ICD 08241

Amateur Radio

SERVING AMATEUR RADIO SINCE 1945
APRIL 1998

CQ

In This Issue:

Cover: Warren (Rev) Norton, WS7W, Casper, WY.

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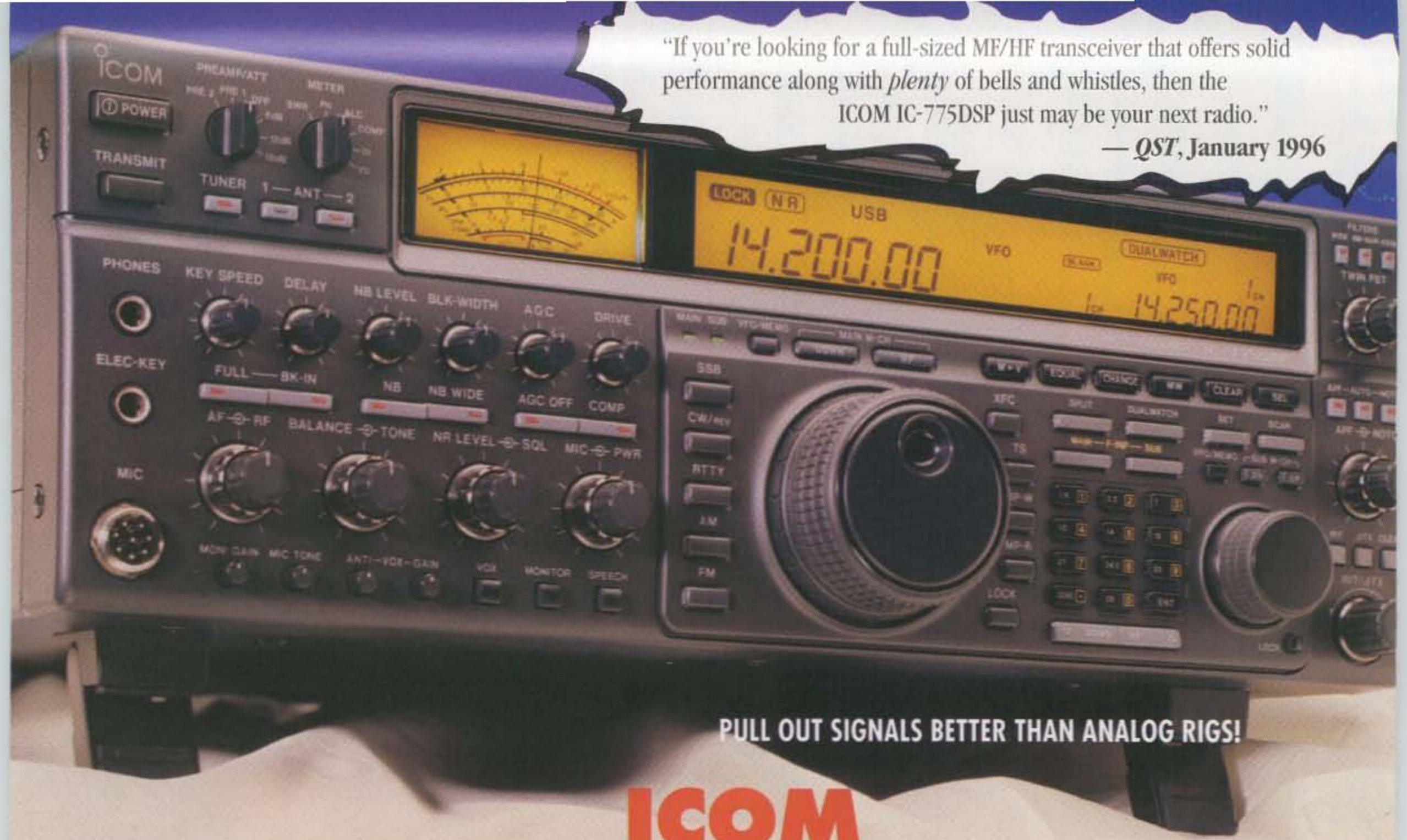
THE RADIO AMATEUR'S JOURNAL



"If you're looking for a full-sized MF/HF transceiver that offers solid performance along with *plenty* of bells and whistles, then the ICOM IC-775DSP just may be your next radio."

— *QST*, January 1996

PULL OUT SIGNALS BETTER THAN ANALOG RIGS!

ICOM IC-775 if-dsp

REVOLUTIONARY IF-DSP TECHNOLOGY ON TRANSMIT AND RECEIVE!

UNSURPASSED SIGNAL QUALITY!

Features you've only dreamed of:

- ICOM DSP on Transmit and Receive
- Noise Blanker/Manual Notch
- Twin Pass Band Tuning
- Dual Receive
- Built-In Automatic Antenna Tuner
- 200 Watt MOS FET PA with built-in Power Supply
- Digital Noise Reduction & Filtering:
  - Digital Low and High Pass Filters
  - Digital Modulation/Demodulation
  - Digital Automatic Notch
  - Digital Ultra-Narrow CW Filter
  - Digital Automatic APF (Audio Peak Filter)
- Rx 100 kHh -29.990 MHz
- New Single Crystal Control DDS
- RTTY/DATA Mode
- HF Packet Ready
- IF Notch
- APF (Audio Peak Filter)
- Quick-Split Function
- Memory CW Keyer
- CW Pitch Control & CW Reverse Mode
- Front and Back CW Key Jacks
- 1Hz Tuning and Display
- Large LCD with CFL Backlighting
- Triple Band Stacking Register
- 99 Memory Channels
- Front Panel Switch Control Dual Antenna System
- Selectable Pre-Amp (2 Levels) and RF Attenuator (3 Levels)
- Built-In Tone Encoder
- VOX
- Tx Frequency Check
- Noise Blanker with Adjustable Level and Width
- AGC with Adjustable Time Constant
- RF Speech Compressor
- Optional SSB filters
- Optional Speech Synthesizer

Serious DX'ers require serious rigs. ICOM's IC-775DSP is engineered new from the ground up using Next Generation design and components, bringing unsurpassed signal quality to the discriminating DX'er. Pull out signals better than analog rigs can!

Transmit DSP at the modulation stage produces a high-quality transmit signal that analog methods just can't match.

Receive DSP enhances very weak signals by reducing noise before it enters the audio amplifier!

Advanced Interference Rejection and Noise Reduction features provide incredibly clear signals! Digital automatic notch, digital low/high pass filters, digital ultra-narrow CW filter, manual IF notch, manual audio-peak filter, CW reverse mode and noise blanker (with adjustable level and width).

Dual Watch with two independent tuning knobs allows simultaneous monitoring of two different frequencies.

Twin Pass Band Tuning allows you to zero in on and isolate a signal from both pass band sides . Ideal for contests, nets, etc....

200 Watt MOS FET PA with Built-in Power Supply provides excellent signal quality, good IMD characteristics and full duty cycle operation.

High Speed, Built-in Antenna Tuner matches most available ham antennas, providing increased useable bandwidth.

Advanced DDS (Direct Digital Synthesizer) system uses an advanced PLL and a single crystal, providing very high stability.

CW Enthusiasts will love the electronic memory keyer, CW pitch control, CW reverse, full break-in (QSK) and two key jacks.

For more information about the IC-775DSP, visit your local ICOM dealer, or **call ICOM's brochure hotline: (425) 450-6088.**

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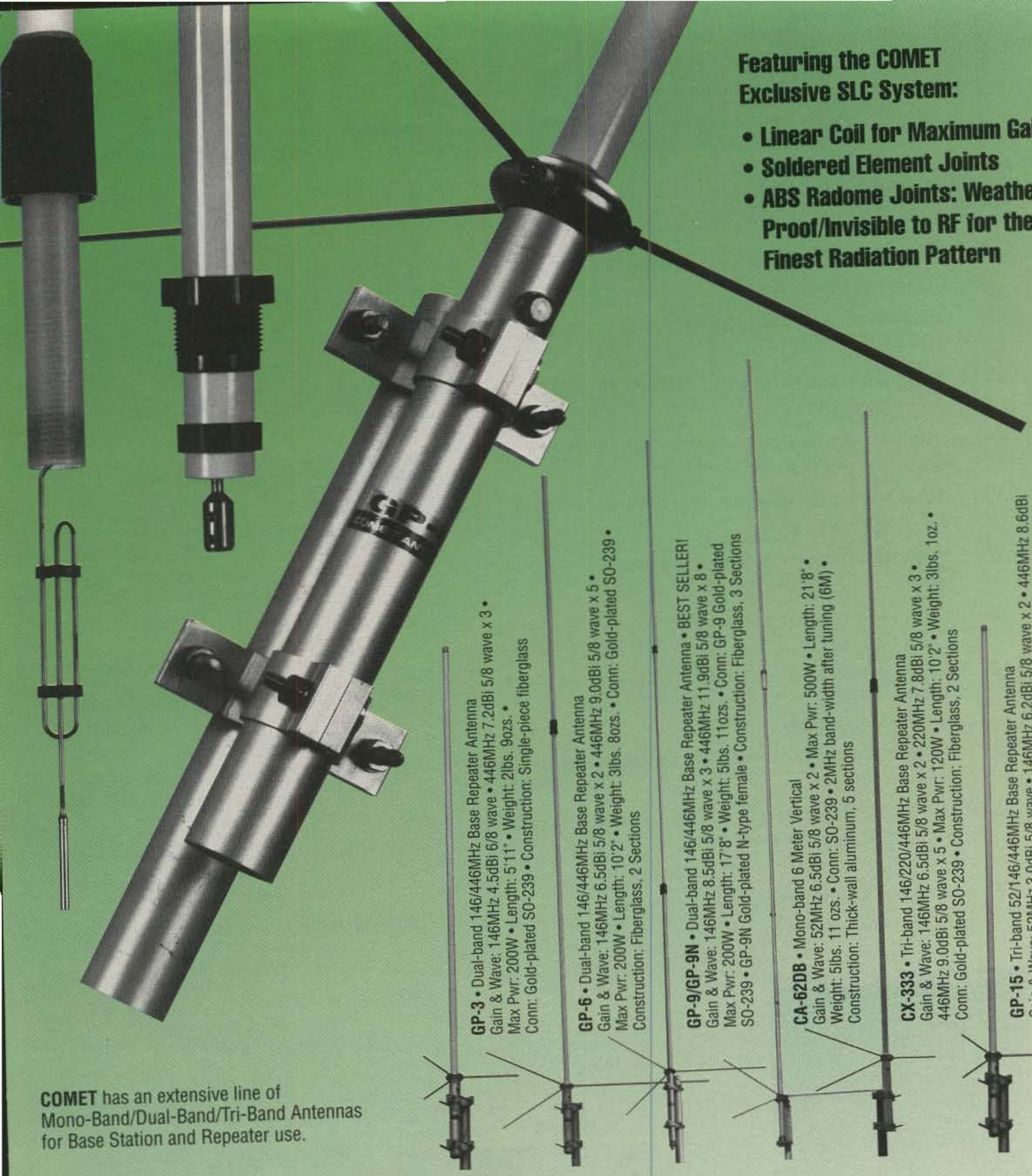

Featuring the COMET Exclusive SLC System:

- **Linear Coil for Maximum Gain**
- **Soldered Element Joints**
- **ABS Radome Joints: Weather Proof/Invisible to RF for the Finest Radiation Pattern**

GP-3 • Dual-band 146/446MHz Base Repeater Antenna
Gain & Wave: 146MHz 4.5dBi 6/8 wave • 446MHz 7.2dBi 5/8 wave x 3 •
Max Pwr: 200W • Length: 5'11" • Weight: 2lbs. 9ozs. •
Conn: Gold-plated SO-239 • Construction: Single-piece fiberglass

GP-6 • Dual-band 146/446MHz Base Repeater Antenna
Gain & Wave: 146MHz 6.5dBi 5/8 wave x 2 • 446MHz 9.0dBi 5/8 wave x 5 •
Max Pwr: 200W • Length: 10'2" • Weight: 3lbs. 8ozs. • Conn: Gold-plated SO-239 •
Construction: Fiberglass, 2 Sections

GP-9/GP-9N • Dual-band 146/446MHz Base Repeater Antenna • BEST SELLER!
Gain & Wave: 146MHz 8.5dBi 5/8 wave x 3 • 446MHz 11.9dBi 5/8 wave x 8 •
Max Pwr: 200W • Length: 17'8" • Weight: 5lbs. 11ozs. • Conn: GP-9 Gold-plated
SO-239 • GP-9N Gold-plated N-type female • Construction: Fiberglass, 3 Sections

CA-62DB • Mono-band 6 Meter Vertical
Gain & Wave: 52MHz 6.5dBi 5/8 wave x 2 • Max Pwr: 500W • Length: 21'8" •
Weight: 5lbs. 11 ozs. • Conn: SO-239 • 2MHz band-width after tuning (6M) •
Construction: Thick-wall aluminum, 5 sections

CX-333 • Tri-band 146/220/446MHz Base Repeater Antenna
Gain & Wave: 146MHz 6.5dBi 5/8 wave x 2 • 220MHz 7.8dBi 5/8 wave x 3 •
446MHz 9.0dBi 5/8 wave x 5 • Max Pwr: 120W • Length: 10'2" • Weight: 3lbs. 1oz. •
Conn: Gold-plated SO-239 • Construction: Fiberglass, 2 Sections

GP-15 • Tri-band 52/146/446MHz Base Repeater Antenna
Gain & Wave: 52MHz 3.0dBi 5/8 wave • 146MHz 6.2dBi 5/8 wave x 2 • 446MHz 8.6dBi
5/8 wave x 4 • Max Pwr: 300W • Length: 7'11" • Weight: 3lbs. 1oz. • Conn: Gold-plated
SO-239 • 2MHz band-width after tuning (6M) • Construction: Single-piece fiberglass

COMET has an extensive line of
Mono-Band/Dual-Band/Tri-Band Antennas
for Base Station and Repeater use.

For a complete catalog of **COMET** Antenna products call or visit your local dealer. Or, contact **NCG Company** at 800/962-2611. Use **COMET** products, and enjoy amateur radio to it's fullest!

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CQ Amateur Radio

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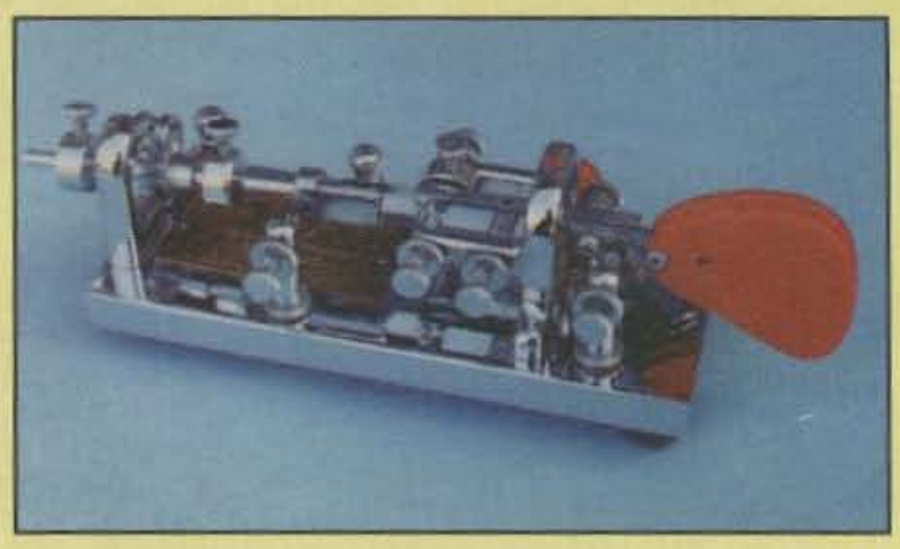
FEATURES



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DEPARTMENTS

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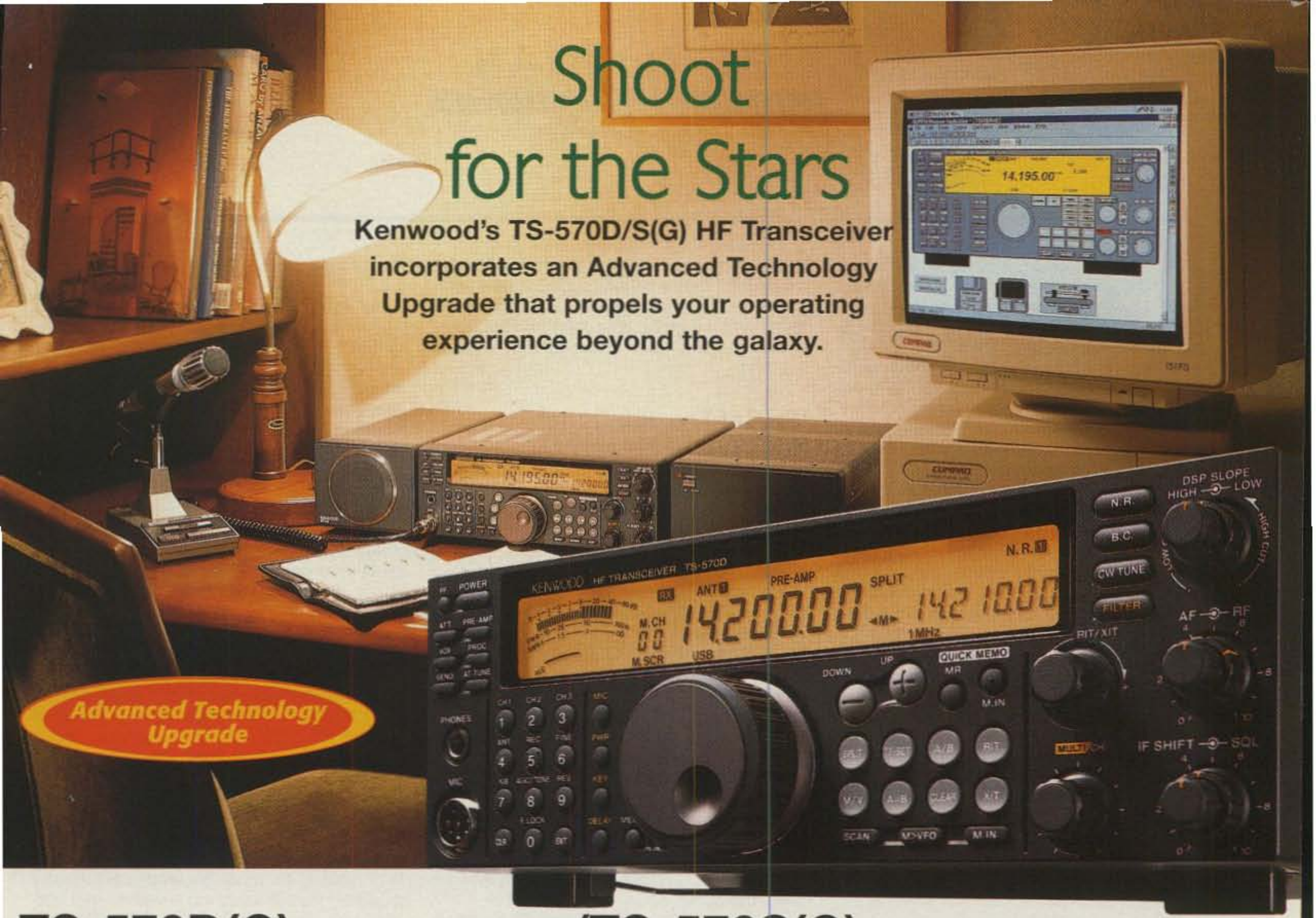
ON THE COVER: This efficient and attractive setup is the operating position of Warren (Rev) Norton, WS7W, out in Casper, Wyoming. The smile is absolutely authentic. You'd smile, too, if you had just received your long-sought QSL from TT8KM! (Photo by Larry Mulvehill, WB2ZPI)

Shoot for the Stars

Kenwood's TS-570D/S(G) HF Transceiver incorporates an Advanced Technology Upgrade that propels your operating experience beyond the galaxy.



Advanced Technology Upgrade

TS-570D(G) HF TRANSCEIVER/TS-570S(G) HF + 6M TRANSCEIVER

Kenwood has not been standing still since the introduction of the TS-570D/S HF Transceiver last year. Now you can command even more of Kenwood's advanced DSP technology with the G model.

The **DSP** filters and extracts signals with digital technology that is unmatchable with standard analog circuits. It provides **CD-class transmit and receive audio quality** that can be shaped to your needs, and two powerful noise reduction systems: **Line Enhancer Method** for SSB/AM modes, and **Speech Processing by Auto Correlation** (SPAC) for CW mode. DSP also enables the **CW-Auto Tune** feature that automatically zero-beats CW signals.

The **Extensive Memory Functions** provide a bank of 100 memory positions split into 90 standard channels for general operation and 10 for programmable VFO, programmable scan and long-term memory. Memory contents can be scrolled, copied or locked out. In addition there are **5 quick memories** for storing frequencies and modes on the fly, perfect for the busy DX contester.

The powerful **Menu System** incorporates **46 menu features** and an **on-line guide** for instant reference. The **large amber backlit LCD display** provides 4 light levels for clear readability under any lighting conditions.

The TS-570D/S has no shortcomings in the construction and performance area. The **continuous-duty 100 watt transmitter** incorporates a large heavy-duty heat sink with integrated cooling fan for non-stop operation even under extreme environmental conditions. The **wide-band receiver** is rock-stable from 500 kHz through 30 MHz with **dual pre-amps** and **dual bandpass filters** for exceptional selectivity and sensitivity.

With the features and performance of a high-end radio integrated into an affordable mobile-size package, the TS-570D/S is the perfect choice for the field or to build a full station around at home.

- Beat cancel
- 2 position antenna switch
- CW auto tune adjust (a world's first)
- Channel scan, program band scan, memory scan with channel lock-out and group channel scan, all with TO (time operated) or CO (carrier operated) resume modes
- Compact 10-5/8 inch by 3-3/4 inch front panel size for any travel or installation requirement
- Preset auto antenna tuner with 18 sub-bands
- Variable electronic keyer (0 and 100 wpm)
- Packet and FSK features
- RCP-2 software for PC-based display and memory configurations available via the Internet
- Full functionality on 6M (TS-570S) including DSP, 100 watts output and preset Auto Antenna Tuner
- QRP output adjustable from 5 to 100 watts

TS-570D/S (G) new features

■ TX sound quality monitor with 9-step monitor volume for absolute control over voice quality ■ NR1 (SSB) is operator controllable in 9-step increments, or automatically tracks input signal strength ■ New CW DSP Filters (80 Hz, 150 Hz and 500 Hz) give you a total of 11 user-selectable filters ■ NR1 and NR2 settings can now re-configure automatically when changing mode groups (SSB/AM/FM to CW/FSK) ■ Manual weight feature (with built-in electronic keyer) for adjusting the relative length of dots and dashes in 16 steps between 1:2.5 and 1:4.0 ■ Equalize receive signals, and use different settings for both TX and RX ■ "One-touch" DSP filter wide mode allows 'resurfacing' to check the band conditions when operating in narrow mode ■ Dual selectable Beat Cancel (BC) works against intermittent beat interference (except in CW mode) ■ CW auto tune mode links only with the RIT frequency without changing the transmit frequency.

Advance Technology Upgrade is available in new production models and for pre-existing TS-570D/S; contact you dealer for details.

ISO 9001
JQA-1205

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Kenwood Corporation
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Amateur Radio Products Group
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ZERO BIAS

AN EDITORIAL

One of life's changes that took a little getting used to was moving the Dayton Hamvention from April to May. Any change is a bit unsettling, especially after three-plus decades of Daytons. Okay, so May didn't work out too badly and the weather is still unpredictable one month later. I've also grown rather fond of our spot in the Ballarina area with nice, comfortable wood floors, a convenient grease-dog vendor, and easy access to the newest restrooms. Adjacent to our booth traditionally have been the large rooms which host the DX and Contest forums. What's not to like?

This year we've had to rethink our typical plans and exercise a few new options. The large areas for the DX and Contest forums are gone this year, replaced by a number of small booths. The two popular forums will now be held about one-half to three-quarters of a mile down the road at a local high school. I don't know how everyone is supposed to get back and forth, but I assume there will be some kind of bus service. At the beginning of this year it also appeared that all of the new small booths had not been sold, which is atypical for Dayton. For us, though, it became necessary to think about moving to a different, more populated area.

When you show up at Dayton this year and look for the *CQ* booth, you'll find us now in the East Hall at booths #578, 579, 580, and 581. We'll be an aisle away from Yaesu and Ten-Tec in the new building. See you there!

It's That Time Again

Speaking of hamfests, the inevitable finally happened. Arnie and I started out the hamfest season this past February at the Miami Tropical Hamboree. Over the weekend I scoured the fleamarket several times, but didn't find any treasure or bargain to bring home. A lot of folks stopped by the *CQ* booth to check on my progress in the fleamarket and to ask how I liked the food. I know that in the scope of human affairs and world events this information would hardly cause something that eventually could cause a ripple, but in terms of amateur radio enjoyment, especially mine, it is quite pertinent.

Well, it was a disappointment not to bring anything back, but there still is the rest of the hamfest season ahead of us. The food offered for sale wasn't bad, and there was an interesting variety and a tempting treat for just about anyone there. The grease-dogs contained the usual mystery meat plus an exotic variety of rare herbs and spices to cap off fine dining. It would be too embarrassing simply to come out and ask what's in them. Besides, you don't really want to know.

As we wrap up this issue (late February), we're making plans to head out to the Charlotte Hamfest the first weekend in March. I usually find something good in the fleamarket there, plus I'm able to go to the woodworking show next door. I've written about the woodworking show over the past few years to mark the difference between it and a hamfest. The big difference between hamfests and other hobby type shows I go to seems to be attitude and not the specific endeavor. We're the only ones who spend an inordinate amount of time trying to define who's real and who's not, and not trying to figure out why we're all doing this thing in the first place.

We Get The Job Done

February was a really rough month for the state of Florida. Storms and tornadoes devastated the state with property damage and loss of life. Once again, amateur radio came through to supply emergency communications to beleaguered areas. I was told at the Miami hamfest that the first storms which hit the Keys and the lower portion of the state immediately took out the police and fire communications. Amateurs almost instantly filled the public safety void.

Up north at the end of the month two packet nodes were handling a ton of traffic after tornadoes ripped through the Orlando area. Once again, we came through.

We as a group can feel proud of a job well done, and most important in the number of people helped. I would hope that the pride we feel and the warmth we enjoy doesn't end with our involvement or participation. There is still a great need for more of us to take part in and prepare for emergency communications. The next disaster very well may be in your home town or neighborhood.

If you're a great believer in everything including the tooth fairy, then you can rest easy in the assumed knowledge that your local municipality has spent enormous amounts of money, your tax dollars, providing the latest and best means of communication both locally and to the "outside world" in case of emergency. You probably also are comforted in the knowledge that all of the agencies that make up public safety can interact via the same communications system to provide immediate relief.

Well, for most of the country those beliefs are false and without merit. The obvious and continuous display of amateur radio over the years in these situations tells us that the system does not work, can be shut down easily, and can be overloaded easily, and the people who are entrusted to come up with the system have never learned anything by past mistakes. No, I don't mean the current people; it's everyone from today back in time to the first system that didn't work.

Why is it that amateur radio always seems to work? It's no longer a novelty that amateur radio continues to get the job done. What is novel is that no one, no municipality, no agency asks why them and not us. When Florida settles down, the taxpayers probably will replace the equipment that was there with pretty much the same stuff with pretty much the same capabilities and of course the very same vulnerabilities. However, it all will be new stuff, and people can gather around it and take pictures for the local newspapers. I may be facetious and doing a disservice to that community, but I have heard over the years from a number of you across the country that this is pretty much how it is.

My own personal experience in working for a small city where I had proposed an improved system for very little money is that it met with a "we'll never need it" attitude. A few months later after the Avionca plane crash when I brought it up again, the powers that be told me that it would never happen again, so we still didn't need it. The sum of money in question then went to purchase two 2-channel HTs (both channels set to the same frequency). I'm sure that the particular community still feels well served by the choice.

Are we that smart? No, but a lot of us sure know what doesn't work, and a lot of us know how to protect what we have. A lot of us know how to do things economically (the word "cheap" sometimes comes to mind), and most of us don't have to award contracts to our brother-in-law or other relative. A lot of us can think the job through and see what is needed to get it done. So, in that sense we're a whole lot smarter that most municipal agencies. We've proved over and over again that between several hundred and a few thousand dollars will continually beat hundreds of thousands of dollars spent on our safety. As I said, it's not a novel experience anymore.

In that respect, what we as amateurs do need is to become far more involved in emergency preparedness. We owe it to ourselves, our families, and our communities to help safeguard everyone's well-being. If anything in amateur radio is real, public safety tops the list. Let's face it: There is no motivation from either experience or from the taxpayer to change the system and solve the problem. Apparently, there aren't too many hearings on why certain things don't work, are easily destroyed, and need periodic costly replacement. Maybe nobody pays much attention to the small group of very dedicated amateurs who come forth to save the day through diligence, perseverance, and thankfully, a willingness to serve. They are the real amateurs, the ones we all should aspire to become.

Remember, each story that we run or that any other amateur radio publication runs about amateurs coming to the rescue is only half a story. While it does point out that more of us need to be involved, each story in effect states that the system in place didn't work, or failed, or possibly both. That's the other half of the story that no one seems to want to talk about or change. The argument that no system is foolproof doesn't really stand the test. I don't recall hearing about or seeing an article about amateurs trying to provide emergency communications and failing. It might have happened, but somehow I don't think so.

What it takes is just our willingness to help out. You can be any age, any license class, love or hate CW; none of it matters. The only thing that matters is can you show up either in person or on frequency, can you do the job or can you learn to do it, and do you want to help the people who can really use your help.

73, Alan, K2EEK

TEST RECEIVERS

NEW PRODUCT SPOTLIGHT

R11 TEST RECEIVER

30MHz - 2GHz Handheld Receiver

NEW

Optoelectronics is pleased to introduce the all new R11 Nearfield FM Test Receiver. Capable of sweeping 30MHz - 2GHz in less than one second, the R11 can lock onto a 5 watt UHF signal as far away as 500 feet in less than one second, demodulate the signal through its built - in speaker, and display the general band the frequency is transmitting in on its LED indicator. The R11 Test Receiver presents all new performance, features, and capabilities.

Instruction Indicators:
LED's will illuminate which mode the R11 is configured for.

Built - in Speaker :
Instantly demodulate any receiver frequency between 30MHz - 2GHz (Cellular Blocked).

Power

U.S. Patent No. 5,471,402

Volume & Squelch Control Knobs

CI-V and Headphone jacks:
CI-V jack allows for connection to the Scout for Reaction Tune. The Headphone jack connection also allows for external speaker.

Frequency Band Indication:
Displays what band the received frequency is transmitting on.

Hold / Mute Button:
The Hold button allows the R11 to stay locked on the received signal.

Lockout / Lockouts on-off:
The R11 allows for 1000 user activated lockouts.

Shift / Off:
The Shift button controls all of the R11's secondary functions.

Skip / Clear Lockouts:
Press the Skip button to continue sweeping. Clear Lockouts will empty the lockout memory.

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ANNOUNCEMENTS

The following Special Events are scheduled for April:

North Carolina, Azalea Coast Amateur radio club, will hold a VE testing session on April 11, 1998 10 AM at Morton Hall. University of North Carolina Wilmington Campus. Contact Jack, WD4OIN, 910-791-1566.

W2RC/IMD, in honor of Marconi's birthday, three HF stations from Rocky Point, Long Island, NY; Radio Central ARC; 0000–2400Z April 25. QSL via N2IME with SASE or 1 IRC or via N2IME via Bureau.

AC4RC, from Wilmington, NC: Azalea Coast ARC, April 18, 1500–2100Z. Operating from the original radio room of the *Battleship, USS. North Carolina BB55.* 7.250, 14.250, 21.35, 28.400. QSL AC4RC, P.O. Box 4044, Wilmington, NC 28406.

CF9ND, from Fredericton, NB Canada. Fredericton ARC; 1600Z April 17 to 2200Z April 19; 150th anniversary of the City of Fredericton. Main frequencies within 20 MHz: 3.764, 7.126. 14.171, 21.247. Stations contacted may request a certificate or QSL card. For more information, contact David Hildebrand, 33 Robinson Drive, Fredericton, NB Canada, E3A 1L7 or telephone 506-450-7449.

W9CCU, Wheaton Community Radio Amateurs will be operating a Special Event station to commemorate the 50th anniversay of the club; 0200–2000Z, April 18, on or near 3.880, 7.280, 14.280, 21.380. QSL with 9×12 SASE to: Ron Hensel, K9ZZE, 43 W 275 Hawkeye Drive, Elburn, IL 60119.

K3DN, Warminster ARC annual Shad Fest, Lambertville, NJ; 1400–2200Z April 25; on 7.250, 14.250, 21.325, 28.440. Stations contacted may request a certificate. QSL to: Warminster Amateur Radio Club, P.O. Box 113, Warminster, PA 18974.

W7AIA, to celebrate the March of Dimes 60 years of Success and 2nd annual Vancouver, WA USA Volkssport Discovery Walks;Clark County ARC; 25 April 1500–2300Z, and 26 April 1500–2200Z, on or near 28.320, 21.320, 14.245, and 7.245. Send QSL and SASE for certificate to Mark Gaunt, 4211 NE 140th Avenue, Vancouver, WA 98682-6948.

The following hamfests, etc., are slated for April:

April 1, **10-70 Repeater Assn. Inc., Annual Electronic Auction**, VFW, Clifton, NJ. For information, call the 10-70 Hotline at 201- 445-5172.

April 3–4, **Southeastern VHF Society Technical Conference**, Altanta Marriott Northwest, between Atlanta and Monetta, GA. For details visit the SVHFS Web page: <http:www.akorn.net/~aebe/svhfs/>.

April 3–4, **All Arkansas Family Hamfest**, Sherwood Forest Convention Center, Sherwood, AR. For information, contact J.C. Smith, N5RXS, 501-568-7982.

April 3–4, **Sand Mountain 7th Hamfest**, Albertville Recreation Center, Albertville, AL. Contact Marshall County Amateur Radio Club, P.O. Box 2811, Albertville, AL 35950, or call Buddy Smith, KC4URL, 205-593-2516; e-mail: <kc4url@airnet.net>. (Exams)

April 4, **LARC Fest**, Boulder County Fair Grounds, Longmont, CO. For information, contact Fred, KBØUUD, 303-678-5830, or e-mail: <frecon.pilz@juno.com>. (Exams)

April 4, **Appalachian Amateur radio Group Hamfest & Computer Show**, Northern Lebanon High School, Fredericksburg, PA. For information, contact Lanny Hoffman, KD3TS, 337 N. 19th Street, Lebanon, PA 17046 (717-274-2148). (Exams)

April 5, **Raleigh ARS 26th Annual Hamfest, NCS ARRL Convention & Computer Fair**, Jim Graham Bldg., NCS Fairgrounds, Raleigh, NC. Contact Wilbur Goss, WD4RDT, 4425 Watkins Rd., Raleigh, NC 27616 (919-676-4697). (Exams)

April 5, **26th Annual Madison Swapfest**, John Q. Hammons Trade Center, Middleton, WI. Contact M.A.R.A., P.O. Box 8890, Madison, WI 53708-8890, call 608-245-8890; or Website: http://www.cs.wisc.edu/~jeremyc/mara/swapfest/>.

April 5, **Framingham Flea Market and VEC Session**, Framingham High School, Framingham, MA. For information, contact Bev Lees, N1OO, FARA, P.O. Box 3005, Framingham, MA 01705, or call 508-626-2012. For exam info., contact Dick Marshall, K1KTK, 508-877-0563. (Exams)

April 5, **Delaware Valley RA Hamcomp '98**, Tall Cedars of Lebanon Picnic Grove, Hamilton Twp., NJ. For information, call 609-882-2240 or <www.slac.com/w2zq>; or Hamcomp '98 DVRA, PO Box 7024, West Trenton, NJ 08628.

April 10–11, **North Mississippi Hamfest & Computer Expo '98**, Trace Convention Center, Tupelo, MS. For information, contact Jack Ellis, KI5QV, Rt 4, Box 198-B, Tupelo, MS 38801; or phone 601-842-7255 or <www.tupelofest.org>. (Exams)

April 11, **Lawton Ft. Sill ARC 52nd Annual Hamfest & Computer Fair**, Comanche County Fairgrounds, Lawton, OK. Contact Bob Morford, KA5YED, 1415 NW 33rd Street, Lawton, OK 73505, or call 580-355-6120; <w5ks@rli.net>.

April 11, **Benton County Radio Operators Hamfest**, Bentonville National Guard Armory, Bentonville, AR. For information, contact BCRO, P.O. Box 883, Pea Ridge, AR 72751.

April 18, **Jpolin ARC Hamfest '98**, John Q. Hammons Convention Center, Joplin, MO.Contact Andy Gabbert, KAØTUD, e-mail:<agabbert@hotmail.com>. (Exams)

April 19, **Smartsfest 1998 Hobby Electronics Show**, Canterbury Park, Shakopee, MN. For further information, contact SMARTS Inc., P.O. Box 144, Chaska, MN 55318; for fleamarket/advance tickets, call Helen at 612-361-6782. (Exams)

April 19, **Jefferson County ARC Spring Hamfest & Computer Show**, Elk's Lodge, Cedar Hill, MO. For information, call Jim, KAØWXN, 314-296-3473. (Exams)

April 19, **DuPage ARC Hamfest & Computer Show**, Hawthorne Race Course, Stickney, IL. Contact DARC Hamfest '98, 7511 Walnut Ave., Woodbridge, IL 60517; or website <http://homepage.interaccess.com/~geirh/>. (Exams)

April 19, **39th Blossomland Blast**, St. Joe Kickers Sport Club, St. Joseph, MI. For information, contact Blossomland Amateur Radio Assoc., 1051 Main Street, St. Joseph, MI 49085, or call 616-982-0404, Mon–Fri. 10 AM – 6 PM or Sat. 10 AM –1 PM. (Exams)

April 24–25, **1998 Little Rock Hamfest and Arkansas ARRL State Convention**, Little Rock Expo Center, Little Rock, AR. For information, contact Jim Blackmon, K5VZ, 1008 Pine St., Arkadelphia, AR 71923, or call 870-246-7833; web site: <http://www.aristotle.net/~n5xay/lrh98.html>.

April 25, **Liverpool Amateur Repeater Club Springfest '98**, Cattle Building, NY State Fairgrounds, Syracuse, NY. For information, contact Robert Hamby, W2WRH, 4196 Lucan Rd., Liverpool, NY 13090 (315-622-1068). (Exams)

April 25, **Valley of the Moom ARC Annual ARRL Hamfest**, Sonoma Valley Veterans' Memorial Building, Sonoma, CA. For information, contact Darrel, WD6BOR, at 707-996-4494. (Exams)

April 25, **Rochester ARC 21st Hamfest**, Graham Arena East Olmsted County Fairgrounds, Rochester, MN. Call 507-285-6522 or e-mail <nØhzn@aol.com>; or write to NØHZN, 4552 5th Street NW, Rochester, MN 55901; website: <http://members.aol.com/rarchams>.

April 25, **Washington County-Fidelity ARC 2nd Annual Hamfest**, next to the West Greenwich Fire Station, **West** Greenwich, RI. For information, contact Bill May 401-822-0520 (e-mail <wa1wm@juno.com>) or Everet Lovenbury, N1VEZ, 401-539-1107, (e-mail <n1vez@juno.com>). (Exams)

April 26, **Twenty Over Nine Radio Club 14th Annual Hamfest/Computer/Electronics Fleamarket**, Canfield Fairgrounds, Canfield, OH. Contact Sharon Spencer, 424 Peffer Street., Niles, OH 44446 (330-544-3666).

April 26, **Moultrie AR Klub 36th Annual Hamfest**, Moultrie/Douglas County Fairgrounds, Lovington, IL. For information, contact M.AR.K., P.O. Box 91, Lovington, IL 61973, or call 217-543-2178 (daytime) or 217-873-5287 (evenings).

April 26, **Penn-Del ARC Hamfest, 1998 ARRL Delaware State Convention**, Nur Temple, New Castle, DE. For information, contact Hal Frantz, KA3TWG, 302-793-1080; e-mail: <hfrantz@magpage.com>.

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Atlas Info Needed

Editor, *CQ*:

Greetings from Carlisle, and I do hope you won't mind me writing to you with a request. I have a lovely piece of kit in my shack, purchased from the late John Franklin, G4CCK. It is an Atlas 210, and I love it to bits. It is a great little transceiver, complete with power module. The mic is an Astatic 575-M6. No doubt modern black box owners would laugh at it, but it gets out into an end-fed inverted-L antenna. (I reside in a preservation area, and anything that pops its head above the parapet is shot down!)

If the rig has a drawback, it is its display and its dial. It is rather a hit and miss affair, and I seem to recall seeing an illustration of an Atlas rig with a digital display. Okay, so here come the questions:

Was this a completely different rig? If it was, is it possible to purchase a digital readout module, or to modify the rig? Is there an Atlas owners club in the USA, similar to the various owners clubs we have here in the UK?

I hope you don't mind the questions, as I could not think of where to direct inquiries, and if the rig is going to be moded, I wish it to be done correctly.

Mick Barber, MØAOH
9 Chiswick Street
Carlisle, Cumbria CA1 1HQ U.K.

An Alternative

Editor, *CQ*:

I would like to thank you and your editorial staff for selecting Karl T. Thurber's article "Longer Than Longwave—How Low is Low?" (January and February 1998 issues). It was most interesting to read the historical view, and also to see that there are other aspects of our hobby that not too many magazines are covering these days. These aspects provide readers an alternative to HF-UHF radio. I would like to see more articles on ELF-VLF-LF technology, too.

Harry A. Weber
Oak Lawn, IL

HAM—Helping All Mankind

Editor, *CQ*:

Being a recently licensed amateur radio operator, I have read many articles pertaining to my new hobby. In one of the articles the author said that the origin of the name "ham" is not known. Ham radio is a hobby, but it also serves people in many different ways. Weather spotting, community events, and traffic handling are some examples. The most important of all services rendered by hams is providing communications in the event of a local emergency or a major disaster. With this in mind, I would like to see the word "ham" as used in our hobby as being an acronym for "Helping All Mankind."

I received my Technician class license on November 13, 1997. I had met several amateurs before taking the exams and have met several more since. I have yet to find another ham who did not make a genuine effort to help me in any way he could. So, I guess that people who become amateur radio operators do so not just to talk on the radio, but because they have a strong desire to help others, I am proud to be one of them.

Ben Farda, Jr., KC2CQK
Utica, NY

Consumerism At Its Finest!

Editor, *CQ*:

What a delight it was to look at the January 1998 cover of *CQ*! Wall to wall, floor to ceiling—transceivers, amplifiers, and gadgets galore from an unending variety of virtually every manufacturer that comes to mind. Herman must believe in giving them all a fair try! One assumes he has done a lot of new product reviews, with that much gear!

I love it all! Conspicuous, copious consumerism at its finest! This is the best portrayal of professional, commercial amateur radio I have seen in my forty years in the hobby! I assume there is a computer and packet radio, etc., above that partial keyboard which is showing in the lower right corner. I hope so.

Herman's extended hands looked timely at Christmas. It is as if he was saying, "Go ahead; help yourself to a present. I'll never miss it anyway." hi hi.

WB2ZPI, *CQ*'s staff photographer, must have felt like he was in Santa Claus's radio/candy store when he tripped the shutter for that shot! I'm pleased Larry could control the salivating drool which would have caused me a problem, had I been given the assignment.

I am thrilled and pleased to read that Herman's XYL is N4RXL. Only a "fellow" or "female" radio amateur can fully appreciate the beauty, the "goodies," the classics, and the joy that awaits a ham in N4CH's wonderful, radio-filled room. However, one final question: Just how does Herman decide which *one* radio to operate at any one time, with this amazing radio room?!

Garry V. Hammond, VE3XN
Listowel, Ontario, Canada

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After reading Part II, the mysteries and frustrations of 160 meter operation may not vanish totally, but the clouds will have lifted and you will have a new understanding of how Topband works.

The 160 Meter Band

An Enigma Shrouded in a Mystery—Part II

BY CARY OLER*, AND DR. THEODORE J. COHEN**, N4XX

In the March 1998 issue of *CQ*, CaryOler and Ted Cohen, N4XX, introduced us to some of the phenomena responsible for the unusual radiowave propagation we observe on the 160 meter band. Included were discussions of D-region absorption, the electron gyrofrequency, the auroral oval, and secondary effects caused by sunspot activity. This month they conclude their two-part presentation with a discussion of ionospheric ducts, tips for improving your Topband DX operations, computer software tools, and a host of other information of interest to both Topbanders and HF enthusiasts alike. Taken together, this two-part series provides the single, most detailed exposition on Topband radiowave propagation ever published in the amateur radio literature.—*K2EEK*

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DXing By Means of Ionospheric Ducts

You may not realize it, but a considerable number of DX openings on Topband over distances greater than 4,000 kilometers may owe their occurrence to a phenomenon known as *signal*

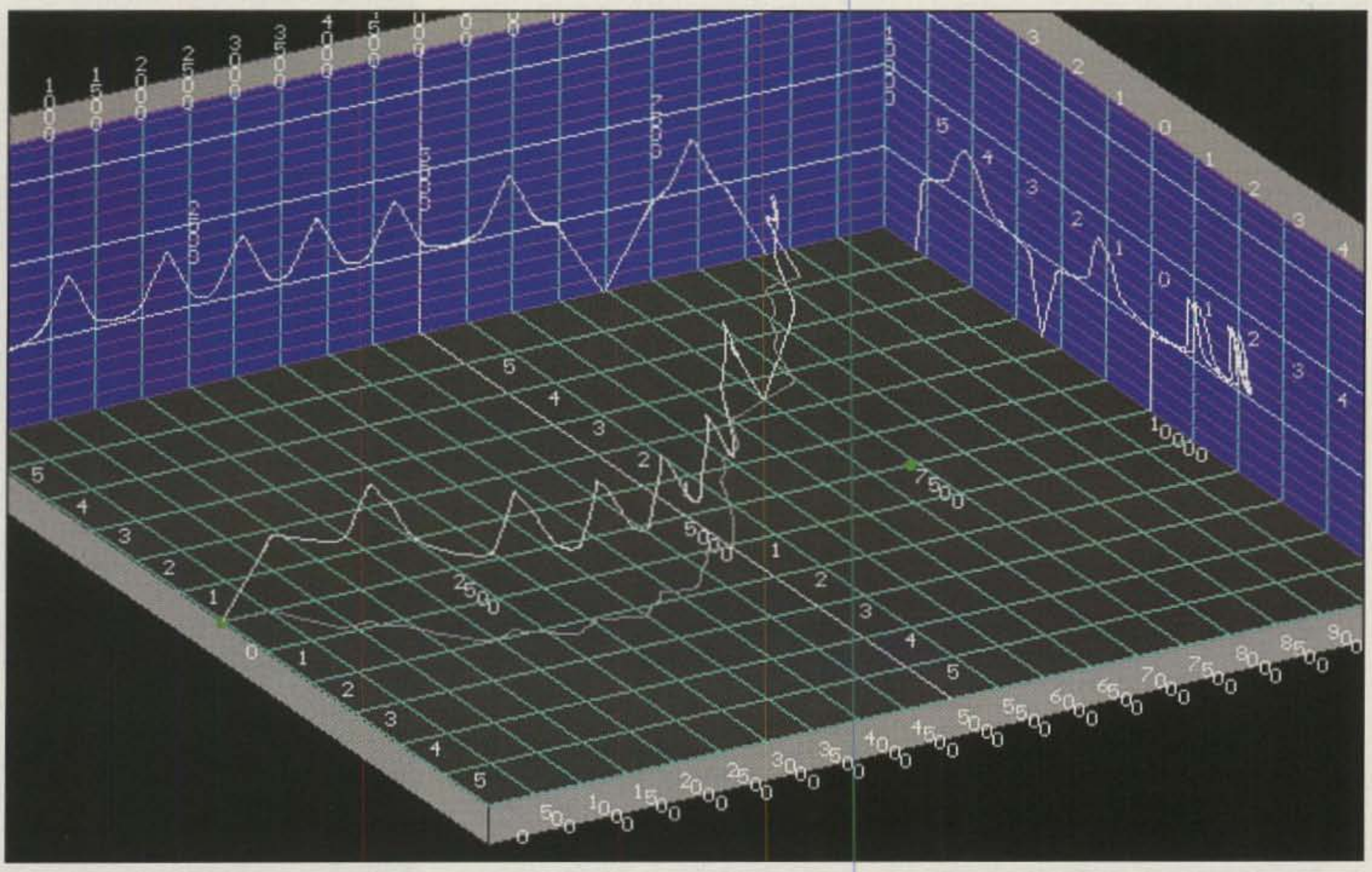

Fig. 5– A ray-traced example of how a 160 meter signal ducted from Washington, D.C. (left-hand green dot) toward Hungary (right-hand green dot) on a night in December during very quiet geomagnetic conditions. The altitude of the signal is shown by the "wall" in the upper-left corner (each line on the wall is separated from each other line by 20 kilometers). The deviation of the ray away from the great-circle path (in kilometers) is shown on the other wall at the top to the top right. The great-circle path is the line connecting the two dots on the base of the three-dimensional grid. Notice how the signal skews northward and southward of the great-circle path as well as the twisting of the ray as it travels through the ionosphere.

ducting. A ball thrown into a narrow tunnel will bounce around the walls of the tunnel while maintaining its general direction of travel. In essence, it is "ducted" through the tunnel. Similarly, a radio signal that is "shot" into an ionospheric "tunnel" will duct between the walls of the tunnel until the walls either disappear or become weak enough to permit the signal to break through. The walls of an ionospheric "tunnel" are the edges of the ionospheric layers. The D-region is normally insufficiently ionized to allow radio signals in the MF and HF bands to duct. However, the increased electron densities in the E- and lower F-regions are sufficient for Topband signals to be ducted *if* they can enter these regions at just the right angles and *if* the right conditions exist.

One such example of ducting, shown here in fig. 5, was visualized by simulating what happens to a signal as it travels into and through the Earth's ionosphere. This figure shows the path the ordinary (primary) component of a 1850 kHz radio signal takes as it travels from Washington, D.C. to Hungary in December under quiet geomagnetic nighttime conditions. The transmitter (Washington, D.C.) is identified as the green dot on the left-hand side of the three-dimensional graph. The receiver (Hungary) is located just under 7,500 kilometers away (see the associated green dot). The line connecting these two green dots (labeled with the number zero) represents the great-circle path from Washington, D.C. to Hungary. The "wall" at the top and left part of the figure shows the altitude of the signal above the surface of the Earth (each line on this wall is separated by 20 kilometers in altitude). The wall on the right side shows the deviation that the signal takes *away* from the great-circle path, in kilometers. The signal itself starts at the Washington, D.C. green circle and travels at a 10 degree takeoff angle toward the ionosphere. The *ground-track* of the signal can be seen on the base of the three-dimensional plot. It stays precisely on the great-circle path until the signal reaches the base of the ionosphere. It then abruptly pulls equatorward (due to magneto-ionic splitting of the signal into *ordinary* and *extraordinary* components) about one kilometer from the great-circle path as it traverses through the D-region. The signal encounters its greatest absorption as it transits the D-region.

At this particular take-off angle, the signal is refracted and bent just enough to allow the signal to begin ducting between the base of the F-region and the top of the E-region, within what is known as the *E-valley region*. Because this region of the ionosphere is in darkness, it is fairly stable and allows the ducting to continue unimpeded for almost 6,500 kilometers—a respectable distance, indeed.

Notice the crooked path of this signal. **It does not precisely follow the great circle path, but deviates northward and southward according to changes in the shape of the ionospheric layers and the orientation of the signal to the Earth's magnetic field through which it is being ducted.** (Most Topband operators who have multiple, directional receiving antennas (e.g., Beverages) will tell you that the signals from distant stations often arrive on azimuths off the great-circle path.) Finally, about 6,500 kilometers from Washington, D.C. the E-region is no longer ionized sufficiently to refract the signal back to the base of the F-region. Therefore, the signal breaks out of the duct and travels back to the Earth's surface. In doing so, it crosses through the absorbing D-region a second time. It then bounces back into the ionosphere and completes one more hop before the simulation ends. A close examination of the signal near the end of its path (where the signal begins moving almost directly away from our line of sight) shows the very odd behavior of a topband signal. It is not straight and linear as you might expect. Indeed, it suffers from kinks and twists that can change the angle of arrival of a signal as well as its direction and polarization characteristics. This is typical behavior for Topband signals, and it is the result of the signal's close proximity to the electron gyrofrequency. The situation gets even worse as the carrier frequency more closely approaches the gyrofrequency.

Our intended recipient in Hungary never heard this signal because the signal fell short of the receiver by about 500 kilometers. Instead, a fellow Topband operator in Czechoslovakia heard the signal loud and clear. If his transmitter and antenna were capable of transmitting enough radiated power at the right angle of elevation required for the signal to enter this same duct, it would begin ducting right back to the operator at Washington, D.C., thereby permitting a two-way conversation.

The strength of this 1850 kHz signal received in Czechoslovakia would have been fairly strong because the signal only crossed through the D-region two times—once when it left the transmitter at Washington, D.C., and again after ducting for almost 6,000 kilometers. It also did not suffer a passage through the auroral zone, but instead passed under it thanks to the very quiet state of the geomagnetic field. **This mechanism probably accounts for the inability of a given station to hear a DX signal that fellow operators only a few hundred kilometers away are copying with exceptional strength.**

Ducting of 160 meter signals is more easily (and more frequently) accomplished than is ducting at shorter wavelengths, because the top-band signal can be refracted to a much greater extent at higher angles of elevation than can signals at shorter wavelengths. Stated another way, Topband signal ducting is most likely to occur when transmission elevation angles of between about 5 to 30 degrees are used. At shorter wavelengths (e.g., 80 to 20 meters), most signals need to be transmitted using shallower angles of elevation of between 0 to 15 degrees to enter the main ducting regions. However, since most amateur antennas can't radiate sufficient energy at transmission elevation angles much lower than about 10 degrees, the total signal energy that enters the duct at higher frequencies will be much lower than the energy emitted into a duct by a 160 meter antenna at Topband frequencies. The end result can be higher signal strengths from 160 meter ducted signals.

Some ducts are very sensitive to changes in ionospheric conditions, take-off angles, and changes in antenna azimuth. This explains why some DX openings are short-lived or change rapidly with time, or are of poor quality. Other ducts are less sensitive to changes, and they may be quite stable for hours and extend over broad ranges of signal azimuth and elevation.

