3GER	1266.....9A3SM	1056.....AC5K	831.....LU3DSI	656.....HA9PP
2771.....K6JG	2224.....LZ1XL	1903.....G3VQO	1687.....IT9VDO	1477.....ZP5JCY	1241.....9A2HF	1051.....4X6DK	830.....LU7EAR	649.....WT3W
2601.....YU7SF	2173.....N4MM	1863.....HA8XX	1680.....S51MU	1457.....JN3SAC	1231.....EA7AAW	925.....LW2EUE	796.....I2EOW	602.....LU6VCD
2439.....N2AC	2117.....W8IQ	1858.....K8LJG	1649.....N2AIF	1448.....LU2YA	1182.....EA6AA	921.....I2MQP	760.....EA2BNU	
2435.....K9QVB	2085.....S51NR	1809.....T14SU	1645.....I7PXV	1440.....EA6BD				



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3CX10,000A3	4CX800A	572B
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4L8P to OZ1HPS
4M5LR to WS4E
4N1Z to YU1AVQ
4S7DA to W3HNK
4X1VF to K1FJ
5N3/SP5XAR to SP5CPR
5V7MD to AB7BB
5W0AN to DF8AN
5W0BS to AA8HZ
5W0DG to AA8HZ
5W0JB to AA8HZ
5W0KI to JE4IVL
5W0TR to AA8HZ
6W1/N2WCQ to PA3BUD
7Z1AB to KN4F
7Z500 to W1AF
9A3NR to WA4JTK
9A4A to 9A4AA
9G1BJ to G4XTA
9G1YR to G4XTA
9H0A to LA2TO
9H30N to PA3BIZ
9H3TZ to DL7VRO
9H3UD to DL8OBC
9H3UJ to PA3CRA
9H3UK to PA3DES
9J2SZ to SP8DIP
9K2MU to WA4JTK
9M2JJ to SM0OEK
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9M8BC to HL5AP
9M8HIM to 9M8DB
9N1ARB to KV5V
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of all the agreements between Israel and Palestine, and based on those agreements, Palestine currently does not qualify as a separate DXCC country. "Palestine has a ways to come" before achieving separate DXCC status. For example, the International Telecommunications Union presently will not issue a distinct prefix to Palestine.

Another important part of any DX gathering is the DX Advisory Committee (DXAC) forum. In New Orleans this year Mike Meyer, W5ZPA, the Delta Division DXAC representative and president of the 1996 NOIDXC, hosted the forum. He explained the new rules and regulations for the DXAC (and all ARRL advisory committees). The chair has a maximum term of two years. Advisory committee members cannot be elected ARRL officers. The DXAC normally does not solicit input from ARRL members on "non-policy" matters. Perhaps the most important change is the new requirement that the DXAC can

investigate only those matters referred to it by the Membership Services Committee of the ARRL Board of Directors.

Mike then discussed some of the matters that the DXAC considered in 1996. One was changing the DXCC country criteria on "rocks," such as Scarborough Reef. The DXAC was deeply divided on this issue, as the 8 to 8 vote demonstrated. Since the vote to change to country criteria was a tie, the DXAC made no recommendation to the Awards Committee to change the rule.

The DXAC also considered whether to withdraw Mount Athos SV/A from the DXCC countries list. (This is different from deleting the entity; in a withdraw, all DXCC credits for the entity are eliminated. This says that the country should never have been on the DXCC list in the first place.) This discussion was precipitated by a change in Greece's constitution and the relationship between Greece and Mt. Athos. However, the vote was 7 for with-

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Total number of active countries is 328. 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 airmail reply. Please make all checks payable to the awards manager.

drawing the entity and 9 *against* any such change. Thus, Mt. Athos remains a current DXCC country.

In the aftermath of the OH2BH/P5 operation, the DXAC also considered whether or not to add a minimum QSO rule, as the Islands On The Air program has. This idea proved very unpopular. Only two DXAC members wanted to continue to study the idea, while 14 were against even further discussion.

The remainder of Saturday was filled with DXpedition reports and technical presentations, which included reports on Namibia, Lord Howe Island, and Burma, as well as lightning and the Internet.

Probably the greatest difference between the NOIDX and other DX gatherings is the Saturday evening banquet. Most such meals are second-rate, but New Orleans does it right. The meal was the best my wife and I have enjoyed in New Orleans, a city known for its excellent restaurants. It even included Bananas Foster for dessert, complete with the flaming demonstration! The dinner was reason enough to attend the NOIDX. The attendees knew what was in store for them at dinner, as many brought their wives. That's something you seldom see at other DX gatherings. After dinner the convention came to a close back in the hospitality room.

In five years the New Orleans International DX Convention has matured into the premier DX gathering. DXers should seriously consider the trip in the future.

73, Chod, VP2ML

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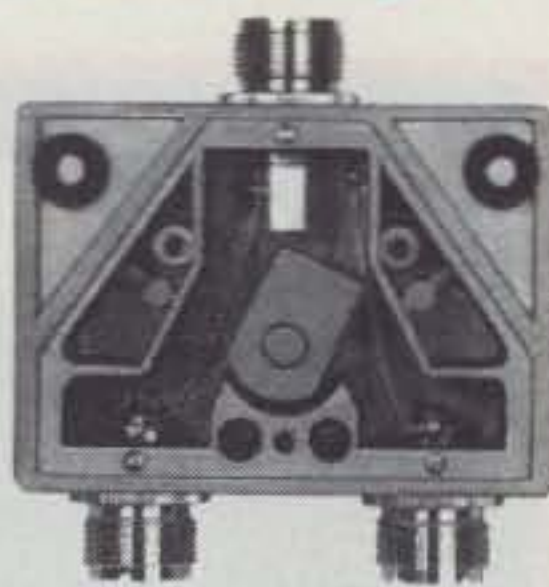
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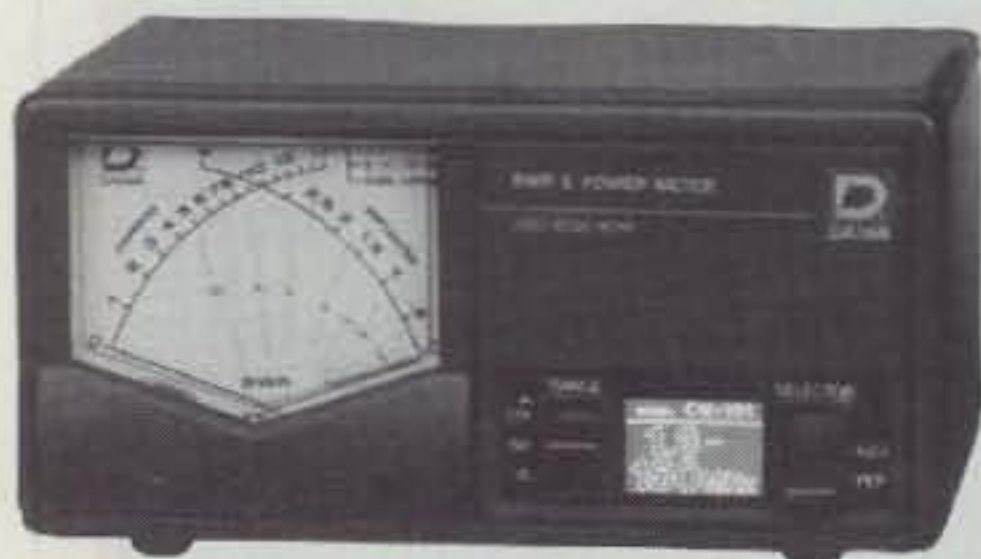
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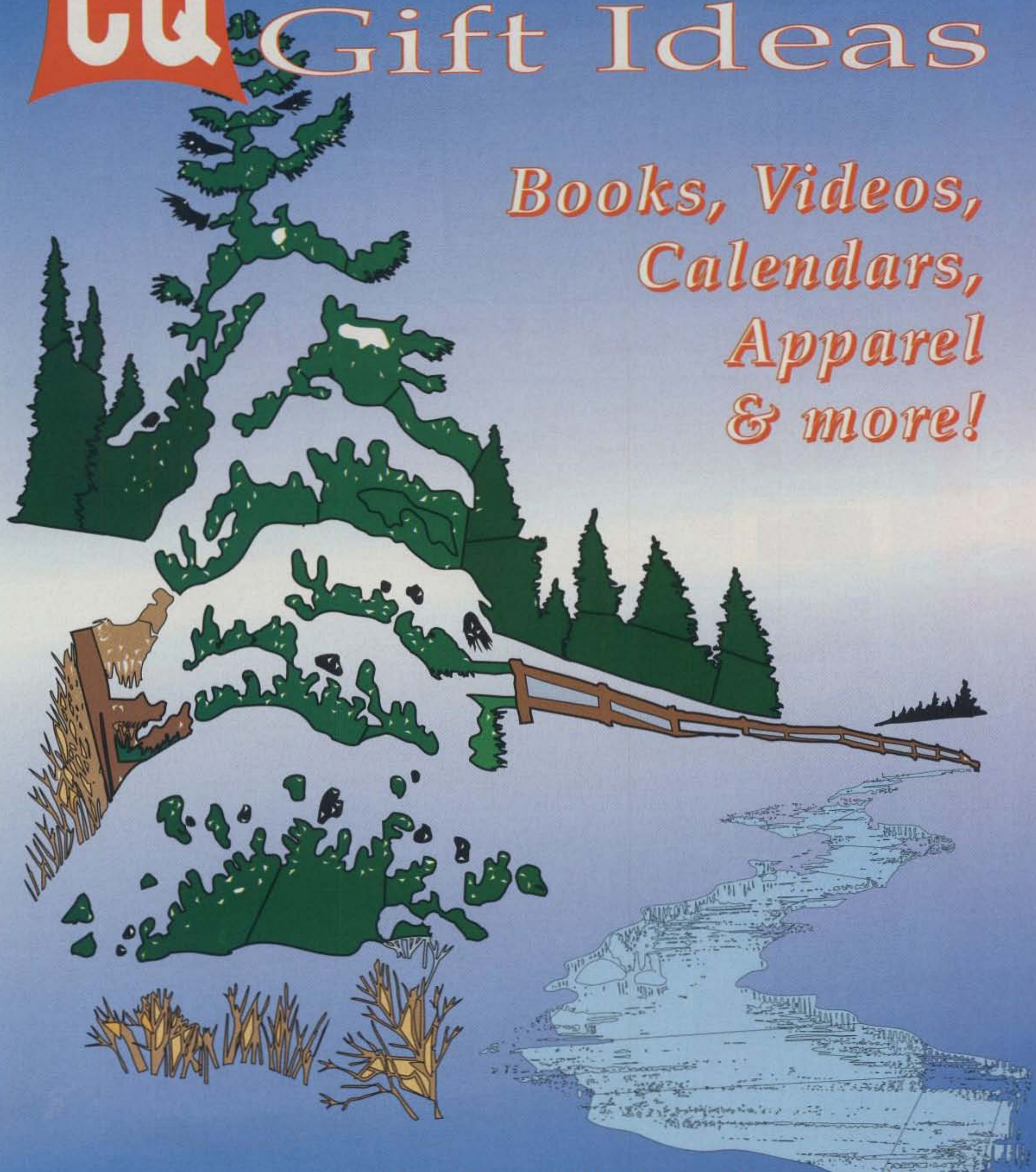
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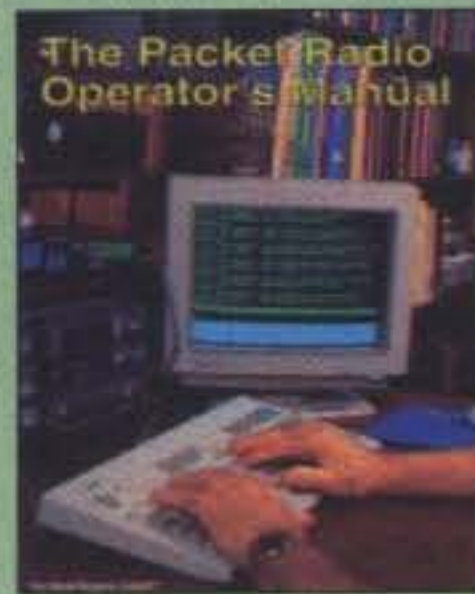


