

ICD 08241

Amateur Radio

SERVING AMATEUR RADIO SINCE 1945
JUNE 2000

<http://www.cq-amateur-radio.com>

CQ

DO NOT
TCH THE ARC

Now including
CQ VHF

In This Issue:

- Hams Help High Seas Rescue, p. 13
- CQ Market Survey: VHF/UHF Handhelds, p. 18
- A Ham Radio Internet, p. 58 & 62
- RTTY Contest Results, p. 30 & 78 and 1999 CQ WW DX High-Claimed Scores, p. 56

Plus three CQ Reviews:

- Patcomm PC-16000A HF Transceiver, p. 52
- Giovannini D2T Antenna, p. 40
- N6TR "Q" QRP Transceiver, p. 73

On the cover: New CQ Contest Hall of Famer
Kid's Day founder Larry Tyree, N6TR,
Spring, Oregon. (Details on p. 113)

*****3-DIGIT 231
01 00658060 9912 200601AFR
JACK SPEER
BUCKMASTER PUB
6196 JEFFERSON HWY
MINERAL VA 23117



THE RADIO AMATEUR'S JOURNAL

Dreams Do Come True



IC-T2H
LAND MOBILE
RUGGED
 2M • 6W@9.6V
 Standard • 500 mW
 Audio • 8 Front
 Panel or PC*
 Programmable
 Keys • Includes
 "AA" Ni-Cds and
 Charger • MIL STD
 810 C/D/E



IC-T22A
SHIRT POCKET
SMALL
 2M • Easy to Use
 • Large Alphanu-
 meric Display
 • Wide Rx Coverage
 Includes Air Band**
 • Up to 5W@13.5V*
 • 80 Memory
 Channels • MIL
 STD 810 C/D/E



**PRICE
 REDUCED!**
 SEE DEALER FOR DETAILS

IC-Q7A
SMALL SIZE,
BIG SOUND
 2M/440MHz
 • Impressive Big
 Audio • 30 to 1300
 MHz Rx** • 200
 Memories • CTCSS
 Encode/Decode
 • Includes 2 "AA"
 Ni-Cds & Charger
 • MIL STD 810 C/D/E



**PRICE
 REDUCED!**
 SEE DEALER FOR DETAILS

IC-T7H
POWERFUL
PERFORMANCE
 2M/440MHz
 • Easy to Use • Up
 to 6 Watts of
 Power* • Air Band
 Rx** • CTCSS
 Encode/Decode
 • Pocket Beep
 • Auto Repeater
 • MIL STD 810 C/D/E



**PRICE
 REDUCED!**
 SEE DEALER FOR DETAILS

IC-W32A
ADVANCED
DUAL BANDER
 2M/440MHz • 5W
 Standard • Easy to
 Use • 200 Memories
 • Alphanumeric Mes-
 saging & Paging
 • V/V, V/U, U/U, U/V
 • CTCSS Encode
 /Decode • MIL STD
 810 C/D/E



**PRICE
 REDUCED!**
 SEE DEALER FOR DETAILS

IC-T81A
WORLD'S FIRST
QUAD BANDER
 6M/2M/440MHz and
 1.2GHz • AM & WFM
 (Rx only), FM • Ni-MH
 Power • 5W@13.5VDC*,
 1W/1.2GHz • CTCSS
 Encode/Decode • RIT
 and VXO for 1.2GHz
 • Auto Repeater
 • MIL STD 810 C/D/E

Call for a free brochure: 425-450-6088

*Optional equipment required. **Reception guaranteed on US ham bands only, cellular blocked.
 ©2000 ICOM America, Inc. 2380 116th Ave NE, Bellevue, WA 98004 • 425-454-8155. The ICOM logo
 is a registered trademark of ICOM, Inc. All specifications are subject to change without notice or
 obligation. HTFAMCQ400



All ICOM HTs meet



All ICOM HTs (except IC-T22A)
 are PC programmable with
 select ICOM options.



ICOM[®]

www.icomamerica.com

THE BEST GEAR. OUR LOWEST PRICES.



IC-746 **SAVE \$200**

Compact, yet serious. HF/6M/2M, 100 watts

IC-T81A **New Low Price!**

World's first quad bander

Limited time savings starting 4/1/00. See dealer for details.



THE 706 LEGACY CONTINUES

IC-706MKIIG **SAVE \$150**

IC-706MKIIG/AH-4 **SAVE \$180**

IC-706MKIIG/AT-180 **SAVE \$200**



IC-207H **New Low Price!**

Compact dual band mobile, detachable head

Limited time savings starting 4/1/00. See dealer for details.



IC-T7H **New Low Price!**

Dual band HT for the price of a single band

Limited time savings starting 4/1/00. See dealer for details.



IC-2800H **SAVE \$30**

Advanced, top of the line dual band mobile

IC-Q7A **New Low Price!**

Super compact dual band HT

Limited time savings starting 4/1/00. See dealer for details.



IC-R75 **SAVE \$100**

Advanced base HF+ world receiver



IC-R10 **SAVE \$50**

Advanced, wide band HT receiver



IC-PCR1000 **SAVE \$50**

The original "world in a little black box" PC receiver

IC-PCR100 **SAVE \$50**

**GET AN ICOM.
DON'T SETTLE
FOR LESS.**

ICOM[®]
www.icomamerica.com

IC-R10

©2000 ICOM America, Inc. The ICOM logo is a registered trademark of ICOM, Inc. SPECIALSC0400

FEATURES

- 13 **HAMS COORDINATE HIGH-SEAS RESCUE:** A call for help brings ham radio to the forefront of an international drama
By Bob Josuweit, WA3PZO, and Rich Moseson, W2VU
- 18 **CQ MARKET SURVEY: VHF & UHF HANDHELDS:** Here's a guide to help you choose the right handheld for you
By Gordon West, WB6NOA
- 30 **RESULTS OF THE 1999 CQ/RJ WW RTTY DX CONTEST**
By Roy Gould, K1RY, and Ron Stailey, K5DJ
- 36 **HAM SHACK IN THE WILDERNESS:** Imagine spending your summers in a solar-powered ham shack at 6365 feet elevation!
By Sam Vigil, WA6NGH
- 40 **CQ REVIEWS: THE GIOVANNINI D2T ANTENNA**
By L. B. Cebik, W4RNL
- 52 **CQ REVIEWS: THE PATCOMM PC-16000A HF TRANSCEIVER**
By Ken Neubeck, WB2AMU
- 56 **1999 CQ WW DX CONTEST HIGH-CLAIMED SCORES**
- 58 **PACKET USER'S NOTEBOOK:** Think spread spectrum! Packet-internet on microwave frequencies
By Buck Rogers, K4ABT
- 62 **COMPUTERS AND INTERNET:** Putting the web on packet
By Don Rotolo, N2IRZ
- 68 **MATH'S NOTES:** A digital primer
By Irwin Math, WA2NDM
- 73 **QRP:** The MFJ Cub, an easy-brew project, plus tips for kit builders
By Dave Ingram, K4TWJ
- 78 **RESULTS OF THE 2000 WW CQ/RJ WPX CONTEST**
- 80 **BEGINNER'S CORNER:** Hurricane season—what can hams do?
By Peter O'Dell, WB2D
- 88 **WORLD OF IDEAS:** Looking for something new? Try bicycle mobile!
By Dave Ingram, K4TWJ
- 102 **ANNOUNCING: THE NEW 2000 CQ WW VHF CONTEST**
- 103 **AMATEUR SATELLITES:** RZ3DZR official ISS callsign, UO-14 FM repeater, and Phase 3-D status
By Philip Chien, KC4YER
- 106 **MAGIC IN THE SKY:** The art of conversation on the air
By Jeff Reinhardt, AA6JR



page 110



page 88

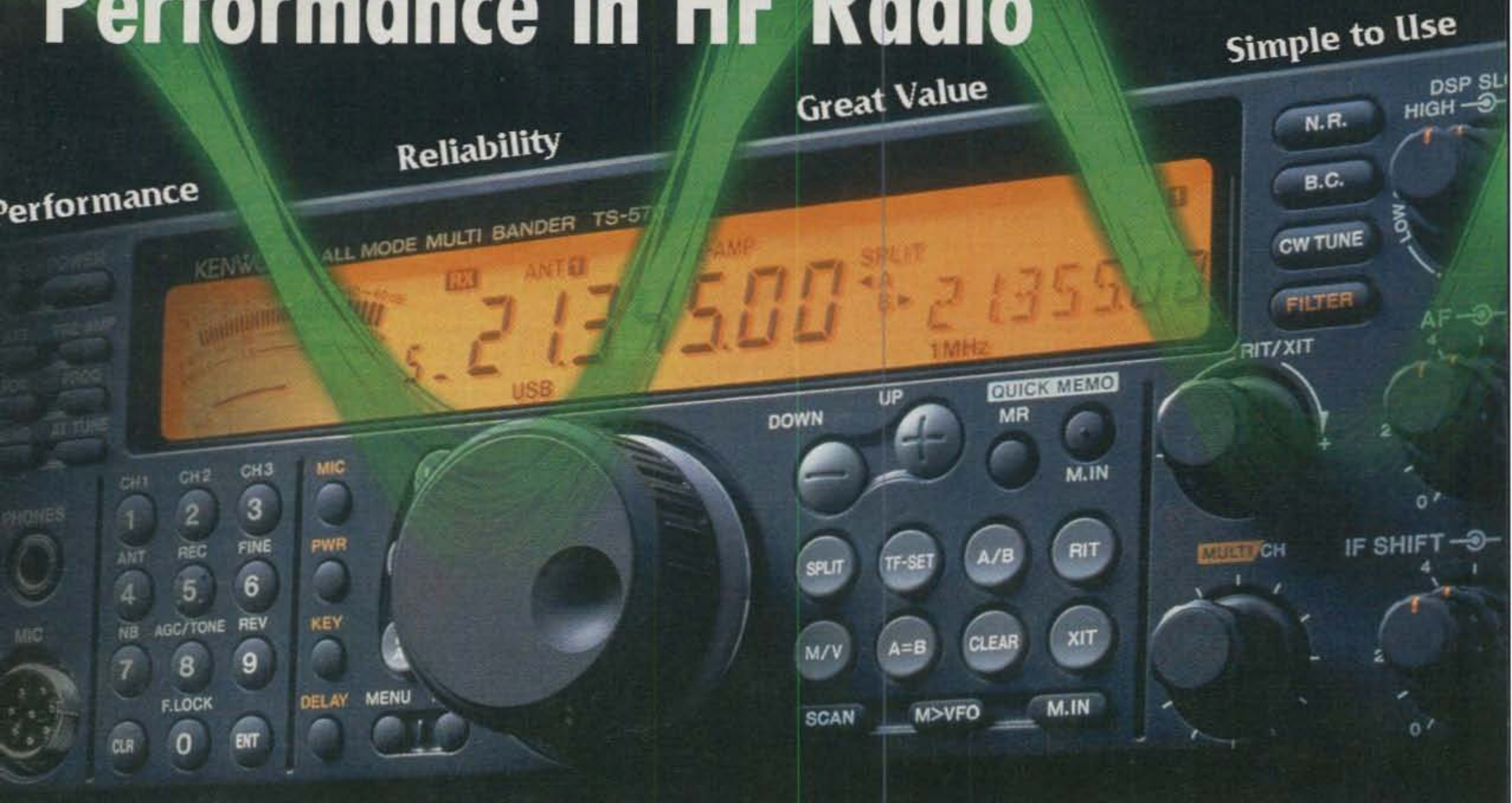
- 86 **DX:** A5, Bhutan and FR/T, Tromelin DXpeditions planned
By Carl Smith, N4AA
- 116 **CONTESTING:** Appreciation for the "little pistol"; contests for June and early July
By John Dorr, K1AR
- 119 **AWARDS:** AB7PX, USA-CA All Counties #997; awards from around the world
By Ted Melinosky, K1BV
- 122 **PROPAGATION:** Surge in sunspot activity; sporadic-E ionization increase in June; DX Charts for June 15 – August 15
By George Jacobs, W3ASK

DEPARTMENTS

- 70 **WASHINGTON READOUT:** Your questions on the new amateur radio restructuring answered
By Frederick O. Maia, W5YI
- 85 **PUBLIC SERVICE:** Getting those bonus Field Day points
By Bob Josuweit, WA3PZO
- 93 **WHAT'S NEW:** Portable and mobile goodies, radio gear, and more
By Karl T. Thurber, Jr., W8FX
- 97 **VHF PLUS:** Six meters starts to play big time!
By Joe Lynch, N6CL

- 4 **HAM RADIO NEWS**
- 6 **ZERO BIAS**
- 10 **ANNOUNCEMENTS**
- 48 **READER SURVEY**
- 126 **OUR READERS SAY**
- 128 **CQ HAM SHOP**

Dollar for Dollar... Best Value & Performance in HF Radio



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 unmatched 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.

- ▶ **FREE** operating manual via FTP site <ftp://ftp.kenwood.net>
- ▶ 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

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 your dealer for details.



ISO 9001
JQA-1205

Communications Equipment Division
Kenwood Corporation
ISO9001 certification

KENWOOD
Amateur Radio Products Group

KENWOOD COMMUNICATIONS CORPORATION
AMATEUR RADIO PRODUCTS GROUP
P.O. Box 22745, 2201 E. Dominguez St., Long Beach, CA 90801-5745, U.S.A.
Customer Support/Brochures (310) 639-5300 Y2ARD-1993/#031700

INTERNET
Kenwood News & Products
<http://www.kenwood.net>

Ham Radio News

From The CQ Newsroom

New Upgrades Welcomed

"Restructuring Weekend" arrived on April 15, and initial reports are that newly-upgraded hams were on the air in droves. By and large, they were welcomed and encouraged. CQ columnist Dave Ingram, K4TWJ, reported hearing occasional "pile-ups" on new Generals sporting "/AG" tags after their callsigns (denoting that they are new Generals). Dave also reported hearing a fair amount of 10 meter AM activity among the new upgrades, primarily with high-end vintage radios sought after for the "full-bodied" AM audio sound.

Contributing Editor-at-Large Gordon West, WB6NOA, reported that dealers around the country told him sales of HF transceivers were brisk in the weeks preceding the April 15 effective date of the FCC's new amateur license structure (and that many customers came in carrying his "Market Survey" article from the April issue of CQ).

There were also occasional reports of old-timers challenging anyone with a "/AE" (a new Extra) or "/AG" as to whether they were "real," but these negative receptions were in the minority and most experienced HFers went out of their way to welcome new operators to the HF bands.

South Africa, Australia Follow U.S. Lead

South Africa and Australia are the latest countries to join the move toward full amateur HF access with only a 5-word-per-minute code requirement. The ARRL Letter reports that South Africa has adopted a new Class A3 license with a distinctive "ZT" prefix, which permits "full license" privileges but with a power limit of 100 watts. The full-privilege Class A1 license retains its 12 wpm code requirement.

South Africa also introduced a Class B "student license," also with a 5 wpm code test, that requires completing a specified construction project resulting in a completed station! The Letter says Class B licensees will be able to operate up to 25 watts on selected band segments.

Australia, meanwhile, announced plans to merge its current Intermediate and Unrestricted amateur licenses, effectively lowering the code test speed for full HF access from 10 to 5 wpm. Actually, the ARRL Letter reports, the two classes would remain distinct but would have identical privileges.

Chesterfield Island New DXCC Country

There's a new DXCC country for DXers to chase—and coincidentally, a major DX-

pedition there on its effective date for DXCC credit. According to the ARRL, contacts made on or after March 23, 2000 with the Chesterfield Islands of New Caledonia will count toward the ARRL's DX award. That happens to be the date on which the TXØDX DXpedition began operations. Acceptance by the ARRL's Awards Committee came after New Caledonia's national ham radio society joined the International Amateur Radio Union (IARU), qualifying the Chesterfields for separate recognition because they are separated from the main part of New Caledonia by more than 350 kilometers.

During six days of operation the TXØDX group made over 72,000 contacts, including more than 2500 on 6 meters and 800 on RTTY. QSL cards from the DXpedition may be submitted to the ARRL for DXCC credit after October 1st.

FCC to OOs: Let's Get Back Together

FCC Amateur Enforcement Chief Riley Hollingsworth, K4ZDH, is calling for a greater role by ARRL "Official Observers" in the enforcement process, according to the ARRL Letter. At a meeting this spring with the League's Enforcement Task Force, Hollingsworth said there had never been a problem with the OOs, other than the lack of FCC follow-up to their complaints and information. Now that the Commission is strongly back in the amateur enforcement business, he said, he hopes that these volunteer monitors will again provide regular reports and collect information on violations that he and his colleagues can use in ongoing efforts to clean up problems on the ham bands.

Mir Back On the Air

The once-abandoned Russian Mir space station has new residents—cosmonauts Sergei Zalyotin and Alexandr Kaleri—and the AMSAT News Service reports that they've fired up Mir's ham station and have been active on 2 meters as U8MIR. Hams in Australia and New Zealand report making voice contacts with the crew and hearing packet signals. In addition, hams in Australia and the U.S. say they've received slow-scan TV signals transmitted from the space station. All operation has been on 145.985 MHz simplex.

Another Delay for P3D Launch?

From the "So what else is new?" department: Arianespace says the next sched-

(Continued on page 126)

EDITORIAL STAFF

Richard S. Moseson, W2VU, Editor
Gail M. Schieber, K2RED, Managing Editor
Lew Ozimek, N2OZ, Technical Consultant
Lew McCoy, W1ICP, Technical Representative

CONTRIBUTING EDITORS

Phil Chien, KC4YER, Amateur Satellites
Arnie Coro, CO2KK, Antennas
John Dorr, K1AR, Contesting
Dave Ingram, K4TWJ, Special Interests & QRP
George Jacobs, W3ASK, Propagation
Bob Josuweit, WA3PZO, Public Service
Joe Lynch, N6CL, VHF
Frederick O. Maia, W5YI, FCC Correspondent
Ed Manuel, N5EM, Amateur Television
Irwin Math, WA2NDM, Math's Notes
Ted Melinosky, K1BV, Awards & USA-CA
Ken Neubeck, WB2AMU, At-Large
Peter O'Dell, WB2D, Beginners
Jeff Reinhardt, AA6JR, Radio Magic
Buck Rogers, K4ABT, Packet Radio
Don Rotolo, N2IRZ, Computers & Internet
Carl Smith, N4AA, DX
Karl T. Thurber, Jr., W8FX, What's New
Joe Veras, N4QB, Radio Classics
Gordon West, WB6NOA, At-Large

AWARD MANAGEMENT

Paul Blumhardt, K5RT, WAZ Award
Norman Koch, WN5N, WPX Award
Ted Melinosky, K1BV, USA-CA Award
Billy Williams, N4UF, CQ DX Award

CONTEST MANAGEMENT

Steve Bolia, N8BJQ, WPX Contest Director
Robert Cox, K3EST, WW DX Contest Director
Roy Gould, K1RY, RTTY Contest Director
David L. Thompson, K4JRB, 160M Contest Dir.

BUSINESS STAFF

Richard A. Ross, K2MGA, Publisher
Arnie Sposato, N2IQO, Advertising Manager
Nicole Tramuta, Sales Assistant
Sal Del Grosso, Controller
Ann Marie DeMeo, Accounting Department
Judith Erickson, Office Manager

CIRCULATION STAFF

Catherine Ross, Circulation Manager
Melissa Gilligan, Operations Manager
Denise Kells, Data Processing
Jennifer Cormagi, Customer Service

PRODUCTION STAFF

Elizabeth Ryan, Art Director
Barbara McGowan, Associate Art Director
Edmond Pesonen, Electronic Composition Mgr.
Julio M. Pezua, Graphic Coordinator
Dorothy Kehrwieler, Production Manager
Emily Leary, Assistant Production Manager
Nicole Tramuta, Advertising/Production
Pat Le Blanc, Phototypographer
Hal Keith, Illustrator
Larry Mulvehill, WB2ZPI, Staff Photographer
Joe Veras, N4QB, Special Projects Photographer

A publication of



CQ Communications, Inc.
25 Newbridge Road
Hicksville, NY 11801 USA.

Offices: 25 Newbridge Road, Hicksville, New York 11801.
Telephone: (516) 681-2922. FAX (516) 681-2926. E-mail
cq@cq-amateur-radio.com. Website: <http://www.cq-amateur-radio.com>. CQ (ISSN 007-893X) is published monthly by CQ Communications Inc. Periodical postage paid at Hicksville, NY and additional offices. Subscription prices (all in U.S. dollars): Domestic—one year \$27.95, two years \$49.95, three years \$71.95; Canada/Mexico—one year \$40.95, two years \$72.95, three years \$110.95; Foreign Air Post—one year \$52.95, two years \$99.95, three years \$146.95. U.S. Government Agencies: Subscriptions to CQ are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed. Entire contents copyrighted CQ Communications Inc. 2000. CQ does not assume responsibility for unsolicited manuscripts. Allow six weeks for change of address.

Printed in the United States of America.

Postmaster: Please send change of address to CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801.

THE VECTRONICS HFT-1500 . . . THE FINEST HIGH POWER ANTENNA TUNER MADE!

- High current Roller Inductor
- SSB*Analyzer Bargraph™
- Cross-Needle Meter
- 6 position Antenna Switch
- Built-in 4:1 Balun
- Gear driven Turns Counter

HFT-1500

\$459⁹⁵

The VECTRONICS HFT-1500 is not just an antenna tuner . . . it's a beautifully crafted work of art, using the finest components available and the highest quality construction.

Every HFT-1500 aluminum cabinet is carefully crafted with a durable baked-on paint that won't scratch or chip.

The attractive two-color Lexan front panel is scratch-proof. Take a quarter. Scratch the HFT-1500 front panel as much as you want. You won't leave a mark!

Arc-Free Operation

Two heavy duty 4.5 kV transmitting variable capacitors and a massive high current roller inductor gives you arc-free operation up to 2 kW PEP SSB.

Precision Resetability

A sturdy hand cranked roller inductor lets you

300 Watt Antenna Tuner

VC-300DLP
\$159⁹⁵



VECTRONICS uses the finest components available to build the highest quality 300 Watt antenna tuner ever made.

You can tune any real antenna 1.8-30 MHz. Custom 48 position switched inductor and continuous rotation 1000 Volt capacitors provide arc-free operation. Handles 300 Watts PEP SSB, (150 Watts on 1.8 MHz).

8 position antenna switch, built-in 50 Ohm dummy load, peak reading backlit cross-needle SWR Power meter, 4:1 balun for balanced line antenna. Scratch-proof Lexan front panel. 10.2x9.4x3.5 inches. Weighs 3.4 pounds.

1500 Watt dry Dummy Load

DL-650M, \$69.95. Handles 100 Watts continuous, 1500 Watts for 10 seconds to 650 MHz. Ceramic resistor. SWR < 1.3. SO-239 connector. DL-650MN, \$74.95 has N connector.



Low Pass TVI Filter

LP-30, \$55.95. Eliminates TVI by attenuating harmonics at the source. Plugs between transmitter and antenna or tuner. Handles 1500 Watts.



High Pass TVI Filter

HPF-2, \$29.95. Installs between VCR/TV and cable TV or antenna lead-in cable. Eliminates or reduces interference caused by nearby HF transmitters.



You can tune verticals, dipoles, inverted vees, yagis, quads, long-wires, whips, G5RVs, etc . . .

SSB*Analyzer Bargraph™

VECTRONICS' exclusive 21 segment bargraph display lets you visually follow your instantaneous voice peaks. Has level and delay controls.

Accurate SWR/Power Meter

A shielded directional coupler and backlit Cross-Needle meter displays accurate SWR, forward and reflected power simultaneously. Reads both peak and average power on 300/3000 Watt scales.

6 Position Ceramic Antenna Switch

Select two coax fed antennas (tuned or bypassed), balanced line/wire or bypass.

Built-in Balun

A 4:1 Ruthroff voltage balun feeds dual high voltage Delrin terminal posts for balanced lines. HFT-1500 is 5.5x12.5x12 inches. Has VECTRONICS' splendid one year limited warranty.

quickly fly from band to band. A precision 5-digit gear driven turns counter lets you accurately return to your previous settings.

Large comfortable knobs and smooth vernier drives on the variable capacitors make tuning precise and easy. Bright red pointers on logging scales make accurate resetability a breeze.

Absolute Minimum SWR

You can tune your SWR down to the absolute minimum!

Why? Because all three matching network components, the roller inductor and both variable capacitors are fully adjustable.

Tune any Antenna

You can tune any real antenna from 1.8 to 30 MHz, including all MARS and WARC bands.

300 Watt Mobile Tuner

VC-300M
\$109⁹⁵



The VC-300M Mobile Antenna Tuner is compact, lightweight, easy-to-operate and is our most economical tuner.

It's compatible with any mobile antenna and any mobile HF transceiver and is compact enough to fit in the most compact car.

It can also be used at home with dipoles, vees, verticals, beams or quads fed by coax.

Backlit dual movement meter simultaneously monitors Power and SWR. Covers 1.8 to 30 MHz. Handles 300 Watts SSB PEP, 200 Watts continuous, (150 Watts on 1.8 MHz). 7.25x8.75x3.6 inches. Weighs 3.4 lbs.

SWR/Power Meters



PM-30
\$79⁹⁵
PM-30UV
\$89⁹⁵



PM-30, \$79.95, for 1.8 to 60 MHz. Displays forward and reflected power and SWR simultaneously on dual movement Cross-Needle meter. True shielded directional coupler assures accuracy. Backlit meter displays peak or average power in 300/3000 Watt ranges. First-rate construction includes scratch-proof case/front panel. 5.3x5.75x3.5 inches. SO-239 connectors.

For 144/220/440 MHz, 30/300 Watt ranges: PM-30UV, \$89.95, has SO-239 connectors. PM-30UVN, \$89.95, has N connectors. PM-30UVB, \$89.95, has BNC connectors.

VECTRONICS®

. . . the finest amateur radio products made!

VECTRONICS 300 Industrial Pk, Starkville, MS 39759 USA VOICE: (662) 323-5800 FAX: (662) 323-6551 WEB: <http://www.vectronics.com>
Free catalog, nearest dealer or to order call 800-363-2922

An Editorial

Ham Radio "Family Values"

"I had never met these people before... but now they're like family to me," Ed Petzolt, K1LNC, told ABC's *20/20* broadcast in April. He was referring to the family of 13-year-old Willem van Tuijl, the Dutch teen shot by pirates off the coast of Honduras and rescued with help from hams around the Americas, including him. In fact, he pointed out, he still hadn't met them in person.

As we were preparing our own story on this high-profile ham radio drama (see page 13), another amateur deeply involved in the rescue, Dr. Jim Hirschman, K4TCV, told us about a face-to-face meeting he and his wife had with the van Tuijls in Dallas. "They're like family to us now," he said, "and I hope we are to them as well."

Like family... like family... The fact is, all of us hams are "like family" to each other, whether we realize it or not, whether we like it or not. (You know the old story: You can choose your friends, but not your relatives. The same goes for hams.) Our "family ties" are demonstrated day after day, in little things as well as big, and in negative ways as well as positive.

We routinely help each other, whether it's explaining on the air how to do something or how to get somewhere, or taking the extra step of going out to help in person. It's what we do, but more than that, it's who we are. We're family. Of course, we have our family squabbles, too, such as the ongoing silliness over code requirements and the occasional clown who can't control his/her behavior and embarrasses everyone.

We've even got the "every family has one" stereotypes—the wealthy uncle who needs to buy every new toy as soon as it comes out (preferably sooner); the lazy brother-in-law who never raises a finger to help, but gets upset when things aren't done to his liking; and the workaholic who lives, breathes, and eats ham radio, sometimes to the exclusion of things such as job, church, and family. As in most families, though, these folks are the exceptions. The vast majority of us know how to behave on and off the air, need to live within a budget, help out as time permits, and keep a balance (of sorts) between our hobby and the rest of our lives.

Of course, the truest hallmark of "family" is how we act when there's a crisis.

In most families, everyone—even those who may be squabbling during better times—comes together to help out. The ham radio "family" is no exception, whether it's staffing an evacuation shelter for days at a time during or after a natural disaster, or staying up and on the radio for 20 hours with a family whose son has been attacked by pirates.

When the van Tuijls—Jacco, KH2TD, and Jannie, KH2TE—needed help, they turned to their radio family, and the family came through. Ham radio "cousins" in four countries, and at least as many U.S. states, not only kept a vigil with the van Tuijls during the initial 20 hours of their ordeal, but went to work behind the scenes as well, making phone calls, finding the right people to cut through red tape, and following through until Willem was safely in a Dallas hospital receiving the advanced care he couldn't get in Honduras.

The ham "family" stayed involved for days afterward, and in the case of people such as Ed Petzolt and Jim Hirschman, plan to stay involved for the long term. After all, we're family. It's what we do. It's who we are.

Let the politicians talk all they want about "family values." We ham radio operators know what family values are really about, and the way in which we demonstrate it through our actions makes me extremely proud to be a part of this very special family.

One closing note on this topic: As you'll read in our report on the ham response to Willem's emergency, one of the people primarily responsible for getting him to the United States for treatment was ARRL President Jim Haynie, W5JBP. Curiously, when I first called League headquarters to find out more about Jim's role, the folks there went to great pains to assure me that Jim had acted as an individual, not in his role as League president, and that no ARRL funds had been spent in this effort. Well, I don't know about the rest of you, but my first thought was "Why not?" I cannot think of a better use of my dues money than to support an effort to save a life, while at the same time focusing a tremendous amount of positive publicity on amateur radio. It's who we are. It's what we do... for family.

More than any words on paper, who we are and what we do are what prompts

someone such as Texas Congressman Pete Sessions—whose office cut through a mountain of red tape, at Jim Haynie's behest, to clear the path for Willem's arrival in Dallas—to tell me twice in the course of one telephone conversation, "We like you guys and we're proud of what you do." We need to keep in mind our obligation to keep on being who we are, and doing what we do, if for no other reason than to protect the "family name."

Family Reunion Time

Many big families have reunions, big parties where everyone gets together, eats a lot, spends a lot, shows off the kids, and looks at how much older everyone *else* has gotten. Our family has those, too. We call them hamfests. Our biggest family reunion each year is the Dayton Hamvention™. I was reminded one weekend recently that Dayton was approaching; on Saturday it was 77° and sunny, and on Sunday we had two inches of snow. Sounds like Dayton weather to me, especially before the folks in the Dayton Amateur Radio Association moved the show into mid-May from late April. The weather recently has been relatively tranquil.

Dayton is Dayton, of course, and every ham should try to get there at least once. This year it has the added attraction of being the ARRL National Convention. But even if you can't make it to "the big one," all over the country there are plenty of other hamfests, large and small, that give you a chance to check out new gear, scour the fleamarket for bargains, and most important, get together in person with "cousins" you may have met only on the radio, or perhaps not at all so far. You can come visit us over the next few weeks at Dayton, Rochester, and Dallas. A hamfest is about the only place I can think of where you can sit down at lunchtime with a total stranger and get up a half hour later with an old friend. You know why that is, don't you? Because we're family!

Dot-Com Time

If you haven't visited CQ's website recently, we encourage you to stop by at <<http://www.cq-amateur-radio.com>> and take a look around. We've been rebuilding the site from the ground up to serve you better, with a new look and

**2:1
Bandwidth (kHz)**

40M	.....	150
30M	....	>50
20M	....	>350
17M	....	>100
15M	....	>450
12M	....	>100
10M	....	>1500
6M	.....	>1500

6
10 12
15 17
20 30
40

Meter Vertical Antenna

For more information on this outstanding HF Multiband Vertical Antenna, visit our web site at:
<http://www.cushcraft.com>
or contact any one of our dealers worldwide.

Do the math!



Rig+Amplifier+Tuner+R8=Performance

What happened to the multiband vertical antenna? For years, multiband verticals with their own counterpoise systems have been the answer for operators in need of a single omnidirectional antenna capable of working all of the desired bands within a small footprint. They were compact, easy to install and didn't require radials making them the perfect choice in many instances.

What happened?? The tuner is what happened. Thanks to the tuner, Hams are now capable of running more mismatched power from their solid state rigs to their antennas than ever before. Although the tuner has obvious merits, combining eight HF bands into thirty odd feet of antenna does not come without some concessions to the laws of physics. Clearly, the ability to tune across the bands combined with an amplifier adds new elements to the traditional multiband vertical equation.

The R8 is the obvious answer. The R8 will allow you to safely run a 3.0:1 VSWR mismatch at 1500 watts CW without damaging its sophisticated components*. The antenna is also quite broadbanded and is less likely to be as sensitive to its surroundings. Equally important, the antenna only has two traps that have been designed to virtually eliminate damage due to moisture induced arcing.

Call your dealer and order one today! The end result will be another equation that you will grow to appreciate.

The R8 = operating confidence, versatility and fun.

* Check VSWR graphs for actual 2.0:1 VSWR bandwidth.



CUSHCRAFT
COMMUNICATIONS ANTENNAS

48 PERIMETER ROAD, MANCHESTER, NH 03103 USA
[Tel.] 1-603-627-7877 • [Fax] 1-603-627-1764

new features. You can get a preview of each month's cover and table of contents before the issue reaches your mailbox or newsstand, and check out back issues as well (just from 2000, so far; we're planning to add a searchable index extending back into the past). Selected articles are included for each of the 2000 issues. A new search engine will help you find items anywhere on the website.

We've also added a "CQ Newsletter," which is a one-way mailing list we use to let you know about breaking news and

other items of interest. Of course, our long-running News and Announcements features are still in place and updated regularly. Another new item is a user survey, with questions that will change from time to time, and with instant results available on your screen. We also invite you to sign in on our guestbook, and check out our ham radio forum section. Categories there at the moment include "Q&A," "Webmaster," "DXing," and "Public Service." Come ask questions or discuss current issues.

We've gathered up several items into our new "CQ Information Center," including links to back issues, information on CQ-sponsored contests and awards, an introduction to ham radio for newcomers, a welcome message for new hams, and writers' guidelines for prospective authors. On the business side of the site, we have links to our advertisers' websites, plus our own online store where you may order CQ books, videos, and other products, as well as enter or renew your subscription.

We're also in the process of changing the old CQ VHF magazine site into a VHF resource center, with links to VHF-related websites, selected articles, tips for new hams, and more.

By the time you read this, we may have made even more additions on both sites. We're improving our websites all the time, so please check in regularly. Members of the newsletter list will be notified by e-mail of significant changes and updates. We'd love to hear your suggestions for additional improvements.

Dot-Ham Time

Now . . . wouldn't it be great if all the benefits of the internet and the World Wide Web could find a home in ham radio? Virtually every club has (or should have) a website, but imagine having one that could be accessed over the air! Imagine all the great things related to ham radio that you can find on the web . . . on the air. Imagine, too, that you're not limited to a diddly 56 k modem speed and tying up your phone line. Well, stop imagining and start planning!

Somewhere deep inside this issue you'll find blueprints for a packet-internet on microwave frequencies, laid out in detail by Packet Editor Buck Rogers, K4ABT. Plus, Computer/Internet Editor Don Rotolo, N2IRZ, and guest columnist Andy Nemec, KB9ALN, discuss the software side of making a ham internet a reality, including Andy's detailed description of how it's *already being done* at 9600 baud in Wisconsin.

We have the technology. What we need now is a concerted effort by manufacturers, software writers, and individual hams (to buy and use the stuff) to help ham radio into the 21st century by beginning . . . just beginning . . . to realize the potential of high-speed digital communications on our microwave bands and to move our technology out of the 1960s and 70s. Read what Buck, Don, and Andy have to say this month. Then start figuring out how you can become "part of the solution."

73, Rich, W2VU

More than just radios....

You probably know all about the great value of **ADI** brand transceivers, but **PRYME Radio Products** makes more than just radios. In fact, we manufacture a full line of aftermarket accessories for all kinds of radios, not just our own! Our line includes accessories for Kenwood, Icom, Yaesu, and many more! From Family Radios, to scanners, to amateur or commercial handheld radios, we have the right item for the job. Our accessories are reliable, innovative, and affordably priced.

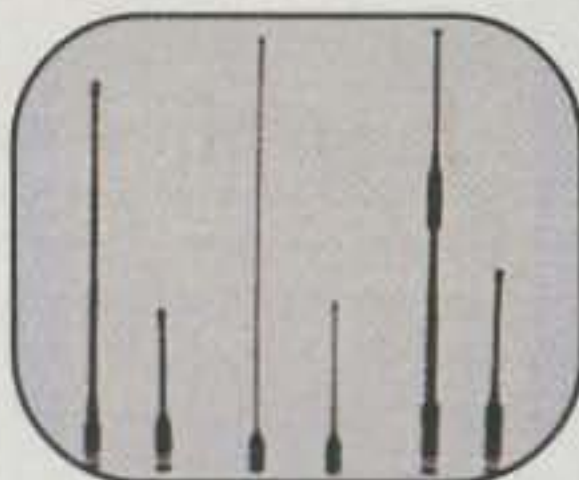
Audio Accessories

Our innovative audio products have made us famous. From the comfort of our SPM-400 mini-boom microphone to the low-profile of our EH-1 invisible ear phone and SPM-700 surveillance mic, we have the right accessory for the job!



Antennas for Handhelds

Most stock antennas for scanners or portable radios are extremely poor. Upgrading to a better antenna can make a huge difference in performance. Our antenna products are specifically designed for maximum performance and durability.



Batteries / Portable Power

We offer many models of rechargeable battery pack for today's most popular handheld radios, as well as a number of portable power stations for those who need power to go.



Order on-line from our entire line of high quality accessories. Visit our **on-line store** on the web at:

<http://www.prymebattery.com>

PRYME
Radio Products

by **PREMIER Communications Corp.**

480 Apollo St. #E • Brea, CA 92821

Phone: 714-257-0300 • Fax: 714-257-0600

Web: <http://www.adi-radio.com>



...POWER ON WITH ASTRON

SWITCHING POWER SUPPLIES...



MODEL SS-10TK



MODEL SS-12IF

SPECIAL FEATURES:

- HIGH EFFICIENCY SWITCHING TECHNOLOGY SPECIFICALLY FILTERED FOR USE WITH COMMUNICATIONS EQUIPMENT, FOR ALL FREQUENCIES INCLUDING HF
- HEAVY DUTY DESIGN
- LOW PROFILE, LIGHT WEIGHT PACKAGE
- EMI FILTER
- MEETS FCC CLASS B

PROTECTION FEATURES:

- CURRENT LIMITING
- OVERVOLTAGE PROTECTION
- FUSE PROTECTION.
- OVER TEMPERATURE SHUTDOWN

SPECIFICATIONS:

INPUT VOLTAGE: 115 VAC 50/60HZ
OR 220 VAC 50/60HZ
SWITCH SELECTABLE
OUTPUT VOLTAGE: 13.8VDC

AVAILABLE WITH THE FOLLOWING APPROVALS: UL, CUL, CE, TUV.



MODEL SS-18

DESKTOP SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-10	7	10	1 1/2 x 6 x 9	3.2
SS-12	10	12	1 1/2 x 6 x 9	3.4
SS-18	15	18	1 1/2 x 6 x 9	3.6
SS-25	20	25	2 1/4 x 7 x 9 1/2	4.2
SS-30	25	30	3 1/4 x 7 x 9 1/2	5.0



MODEL SS-25M

DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2 1/4 x 7 x 9 1/2	4.2
SS-30M*	25	30	3 1/4 x 7 x 9 1/2	5.0



MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30	25	30	3 1/2 x 19 x 9 1/2	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30M	25	30	3 1/2 x 19 x 9 1/2	7.0



MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3 1/2 x 19 x 9 1/2	10.5
SRM-30-2	25	30	3 1/2 x 19 x 9 1/2	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3 1/2 x 19 x 9 1/2	10.5
SRM-30M-2	25	30	3 1/2 x 19 x 9 1/2	11.0



MODEL SS-12SM/GTX



MODEL SS-10EFJ-98

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

EF JOHNSON AVENGER GX-MC41
EF JOHNSON AVENGER GX-MC42
EF JOHNSON GT-ML81
EF JOHNSON GT-ML83
EF JOHNSON 9800 SERIES
GE MARC SERIES
GE MONOGRAM SERIES & MAXON SM-4000 SERIES
ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
MOTOROLA LOW POWER SM50, SM120, & GTX
MOTOROLA HIGH POWER SM50, SM120, & GTX
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

NEW SWITCHING MODELS

SS-10GX, SS-12GX
SS-18GX
SS-12EFJ
SS-18EFJ
SS-10-EFJ-98, SS-12-EFJ-98, SS-18-EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

CIRCLE 134 ON READER SERVICE CARD



G3-144
Omni Directional
Fixed Station

The **G3-144** was designed with the cost conscious amateur in mind. This small, inexpensive antenna is ideal for home or command post.

Gain: 3 dB
Length: 7.5'
Max Power: 200 watts



NEW!

NEW!

MX Series
Mobile Magnetic
Mount Antennas

Dual Band
MX-270 & MX-270B

Gain: 2.4 / 4 dB
Max Power: 100 watts
Mount: NMO style
magnet



BBG & BBGT-144
NMO Style Antennas

Gain: 3.4 dB
Max Power: 200 Watts
Mount: NMO style
includes swivel ball and
spring. BBGT
includes trunk
mount and coax.