Some ducts suffer from non-reciprocity, as well, which means you may hear someone but be unable to get them to hear you. This is much more common on 160 meters than

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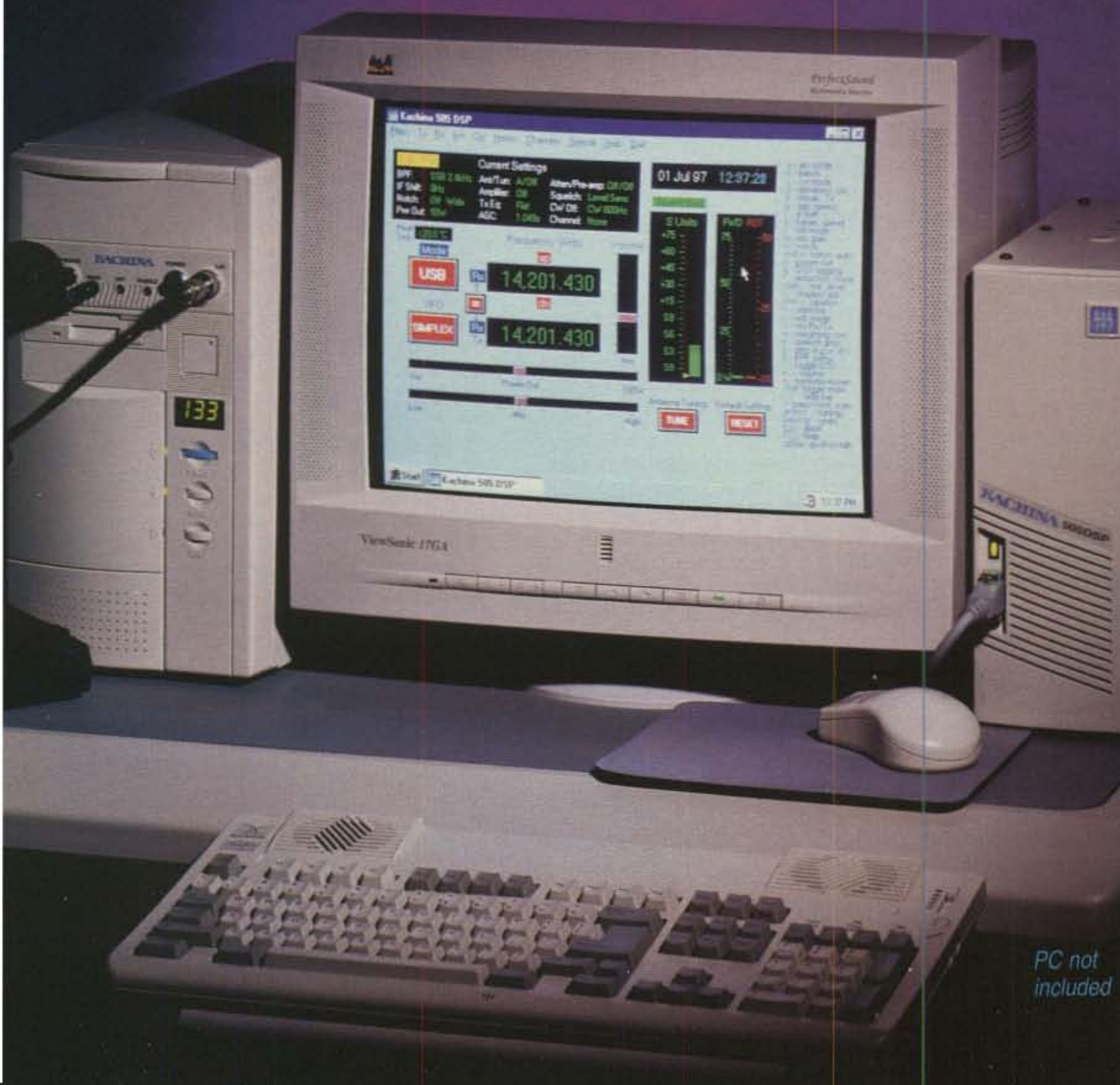

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on higher frequencies. If you suspect the DX to be the result of ducting, the best advice is to determine the proper azimuth to the DX contact and try to "shoot" your signals skyward using your antenna with the lowest take-off angles possible. (Given the size of most 160 meter antennas, you may not have much of a choice from which to choose!)

Tips for Improving Your Topband DX Operations

There are several important components that can improve your chances of successfully working DX on Topband.

The first, and probably the foremost, tip is to **wait for very quiet geomagnetic conditions.** The trick here is to wait for *sustained* intervals of quiet conditions *over the high latitude regions*. Using Boulder **k**-indices broadcast on WWV/WWVH at 18 minutes past each hour will not suffice, because Boulder, Colorado is far from the auroral ovals. The **k**-indices acquired at Arctic stations such as Inuvik, Baker Lake, and Cambridge Bay (all in Canada) are much more suitable for this application, because these stations are located within the auroral oval. Therefore, sustained three-hour **k**-indices of zero at these stations for periods of time lasting at least eight hours should prove to be a more accurate measure of the potential for 160 meter DX openings along high-latitude circuits. The reason for this is that research has shown that the auroral ovals require at least eight hours to contract to their most poleward positions (Ref. 7).

Sustained periods of zero **k**-indices are most common during the rising phase of the solar cycle, which we are now experiencing! They are the least common in the declining years of the solar cycle, when the appearance of low (solar) latitude and transequatorial coronal holes keep the Earth's geomagnetic field in a relatively continual state of flux. For the next two to four years, then, there should be a fairly large number of sustained quiet geomagnetic periods. Put another way, DX openings on Topband should be at their best during the next two to four years.

For reasons that are still uncertain, there often are periods of time immediately following the arrival of interplanetary disturbances when propagation on Topband is momentarily enhanced. This may be due to the fact that large changes can occur in the chemical makeup and neutral wind patterns of the ionosphere following the arrival of interplanetary disturbances from the Sun. It is entirely possible that changes in neutral winds might produce rarefied areas of D-region electron densities, resulting in abnormally low absorption levels for top-band signals. These conditions are, so far, mostly unpredictable, and they cannot easily be detected except through the observation of unusual DX on Topband or by means of specialized ionosondes. Greater research efforts into the nature and response of the neutral winds to interplanetary stimuli is required to solve this important problem.

Low and stable background x-ray flux values (in the 1 to 8 Ångstrom band) *may* help contribute to lower nighttime D-region electron densities and better Topband DX conditions.

Alternatively, although the D-region for the most part does dissipate after sunset, high x-ray flux values observed during the day can considerably increase electron densities in the day-side D-region. Speculative reasoning, then, suggests that residual effects on the night-side may become manifest (particularly during the first few hours after sunset) through the action of the neutral winds. In other words, during periods of high background x-ray flux values, propagation on Topband may be poorer for a slightly longer length of time after sunset—again, depending on the flow of the neutral winds at D-region altitudes.

The importance of electron gyrofrequencies cannot be understated. A successful Topband operator should keep in mind that signals will

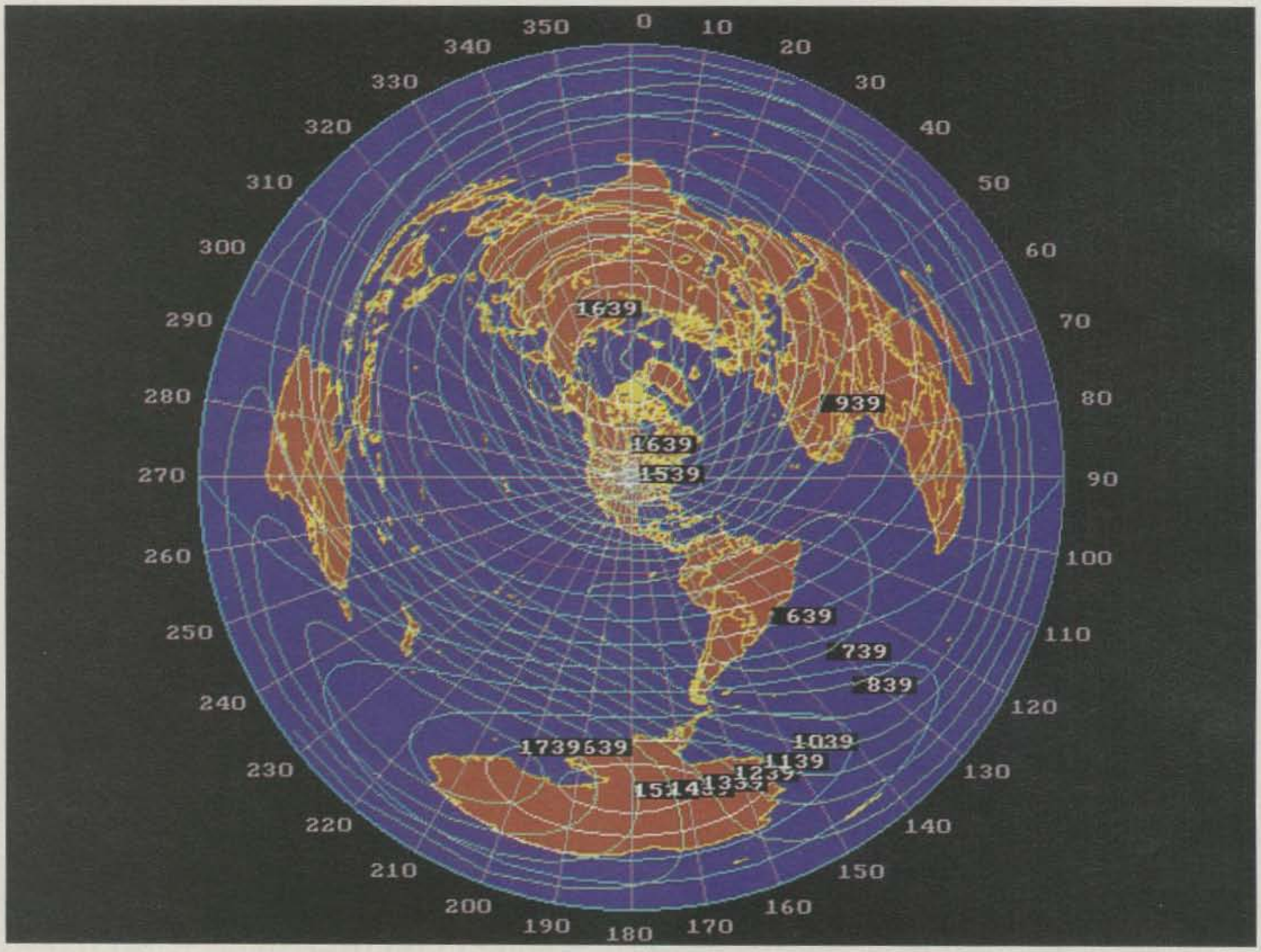

Fig. 6– An oblique azimuthal equidistant electron gyrofrequency map centered on the United States. It shows the electron gyrofrequencies a 160 meter signal would encounter on any azimuth from the U.S. to the rest of the world.

be less strongly absorbed and behave more like a conventional signal is expected to, *the farther away from the electron gyrofrequency is the carrier frequency*. To this end, it is wise to consult an electron gyrofrequency map when contemplating paths you want to use. Using paths that have steadily decreasing gyrofrequencies will have less of a degratory effect on signals than will paths that are associated with increasing gyrofrequencies.

A very useful and unique map, centered on the United States and shown in fig. 6, can help individuals in the United States determine what the electron gyrofrequencies are for any signal azimuth. The radial azimuth "spokes" in fig. 6 are labeled on the outside of the image. The blue ovals are lines of geographic latitude (the red oval is the equator) and the whitish-green contours are the electron gyrofrequencies, given in *kHz* and spaced at intervals of 100 kHz. Fortunately for amateurs in the United States, the electron gyrofrequencies decrease on most signal paths except those which pass into Canada, the Arctic, and Siberia. Gyrofrequency conditions are best towards South America and Africa. Unfortunately for amateurs in the United States, electron gyrofrequencies are about as high as they can get, ranging from about 1300 to 1600 kHz. Propagation of topband signals within South America and even from South America to South Africa are much less affected by the gyrofrequency than are paths from North America to these regions because of the much lower electron gyrofrequency in South America and Africa.

Topband signals are very susceptible to sporadic-E. Even weak sporadic-E "clouds" that might not affect the higher frequencies noticeably can have a substantial impact on 160 meter signals by increasing absorption or refracting signals in wanted or unwanted ways. The only benefit that sporadic-E might provide for top-band operators is if signals reach the sporadic-E cloud from above (that is, on the way down from an F-layer reflection). In these instances, the signal will be reflected back to the F-region, which will effectively increase the distance traveled by the signal (in some cases, perhaps considerably). However, keep in mind that sporadic-E clouds are sometimes non-linear in shape and may contain bulges or other non-uniform structures that might scatter your signals instead of uniformly reflecting them along the great-circle path. Remember, too, that 160 meter signals are *easily* refracted, even by fairly low electron densities.

The ionosphere is a chemically active, electrically charged, fluid-like environment. Ripples in the electron density at the base of the ionosphere (and, indeed, at the bases of each of the layers in the ionosphere) exist and are continually traveling from place to place through the action of the neutral winds. This is important for propagation on lower frequencies because signals that encounter large traveling ripples in electron density can suffer from absorption fading, a periodic fading phenomenon that can produce moderately deep fading of Topband signals, as well as signal divergence (defocusing) and multipathing.

Computer Software Tools

Today there are substantial software tools available to the amateur and professional radio communicator that were not available a few years ago and that can be used to help moni-

tor Topband conditions. One of the more substantial ones for analyzing signal paths is the Proplab-Pro software package. Most of the maps and the ray-traced examples in this article were produced using this software. Another very substantial tool is a software package known as SWARM (Solar Warning And Real-time Monitor). This software can be used to monitor everything from geomagnetic and ionospheric conditions to solar activity and solar wind conditions, all in *real-time*. It is particularly valuable for the prediction of quiet geomagnetic intervals and the arrival of interplanetary disturbances.

In January 1998, the ACE (Advanced Composition Explorer) spacecraft began sending nearly continuous measurements of the solar wind from its vantage point outside of the Earth's magnetosphere (about a million kilometers "upstream" of the Earth, between the Earth and the Sun). This distance is fortuitous in that the spacecraft is able to detect the arrival of interplanetary disturbances up to an hour before they impact on the Earth. Because the data provided by the ACE spacecraft will be nearly continuously transmitted to the Earth, users of the SWARM software will be able to detect the arrival of these disturbances up to an hour before they actually reach the Earth's magnetosphere. This is sufficient time for radio communicators to prepare to take advantage of the momentary enhancements that can occur in Topband (and other band) conditions shortly after the arrival of these disturbances. The software will also audibly alert you when geomagnetic activity surpasses certain threshold levels. These audible alerts can be useful for radio communicators who may stop looking for DX opportunities on Topband if geomagnetic activity spawns **k**-indices of perhaps 4 or higher. The software will even fetch current solar flux values and sunspot numbers, solar imagery, auroral imagery from the POLAR spacecraft, up to 19 different types of daily, weekly, and monthly reports from forecast centers around the world, plot sunspot regions and other activity on a simulated image of the Sun, monitor x-rays for solar flares and protons that can devastate polar-path radio signals, and much more.

These software packages can be, to the serious radio communicator, as important as a good rig on a mountaintop. For additional information, contact the main Internet web pages for these software packages at <http://solar.uleth.ca/solar/www/swarm.html> and <http://solar.uleth.ca/solar/www/proplab.html>.

The Solar Terrestrial Dispatch

The Solar Terrestrial Dispatch (STD) is a superb source of information on the Sun and its effects on the space environment near the Earth. For readers who wish to investigate further the effect of the Sun on our ionosphere and on the propagation of their signals, whether on Topband or at frequencies higher in the radio frequency spectrum, the Solar Terrestrial Dispatch (STD) invites you to visit <http://solar.uleth.ca/solar> on the World Wide Web. This site provides current information on the state of the Sun and its effect on the Earth and on the space environment near the Earth. Current ionospheric maps of maximum usable frequencies, critical F2-layer frequencies, auroral activity sightings, solar activity observations, and much more is available at this site. The numerous services provided there are made possible through the kind cooperation of the University of Lethbridge, Canada.

Coordinated Amateur Radio Observation System (CAROS)

The Solar Terrestrial Dispatch is currently studying 160 meter propagation in greater depth, with a hope of isolating some of the more influential factors that might lead to improved models of propagation. They are, therefore, soliciting the involvement of all individuals who communicate or regularly listen on 160 meters. Although the 1997–1998 season for Topband will soon be over, we would appreciate receiving as much input as possible regarding observed contacts and propagation conditions on Topband. Further, we would like to continue to receive reports throughout the northern hemisphere's summer and on into the 1998–1999 Topband season.

In support of this and other radio communicators on higher frequencies, we have developed CAROS, which can be accessed through the STD on the World Wide Web (see below). We hope that Topband operators, as well as those who work the higher frequencies, will contribute their observations to our CAROS system. All reports are archived. The contributed reports can then be analyzed in detail and studied in combination with ionospheric data. It is hoped that through a collection effort such as this, we will be able to pry loose some of the secrets of 160 meter propagation. But the success of this project is dependent upon the number of reliable reports that are received. Please submit any observations you make to the CAROS system at <http://solar.uleth.ca/solar/www/subcaros.html>. The latest observations submitted to CAROS can be seen at <http://solar.uleth.ca/solar/www/caros.html>.

Other Available Internet Services

You may like to know that the STD is now offering solar and geophysical (including ionospheric) reports, alerts, and warnings, etc., to the public, free of charge. Anyone can subscribe to this service by visiting <http://solar.uleth.ca/solar/www/sublists.html> on the Web.

The STD also has constructed a Web page devoted specifically to 160 meter propagation that contains parameters that are thought to be reasonable indicators of potentially favorable top-band DX conditions. Included on this page are near-real-time images of the auroral oval and current geomagnetic indices for key Arctic stations. Armed with this information, and knowing the great-circle path your top-band signal is taking, operators should be able to determine whether DX propagation on Top-band to various locations around the world might be possible. Keep in mind that this page is still experimental and that its developers do not yet claim to provide reliable propagation predictions for 160 meter signals. However, the Web page represents a good start that will serve as a base upon which to build theories and models. It will provide amateurs with the information required to help us prove or disprove the reliability of the propagation models employed. The URL is: <http://solar.uleth.ca/solar/www/topband.html>.

The Solar Terrestrial Dispatch is also offering a course over the Internet that teaches individuals how to predict space weather and radio propagation conditions. It is the most comprehensive course that can be taken over the Internet, and it covers all of the topics that have been discussed in this article, including topics such as the prediction of coronal mass ejections from the Sun and ionospheric disturbances and processes that can affect radio propagation. A complete list of topics and materials can be found at <http://solar.uleth.ca/solar/www/course.html>.

Conclusions

Topband is one of the last frontiers for radio propagation enthusiasts. It involves regions of the Earth's environment that are very difficult to explore and are poorly understood. These factors have led to our failure to predict propagation conditions with any level of accuracy. They also account for our inability to explain some of the puzzling mixtures of conditions that make this one of the most interesting and volatile bands available to the amateur service.

Topband may be the lowest band in the amateur spectrum, but it has one of the most promising and exciting futures possible!

Reference

7. Nakai, H., Y. Kamide, D. A. Hardy, and M. S. Gussenhoven, "Time scales of expansion and contraction of the auroral oval," *Journal of Geophysical Research,* Vol. 91, No. A4, pages 4437–4450. ■

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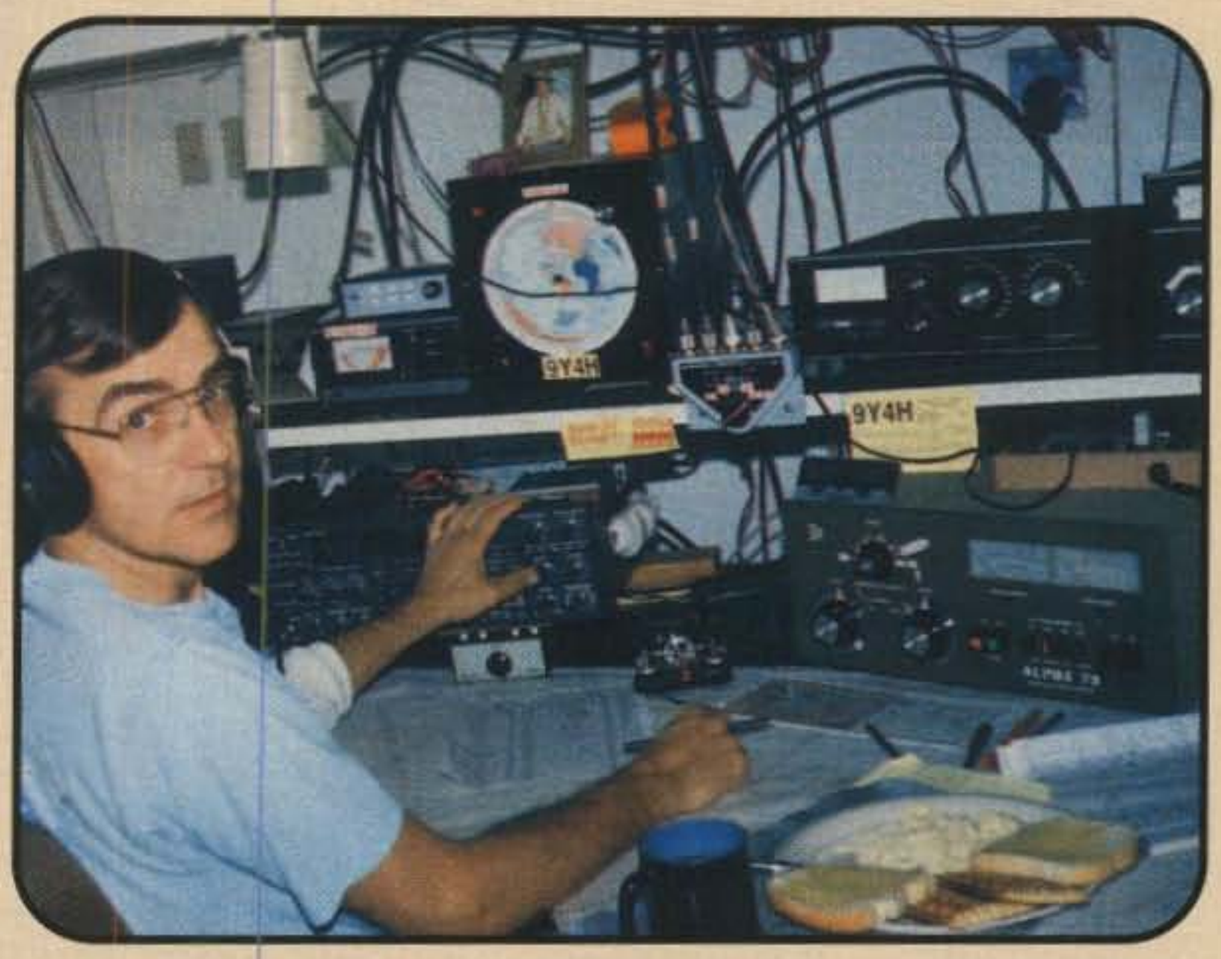

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W1ICP takes another look at an old friend, the G5RV antenna. It's been around for a long time, it's popular, and most of all, it still works.

Another Look at the G5RV Antenna

BY LEW McCOY*, W1ICP

Certainly one of the most popular wire antennas over the years has been the dipole described by R. L. Varney, G5RV. As I understand it, this antenna originally was designed by G5RV to cover the 20 meter band. It is a dipole, but an unusual dipole in that it consists of three half wave lengths on 20 meters fed at the center. G5RV originally fed this antenna with tuned, open-wire feeders. What we originally had, then, was a dipole 102 feet long and center fed.

Varney's idea was to make a good antenna for 20 meters, and he certainly succeeded. However, many amateurs were not happy with a single-band antenna. They wanted to know if the antenna would work on other bands. Not long after, Varney described his antenna in a British magazine, as I recall. It was later written up in the *RSGB* (Royal Society of Great Britain) *Handbook*.

In order to work on other bands, the antenna uses tuned feed lines, such as open-wire line or these days the popular ladder line. An antenna such as the G5RV, which is 102 feet long, easily works, and works well, on many other bands, including the 80 meter band. Without going into too many technical details, because it is long for the higher bands it also works well on 20 through 10 meters. Therefore, what we have using a Transmatch to tune the system is a reliable multiband antenna that will cover 80 through 10 meters. It also will work on 160 by tying the feeders together at the transmitter and using the system as a form of top-loaded wire. (I have used the antenna on 160 in this manner, and it has performed fairly well.)

Some stubborn amateurs did not want to use a tuner or Transmatch, so they tried other methods of feed. The first, or just tuned feeder, is shown in fig. 1 at (A), and the other method of using a combination of different impedance lines is shown at fig. 1(B). (This is as Varney describes the feed in the *RSGB Handbook.)*

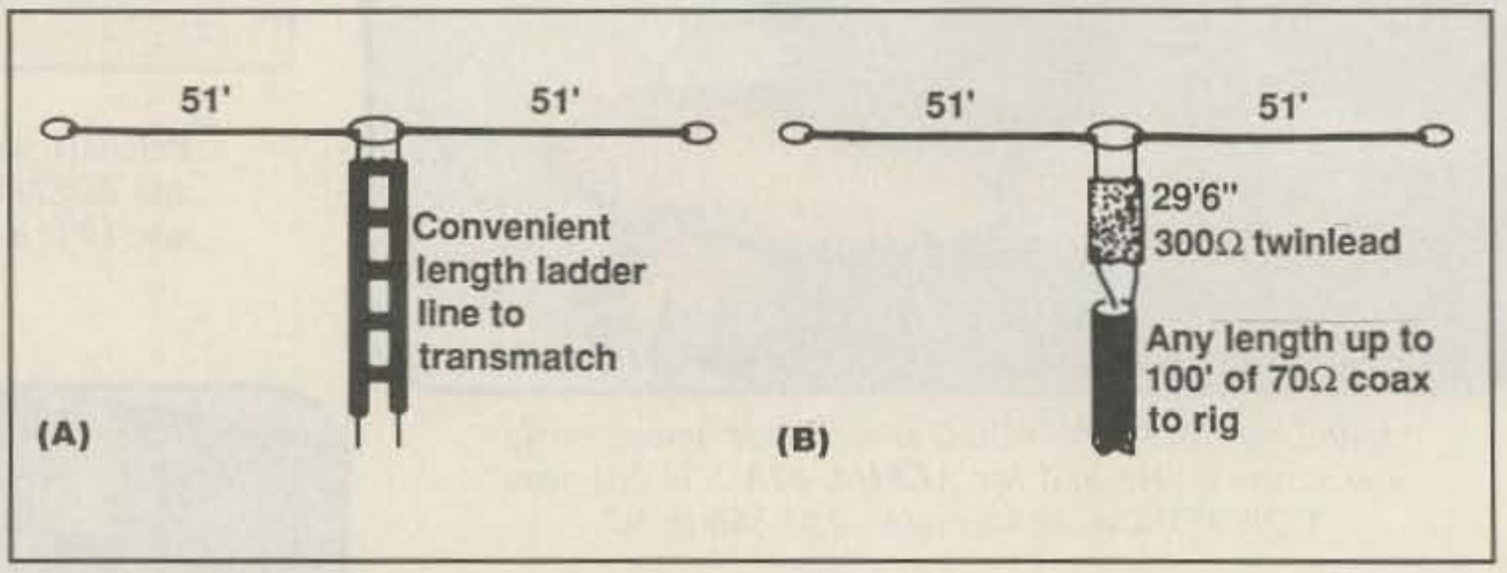

Fig. 1– At (A) is the standard G5RV configuration. At (B) we have a system that "might" match a 50 ohm load.

There are a couple of "egg on the face" problems with the method shown at (B). You must realize that the feed impedance of a dipole (or any antenna, for that matter) is influenced by many factors. The height above true earth is the main controlling factor, plus surrounding objects can also get into the act. What this really means is that if you use such a system, it may (??) work, but there is no guarantee. The ideal system is to use a Transmatch. Then you know you can match the system to your rig.

It is worth noting that *The W6SAI HF Antenna Handbook* by Bill Orr, W6SAI (available from *CQ*) has considerable information on various combinations of the G5RV method shown at fig. 1(B). As Bill points out in his excellent book, there are many controlling factors that can affect the SWR when trying to accomplish multiband operation. In many cases, some of these modifications put the SWR figure well over 3 to 1, making transceiver shutdown a problem. That's why I recommend a Transmatch. In this case, the excellent antenna can be used on all bands and all frequencies under a matched condition.

It is interesting to note that Varney designed this antenna back in the days before transmitters had built-in antenna tuners. Now you must have an antenna system that will *not* present an antenna impedance load of more than 3 to 1. If the system does, the transmitter will shut down. However, no matter what I write, some amateur will still want to try the no-tuner method. Good luck.

A note is in order here for those amateurs who have never used TV 300 ohm

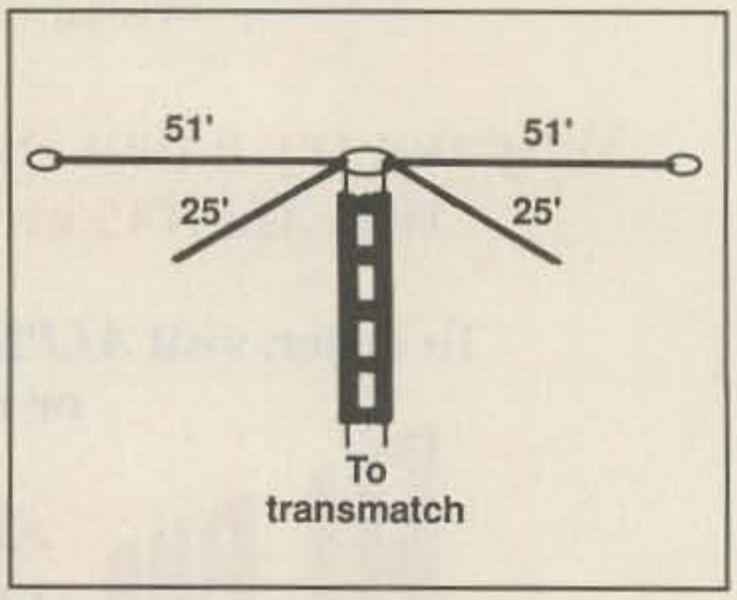

Fig. 2– If you use a 51 foot dipole in conjunction with the regular G5RV, the antenna will perform on 10 meters.

*Technical Editor, 1500 W. Idaho Street, Silver City, NM 88061
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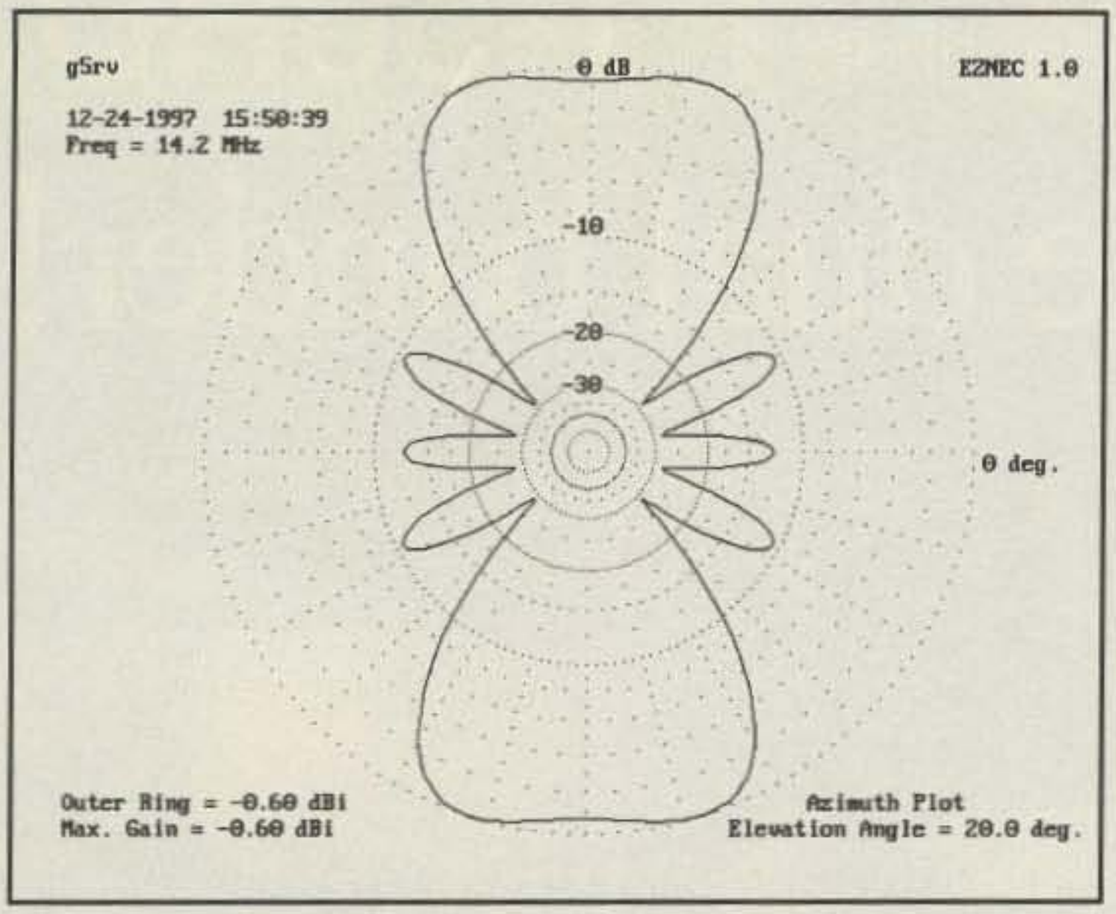

Fig. 3– An azimuth pattern for the G5RV antenna on 20 meters.

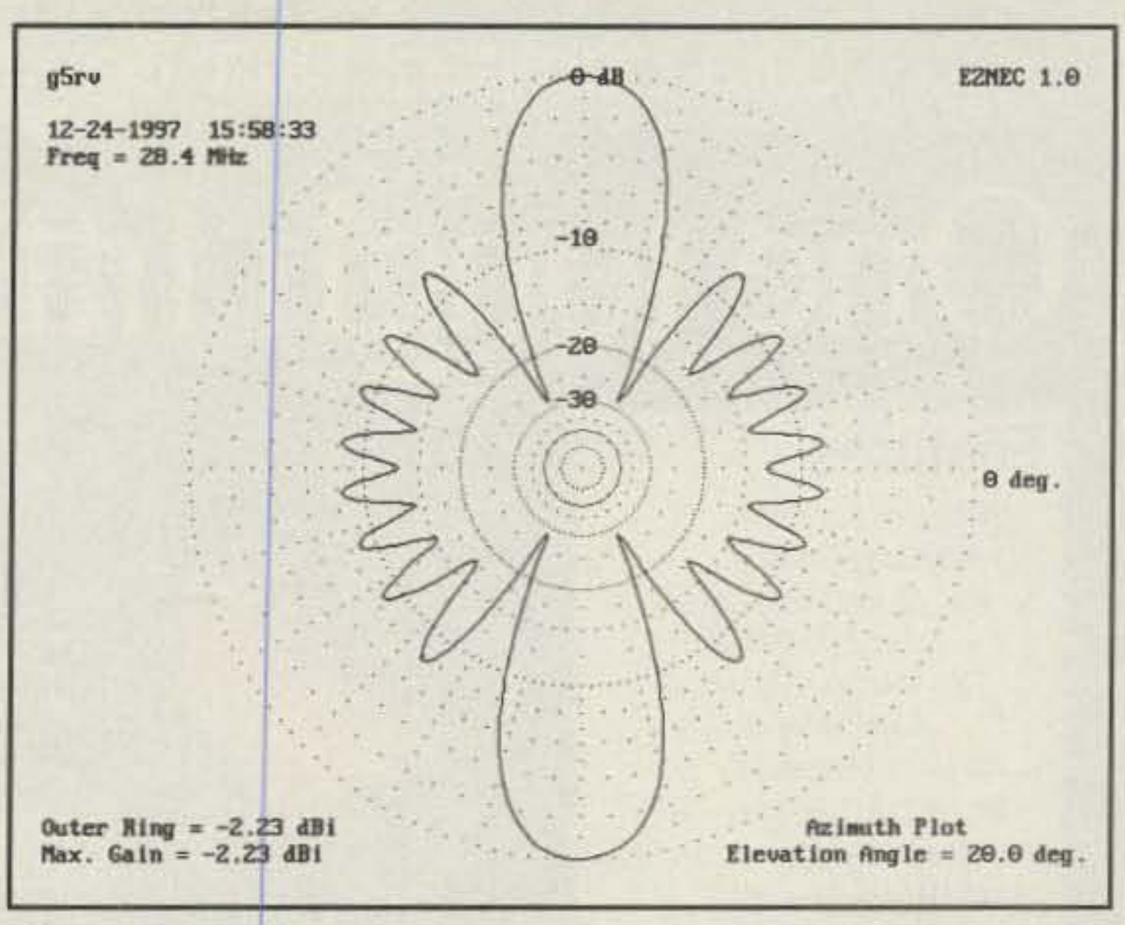

Fig. 4– This is an azimuth plot for 28.4 MHz, at a radiation angle of 20 degrees. Note the two distinctive lobes.

twinlead for feeders. This is usually an inexpensive feed line and is fairly low loss on 80 through 10 meters. As a tuned line, the twin lead can handle power fairly well. I have used the line at kilowatt inputs. However, when it rains, the impedance of the line can vary a great deal. Therefore, be aware of that problem. Your tuning is likely to change.

How about using the G5RV as an inverted V? Many amateurs have done so, but keep in mind that as a rule a horizontal dipole will always work better than an inverted V. Also, with the matching line section shown in fig. 1(B), it is difficult to predict what will happen. The only rule I would throw in here is McCoy's rule: If the darn thing works, leave it alone. Remember, there is a very old rule I learned in amateur radio many, many years ago. The rule is don't be afraid to experiment.

I have heard that some amateurs have experienced problems with the G5RV on 10 meters. We are approaching a time of good conditions on 10 meters. It would be a simple matter to arrange another dipole in parallel with the 102 feet, but make this three half waves on 10 meters—or 51 feet. (I have tried this, and it works.) I have shown this in fig 2. While it works, I have never been very happy with common feed to multiple dipoles. With more than one dipole tied to a common feed line, coax for example, you never know exactly what kind of impedance or radiation pattern you will encounter.

To that end, I have taken an average height of 30 feet for a horizontal G5RV (over average ground conditions) and run some typical patterns you can expect from the antenna. I did this using EZNEC, an antenna computer program.

In any event, this will provide you with a relative idea of the radiation pattern of the G5RV at a very common height. Keep in mind when you look at antenna advertising for the G5RV that the G5RV is specifically a 102 foot dipole. Any other configuration is simply another dipole that is tuned or matched. A simple question often asked is if the G5RV is a better performer than a half wave dipole cut for the 80 meter band—say, 130 feet. Nearly always, a larger or longer antenna will outperform a shorter antenna. The difference between a G5RV and a half wave 80 meter dipole is really slight, so there isn't much room for argument as to which is better. ■

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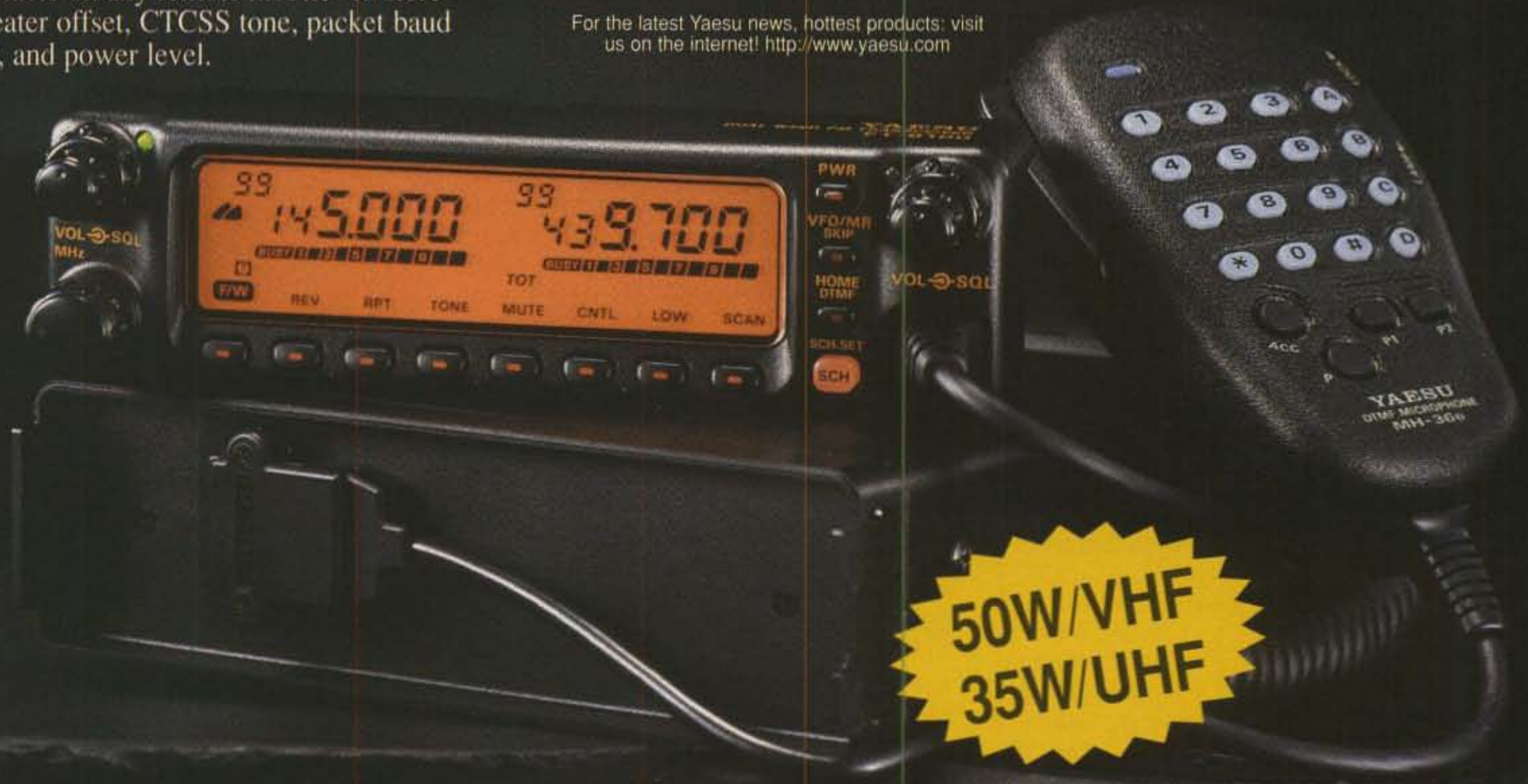


50W/VHF
35W/UHF

The PATCOMM PC-16000 High-Frequency Transceiver

BY PAUL CARR*, N4PC

Most of the modern transceivers on the market today are basically of the same type: They support HF SSB, CW, and often FM on the bands from 160 through 10 meters. The equipment I am about to review involves a different concept. I think I would describe the PC-16000 as a communications system. Not only does the equipment support the functions outlined earlier, it also has a self-contained modem for the digital modes. There is no need to have "add-ons" on your operating desk. Everything you need for CW, RTTY, and ASCII are contained within a neat desk-top unit.

The PATCOMM PC-16000 self-contained transceiver, terminal, and keyboard communications system.

Circuit Description

The PATCOMM PC-16000 transceiver uses a combination of Direct Digital Synthesis (DDS) and Phase Locked Loop (PLL) synthesizer techniques to generate the necessary frequencies within the transceiver. Resulting signals are extremely stable, and they have a low noise content. They can be tuned in increments of as little as 1 Hz, which gives an analog feel with crystal stability.

A dual up-conversion receiver is used to provide continuous coverage from 1.5 to 29.9 MHz and transmit coverage on all amateur bands within this range. Receiver performance is enhanced by using Rockwell Collins mechanical filters in the IF stage. Further filtering is provided by using "brick wall" audio DSP (digital signal processing) filters.

The phasing technique (as opposed to the crystal filter approach) is used for generating and receiving SSB, FSK, and CW. The PC-16000 also supports the reception and transmission of AM and FM (with an optional adapter) modes. In the AM mode, a fixed 4 kHz wide IF and audio filter is used and a "controlled current source" AM detector is used for enhanced audio quality. A squelch control is provided for the FM mode.

Lowpass and bandpass filters are used in the receiver front end to enhance the IMD response and to increase the dynamic range. An attenuator is also provided for use on extremely strong signals.

The transmitter section of the PC-16000 generates up to 100 watts of output power in all modes. There is a massive heat sink which allows long-duration transmissions without the need of a cooling fan. There is also an RF speech processor which provides about 10 dB of compression to produce a higher RMS output in the SSB mode.

Some Additional Information

The tuning knob is located in the approximate center of the front panel. Directly above the tuning knob there is a multifunction LCD. Normally, the top line of information on this display shows the transmit frequency and the bottom line shows the receive frequency. If you are operating in the CW or RTTY modes, the top line of the display shows the incoming message. This data can also be sent to a terminal or PC, using a terminal program.

The display will also show the offset between the receive and transmit frequencies. In CW the transmit frequency is 800 Hz lower than the receive frequency. The offset for RTTY is 2290 Hz lower than the receive frequency. These offsets can be changed by the operator.

There is a provision for RIT with the transceiver. By pressing the RIT button once, this feature is activated. The receive frequency can now be moved to any setting within the band. If the tuning knob is not moved for approximately 5 seconds, the RIT will automatically disengage and the transmit and receive frequencies will be synchronized again.

Pressing the RIT button twice will place the transceiver into the SPLIT mode. In this mode the transmit and receive frequencies are independently adjustable and will remain that way until the unit is removed from the SPLIT mode. Pressing the SYNC key will remove the unit from the SPLIT mode.

The PC-16000 has a total of 100 memories. There are ten memories allocated to each amateur band, and ten for frequencies outside the amateur bands. There is also one scratch-pad memory to quickly store the current status of the unit.

On the back of the unit there are three SO239 antenna connectors. Any of three antennas can be selected from the front panel. There is also a provision for variable-speed tuning that is controllable from the front panel. The speed can be varied from 10 Hz steps (normal) up to 10 kHz.

Miscellaneous Functions

There is a built-in iambic keyer to use with your own keyer, paddle, or keyboard-generated CW. The speed is variable from 5 to 75 words per minute.

*97 West Point Road, Jacksonville, AL 36265

The AGC function is controllable from the front panel. There are two speeds. The slow speed is recommended for SSB and the fast position is recommended for CW. These speeds will toggle when the AGC button is pushed.

Automatic CW/RTTY Decoding

The PC-16000 contains the digital circuitry and software necessary to decode and display incoming digital signals. The top row of the LCD display will blank and the decoded characters will scroll from left to right. A terminal (or a PC using a terminal) may also be used to display the incoming data. Any suitable serial RS-232 type device capable of 2400 baud NO parity and 7 data bits will be able to display the decoded data.

Keyboard Transmission Of CW/RTTY

By using an IBM AT-type keyboard (supplied with the transceiver), CW/RTTY can be sent without any additional hardware or software. In the CW mode, any character that is now typed will be sent at whatever speed has been established by the Key Speed Function. The outgoing text may be halted at any time by pressing the ESC key.

Specialized DSP Functions

In addition to the 2.4 kHz, 1.8 kHz, 500 Hz, 250 Hz, and RTTY DSP filters already mentioned, the PC-16000 contains two special DSP filters. There is an auto-notch filter that will lock onto and notch out any constant tone in the receiver passband. This is intended for use on SSB, where interfering carriers may be significantly reduced by the use of this function. The auto-notch is only available in the 2.4 kHz and 1.8 kHz bandwidths. There is a manual notch filter designed for use in the CW/RTTY modes.

The second special DSP filter that is included is the DE-noiser. This filter will reduce the overall background noise and reduce fatigue during long periods in high noise levels. As with the auto-notch, the DE-noiser will function only in the 2.4 kHz and 1.8 kHz bandwidths. Also, there is a noise blanker, activated by a front-panel control, that is useful in reducing pulse-type noise, such as the noise generated by ignition systems.

On The Air

I am happy to report that the time I have spent on the air with this rig has been a real pleasure. I received many glowing reports about the transmitted audio and the excellent keying characteristics. I must admit that I was spellbound as I watched the incoming CW and RTTY signals. That was a great relief from the concentration necessary to decode signals with the "computer between the ears." I must report that if you intend to spend a good bit of time operating from the keyboard, it will be necessary to thoroughly study the manual. There are numerous keystrokes that must be committed to memory for proper operation of this system. Yes, I did say "system." This is more than a transceiver. It is a self-contained transceiver, terminal, and keyboard. The bottom line is the PC-16000 is a very good unit, and I am sure it will give years of trouble-free service.

Dimensions of the unit are 14.25 inches wide, 13.5 inches deep, and 3.5 inches high, not including knobs and feet. It weighs approximately 15 pounds.

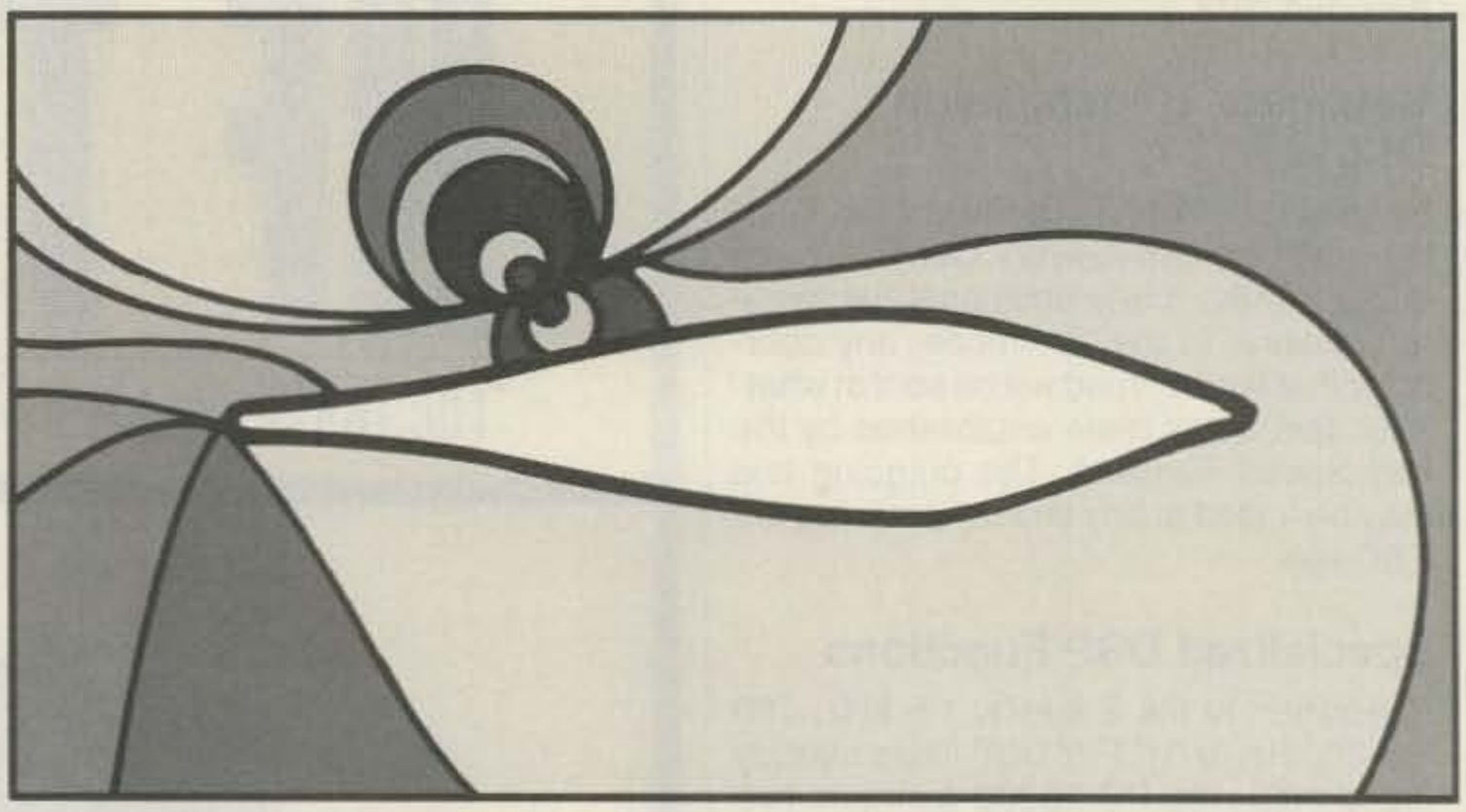
The PATCOMM PC-16000 is available from PATCOMM Corporation, 7 Flowerfield, Sate M, St. James, NY 11780 (516-862-6512). The price is $1649.00. ■

The Lauton Institute finally solved a problem that has long plagued 160 meter operators on the North American-European path.

Interference on Trans-Atlantic ESP Paths

BY PROFESSOR EMIL HEISSELUFT*
LAUTON INSTITUTE
GROSSMAUL-AN DER DONAU, AUSTRIA

Topband (160 meter) operators long have joked about using "ESP filters" to snag those rare ones on the trans-Atlantic path. What many don't know, however, is that some very well-known Topband operators in the VE1 and W1/W2 regions of North America have long attempted to use ESP as a way of digging out and working the many very low-power 160 meter stations located in Europe and east-central Asia. So serious is this group of DXers that they recently commissioned the Lauton Institute to investigate why ESP does not seem to yield the expected results (i.e., QSOs!) on the trans-Atlantic path. The results below, published for the first time ever in the popular literature, will astound you. —Alan, K2EEK



The electric field generated by a wave fish is distorted by a small, nearby foreign object. The fish then senses the perturbed field along its skin surface. Modified after Wickelgren, 1996)

During the 1996–1997 160 meter DX season, which extended roughly from September 1996 through March 1997, there was no lack of stations to work on Topband. Although many complained that the conditions were poorer than in prior seasons, one could, with a little patience and luck, work more than 100 countries on this band during this period, even using only a modestly equipped station. Such an accomplishment was possible in spite of the irrational behavior of many of your biggest "DX guns," who insist, night after night, on exchanging signal reports and greetings with the same stations they have contacted virtually every night in the previous month.

Such bizarre behavior aside, it should be noted that these very same operators, all of whom employ extensive arrays of directional transmitting and receiving antennas, have been pushing the "envelope" (as you Americans say) on working the low-power stations in Europe and east-central Asia. These are the stations that are two or three layers down in the noise and QRM from the stations heard most frequently on your side of the Atlantic. What they have been attempting to do, in fact, is to use extrasensory perception (ESP) as a way of digging out the callsigns of the weaker stations, even before they are posted on the Internet by other operators on the Continent. Efforts to use ESP, however, have failed miserably to yield the expected results! But why?

So it was, dear readers, that a distinguished group of Maritime Canadian and New England 160 meter enthusiasts approached the Lauton Institute in March 1997 to commence a study on why trans-Atlantic ESP was failing to yield the sought-after callsign information that, by all expectations, should be available to them. So desperate were they to solve this problem that collectively they raised over US$100,000 to fund the effort. The reason they came to the Institute, by the way, had to do with pioneering ESP studies I conducted there in the 1970s. These studies, reviewed in part in April 1977 *CQ*,[1] demonstrated unequivocally that the frequencies below 3 kHz, in the ultra-low-frequency (ULF) band, mediate information transfer by paranormal processes. Before getting into the results of the 1997 study, it would be useful to present a brief review of the reasons why such information transfer is confined to this band.

Extrasensory Perception (ESP) And The ULF Band

Kogan[2,3,4,5] believed that information transfer by paranormal processes is mediated by ULF waves (0.3 to 3 kHz) for the following reasons:

- Attenuation at these frequencies is slower than that predicted by the inverse-square law.
- Source-receiver distances lie in the induction field range (we are dealing with wavelengths of 100 km and greater).
- The low bit rates (on the order of 0.005 to 0.1 bit-sec) are compatible with the information-carrying capacity of ULF waves.

**Professor Heisseluft currently is in West Africa, where he is collecting elephant-nosed fish (*Gnathonemus petersil*) for electric field studies. Correspondence may conveniently be directed to the professor c/o* CQ.
<heisseluft.emil@mashuga.orf.at>

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Puthoff and Targ[6] published results from more than 50 ESP experiments which agreed with the (unpublished) results that Professor Jerry Ostermond-Tor and I performed in 1958, when I was a student of the professor. Specifically, on a path between Bad Salzufleln, Germany to the Lauton Institute, on several occasions (notably, at 1600 UTC on August 28, 1958) I was able to "see" in my mind's eye a visual image—or so-called "remote view"—of the *"Hinter der Wieke"* in Bad Salzuflen, Germany. Clearly, ESP, probably mediated by the ULF band, was a viable paranormal tool. But why has this information medium failed miserably on the trans-Atlantic path? The answer to that, my dear friends, lies in the little known existence of "strongly electric fish."

Strongly Electric Fish and Their Relationship To ESP Interference

Strongly electric fish were first detected by zoologist Hans Lissmann at Britain's Cambridge University in the 1950s.[7] Researchers at the University determined that the fish they were studying, named "wave fish," actually used self-generated electric fields to detect objects in the water around them. These wave fish had skin that was dotted with tuberous receptors that were used to detect the electric fields generated by the fish. The electric field distortion patterns detected (see fig. 1) were then integrated by the fish's brain to yield a "picture" of the fish's surroundings. To ensure the effectiveness of this viewing capability, a given fish will generate signals at a unique frequency and will tune its tuberous receptors to that frequency.