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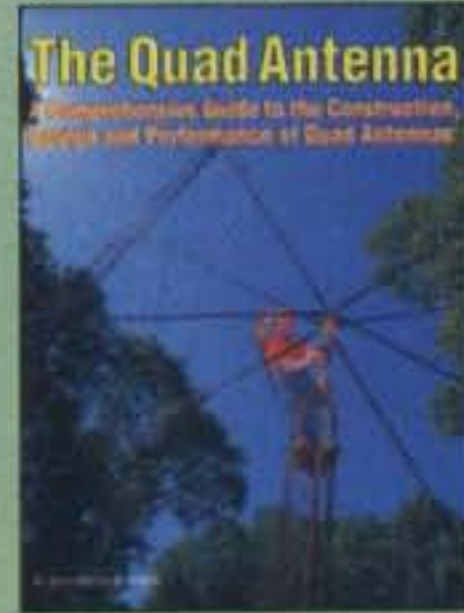


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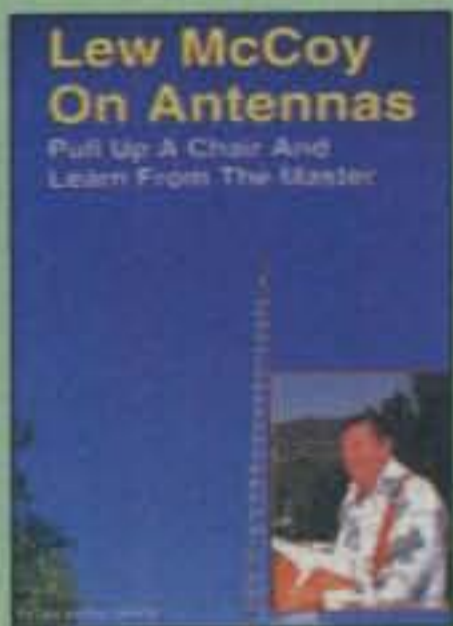


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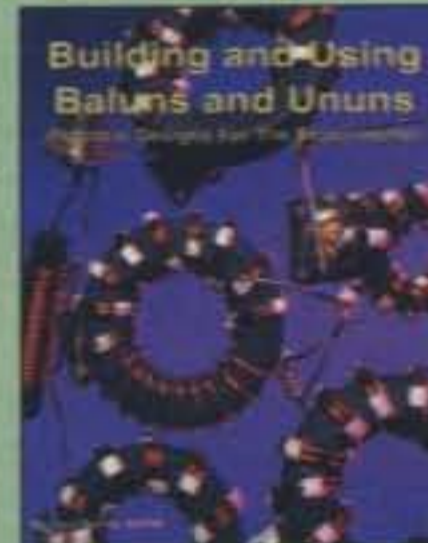


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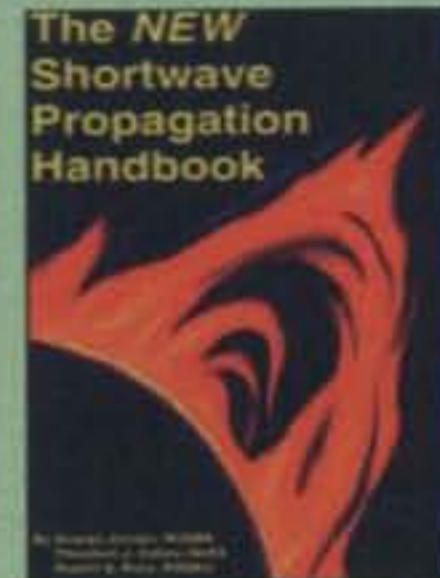


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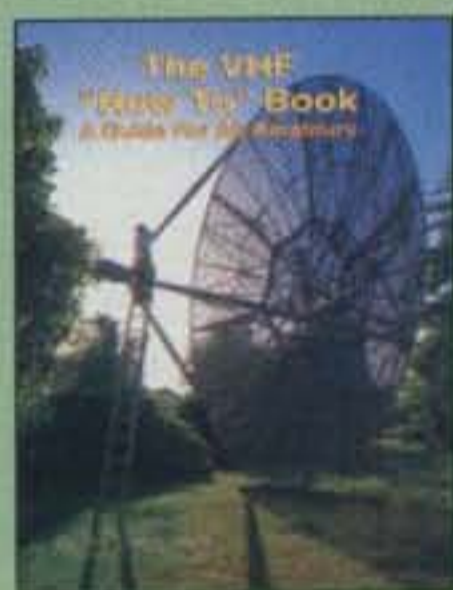


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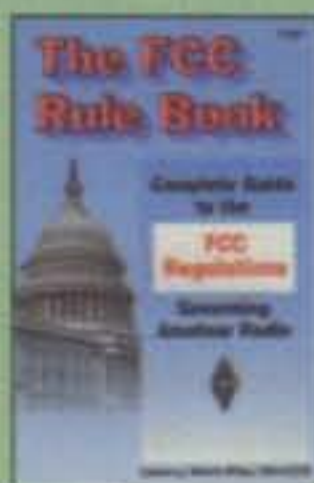
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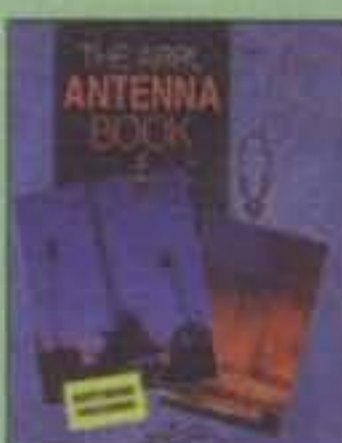
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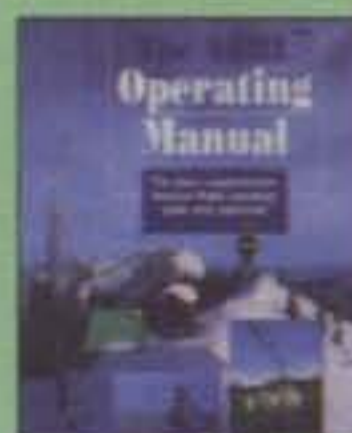
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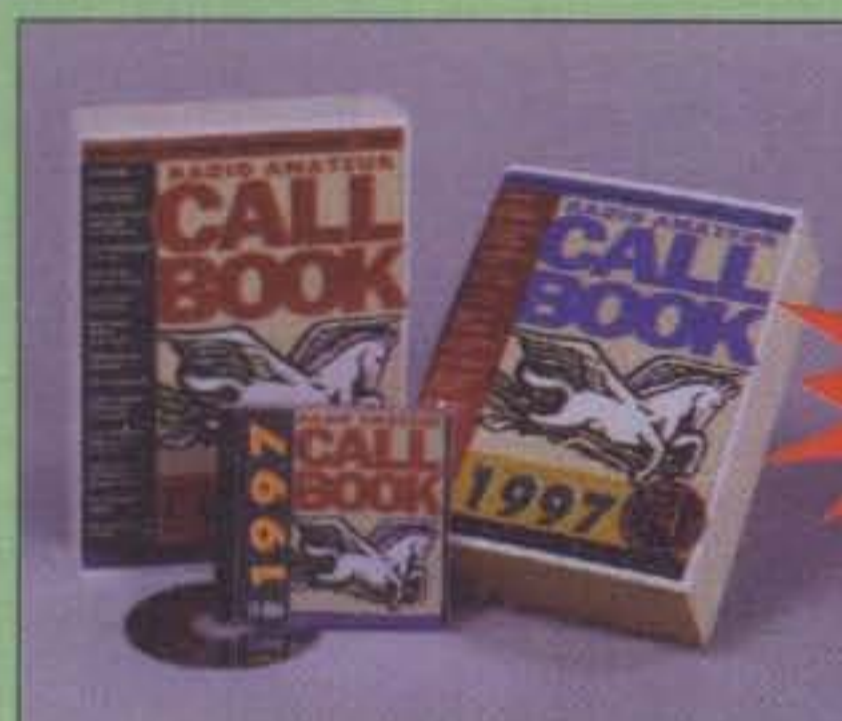
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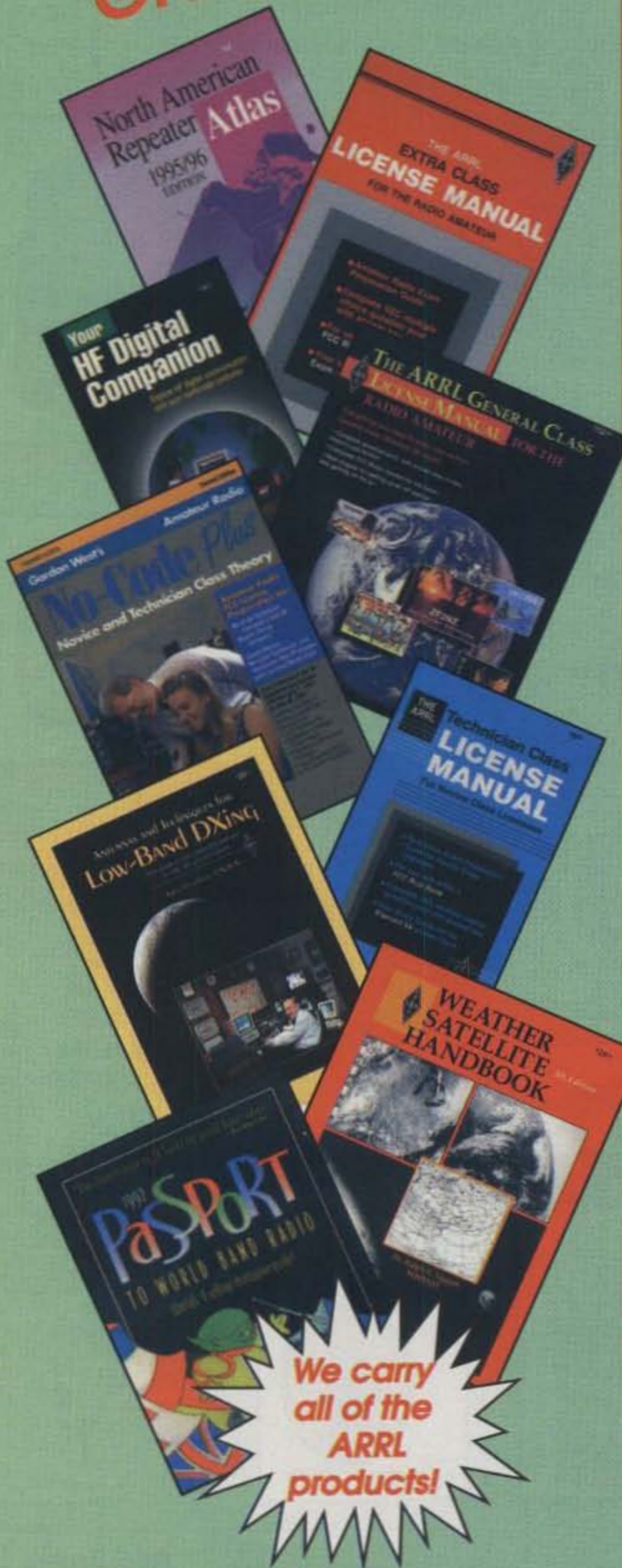
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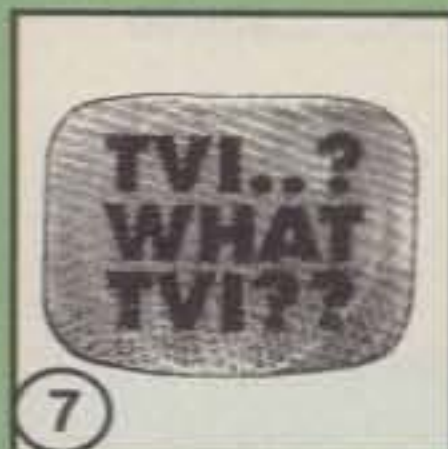
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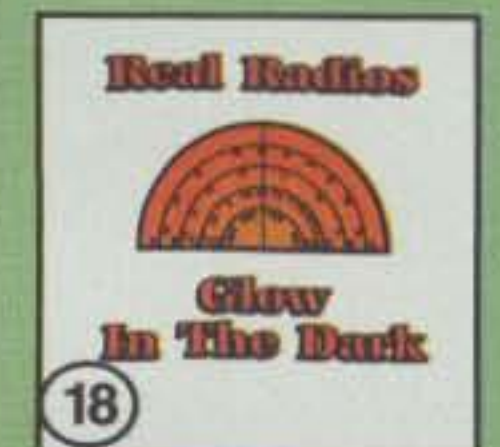
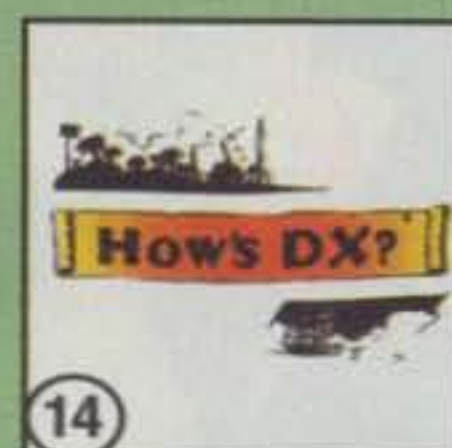