See us at Dayton - booths 31 & 32
New-Tronics Antenna Corporation

1 New-Tronics Place
Mineral Wells, Texas 76067-9563
940.325.1386 fax 940.328.1409
e-mail: service@new-tronics.com
www.new-tronics.com

*Reliability & Performance...
Beyond your Expectations!*

CIRCLE 65 ON READER SERVICE CARD

Announcements

• **QRP TAC Sprint** – Sponsored by the eastern PA QRP Club, Saturday June 3, 1800– 2359 UTC, CW only. Exchange: Call, RST, name, state, and TAC (telephone area code) or DX area code. Pennsylvania stations will send an "X" after the prefix. Categories: QRP, 5 watts or less output; QRPp, less than 1 watt output; Tactical, portable or temporary station using temporary antennas; Homebrew, you built a kit or from scratch; Newbie, first contest you have ever entered. You may enter up to four possible combinations of categories. QSO points: 5 points for every QSO; 10 points for each QSO with a Pennsylvania station; 500 points for each contact with N3EPA. The same station may be worked on different bands for additional QSO points and multipliers. HF bands 10, 15, 20, 40, 80 meters. No WARC bands. Suggest staying "around" the standard QRP frequencies. Multiplier = TAC and DX TAC; 500 points x number of QSOs with N3EPA. Total score = (QSO points x TACs) + 1000 points for every category you enter. Plaques for each winner in each category and awards for second and third place. Submit log showing Band, Time UTC, Station, RST Sent & Received, Name, State or Country, Telephone Area Codes. Logs must be received by July 8, 2000 and go to Eastern PA QRP Club, N3EPA, Att: Ron Polityka, 1155 Robeson St. 2nd Fl., Reading, PA 19604-2151. For a sample log: web <<http://www.n3epa.org>>, e-mail: <n3epa@talon.net>, or send an SASE to address above.

• **FieldStar 2000** – June 23–25, Vernonia Peak Observatory, Vernonia, Oregon. Includes Field Day contest with call W7NTO, Star Party and Conference (24th), and Astronomy Swapmeet (24th). For information: FieldStar 2000, Vernonia Peak Observatory, 55371 McDonald Rd., Vernonia, OR 97064 (503-429-2430; e-mail: <smikalow@vernonia.com>).

• **These Special Events are scheduled for June:**
K2BSA/Ø, from Xtreme Scouting, St. Louis, Missouri; Greater St. Louis Area Council Boy Scouts of America; June 2–4 on 14.290, 21.360, 28.350. QSL to Richard A. Grady, NØJYU, 5976 Keith Place, St. Louis, MO 63109-3446 (SASE).

W2I, from Watsessing School International Festival, Bloomfield, New Jersey; May 26–June 9. QSL with SASE or 2 IRCs to W2VU Callbook address or c/o CQ magazine. Please state "W2I Special Event" on the envelope.

W2MO, from 8th Civil War Enactment, Peterboro, New York; Madison-Oneida ARC; 1400–2000Z June 10 on 7.275, 14.275, 28.375, 146.55 MHz. For certificate send SASE to MOARC, Box 241, Verona, NY 13478.

W3GR, from commemoration of use of electronics on D-Day, Baltimore, Maryland; Historical Electronics Museum ARC; 1400–2100Z June 3 and 4 on 7.115, 14.250, 21.245, 28.440 MHz. For certificate send QSL and 55 cents postage to W3GR, Historical Electronics Museum, P.O. Box 746, MS 4015, Baltimore, MD 21203 (e-mail: <w3gr@arrl.net>; web: <<http://members.aol.com/wk3p>>).

KSØJC, honoring Marshal Ensor, code teacher, from Ensor Museum, Olathe, Kansas, 1800–2200Z June 3 and 4. For QSL send QSL and SASE to Dan Reed, 29545 W. 152nd Ter., Gardner, KS 66030.

J430, from the lighting of the Olympic Flame in Olympia, Greece; May 5–30 on 10–160 meters SSB only. Colorful QSL (direct only) via John Theofilopoulos, SV3AQR, Box 30, Amalias 27200, Greece.

VB3SF, from Old Home Week 2000, Smiths Falls, Ontario, Canada; June 30 to July 2. For more information contact <ve3gid@rac.ca> or <ve3uuh@rac.ca>; web: <www.falls.igs.net/~scalver>.

VE3MIS, from Streetsville Founders Bread & Honey Festival, Streetsville, ON, Canada; 1400–2000Z June 3 & 4 on 7.230, 14.240, 28.340 MHz ±QRM. QSL to MARC, c/o Michael Brickell, 2801 Bucklepost Cres., Mississauga, ON L5N 1X6 Canada (e-mail info: <ve3mis@rac.ca>; <www.marc.on.ca>).

• **The following hamfests, etc., are slated for June:**
June 2–3, **Hamboree 22** ARRL Midwest/Dakota Div. & Iowa State QRP Convention, Marina Inn, **S. Sioux City, Nebraska**. Contact LeRoy Baldwin, WØOFY, 645 S. Mentzer Rd., Robins, IA 52328 (319-395-7183; e-mail: <lgbw0ofy@aol.com>). Talk-in 146.31/91. (Exams)

June 2–3, **Atlanta Radio Club Hamfest**, Jim Miller Park, **Marietta, Georgia**. Contact Charles Golsn, N4T2M, 5580 Lake Forest Dr., Atlanta, GA 30342 (404-252-3303; e-mail: <cgolsen@atlanta.com>). Talk-in 146.820-. (Exams 9 AM June 3 at First United Methodist Church.)

June 2–4, **Atlantic Div. Convention**, Monroe County Fairgrounds, **Henrietta, New York**. Contact Harold Smith, K2HC, 300 White Spruce Blvd., Rochester, NY 14623

(phone 716-424-7184; fax 716-424-7130; e-mail: <info@rochesterhamfest.org>; web: <<http://www.rochesterhamfest.org>>). Talk-in 146.88. (Exams Sat. afternoon Monroe Social Services Bldg.)

June 3, **Sagamon Valley RC Hamfest**, Illinois State Fairgrounds, **Springfield, Illinois**. Contact Ed Gaffney, KA9ETP, 13977 Frazee Rd., Box 14A, Divemon, IL 62530 (217-628-3697; e-mail: <egaffney@family-net.net>). Talk-in 146.685-. (Exams)

June 4, **Manassas Hamfest**, Prince William County Fairgrounds, **Manassas, Virginia**. Contact Mary Lu, KB4EFP, 703-369-2877; e-mail: <mblasd1638@aol.com>. Talk-in on 146.97, 224.660-, 442.200+. (Exams call Keith, 703-791-6129 or <km4aa@erols.com>.)

June 4, **Newington Amateur Radio League Hamfest**, Newington High School, **Newington, Connecticut**. Contact Tom Ponte, WB1CZX, 99 Jeffrey Ln., Newington, CT 06111 (860-666-4539; e-mail: <wb1czx@arrl.net>). Talk-in 145.45, 146.52, 224.84, 443.05. (Exams 12 noon, walk-ins okay, more info K3UFG 860-206-3379; <k3ufg@arrl.net>)

June 4, **Hall of Science ARC Hamfest**, NY Hall of Science parking lot, Flushing Meadow Corona Park, **Queens, New York**. Contact Stephen Greenbaum, WB2KDG, evenings 718-898-5599, <wb2kdg@bigfoot.com>. Talk-in 444.200 repeat, PL 136.5, 146.52 simplex. (Exams 10 AM, info 718-323-3464)

June 9–10, **Ham Com 2000 & ARRL Texas State Convention**, **Arlington, Texas**. Contact Ham Com, Inc., P.O. Box 12774, Dallas, TX 75225-2111 (phone 214-361-7574; <www.hamcom.org>; <<http://www.hamcom.org>>). (Exams)

June 10, **Bloomsburg Hamfest/Computer Show & ARRL EPA Section Convention**, Bloomsburg Fairgrounds, **Bloomsburg, Pennsylvania**. Contact George, N3KYZ, 570-784-2299, e-mail: <n3kyz@epix.net>. Talk-in 147.225+, PL203.5, 146.52. (Exams 10 AM)

June 10, **Central Missouri Hamfest**, Macon Votek School, **Macon, Missouri**. Contact Dale Bagley, e-mail: <n0pr@arrl.net>; web: <www.cyberusa.com/~kfoster/hamfest.htm>.

June 11, **Wabash Hamfest & Computer Show**, Wabash County 4-H Fairgrounds, **Wabash, Indiana**. Contact Wabash County ARC, c/o Ralph Frank, 4010 N. 700 W., Wabash, IN 46992 (765-833-7372; e-mail: <wial@netusal.net>). Talk-in 147.03/147.63, 442.325/447.325.

June 11, **20/9 ARC Hamfest 2000**, Mahoning County Joint Vocational School, **Canfield, Ohio**. Contact Don Stoddard, N8LNE, 55 S. Whitney Ave., Youngstown, OH 44509 (330-793-7072; e-mail: <N8LNE1@juno.com>). Talk-in 147.315, 443.225, 145.275.

June 11, **Knoxville Hamfest & ARRL Delta Div. Convention**, National Guard Armory, **Knoxville, Tennessee**. Contact David Bower, K4PZT, 423-670-1503 evenings, e-mail: <rack@kornet.org>. Talk-in 147.30+, 224.50-, 444.575+. (Exams register before 1:30 PM)

June 11, **Goodyear ARC Hamfest**, Goodyear Wingfoot Lake Park, **Suffield, Ohio**. Contact Don Longshore, N8QCA, 330-733-7989. Talk-in 146.985- or 146.520. (Exams)

June 11, **LIMARC ARC Spring Hamfest**, BRIarcliffe College, **Bethpage, New York**. Call 24-hour info line 516-520-9311; e-mail: <hamfest@limarc.org>; <<http://www.limarc.org>>. Talk-in 146.85, 136.5PL. (Exams 10 AM)

June 11, **Six Meter Club of Chicago Hamfest**, DuPage County Fairgrounds, **Wheaton, Illinois**. Call 24-hour info line 708-442-4961. Talk-in 146.52, 146.37/97 (107.2). (Exams 9–11 AM, call to register)

June 17, **Franklin AR Repeater Assn. Picnic & Tailgate**, Bronco Club, **Franklin, North Carolina**. Contact Ralph Atkinson, WB4ZNB, 30137 Country Club Rd., Courtland, VA 23837 (757-562-5710). Talk-in 147.30/90.

June 17–18, **Midland Millennium Swap**, Midland County Fairgrounds, **Midland, Michigan**. Contact MARC Hamfest, P.O. Box 1049, Midland, MI 48641-1049; or Del, WB8FYR, 517-636-5097 (w), 517-689-3477 (h), e-mail: <lafevordel@aol.com>.

June 18, **Dad's Day Hamfest & Computer Show**, Lake County Fairgrounds, **Crown Point, Indiana**. Contact Jim Hamey, KF9EX, 2600 W. 61st Place, Merrillville, IN 46410 (219-980-1798; e-mail: <kf9ex@arrl.net>). Talk-in 147.00, 146.520. (Exams)

June 18, **Father's Day Hamfest & Computer Show/Flea Market**, Nordonia High School, **Macedonia, Ohio**. Contact Rich James, N8FIL, 330-468-6021; CARS, P.O. Box 133, Sagamore Hills, OH 44067; e-mail: <hamfest@cars.org>; <<http://www.cars.org>>. Talk-in 146.82-

AMERITRON True Legal Limit™ Tuner

Easily handles 1500 Watts continuous carrier even on 160 Meters . . . High-current edge-wound silver plated Roller Inductor . . . Two 500 pf high capacitance tuning capacitors with 6:1 vernier reduction drives . . . 3 core choke balun . . . Six position antenna switch . . . True peak reading Cross-Needle SWR/Wattmeter . . .

Call your dealer for your best price!

AMERITRON ATR-30

\$599

Suggested Retail

- Handles 1500 Watts carrier
- Super High Current edge-wound silver plated Roller Inductor
- 500 pf tuning capacitors with 6:1 vernier reduction drives
- 3 core choke balun
- 6 position antenna switch
- True peak reading meter



AMERITRON's ATR-30 True Legal Limit™ roller inductor antenna tuner is ham radio's toughest! It'll handle 1500 Watts continuous carrier output on all modes and all HF bands into most antennas -- even on 160 Meters where most antenna tuners fail.

It's perfect for Ameritron's most powerful amplifiers where the ATR-30 just loafs.

All band coverage lets you operate 1.8-30 MHz including all MARS and WARC bands.

Super High Current Roller Inductor

You'll see Ameritron's new super high current air core roller inductor. It's edge-wound from a thick solid copper strip and silver plated. This produces a large surface area and a massive conductor. It can carry huge circulating RF currents and withstand

tremendous heat that'll melt or burn ordinary roller inductors.

A gear driven turns counter and crank knob gives you precise inductance control.

Two 500 pf Tuning Capacitors

Two 500 pf -- the highest of any antenna tuner -- variable transmitting capacitors give you no-arc wide range impedance matching for true high power performance.

6:1 vernier reduction drives makes capacitor tuning smooth and easy.

Super Balun, 6 position Antenna Switch

Super heavy duty three core choke balun lets you match virtually any balanced feed-line antenna without core saturation.

A 6 position antenna switch lets you select your desired operating antenna.

Read true Peak Power

Ameritron's active electronic true peak reading meter accurately reads forward and reflected power and SWR simultaneously on a lighted Cross-Needle meter.

Roomy Cabinet maintains High-Q

Roomy extra-strong .080 inch thick aluminum cabinet gives highest efficiency and lowest loss. 13 1/4" W x 5 5/8" H x 17 1/2" D inches.

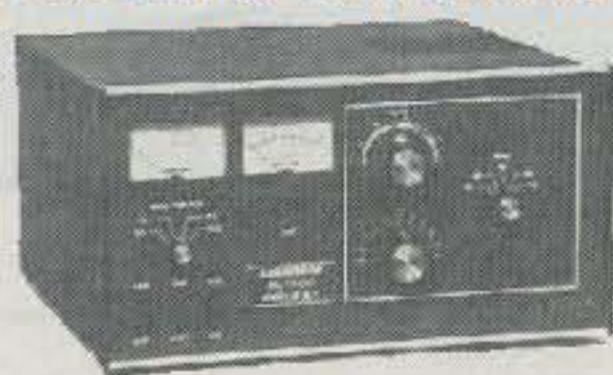
AMERITRON ATR-15 Antenna Tuner

ATR-15, \$399. Handles 1500 Watts RF output. Slightly less on 160 Meters. Bandswitched T-Network, peak reading SWR/Wattmeter, covers 1.8-30 MHz, 6 pos. antenna switch, balun. 13 1/2" W x 5 1/2" x 13 1/4" in. Perfect for AL-80B/AL572.

Ameritron has the best selection of TrueLegalLimit™ HF Amplifiers

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

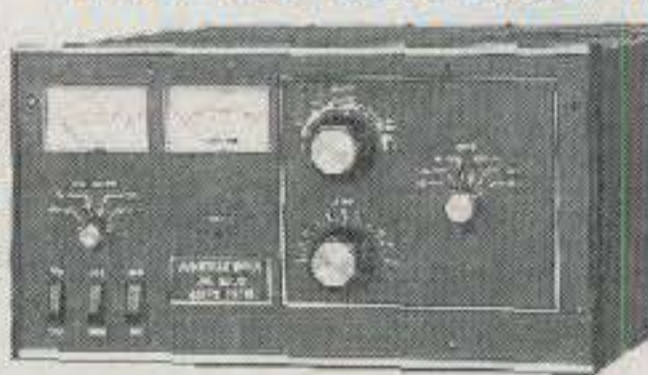
Ameritron's most powerful Amp with Eimac® 8877 ceramic tube



AL-1500
\$2845
Suggested Retail
TrueLegalLimit™
Ameritron's
most powerful
amplifier uses

the herculean Eimac® 8877 ceramic tube. It's so powerful that 65 Watts drive gives you the full output power -- and it's just loafing because the power supply is capable of 2500 Watts PEP. All HF bands, all modes. 77 pounds, 18 1/2" D x 17" W x 10" H in.

Ameritron's toughest Amp with Eimac® 3CX1200A7 tube



AL-1200
\$2395
Suggested Retail
TrueLegalLimit™
Get ham
radio's toughest
tube with AL-

1200. The Eimac® 3CX1200A7 has a 50 Watt control grid dissipation and the lowest history of field replacement of any modern transmitting tube that we use. 90 Watts in gives you full power out. All HF bands, all modes. 76 pounds, 18 1/2" D x 17" W x 10" H in.

Ameritron's classic Amp with 2 graphite plate Amperex® 3-500ZG tubes



AL-82
\$2295
Suggested Retail
TrueLegalLimit™
Most linears
using 3-500s
can't give you

1500 Watts because their lightweight power supplies can't use these tubes to their full potential. AL-82 is ham radio's only super 3-500 amp! 100 Watts in gives you full power out. All HF bands, all modes. Hefty 76 pounds, 18 1/2" D x 17" W x 10" H inches.

1.5 plus kW SSB HF Amp with 2 Eimac® 3CX800A7 tubes



AL-800H, \$2395 suggested retail. Two Eimac® 3CX800A7 tubes produces 1500 plus Watts SSB PEP with 55 Watts drive. 52 lbs., 8 1/2" H x 16 1/2" D x 14 1/4" W in. AL-800, \$1695 suggested retail, single 3CX800A7, 1250 Watts out with 70 Watts drive.

NearLegalLimit™ Amp with four Svetlana® 572B tubes



AL-572, \$1395 suggested retail. New class of Near Legal Limit™ amplifier gives you 1300 Watts SSB PEP power output (70 Watts drive) for 65% of price of full legal limit amps! Instant 3-second warm-up. 40 lbs. 8 1/2" H x 15 1/2" D x 14 1/2" W inches.

1 kW Desktop HF Amp with Amperex® 3-500ZG tube



AL-80B, \$1299 suggested retail. Gives you full kilowatt SSB PEP output (85 Watts in) from a whisper quiet compact desk-top linear. 8 1/2" x 14 x 15 1/2" in. Plugs into 120 VAC outlet. Graphite plate Amperex® 3-500ZG tube. Nearly 70% efficiency. Weighs 48 lbs.



Precision SWR/Wattmeter

AWM-30, \$149 suggested retail. Active circuit gives true peak/average readings on lighted Cross-Needle meter. 3000/300 Watt ranges. Remote sensor.

Call your dealer for your best price!

Free Catalog: 800-713-3550

AMERITRON®

... the world's high power leader!

116 Willow Road, Starkville, MS 39759
TECH (662) 323-8211 • FAX (662) 323-6551
8 a.m. - 4:30 p.m. CST Monday - Friday
For power amplifier components call (662) 323-8211
<http://www.ameritron.com>
Prices and specifications subject to change without notice. ©2000 Ameritron

See Us At Dayton Hamvention – Booths 21, 22, 23!



HAM RADIO OUTLET

WORLDWIDE DISTRIBUTION

ANAHEIM, CA
(Near Disneyland)
933 N. Euclid St., 92801
(714) 533-7373
(800) 854-6046
Janet, KL7MF, Mgr.

BURBANK, CA
2492 W. Victory Bl., 91506
(818) 842-1786
(800) 854-6046
Eric, KA6IHT, Mgr.
Victory Blvd. at Buena Vista
1 mi. west I-5

OAKLAND, CA
2210 Livingston St., 94606
(510) 534-5757
(800) 854-6046
Mark, W17YN, Mgr.
I-880 at 23rd Ave. ramp

SAN DIEGO, CA
5375 Kearny Villa Rd., 92123
(858) 560-4900
(800) 854-6046
Tom, KM6K, Mgr.
Hwy. 163 & Claremont Mesa

SUNNYVALE, CA
510 Lawrence Exp. #102
94086
(408) 736-9496
(800) 854-6046
Ken, K1ZKM, Mgr.
So. from Hwy. 101

NEW CASTLE, DE
(Near Philadelphia)
1509 N. Dupont Hwy., 19720
(302) 322-7092
(800) 644-4476
Rick, K3TL, Mgr.
RT.13 1/4 mi., So. I-295

PORTLAND, OR
11705 S.W. Pacific Hwy.
97223
(503) 598-0555
(800) 854-6046
Rich, KK7PL, Mgr.
Tigard-99W exit
from Hwy. 5 & 217

DENVER, CO
8400 E. Iliff Ave. #9, 80231
(303) 745-7373
(800) 444-9476
Joe, KD0GA, Mgr.
John, K5EHP, Mgr.

PHOENIX, AZ
1939 W. Dunlap Ave., 85021
(602) 242-3515
(800) 444-9476
Gary, N7GJ, Mgr.
1 mi. east of I-17

ATLANTA, GA
6071 Buford Hwy., 30340
(770) 263-0700
(800) 444-7927
Mark, KJ4VO, Mgr.
Peri, KC4CQS, Mgr.
Doraville, 1 mi. no. of I-285

WOODBRIIDGE, VA
(Near Washington D.C.)
14803 Build America Dr.
22191
(703) 643-1063
(800) 444-4799
Mike, N4MDK, Mgr.
Exit 161, I-95, So. to US 1

SALEM, NH
(Near Boston)
224 N. Broadway, 03079
(603) 898-3750
(800) 444-0047
Chuck, KM4NZ, Mgr.
sales@hamradio.com
Exit 1, I-93;
28 mi. No. of Boston

Call For Spring Specials!



FT-840

- 100W • 12V DC • DDS
- Gen. Cov. Rx, 100 mem.
- Optional Ext. Auto • Tuners Available

Call Now For Our Low Pricing!



FT-1000MP HF Transceiver

- Enhanced Digital Signal Processing
- Dual RX
- Collins SSB filter built-in
- 100W, Power supply built-in

Call Now For Low Pricing!



FT-100 HF/6M/2M/70CM Transceiver

- Compact Transceiver w/detachable front panel
- Rx 100kHz to 970mHz (cell blocked)
- Tx 100W 160-6M, 50w 2M, 20W 70CM
- Built-in DSP, Vox, CW keyer
- 300 Memories

Call Now For Low Pricing!



FT-2600M 2M Mobile

- Compact 2M 60W mobile • 12000/9600 baud
- 4 selectable power levels • Built-in CTCSS/DCS
- 175 mems, 8 character alpha-numeric display
- Low intermod Rx, Rugged

Call Now For Low Pricing!



VR-500

Handheld Receiver

- 100kHz - 1300 mHz
- CW, LSB, USB, AM, FM (narrow and wide)
- Cell blocked in USA
- 1000 memory channels
- 8 character alpha-num display

Great Sound, Call Today!



VX-5R

50/2M/440HT

- Wideband RX, 6M-2M-440TX
- 5W output
- 220 mems, opt. barometer unit
- Alpha Numeric Display
- CTCSS/DCS built-in
- Li-Ion Battery

Call For Low Price!



VX-1R

2M/440 Sub-Mini HT

- 290 Memory Channels
- .5W output
- Receives 76-999mHz plus AM BCB (Cell Band Blocked)
- Lithium Ion Battery

Call For Your Low Price!



FT-50RD

2M/440MHz Compact HT

- DVR, Decode, Paging Built-in
- Alpha numeric display
- Wide Band receive
- Battery Saver
- 112 Memories
- Mil-Spec
- HiSpeed scanning

Call For Your Low Price!



FT-847

Ultimate Base Station, HF, VHF, UHF

- 100w HF/6M, 50w 2M/430 mHz
- DSP • Full Duplex Cross-band
- 1200/9600 Baud Packet Ready

Call for Low Price!



FT-90R

2M/440 Mini Dualbander Transceiver

- 50w 2m, 40w 440mHz
- Wide Rx • Detachable Front Panel
- Packet Ready 1200/9600 Baud
- Built-in CTCSS/DCS Encoder/Decoder
- Less than 4" wide!

Call for Your Low Price!



FT-920 HF+6M Transceiver

- 100w 160-6M, 12VDC
- Built-in DVR, CW Memory Keyer
- DSP, Auto-Notch • 99 Memories
- Computer controllable, CAT System

Call For Low Pricing!



FT-810OR 2M/440 Mobile

- Ultra Compact • 50w/35w 2m/440
- 110 memories • Wide Band RX
- Backlit mic • Removable front panel w/op

Call Now For Special Pricing



AZ, CA, CO, GA, VA residents add sales tax. Prices, specifications, descriptions, subject to change without notice.

Look for the HRO Home Page on the World Wide Web
<http://www.hamradio.com>

COAST TO COAST
FREE SHIPPING
UPS - Most Items Over \$100
Rapid Deliveries From
The Store Nearest To You!



Drama on the high seas comes to a ham shack near you, as a call for help brings amateur radio operators together to help a wounded boy.

Hams Coordinate High-Seas Rescue

BY BOB JOSUWEIT,* WA3PZO, and RICH MOSESON,** W2VU

“**W**e’re on a sailboat off Nicaragua. My son has been shot and I think he’s going to die. What can I do?” This was the situation into which a group of hams around North, Central, and South America found themselves thrust on March 28, after a distress call turned a routine chat on 20 meters into the focal point of an international drama and the start of a week-long rescue effort reaching from Honduras to Florida to Texas, and the halls of Congress.

The drama began as Phil Fiol, WB2BMC, was beginning a routine QSO with Ray Farber, WB1AVE, and they heard a station yelling “Break break break!”

“I was skeptical at first, but I let him in,” says Fiol, “and asked how we could help him. When he started talking, I could tell from the urgent tone in his voice that this was probably legit.”

The voice belonged to Jacco van Tuijl, KH2TD. He was on an around-the-world sailing voyage with his wife, Jannie, KH2TE, and their 13-year-old son, Willem. They had started out five years ago from their home in The Netherlands, got ham licenses about two years ago during an extended stay in Guam, and were now heading for home. They had come through the Panama Canal and were anchored some 50 miles off the Central American coast, near Honduras and Nicaragua.

As you’ve probably heard through the general news media (The story was carried on various network news programs and was highlighted on ABC’s *20/20* and in *People* magazine.) the family was attacked by modern-day pirates, probably drug traffickers, who shot Willem with an AK-47 before “getting nervous” and taking off with an outboard motor and a damaged dinghy as their only “booty.” For the grueling hours that followed, ham radio was Willem’s only lifeline. This is the story of how hams around the Americas pooled their efforts and their abilities, both on and off the air, not only to bring Willem to shore, but to bring him to the advanced medical treatment he needed to survive.

Touched by an Angel?

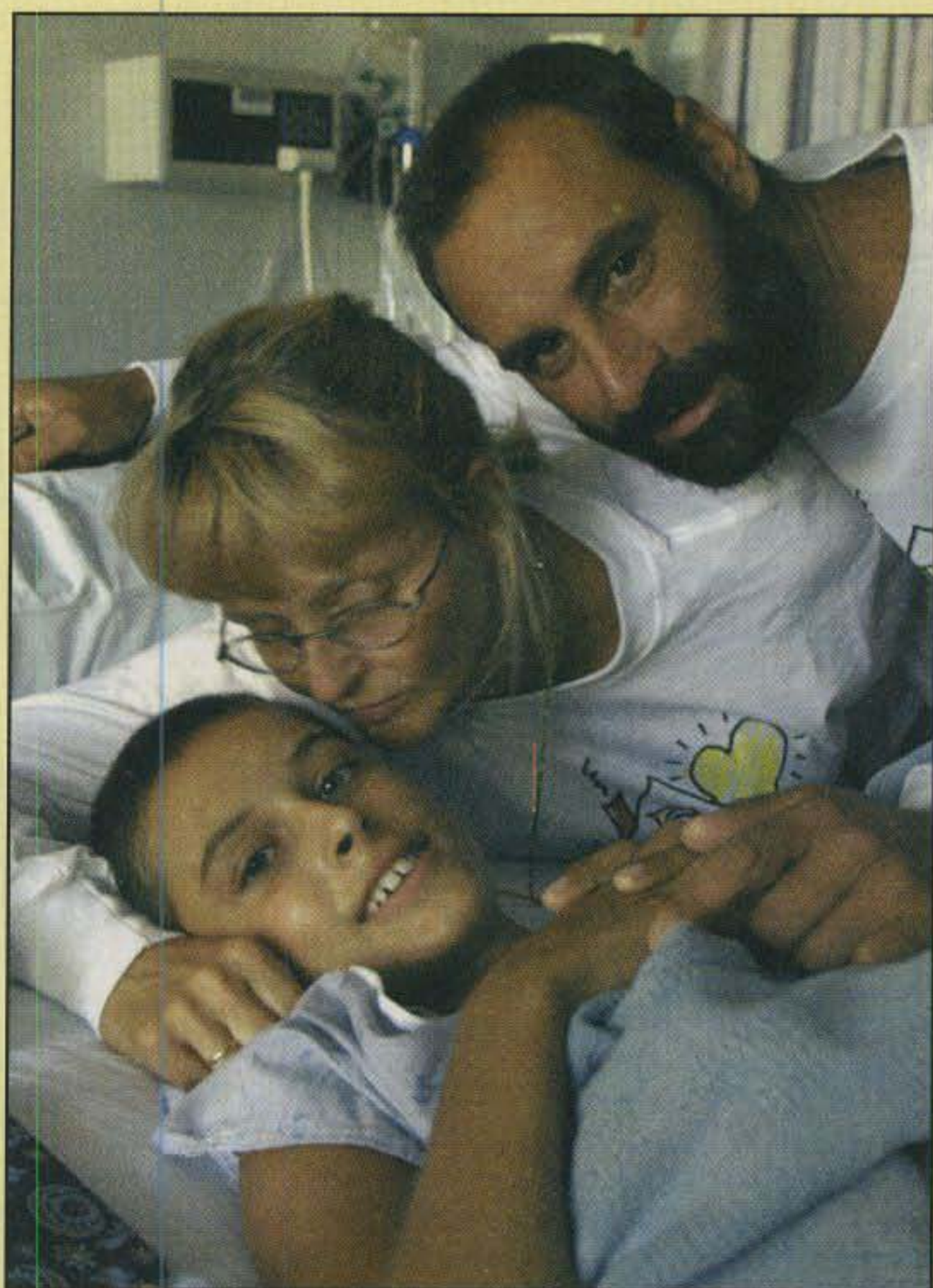
If it hadn’t really happened, this story might have been a script for an episode of *Touched by an Angel* on TV. It is a story of the right people being in the right places at the right time—

* Public Service Editor, CQ

e-mail: <wa3pzo@cq-amateur-radio.com>

** Editor, CQ

e-mail: <w2vu@cq-amateur-radio.com>



Thirteen-year-old Willem van Tuijl (bottom) recuperates from gunshot wounds at Children’s Medical Center of Dallas. He was attacked on March 28 off the coast of Honduras by pirates suspected of being drug traffickers, and was rescued with the help of ham radio operators. With him are his mother, Jannie van Tuijl, KH2TE, center, and his father, Jacco van Tuijl, KH2TD, top. (AP/Wide World photo)

and doing the right thing. “It was like a puzzle; the pieces all had to fit. And they did,” said Jim Haynie, W5JBP, president of the ARRL and one of the participants in this real-life drama.

The initial “piece of the puzzle” was the first person Jacco van Tuijl reached with his distress call. This was Phil Fiol, WB2BMC, manager of the Intercontinental Amateur Traffic

Nets Play Key Role

The Intercontinental Amateur Traffic Net and the Maritime Mobile Service Net both played key roles during this emergency. Both meet daily on 20 meters.

The Intercontinental Amateur Traffic Net (IATN) meets 7 AM to 12 noon on 14.300 MHz. It has been on the air since 1960. The Maritime Mobile Service Network, (12:00–22:00 Eastern time seven days a week, on 14.300/14.313 MHz) was formed in January 1968. The Maritime Mobile Service Network immediately follows the IATN.

The network is recognized by the United States Coast Guard and has been instrumental in handling hundreds of incidents involving vessels in distress. The network also acts as a weather beacon for ships during periods of severe weather and regularly repeats weather warnings and bulletins from the National Weather Service and the National Hurricane Center.

For further information on the nets, check out their web pages or visit them on 20 meters. Intercontinental Amateur Traffic Net: <<http://www.geocities.com/Eureka/Gold/2485/index.html>>; Maritime Mobile Service Net: <<http://www2.acan.net/~mmsn/mmsn.htm>>.

Net (IATN), one of two daily nets that meet on 14.300 MHz to provide assistance primarily to hams at sea. However, Jacco didn't know to look on the net frequency. Phil and Ray, WB1AVE, were rag-chewing up near the top of the band, on 14.343 MHz. They both knew just what to do.

"After he told us what had happened," Fiol told CQ, "Ray went to call the US Coast Guard, and Jacco and I went to 14.300," the frequency shared by the IATN, which operates in the mornings, and the Maritime Mobile Service Net, which follows every afternoon. The Maritime Mobile net was in operation at this time.

"I asked the net control, Roger, WD9EQG, near Chicago, for permission to take over the net frequency for this emergency," Fiol continued. "He handed it over to me, and I grabbed a hold of people on the frequency who I knew had had experience with this sort of thing before . . . They were Dick Fernandes, KD5BZ; Vega, J39GH, in Grenada; Frank Kelly, N3FK; Peter Sosnow, W1KY, a doctor in Niskayuna, New York, near Albany; Fred Moore, W3ZU, near Philadelphia; and Mike Anson, YV5/VE7AMV, in Caracas, Venezuela."

"We started the ball rolling," said Fiol. "The US Coast Guard contacted the Honduran Navy . . . Someone else tried

to contact any cruise ships that might be in the area, since they tend to have doctors and mini-hospitals on board. But there were none nearby. We also had a doctor on frequency, Jim Hirschman, K4TCV, of Miami, Florida. In the background, Ed Petzolt, K1LNC, of Hobe Sound, Florida, was listening and making contact with embassies and US government agencies."

At the same time, Pete Sosnow, W1KY, was contacted by Mike Pilgrim, K5MP, a net control station for the Maritime Net. Sosnow, who works in an emergency room and is used to treating gunshot wounds as part of his normal duties, told CQ he was heading out the door to work when the call came. He offered to be available by telephone should it be required. Sosnow knew all too well that medical treatment was going to be required to save Willem's life and commented that even with all of the modern communications equipment, ham radio still can play an important part in medical care.

Fiol continued, "The Coast Guard then came on frequency to let us know that the Honduran Navy would be getting involved. Meanwhile, Jim, K4TCV, was talking to the boy's dad and mom, telling them to wrap his legs in sheets to minimize blood flow, and to take his pulse every 15 minutes. He also told them not to give him any water or painkillers. The wife, Jannie van Tuijl, KH2TE, is a pediatric nurse, and she was holding and applying pressure to his wound the whole time."

The "Right" Doctor

Jim Hirschman, K4TCV, was the next piece of the puzzle to fall into place. Jim is not only a doctor and a boater, he is one of the fathers of the emergency medical system we take for granted today in the United States. He helped establish the nation's first team of fire department paramedics in Miami in 1968, and since 1974 he has been Medical Director of the Coral Gables (Florida) Fire Rescue System.

"I got a long-distance landline call at 7 PM on Tuesday from Beryl Nelson, VP5DB, an American living in Turks and Caicos," Hirschman told us. "He says, 'Jim, you're needed on the radio.' I said, 'What for?' He said, 'A boy has been wounded on a boat and needs medical advice.' That's what I do, give medical advice on the radio, whether it's to an ambulance crew or on the ham bands."

Jim came up on the net frequency and was immediately told to call Jacco. He introduced himself and asked Jacco to



Fred Moore, W3ZU, of suburban Philadelphia, Pennsylvania, played a key role in getting Willem the help that he needed. Fred was able to speak in Spanish with Honduran Navy officials and was net control of the emergency net through a very long night. (Photo by Bob Josuweit, WA3PZO)

Standby and Listen!

Fred Moore, W3ZU, said that the best help many provided during this emergency was just standing by. "Basically, what needs to be done is a lot of listening and very little talking," said Fred, who is a regular participant on the Maritime Mobile Service Net. "The net control station is obligated to make all aware that there is an ongoing emergency and that he will not accept any frivolous calls. And that's what I did through the night."

He urged operators encountering an emergency net to simply "be quiet and listen" unless they can contribute to the situation. Moore says the long hours of duty and little glory can be gratifying. "It makes me feel good when there's a positive result. Hopefully, we were instrumental in helping to save that boy's life, who was at no fault."

tell him what had happened. Jim related, "He said, 'We're on a sailboat off Nicaragua. My son has been shot and I think he's going to die. What can I do?' . . . I asked him how old his son was and where he'd been shot. He told me, 'He's 13 years old and he was shot in the side and blood is coming out all over, and he is paralyzed. He can't feel anything from the waist down.'"

For the next eight hours Jim kept in contact with Jacco, offering advice as needed, as well as support. "At about 10 o'clock, three hours into all this," Hirschman recounted, "Jacco began to sob, 'My boy is going to die and there's nothing I can do.' I came on and said, 'Jacco, you're a good father and a good mariner and a good communicator. You're doing everything right and I believe everything will be okay. Plus, you have lots of people right here on the frequency cheering you on.' The net control took my cue and he and several other people followed with some very supportive comments to help keep Jacco's spirits up." The family later told reporters they believe Hirschman's advice and availability helped to keep their son alive overnight.

Help in Two Languages

About four hours after everything started, the Honduran Navy came up on frequency. The operator, Nelson, spoke very little English, according to Hirschman, who said he knew enough Spanish to relay the van Tuijl's latitude and longitude. At that point, WB2BMC, still running the net, said he knew that Fred Moore, W3ZU, in Pennsylvania, spoke Spanish fluently, and passed the net control job over to him.

"He started talking and negotiating with the Honduran Navy," said Fiol.

"They in turn set up a rendezvous point to where the van Tuijl's would have to sail—about 8 to 10 hours of sailing time away—where they could transfer Willem and bring him to a sandy beach." Moore told *CQ* he was impressed that from some 2000 miles away he was able to bring the Honduran Navy vessel, the *Cisne*, and the van Tuijl's to the same spot.

Once the rendezvous was made, Willem was transported to an airfield, where a helicopter whisked him and his mother to a hospital in La Ceiba, Honduras. There Willem underwent lifesaving emergency surgery. However, doctors in Le Ceiba told the family that the boy's remaining kidney's function had been compromised, and if Willem did not get proper medical follow-up within the next day or two, it could lead to irreversible complications. There was an urgent need to get him to a hospital where he could receive advanced medical treatment.

More Puzzle Pieces Fall Into Place

Also in La Ceiba was Hector Godoy, HR3HGB, one of the regular net control stations on the IATN. He kept the van Tuijl's in touch with hams in the US and provided a phone patch to the hospital for Jacco until he could get ashore.

Back in the US, Ed Petzolt, K1LNC, was working the phones, trying to find a hospital to which Willem could be transferred. After one hospital turned him down, he contacted Florida Senator Bob Graham, whose office called the Dutch consulate and was told that "we're handling that" and did not pursue it further. Ed also tried without success to get help from the White House.

Meanwhile, ARRL President Jim Haynie, W5JBP, was monitoring regular e-mail updates on the situation. When it seemed that Ed's appeals for help were falling on deaf ears, he decided to see if he could make anything happen.

Haynie told *CQ*, "At first, I figured we'd wait and see what kind of response he gets. But when it seemed that nothing was going to happen right away, I suggested that my secretary call Congressman (Pete) Sessions, whom I'd met with earlier this year on a trip to Washington." (*Sessions was instrumental late last year in getting the FCC to finally make a decision on restructuring.*—ed.) Haynie continued, "His Chief of Staff, Jeff Koch, who's also a ham (NU5Z), got involved and said he'd work on it. Twenty minutes later I got a call back that Congressman Sessions had gotten clear-



Rep. Pete Sessions (R-Texas) brought together key elements of the successful effort to bring Willem to the United States for advanced treatment, after being asked to help by ARRL President Jim Haynie, W5JBP. (Photo courtesy Rep. Sessions)

ances from INS (Immigration and Naturalization Service) and U.S. Customs."

The congressman's office, along with Haynie, also got the wheels moving for Children's Medical Center in Dallas not only to accept Willem for treatment, but also to send its own airplane to Honduras to pick him up. This required even more cooperation from INS and U.S. Customs, said Koch, because the hospital wanted to bring the flight into Love Field, which isn't normally used for international flights.

Koch had to arrange for customs and immigration officials to be on-hand when the flight arrived, "something they don't usually do at 2 in the morning," noted his boss, Rep. Sessions. Koch also got the Federal Aviation Administration to designate the flight as a "Lifeboat" flight, which he says gives it priority clearance "to make a beeline for the airport." The FAA also contacted its Central American counterpart, which arranged to keep the airport in Honduras open past its normal 9 PM closing time. Hector, HR3HGB, managed to arrange to have a fuel truck waiting at the airport to refuel the small jet when it arrived.

"Children's Medical Center is the real hero," said Congressman Sessions. "The rest of us just helped. Children's Medical Center decided to take this boy and they're the ones who dispatched the jet. What we did, from this office,

was (help) make everything work in a coordinated fashion . . . All this was, was doing the right thing. Jim Haynie and Stacy (Jim's assistant) and Children's Medical Center did most of the work and deserve the lion's share of the credit."

Sessions says his main role was bringing the key parties together. "The importance of this entire matter is that the first run of trying to help this boy—through the embassy, a senator's office, and the White House—was to no avail," the Congressman explained. "Because of Jim Haynie and his relationship not only with Jeff, but with me, we were able to coordinate an across-the-board response to help this young man. We know each other, we trust each other . . .

. . . and we have the same kind of relationship with Children's Medical Center."

At press time, Willem van Tuijl remained hospitalized in Dallas, still paralyzed from the waist down, but facing a full recovery of his kidney functions. The pirates had not been caught, and virtually no one held out any hope that they ever would be. However, his parents have no doubt that amateur radio saved Willem's life.