Neurobiologist Harold Zakon believes that sex hormones influence the frequency emitted. For example, in one species he studied, females emitted a signal at 150 Hz, while males were observed to transmit at 60 Hz. To prove his theory, Zakon went so far as to give male hormones to female fish, whose transmit and frequencies thereupon shifted downward in frequency. What is important to note here, of course, is that the frequencies involved are around the middle of the ULF band—exactly where ESP takes place! And therein lies the answer to the puzzle as to why trans-Atlantic ESP apparently fails to work: *The interference from electric fields generated by countless numbers of wave fish in the North Atlantic bury human-generated ESP signals in noise.* Astounding, to be sure, but true nevertheless.

To confirm these findings, my colleagues and I undertook our own experiments in the field of wave fish. Specifically, we used pairs of male-male and male-female wave fish to study the bursts of rapid electric pulses emitted by these fish. In the case of the male-male pair, the pulses, which were easily detected, apparently were used to warn away potential intruders. On the other hand, we observed a very pronounced shift in the periodicity of female-generated pulses, from erratic to regular, even-spaced pulses, when the female was attempting to attract a male. The male, in turn, signaled his willingness to be with her.

Finally, our studies revealed that while some fish pulsed with repetition rates on the order of 50–15 Hz, most exhibited emissions in the band 250–1250 Hz.

Conclusions

Needless to say, the Topband amateurs who commissioned the Institute's study on wave fish were not pleased! There was no denying the fact that wave fish in the North Atlantic were burying ESP signals generated by amateurs in Europe and east-central Asia. Further, there was little that could be done to overcome this problem, given the limitations imposed by the extraordinarily long wavelengths involved. However, in their last correspondence to the Lauton Institute, at least three of the amateurs involved indicated that they were installing multiple arrays of Beverages directed at various points of the compass in their efforts to dig ever deeper into the noise on Topband. ■

References

1. Heisseluft, E., "Broadcasters threaten takeover of amateur ULF band at WARC 79," *CQ*, April 1977.
2. Kogan, I. M., "Is telepathy possible?" *Radio Engineering*, Vol. 21, p. 75, 1966.
3. Kogan, I. M., "Telepathy, hypnosis and observations," *Radio Engineering*, Vol. 22, p. 141, 1967.
4. Kogan, I. M., "Information theory analysis of telepathic communication experiments," *Radio Engineering*, Vol. 23, p.122, 1968.
5. Kogan, I. M., "The information theory aspect of telepathy," RAND Publ., Santa Monica, CA, p. 4145, 1969.
6. Puthoff, H. E. and R. Targ, "A perceptual channel for information transfer over kilometer distances: Historical perspective and recent research," *Proc. IEEE*, Vol. 64, No. 3, 1976.
7. Wickelgren, I., "The strange senses of other species," *IEEE Spectrum*, March 1996.
8. Devoldere, J., ON4UN, *Antennas and Techniques for Low-Band DXing*, Chap. 7, p. 7-21, ARRL, Newington, CT, 1994.

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The MFJ Model 1798 Vertical Antenna

BY PAUL CARR*, N4PC

One of the most misunderstood antennas in use by radio amateurs is the vertical. It is not uncommon to hear people on the bands describe the vertical as "the antenna that radiates equally poor in all directions." Obviously, these comments originate from people who do not fully understand the attributes of the vertical antenna. To look at some of the finer points of the antenna, consider the following:

1. The vertical has a low angle of elevation even when mounted at ground level.

2. It provides low visual impact, which can be used to great advantage when you need an antenna to which the neighbors will not object.

3. Very little space is required to mount the vertical. Often it can be roof mounted.

4. As far as DX is concerned, sometimes it is possible to hear and work DX while other amateurs are rotating their multi-element arrays. (That always provides a chuckle for me!)

The MFJ 1798 vertical may be the antenna for which you have been looking, and it covers 80 through 2 meters. Here is my evaluation.

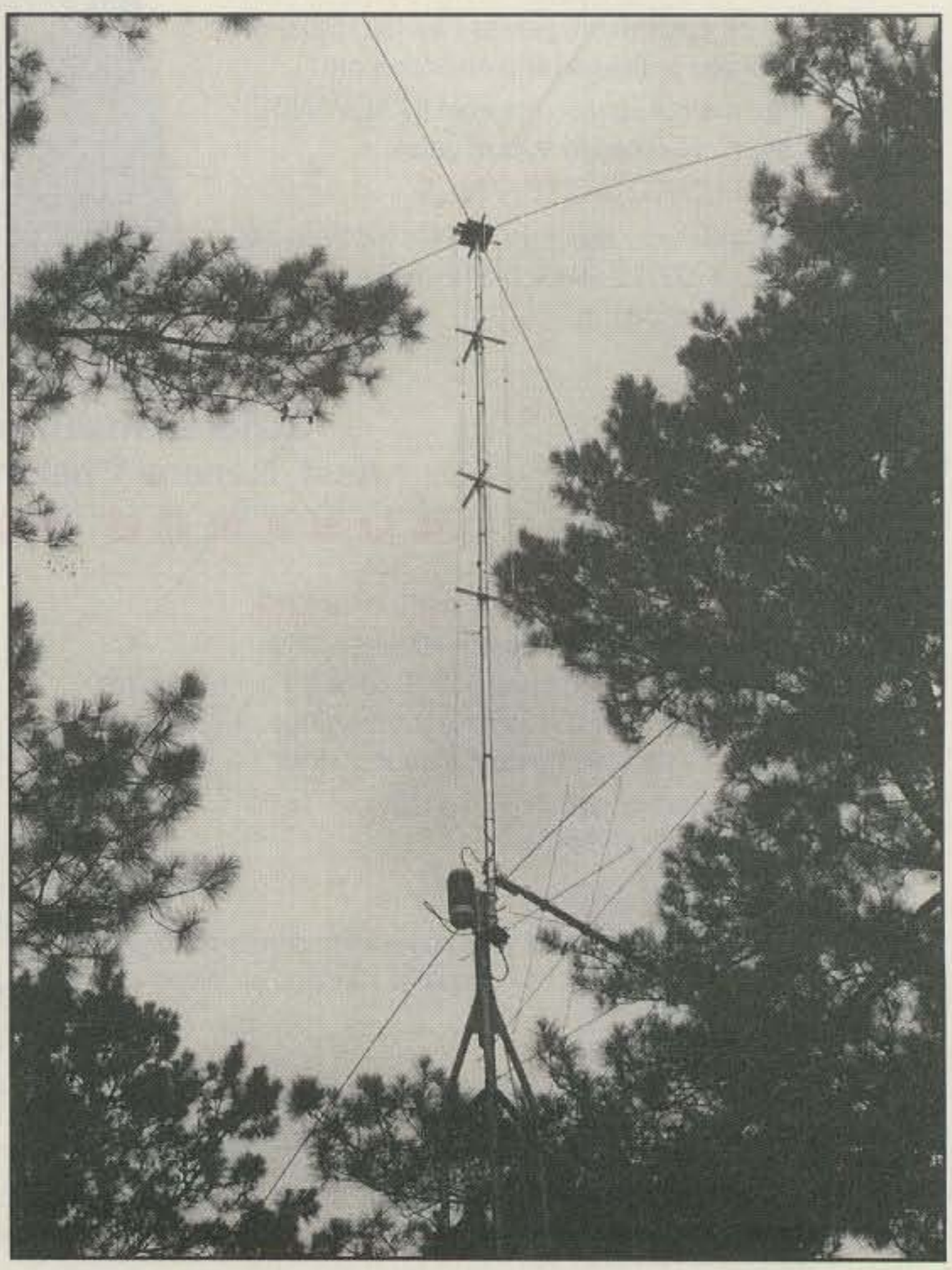
*97 West Point Rd., Jacksonville, AL 36265

Background

The basic design concept for this antenna is very straightforward. The antenna is an electrical quarter wavelength on all bands except one. One thing that may seem a bit strange is the fact that the antenna is fed at the top. If you feed an antenna one-quarter wavelength from one end of the radiator, this is the point of minimum impedance, which means a point of maximum current. If the point of maximum current is at the top of the antenna, this means the radiation is enhanced. There is also an electrical counterpoise at the top of the antenna. This reduces the ground effects and increases the overall efficiency of the antenna.

If you take a look at the formulas for antenna lengths, you immediately can see that low frequency implies large structures. The size can be reduced significantly by careful engineering. The staff at MFJ has done a beautiful job of size reduction on the lower four bands by using capacity hat loading. I prefer this approach, since the losses are lower with capacity hats than with load coils. One disadvantage of using size-reduction techniques is that you also reduce the available bandwidth of the antenna. Here a decision must be made. I selected my favorite section of the 80 and 40 meter CW bands, and tune for minimum SWR. On the bands above 20 meters, the anten-

Prior to assembly, lay out all the components in a clear space. Check the parts and hardware count against the manual. Most of all, take your time. This is what the 1798 looks like as it comes from the box.



A bit of patience and time will have your MFJ 1798 completed and up in the air looking like this.→

Having a test jig, such as shown, makes assembly easier.

na is a full-size quarter-wave vertical, and the bandwidth is "across the band." The one exception to this is on 6 meters. The 6 meter band coverage makes use of the fact that a quarter-wave 17 meter resonator becomes a three-quarter wavelength resonator on 6 meters. This length will also provide a low-impedance feed point on 6 meters.

Overall height of the 1798 is less than 20 feet, and its footprint is about 12 feet.

Assembly

Before any assembly is attempted, I recommend that a complete inventory of all hardware be completed. There is a complete parts list included in the instruction manual to aid you in this effort. There is also a list of recommended tools required for construction.

The overall assembly is very straightforward. Follow the step-by-step instructions listed in the manual. One thing that I found very helpful was to mount the top section of the vertical radiator in a bench vice. This makes a very sturdy work station and allows you to mount the aluminum "spokes" and the surrounding wires of the counterpoise. After the subassembly is complete, the top portion of the antenna can be attached permanently to the remainder of the vertical radiator. This is the only slight deviation that I made from the instruction manual. Complete the remainder of the assembly as outlined in the manual.

Frequency and SWR Adjustment

To facilitate final tuning, I placed the completed antenna on a triangular tilt-over tower that I have for my antenna experiments. This tower arrangement is not essential, but you do need some arrangement that will allow you access to both the bottom and top of the antenna.

Start by tuning the antenna to resonance on 80 meters. With the spokes of the top hat at full length, the resonant point is slightly below the 80 meter CW band. There is a table in the instruction manual that shows how much the resonant frequency is raised by removing one inch from a single spoke. You can use this information to calculate the lengths that must be removed from each spoke to place the resonant point at the desired portion of the band. Tuning the antenna to the desired resonant point is much easier than writing about it.

After the antenna is properly tuned on 80 meters, follow the same procedure to tune the antenna on 40 and 30 meters. On 20 meters, there are two rods that are parallel to the ground. Resonance is established by sliding these in or out of their mounting clips.

The bandwidth on 80 meters is approximately 35 kHz, and on 40 meters it is about 25 kHz. On the remainder of the bands 30 through 2 meters, the bandwidth is across the entire band.

On 17 through 2 meters, resonance is obtained by shortening or lengthening the vertical radiator element. This is where the tilt-over tower comes in handy. The entire tune-up procedure goes very well, and it can be speeded up considerably with careful forethought.

Overall time for assembly and tuning of this antenna was about 10 hours spread over two days. I like to have some time away from the antenna so I can perform a check of the work that has been completed. You may prefer a different approach, but this is what works best for me.

Initial Evaluation

I kept the antenna on the tilt-over tower for the initial evaluation. I must admit the antenna performed beyond my expectations. It is a real pleasure to be able to switch from band to band and not be concerned with having to adjust a Transmatch. I found this to be especially pleasing when I was operating during the Field Day contest. I could change bands and make calls with no effort.

Just as a little test, I wanted to see how many states I could work during a one hour period. When the time was up, there were 25 states in my log. That was fun!

I would feel guilty if I closed this evaluation with no mention of safety. Remember, antennas are made from conducting materials, and as such they should never be placed in an area where they can come in accidental contact with electrical conductors. In addition, careful consideration should be given to properly grounding the antenna against lighting strikes. You cannot be too careful.

Availability

The antenna is available from MFJ Enterprises or their authorized distributors. The list price is $199.95. I think this antenna will be in operation from my QTH for a long time. ■

We've all been there. We've all lucked out— for the time being, that is. While the next time may be our turn, there's still time to change the situation and improve our antenna installations.

A Tower Installation Design Failure

BY PATRICK O. CONNELL*, WA7PDC

I have found many parallels between my livelihood as an industrial forester and being an amateur radio operator. For example, get together a bunch of my colleagues who are directly involved in tree nurseries, and you know how the "pecking order" and quality of their experiences are measured? By the number of abject crop failures that they have experienced.

Probably the fastest way to gain peer standing is to experience a catastrophe that is yet to have been visited upon another known living soul! Amateur radio is much the same.

I started my amateur life when I was 14, nearly 35 years ago, as WN6JLC. If I dredged up any of some of the *classical* stunts that I pulled, my sainted mother probably would still rise up. This article was written to share with you my most recent experience (catastrophe) pertaining to antenna systems.

Inevitably, as amateurs focus on a particular aspect of the hobby, the resulting ham shack and antenna farm become specialized and advanced, reflecting their interests. I grew up reading Lew McCoy and others reminding us that the most effective improvement to an amateur station would focus on the antenna. As my passion has been weak-signal VHF, all this advice could be condensed into two terms: *higher* and *larger* antennas.

A natural step toward obtaining a competitive antenna system is to secure a tower. I have used Rohn 25 towers for nearly 20 years, and I recently had my first tower failure. Well, actually that's incorrect. Understand that the tower system failed, but it was no fault of Rohn.

Nearly ten years ago I roof-mounted two sections of Rohn 25 tower at my current home. Subsequently, the tower supported a tribander and a 4-element 6 meter beam that I messed with and changed annually, until I chucked the tribander. Finally, last spring I installed a stacked pair of 6-element 6 meter beams spaced 12 feet (5/8 wavelength). It crashed this past October, and I am grateful.

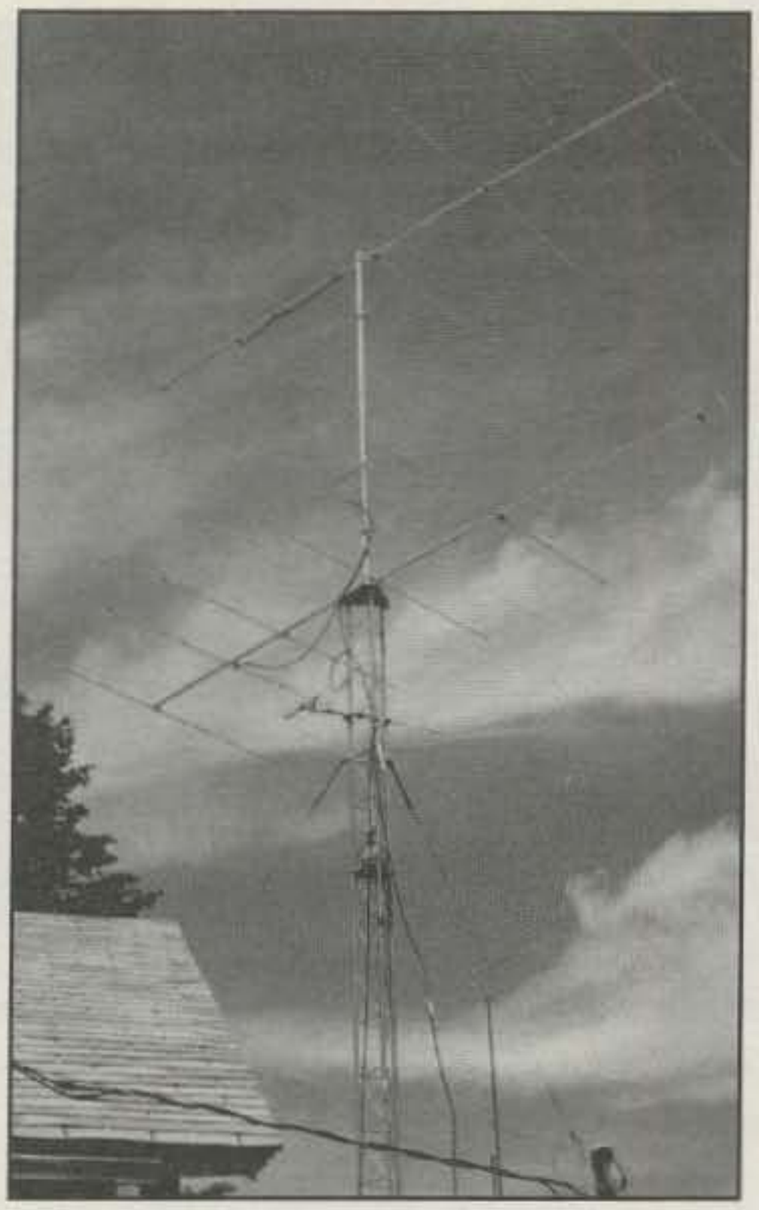
I was real lucky when the tower came down late last year. First, I wasn't on it at the time, and second, it didn't do more damage.

One reason why I am grateful is that I wasn't on the darn thing, as it likely would either have paralyzed or killed me. That statement is a fact, and my risk was entirely avoidable. Even worse, I knew better.

An additional reason why I'm grateful is that the incident occurred while I was involved with the installation of a metal roof on my house, and I had been pondering how the devil I could maneuver around the tower mount with the roofing. That issue quickly became a non- issue.

My fundamental mistake was a lack of preventive maintenance on the tower-mounting arrangement. While my guying system wasn't the best, it would not have failed with a few moments of care and feeding every year. Originally, I placed a couple of 2×8s as a base plates for the tower itself, and anchored them through the roof into the rafter/truss system. Likewise, I took pains to balance the spacing of the guy anchor points, which were lag-

* *284 Cooper Lane, Hamilton, MT 59840*

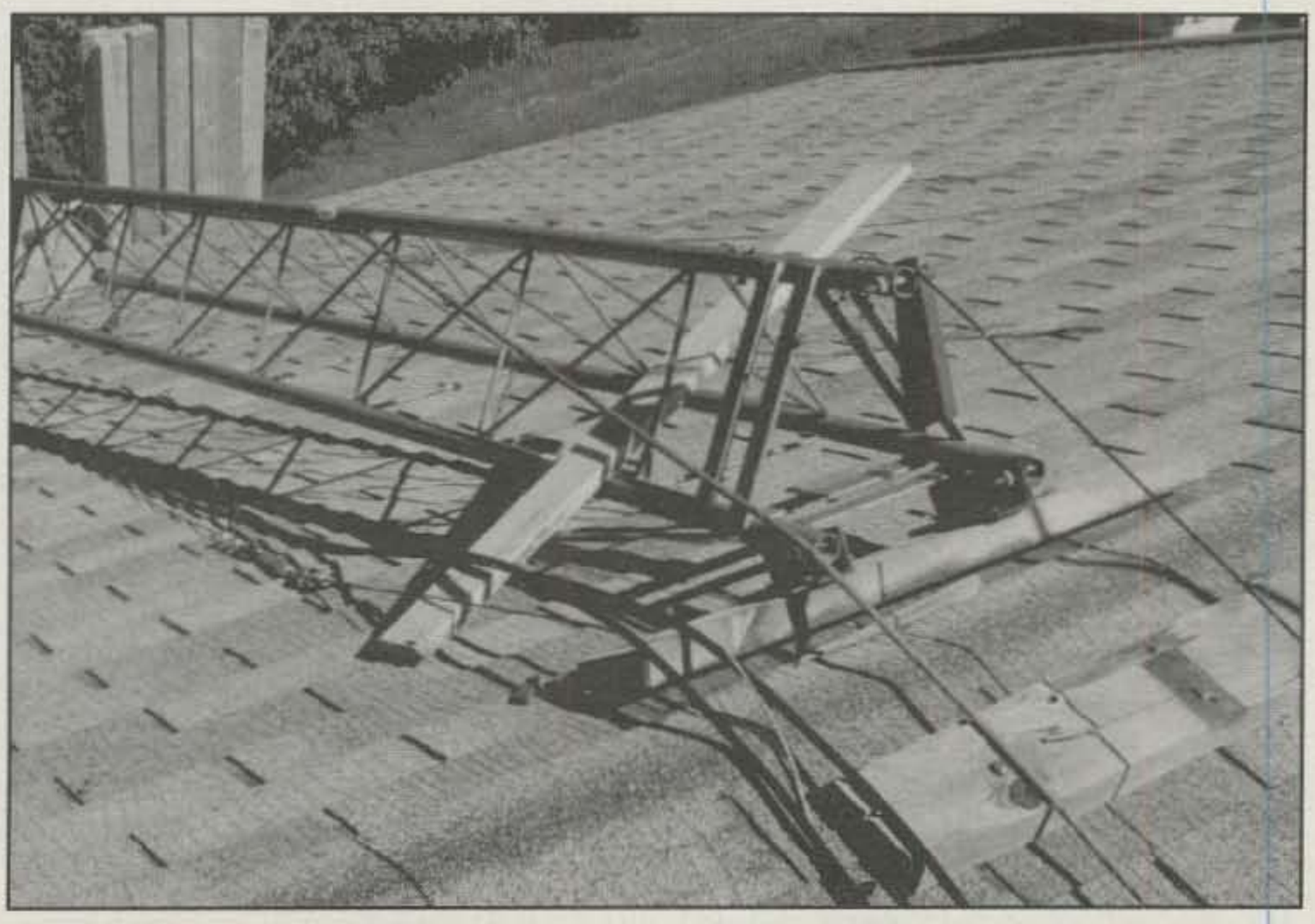


Prior to its demise, this is the tower which once supported a 6 meter beam and a tribander, and at its last moment held a pair of 6-element, 6 meter beams.

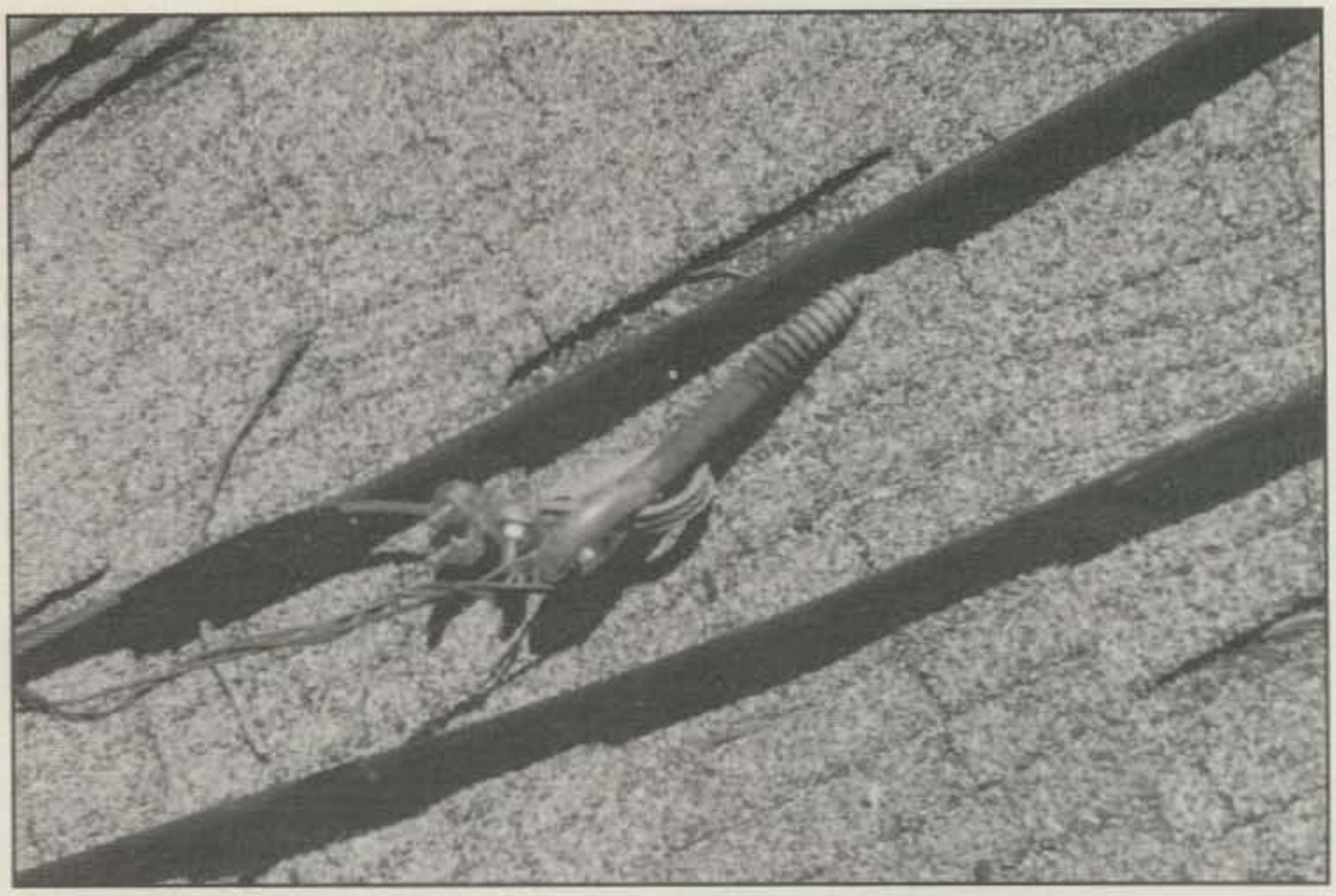
style eye bolts, and ensure that they were also secured into the rafter truss system.

The 2×8s that I used as base plates extended quite a bit beyond the tower. This procedure was essential, as it effectively distributed the actual weight of the whole tower, rotator, and antennas across at least three truss members. Under *no circumstances* should you simply bolt the tower roof base to the roof without such a system to distribute the vertical forces, as most modern homes only have either 1/2 inch plywood or oriented-strand board (OSB) for roof sheathing. Older homes typically had 1×boards. Either style of roof sheathing is absolutely *not* capable of supporting the weight of the tower, and the typical truss spacing of 16 or 24 inches guarantees you can't just "luck out" and expect the tower's hardware to match. Additionally, to reduce risks to the truss system from the twisting forces encountered in an antenna system, I added additional side truss supports in the attic. The base mount initially was not a problem.

Hindsight, always being so clear, points out that I had clear warning of the deteriorating nature of my installation, and that risk percentages were beginning to add up. The 2×8 base plates sat year after year, through rain, snow, and –40°F and 100°F+ temperatures. While initially the plates has a treatment of a spar varnish, I subsequently did not annually renew the coating, and the wood proceeded to weather and crack. Likewise, I did not annually check and remove old caulking around the guy anchor eyebolts. I will admit that I had inspected the plates over the last couple of years and had decided to replace them—when I got to it. However, I determined that since the primary forces on the mounting were vertical, it wasn't going "to go anywhere" and I was safe. The fact was, my analysis was accu-



By seeing but not actually looking at the wooden plates, I failed to notice the changes taking place. The wood had weathered and cracked without regular maintenance, allowing water to infiltrate and rot the bolt hole.

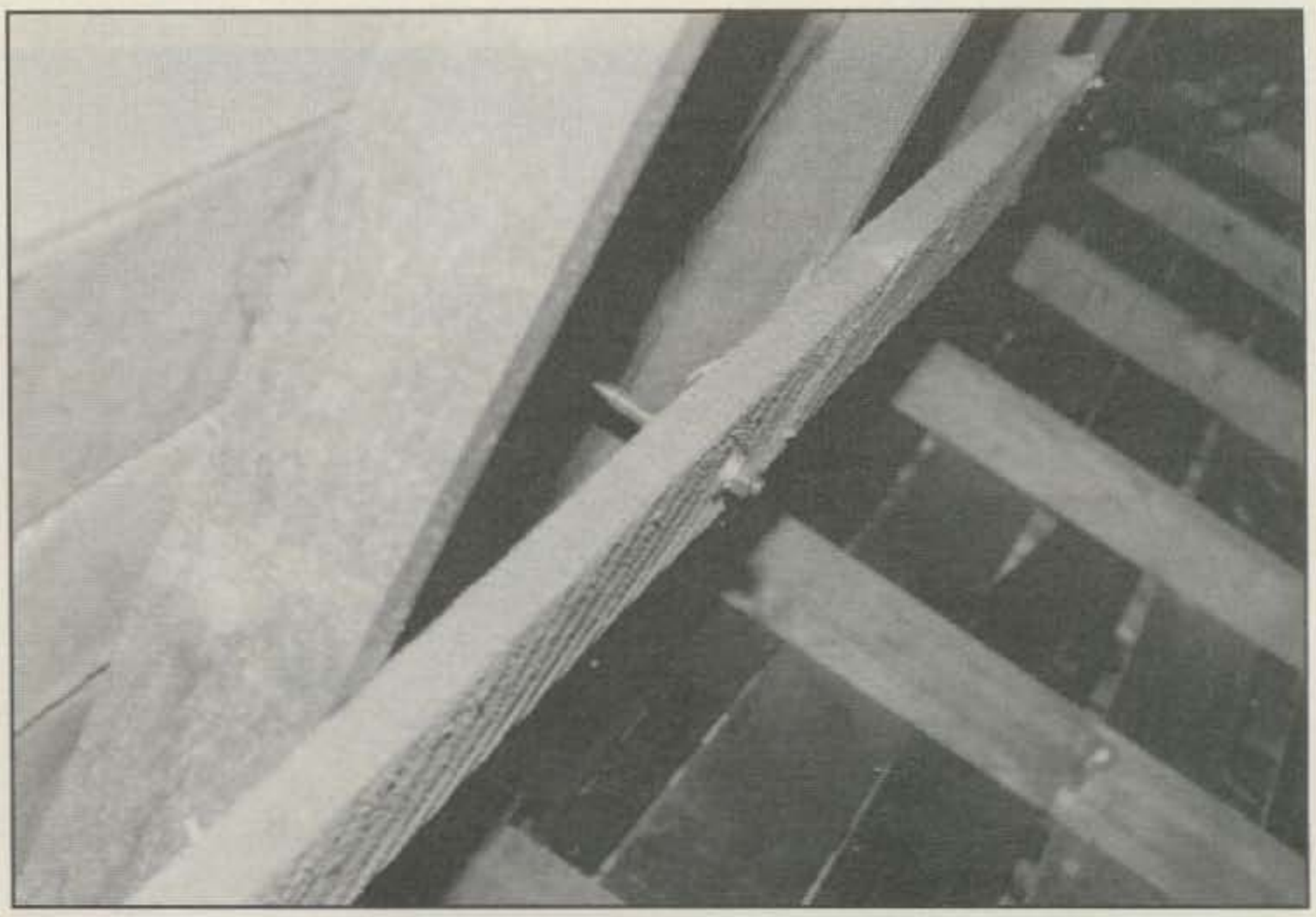


To bring the point home, the eyebolts all showed rust and discoloration on the part of the screw that was in the wood.

rate on that narrow point, but failed to process the critical bit of data that stems somewhat from one of Murphy's subsequent theorems: (1) It's always worse than it appears; (2) If it looks bad, it is.

Even though I checked the guylines every time I faced climbing the tower, I did not see the danger building under the surface of the roof where the lag bolts were screwed into the rafters.

The prolonged exposure to weather inexorably began to deteriorate the actual lag bolt connections of the tower *and guys*. Basically, moisture had infiltrated around the base mounting plates, as well as around the eyebolt lag screws that served as the anchor point for the guylines into the rafter/truss system and rotted out the wood! This can be verified by the dark reddish-brown appearance of the eyebolt



My new system involves some considerable beefing up, plus regular maintenance. This time I've included a heavy- duty 2" × 6" anchored to the inside rafters. Running through the outside wooden plates, roof, and the 2" × 6" are high-quality machine-screw bolts and eyebolts with appropriate flat and lock washers.

lag that had been screwed into the rafter and failed. Subsequent removal of the tower confirmed that all the lag screws to some degree were in process of failure. The impact of this inspection was not lost on my psyche, as I had just made several trips up and down that tower five months earlier while erecting my new "super six" antenna array!

I was working in my backyard when the tower failed. We were experiencing a blustery breeze, with gusts up to 25 mph. In its youth, the tower had withstood gusts up to 50–60 mph. Aside from my obvious dismay over the damage caused to my mast and antennas, and the subsequent forced QRT of my station, I know I was extremely lucky.

I urge anyone with roof-mount towers to reevaluate their system and to do some simple preventive maintenance so that they neither have to go QRT or potentially become a Silent Key.

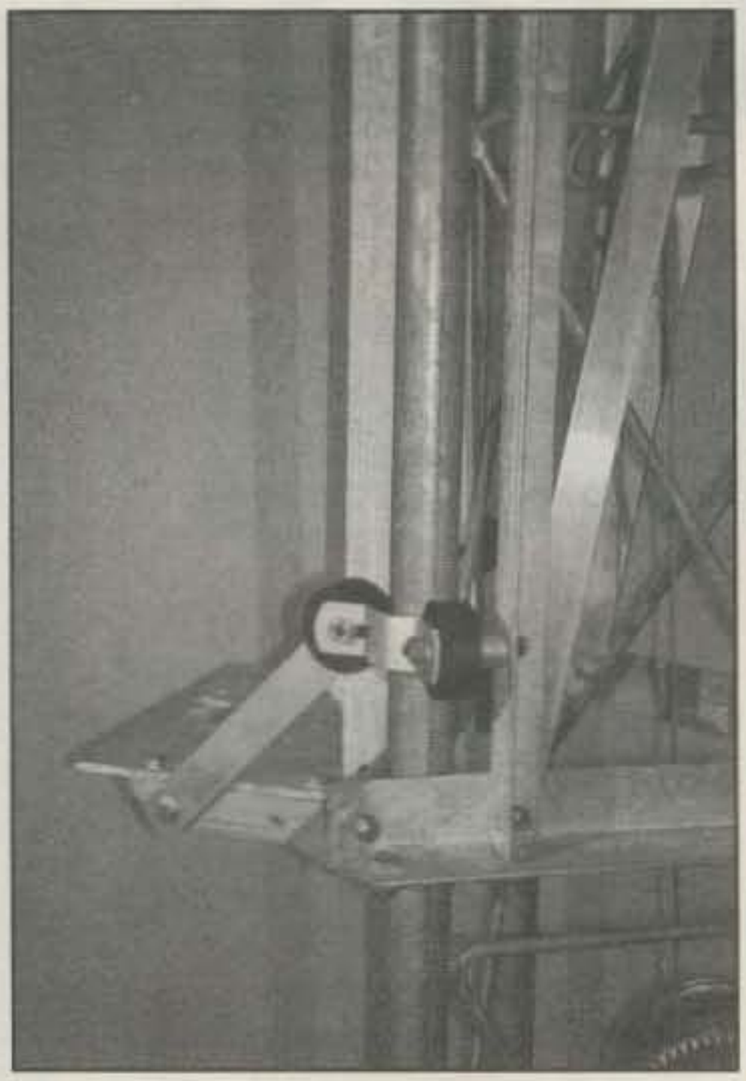
Really evaluate the need to have a roof-mounted tower. There are several relatively short tower systems designed for roof-peak use. One of their characteristics of value is that they stand erect by themselves. The design of conventional towers appears to be based upon having a big chunk of concrete in the ground as a base anchor. With a sufficient anchor, these towers can be self-supporting to a rather tall level.

If you are absolutely limited to a roof-mount tower for your skyhook, there are a couple of connection designs that should prevent you, too, from enjoying my happy experiences. Use high-quality machine-screw bolts and eyebolts with appropriate flat and lock washers. Position your bolts to avoid the rafters, and use long enough shank bolts to anchor through a quality 2×6 anchored to the rafters. To produce a connection failure, this approach requires a compression force to shear the 2×6. The typical guys used in amateur applications will rupture before this type of anchor connection. I use this system on my other, still standing, ground-based tower with guy points to my garage. However, if you have any concern about this technique, you could also utilize a length of 2" by .125" steel strap under the flatwasher as a pressure plate extending past the adjacent rafters.

Back topside, you need to weather-seal the bolt holes through the roof. Realize that asphalt composition roofing and wood shakes are installed multi-layered. Make sure that you fully caulk the hole's side walls as well as the very top.

Finally, take the effort to annually inspect the structure, and replace anything that looks used, abused, or worn. Remember Murphy! ■

CQ SHOWCASE



Hazer Roller Bearing Set From Glen Martin Engineering

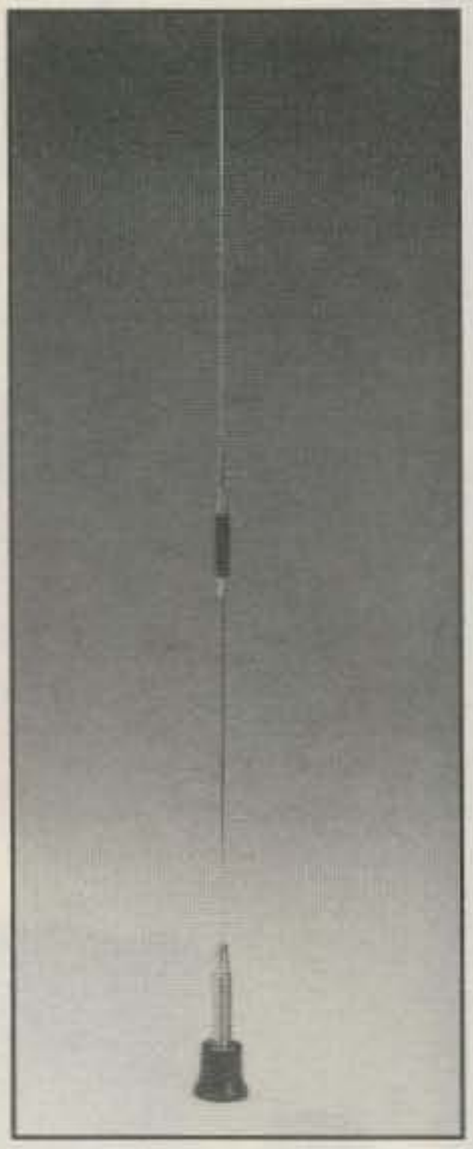
Glen Martin Engineering now produces a Roller Bearing Set for Hazers that fits on Rohn and Martin Towers. The Roller Bearing Set improves the smooth contact of the Hazer with the tower. The bearings easily roll over tower joints or other rough spots. They eliminate any previous play or sideward movement on a Hazer.

Suggested retail price of the Roller Bearing Set (HR-2040) for Hazer 2, 3, and 4 is $59.95. For Hazer 5 and 6 (HR-6040) it is $44. For more information, contact Glen Martion Engineering, 13620 Old Hwy 40, Boonville, MO 65233 (phone 660-882-7500; fax 660-882-7200; e-mail <http://www.glenmartin.com>), or circle number 102 on the reader service card.

Wheeler Applied Research's Code Quick 2000 CD Rom

Code Quick 2000 CD Rom from Wheeler Applied Research is designed for attaining mastery of Morse Code. On the CD Rom are several programs designed especially for Windows 95. The sound card is utilized to provide flawless "Farnsworth type" code from 2–40 wpm. There are 999 QSOs, 999 VE type tests, unlimited random code, a generous help file, and other features. The CD can be a stand-alone, but is also linked with a new cassette course. Both use the proven "Code Quick Sound Alike Method." The CD Rom also comes with all current FCC theory pools from Novice through Extra and a game called Code Quick Plus.

For more information, contact Wheeler Applied Research, 38221 Desert Greens Dr. W., Palm Desert, CA 92260 (phone 760-773-9426, orders toll free 1-800-782-4869; web <http://www.codequick.com>) or circle 104 on the reader service card.



Larsen Wide-Band UHF Antenna

Larsen's NMO WB 406 C wide-band, UHF antenna provides 60 MHz of bandwidth at 2:1 VSWR and can be tuned to achieve 25 MHz of bandwidth at 1.5:1. The WB 406 is factory tuned to cover 406–470 MHz at 2:1. Cutting instructions are included to tune the antenna to cover up to 512 MHz. It provides an average of 3.5 dBd gain and mounts on the NMO 3/4 inch mount. The antenna utilizes a special coil housed in a compact Makroblend (a resin polymer plastic) shell. It is also supplied with Larsen's internally shorted shock spring for extra durability.

The antenna is covered by Larsen's 3-year No-Nonsense Warranty. For more information, contact Larsen Electronics, Inc., 3611 NE 112th Ave., Vancouver, WA 98682 (phone 360-944-7551; fax 360-944-7556), or circle number 103 on the reader service card.

"Amateur Radio Prefix Maps" From Radio Amateur Callbook

The winter edition of the Radio Amateur Callbook CD-ROM includes "Amateur Radio Prefix Maps" which display in color prefix, state, or country where the amateur resides. Other upgrades to the winter edition include extended Wordsearch (search by first name, last name, city, and zip code all in one search); additional fields (previous call and class, e-mail address, fax number, special comment, and vanity call indicator); simplified text search; and listings of over 1.4 million ops.

For more info, contact Radio Amateur Callbook, P.O. Box 2013, Lakewood, NJ 08701 (908-905-2961; fax 908-363-0338), or circle 100 on the reader service card.

Yaesu GA-2500 and GA-3000 Tower Mount Absorber Joints

Two tower-mounted absorber joints for rotators are now available from Yaesu. The GA-2500 and GA-3000 Tower Mount Absorber Joints are designed to both reduce stress to rotator gears and lessen the chance of binding. Made from high-density polypropylene, the absorber joints increase rotator performance by cushioning and absorbing shock produced by rotation start and stop and sudden wind gusts. The pivoting design permits the rotator base to compensate for up to 2 degrees of offset from vertical. The joints install inside the tower between the rotator and tower mounting plate.

The GA-2500 is suited for use with the light- to medium-duty G-400, G-450, G-800S, and G-800DX Rotators, and the GA-3000 is for heavy-duty installations with the G-1000SDX and G-2800DX rotators. For more information, contact Yaesu USA, 17210 Edwards Rd., Cerritos, CA 90703 (562-404-2700).

PacTerm '98 from Kantronics & Creative Services Software

Kantronics and Ceative Services Software have presented a 32 bit terminal software for the Kantronics™ TNC - PacTerm '98. The software takes advantage of true multitasking in Windows 95 and Windows NT and uses standard Windows commands. Features include: support of G-TOR® and G-TOR Monitoring; multi-stream and multi-port support (up to 26 streams per packet port, each in a different window); switch between streams with the click of the mouse; text and binary file transfers with YAPP; support of COM1 to COM35; user defined colors and fonts; user defined macros; and more.

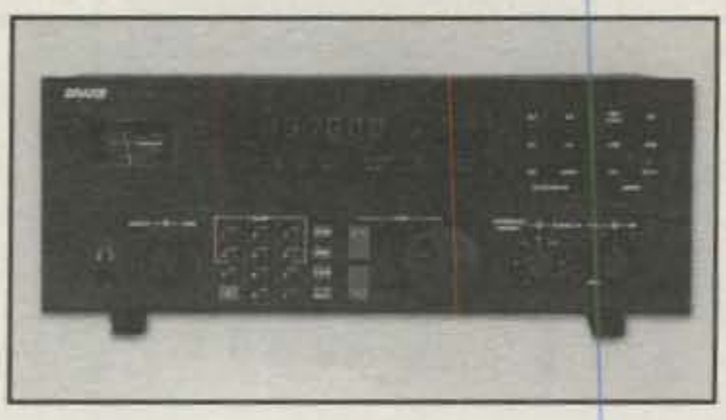
The software requires Kantronics Host Mode (compatible with all Kantronics TNCs with current firmware); Kantronics KAM Plus or KAM with enhancement board, Kantronics KAM with version 7.0 firmware, KPC series with version 5.0 firmware or later, or Kantronics Data Engine with version 2.0. For more information, contact Creative Services Software, Inc., 106 Heathrow Court, Florence, AL

35633 (205-767-3739; fax 205-760-9453; <http://www.cssincorp.com>); or Kantronics, 1202 E. 23rd St., Lawrence, KS 66046-5099 (913-842-7745; fax 913-842-2021; <http://www. kantronics.com>); or circle 106 on the reader service card.

R.L. Drake R8B World Band Communications Receiver

R.L. Drake's R8B is suited to both the beginner and expert alike, maker says. The unit includes selectable sideband synchronous detection, 1000 programmable memories, multiple built-in filters, and more. The 100 kHz to 30,000 kHz frequency range allows coverage of all world bands. Additional VHF bands (35–55 and 108–174 MHz), including marine and aircraft bands, are also available with an optional VHF converter. A built-in noise blanker minimizes electrical interference; passband offset control minimizes or eliminates adjacent signal interference without compromising intelligibility. To receive weak or fading signals the R8B employs a selectable AGC delay, as well as the synchronous detector.

Also included are keypad entry of all functions, large controls, alphanumeric liquid-crystal display, built-in mini-voltage power supply, RS232C serial interface, tone control, removable power cord, two



clock timers, built-in speaker, dual antenna inputs, mute switch for use with transmitter, and headphone jack. For more information, contact R.L. Drake Company, 230 Industrial Drive, Franklin, OH 45005 (513-746-4556; fax 513-743-4510; web <http://www.rldrake.com>), or circle number 101 on the reader service card.

Rocky Mountain Antennas J-Pole Antennas

Rocky Mountain Antennas has introduced the JP-2M and JP-5B J-pole 2 meter/70 cm dual banders for the amateur VHF/144–148 and 440–445 MHz bands. The JP-2M is a 2-element antenna designed for mobile and/or marine use. The JP-5B is a 5-element antenna designed for base-station use. Both are constructed of stainless steel with black powdered rugged paint, and both incorporate a long-lasting black anodized aluminum base plate. Each is fitted with a silver SO-239 with gold center pin. Each is constructed using coiling for inductive tuning network.

Retail price of the JP-2M is $59.95; the JP-5B is $69.95 (available June '98), both plus s&h. For more information, contact Rocky Mountain Antennas, 1409 Pine St., Everett, WA 98201 (phone 425-303-0084; fax 425-339-8534), or circle number 105 on the reader service card.

WriteLog Contest Software Rttyrite/WinRTTY from K5DJ

Writelog is contest logging software designed to fully deliver the use of Windows 95 or Windows 3.11. This one package can handle CW, SSB, and RTTY contesting needs. It features: the ability for the user to work RTTY using any 16-bit (or better) sound card (no other hardware required); full radio control; helpful band map; packet interface; fast Ethernet networking; super check partial; click and go mouse support; perfect log submission; two radio support; and support of all major contests in all modes, maker says.

WriteLog is priced at $50 (add $10 for printed manual, or download free). For more information or to order, contact Ron Stailey, K5DJ, 504 Dove Haven Drive, Round Rock, TX 78664-5926 (512-255-5000); or e-mail <k5dj@easy.com; or web <http://www.contesting.com/writelog>.

Results of the 1997 CQ WW VHF Contest

BY JOE LYNCH*, N6CL

Conditions were poor to fair to good for the 1997 contest, depending on where in the world you were. The upper Midwest enjoyed a 3 1/2 hour opening into the eastern seaboard during Sunday afternoon. Total number of entrants was just over 80, a bit lower than in 1996.

The Winners

The highest score turned in was from a Multi-Op Fixed Class I station. W2DRZ, with operators N2s ODU, XTX assisting, amassed over 125k points while operating on six bands. The top Single Fixed operator was K8TQK, with a score in excess of 47k. The top Single Portable score was W3KN/2, with 5k. The top Multi-Op Fixed Class II was TM2DX, with almost 49k. The top Multi-Op Portable Class II entrant was E22AAB with nearly 26k points, and they did that by making over 1k QSOs!

Speaking of Thailand, there were 21 entrants from that country, making it the second largest participating country, next to the U.S. Thanks again to John Narissara Shaowanasai, HS1CHB/N9WMS, for forwarding their logs. The top QRP entrant was VE1ASJ with more than 9k. The top Rover was K9DTB with almost 4.5k.

This and That

Thanks to the Thailand participants, this contest is getting a great boost, particularly in Asia. Among their contest entrants was the first non-U.S.-Canada Rover station, E21IYW.

Overall, participation is a bit down from last year. There are a couple of reasons—propagation and untimely reporting of the results. Hopefully, with the earlier publication of the results and the posting of the raw scores on my home page, we may have turned a corner regarding the latter reason. There is not much we can do about the former, except to operate in spite of indicative propagation. You never know when the band is open when you are not on the air. It's sort of like the philosophical question of whether or not a tree makes a noise when it falls in the forest if no one is there. Of course it does. It just is that no one heard it! In the case of band openings, of course they are open. With no one there to participate, it just was that no one worked anyone! Let's try not to make that happen this year.

Overall, the scoring of logs was vastly improved over years past. There was some confusion on the part of some of the Thailand entrants, with some operators claiming Multi-Op Class I Portable status. This is reserved for stations which have more than four transmitters going simultaneously. Because all Thailand entrants were on the single band of 2 meters, it is assumed that they had only one transmitter going on that band, hence their qualifying for the Multi-Op Class II Portable category.

It was good to see some entrants trying out their new vanity calls. Undoubtedly, there will be more this year. Speaking of this year, the rules for the 1998 contest will be published next month. They are posted on my home page now. Hope to see you in this year's contest!

73, Joe, N6CL

Random Comments

Conditions could have been better; contest was fun as usual. . . . *N4ION*. Great UHF conditions. First contact on 50 MHz. A filament on one of my 3-500 tubes went out which caused an imbalance. It arced over and took out my receiver. . . . *WA2FGK*. My coaxial cable was eaten by a cow! . . . *FA1APR*. The great opening to the northeast lasted for hours allowed us to work seemingly everyone that was on in W1 land and the Canadian Maritimes.

Doubled last year's score and worked four new grids on 432 MHz. Fine contest and WX cooperated. . . . *N8PVT*. Operated CW only as a Rover. Poor con-

Category Winners

Single Operator, Fixed
K8TQK 47,464

Single Operator, Portable
W3KN/2 5,364

Multi-Op Class I, Fixed
W2DRZ 125,296

Multi-Op Class II, Fixed
TM2DX 48,822

Multi-Op Class II, Portable
E22AAB 25,968

QRP
VE1ASJ 9,240

Rover
K9DTB 4,402

Site of Multi-Op Class II Portable station N8PVT, 100 feet above Lake Michigan, outside of Manistee. (Photo courtesy N8PVT)

P.O. Box 73, Oklahoma City, OK 73101
(phone 405-528-6625; fax 405-528-0746)
Internet jlynch@post.cis.smu.edu

AMERITRON . . . 800 Watts . . . $795

meritron AL-811H gives you four 811A tubes, 800 watts, superior quality -- for less money -- than ne competitor's 3 tube 600 watt unit . . . Why settle for less power, less quality and pay more money?

AL-811H
$795
Suggested Retail

AL-811
$649
Suggested Retail

Only the Ameritron AL-811H gives you *four fully neutralized* 811A transmitting tubes. You get absolute stability and superb performance on higher bands that can't be matched by un-neutralized tubes.

Ameritron mounts the 811A tubes *vertically* -- not horizontally -- to prevent hot tube elements from sagging and shorting out. Others, using *potentially damaging horizontal mounting*, require special 811A tubes to retard sagging and shorting.

A *quiet*, powerful computer grade blower draws in plenty of cool air. It *pressurizes* the cabinet and efficiently cools your 811A tubes. Our air flow is so quiet, you'll hardly know it's there -- unlike noisy, poorly chosen blowers.

You also get efficient full size heavy duty tank coils, full height computer grade capacitors, heavy duty high silicon core power transformer, slug tuned input coils, operate/standby switch, transmit LED, ALC, dual meters, QSK compatibility with QSK-5 plus much more.

AL-811 has three 811A tubes and gives 600 Watts output for only $649.

Kilowatt Amplifier

AL-80B
$1249
Suggested Retail

Full kilowatt PEP output from a whisper quiet compact desktop linear Only 8½x14x15½ inches. Plugs into nearest 120 VAC outlet. All bands 160-15 Meters, 1000 watts out on SSB, 850 watts out on CW, genuine Amperex 3-500ZG tube has graphie plate, nearly 70% efficiency, inrush current protection, multi-voltage tranformer.

NearLegalLimit™ Amp

AL-572
$1395
Suggested Retail

New class of *Near Legal Limit™* amplifier gives you 1300 Watt PEP SSB power output for *65%* of price of full legal limit amps! Four rugged *Svetlana* Russian 572B tubes. Instant 3-second warm-up. Plugs into 120 VAC. Compact 8½Hx15½Dx14½W. 160-15 Meters. 1000 Watt CW output. Tuned input, instantaneous RF Bias, dynamic ALC, parasitic killer, inrush protection, two lighted Cross-Needle meters, multi-voltage transformer.

AMERITRON HF Linear Amps with Eimac™ 3CX800A7

AL-800H
$2295
Two tubes
1500 Watts plus

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AL-800
$1595
Single tube
1250 Watts

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Both amps have an adjustable slug tuned input circuit, grid protection, ALC control that is front panel adjustable,vernier reduction drives, heavy duty 32 pound grain oriented silicone steel core transformers and high capacitance computer grade filter capacitors.

These amplifiers have multi-voltage operation (14 user selectable AC line voltage from 90-140; 200-250 VAC), quiet pressurized ventilation systems, dual illuminated Cross-Needle meters that read peak forward and reflected power, SWR, high voltage, grid current and plate current.

Vernier reduction drives make tuning adjustments smooth and easy Ameritron's exclusive *Step-Start Inrush Protection™* stops damage to your amplifier from inrush current. Ameritron amps feature an attractive Lexan front panel decal and superior, all metal construction -- it's built to last! Uitra compact desktop size is perfect for your operating station. 8½x16½x14¼".

AMERITRON no tune Solid State Amplifiers

Ameritron ALS-500M Mobile no tune Solid State Amp has 500W out, covers 1.5-22 MHz

ALS-500M
$799
Suggested Retail

Ideal Mobile amplifier -- uses 13.8 Vdc mobile electrical system, very compact 3½x9x15 in., extremely quiet, 500W output, 1.5-22 MHz coverage, instant bandswitching, no tuning, no warm up, no tubes, SWR protected.

Ameritron ALS-600 no tune Solid State FET amp includes heavy duty power supply, 600 Watts out

ALS-600
$1299
Suggested Retail

No tuning, no fuss, no worries -- just turn it on and operate. *Includes* AC power supply, 600 W output, continuous 1.5-22 MHz coverage, instant bandswitching, *fully* SWR protected, extremely quiet, very compact. Amp is 6x9½x12 inches.

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AMERITRON's* legal limit *amplifiers use Peter Dahl super heavy duty Hypersil® power transformer capable of 2500 watts!

Ameritron's most powerful Amplifier

AL-1500 *with Eimac® 8877 ceramic tube*
$2795
Suggested Retail

Ameritron's *most powerful* amplifier uses the herculean Eimac® 8877 ceramic tube. It's so powerful that 65 watts drive gives you the full legal output -- and it's just loafing because the power supply is capable of 2500 Watts PEP.

Ameritron's toughest legal limit Amp

AL-1200 *with Eimac® 3CX1200A7 tube*
$2295
Suggested Retail

Get ham radio's *toughest* tube with the Ameritron AL-1200 -- the Eimac 3CX1200A7. It has a 50 watt control grid dissipation. What makes the Ameritron AL-1200 stand out from other legal limit amplifiers? The answer: A super heavy duty power supply that loafs at full legal power -- it can deliver the power of more than 2500 watts PEP two tone output for a half hour.

Ameritron's Classic legal limit linear amp with a pair of graphite plate

AL-82 *Amperex® 3-500ZG tubes*
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Suggested Retail

Get full legal output using a *pair* of durable 3-500ZGs. Most competing linears using 3-500s *can't* give you 1500 watts because their light-weight power supplies *can't* use these tubes to their full potential. AL-82 is ham radio's *only* super 3-500 amp!

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Oil cooled 50 ohm dummy load handles 1500 W for 5 minutes. SWR under 1.2 up to 30 MHz. Low SWR to 400 MHz.