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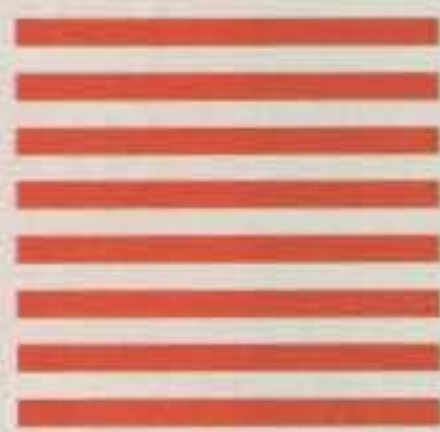
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NG8D	66,690	432	51 14								
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KB9LKO	52,033	377	54 7	9A1A	677,560	1064	34 70	PA6A	880,210	1124	46 69
				9A5D	100,646	398	6 43	PA6Z	410,595	723	34 59
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KD9SV	361,672	1032	58 48	OK5TOP	341,462	724	25 58	LA8G	174,705	585	8 49
NJ9C	100,110	604	54 17	OK1IW	184,256	576	16 48				
W9RE	65,912	300	51 26	OL5X	180,967	468	20 53				
KK9I	43,080	302	47 13	OK1KJV	79,200	382	2 42				
				OK1KUO	71,576	324	7 39				
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AABRS	303,620	953	57 37	G3VGG	121,800	377	23 35	RU1A	220,242	618	11 55
								UA3AB	127,307	376	9 52
IOWA				FINLAND				SLOVAKIA			
KE0FT	60,800	411	55 9	OH2BCI	220,116	602	15 53	OM7M	528,736	804	36 68
				OH3ES	105,112	360	2 54	OM5M	459,610	844	28 67
MINNESOTA				GERMANY				SPAIN			
KN0Z	63,294	368	55 11	DK1NO	476,442	795	35 67	EA3CWK	156,522	535	8 49
W0SEI	41,122	315	51 7	DK2OY	327,918	632	32 61	EA5BY	66,330	292	5 40
				DK0EE	268,600	624	28 57				
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K0LIR	170,150	847	55 27	HG5A	413,864	825	25 63	SL3ZV	384,660	762	27 63
				HG1G	329,508	723	27 54	SK1BL	232,764	645	16 52
NORTH DAKOTA				ITALY				YUGOSLAVIA			
KB0LFV	24,960	236	48 0	I4JMY	465,864	818	33 61	UR0I	216,648	523	14 58
				IK2HDG	125,788	405	13 46	UT7L	138,040	456	5 53
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				LY7A	240,312	662	15 53				
MEXICO											
XE2											
/WA7UQV	348,300	910	58 17								
ASIA											
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RK9CWW	191,394	428	0 49								
JAPAN											
JA3ZOH	139,136	244	28 36								
JA1YDU	109,058	209	32 30								
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*AA1AB	31,768	323	41 3
*K2AZ	27,136	208	42 11
*KE2PF	25,104	235	43 5
K2PS	17,380	174	39 5
*N2NYR	12,506	153	36 1
WA2WYR	12,495	107	44 5
*K2PBP	11,550	149	34 1
W1GD	10,730	129	34 3
*K2FL	7,047	120	27 0
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K1VWL	17,982	226	37 0
WV1C	11,136	159	32 0
*N4REE	10,560	153	32 0
*K1DII	871	29	13 0
MASSACHUSETTS			
AA1EY/DRP	17,100	207	38 0
K1VV	9,800	119	32 3
*W01N	8,250	113	33 0
MAINE			
W1CEK	22,944	233	48 0
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WA1HYN	19,116	252	34 2
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N2GQS	51,948	464	48 4
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N2PP	41,415	316	46 9
AA2SA	22,442	198	44 5
*K2UF	20,787	233	39 2
*NA2A	20,172	221	40 1
N2XTX	17,954	184	45 2
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WR2V	13,794	165	38 0
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*N2FF	8,224	121	32 0
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N2KA	2,835	40	24 3
*N2PNX	280	15	7 0
DISTRICT OF COLUMBIA			
*W3USS	15,015	178	37 2
DELAWARE			
*NY3C	33,866	388	39 2
MARYLAND			
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K3ZO	18,767	145	39 10
W3HVQ	8,316	101	34 2
*W3CPB	7,380	114	30 0
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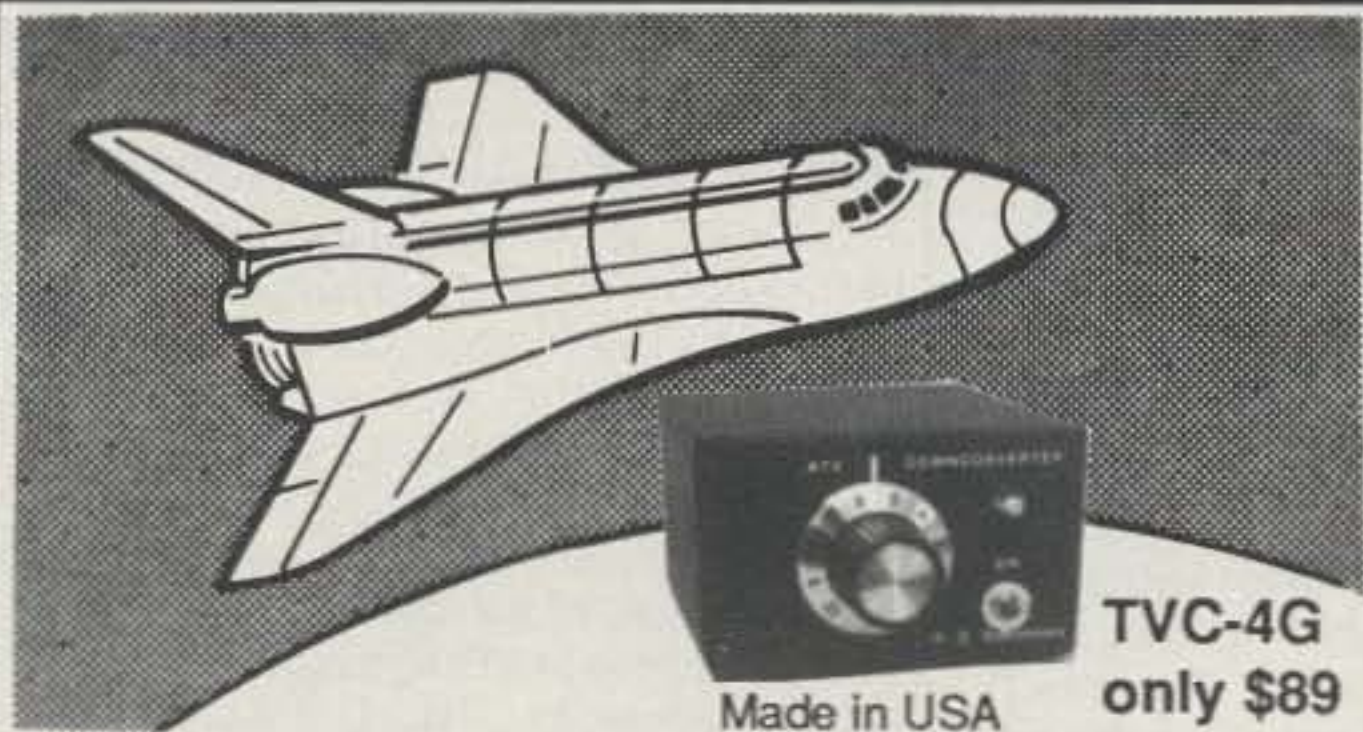
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GW4BLE	14,520	88	0 33	AA1K	33,060	200	45 13	WR8C	258,720	1259	57 27	OM2I	75,117	307	1 48				
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H44MS	560	8	6 2	P40V	397,024	532	52 24	ES50	100,550	391	1 49	115,700 461 6 44							
SOUTH AMERICA				COLOMBIA				FINLAND				SOUTH AMERICA							
ARUBA				PERU				FRANCE				COLOMBIA							
P40V	397,024	532	52 24	OA40	5,800	32	13 7	F5GTR	77,775	308	7 44	HK6LRP 14,616 55 21 8							
COLOMBIA				NETHERLANDS ANTILLES				GERMANY				SOUTH AMERICA							
HK3MKQ	8,778	48	16 6	PJ9JT	55,460	122	36 11	DL0MI	51,658	264	5 41	SWEDEN							
HJ6VKH	5,640	31	12 8	VENEZUELA				MISSOURI				SWITZERLAND							
FERNANDO DE NORONHA				VENEZUELA				MINNESOTA				SWITZERLAND							
PY0FF	138,690	210	39 28	YV2IF	147,832	228	47 21	90,720 644 55 8	ESTONIA				SWITZERLAND						
NETHERLANDS ANTILLES				VENEZUELA				KANSAS				FINLAND							
PJ9JT	55,460	122	36 11	YV1DRK	57,132	129	33 13	74,816 531 56 8	FRANCE				FINLAND						
VENEZUELA				VENEZUELA				KANSAS				FRANCE							
YV2IF	147,832	228	47 21	YV1DRK	57,132	129	33 13	41,006 314 54 4	GERMANY				FINLAND						
YV1DRK	57,132	129	33 13	YV1DRK	57,132	129	33 13	37,490 400 46 0	GERMANY				FINLAND						

SSB CHECK LOGS: Thanks to the following stations for their valuable check logs for SSB, AI11, CT1AVR, DE1TTW, IK8ENH, LZ2UZ, LZ3AB, N29Z, SPL-2100189, SP7VCK, VE4WR, YL2IP.