The Value of Ham Radio

"I thought there was a high likelihood that Willem would die, especially as the hours ticked by without help," said Hirschman in an interview. "But I figured

Handling Maritime Emergencies

The Maritime Mobile Service Net recommends that anyone receiving an emergency call from a boat or ship try to get the following information for relay to Coast Guard or other appropriate officials:

1. Name of the person initiating the emergency announcement
2. Callsign (if the person is a ham)
3. Nature of the emergency
4. Latitude and longitude (or general position)
5. Number, age, and condition of people on board
6. What is the weather like? What is the sea state?

Remember, in an emergency anyone may use any means at his/her disposal to call for help, including the use of amateur frequencies by non-hams. In addition, if you are handling a maritime emergency, you may be contacted on amateur frequencies by the Coast Guard and/or domestic/foreign military stations. This is all perfectly legal, and you should cooperate fully.

as long as he's alive and his father is still talking, I'll stick with him, because where there's life, there's hope. So I stuck with him and it turns out it's a good thing I did. . . . I was glad that I was an amateur radio operator with the skills and equipment to participate in this save, and to be able to contribute my professional skills."


"Without amateur radio this would be a story about a boy who died in a Honduran hospital," said Haynie in an interview with the *Dallas Morning News*. "This isn't the first time I've been involved in emergency communications," Haynie later told *CQ*, "but it is the first time I've ever been able to help get things to happen real quick . . . a couple of hours on 20 meters and 20 or 30 phone calls, and things happen."

The family's 44-foot sailing sloop remains in Roatan, Honduras, with the family cat, "Ketchicat," still aboard. The vessel and Ketchicat were being taken care of by a local marina, which gave the family a month's free dockage. Jacco says he hopes the name of his vessel, *Hayat*, will be a good omen. In Turkish, his mother's native language, van Tuijl said, "It means *life*. That's got to be a good sign."

Fund Established


A fund has been established to assist the van Tuijl family with medical expenses. Donations are invited to: Willem Fund, c/o Southwest Bank, 1603 LBJ Freeway, Suite 100, Dallas, TX 75234. ■

ADVANCED SPECIALTIES INC.
New Jersey's Communications Store



VX-5R
50/144/430 MHz Triple Band
WideReceive, 5w Output

YAESU ALINCO
AMATEUR RADIO'S VALUE LEADER™




DR-605T
100 mem. Dual Band Mobile

Authorized Dealer


ALINCO * LARSEN * COMET * RMS * ADI * MFJ * RAMSEY KITS
MAHA * ANLI * UNIDEN * RANGER * YAESU * REXON

NEW AMATEUR RADIO - SCANNERS - BOOKS - ANTENNAS -
FILTERS - GMRS - ACCESSORIES & MORE



DJ-V5
New "Clear Ice Blue"
V/UHF, FM
Handheld

Closed Sunday & Monday NO CATALOGS
Orders/Quotes 1-800-9-2M-9HAM
(201)-VHF-1270
114 Essex Street Lodi, NJ 07644



FT-90R
Micro Mobile Dual Band

web site: <http://home.att.net/~advancedspec/>

- DIP switch programmable
- Miniature in size
- 37 EIA tones, 27 non-standard tones from 33.0 to 254.1 Hz included
- Reverse Burst built-in
- Easy 3 wire hookup



SS-64 CTCS Encoder
.66" x 1.08" x .21"

SS-64 DIP Switch Programmable CTCS Encoder \$28.95

- Fully enclosed CTCS encoder
- All 32 EIA tones from 67.0 to 203.5 Hz included
- Perfect for mobile / base applications



TE-32 Multi-Tone CTCS Encoder \$49.95

- 51 CTCS Tones
- 106 DCS Codes
- Supports 157 Repeater Subscribers
- On-Line Computer Help
- Repeater CW ID
- Air Time Loading & Analysis Graphs
- Signalling Formats: CTCS, DCS & DTMF



TP-3200 Shared Repeater Tone Panel

TP-3200D Table Top Version \$269.95 each
TP-3200RM-A Single Rack Mount version \$279.95 each
TP-3200RM-B Triple Rack Mount version \$279.95 each
*Holds up to three TP-3200s

- Eight programmable, selectable messages
- Fully field programmable via included keypad
- Meets all FCC identification requirements



ID-8 Automatic Morse Code Identifier \$69.95



ID-8 Automatic Morse Station Identifier \$69.95



COMMUNICATIONS SPECIALISTS, INC.
426 WEST TAFT AVENUE • ORANGE, CA 92865-4296
(714) 998-3021 • FAX (714) 974-3420
Entire U.S.A. (800) 854-0547 • FAX (800) 850-0547
<http://www.com-spec.com>

CIRCLE 48 ON READER SERVICE CARD

10 Bands -- 1 MFJ Antenna!

Full size performance . . . No ground or radials

*Operate 10 bands: 75/80, 40, 30, 20, 17, 15, 12, 10, 6 and 2 Meters with one antenna
Separate full size radiators . . . End loading . . . Elevated top feed . . . Low Radiation Angle . . . Very wide bandwidth . . . Highest performance no ground vertical ever . . .*

Operate 10 bands -- 75/80, 40, 30, 20, 17, 15, 12, 10, 6 and 2 Meters with this MFJ-1798 vertical antenna and get full size performance with no ground or radials!

Full size performance gives high efficiency for more power radiated. Results? Stronger signals and more Q-5 QSOs.

Full size performance also gives you exceptionally wide bandwidths so you can use more of your hard earned frequencies.

Full size performance is achieved using separate full size radiators for 2-20 Meters and highly efficient end loading for 30, 40, 75/80 Meters.

Get very low radiation angle for exciting DX, automatic bandswitching, omni-directional coverage, low SWR. Handles 1500 Watts PEP SSB.

MFJ's unique *Elevated Top Feed™* elevates the feedpoint all the way to the top of the antenna. It puts the maximum radiation point high up in the clear where it does the most good -- your signal gets out even if you're ground mounted.

It's easy to tune because adjusting one band has minimum effect on the resonant frequencies of other bands.

Self-supporting and just 20 feet tall, the MFJ-1798 mounts easily from ground level to tower top -- small lots, backyards, apartments, condos, roofs, tower mounts.

Separate Full Size Radiators

Separate full size quarter wave radiators are used on 20, 17, 15, 12, 10 and 2 Meters. On 6 Meters, the 17 Meter radiator becomes a 3/4 wave radiator.

The active radiator works as a stub to decouple everything

MFJ's Super High-Q Loop™ Antennas



MFJ's tiny 36 inch diameter loop antenna lets you operate 10 through 30 MHz continuously -- including the WARC bands!

Ideal for limited space -- apartments, small lots, motor

homes, attics, or mobile homes. **\$379⁹⁵** MFJ-1786
Ship Code F

Enjoy both DX and local contacts mounted vertically. Get both low angle radiation for excellent DX and high angle radiation for local, close-in contacts. Handles 150 watts.

Super easy-to-use! Only MFJ's super remote control has *Auto Band Selection™*. It auto-tunes to desired band, then beeps to let you know. No control cable is needed.

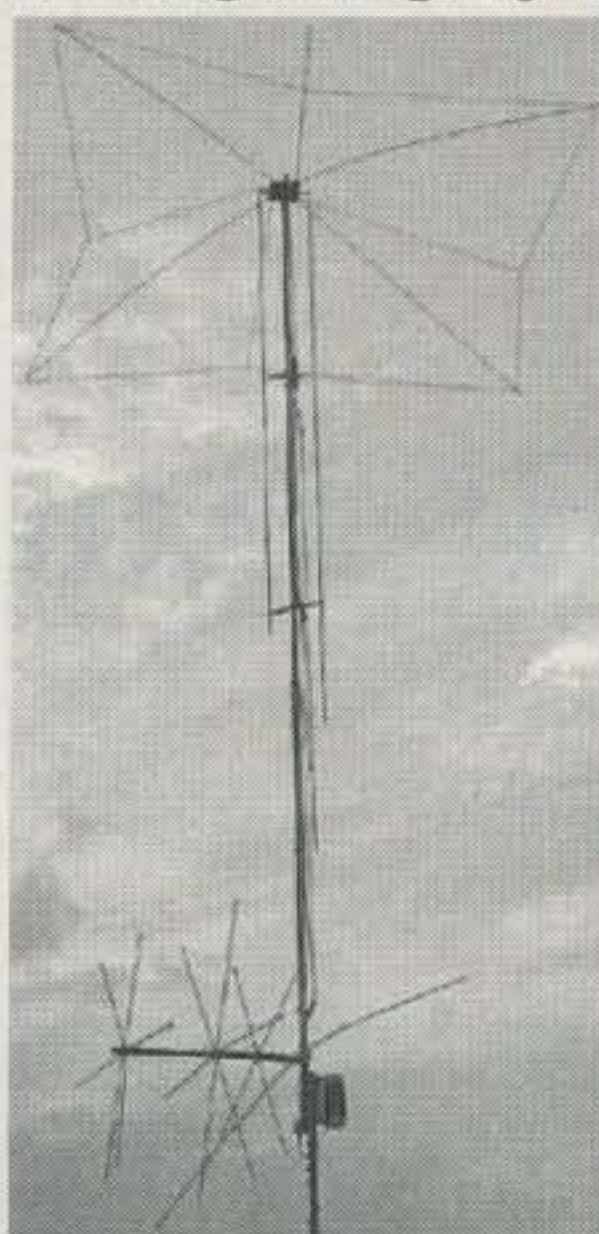
Fast/slow tune buttons and built-in two range Cross-Needle SWR/Wattmeter lets you quickly tune to your exact frequency.

All welded construction, no mechanical joints, welded butterfly capacitor with no rotating contacts, large 1.050 inch diameter round radiator -- not a lossy thin flat-strip -- gives you highest possible efficiency.

Each plate in MFJ's tuning capacitor is welded for low loss and polished to prevent high voltage arcing, welded to the radiator, has nylon bearing, anti-backlash mechanism, limit switches, continuous no-step DC motor -- gives smooth precision tuning.

Heavy duty thick ABS plastic housing

MFJ . . . the world leader in ham radio accessories!



MFJ-1798

\$289⁹⁵
Ship Code F

beyond it. In phase antenna current flows in all parallel radiators.

This forms a very large equivalent radiator and gives you incredible bandwidths.

Radiator stubs provide automatic bandswitching -- absolutely no loss due to loading coils or traps.

End Loading

On 30, 40, 75/80 Meters, end loading -- the most efficient form of loading -- gives you highly efficient performance, excellent bandwidth, low angle radiation and automatic bandswitching.

MFJ's unique *Frequency Adaptive L-Network™* provides automatic impedance matching for lowest SWR on these low bands.

Tuning to your favorite part of these bands is simple and is done at the bottom of the antenna.

No Ground or Radials Needed

You don't need a ground or radials because an effective counterpoise that's 12 feet across gives you excellent ground isolation.

You can mount it from ground level to roof top and get awesome performance.

No Feedline Radiation to Waste Power

The feedline is decoupled and isolated from the antenna with MFJ's exclusive *AirCore™* high power current balun. It's wound with *Teflon®* coax and can't saturate, no matter how high your power.

Built to Last

Incredibly strong solid fiberglass rod and large diameter 6061 T-6 aircraft strength aluminum tubing is in the main structure.

Efficient high-Q coils are wound on tough low loss fiberglass forms using highly weather resistant *Teflon®* covered wire.

MFJ halfwave vertical

6 bands: 40, 20, 15, 10, 6, 2 Meters . . . No radials or ground needed

Only 12 feet high and has a tiny 24 inch footprint! **\$199⁹⁵** MFJ-1796
Ship Code F

Mount anywhere -- ground level to tower top -- apartments, small lots, trailers. Perfect for vacations, field day, DXpedition, camping.

Efficient end-loading, no lossy traps. Entire length is always radiating. Full size halfwave on 2/6 Meters. High power air-wound choke balun eliminates feedline radiation. Adjusting 1 band has minimum effect on others.

MFJ-1792, \$169.95. Full size 1/4 wave radiator for 40 Meters. 33 feet, handles 1500 Watts PEP. Requires guying and radials.

MFJ-1793, \$189.95. Like MFJ-1792 but has full size 20 Meter 1/4 wave also.



has ultraviolet inhibitor protection.

NEW! MFJ-1788, \$429.95. Same as MFJ-1786 but covers 40 Meters-15 Meters continuous. Includes super remote control.

MFJ-1782, \$339.95. Like MFJ-1786 but control has only fast/slow tune buttons.

MFJ-1780, \$249.95. Box Fan Portable Loop is about the same size (2x2 foot) as a box fan, complete with handle. Covers 14-30 MHz. Control has fast/slow tunes.

MFJ Portable Antenna

MFJ-1621 lets you operate in most any electrically free area -- apartment, campsite, hotel, the beach, etc.

DXCC, WAZ, WAC, WAS have been won with MFJ-1621! Work 40, 30, 20, 17, 15, 12 and 10 Meters with a telescopic whip that extends to 54 inches. Mounted on a sturdy 6x3x6 inch cabinet. Built-in antenna tuner, field strength meter, and 50 feet of RG-58 coax cable. Handles 200 Watts.

MFJ's G5RV Antenna

Covers all bands, 160-10 Meters with antenna tuner. 102 feet long, shorter than 80 Meter dipole. Use as inverted

vee or sloper to be more compact. Use on 160 Meters as Marconi with tuner and ground. Handles full legal limit power. Add coax feedline and some rope or other nonconductor and you're on the air!



MFJ-1621, Ship Code A

\$89⁹⁵

MFJ-1778, Ship Code A

\$39⁹⁵

Free MFJ Catalog
and Nearest Dealer . . . 800-647-1800

<http://www.mfjenterprises.com>

1 Year No Matter What™ warranty 30 day money back guarantee (less s/h) on orders from MFJ

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST, Mon.-Fri.
FAX: (601) 323-6551; Add s/h
Tech Help: (601) 323-0549

Prices and specifications subject to change. (c) 1998 MFJ Enterprises, Inc.

The second installment of our Market Survey series takes you through all the current handhelds and raises important points to look for—or stay away from—when selecting that right handheld for your particular type of use.

CQ Market Survey:

VHF & UHF Handhelds

BY GORDON WEST,* WB6NOA

Looking for a new VHF/UHF handheld? Are you looking for a basic handheld to get started with or to give your harmonic who just passed the Technician test? Maybe you are looking to retire your present HT and replace it with a new handheld that does literally everything.

With over 33 different handheld models available, your search for the “best” one deserves a lot more than a few short answers from your pals or the ham salesman.

“When I am asked what is the best handheld to buy, I try to spend as much as 10 minutes to qualify my customer with the right type of handheld equipment that will serve his or her specific requirements,” comments Ham Radio Outlet’s Terry Dean, N6WI. “Unless I know how my customer plans to use the equipment, I am hesitant to recommend a handheld by either brand name, price, or features.”

Amateur Electronic Supply’s Ray Grenier, K9KHW, agrees: “I had one customer who was planning on taking his HT to Europe, and I suggested that a handheld with built-in, general-coverage, shortwave receive might very well be her best choice,” he explained. “And my very next customer was a fireman, and he needed 800 MHz public safety receive capabilities that only a few new handhelds still continue to offer.”

Lesson 1: Don’t accept any advice on which handheld is best for you unless there is plenty of dialogue on how the



Alinco's DJ-V5 is very cute but also very functional. It transmits on 2 meters and 70 cm and receives everything (except cellular) between 76 and 999 MHz. With a healthy 5 watt output, it could nearly qualify to be a “Rambo” rig as well. (Courtesy Alinco USA)

equipment is to be operated. If you buy a handheld just because two of your fishing buddies have the same equipment, you may find out later that the HT lacks some features that you had real-

ly wanted for listening to, say, the aviation service.

Classification By Frequency of Use

Say what? Classification by frequency of use simply means that a major factor in deciding which handheld is best for you is how often you intend to use it.

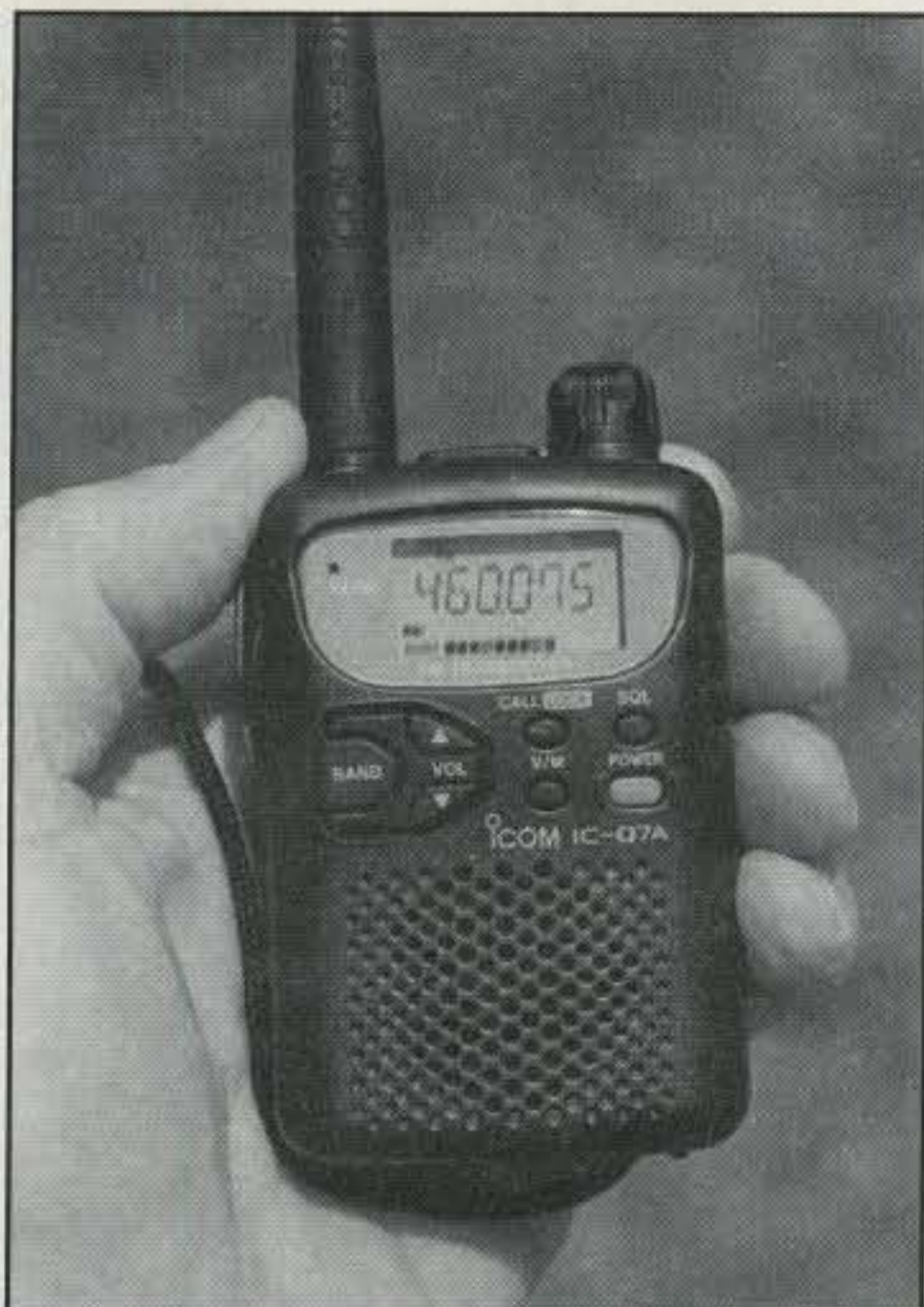
“Some of our customers are looking for a handheld only to use now and then, out with the scouts, on a camping trip. The rest of the time they use a more elaborate handheld or mobile radio when driving around town,” explains P.J. at Jun’s Electronics. “Other customers may depend on their handheld radio to do literally everything—such as going mobile, doing portable packet with either built-in or external TNC, APRS signaling, simultaneously monitoring VHF and UHF or two VHF frequencies, and even becoming a sensitive shortwave receiver that gets the latest news from the BBC.”

A handheld with too many features and complicated hidden layers of sub-menus could be frustrating for the casual user out on a hiking trip. However, take a basic single-band or dual-band handheld and give it over to the APRS guru, and he/she might scream that it doesn’t have built-in TNC capabilities.

Brand Names

Most, but not all, amateur radio equipment manufacturers offer a variety of VHF/UHF handhelds to complement their high-frequency radio line-up. In today’s ham radio marketplace there are a half-dozen companies offering a

*CQ Contributing Editor at Large
2414 College Drive, Costa Mesa, CA 92626
e-mail: <wb6noa@cq-amateur-radio.com>



The ICOM IC-Q7A is a tiny little thing with lots of features, including receive coverage from 30–1300 MHz (minus cellular), which means it can tune in the 6 meter, 222 MHz, 902 MHz, and 1296 MHz ham bands, along with providing full transceive operation, with 1/2 watt output, on 2 meters and 70 cm.



They don't get much cuter than the Alinco DJ-C5, a nearly credit-card-sized two-band handheld. It does have a fixed antenna, and only puts out a half watt, but it has broad receive coverage and 50 memories. Not bad for something that will slip into your purse or shirt pocket. (Courtesy Alinco USA)

"Cute" Handhelds

	Yaesu VX-1	Alinco DJ-V5	Alinco C5T	Alinco S11	Alinco S41	ICOM Q7A	Kenwood TH22
Ham Bands	2m/440	2m/440	2m/440	2m	440	2m/440	2m
Output Power	1/2W	5W	1/2W	1/2W	1/2W	1/2W	5W
RX Coverage (MHz) (cellular blocked)	76/999	76/999	108-174 420-479	Ham	Ham	30-1300 + wide FM	135-174
Air Receive	Yes	Yes	Yes	No	No	Yes	No
Memories	291	200	50	21	21	200	40
Alphanumeric	Yes	Yes	No	No	No	No	No
Dual RX	No	No	No	No	No	No	No
Dual Knobs	No	No	No	No	No	No	No
Auto Rptr Shift	Yes	Yes	No	No	No	Yes	Yes
Tone Scan	Yes	Yes	No	No	No	Yes	Yes
Backlit Keypad	Yes	Yes	Yes	No	No	No	Glows
Cloning	Yes	Yes	No	No	No	No	No
Computer Prog.	Yes	Yes	No	Yes	Yes	Yes	No
Ant. Connector	SMA	SMA	Fixed ant.	Fixed ant.	Fixed ant.	SMA	BNC
12 VDC Operation	Yes	Yes	No	No	No	No	Yes
CTCSS Encode	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CTCSS Decode	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCS Tone	Yes	No	No	No	No	No	No
Power Levels	2	3	2	2	2	—	3
Audio Output	1/4W	1/2W	1/3W	1/4W	1/4W	1/2W	1/4W
Power Saver	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DTMF Slots	8	8	—	—	—	—	—
Seen Selling \$\$	\$169	\$239	\$155	\$88	\$88	\$134	\$199

dizzying array of portable equipment: ADI/Premier, Alinco, ICOM, Kenwood, RadioShack, and Yaesu. A few other companies—such as Azden, Maha, Midland, and Standard—have left the amateur HT market in recent years, but some of their gear may still be available new from dealers or used at hamfests. In this article we will focus on the models that are in the manufacturers' current line-ups.

Frustrating Non-Conformity

All of today's handhelds come with agonizing non-conformity. The Kenwood battery pack won't fit a Yaesu radio; Yaesu's battery won't work with ICOM rigs; some of the older ICOM packs may slip onto RadioShack HTs, but won't make the right connections; and surely Alinco batteries won't work on ADI HTs. In addition, when it comes to manufacturer-supplied battery chargers, there is absolutely no industry standard on what part of the charging pin is tip positive or tip negative, or shell positive or shell negative. Even though the jacks may look the same, don't count on brand "K" plugging right into brand "Y" without major smoke damage.

It's the same story with microphone and speaker/earphone jacks. Kenwood does it one way and most of the others do it another way, plus there are a few exceptions that don't do it either way! There's even some variation between different models by the same manufacturer! This is why accessory manufacturers such as MFJ, Maha, and ADI/

Premier are doing a great business by supplying the right type of speaker mic and headsets for the specific makes and models of HTs. Remember: Just because the plugs fit into the jack doesn't necessarily mean you have a proper match.

We are a little bit better off when it comes to antenna jacks. Some handhelds use the tried-and-proven BNC, "rubber-duck" receptacles, but after a few years of constantly plugging in BNC external antenna connections, this jack works loose and the radio antenna circuit becomes intermittent. Many new small handhelds come with the SMA screw-on antenna connector. These seem to be working out well, but you should be cautioned not to overstrain this connection by running all sorts of adapters to take RG8U cable and bring it down to an SMA connection at the base station. Rather, go for an RG-174 adapter cable system and take the wear and tear off the relatively fragile SMA connection point.

As for programming, every manufacturer has its own idea of how to input frequencies. Some equipment is all set for automatic repeater offset, and this is good, but why one manufacturer does not enable this feature straight out of the box is a mystery to me. You need to go to a secret sub-menu to turn on auto-repeat.

Finally, and I say *finally*, most manufacturers are now giving us CTCSS tone *decode* along with the more-common *encode*. After all, why not? Both functions generally are found on a single

"Rambo" Handhelds

	Kenwood G71	ADI Pryme 222	ADI 52	ADI 400	ADI 201	Alinco 195	Alinco 191	Alinco 280	ICOM T2H	ICOM T7H
Ham Bands	2m/440	222	6m	440	2m	2m	2m	222	2m	2m/440
Output Power	6W	5W	5W	5W	5W	5W	5W	4W	6W	5W
RX Coverage (MHz) (cellular blocked)	118-174 400-480	216-229	40-54	400-480	130-179	Ham	135-173	210-240	136-174	118-174 400-470
Air Receive	Yes	No	No	No	No	No	No	No	No	Yes
Memories	200	41	41	40	40	40	40	10	40	70
Alphanumerics	Yes	No	No	No	No	Yes	No	No	Yes	No
Dual RX	No	No	No	No	No	No	No	No	No	No
Dual Knobs	No	No	No	No	No	No	No	No	No	No
Auto Rptr Shift	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Tone Scan	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Backlit Keypad	Yes	Partial	Partial	—	—	No	Yes	No	No	Yes
Cloning	No	Yes	Yes	—	Yes	Yes	Yes	No	Yes	Yes
Computer Prog.	No	Yes	Yes	—	No	—	No	No	Yes	Yes
Ant. Connector	SMA	BNC	BNC	BNC	BNC	BNC	BNC	BNC	BNC	BNC
12 VDC Operation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CTCSS Encode	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes
CTCSS Decode	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes
DCS Tone	No	No	No	No	No	Yes	No	No	No	No
Power Levels	3	2	2	2	2	3	3	2	3	3
Audio Output	3/4W	3/4W	3/4W	1/3W	1/2W	1/2W	1/2W	1/2W	2/3W	1/2W
Power Saver	Yes	Yes	Yes	Yes	—	Yes	Yes	No	Yes	Yes
DTMF Slots	10	—	—	—	—	8	9	—	5	9
Seen Selling \$\$	\$249	\$299	\$299	\$199	\$200	\$175	\$175	\$275	\$159	\$229

"Rambo" Handhelds (continued)

	Yaesu 50	Yaesu 51R	Yaesu 10R	Yaesu 40R	Yaesu 911	Yaesu 23R	Yaesu 33R	Yaesu 11R	Yaesu 41R	Cherokee AH-50
Ham Bands	2m/440	2m/440	—	440	1.2 GHz	2m	222	2m	440	6m
Output Power	5W	5W	5W	4W	2W	5W	5W	5W	5W	5W
RX Coverage (MHz) (cellular blocked)	76-200 300-999	76-999	140-174	420-470	Ham	Ham	Ham	100-180	420-470	Ham
Air Receive	Yes	Yes	Yes	No	No	No	No	Yes	No	No
Memories	112	200+	100	99	49	10	10	150	150	5
Alphanumerics	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Dual RX	No	Yes	No	No	No	No	No	No	No	No
Dual Knobs	No	No	No	No	No	No	No	No	No	No
Auto Rptr Shift	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Tone Scan	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Backlit Keypad	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
Cloning	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Computer Prog.	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Ant. Connector	SMA	BNC	SMA	SMA	BNC	BNC	BNC	—	—	BNC
12 VDC Operation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CTCSS Encode	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
CTCSS Decode	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
DCS Tone	Yes	Yes	Yes	Yes	No	No	No	—	—	No
Power Levels	3	5	3	3	2	2	2	3	3	2
Audio Output	1/2W	3/4W	3/4W	3/4W	1/2W	1/2W	1/2W	1/2W	1/2W	1/2W
Power Saver	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DTMF Slots	—	—	—	—	10	No	No	—	—	—
Seen Selling \$\$	\$430	\$350	\$250	\$275	\$550	\$300	\$350	\$189	\$189	\$150

CTCSS chip. This chip also contains a myriad of pager-type modes, and quite frankly, I have found almost no hams or organizations or husband-and-wife teams that regularly use the pager function. Maybe they can't figure out how to program it, and as I just said, each radio programs differently.

One manufacturer—ADI/Premier—took my advice on programming for the new ham and now offers its dual-band handheld factory-preprogrammed with

the USA's top 2 meter and 440 MHz ham repeater and scanner-receive frequencies. Straight out of the box it will play the most common ham repeater channels, paramedic receive frequencies, weather channels, police frequencies, and aeronautical AM receive frequencies. No programming necessary, and like many of the other manufacturers, you can do any necessary reprogramming with your laptop computer and either factory-supplied or factory-

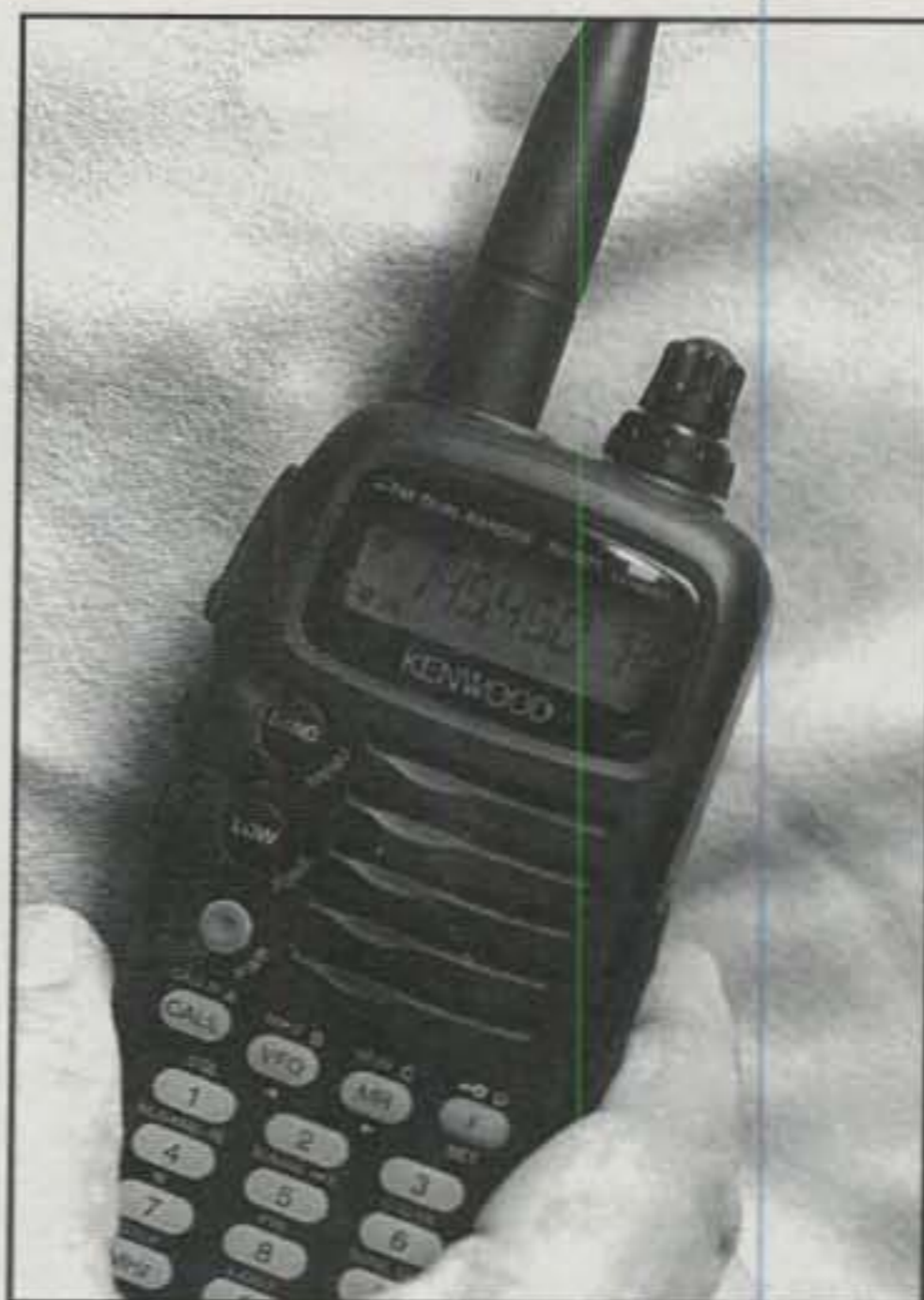
approved PC program kits. Easier yet, if you have the same exact type of handheld as a buddy, a simple cable kit from the electronic-entertainment store may let you *clone* memory channel information from one radio to the other.

User and Radio Categories

Now that we've looked at some of the major considerations that go into deciding which HT to buy, and some of the



Yaesu's FT-51R is typical of the "Rambo" class of handhelds—a solid 5 watts out, two-band operation on 2 meters and 70 cm, receive capability from 76–999 MHz (minus cellular, of course), more than 200 memory slots, and a whopping $\frac{3}{4}$ watt audio output from its built-in speaker. (Courtesy Yaesu USA)



Kenwood's TH-G71 operates on 2 meters and 70 cm and offers 200 memory channels, which may also store public service and air-band receive frequencies. With up to 6 watts output, it is in the "Rambo" category.



One of the few 222 MHz handhelds on the market today, Pryme's PR-222 (along with its 6 meter cousin, the PR-52) gives you access to a great but underpopulated ham band. The 222 MHz band offers propagation similar to 2 meters, but with better ability to work from inside buildings. Most scanners don't cover this band, so it's a favorite for event controllers looking for a coordinating frequency out of the "public ear."

features and frustrations common to most handhelds, let's start looking at specific radios. We'll break them down into four basic categories:

Cute and Functional: Very small in size, but loaded with big radio features.

Rambo Radio: Big-sized HT, qualified for fire-line communications when working your next emergency event.

Totally Cool: Mid-sized HT that will dazzle your friends with things it can do that theirs can't.

Le Ultimate: If you're good at computers and can program your VCR without the book, you could very well meet the challenge of using all of the features in the ultimate HT.

Cute and Functional

Under the "cute and functional" category, the micro Yaesu VX-1R two-band transceiver is deserving of your review down at the local radio store or in a ham catalog. The VX-1R weighs in at only 4 ounces, yet it can scan the entire VHF and UHF band from 76 MHz to 999 MHz (cellular blocked). This means scanning

DENVER AMATEUR RADIO SUPPLY

Lancaster County, Pennsylvania

KENWOOD

TH-D7A

FM Dual Bander APRS and 9600 Baud TNC Built-in



TS-570D(G)

Full Featured HF Base (S) Model includes 6 meters



TM-D700

Dual Band Mobile w/Built-in TNC (Voice & Data Communicator)

YAESU

FT-100

HF/6M/2M/430MHz Super Compact Transceiver



VX-5R

50/144/430 MHz Heavy Duty FM Handheld



FT-847

All Mode HF/50/144/430 MHz Unequaled Satellite Rig

ICOM

IC-706 MKIIG

HF/50/144/440 MHz Plus New Features & More Power



NEW

IC-756 PRO

32 Bit Floating Point DSP HF thru 6M



IC-2800H

Dual band, 50w/35w, Large, Color LCD Screen



Ameritron ADI Bencher Butternut MFJ
Cushcraft Diamond MAHA Astron
Kantronics Larsen Mirage Lakeview

Quotes & Orders 1-800-891-9199

Tech & Info (717) 336-6060

www.denverradio.com

Route 272, Wabash Center

1233 N. Reading Road

Stevens, PA 17578

Lancaster County

Located 2 miles south of the PA Turnpike exit 21 on Rt 272

M,T,F 9-6 W,TH 9-8 Sat 9-3

"Totally Cool" Handhelds

	ADI 600	Alinco G5	ICOM G2XAT	ICOM W32	ICOM T22A	Kenwood TH79	RadioShack 200	RadioShack 400
Ham Bands	2m/440	2m/440	2m	2m	2m	2m/440	2m	440
Output Power	5W	5W	7W	5W	5W	5W	2W	1W
RX Coverage (MHz) (cellular blocked)	108-174, 330-500 800-985	108-173 420-480	Ham	118-174 400-470	118-174	118-174 300-470	136-174	420-470
Air Receive	Yes	Yes	No	Yes	Yes	Yes	No	No
Memories	200	200	40	200	80	82	30	30
Alphanumerics	Yes	No	No	Yes	Yes	Yes	No	No
Dual RX	Yes	Yes	No	Yes	No	Yes	—	—
Dual Knobs	Yes	No	No	Yes	No	Yes	—	—
Auto Rptr Shift	Yes	Yes	No	Yes	Yes	Yes	No	No
Tone Scan	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Backlit Keypad	Yes	Yes	No	Yes	No	No	No	No
Cloning	Yes	No	No	Yes	No	Yes	No	No
Computer Prog.	Yes	No	No	Yes	No	No	No	No
Ant. Connector	BNC	BNC	BNC	BNC	BNC	BNC	SMA	SMA
12 VDC Operation	Yes	Yes	Yes	Yes	Yes	Yes	9V	9V
CTCSS Encode	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CTCSS Decode	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCS Tone	No	No	No	No	No	No	No	No
Power Levels	3	3	3	3	3	3	2	2
Audio Output	1/2W	3/4W	1/2W	1/2W	1/2W	3/4W	1/2W	1/2W
Power Saver	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DTMF Slots	10	20	5	5	5	10	1	1
Seen Selling \$\$	\$199	\$280	\$200	\$295	\$225	\$369	\$179	\$199

public safety frequencies, listening to television audio, hearing the FM music band, and running a half watt out for local 2 meter and 70 cm ham channels. This cute little radio is loaded with so many features that you *definitely* will need to keep the instruction manual nearby. It's a mama to program, so try to find someone else with the same unit and do a clone.

Alinco makes a DJ-V5 with very broad VHF and UHF receive coverage. If you want an HT that doubles as a scanner, this certainly is one to consider. If you're *really* looking for cute, check out the DJ-C5T two-band, credit-card-sized radio from Alinco. Next time you get dragged to the opera or a recital and want to secretly stay tuned in to the local repeater, pop in the ear bud and this tiny rig gives you 2 meters and 70 cm, 1/3 watt output, and also AM air-band receive.

Alinco continues in the "cute" category by offering Family Radio Service style, single-band HTs, each with just under 1/2 watt output, but small enough to go in a ski jacket. Look at the DJ-S11 (2 meters) or DJ-S41 (70 cm). They sell for under \$100 apiece!

ICOM America also has a tiny "cute" radio entry, the dual-band IC-Q7A. It covers 2 meters and 70 cm, plus unlimited VHF/UHF reception from 30 MHz up to 1300 MHz, cellular blocked. It tunes in FM music stations and TV audio loud and clear. It is shirt-pocket sized, and puts out just under 1/2 watt on VHF and 1/3 watt on UHF. It is small enough to run on two AA batteries.

Kenwood offers "cute" single-band 2 meter and 70 cm HTs that offer extended public safety receive, and plenty of power (3 watts output) to give them a lot more punch than the competition but in a slightly larger, round-cornered case. My wife Suzy, N6GLF, runs the 2 meter TH-22 both portable as well as in the car, and I have set it up so she can easily zip through the pre-programmed channels and have little opportunity to knock it off frequency or put it in a non-function mode. That's when you accidentally hit one button on your HT and it goes beep, and then fails to work. You won't have that problem with the little Kenwood twins.

Are all of the "cute and functional" radios easier to operate and program than more fully-featured equipment? Not necessarily. It's a good idea to view the equipment up close if you can, and see what it takes to program in new frequencies and recall memorized channels. And the more memory channels, the better!

"Rambo" Radios

These are the heavier, beefier, bigger, and longer-battery-life handhelds that seasoned radio operators may choose for their loud audio, bigger display read-out, and all around larger buttons for field use. One of my favorites, the Kenwood TH-235 single-bander, actually comes from the company's land mobile radio mold, featuring ear-splitting audio, simple keypad programming, plenty of

memory channels, and capabilities for a variety of massive battery packs to be attached at the bottom. If you find any at a swapmeet, pick them up quickly.

The Kenwood TH-G71 is a good, tough, 2 meter and 70 cm, two-band handheld with 6 watts output. It has 200 memory channels and a lighted keypad so you can see what you're doing at night. This is a *two-band* radio, not a dual-band radio. Two bands means that you memorize the channels in any one of 200 memory slots, but you get just one channel at a time on the display and out of the speaker. This makes sense to me for most HT operation, except for public safety use, for which you may prefer a dual-band handheld with dual running receivers.

ADI also has short, stocky, workhorse transceivers, the Pryme PR-222 for the 222 MHz band and the PR-52 for 6 meters. You need the book to figure out how to program them, but once you get everything into memory, you're all set. ADI also offers single-band handhelds—the AT400 and AT201—and these are good, simple, start-up transceivers that are built to take a rough environment. Best of all, you can use them for self-defense next time you are providing communications at a riot!