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CIRCLE 115 ON READER SERVICE CARD

ditions. . . . *K9DTB.* I wish I had a quarter for every rubber-neck that checked us out on the freeway with our array. . . . *KB7VTP.* Thanks to the Steamboat Springs Ski Area for allowing us to use their facilities at 10,400 foot elevation. Who forgot to turn on the sporadic-E propagation? . . . *KØYO.*

All contacts with DX70—low power. Used a 3-element beam at the start of the contest and a rotating dipole after the thunderstorms. Battery power from atop Cadillac Mountain (FN54). . . . *AL7PO/1.* Surprised at the complete lack of interest by the Montreal VHF community in this contest again this year. . . . *VE2SHW.* I only operated for four hours on Sunday because of work on Saturday and Sunday. Conditions were great, but there was no one on! Hopefully it'll be better next year. . . . *KA3SDP.*

Big change from last year when I was VY2KX! . . . *VE7XF.* Band conditions were not good at all! . . . *WA5VKS.* My biggest thrill was making lots of contacts with my home-built transverter despite lack of sporadic-E for the second year in a row! . . . *VE7VDX.* Very poor propagation. Meteors were helpful. Little activity but lots of fun anyway! . . . *W3KN.* After a week of roving grids in Nova Scotia and New Brunswick with no propagation at all, it was wild to see the band open on the second day of the contest. I rounded up rigs and headed for the Bay of Fundy. I had fun and great weather—real sunshine (rare in the Bay of Fundy)! . . . *VE9AIM.*

I was real happy to see 6 meters open up during the contest! It seems that hot-dry days bring a lot of high-level electrical noise with them. Bands here were +10 to +20 dB most of the time. . . . *N8NQS.* Not much activity around here during the hours that I operated. Did have a few interesting contacts, mainly on 2 meters. Caught a quick opening on 6 meters for a VE2—and that was that! . . . *AD4F.* There weren't many hams in the contest on 2 meters or 125 cm FM. . . . *KC2AWX.*

Hope to have more open time in the next contest. Also good to see that extra points are given for CW. . . . *WA2ZFH.* Worked KØYO in DN60 on 222 MHz for a new grid. . . . *NØLL.* ■

VHF RESULTS

Number groups after call letters denote following: Final score, number of QSOs (including multipliers for band and CW contacts), Total grid locators, Bands operated (A = 50, 7 = 70, B = 144, C = 222, D = 432, 9 = 902, E = 1296, F = 2304, G = 3456, H = 5670, I = 10G, J = 24G, L = Light), (in the case of Rovers) number of grid locators activated, additional operators. Certificate winners are listed in bold.

Single Operator, Fixed

Asia

Thailand

E21DKD	**1290**	**26**	**33,540**	**B**
HS1FCB/5	**498**	**15**	**7,470**	**B**
HS4DHK	**285**	**19**	**5,415**	**B**
E2ØIRD	**536**	**5**	**2,680**	**B**
HSØWGB	**193**	**9**	**1,737**	**B**
E21RZA	194	3	582	B
HS8FST	192	3	576	B
E21MZH	111	5	555	B
E21ZVF	47	2	94	B

Europe

France

F5JKK	**179**	**87**	**15,573**	**AB**
F4BBL	65	21	1,365	B

Poland

SP9UOP	**14**	**19**	**266**	**A**

Spain

EA1DDU	**5**	**5**	**25**	**B**

North America

Canada

VA2YUL	8	1	8	B
VE2SHW	21	3	63	B
VE3SXE	**39**	**28**	**1,092**	**AB**
VE7XF	**99**	**27**	**2,673**	**ABD**

Mexico

XE2HWB	**25**	**11**	**275**	**AB**

United States

W1

N1NQD	**33**	**16**	**528**	**ABCD**

W2

WA2FGK	**373**	**95**	**35,435**	**ABCD9E**
N2UAH	112	29	3,248	ABD
WA2ZFH	21	9	189	ABCD
KC2AWX	14	4	56	B

W3

KA3SDP	**38**	**23**	**874**	**ABD**
WA3CSP	6	6	36	A

W4

AD4F	**36**	**18**	**648**	**ABD**

W5

KB5IUA	**243**	**73**	**17,739**	**ABCD9E**
W3XO/5	103	41	4,223	ABCD9E
K5AM	75	51	3,825	A
KC5LOW	61	32	1,952	AB

W6

N6IFW	**67**	**22**	**1,474**	**ABD**
KD6RXT	36	16	576	ABD

W7

KE7SW	**119**	**30**	**3,670**	**ABCD9EF**

W8

K8TQK	**349**	**136**	**47,464**	**ABCD9E**
N8NQS	86	48	4,128	ABD

W9

W9IIX	**133**	**67**	**8,911**	**ABCDE**

WØ

NØLL	**40**	**26**	**1,040**	**ABCD**
WØRT	29	16	464	ABD
WA2HFI/Ø	25	16	400	AB
KBØSPC	25	14	350	A
NEØP	24	11	264	AB
KBØRPL	15	14	210	AB

Single Operator, Portable

Asia

Thailand

HS5JRH/8	**196**	**5**	**980**	**B**

North America

Canada

VE9AIM	**38**	**25**	**950**	**AB**

United States

W2

W3KN/2	**149**	**36**	**5,364**	**AB**
NL7XM/2	4	2	8	AB

W3

N3WTW	**25**	**12**	**400**	**AB**

W6

KF6CU	**88**	**32**	**2,816**	**ABCDI**
KF6FJG	19	8	152	AB

Multi-Op, Class I, Fixed

North America

United States

W2DRZ	**656**	**191**	**125,296**	**ABCD9E**
			(Oprs. N2s ODU, XTX)	

Multi-Op, Class II, Fixed

Asia

Thailand

HS1RNW	**925**	**26**	**24,050**	**B**
			(Oprs. HSs 1DNI, 4HYB, ØYOZ)	
HS5ØKU	**1052**	**16**	**16,832**	**B**
			(Oprs. E2s 1EIC, ØJTW, ØKAZ, HSs 4HOZ/1, 5SPC/1, 7NEG, 8AAB/1)	
HS9BHU/1	**792**	**12**	**9,504**	**B**
			(Oprs. unknown)	
HS5KJD	167	13	2,171	B
			(Opr. HS5JQX)	
E21CGO	**422**	**5**	**2,110**	**B**
			(Opr. E2s 1WNU, ØJOE, HSs 3ANP/1, 3KRN/1, 4AED/1, 4DOG/1, 4EPJ/1, ØGKM/1)	
HS6AB	**157**	**11**	**1,727**	**B**
			(Oprs. HS6s FTS, HPR, IQD, MIB, NNS, NPF, OBD, OYX, PAT)	

Europe

France

TM2DX	**618**	**79**	**48,822**	**B**
			(Oprs. F1PEZ, F6s CWN, GVW, HMQ, IFR)	

North America

United States

W4

WS4F	**169**	**78**	**13,182**	**ABCDE**
			(Opr. AE6E)	
KF4QQY	68	36	2,448	ABD
			(Opr. unknown)	
N4ION	39	16	624	ABCD
			(Opr. K4EKW)	

Multi-Op, Class II, Portable

Asia

Thailand

E22AAB	**1082**	**24**	**25,968**	**B**
			(Oprs. HS6s HKN, HSM, MAQ, MMM, MYR, MYW, OJY, ONO, ONX, PPP)	
E22AAA	**1403**	**15**	**21,045**	**B**
			(Oprs. E2s 1IZE, 1LSE, 1OAV, 1RWD, 1SNN, 1VX, 1WRM, ØGJW, ØHIS, ØHO, ØIKV, HSs 1EHB, 1JQP, 2SVM/1, 9HQR/1, 9JLS/1, ØGBI, ØVOC, ØXNO, ØYOD)	
HS6HKH	**950**	**15**	**14,250**	**B**
			(Opr. unknown)	
E2ØJBD	**800**	**16**	**12,800**	**B**
(Oprs. E2Øs FMC, FOX, GMX, GMY, JPI)				

North America

United States

W3

N3WDX	**78**	**20**	**1,560**	**ABD**
			(Opr. unknown)	

W6

AB6SO	**43**	**12**	**516**	**ABCD**
			(Opr. KD6PIW)	

W8

N8PVT	**120**	**62**	**7,440**	**ABD**
			(Opr. KC8ALA)	

W9

N9NNP	**218**	**59**	**12,812**	**BCDE**
			(Opr. N9GH)	

WØ

KØYO	**140**	**48**	**6,720**	**ABCD**
			(Oprs. W1XE, NØKE)	

QRP

Europe

France

FA1APR/P	**80**	**25**	**2,000**	**B**

Slovenia

S57KRI	**64**	**26**	**1,664**	**B**

Sweden

SM6WET	**90**	**60**	**5,400**	**A**

North America

Canada

VE1ASJ	**164**	**56**	**9,240**	**AB**
CG2PIJ	**135**	**50**	**6,750**	**ABD**
VE7VDX	**73**	**15**	**1,095**	**ABD**

United States

W1

AL7PO/1	**84**	**30**	**2,520**	**A**
N1RWY	38	22	836	AB
WG1Z	21	3	84	B

W3

WN3C	**17**	**8**	**136**	**BD**

W5

WA5VKS	**44**	**19**	**836**	**ABD**

W8

N8XA	**138**	**41**	**5,658**	**ABCD9E**

Rover

Asia

Thailand

E21IYW/R	**209**	**7**	**1,463**	**B**	**1**

North America

United States

K9DTB/R	**71**	**62**	**4,402**	**ABCD9E**	**5**
KB7VTP/R	**64**	**36**	**2,304**	**AB**	**5**

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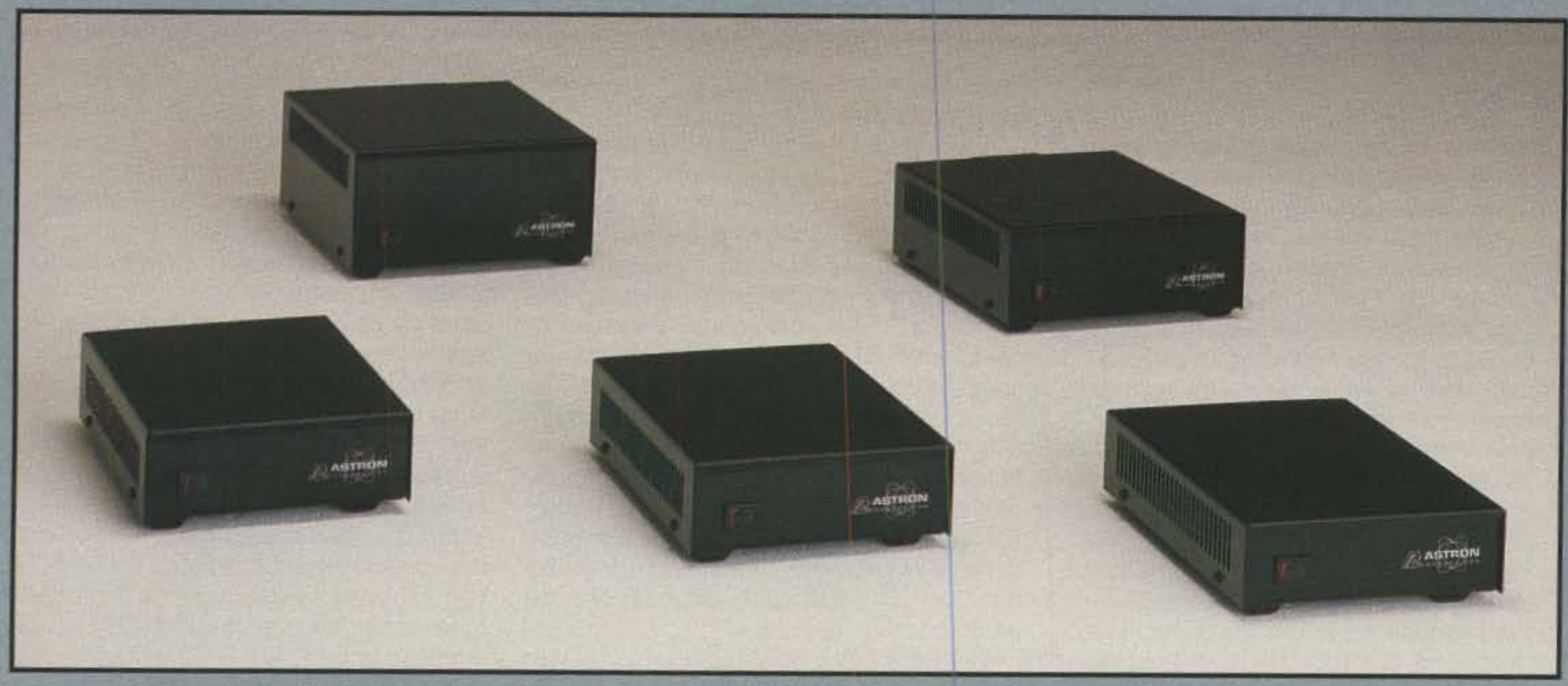

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SS-18	15	18	2.3 x 6 x 9	3.6
SS-25	20	25	2 7/8 x 7 x 9 3/8	4.2
SS-30	25	30	3 3/4 x 7 x 9 5/8	5
SS-25M*	20	25	2 7/8 x 7 x 9 3/8	4.2
SS-30M*	25	30	3 3/4 x 7 x 9 5/8	5

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BY IRWIN MATH, WA2NDM

MATH'S NOTES

WHAT'S NEW AND HOW TO USE IT

April Fool's?

Do we do an April Fool's column this year or do we not? That is the question. For many years we have wanted to do one, but for one reason or another never have. The topics certainly exist now and have existed before, but often they are not as "foolish" as they seemed when we first thought of them.

For example, there was the time I thought of a clever scheme of picking up audio with a wide-range microphone, amplifying it, and reproducing it through a series of speakers, out of phase with the input so that total cancellation would occur. This would result in sound-proofing to an extent never before achieved. Well, a company called Noise Cancellation Techniques (and I am sure others) went on to produce a system that does exactly this. The difference is that they do it through earphones, and in addition, introduce audio that is not cancelled, with unique results. The phase-shifted audio achieves cancellation levels that can reduce the noise level in a helicopter to the point where it is almost gone. The non-phase shifted audio allows conversations to occur in the same environment. The result is clear conversation in a very noisy situation.

Another version that they were working on the last time I visited was to reduce the noise from a tractor-trailer truck by feeding out-of-phase audio (in the form of engine noise) into an electronic muffler. What was the electronic muffler, you ask? Basically, a high-power speaker and audio amplifier combination!

Another April Fool's article prospect was one in which we planned to introduce a "new technique" utilizing a "revolutionary" fiber-optic cable with a copper core and lead-tin cladding for signal transfer without the need for expensive optical transmitters and receivers. Standard connectors could be used and connections could be made without special tooling. For those of you who have not immediately caught on, this is nothing more than common tinned copper hookup wire. Well, you can now obtain the fiber-optic cable that has copper deposited directly on the glass surface of the fiber, which could then be used as an electrical conductor. Not an exact parallel, but close!

The Dick Tracy wrist radio, which would have been a good April Fool's miniaturization project in the '40s and '50s, is now a reality. Look at the new Alinco "credit-card" rig. If you put the battery in your pocket and cut down the case, the rest could easily fit on your wrist. Did Dick Tracy use a repeater? Did he ever envision the incredible propagation of 300 milliwatt 800 MHz signals (cellular)? Even a wrist TV is not that far-fetched anymore.

So how does one write an April Fool's column that will not result in real technology? I believe the only answer is to try to somehow "bend theory" without having the reader catch on. In the spirit of the day, see how this one strikes your fancy.

As we all know there is a growing problem with bandwidth, particularly when trying to transmit video over telephone lines or the low bands. The solution, of course, is to compress everything. This is now standard in the newer digital formats such as MPEG-2, and is capable of rather high compression levels. Taking it to the extreme, and with some slow-scan techniques, *almost* real-time video can now be achieved over 5 kHz phone lines. Just look at the new breed of "video telephones" that are on the market. Well, what follows is a method that the experimenter can employ and that does not use expensive compression chips, both rather an application of an old scheme.

Fig. 1 shows the transmitting portion of the "amateur experimenter's scheme." As you can see, a video signal is first applied to an oscillator, say around 40 MHz, producing a conventional FM modulated output. Since all video information is contained in the instantaneous frequency of the oscillation, the signal can then be applied in the limiter, which removes any AM component but preserves the frequency deviations.

The limiter we chose is a simple comparator stage based on a Linear Technologies LT-1011 with a digital output. The result is a digital pulse train with frequency that varies in step with the input signal. This "pulse FM" signal is now applied to a simple chain of digital flip-flops, each one reducing the frequency by a factor of two until the output is finally divided to around 5 kHz. Alternately, a single divider chip can be used. The final reduced output is not critical, as long as

c/o CQ magazine

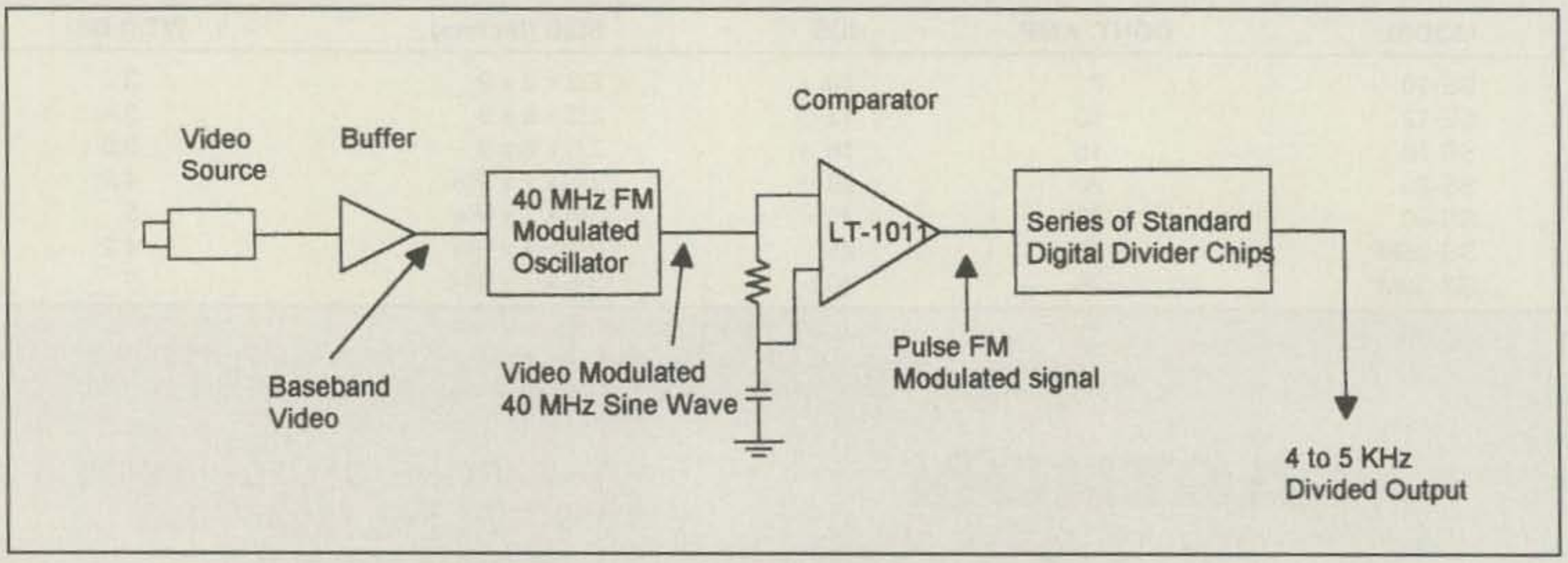

Fig. 1– Block diagram of experimental "narrow-band video" divider network.

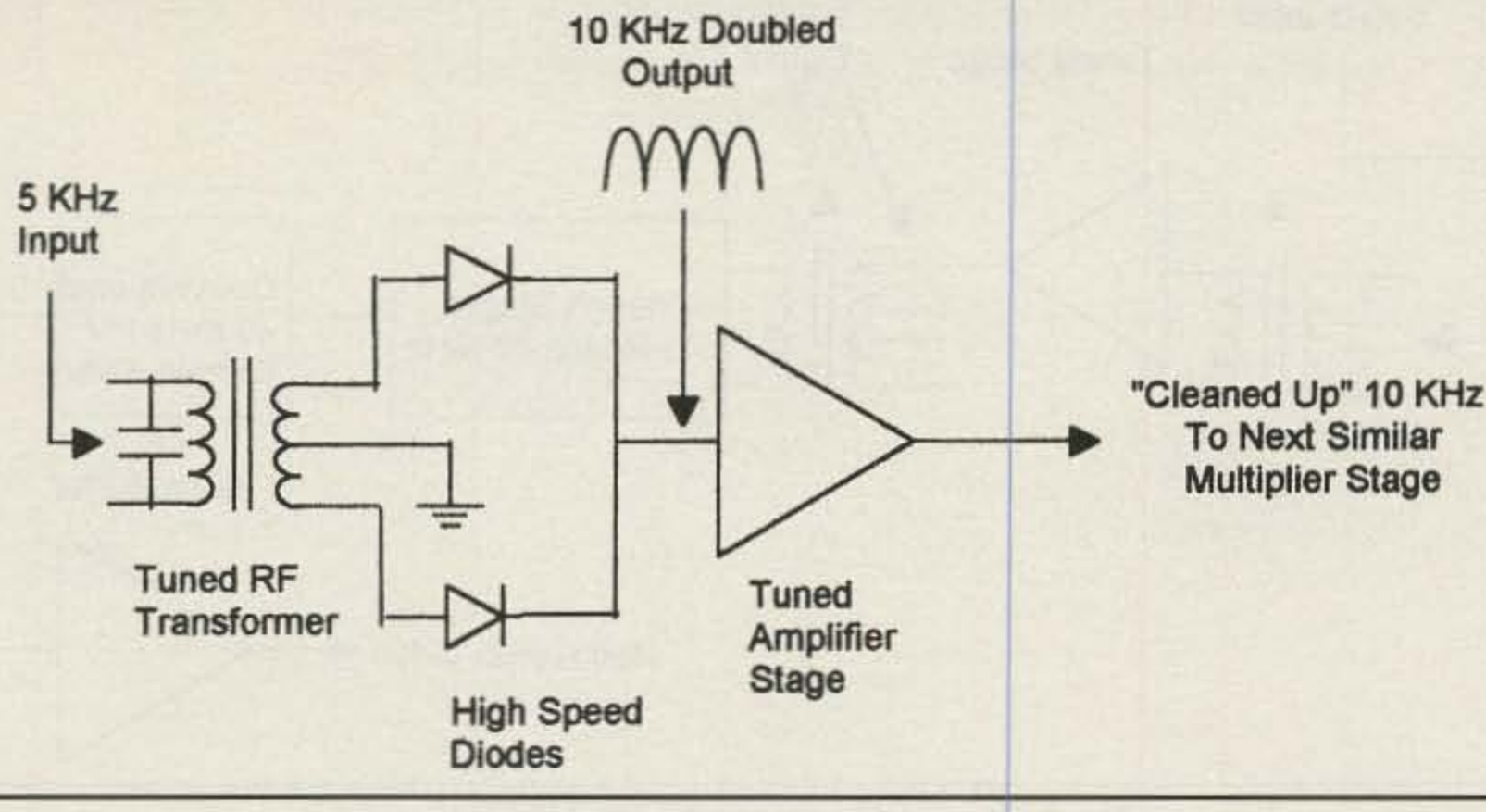

Fig. 2– Diode-based frequency multiplier stage.

it is within the voice band. As the incoming frequency changes, due to the modulation, the divided output also changes in the same ratio. It has to, since it is locked to the input.

Now we can transmit the 5 kHz FM signal by any means we choose and receive it at the far end of the link. Once the signal is back into its FM form, it is applied to a frequency multiplier chain which can take the form of a series of fig. 2 type diode double stages, or a series of common tuned multiplier stages such as fig. 3. When the original 40 MHz is reached, the resulting signal contains all of the deviation of the original and can be detected by a normal FM detector. The result is the original video signal. This allows real-time video to be sent over no more bandwidth than a common audio signal. Any means can be used for the transmitter/receive portion of the link from AM to SSB to FM as long as it can pass a 5 kHz signal.

As I write this, I too am taken in by the technique. Is it possible that this is another April Fool's scheme that is really not so foolish? You tell me!

February Correction

With regard to the emergency home light-

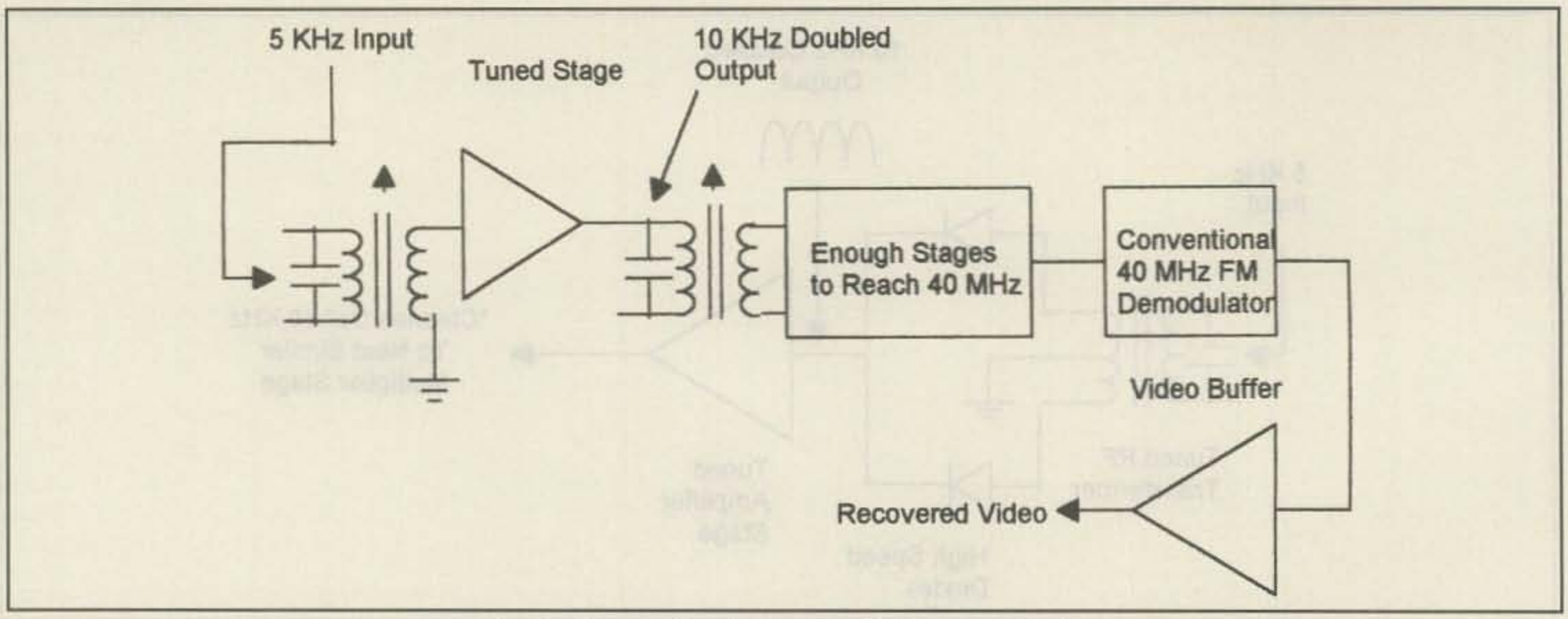

Fig. 3– Conventional tuned multiplier stage design.

ing system described in the February column, we received several comments regarding the potential problems that could occur if the suggested gel-cell used for the battery backup were to accidentally short-circuit.

In the event of a direct short across the battery terminals, the high currents produced could cause overheating and even cause a fire. To prevent this, one should fuse both sides of the battery, enclose the battery and charger circuit in a metal enclosure, and even mount the LED current-limiting resistors inside this same enclosure. In-line fuse holders (with 1 ampere quick blow fuses) connected directly to the battery terminals and used as the "connecting wires" from the battery to the rest of the circuitry should be sufficient. If this is done, and a short does occur in the internal portion of the circuitry, the fuses will blow. If a short occurs in the external wiring, the current will be limited, by the current-limiting resistors, to a level somewhat higher than the normal LED current (30 to 40 ma).

Finally, whatever connecting wire you use to wire the LEDs, be sure to use a high-quality UL-approved product with a rating designed for low voltages. Most home centers and electronic supply sources have this type of wire.

73, Irwin, WA2NDM

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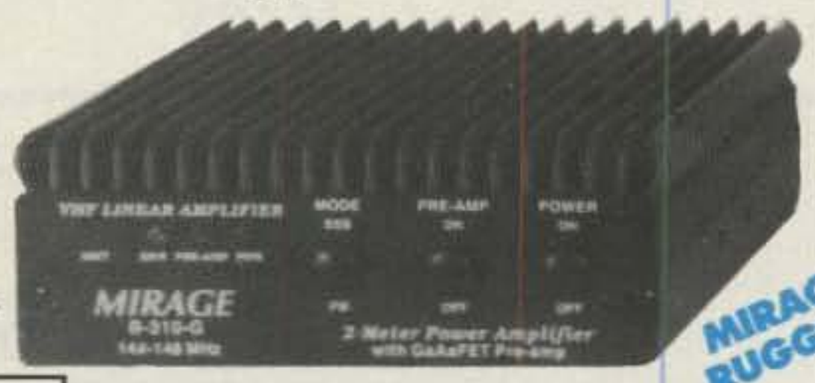
B-310-G Suggested Retail

NEW!



MIRAGE RUGGED!

Power Curve -- typical B-310-G output power							
Watts Out	25	50	75	95	100	100+	100+
Watts In	¼	½	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 15 dB gain -- lets you dig out weak signals.

Fully Protected

***SWR** Protection* prevents damage from antennas whipping in the wind. *Reverse 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* 4¾x1¾x7¾ inch 2½ pound amplifier that delivers a *super powerful* 100 watts.

Free Accessories

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.

Dual Band 144/440 MHz Amp

$159.95 BD-35 Suggested Retail

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 5x1¾x5 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

$89.95

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***

MIRAGE RUGGED!

35 watts, FM only . . . $69.95

B-34, $69.95. 35 watts out for 2 watts in. Like B-34-G, FM only, less preamp, mobile bracket. 3⅛x1¾x4¼ inches.

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. 12x3x5½ 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.

B-1016-G, $379. MIRAGE's most popular *dual purpose* HT *or* mobile/base amplifier. 160 watts out/10 W in. For 0.2-15 watt transceivers.

B-215-G, $379. MIRAGE's most popular *handheld* amp. 150 watts out/2 watts in; 160 watts out/3½ W in. For 0.25 to 5 watt handhelds.

Call your dealer for your best price!
Nearest Dealer/Free Catalog: 800-647-1800

http://www.mirageamp.com

Technical: 601-323-8287 Fax: 601-323-6551

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MIRAGE . . . the world's most rugged VHF/UHF amplifiers

CIRCLE 143 ON READER SERVICE CARD

BY KARL T. THURBER, JR., W8FX

THE DIGITAL DIPOLE

FROM SOFTWARE THROUGH ANTENNAS FOR THE SHACK

Bookshelf '98

Wow! Do I have a tall stack of books and catalogs this month! To this end, we'll depart somewhat from our usual "antennas, accessories, and software" format for "The Digital Dipole" to cover some of these interesting radio, electronics, and computer books and catalogs. Let's begin.

Fig. 1– A variety of inexpensive, high-quality, and good-performing fixed station and mobile antennas and accessories are offered by the Lakeview Company of Anderson, South Carolina. The company's Web site shows the firm's extensive antenna and accessory product line, and it lets you request a hardcopy catalog and even place an order online. You'll find the new Lakeview Company site at <http://www.hamstick.com>.

From the Bookshelf

Spectrum Guide. As radio amateurs, most of us are aware of what the electromagnetic (EM) spectrum is. Just in case the ol' dictionary isn't at arm's length, let's recall that the EM spectrum is an array of radiant energies—types of EM radiation—usually classified by wavelength. In order of decreasing wavelength and increasing frequency, these are radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, x-rays, and gamma radiation.

As radio amateurs and hobbyists, we're most concerned with the radio and microwave spectrum. It extends from a few hertz (Hz) to more than 300 gigaHertz (GHz). In the lowest frequency range are the ultra low frequencies (ULF), from about zero to 3 Hz. Above ULF are the extremely low frequencies (ELF), 3 Hz to 3 kHz. Above that, from 3 to 30 kHz, are the very low frequencies (VLF). Next are low frequencies (LF), from 30 to 300 kHz. The medium frequencies (MF) are from 300 to 3000 kHz (3 MHz).

From 3 MHz to 30 MHz are the high frequencies (HF). Above are the very high frequencies (VHF), from 30 to 300 MHz. The ultra high frequencies (UHF) run from 300 to 3000 MHz, or 3 GHz. From 3 GHz to 30 GHz are the super high frequencies (SHF), and from 30 GHz to 300 GHz are the extremely high frequencies (EHF).

Having said all that, I'll direct your attention to a highly detailed, 373-page reference source for a good chunk of the EM spectrum by industry insider Bennett Z. Kobb, KC5CW. His book is *Spectrum Guide: Radio Frequency Allocations in the United States, 30 MHz–300 GHz*. The book lists, identifies, and explains the commercial, government, scientific, and other uses of each of the VHF, UHF, SHF, and EHF bands, 30 MHz to 300 GHz.

The book provides historical and application information so that readers can easily locate what they want and anticipate what they're likely to find anywhere in the spectrum above 30 MHz. Better than a spectrum wall chart, the book also includes official data from the U.S. Table of Frequency allocations, plus complete subject and band indexes.

The $29.95 New Signals Press book, now in its third edition, is available from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725-0056 (516-543-9169; e-mail <crbbooks@aol.com>; Web <http://www.crbbooks.com>).

We also should mention that CRB Research publishes several catalogs each year, and also places parts of them on their Web site. Most of the books they distribute are about "mainstream" radio and electronic topics, but more than a few are rather offbeat. Titles cater to an eclectic audience, possibly more so than other radio booksellers. Check out their catalog for some interesting reads.

Internet & Web Answers! Certified Tech Support. We have profiled in the past several Osborne/McGraw Hill "Certified Tech Support" computer support and help books. These were developed with Stream International (<http://www.stream.com/stream/home.html>), an experienced provider of "third party" technical support. In a recent column we featured *Windows 95 Answers! Certified Tech Support*, Second Edition.

Now the publisher has turned his sights to the Internet and the World Wide Web. *Internet & Web Answers! Certified Tech Support* is another very capable, easy-to-use troubleshooting and reference guide that provides quick, reliable, and expert answers to hundreds of Internet and Web questions.

Written by noted computer author and journalist Cheryl Kirk, the book features over 400 answers to the most common Internet and Web questions. Topics include e-mail, Web browsing, Newsgroups, FTP (file transfer protocol) downloads, chat groups, Internet telephony, Net-based multimedia, and creating Web pages. Some special features include "top ten FAQS" (frequently asked questions), "at-a-glance" overviews for each chapter,

289 Poplar Drive, Millbrook, AL 36054

solutions to the most common error messages, and a comprehensive index.

The $24.99 book is in bookstores and is from Osborne/McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710 (1-800-262-4729; Web <http://www.osborne.com>).

Two New Riders' Guides. Some time ago we profiled the *New Riders' Official World Wide Web Yellow Pages,* 1996 Edition. As we noted, fully half the battle of effectively using the Internet, and especially the Web, lies in simply *finding* stuff. The difficulty in untangling the Web (and the larger Internet of which the Web is a subset) has spawned a new publishing industry niche devoted to producing Internet and Web site directories.

Reflecting constant changes in the Web, the book now is in its sixth edition. The new 1997 edition is a 993-page tome that helps plug you into the Internet and the Web with not only raw yellow-page style listings, but also with introductory chapters that fully explain the concepts behind the Internet and the Web. There are chapters devoted to getting connected, Web browsers, search engines, e-mail, Web TV, and related topics.

The $29.99 New Riders/Macmillan book comes bundled with its own Browser-searchable CD-ROM that is, in effect, a "hotlink version" of the paper book. You need only identify it in your Web browser program and then point, click, and directly jump to any of the sites listed in the book. Site descriptions and links now are provided to over 10,000 Web sites.

We should mention that New Riders also offers a very similar book, *The New Riders' Official Internet Yellow Pages,* Sixth Edition. Covering both the Web and the Internet as a whole, this latter book—at 1150 pages and carrying the same $29.99 pricetag—seems to offer a little more for your buck. The introductory articles and information that open the two books are similar, but the latter Internet book also covers parts of the Internet other than the Web—FTP sites, Listservs, and Newsgroups, for example. The books are otherwise comparable, but if I were shopping I would go for the Internet book.

Both New Riders Publishing book/disc combos are from Macmillan Publishing USA, 201 West 103rd St., Indianapolis, IN 46290 (1-800-858-7674). Contact them for a free catalog: e-mail <info@mcp.com>; Web <http://www.mcp.com>.

Antenna Notes

Lakeview Company Tri-Magnet Mobile Mount. On several occasions we've mentioned the inexpensive, high-quality, and good-performing fixed station and mobile antennas and accessories made by the Lakeview Company of Anderson, South Carolina. We began covering Lakeview products in the early 1980s after discussions with the company's founder, George Shira, WD4BUM, at several southeastern hamfests.

George founded the company in 1982. His thinking was that the cost of a simple antenna was too high, and that he could build antennas himself that would outperform others. This resulted in the first Hamstick® mobile HF antenna. George retired in 1991, turning the reins over to son Butch, N4WHB, who has made available many new and upgraded products from what he calls "the Hamstick people."

A recently upgraded product is the popular Model 375 Tri-Magnetic Mount, which now comes with all stainless steel hardware. It's definitely one of their most popular mounts for heavy-duty HF mobile use, especially with the Hamsticks.

The tough, aluminum-based mount, which has a 12" × 14" footprint, holds all HF Hamstick antennas and many others with three black-powder-coated magnets that have over 400 lbs. of "holding power." The $39.95 unit comes with an industry-standard 3/8"-24 TPI thread mounting and 15 feet of RG-58 coaxial cable with a PL-259 connector installed. Other connector configurations (SO-239 and NMO mount) are available for an extra $5 charge.

A flyer is available that covers the entire

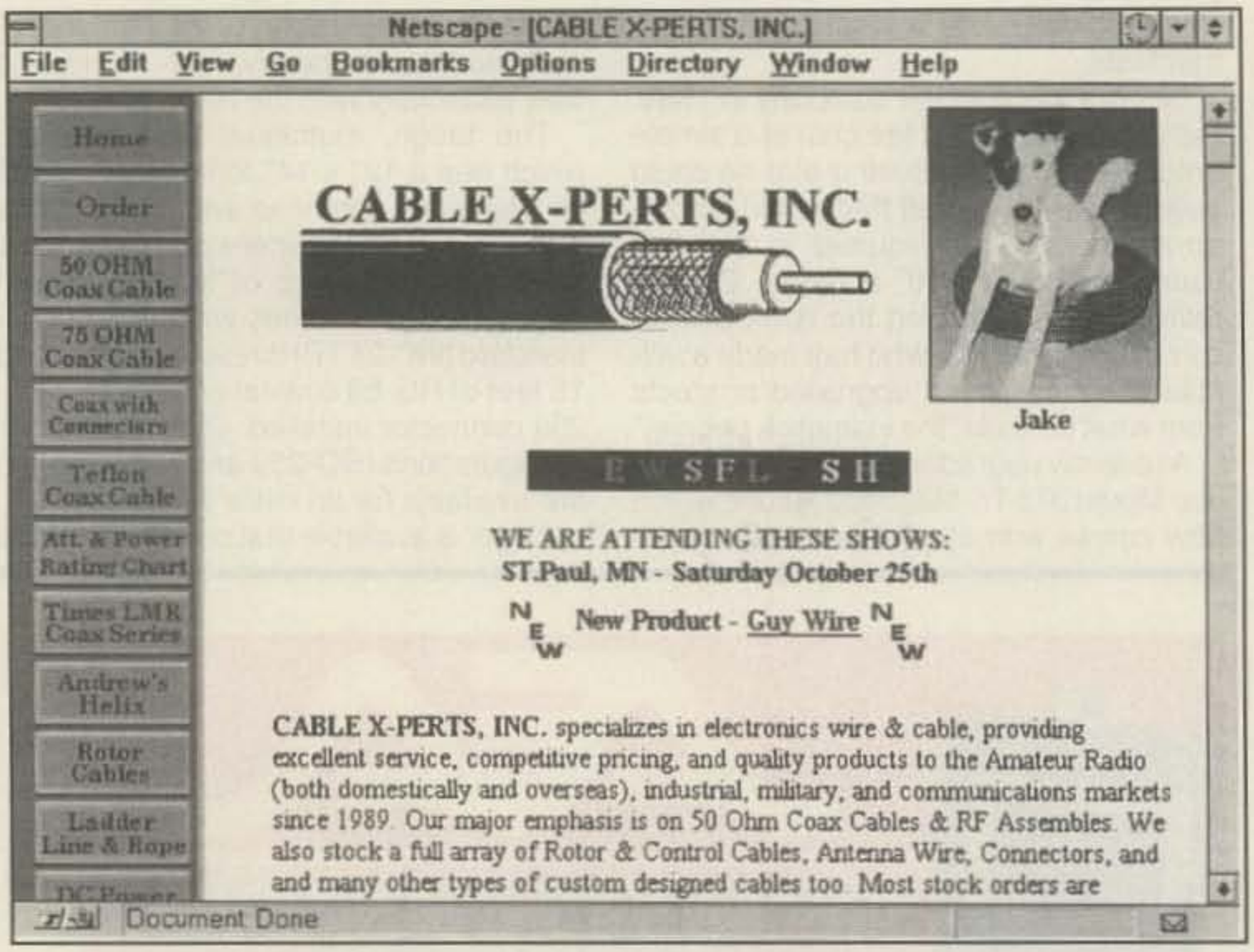


Fig. 2– Cable X-Perts has taken its products to the Web. Their well-designed site, which you'll find at <http://www.cablexperts.com>, offers the latest product updates, important technical information, monthly specials, and catalog changes. You can browse the site, pick out the products you want, and even fill out an online order form if you like.

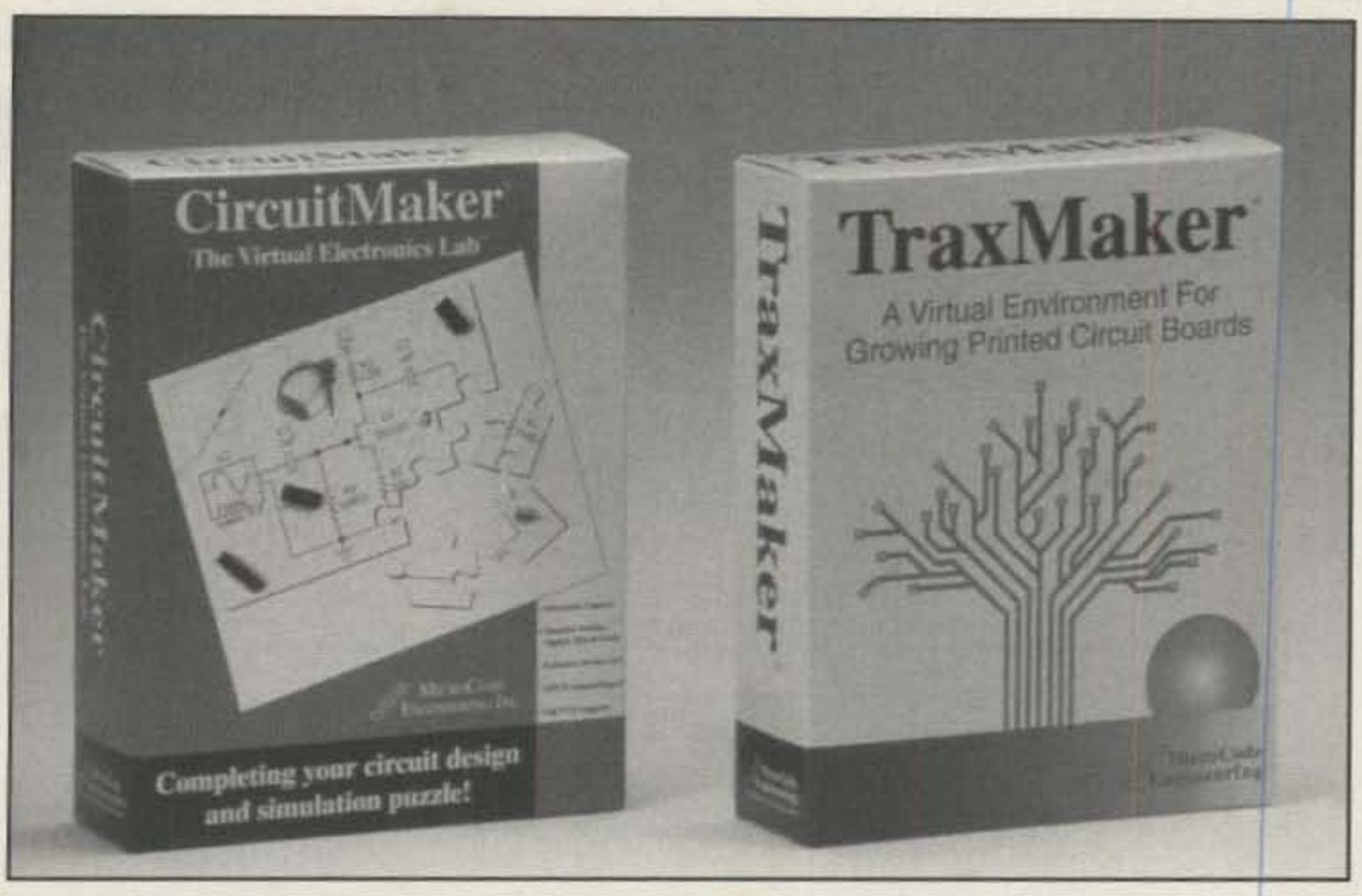
product line, including the Hamsticks, which are good companions for the mount. Contact Lakeview Co., Inc., 3620-9A Whitehall Rd., Anderson, SC 29624 (864- 226-6990; e-mail <hamstick@hamstick.com>; Web <http://www.hamstick.com>). (See fig. 1.)

The Bencher Skyhawk 3X10 Triband Yagi. In last November's column we reminded readers that the Butternut Electronics antenna product line had been acquired by Bencher, Inc. As a result, both Bencher and Butternut products now are available from a single source or through a network of dealers.

The Bencher line focuses on keyer paddles, hand keys, a lowpass filter (the Model YA-1), and the ZA-1A 1:1 balun. The Butternut line is antenna-oriented and features the HF9V-X nine-band vertical antenna, HF2V vertical for 80 and 40 meters, HF6V-X six-band HF vertical, and HF5B compact butterfly beam.

A brand new antenna, which should be available by the time you read this issue, is the "next generation" Bencher Skyhawk 3X10 beam, which represents the first product in a new line of antennas. It's enthusiastically billed as "a competition grade, new design, trap-free triband Yagi."

Developed by antenna expert Jim Breakall, WA3FET, and his team (which



The new CircuitMaker® Version 5 is an easy-to-use, Windows-based schematic capture and simulation tool package. It allows fast, accurate mixed analog/digital simulation, a feature previously available only in much higher cost software. CircuitMaker lets you test and troubleshoot circuits in its "Virtual Electronics Lab"™ without worrying about bad parts or faulty connections. The CircuitMaker Version 5 Design Suite operates on the Windows 3.1, 95, and NT platforms. (See text of this month's column for more details.)

included noted contester Tim Duffy, K3LR, and DXer Bob Locher, W9KNI), the "no-compromise, no-apology" antenna features 10 elements on a 23 ft. boom, and reportedly is the equivalent of three full-sized Yagis sharing a common feedline and a common boom. The innovative design offers three elements on 20 meters, three on 15 meters, and four on 10 meters. All elements are full-sized and there are no traps to be found.

The benefits of the new design are said to include very wide bandwidth and superb gain over the entire design range. Mechanically, the elements are light, thin, and strong, and they aren't burdened with having to handle heavy traps. Some of the antenna's special features, in addition to wide bandwidth and high gain, include excellent front-to-back (F/B) ratios, low weight, zero mast torque, and 85 mph wind survival. Contact Bencher for additional technical details and current pricing.

A free brochure with specifications on all Bencher and Butternut products is available from Bencher, Inc., 831 North Central Ave., Wood Dale, IL 60191-1219 (phone 630-238-1183; e-mail <bencher@bencher.com>; on the Web <http://www.bencher.com>).

Comet CYA-240 Dual-Band Yagi. The Japan-based Comet Antenna line of HF, VHF, and UHF monoband, dual-band, and triband base, repeater, and mobile antennas is distributed in the U.S. by NCG Companies. The Comet line has expanded greatly over the years.

One of the newest antennas in the product lineup is the Model CYA-240, a dual-band Yagi for 146 and 446 MHz. The antenna's elements (three elements on VHF and five on UHF) are positioned for high efficiency, and the antenna may be mounted horizontally or vertically. It's constructed of heavy-duty, high-quality aluminum and is equipped with stainless-steel mounting hardware. High gain and F/B ratio, as well as low SWR, are claimed. Suggested list price is $110 at dealers; it includes the duplexer, so there are no additional items to purchase.

For a Comet catalog and spec sheets, contact NCG Companies, 1275 North Grove St., Anaheim, CA 92806 (telephone 1-800-962-2611; e-mail <micks@cometantenna.com>; Web <http://www.cometantenna.com>).

Cable X-Perts Takes to the Web. In recent columns, notably October 1997, we highlighted the cable and cable-related products offered by Cable X-Perts. As we indicated, their 1997 Master Catalog focuses on several groups of coaxial cable; a complete range of wire, transmission line, rotor cable, and assorted antenna and cable accessories also is offered. Besides the product lineup, the 20-page catalog includes handy charts showing coax attenuation and power ratings, and two pages of connector and adapter "how to" installation information.

Now Cable X-Perts has taken to the Web. Their well-designed site at <http://www.cablexperts.com> (fig. 2) offers the latest product updates, important techni-

cal information, monthly specials, and catalog changes. You can browse the site, pick out the products you want, and fill out an online order form if you like. For a current hardcopy catalog, contact Cable X-Perts, Inc., 416 Diens Drive, Wheeling, IL 60090 (1-800-828-3340; e-mail <cxp@ix.netcom.com>); on the Web <http://www.cableexperts.com>).

Web Notes from The Wireman. We've covered "The Wireman," Press Jones, N8UG's coax, wire, and antenna accessory products several times. We noted in a recent column that The Wireman now was on the Internet, besides fielding a booth or giving a lecture at some 10 to 20 hamfests a year.

Recently, however, Press made some major changes to his online presence. He's still on the Web, but with a new site. The new site, which he hired a Web site professional to construct, is at <http://www.thewireman.com>. The new page (fig. 3) includes information on the "Certified Quality" philosophy, details on classic and new products, and ordering forms. By the time you read this, Press also should have a "hot sheet" in which he'll post specials, new items, hints and kinks, and the like.

Press also says he's been setting up production and marketing affiliations with several other wire- and cable-oriented suppliers. The first of these partnerships, with Davis RF, Inc. and Orion Wire, should afford greater availability of product, more extensive technical information, and more competitive pricing, as a result of combined skills and buying power. He's enthusiastic as to what this "triad" will be able to do, with their combined product mix and experience.

Press also tells us that other alliances are on the drawing board, and he's working with other manufacturers to develop several new products. Some new items already in the inventory include two types of rotor disconnects; the original "TENNATEST" VHF/HF Noise Bridge, designed by F. Gordon Adams, W8URR; and the GD Grounding Buss. We'll keep you posted on the new stuff.

For more information and a sales flyer, contact The Wireman, Inc., 261 Pittman Road, Landrum, SC 29356 (1-800-727-9473; e-mail <n8ug@juno.com>; Web <http://www.thewireman.com>).

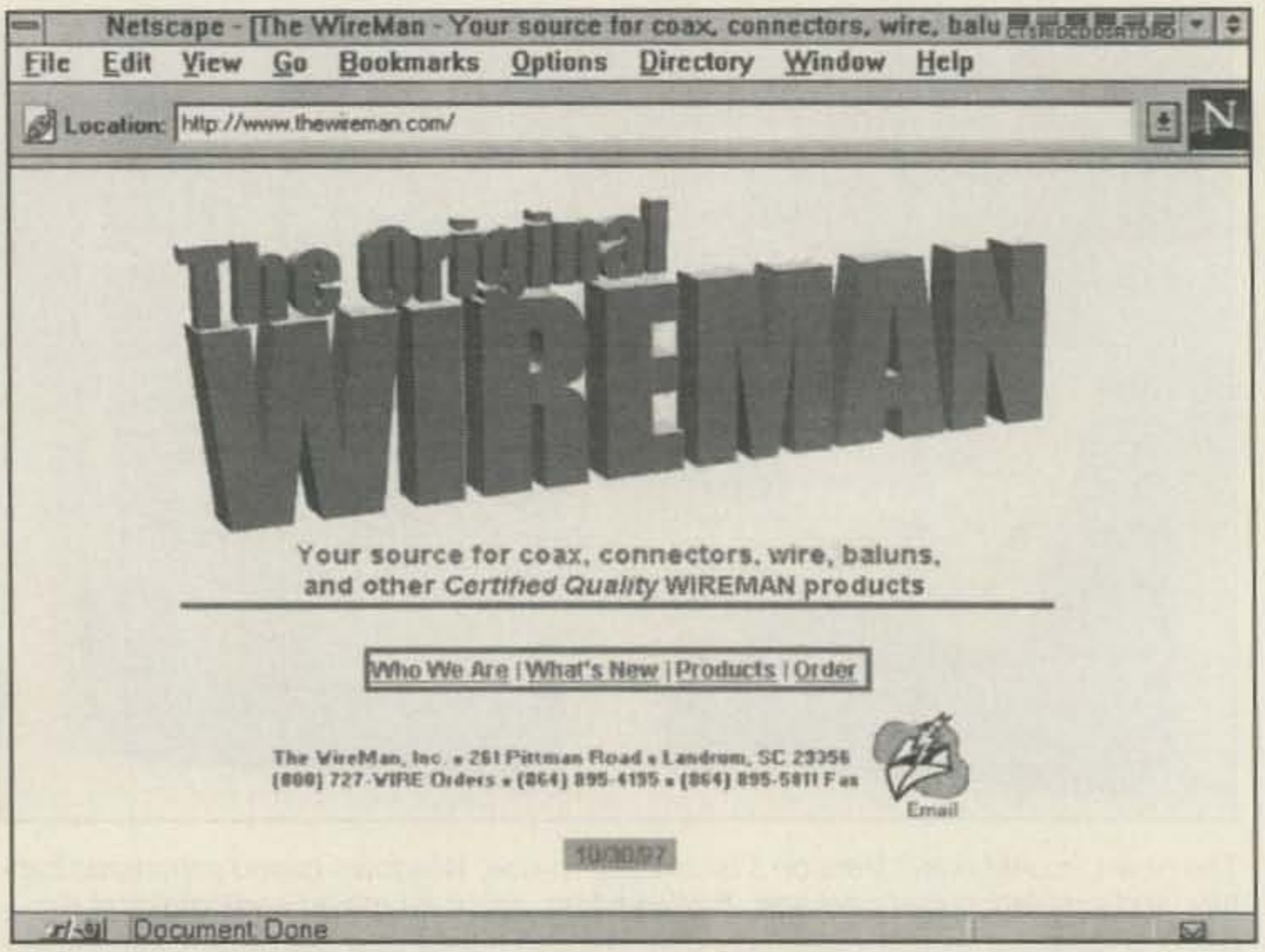


Fig. 3– "The Wireman," Press Jones, N8UG, is a major supplier of coax, wire, and antenna accessories. Press is on the Web with a "new and improved" site at <http://www.thewireman.com>. The new site includes information on the "Certified Quality" philosophy, details on both classic and new products, and ordering forms. By the time you read this, Press also should have added a "hot sheet" in which he'll post specials, new items, hints and kinks, and the like.