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WASHINGTON READOUT

REGULATORY NEWS IN THE WORLD OF AMATEUR RADIO

Operating in Foreign Countries

Amateurs traveling to foreign countries generally like to bring their hand-held radios along with them and chat with the local amateurs on 2 meters. Some bring HF rigs with them and operate as a DX station. Currently, foreign amateur operators are authorized to operate stations in the U.S. under three circumstances:

1. The Part 97 Amateur Service regulations provides operating privileges in the U.S. to citizens of Canada who hold amateur service licenses issued by the Government of Canada. Likewise, Canadian amateurs can operate in the U.S. This is due to a bilateral 1952 treaty which permits visiting amateurs to operate radio stations in the territory of the other country without further licensing. The visiting amateur simply identifies his or her station in the usual manner and appends the callsign with the prefix and area number being visited. The city and state in which the operation takes place must be announced on the amateur airwaves at least once during the exchange.

2. The rules also provide operating privileges to radio amateurs who are citizens of some 76 countries (see box) the governments of which have entered into bilateral reciprocal operating arrangements with the United States. They obtain nonrenewable one-year permits to operate their amateur stations in the U.S. The FCC issues some 2500 reciprocal permits annually.

3. Non-U.S. citizens who pass the required examinations are granted licenses in the same manner as U.S. citizens. This procedure is usually used by foreign operators who reside permanently in the U.S., by those who are here for lengthy stays, or when a reciprocal licensing arrangement does not exist between the foreign amateur's home country and the United States. Several hundred foreign nationals are administered U.S. amateur radio examinations annually. U.S. amateur license examinations are also available in several foreign countries. These test sessions are usually staffed by U.S. overseas workers or foreign amateurs who hold senior-level U.S. licenses.

Two More Systems on The Way!

There are two additional pending reciprocal arrangements that will eventually provide even more convenient ways for foreign amateurs to operate stations in the U.S. and vice versa. They are the European Conference of Postal and Telecommunications Administrations (CEPT) radio amateur license and the Inter-American Convention on an International Amateur Radio Permit (IARP). This last arrangement is most often referred to as the CITEL/Amateur Convention. These treaty negotiations were prompted by amateur operators who want to operate their stations during interna-

*National Volunteer Examiner Coordinator,
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Reciprocal Operating Arrangements

The United States has made arrangements with the following countries to grant a reciprocal operating permit to their citizens who hold amateur service licenses issued by the country of citizenship:

Antigua and Barbuda, Argentina, Australia, Austria, The Bahamas, Barbados, Belgium, Belize, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Canada (Canadian amateur service stations do not need a reciprocal operating permit while operating in the United States), Chile, Colombia, Costa Rica, Croatia, Cyprus, Denmark (including Greenland), Dominica, Dominican Republic, Ecuador, El Salvador, Federated States of Micronesia, Fiji, Finland, France (including French Guiana, French Polynesia [Gambier, Marquesas, Society, and Tubuai Islands, and Tuamotu Archipelago], Guadeloupe, Ile Amsterdam, Ile Saint-Paul, Iles Crozet, Iles Kerguelen, Martinique, New Caledonia, Reunion, Saint Pierre and Miquelon, and Wallis and Futuna Islands), Federal Republic of Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Iceland, India, Indonesia, Republic of Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kiribati, Kuwait, Liberia, Luxembourg, Macedonia, Republic of the Marshall Islands, Mexico, Monaco, Netherlands, Netherlands Antilles, New Zealand, Nicaragua, Norway, Panama, Paraguay, Papua New Guinea, Peru, Philippines, Portugal, Seychelles, Sierra Leone, Solomon Islands, Republic of South Africa, Spain, St. Lucia, St. Vincent and the Grenadines, Surinam, Sweden, Switzerland, Thailand, Trinidad and Tobago, Tuvalu, United Kingdom (including Bermuda, British Virgin Islands, Cayman Islands, Channel Islands [including Guernsey and Jersey], Falkland Islands [including South Georgia Islands and South Sandwich Islands], Great Britain, Gibraltar, Hong Kong, Isle of Man, Montserrat, Northern Ireland, Saint Helena [including Ascension Island, Gough Island, and Tristan Da Cunha Island], and Turks and Caicos Islands), Uruguay, and Venezuela.

tional travel without first having to obtain a permit from the country visited.

The CEPT license and IARP are now on their way toward becoming a reality. On September 20 the FCC issued a 14-page Notice of Proposed Rule Making looking toward permitting radio amateurs from certain foreign countries to operate their stations while on short visits to the U.S. The NPRM suggests new rules which, if approved, will implement these two pending international reciprocal operating arrangements.

The new policy will make it easier for U.S. amateur operators to operate stations temporarily in 22 European and 10 South and Central American countries with a minimum of paperwork. It will also benefit amateur operators of these same countries by allowing them to operate stations in places where the service is regulated by the FCC.

CEPT Radio Amateur License

Under CEPT recommendation T/R 61-01 (the CEPT Agreement), CEPT radio amateur licenses are granted by the country of which the person is a citizen. By possession of these licenses, holders can operate an amateur station temporarily in any participating CEPT country without first obtaining another license or permit from the host country (see box).

The CEPT Agreement also provides for reciprocal operation between participating CEPT countries and participating non-CEPT countries. The agreement, however, does not cover the operation from stations from nonCEPT participants in the countries of other non-CEPT participants. Three non-CEPT countries (Israel, Peru, and New Zealand) are currently participating in the CEPT Agreement.

With the U.S. as a participating non-CEPT country, U.S. citizens could operate amateur stations temporarily in participating European

CEPT Radio Amateur Licenses

A CEPT license is issued by a country belonging to the European Conference of Postal and Telecommunications Administrations (CEPT) that has adopted Recommendation T/R 61-01 (Nice 1985, revised in Paris 1992 and by correspondence August 1992). The following countries recognize CEPT radio amateur licenses:

Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France (including French Guiana, French Polynesia [Gambier, Marquesas, Society and Tubuai Islands, and Tuamotu Archipelago], Guadeloupe, Ile Amsterdam, Ile Saint-Paul, Iles Crozet, Iles Kerguelen, Martinique, New Caledonia, Reunion, St. Pierre and Miquelon, and Wallis and Futuna Islands), Federal Republic of Germany, Hungary, Republic of Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Romania, Slovakia, Sweden, Switzerland, and the United Kingdom (including Bermuda, British Virgin Islands, Cayman Islands, Channel Islands [including Guernsey and Jersey], Falkland Islands [including South Georgia Islands and South Sandwich Islands], Great Britain, Gibraltar, Hong Kong, Isle of Man, Montserrat, Northern Ireland, Saint Helena [including Ascension, Gough Island, and Tristan De Cunha Island], and Turks and Caicos Islands).

countries, and their citizens could enjoy similar operating privileges in the U.S. The FCC has already requested the Department of State to apply for participation in the agreement as a non-CEPT country. It is expected that the agreement will be concluded by the end of this year.

An International Amateur Radio Permit

The Inter-American Convention on an International Amateur Radio Permit is an arrangement that would allow visitors to operate stations temporarily in other countries of the Americas. The Inter-American Amateur Convention was adopted and opened for signature by the General Assembly of the Organization of American States at its Twenty-Fifth Regular Session, held June 5, 1995, in Montrouis, Haiti.

The August 21-25, 1995 meeting of the Inter-American Telecommunications Commission (CITEL) Permanent Consultative Committee III: Radio Communications adopted a resolution submitted by the U.S. urging members to sign the CITEL/Amateur Convention.

Participation in the CITEL/Amateur Convention would allow U.S. citizens to operate amateur stations in ten countries within CITEL (see box). Under the CITEL/Amateur Convention, individual amateur operators with an International Amateur Radio Permit (IAP) would have reciprocal operating privileges.

Article 3 of the CITEL/Amateur Convention provides that an IARP may be issued by the home administration, or, under authority delegated, by the member society of the International Amateur Radio Union (IARU). The American Radio Relay League (ARRL) has offered its services to the Department of State to conduct this work on a non-discriminatory basis, at no cost, charge, or expense to the United States Government.

On July 19, 1995 the ARRL filed a Petition for Rule Making (assigned RM-8677) requesting amendment of the rules to implement the CITEL/Amateur Convention. The League further requested the Commission to acknowledge the arrangements to be made between the ARRL and the Department of State for the issuance of IARP documents to U.S. citizens for their use in other CITEL countries.

Foreign Amateur Operators Visiting The U.S.

The FCC said it believed that U.S. participation in both the CEPT and CITEL agreements would benefit U.S. amateur operators who travel to Europe and the Americas, as well as foreign amateur operators visiting places where the amateur service is regulated by the Commission.

"Arrangements of the types contemplated are authorized by the Communications Act," the FCC said. "Those statutory provisions authorize the Commission to permit an alien, licensed by his or her government as an amateur operator, to operate an amateur station in the U.S., provided there is in effect a multilateral or bilateral agreement that allows such operation on a reciprocal basis. Therefore, in anticipation of U.S. participation, we tentatively conclude that the rules should be amended to authorize, by rule, citizens of participating CEPT countries holding CEPT radio-amateur licenses and citizens of participating CITEL countries holding IARPs to operate amateur stations in the U.S. temporarily.

"We believe that the temporary period for operation in the United States under a CEPT radio amateur license or IAP should be of sufficient duration to provide flexibility for foreign visitors on business trips and vacations, tourists and persons attending conferences, as well as students and visiting professors, to operate their amateur stations without the need to submit applications or take examinations well in advance of their visit," the FCC said. The Commission proposed to authorize up to 180 days within the immediately preceding five years. "This would benefit foreign amateur operators who make several short-term visits to the United States during the five years, as well as those who make but a single visit. . . . A longer stay would appear to warrant obtain-

ing an amateur service license because of the likelihood of more sophisticated station operations." The FCC requested comments "... concerning our proposed definition of short-term visits as stays for 180 days within the immediately preceding five years."

The Commission said it believed that most temporary amateur operation would be through handheld or mobile transceivers. The Part 97 rules do not permit the holder of a reciprocal permit to establish an auxiliary, beacon, or repeater station.

"We believe generally that widespread access to information of the authorization status of transmitting stations promotes self-policing and discourages unlicensed stations from operating on the amateur service bands. We

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provide an accessible data base listing the amateur stations and operators that we authorize. It is updated daily and disseminated through the Internet. [It also lists the persons to whom the FCC has issued a reciprocal amateur operating permit.] The amateur service community further processes and disseminates this information electronically.

"Under the procedures proposed, . . . operation would be authorized by rule rather than by the grant of a license or permit. Information on the status of holders of CEPT radio-amateur licenses and IARPs, therefore, would have to be obtained from the responsible agencies in the country of issuance.

"Considering the short time period during which foreign visitors would be operating amateur stations, we do not believe it would be necessary for the Commission to routinely collect and disseminate the information. We have no objections, however, to the amateur service community doing so."