Alinco offers the DJ-195 and DJ-191 HTs, and both sets can run up to 5 watts output from their relatively large diecast-aluminum frame. Alinco also offers the DJ-280 as an older style, but very powerful 222 MHz transceiver with a scant ten memories of repeater or simplex



The ADI AT-600 comes straight from the factory with the most popular repeater and public service receive frequencies already programmed in! This means it should be ready to go, out of the box, on at least one repeater in your area. It also offers simultaneous dual-band receive, as opposed to many other HTs that let you listen to only one signal at a time.

recall. The 280 from Alinco is a prize catch, however, because of the great-sounding transmit and receive capabilities on the 222 MHz band.

ICOM America offers the single-band, 2 meter, IC-T2H. This handheld gives you fantastic audio output and can pump out an incredible 6-7 watts of output power. Encode and decode tone squelch are included, and it holds 40 memory channels with the battery going on the back.

Another solid ICOM two-band transceiver is the IC-T7H. Remember, two bands meaning 2 meters and 440, but one at a time. This relatively large radio also pumps out plenty of audio output, and a lot of the older ICOM accessory mics for the original Z1A, W31, and T22 work on this HT as well.

The Yaesu FT-50, along with the much larger FT-51R, both qualify for the Rambo radio category, as do the single-band FT-10R and FT-40R. All of the Yaesu radios feature Mil Spec (military specifications) construction, and there are plenty of O-rings to keep out moisture and dust. These rigs actually come from a land mobile mold when it comes

RADIO WORKS

Antenna Fever

SuperLoop, 80, 112' long, 80-10 m. Simply the best \$105
 SuperLoop 40, 56' long, 40-10 m. Ready for DX \$90
CAROLINA WINDOMS - best simple wire antenna yet.
 CW 80 - 80-10 m, 132' long Make a big signal. \$89.95
 CW 40, 40-10 m, 66' Used to set 2 world records. \$87.95
 CW 160, 160-10 m, 252' Be heard on 160 \$125.95
 CW 160 Special, 160-10 m, 132' Be on all bands \$129.95
 G5RV Plus, 80-10 m, 102', High power current balun \$59.95

Current Baluns

B1-2K 1:1 2 KW SSB 80-10m Current Balun \$22.95
 B1-5K 1:1 5 KW SSB 160-10m Precision \$33.95
 B1-1KV 1:1 1 KW SSB 15-2 m VHF balun \$27.95
 Y1-5K 1:1 5 KW SSB 160-10m "YagiBalun" \$35.95
 B4-1KXV 4:1 1 KW SSB 15-2 m VHF balun \$31.95
 B4-2KX 4:1 2 KW SSB 160-10m Precision \$45.00
 RemoteBalun High power 4:1 for ladder line \$49.95

NEW RFI QUICK FIX

For really tough RFI and RF feedback problems, you can't beat the new T-4 and T-4G Ultra Line Isolators. It's isolation factor is 50% higher than previous models - far better than expensive imported copies. The T-4G goes even further with it's built-in ground strap for direct line Isolator grounding. Before coax enters your shack, stray RFI is shunted directly to ground. Use with Vertical antennas at feed point. To prevent ground loop problems, install two T-4s between your transmitter, linear and tuner. Use with any antenna to reduce feed line radiation. This is the RFI BIG GUN.

All Line Isolators have SO-239 input and output connectors. 160-10 m, 2 KW+, winding Z @ 3.5 MHz > 75K, @ 14 MHz > 50 K

T-4 Same as T-4G but without direct grounding \$32.95
 T-4G Ultra Line Isolator, max RFI protection \$35.95
 T-5G Marine version, HF & VHF isolation - the best \$59.95
 T-6 VHF version of T-4 15-2 meters, 1 KW \$28.95

Jim's New Book - "Frequently Asked Questions about Antenna Systems and Baluns." This 120 page book answers questions and dispels myths. The material is presented in a style that's easy to read and Jim, W4THU, is not beyond poking fun at jealously held concepts that don't quite hold up under close scrutiny. However, at the heart of this book are questions that a lot of hams ask over and over again. Available now - \$10.95 + \$3 postage.

Antenna Wire and Parts

"And, not a dog in the bunch!"

PL-259ST Silver-Teflon, U.S.A. SALE \$1.00
 PL-259GT Gold-Teflon, U.S.A. \$1.49 or \$30 pk of 25
 N-200 'N' Silver-Teflon, installs like a PL-259 \$3.00

Coax & cable prices <100'/100'+

RG-8X Plus Type IIA non-contaminating jacket, 95% 26¢/22¢
 RG-213 Plus Enhanced, 96%+super quality jacket 54¢/38¢

RG-8X Premium, 95% braid 14¢
 RG-213 Top Quality, 95% 35¢
 ExtraFlex Flexible 9913-type 59¢

R1 Rotator 8 conductor (2 x #18, 6 x #24) SALE 26¢/20¢
 R2 Rotator 8 conductor (2 x #16, 6 x #18) SALE 47¢/35¢

#14 HD Stranded, 7-conductor hard-drawn 8¢
 #14 FlexWeave 168-strand, bare, for any wire ant. 14¢
 #12 FlexWeave 259-strand, excellent for long runs 19¢

#13 Insulated Very tough jacket, strong, for heavy weather 16¢
 450 Ladder #16 stranded conductor, poly, SALE 22¢/16¢
 450 Ladder #14 stranded conductors, poly SALE 30¢/24¢

1/2" Braid Tinned-copper, for grounding, any length 65¢
 2" Strap Copper strap, heavy .020" thick any length \$1.75

Pulleys - for antenna support rope. Highest quality, small, lightweight, sailboat type for fibrous rope - for 3/16" rope \$11.95 or 5/16" rope \$14.95

Antenna Support Line MilSpec Dacron, single solid braid, fungus & sun resistant, 3/16" 700# test, our most popular 100' hanks \$8

Kevlar-no stretch .075" dia. 500# test, Dacron jacket 200' spl \$15.95

The RADIO WORKS

Orders & Technical (757) 484-0140
 FAX (757) 483-1873

Order Hotline (800) 280-8327

Box 6159, Portsmouth, VA 23703

VISA and MC welcome. Give card #, exp. date, signature. Add shipping (figure 10% \$8 min) Prices subject to change. Mention ad for sale prices

email - W4THU@radioworks.com

Visit us at <http://www.radioworks.com>

General Catalog 2000 80 pages of HF and VHF baluns, Line Isolators, high performance wire antennas, wire, cable, coax, connectors, station accessories, tuners, coax switches, support line, etc. It's all there. Free, allow 2-3 weeks for bulk mail, or send \$2 for a Catalog by Priority Mail

CIRCLE 84 ON READER SERVICE CARD



synctime metallic mesh band, metal bezel mineral lens, hi-tech polymer case \$179.95



atomic radio with 2 alarms and temperature, day, date, LCD \$59.95



atomic digital alarm sport watch 2nd UTC 24hr time display, lap etc. \$99.95

a new millenium!
 time to be on time
 atomic time!

with the world's most accurate time pieces, atomic clocks & watches from

ATOMIC TIME

- reliable convenient time pieces
- synchronized to the u.s. atomic clock, fort collins/co
- accurate to 1 second in 1 million years
- engineered in germany
- radio-controlled time

choose from our wide variety:

- casual & sport watches
- travel alarms • wall clocks
- desk clocks • wood clocks
- radios • weather stations
- computer UTC clocks
- industrial & commercial clocks

20% off second item

call for our free brochure:

(630) 472-9999

or go to www.atomictime.com

credit card orders call toll free

1-800-985-8463

send checks/money orders for the total amount incl. s&h \$7.00 to

ATOMIC TIME, INC.
 1010 JORIE BLVD., #332
 OAK BROOK, IL 60523



atomic dual alarm clock w. 2nd world time, 5x4x2 1/2" black arch design \$59.95



jumbo digit atomic clock w. temperature & humidity, wall or desk 8"x11"x1" • \$79.95



black arabic 12" wall clock for home or office • \$69.95 (wood \$89.95)

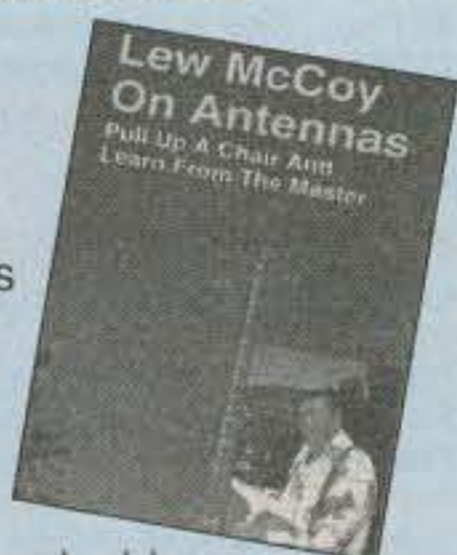
CIRCLE 39 ON READER SERVICE CARD

CQ Books

McCoy on Antennas

by Lew McCoy, W1ICP

This is truly a unique antenna book that's a must read for every amateur. Unlike many technical publications, Lew presents his invaluable antenna information in a casual, non-intimidating way for anyone!



Order No. MCCOY **\$15.95**

W6SAI HF Antenna Handbook

by Bill Orr, W6SAI

Nearly 200 pages filled with dozens of inexpensive, practical antenna projects that work! This invaluable resource will guide you through the construction of wire, loop, yagi and vertical antennas.



Order No. HFANT **\$19.95**

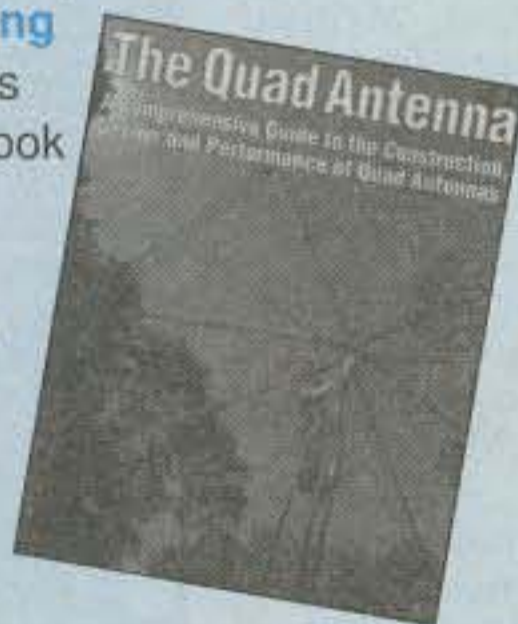
The Quad Antenna

by Bob Haviland, W4MB

Second Printing

You'll enjoy this authoritative book on the design, construction, characteristics and applications of quad antennas.

Order No.



Please add \$4 shipping & handling
Free shipping & handling for orders \$50 and over

CQ Communications, Inc.

25 Newbridge Road

Hicksville, NY 11801

Phone: 516-681-2922

Fax: 516-681-2926

**or call toll-free
800-853-9797**

to how solidly they are built, and the FT-51R is truly considered a dual-band radio because it does offer *simultaneous* 2 meter and 440 MHz reception. The FT-51R can also do 80 alphanumeric memory displays, allowing you to assign a short name to 80 of the channels you have programmed. In addition, if you run it on low power, you can also use it as a built-in crossband repeater—but be sure to clear any such use with your local frequency coordinator.

Yaesu also offers the FT-911, FT-23R, and FT-33R single-band transceivers which cover the 1.2 GHz, 2 meter, and 222 MHz bands, respectively. These are relatively old designs with just 40 memory channels, but they are built Rambo-tough and deliver a surprising amount of audio output.

You should also check out the tough Mil Spec FT-11R or FT-41R 2 meter or 440 MHz Yaesu handhels because of their wide receiver coverage and six-character alphanumeric displays. They also feature a large, full-sized, back-lit DTMF keypad, along with an incredible 150-channel memory bank.

Totally Cool!

The next category of handhels covers those which offer us some "totally cool" features straight out of the box. The first one in this group that comes to mind is the dual-band ADI AT-600. This is a true dual-band radio with simultaneous reception on 2 meters and 70 cm, including crossband repeater function. What makes it so cool is the fact that the radio is factory-preprogrammed for popular ham and scanning frequencies, and straight out of the box it will play in almost any city of the country with plenty of active channels. This way you can tune in to repeater operation, and if you are new to ham radio, get an earful of what it takes to be proficient in communicating over these electronic party lines. The ADI AT-600 is also PC-programmable and has 200 memory channels with 120 alphanumeric memories, a back-lit keypad, and relatively straightforward programming. Its real "coolness," though, is it is fully loaded with preprogrammed channels, *straight out of the box!*

The gang at Alinco offers the DJ-G5TH dual-band handheld with dual running receivers and capabilities of crossband repeat. What makes the Alinco cool is how simply it programs without the need to continuously scrutinize the instruction manual. You can even load in aeronautical channels and see activity with their cool channel



The Yaesu VX-5R fits in nearly every one of our categories. It's small and cute, has 5 watts out and $\frac{3}{4}$ watt of audio to the speaker, operates on 6 meters as well as 2 and 440, and receives AM broadcast plus the most popular shortwave bands as well as everything (except cellular) between 48 and 999 MHz. (Courtesy Yaesu USA)

scope, which gives you a pan-adapter-type view of what's happening on each side of your current frequency.

At ICOM, the cool feature of the relatively common-looking IC-2GXAT single-band handheld is that it squeezes out over 7 watts with the BP-132A battery or by running off car power. The only precaution here is not to transmit for long periods of time on high power. If you do, the back of the equipment is literally going to get red hot. However, when it comes to good, simple programming, I like the IC-2GXAT a lot because it is an uncomplicated radio to work straight out of the box.

Do you need to monitor two VHF or two UHF frequencies at the same time? You can do this with the dual-band IC-W32A 200-memory-channel handheld. That's quite cool, to be able to monitor, in-band, two different repeater frequencies at the same time. There is also an eight-character alphanumeric display that goes along with the ICOM W32 workhorse cool radio.

Here's another totally cool ICOM HT—a *three-band* transceiver that can work on 6 meters, 2 meters, and 70 cm,

Big Savings on Radio Scanners

COMMUNICATIONS ELECTRONICS INC.

Order on-line and get big savings

Take advantage of Communications Electronics special savings when you enter your order directly on the internet. Visit CEI at <http://www.usascan.com>, and click on "CEI News" to get your big CEI E-Value savings. Resellers, get extra special pricing when you fax your sales tax license to CEI at +1-734-663-8888.

DISTRIBUTOR'S COUPON EXPIRES 09/30/00 #0006C2

SAVE \$30 on MPV32 or RH256N

Save \$30 when you purchase your RELM MPV32 or RH256N transceiver directly from Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Telephone orders accepted. Call 1-800-USA-SCAN. Mention offer CEIM. TERMS: Good only in USA & Canada. Only one coupon is redeemable per purchase and only on specified product.

NEW! RELM® MPV32-A Transceiver

Mfg. suggested list price \$515.00/Special \$299.95

Looking for a great hand-held two-way transceiver? Fire departments depend on the RELM MPV32 transceiver for direct two-way communications with their fire or police department, civil defense agency or ham radio repeater. The MPV32 is our most popular programmable frequency agile five watt, 32 channel handheld transceiver that has built-in CTCSS. This feature may be programmed for any 50 standard EIA tones. Frequency range 136.000 to 174.000 MHz. The full function, DTMF compatible keypad also allows for DTMF Encode/Decode and programmable ANI. Weighing only 15.5 oz., it features programmable synthesized frequencies either simplex or half duplex in 2.5 KHz. increments. Other features include PC programming and cloning capabilities, scan list, priority channel, selectable scan delay, selectable 5 watt/1 watt power levels, liquid crystal display, time-out timer and much more. When you order the MPV32 from CEI, you'll get a complete package deal including antenna, 700 ma battery (add \$20.00 to substitute a 1000 ma battery), battery charger, belt clip and user operating instructions. Other useful accessories are available. A heavy duty leather carrying case with swivel belt loop part #LCMP is \$49.95; rapid charge battery charger, part #BCMP is \$69.95; speaker/microphone, part #SMMP is \$54.95; extra high capacity 1000 ma. ni-cad battery pack, part #BPMP1 is \$79.95; extra 700 ma. ni-cad battery pack, part #BPMP7 is \$59.95; cloning cable part #CCMP is \$34.95; PC programming kit, part #PCKIT030 is \$224.95. A UHF version with a frequency range of 450-480 MHz. part #MPU32 is on special for \$299.95. Your RELM radio transceiver is ideal for many

different applications since it can be programmed with just a screwdriver and programming instructions in less than 10 minutes. Programming is even faster with the optional PC kit. The programming instructions part #PIMPV is \$19.00. Call 1-800-USA-SCAN to order for RELM radios.

Bearcat® 895XLT-A1 Radio Scanner

Mfg. suggested list price \$729.95/Special \$194.95

300 Channels • 10 banks • Built-in CTCSS • S Meter

Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage: 29.000-54.000 MHz., 108.000-174 MHz., 216.000-512.000 MHz., 806.000-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

The Bearcat 895XLT is superb for intercepting trunked communications transmissions with features like TurboScan™ to search VHF channels at 100 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a Signal Strength Meter, RS232C Port to allow computer-control of your scanner via optional hardware and 30 trunking channel indicator annunciators to show you real-time trunking activity for an entire trunking system. Other features include **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. **CTCSS Tone Board** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord \$14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; **MB001** Mobile mounting bracket \$14.95; **EX711** External speaker with mounting bracket & ten feet of cable with plug attached \$19.95. The BC895XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden factory warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS or LTR systems. Call 1-800-USA-SCAN.

TrunkTracking Radio

DISTRIBUTOR'S COUPON EXPIRES 09/30/00 #0006C2

SAVE \$75 on one BC245XLT

Save \$75 when you purchase your Bearcat 245XLT handheld scanner directly from Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Telephone orders accepted. Call 1-800-USA-SCAN. Mention offer CEI2. TERMS: Good only in USA & Canada. Only one coupon is redeemable per purchase and only on specified product.

Bearcat® 245XLT-A TrunkTracker

Mfg. suggested list price \$429.95/CEI price \$269.95

300 Channels • 10 banks • Trunk Scan and Scan Lists

Trunk Lockout • Trunk Delay • Cloning Capability

10 Priority Channels • Programmed Service Search

Size: 2-1/2" Wide x 1-3/4" Deep x 6" High

Frequency Coverage:

29.000-54.000 MHz., 108-174 MHz., 406-512 MHz., 806-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

Our new Bearcat TrunkTracker BC245XLT, is the world's first scanner designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. Our scanner offers many new benefits such as **Multi-Track** - Track more than one trunking system at a time and scan conventional and trunked systems at the same time. **300 Channels** - Program one frequency into each channel. **12 Bands, 10 Banks** - Includes 12 bands, with Aircraft and 800 MHz. 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. **Smart Scanner** - Automatically program your BC245XLT with all the frequencies and trunking talk groups for your local area by accessing the Bearcat national database with your PC. If you do not have a PC simply use an external modem. **Turbo Search** - Increases the search speed to 300 steps per second when monitoring frequency bands with 5 KHz. steps. **10 Priority Channels** - You can assign one priority channel in each bank. Assigning a priority channel allows you to keep track of activity on your most important channels while monitoring other channels for transmissions. **Preprogrammed Service (SVC) Search** - Allows you to toggle through preprogrammed police, fire/emergency, railroad, aircraft, marine, and weather frequencies. **Unique Data Skip** - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. **Memory Backup** - If the battery completely discharges or if power is disconnected, the frequencies programmed in your scanner are retained in memory. **Manual Channel Access** - Go directly to any channel. **LCD Back Light** - An LCD light remains on for 15 seconds when the back light key is pressed. **Autolight** - Automatically turns the backlight on when your scanner stops on a transmission. **Battery Save** - In manual mode, the BC245XLT automatically reduces its power requirements to extend the battery's charge. **Attenuator** - Reduces the signal strength to help prevent signal overload. The BC245XLT also works as a conventional scanner. Now it's easy to continuously monitor many radio conversations even though the message is switching frequencies. The BC245XLT comes with AC adapter, one rechargeable long life ni-cad battery pack, belt clip, flexible rubber antenna, earphone, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, ESAS or LTR systems. Hear more action on your radio scanner today. Call CEI today at 1-800-USA-SCAN to order your BC245XLT radio scanner.



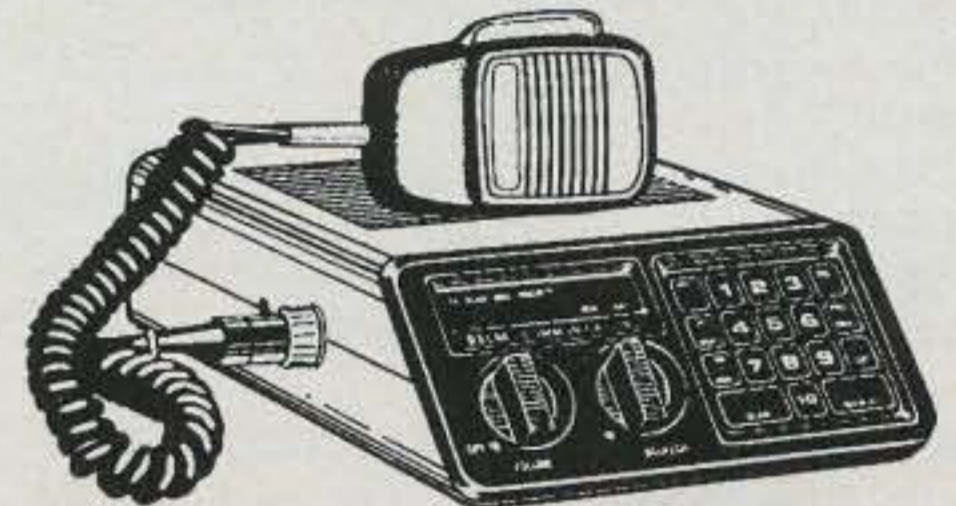
WX/VHF/CB Radios

Have fun and use our CB, shortwave and commercial radios to keep in touch with the world, friends and family.

Cobra 148GTL-A3 SSB CB/SPECIAL \$114.95
 Maxon HCB40WX handheld CB with 10 weather ch. \$69.95
 Davis 7440CS-A Complete weather station \$419.95
 RELM SMV4099W-A 40 watt VHF mobile transceiver .. \$349.95
 Uniden GRANTXL-A SSB CB Mobile \$124.95
 Sangean ATS909-A shortwave receiver \$229.95
 Sangean ATS818CS-A shortwave receiver \$199.95
 Sangean ATS404-A shortwave receiver \$79.95

Radio Scanners

AOR8200B-A wideband handheld scanner/SPECIAL \$519.95
 AOR5000B+3-A wideband communications receiver \$2,089.95
 AOR3000A-A wideband base/mobile scanner/SPECIAL ... \$1,049.95
 AOR AR16BQ wideband handheld scanner w/ quick charge \$209.95
 Bearcat 895XLT-A1 300 ch. TrunkTracker base scanner \$194.95
Bearcat 780XLT Reserve yours now at <http://www.usascan.com>
 Bearcat 278CLT-A 100 ch base AM/FM/SAME WX alert \$169.95
 Bearcat 248CLT-A 50 ch. base AM/FM/weather alert scanner \$99.95
 Bearcat 245XLT-A 300 channel TrunkTracker II scanner \$269.95
 Bearcat Sportcat 200 alpha handheld sports scanner \$174.95
 Bearcat Sportcat 180B handheld sports scanner \$149.95
 Bearcat 80XLT-A3 50 channel handheld scanner \$104.95
 Bearcat 60XLT1-A 30 channel handheld scanner \$79.95
 Bearcat BCT7-A information mobile scanner \$149.95
 ICOM ICR8500-A2 wideband communications receiver \$1,479.95
 ICOM PCR1000-A2 computer communications scanner \$329.95
 ICOM ICR75-A2 communications receiver \$664.95
 ICOM R10-A2 handheld wideband communications receiver \$289.95



RELM® RH256N-A Transceiver/SPECIAL

Mfg. suggested list price \$460.00/Special \$284.95

Size: 6-1/2" Wide x 10-3/4" Deep x 2-3/4" High

Frequency Coverage: 144.000-174.000 MHz.

Now...everyone can have their own RELM two-way transceiver and stay in touch with their department. The RELM RH256N is a powerful 25 Watt scanning transceiver that is perfect for law enforcement, fire and urban search and rescue agencies. The RH256N is programmable for up to sixteen different frequencies with selectable CTCSS tones on each channel. Also includes simplex and repeater capability, scan delay and time-out timer. Built-in priority scanner is selectable from the slope-front panel. When you order the RH256N from CEI, you'll get a complete package deal including microphone, vehicle mounting bracket, DC power cords and RELM's two year limited warranty. You can also use the RH256N as a base station if you order our 22 amp 12 Volt DC power supply part #PS26KX for \$94.95 and \$25.00 shipping. VHF transmitting antenna with PL259 connector part #ANTK is \$29.95. Programming instructions part #PI256 is \$19.00.

Buy with confidence

It's easy to order from us. **Mail orders to:** Communications Electronics Inc., P.O. Box 1045, Ann Arbor, Michigan 48106 USA. Add \$20.00 per weather station or radio product for UPS ground shipping, handling and insurance to the continental USA unless otherwise stated. Add \$13.00 shipping for all accessories and publications. Add \$13.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, Guam, P.O. Box or APO/FPO delivery, shipping charges are two times continental US rates. Michigan residents add state sales tax. No COD's. Satisfaction guaranteed or return item in unused condition in original packaging within 61 days for refund, less shipping charges. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express, MasterCard, IMPAC or Eurocard. Call anytime 1-800-USA-SCAN or 800-872-7226 to order toll-free. Call 734-996-8888 if outside Canada or the USA. FAX anytime, dial 734-663-8888. Dealer and international inquiries invited. Order from Communications Electronics Inc. today and save.

Price schedule effective June 2, 2000 AD #060200CQ © 2000 Communications Electronics Inc.

For credit card orders call
1-800-USA-SCAN

Communications Electronics Inc.

Emergency Operations Center

e-mail: cei@usascan.com

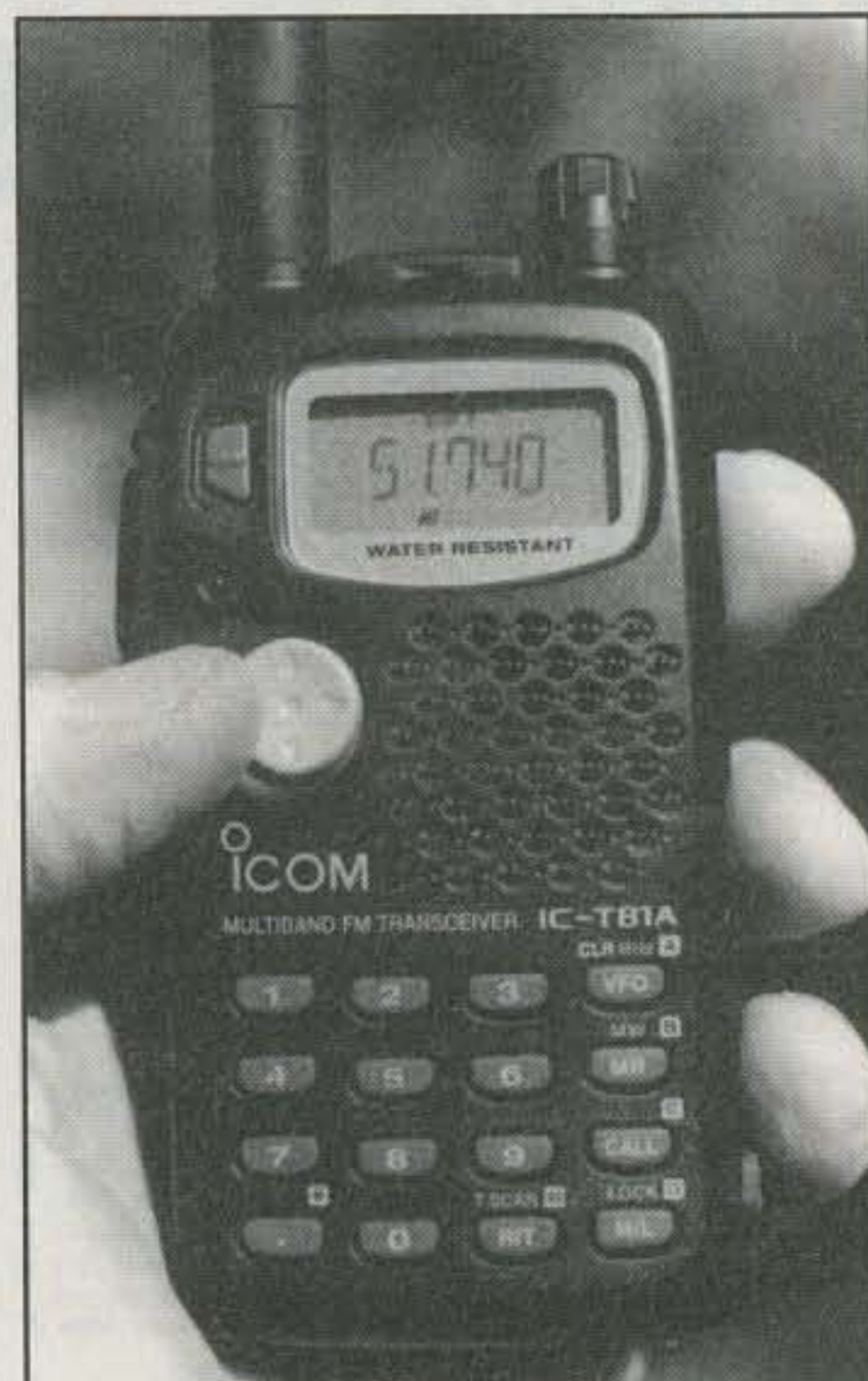
www.usascan.com

PO Box 1045, Ann Arbor, Michigan 48106-1045 USA

For information call 734-996-8888 or FAX 734-663-8888

"Ultimate" Handhelds

	Kenwood D7A	ICOM T81A	Yaesu VX5R
Ham Bands	2m/440	2m, 6m, 440, 1270	2m, 6m, 440
Output Power	5W	5W	5W
RX Coverage (MHz) (cellular blocked)	118-136, 136-174 400-480	6m, 74-170 + wide FM, 400-470, 1.2 Ham	.5-16, 48-999 + wide FM
Air Receive	Yes	Yes	Yes
Memories	200	124	220
Alphanumerics	Yes	Yes	Yes
Dual RX	Yes	No	No
Dual Knobs	No	No	No
Auto Rptr Shift	Yes (2m)	Yes	Yes
Tone Scan	Yes	Yes	Yes
Backlit Keypad	No	No	Yes
Cloning	No	Yes	Yes
Computer Prog.	Yes	Yes	Yes
Ant. Connector	SMA	SMA	SMA
12 VDC Operation	Yes	Yes	Yes
CTCSS Encode	Yes	Yes	Yes
CTCSS Decode	Yes	Yes	Yes
DCS Tone	No	No	Yes
Power Levels	3	3	3
Audio Output	1/2W	1/2W	3/4W
Power Saver	Yes	Yes	Yes
DTMF Slots	10	9	9
Seen Selling \$\$	\$399	\$350	\$350



as well as public safety receive scanning. The recently discontinued IC-T8A also has wideband FM capabilities so you can trick the equipment into thinking it's a TV tuner. It listens to aeronautical channels quite nicely, too, and is PC-programmable with optional cloning software and cable.

From Kenwood, I like the TH-79 with the KSS Sky Command feature. There are 40 channels on VHF, and 40 on UHF, each of which can take an alphanumeric tag of up to seven characters. Cool features: It can be set up for full-duplex crossband operation, or dual in-band receive on VHF or UHF. There is also a guide function on the LCD panel that helps you figure out what sub-mode you have punched in. Best of all, the TH-79KSS can take advantage of the Kenwood Sky Command system, which allows this little transceiver to run a Kenwood HF base station by remote control. Newer versions of the TH-79 have this Sky Command function already built in. (Note: The FCC is in the process of deciding whether the Sky Command system is legal on 2 meters. —ed.)

Over at Yaesu, the FT-51R fits in the "totally cool" category because of the frequency display built into its remote speaker-microphone. The audio output from the speaker built into the mic is also terrific, but I like the idea of a separate HT mic that also shows me my frequency, right in front of my nose!

Also in the "cool" category is Radio Shack's pair of single-band HTs, one each for 2 meters (HTX-200) and 70 cm

(HTX-400). I have tested the 2 meter transceiver, and it puts out about 1/4 watt with two AA batteries and over 2 watts of power when running off an external power source, such as your car battery. Each radio is truly cool because of its relatively small size, simple programming techniques, and built-in sub-audible tone encode and decode capabilities. RadioShack also sells a 3 1/2 foot SMA-to-BNC cable kit to make this handheld quite at home in your car or your home QTH without big, heavy coax tugging at the fragile SMA connection.

Audio on both handhelds is excellent, and there's plenty of it for listening to this equipment in a big crowd. Thirty memory channels is just about right for most of us who use local and distant repeaters, but may not necessarily be if you are traveling across country and need to store more than 30 channels.

Le Ultimate

These are radios for the ham operator well tuned in to the VHF and UHF bands. They represent the top of the line from their manufacturers, and incorporate many features that add just a little bit to the price tag to put it up in the \$500-\$600 category. This equipment is not necessarily more complex to operate, but it has more complex capabilities that you must figure out *how* to operate.

We will start out with the Kenwood TH-D7A with built-in 1200/9600 baud packet TNC, along with built-in software for APRS (Automatic Position Reporting System). Besides being a dual-

band, simultaneous-receive, 2 meter and 440 MHz handheld, the front display shows information each time correct APRS data is received. No external computer or TNC required! You can tie a GPS receiver into this equipment and send out your position. You could do it manually, too.

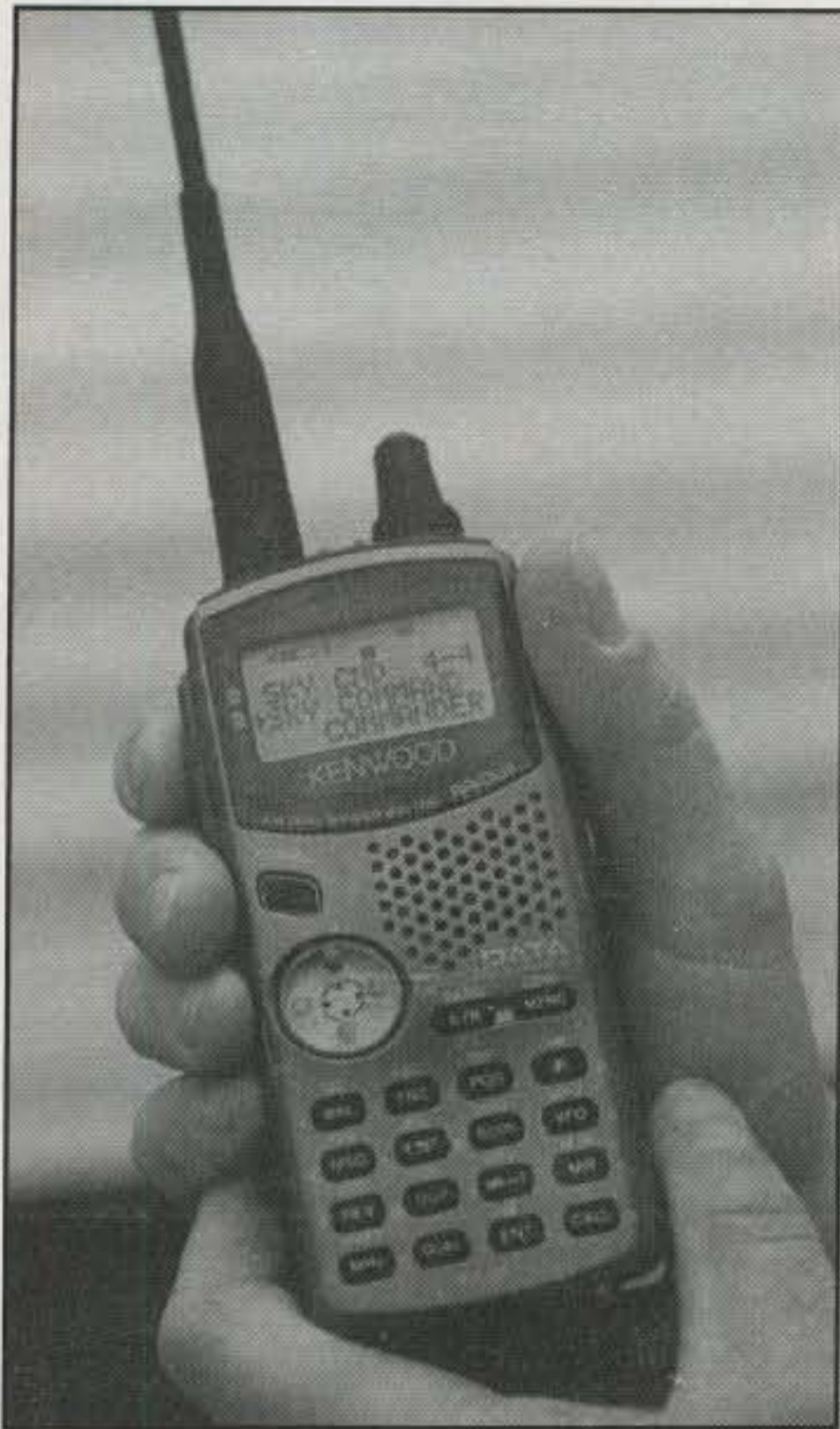
You can also tie the TH-D7A into the matching VC-H1 portable slow-scan television handheld. The VC-H1, tied into the TH-D7A (or for that matter almost any Kenwood handheld) can send and receive high-resolution JPEG format color pictures, and you can easily also send a color picture over any VHF or HF SSTV frequency.

The Kenwood TH-D7A works quite nicely with the Kenwood Sky Command system described earlier for the TH-79A. Kenwood uses a four-position rocker button for many of the sub-functions, and the rocker pad works beautifully. If you're looking for the ultimate handheld from Kenwood Corporation, do consider the TH-D7A.

ICOM's ultimate handheld is the IC-T81A quadruple-band transceiver cov-

ICOM's IC-T81A is the only four-band handheld on the amateur market today covering 6 meters, 2 meters, 70 cm, and 23 cm (1270-1300 MHz), with 5 watts out and over 100 memory channels. On the receive side, it covers the 6 meter and 23 cm ham bands, plus 74-170 and 400-470 MHz, with AM for aircraft receive and wide FM for tuning in FM broadcast and TV audio signals.

ICOM's ultimate handheld is the IC-T81A quadruple-band transceiver cov-



The Kenwood TH-D7A was the first amateur handheld with a built-in 1200/9600 baud packet TNC and software for sending and receiving APRS (Automatic Position Reporting System) packets. It is also compatible with Kenwood's Sky Command remote-control system for certain HF transceivers.

ering 6 meters, 2 meters, 70 cm, and 1.2 GHz in one compact body. The unit also has wideband FM reception, AM aeronautical reception, and up to 124 memory channels along with auto-repeater function. Yes, it is PC-programmable.

The IC-T81A works extremely well, and even better if you hook it up to an outside antenna for 6 meter operation. It may take you only a few minutes to master the instruction manual, but it could take you several hours to ultimately master the very sensitive multi-function rocker switch. Once you get the right touch, though, you'll be able to go in and out of tones and the function menu quite easily. Getting the right touch is going to take some time!

Yaesu's ultimate handheld transceiver is the VX-5R. It features a spectral band display along with receive coverage from the AM broadcast band through 16 MHz shortwave, and 48 through 999 MHz VHF and UHF scanning capabilities (cellular blocked), including wideband AM and FM broadcast. The VX-5R has so many functions that it may take you a year to figure out all of them. With

220 memories, it's absolutely top of the class at Yaesu, and if you're looking for a handheld that can also tune in WWV time signals, this unit has it.

What's Best for You?

So which handheld is for you? See them, touch them, and then check out the many features we have described

as you figure out how you plan to use one in the field. Then enjoy everything that the manufacturers have gone overboard to bring us in quality equipment at a fraction of the price we would pay for it if it were a product going into the land mobile or commercial field. Amateur radio equipment has a lot more features than comparable commercial radio equipment at a fraction of the price.



Tri-Ex
SKY NEEDLE

The NEW



"A Legend In Our Time"

For 40 years Tri-Ex has been the leader in design and manufacturing of strong self-supporting amateur towers with thousands sold throughout the United States and abroad. To continue the growth into the next decade, a lot of changes were implemented in January 2000 at the management level to improve, upgrade and revitalize the amateur tower market. These important changes are very beneficial to all radio amateurs looking to purchase a strong tower, with fast delivery at a very appealing price.

IMPROVED TOWER DESIGN

As of January 2000, 60,000 KSI yield steel tubing was implemented on all tower legs, allowing for stronger towers and superior wind load capacity up 25% plus on most models, a Tri-Ex exclusive. A good example is the LM470E model, which jumped to 42-sq.ft. of antenna at 50 MPH and 24-sq.ft. of antenna at 70 MPH. The 54-foot LM354HD zoomed to 80-sq.ft. of antenna at 50 MPH (60 sq. ft. at 70 MPH). Vertical dead load went up 30%.

TRI-EX TOWER PRICES

Reduced across the board and better than competitive in pricing. An example is the motorized heavy duty Tri-Ex model LM470E now available for \$4,750. including the rigid base concrete rebar cage (check out our web page for other tower prices). With the LM470E, DX Series and higher we only require 60% money down on order.

DELIVERY TIMES

Average delivery time of 3-4 weeks or shipped immediately out of inventory. New installation guide with 84 color photos available for Tri-Ex buyers.