Soft Stuff

Update: CircuitMaker® Version 5. As we noted in May 1996, there's a big market for electronics software that lets you draw schematics, breadboard circuits, and lay out PC boards on your desktop PC. Schematic drawing or capturing, simulation, and circuit analysis software is even gaining in the home workshop.

In that column I checked out MicroCode Engineering's CircuitMaker, an easy-to-use, Windows-based schematic capture and simulation tool. Now the publisher offers CircuitMaker Version 5, with a host of enhancements and new features in one complete "Design Suite."

The new software allows fast, accurate mixed analog/digital simulation, a feature previously available only in much higher cost software. Along with the expanded simulation capability, the new release offers many professional features, including a larger device library of over 4000 devices. A host of analyses in CircuitMaker allows you to test and troubleshoot circuits in its "Virtual Electronics Lab"™, without worrying about bad parts or faulty connections that often plague traditional prototyping.

CircuitMaker Version 5 operates on the Windows 3.1, 95, and NT platforms. Copies are $299, and special upgrade offers are available for registered users. For more information, contact MicroCode Engineering, Inc., 927 W. Center Street, Orem, UT 84057 (1-800-419-4242; e-mail <sales@microcode.com>; Web <http://www.microcode.com>).

Update: Procomm® RapidRemote 1.1. As we noted in August 1997, the ability to efficiently and effectively remotely access and control applications and data from a home or office PC, or a network, located anywhere in the world, can be a real lifesaver for the traveler. In that column,we examined Procomm® RapidRemote for Windows 95. The program was billed by publisher Quarterdeck as "remote control for the rest of us," since anything you can do sitting in front of your PC, you can now do by phone from anywhere in the world, and do it fast.

In that column we highlighted key program features, so we won't rehash them. However, we'll tell you that the new RapidRemote 1.5 now offers cross-platform support for Windows 3.1x, 95, and NT 4.0; "SmartWizards" to automatically guide you through configuring communications parameters and setup; fast screen refresh technology; high-speed file transfers; etc. All things considered, the program represents very capable, reasonably priced remote-control communications software.

The program's estimated street price is $69.95. It's from Quarterdeck Corporation, 13160 Mindanao Way, Marina Del Rey, CA 90292-9705 (1-800-683-6696; e-mail <info@quarterdeck.com>; Web <http://www.quarterdeck.com>).

Wrap-Up

That's all for this time, gang. Next time more "Digital Dipole" topics of current interest. See you then.

Overheard: Life will be much more fun if you recognize that you really shouldn't live your life with the brakes on.

73, Karl, W8FX

WHO SAYS YOU CAN'T IMPROVE A MASTERPIECE

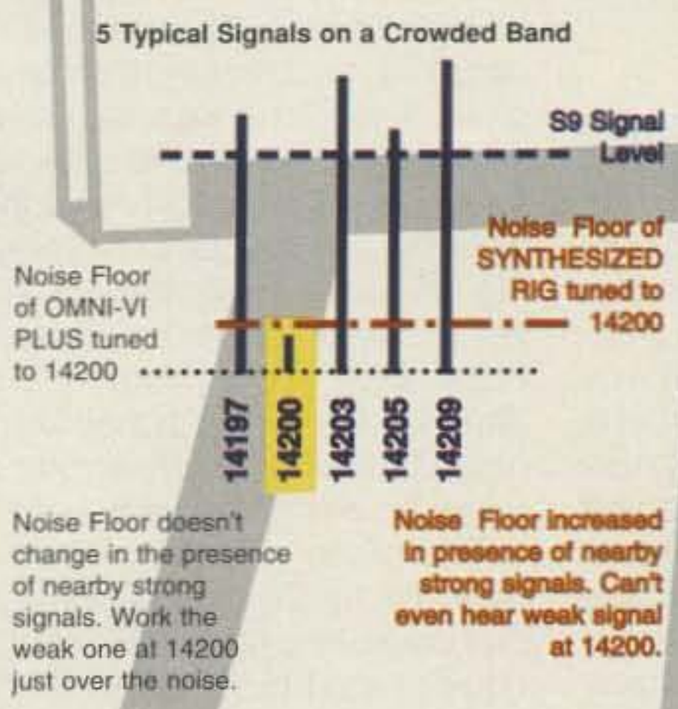
Like a great artist who steps back, reflects, then adds a final brush stroke, we hams at TEN-TEC could not resist a few subtle but powerful refinements to our treasured OMNI-VI. Take a look at this new "OMNI-VI *PLUS*", and judge for yourself how we improved a masterpiece....

JUST THE RIGHT AMOUNT OF DSP...

...to forget about those add-on DSP boxes. New, single button NOISE REDUCTION improves signal-to-noise on the weakest signals - makes SSB and CW leap out of the noise. DSP LOW PASS is now available in all modes providing 5 choices to cut the highs "just the way you want" to reduce listening fatigue. Rig even remembers your separate choices for SSB and CW. The DSP processor adds two more subtle features to the canvas. Built-in AUTO NOTCH instantly eliminates interfering carriers - now work 40 meters day or night. Finally, CW transmit offset is adjustable 400 - 990 Hz with auto tracking sidetone.

WORK STATIONS OTHER RIGS CAN'T EVEN HEAR

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



Phase noise generated *inside* the competitor's rig 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. No other transceiver comes close. With this masterpiece in your shack, you'll work stations missed by others.

SUPERB SELECTIVITY

The artist is never quite satisfied....We've added one more optional filter position. Provides up to 4 choices of bandwidth in the 6.3 MHz I-F and now 3 choices in the 9 MHz I-F. Two of the 7 filters are standard; add only the options that fit your "view" of the bands. In the OMNI tradition, all filters remain independent of mode.

ATTENTION TO THE DETAILS

Rigorous computer controlled tests now exercise every OMNI. Made possible by the rig's high speed PC Interface coupled to automatic test equipment. Our own custom software orchestrates the entire process. There's also an overnight burn-in. OMNIs transmit into dummy loads cycling between RX and TX every few seconds changing bands along the way. One final performance check finishes things up. A reliable masterpiece out of the box and for years to come.

THE FINISHING TOUCHES

Silky smooth, lightening fast QSK, iambic keyer, front panel layout meant to use not just admire, revised menu system for quicker access, adjustable display intensity, adjust main tuning knob for the feel you like, band stacking registers, 100% duty cycle final so rugged it doesn't require SWR foldback, one-year warranty backed by the legendary TEN-TEC service...all the traits of a masterpiece.

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- No-Risk 30-day Money-Back Guarantee**
- We take trades on used TEN-TEC gear.
- We accept VISA, Mastercard, and Discover
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**Customer pays shipping both ways.

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Sevierville, TN 37862
Office: (423) 453-7172
FAX: (423) 428-4483
e-mail: sales@tentec.com
Repair Dept.: (423) 428-0364 (8a - 4p EST)

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MADE IN TENNESSEE

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Contact factory for copy of detailed upgrade package.

BY BILL ORR, W6SAI

RADIO FUNdamentals

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

Amelia Earhart and the Radio Amateurs

In the "thirties" Amelia Earhart was America's popular sweetheart. Honor student in college, nurse's aide during World War I, medical student at Columbia University, she became interested in aviation, quickly earned her pilot's license, and took up flying. By 1922 she had set an altitude record for women by climbing to 14,000 feet at an air show. Amelia was on her way to the big time!

An unlikely champion of Amelia was Mrs. Frederick Guest, a rich socialite who yearned to be the first woman to fly the Atlantic. She bought a trimotor Ford from Admiral Byrd, the famous explorer, and made an agreement with George Putnam, a well-known publisher, to generate a book about the flight. However, Mrs. Guest's family objected to the whole idea. Mrs. Guest reluctantly dropped her daydream and began looking for a female aviator who could take her place. Putnam eventually contacted Amelia, who agreed to the flight, and a legend was born.

Today the mystery of the disappearance of Amelia Earhart remains unsolved.

The Transatlantic Flight

Much to Amelia's chagrin, she learned she would be only a passenger on the Atlantic flight. A pilot and a mechanic were in control of the plane. The Putnam propaganda machine went into action, though, and so it was on June 3, 1928, that Amelia Earhart burst into stardom as the first woman "pilot" to fly the Atlantic. Her name would soon become a household word, and she would be as famous a flier as Charles Lindberg!

While Amelia was setting new speed and altitude records in the air, Putnam divorced his wife and in 1931 married Amelia. Putnam was a genius at promotion and Amelia was quickly immersed among the luminaries of the day. To really prove her worth as a pilot, Amelia bought a Lockheed Vega and flew the Atlantic in 1932—alone. She was now an international sensation and a star of the first magnitude. She was a public speaker, wrote magazine articles, endorsed products, and promoted the ability of women in a man's world. A crowning achievement was her solo flight from Hawaii to the mainland. Her flight was a success, guided by compass signals from radio station KFI in Los Angeles. Interestingly, her flight was monitored by scores of radio amateurs, who copied her messages and relayed them to KFI when radio conditions were poor. Amelia was impressed at the amateur's ability to copy her signals and decided to make use of their talents during her future flights.

48 Campbell Lane, Menlo Park, CA 94025

Amelia to Fly Around the World With Radio Amateurs' Help

How could she cap her many achievements and awards? Driven by her personal enthusiasm and aided by her publicity-minded husband, her new goal was to fly around the earth at the equator! She had just received delivery of a new Lockheed 10E twin-engine Electra, presented to her by her husband on her 39th birthday. The money to purchase the plane was derived through a Purdue Research Foundation. Where the money came from, in fact, remained a mystery. In any event, she had the plane, along with the visible participation of the U.S. Navy, who took her under its wing.

This was to be an operation of the first magnitude. Mindful of the assistance provided by radio amateurs on her Honolulu-Oakland flight, she called upon Walter McMenamy (call unknown) to help with the arrangements. He had set up a worldwide network of amateurs, including Guy Dennis, W6NNR (later W6DI), Karl Pierson, W6BGH, of the Patterson Radio Company (designer of the famous PR-10 receiver), and Joseph Gurr. Emmett Patterson of Patterson Radio donated a number of PR-15 receivers for the project.

Other amateurs who assisted in the planning of a worldwide network were Frank Christman, W6ALJ; Charles Cheatham, W6CUU; Wally Gee, W6EGH; and John Pitts, W6CQK. Overseas stations who participated were K6GNW (Howland Is.), VK4DJ, VS1AB, HS1PJ, VU2AX, ST2WF, PY7AA, PZ1AB, VP3BG, HP1A, and XE1G. Thus, Amelia would be in contact with at least one amateur station at any point in her flight. Plans were set afoot to activate the network on 20 meter phone and CW that would track Amelia around the clock and around the world. She would never be out of the sound of a human voice ready to assist her in an emergency. This would not be the first flight to circle the globe, but it would be the longest—about 29,000 miles centered about the equator.

The U.S. government took an interest in the proposed flight, as Amelia's plane would be passing over areas where little information was available as to the warlike intentions of various governments.

Her first attempt was to fly from east to west around the world, starting in Oakland, California. She reached Hawaii successfully, but blew a tire on takeoff in Honolulu. The plane was severely damaged and had to be shipped back to California for repairs. The cost of repairing the plane seemed prohibitive to Amelia. However, high-level officials in the U.S. Government were searching for any possible way to obtain intelligence information concerning Japanese activities in their Mandated Colonies. Amelia's flight across the Pacific might be of enormous benefit.

The plane was dismantled and crated by Army Air Corps personnel and sent to the Lockheed plant in Burbank, where it disappeared into a hangar that was guarded by military police. Eventually, a Lockheed emerged from the mysterious hangar for her use, but it was not the same plane she had previously used. It was faster and had bigger engines, larger gas tanks, two aerial survey cameras, and up-to-date radio and navigation equipment. The person or organization that paid for this expensive revision was unknown. It was not Amelia or her backers.

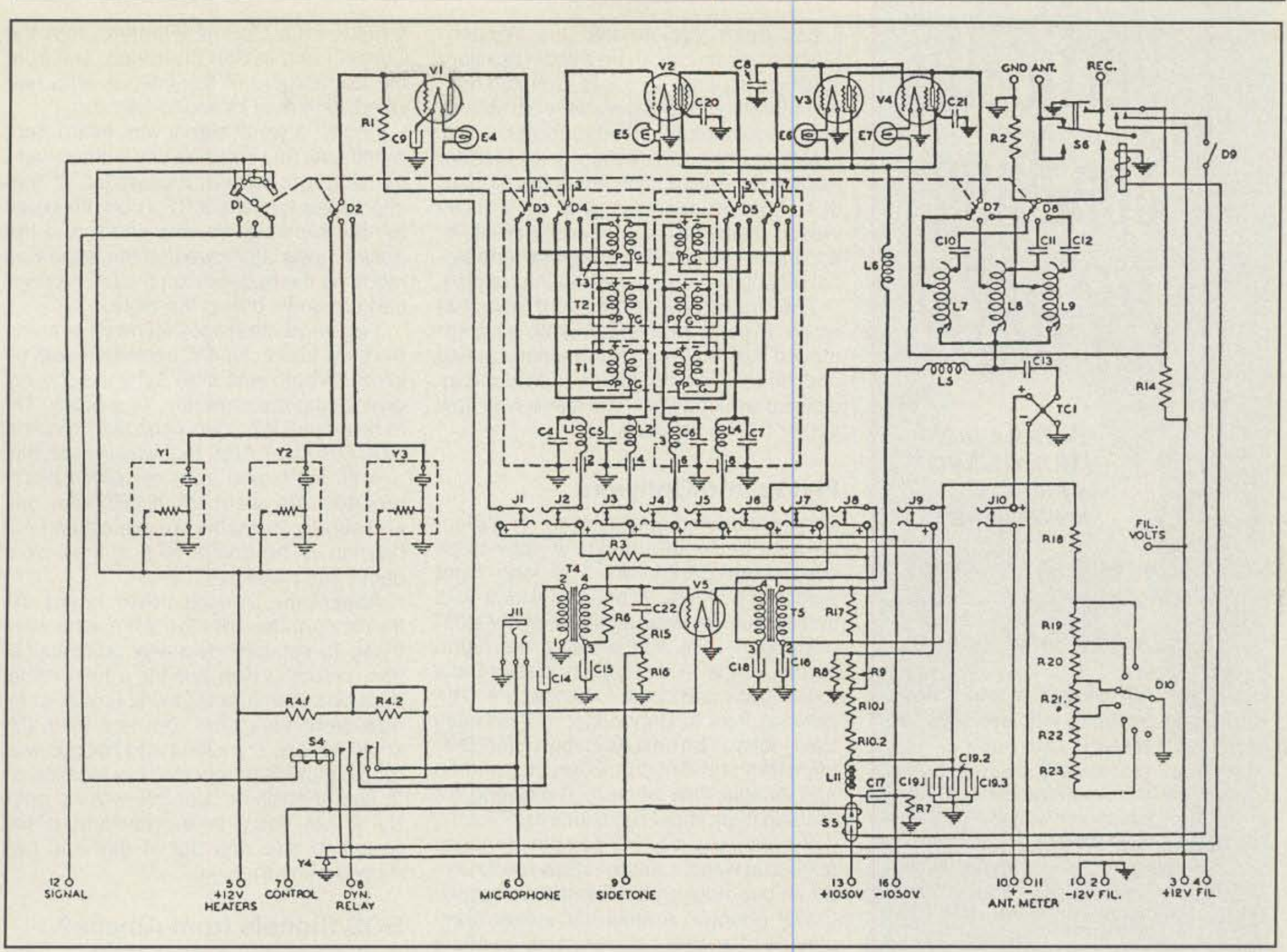

Fig. 1– Schematic for Amelia Earhart's W.E. Model 13-C transmitter. The final amplifiers (V3 and V4) were two type 282A tubes in parallel. This equipment could be remote controlled.

Amateurs Told to Butt Out!

In May 1937 the new plane was turned over to Amelia. Most of Amelia's civilian advisors had been pushed aside and were replaced by military or government personnel. Of course, nothing could prevent them from listening in! The plane was moved to the Pan American maintenance hangar and the new radio and navigation equipment was installed.

The old Western Electric model 20B receiver and control unit were removed, and a new, secret low/medium-frequency direction-finding receiver was installed. This was a precursor to the Bendix RA-1 World War II receiver. It covered 150 kHz to 10 MHz in five bands and could receive CW or voice. It could be switched between the aircraft antenna or a DF loop antenna.

The new transmitter was a Western Electric model 13-C, 50 watt screen-modulated affair capable of operating voice or CW on three frequencies: 500, 3105, and 6210 kHz (fig. 1). It was mounted in the cabin with remote controls to the cockpit.

Neither 3105 nor 6210 kHz were frequencies that were completely monitored by ground stations around the world, although these frequencies were extensively used by General Aviation in the United States. The 500 kHz channel of the transmitter was not used, as no crystal was installed for this frequency.

Besides the loop antenna for DF work, a 250-foot trailing wire antenna on a motor-controlled reel was installed at the rear of the plane. An auxiliary loading coil could be used for the 500 kHz channel, assuming the transmitter was set up for this frequency.

The third antenna was a fixed, V-configuration wire antenna starting at a stub at the front of the plane and running back to the two vertical tail fins. This antenna had poor efficiency, being close to the body of the plane, and was very short with respect to the operating frequencies. It was only useful for short-range communication, such as around an airport. For long-distance communication (such as required across the Atlantic and Pacific), the trailing antenna was the correct one to use. An antenna selector switch and send-receive push-to-talk circuit were also added to the plane.

A Fateful Decision at Miami

At the last minute, however, the trailing wire and associated motor reel and control equipment were removed from the plane. The reason given publicly was to save weight. The new DF equipment didn't need the long-wire antenna, but the removal of the long antenna was an error of the first magnitude. With the short fixed antenna, transmitter efficiency on 500 kHz was virtually zero. It would be impossible for a distant station to take a good DF bearing on her because her 500 kHz signal would be so weak.

Things were not much better on the higher bands. It was recently estimated by a NASA expert (Paul Rafford, Jr.) that radiated power on 3105 kHz was reduced to about one-half watt, and power on 6210 kHz was about 3 watts. This great power loss was due to the various loading circuits needed to achieve resonance with the short, inefficient fixed antenna. Worse,

it has been thought that the Western Electric transmitter, even with an auxiliary loading coil, was difficult to tune and maladjustment could have caused severe overmodulation on all frequencies.

No one seemed to recognize the fact that making DF readings on either the 3105 or 6210 kHz frequencies was very dicey indeed because of the problem of inaccurate bearings due to ionospheric signal reflection blurring the bearing reading.

The final irony of the flight was that when Amelia reached Miami, she removed the key from the transmitter, since both she and her navigator, Fred Noonan, disliked working CW. The stage was now set for the tragic finale.

Flying into Oblivion

The flight started out smoothly. The Electra went to South America in easy steps across the Caribbean. The long flight across the South Atlantic to Africa was uneventful. Fuel was available at her stopover points. On and on went the flight, across Africa to India, then across India to Bangkok and down to Singapore. The next leg was to Bandoeng, in the Dutch East Indies. The next day, soon after takeoff, some undefined problem cropped up and Amelia flew back to Bandoeng for "certain instrument adjustments."

Surprisingly, a Lockheed maintenance specialist was available in Bandoeng to to do an overhaul on the Electra's engines. Oddly enough, Amelia had never complained of engine troubles, and the plane was not even scheduled for a standard checkup. That had just taken place at Karachi. What was going on?

One plausible explanation was that the specialist probably serviced the Electra's secret cameras, collecting exposed film and reloading the cameras with fresh film.

The Electra finally embarked for Timor, then to Darwin, where the plane stayed for two days. Finally, after a 7 hour, 43 minute flight Amelia landed at Lae, New Guinea, and the next day, July 1, 1937, the big twin-engine Lockheed Electra began the 2556 mile long flight in the direction of Howland Island. This was the most hazardous portion of the flight.

July 2, 1937

At dawn the Coast Guard cutter *Itaska* was stationed at Howland Island to provide radio contact to Amelia as she approached her destination. The information given to the *Itaska* was obscure. The *Itaska* did not know the arrival time of the flight, and the frequencies and times to be used for communication with the flight were confusing. A last-minute cable from Amelia at Lae suggested frequencies, but she was mixed up between meters (wavelength) and frequency in kilocycles (kiloHertz). Conflicting information came from Amelia, from George Putnam, from the Coast Guard in San Francisco, and from the Department of the Interior, who had jurisdiction over Howland Island.

Finally, a weak signal was heard from Amelia. All that could be understood were the words "cloudy and overcast." It was impossible to make a DF fix on the signal as the transmission was short, and the *Itaska*'s logs later revealed the issue was moot, as the batteries on the DF receiver had run down during the night.

Two short messages followed over the next few hours. No DF bearings could be taken. Where was she? Why did she not give a long transmission for a proper DF to be made? Why didn't she shift frequency to 500 kHz? Alas, that was impossible.

A strong signal from the plane finally reported they were about 200 miles out, and shortly thereafter Amelia asked for a bearing to be taken, saying they were about 100 miles out.

Apparently, Amelia never heard the frantic operators of the *Itaska*, who were trying to establish two-way communication, pleading with her for a long transmission suitable for DF work. Amelia's signals were very loud, but she said she could not see the island and her gas was running low. She reported her location on "a line of position," but this was no help. By 9 AM, local time, Howland Island assumed she was out of gas and had dropped into the sea.

SOS Signals from Amelia?

Just as a massive search for the missing plane was instigated, a commercial radio operator on Nauru Island heard Amelia. The signal was weak, but a few words stood out: "Land in sight ahead."

The next day, a Pan American Airways operator on Wake Island reported a signal from Amelia saying they were down on an unknown island, about 177 degrees longitude. One wing of the plane was broken. The transmission lasted long enough for Nauru to get a DF fix, showing the signal was coming from northwest of Howland Island. Amateur radio operators in Honolulu and Los Angeles heard a series of three long dashes, indicating the plane was on land. Two long dashes would have indicated a water landing.

The location of the landing could roughly be spotted on a map. It was in the Japanese-held Trust Territories. The U.S. ships and planes could not go searching there. A frantic request to the Japanese government brought a large portion of the Japanese navy from their nearby base at Truk to search the area, but permission was denied for the U.S. to do the same. Eventually the search was called off. However, a controversial final message believed to be from Amelia described a Japanese shore patrol approaching her wrecked plane—then silence.

Sixty Years Later

Amelia's disappearance is still shrouded in mystery. She and her navigator, Noonan, were seen by witnesses on Japanese-occupied Kwajalein and Saipan—or were they? A high-altitude reconnaissance photo of the island of Taroa in 1944 showed a Japanese air base and a distinctive twin-tailed monoplane with one wing missing sitting on a pad at the edge of the runway, or was it something else? The island was bypassed by Allied Forces and never occupied.

At the end of the war George Putnam received an unsigned telegram via the Canadian Embassy in China saying the prison camp was liberated and Amelia was well! But was the telegram authentic? No one could tell. An investigation at the site of the prison camp was undertaken, but no evidence of Amelia's presence was found.

Today, the mystery of Amelia's last flight is as deep and confusing as it ever was. Why was the radio amateur net disbanded at the last minute? Did Amelia make a dog-leg in her flight to Howland, deliberately overflying the Japanese Mandated island of Truk to get photos of the big naval base? If she did, that could explain her radio silence and abrupt transmissions. She didn't want the Japanese to track her.

The Amelia Earhart files of the U.S. Government are under lock and key. An interesting clue, however, turns up in a transcript of a phone call between Henry Morgenthau, Secretary of the Treasury, made on May 13, 1938 to Eleanor Roosevelt's private secretary. Morgenthau said, in part, "I know what the Navy did, I know what the *Itaska* did, and I know how Amelia Earhart absolutely disregarded all orders, and if we ever release this thing, goodbye Amelia Earhart's reputation." What did he mean by that statement?

In 1998 the disappearance of Amelia Earhart still remains unsolved.

Acknowledgements

Basic material for this month's column was obtained from:

Almon A. Gray (USNR, ret.); "Amelia Didn't Know Radio," United States Naval Institute *Naval History,* December 1993.

Fred Goerner, *The Search for Amelia Earhart,* Doubleday & Co., NY, 1966.

Brink, Randall, *Lost Star: the search for Amelia Earhart,* W.W. Norton & Co., NY, 1994.

Tom Kneitel, "The Mystery of Amelia Earhart," *Popular Communications,* July 1987.

Henri Keyzer-Andre, *Age of Heroes,* Hastings House, NY, 1966.

Thanks to Jim Maxwell, W6CF, who found the photo of Amelia Earhart on the Internet. 73, Bill, W6SAI

BY BUCK ROGERS, K4ABT

PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

Now That We Have the Nodes and Backbones . . .

Now that we have the LAN nodes and 9600 baud nodes, where do we go from here? Having covered several radio modifications for both 1200 and 9600 baud nodes over the last 12 months, now is the time to consider the configuration of the LAN and backbone nodes we've built. What is the priority that must be applied to the LAN (1200 baud) node, and how do we force the data from the LAN nodes onto the 9600 baud backbone node? In this month's column I'll provide answers to these questions and more.

First of all, I don't call it "forcing" the data from the LAN node onto the backbone. I call it migration of data to the 9600 baud backbone. If we "allow" the data to follow the hierarchy of our parameters and mode settings, then we have not "forced" the data; we've simply allowed it to migrate via a path that is cleared for this purpose.

Later in this installation of the "Packet User's Notebook," I'll show you how we do impose some constraints on the nodes through locked routing. Locked routes perform the task of forcing traffic and data to a close neighbor-node before the data is sent via a non-locked path.

In short, we are going to first "allow" migration of data from LAN to backbone by enabling a node hierarchy. Then we will impose a policy to ensure that data is further directed along a path to specified "target" nodes. This latter configuration is normally employed where nodes are far apart or have poor radio (HDLC) linking. Note that I said "normally." In our case, we will be imposing this insurance policy to each and every node in the system, both LAN and backbone.

Param #	Definition of Use	EPROM "Default"	Min.	Max.	1200 Baud	9600 Baud
1	Size of destination node list	100	100	400	100	100
2	Minimum auto update quality	10	0	255	60	143
3	HDLC (radio port) quality	10	0	255	60	143
4	RS-232 (Crosslink) port quality	255	0	255	255	255
5	Initial obsolescence count	7	0	255	9	9
6	Minimum Obsolescence to broadcast	5	0	255	5	5
7	Nodes broadcast interval (seconds)	1800	0	65535	1800	900
8	Initial time-to-live	16	0	255	16	16
9	Transport FRACK timeout (seconds)	180	5	600	220	220
10	Transport RETRY counter	3	1	127	3	3
11	Transport (L4) ack delay (seconds)	2	1	60	2	2
12	Transport busy delay (seconds)	180	1	100	60	60
13	Transport window size (frames)	4	1	127	4	4
14	Transport overfill limit (frames)	4	1	127	4	4
15	No-Activity time-out (seconds)	900	0	65535	900	900
16	Persistance (n/256)	64	0	255	64	255
17	Slottime (x 10ms)	10	0	127	10	1
18	FRACK (T1) time	5	1	15	5	1
19	AX.25 windowsize (L2 MaxFrame)	2	1	7	3	3
20	AX.25 (L2) retries	10	1	127	10	10
21	ACK (T2) time (L2 RESPTIME)	100	0	65535	100	60
22	Active check (T3) (x10ms)	65535	0	65535	0	0
23	Digipeat	0	0	1	0	0
24	Callsign validation	1	0	1	0	1
25	Beacon mode control	2	0	2	1	2
26	CQ broadcasts	1	0	1	1	0

Table I– How we allow a "natural" migration of data packets from the user port onto the backbone (columns labeled 1200 and 9600 baud).

Credits and Kudos

Before I get too deep into this month's column, our thanks to Ron Raikes, WA8DED (Mike Busch NetROM/Software 2000); Hans Georg Giese, DF2AU (TheNET/NORD-LINK); Dave Roberts, G8KBB; Neville Pattison, GØJVU; and Bill Beech, NJ7P (theNet Plus).

Although the subject of our discussion is the X-1J Rev 4C node code, the formula we use here is similar to that of the original NetRom and TheNET codes. The 26 parameters used in theNet and NetRom are much the same today as then. The addition of the 17 mode settings made the X-1J4 code easier to use and more supportive of our LAN and backbone networks.

I truly do understand that there are many new kids on the block. However, for now the X-1J4 is the easiest to use, since it continues to be a feature-filled, EPROM-based code that is easily installed into a TNC2 clone or the Timewave/AEA PK-96 to provide a stand-alone node on the hill.

Eight Times Faster

Not to be argumentative, but to be rational about it, so many operators are missing out on the best of all worlds by trying to jump to a low-powered, high-speed, system that lets them run fast data short distances. In the meantime they are completely losing sight of where the fun and action really is. Long-haul 9600 baud is really great to use, and the radios for 9600 baud are now plentiful—commercial modifieds or amateur built. The Alinco DR-150, a Kenwood TA-251, ICOM, Yaesu— they all have radios that will run more than 30 watts at 9600 baud.

Think about it for a moment—9600 baud! That is eight times faster than 1200 baud! In our network here in the east, we have over 60 radios on our 6 meter 9600 baud backbone. All are running 50 or more watts of power output and linking across ten states with ease. While we are having fun at 9600 baud, some are struggling to get across town at 56Kb on a 2 watt radio. What's wrong with this picture?

Let's Draw A New Picture

The hierarchy shown in Table I, columns labeled 1200 and 9600 bauds, illustrates how we allow a "natural" migration of data packets from the user port onto the backbone. Other networks may use a different concept. Our network here in the east does not endorse any particular routing scheme. Too many cooks have already spoiled the broth by trying to make network configuration complicated. Node and network maintenance is *not* complicated. Follow our format and you will soon understand node configuration. It is true that a measure of "node" common sense should be applied when setting up a network. One thing we do know, our network here in the east, as configured, works very well and does carry lots of traffic!

To better understand the parameter settings in Table I, we need to understand the definitions for the parameters. Following

211 Luenburg Drive, Evington, VA 24550
e-mail: K4ABT@PacketRadio.com

the parameter definitions, I'll set the "table" for the mode configuration as Table II.

X-1J4 Parameter Definitions

Parameter 1. Maximum destination node list size. Defines the maximum number destination nodes allowed in the node's routing table. Each destination consumes 32 bytes of RAM. The system node operator (SNO) can use this parameter to limit the amount of RAM that is allocated to the routing table, thus ensuring that sufficient space remains for other node buffers. Normally there are 720 free buffers in the X-1J4 node at startup.

Parameter 2. Worst quality for auto-update. Defines the poorest route quality that can be added to the node's automatic routing table. The SNO can use this parameter to limit the automatic routing update function to accept only higher-quality routes. In addition, the automatic update function can be disabled altogether by setting this parameter to zero.

Parameter 3. Channel 0 (Radio Port) quality. Defines the quality of the radio channel connected to the node's HDLC port. The SNO should set this parameter to an appropriate quality value in accordance with the speed, reliability, and congestion anticipated on the channel. The default value of 192 is appropriate for a 1200-baud user-accessible frequency.

Parameter 4. Channel 1 (RS232 Port) quality. Defines the quality of the TNC-to-TNC interconnect channel connected to the node's RS232 port. The SNO should set this parameter to an appropriate quality value in accordance with the speed, reliability, and congestion anticipated on the channel. The default value of 255 is appropriate for a 9600-baud two-modem interconnect cabled gateway.

Parameter 5. Obsolescence count initialize. Defines the initial value given to the obsolescence counter of a route that has recently been added or updated by the node's automatic routing table. The obsolescence count of a route is also reinitialized to this value whenever the route is successfully used or when the period is set to the noted value shown in the STATS table of the X-1J4 node. The obsolescence count of a route is decremented once each auto-update broadcast interval (see parameter 7). Periodic decrementing of route obsolescence counts can be disabled altogether by setting this parameter to zero (0).

Parameter 6. Obsolescence count minimum to be broadcast In the X-1J4 node. This parameter defines the minimum obsolescence count threshold below which a route will not be included in the node's automatic routing broadcasts. The purpose of this threshold is to prevent the node from broadcasting outdated routing information to other nodes. If parameter 5 is greater, the X-1J4 node's broadcasts will *not* include destination nodes other than itself.

Parameter 7. Auto-update broadcast interval (seconds). Defines the number of seconds between automatic routing broadcasts issued by the node. The default value of 3600 specifies an hourly broadcast. X-1J4 node broadcasts can be disabled altogether by setting this parameter to zero (0).

Parameter 8. Network TIME TO LIVE initialize. Defines the initial value of the time-to-live; field in the network header of all network-layer frames originated by this node. The time-to-live field is decremented by each intermediate node that relays the frame. If the time-to-live value ever reaches zero, the frame is discarded. This protects the network against frames living forever as the result of a routing loop.

Parameter 9. Transport timeout (seconds). Defines the number of seconds between transport-layer retries.

Parameter 10. Transport maximum tries. Defines the maximum number of transport-layer tries attempted before a circuit failure is reported.

Parameter 11. Transport acknowledge delay (seconds). Defines the number of

Mode #	Function	1200 Baud Node/Port	9600 Baud Node/Port
1	Host mode control (RS-232 port,hardware handshake).	0	0
2	CWID repeat period (seconds) #=ON, 0=OFF	0	0
3	CWID keyer speed (10 milliseconds per dot)	6	6
4	Nodes port broadcasts (RS232 and/or HDLC)	3	3
5	RS-232 crosslink protocol	0	0
6	Transmit keyup delay/TXDelay X 10 milliseconds	35	15*
7	Full duplex (0=OFF 1=ON)	0	0
8	Crosslink node broadcast interval (seconds)	500	500
9	Node broadcast algorithm port control flag	2	2
10	Beacon interval (seconds)	3600	1800
11	Connect redirect flag	1	1
12	User help message control flags	27	27
13	Hash node broadcast port control (1 bit per port)	0	0
14	Enable/Disable extra alias monitoring	0	0
15	Auto-reconnect to node after "bye" from mailbox or neighbor node	1	1
16	Control of slime trails (Bit 0 hides slime trails)	0	0
17	Digipeat control (Disable L2 Uplink & Downlinks)	3	3

**Depends on radio PTT to full output power, time.*

Table II– How we configure our nodes with the "mode" settings. The mean settings are shown in each of the mode command lines.

seconds of delay used by the transport layer from the time it receives an information message until it sends an information-acknowledge message. Purpose of this delay is to give the acknowledgement an opportunity to be added to another outgoing information frame or packet.

Parameter 12. Transport busy delay (seconds). Defines the maximum number of seconds that the transport layer will remain choked, as the result of an incoming message that has the choke flag bit set. The purpose of this timeout is to prevent an infinite hang-up in the event that the un-choke message is lost.

Parameter 13. Transport requested window size (frames). Defines the maximum number of incoming, out-of-sequence information messages that the transport layer will buffer while waiting for the next expected information message to arrive. Also defines the maximum number of outgoing information messages that the transport layer will send without receiving acknowledgement.

Parameter 14. Congestion control threshold (frames). Defines the maximum allowable backlog of messages that the transport layer will buffer before it sends a choke message. Also defines the maximum allowable backlog of frames that the link layer will buffer before it sends a receive-not-ready (RNR) control frame.

Parameter 15. No-activity timeout (seconds). Defines the maximum number of seconds that a transport-layer circuit or a link-layer connection can remain idle (for example, no information transfer in either direction) before it is automatically disconnected.

Parameter 16. P-persistence (p=/256). Together with slot time (parameter #17), defines the exponential delay algorithm used by the node when keying up its transmitter. When the node has something to transmit and the channel is clear, the node generates a random integer in the range 0 – 255. If the random number is less than or equal to the P-persistence parameter, the node keys up its transmitter immediately. Otherwise, the node delays for one slot time, generates a new random number, and repeats the procedure.

Parameter 17. Slot time (10ms increments). Together with P-persistence (parameter #16), defines the exponential delay algorithm used by the node when keying up its transmitter. The default value of 10 corresponds to a slot time of 100 milliseconds. NOTE to the wise— and maybe the "unwise": Setting this parameter to 0 (zero) may make the node respond fast! Maybe too fast. (For 9600 baud, I use 255 as the setting for parameter 16 and 1 for parameter 17).

Parameter 18. Link T1 timeout frack (seconds). Defines the number of seconds between link-layer retries. When digipeating is used, this value is multiplied by 2 × D+1, where D is the number of digipeaters.

Parameter 19. Link transmit window size maxframe. Defines the maximum number of outgoing information frames that the link layer will send without receiving acknowledgement.

Parameter 20. Link maximum tries. Defines the maximum number of tries that the link layer will attempt before reporting a link failure. If this parameter is set to zero (0), the link layer will retry forever. (In the SEDAN nodes, we recommend that this parameter is *never* set to zero [0].)

Parameter 21. Link T2 timeout (10ms increments). Defines the delay (measured in 10-millisecond increments) used by the link layer from the time it receives an information frame until it sends an acknowledgement (RR, RNR, or REJ) control frame. The purpose of this delay is to give the acknowledgement an opportunity to be attached to another outgoing information frame.

Parameter 22. Link T3 timeout (10ms increments). Defines the maximum no-activity period (measured in 10-millisecond increments) permitted by the link layer before it issues a poll to make sure the link is still intact. This timeout is also used to break link-layer choke deadlocks. *Note:* This parameter is the same as CHECK, and can be defaulted to 0 as a means of reducing node QRM.

Parameter 23. AX.25 digipeating (1 = enabled, 0 = disabled. Defines whether or not the node will perform AX.25 digipeating. The default value of 1 causes digipeating to be enabled.

Parameter 24. Validate callsigns (1 = enabled, 0 = disabled). Defines whether or not the node will perform validation checks on amateur callsigns. The default value of 1 causes callsign validation to be enabled.

Note: If callsign validation is turned OFF (0), users will experience long delays if they request connects to inactive nodes before getting back a FAILURE WITH, response.

Parameter 25. Station ID beacons (2 = on, 1 = conditional, 0 = off). Defines whether or not the node will broadcast station-identification beacons. The default value of 2 causes station identification to be broadcast every 10 minutes. The value of 1 causes station identification to be broadcast only if the node has transmitted since the last beacon. A zero (0) will disable station identification.

Note: Many sysops set this parameter to 0 as a means to reduce unnecessary node QRM on the channel. The X-1J4 node ID's itself each time it sends a packet, so there is no legal requirement to have ID's turned on.

Parameter 26. CQ Broadcasts (1 = on, 0 = off). Defines whether or not the node will broadcast AX.25 UI-frames in response to the CQ command. Even if such broadcasts are disabled by setting this parameter to zero, the other features of the CQ command continue to operate normally. The default value of 1 enables CQ broadcasts.

Note: When a station connected to an X-1J4 node through several distant nodes issues a UI QRA command, the distant node will poll stations that have the QRA feature for an ID. After about 40 seconds, the station that sent the polling (UI QRA) can issue the Mheard command and receive a list of the station that identified in the area of the distant X-1J4 node that was polled.

More Than Just Parameters And Modes

Although there are more commands and node configuration features in the X-1J4

node code, we will only cover the parameter and mode configuration in this month's column.

For the SNO who has an in-depth interest, the X-1J4 allows for locking out unwanted, up, down, or digipeated links. It is structured with other features for TCP/IP calls and IP addressing, it has IP routers and provisions for SNO IP path assignments, IP Automatic Routing Protocols (ARP), and the list goes on. Add to these notable featuresthe fact that the X-1J4 also has auto-connect routing commands to force a connect into either a nearby BBS, PBBS, or mailbox. For the DX spotter, there is a DXC command that autoroutes a connect into the DX spotting node(s). The list of great features goes on and on. To really feel the full impact of the X-1J4 node, send for the disk of the code and the book that supports many of the TNC to X1J4 node conversions. All mods in this book are supported by AutoCadd drawings of the conversions.

There is no charge for the two books (one book covers the TNC2 to X1J4; the other book covers the PK-96 to PKX1J4 mods). However, there is a fee of $5.00 to cover the $3.00 priority pouch (postage), the disk, and handling. ***Please note:*** The X-1J4 node code is only supplied on a 3.5 inch 1.44 mb disk. I include the code for both the X1J4 TNC2 and the PKX1J4 for the TimeWave/AEA PK-96 node conversions. I also include the documentation on the disk for both the TNC2 and the PK-96 node configuration.

U.S. and Canadian orders only: Be sure to include your return address, and check or money order for $5.00 U S ($10.00 for Canadian orders). *Do not send IRCs!* Mail to: X1J4 TheNET Books, 211 Luenburg Drive, Evington, VA 24550.

Mode Settings for the X-1J4 Nodes

In Table II we will keep it simple by illustrating the settings and how we configure our nodes with the "mode" settings. The mean settings are shown in each of the mode command lines. Therefore, the system node operator may choose whichever configuration number he/she pleases.

Locking Routes

(When using the parameters shown in table 1.) Note: Port 0 (zero) = radio. Port 1 (one) = RS-232 port.

For 1200 baud, and when locking (radio port = 0) paths between 1200 baud neighbor nodes, use a "locked path" quality of 192. Be sure both neighbor nodes are locked to each other and use the same value (192). Locked route example:

R 0 [NeighborNodecall&SSID] + [port quality (192)

For 9600 baud, when locking (radio port = 0) paths between 9600 baud neighbor nodes, use a "locked path" quality of 240. Be sure both neighbor nodes are locked to each other and use the same value (240). Locked route example:

R 0 [NeighborNodecall&SSID] + [port quality (240)

Locking (RS232) Gateways

When locking gateway (1200 to/from 9600) neighbor nodes (nodes connected via port 1/RS232) umbilical, use a route quality of 255. Example:

R [neighbor nodecall] + [port quality (255)]

When three nodes are in a "node-stack," use port quality of 250. For four nodes in the node-stack (diode-matrix), use port quality of 245.

To remove a locked route, substitute the – (minus) sign for the + (plus) sign.

Don't forget to visit the PacketRadio Networking Home pages at: <http://www.packetradio.com>.

Having fun with Packet Radio!

73 de BucK4ABT
e-mail: k4abt@packetradio.com

BY JOE LYNCH, N6CL

VHF PLUS

ALL ABOUT THE WORLD ABOVE HF

Powering and Driving Your Rover Operation

Recently, Dave Bostedor, N8NQS, queried the participants of the VHF reflector (vhf@w6yx.stanford.edu) about Rover operations. His two questions were the following: (1) How do you DC power your equipment? (2) Is your station more of a "multi-location portable" or "Rolling Rover"? My thanks goes to Dave for granting me permission to reprint the responses he forwarded to me.

In commenting to him about the responses, I stated the following: "I believe that Rover operators should be willing to share information because it will be of benefit to all. It is not as though anyone has a deep secret to success that they want to keep to themselves. It is more like this: Each of us has information peculiar to our operation. What may work for one person will not work for someone else. However, it is through the sharing of information that all benefit and we are able to improve our situation."

Both Dave and I were pleasantly surprised by the number of informative responses. Below are several of them, beginning with Dave's and ending with mine.

"Power: I've powered my traveling ham shack on the car battery, and also off a 4 KW generator.

"Portable Rover: Some contests, and grid square expeditions, were arranged so that I could spend a good deal of time in each grid square I visited. On these occasions, I prefer the 4 KW gas generator, and an Astron RM-60M power supply, modified by Astron to handle 80 amps. It meets the need of the 350 watt TE Systems amplifiers I enjoy running. The antennas, for these events, will get elevated as high as I can get them, usually 20– 40 feet. I remember one time when expeditioning in northern Quebec, I awoke early and thought I'd go out and start the generator. I looked out my van window at the silent generator only 50 feet away, with an extremely large black bear about 3 feet behind it. I was wishing then that I had hooked up the radios to the van battery. . . . The bear left, and I slipped out silently, started the generator, and ran back to the van and caught the tail end of a double-hop E opening to Europe.

"Rolling Rover: When operating, so that I can move while transmitting I run 100 watts on 6 and 2 meters, and use the vehicle battery. My problem there is that when I stop and shut off the engine, I frequently have received reports that my audio sounds like it is "FMing." I restart the vehicle and sound great. I suspect that the difference between my 13.8 VDC alternator and my 12 VDC battery is the cause. I wonder how the 12VDC battery pack fellows get around this problem? Is it a current problem? Or voltage?" *[It's usually a voltage problem, Dave. I've had the same experience when my battery drops below a certain voltage. In fact, the IC-706 refuses to key on CW on low voltage—ed.]*

Bill, N3KKM, stated: "I have used deep cycle batteries tied into the auto charging system, but found that to be less than ideal performance at the 12V or less level than at the charging rate of deep cycle batteries (whatever it is).

"January contests generally require a heated 'shack,' so the engine usually runs the entire contest with windows rolled down an inch or so to avoid carbon monoxide.

"The past two contests I have not roved, but have operated portable from a local park. I have used a Honda 750 watt generator to power two Astron 35 amp power supplies and a rotator. I use one power supply to power the FT736 and the Kenwood 690 and the other to power the bricks. I have used three rotator systems over the years; still experimenting there also. Armstrong works well in the summer and then you can listen to the rig while rotating. Using the vehicle as a rotator worked better, but was difficult to be precise, especially in the dark, and everyone I worked the first time was always off the back of the beam. Current setup of using rotator mounted on top of van works well using the generator power."

Don Sipes, VE6NTT, wrote: "I have Rovered all about southern Alberta for a number of VHF contests in a truck-mounted camper. We run three stations on 6, 2, and 70 cm with brick amps of 100, 170, and 100 watts, respectively. Usually do 4 to 6 grids in the weekend. I have a heavy-duty truck battery that powers both truck and camper, 700 cold cranking amps/180 minutes reserve. For roving I connect a 800 cold cranking amp/180 minute reserve marine battery (both Sears Diehards) in parallel and power everything off that. I find with travel between grids and some quiet band times I'm able to operate the weekend with no problem and run lights as well.

"In June 1996 we ran about 60 contacts in a 1 hour period from the same grid location and I was still able to start the truck. If in doubt I run the truck for a few minutes. This arrangement probably wouldn't hold up in a heavily populated area where many contacts can be made from each location, but for out here it serves well."

Brad, W9FX, commented: "The DC power in the W9FX/Rover setup is applied through a direct connection of a pair of number 8 wires to the vehicle battery posts. The other end of those wires is attached to a deep cycle 12V battery (housed in a transit case) which is kept in the passenger compartment of the vehicle. Wiring to the various rigs, then, comes off that deep cycle battery via a homemade distribution buss which consists of a pair of 1"× .0625" brass strips screwed to a slab of river cherry (I know, curly maple might have looked better . . . but it's what was handy in the shop the day I made it . . .) to form a base. Connections to the buss are made using number 10 brass machine screws, nuts, and washers. The antenna rotor which I describe below is powered using an Astron inverter. All the rest of the equipment is powered using the 12V system.

"The Rover setup, which belongs to N9BJG, is a 'Rolling Rover,' a Chevy Astrovan equipped with a Reese hitch into which is plugged a 1.25 inch diameter mast constructed of high-strength tube steel (the stuff stock-car roll cages are made of). On top of that mast rides an inexpensive Radio Shack rotor and another length of mast to which are mounted antennas for 6, 2, 222, 432, and 1296 MHz.

"The only problem this setup poses is a limitation in the ability of the rotor to overcome the wind load presented by the antennas at highway speeds. That's a fancy way to say 'don't turn the antennas while driving, because once they get headed toward the back of the van, they stay that way.'

The 1296 MHz loop Yagi is just a bit much for it. The lowest antenna of the stack, our 6 meter loop, is placed on the mast to just clear the roof of the van. The overall height of the array above ground is a little over 9 ft. We've not had any clearance problems with man-made structures yet, but have detuned an antenna or two driving down tree-lined country roads. The 432 MHz Yagi, in particular, seems to most often be festooned with greenery."

Dan Evans, N9RLA, wrote: "I thought I would throw in a few comments from a rookie Rover team. First of all, I and my cohort, Troy, N9RMJ, would like to thank everyone for their helpful

VHF Plus Calendar

April 3	First Quarter Moon.
April 3–4	Southeast VHF Conference. (Details in last month's column.)
April 5	Good EME conditions.
April 9	Moon apogee.
April 11	Full Moon.
April 12	Poor EME conditions.
April 18	Lowest Moon declination.
April 19	Last quarter Moon. Very poor EME conditions.
April 22	*Lyrids* meteor shower predicted peak.
April 23	*Pi-Puppids* meteor shower predicted peak.
April 25	Moon perigee.
April 26	Good EME conditions but New Moon.
April 30	Highest Moon declination.

**EME Conditions courtesy W5LUU.*

P.O. Box 73, Oklahoma City, OK 73101
(phone 405-528-6625; fax 405-528-0746)
Internet jlynch@post.cis.smu.edu

suggestions before the contest. We were a lot better prepared and had more fun thanks to your help! And was it ever fun! We scored a whopping 1508 points! Sure, we aren't going to win anything with that score, but we had a blast and learned a lot, so look out in June.

"I think all that 'east coast advantage' stuff is just a story they cooked up to discourage any serious competition. But we're wise to your game now, so look for some upcoming big upsets—hi, hi!

"For DC power we had two options: (1) Two pre-charged deep cycle marine batteries; (2) Heavy-gauge wiring direct to the van's battery. We had planned to use the deep cycle batteries for our 'primary' station power and to rely on the van as back-up. The logic was that way we wouldn't run the van's battery down 30 miles from nowhere! As it turned out, we had to let the engine run almost the full time just for the heat! And as there was hardly any engine noise to deal with (beginner's luck), we just powered everything off the van's battery.

"We were almost exclusively multi-location portable. We had antennas for 6, 2, and 440 on one 15 foot mast erected on the rear of the van and turned using the Armstrong method. We did have a 2 meter mag mount for FM, but we only made a couple of contacts while in motion. Our plan was to only activate four grids, so we figured on having plenty of operating time from each location.

"Lessons Learned: (1) Be sure to schedule time off from work so the boss can't spring a Saturday on you at the last minute and ruin half your contest. I already have future significant events scheduled, so that won't happen again!

"(2) Antennas are everything! I'm currently homebrewing an 8-element Yagi for 2 meters. That's not great, but it should perform much better than the tired old quad I was using. I'm also planning a small beam for 6 meters in hopes of getting some better 6 meter gear for the next contest. The Yagi for 440 FM was adequate. It would have been nice to have 432 SSB, but with my budget that's not going to happen any time soon, so we will just have to be happy with FM only.

"(3) In January it's much colder on hilltops than it is at home. Don't forget to bring your gloves! Putting up antennas in the cold wind without gloves isn't much fun.

"(4) Get some sleep. Between the hours of 2 AM and 6 AM Sunday morning we never heard a single station, so at least one of us should have used that time to get some rest. Of course, this could have been related to the lack of propagation and weak antennas. . . .

"Best DX: Our EM78 to W4ZRZ in EM63 on 2 meters. *Cool!*"

Dick Flanagan, W6OLD, stated: "I am not an active Rover, but I have an operational mobile capability from 160 through 10 meters all mode, 10 meters through 450 MHz FM, plus the usual cell phone, CB, and GPS gear.

"I run a 4WD Ford F-150 pickup with a large deep cycle battery under the hood, diode-isolated from the standard truck battery. I also run an after-market 150 amp alternator.

"All radios have direct fused red and black runs to the deep cycle battery. There are also large-gauge wires from the deep cycle battery to a heavy-duty barrier strip under the dash to power all the various accessories, spot lights, etc. Separate circuit-breakered runs for the off-road lights also come off the deep cycle battery. Nothing comes off the truck battery except the truck, itself, and its lights.

"When we run with our small travel trailer, the trailer's two deep cycle batteries are in parallel with the deep cycle in the truck. When we are able to plug the trailer into commercial power, its batter charger charges all four batteries, including the truck through the diode isolator.

"Antennas are a Bandhopper (industrial strength screwdriver) for 160–10 meters all-mode, Hustler combination for 6/10 meters FM, Diamond dual-band for VHF/UHF, Comet 5 dBi for cellular, RS center load for CB, and Motorola active Traxar for GPS.

"Everything is operational in motion and we can run fixed for a decent amount of time off the single deep cycle battery. For extended portable operations, however, we run with the engine idling. With 57 gallons of fuel in extended range tanks, we can operate for a decent amount of time.

"We also carry an 1800 watt Honda generator with us, with 120 VAC and 12 VDC outputs. It is quiet, weighs only 80 pounds, and can run 8 hours on its own internal tank.

"Nothing unique, but perhaps some ideas folks can use."

Charlie, N7SFT, wrote: "For multi-location Rovering and mountaintopping I use a large deep cycle (Stowaway 800) battery. Its 100+ amp hours will power four 25 watt rigs (6, 2, 1.25, and .7 meter) all day. I've tried other, smaller batteries like X-ray machine gel cell pull outs and old car batteries, but they don't have the capacity and life that the big Stowaway does.

"At present I only have one brick that I use

on 432. I can still get by with the single battery. If and when I get bricks for 6 and 2 meters, I'm going to need additional power. But, what the heck! A Stowaway 800 only costs about $55 at Sam's Club. The drawback to this kind of power is weight. It takes a lot of lead to hold 100 AHr.

"I use a 10 amp charger to pump up the battery overnight. I'm not as dedicated as some Rovers and only operate during daylight hours."

Stu Olson, N7QJP, commented: "Radios/Station: This past contest, I ran three bands in the vehicle. The 6 and 2 meter SSB rigs are permanently mounted in and on the vehicle, so I did operate them while in motion. The 432 MHz rig was a temp installation, just for the contest, as was the small Yagi which I erected at each stop. I also had a rotatable dipole for 6 meters, which I used a couple of times (it does better than the horizontal omni). When I used it, it shared the mast that held the 432 Yagi.

"Power: The permanent radios ran directly from the vehicle battery, as they do any other time. I had a deep cycle RV battery along for the 432 MHz rig and its 100 watt brick. I have the ability to charge the RV battery when moving. However, I did not need to do so. I ran my laptop (for logging) with an inverter supplying its little 110V switching supply. The inverter was hooked to a 24 AH sealed lead acid battery."

Robin Midgett, KB4IDC, stated: "I'll probably bore you with this description because I'm very happy with our power source and how it came to be.

"Bruce Martin, KQ4TV, and I use six deep cycle lead acid golf-cart batteries. They are 6 volt cells, made by Trojan, model #105. We run them in three paralleled strings of 12V. I purchased them from a local golf-cart shop in the winter time, just as they were getting lots of battery trade-ins, for $10 each. The shop manager let me use his battery testing device (a 12 VDC heater with a calibrated meter, basically), to load test the batteries before I bought them; hence, I was able to choose the best six. He even threw in a new set of stainless-steel nuts for the posts and a handy-dandy carrying strap made for the Trojan batteries! We haven't run them down on a contest weekend yet. We figure we have about 500 AH of storage. At 66 lbs. each, that's 7.58 AH per pound. They also power a repeater and an ATV station in the van over the Dayton HamVention weekend.

"We intend to replace the jumpers between 6V batteries with fused links this season. This will prevent a total meltdown of the pack if any one battery shorts internally. We built a nice 3/4 inch plywood box with a removable top/front cover piece to hold the batteries. The seams of the box are sealed with silicon, and we will coat the inside of the box this season, perhaps with spray-on automotive undercoating. This is not to say that we have had problems with the lead-acid cells, just that a little C.Y.A. goes a long way in an unexpected situation.

"On to your second question. As you may have deduced by now, this is definitely a Rolling Rover operation! The vehicle is basically dedicated to the purpose (plus hamfesting), so we have become very intent on making whatever modifications to the vehicle are necessary to improve our operating. We currently operate from 6 meters up to 23 cm, minus 33 cm. We plan to add 33 cm SSB and 23 cm SSB with transverters this year and also get into 10 GHz."