U.S. Amateurs Visiting Foreign Countries

The FCC said, "No amendments to our rules are necessary for operation by U.S. citizens in foreign countries. Further, we do not contemplate that the Commission will issue individual licenses for operation in foreign countries nor maintain a data base of such information. To activate operating authority in Europe under the CEPT Agreement, a traveler would have to carry credentials explaining in English, French, and German that the person, if a U.S. citizen and if a Commission-licensed amateur operator, is

entitled to certain amateur station operating privileges in the specific European countries that have implemented the CEPT Agreement. For this purpose, we propose to rely upon (1) a public notice containing the necessary explanation, (2) the Commission issued amateur service license document (FCC Form 660), and (3) proof of U.S. citizenship. For the CITEL/Amateur Convention, we have no objection to the mechanism that ARRL wishes to establish for the issuance of IARP documents to U.S. citizens. We request comment on these conclusions and issues, including the desirability of relying upon a public notice or other document similar to that proposed for the CEPT Agreement."

Operator Privileges

In view of the variations in operator requirements and privileges between countries and the temporary nature of the intended operations, the FCC said the CEPT license or IARP permit should not be used to circumvent the license examination system of the host country.

"We propose, therefore, that no resident alien or U.S. citizen, regardless of any other citizenship held, be eligible to operate an amateur station in the U.S. under a CEPT radio-amateur license or IARP. We believe that the operating requirements for a resident alien should be the same as that for a U.S. citizen. We propose, moreover, that when a non-U.S. citizen holding either a CEPT radio amateur license or an IARP obtains a ten-year term license grant, only the operator privileges of the Commission license apply. When a person, regardless of citizenship, obtains a Commission license, the skill level at which the person can operate a station properly in the U.S. has been established accurately by our amateur service community. The volunteer examiners in the community determine through a series of increasingly difficult examinations in regulatory, operational, and technical matters the highest of six classes of operator license at which the person can operate an amateur station properly under the Commission's rules for the amateur service. We request comment on these proposed safeguards for our amateur operator license examination system.

"There are two classes of CEPT radio-amateur licenses and IARPs. Class 1 requires knowledge of the International Morse code and carries all operating privileges. It is, therefore, similar to our Amateur Extra Class. Class 2 does not require knowledge of telegraphy and carries all operating privileges above 30 MHz. It is, therefore, similar to our Technician Class operator license.

"We propose, therefore, to authorize for Class 1 operators the frequency privileges of Amateur Extra Class operators. We further propose to authorize for Class 2 operators the frequency privileges of Technician Class operators. Finally, we propose to add the CEPT radio-amateur license and the IARP to the rule providing for station identification by foreign visitors operating amateur stations in the U.S. We request comment on these proposed operator privileges and station identification requirements."

Filing Comments On The Proposal

" . . . interested parties may file comments on or before December 1, 1996, and reply comments on or before January 13, 1997." To file

formally, you must file an original and four copies. If you want each Commissioner to receive a personal copy, you must file an original and nine copies. Comments go to: Office of the Secretary, Federal Communications Commission, Washington, DC 20554.

You may also file comments by electronic mail addressed to Maurice J. Depont at <mdepoint@fcc.gov>. Be sure to include the docket number (WT Docket No. 96-188) and your full name and mailing address in the text of the message.

The New Proposed Part 97 Regulations

The new proposed rule amendments are:

§ 97.5 Station license required

(c.) * * *

(3) A CEPT radio-amateur license issued to a person by the country of which the person is a citizen. The person must not:

(i) Be a resident alien or citizen of the United States regardless of any other citizenship also held.

(ii) Hold an FCC-issued amateur operator license nor reciprocal permit for alien amateur licensee.

(iii) Be a prior amateur service licensee whose FCC-issued license was revoked, suspended for less than the balance of the license term and the suspension is still in effect, suspended for the balance of the license term and relicensing has not taken place, or surrendered for cancellation following notice of revocation, suspension, or monetary forfeiture proceedings; or

(iv) Be the subject of a cease and desist order that relates to amateur service operation and which is still in effect.

(4) An IARP issued to the person by the country of which the person is a citizen. The person must not:

(i) Be a resident alien or citizen of the United States, regardless of any other citizenship also held,

(ii) Hold an FCC-issued amateur operator license nor reciprocal permit for alien amateur licensee;

(iii) Be a prior amateur service licensee whose FCC-issued license was revoked, suspended for less than the balance of the license term and the suspension is still in effect, suspended for the balance of the license term and relicensing has not taken place, or surrendered for cancellation following notice of revocation, suspension or monetary forfeiture proceedings; or

(iv) Be the subject of a cease and desist order that relates to amateur service operation and which is still in effect.

§ 97.7 Control operator required

(c.) A CEPT radio-amateur license issued to the person by the country of which the person is a citizen. The person must not:

(1) Be a resident alien or citizen of the United States regardless of any other citizenship also held,

(2) Hold an FCC-issued amateur operator license nor reciprocal permit for alien amateur licensee;

(3) Be a prior amateur service licensee whose FCC-issued license was revoked, suspended for less than the balance of the license term and the suspension is still in effect, suspended for the balance of the license term and

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International Amateur Radio Permit

The IARP is a document issued pursuant to the terms of the Inter-American Convention on an International Amateur Radio Permit by a country signatory to that Convention, other than the United States. Montrouis, Haiti. AG/doc. 3216/95.

The CITEL countries are Argentina, Brazil, Canada, Chile, Colombia, Ecuador, Honduras, Mexico, Paraguay, Peru, United States, and Uruguay.

relicensing has not taken place, or surrendered for cancellation following notice of revocation, suspension or monetary forfeiture proceedings; or

(4) Be the subject of a cease and desist order that relates to amateur service operation and which is still in effect.

(d) An IARP issued to the person by the country of which the person is a citizen. The person must not:

(1) Be a resident alien or citizen of the United States regardless of any other citizenship also held,

(2) Hold an FCC-issued amateur operator license nor reciprocal permit for alien amateur licensee;

(3) Be a prior amateur service licensee whose FCC-issued license was revoked, suspended for less than the balance of the license term and the suspension is still in effect, suspended for the balance of the license term and relicensing has not taken place, or surrendered for cancellation following notice of revocation, suspension, or monetary forfeiture proceedings; or

(4) Be the subject of a cease and desist order that relates to amateur service operation and which is still in effect.

§ 97.107 Alien control operator privileges

(c.) The privileges available to a control operator holding a valid CEPT radio-amateur license are as specified elsewhere in this Part provided the holder:

(1) Complies with the terms of the agreement between the CEPT and the United States;

(2) Is not a resident alien or citizen of the United States;

(3) Has not been in any area where radio services are regulated by the FCC for more than 180 days within the immediately preceding five years;

(4) Does not hold an FCC-issued operator/primary station license grant; and

(5) Does not hold an FCC-issued reciprocal permit.

(d) The privileges available to a control operator holding a valid IARP are as specified elsewhere in this part provided the holder:

(1) Complies with the terms and conditions of the Inter-American Convention on an International Amateur Radio Permit (AG/doc. 3216/95)

(2) Is not a resident alien or citizen of the United States;

(3) Has not been in any area where radio services are regulated by the FCC for more than 180 days within the immediately preceding five years;

(4) Does not hold an FCC-issued operator/primary station license grant; and

(5) Does not hold an FCC-issued reciprocal permit.

(e) At any time the FCC may, in its discretion,

modify, suspend, or cancel the reciprocal permit for alien amateur licensee, or the amateur service privileges of any Canadian amateur service licensee, CEPT radio amateur licensee, or IARP permittee within or over any area where radio services are regulated by the FCC.

§ 97.119 Station identification

(f) When the station is transmitting under the authority of a reciprocal permit for alien amateur licensee, a CEPT radio amateur license, or an IARP, an indicator consisting of the appropriate letter-numeral designating the station location must be included before, after, or both before and after, the call sign issued to the station by the licensing country. When the station is transmitting under the authority of an amateur service license issued by the Government of Canada, the station location indicator must be included

after or both before and after the call sign. At least once during each intercommunication, the identification announcement must include the geographical location as nearly as possible by city and state, commonwealth, or possession.

§ 97.301 Authorized frequency bands

(a) For a station having a control operator who has been granted a Technician, Technician Plus, General, Advanced, or Amateur Extra Class operator license or who holds a CEPT radio-amateur license or IARP of any class. (All amateur frequencies above 30 MHz.)

(b) For a station having a control operator who has been granted an Amateur Extra Class operator license or who holds a CEPT radio amateur license Class 1 license or Class 1 IARP. (Amateur frequencies available to the Amateur Extra Class.) 73, Fred, W5YI

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PROPAGATION

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Better HF Propagation Coming!

Bulletin

This issue of *CQ* should reach most readers in time for the CW weekend of the *CQ* World-Wide DX Contest, November 23-24. Here is an updated day-to-day propagation forecast for the weekend made at press time.

Conditions may even be a bit better than we forecast last month. It now looks as if we can expect High Normal conditions on both days of the contest weekend, with a chance that they may climb to Above Normal at times.

The question I am asked most often these days is "When can we expect more sunspots and better HF propagation conditions?" Although it will take another six months for the world's solar experts to define the end of sunspot Cycle 22 and the beginning of Cycle 23, it looks almost certain that these events took place during 1996.

During early September we went to three of the world's top experts for their opinions. The scientists at the Solar-Terrestrial Physics Division of the National Geophysical Data Center (NGDC) in Boulder, Colorado expect the new cycle to begin during December 1996. On the other hand, the experts at NOAA's Space Environment Center (also in Boulder, Colorado) are of the opinion that Cycle 22 ended and the new cycle began during either May or June 1996. Dr. André Koeckelenbergh from the Royal Observatory of Belgium, the official keeper of the world's sunspot records, also points to December 1996 as the date of the big event. A graphical presentation of these expert forecasts of the demise of Cycle 22 is shown in fig. 1.

Another interesting trend of the last days of Cycle 22 and the possible beginning of Cycle 23 is shown graphically in fig. 2. From March 1995 through July 1996 there were varying numbers of days each month when the sun was completely devoid of any spots. The most number of spotless days occurred during April and May 1996. During August 1996, for the first time in a year and a half, spots were observed on every day of the month. When one cycle ends and a new one begins, the sunspots change magnetic polarity and appear at different solar latitudes. It seems that most of the spots observed during August were "new cycle" spots. If this is the case, Cycle 23 began prior to August 1996 and probably during June or July.

The expert opinions are narrowing, and in all likelihood Cycle 23 has already begun and is now on the way up. Next month's column will contain a forecast for the new cycle's expected climb in 1997, and a "guess" as to when its maximum might occur. Better days are coming!

The Royal Observatory of Belgium reports a mean sunspot number of 14 for August 1996. As mentioned previously, there were no spotless days during the month, with daily values ranging from a low of 9 to a high of 23. The

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e-mail: g.jacobs@ieee.org

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for December 1996

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 3, 18, 24, 28	A	A	B	C
High Normal: 7, 9, 15, 19-20 27, 31	A	B	C	C-D
Low Normal: 2, 4-5, 8, 10, 13-14, 16-17, 21-23, 29-30	B	C	D	D-E
Below Normal: 1, 6, 11, 26	C	C-D	D-E	E
Disturbed: 12	C	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 S9 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.

HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.