SHIPPING COSTS

We're 50-70% lower than other crank-up tower manufacturers on cost for shipping your tower (ask for freight quote).

TRI-EX TOWER WEB PAGE

A complete new web page loaded with pictures, information and comparison charts, etc. The First Call web site is the most complete tower web page ever put up on the Internet.

www.firstcallcom.net

FIRST CALL COMMUNICATIONS, INC.

32 Grove Street, Spring Valley, NY 10977

Phone: 914-352-0286 800-HAMTOWER (800-426-8693)

Fax: 914-357-6243 E-mail: firstcall@cyburban.com

Web: www.firstcallcom.net Hours 9-5 pm ET Mon.-Fri.

WE SHIP WORLDWIDE



CIRCLE 60 ON READER SERVICE CARD



FT-1000MP
The radio of choice for world-class contest operators, the FT-1000MP provides 100 Watts of power, Enhanced DSP™, Dual In-band Receive, Cascaded IF filters, General Coverage RX, and 160-10 M TX. (DC-only version also available.)



FT-920
The FT-920 HF/6M Transceiver is designed for today's active Ham. It features high-speed DSP in all modes, 127 memory channels, AFSK or FSK Digital operation, new-technology MOSFET PA finals, high-speed Automatic Antenna Tuner, and high-resolution LCD display.



FT-1000D
Truly an elite-class HF masterpiece, the 200 Watt FT-1000D provides Dual Receive (in-band or cross-band), Cascaded IF Filters, extraordinary Dynamic Range, DDS, high-speed Automatic Antenna Tuner, and 100 memory channels.



FT-100
This ultra-compact HF/VHF/UHF 100 Watt Transceiver provides SSB, CW, AM, FM and AFSK coverage of the HF, 6M, 2M and 70 CM bands. Features include 300 memory channels, built-in Electronic Memory Keyer, DSP, IF Shift, IF Noise Blanker, and CTCSS/DCS.



FT-840
Affordable yet feature filled, the FT-840 is an ideal traveling companion. It offers 160-10M TX with general coverage RX, 100 memory channels, DDS, CTCSS, Twin Band Stacking VFOs, and excellent receiver dynamic range.



FT-600
This compact 100 Watt HF Transceiver offers the utmost in operating simplicity. The MIL-STD rated FT-600 covers the 160-10M Amateur bands with General Coverage Receive, 100 memory channels, Direct Keypad Frequency Entry, and a front-mounted speaker.



VL-1000/VP-1000
The VL-1000 Quadra System is a Solid-State Linear Amplifier featuring four twin-MOSFET PA modules to produce 1000 Watts of clean power output on 160-15 Meters (500 Watts on 6M, modifiable for 12/10 meters). Included are an Automatic Antenna tuner, 2 Input and 4 Output Antenna Jacks, and extensive status displays on the multi-function LCD.

FT-847

The introduction of the FT-847 completely redefines base station operation by offering three radios in one—HF, VHF/UHF and Satellite. A full power multi-mode transceiver, the appropriately named Earth Station covers the HF, 50 MHz, 144 MHz and 430 MHz bands, and it includes crossband Full Duplex operating capability for satellite work. Its exceptional receiver performance is ready for all aspects of DX work thanks to the DSP filtering. And for local FM work both CTCSS and DCS encode/decode are built in. The FT-847 is an engineering breakthrough offering you the earth, the sky, and the moon in one compact package.



THE TASK MASTERS.

They're out there. Those elusive DX signals that can't poke through the QRM regardless of the late-night hours you put in trying to find them. But when a Yaesu HF enters the picture, weak signals suddenly jump into your headphones. Yaesu's High Frequency transceiver technology uniquely combines years of RF and AF design know-how with cutting edge advancements in IF filtering, noise reduction, and dynamic range. Whether you're on high bands or low, at home or away, the high frequency technology of Yaesu's task masters quickly fills up your log with contacts. Learn more about Yaesu products on the web at www.yaesu.com

YAESU Choice of the world's top DX'ers.

©1999 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703, (562) 404-2700. Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.



FT-8100R

The versatile FT-8100R Dual Band Mobile offers rugged RF design, 50 Watt (VHF)/35 Watt (UHF) power output, 310 memory channels, Dual Receive (VV/UU/VU), Enhanced Smart Search™, CTCSS Encode, and a TX Time-Out Timer. (ADMS-2D programming software available.)



FT-100

This ultra-compact HF/VHF/UHF 100W Transceiver provides SSB, CW, AM, FM and AFSK coverage of the HF, 6M, 2M and 70 CM bands. Features include 300 memory channels, built-in Electronic Memory Keyer, DSP, IF Shift, IF Noise Blanker, and CTCSS/DCS.



FT-3000M

This 70W high-powered 2M FM Mobile provides extended UHF receiver coverage, AM Aircraft RX, and is MIL-STD approved. The FT-3000M features 81 memory channels, Smart Search™, CTCSS/DCS and is 1200/9600 Baud Packet compatible. (ADMS-2D programming software available.)



FT-1500M

Yaesu's FT-1500 2M FM Mobile, a masterpiece of RF and mechanical engineering, is a trend-setting blend of compactness and functionality. Excellent receiver performance, direct keypad frequency entry, Alpha-Numeric Memory system, and 50 Watts of output power are just the start. Easy to install, program, and operate, the FT-1500M is a space-age wonder at a down-to-earth price.



FT-2600M

This heavy-duty VHF FM Mobile is encased in a durable aluminum die-cast chassis/heatsink assembly, and manufactured to MIL-STD 810 requirements. Features include 60 Watt power output, 179 memory channels, direct keypad frequency entry from microphone, Alphanumeric memories, and PC programming capability with optional ADMS-2E software.

FT-90R

The new FT-90R VHF/UHF Mobile Transceiver wasn't given the name Micro Mobile for nothing. Weighing only 1.42 pounds, half the size of the competing brands, it fits almost anywhere. But don't let the size fool you. The FT-90R is one powerful Dual Band FM Transceiver. The high-performance receiver front end utilizes a GaAs MES FET device for excellent sensitivity, allowing for greater simplex range and access to distant repeaters. The adaptable Micro Mobile has programmable function keys, a high-capacity memory system and a versatile scanning system for active operation. (ADMS-2E programming software available.)



LITTLE BIG MOUTH.

Life is an adventure. So whether you're on expedition or vacation, you will probably encounter some rough going along the way. And when you do, you'll be glad that your mobile transceiver is a Yaesu. With units small enough to install almost anywhere and rugged enough to achieve military approval for shock and vibration, Yaesu is the obvious choice for dependability. Its exceptionally clear signal and wide dynamic range tame even the most crowded bands, and provide outstanding protection from intermodulation in urban areas. Learn more about Yaesu products on the web at www.yaesu.com

YAESU ...leading the way.

©2000 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703, (562) 404-2700. Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

Results of the 1999 CQ/RJ WW RTTY DX Contest

BY ROY GOULD,* K1RY, AND RON STAILEY,** K5DJ

There were over 650 logs for the 1999 RTTY Contest, with approximately 400 of them sent via e-mail. Problems continue, as many entrants did not name the attached files by their callsign. This is a time-consuming problem for us, as we have to find out what file belongs to whom. In addition, if you find yourself as a check log in these results, it is due to an incomplete summary sheet, a log only with *no* summary sheet, or just a very sloppy log. Please follow the rules. You *must* break out all multipliers by zone, country, and US/VE area. Keep in mind all of the above when submitting your log for the 2000 contest.

Single Operator

Single Operator, High Power. The top score was achieved by P43P operated by Jacobo, with an impressive 2096 QSOs. Close behind him was EMØI, followed by Eddie operating as TY1RY and then S58T, with many more in the million-point class.

Single Operator, Assisted. Vitaly, UXØZ, won this category with over 3.5 million points, followed by Barry, W2UP, just a few points behind at 3,147,300. Next were KI1G and JS3CTQ.

Single Operator, Low Power. This was our most popular entry class, with over 200 entries. A battle took place here, with Don, AA5AU, taking top honors with a final score of 1,716,112 points, just beating out Jody, VP5JM, who had 1,601,328. Next were PY2MNI and VO2WL, followed closely by UY8IF, LV5V, and WB8YJF.

Single Operator, Single Band 3.5 MHz. Sam, UT9F, had 351 QSOs and 62 countries to win on 80 meters. Not far behind was S57CQ, followed by 9A9A and 9a5Y.

7.0 MHz. Robert, S57AW, had 661 QSOs and 80 countries on this band to win this category, with EA9PP and F/OK1EE giving chase.

*P.O. Box DX, Stow, MA 01775
e-mail: <k1ry@contesting.com>

**504 Dove Haven Dr., Round Rock, TX 78664
e-mail: <k5dj@contesting.com>



Josef, SP3JHR, was single operator, low power in the contest.

14 MHz. 9A2DQ had 929 QSOs on 14 MHz to take first place, followed by VA3MM, UA4LCQ, and G5G operated by GØNUP.

21 MHz. The most popular single band category this year was 21 MHz, with some very good scores. Nikola, 9A5W, won it with 984 QSOs, working 33 zones and 95 countries in the process! ERØF was next, with NP2E and AEØQ giving chase.

28 MHz. Rodrigo, PY2KC, won on this band with 78 countries worked and just over 800 OSOs. Close behind him were LU3EKC and HC1JQ.

Multi-Operator

Multi-Operator Multi-Transmitter. The HC8N gang operated from the Galapagos, where I was for the first CQ WW RTTY. They did a bit better than I did, however. They made 4688 QSOs with 103 countries on 20 meters and close to that on 15 and 10 meters. It was a great effort by N4GN, WF1B, W6OTC, K6AW, HC1OT, W5AP, and N5KO.

Another great effort was P3A from Cyprus. A group of top Russian operators turned in a score of just over 7.5 million points. The ops were RA9JX, RZ3TX, UA9CDV, RAØAM, RZ9WZ, and UA9CKP. The stateside boys from W3LPL came in third in the world this time. Other great efforts came from RW2F, HG3DX, and many others. There used to be only two or three entries in the Multi-Multi category, but this year we had 13.

Multi-Operator, High Power. Robby and a group as VY2SS went to Prince Edward Island to give us Zone 1. They took this class with 3,693,690 points, followed closely by the OT9E effort from Belgium. Close behind them were IK2QEI and OH1F, followed by YL4U. There were lots of great and *close* scores in the top five in this category.

Multi-Operator, Low Power. The group from Z30M won here with 2,226,536 points with 1636 QSOs along the way. Close behind was the US effort from the gang at KE1FO, followed by

TOP SCORES

Single Op High Power

P43P .....3,633,216	S58T .....2,335,440
EMØI.....3,553,022	(Op: UN5PR)
TY1RY.....2,992,411	LZ5Z.....2,127,684
(Op: GØAZT)	

Single Op Low Power

AA5AU .....1,716,112	VO2WL .....1,178,310
VP5JM.....1,601,328	UY8IF.....1,149,615
PY2MNL.....1,419,990	

Single Op Assisted

UX0B.....3,567,116	JS3CTQ .....2,054,289
W2UP.....3,147,300	DK3GI .....1,721,055
K11G.....2,691,084	

Multi-Op High Power

VY2SS.....3,693,690	OH1F .....3,259,872
OT9E.....3,500,656	YL4U .....3,247,692
IK2QEI.....3,475,276	

Multi Op Low Power

Z30M.....2,226,536	S57KM .....1,283,732
KE1FO .....1,980,508	RK9CZO .....806,400
9A5D .....1,353,828	

Multi-Op Multi-Transmitter

HC8N .....11,081,800	RW2F .....5,610,423
P3A .....7,571,382	HG3DX.....5,584,727
W3LPL .....6,280,423	

Single Op 3.5 MHz

UT9F .....61,488	9A5Y .....46,648
S57CQ .....59,184	(Op: 9A6KTS)
9A9A .....57,040	CT1AOZ.....36,814

7.0 MHz

S57AW .....245,055	F/OK1EE .....132,000
EA8PP .....218,004	

14 MHz

9A2DQ .....404,448	G5G .....352,365
VA3MM .....382,184	(Op: GØNUP)
UA4LCQ .....364,620	5B4WN.....279,660

21 MHz

8P9Z.....597,987	NP2E.....402,862
9A5W .....470,057	AEØQ .....365,427
ERØF .....444,400	
(Op: UXØFF)	

28 MHz

PY2KC .....369,562	LT3C .....300,339
LU3EKC .....342,103	LW7EIC.....281,281
HC1JQ .....307,365	

very few photographs sent—one, to be exact. Next time please send along some photos.

As always, we are always looking for plaque sponsors. Contact Ron, K5DJ, at the address/e-mail on this page if you are interested.

73 de Roy, K1RY, and Ron, K5DJ

Station Operators

HG3DX: HA1TL, HA1DAC, HA3UU, HA3AU, HA3UF, HA9RU, HA9OA, HA9RC, HA1YA, HA1WD. **VE7SOD:** VE7CFD, VE7SZ, VA7RR. **HC8N:** N4GN, WF1B, W6OTC, K6AW, HC1OT, W5AP, N5KO. **K8AA & KG8CO.** **W3LPL:** K4GKM, N3OC, N3UN, N8YYS, NE3H, NO2T, W2GG, W3EKT, K3MM. **P3A:** RA9JX, RZ3TZ, UA9CDV, RAØAM, RZ9WZ, UA9CKP. **UA6AN:** UA6AF, UA6AHF, RA6BE, RA6ABW. **N9NCX:** KS9W, KG9X. **RW2F:** RA2FA, RN2FA, UA2FB, UA2FF, UA2FZ. **CE8SFG:** CE8FSG, CE8FGC, CE8GLQ. **OM5M:** OM1KM, OM2KM, OM2RA, OM3BH, OM3BG. **LZ2MC:** LZ1MYL. **IK2BUF:** IK2UCK,

IT2AVK. **RY9C:** UA9CGA, RW9CF, RV9COX. **VY2SS:** K5DJ, WT4I, W4GKM, N1RCT, VE9DX, VE9MY, VE9ML, VE5FN, VY2DR. **OL5Q:** OK1HRA, OK1VSL, IK1INC, OK1FFU. **LW8EXF:** LU7DW. **AF4Z:** KC4HW, KE4MMI, WA4HDS, WB2EQS, K4QD, K4AW, K4PX, AB4ET, KT4FY, KF4ZNC, K9ES, NB4C. **OH1F:** OH1MDR, OH1MM, OH1NOA. **RK3RWL:** RN3RC & RN3RX. **OT9E:** ON4GG, ON4AME, ON4CBA, ON4ANT, ON4AOI, ON4AWK, ON4AMM. **VE3FJB:** VE3IJM, VE3VSM. **NØMJ:** WØGJ. **IK2QEI:** IK2QUE, I2EOW, IK2PZC, IZ2AAJ, IK4MTF. **OHØXY:** OH1DT, OH3TY, OH3WK, OH6XY. **KH7R:** KH6ND, KH7U, AH6OZ. **RK9JWZ:** UA9JIJ, UA9JMD, UA9JMS. **RU1A:** RW1AC, RN1AM, UA169-946, Alex Vadim. **PI4COM:** PA3BWD, PA3EWP, PA3EA, PA5ET, PA7FM. **KE1FO:** KT1M, WM1K, N1XS, KE1AK, WØDC, K1TTT. **RK9CZO:** RX9CAZ, RX9CX, RA9CDH, Rjamov K. **Z30M:** Z31GX, Z32PT, Z32XX, Z31JA, Z33ZOD. **9A7P:** 9A5AEI, 9A6NHH, 9A3RE, 9A6NPM. **9A5D:** 9A3AY & 9A4NC. **N6OJ:** K6ZWB, K6ANP, K6WAP. **KD4RGB:** & N4VHK. **WB8SKP:** KA8CVE, WD8OWA, NK8G. **WN1E:** & AA1MM.

Check out the forums on our website
www.cq-amateur-radio.com

LOG-PERIODIC ANTENNAS by TENNADYNE

Since 1986

*If your antenna were a business tool, you would
have upgraded it long ago.*

LPs from 2 - 1300 MHz, 12 to 130 ft booms

ALUMINUM WITH A PhD

Want details? Visit our web site at www.tennadyne.com, call us at
915-446-4510 or E-mail us at tennadyne@kctc.com

Heavy Duty Components

for the **HEAVY DUTY HAM**

Hipersil plate and filament transformers,
high voltage rectifiers, vacuum variables,
DC filter chokes & capacitors, roller inductors,
RF plate & filament chokes

Peter W. Dahl Co.

Call or fax for an extensive catalog.

www.pwdahl.com • pwdco@pwdahl.com

915 751-2300 • fax: 915 751-0768 • 5869 Waycross • El Paso, TX 79924



9A5D and S57KM with over a million points also.

Summary

Thanks to all participants. Again, please follow the rules for scoring and reporting results. As always, a big thanks to Gail at CQ for putting up with me (Roy)!

See you this year on September 23-24 for the 2000 RTTY Contest. Due to the number of entries received via e-mail and computer disks, there were very few soapbox comments, not even enough to print here. There were also

CIRCLE 78 ON READER SERVICE CARD

1999 PLAQUE SPONSORS AND WINNERS

Single Operator, High Power (SOH)

World: Sponsored by Nick Smith, W4GKM. Winner: **Jacob Oduber, P43P.**
USA: Sponsored by John (Bob) Orton, WA6BOB. Winner: **George Johnson, W1ZT.**
N.A.: TG9VT Memorial sponsored by K1RY & W2JGR. Winner: **Scott Lehman, N9AG** at N8NR.
S.A.: Open.
Oceania: Sponsored by HamStuff (by W7NN). Winner: **9M6BG (Opr: Brett Graham, VR6BG).**
Africa: Sponsored by Doug Faunt, N6TQS. Winner: **TY1RY (Opr: Eddie Schneider, G8AZT).**
Europe: Sponsored by Hal Communications, Corp. Winner: **EM0I (Opr: Nick Nikitjuk, UT2IZ).**
Asia: Sponsored by Don Busick, K5AAD. Winner: **UP5P (Opr: Romeo Loperev, UN5PR).**

Single Operator, High Power (SOA)

World: Sponsored by CQ Magazine. Winner: **V. D. Veter, UX0Z.**
USA: Sponsored by RTTY by WF1B. Winner: **Rick Davenport, K11G.**
N.A.: Sponsored by Barry Kutner, W2UP. Winner: **Barry Kutner, W2UP.**
S.A.: Sponsored by Great Lakes DX & Contest Club, K9PXV. Winner: **M. Brunelle, FM5CD.**
Oceania: Open.
Europe: Sponsored by *The New RTTY Journal*. Winner: **Roland Mensch, DK3GI.**
Asia: Sponsored by ICDXA-ICOM DX Association. Winner: **Niroyuki Imaba, JS3CTQ.**
Africa: Open.

Single Band

World 10 Mtrs: Sponsored by N1JJ, Johnson Joules Contest Club. Winner: **Rodrigo Tarikian, PY2KC.**
World 15 Mtrs: Sponsored by Denis W4DC & Mike KA4RRU. Winner: **John Jerrett, 8P9Z (Opr: K4FJ).**
World 20 Mtrs: Sponsored by Kunihiro Fujii, JH1QDB. Winner: **Zelimir Klasan, 9A2DQ.**
World 40 Mtrs: Sponsored by Tri-County DX Association. Winner: **Robert Bajuk, S57AW.**
World 80 Mtrs: Sponsored by Neal Campbell, K3NC. Winner: **Sam Sorokin, UT9F.**

Low Power, All Band

World: Sponsored by *Amateur Radio Trader* (by W4GKM). Winner: **Don Hill, AA5AU.**
USA: Sponsored by *The New RTTY Journal*. Winner: **Jon Severt, WB8YJF.**
N.A.: Sponsored by Dick Stevens, N1RCT. Winner: **Jody Millspaugh, VP5JM.**
S.A.: Sponsored by Doug Faunt, N6TQS. Winner: **W.F. Gomez, PY2MNL.**
Oceania: Sponsored by Dave Barr, K2YG. Winner: **Eric Esposito, FK8GM.**
Africa: Sponsored by Billy Gallier, W4WX. Winner: **Dave Plaskett, ZS6RVG.**
Europe: Sponsored by Don Hill, AA5AU. Sponsored by **Igor Fomin, UY8IF.**
Asia: Sponsored by Bruce D. Lee, KD6WW. Winner: **JY9NX (Opr: Koji Tahara, JM1CAX).**

Multi-Single High Power

World: Sponsored by *Amateur Radio Trader* (by W4GKM). Winner: **VY2SS.**
USA: Open.
N.A.: Sponsored by WriteLog for Windows (by K5DJ). Winner: **AF4Z.**
Oceania: Open.
S.A.: Sponsored by The Florida Boys. Winner: **LU4FM.**
Europe: Sponsored by Rodrigo Isola Tarikian, PY2KC/PW2C. Winner: **OT9E.**
Asia: Sponsored by Tom Moore, WA8RPK. Winner: **RY9C.**
Africa: Open.

Multi-Single Low Power

World: Sponsored by Hal Communications Corp. Winner: **Z30M.**
USA: Sponsored by Platinum Coast Amateur Radio Society. Winner: **KD4RGV.**
N.A.: Sponsored by Tom Morton, K6CT. Winner: **KE1FO.**
Oceania: Open.
S.A.: Open.
Europe: Sponsored by Euraf Communications, Benin (by TY1PS). Winner: **9A5D.**
Asia: Open.
Africa: Open.

Multi-Multi

World: Sponsored by CQ Magazine. Winner: **HC8N.**
Europe: Sponsored by W3LPL RTTY Contest Group. Winner: **RW3F.**
Asia: Sponsored by *The New RTTY Journal*. Winner: **P3A.**

Following callsign is Class of Operation (SOH = Single Op High Power All Band, SOL = Single Op Low Power All Band, SOA = Single Op Assisted All Band, MOH = Multi-Op High Power All Band, MOL = Multi-Op Low Power All Band, MOM = Multi-Op Multi-Transmitter), Final Score, QSOs, Points, Zones, Countries, and US/VE. Certificate winners are listed in bold.

1999 RTTY RESULTS

AFRICA

TY1RY	SOH	2,992,411	1,988	5,879	94	251	164
						(Opr: G8AZT)	

CANARY ISLANDS

EA8PP	7	218,004	493	1,473	26	73	49
EA8AG	SOL	187,968	357	1,056	56	116	6
EA8AKQ	SOL	153,276	323	964	38	98	23

CEUTA & MELILLA

EA9JZ	21	300,736	679	2,032	27	73	48
-------	----	---------	-----	-------	----	----	----

LIBERIA

EL2WW	SOH	378,144	610	1,818	57	141	10
						(Opr: ON4WW)	

SOUTH AFRICA

ZS6RVG	SOL	324,095	411	1,223	58	145	62
--------	-----	---------	-----	-------	----	-----	----

ASIA

ASIATIC RUSSIA

RK8AXX	MOM	3,170,034	2,113	5,838	112	326	105
RY9C	MOH	3,135,000	1,844	5,225	121	356	123
UA9MA	SOA	1,458,984	1,155	3,286	92	274	78
RX9SR	SOH	1,259,072	1,066	3,056	82	235	95
UA8FZ	SOL	1,028,432	909	2,584	95	204	99
RK9JWZ	MOH	828,184	913	2,572	65	200	57
RK9CZO	MOL	806,400	805	2,304	72	222	56
RA9MY	SOL	449,568	552	1,561	66	183	39
UA9CLB	21	209,751	528	1,509	28	77	34
UA8CA	28	49,895	205	587	23	53	9
UA9CDC	SOL	10,010	54	154	19	37	9
UUSJWL	MOL	4,628	40	89	18	33	1

CYPRUS

P3A	MOM	7,571,382	3,876	11,037	124	384	178
5B4WN	14	279,660	693	1,770	29	77	52

E. MALAYSIA

9M2TO	SOL	401,580	630	1,746	61	167	2
						(Opr: J8BDMV)	

INDONESIA

YB8UNC	SOH	345,675	427	1,257	70	155	50
--------	-----	---------	-----	-------	----	-----	----

ISRAEL

4Z5CP	SOL	816,320	893	2,551	75	198	47
4X6UO	14	188,238	465	1,374	23	66	48

JAPAN

JS3CTQ	SOA	2,054,289	1,497	4,201	99	244	146
JH4UYB	MOH	1,788,720	1,339	3,855	99	243	122
JA1YNE	SOH	1,056,482	952	2,702	90	212	89
JA1BWA	SOH	829,560	784	2,230	91	74	207
JE2UFF	21	244,112	561	1,606	30	75	47
JH3AIU	SOH	165,312	345	984	34	83	51
JA2AXB	SOH	163,401	262	753	65	110	42
JH8KYU/1	SOL	140,844	259	726	58	98	38
JA7EMH	SOL	122,144	260	694	50	117	9
JA2BY	21	118,809	318	921	26	55	48
JA3EVZ	21	115,240	299	860	28	66	40
JJ1VEZ	SOH	108,720	204	604	42	58	80
JA7KM	SOL	85,636	195	542	43	91	24
JG1GGU	21	70,596	236	666	23	60	23
7K4QOK	14	41,420	153	436	21	57	17
JA3MIB	SOL	36,400	124	350	25	60	19
JA1SJV	28	34,188	158	444	20	50	7
JE2OTM	28	33,840	147	423	19	46	15
JA8RJE	28	33,300	128	370	25	56	9
JA1BUI	SOL	32,385	91	255	45	62	20
JR3RIY	21	14,756	83	238	16	40	6
JH1QDB	SOL	12,555	55	155	30	43	8
7M4KSC	SOA	11,627	59	151	31	44	2
JK2VOC	SOL	8,662	48	122	32	39	0
JF5FGY	21	8,533	55	161	16	24	13
JN1MSO	SOL	6,477	50	127	33	18	0
JA2KPV	14	1,638	22	63	9	15	2

JORDAN

JY9NX	SOL	1,087,019	1,051	3,062	65	201	89
						(Opr: JM1CAX)	

KAZAKHSTAN

UP5P	SOH	2,595,159	1,609	4,577	119	338	110
						(Opr: UN5PR)	
UP8F	SOA	750,778	826	2,303	72	209	45
						(Opr: UN7FK)	

It's a tough job, but somebody's gotta do it...getting paid to spend the summer in the wilderness, playing with ham radio, and—oh, yes—keeping an eagle eye out for forest fires.

Ham Shack in the Wilderness

BY SAM VIGIL,* WA6NG

Imagine spending your summers in a solar-powered ham shack at 6,365 feet elevation...and getting paid for it! That's how Paul Boring, WA7WYD, and his wife Chris, N7HLB, have spent their summers for the past 16 years. There are a few tradeoffs of course: you have to scan for "smokes" every 15 minutes from dusk to dawn, and sometimes you're really close to the action when a wildfire erupts. It's serious business, but when the sun goes down, there's time to enjoy nature and ham radio!

An Old Friend

Paul and I have known each other since high school. Paul's father, the late Emery Boring, W6IIF, was the first ham operator I ever met. Seeing him work a DX station on 20-meter phone with his Viking Ranger transmitter and National HRO receiver inspired me to get my own ticket in 1961. But Paul wasn't a ham in those days, and as sometimes happens with friends with different interests, we went our separate ways after high school and lost track of each other.

Several years ago, I read an article about Emery Boring in the Silent Key column of *Worldradio* magazine. The article mentioned that both of his sons were hams, including my old friend Paul, who was now WA7WYD, and older brother Bob, K6YGI. I looked up Paul's address on the Internet and we struck up a long running correspondence, culminating in an invitation to visit Paul and Chris at the East Butte Lookout in Central Oregon (Photo A).

*1890 Castillo Court, San Luis Obispo, CA 93405
e-mail: <Lvengr@aol.com>

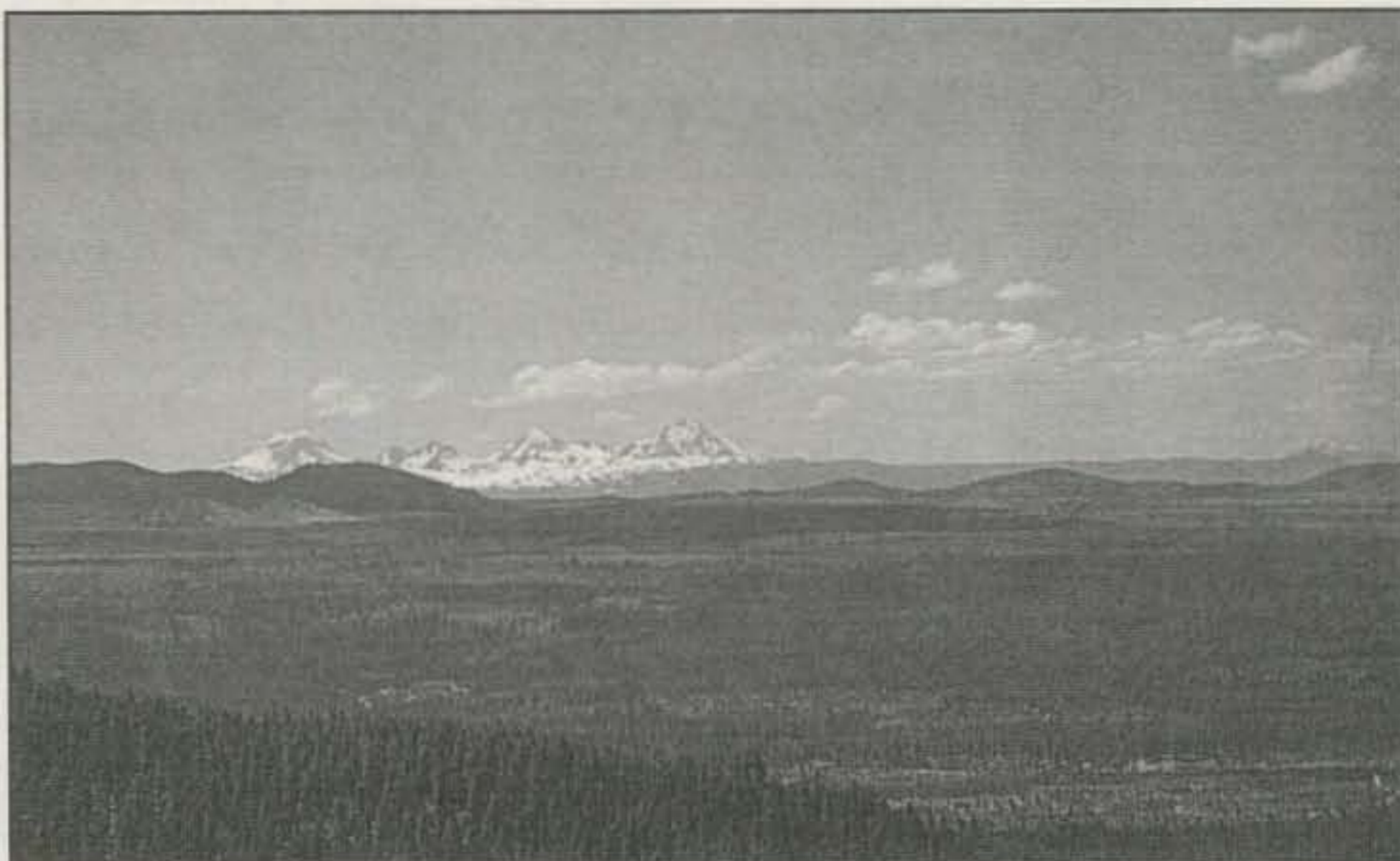


Photo A. Ham shack with a view! Imagine spending your summers here—with some of the conveniences of home...and no QRM! (Photos by the author, except as noted)

Another old friend from Paul's high school days, Monte Waite, WA6JYB, also went along on the trip.

Life in a Lookout

Paul is a high school biology teacher in Canby, Oregon, and has spent the past 16 summers operating forest lookouts for the U.S. Forest Service (Photo B). Paul and Chris started in 1983 as unpaid volunteers at the Tamarack Lookout in the Umatilla National Forest. Over the past few years, they have worked lookouts at Si Si Butte, Fox Butte, and Sand Mountain.

Their current lookout, East Butte, was originally built in the 1930s and was completely rebuilt in 1994. It is all wood construction and 33 feet high. A compact 182-square-foot platform at the top

is both their workplace in the daytime and their living quarters at night. The lookout has a propane powered stove (Photo C), heater, refrigerator, and two independent solar cell electrical systems. One solar system powers the Forest Service VHF radio and backup cellphone, and the second powers two ham rigs: a 100-watt HF SSB rig and a 50-watt VHF FM rig.

A typical work day for Paul and Chris starts at around 9:30 a.m. After a morning radio check, they scan the horizon for smoke every 15 minutes. When smoke is spotted, a bearing is found using the Osborne Firefinder, an optical sight positioned in the exact center of the lookout (Photos D and E). Bearings are radioed to the Forest Headquarters for plotting to determine the exact location of the fire. At least two



Photo B. The East Butte Lookout, with Paul Boring, WA7WYD, on the stairs.



Photo C. Chris Boring, N7HLB, and daughter Heidi prepare a meal in the compact kitchen.

bearings are required for a reliable fix on the fire location. There's a friendly competition among fire spotters to report the first bearing. In their 16 years of service, Paul and Chris have been first reporters on over 450 fires.

Housekeeping chores take a fair amount of time. Because of the limited storage in the lookout, meals must be carefully planned. Driving to the store to pick up a loaf of bread is a 60-mile roundtrip, and the nearest water is nine miles away and must be hauled in. Food, water, and other supplies must be hauled up 33 feet of stairs or lifted up the homebrew dumbwaiter. Also, since there is no running water, the "amenities" are limited. Paul has rigged up an innovative solar-heated shower that provides enough hot water for a shower every two days!

Ham Shack in the Sky

Paul and Chris discovered the value of ham radio as a backup to the U.S. Forest Service system very early in their lookout careers. In fact, in an incident which was described in the January,

1988, issue of *Worldradio*, Chris was instrumental in relaying a Mayday call on 146.52 simplex about a car accident that occurred over 50 miles away.

Today they routinely scan the 2-meter national calling frequency, 146.52 MHz, and several local repeaters. They've also organized a



Photo D. Paul takes a smoke sight with the Osborne Firefinder



← Photo E. Closeup of the Osborne Firefinder

Photo F. Lightning strike at Acker Rock Lookout, Umpqua National Forest, Oregon. (Photo by Bob Boring, K6YGI)

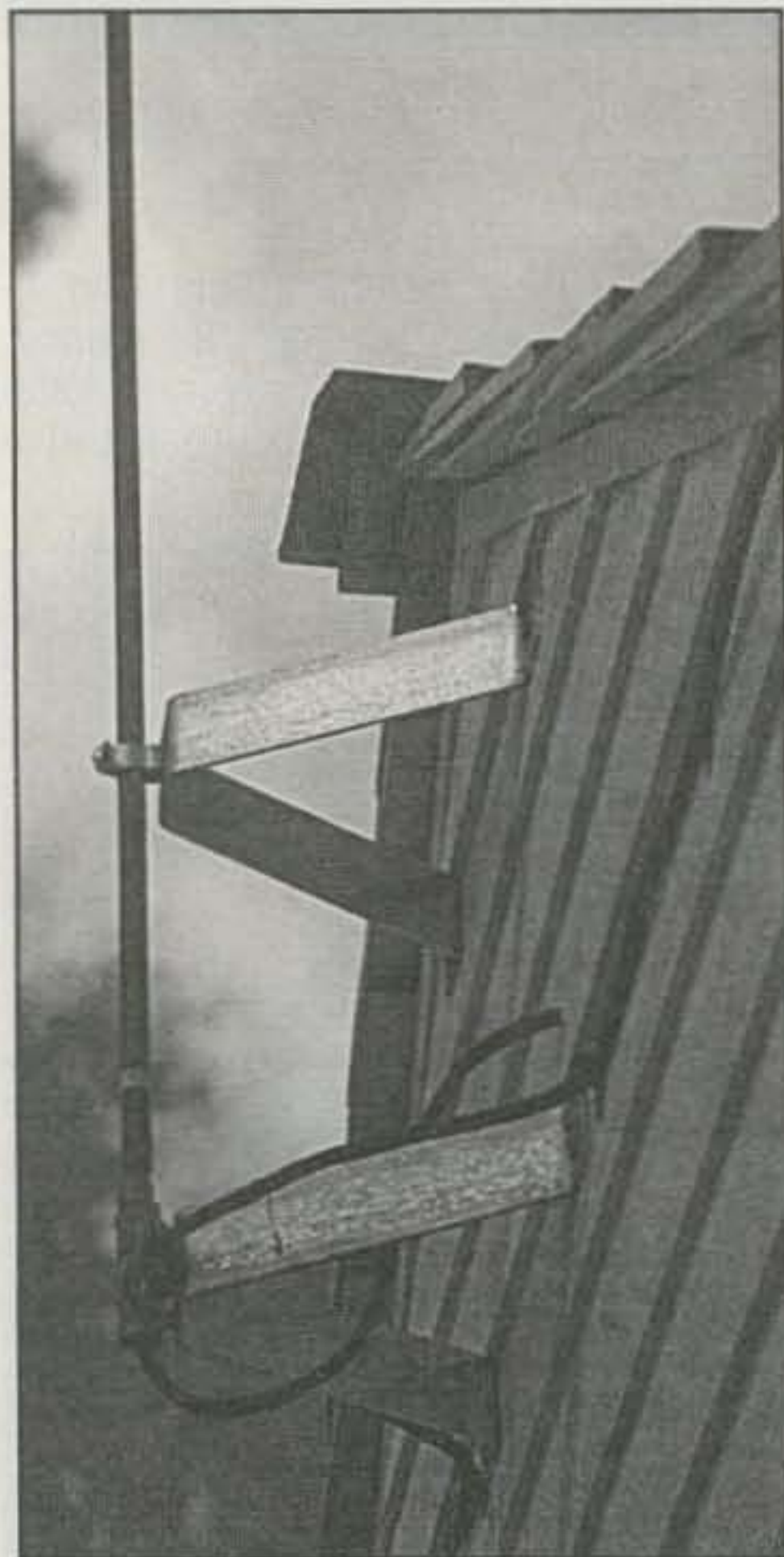


Photo G. Closeup of one of the lightning rods at the East Butte lookout tower.

weekly Lookout Net on 2 meters. Paul uses a four-element Yagi and a J-pole on 2 meters, and, with his 50-watt FM rig and 6,365-foot elevation, simplex contacts over 100 miles are routine. Hams check-in from lookouts across Oregon and Washington. The net has proven to be a great morale booster for hams at some of the more remote lookouts, especially those which are staffed by a single person.

Paul also works HF SSB. He limits his output to less than 50 watts to conserve his limited solar charged battery capacity. The antenna is a multiband inverted-vee dipole which slopes down from the lookout's balcony. With the nearest power lines over 20 miles away, Paul enjoys a summertime noise level on 75 meters of less than 1 S unit! SSB sounds almost as clean as FM!

Because of their daytime duties, Paul and Chris primarily operate in the evenings, limiting HF activity to 14 MHz and below. During my visit, we worked Italy on 20-meter SSB—not bad for 50 watts into a dipole. Paul doesn't routinely work contests at the lookout, but has been known to get on the air for a few hours during Field Day. His 50 watts puts out a big signal from his near perfect location. Now if I can only get him on some of the VHF contests as well!

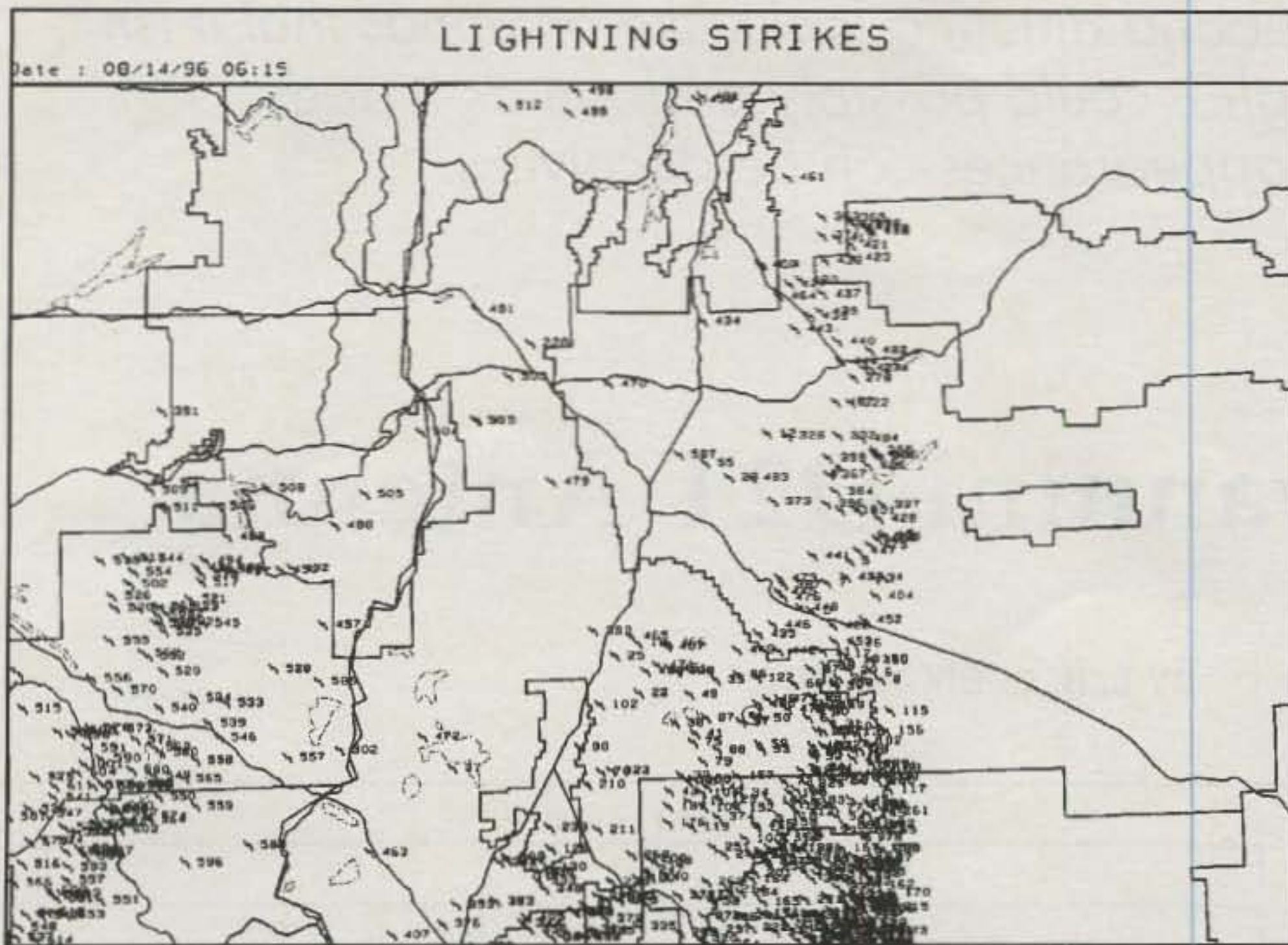
Paul's ham radio solar system consists of a small 30-watt solar panel and

a deep cycle 12-volt battery. The charge level is controlled manually by switching off the panel when the battery is charged. This arrangement gives three to four hours of ham operating in the evening or two hours operating time on a small portable TV set. The Forest Service solar system uses a separate solar panel with a charge controller and a gel cell battery. It operates the Forest Service VHF radio and a backup cell-phone.