Mike, N1JEZ, wrote: "The N1MJD/R Rover Team is a little nuts. For power, we have four systems. First, the vehicle is a Ford Explorer. (1) We use two separate 30 amp fused runs from the vehicle battery—one to the front seat, and one to the rear seat. (2) We carry two heavy-duty deep cycle batteries with two chargers to "top" them off when we stop overnight at a motel early Sunday morning. (3) We carry an Astron 50 amp supply and a Honda 1 KW generator. (4) We also invert 140 watts of AC from 12V for small map lights and for the AC charger for the IBM Thinkpad we use for logging and also for the 1296 MHz rotor when we're moving, and the Expresso Machine (just kidding). All connections are the quick-disconnect type. Lots of options with the above system. Virtually wherever we are we have a good supply of power.

"As far as the vehicle, it is designed for both fixed and mobile. We have a full array of mobile antennas (SSB/FM) for the five bands we presently carry. We're mobile about 70% of our contest time. We also carry a 25 ft. mast with a drive on plate (commercial, made by Will-Burt). We use a Yaesu G800 rotor system when fixed with a CC 13B2 and KLM 440-16X. We also have a 222 beam, but up to now we have left it behind. There's only so much room on the roof of a Ford Explorer!"

Jeff, W2FU, stated: "I have used both an inverter and a generator, and although slightly more troublesome, I prefer the generator (1500 Watt Astron verses 1 KW Honda). The generator seems to create a more stable AC line for stuff, and I have not yet figured out how to get rid of the inverter hash, especially on 6 meters. The inverter seems to radiate from the DC feed. When on the generator, I power the larger bricks for 6, 2, and 432 MHz on the battery from the vehicle and everything else from a 35 amp

Astron supply. Separate +28 and –30 volt supplies (from AC) power the microwave stuff, including the TWTA I use on 3, 5, and 10 GHz.

"We are certainly a portable station—only make contacts while moving on FM when in range of metro area (not much). As opposed to some others, our Rover uses my everyday 1996 Explorer and is equipped with a hinge-over 28 foot aluminum tower and a separate 16 foot mast with 144, 222, and 432 MHz."

Dave, N6TEB, wrote the following: "I will answer both questions with one response:

"When I rove with antennas mounted on a push-up pole on the back of my car, I simply leave the motor running whenever I stop. My 91 Ford Explorer ran 12 hours Saturday and about 10 hours Sunday during the Sweepstakes. I recommend you test your car first for overheating before trying this. I also brought along a 1.6 KW portable generator that I picked up at Sam's Club for about $400 as a backup. It also has the ability to recharge my car battery should I ever run it down. (Never used it during the Sweepstakes.)

"Last June I camped out with a tent and the same generator from CM94 on Saturday before I started roving on Sunday. The little generator provided enough power for the station and allowed me to restart my car when I ran the battery down by leaving the doors open too long.

"I like working mountaintops and roving. Still learning but having a lot of fun."

My (N6CL) comments were the following: "I use a deep cycle battery to power my station. I charge the deep cycle battery by way of the alternator. However, I have a commercially made battery isolator (available from auto parts stores and RV centers) that isolates the deep cycle battery from the van's battery. I also have a switch mounted under the dash that I use to switch in and out the alternator as a partial solution to eliminate internally generated QRN.

"I was inspired to install the deep cycle battery, and thereby go strictly DC, by Jack Henry, N6XQ, and Chip Angle, N6CA, who both switched away from gas-powered generators. Jack principally did so because of the space and the fact that for his low-power microwave operation it took less to run and maintain than a gas-guzzling generator.

"Even so, Wayne Overbeck, N6NB, still uses a generator, principally because he runs high power when he goes out. He would not be considered a Rover, however, because he usually locates in one grid and operates from his van in that grid throughout the contest.

"Regarding the equipment, I drive a conversion van back and forth between Oklahoma City and Dallas-Ft. Worth area weekly. Therefore, I do not set it up for rovering until I plan for a contest weekend. Even so, I do keep some of the equipment in the van at all times—mainly the linears, which I have lying on the floor between the two captain's chairs.

"I have one permanently mounted antenna, an outbacker, on the back door of the van, attached to the spare-tire mounting bracket. I use a mag-mount antenna for 2 meters.

"For my rovering station, I install an FT-736, which I keep at home. I also have the antennas at home in the garage ready for the next Rover operation.

"Speaking of antennas, I am in the process of redesigning the antenna system. I have purchased luggage bars and will design something around them when I have the time—hi. Currently I have both an M² and an NØLRJ designed antennas for 6 meters. I have a 5-ele-

ment quad for 2 meters and an 8-element quad for 70 cm.

"I have talked with Tom, KØTLM, and Denise, AJØE, about their joint Rover operations, and they told me that they keep the engine running because of an experience of running down the battery in her conversion van one time. I prefer to not do that, because I keep the doors open on my van and exhaust invariably finds its way into the interior of the van. Even so, when Carol King, K5CPZ, and I were working as volunteers for the Salvation Army in the aftermath of the Oklahoma City bombing, I ran the van for hours on end because we needed the heat from the van's heater. It was cold and rainy a few of the nights during our operation. For gas, we got refueled from an Air Force tanker which was parked in the vicinity for that purpose. We only moved the van from the area once during the week that we worked the operation.

"Regarding the deep cycle battery, I am thinking about adding a second one in parallel with the first so that I have that additional time between chargings. As I stated in my first post, I can isolate the alternator and the engine battery from the deep cycle battery so I do not run the risk of a dead engine battery during an operation."

You may notice that several of us are using deep cycle batteries. There is some controversy concerning charging the battery off the automobile's charging system because of the lower "float" voltage of the deep cycle battery. The consensus seems to be that continuously charging one of these batteries at the higher voltage will lower the life of the battery. I will be checking into this for a future column.

Regarding Astron power supplies, Richard Amirault, N1JDU, made the following comment: "You can special order Astron power supplies with a float charge circuit (Astron calls this the BB option for Battery Backup). If commercial power fails, the battery will take over—sort of like a 12 volt UPS (uninterruptable power supply). That is what I have on my APRS WX station. I initially used an old car battery, but it boiled dry. I opened up the Astron and set the adjustment control for 13.4 VDC for my new deep cycle battery. Long may it last!"

If you have a unique Rover setup and would like to comment on it in this column, please write to me about it.

CQ VHF National Foxhunting Weekend April 25–26

Our sister publication, *CQ VHF*, is urging amateur radio clubs and operators across America to go "foxhunting" on the last weekend of this month. However, the bushy-tailed animals have nothing to fear. Amateurs, after all, are not hounds, and in amateur radio lingo, a "foxhunt" is one of several names for Amateur Radio Direction Finding (ARDF), a competition to locate a hidden radio transmitter.

CQ VHF magazine has designated the last weekend in April as the "*CQ VHF* National Foxhunting Weekend," and is encouraging amateur radio operators and radio clubs to conduct a hidden transmitter hunt at that time. Unlike traditional amateur radio contests, there are no standardized rules, log sheets, or reporting forms.

"It's not a national contest, and there are no set rules," writes radio foxhunting veteran Joe Moell, KØOV, in an article announcing the event in this month's issue of *CQ VHF*. "It's just a time for clubs, schools, and Scout groups to try this exciting radiosport." Moell notes that participation is not limited to licensed amateurs. "There's no license requirement to receive, so everyone can participate."

On-air competition is an amateur radio tradition dating back nearly to the birth of the hobby, and foxhunting has been part of that tradition for at least 60 years. Foxhunting may be done by car or on foot, and the magazine is encouraging amateur radio groups to use either one or both during the National Foxhunting Weekend. And there's more than a fun day of friendly competition involved.

"Foxhunting is certainly fun and a competitive challenge," says *CQ VHF* Editor Rich Moseson, W2VU, "but it also teaches important direction-finding skills that may be called upon in searching for a downed airplane or lost hiker using an Emergency Locator Transmitter, or for tracking down sources of interference."

"Transmitter hunting belongs in the mainstream of amateur radio," adds Moell. "Ham RDF can be used for public service and to save lives."

The *CQ VHF* National Foxhunting Weekend coincides with efforts by other amateur radio groups to promote the sport. The Portland, Oregon based Friendship Amateur Radio Society has been working to bring international-style, on-foot, foxhunting, already popular in Europe and Asia, to North America. And in January, the American Radio Relay League (ARRL) endorsed those efforts and approved the appointment of a national ARRL ARDF Coordinator to encourage activity.

Groups participating in the *CQ VHF* National Foxhunting Weekend are encouraged to send reports of their activity directly to Joe Moell, KØOV, at P.O. Box 2508, Fullerton, CA 92837, or via e-mail to <homingin@aol.com>. E-mail reports may also be sent to the magazine at <cqvhf@aol.com>.

Current Meteor Showers

This month's meteor showers are the following: The *Lyrids* meteor shower is active between 19–25 April. It is predicted to peak around 1000 UTC on 22 April. This is a north-south shower, producing at its peak around 10–15 meteors per hour, with the possibility of upwards of 90 per hour. A minor shower and its predicted peaks this month is the *pi-Puppids* (2000 UTC, 23 April). The above information courtesy the International Meteor Organization and their home page at <http://www.imo.net>.

Current Conferences

The Southeastern VHF Society plans to hold its annual conference in Marrietta, Georgia, April 3–4, 1998. Complete information was published in last month's column. In case you missed it, you can also get complete information by checking their home page at <www.akorn.net/~ae6e/svhfs> or by contacting Jim Worsham, W4KXY, 1998 Conference Chairman, e-mail: <w4kxy@bellsouth.net>.

ARRL Plans VHF-Related Action

The following was supplied by Bill Pasternak, WA6ITF/Newsline: At the January ARRL Board Meeting the following resolutions were passed: From the ARRL Bulletin Service, "In response

to repeated member complaints of malicious interference and the use of foul language on the amateur bands, the Board established an Enforcement Task Force to push for better rules enforcement from the FCC. Vice President Joel Harrison, W5ZN, will chair the 10-member panel. Other members include President Stafford, Directors Joe Falcone, N8TI, Frank Fallon, N2FF, Kay Craigie, WT3P, Fried Heyn, WA6WZO, and Marshall Quiat, AGØX, Vice President Hugh Turnbull, W3ABC, General Counsel Chris Imlay, W3KD, and Field Services Manager Rick Palm, K1CE. The Task Force will oversee and work closely with the Amateur Auxiliary and make recommendations to the Board on enforcement issues.

"The ARRL also will ask the FCC for a declaratory ruling to put teeth into the voluntary band plan concept. The League wants the FCC to affirm that any operation that conflicts with established, voluntary band plans and causes interference or adversely affects those operating in accordance with applicable band plans 'is not good amateur practice' and would be considered a rules violation."

AMSAT News Service editor BJ Arts, WTØN, SK

The following is from the ARRL Official Bulletin Service: "AMSAT News Service Bulletin Editor Bernard J. 'BJ' Arts, WTØN, of Hibbing, Minnesota, died unexpectedly on February 9, 1998. He was 37.

"Arts took over the handling of the weekly AMSAT a couple of years ago, according to AMSAT-NA President Bill Tynan, W3XO. Tynan expressed shock at Arts' untimely passing. 'He certainly was a big help to AMSAT,' he said. "He will be missed by all of his friends around the world.'

"According to fellow club member Gregg Mihelich, AAØDX, Arts was hospitalized after complaining of flu-like symptoms and died a short time later.

"Arts was an active VHFer and satellite op. A broadcaster, he had been employed at WDIO-TV in Duluth, Minnesota, and at KSTP-TV in Minneapolis, where he'd won an Emmy Award. He also worked as an announcer on WMFG radio in Hibbing.

"BJ Arts was a life member of the ARRL and was president of the Midrange Amateur Radio Club. He also was an Assistant Emergency Coordinator in Northern St Louis County and a Skywarn volunteer. He was active in Army MARS as AAR5EL. Survivors include his mother an a sister."

And Finally. . .

We reported lots of stuff, particularly as it relates to Rover operation, this month. I am aware that the Contest Advisory Committee at the League has voted to keep the Rover rules unchanged for the ARRL contests. However, I feel that the Rover category is such a wonderful category to have fun within that it doesn't matter what the rules are for one to participate and have the fun. If you really are interested in operating Rover under the "old" ARRL rules, then participate in the CQ VHF contest in July. We have not, nor will we be, changing the Rover rules! Even so, whatever your preference for contesting, the bottom line is: Have fun, and please keep me informed about the fun you are having in this aspect of our wonderful hobby.

Until next month . . . 73, Joe, N6CL

BY TED MELINOSKY, K1BV

AWARDS

NEWS OF CERTIFICATE AND AWARD COLLECTING

This month we profile Frank L. Yohe, Jr., AA9JJ, USA-CA All Counties #935. Frank began his "paper chasing" after his retirement in 1991. Here is his story.

"I was first licensed as a Novice in Oklahoma in 1980 with the call KA5HRG. I received a lot of help from my Elmer, Billy Oliver, K5KDR. Later that same year, I upgraded to Technician with the call N5CIJ. Late in 1983 I finally managed to pass the 13 wpm code test and upgraded to General. It wasn't until I retired from the Federal Aviation Administration in 1991 that I made any effort to upgrade any further.

"During the first few years most of my activity was on 2 and 6 meters with some CW activity on HF. I didn't get into 'paper chasing' until after I retired. My first activity along that line was getting WAS on 75 meters while operating on the GERATOL Net. Later I got VUCC on 6 meters.

"Then about three years ago the editor of our local newspaper, John Callarman, KA9SPA, suggested that I look into something called 'county hunting.' He gave me the frequencies and some general information on how to get started. I also got a lot of help and encouragement from Fred Zurbriggen, WB9YZE. It wasn't very long before I was 'hooked.'

"About a year after I started chasing counties, I decided I needed to pay back some of the help that I had been getting from the many mobiles. My wife and I like to travel, and it seemed like a good way to pay back the other people on the Nets. As it turned out, my wife, Kay, N9QPQ, and I have gotten to where we really enjoy putting out counties.

"Another activity that we have come to enjoy very much is the conventions. It is nice to add a face to the names and calls that we have been talking to on the radio. We have found a new group of very nice friends.

"I have so many people I need to thank for all that help I have received all along in county hunting, and especially as I finished up. I don't feel I can do justice to all of them here, but I will be thanking them in person as I get the chance. Along this line, I think the best part of county hunting is the activity in which the participants work together to help each other rather than selfishly compete against each other."

USA-CA Special Honor Roll

Paul L. Beach, Jr., KC4UCE
USA-CA All Counties #945
January 13, 1998

USA-CA Honor Roll

500		1500	
HA9RT	3001	KC4UCE	1223
SP4JWR	3002	**2000**	
9K2HN	3003	KC4UCE	1126
KC4UCE	3004		
KKØDX	3005	**2500**	
		WB9IFE	1052
1000		KC4UCE	1053
SP4JWR	2465		
KC4UCE	2466	**3000**	
		KC4UCE	962

The total number of counties for credit for the United States of America Counties Award is 3076. The basic award fee for subscribers is $4.00. For nonsubscribers it is $10.00. To qualify for the special subscriber rate, please send a recent *CQ* mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from *CQ* Magazine, 76 North Broadway, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated March 1, 1997. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 65 Glebe Road, Spofford, NH 03462-4411 USA. DX stations must include extra postage for airmail reply.

The Icelandic Radio Assn. Awards Program

This month I am pleased to present the awards program of the Icelandic Radio Association, which is efficiently managed by TF5BW just north of the Arctic circle in Akureyri. Billi, TF5BW, uses the full capabilities of computer design and inkjet printing to produce a colorful and well-designed series of awards.

During the early 1980s, I was a member of a Naval Reserve group which spent three two-week periods in Iceland as part of NATO exercises. The land is hauntingly beautiful and desolate at the same time. Upon entering Reykjavik, this all changes. You think that you are in Norway or Sweden with all the conveniences of modern Europe. It is a very interesting country.

General Requirements for the entire series. The awards are available equally to amateurs and SWLs. For the IRAA Award, the TF stations contacted must be Icelandic resident amateurs operating from Icelandic territory. GCR is accepted. Contacts must be made from the same call area in your country, but where no call area exists, from the same country. Apply to: Brynjolfur Jonsson, TF5BW, P.O. Box 121, Is-602 Akureyri, Iceland.

The 1997 Iceland Award sponsored by the Icelandic Radio Association and managed by TF5BW.

The 1998 Iceland Award. This award may be earned each year.

The Iceland Award. Contact or hear Icelandic stations during any one calendar year. May be earned each year. All bands and modes. TF's need seven Icelandic stations; all others need just two. No /TF's may be used. Application must have reached the awards manager by June of the year following the year in which the contacts were made. The award will have a different design each year. Samples of 1997 and 1998 awards are shown here. Fee is 8 IRCs, or $US5. You do not have to possess the cards.

IRA Zone 40 Award. Contact the DXCC countries located in CQ Zone 40: Iceland (TF), Greenland (OX), Jan Mayen JX), Svalbard (JW) and Franz Josef Land (UA1). SWL okay. All bands okay, but all contacts must have been made in the

The IRA Zone 40 Award is issued for contacting the DXCC countries located in CQ Zone 40.

65 Glebe Road, Spofford, NH 03462-4411
e-mail: k1bv@top.monad.net

same mode to earn the award. Single band endorsed on request.

DX stations need one confirmed QSO with each country (5 QSOs).

EU same as above except 3 TF QSOs (7 QSOs).

TF same as above except 15 TF QSOs (19 QSOs).

Fee is 15 IRCs, or $US10.

The Icelandic Radio Amateurs Award.

Icelandic Radio Amateurs Award (IRAA). Earn required points by contacting Icelandic stations on different bands and modes.

ITU Zones 5, 9, 18–20, 27–29—98 points needed.

ITU Zones 1–4, 6–8, 21–26, 30, 31, 37, 37—48 points needed.

ITU Zones 10–13, 32–35, 38–40, 46–48—28 points needed.

ITU Zones 14–16, 41–45, 49–75—18 points needed.

Point Values for the IRRA Award

Band	Novice	CW	RTTY	SSTV	SSB
1.8		10	8	8	6
3.5	32	8	6	6	4
7.0	24	6	5	5	3
10		5	4	0	0
14		3	2	2	1
18		4	3	3	2
21	16	5	4	4	3
24		6	5	5	4
28		7	6	6	5
50		8	7	7	6
>144		48	48	48	48

All contacts via Satellite = 8 points.

There is no time limit. QSL cards or photocopies must be submitted along with GCR list. Fee for award is 14 IRCs. Mixed mode contacts and cross band contacts are not valid except for contacts by ama-

teur satellite. Each station may be contacted only once per band per mode.

Worked All Nordic Countries Award. Contact Nordic countries from the following list.

Class A: One confirmed QSO with each of the 11 countries.

Class B: One confirmed QSO with 8 and 2 in CQ Zone 40.

Class C: One confirmed QSO with 5 and 1 in CQ Zone 40.

The Worked All Nordic Countries Award.

Note that one contact with an Icelandic station is needed for any of the classes of the award.

Countries: JW Svalbard, OJØ Market Reef, TF Iceland, JX Jan Mayen, OX Greenland, LA Norway, OY Faroe Isl., OH Finland, OZ Denmark, OHØ Aland Isl., SM Sweden.

Note: Contacts with /TF, /OHØ, etc., are not valid for this award except for OJØ. SWL okay. No time or band limits, but all QSOs must be on the same mode. Single band endorsement on request. The first award to a DXCC country will be endorsed as such. Send GCR list and fee of $US5, or 8 IRCs.

Albany ARA Award

Closer to home is an award offered by the Albany Amateur Radio Association. I read on the CQ-CONTEST reflector that this group was going to have a practice session to get ready for the ARRL 10-Meter Contest, and that it would be a "round-robin" affair with each station giving a consecutive QSO number and the name of the previous station they contacted. It would last only for an hour or so. Albany is about 100 miles west of this QTH, and I was really pleased to contact the required members during this short period. There's a lot of HF activity in New York's capital city! Even better, you will have the chance to earn the award using any Albany QSLs in your collection, since there is no time limitation. The rules:

Worked Albany Radio Amateurs Award (WARM). AARA members or amateurs in Albany, Rensselaer, or Schenectady counties need 15 points, including 5 AARA members. Other New York stations need 10 points, and 1 AARA member. The rest of the continental USA needs 7 points, and 1 AARA member. All others need 5 points and 1 AARA member. A point consists of a single two-way QSO with an "Albany" station on any band. No repeater contacts. Note that an Albany station includes any city, town, county, village, borough, etc., with the word "Albany" in its name. There are some 34 Albany entities available in the world. Send a list of contacts with full log details and two first-class mail stamps for USA or 2 IRCs for anyone else to: Harry Hovey, WF2B, 15 Sylvan Lane, Troy, NY 12180.

The Worked Albany Radio Amateurs Award. For details contact WF2B.

Certificate Size

A recent comment from Serafin, DU1SAN, mentions the problem of the wildly different physical size of DX awards. In the Philippines, as in the USA, most frames for photograph or certificate mounting are in the 8.5" × 11", 9" × 12", and 11" × 14" sizes. Many DX awards are off-size from these, and special problems are encountered for the operator who wants to mount and arrange them on a wall. He further comments that contest certificates are also included in this situation.

I'll have to agree that there is a wide variety of sizes, so most of mine end up in binders or in extra-large photo-mounting books. The really good ones are on the wall. I'd be happy to hear of any reader's suggestions or comments on how to handle them. It sounds like a pleasant problem to have, and indicates that you are a successful awards hunter.

URL of the Month

The Wireless Institute of Australia has an excellent series of pages on this national society's award series. Now that the sunspots are beginning to support better long-range communication, maybe I'll be able to hear some VK's again. The URL is: <http://marconi.mpce.mq.edu.au/wia/federal/awards.html>.

I'm still looking for samples of the awards that your club or national society sponsors. Send them to the address shown in the beginning of this column.

73, Ted, K1BV

BY JOHN DORR, K1AR

CONTEST CALENDAR

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Monthly Contesting Tips—A CQ Anthology, Part I

April's Contest Tip

Have you checked out the Internet lately for contest information? There's a wealth of information and key contacts available for free! For example, look at <http://www.contesting.com>. Spawned by the efforts of Bill Fisher, W4AN (and others), this site stands out as one of the best sources of information that will help your contest efforts. As you might expect, there are many, many more Internet sources, including clubs, publications, user groups, etc. Use your favorite Web site search engine to "gain the knowledge."

6th Annual Dayton Contest Banquet

The sixth annual Contest Banquet at the Dayton Hamvention will be on Saturday night, May 16th, at the Crown Plaza Hotel, Fifth & Jefferson Streets, in Dayton. Included during the dinner will be CQ Contest Hall of Fame presentations, prizes, and a program. Cost for the tickets is $28.00 per person. Seating is limited to around 300. To order tickets with a credit card, call (from 1500–2300Z) in the U.S. 1-800-457-7373 or outside the U.S. 603-899-6957, e-mail <nx1g@top.monad.net>. The cutoff date to order tickets is May 7th.

In late 1992 I began the idea of publishing a monthly contest operating tip. Since its inception, I've been asked many times to publish an anthology of these tidbits, whether it be for new readers or just as a handy contest operating tool. Well, I finally got around to gathering it all up. This month we present the tips from 1992 and 1993. In subsequent months we will continue the anthology. Maybe after reading them, you'll be reminded of your own ideas to add to the pile. Feel free to e-mail your thoughts to me for a future monthly edition. And now, on to the 1992 and 1993 "Contest Tips."

1992

November: I am beginning this new feature with a surprising entry found in a passage from the *Holy Bible* in Luke 14:28-30: "For many of you desiring to build a tower, does not first sit down and count the cost, whether he has enough to complete it? Otherwise, when he has laid the foundation, and is not able to finish, all who see it will mock him saying, "this man began to build and was not able to finish."

December: If you don't think you can run stations at the beginning of the contest, spend 30 minutes prior to the opening gun logging multipliers. Ten or 20 memories loaded with multipliers' run frequencies can really help you get off to a fantastic start!

2 Mitchell Pond Road, Windham, NH 03087
e-mail: K1AR@contesting.com

Calendar of Events

Mar.	**28-29**	**CQ WW WPX SSB Contest**
Apr.	1	NOTA Contest
Apr.	4-5	SP DX Contest
Apr.	4-5	EA RTTY Contest
Apr.	10-12	Japan Int'l DX Contest, High Bands
Apr.	11-12	MARAC County Hunters SSB Contest
Apr.	11-12	DIG QSO Party
Apr.	13	Low Power Spring Sprint
Apr.	18	European Spring Sprint
Apr.	18-19	Holyland DX Contest
Apr.	18-19	YU DX Contest
Apr.	25-26	Florida QSO Party
Apr.	25-26	Nebraska QSO Party
Apr.	25-26	Helvetia Contest
Apr.	25-26	Ontario QSO Party
May	2-3	ARI Int'l DX Contest
May	2-3	Massachusetts QSO Party
May	2-3	Connecticut QSO Party
May	2-3	MARAC County Hunters CW Contest
May	9-10	CQ-M Int'l DX Contest
May	9-10	Nevada QSO Party
May	9-10	Georgia QSO Party
May	16-17	Baltic Contest
May	23-24	Texas QSO Party
May	**30-31**	**CQ WW WPX CW Contest**

1993

January: A careful review of the previous year's log before a contest can help you in a number of ways. In addition to revealing a scoring target to beat, it can be helpful to make a list of the top 10 to 15 actions you could have taken to improve your score that year and place it in front of you as a reminder for this year's contest.

February: Even though there seems to be a focus on the "band edges," don't be afraid to use the high end of the bands as well. In one hour during a run in the 1992 CQ WW SSB Contest, I had HS, 8Q7, 4S7, TL8, and 9K call me while operating on 14318 kHz!

March: Avoid the temptation of diving directly into a pileup after first hearing the frenzy. Take the time, especially when using a smaller station, to listen to the operating style of a needed multiplier before calling. Adding a planned delay of two or three QSOs to learn the *DX station's* techniques will usually reduce the time needed to get him into *your* log.

April: I'm sure you recall the technique entered during a contest when you are "looking for multipliers"? As you tune up and down the bands, don't forget to call *any* needed station—even if he's not a new multiplier. Maybe I'm the only guy who does this (although I doubt it), but it is easy to get into multiplier mode and skip calling the easily workable stations. The extra effort could mean an additional 20–30 QSOs in your log!

May: This may sound like common sense, but it's worth a try. When calling in a big CW pileup, don't be afraid to move your transmit frequency a little off the center of the chaos. If you put yourself in the shoes of the DX station, it begins to make sense. Except for the biggest stations or rare propagation advantages, brute-force calling almost never pays off!

June: How's your Spanish? If you're like me, you know most of the numbers and can "fake" your callsign. With that knowledge, you can be amazingly effective at calling CQ with the beam south during slow hours and work a remarkable number of casual QSOs (and passable mults) to the south. Try it Lately it's never been better!

July: Does the physical size of your QTH limit you from erecting 500+ foot beverages? I have discovered that there are times when existing antennas can enhance receiving quality on 80 and 160 meters. For example, try using your 40 meter antenna on 80 or 160 as a receive array. If stations are loud enough, improved signal-to-noise ratios can more than compensate for reduced signal strength levels and heighten your ability to copy low-band signals—without a beverage!

August: Here's an idea for that second VFO in your transceiver. When you're in "search and pounce" mode, try searching with both VFOs. While waiting to work one station on VFO "A," you can use that idle time to find another needed QSO with the second VFO. Try tuning up from the bottom with one and down from the top of the band with the other. If you are using a multiband antenna, you can even try this technique across two different bands!

September: Improve your contest score by being aware of when you send unnecessary information during contest exchanges. CW examples include: Sending a leading "0 or T" in front of your single-digit CQ/ITU zone, ending a CQ with a "K," starting an exchange with "UR" 59905. SSB examples include: "QSL . . . QRZ," K1AR, "UR" 5905 "OVER," etc. If you think these illustrations are insignificant, trying sending "UR" on CW 200 or more times and imagine working stations during that same time period.

October: You will often find that rare DX does not want to be passed to another band. A last resort is to make a schedule with the station. The secret is to make multiple schedules with as many stations as reasonable for the same time/frequency. With 10–15 schedules arranged, the odds are good that two or three will actually show up, making the effort worthwhile. Nothing beats having a mini-pileup of multipliers calling you!

November: Maybe this is an idea that David Letterman (U.S. TV talk show host) stole from me. For years now, before every contest I compile a "Top-10" list of strategies/events that I executed well and those which needed improvement based on the previous year's contest. What's different is that I have begun saving them, compiling a multi-year set of lists. The "well-executed" list can be a source of encouragement, while the areas needing improvement gives you something to shoot for each time you operate. This technique can only improve your score!

December: Here's one for the multi-ops! Have you tried every filter technology known to man and still have interference between stations? Try looking outside for the source of your troubles. A long-standing inter-station QRM problem recently was fixed at K1EA's station by tightening the back stay hardware on one of Ken's 20 meter Yagis. The S-8 interference it had previously generated on 15 meters went completely away!

(To Be Continued)

Final Comments

There are two corrections to the WPX SSB Results published in the March issue. Left off the trophy list: Canada Low Power, Amateur Radio League of Alberta Award, won by Glenn Wyant, VA3DX. Also an additional log: CP6XE, All Band; 1,709,625; 1122; 485. Remember to provide material for the July column by May 1.

73, John, K1AR

42nd Annual Neighborhoods-on-the-Air (NOTA) Contest

0000Z–1954Z Tues., Apr. 1

Have you ever wanted to be in a "rare one" during a contest, but can't afford a DXpedition to an exotic island? Operating in this popular affair is your big chance. The objective of this contest is for radio amateurs in neighborhoods around the world to contact other radio amateurs in other neighborhoods, villages, towns, cities, counties, states, oblasts, countries, islands, and zones. All amateur bands and modes may be used.

Classes: There are numerous categories in this contest. Single-operator categories include single operator unassisted, single operator with packet, single operator with pocket, single operator with locket, single operator with-racket, single operator with docket, and single operator with ticket. Additional single-operator categories will be added as necessary to ensure that every entrant wins the category he thinks he should. Similarly, multi-operator categories include multi-single, multi-multi, multi-single but really multi-multi, multi-single because we don't have enough stuff to do multi-multi, multi-single because we're just a couple of old guys drinking beer and having fun because we can't beat the young guys with big stations, and other categories that allow you to win a certificate. Mobile/Roamer Operation: An operator may operate from several neighborhoods during the contest period. However, at any given location, only a single NOTA designator may be used. In the words of Buckaroo Banzai, "No matter where you go, there you are."

Exchange: RS(T) and NOTA designation for your location. You may add serial number, power, zone, PO Box, shoe size, or name if you are uncomfortable with this exchange; we're flexible.

Frequencies: Use all bands, including the 30, 17, and 12 meter bands. Those bands seem to have been inadvertently overlooked by all other contest-sponsoring organizations. It's high time we saw some activity there, so go for it! On most other bands, it may be useful to operate wherever other stations are heard; usually this will be on or very close to net frequencies. It is generally very easy to attract stations to call you by calling CQ close to a net or rare DX station. Since all modes may be used, operate to the full extent of your license's privileges. Make sure you use all frequencies available to you. We want every station in the world to know there's a contest going on, and hopefully they will anticipate gladly instead of complaining that there are no clear frequencies.

Scoring: Score one point for each exchange sent, and one point for each exchange received. If a sent exchange is copied by more than one station, score one point for each station that copies your exchange. Note that it is not necessary to actually confirm that the other stations copied your exchange. Assume that if you sent it correctly, they copied it correctly—all of them. A station may only be contacted for credit once per QSO.

Multiplier: Multiply total points by total number of NOTAs contacted on each band-mode. It is up to each participant to determine his/her correct NOTA designator.

NOTA Designators: Determining your NOTA designator is simple. In most towns, there is only really one active amateur radio operator. The others have typically given up amateur radio for the Internet, or operate only 2 meter FM. While 2 meters is still technically an amateur band, it isn't really what we had in mind here. This makes assignment of your NOTA designator fairly easy. For example, KC1XX in Mason, New Hampshire is the only amateur in town. His NOTA designator is thus NH-M-01. Since KC1XX has the biggest station in any New Hampshire town starting with "M," he gets the "01" NOTA suffix. In towns where there are several stations, the town may be subdivided into smaller units. For example, K1DG, N6BV/1, K1TR, K1AR, and WE1F are all active contesters living in Windham, NH. K1DG, with two towers in the northwest corner of town, is in NOTA NH-W-NW-01. K1TR, in north central Windham, with one tower, is in NH-W-NC-01. N6BV/1, a bit farther northeast, with one tower, is in NH-W-NE-01. WE1F, near the center of town, is in NH-W-C-01. K1AR, in the northeast corner of town, is in NH-W-NE-01. If another amateur moves into, say, central Windham, slightly south of WE1F, his neighborhood will be designated NH-W-SC-01. Please note that it is the operator's responsibility to determine his/her own NOTA designator. If two operators inadvertently assign themselves the same NOTA designator, the station with more QSOs gets the lower number suffix, and the station with fewer QSOs must start over with his new NOTA. *Note:* A neighborhood must be no smaller than the size of a modern HF rig and must be a fixed location. Neighborhoods may be as large as an entire country if there is limited contest activity. There should be only one contest participant in any one neighborhood.

DX Windows: Only DX Windows 95 may be used. DX Windows NT would give an unfair advantage to N2NT and N6NT, so we can't have that.

Computer Logging: If you can find a program that supports this contest, go ahead and use it. Good luck. If somehow you find one, you may submit your log on floppy disk or via e-mail to <Poisson54@aol.com>.

Awards: Every entrant will receive an award for high score in his/her neighborhood. You can us it to impress your family and neighbors. Next time one of them hassles you about TVI or a new antenna you want to install on their land, just show them the award you won while representing the neighborhood in an Official International Amateur Radio competition. They

had better cooperate or the neighborhood will lose next time. Just think what such a shameful turn of events will do to property values!

Club Competition: All amateurs in a neighborhood may pool their scores for a club submission. Actual membership in a club, attendance at a meeting, or even the existence of something resembling a club is optional. Note: A club callsign does not indicate existence of an actual radio club.

All paper, disk, and e-mail logs must be beaten into submission by April 2, 1998. No exceptions. This means you. And no fooling around with the log after the contest. None of this database cross-checking stuff. Just send it in. We probably won't find any mistakes anyway. Logs may be sent to <poisson54@aol.com> or Poisson d'Avril MIS Communications, Dept. NOTA, 144 Kendall Pond Road, Windham, NH 03087 USA. Be sure to include an SASE and substantial contributions for final results, which may or may not be published depending on how the contest commitee feels.

EA RTTY Contest

1600Z Sat., to 1600Z Sun., Apr. 4–5

This is the 1998 edition of the Spanish RTTY Contest sponsored by U.R.E. It is open to participants worldwide on 80-10 meters.

Classes: Single operator, all bands and single band, multi-single, and SWL.

Exchange: Signal report and Spanish Province (for EA stations). All others substitute CQ Zone for Province.

Scoring: For non-EA stations—on 10–20 meters credit 1 point for contacts in your continent, 2 points for QSOs outside your continent. On 40 and 80 meters triple your QSO points (i.e., 3 within your continent/6 outside your own continent). QSOs between stations in the same country are only valid for multiplier credit and have no QSO point value.

Multipliers: Credit EA provinces (maximum 52) and DXCC countries worked per band. The first QSO with an EA, EA6, EA8, and EA9 station, on each band, counts for 2 multipliers (DXCC + Province).

Final Score: Multiply total QSO points times multiplier.

Awards: Various certificates and plaques are available to the winners of each operating category.

Send your entries by May 9th to: EA RTTY Contest, c/o EA1MV, Antonio Alcolado, P.O. Box 240, 09400 Aranda de Duero (Burgos), Spain. E-mail logs may be sent (in ASCII format, only) to <alcolado@redestb.es>.

Polish "SP" DX Contest

1500Z Sat., Apr. 4 to Sun., 1500Z Apr. 5

Sponsored by the Polski Zwiagek Krotkofalowcow (PZK), this one is on CW and SSB and is held the first weekend of April, generating high operating activity by the SPs. Contest operation is on all bands 160–10 (no WARC bands).

Classes: Single operator, single and all band (CW, SSB, or mixed mode). Multi-operator, single transmitter (all band, both modes only), and SWL.

Exchange: Signal report plus a three-digit serial number. SP stations will substitute their two-letter province abbreviation for the number.

Multiplier: Count the total number of Polish provinces worked (maximum of 49).

Scoring: Three points per QSO times the number of Polish provinces worked.

Awards: Certificates will be awarded to the high scores in each class per country.

All logs must be received no later than April 30th. Send your entries to: Polski Zwiazek Krotkofalowcow, Contest Committee, P.O. Box 320, 00-950, Warszawa, Poland.

YLRL DX to NA YL Contest

CW: Apr. 9–11 SSB: Apr. 23–25
1400Z Wednesday to 0200Z Friday

This is another popular YLRL sponsored contest open only to licensed women operators around the world.

Classes: Single operator only.

Exchange: QSO number, RS(T), and ARRL section/country. Entries in log must also show time, band, date, and transmitter power.

Frequencies: CW—3540–3570, 7040–7070, 14040–14070, 21120–21150, 28180–28210 kHz. SSB—3940–3970, 7240–7290, 14250–14280, 21380–21410, 28280–28410 kHz.

Scoring: Phone and CW are entirely separate contests. DX YLs, including Alaska and Hawaii, may contact the North American Continent. A station may be counted as one point and worked once per band for credit. Multiply the number of QSOs by your total multiplier (sections/countries) for final score. You may apply a bonus multiplier of 1.5 if less than 150 watts is used at all times during the contest.

Awards: Various cups and plaques will be awarded to the category winners. In addition, certificates will be provided to all second- and third-place winners.

Logs are due 30 days after the conclusion of each contest. Mail logs to: Nancy Hall, KC4IYD, P.O. Box 775, N. Olmsted, OH 44070-0775.

Japan Int'l DX CW Contest (High Band)

2300Z Fri. to 2300Z Sun., Apr. 10–12

The object for this one is for amateurs around the world to work as many JA stations in as many JA prefectures as possible and is sponsored by *FIVE-NINE* magazine. The maximum operating period is 30 hours (except for JAs, who can use the full 48 hour period) with off periods longer than 60 minutes. This is the high band edition (others to follow in subsequent months); operation is limited to 20–10 meters.

Classes: Single operator—high power/low power/all band/single band; multi-operator; marine mobile. All stations can use packet radio DX spotting.

Exchange: JA—RST and prefecture number (1–50). Others—RST and CQ Zone.

Scoring: 20 and 15 meters—1 point per QSO, 10 meters—2 points. Multipliers are total prefectures worked per band (DXCC countries for JA). Final score is total QSO points times multiplier.

Awards: Plaques and awards will be sent to the winners in each class around the world. A special contest award will be offered to anyone working all Japanese prefectures during the contest period. E-mail entries are accepted, too. To obtain electronnic log instructions, send an e-mail to <jidx-info@dumpty.nal.go.jp> (this address is only for information request) with the command **#get jidxelog.eng** in the body of the message. Commands must start with the "#" character.

All logs must be postmarked no later than May 31st and sent to: JIDX HFCW Contest, c/o Five-Nine magazine, P.O. Box 59, Kamata, Tokyo, 144 Japan. Contest results will be sent to anyone including one IRC and an SAE.

MARAC County Hunters SSB Contest

0000Z Sat. Apr. 11 to 2400Z Sun. Apr. 12

The Mobile Amateur Radio Awards Club is sponsoring the 27th running of this event. Mobile and fixed operation from every county in the United States is welcome. Mobiles and portables may be worked each time they change counties or bands.

Exchange: RS(T), U.S. county and state (province/country for others).

Scoring: One point for fixed stations; 15 points for mobiles; US/VE contacts with DX countries are worth 5 points. Final score is computed by the total QSO points times the total number of U.S. counties worked.

Frequencies: 3880, 7240, 14270, 21340, 28340 kHz. Fixed stations should operate above the suggested frequencies to allow more freedom for mobiles to operate on clear frequencies.

Awards: Certificates will be awarded to winning fixed stations in each state/province/country; mobiles in each state operating in 3 or more counties with a minimum of 10 QSOs per county. MARAC plaques to the highest scoring first- and second-place mobile stations in the U.S., North American fixed station, and DX station.

Completed logs, summary sheets, and check sheets must be received by May 8th and go to: Bill Nash, WØOWY, 13212 N. 37th Ave., Phoenix, AZ 85029. Enclose a #10 SASE and two units of postage with your entry for a copy of the final results.

YU DX Contest

1200Z Sat. Apr. 18 to 1200Z Sun. Apr. 19

The Yugoslav Amateur-radio Association (SRJ) and the Yugoslav DX Club (YUDXC) invite amateurs around the world to participate in the 1998 YU DX Contest.

Classes: Single op (SSB only, CW only, mixed modes), and multi-single (the standard 10-minute rule applies to this category).

Exchange: RS(T) and ITU zone.

Scoring: QSOs with your ITU zone—1 point; QSOs with stations in your continent but different ITU zone—3 points; All others—5 points. Contacts are permitted with the same station on both modes.

Multiplier: ITU Zones and Yugoslav prefixes per band.

Final Scoring: Total QSO points times the total sum of multipliers worked per band.

Awards: Winning trophy cups will be awarded to the top YU and non-YU log. Certificates will be awarded to geographic area winners.

All entries must be postmarked no later than 30 days after the contest. Logs should be sent to: YU DX Contest, P.O. Box 48, 11001 Beograd, Yugoslavia.

Swiss Helvetia Contest

1300Z Sat., Apr. 25 to 1300Z Sun., Apr. 26

This is a good chance to build up your Canton total for the Swiss Helvetia Award, which requires confirmation from all 26 Cantons.

Classes: Single Op (High power or QRP),

Multi-single, SWL. All entries are mixed-mode only.

Frequencies: Use 1.8-28 MHz (no WARC bands) on both phone and CW.

Exchange: RS(T) plus a 3-digit serial number. Swiss stations will also include a 2-letter abbreviation for their Canton.

Scoring: Only contacts with Swiss stations count. Each contact with an HB station is worth 3 points. You may only work a station once per band regardless of the mode.

Multiplier: The sum of the Cantons worked on each band (26 per band).

Final Score: Calculate your final score by multiplying your total QSO points by the sum of Cantons worked.

Awards: Certificates will be awarded to the top scorers in each country and each USA and VE call area.

Logging: Indicate a Canton in a separate column for each band the first time it is worked. Check your log for duplicates and include a summary sheet showing the scoring and your name and mailing address in block letters. Also include the usual signed declaration.

The mailing deadline for contest logs is May 31st. All logs are to be sent to: Nick Zinsstag, HB9DDZ, Salmendorfli 8, CH-5084, Rheinsulz, Switzerland.

Nebraska QSO Party

1700Z Sat. Apr. 25 to 1659Z Sun. Apr. 26

Help complete your 5BWAS by operating in this popular QSO party. This contest is for single operators only with operation allowed on all non-WARC HF bands, 160-10 meters. All operating modes are permitted.

Classes: Single operator, multi-single, mobile, and Novice/Tech.

Exchange: NE stations—RS(T) plus county (93 maximum). Non-NE stations—RS(T) plus US state, VE province, or DXCC country.

Scoring: Credit one point per QSO for SSB contacts; two points for CW. Final score is calculated by multiplying total QSO points times multiplier.

Frequencies: CW—1805 kHz and 80 kHz up from lower band edge. SSB—1855, 3880, 7280, 14280, 21380, 28380, 146460 kHz. Novices operate 10 kHz up from lower band edge and 28380 kHz.

Awards: Five plaques are available for category winners in Nebraska, US, and overseas as well as Novice/Tech/Tech+ stations. Certificates will also be awarded as appropriate.

Logs and a signed summary sheet must be postmarked no later than May 31st. Send all entries to: Nebraska QSO Party, P.O. Box 375, Elkhorn, NE 68022-0375. Enclose a #10 SASE for final results.

1998 Florida QSO Party (FQP)

1800Z–0359Z Sat. Apr. 25
1400Z–2359Z Sun. Apr. 26

This one is back and sponsored by the Florida Contest Group. Here's your chance for amateurs outside of the state of Florida to make contact with as many Florida stations as possible. Florida stations work everyone. Stations may operate the full 20 hours.

Classes: A) Single operator—One person performs all operating and logging functions. Use of spotting nets is not permitted. Only one (1) transmitted signal on the air at any time.

(B) Multi-operator—Those obtaining any form of assistance, such as relief operators, loggers, or use of spotting nets. *Note:* Multi-operator stations do not have to remain on a band for 10 minutes before changing bands. (1) Multi-single. Only one (1) transmitted signal on the air at any time. (2) Multi-multi. More than one (1) transmitted signal on the air at any time. No simultaneous SSB/CW signals on one band at the same time.

(C) Mobile—Mobile is a station that is self-contained (radio, antenna, power source) capable of motion. Motion is optional. Mobile entrants may be either Single Operator or Multi-operator.

(D) Novice/Technician—Novice or Technician licensees perform all operating and logging functions. There are three power output categories for all categories: (a) QRP—5W output or less, (b) Low Power—150W output or less, (c) High Power—more than 150W output. Logs not showing power output category will be listed as high power.

Modes:(A) Single Operator, Mobile, and Novice/Technician categories may operate: (1) Mixed mode (phone and CW), (2) Phone only, (3) CW Only. (B) Multi-operators work Mixed mode only.

Exchange: Florida stations send signal report and county. All other W/VE stations (including KH6/KL7) send signal report and state or province. DX stations (including KH2/ KP4, etc.) send signal report and DXCC country.

Scoring: (A) QSO Points: Each complete non-duplicate Phone contact is worth 1 point. Each complete non-duplicate CW contact is worth 2 points. No partial-contact credit. Duplicate contacts must be clearly identified and are worth 0 points. Stations may be worked once per mode, per band—i.e., WC4E may be worked on both 20 CW and 20 SSB for credit.

Multipliers: For Florida stations, 50 states (including Florida); Canada MAR (VE1, VE2, VE9, VY2), NF (VO1, VO2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NW (VE8), YT (VY1); DXCC countries (except the US, Canada, KH6, and KL7). A multiplier can be counted once per mode. Working NP4Z on CW and then on SSB is two Puerto Rican multipliers. (2) All others work Florida counties (a maximum of 67). Florida mobile stations that change counties are considered to be a new station and may be contacted again for point and multiplier credit. Florida stations on a county line may be claimed as a multiplier for any or all of the counties they give in their exchange. A Florida county multiplier can be counted once per mode. Working W1YL in Hillsborough County on CW and then on SSB is two county multipliers.

Final Scoring: Multiply QSO points by total multipliers by the power multiplier (see below). Florida mobile operations must submit separate logs for each county activated; a mobile

entrant's score will be the total points for all counties activated by that effort.

Power Multiplier: If all QSOs were made using 5W or less, multiply your score by 5; if all QSOs were made using less than 150W, multiply your score by 2; if any or all QSOs were made using more than 150W, multiply your score by 1.

Frequencies: CW—3.545, 7.045, 14.045, 21.045, and 28.045 and 10 kHz up for Novices/Technicians. Phone—3.850, 7.225, 14.250, 21.300, and 28.450. Look for SSB activity on the hour and CW on the half hour. Fixed stations are urged to call CQ above/below these frequencies to keep them clear for low power mobile operations. No 160 meters, WARC, or VHF bands.

Awards: Certificates will be awarded to top scorers in each category from each Florida county, State, Canadian province, and DXCC country. Special awards may be awarded at the discretion of the Florida QSO Party Contest Committee.

Entries must be postmarked no later than 30 days after the end of the contest (May 26, 1998). No late entries can be accepted. Any logs (other than check logs) with over 100 QSOs are encouraged to submit their logs in computer readable format. Any entrants who submit paper logs with more than 100 contacts must also include cross-check (dupe) sheets. You may submit your contest logs via e-mail to <FLQSOParty@aol.com>. Send your summary sheet file and your log file following the ARRL Suggested Standard File Format. You may submit your logs on diskettes instead of paper logs. The floppy diskette must be IBM compatible, MS-DOS formatted, 3.5 inch. Log information must be in an ASCII file. Contest logs (paper or diskette) may be submitted to: Florida Contest Group, c/o Jim White, K4OJ, 1508 W. Patterson St., Tampa, FL 33604. You may also receive entry forms (rules, summary sheet, log sheet, and county abbreviations) by mail. Please send a business sized SASE, to Florida Contest Group, c/o Jim White, K4OJ, 1508 W. Patterson St., Tampa, FL 33604 or obtain info at the FQP Web site at: <http://home1.gte.net/wd4ahz/fcg/ssqp.htm>.

Ontario QSO Party

1800Z Sat. Apr. 25 to 1800Z Sun. Apr. 26

Here's a fun contest sponsored by the Ontario DX Association.

Classes: Multi-operator, single operator low power (up to 150 watts on HF, up to 50 watts on VHF/UHF), single operator high power (over 150 watts on HF, and over 50 watts on VHF/UHF), single operator single band, mobile, HF QRP (5 watts and under), VHF/UHF FM QRP, CW, SSB, or mixed mode, and SWL.

Exchange: Ontario stations send signal report and Ontario county, district, regional municipality, or city in the case of the amalgamated City of Toronto. Other stations send signal report and Canadian province/territory, U.S. state, or DXCC country.

Frequencies: Phone/CW—All HF bands 160-10 meters with the exception of the WARC bands (12, 17, and 30 meters) which by IARU agreement are contest-free. All VHF/UHF bands, too. Suggested frequencies for QRP/mobile stations: SSB—1.870, 3.735, 3.860, 7.070, 7.260, 14.130, 14.265, 21.260, 28.360; CW—1.820, 3.520, 3.720, 7.020, 7.120, 14.020, 21.020, 21.120, 28.020; FM—52.540, 146.550, and 446.100. Operators may not use repeaters for the purpose of the contest. Operators should keep the 2 meter FM simplex calling frequency of 146.520 MHz clear. Operators may not use repeaters for the purpose of soliciting contacts.

Scoring: Ontario stations work everyone. Stations outside Ontario work only Ontario stations. Score 1 point for every station worked per band. Score 10 points for working VE3ODX and VA3RAC per band. Shortwave listeners log only Ontario stations. Work each station once per band whether CW or SSB. Ontario stations earn 1 multiplier point for each Ontario county, district, regional municipality and the amalgamated City of Toronto worked on each band (see multiplier list), each Canadian province/territory, each U.S. state and DXCC country. Stations outside Ontario earn 1 multiplier point for each Ontario county, district, regional municipality, and for the amalgamated City of Toronto worked on each band. Shortwave listeners use the same formula for multiplier points as stations outside of Ontario. Mobile and/or portable stations may be worked once per band from each Ontario county, district, or regional municipality they operate from.

Awards: Certificates will be awarded to the top scorers in each category and to top scorers in each Ontario county, district, regional municipality, amalgamated City of Toronto, Canadian province/territory, U.S.A. state, and DXCC country. Each station making over 100 QSOs will qualify for an "Ontario QSO Party" badge bearing your callsign. Operators at multi-operator stations making over 100 QSO's will also qualify. Other certificates may be awarded based on activity. The grand prize will be a personal copy of *Passport to World Band Radio* to the top scorer from Ontario, Canada (outside Ontario), the U.S.A., and DXCC entry.

Entries should be postmarked no later than May 31, 1998. Send your logs to: Ontario QSO Party, Ontario DX Association, P.O. Box 161, Stn. A, Willowdale, Ontario M2N 5S8. Entries can be sent on disk or via the Internet in standard text file format. (Please do not send logs in a word processing format and please include your snail-mail address). Send e-mail logs to <ve3sre@compuserve.com>.

If you qualify for an "Ontario QSO Party" badge please send $2.00 to help cover costs. Entry forms may be downloaded from the ODXA Web site at <http://www.grove.net/~odxa> or send an e-mail note to: <ve3sre@compuserve.com> or by sending an SASE to the ODXA.

BY DAVE INGRAM, K4TWJ

WORLD OF IDEAS

A LOOK AT THE WORLD AROUND US

Keys, Keys, and More Keys!

Amateur radio's love affair with CW and keys is truly amazing. It has outlived spark and AM, promises to outlive sideband, and only gets better with each passing year. Indeed, beautifully sent CW with a fine-crafted key, bug, or paddle is timeless, and it is also communications art at its best. Need I substantiate that statement? Haven't you attended a formal CW recital? Tisk, Tisk! Practice sending the first sentence from our country's Declaration of Independence at a good clip (say, 30 or 35 wpm) and with a smooth swing using a classic bug and just try to contain your enthusiasm. Properly administered, the dots and dashes flow in a magnificent rhythm that bring a tear of joy to appreciative ears. Such sounds rival the clarinet of Pete Fountain, guitar of Chet Atkins, and voice of Whitney Houston. May the beauty of it all last forever!

Yes, friends, we are back with another two-part "keys special" featuring more delightful Morse instruments both new and old (one never has too many keys!). Also, by request, we are including some photos of the manufacturers and designers behind the keys—"Good Guys in CW," so-to-speak. It promises to be yet another big-time treat, so whip out your magnifier, kick back, and enjoy the views!

A special thanks goes to those who send photos of their special keys. That is the key (no pun intended) to ensuring this series continues. Today interest in new keys and paddles is particularly high, so let's begin at that point. As usual, hold on tight while we move fast to squeeze in all possible views and details!

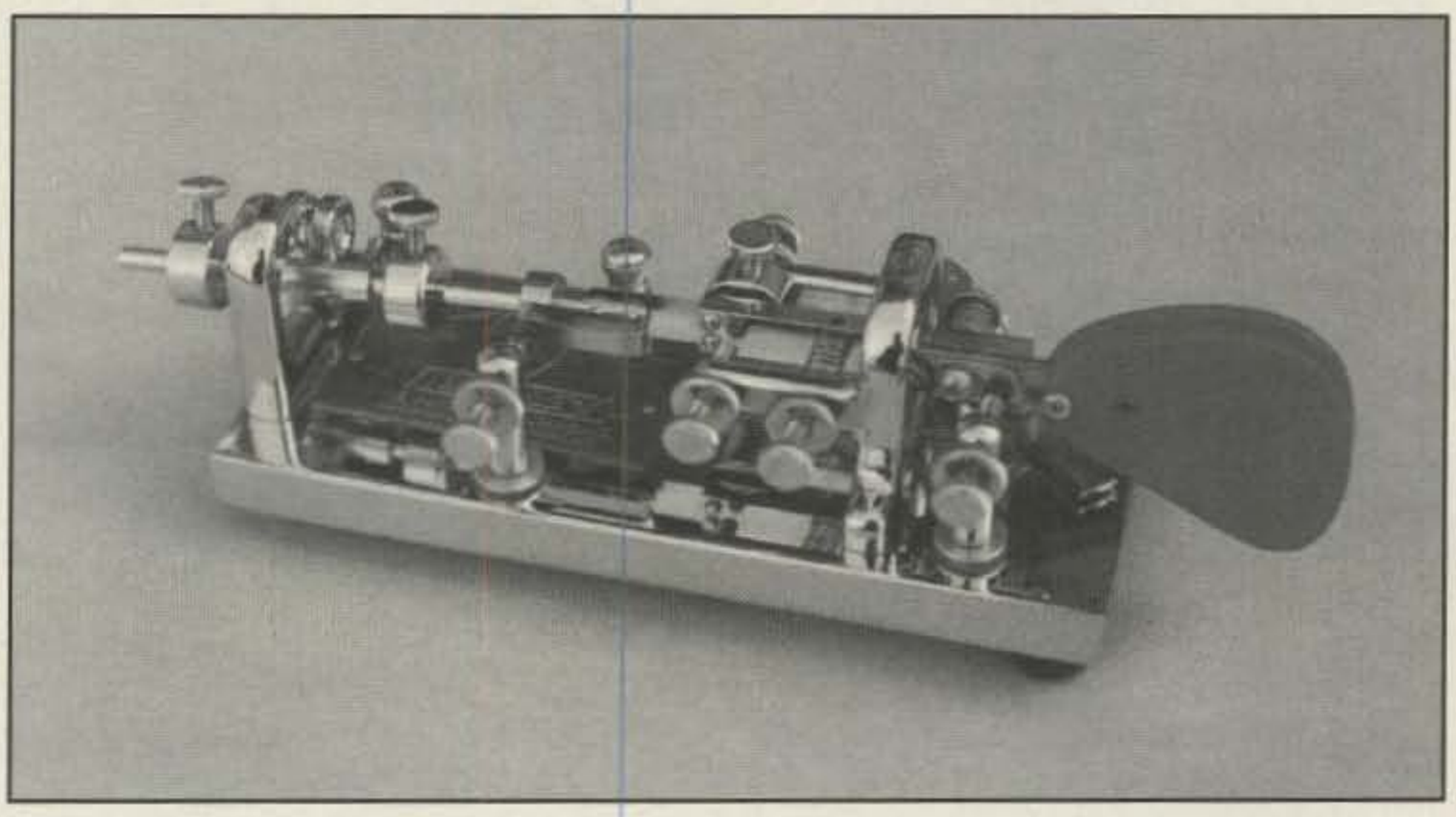

Photo 1– Say your bug's dots run too fast? Need more fist-friendly handles for your paddle? Two new Vibroplex accessories are the answer. A slip-on pendulum extended, shown installed on my classic Blue Racer and protruding past its rear damper arm, tames even the fastest bug. The curved and "sized up" fingerpieces also fit a Vibroplex bug or paddle and give it a fresh look with an easy-to-manipulate feel. Both items are now available from the Vibroplex Company.