2. With the propagation index, use the above table to find the expected signal quality associated with the band opening for any date of the month. For example, an opening shown in the charts with a propagation index of 3 will be fair-to-poor (C-D) on Dec. 1st, fair (C) on the 2nd, excellent (A) on the 3rd, fair (C) on the 4th and 5th, etc. Santa Claus is expected to bring good (B) conditions on the 25th!

mean level for August results in a 12-month smoothed sunspot number of 10 centered on February 1996. A smoothed sunspot number of approximately 10 is forecast for December 1996 as the new cycle begins its climb upward.

A corresponding 10.7 cm mean solar flux level of 73 was reported for August 1996 by the Dominion Radio Astrophysical Observatory at Penticton, B.C. This results in a smoothed solar flux value of 72 centered on February 1996. A smoothed 10.7 cm flux level of approximately 72 is expected during December 1996.

December Band Openings

Twenty meters should continue to be the best band for worldwide DX during December. The band should open on most days just after sunrise and remain open until an hour or two after sunset. Signals should peak towards Europe and the east about noon, towards Africa during the early afternoon, towards South America during the late afternoon, towards the Pacific area and Australasia during the early evenings, and towards Antarctica a bit later in the evening. When conditions are High or Above Normal, the band may remain open for DX until as late as midnight. Look for some fairly good DX openings on 15 and 17 meters when conditions are

High or Above Normal. Check for openings towards Europe, Africa, and the east before noon; towards South America during the early afternoon; and towards the Pacific and Australasia during the late afternoon. It may be possible for some 10 and 12 meter DX openings when conditions are High or Above Normal. The best bet is for openings towards South America during the early afternoon, although the band may also open briefly towards Africa from the eastern half of the country and towards the Pacific and Australasia from the western half.

With hours of darkness at a maximum in the northern hemisphere, and static levels at seasonally low values, a considerable improvement is expected in DX propagation during the hours of darkness on the 30, 40, 80, and 160 meter bands. Thirty and 40 meters should open for DX during the early afternoon, with the first signals coming from Europe. After sundown the band should open to Africa and to South America. Signals from the Pacific area, the Far East, and Australasia should peak just before sunrise, but the band may remain open for an hour or two later. Fairly good DX is also expected on 80 meters between sundown and sunrise. Signals from Europe, Africa, and the east should peak before midnight; signals from South America should be in for most of the hours of darkness; signals from Australasia and the Pacific area should peak just before sunrise. There will be many nights during December when 80 meters will be the best band for DX propagation. Check 30, 40, and 80 for long-path openings during the sunrise and sunset periods.

This should be another good year for 160 meter DX conditions. Look for openings towards Europe and the east as early as 8 PM in the EST time zone, with the band remaining open until 2 AM. Check for European openings in the CST time zone between 8 PM and 1 AM, from 8 PM to midnight in the MST zone, and to 11 PM in the PST zone. Some openings towards the south, especially to the Caribbean area, should be possible from about 10 PM to 2 AM in all time zones, and possibly right up until local sunrise. Openings towards the Pacific and Australasia favor west coast stations, but it will be worth looking for these openings in all time zones between 4 AM and sunrise. A good rule to remember about 160 meter DX openings is that conditions tend to peak about the time that the sun rises at the easternmost terminal of a DX path, or during the night-to-day "grayline" period.

Short-skip conditions during December favor the 40 and 80 meter bands for daytime openings less than 250 miles in length. Try 80 and 160 meters for this same distance at night. For openings between 250 and 750 miles, 40 meters should be optimum during the day and both 80 and 160 meters at night. Try 20 meters during the day for openings between 750 and 1300 miles; 30, 40, or 80 meters from sunset to midnight; and 80 meters from midnight through the sunrise period. Try 30 and 40 meters again for an hour or so after sunrise. For

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HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (15 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. An ** indicates best time to check for 10 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 standard time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 8 hours in PST Zone, 7 hours in MST Zone, 6 hours in CST Zone, and 5 hours in EST Zone. For example, 13 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 04 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

December 1996 to February 1997 Time Zone: EST (24-Hour Time) EASTERN USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Central	09-11 (1)	07-08 (1)	06-07 (1)	15-16 (1)
Europe & North Africa		08-09 (2)	07-09 (4)	16-17 (2)
		09-11 (3)	09-11 (3)	17-19 (3)
		11-13 (2)	11-13 (4)	19-00 (4)
		13-14 (1)	13-14 (3)	00-02 (2)
			14-15 (2)	02-03 (3)
			15-17 (1)	03-05 (1)
				17-19 (1)*
				19-20 (2)*
				20-02 (3)*
				02-03 (2)*
				03-04 (1)*
Northern & Eastern Europe	08-10 (1)	07-08 (1)	06-07 (1)	16-19 (1)
		08-10 (2)	07-09 (3)	19-23 (2)
		10-12 (1)	09-12 (2)	23-03 (1)
			12-14 (1)	19-02 (1)*
Eastern Mediterranean & Middle East	08-10 (1)	08-09 (1)	06-09 (1)	18-20 (1)
		09-10 (3)	09-10 (2)	20-22 (2)
		10-11 (2)	10-13 (3)	22-00 (1)
		11-12 (1)	13-15 (2)	20-23 (1)*
			15-17 (1)	
West Africa	09-11 (1)	07-08 (1)	06-07 (1)	18-22 (1)
	11-13 (2)	08-09 (2)	07-09 (2)	22-00 (2)
	13-15 (1)	09-12 (3)	09-13 (1)	00-03 (1)
		12-14 (4)	13-15 (2)	03-04 (2)
		14-15 (3)	15-17 (4)	00-02 (1)*
		15-16 (2)	17-18 (3)	
		16-17 (1)	18-19 (2)	
			19-20 (1)	
East & Central Africa	10-13 (1)	08-10 (1)	07-13 (1)	18-00 (1)
		10-12 (2)	13-15 (2)	
		12-13 (3)	15-17 (3)	
		13-15 (2)	17-18 (2)	
		15-16 (1)	18-19 (1)	
Southern Africa	09-10 (1)	07-09 (1)	07-08 (1)	18-19 (1)
	10-12 (2)	09-12 (2)	12-14 (1)	19-21 (2)
	12-13 (1)	12-14 (3)	14-15 (2)	21-00 (1)
		14-15 (1)	15-17 (3)	19-22 (1)*
			17-18 (2)	
			18-20 (1)	
Central & South Asia	Nil	08-10 (1)	06-07 (1)	06-08 (1)
		17-19 (1)	07-09 (2)	20-22 (1)
			09-11 (1)	
			18-21 (1)	

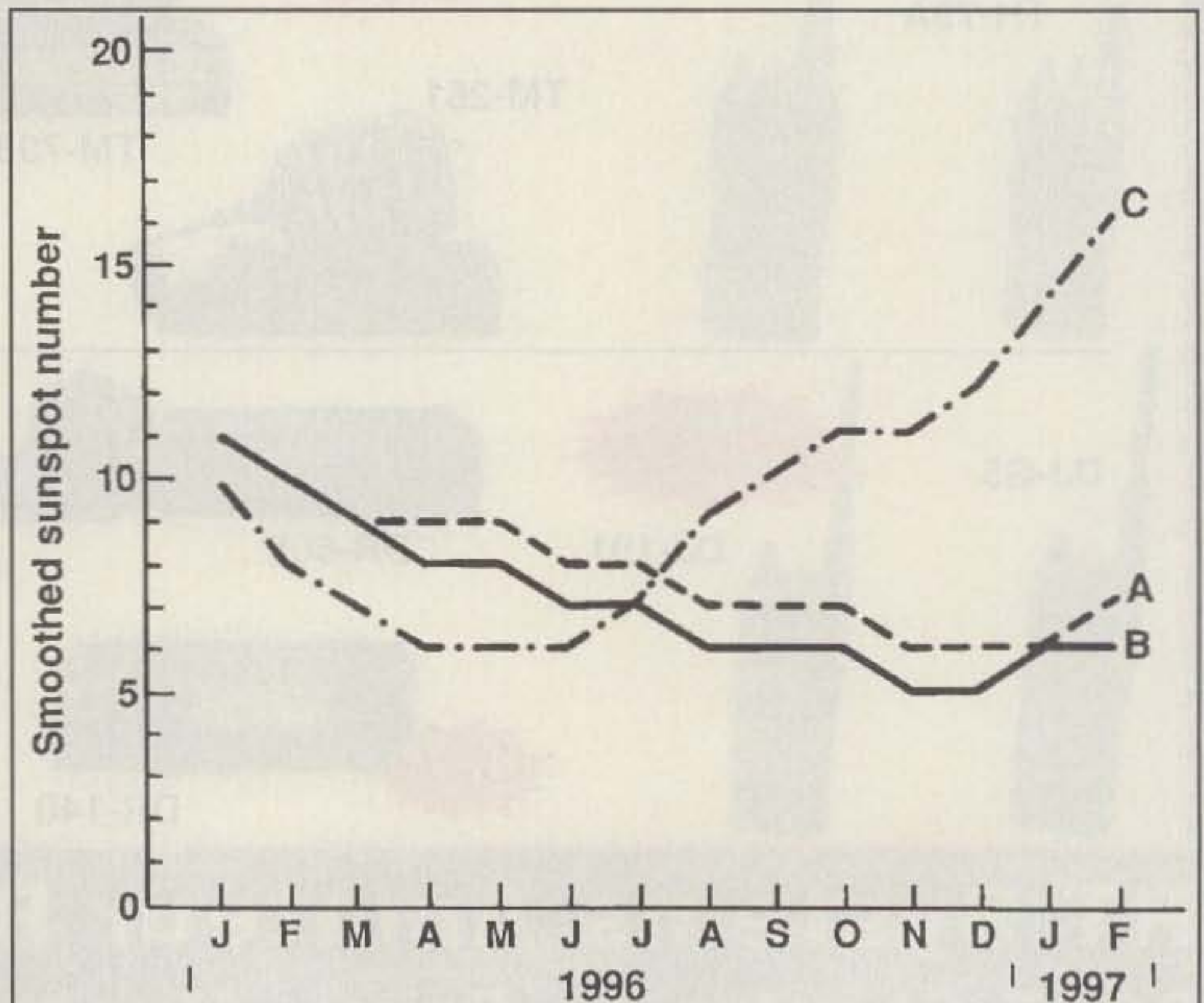


Fig. 1— Expert opinions for the date on which Cycle 22 ended: (A) NGDC, Boulder; (B) Royal Observatory of Belgium; (C) NOAA/SEC, Boulder.