Lightning

Lightning is a major concern at lookouts (Photo F). The lightning protection system at the East Butte Lookout is a typical design. The lookout is protected by two solid copper lightning rods (Photo G) which are connected to a ground bus system that runs down each leg of the tower. All metal objects inside the lookout, including the stove, tables, and the Osborne Firefinder, are connected to the ground bus, which is connected to copper mats buried at the base of each leg of the lookout. As many as 5,000 lightning strikes have been recorded in a 24-hour period in the Deschutes National Forest where the East Butte Lookout is located (see Map).

In spite of these precautions, riding out a storm in the lookout is literally a



Map. This printout from the U.S. Forest Service lightning tracking network shows lightning strikes in a single 24-hour period in the area that includes the East Butte Lookout. The numbers on the map are serial numbers of the lightning strikes, which are concentrated in high areas. The lightning-free zone on the right-hand side of the map is desert.

hair-raising experience! Paul and Chris sit out storms on high stools with glass insulators on the legs. They have often seen the eerie purple glow of St. Elmo's fire on wire fencing on the balcony. Since lightning is the major cause of forest fires, fire spotters have to be especially vigilant during storms.

On August 1, 1999, Paul got a first-hand look at how dangerous lightning strikes can be. At 5:00 p.m., a strike hit within 200 yards of the lookout. At 5:30 p.m., Paul and Chris reported a "smoke"

at their location—the strike had ignited a "snag" (a partially fallen tree).

Because the nearest firefighting crew was over an hour away, Paul was directed to contain the fire until help arrived. By 6:30, Paul had found the snag and began to "line" the fire (clearing an area around the snag down to bare soil). Paul was in constant contact with Chris in the Lookout via 2-meter simplex while she continued her watch for additional fires and relayed communications from the Forest Headquarters to Paul. By the

"As many as 5,000 lightning strikes have been recorded in a 24-hour period in the Deschutes National Forest where the East Butte Lookout is located...."

time the firefighting crew arrived at about 8:30 p.m., Paul had controlled the spread of fire. His ham radio link to the lookout had played a vital role in his safety.

Lookout Lore

There have been countless books written about lookouts and the unique lifestyle of the people who operate them. There is even a popular ham radio book, *Firewatch*, by Cynthia Wall, KA7IIT. Paul only recently read the book, but says that its depiction of lookout life is pretty realistic. It's even possible to rent an unoccupied lookout from the U.S. Forest Service. Lookout rentals are handled individually by each National Forest.

Many lookouts welcome visitors. But you should check first with the District Ranger office about visiting policies. Don't start climbing the stairs of the lookout unless you're invited up. Remember the lookout is both a workplace and home for the fire spotters. Above all, don't approach a lookout at night. Respect the privacy of the fire spotters.

Old Friends United

One of the best aspects of ham radio is that it is a lifelong hobby. Ham radio friendships can span the years as well as thousands of miles. Visiting Paul and Chris at their "Hamshack in the Sky" (Photo H) was a great example of how ham radio can bring old friends back together again. ■



Photo H. Old friends united. From left, Monte Waite, WA6JYB, Sam Vigil, WA6NGH, Paul Boring, WA7WYD, and Chris Boring, N7HLB.

Resources

To learn more about fire lookouts and the lives of people who work in them, we recommend the following:

Kresek, Ray, *Fire Lookouts, 3rd Edition*, Historic Lookout Project, 123 W. Westview, Spokane, WA 99218, 1998, 414 pages.

Rex's Forest Fire Lookout Page, <<http://www.geocities.com/Yosemite/Meadows/4890/index.html>>

Wall, Cynthia, *Firewatch*, American Radio Relay League, 1993, 181 pages.

The Giovannini D2T wideband antenna looks like antennas that it isn't, and doesn't look as though it could possibly perform as it does. However, says W4RNL, appearances can be deceiving.

CQ Reviews:

The Giovannini D2T Antenna

BY L. B. CEBIK,* W4RNL

Let's begin with a pop quiz. What appears to have the size and shape of a 12 meter two-element beam—but isn't? What appears to have the wiring scheme of a ZL-Special—but isn't? The answer is the D2T, an innovative antenna from Giovannini Elettromeccanica of Italy.

From the outset, we should understand what the antenna is, and what its intended use is, in order to make any reasonable comparisons. The appearance, as we just noted, can mislead us. The D2T belongs in a class with a number of wide-band antennas providing a low 50 ohm SWR continuously across a wide frequency range. The D2T offers such coverage from 1.5 to 200 MHz.

In principle, the antenna uses the same fundamental technique that we encounter in the wide-band "folded dipole" made by B&W, Giovannini, and others. The top portion of fig. 1 shows the general layout of this basic antenna. One typical length is 90 ft., although longer versions up to nearly 200 ft. are available. A non-inductive resistor in the 800 to 900 ohm range provides a termination that sets the feedpoint impedance as well. An RF transformer with a transformation ratio of about 16:1 provides a reasonably good match to 50 ohm coax over the entire frequency range. Since the non-inductive resistor dissipates some of the power supplied to the antenna, the performance varies across the range of use (usually 1.8 to 30 MHz for the size antenna shown in fig. 1), with decreasing gain as the frequency decreases.

Military and government services often employ such antennas to reduce the number of antennas and the number of

*1434 High Mesa Drive, Knoxville, TN 37938-4443
e-mail: <cebik@utk.edu>

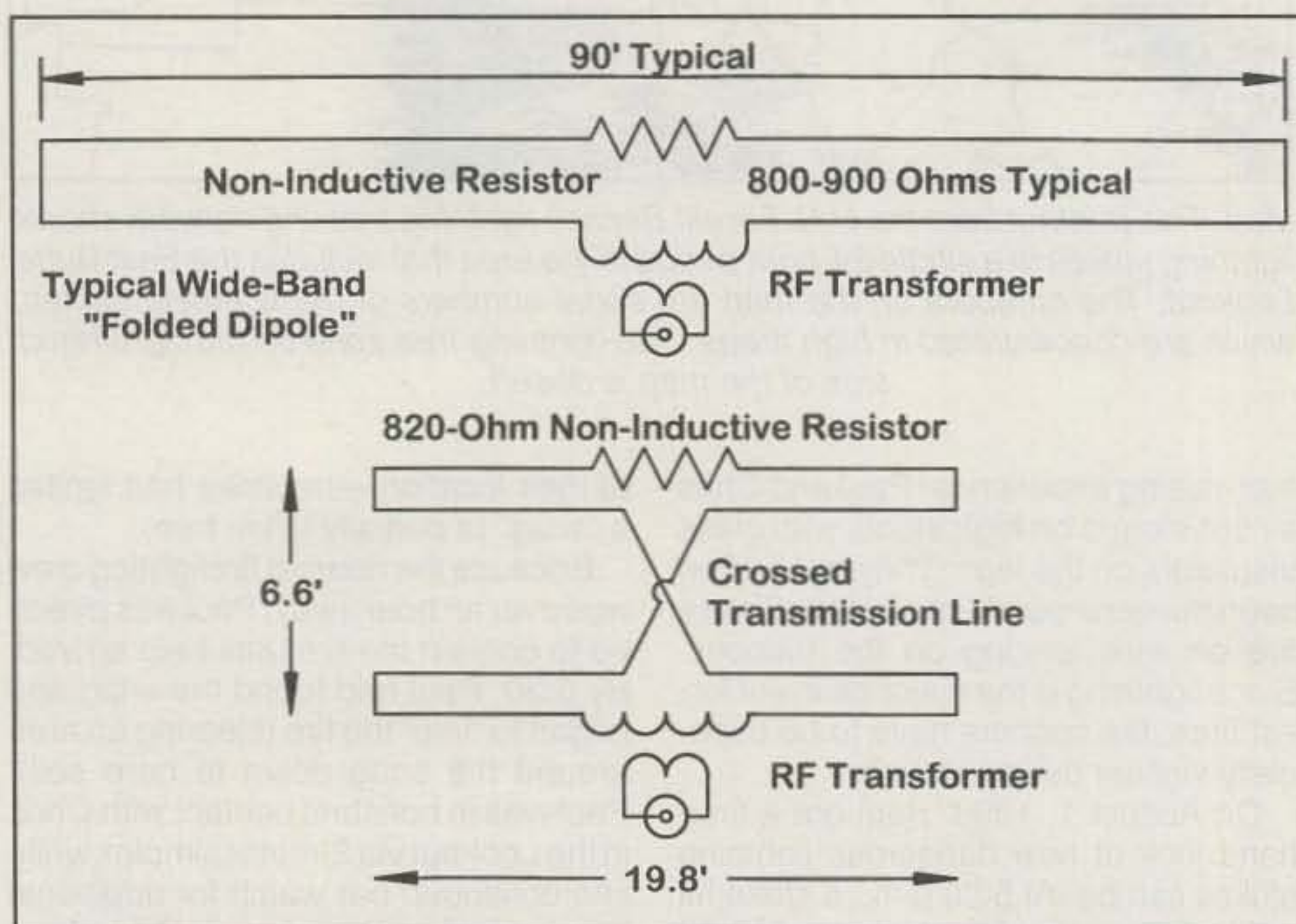


Fig. 1—Outline sketches of a standard folded terminated antenna and the D2T.

adjustments necessary to assure that the antenna is well-matched to transmitting and receiving equipment. Short-wave listeners often use them for much the same reason, with the added benefit that this class of antenna provides a better signal-to-noise ratio than many other types at lower frequencies, in part by preventing front-end overload. Most modern receivers have excess gain to make up for the reduced overall signal strength. Hams with limited space have used this type of antenna with success for general QSO purposes. The lowest bands present a challenge, since gain drops rapidly, but numerous hams accept that trade-off for the convenience and compactness of the installation.

Giovannini's innovation in this class of antennas is a further size reduction.

As shown in the lower half of fig. 1, the element is a continuous loop of wire formed into two parallel sections, each about 19.8 ft. long. Close-spaced and crossing wires connect the feedpoint loop with the loop holding the terminating resistor. Since the wires running front to back are closely spaced, they do not radiate significantly, although their continuously varying spacing makes a determination of their characteristic impedance a complex task. The front-to-back spacing is about 6.6 ft., and the entire package takes little more room than a 12 meter beam.

The actual antenna places the parallel wires for each of the loops in a vertical plane. They are supported by three-piece fiberglass tubes, which attach to a metal boom. The lower wires

MFJ tunable Super DSP filter

Only MFJ gives you tunable and programmable "brick wall" DSP Filters

MFJ's tunable super DSP filter automatically eliminates heterodynes, reduces noise and interference *simultaneously* on SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX, weak signal VHF, EME, satellite.

You get MFJ's tunable FIR linear phase filters that minimize ringing, prevent data errors and have "brick wall" filter response with up to 57 dB attenuation 75 Hz away.

Only MFJ gives you 5 tunable DSP filters. You can tune each lowpass, highpass, notch, and bandpass filter including optimized SSB and CW filters. You can vary the bandwidth to pinpoint and eliminate interference.

Only MFJ gives you 5 factory pre-set filters and 10 programmable pre-set filters that you can customize. Instantly remove QRM with a turn of a switch!

MFJ's automatic notch filter searches for and eliminates multiple heterodynes.

You also get MFJ's advanced adaptive noise reduction. It silences background noise and QRN so much that SSB signals sound like FM.

The automatic notch and adaptive noise reduction can be used with all relevant tunable pre-set filters.

Automatic gain control (AGC) keeps audio level constant during signal fade.

Tunable bandpass filters

Narrow band signals like CW and RTTY jump out of QRM when you switch in MFJ's exclusive tunable FIR bandpass filters.

You can tune the center frequency from 300 to 3400 Hz, and vary the bandwidth from 30 Hz to 2100 Hz -- from super-tight CW filters to wide razor-sharp Data filters.

You can use two tunable filters together. For example, tune one to mark, one to space and set bandwidth tight for a super sharp RTTY filter.

Tunable highpass/lowpass filters

You can tune the lower cutoff frequency 200 to 2200 Hz and the upper cutoff frequency 1400

U.S. Patent D374,010
MFJ-784B
\$249⁹⁵



to 3400 Hz. This lets you create custom filters for voice, data and other modes.

Signals just 75 Hz away literally disappear -- they are reduced 57 dB!

Automatic notch filter

MFJ's automatic notch filter searches for and eliminates multiple heterodynes in milliseconds. It's so fast, that even interfering CW and RTTY signals can also be eliminated.

You can selectively remove unwanted tones using the two manually tunable notch filters -- an MFJ exclusive. Knock out unwanted CW stations while you're on CW.

Adaptive Noise Reduction

Noise reduction works in all filter modes and on all random noise -- white noise, static, impulse, ignition noise, power line noise, hiss.

The LMS algorithm gives you up to 20 dB of noise reduction. Noise reduction is adjustable to prevent signal distortion.

15 pre-set filters -- factory set or you custom program

You can select from 15 pre-set filters. Use for SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX or any mode.

If you don't like our pre-set filters, you can program your own -- an MFJ exclusive! Save center frequency/bandwidth, lowpass/highpass cutoffs, auto/manual notch, noise reduction -- all filter settings -- in 10 programmable filters.

Plus more . . .

A push-button bypasses your filter -- lets you hear the entire unfiltered signal.

2 1/2 Watt amplifier, volume control, input

level control, speaker jack, PTT sense line, line level output. 9 1/2 x 2 1/2 x 6 inches.

Plugs between your transceiver or receiver and external speaker or headphones. Use 12 VDC or 110 VAC with MFJ-1315, \$14.95. Cable Pack, MFJ-5184, \$7.95, includes receiver cable, DC cable, 2 open-end TNC cables.

New Features

MFJ's exclusive tunable Spotting Tone™ -- accurately tunes even the narrowest CW filter.

MFJ's exclusive Adaptive Tuning™ -- tuning rate automatically becomes finer as you narrow bandwidth -- makes narrow filters easy-to-use.

MFJ's exclusive FilterTalk™ -- sends precise filter settings in Morse code.

Has automatic notch with variable aggressiveness, new quieter 2 1/2 Watt audio amplifier, new speaker switch keeps phones always active.

Manual and automatic notch can be used together. Noise reduction, automatic notch and custom filter you saved in memory is selected.

You get an accurate easy-to-use input level indicator, improved manual notch in the CW mode, adjustable line level output, more Mark-Space frequencies and baud rates for data filters and automatic bypass during transmit for monitoring CW sidetone, voice or data by sensing the PTT line.

Firmware Upgrade

For MFJ-784, order MFJ-55, \$29.95. Gives you most features of the MFJ-784B.

60 dB Null wipes out noise and interference

MFJ-1026
\$179⁹⁵



Wipe out noise and interference before it gets into your receiver with a 60 dB null!

Eliminate all types of noise -- severe power line noise from arcing transformers and insulators, fluorescent lamps, light dimmers, touch

Add DSP to any Multimode

MFJ-781 Add "brick wall" DSP filtering to any TNC or multi-mode data controller. Copy signals buried in noise and QRM. Under severe QRM, DSP greatly improves copy of Packet, AMTOR, PACTOR, GTOR, Clover, RTTY, SSTV, WeFAX, FAX, CW -- nearly any digital mode. Automatic gain control, On/Off Bypass switch. Plugs between transceiver and multi-mode. Uses 10-16 VDC or 110 VAC with MFJ-1312B, \$14.95. 4 1/2 x 2 1/2 x 5 inches.

DSP for your MFJ-1278/B

Plug a MFJ-780 "brick wall" DSP filter into your MFJ-1278/B multi-mode and you won't believe your eyes when you see solid copy from signals completely buried in QRM! MFJ-1278/B automatically selects the correct DSP filter for Packet, AMTOR, Pactor, RTTY, ASCII, FAX, Color SSTV, Navtex or CW. Plug in a MFJ-780 and copy signals that other multi-modes can't. Some soldering needed.

controlled lamps, computers, TV birdies, lightning crashes from distant thunderstorms, electric drills, motors, industrial processes . . .

It's more effective than a noise blanker because interference much stronger than your desired signal can be completely removed without affecting your signal.

It works on all modes -- SSB, AM, CW, FM -- and frequencies from BCB to lower VHF.

You can null out strong QRM on top of weak rare DX and then work him! You can null out a strong local ham or AM broadcast station to prevent your receiver from overloading.

Use the MFJ-1026 as an adjustable phasing network. You can combine two antennas to give you various directional patterns. You can

null out a strong interfering signal or peak a weak signal at a push of a button.

Easy-to-use! Plugs between transmitting antenna and transceiver. To null, adjust amplitude and phase controls for minimum S-meter reading or lowest noise. To peak, push reverse button. Use built-in active antenna or an external one. MFJ's exclusive Constant Amplitude Phase Control™ makes nulling easy.

RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312B, \$14.95. 6 1/2 x 1 1/2 x 6 1/4 inches.

MFJ-1025, \$159.95. Like MFJ-1026 less built-in active antenna, use external antenna.

Free MFJ Catalog
and Nearest Dealer . . . 800-647-1800

<http://www.mfjenterprises.com>

• 1 Year No Matter What™ warranty • 30 day money back guarantee (less s/h) on orders direct from MFJ

MFJ MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(662) 323-5869; 8-4:30 CST, Mon.-Fri.
FAX: (662) 323-6551; Add s/h
Tech Help: (662) 323-0549

Prices and specifications subject to change. (c) 2000 MFJ Enterprises, Inc.

MFJ . . . the world leader in ham radio accessories!

CIRCLE 103 ON READER SERVICE CARD

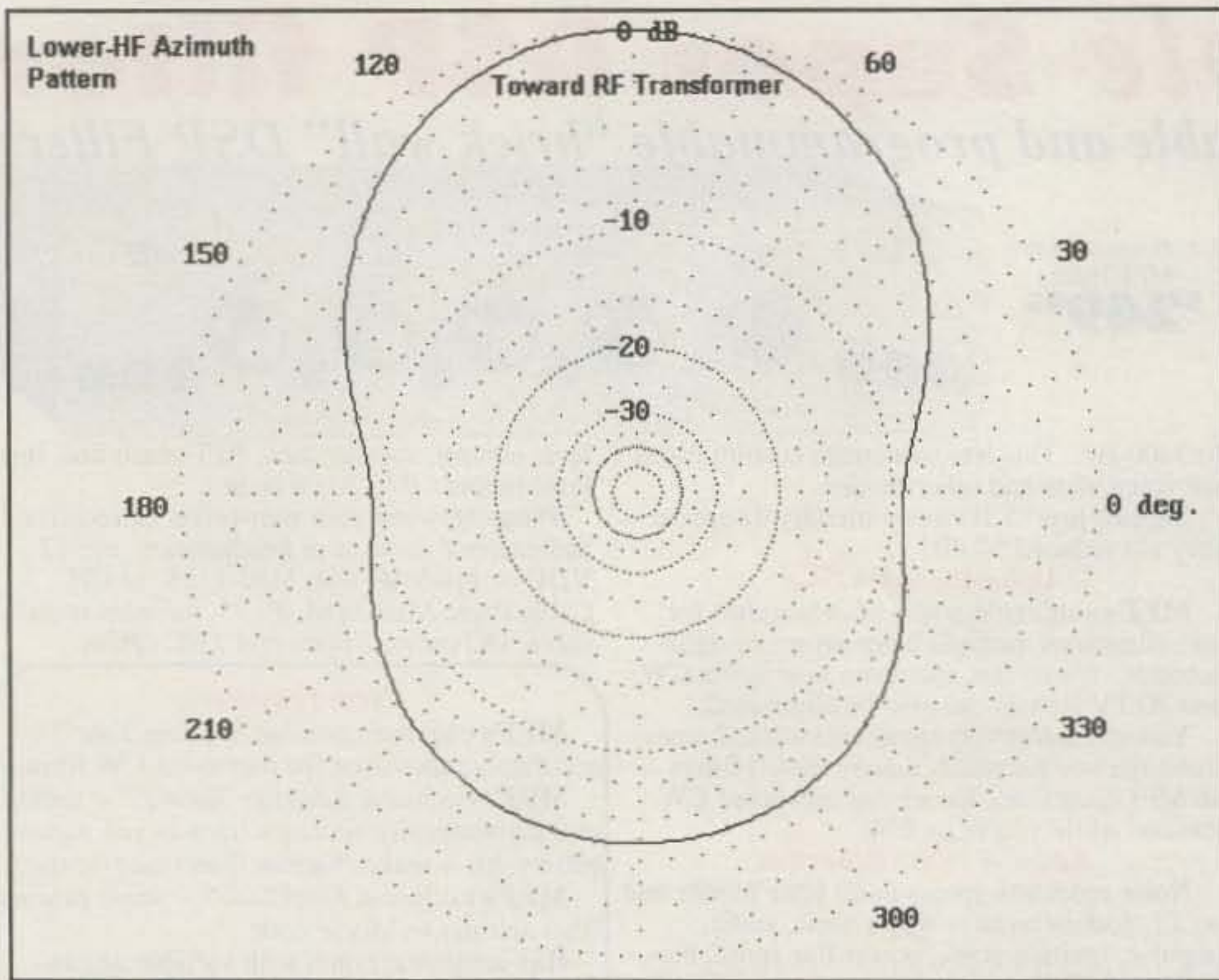


Fig. 2— Free-space azimuth pattern of the D2T at a lower HF frequency (below 10 MHz).

connect to the sealed RF transformer on one side and to the non-inductive resistor (within a fiberglass tube for good cooling and rain protection) on the other. The elevated wires meet at a Tee fixture, where they become the front-to-back crossing section of transmission line. The actual phase shift of signal along the front-to-back wires varies from one frequency to the next. Thus, while the antenna resembles a ZL-Special, its operation is quite different.

I have modeled a version of the antenna to check the potential patterns that might emerge. In free space the antenna shows some directivity toward the RF transformer side at lower frequencies (below 10 MHz). As the frequency is increased in the HF range, the antenna shows both gain and usable directivity in the direction of the terminating resistor. At fairly standard amateur and SWL mounting heights of 30 to 40 ft., the lower frequency directivity tends to disappear at low angles of radiation.

Fig. 2 shows a representative pattern modeled for the 30 ft. test height used here. The directivity becomes very usable at higher HF frequencies, as shown by fig. 3. In both cases I have purposely not shown the exact frequency or gain of the system, since there are limitations to the accuracy of the model. Although reliable as a general indicator of potential performance,

the model cannot capture effects of the lower wire being laid against the fiberglass support, which may slightly increase the electrical length of the lower wire in each of the loops (in a manner related to the use of insulated wire).

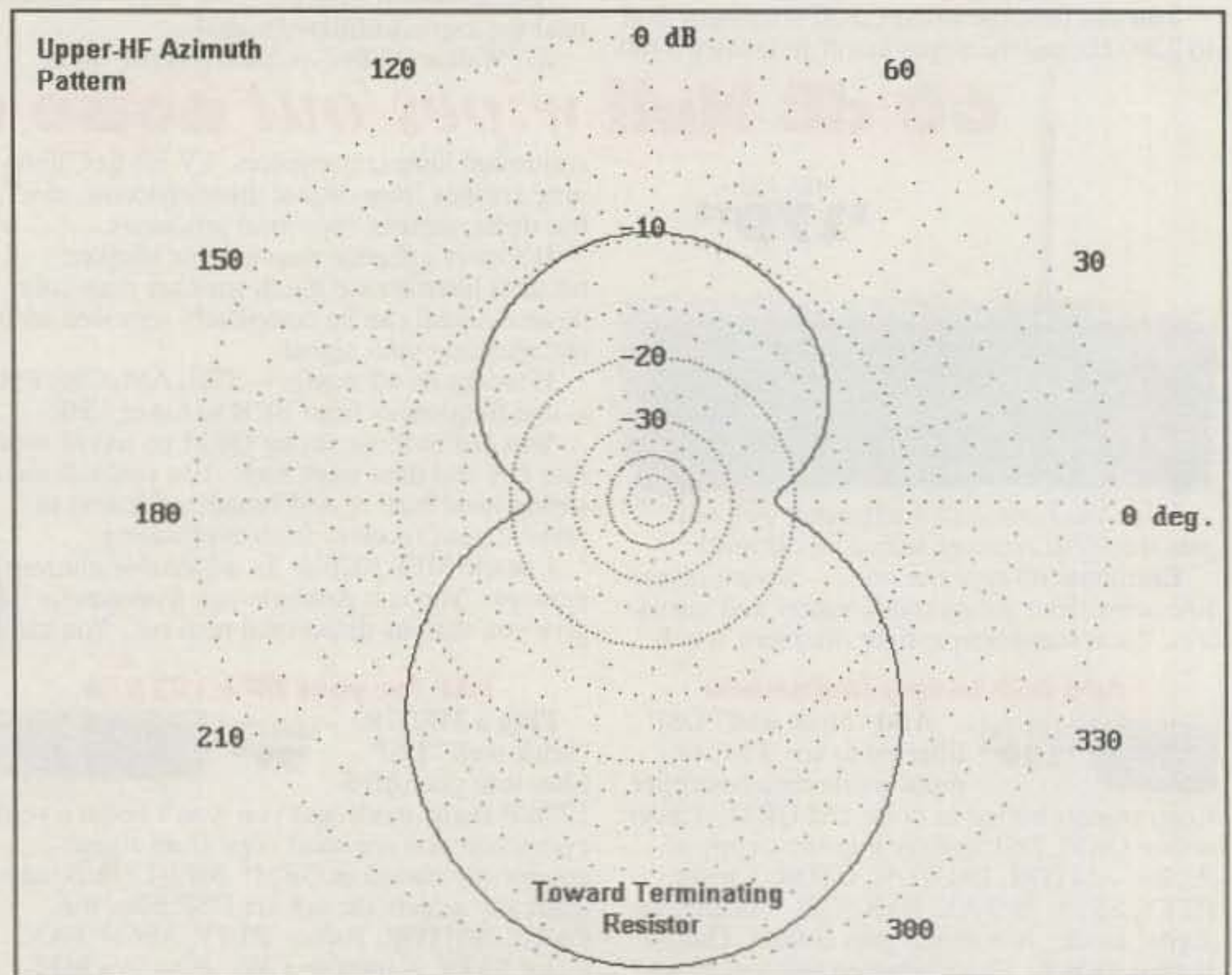


Fig. 3— Free-space azimuth pattern of the D2T at a higher HF frequency (above 25 MHz).

Hence, I do not claim precision for the modeled results.

Models, nevertheless, do clearly show what happens as we raise the frequency of our signals. The 2:1 SWR curve extends to 200 MHz, so 2 meter operation is quite feasible. Fig. 4 shows the 6-lobe pattern. Since the antenna is light enough (19 lbs.) to use a simple rotator, it is feasible to have a single compact antenna for all of the common HF and VHF ham bands, as well as one that covers all of the shortwave and lower VHF listening frequencies.

Assembly

Giovannini has devoted the majority of its efforts to antennas with military and governmental applications, with amateur antennas comprising about 30% of its business. The company manufactures an impressive array of large quad and log-periodic antennas, samples of which can be seen at its web site (<http://www.antenna.it>). The military requirement for a durable antenna structure shows up in the D2T materials. The boom is about 1.6 in. in diameter, while the center portions of the fiberglass element support rods are over an inch in diameter. The boom-to-support brackets are clam-shell clamps welded at right angles, using $3/16$ in. steel. (Actual material dimensions are in millimeters, and only rough English-unit equivalents

are given here.) Were I to try to replicate the antenna with home shop construction techniques, my version would be lighter, but most likely it would be far less durable.

Antenna assembly is straightforward, and the instruction set is very detailed. The instructions might benefit from a review by an American or British technical editor to replace some unusual expressions with those more commonly found in US or English writing. However, having to read each instruction twice to assure comprehension does have its advantages in terms of keeping the assembly process error free.

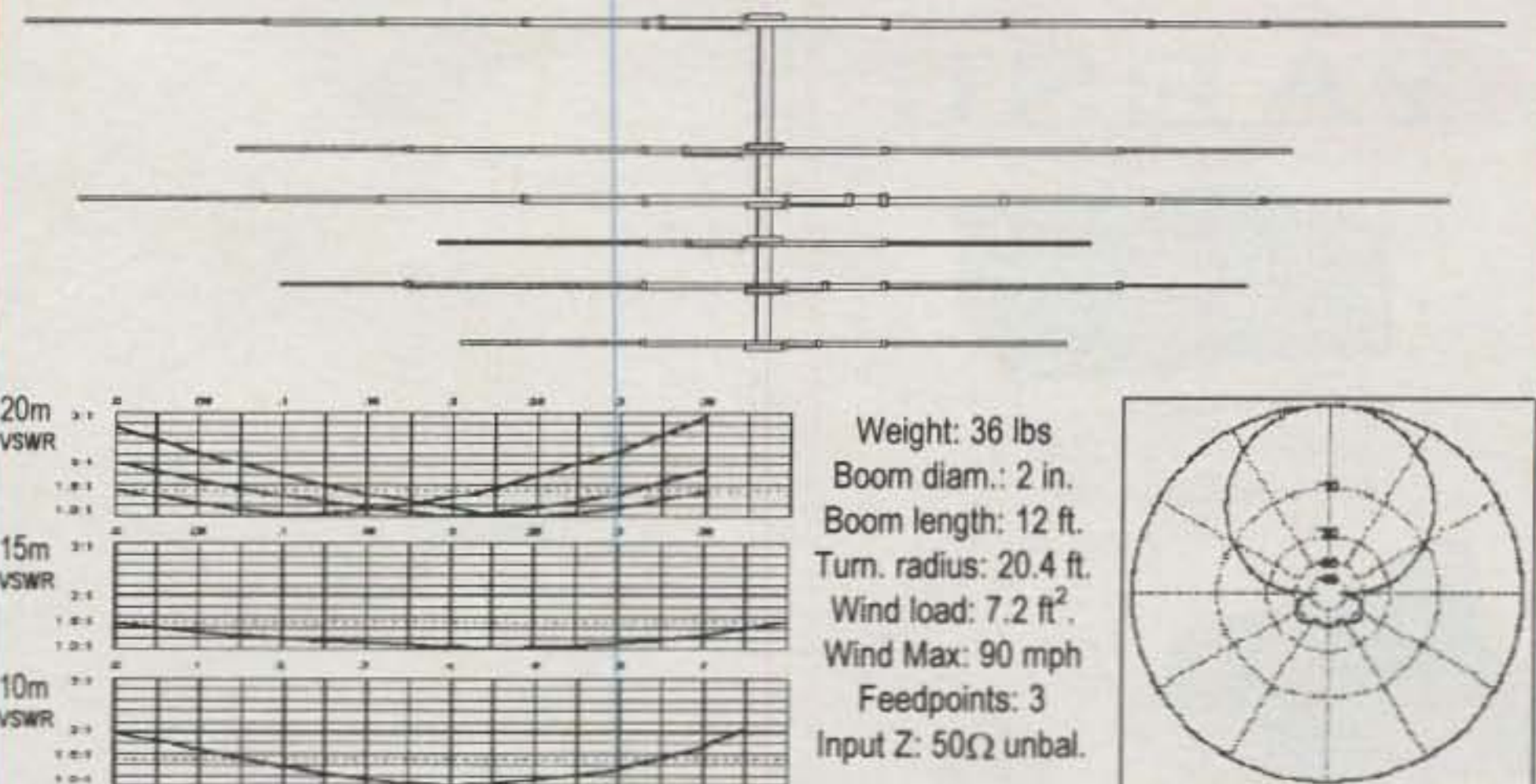
Assembly involves joining the major support elements (including mounting the resistor and transformer assemblies), cutting the wire for the elements, and mounting the wires. The steps proceed in a logical fashion. You will need some metric wrenches—namely, 17, 10, and 7 mm sizes. You will also need a 6 mm drill bit, but a 7/32 in. bit will do the job. Mounting the wire elements involves a bit of soldering at junctions of the wire, which is roughly equivalent to AWG #14. You also will tie down the wires to the supports with a large collection of cable wraps. The process took me most of a morning—about 4 hours total work time, including time to review instructions and look carefully at the photos. As with any antenna assembly, it pays to check and recheck each step in the process.

Photo A shows the collection of parts before assembly. I used my (two-car) garage floor as the assembly table. I laid out carefully measured lines for wire cutting on the floor, since the wire comes in one long piece. The user must cut fairly precise lengths for the element portions for each end of each loop and for the crossing line that connects the front and aft loops. A 35 watt soldering iron or pencil is sufficient for the small jobs of binding the wire-end loops. However, before soldering, lay out the entire piece of wire to be sure of the fit.

Since there is more than enough wire, I cut my pieces long and prestressed them to remove all kinks before trimming them to the final length. Pre-stressing the wire for the D2T requires only enough pressure to remove the kinks created by shipping it wrapped around a piece of corrugated cardboard. My process simply was to cut each wire long, since Giovannini supplies excess wire. I taped one end and clamped it in the shop vise, then wrapped the other end around a wooden dowel and tugged several times until the kinks were gone when I let the wire go slack again.

The 36lb. PILEUP BUSTER

RB-36x Tri-band beam for 20, 15, & 10m



Weight: 36 lbs
 Boom diam.: 2 in.
 Boom length: 12 ft.
 Turn. radius: 20.4 ft.
 Wind load: 7.2 ft².
 Wind Max: 90 mph
 Feedpoints: 3
 Input Z: 50Ω unbal.

SUPERGAIN... >8 dBi free space, 20, 15, 10m
RUGGED..... Space-age aluminum alloy
UNIQUE..... The supergain performance is backed up by a money-back GUARANTEE!
LOW NOISE... As quiet as a quad
LONGEVITY... All stainless steel hardware

Mono-band beams for all bands from 6m to 20m
 Dual-band beams for 20 & 15m, 17 & 12m, 10 & 6m

For more info
 Visit our website at:
<http://www.raibeam.com>
 or send SASE for brochure
 To order call
1-888 530 2326
 All beams are UPS shippable

RaibeamTM

857 Park Avenue
 Brooklyn, NY 11206
 Phone: (718) 388-1440
 E-mail: sales@raibeam.com



Surplus Sales of Nebraska

See You At DAYTON Booth 132

Collins Parts & Tube Kits

KWM-2/KWM-2A Manual covers all versions	\$ 25
312B-4 / 312B-5 Manual NOW ON SALE	\$ 15
KWM-2 Relay Conversion Kit	\$135
Collins Spray Paint, All Colors	\$ 10
Speaker Replacement - S-Line 4Ω	\$ 24
#557 Ceramic Trimmers, 3-12, 5-25, 8-50 pF	\$ 5
Tube Kit - KWM-2/A With 6146W Finals	\$125
Tube Kit - KWM-2/A WITH OUT 6146W Finals	\$100
Tube Kit - 51S-1	\$135
Tube Kit - 75S-1	\$ 85
Tube Kit - 75S-3 / A / B / C	\$100
Tube Kit - 32S-1 or 32S-3 / A please specify	\$105
4D32 fits 32V-1, 32V-2 or 32V-3	\$18 5+ \$15
36' AC-2811 Vertical Antenna	\$129 16' AC-2810 \$75



Ferrite Split Beads

For RFI Suppression

Just clamp around any wire or cable, snap plastic cage (or ty-wrap 1/2" model) and snuff out almost any RF interference traveling down the wire. Material 43 ferrite made by Fair-Rite.

3/8" Bead with cage	\$2.50 ea	10+ \$2	100/\$150
1/2" Bead no cage	\$5.50 ea	6+ \$5	100/\$4
3/4" Bead with cage	\$11 ea	6+ \$10	

500,000 Vacuum Tubes On Hand

811A - JAN - Mil-Spec.
 Made by Cetron (RCA Design) for use in any 811A amplifier, horizontally or vertically. Collins, Ameritron, etc.
\$20 each Matched set of 4 \$85
 GE 6146W Replaces 6146, 6146A, 6146B. \$14 \$29 pair
 12BY7A-JAN (GE)... \$9 6CL6-JAN (GE)... \$5



SHW-4489

4" dia. 6:1

Jackson Brothers quality dial drive. 1/4" shaft. \$45 2+/\$42



RF-3708NM

50Ω Termination

Narda 5 watt, DC-18 GHz, 50Ω termination. N male. New, factory packaging. \$20 3+/\$17

12vdc 120cfm

FAN-4212
 Papst Multifan 4-3/4" x 1-3/4"
 7-14 vdc (12v nom.) 440ma
 5.3 watts. \$23 ea. 3+/\$19



1502 Jones Street, Omaha, NE 68102 • Fax: 402-346-2939 • e-mail: grinnell@surplussales.com
 Visa, MasterCard, American Express or Discover • website: www.surplussales.com

800-244-4567 • 402-346-4750

ASSOCIATED RADIO

YAESU



FT-847
HF, 50MHz, 144 and 440 MHz
All-Mode Earth-Station



FT-100
Ultra Compact,
100W, HF, VHF,
UHF Transceiver



FT-8100R
50W/35W Versatile, Dual Band Mobile



VX-5R
World's Smallest
6M, 2M, 440MHz,
5 Watt Handheld



FT-50RD
Dual Band,
5 Watts,
Built to Mil-810
Standard



FT-1500
50 watt, 2 meter, FM Mobile

WE ARE A FULL LINE DEALER.

Call Today! Accessories,
Antennas, Power Supplies, HF,
VHF/UHF, Receivers, Scanners,
Keys, Meters, Head Phones,
Books, Kits, Packet, Batteries,
Chargers, Amplifiers and more...

*Let us be your new and used
Amateur radio dealer.*

We service most brands.
Yaesu Factory Authorized
Service Center.

Orders 1-800-497-1457

Tech & Info (913) 381-5900

Fax (913)648-3020

E-mail: sales@associatedradio.com

<http://www.associatedradio.com>

Send SASE for catalog.

8012 Conser
Overland Park, KS 66204
M-F 9-5:30 Sat 9-1pm

2-Meter Azimuth
Pattern

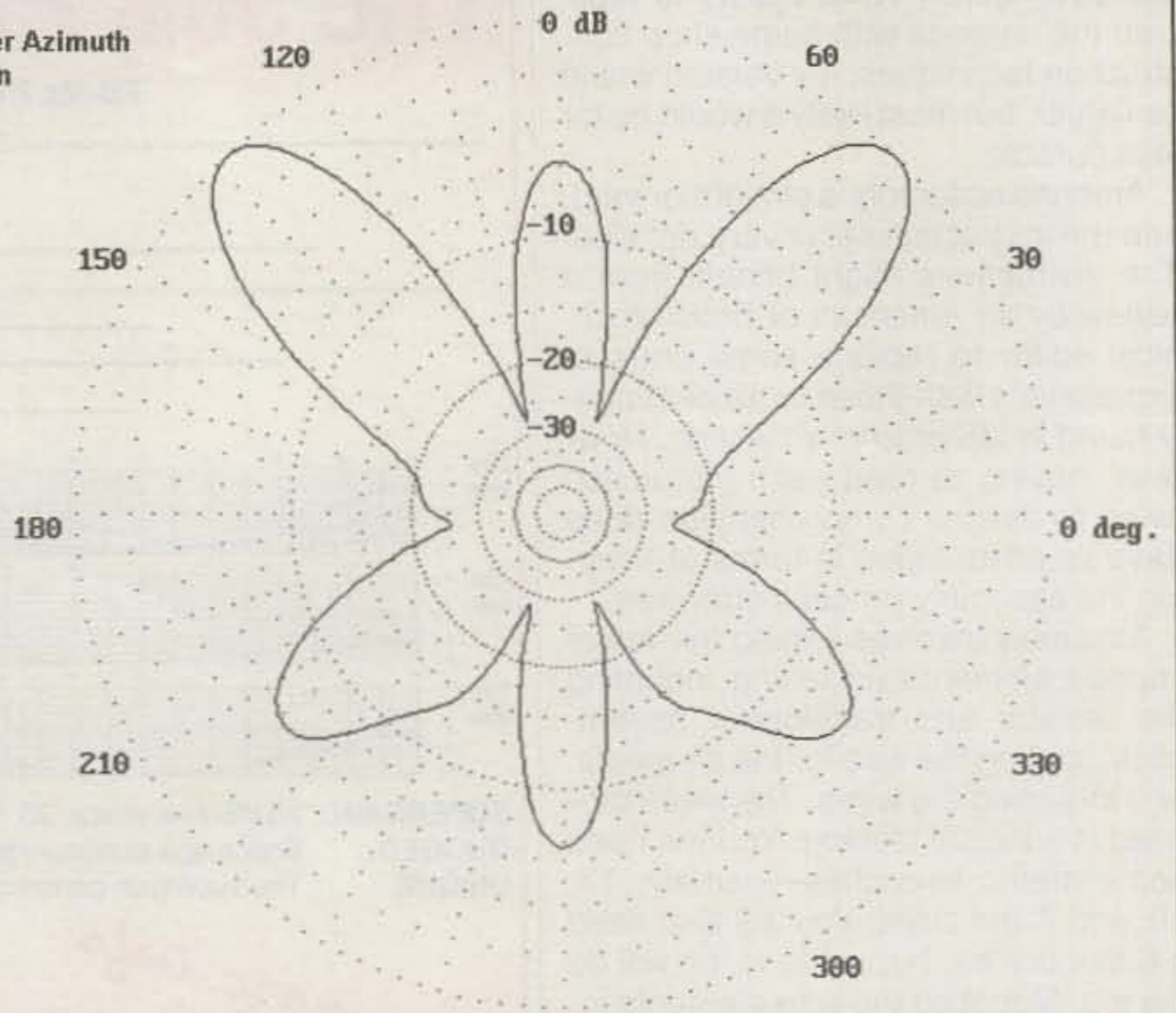


Fig. 4— Free-space azimuth pattern of the D2T at about 2 meters.