New Vibroplex Goodies

From Alabama's port city of Mobile and the facilities of Vibroplex come details of two new accessory items which owner "Mitch" Mitchell, WA4OSR, says "should have been included in the line years ago." The new goodies are a chrome pendulum extension for taming fast dots with a bug, and a pair of curved and "sized up" fingerpieces for a paddle or bug. Both are shown installed on my deluxe model Blue Racer in photo 1.

The pendulum extension is secured with a set screw, and typically lowers my bug's minimum speed of 25 words-per-minute down to 7 or 10 wpm. Want even slower speed? Just slip a weight from the original pendulum onto the extension, and the speed will drop to around 5 wpm. Put both weights on the extension, and a receiving operator can fall asleep between words. It is neat and just like the mechanism in a regular Vibroplex; it's glitzy.

The fingerpieces are polished red lucite and seem ideal for operators with large fingers or a "heavy" fist. Their extra size also gives a paddle or bug the perfect balance for really enjoyable (captivating!) sending while adding an extra touch of glamour to the key. Both items (plus many other CW delights) are available from The Vibroplex Company, Inc., 11 Midtown Park E., Mobile, AL 36606 (1-800-840-8873).

Incidentally, if you have not met Vibroplex's new owner, Mitch, WA4OSR, check out his "behind the booth mugshot" in photo 2 and say hello to him at a hamfest this summer. Mitch is a congenial chap who always has some good thoughts on amateur radio, CW, and keys. He is doing a superb job of preparing Vibroplex for the next millennium and is a genuine "Good Guy in Keys"!

Photo 2– Vibroplex's new owner, Mitch Mitchell, WA4OSR, is dedicated to expanding the company's line while improving product quality. Whenever he can, he also hits the hamfest scene with goodies galore—a genuine "Good Guy in Keys"!

New G4ZPY Treat

Looking eastward across the big pond, Gordon Crowhurst, G4ZPY, and his XYL, Brenda, asked us to pass along a hearty thanks to everyone for their continuing interest in Gordon's handcrafted keys and paddles. They also wish to share views of the latest addition to the G4ZPY line—the 3-in-1 miniature paddle and keyer combo shown in photo 3.

4941 Scenic View Dr., Birmingham, AL 35210

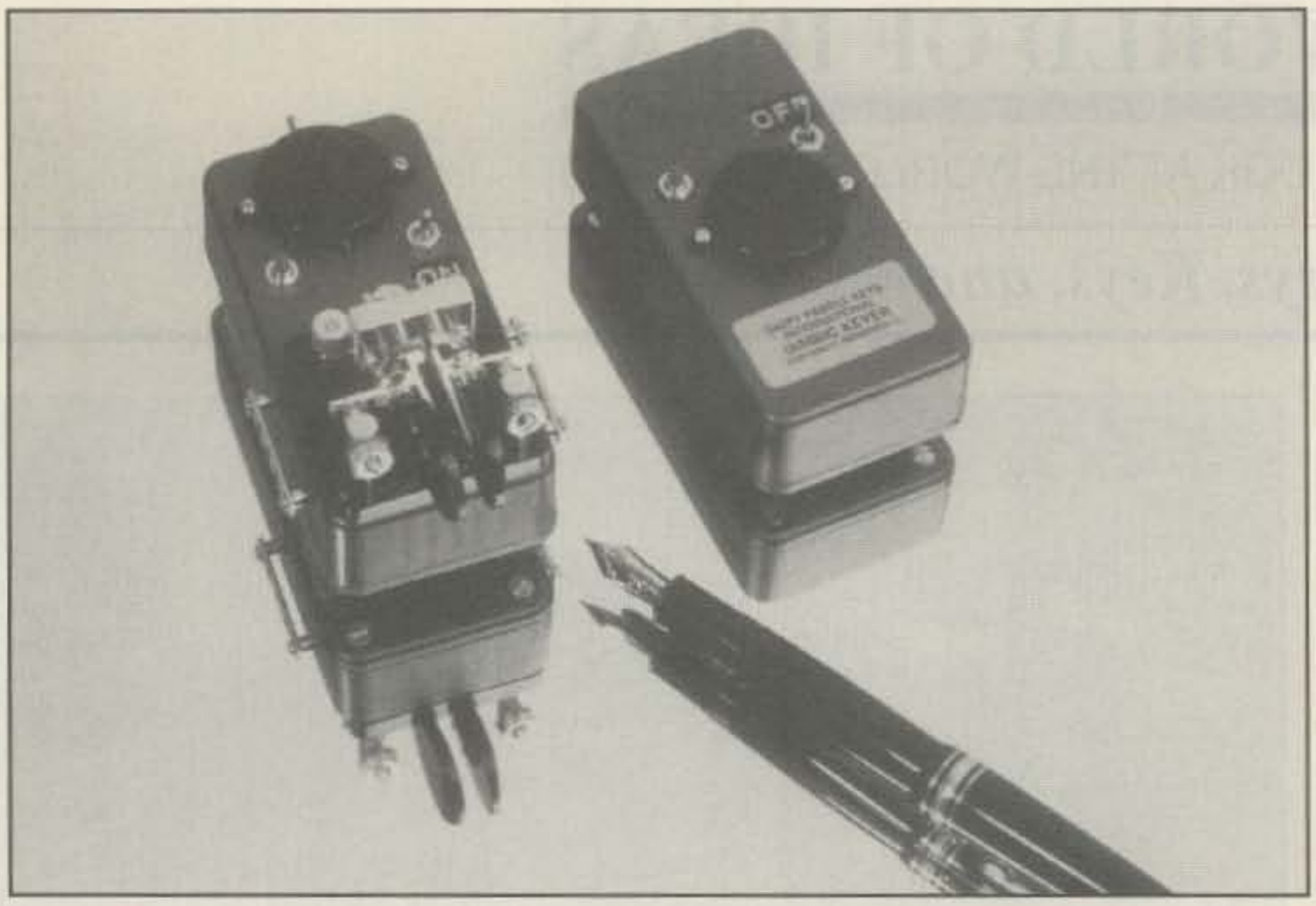

Photo 3– This CW combo unit from Gordon Crowhurst, G4ZPY, features his miniature iambic paddle fitted to a compact case housing a popular Tick keyer. Paddle looks and handles great. All keyer functions are accessed by a single pushbutton. The round black item atop the case is Piezo Sounder for sidetone. Paddle combo and keyer (shown on a mirror) are also available separately.

The paddle measures only 1.5 inches square, has a deep polished luster and very precise adjustments, and handles great at speeds up to 45 wpm. It is exceptionally well-made and quality throughout! The mating electronic keyer (in black case beneath paddle) is a Tick from Embedded Research, as we featured in this column last fall. A single pushbutton is used to set speed, left or right hand operation, switch sidetone on/off, keydown for tune-up, etc. I feel quite comfortable saying Ticks are the hottest new keyers on the CW scene today, and G4ZPY's new combo should prove to be a winner. The paddle and keyer (available together or separately) are available directly from G4ZPY, 41 Mill Dam Lane, Burscough, Ormskirk, Lancs, England L40 TTG (telephone 44-1704-894299).

Gordon's background/history on how he began making keys, incidentally, is a truly inspirational success story. He started in 1986 without a penny to his name and had to improvise on machinery. When he displayed his work at the first hamfest, he sold everything he had taken with him: 25 single-lever and 3 twin-lever paddles. Proceeds were then invested in better equipment (Gordon was a professional machinist and metal worker). Soon thereafter, customers insisted Gordon also produce hand/pump keys, so the line began to grow. Today Gordon has the world's largest selection—over 60 types of paddles and keys—all of his own design, copyrighted, and impeccable in workmanship. In addition to making polished brass, nickel, chrome, and gold-plated keys and paddles, Gordon also finds a few minutes a week to operate 20 CW around the FISTS hangout of 14.056 MHz. Pass along a cheerful hello if you hear him on the air.

NE8KE and KK5PY Keys

Back stateside, Boyd Mason, NE8KE, and his new partner Dennis Foster, KK5PY, continue to pump out an endless variety of neat little "NeKes." A few of their latest offerings are shown in photo 4. There is a pocket-knife-type "swing out" paddle for toss'n go use, a long-necked paddle for handheld use, a pocket paddle with a "twist to use" protective cover for finger-pieces, an enclosed "box key," a clever plug-in key, and the familiar leg-strapped knee key. All of these are characterized by a jewel-type "button" at their finger-piece end, which has become a sort of NeKe trademark.

In many ways, Boyd and Dennis remind me of the Blue Bell ice cream folks: They make and enjoy all (the paddles) they can, and sell the rest. Both of them also have a "designer flair" in turning out one-of-a-kind keys for operators wanting something different than traditional paddles. "Reading between the lines," I sense Boyd eventually may pass the main operation over to Dennis and concentrate more on exotic variations of keys, while Dennis fills regular, plus special, orders and develops miniature keys for the QRP gang. A mugshot of Boyd is included in photo 5 so you can recognize him at hamfests. Hopefully, a photo of Dennis will arrive in time for our QRP column. Yes, Dennis is a big-time QRPer and also HF bicycle mobileer. Watch for views and details of his setup in our next QRP column. I also understand Dennis has developed a vertical paddle that should be a heartthrob. Hopefully, a photo of it will arrive in time for inclusion in Part II next month.

Want a NeKe? Drop a note to Boyd, NE8KE, 8297 Cleveland W., Coopersville, MI 49404, or Dennis, KK5PY, 61700 E. 180 Road, Fairland, OK 74343.

Kitano Key

Do you occasionally strum on a tabletop when bored or while waiting for service in

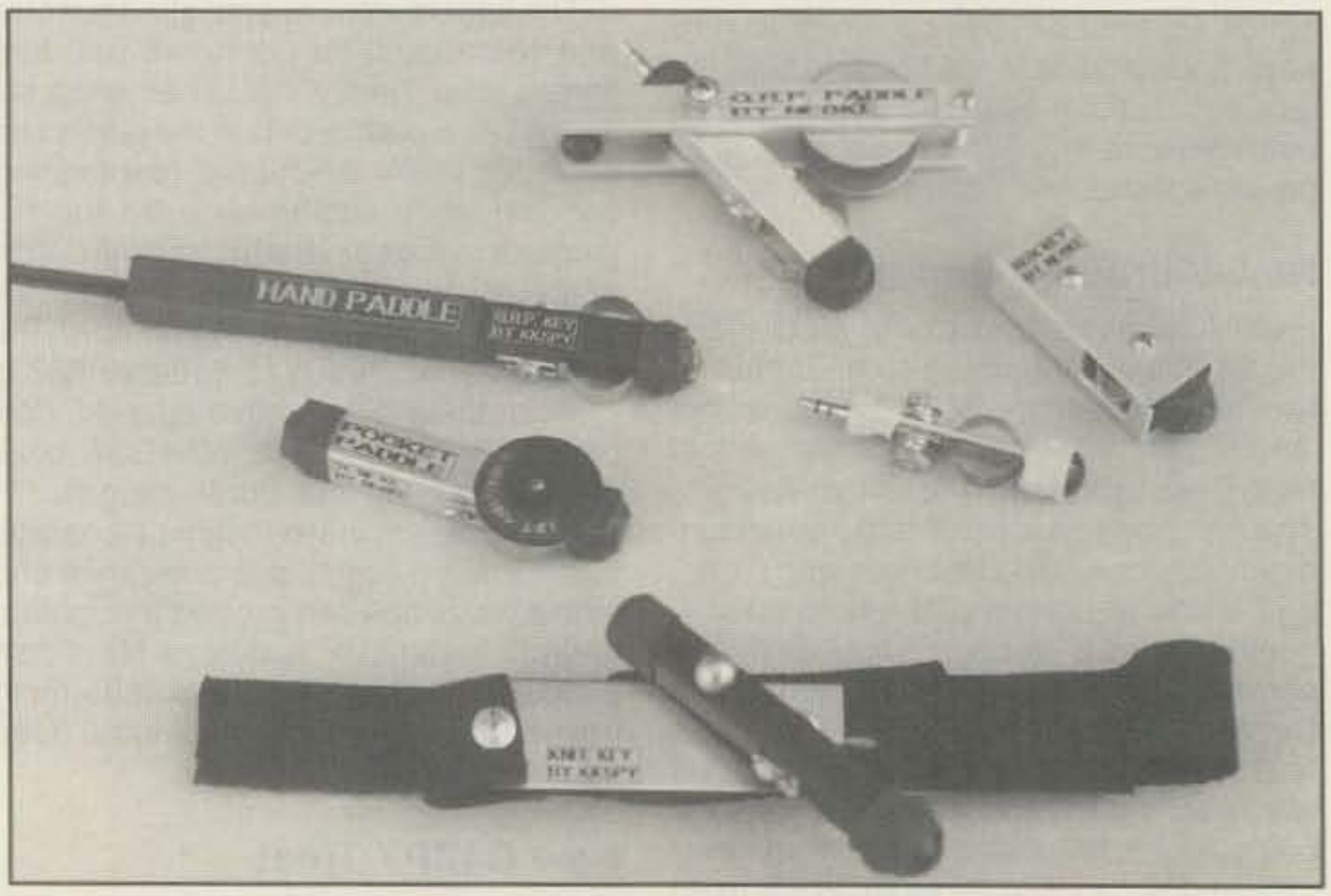

Photo 4– Boyd Mason, NE8KE, and Dennis Foster, KK5PY, make a variety of paddles they call "NeKes." Their most popular versions are the leg-strapped paddle (bottom) and the plug-in QRP paddle (middle right). Other varieties are discussed in the text.

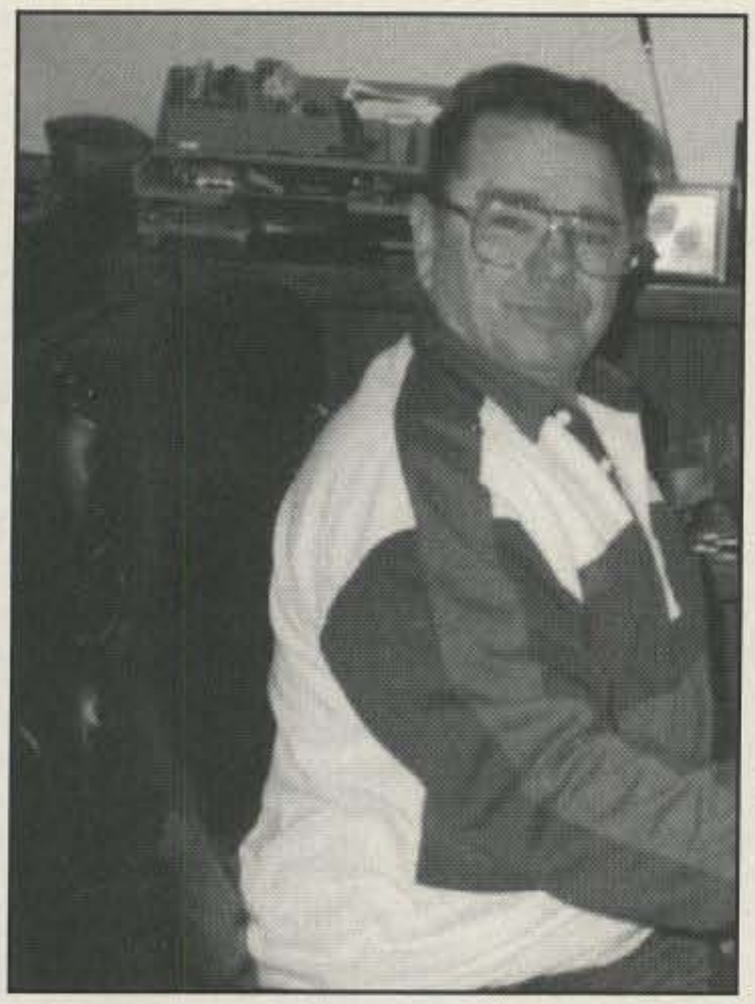

Photo 5– Boyd Mason, NE8KE, is another "Good Guy in Keys" you may spot zipping around hamfests this summer. If you catch up with Boyd, ask about his latest NeKe ideas. They are endless!

a cafe? Does your paddle tend to "walk" on a desk or slip and slide when operating CW mobile? Looking for something different in a paddle? Well, check out the cricket-style Kitano key made by Kit Raymond, N2LMC, and shown in photo 6. Its levers move vertically rather than horizontally, and each is adjustable in gap and tension to mate with your fist.

The key is solid brass, its levers swing from the rear, and it is exceptionally quiet during use. You operate it by lightly pressing one fingerpad with a finger to make dots and pressing the other fingerpad with a thumb or another finger to make dashes. Kit says mobileers and folks with arthritic fingers find new pleasure in CW cricketing with a Kitano. Maybe you should give it a shot. As an alternative, the key could be used as a dual hand key for simultaneously working two bands with two rigs—my kind of fun!

Want one? Contact the Kitano Key Company, 619 Cherry Valley Road, Princeton, NJ 08450 (609-924-0145).

NorCal/K8FF Paddle Kit

Have you ever dreamed of making your own custom-style iambic paddle and maybe adding special fingerpieces to match your fist? Well, friends, now is your chance to turn that vision into reality. NorCal, the same QRP group that brought you the hot little 38 Special transceiver kit last year, is presently offering a compact magnetically-tensioned paddle kit complete with all the bits and pieces at another bargain-basement price (photo 7). The paddle is in "unfinished" form, which means all holes are predrilled and tapped, and you complete it using a file, sandpaper, emory cloth, and plenty of elbow grease.

The paddle was designed by Wayne Smith, K8FF. Each lever is adjustable in gap and tension, and their bearings are permanently lubricated for long life. A magnet in the center block (between levers) "pulls" on screw heads in each lever for tensioning. Overall action is quite good.

I understand paddle kits will be available until mid-October, but as I said about the 38 Special in our September column, that is assuming parts supplies hold together that long. Jump quick if you want one! Kits are $30 plus postage ($5 U.S., $10 Canada and Europe, $15 Japan and South Pacific). Checks should be made payable to and mailed to Jim Cates, 3241 Eastwood Rd., Sacramento, CA 95821.

Speaking of the 38 Special, incidentally, those of you holding returned checks may yet end up the real winners. Unofficially, I hear a new company has "picked up" the 38 Special and may soon announce a highly improved version of the kit. More details as they are available.

In Memory of N2DAN/SK

Perchance you have not heard, yet another noted figure in amateur radio (keys in particular) recently passed to those great ethereal waves in the sky—Steve Nurkiewicz, N2DAN. I am sure everyone agrees Steve was to CW and keys what Doug DeMaw, W1FB, was to solid state and QRP, and both will be sorely missed. Fortunately, Steve's memory and handiwork live on through his famous Mercury paddle gracing amateur radio setups worldwide. Just like a classic auto or a Picasso painting, it represents timeless beauty and perfection.

Views of Steve and his incredible Mercury paddle are shown in photos 8 and 9. As anyone who has seen or owns a Mercury knows, the paddle has such glitz and glamour that photographing it is nearly impossible. Indeed, the only picture I ever shot of a Mercury that did it justice is in my *KEYS II* book, where it now stands as a tribute to "the best!"

Vailograph Revisited

Now moving into the "exotic items from eras past" category, I am proud to honor your requests for a return view of the rare and most unusual Vailograph bug adapter for a hand key (photo 10). This vertically-standing contraption secures in the right desk-mounting screw hole of a J-38-type key and semi-automatically produces a string of dots as follows.

First, the key's arm is reset for a wider gap, and then one of the Vailograph's rods is positioned on the arm to produce a new center resting point. When the key's arm

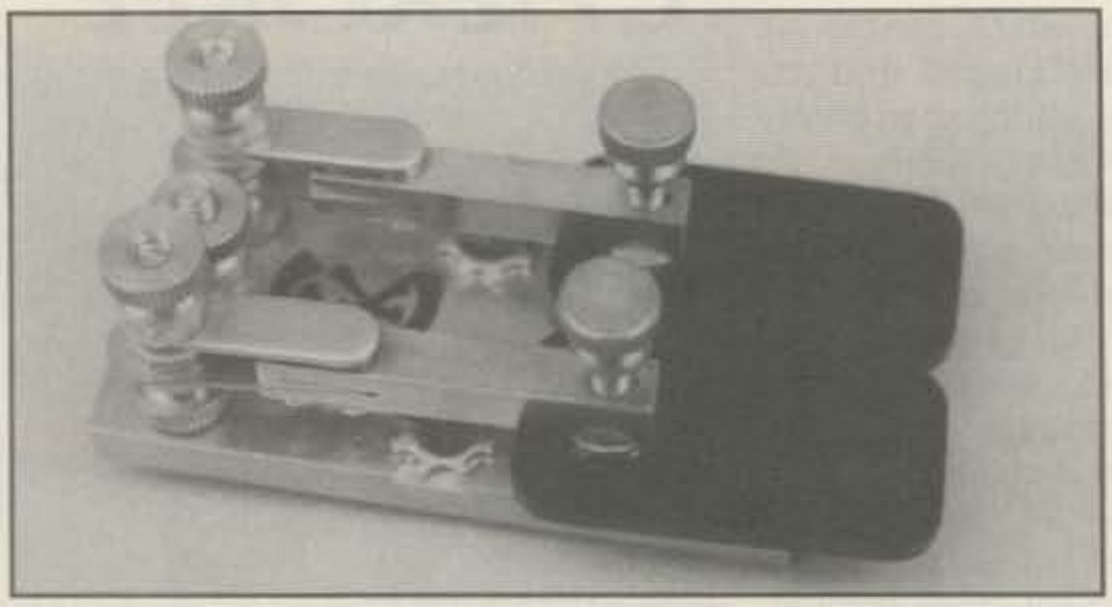

Photo 6– Cricket, anyone? This classy-looking Kitano key is made by N2LMC and sports dual levers that move vertically rather than horizontally. Once acclimated to the technique, cricketing can be fun—really!

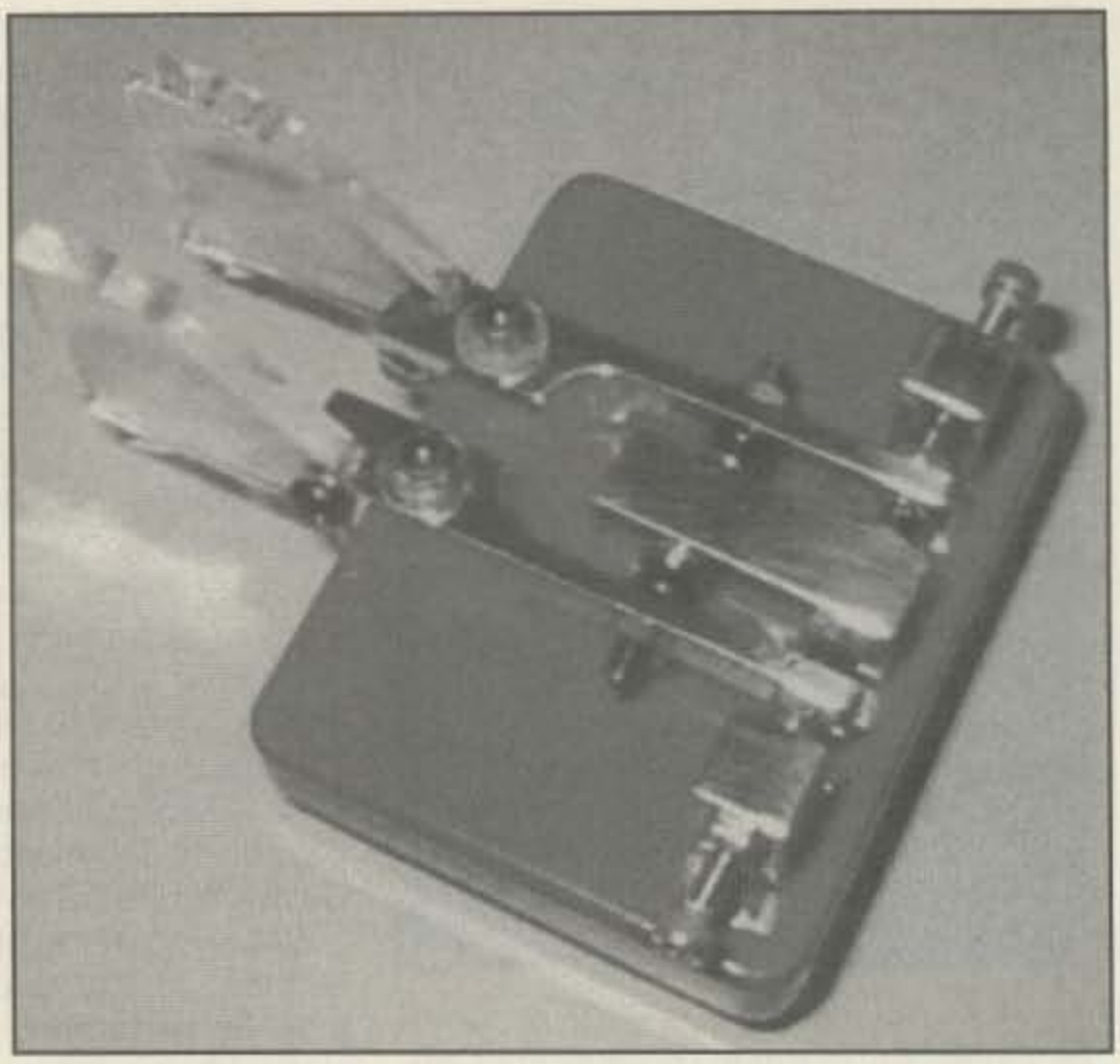

Photo 7– The NorCal/K8FF paddle kit in "finished form." Item sports a brass mechanism an owner can buff and polish to perfection or get chrome plated, magnetic tensioning, and gap adjustments for each arm. Approximate "finishing" and assembly time is 5 hours.

is pressed down, the Vailograph is unaffected and dashes are made as usual. When the arm is raised, however, the Vailograph's rod moves up and releases a damper arm that stops the pendulum from swinging. The damper arm is that dark rod between the tip-top rod adjusting screw and the "midway down on left side" dot adjusting screw. The freed pendulum then swings from its top pivot point, its attached contact tapping against the dot contact screw (below and to the right of the weight) until stopped by the damper arm. The pendulum may not be recognized at first glance, but it is the long vertical rod on the right side. It has a single weight on it.

How does it feel in use? Don't ask. It's a real fun item for sure, but training your fist to move "90 degrees out of ordinary" is an entirely different matter. Our special thanks to Gil Schlehman, K9WDY, for sharing this view. To the best of our knowledge, he has the only Vailograph left in existence (sigh!).

If you enjoy studying rare, exotic, and collectible keys, bugs, and paddles (new and old), check out my self-published book entitled *KEYS II: The Emporium*. It is loaded with views and info on keys like the world has never seen (indeed, many are kept in locked vaults). Folks are going wild over *KEYS II* (it is becoming as collectible as its featured keys). If *KEYS II* is not available at your favorite dealer, drop a note and check for $15 plus shipping ($2 book rate, $3 two-day Priority Mail) to Dave Ingram, K4TWJ, 4941 Scenic View Dr., Birmingham, AL 35210, and I will zip a copy—autographed if you wish—directly to you.

Eberbach Key

From our constantly changing "whatzit department" comes more insight into the unusual strap-type Eberbach key featured here a couple of years ago (photo 11). Neil Friedman, N3DF, stepped forward with a page from the company's 1913 catalog describing the key. He also pointed out Eberbach Corp. is located in Ann Arbor, Michigan, and has been manufacturing scientific and electrical laboratory instruments since the mid to late 1800s—evidently from the same location or city. Do you suppose they still (unknowingly) have some vintage telegraphic goodies in corners of their old stockrooms? Have any of our readers in Michigan visited Eberbach lately? A blowout surprise might await you. Remember to let us know what you find!

Briefly, the Eberbach works as follows.

Photo 8– Steve Nurkiewicz, N2DAN/SK, was known worldwide for his love of CW and his famous Mercury paddle, which was often acclaimed as one of the world's top telegraphic instruments.

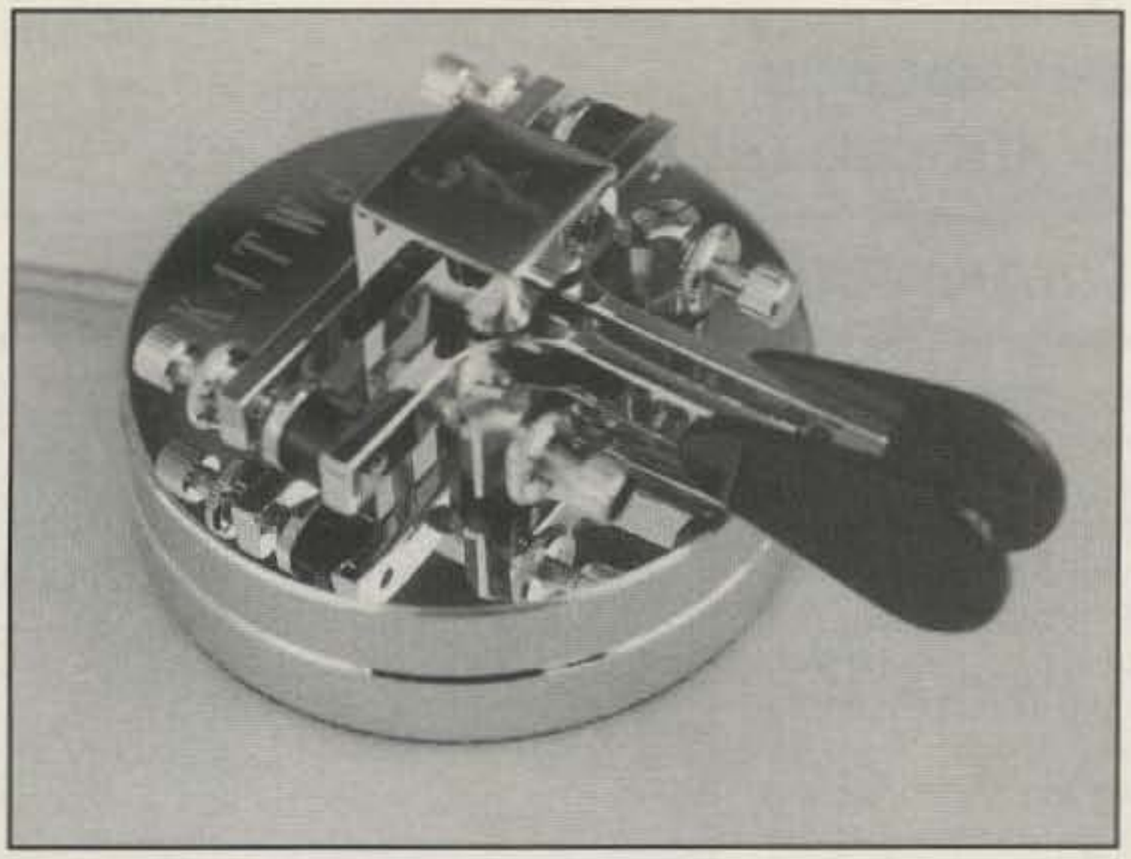

Photo 9– Le Ne Ultra! Nurkiewicz's Mercury paddle sports magnetic tensioning with unique snap action and rhodium contact. Both appearance and performance are totally beyond comparison. Paddle is so flashy that photographing diamonds on a mirror is easier.

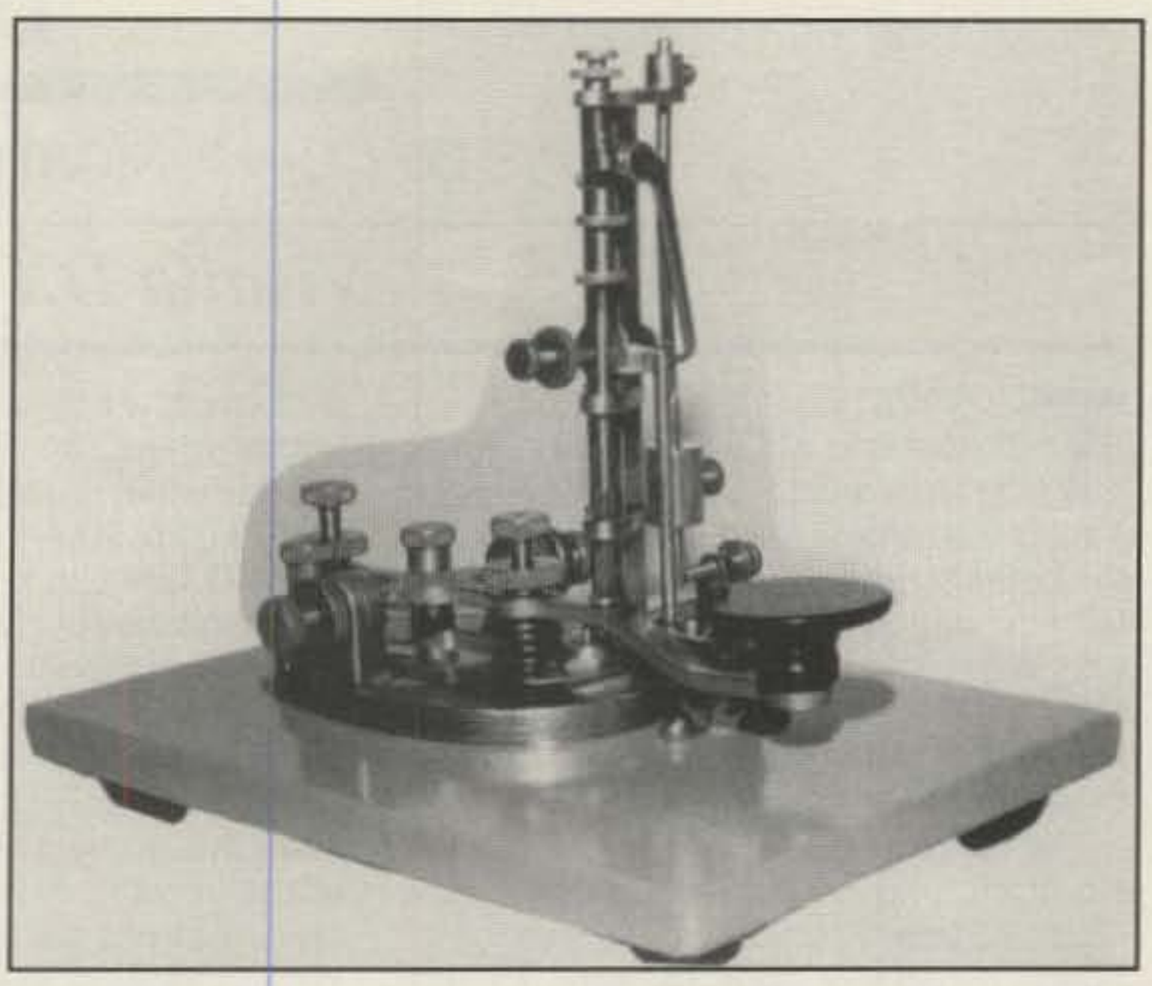

Photo 10– A rocket launcher for a hand key? No, it is the amazing Vailograph add-on bug adapter for a hand key. Once installed, an operator presses down to make dashes, or pulls up on the knob to make dots. With careful adjustment and practice (holding knob at its center/off position), simply moving a finger off the knob could produce dots. (Photo courtesy Gil Schlehman, K9WDY)

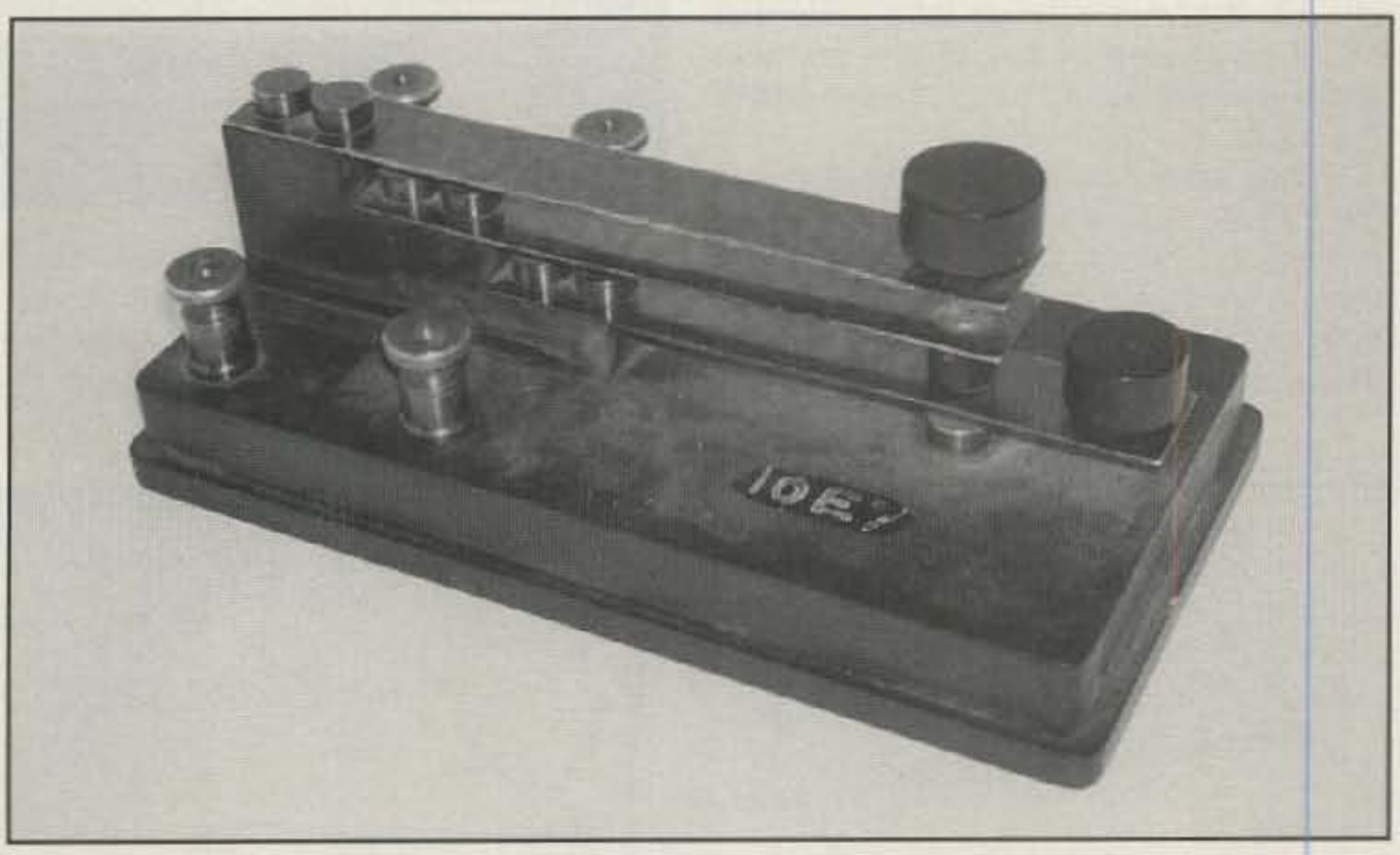

Photo 11– This double-action Eberbach key sports four contacts and was probably used on underseas cable lines or laboratory setups of eras past. Company is still in business today, in Ann Arbor, Michigan. (Details in text.)

Pressing its lower knob closes one circuit (maybe for dashes). Lightly pressing the upper knob closes another circuit (maybe for dots), and pressing harder on the top knob closes both circuits (maybe to ring a bell and wake up a distant operator). Such double-action-type keys were used on old-time underwater cable lines!

QSY

That wraps up the views for this time, gang, but wait until you see all the goodies lined up for Part II coming next month. There are some new miniature keys for QRP, a couple of very special surprises, and . . . Well, let's leave it as a "cliff hanger" and say stay tuned. You'll love it! Meanwhile, let's meet on 30 meters one weeknight around 0130 GMT or near 14,060 kHz one Saturday or Sunday at around 2230 GMT.

73, Dave, K4TWJ

DX

BY CHOD HARRIS, VP2ML

NEWS OF COMMUNICATION AROUND THE WORLD

Visalia DX Convention

The 1998 Visalia International DX Convention will be held May 1–3 at the Holiday Inn in Visalia, California. This is the largest pure-DX convention in the country, and second only to the Dayton Hamvention in the number of DXers attending. With improving band conditions and subsequent interest in DX and DXing, this would be a good time to make this convention part of your plans.

Registration for the Joint Meeting of the Northern and Southern California DX Clubs (to use the official name of the gathering) is US$55 prior to April 15 and US$60 after that date). Registration includes all convention activities, the Saturday night banquet, and Sunday breakfast. Send your check payable to the International DX Convention to Don Bostrom, N6IC, 4447 Atoll Avenue, Sherman Oaks, CA 91423. Don's home phone is 818-784-2590. Amateurs under the age of 21 can receive a complimentary convention-only (no meals) registration, with appropriate identification.

The Holiday Inn regularly sells out for this convention. However, if you want to check for possible cancellations, call the hotel at 209-651-5000. If the Holiday Inn is full, try the nearby Lamplighter Inn at 209-732-4511 or the Radisson in downtown Visalia at 209-636-1111.

For those DXers who will be attending Visalia for the first time, or armchair attendees, let's walk through a typical convention experience.

The first task is getting to the Holiday Inn. Although the hotel is adjacent to the Visalia airport, there is no commercial service to that airport on weekends. The nearest city served by real airlines is Fresno, about an hour north. If you have access to your own plane, you can fly into Visalia, as several convention goers do every year.

The rest of us try to arrange a car pool for the five-hour drive from either San Francisco or Los Angeles. The fact that Visalia lies about the same distance from the population centers of the two sponsoring clubs is a major reason for its selection as the convention site. Also, the hotel is inexpensive and allows the convention to host its own cocktail parties. These are the reasons why the convention has been at its present location for almost all of its history. (It has been held in Fresno a few times in recent years.)

Most of the attendees aim to arrive early Friday afternoon. The repeaters in the central valley buzz with the callsigns of well-known DXers and foreign guests. Some DXers aim to arrive Thursday night in order to play in the International DX Golf Tournament on Friday morning, which tees off at about 10 AM. The golf course is right next to the hotel.

Once at the Holiday Inn, the DXer will note the many callsign license plates, mixed in with a few other notable plates. My own plates are Dog Xray, for example. While checking in to the hotel, the convention goer will meet many famous DXers around the registration desk. Once checked into the room, the attendee returns to the hotel lobby to pick up the convention registration package.

The smart DXer then immediately heads for the main meeting room, where the Saturday banquet seating chart is displayed. Put your callsign on a table that has a good view of both the head table and the projection screens at each end of the room.

Friday afternoon is a good time to visit the private suites of some of the commercial exhibitors. Dayton it's not, but a handful of radio manufacturers display their latest models and answer questions. There is even a small exhibitor room open

How to put up a tower without much space? Chris, SV2CWY, solved that problem with a homemade tower extending through the roof of his house.

Jim, SV2CCA, bolts a four-element, five-band Mosley TA53M to SV2CWY's roof tower.

P.O. Box 50, Fulton, CA 95439
e-mail: chod@compuserve.com

How about scuba when the bands close? Bert, CX3AN, Gary, N7QXQ/HR6, and Mario, CX4CR, operated as HR6XX from Roatan Island (NA-067).

on Saturday, primarily for those manufacturers and DX services who donated prizes for the drawings.

Late Friday afternoon there may be a couple of presentations, often videos of recent DXpeditions. The pool-side cocktail party is a great time to catch anyone you missed earlier in the day. For those DXers looking for a good meal, the Vintage Press in Visalia is by far the best place to eat in the area. You *will* need a reservation Friday night.

Back at the hotel, there are a few more DXpedition videos and other presentations. More interesting are the informal parties that go on far into the night. Be sure to get a good night's sleep, however; the next day will be a long one.

Saturday morning begins with the official welcome by members of the hosting

The WPX Program

SSB

2662 .....DU1COO

CW

2974 .....JA7KXH 2975 .....JK1BSM

Mixed

1798.....RW3AX 1799.....YU1XW

CW: 350 JK1BSM, RAØFU. 400 JK1BSM, RAØFU. 450 RAØFU. 500 RAØFU. 950 K2LUQ. 1250 W7OM. 1300 W7OM. 1400 W7OM. 1450 W7OM. 1850 I7PXV.
SSB: 350 DU1COO, RAØFU. 400 DU1COO, RAØFU. 450 DU1COO, RAØFU. 500 N1SHM, DU1COO, RAØFU. 550 DU1COO. 600 ON4BCM, IV3BKL, DU1COO. 650 DU1COO. 700 DU1COO. 850 DJ8WQ. 1000 AA1KS. 1050 IT9SVJ. 1100 IT9SVJ. 1150 IV3VCG, IT9SVJ. 1200 KF4FP, IT9SVJ. 1250 IT9SVJ. 1300 IT9SVJ. 1350 IT9SVJ. 1400 IT9SVJ. 1450 W7OM, IT9SVJ. 1500 W7OM, IT9SVJ. 1550 W7OM. 2000 K5RPC. 3650 F6DZU. 3700 F6DZU. 4050 ZL3NS.
Mixed: 450 RW3AX, RAØFU. 500 RW3AX, RAØFU. 550 RW3AX. 600 RW3AX. 650 RW3AX. 700 RW3AX. 750 RW3AX, WA2FKF. 800 RW3AX. 1200 AA1KS. 1250 KF4FP. 1850 W7OM. 1900 W7OM. 1950 W7OM. 2000 W7OM. 2050 W7OM. 2100 W7OM. 2150 W7OM. 2800 IK2ILH. 2850 IK2ILH. 3600 SM3EVZ.

10 meters: RW3AX
15 meters: RW3AX, RAØFU
20 meters: ON4BCM, RW3AX, RAØFU
40 meters: RW3AX, RAØFU
80 meters: RW3AX, RAØFU
160 meters: DL3JSW, RAØFU

Asia: RW3AX, RAØFU
No. America: RAØFU
So. America: DL3JSW
Europe: RW3AX, RAØFU
Oceania: DL3JSW, RAØFU

Award of Excellence Plaque Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS. I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, YU2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD. IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, S57J, EA8BM, DL1EY, KU0A, KØDEQ, VR2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLD.

Award of Excellence Plaque Holders with 160 Meter Endorsement: K6JG, N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, K9BG, W1BWS, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, KØDEQ, VR2UW, DJ3JSW, OE6CLD.

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.

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 the 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, files will be made inactive. Lifetime Honor Roll fee is $4.00 (U.S.) for each mode, with no fee for additions.

MIXED

4773.....F9RM
4740.....9A2AA
3932.....W2FXA
3789.....EA2IA
3675.....UA3FT
3585.....W1CU
3583.....K6JG
3523.....N4NO
3454.....N6JV
3413.....VE3XN
3305...SM3EVR
3285.....N4MM
3258.....N9AF
3253.....I2PJA
3249.....N477
3183.....YU1AB
3154.....N5JR
3114.....9A2NA
3103.....I1EEW
3017..WA8YTM
3005...PAØSNG
2990.....HA8XX
2966.....YU7SF
2880...YU7BCD
2848.....K9BG
2831.....KF2O
2779.....I2MQP
2678.....N2AC
2660.....4N7ZZ
2615.....I2EOW
2640..WB2YQH
2574.....S53EO
2546..SM6DHU
2520.....IK2ILH
2512...JH8BOE
2500.....HA5NK
2464.....K8LJG
2432.....KØDEQ
2376.....HAØIT
2229.....K5UR
2218.....F6IGF
2187.....9A4RU
2185.....K2XF
2168.....N6JM
2165.....S58MU
2165.....W6OUL
2128.....W4UW
2111.....W9IL
2088....W8UMR
2087.....KS4S
2039....YU7JDE
2019.....G4OBK
2001...OE6CLD
1919...SM6CST
1778.....DJ1YH
1765.....K5IID
1732.....LU8DY
1718...VE4ACH
1701.....IØAOF
1696...PY2DBU
1694.....EA5BM
1656.....I2EAY
1628.JKN3SAC
1625.....KØNL
1607...OZ1ACB
1533.....W7CB
1431...I1-21171
1396.....YU1ZD
1378.....Z32KV
1371.....F6HMJ
1356.....NG9L
1299.....N3ED
1293.....WØIZV
1257.....WT3W
1245.....N1KC
1198.....S52QM
1192..KW5USA
1174.....AA1KS
1151...VE6BMX
1100...KB5OHT
1098.....VE6FR
1073....JR3TOE
1964..WB2PCF
1059.....RAØFU
1041.....W2EZ

SSB

4688.....F9RM
4122.....IØZV
3743.....VE1YX
3635.....ZL3NS
3405.....F6DZU
3338.....K6JG
3246.....I2PJA
2935...EA8AKN
2913.....CT4NH
2896.....EA2IA
2892.....N4MM
2855.....F2VX
2745.....OZ53V
2731.....HA8XX
2728.....I4CSP
2725.....I1EEW
2707.....N4NO
2638.....N5JR
2612...PAØSNG
2507.....I2MQP
2434...LU8ESU
2411.....9A2NA
2390...EA3AQC
2378.....KF2O
2367..WA8YTM
2349.....UA3FT
2324...CT1AHU
2301.....4X6DK
2296.....I8KCI
2281.....I2EOW
2274.....EA5AT
2267...YU7BCD
2265.....PY4OY
2189.....KF7RU
2124.....KD9OT
2097.....EA1JG
2088.....K5RPC
2063.....CX6BZ
1958.....IN3QCI
1906.....K5UR
1881..SM6DHU
1867...OE6CLD
1809.....LU8DY
1760.....HAØIT
1716...OE2EGL
1703.....KBØC
1681.....YU7SF
1653.....K8LJG
1649...EA5CGU
1639.....K2XF
1590.....KS4S
1536.....HA5NK
1535.CT1BWW
1522.....W6OUL
1497....DK5WQ
1489.....K3IXD
1463.....K8MDU
1451.....IT9SVJ
1450.....K2EEK
1416....IKØEOM
1398....IK2AEQ
1396.....I3ZSX
1395.....EA5KY
1353.....K5IID
1346.....W9IL
1336.....G4OBK
1288.....I3UBL
1243.....DF7HX
1229.....YC2OK
1196.....KØNL
1189...SV3AQR
1182...WA2FKF
1175..LU5EWO
1145.....K4CN
1127.....EA8AG
1016.....WT3W
1010.....KI7AO
1004...LU3HBO
954.....EA1AX
933.....DF1IC
924.....EA1MK
924.....N1KC
922.....DL8AAV
873.....I2EAY
869.....N3ED
869.....JR3TOE
837.....N1RT
836....EA3EQT
804.....AG4W
792...EA5GMB
778.....N3DRO
675....VE6BMX
605.....N7VY

CW

4081.....IT9TQH
3890..WA2HZR
3439.....N6JV
3098.....UA3FT
3073.....N4NO
2881.....N4UU
2864.....K6JG
2861.....EA2IA
2674.....YU7SF
2600.....K9QVB
2468.....W2ME
2401.....G4UOL
2337.....N5JR
2314...YU7BCD
2312..WA8YTM
2288.....N4MM
2247.....LZ1XL
2124...JA9CWJ
2104.....9A2NA
2046.....HA8XX
2035.....HA5NK
2011.....KA7T
1982.....KF2O
1973.....G3VQO
1927.....K8LJG
1927..SM6DHU
1904....VR2UW
1900.....TI4SU
1876.....HAØIT
1867.....S58MU
1863.....N6FX
1857.....G4SSH
1816...SM6CST
1795.....W1WAI
1777.....OZ5UR
1755.....K5U8R
1744.....87PXV
1730....IT9VDQ
1695.....K2XF
1690.....DJ1YH
1641.....G4OBK
1641.....W6OUL
1594.....I1EEW
1588.....LU2YA
1538....IK3GER
1527.....EA6BD
1510.....KS4S
1454.....EA5YU
1416.....9132M
1411..SM5DAC
1389.....I2EAY
1346.....9A2HF
1317.....N1IA
1293.....IK5TSS
1280.....ZB2EO
1230.....EA6AA
1168.....AC5K
1124.....LU3DSI
1083.....4X6DK
1074.....W9IL
1085.....I2MQP
1066.....N3ED
1058.....DF6SW
1033.....I2EOW
1032.....W4UW
982.....LU7EAR
949.....K2LUQ
927.....9A3UF
906.....YU1TR
890.....KB5OHT
884.....PY4WS
821.....RAØFU
820.....K3WWP
759.....VE6BMX
730.....WT3W
725.....KØNL
623.....LY3BY
6O3....OE6CLD
600.....N1KC

club, which this year is the Southern California DX Club. Following are some technical presentations and DX reports. After lunch, the much anticipated DX forum convenes in the main meeting room. What is the DX Advisory Committee doing? What changes in the DXCC country list are under consideration? The DX forum is typically the best attended event during the entire day. More forums, technical talks, and DX reports complete the Saturday program.

Meanwhile, some smart DXers are waiting in line to have their QSL cards checked for DXCC, as a representative of the DXCC desk attends every convention.

On Saturday evening most attendees dress for dinner, meeting first at the poolside cocktail party. Following dinner and the obligatory introductions of all the officers, convention committee, etc., there is a major presentation of some sort, usually of the most important DXpedition of the past year. No one leaves early, however late it might get, as the drawing for many of the major prizes immediately follows the banquet speech. Again, informal parties are scattered around the hotel, completing a long, DX-filled day.

Sunday morning a tired-looking group of DXers gets their breakfast from the buffet and find their table from the previous night. After breakfast, there is another major presentation, followed by another round of prize drawings, before the DXers head out for the long ride home.

The Visalia experience is intense, an in-depth exposure to all aspects of DX and many experienced and knowledgeable DXers. It is well worth attending. Maybe I'll see you there this year or next.

While Visalia is the largest of the "pure DX" gatherings, other such get-togethers

DJ6SI (left) and DJ9ZB operated as 3XA8DX last December, making more than 10,000 QSOs during their effort.

The WAZ Program

Single Band WAZ

10 Meter SSB

490.....JA1EOD

15 Meter SSB

511.....JA1EOD

20 Meter SSB

1020 .....PY3LP 1021.....N1KC

20 Meter CW

480 .....IK5TSS 482.....DL9TJ
481 .....HL1XP

40 Meter CW

197.....JA1EOD 198.....DL9TJ

40 Meter CW

197.....JA1EOD 198.....DL9TJ

160 Meter WAZ

124.....W9XY, 30 Zones, New
125.....OM2XW, 34 Zones, New
126.....DK5PR, 35 Zones, New
126.....PAØCLN, 36 Zones, New

All Band WAZ

SSB

4421 .....JH1XDW 4422.....N1KC

CW/Phone

7774.....JA2MOG 7779.....PY4AST(CW)
7775 .....JM2RUV 7780 .....ON4CAS
7776 .....JA6UDI 7781.....N1KC
7777.....HB9BIN 7782.....NRØT
7778.....DL8DZV

All CW

114.....JA1EOD

Phone

629.....JA1EOD

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.

5 Band WAZ

As of December 31, 1997, 472 stations have attained the 200 Zone level.