Southeast Asia	Nil	08-11 (1) 17-19 (1)	06-07 (1) 07-09 (2) 09-12 (1) 19-21 (1)	06-08 (1) 20-22 (1)
Far East	Nil	16-17 (1) 17-19 (2) 19-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-21 (1)	05-08 (1) 05-07 (1)*
South Pacific & New Zealand	13-17 (1)	11-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	03-07 (1) 07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-22 (1)	01-02 (1) 02-04 (2) 04-07 (3) 07-08 (2) 08-09 (1) 04-05 (1)* 05-07 (2)* 07-08 (1)*
Australasia	16-18 (1)	09-12 (1) 15-16 (1) 16-18 (2) 18-20 (1)	06-07 (1) 07-10 (2) 10-14 (1) 14-16 (2) 16-18 (1) 18-20 (2) 20-22 (1)	03-05 (1) 05-07 (2) 07-09 (1) 05-08 (1)*
Caribbean, Central America & Northern Countries of South America	09-10 (1) 10-12 (2) 12-14 (1) 14-16 (2) 16-17 (1)	07-08 (1) 08-11 (3) 11-13 (2) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (2) 07-09 (4) 09-11 (3) 11-15 (2) 15-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-22 (1) 22-00 (2) 00-06 (1)	17-18 (1) 18-19 (2) 19-21 (3) 21-04 (4) 04-05 (3) 05-06 (2) 06-07 (1) 19-20 (1)* 20-22 (2)* 22-02 (3)* 02-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-12 (1) 12-15 (2) 15-16 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-16 (4) 16-17 (3) 17-18 (1)	13-14 (1) 14-15 (2) 15-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-22 (1) 22-00 (2) 00-03 (1) 05-06 (1) 06-08 (2) 08-09 (1)	19-21 (1) 21-02 (2) 02-05 (1) 21-03 (1)*
McMurdo Sound, Antarctica	Nil	07-10 (1) 16-18 (1)	07-09 (1) 17-18 (1) 18-22 (2) 22-00 (1) 00-02 (2) 02-03 (1)	00-05 (1)

December 1996 to February 1997
Time Zones: CST & MST (24-Hour Time)
CENTRAL USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Southern Europe & North Africa	09-11 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-12 (2) 12-13 (1)	06-08 (1) 08-09 (2) 09-12 (3) 12-13 (2) 13-15 (1) 22-00 (1)	16-18 (1) 18-20 (2) 20-00 (1) 00-02 (2) 02-03 (1) 17-20 (1)* 20-01 (2)* 01-02 (1)*
Northern, Central & Eastern Europe	Nil	07-08 (1) 08-10 (2) 10-12 (1)	07-08 (1) 08-11 (2) 11-13 (1) 23-01 (1)	17-19 (1) 19-22 (2) 22-01 (1) 19-00 (1)*
Eastern Mediterranean & Middle East	Nil	08-11 (1)	06-09 (1) 09-12 (2) 12-14 (1) 22-00 (1)	18-20 (1) 20-22 (2) 22-23 (1) 20-22 (1)*
West & Central Africa	08-10 (1) 10-12 (2) 12-13 (1)	07-09 (1) 09-11 (2) 11-13 (3) 13-14 (2) 14-15 (1)	06-11 (1) 11-13 (2) 13-16 (3) 16-17 (2) 17-19 (1) 22-02 (1)	18-21 (1) 21-23 (2) 23-01 (1) 19-22 (1)*
East Africa	10-12 (1)	07-11 (1) 11-13 (2) 13-14 (1)	06-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-19 (1)	19-23 (1)
Southern Africa	08-09 (1) 09-12 (2) 12-13 (1)	07-09 (1) 09-11 (2) 11-13 (3) 13-15 (2)	07-13 (1) 13-15 (2) 15-17 (3) 17-18 (2)	18-19 (1) 19-21 (2) 21-23 (1)

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		15-16 (1)	18-20 (1)	
			23-01 (1)	
Central & South Asia	Nil	08-10 (1) 19-21 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-22 (1)	06-08 (1) 19-21 (1)
Southeast Asia	Nil	08-11 (1) 17-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 16-17 (1) 17-19 (2) 19-20 (1)	04-07 (1)
Far East	Nil	07-09 (1) 16-17 (1) 17-19 (2) 19-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 15-17 (1) 17-19 (2) 19-21 (1)	02-04 (1) 04-06 (2) 06-07 (1) 04-07 (1)*
South Pacific & New Zealand		12-14 (1) 14-16 (2) 16-18 (1)	10-12 (1) 12-14 (2) 14-17 (3) 17-19 (2) 19-20 (1)	06-07 (1) 07-09 (3) 09-12 (2) 12-15 (1) 15-17 (2) 17-20 (3) 20-21 (2) 21-22 (1) 02-04 (1)
Australasia		14-15 (1) 15-17 (2) 17-18 (1)	09-11 (1) 13-15 (1) 15-17 (3) 17-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-18 (1) 18-21 (2) 21-22 (1)
Caribbean, Central America & Northern Countries		08-10 (1) 10-14 (2) 14-16 (1)	07-08 (1) 08-09 (2) 09-13 (3) 13-16 (4) 16-17 (2)	06-07 (2) 07-11 (3) 11-14 (2) 14-16 (3) 16-18 (4)

of South America		17-19 (1)	18-19 (3) 19-20 (2) 20-22 (1) 22-00 (2) 00-06 (1)	19-21 (1)* 21-01 (2) 01-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay		08-11 (1) 11-15 (2) 15-17 (1)	07-08 (1) 08-13 (2) 13-15 (4) 15-16 (3) 16-17 (2) 17-19 (1)	05-06 (1) 06-08 (2) 08-10 (1) 12-14 (1) 14-15 (2) 15-17 (3) 17-19 (4) 19-20 (2) 20-22 (1) 22-00 (2) 00-03 (1)
McMurdo Sound, Antarctica	Nil	07-09 (1) 16-18 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-18 (1) 18-22 (2) 22-00 (1) 00-02 (2) 02-03 (1)	22-05 (1)

Central, Northern & Eastern Europe	Nil	07-09 (1)	06-07 (1) 07-10 (2) 10-13 (1) 23-01 (1)	17-00 (1) 19-23 (1)*
Eastern Mediterranean & Middle East	Nil	07-09 (1)	06-07 (1) 07-09 (2) 09-11 (1) 21-23 (1)	18-21 (1)
West & Central Africa	09-12 (1)	07-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-14 (1)	06-10 (1) 10-13 (2) 13-16 (3) 16-18 (2) 18-19 (1)	18-22 (1)
East Africa	Nil	08-11 (1)	08-10 (1) 13-16 (1) 21-23 (1)	18-20 (1)
Southern Africa	08-11 (1)	06-08 (1) 08-10 (2) 10-12 (3) 12-13 (2) 13-14 (1)	07-11 (1) 11-13 (2) 13-16 (3) 16-18 (2) 18-19 (1) 00-02 (1)	18-20 (1)
Central & South Asia	Nil	09-11 (1) 17-19 (1)	08-10 (1) 17-19 (1) 19-20 (2) 20-21 (1)	05-07 (1) 18-20 (1)
Southeast Asia	15-18 (1)	09-11 (1) 15-16 (1) 16-18 (2) 18-19 (1)	07-09 (1) 09-11 (2) 11-16 (1) 16-19 (2) 19-20 (1)	03-08 (1)
Far East	15-17 (1)	14-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1)	08-10 (1) 13-14 (1) 14-15 (2) 15-18 (3) 18-19 (2) 19-21 (1)	00-01 (1) 01-03 (2) 03-06 (3) 06-08 (2) 08-10 (1) 02-08 (1)*
South Pacific & New Zealand		12-14 (1) 14-16 (2) 16-17 (1)	09-12 (1) 12-14 (2) 14-16 (4) 16-17 (3) 17-18 (2) 18-20 (1)	07-08 (1) 08-10 (2) 10-15 (1) 15-16 (2) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1) 03-05 (1)
Australasia		13-15 (1) 15-17 (2) 17-18 (1)	08-12 (1) 12-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-10 (3) 10-12 (2) 12-17 (1) 17-18 (2) 18-20 (3) 20-21 (2) 21-22 (1)
Caribbean, Central America & Northern Countries		09-11 (1) 11-14 (2) 14-16 (1)	06-07 (1) 07-08 (2) 08-12 (3) 12-14 (4) 14-15 (3) 15-16 (2) 16-17 (1)	06-07 (2) 07-09 (3) 09-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-20 (2) 20-22 (1) 22-00 (2) 00-06 (1)
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay		10-12 (1) 12-14 (2) 14-15 (1)	07-10 (1) 10-12 (2) 12-13 (3) 13-15 (4) 15-16 (2) 16-18 (1)	08-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-23 (1) 23-01 (2) 01-06 (1) 06-08 (2)
McMurdo Sound, Antarctica	Nil	07-09 (1) 12-15 (1) 15-17 (2) 17-18 (1)	16-18 (1) 18-19 (2) 19-22 (3) 22-01 (2) 01-03 (1) 07-09 (1)	23-05 (1)

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Western & Southern Europe & North Africa	07-09 (1)	07-08 (1)	05-07 (1)	18-20 (1)
		08-10 (2)	07-10 (2)	20-23 (2)
		10-11 (1)	10-12 (1)	23-01 (1)
			23-01 (1)	19-23 (1)*

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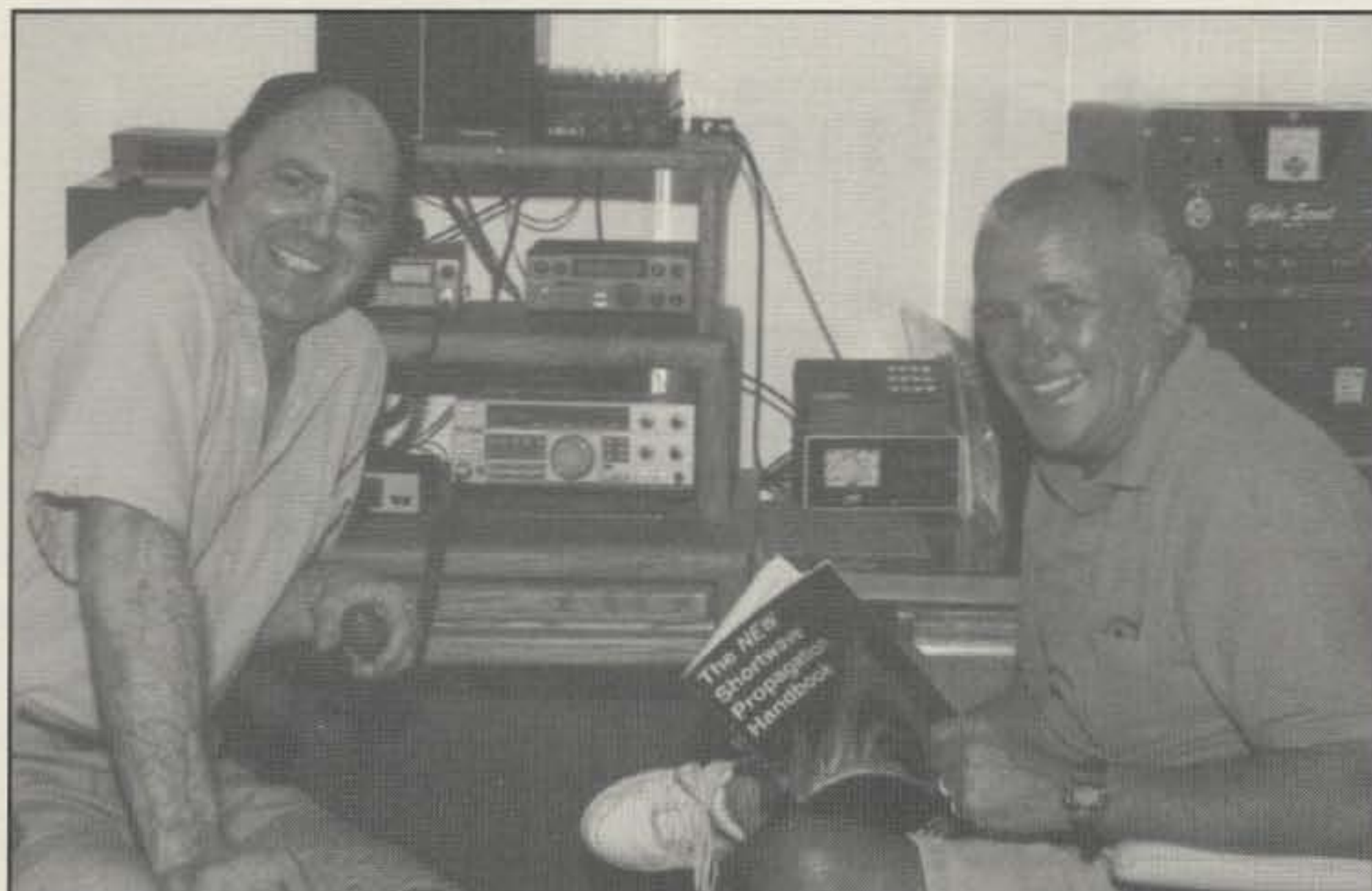


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CIRCLE 51 ON READER SERVICE CARD

** Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.
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.*



At a secret meeting in Fountain Hills, Arizona in August, Ted Cohen, N4XX (on the left), and Bob Rose, K6GKU, in coordination with George Jacobs, W3ASK, put the finishing touches on the design for sunspot Cycle 23. George, Ted, and Bob, co-authors of The NEW Shortwave Propagation Handbook, are predicting a nice jump in the sunspot numbers during 1997, with openings on 15, 12, and 10 meters not far behind. It may be a bit chilly as you read this, but on the day Ted and Bob got together, the temperature was a toasty 105 degrees F—a small reminder, indeed, of what the Sun can cook up when it puts its mind to it. (Photo by Susan Cohen and Bob Rose.)

openings between 1300 miles and the maximum one-hop distance of 2300 miles, 17, 15, and 20 meters should be optimum during the day; 20, 30, and 40 meters from sundown to midnight; and 40 and 80 meters from midnight to sunrise. Ten and 12 meters should also provide some short-skip openings between 1300 and 2300 miles during the daylight period, when conditions are High Normal or better.