Finally, I measured and cut the wires to length by clipping off the small amounts at the ends that were deformed due to clamping. Since the process does not require very large pressures, almost any alternative technique that removes the kinks in advance of final cutting and assembly will work as well.

Every part is well labeled with an ID number, and small parts come in a

series of labeled plastic bags. In addition, the manual contains a number of detail photographs and an engineering sketch to further assist the assembly process. The builder can easily correlate the instruction steps to photos and sketches in order to verify correct assembly every step of the way.

Giovannini recommends the use of a stand to place the antenna at work

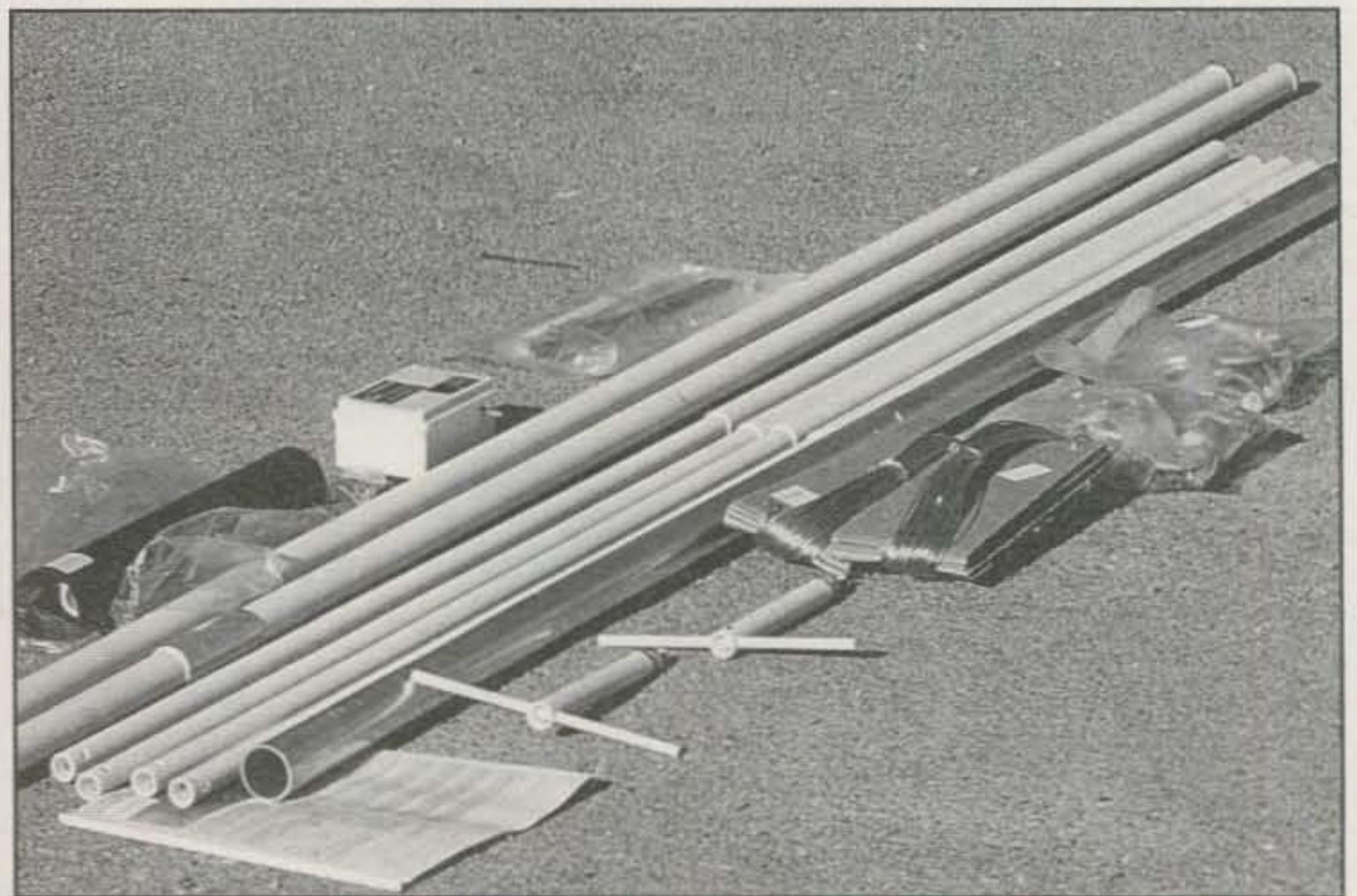


Photo A— A view of the antenna parts awaiting assembly. (Photos by the author)

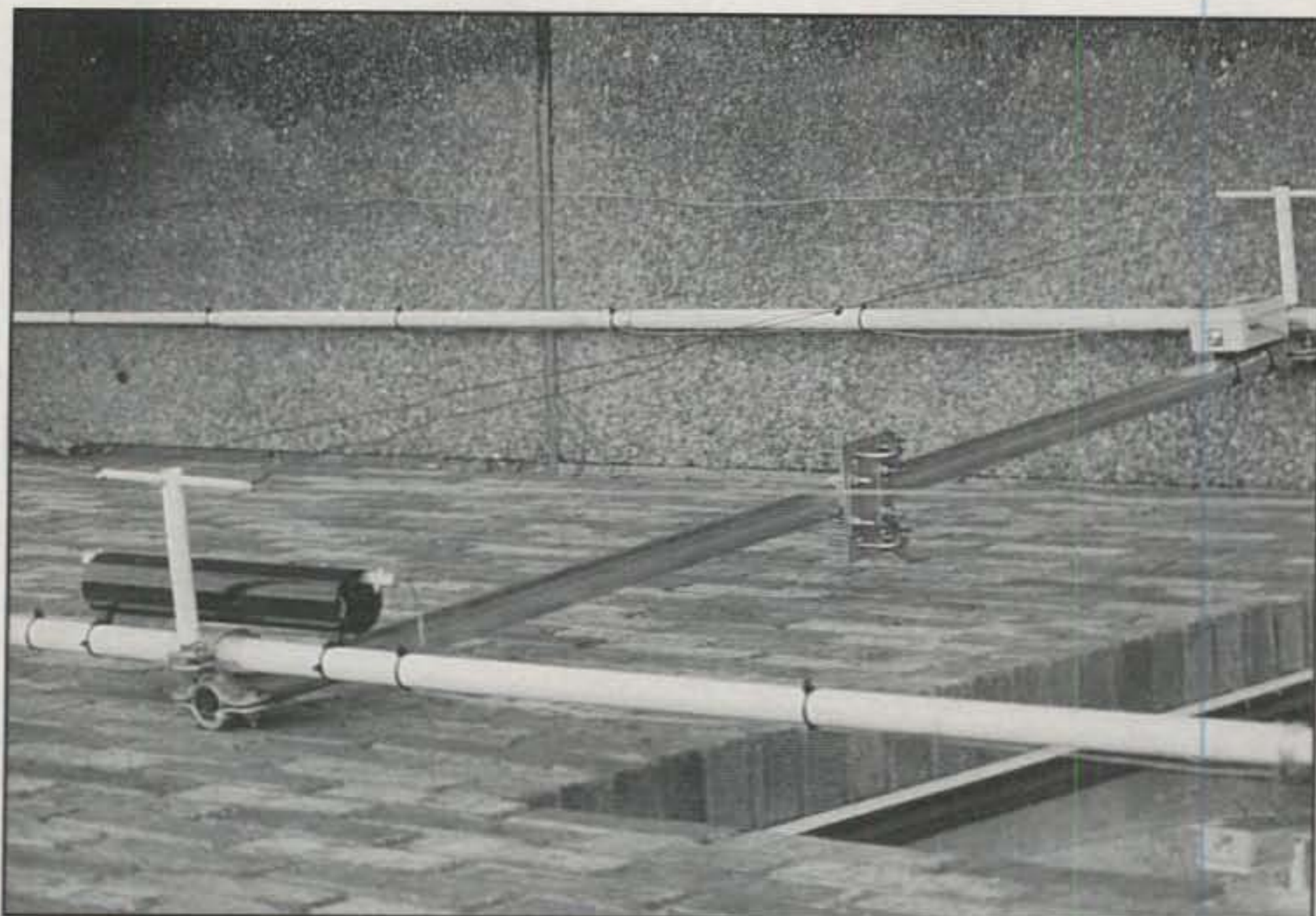


Photo B— The D2T on its assembly stand.

height. Photo B shows the antenna in the process of construction on the stand that I built about a year ago for just such purposes. Since my assembly support mast is only 1.25 in. in diameter, I used my own center plate and U-bolts. Giovannini supplies a heavy-duty version of the boom-to-element clamps for the boom-to-mast mounting, but it is better suited to larger diameter masts.

Photo C is a view of the antenna being mounted to my tilt-over small-antenna test mast. The combination of aluminum boom, copper wire, and white fiberglass supports creates an unusual first impression, compared to more common antenna types.

Performance

To provide myself with some base-line expectations, I performed a frequency sweep of the modeled antenna from 2 through 30 MHz, in 1 MHz steps. The 1 MHz spacing between steps overlooks potential oddities at intermediate frequencies. However, the performance curves were relatively smooth. The 820 ohm VSWR, for example, changed slowly and regularly, with peaks at 22 and 20 MHz, but never over 2.2:1. Giovannini recommends the use of a long 50 ohm feedline so that the SWR at the transmitter end of the line never exceeds 2:1. The line I used was a bit shorter than recommended—about 135 feet overall.

The sweep, performed on a free-space model, showed a pattern reversal around 20 MHz. However, the tran-

sition is so slow that the change could not be observed operationally. Below the changeover frequency, gain drops off and the elevation angle increases rapidly, so the directional lower-HF pattern was not operationally observable. At 20 meters the antenna appeared to perform similar to a dipole, with a front-to-side ratio in the 5 dB region. Performance appeared to be roughly equal to that of an HF5B on 20.

At 10 meters the antenna appeared

to be quite directional, with a front-to-back ratio similar to that of a 2-element Yagi—somewhere between 6 and 10 dB. Forward gain (toward the resistor) compared well with an HF5B butterfly beam, and the front-to-back ratio appeared similar, especially with local area signals. I checked into the local Great Smoky Mountain net, and no one detected that I was using the D2T rather than my usual antenna.

The real challenge is operating on 30 through 80 meters. Fig. 5 shows the free-space gain curve for my model of the D2T. I purposely omitted the gain numbers, since the important feature of the curve is the increasing rate of gain decline as the frequency decreases. Although contacts from 20 meters upward were easy to make, contacts below 10 MHz proved more difficult. The smaller overall size of the elements creates a gain curve that falls off more rapidly with decreasing frequency than the gain curve for a standard 90 ft. wide-band "folded dipole," as shown by the second curve in fig. 5. A comparison of the 25 MHz azimuth patterns of the D2T and a standard 90 ft. terminated horizontal antenna appears in fig. 6.

In receiving comparisons on 80 and 40 relative to a ground-mounted GAP VI, the D2T showed less signal strength as the frequency decreased. On 80 meters the receiver preamplifier was always necessary to bring received signals close to the level provided by the vertical antenna. On 30 meters, where



Photo C— The D2T mounted to the test mast prior to raising for tests.

AEA SWR-121V/U

Graphical SWR Analyzer



- Graphs SWR curve for test antenna
- Acts as "RF Dipper"
- Covers 120-175, 200-225 and 400-475 MHz
- Built in Sweep Generator
- Instant coax loss measurement
- Internal AA battery holder
- Optional Windows 95/2000 Software available NOW!

www.aea-wireless.com

1-760-598-8900
1-800-258-7805



Be an FCC LICENSED ELECTRONIC TECHNICIAN!



No costly school. No commuting to class. The Original Home-Study course prepares you for the "FCC Commercial Radiotelephone License." This valuable license is your professional "ticket" to thousands of exciting jobs in Communications, Radio-TV, Microwave, Maritime, Radar, Avionics and more...even start your own business! You don't need a college degree to qualify, but you do need an FCC License.

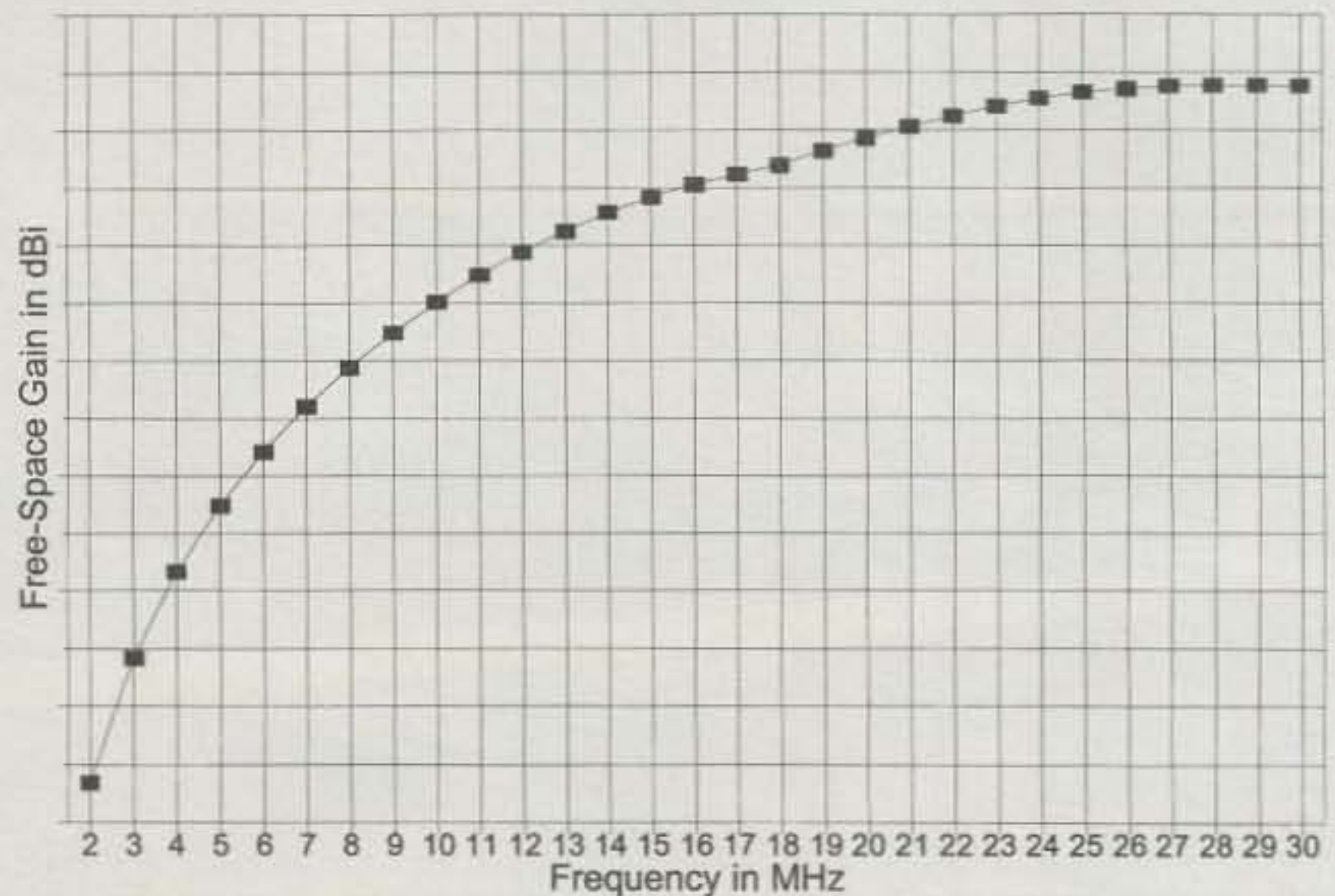
No Need to Quit Your Job or Go To School
This proven course is easy, fast and low cost! **GUARANTEED PASS**—You get your FCC License or money refunded. **Send for FREE facts now. MAIL COUPON TODAY!**
Or, Call 1-800-932-4268 Ext. 96

COMMAND PRODUCTIONS

FCC LICENSE TRAINING, Dept. 96
P.O. Box 2824, San Francisco, CA 94126
Please rush FREE details immediately!

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

D2T Free-Space Gain



90' Wide Band FD vs. Doublet Free-Space Gain

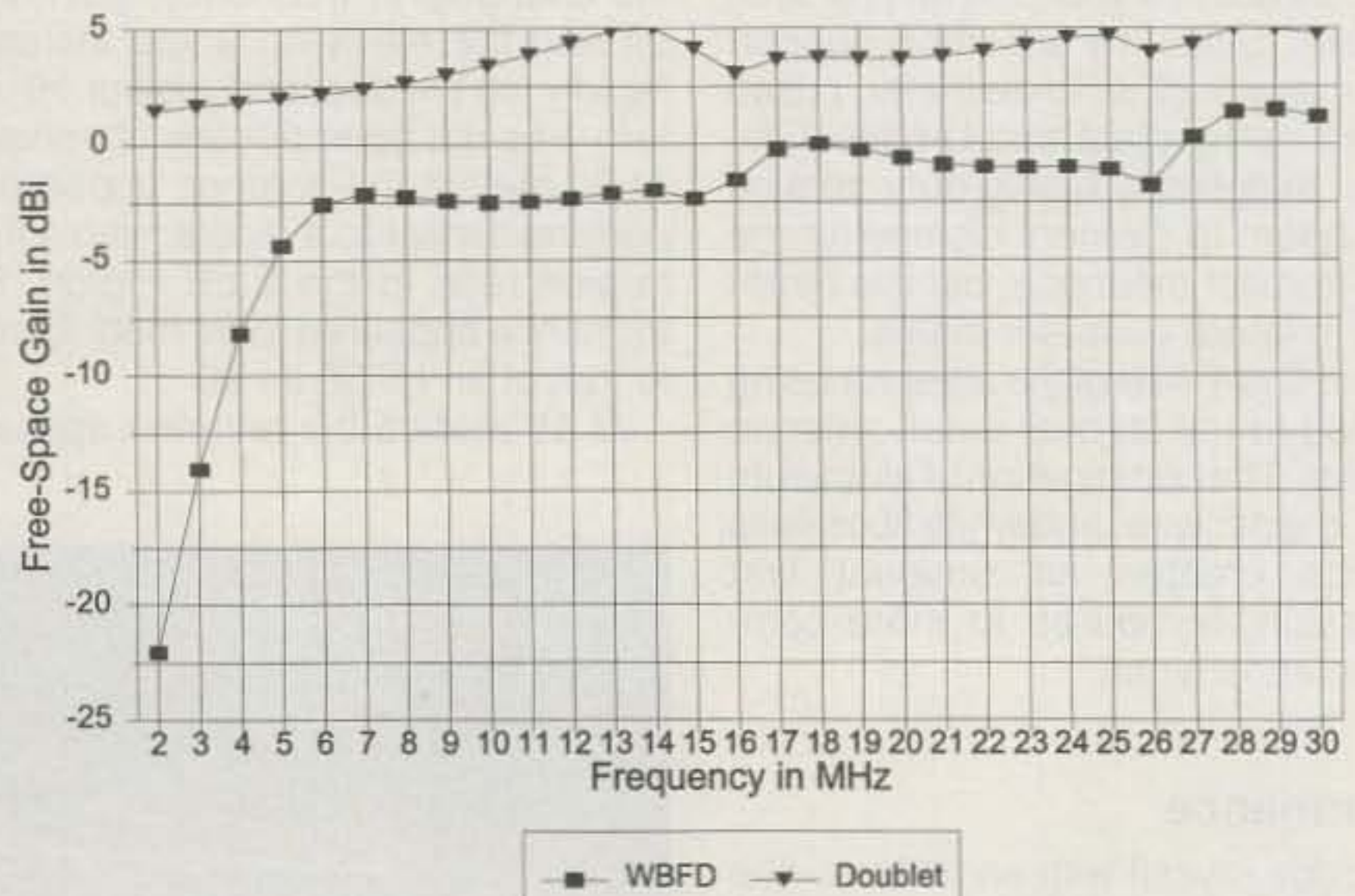


Fig. 5— Modeled gain levels of the D2T and a 90 ft. "folded dipole" terminated antenna. Due to possible imprecisions in the model, the gain numbers on the Y axis have been omitted. The general trend should be reliable.

the GAP VI provides no operation and the SWR is over 5:1, received signals appeared to be about equivalent to those of the D2T.

I patched in an extra 70 ft. of coax cable in order to verify the VSWR claims. With 200 ft. of 50 ohm coax the SWR at the operating position remained below 2:1 on all ham bands, including 2 meters. In fact, my MFJ-259 showed no peaks above 2:1 through its range (to about 170 MHz), although the

anticipated periodic highs and lows (from 1:1 to about 1.9:1) showed up well. Removing the extra cable produced a few frequencies with just a small rise above the 2:1 level—no problem for any short-wave receiver or a transmitter with a built-in antenna tuner.

I used the antenna to sample short-wave listening, since my receiver provides full HF coverage. As expected, the overall lower signal level actually improved reception under some condi-

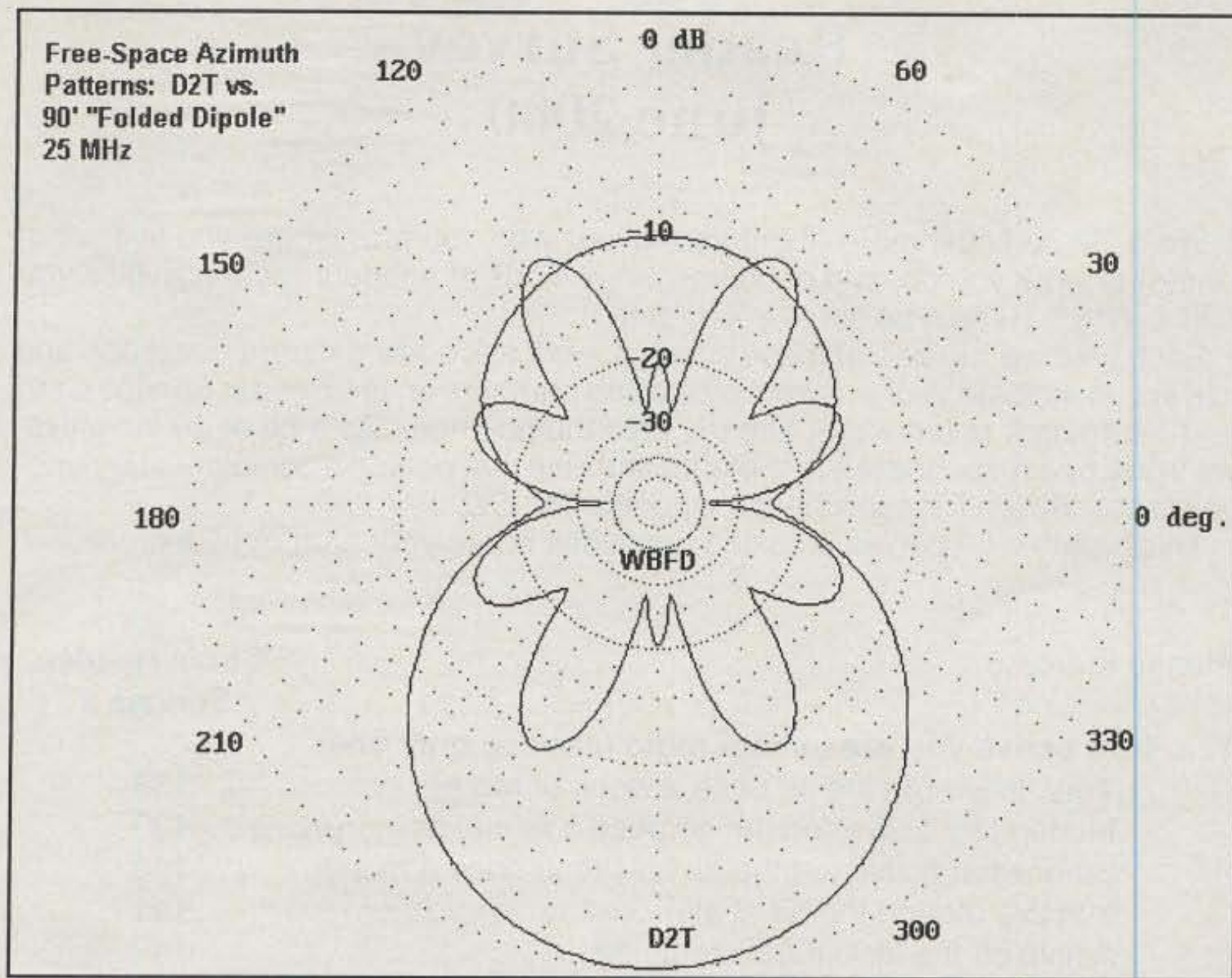


Fig. 6—Azimuth patterns at 25 MHz for the D2T and a standard 90 ft. "folded dipole" terminated horizontal antenna. Note the 9 dB gain differential at this frequency.

tions. Compared to my regular antennas, it seemed easier to separate stations. Although I did not measure the signal-to-noise ratio, the general level of QRN also seemed less with the D2T. At my location, Radio Havana often requires the use of the receiver attenuator and even then may peg the S-meter during the Arnie Coro, CO2KK, broadcast. With the D2T the signal level was lower and seemingly more consistent.

Conclusions

These notes are, of course, user impressions based on comparisons with antennas designed for amateur band use. Nonetheless, the D2T appears to be a very good small SWL receiving antenna that is likely to be fairly inconspicuous once in service.

Both my modeled performance forecasts and my experiences coincided well with the published figures in the D2T manual. In operation, the specified 5 dB front-to-side ratio in the mid-HF region and 10 dB front-to-side ratio in the upper HF region were verified easily. The front-to-back ratio in the upper HF region appeared stronger with local signals than with DX, but easily exceeded the specified 5 dB in both cases. I have no way of directly measuring gain, but the comparisons with a two-element fan Yagi and a multiband vertical antenna are indicative of reasonable perfor-

mance for an antenna of its size. SWL performance seemed especially good, as I easily was able to sort out lower HF SW broadcasting stations, without interference from adjacent strong signals.

My only reservation concerns the potential for amateur operations on 80 and 40 meters. Receiving performance, even using only the internal transceiver pre-amplifier, appears quite ade-

quate. However, the transmitting performance of the D2T drops off faster at lower frequencies than does the performance of a 90 ft. wide-band "folded dipole." This fact is quite reasonable considering the smaller size of the D2T, even if its elements were spread into a straight line. Lower HF operation will be a challenge at even 100 watts output. If the user has a bit of space left over, installing a loaded short vertical for 80 and 40 can improve the situation. Since the D2T receives well in terms of signal-to-noise ratio, an A-B receiving switch might be in order to determine the clearest signal (in contrast to merely the strongest) to enhance reception.

None of these schemes, of course, will equal the use of full-size narrow-band antennas for each amateur band. However, the D2T was not built to compete with antenna farms. Instead, it was designed expressly for the individual with severe space restrictions that permit perhaps a single antenna of small proportions. Within the class of terminated folded wire antennas, the D2T is an interesting and ingenious addition.

The D2T is manufactured by Giovannini Elettromeccanica, Via Enrico Mattei 9, 50039 Vicchio (Florence), Italy. It is distributed in the US by Murray Neece, K5MDM (telephone/fax: 915-580-9051, e-mail: <antennas@qth.com>), and retails in the US for \$595 plus shipping (introductory price: \$495 plus shipping). US dealer inquiries are invited. Prices outside the US are on Giovannini's website at <http://www.antenna.it>.



NEMAL
Cable & Connectors
for the Electronics Industry

Manufacturers of Cable and Connectors
Specialty and Custom Assemblies

Factory authorized distributor for Alpha, Amphenol, Belden, Kings, Times, Cablewave

★ Entire Catalog w/Ordering Info ★
www.nemal.com

COAXIAL CABLES
(per ft - 100ft prices)

1181F flexible 9913F BELDEN.....	.62
1180 BELDEN 9913 very low loss (real Belden).....	.52
1102 RGB/U 95% shield low loss foam 11ga.....	.34
1110 RGBX 95% shield (mini 8).....	.15
1130 RG213/U 95% shield mil spec NCV jkt.....	.36
1140 RG214/U dbl silver shld mil spec.....	1.85
1705 RG142B/U dbl silver shld, teflon ins.....	1.50
1450 RG174/U 50 ohm, 100" od mil spec.....	.14
1410 RG58/U mil type 50 ohm 95% shield.....	.12

**ROTOR CABLE
8 CONDUCTOR**

8C1822 2-18ga and 6-22ga.....	.22/ft
8C1620 2-16ga and 6-20ga.....	.32/ft
8C1618 2-16GA and 18GA.....	.42/ft

**CONNECTORS
MADE IN USA**

NE720 Type N plug for Belden 9913.....	\$3.75
NE723 Type N jack for Belden 9913.....	4.85
PL259AM Amphenol PL259.....	.99
PL259TS PL259 teflon ins/silver plated.....	1.39
PL258AM Amphenol female-female (barrel).....	2.25
UG175/UG176 reducer for RG58/59 (specify).....	.22
UG21D N plug for RG8,213,214.....	3.30
UG83B N jack to PL259 adapter, teflon.....	6.50
UG146A SO239 to N plug adapter, teflon.....	5.75
UG255 SO239 to BNC plug adapter.....	4.75
SO239AM UHF chassis mt receptacle, Amphenol.....	1.50
UG88C BNC plug.....	
RG58,223,142.....	2.09

NEW! EXCLUSIVE

NE5080 UHF Plug For RG217
Teflon/Gold Pin
\$22.50

HARDLINE 50 OHM

FLC12 1/2" Cablewave corr. copper blk jkt.....	1.85/ft
FLC78 7/8" Cablewave corr. copper blk jkt.....	4.55/ft
NM12CC N conn 1/2" corr. copper m/f.....	26.50
NM78CC N conn 7/8" corr. copper m/f.....	64.50
UM12CC PL259 for 1/2" corr. copper.....	22.25
FLX14 1/4" super flexible.....	1.35/ft
FLX12 1/2" super flexible.....	2.95/ft

* Prices do not include shipping. Visa/Mastercard \$30 min. COD add \$5. Call or write for complete price list.

Automated Fax-Back System
(305)981-9800. Obtain catalog pages and product info 24hrs a day

12240 NE 14th Ave., N. Miami, FL 33161
(305) 893-3924 24hr. FAX (305) 895-8178 (800) 522-2253
SAO PAULO, BRASIL - TEL: 011-535-2368
E-MAIL: INFO@NEMAL.COM Home Page On Internet: http://www.nemal.com



What You've Told Us...

Our February survey asked for demographic information about our readers, their levels of education, and their occupations. *CQ's* readers are 99% male and 81% are married. No surprises there, but there was one in the age category. Only 13% of you are under age 45. The biggest age group is 55-64 at 31%, followed by 45-54 (22%), 65-74 (21%), and 75 or over (13%).

There was a slight surprise in responses to the education question, with nearly as many of you holding postgraduate degrees (23%) as bachelor's degrees (24%). Other responses here were high-school graduate (19%), tech-school graduate (16%), two-year college degree (14%), out of high school/not graduated (2%), and still in college or technical school (1%). Another one percent (combined) are either currently in elementary or secondary school or are in graduate school. Overall, we are a very highly educated group of people.

That quality carries through to our jobs as well. First of all, 43% of you are retired. Since only 34% are 65 or older, that means a fair number of you managed to retire before reaching age 65. Among those who have not yet retired, 30% work in professional or executive jobs, 28% in technical careers, and 11% in government. Under 10% each were education/creative (8%), service industries (6%), other (6%), disabled/not working (4%), factory worker (3%), unemployed (2%), student (1%), and homemaker (1%).

This survey tells us as much about who we're not as who we are. It also shows us statistically the challenge we face in recruiting more "young" people (under 45) into our ranks.

As always, thank you for your responses. Our free subscription winner this month is Rob McKenna of Newark, Ohio.

Reader Survey June 2000

We'd like to know more about you—about who you are, where you live, what kind(s) of work you do, and of course, what kinds of amateur radio activities you enjoy. Why? To help us serve you better.

Each time we run one of these surveys, we'll ask a few different questions and ask you to indicate your answers by circling numbers on the Reader Service Card and returning it to us (we've already paid the postage). As a bit of an incentive, we'll pick one respondent every month and give that person a complimentary one-year subscription (or subscription extension) to *CQ*.

This month we'll continue asking questions about your ham radio activities.

Please indicate...

Circle Reader
Service #

1. ... how active you are in ham radio (choose only one)

Very active (on the air once a week or more)	138
Moderately active (on the air once a month or more)	139
Somewhat active (on the air less than once a month)	140
Inactive (not on the air at all)	141
Active off the air but not on the air	142

2. ...which of these on-the-air activities you enjoy

(circle all that apply)

Amateur TV (Fast Scan)	143
Amateur TV (Slow Scan).....	144
Award chasing.....	145
Contesting (HF).....	146
Contesting (VHF)	147
Digital Modes (HF)	148
Digital Modes (VHF).....	149
DXing	150
EME (Moonbounce)	151
Experimentation (on-air).....	152
Mobile operating (HF)	153
Mobile operating (VHF).....	154
Public Service/Traffic Handling	155
QRP (Low Power)	156
Rag-Chewing	157
Repeater operating	158
Satellites.....	159
VHF/UHF Weak-Signal	160
Other	161

3. ...which of these off-the-air activities you enjoy

(circle all that apply)

Attending club meetings & activities.....	162
Building/designing/modifying antennas.....	163
Building/designing/modifying equipment.....	164
Giving license exams (Volunteer Examiner)	165
Helping other hams or potential hams ("Elmering")	166
Reading ham magazines	167
Research/Experimentation.....	168
Teaching licensing courses.....	169

Thank you for your responses. We'll have more questions for you next month.

AOR™

The Best Just Got Better!



AOR has just improved its world-class AR8200 B portable receiver. The AR8200 Mark II B leaves others behind, with a new Temperature Compensated Crystal Oscillator that maintains frequency stability without regard to changing ambient temperatures. A new keyboard layout and improved illumination allow easy operation in a variety of conditions.

Discover why AOR receivers are the choice of many federal, state and local government agencies. Military users, laboratories and professional news-gathering operations also use AOR receivers.

When you're ready
to own the **best**,
you're **ready** for **AOR.**

NEW! AR8200 Mark II B

- New TCXO for greater stability – performance not found in most desktop units!
- Brighter backlit display for easy use anytime
- New telescopic antenna included for better reception
- New keyboard layout for easier operation
- Attractive new black case
- Now includes 1100 mAh high capacity Ni-Cd batteries
- 500 KHz ~ 2040 MHz * coverage
- 1,000 memory channels (20 banks)
- Computer control and programming. *(requires optional connection cable)*
- Download free control software from AOR web site!
- "All Mode" reception includes "super narrow" FM plus wide and narrow AM in addition to USB, LSB, CW and standard AM and FM modes
- True carrier reinsertion in USB and LSB modes.
- Includes 3 KHz SSB filter!
- Detachable MW antenna
- Optional internal slot cards expand the AR8200 MarkII B capabilities. Choose from Memory Expansion (up to 4,000 memories), CTCSS Squelch & Search, Tone Eliminator, Voice Inverter and Record Audio (saves up to 20 seconds of audio)
- Tuning steps programmable in multiples of 50 Hz in all modes
- 8.33 KHz airband step is correctly supported
- Noise limiter and attenuator
- Band activity "scope" display with "save trace" capability
- Four-way side panel rocker switch allows one-hand operation
- Large display includes A and B VFO frequencies and signal strength meter
- Battery Save function with Low Battery indicator
- Operates on 12 VDC external power
- 4 AA Ni-Cd batteries supplied, also uses standard AA dry cells
- BNC antenna connector
- Wide choice of accessories
- Patented design (U.S. Pat. No. 6,002,924)

AOR™

AOR U.S.A., Inc.

20655 S. Western Ave.

Suite 112 Torrance, CA 90501

310-787-8615 Phone • 310-787-8619 Fax

www.aorusa.com

CIRCLE 15 ON READER SERVICE CARD

*Cellular frequencies blocked in compliance with USA regulations. Continuous coverage models available for authorized users/agencies; documentation required. AOR engages in ongoing efforts to improve its products. As such, design and performance parameters may change without notice or obligation on the part of the manufacturer and/or distributor(s).

Don't be confused. Patcomm's PC-16000A isn't just a tweaked-up version of its original PC-16000. In many ways it's a whole new radio. Contributing Editor-at-Large Ken Neubeck, WB2AMU, ran it through its paces...

CQ Reviews:

The Patcomm PC-16000A HF Transceiver

BY KEN NEUBECK,* WB2AMU

Imagine a ham radio company taking one of its existing radios currently in production and creating a new and improved version. Well, this is essentially what Patcomm has done with one of its original radios, the PC-16000 HF transceiver. The company has taken the approach of continuous product improvements based on lesson learned, as well as taking advantage of new technology when it becomes available.

The original PC-16000 came out in 1997 and brought a lot of interesting new features into the ham transceiver market. The revised PC-16000 continues to provide these features and now comes in two models, an A model for the American version and an E model for sale in Europe. (The difference between the A model and the E model is not significant for hams in the basic use of the radio; there are just some minor changes in the unit's programming.) While keeping the same unique features, however, the revised PC-16000A and E models have a significantly improved front-panel appearance along with some other minor improvements over the original model.

Basic Features

The PC-16000A is an HF transceiver that covers 160 through 10 meters with a general-coverage receiver from 1.5 to 30 MHz. The radio has the capabilities of AM, SSB, CW, and RTTY transmission. The transmitter is rated at 100



Patcomm's PC-16000A has a less-cluttered look than the original model, along with a bigger frequency display and easier-to-use tuning knob. The unique features of the original, such as built-in CW and RTTY decode and display capability, are retained and in some cases improved. (Photos by the author)

watts output and requires a 20 amp power supply for maximum power. A nice feature of the radio is that the power output level is adjustable and can be read on the digital display.

The radio measures 14 $\frac{1}{4}$ " W \times 13 $\frac{1}{2}$ " L \times 3 $\frac{1}{2}$ " H and weighs about 15 pounds. At this size and weight the PC-16000A basically would be considered a desktop unit, although Patcomm has received letters from hams who have installed it in their cars (generally on the back seat!).

Here's a quick rundown of what's new in the 16000A, and what remains the same as in the original 16000:

Major Improvements Over Original Model

- Larger digital LCD display for reading frequency.
- Larger S meter for easier reading.

• Front-panel switches have been arranged in a better layout.

• Ability to listen to the transmit frequency while operating split frequency.

• A larger main tuning knob which also has a circular indent for fingertip tuning, compared with the mini knob that was attached to the main tuning knob of the original unit.

Features That Remain The Same

The upgraded PC-16000 retains the following features of the original model:

• A total of ten memory frequencies that can be stored for each band—i.e., M200 is the first memory position for 20 meters.

• Double conversion receiver (45 MHz and 455 kHz IFs).

• Same rear-panel layout. This includes three antenna input connections that can be selected via a switch on the

*CQ Contributing Editor-at-Large, 1 Valley Rd., Patchogue, NY 11772
e-mail: <wb2amu@cq-amateur-radio.com>

front panel. Each antenna setting can be programmed into memory along with other settings. This is ideal for anyone who has more than one antenna and wants to use different antennas on different frequencies.

- No cooling fans—just a moderate-size heat sink. As in the original unit, the PC-16000A runs cool and does not require cooling fans. A moderately large heat sink is installed on the rear panel of the unit to provide the necessary cooling for the final transistors.

- Keyboard input connection along with two auxiliary connections.

- CW and RTTY modem with send and receive capabilities. As in the original unit, the radio can send RTTY or CW by use of a computer keyboard. In addition, it can decode CW and RTTY signals and displays the message on the top line of the frequency display.

- Built-in iambic CW keyer.

- Two-line display that shows the transmit frequency on the top row and the receive frequency on the lower row. Although there is only one VFO, the radio will operate split-frequency.

- Receiver includes DSP filter with auto-notch and de-noise, VOGAD, and RF clipping.