New recipients of 5 Band WAZ Award with all 200 Zones confirmed:

JA1EOD

The top contenders for 5 Band WAZ (zones needed, 80 meters):

N4WW, 199 (26)
AA4KT, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
W9WAQ, 199 (26)
VE7AHA, 199 (34)
W9CH, 199 (26)
IK8BQE, 199 (31)
JA2IVK,199 (34,40m)
K1ST, 199 (26)
ABØP, 199 (23)
KL7Y, 199 (34)
UY5XE, 199 (27)
NN7X, 199 (34)
OE6MKG, 199 (31)
HA8IB, 199 (2 on 15)
OH2DW, 199 (1)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
W6SR, 199 (37)
S57J, 199 (2)
W3UR, 199 (23)
KC7V, 199 (34)
GM3YOR, 199 (31)
KZ4V, 199 (26)
W8DX, 199 (34)
N4CH, 199 (18 on 10)
N6AW, 199 (34)
UA3AGW, 198 (1, 12)
VO1FB, 198 (19, 27)
EA5BCK, 198 (27, 39)
K4PI, 198 (23, 26)
G3KDB, 198 (1, 12)
KG9N, 198 (18, 22)
KM2P, 198 (22, 26)
DKØEE, 198 (19,31)
KØSR, 198 (22, 23)
K3NW, 198 (23, 26)
UA4PO, 198 (1, 2)
K5RT, 198 (22, 23)
JA1DM, 198 (2, 40)
OE1ZL, 198 (1,31)
9A5I, 198 (1, 16)
KE9A, 198 (18,23)
DJ4GJ, 198 (1, 31)
OH2VZ, 198 (1, 31)
W2YC, 198 (24, 26)
W6DN, 198 (17, 34)
N5KO (18, 18 on 40)

The following have qualified for the basic 5 Band WAZ Award:

JA1EOD, 200 Zones DL9TJ, 192 Zones
N6AW, 199 Zones

Endorsements:

VE5KX/WØ, 170 Zones DK7YY, 188 Zones
N5KO, 198 Zones

1067 Stations have attained the 150 Zone level as of December 31, 1997.

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.

have their own attractions. Dayton, of course, attracts many hundreds of DXers and DX from around the world. The Crowne Plaza hotel is "DX Central" at Dayton, with many hospitality suites as well as the DX Dinner (see below).

The Pacific Northwest DX Convention is held in late July, rotating among Portland, Seattle, and Vancouver. While primarily a regional convention, this is always well run and well attended.

The Seventh Annual New Orleans International DX Convention is August 14–15 at the Royal Sonesta Hotel in the historic French Quarter of New Orleans. This convention is very well run in an excellent facility with lots of non-DX attractions within a short walk. More details to come later. While not as large as Visalia, it is a lot easier to get to, at a first-rate hotel, and with much better food. The quality of the program is equal to that at Visalia.

Finally, the W9DXCC DX Dinner is a one-day convention held outside Chicago in early September. The presentation of the DX Hog of the Year award highlights the banquet.

Whatever DX convention you choose to attend this year, you will come away from the event with your DX batteries recharged and with renewed enthusiasm for the DX chase.

DXCC 2000

As was expected, the ARRL Board of Directors approved the report of the DXCC 2000 committee at the regular

QSL INFORMATION

3B8/JE2HCJ to JA2JSF
3W5KVR to EA5KB
3W5MNB to JA2MNB
4S7UB to KJ6UB
4U1WRC to 4U1ITU
5H3ES to DF9SU
5H3PW to KØOB
5N37YZC to WA1ECA
5N7YZC to WA1ECA
5R8EY to DJ1RL
9G5WD to G4RWD
9H3PB to DF4EK
9H3WC to ON4CCC
9M8TG to JH3GAH
9M8YY to JH3GAH
9Q5HX to IK2MRZ
BVØGSM to BV4ME
D2BB to W3HNK
FOØBRD to N6RT
FOØKEO to N7CQQ
FOØMIT to W6RW
FOØPLA to W8AEF
FOØSPE to W6KK
FO5VO to N6VO
FO8DX to KG6AR
FP5BU to F5TJP
H23W to 5B4WN
H27W to 5B4WN
HR6XX to CX3CE
J68BG to YU1NR
JY8ZW to K4ZW
KHØS to JA1OGX
KHØU to JA1QNV
N2NL/KH2 to W2YC
LX8DL to LX1DA
P3ØWN to 5B4WN
P4ØGH to WA2TTI
P4ØNR to YU1NR
PJ8/KG8XV to JH1ROJ
PJ9Q to W9QQ
T88X to JA6BSM
TT8JFC to WA4ZJB
UK4YT to K4YT
V26KW to K3TEJ
V29NR to YU1NR
V85TG to JH3GAH
VK6BAT to N6ZZ
VP2ENR to YU1NR
VP8CTR to DL5EBE
VR2WO to KA9UQT
VR97SAR to VR2XRW
VS97SAR to VR2XRW
YB52RI to YBØBEH
YBØARA/9 to N2AU
ZD7OK to N2AU
ZF2CU to W5CU
ZF2MU to K4BI
ZF2RA to K7AR
ZK1AAT to KQ2I
3D2SJ to Fr. Steve Dives MSC, P.O. Box 1354, Suva, Fiji
5NØRMS to M. P. Simonet, P.O. Box 2873, GPO Marina, Lagos, Nigeria
6V1C to Christian Saint Arroman, B.P. 3263, Dakar, Senegal
9H1BD to Herbert Catania, 2, Gatwick Court, Triq It-Turisti, St. Paul's Bay SPB 06, Malta
9K2SQ to Abdullah Ali al-Sayegh, P.O. Box 38899, Dahiya A. al-Salem 72259, Kuwait
BD4DL to Strong, P.O. Box 031-103, Shanghai 200031, China
BG4AFV to Ina, P. O. Box 031-103, Shanghai 200031, China
BOØBSC; BVØBSB, BSC, BSD, BSE, BSF, BSG, BSH, BSI, BSJ, BSK, BSL, BSM, BSN, BSO, BSP, BSQ, BSR, BST, BSU, BSV, BSX, BSY to Scouts of China, 13/F, 20, Chun-Lun St., Taipei 104 Taiwan
CT3HF to Duarte, P.O. Box 40, P-9126 Canico, Madeira, Portugal
CU3EJ to Leonel Gaspar Cardoso Avila, Canada das Almas, P-9700 Angra do Heroismo, Terceira, Acores, Portugal
CU5AM to Jose M. S. Silveira, P.O. Box 10, P-9800 Velas, Acores, Portugal
C21RK to Ruben Jim Kun, P.O. Box 139, Buada District, Nauru
DS1HAM to Kim Jung Hee, Kae Hwa Apt. #107-305, Bang Hwa 3 Dong, Kang So-Ku, Seoul 157-223, Korea
DS4BHW to Pil-Ki Kim, P.O. Box 27, Suncheon 540-600, Korea
DS5RNM to Lee Joonha, P.O. Box 49, Nam Daegu 705-600, Korea
GM4DKO/DU3 to John Fraser, 318 Caingin, San Rafael, Bulacan, Philippines
E21LLR to Piti Eksitikul, P.O. Box 7, Bangkok 10206, Thailand
FR5HA to J. Lallemand, 173 Rue E. de Parny, F-97421, La Riviere St-Louis, France
HH5HK to David K. Hodges, Hopital Bon Samaritan, Limbe, c/o Agape Flights, 7990 15th St. E, Sarasota, FL 34243
HL1CG to Song Hyung Suk, Kae Hwa Apt. #107-305, Bang Hwa 3 Dong, Kang So-Ku, Seoul 157-223, Korea
HL1DH to Rim Dong-Yoon, Ju-Gong Apt. 205-705, Sang-Gye 6 Dong 740, Seoul 139-206, Korea
HL2DNU to Joong Hwan Go, 914-7 Toegyedong, Chuncheon, Kangwondo, Korea
HL2TIZ to Wook Han, Sanbondong, Eulji Apt. 615-1102, Kunpo, Kyungkido, 435-040, Korea
HL3ADI to Bae Jeong-Ho, P.O. Box 50, Taejon 300-600, Korea
HL3EHL to Cha, 99-15, Jungcheon-Dong, Jung-Gu, Taejon 301-080, Korea
HL3EOR to 99-15, Jungcheon-Dong, Jung-Gu, Taejon 301-080, Korea
HL5FBT to Kim Keum-Cheol, P.O. Box 34, Namdaegu 705-600, Korea
HL5QY to Ki Hwan Yang, Sin Jin Park Apt. 513-7B2L, Wol Bong Bang A Dong, Dong Ku, Ulsan 682-020, Korea
HL5YI to Chae Sang Su, Electrical Dept., Dong Myung Technical High School, Yong Dang Dong, Nam Gu, Pusan 608-080, Korea
HP1BYS to Elio Eloy Salinas Ray, P.O. Box 6-9776, El Dorado, Panama City, Panama
HP1DGX to Victor R. Martinez Ch., P.O. Box 87-3670, Zona 7, Panama City, Panama
JE3XRX/HR1 to Masaya Onishi, P.O. Box 5229, Tegucigalpa, Honduras
JW7VK to Tormod Eriksen, Bakke Sondre 99, N-2040 Klofta, Norway
JX6RHA to Unni Gran, Mellomasveien 128, N-1414 Trollasen, Norway
LX1DE to J. Faber, 5-9 rue de la Fontaine, L-4122 Esch-Alzette, Luxembourg
SVØLM to Charles L. Lewis, P.O. Box 1001, GR-671 00 Xanthi, Greece
SV1CQH to George Staikos, Solomoy 13, GR-301 00 Agrinio, Greece
SV1EET to Takis Papakiriakopoulos, 7-13 Laodikias Str., Vironas, GR-162 32 Athens, Greece
SV1EPE to Minos Iosif, P.O. Box 75039, GR 176 10 Athens, Greece
SV2CQB to Elias Tasos, 6 Koroxenis, GR-502 00 Ptolemais, Greece
SV5DDR to Maniatakis Vasilis, P.O. Box 329, GR-851 00 Rodos, Greece
T77WI to Giancarlo Montico, P.O. Box 3, San Marino City, SAN Marino
TR8JPF to Jean-Pierre Finet, Camp de Gaulle, B.P. 177, Libreville, Gabon
UAØYAY to Pavel F. Ustinov, P.O. Box 40, UD-1, Kyzyl-11 667011, Russia
V31PC to Don Owen-Lewis, P.O. Box 7, Punta Gorda, Belize
VU2SDU to Shaik S. Sadaqathullah, G. P.O. Box 1721, Mannady, Madras Chennai 600 001, India
ZP1AB to Artur Hiebert Braun, P.O. Box 34, Loma Plata, Chaco 883, Paraguay
ZP5ADG to Astolfo Davalos Gonzalez, San Antonio 656, C. Republica Dominicana, Asuncion, Paraguay
ZP5CSM to Claudia Schubeius, P.O. Box 1059, Asuncion, Paraguay
ZP5ERC to Esteban Rabery Caceres, C. C. 2045, Asuncion, Paraguay
ZP5FAF to Felix Acosta Granados, Tte. Alvarenga 1324, Asuncion, Paraguay
ZP5YAL to Ana Lia Zambon, Av. Republica Argentina 2886, Asuncion, Paraguay

The table of QSL managers is courtesy of John Shelton, K1XN, editor of "The GOLIST," P.O. Box 3071, Paris, TN 38242 (phone 901-641-0109; e-mail <golist@iswt.com>).

January board meeting. The *ARRL Letter* reported as follows:

"Approved by the Board were rules changes for the DXCC program that had been recommended by the DXCC 2000 Committee. Under the new criteria, no countries currently on the DXCC list will be removed. In the future, countries will be referred to as entities. A political entity will be added to the DXCC list if it meets any one of three criteria: it is a UN member state, it has an ITU prefix block assigned, or it has a separate IARU member society. The new criteria also replace all DXCC measurements, including physical separation distances, with metric system figures

CQ DX Awards Program

SSB

2241 ..... NV2K

SSB Endorsements

320 ..... K7LAY/328
320 ..... I8KCI/327
310 ..... WA2FKF/312
275 ..... LU3HBO/292
275 ..... KK4TR/283
150 ..... NV2K/154

CW Endorsements

320 ..... K4CN/325
320 ..... K2JLA/326
300 ..... K8JJC/306

RTTY Endorsements

275 ..... K3UA/288
275 ..... G4BWP/276

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.

roughly equivalent to the former distances. While the 57 entities on the deleted list will remain, no new countries will be added to the deleted list in the future. Deleted entities simply will be removed. In addition, the new rules specify a minimum 'island' size of 100 meters measured in a straight line. The DXCC field checking program will remain in place. The effective date of the changes will be announced later this year. The DXCC 2000 Committee was discharged with the Board's thanks."

Upcoming DX Operations

Look for **GU/F5SGI** from the island of Guernsey April 11–17, mostly 40–10 meter CW, and also on the Islands On The Air frequency of 14260 kHz. QSL via the home call, either direct or via the French (REF) bureau.

JX7DFA is LA7DFA, active until October from Jan Mayen. He is active on all bands, 1606 meters, on CW, SSB, and the digital modes. QSL via home call.

Club Officers

The 1998 officers of the Texas DX Society are: President Bob Walworth, N5ET; Vice President Henry Schneider, W5HNS; Secretary Earl Morse, N5TU; Treasurer Madison Jones, W5MJ; DX Chairman Buzz Jehle, N5UR; Contest Chairman Joe Staples, W5ASP; Repeater Chairman Jim Lane, N5DC; Field Day Chairman Dale Martin, KG5U; and Bullsheet Editor Dave Sarkozi, WG5N.

The South East Michigan DX Association officers for 1998 are: President Gene Klinger, AA8GX; Vice President Hank Kohl, K8DD; Treasurer Buck Switzer, N8CQA; Secretary Stan Arnett, AC8W; Program Chair Byron Johnson, WA8LCZ; Awards Manager Gary Rutledge, KR8V; and Director Bob Thompson, VA3RJT.

The 1998 officers of the Western Washington DX Club are: President Bob Preston, W7TSQ; Vice President Dick Swanson, K7BTW; Secretary Mike Schone, WA7BAT; Treasurer Marina Zuetell, N7LSL; and Trustees Duncan Carman, W7JEN, John Gohndrone, N7TT, Joe Gregory, W7QN, Adam Kerner, K7ST, Mike Pickard, K7NPN, Mike Mraz, N6MZ, and Roger Huntley, W7VV.

The new officers of the Southern California DX Club are: President Will Angenent, KN6DV; Vice President Harvey Laidman, W8DX; Secretary Jim Zimmerman, N6KZ; Treasurer Charlotte Iseda, KB6FXS; Membership Harvey Shore, K6EXO; Web site Bruce Horn, WA7BNM; and Board members Carl Gardenias, WU6D, Cathy Gardenias, KF6LFB, and Larry Shapiro, K6RO.

The 1998 officers of the Eastern Iowa DX Association are: President Terry Cellman, WAØAWL; Vice President Robert Walstrom, WØEJ; and Secretary-Treasurer Frank Apple, WØGWK.

The officers of the Northern California DX Club are: President Ted Park, K6XN; Vice President George Allan, W6YD; Secretary Ron Panton, W6VG; Treasurer Keith Butts, KN6K; and Directors Ted Algren, KA6W, Gordon Girton, W6NW, and Garry Shapiro, NI6T.

Dayton

The 12th Annual DX Dinner at the Crowne Plaza Hotel in Dayton is Friday, May 15 with a cash bar at 6:30 PM and dinner at 7:15. For more information, contact Steve Bolia, N8BJQ, at <n8bjq@erinet.com> or call 937-788-2803 during the day.

73, Chod, VP2ML

BY FREDERICK O. MAIA, W5YI

WASHINGTON READOUT

REGULATORY NEWS IN THE WORLD OF AMATEUR RADIO

Restructuring the Amateur Service

The Board of Directors of the American Radio Relay League held their annual meeting at the Marriott Hotel in Rocky Hill, Connecticut on Friday, January 16, and Saturday, January 17, 1998. On an 11 to 4 vote, the Board voted not to petition the FCC to restructure the amateur radio license classes and to increase HF privileges for Novice and Technician Plus licensees.

The board also rejected a proposal made by West Division Gulf Director Jim Haynie, W5BJP, to look into the feasibility of asking the FCC to reduce the number of license classes from six to three. Class A would have consisted of Extra and Advanced, Class B would have included General and Tech Plus, and Class C would have included Technician with the Novice Class eliminated. The advantage of such a lineup would be not only to streamline the Amateur Service, but it would eliminate the 20-wpm code test. We assume that Tech Plus and General would require a proficiency of 5 words-per-minute; Advanced and Extra 13 wpm.

Background Information

At the World Administrative Radio Conference in 1979, the United States delegation suggested that the RR 2735 (the amateur telegraphy requirement) be changed " . . . to permit administrations to develop their own licensing requirements." These international radio conferences are where the various countries of the world meet to agree on matters of mutual importance.

The U.S. proposal reduced the requirement to the status of a recommendation, which in effect was the same as deleting the regulation. This proposal was made even though the ARRL had surveyed its membership and had received an overwhelming response requesting "no change." The U.S. proposal, however, was not successful. Instead, it was agreed to modify the code waiver frequency to 30 MHz. It continues to this day, and any amateur operating on the medium- and high-frequency amateur bands must prove that they are proficient in manual Morse telegraphy. The international Amateur Service law does not specify a code proficiency speed.

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (817-461-6443; e-mail W5YI@W5YI.org)

The 1995 World Radio Conference (WRC-95) was held in Geneva between October 23 and November 17, 1995. A feature of WRCs is that consideration is always given to simplifying the Radio Regulations by the so-called VGE (Voluntary Group of Experts). To deal with this item, in 1994 the International Amateur Radio Union, a federation of amateur radio societies around the world, established an ad hoc committee to look into the issues surrounding retention or deletion of the Morse code as a requirement for an amateur license. The findings of the committee were:

- Every amateur should have an appreciation of the satisfaction that competency in code can bring,
- Morse code is the only practical means of ensuring that amateur stations possess a capability for intercommunication. The Q-code and unique telegraph abbreviations provide a common language,
- Changing the Morse requirement would alter the basic character of the amateur service,
- Morse equipment is simpler, less expensive, easily home-constructed, and
- It is the ideal mode for weak-signal and propagation experimentation.
- Elimination of the Morse requirement would allow standards to fall, resulting in possible congestion of the HF bands.

The 1994 IARU Report advised against any change in the Morse requirement. Furthermore, the IARU said it would only endorse change when there was clear support from all three IARU regions. Opponents of the IARU position felt that there was a "hidden agenda"—that being the need to control the number of participating amateurs (with its accompanying interference) and that the code requirement was being used as a "filter."

At WRC-95 the VGE made no recommendation about changing any Amateur Service rules. The New Zealand government, however, adopted a position which looked toward totally ending the Morse code requirement. Their proposal, put forth at WRC-95 on October 31, 1995, was simply to abolish international Radio Regulation 2735 in favor of RR2736. RR2735 requires Morse code knowledge (no speed is specified) when the amateur communication takes place below 30 MHz. RR2736 leaves amateur operator requirements up to the various national administrations.

The proposal became very controversial. Some administrations (including the United Kingdom) favored the change, while others opposed it or said the time was not right and the issue needed further study within the amateur community. The ultimate action was to delay further consideration until 1999, although an initial proposal looked toward resolving the issue at WRC-97.

WARC-92 agreed that the general scope of future conferences should be established four years in advance. Accordingly, before WRC-95 adjourned, Resolution 720, "A Preliminary Agenda for the 1999 World Radiocommunication Conference," was adopted. Item 2.2 of this agenda is: "Consideration of Article S25 concerning the Amateur Service and the Amateur-Satellite Service."

The IARU's Future of Amateur Radio Committee

Soon after WRC-95 was over, the International Amateur Radio Union formed an ad hoc committee called "The Future of the Amateur Service Committee (FASC)." Three of the seven members were from the ARRL. The purpose of the committee was to examine the international regulations governing the Amateur Service and Amateur Satellite Service with a view toward formulating any needed changes for the next century. The committee was given the task of assisting in the development of that policy.

The ARRL's Board of Directors also formed their own ad hoc Planning Committee to address the the WRC-99 Amateur Service agenda item and to conduct an opinion survey of amateurs. The committee consisted primarily of high-level ARRL officials. (Six of the nine members included two Vice Presidents, three Division Directors, and a Vice Director.)

The survey, completed by an independent research company, was heavily weighted in favor of getting ARRL membership opinions, rather than those from the general amateur population. The sampling consisted of polling 1100 ARRL members and 427 non-members. The response rate was 77%, or 1176 responses.

The findings were totally predictable. Amateurs who had passed a telegraphy examination overwhelmingly wanted the requirement to remain. Both ARRL members and especially non-members who

had not passed a code test, opposed retention of the requirement.

Amateur Extra Class operators who had passed all telegraphy tests—including the high-speed 20-wpm exam—were particularly adamant in their opinion that the requirement should remain. Interestingly, three-quarters of the respondents said they rarely or never use Morse code. Most respondents also felt there were too many license classes. Based on the results of the opinion survey, the ARRL WRC-99 Planning Committee recommended in December that the Morse code requirement for HF operation remain in place. On January 17, 1997 the ARRL Board predictably agreed with the Committee's finding.

The surprise was that the WRC-99 Committee also recommended that the U.S. Amateur Service be restructured. Basically, they proposed that the present Novice Class be eliminated and Novice licensees given the opportunity to take an open-book test to upgrade to what is now the Technician Plus license.

The present Technician Class would be renamed the Basic Class license, and the present Technician Plus license would be called the Intermediate Class license. Every license class above the Basic Class would obtain additional phone frequency privileges.

The biggest change was to take place at the Intermediate Class level with additional CW privileges and phone privileges on 160, 80, 15, and 10 meters. The General Class code would be reduced to 10 wpm. Additional and more stringent code exams were also proposed. All telegraphy examinations would have to be passed using a one-minute solid-copy format which would include a sending test.

The ARRL Board accepted the report and asked the membership to comment on the planning committee's proposal prior to May 31, 1997 so that they could vote on the matter at their July Board meeting. Response from the membership was varied and sometimes volatile.

No action, however, was taken at the July 18–19, 1997 ARRL Board meeting "since no clear consensus had emerged" on restructuring the Amateur Service. The Board voted to extend the period for member comments and revisit the issue later.

It came up again at the 1998 Annual Meeting, and the Board agreed to vote on Amateur Service restructuring. The Board's plan for restructuring turned out to be somewhat different than what the Planning Committee first proposed. The ARRL's plan for amateur restructuring was presented in the form of a resolution for voice vote.

Resolution to Restructure The U.S. Amateur Service

WHEREAS, at the request of the Board the WRC-99 Planning Committee studied and reported on various concepts for simplification of the Amateur Radio Service licensing structure and increased HF privileges for Novice and Technician Plus licensees; and

WHEREAS, the committee report was presented to the Board at its 1997 meeting and at the instruction of the Board was printed in March 1997 *QST*; and

WHEREAS, members were invited to comment to their Directors; and

WHEREAS, at its Second 1997 Meeting the Board extended the period for comment and resolved to reexamine the issue at a later date;

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors instructs the General Counsel to draft, but not to file prior to final approval at the July 1998 Board Meeting, a petition for FCC rule-making incorporating the following principles:

1. No changes in Morse code testing would be proposed.

2. No new Novice licenses would be issued after the effective date of new rules, but existing licenses would be renewable, with present VHF/UHF privileges and CW HF privileges similar to those of Technician Plus.

(a) Anyone holding a Technician license issued before the effective date of new rules would be able to upgrade to Technician Plus on passing a 5-word-per-minute code test.

(b) Anyone issued a Technician license after the effective date of new rules, since they will have passed a written examination dealing only with VHF, would have to pass a new written exam oriented toward HF as well as a 5-wpm code test.

(c) Novice licensees wishing to upgrade would receive credit for the 5-wpm code test, but would be required to pass the new written examinations for the classes of license being sought.

4. The current HF CW frequency allocations for Technician Plus (and Novice) licenses would be reallocated to provide expanded HF phone frequencies for General, Advanced, Extra and Technician Plus licensees.

(a) Expand the existing HF phone bands as follows:

General Class	3800–4000
Advanced Class	3725–4000
Extra Class	3700–4000
Technician Plus	3925–4000
General Class	7200–7300
Advanced Class	7125–7300
Extra Class	7125–7300
Technician Plus	21350–21450
General Class	21250–21450
Advanced Class	21175–21450
Extra Class	21150–21450

No change to 160, 20, 17, 12, 10 meters

(b) Allocate CW HF privileges for Technician Plus (and Novice) as follows:

80 meters	3550–3700
40 meters	7025–7050
15 meters	21050–21100
10 meters	28050–28300

BE IT FURTHER RESOLVED, that members are to be advised of the Board's intention to authorize the filing of this petition at the 1998 Second Meeting of the Board, and are to be invited to offer additional comment on the merits of the proposals contained therein.

The Board voted **not** to adopt that resolution. It was then moved by West Gulf Division Director Jim Haynie, W5JBP, that the Executive Committee study the filing of a petition with the FCC to implement a restructuring of the five license classes to three; the three classes being class A, B, and C. Class A will consist of Extra and Advanced; Class B General and Technician Plus; and Class C Technician.

A roll-call vote was requested, with ten Directors voting against the motion. Directors Metzger, Frenaye, Butler, Heyn, and Haynie voted for the motion. Therefore, that version of restructuring also was defeated—or at least precluded from further consideration.

Strangely, however, the ARRL put out the word in one of the bulletins that the Class A, B, and C restructuring version would be further studied, and amateurs began contemplating that the General Class code might go to 5 wpm and Extra to 13. The League later corrected that error.

Rejection of these plans completes the Board's consideration of its WRC-99 Planning Committee proposal. At this point, the ARRL is no longer considering any type of license class restructuring. It is our understanding, however, that Jim Haynie plans to once again resubmit his motion at the ARRL Board meeting in July. We would be interested in learning what you think of it. Send your comments to <FMaia@internetMCI.com>.

My own personal belief as to why the ARRL Board is no longer considering any form of Amateur Service license class restructuring is that the ITU has taken Agenda Item 2.2 (consideration of the Amateur and Amateur-Satellite Services) off the WRC-99 agenda. The matter has now been added to the preliminary agenda for the next World Radio Conference to be held in 2001. The reason given for the postponement was that the WRC-99 Agenda is too crowded. It thus appears that the Morse code requirement in the Amateur Service will be with us well into the 21st century.

73, Fred, W5YI

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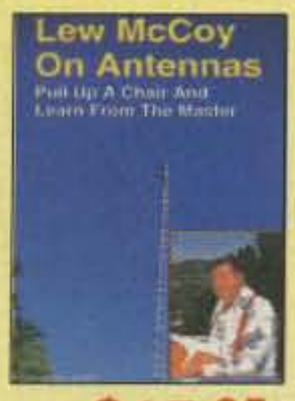

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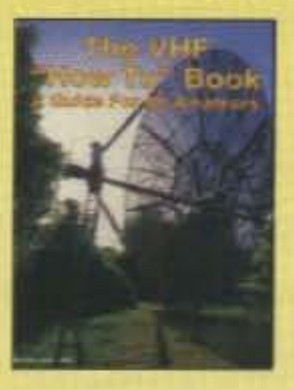

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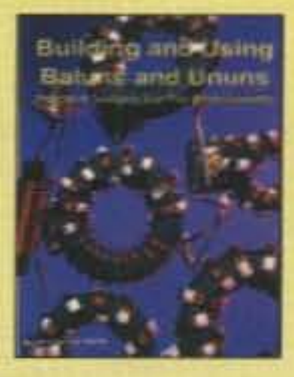

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BY GEORGE JACOBS, W3ASK

PROPAGATION

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Up, Up It Goes—Cycle 23

The Royal Observatory of Belgium reports a monthly mean sunspot level of 42 for December 1997. This result in a 12-month running smoothed sunspot number of 20 centered on June 1997. This is an increase of two points from the previous month's level, as the new cycle begins to increase at a more rapid rate. During December daily levels of solar activity varied between a high of 68 on the 12th and low of 15 on the 19th.

According to daily observations made at Penticon, British Columbia by the Dominion Radio Astrophysical Observatory of Canada, the adjusted mean level of 10.7 cm solar flux for December 1997 was 96. This results in a 12-month running number of 81 centered on June 1997. The level of 10.7 cm flux is paralleling very closely the increasing sunspot count.

A smoothed sunspot number in the mid-to-upper 50s and a 10.74 cm solar flux level in the neighborhood of 117 are forecast for April 1998.

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for April 1998

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 7-8, 15, 19	A	A	B	C
High Normal: 5-6, 10-11, 14, 16, 26	A	B	C	C-D
Low Normal: 2-4, 9, 12, 17-18, 20-22, 25, 29-30	B	C-B	C-D	D-E
Below Normal: 1, 13, 23-24 28	C	C-D	D-E	E
Disturbed: 27	C-D	D	E	E

Where expected signal quality is:

A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9+, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S9, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S6, with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the 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 path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 3 will be fair-to-poor (C-D) on April 1st, fair-to-good (C-B) on the 2nd through the 4th, good (B) on the 5th through the 6th, excellent (A) on the 7th and 8th, etc.

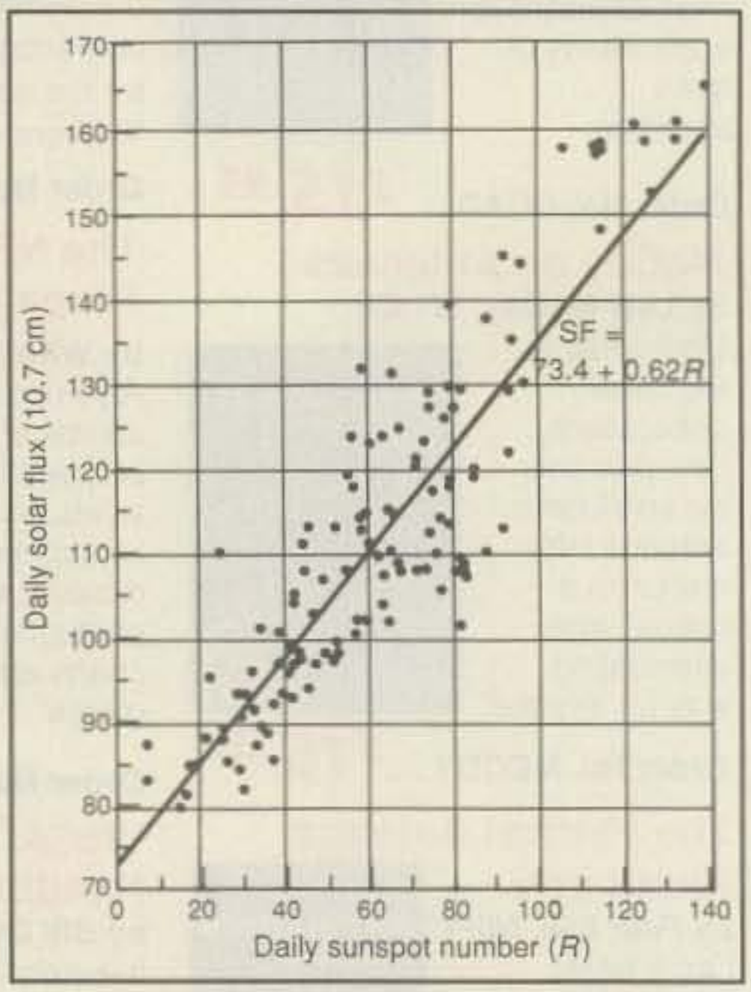

Fig. 1– Comparison of daily values of solar flux vs. daily sunspot numbers.

Sunspot Number and Solar Flux

Both the smoothed sunspot number and the 10.7 cm level of solar flux are indicators of solar activity. An unbroken daily record of telescopic counting of sunspots goes back to the mid-1700s. In 1848 the Swiss astronomer Johann Rudolph Wolf introduced a systematic method for counting sunspots and for determining a sunspot number. The method is still in use today at solar observatories throughout the world. It takes into account the total number of individual spots visible on the face of the sun, the number of groups into which they cluster, and a calibration factor which varies with each telescope used. An observer multiplies the number of groups seen by ten and adds this to the number of individual spots seen. This result is then multiplied by the calibration factor to arrive at a daily sunspot count for that particular observatory.

The official international daily sunspot number is determined by Dr. Andre Koeckelenbergh of the Royal Observatory of Belgium by computing the weighted average of the daily numbers that are recorded at a network of cooperating observatories. The monthly mean number is derived from the daily values, and the 12-month running smoothed sunspot number, upon which the sunspot cycle is based, is determined by averaging 12 consecutive monthly mean values.

As precise as Dr. Wolf's method is for counting sunspots, it is a subjective method, and there is some degree of variation in the results of different observers. Radar research conducted during World War II detected electromagnetic radiations from the sun, which were found to be associated with sunspots and solar flares. Termed *solar flux* or *solar noise*, it occurs at frequencies between approximately 20 and 5000 MHz. Solar noise can be observed best by aiming a high-gain directional antenna at the sun.

Since the end of World War II, daily observations of solar noise have been made at several observatories throughout the world, but chiefly at the Dominion Astrophysical Observatory of Canada at Penticon, B.C. There, the solar noise level at approximately 2800 MHz (10.7 cm) is measured precisely at local noon every day. These values of daily solar flux levels are broadcast by voice on WWV at 18 minutes after each hour. Solar flux is also tabulated for monthly means and for 12-month running smoothed values. A very close correlation has been found to exist between solar flux values and sunspot numbers. This is shown in fig. 1.

Determining solar activity based on solar flux values has some advantage over telescopically determining the sunspot count. Measuring the signal strength of solar noise is more sensitive and precise and less subjective than counting sunspots. Solar flux measurements can be made when the sun is obscured by clouds and in any type of weather, although solar flares can influence readings.

The measurement of radio frequency radiation from the surface of the sun on 10.7 cm has proven to be a very sensitive indicator of solar activity, particularly on a day-to-day basis. On the other hand, telescopic observations of the sun have been made daily for nearly 250 years. While they are not as objective an indicator of solar activity as solar flux measurements, they do represent a long historical chain of solar data. Determining solar activity by both methods is expected to continue to provide valuable information for radio amateurs and for all users of the high-frequency spectrum.

11307 Clara Street, Silver Spring, MD 20902
e-mail: g.jacobs@ieee.org

April Propagation

Spring HF propagation conditions mean somewhat fewer DX openings on the 10 and 12 meter bands. Openings should remain much the same on 17 and 15 meters, as they were earlier this year, but are expected to improve on 20 meters during the late afternoon and evening hours and on 30 and 40 meters during the night. Seasonably favorable conditions for long DX openings between the northern and southern hemispheres, associated with the equinoctial period, should continue through the month. An increased number of short-skip openings due to sporadic-*E* propagation is expected during April, and a major meteor shower is also expected to take place.

Twenty meters should be the optimum band for DX propagation during April. The band should open to most parts of the world shortly after sunrise, and remain open for DX throughout the daylight hours and well into the evening. Exceptionally strong signals should often be noticeable during the late afternoon and early evening hours.

Expect somewhat fewer openings on 15 and 17 meters this month, but some fairly good DX still should be possible to many areas of the world during the daylight hours. Peak conditions are expected during the afternoon and early evening hours on this band.

Fewer DX openings are expected on 10 and 12 meters this month, but some should be possible towards Central and South America, the Caribbean area, and to the South Pacific during the afternoon hours, particularly during periods of High or Above Normal conditions.

Improved DX propagation conditions are expected on 30 and 40 meters during April. These bands should open toward Europe and the east an hour or so before sundown, toward the south an hour or so after sundown, and towards the west and South Pacific after midnight. Expect good DX openings throughout the hours of darkness, but signals should peak around midnight from an easterly direction and an hour or so before sunrise from all other directions.

Fair good DX openings to many areas of the world should also be possible on 80 meters during the hours of darkness and at sunrise. There is also a chance for a few 160 meter DX openings during this same time period.

Seasonably favorable equinoctial propagation conditions should continue during April for openings between the northern and southern hemispheres. Be sure to check during the sunrise and sunset twilight periods for some exceptionally good openings on 15, 17, and 20 meters from the USA to areas in the southern hemisphere such as Australasia, South America, southern Africa, etc. These inter-

HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

April 15–June 15, 1998
Time Zone: EDT (24-Hour Time)
EASTERN USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Central Europe & North Africa	Nil	09-14 (1) 14-18 (2) 18-19 (1)	05-06 (1) 06-10 (2) 10-12 (1) 12-14 (2) 14-17 (3) 17-20 (4) 20-21 (3) 21-22 (2) 22-01 (1)	19-20 (1) 20-21 (2) 21-00 (3) 00-02 (2) 02-03 (1) 20-21 (1)* 21-22 (2)* 22-00 (3)* 00-01 (2)* 01-02 (1)*
Northern Europe & CIS (former Eur. USSR)	Nil	10-13 (1) 13-15 (2) 15-17 (1)	06-09 (2) 09-13 (1) 13-15 (2) 15-17 (3) 17-19 (2) 19-23 (1) 23-01 (2) 01-06 (1)	19-20 (1) 20-23 (2) 23-01 (1) 20-00 (1)*
Eastern Mediter-ranean & Middle East	Nil	11-15 (1) 15-17 (2) 17-19 (1)	06-08 (1) 13-16 (1) 16-19 (2) 19-23 (3) 23-00 (2) 00-02 (1)	19-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Western Africa	14-18 (1)	08-13 (1) 13-14 (2) 14-15 (3) 15-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	08-14 (1) 14-17 (2) 17-18 (3) 18-20 (4) 20-22 (3) 22-01 (2) 01-06 (1)	20-22 (1) 22-02 (2) 02-03 (1) 00-02 (1)*
Eastern & Central Africa	16-18 (1)	09-11 (1) 11-14 (2) 14-17 (3) 17-18 (2) 18-19 (1)	05-06 (1) 06-08 (2) 08-09 (1) 14-16 (1) 16-18 (2) 18-21 (3) 21-23 (2) 23-01 (1)	21-01 (1) 22-00 (1)*
Southern Africa	Nil	08-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-19 (1) 23-01 (1)	21-22 (1) 22-00 (2) 00-02 (1) 22-01 (1)*
Central & South Asia	Nil	10-12 (1) 18-20 (1)	07-10 (1) 14-16 (1) 19-22 (1)	05-07 (1) 19-21 (1)
Southeast Asia	Nil	10-12 (1) 18-20 (1)	07-08 (1) 08-09 (2) 09-11 (1) 19-22 (1)	Nil
Far East	Nil	18-21 (1)	07-08 (1) 08-10 (2) 10-12 (1) 22-00 (1) 00-02 (2) 02-04 (1)	04-06 (1)
South Pacific & New Zealand	17-20 (1)	08-09 (1) 09-11 (2) 11-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-22 (1)	04-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-04 (2)	02-03 (1) 03-04 (2) 04-06 (3) 06-07 (1) 02-03 (1)* 03-05 (2)* 05-06 (1)*
Australasia	18-20 (1)	17-19 (1) 19-21 (2) 21-22 (1)	07-08 (1) 08-10 (2) 10-11 (1) 15-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-01 (3) 01-03 (2) 03-04 (1)	03-05 (1) 05-07 (2) 07-08 (1) 04-07 (1)*
Caribbean, Central America & Northern Countries of South America	10-14 (1) 14-17 (2) 17-19 (1)	08-10 (1) 10-11 (2) 11-14 (3) 14-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	04-06 (1) 06-07 (2) 07-08 (3) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-22 (4) 22-00 (3) 00-04 (2)	19-20 (1) 20-21 (2) 21-04 (3) 04-06 (2) 06-07 (1) 21-02 (1)* 02-05 (2)* 05-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-16 (2) 16-17 (3) 17-19 (1)	07-08 (1) 08-11 (2) 11-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (2) 19-21 (1)	04-06 (1) 06-09 (2) 09-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-01 (3) 01-04 (2)	20-21 (1) 21-04 (2) 04-06 (1) 23-03 (1)* 03-04 (2)* 04-06 (1)*
McMurdo Sound, Antarctica	Nil	14-15 (1) 15-17 (2) 17-19 (1)	07-08 (1) 08-09 (2) 09-10 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	01-05 (1)

Time Zones: CDT & MDT
(24-Hour Time)
CENTRAL USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	Nil	14-18 (1)	06-08 (1) 08-10 (2) 10-13 (1) 13-15 (2) 15-17 (3) 17-18 (4) 18-19 (3) 19-21 (2) 21-22 (1) 22-00 (2) 00-02 (1)	19-21 (1) 21-23 (2) 23-01 (1) 21-00 (1)
Northern, & Central Europe & CIS (former Eur. USSR)	Nil	13-15 (1)	06-07 (1) 07-10 (2) 10-14 (1) 14-17 (2) 17-19 (1) 22-00 (2)	20-00 (1)
Eastern Mediter-ranean & Middle East	Nil	15-17 (1)	07-09 (1) 13-16 (1) 16-22 (2) 22-00 (1)	20-00 (1)

Western Africa	13-17 (1)	12-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	05-06 (1) 06-08 (2) 08-09 (1) 12-15 (1) 15-17 (2) 17-18 (3) 18-20 (4) 20-21 (3) 21-23 (2) 23-00 (1)	20-01 (1)
Eastern & Central Africa	14-17 (1)	10-14 (1) 14-16 (2) 16-18 (1)	06-08 (1) 13-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	21-00 (1)
Southern Africa	Nil	08-10 (1) 10-12 (2) 12-13 (3) 13-14 (2) 14-15 (1)	14-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 22-23 (1) 23-01 (2) 01-02 (1)	20-22 (1) 22-00 (2) 00-01 (1) 23-01 (1)*
Central & South Asia	Nil	09-11 (1) 18-21 (1)	07-10 (1) 18-20 (1) 20-22 (2) 22-23 (1)	05-07 (1) 19-21 (1)
Southeast Asia	Nil	08-10 (1) 19-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-22 (1)	05-07 (1)
Far East	Nil	18-21 (1)	20-00 (1) 00-04 (2) 04-06 (1) 06-07 (2) 07-08 (3) 08-09 (2) 09-11 (1) 15-18 (1)	03-05 (1) 05-06 (2) 06-07 (1) 05-06 (1)*
South Pacific & New Zealand	14-16 (1) 16-18 (2) 18-20 (1)	07-09 (1) 11-14 (1) 14-17 (2) 17-19 (3) 19-21 (2) 21-22 (1)	16-19 (1) 19-21 (2) 21-23 (3) 23-01 (4) 01-03 (3) 03-07 (2) 07-10 (3) 10-11 (2) 11-12 (1)	00-02 (1) 02-04 (2) 04-05 (3) 05-06 (2) 06-07 (1) 02-04 (1)* 04-05 (2)* 05-06 (1)*
Australasia	17-20 (1)	09-11 (1) 16-18 (1) 18-21 (2) 21-22 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-15 (1)	02-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Caribbean, Central America & Northern Countries of South America	10-14 (1) 14-17 (2) 17-19 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	00-04 (2) 04-06 (1) 06-08 (2) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-22 (4) 22-00 (3)	19-21 (1) 21-22 (2) 22-03 (3) 03-05 (2) 05-07 (1) 21-23 (1)* 23-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-15 (2) 15-16 (3) 16-17 (2) 17-19 (1)	07-08 (1) 08-12 (2) 12-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	05-06 (1) 06-10 (2) 10-16 (1) 16-18 (2) 18-19 (3) 19-23 (4) 23-01 (3) 01-02 (3) 02-04 (2) 04-05 (1)	21-22 (1) 22-00 (2) 00-02 (1) 02-04 (2) 04-06 (1) 00-04 (1)*
McMurdo Sound, Antarctica	Nil	13-15 (1) 15-18 (2) 18-19 (1)	06-09 (1) 17-18 (1) 18-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	00-06 (1)

Time Zone: PDT (24-Hour Time) WESTERN USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	Nil	12-16 (1)	06-08 (1) 08-11 (2) 11-13 (1) 13-17 (2) 17-19 (1) 20-22 (1)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Central & Northern Europe & CIS (former Eur. USSR)	Nil	Nil	07-08 (1) 08-10 (2) 10-12 (1) 12-15 (2) 15-17 (1) 20-22 (1)	20-23 (1) 21-22 (1)*
Eastern Mediterranean & Middle East	Nil	13-15 (1)	07-10 (1) 10-12 (2) 12-13 (2) 13-15 (2) 15-17 (1) 20-22 (1)	20-23 (1)
Western Africa	13-15 (1)	09-12 (1) 12-15 (2) 15-17 (1)	05-06 (1) 06-08 (2) 08-15 (1) 15-18 (3) 18-20 (2) 20-22 (1)	20-23 (1)
Eastern & Central Africa	Nil	10-14 (1)	07-09 (1) 12-14 (1) 14-16 (2) 16-18 (1)	20-22 (1)
Southern Africa	Nil	10-12 (1) 12-14 (2) 14-15 (1)	07-09 (1) 13-14 (1) 14-17 (2) 17-18 (1) 21-22 (1) 22-00 (2) 00-02 (1)	19-21 (1) 21-22 (2) 22-23 (1) 20-22 (1)*
Central & South Asia	Nil	09-11 (1) 19-21 (1)	07-08 (1) 08-10 (2) 10-11 (1) 17-19 (1) 19-21 (2) 21-23 (1)	04-07 (1)
Southeast Asia	Nil	09-11 (1) 16-19 (1) 19-21 (2) 21-22 (1)	04-07 (1) 07-08 (2) 08-10 (3) 10-11 (2) 11-12 (1) 22-00 (1) 00-04 (2)	04-07 (1) 05-06 (1)*
Far East	Nil	14-17 (1) 17-20 (2) 20-22 (1)	04-07 (1) 07-08 (2) 08-09 (3) 09-10 (2) 10-12 (1) 12-14 (2) 14-21 (1) 21-23 (2) 23-00 (3) 00-02 (4) 02-03 (3) 03-04 (2)	02-03 (1) 03-06 (2) 06-08 (1) 03-06 (1)*
South Pacific & New Zealand	13-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1)	10-12 (1) 12-16 (2) 16-17 (3) 17-19 (4) 19-20 (3) 20-21 (2) 21-23 (1)	05-08 (1) 08-12 (2) 12-17 (1) 17-19 (2) 19-21 (3) 21-23 (4) 23-01 (3) 01-05 (2)	23-01 (1) 01-02 (2) 02-06 (3) 06-07 (2) 07-08 (1) 01-02 (1)* 02-05 (2)* 05-06 (1)
Australasia	15-17 (1) 17-19 (2) 19-20 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (2) 22-23 (1)	05-08 (1) 08-10 (3) 10-12 (1) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-03 (3) 03-05 (2)	01-02 (1) 02-04 (2) 04-06 (3) 06-07 (2) 07-08 (1) 02-03 (1)* 03-05 (2)* 05-06 (1)*
Caribbean, Central America & Northern Countries of South America	10-14 (1) 14-17 (2) 17-18 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	00-03 (2) 03-05 (1) 05-06 (2) 06-08 (3) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-20 (4) 20-00 (3)	19-20 (1) 20-21 (2) 21-02 (3) 02-04 (2) 04-06 (1) 21-00 (1)* 00-03 (2)* 03-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	13-15 (1) 15-17 (2) 17-18 (1)	07-08 (1) 08-12 (2) 12-14 (1) 14-15 (2) 15-16 (3) 16-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	00-02 (2) 02-06 (1) 06-10 (2) 10-15 (1) 15-17 (2) 17-18 (3) 18-23 (4) 23-00 (3)	20-22 (1) 22-02 (2) 02-04 (1) 21-03 (1)*
McMurdo Sound, Antarctica	15-17 (1)	15-16 (1) 16-18 (2) 18-19 (1)	16-18 (1) 18-19 (2) 19-21 (3) 21-23 (2) 23-01 (1) 04-06 (1) 07-09 (1)	23-03 (1) 03-06 (2) 06-07 (1)

Predicted times 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.

hemispheric openings can take place at other times and on other bands as well, as shown in the DX Propagation Charts.

Ionospheric absorption should continue to increase in the northern hemisphere during April, as the sun rises higher in the northern sky. This should result in somewhat weaker DX signal levels during daytime openings, compared to the winter months. Static levels are also expected to increase noticeably during April, as thunderstorms become more numerous. This should result in higher noise levels, particularly on 30, 40, 80, and 160 meters.

Short-Skip Propagation

For openings between 50 and 250 miles, the best band should be 80 meters during the day and 160 meters at night. Between 250 and 750 miles, 30 and 40 meters should be best during the day, 80 meters for an hour of two after sunrise and again from sunset to midnight, and 160 meters from midnight to sunrise. For openings between 750 miles and the one-hop, short-skip limit of 2300 miles, use 20 meters during the day, 30 and 40 meters for an hour or so at sunrise and again from sunset to midnight, and 80 meters from midnight to sunrise. Look for 15 and 17 meter short-skip openings from about 10 AM to sundown, ranging between approximately 1300 and 2300 miles, although at times openings may be as short as 500 miles. There is also the possibility of some 10 and 12 meter short-skip openings during the daylight hours over similar distances.

The DX Propagation Charts in this month's column contain DX propagation predictions for each amateur band between 10 and 160 meters for the period April 15 through June 15, 1998. Beginning this month and continuing through the summer and fall, the times shown in the charts will be local *daylight* time (EDT, CDT, MDT, and PDT).

For more detailed predictions of short-skip openings between distances of 50 and 2300 miles, refer to the Short-Skip Charts, which appeared last month.

Mail Bag

I have received quite a bit of snail and e-mail asking how to "decode" a portion of

Latest High Frequency Radio Propagation Report

SUBJ: HF RADIO PROPAGATION REPORT
JOINT USAF/NOAA BULLETIN PREPARED AT THE 55SWXS, FALCON AFB, CO.
SECONDARY HF RADIO PROPAGATION REPORT ISSUED AT 04/1719Z FEB 98.
PART 1. SUMMARY 04/1200Z TO 04/1800Z FEB 98.
FORECAST 04/1800Z TO 04/2400Z FEB 98.

		QUADRANT			
		I	II	III	IV
		0 TO 90W	90W TO 180	180 TO 90E	90E TO 0
REGION	POLAR	N5	N5	N5	N5
	AURORAL	N5	N5	N4	N5
	MIDDLE	N6	N6	N6	N6
	LOW	N7	N7	N6	N7
	EQUATORIAL	N7	N7	N7	N7

PART II: REMARKS
ISSUED BY THE 55TH SPACE WEATHER SQUADRON, FALCON AFB, CO.
IF YOU HAVE QUESTIONS OR REQUIRE FURTHER INFORMATION, CALL THE DUTY FORECASTER AT DSN 560-6312, COMMERCIAL 719-567-6312.

Fig. 2– Sample of six-hourly HF Radio Propagation Report jointly prepared by the USAF and NOAA and available from the NOAA website: <http://www.sec.noaa.gov>.

the propagation report put out four times a day on WWV and on the NOAA web page. A sample of this report is shown in fig. 2.

The report is a grid of HF propagation conditions *observed* during the previous six hours before the release time, and a *forecast* of expected conditions during the upcoming six hour period. The grid is based on four geographical sectors each consisting of four longitude *quadrants* (0 to 90 west, 90 west to 180, 180 to 90 east, and 90 east to 0) and five latitude *regions* (Polar 70 to 90 degrees, Auroral 50 to 70 degrees, Middle 30 to 50 degrees, Low 10 to 30 degrees, and Equatorial 0 to 10 degrees). A letter/number combination is used to describe the observed/forecast propagation conditions within each area or block of the grid. The conditions observed during the previous six hour period are rated: W = Poor, U = Fair, and N = Normal. The forecast for the following six hours is shown as: 1 = Useless, 2 = Very Poor, 3 = Poor, 4 = Poor to Fair, 5 = Fair, 6 = Fair to Good, 7 = Good, 8 = Very Good, 9 = Excellent.

For example, referring to fig. 2, in the Middle Latitude Region, an N is shown for Normal HF propagation conditions observed during the previous six hour period in all Longitude Quadrants. A forecast of 6 for fair to good conditions is shown for the next six hour period in all quadrants.

You may want to save this section to have it handy when you check the NOAA Web Site (<http://www.sec.noaa.gov>) or WWV (18 minutes past each hour) for the propagation reports.

VHF Ionospheric Openings

April looks like it should be a good month for VHF ionospheric openings. *Lyrics*, a major meteor shower, should take place between April 22–23, with a peak expected during the late afternoon of April 22. During the shower's peak, at least 15 good-sized meteors should enter the Earth's atmosphere hourly, permitting fairly good meteor-scatter-type openings on the VHF bands.

Trans-equatorial propagation (TE), should reach a seasonal peak during April. TE openings are most likely to occur between 8 and 11 PM local time on long north-south paths which cross the *geomagnetic* equator at approximately a right angle. TE openings toward South America from the USA favor locations in the southern states, but some openings may also be possible to more northerly states.

A seasonal increase in sporadic-*E* ionization usually begins during April and continues through the spring and summer months. This should result in an increased number of short-skip openings on 15, 12, and 10 meters during April, as well as occasional openings on 6 meters. Openings on 10, 12, and 15 meters will range between approximately 400 and 1300 miles, while those on 6 meters will usually be between 750 and 1300 miles. While sporadic-*E* ionization can occur at just about any time, there is a tendency for it to peak between 8 AM and noon and again between 5 and 9 PM local time.

Unusal ionspheric openings on the VHF bands can also occur during April from widespread auroral activity. The best times to check for such openings are during periods of radio storminess on the HF bands. Check the Last-Minute Forecast at the beginning of this column for those days during April that are expected to be Below Normal or Disturbed.

73, George, W3ASK

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FREE Ham Gospel Tracts, SASE. KW3A, 265 West Ave., Springfield, PA 19064.

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(continued on page 99)

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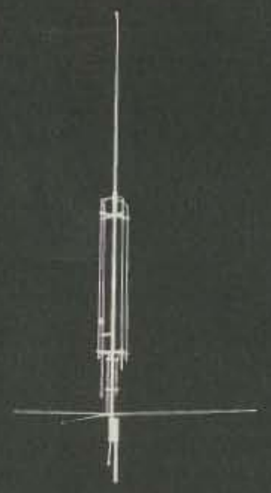

Eagle DX

Challenger DX

Voyager DX

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

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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 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."

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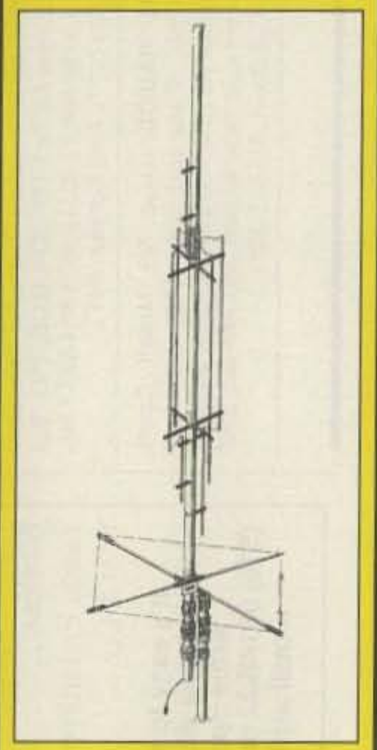

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Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	$269
Titan DX			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	$299
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	$399

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– *QST*, May 1997

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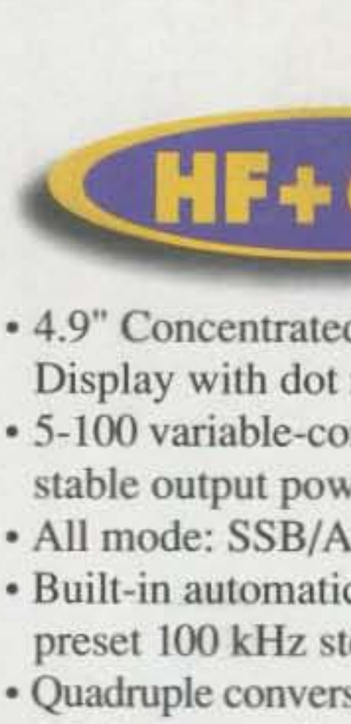

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