This month's column contains DX Propagation Charts valid through February 1997.

VHF Ionospheric Openings

Quite a bit of meteor shower activity is expected during December. *Geminids*, a major meteor shower, should take place between December 3rd and 15th. It is expected to peak with a

meteor rate of about one a minute on December 12th. This should permit some fairly good meteor-type openings on 10, 6, and 2 meters. A second, but less intense shower period, called *Ursids*, is expected later in the month. This shower should take place between December 16th and 23rd, peaking on the 21st with a meteor rate of about 15 an hour.

A secondary seasonal peak in sporadic-E propagation usually takes place during December (the major peak is during the summer months). This should result in occasional short-skip openings on 10 and 6 meters as short as a few hundred miles and as long as 1400 miles.

Some auroral-type VHF ionospheric openings are also likely to occur during December, especially when ionospheric conditions on the HF bands are Below Normal or Disturbed. Check the Last-Minute Forecast at the beginning of this column for those days that are forecast to be in these categories during the month.

For the very patient, a trans-equatorial-scatter, or TE, opening may be possible on 6 meters between the southern half of the USA and South America. Openings, if any, will likely be few and far between, and will be distorted by flutter fading. The best time to try for a TE opening is between 8 and 11 PM.

Season's Greetings

The editor of this column would like to take this opportunity to extend his warmest greetings for the Holiday Season to everyone, everywhere. My best wishes for good health, peace, and improved HF propagation as the new sunspot Cycle 23 begins its climb upwards.

73, George, W3ASK

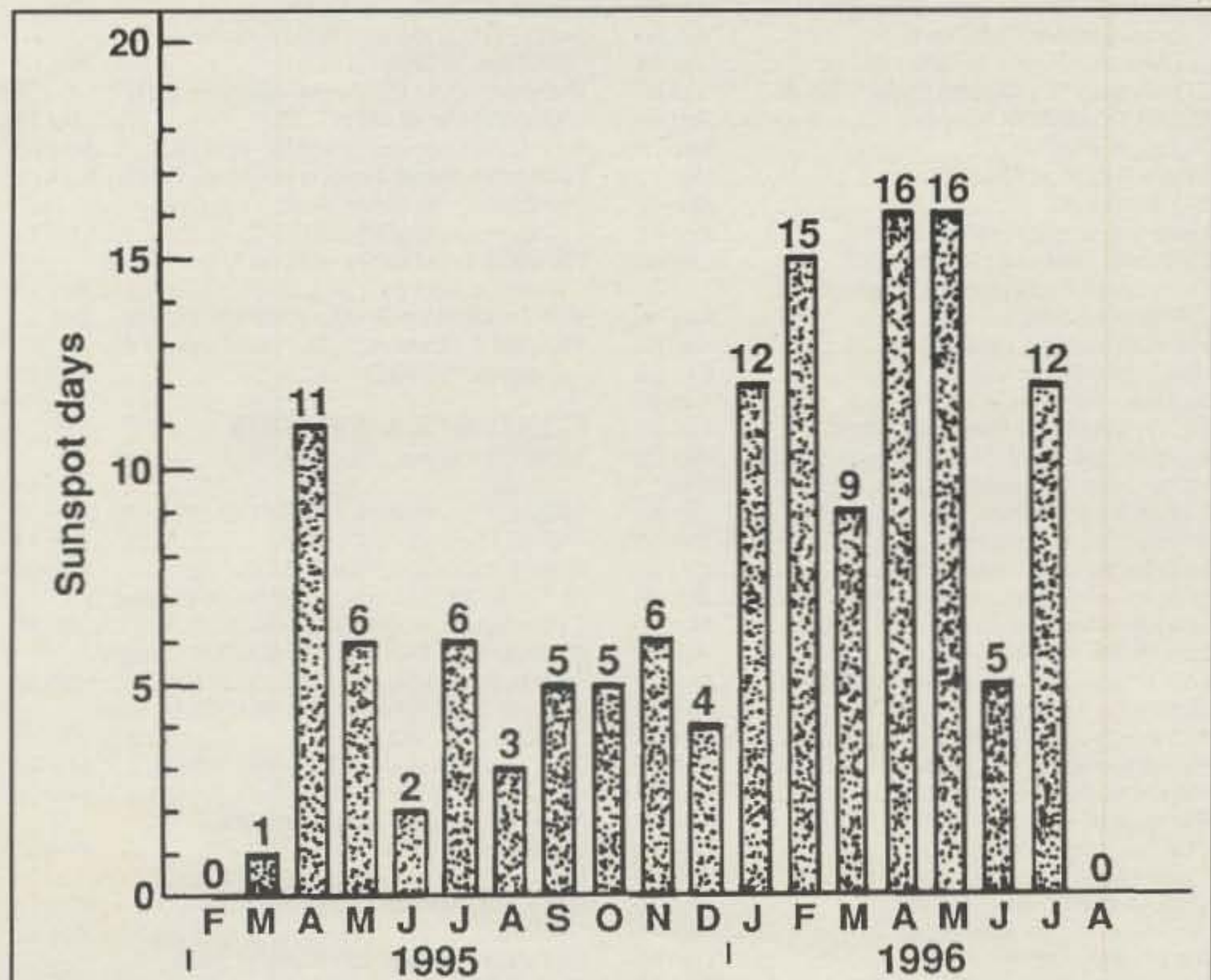


Fig. 2— Number of spotless days reported for each month from February 1995 to August 1996. Note that for the first time in 18 months there were no spotless days observed during August 1996. This may be an indication that new sunspot Cycle 23 is underway.

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CIRCLE 129 ON READER SERVICE CARD

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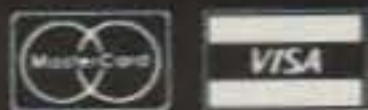
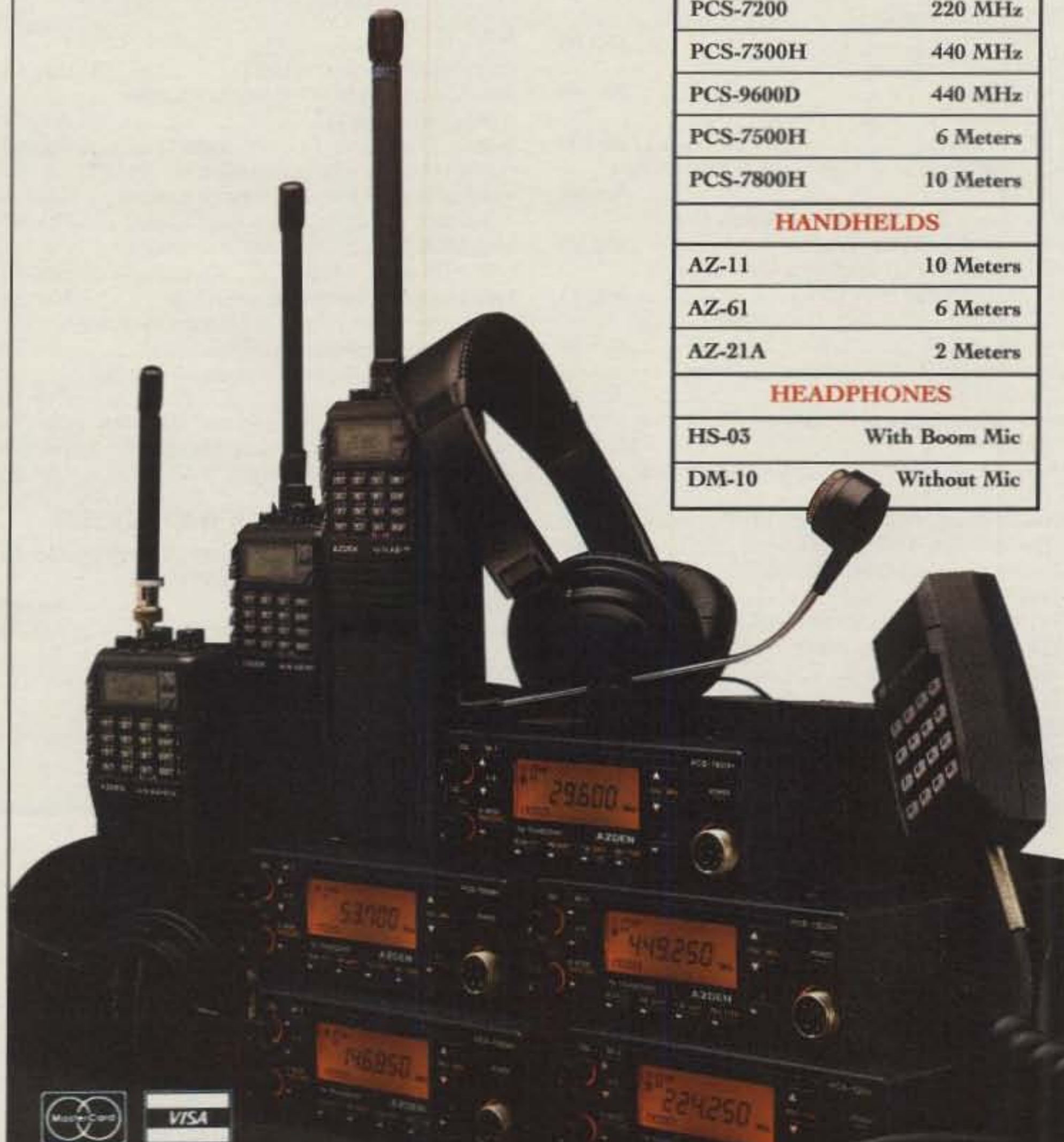
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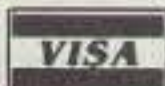


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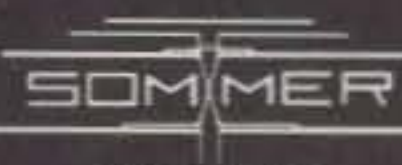
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