- Variable speed tuning that tracks with the speed at which the knob is turned.

- Same good overall quality control. The pushbuttons on the front panel work well and are relatively easy to push. Inside, the radio consists of modular construction and circuit-board layout that is well thought out. All units undergo a power-on burn-in process at the facility prior to shipping.



Rear view of the unit shows a nice, simple layout along with a decent-size heat sink. There are no fans on this unit, and it doesn't need any. Note the three antenna inputs, which are selectable from the front panel. The cable for the supplied keyboard plugs into the jack shown on the far left in the photo.

- A well-written manual that walks the user through some of the radio's unique functions.

Operation

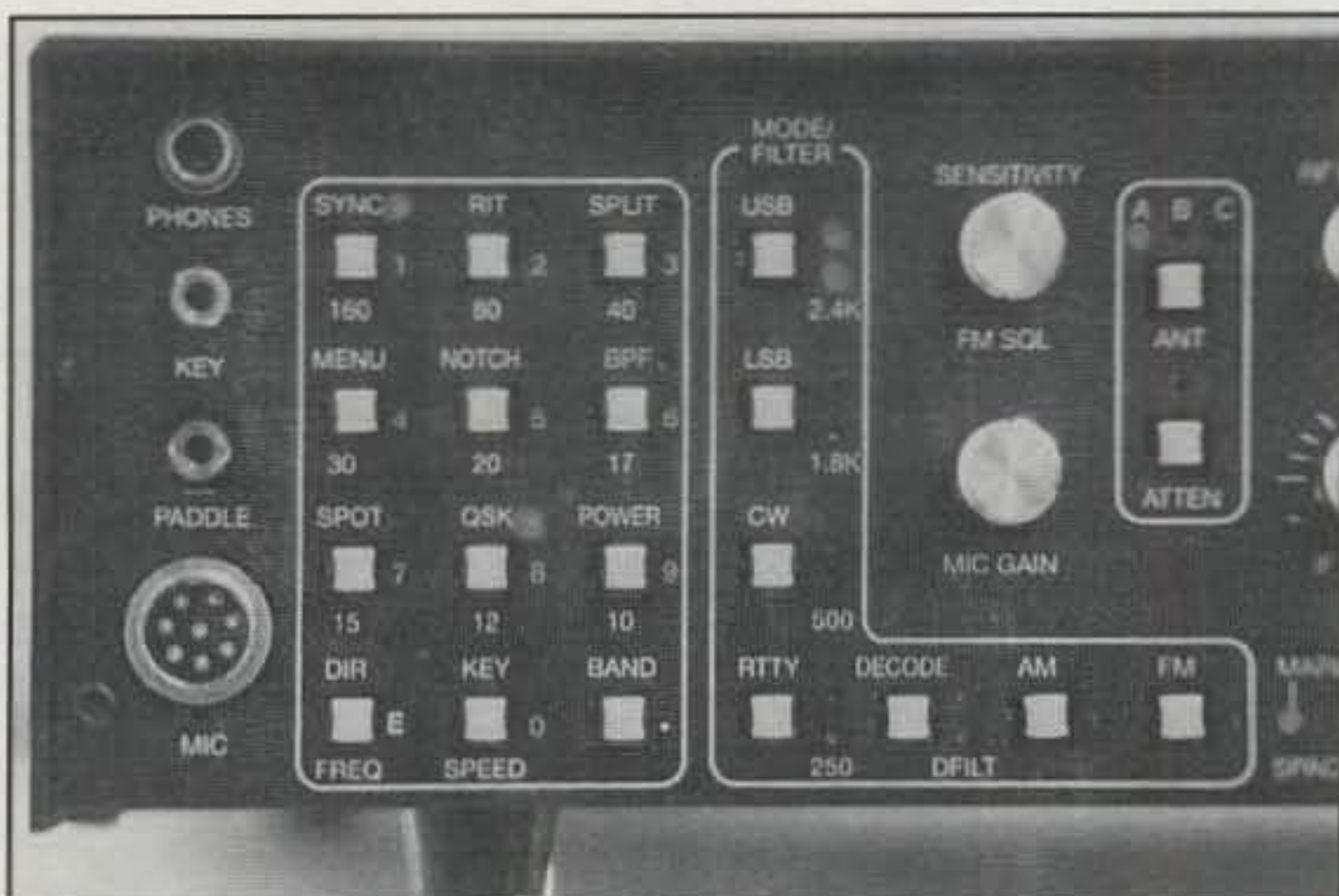
Compared with the original PC-16000 transceiver, the revised version is much more user-friendly and easier to use. I had a chance to use the radio on a number of bands—primarily 10, 15, and 40 meters—working a number of US and DX stations. Many of the stations I worked had not heard much about the PC-16000. I hope this review will make more hams familiar with this radio.

I enjoyed using the keyboard function to send CW, rather than a regular key, and can see how this is a wrist-saver during heavy activity such as a major contest. By the way, there are still standard CW key and keyer jack inputs on

the radio for conventional CW work.

During the time I had the radio for review, I had some fun using the decode function for CW and RTTY. The CW function works best when someone is sending near perfect CW, and the RTTY works best when the signal is reasonably strong. Typically, one has to tune on the high end of the signal to get the best results. The CW decode is a great feature to use when you are using your own memory or jotting down notes on a scratch pad. This probably would be a good feature for a ham working to increase his/her code speed.

The quality of the PC-16000A's received signals is very good. I found that the DSP function was useful in filtering out nearby signals on the band, even though the various receive features may take some getting used to. One minor problem I encountered was that



A closer view of some of the buttons on the front panel. They are more spread out on the PC-16000A version than on the original PC-16000, making it easier to read the labels to be sure you are pressing the right one.



The two-line display on the PC-16000A is larger than on the original PC-16000. In "split" operation, the display shows transmit frequency on the top line and receive frequency below. Decoded CW and RTTY signals also scroll across this screen.

SITTING ON A TAX WRITE-OFF?



DONATE YOUR RADIO

Turn your excess Ham Radios and related items into a tax break for you and learning tool for kids.

Donate your radio or related gear to an IRS approved 501 (c)(3) charity. Get the tax credit and help a worthy cause.

Equipment picked up anywhere or shipping arranged. Radios you can write off - kids you can't.

Call (516) 674-4072
FAX (516) 674-9600
e-mail: crew@wb2jkj.org
www.wb2jkj.org

WB2JKJ

THE RADIO CLUB OF
JUNIOR HIGH SCHOOL 22

P.O. Box 1052
New York, NY 10002

*Bringing Communication to
Education Since 1980*

Discovering a Ham Radio Company on Long Island!



Patcomm CEO Frank Delfine, WB2UJS, at a workbench in his company's Saint James, Long Island, manufacturing plant.

During the quiet times of the year 6 meters can be kind of lonely. Therefore, when you hear any station on the air, you jump on them quickly. One of these stations was Frank Delfine, WB2UJS. I worked him in January 1999 on 6 meter CW. He did not say anything on the air with regard to the fact that he is the CEO of Patcomm or that he was using a new radio his company was developing. A few months later I worked Frank again, this time from the parking lot of a mall where my wife was shopping. He noted that I was only five minutes from his shop and invited me to visit. At this time I had no idea that his "shop" was a ham radio manufacturing company!

When I visited Frank, I was surprised to find that he is in charge of a ham radio company that has two radios on the market—the PC-16000 and the PC-9000. I just could not believe that there actually is a ham radio manufacturer on Long Island; after all, there are so few anywhere in the United States! Once the initial shock passed, I realized that Frank had developed some radios with very interesting features.

Frank had been an electrical engineer for a bar-code equipment manufacturer before going out on his own, first as a consultant and then as the head of his own radio company, originally named Patriot Communications, and today known as Patcomm.

Patcomm's first offering in the ham radio market was the original PC-16000 in 1997. This radio had a unique appearance with multiple push-button controls along with the unique feature of a built-in CW/RTTY decoder plus a keyboard interface for sending text. A number of these features also appear on Patcomm's HF plus 6 meter radio, the PC 9000. Lessons learned from the manufacture of the PC-16000 were used to improve some design aspects of the PC-9000, even though it has a significantly different appearance and size.

Frank and Patcomm are currently working on a receiver version of the PC-16000A. Also, with the development of new architecture and technology, work will be done on a low-cost 100 watt HF radio with 6 meters as an option. The ideas used by Patcomm to develop each of these radios end up creating new ideas for future radio designs. Thus, the company is on a very good track toward coming up with some interesting radio designs and features in the competitive ham radio transceiver market.

on occasion, when I used a 40 meter dipole on 15 meters I picked up signals from a local high-powered AM commercial broadcast station which has its antenna site located less than two miles away. The signal appeared to be some sort of harmonic at a signal strength of about S3 that was situated at two or three spots on the band. It seemed to be a function that was related to the IF frequencies used in the radio that was interacting with the particular frequency of the nearby broadcast station. The problem can be fixed by using either a filter or traps. This may be required for those who live very close to broadcast stations that generate harmonics. Patcomm has told me that they will work with anyone who encounters a similar condition with a local broadcast station and make any necessary changes.

Summary

Because of its size, the PC-16000 is best suited for base-station use, as it will require a reasonable-size table or desk on which it can be placed. It also

looks as if it would be a good radio for Field Day use because of its large meters; however, a little bit of manual-reading time will be required for those operators not already familiar with Patcomm products.

The radio is rugged, well made, and attractive. The list price of the PC-16000A is \$1749, and this includes a microphone as well as a standard computer keyboard that is used for sending CW and RTTY. There are no separate options for the PC-16000A, as special features such as 2.4K SSB and 500 Hz CW Collins mechanical filters are already built into the radio. Remember also that the basic package already includes the unique features of sending and decoding CW and RTTY signals, as well as displaying decoded text on the screen. At one time, FM was considered a possible option, so space was left on the panel and in the unit for an FM board. No requests for this feature were made and no further development ensued, although the possibility of including FM still remains.



The inside of the unit shows surface-mount technology and a neatly arranged layout. Patcomm prides itself on its quality control.

Patcomm offers another unique service: For \$375, owners of original PC-16000 transceivers can send in their radios to be converted to the newer version PC-16000A or E model. Some

hams may find it advantageous to pick up the original PC-16000 for a good price and just get the conversion to bring it up to date. I don't seem to recall any other company that has done any-

thing like this. For a \$25 shipping fee units can be shipped back in form-fitting foam via UPS. Patcomm's website features its products and ordering info: <<http://www.patcomradio.com>>.

With the PC-16000A you are getting more than just a regular HF transceiver. You are getting the additional features of built-in RTTY and CW send and receive capabilities in one unit. Any other HF radio set up for similar functionality would need additional boxes which would take up more space on your operating table!

Because Patcomm is a small company, it is able to make changes to an existing radio and cut this into the production line relatively quickly. I see a very good future for this radio in the base station market because of this capability and the radio's unique features. It will be an interesting future for Patcomm as it introduces new products into the ham radio market.

For more information on the PC-16000A see any Patcomm dealer or contact: Patcomm Corporation, 7 Flowerfield, Suite M100, St. James, NY 11780 (telephone 631-862-6511; fax 631-862-6529; e-mail: <patcomm1@aol.com>; on the web: <<http://www.qth.com/patcomm>>.

Batteries / Chargers

BUY DIRECT FROM THE U.S. MANUFACTURER

SPECIAL
FOR THE
MONTH OF JUNE

**10%
OFF**

ON ALL
NiCD and NiMH
REPLACEMENT BATTERIES
for **CAMCORDERS**

Monthly Discounts Applicable
to End-User's ONLY

Look for July's Special
of the Month

**Charges Ni-Cd &
Nickel Metal Hydride
Batteries**

W&W has the **LARGEST**
selection of **Ni-Cd** and
NiMH Batteries in the
world to date for both the
Ham and Communication
market alike.



Also available
for 2 and 6
stations

The most complete selection of cups
in the industry



NYS residents add 8.5% sales tax.
Add \$5.00 for shipping.

W & W MANUFACTURING CO.

800 South Broadway, Hicksville, NY 11801-5017

E-Mail: w-wassoc@ix.netcom.com Web Site: wwassociates.com

Made in
U.S.A.
Send for
free
catalog &
price list

IN U.S. & IN CANADA CALL TOLL FREE 800-221-0732 • In N.Y.S. 516-942-0011 • FAX: 516-942-1944

MADE IN U.S.A.

Prices & Specifications subject to change without notice.

CIRCLE 100 ON READER SERVICE CARD

The Phoenix Shall Rise

Once upon a time there was a glimmer of hope. There were legions of nodes and digipeaters across our land, enough to link every city in the nation to one another. Then came the "internet," and those nodes, digipeaters, and many other facets of amateur radio began to fade into oblivion.

Let's look at the reasons why all these changes took place. First and foremost is the age of the computer. No, what I really mean is the age of the *family* computer, an affordable tabletop device that opened up an avenue which enabled the use of the modem to connect to a local BBS. No, not a packet BBS; I mean a telephone BBS.

Gotcha! I'll bet you'd almost forgotten that before the internet there were hoards of BBSes all across the United States. There were some of our ranks who even became "addicted" to BBS downloading—not that the downloads were worth anything or the program was useful. The "user" would somehow justify in his or her mind that it was a "utility" and that it must be good or the purveyor wouldn't have placed it on the BBS for everyone to use.

The lure of the modem and landline BBS became a more powerful addiction when many users discovered that images, both drawn and scanned, could also be viewed and saved to display again and again. Images in the graphic interchange format (GIF) and other similar formats became the key that gave even more reasons for "going on line."

The phrase "going on line" came about before the internet's popularity grew to the proportions it is today. It was the Hayes™ modem that helped change the nature of our world, but it was *speed* that spelled the end of an era for some hobbies and services. There were "speed wars" that brought about much of the change and increased interest in landline modem power.

I remember the first 300 baud modem. Everyone who had any kind of TRS-80 with TRSDOS, Radio Shack Color Computer (CoCo), or Commodore VIC or 64, and even some old CPM machines, had one. Anything that would

support a serial port and a terminal program that would attach to a modem was being brought into the home, moreover into the ham shack.

The Race was On

Speed wars began to emerge in the ranks of the modem manufacturers. It was soon apparent that 1200 baud was coming of age. Then someone really made a quantum leap by introducing a new layer and slightly different protocol that enabled different compression techniques to take place "on the fly." This cleared the way for a leap from 9600 baud to over 14,000 bits per second (bps). The race was on!

Soon we had 28,800 bps. Next came the modem that would handle 33,600 bps, and today most of us have the V.90 ("Vee dot 90") type modems which handle 56,000 bps. Our only problem is whether our telephone lines will handle 56,000 bps. Many of us have the 56 kb modem, but we don't really have 56 kb landline capability. That's a topic for another column, however.

To Die So Young

It's not enough to watch as one so young dies a slow, agonizing death. There is also the wake that follows when we just wonder why.

There is no sense or reason to sit idly by and watch as our hobby gives way to another landline-based medium. It's not too late to make a new era in amateur radio come to life. From these ashes, the Phoenix shall rise.

The first paragraph of this section ended with "why." Now . . .

Why Not?

Why not move away from the internet and even the "dead-end street of 219–220 MHz" and move to frequencies that have no "conditions and limitations"?

Wow! Did you all see those light bulbs go on?! Let's try for some broadband frequencies that would allow *all hams* to use this kind of technology.

Hundreds of people and organizations put together some useful suggestions in the form proposed rulemaking that helped move our license base to a more comprehensive level of understanding. As a result, the FCC moved to make

fewer license classes. Maybe the restructuring doesn't please everyone, but it does make sense.

Perhaps you are asking, "What does license restructuring have to do with the subject matter of this article?" Just this: The FCC has moved the license base into the new millennium, so why not do the same with the rest of our hobby and adopt a new technological approach that will move all of our hobby into this century!

Think Spread Spectrum!

We are long overdue for an upgrade in ham radio technology. We have a need for nationwide frequencies that would allow *wide* 56 or 64 kb amateur radio networking. Let's call it **AmateurNET**, or **AmNET**. Whatever we call it, it should give us internet-type operations on VHF, UHF, and frequencies above 1000 MHz (1 GHz).

We're talking about frequency channels that are at least 100 kHz wide. These frequencies should be available nationwide, so as to provide the service we are looking to utilize. The service would be "wireless," use wide-band radios capable of streaming data, and use NetScape™ and Internet Explorer™ type browsers. The mode would be exclusively for ham radio licensees. This new technological move would bring new life into amateur radio, much the same as SSB did in the 1950s and FM did in the late '60s and '70s.

Think about it—an amateur radio network that rivals any and all other networks; a wireless environment in which only hams can operate.

Take a look around you. The median age of hams is over 50. When you are at the next hamfest, look around you. All that gray hair! I rest my case and make this next statement: AmNET would draw new, younger blood into ham radio.

Instead of beating our browsers against 200 million internet users, we would be operating in a high-speed wireless environment that would have only licensed ham radio operators—for the moment let's say under a half-million operators.

Here's what would happen: We would begin to see ham radio using digital voice, data, video, streaming video.

The RF Applications VFD RF Power/VSWR Meter

The ONLY Wattmeter for the Serious Operator

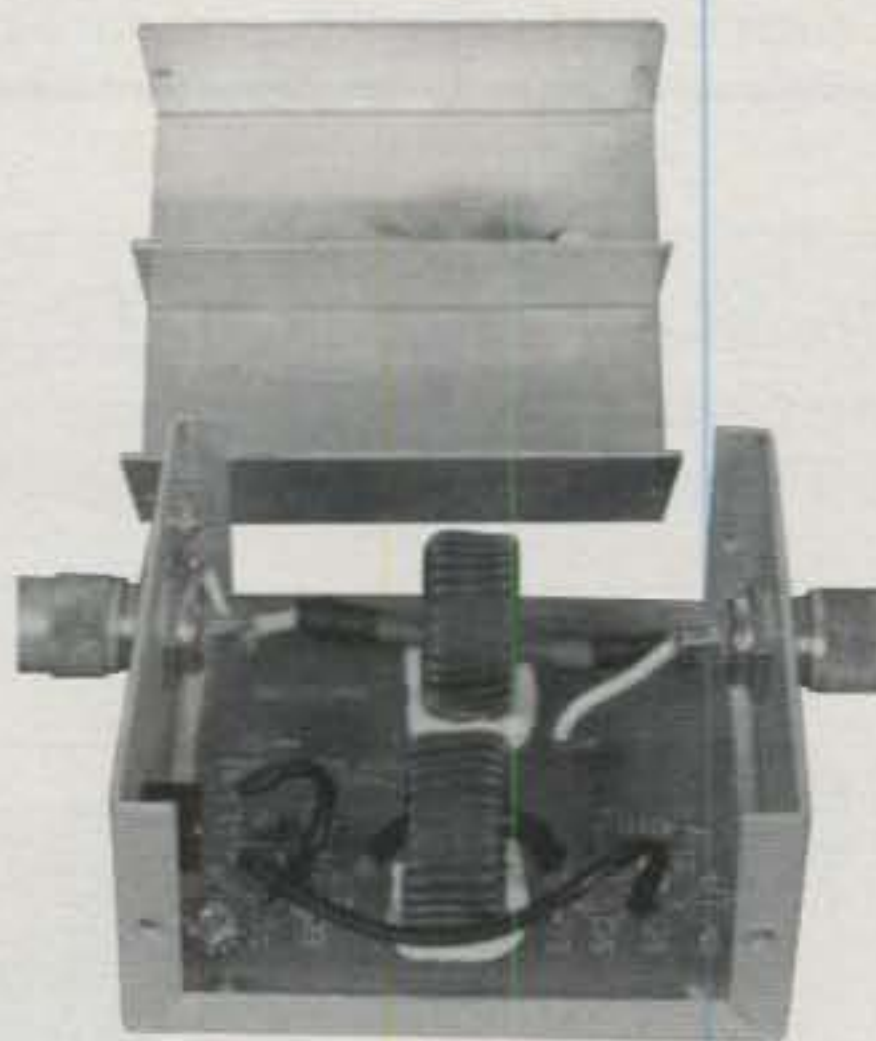
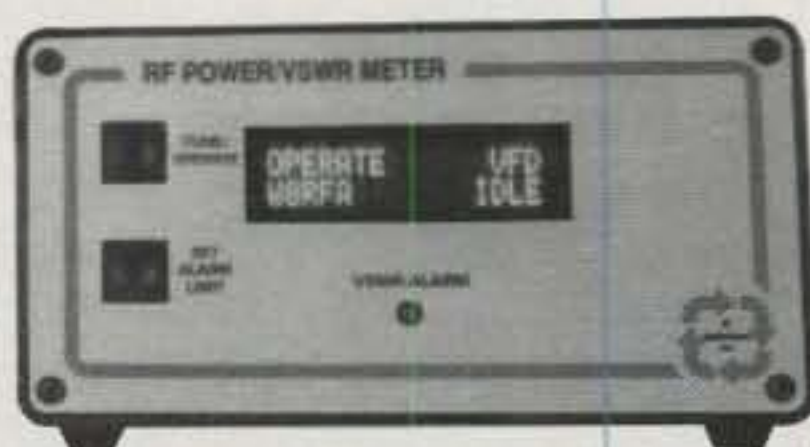
**VHF
VERSION**
now available

EXCITING NEW TECHNOLOGY

RF Applications, Inc. VFD Series Wattmeters represent breakthroughs in microprocessor, display and software technology. These units feature a 2 line by 16 character vacuum fluorescent display, tuning and operate modes, and a settable VSWR alarm limit. With our VFD External Relay Option, you can use this instrument to interrupt your transmit control circuitry to protect your valuable station equipment in high VSWR conditions (wrong antenna, bad cable, ice, etc.).

We can even *personalize* your wattmeter with your callsign (11 characters maximum). The Vanity Option is supplied as a separate chip (you keep the original), so your VFD can still be used by someone else!

Housed in a compact (5.75" by 3.0" by 2.0") enclosure, the VFD Series Wattmeters offer many features you cannot find anywhere else. The VFD Wattmeters use our "battle proven" remote sensor design being used around the world today. All this at a price you can afford.



The VFD gives you a real time peak and hold display of your actual power and VSWR *every time you transmit*. This means that you'll always know that your system (exciter, amplifier, feed lines, antennas, etc.) are operating the way you intend them to. Tuning an amplifier has never been easier because the VFD's 65 element bar graph gives you better resolution than a meter. In addition, you can select a quick update for the displayed power (Tune Mode).

IS IT ACCURATE?

The VFD uses sophisticated technology that achieves remarkable accuracy in a low cost package. Compare it with your Bird™ or other accurate meter. You'll be amazed at this unit's performance.



ALARM INDICATION



You can set the VFD to tell you if your VSWR has exceeded a preset limit. A bright red LED tells you if you have exceeded 1.5:1, 2.0:1, 2.5:1 or 3.0:1 (the default). If you have installed the optional relay, you can disable your amplifier to prevent damage to your system.

THE BEST SENSOR

The VFD uses our P-3000-D sensor. Insertion loss and VSWR are minimal, and the sensor uses large cores that will not saturate, even above 1.5 kW. Network analyzer plots of the sensor's performance are available on request.

WHAT YOU GET

The VFD is shipped with a display unit, the P-3000-D sensor and a 12 VDC power cable. This product is covered by RF Applications' standard two year warranty.



KEY SPECIFICATIONS

Frequency range:
1.8 to 30 MHz (60 MHz with recalibration)

Power:
5 - 2,955 watts (VSWR accuracy suffers below 20 watts)

Nominal impedance: 50 ohms

Accuracy:
Better than $\pm 10\%$ of the displayed reading

Operating power:
12 VDC at 130 mA average, 200 mA max

Connectors: SO-239 (2)

Signal cable length: 62" (24.4 cm)

Shipping weight: 3 pounds

COST AND OPTIONS

The VFD sells for \$249.00, and the following options are available:

Vanity Option (\$20.00)—You can special order a replacement chip for your VFD that can contain up to 11 characters of your choosing.

VSWR Alarm Relay Option (\$20.00)—This option adds a reed relay output to the VFD that you can use to inhibit a radio or amplifier when your preset VSWR limit is exceeded.

Power Monitor Option (\$35.00)—The Power Monitor Option allows your VFD to monitor your transmitted power and gives you relay contacts to let you know that you are applying RF to an antenna.

All options are available factory direct only.

OUR CUSTOMERS SAY

"This one is a keeper. Easy on the amp, and easy on the QRM."

--WXOB

"Best station accessory value since computer logging."

--W3LPL

"Best wattmeter I own."

--W4AN

Founded in 1992, RF Applications has products installed and operating around the world.

RF Applications, Inc.
7345 Production Drive
Mentor, OH 44060 USA

+1 440.974.1961 Voice
+1 440.974.9506 Fax
1.800.423.7252 Orders

<http://www.rfapps.com>
sales@rfapps.com



Anything and everything done on the wire-line internet could be done better and faster on our high-tech AmNET. Since this wireless AmNET would be on the ham bands, used only by licensed hams, it would be *free*. No monthly fees for licensees. I, for one, would help buy and build nodes to support it, and I would also provide gateway servers on these frequencies. *No collisions—just lots of real-time fun, and it would be free and wireless!*

Planning the Journey

Tell your friends, both amateurs and others, about this article. Together we can make it happen. Everyone stands to gain from this new thrust into the 21st century. It's the platform we've needed for amateur radio and packet for a long time. Here are the ingredients for our

"limited-access information superhighway" (AmNET).

Yes, we have to do a bit of planning with regard to what vehicle we wish to use to journey down this digital superhighway of our future in ham radio. For openers, where are all the transceivers that will pass 64 kb? Somehow we've learned to create the numbers in multiples of 64 kb, such as 128k, 256k, 512k, 1024k, 2048k, and so on, up to 64 kb. In there somewhere lie the 56 and 64 kb that fit well into the scheme of things related to the 100 kHz bandpass with which we have to work. In addition, 100 kHz will enable a guard band on either side of the required bandpass at 56 kb.

The Real Fun of AmNET

Let's think in terms of using a browser such as NetScape™ or Internet Explor-

er™. With servers and nodes that are supported exclusively by and for amateur radio operators, we will have a *wireless* "internet" that will rival and even surpass the present-day wire-line internet. Not only will this amateur radio internet allow data communications and file transfers much like the wire-line internet, it will also support digital voice, much like, but better than, ICQ and NetTalk'r, etc.

Some efforts along these lines are already being made, even with our current speed limits. In fact, a ham internet experiment in Wisconsin is the topic of this month's "Computers and Internet" column.

Sorry, Charlie


Remember those pop-up commercial ads that annoy us when we access a page on the internet? What about all that advertising SPAM? Now Buck has opened up a can of worms! Sorry, Charlie, but that problem will go away. You are absolutely correct: Amateur radio is still a commercial-free hobby. No, we will *not* be in competition with the internet and certainly not with the ISPs. How much competition did amateur FM give to the mobile telephone industry? None! Even I carry a cellular telephone. Nor will AmNET take away from HF, VHF, and UHF amateur operations. DX contesting fun and VHF/UHF repeater use will be with us for a long time to come.

This new thrust will generate the drive to propel us into a new operating environment within amateur radio. This new operating environment will have much the same effect as single-sideband and FM did a few decades ago.

Here is the final thrust of what I'm trying to convey: The OEM who designs and markets the 56 or 64 kb radio and streaming modem interface will have a radio/modem combination that will command a respectable price, and it will sell! I will be one of the first purchasers. I will support nodes, I will promote, and I will use every means at my disposal to help the transceiver OEM(s) realize their efforts were worthwhile.

A Quarter of a Million Transceiver Sales

For now it appears that someone or some group is afraid of the backlash from the ISP and HF vendors. Somehow I think that these parties or groups should remove their heads from the sand and look beyond that fear to see the beauty of the trees—and the forest. Here lies the potential of more than a quarter of a million sales of 64 kb trans-



**Use Your Free Reader Service Card
For More Information On Companies
Advertising In This Issue of CQ.**



DIRECTION FINDERS
VHF phase sense antennas with audio and led left right indication. Use with any FM Xcvr. From \$139.95. DF attenuators also. New elt model!

RADIO ENGINEERS
7969 Engineer Road #102
San Diego, CA 92111 858-565-1319

Be a Ham Operator
without learning Morse Code!
NO CODE TECHNICIAN NEW Updated
Questions! Home study course contains 192 pg. textbook, FCC Rules & IBM compatible software.

\$34⁹⁵
Postpaid Money Back Guarantee! Plus \$4 Shipping

VISA or Mastercard Accepted.
TOLL FREE 1-800-669-9594
The W5YI Group, Box 565101, Dallas, TX 75356



CIRCLE 98 ON READER SERVICE CARD

A CQ Advertiser
Since 1947
AMERICAN MADE



VIBROPLEX®

Code Warrior Junior

Vibroplex is pleased to announce the production version of the Norcal K8FF Key, the Code Warrior Junior. This unique small Iambic key measures only 2 1/2" x 3". It is designed using magnets. **NO SPRINGS!** Each key is serial numbered and dated. With Black Base and Clear Paddles—this key is a perfect addition to your QRP or Home Station! Order early for lowest serial numbers!

\$99⁹⁵ plus S/H



Code Warrior Junior
(Prototype pictured)

The Vibroplex Company, Inc., 11 Midtown Park East, Mobile, AL 36606
1-800-840-8873 FAX 1-334-476-0465 email: catalog@vibroplex.com
Web Catalog—www.vibroplex.com Dealers wanted outside the US. Call or FAX

Here it is! The most accurate and extensive CD-Rom available!

\$5⁰⁰
DISCOUNT

Radio Amateur SUMMER 2000

Call Book 2000

BRAND NEW
AMATEUR RADIO
PREFIX MAPS!

New Features

- ▲ Program now in English, German or French; selectable by user.
- ▲ New information for both US and International!
- ▲ US Data: Population by City, State Capitals and other interesting information.
- ▲ International Data – Population by Country Capitals, & more.

Features

- ▲ Contains more than 1,550,000 calls.
- ▲ More than 45,000 E-Mail listings.
- ▲ New option to run directly from your hard drive.
- ▲ EDIT feature allows users to input up-to-date information.
- ▲ Interactive Beacon Listing (Scheduler) – On request will show beacons position using IARU beacon system.
- ▲ Bearing and Distance included for most calls.
- ▲ Print address on labels or envelopes.
- ▲ Over 54,000 QSL Managers.
- ▲ Windows/DOS platform.
- ▲ Single maps for each state in the US, and detail maps for each Province of Canada.
- ▲ Pinpoint on the maps, the location of each call retrieved.
- ▲ Extended Wordsearch allows users to specify search criteria. Search by both first & last name, city, state & more. (U.S. Data only).
- ▲ Search international data by call, or use our text search for a more extensive search.
- ▲ Data displayed for US entries: Call, Name, QTH, class, issue & expiration dates, previous call, previous class, latitude & longitude, E-mail address, fax number, special comments, and much more.
- ▲ Print the entire Windows Help file with one click of a button.

Our New CD Offers Unmatched Coverage of The World

Colorful Maps of most of the World including small islands. Click on a button to view. "Only on the Radio Amateur Call Book CD-Rom."

The CD-Rom contains more than 1,550,000 listings world-wide covering more than 250 countries, islands and dependencies.

The Radio Amateur Callbook/CD-ROM contains both North American and International listings!

Listings can be found quickly by name, location and call letters – even when the information is incomplete!

The most accurate & extensive CD-Rom available.

With discount, only \$44.95 plus \$5.00 S & H. ITEM #8759X

Order Toll Free

1-888-905-2966 (USA Only)
1-732-905-2961 • Fax 1-732-363-0338
E-mail: 103424.2142@compuserve.com
Web site: www.callbook.com
VISA, MasterCard and American Express accepted.

Or write

RADIO AMATEUR CALLBOOK
575 Prospect St. • Lakewood, NJ 08701

See us at Dayton, Booth numbers 46 & 47



CIRCLE 80 ON READER SERVICE CARD

ceivers and streaming data modems. That's 250,000 times X dollars that would be generated from the amateur radio market alone. While I'm at it, this number is for the US market only.

Now consider what happens when other countries begin opening other frequencies for this kind of amateur radio use. In addition, there are thousands of UHF and microwave experimenters in the ranks of ham radio operators who will gladly support wide-band microwave links.

I'm doing as much as I can, as I try to design or modify transceivers to make our digital hobby faster. Now it is time for many others to jump into the ring and help make this dream crystallize, make it *real!* It is only two paces away from being a reality.

For whatever it's worth, let's "get real" and build a massive network that will complement the amateur radio community. Let's also hope that the FCC (and the American Radio Relay League) will listen to the wisdom and judgment of those of us who remember the beginnings of our present-day packet system.

At this time with this technology and a few 100 kHz wide frequencies we have a chance to apply the "right stuff." If we

do not, then we may have to relegate ham radio to the same archives as the 140 mile-per-gallon Tucker Carburetor.

Packet—More Fun Than We Ever Imagined!

Packet can be even more fun if we govern ourselves accordingly—now, today! We have to launch a *pro-active* campaign in two directions. First we have to provide the transceiver manufacturers with a reason to put some research and design into this project. In this column I've provided them with sales numbers, and these figures are nothing to scoff at. Second we have to let the vendors know that our ranks are large in number. I recall in 1994 one manufacturer told me he had sold almost a quarter of a million packet controllers. Let's see... That means if we look at the other remaining TNC manufacturers, there are more than a million TNCs out there.

Now for the transceiver original equipment manufacturers (OEMs) and vendors, here is your key to another successful 10 to 20 years in the industry. The time has come for an enterprising manufacturer or transceiver vendor to provide a high-speed trans-

ceiver for the new millennium digital amateur radio operator.

We Have the Clout And the Momentum

Having gathered the momentum and the numbers that give us the prominence to exert influence, it's time we make known our needs and requirements to the OEMs and packet radio vendors. The FCC has done its part, and now it's time to call on the OEMs! A short letter, a note, any way that you can convey a message that reflects your feelings is what is now needed to get results. Call, write, or fax the OEMs a copy of this column! My shouting and pouncing on my hat should not be the only message that is sent.

Who knows? Maybe soon we will see even more people who want to get away from the 200 million to half a billion internet 56 kb users and become hams, joining the 500 thousand hams who will have a faster, wireless medium that is *free* to the licensed user.

Happy Packeting de Buck4ABT
e-mail: <k4abt@packetradio.com>
Visit: <www.PacketRadio.com>
and <www.AmateuRadio.org>

Ham Radio's Online Connection

Putting the Web on Packet

Most people consider the Internet to be synonymous with the World Wide Web, when in fact Internet is merely the "pipeline" that carries the data from "HTTP" (web) servers to the end user. Although setting up a web server on the Internet is no great feat, how about using a different pipeline, one accessible only to hams, with virtually unlimited access speeds possible? Yes, packet radio. We amateur radio operators have tons of high-quality radio spectrum, and increasingly sophisticated RF gear, available to implement a data pipeline that can rival any wired connection.

This month's "Packet User's Notebook" column, by Buck Rogers, K4ABT, outlines a proposal to create a ham radio Internet, complete with capabilities for digitized voice, video, and of course web pages. Here in "Computers and Internet" this month we will see how some hams in Wisconsin are already using packet radio to carry HTTP data. Andy Nemecek, KB9ALN, has updated and re-written an article that appeared in the February 1999 issue of *CQ-VHF*. Drop that old notion of packet being 1200 baud and text-based. With some of the new European radios and modems rated at 76 kilobaud, we have the means to beat those puny 56 kb phone modems today. In the not-too-distant future the TAPR Spread Spectrum Radios, with their potential "over 500 kb" data rates, will blow wired connections out of the water. Hold on to your hats, 'cause here we go over to Andy...

Web Pages on Packet Radio: The Basics

Before we discuss how to set up a web service, it is important to understand the client/server concept. A *client* is a computer running software designed to collect and display (or store) information provided by the server. When you connect to the Internet and view web pages, your computer uses a web browser as the client software. A *server* is a computer running a specific program that allows it to provide a service on behalf of a user or another computer. In the World Wide Web, a computer that

stores and dispenses copies of web pages is known as a *web server*.

To use a familiar example, a packet BBS is an example of a server, and a user reading bulletins from that server is using a client computer.

Therefore, to deliver web pages, we need a server to store and distribute the web pages on demand, suitable client software to interpret and display the pages, and a network to deliver them. The network can be radio-based just as easily as wire-based.

Network Interconnection

Packet radio uses the AX.25 protocol as the standardized method that our computers use to communicate with each other. TCP/IP, Net/Rom, and other protocols can be sent via packet radio, but they must first be "wrapped up," or "encapsulated," into an AX.25 packet. Of particular interest is TCP/IP encapsulation, because this is the native language of the Internet. Once we have the ability to send TCP/IP packets, we then need the ability to carry the packets to

their destination: This is where the radio network comes into play. When all of these pieces (server, radio interface, and radio network) are put together, we have something that looks like fig. 1.

Specifics of Our Setup

On our packet-based web system in Green Bay, Wisconsin, the server uses Linux as an operating system on an older 33 MHz 486 computer. For those who may be unfamiliar with Linux, it is a multi-tasking operating system that is gaining wide popularity these days. Because of its multi-tasking nature, it is able to run the two programs necessary to serve up those fresh web pages.

The program that actually talks to the TNC (terminal node controller) and provides radio service (such as a BBS and other conventional packet functions) is *JNOS*. This software, a flavor of KA9Q's famous NOS, is coupled to Linux as though it were a separate computer through a pretend Serial Line Internet Protocol (SLIP) pathway called a UNIX "pipe." The actual web-server software

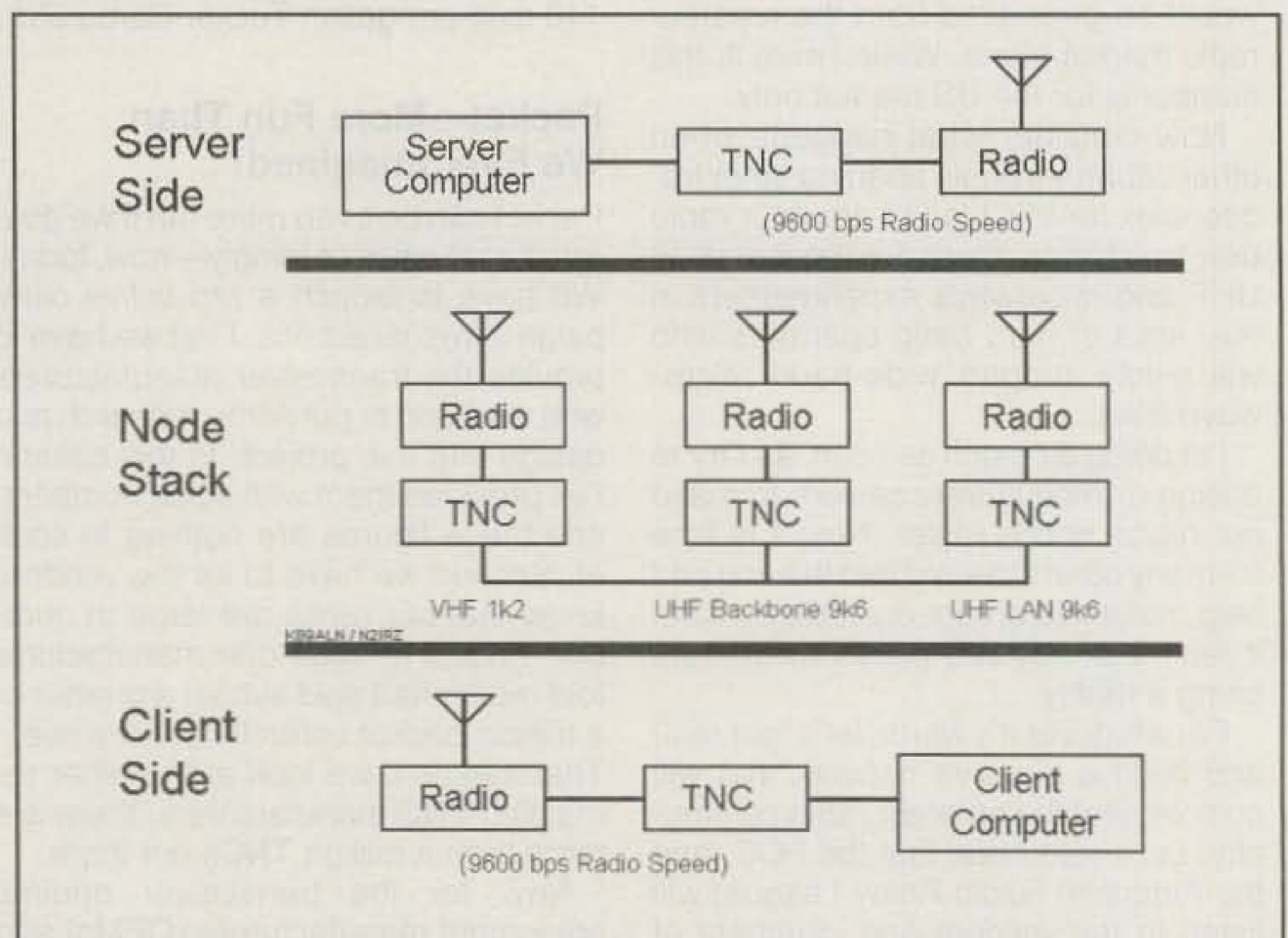


Fig. 1—An overview of the setups for the server and client side computers. The node site runs standard TheNET firmware, but almost any networking system will work just fine. We presently use 9k6 radio channels but hope to upgrade to 19k2 to improve performance.

545 Baylor Ave., River Vale, NJ 07675
e-mail: <n2irz@cq-amateur-radio.com>

is *Apache*, a very popular and well-used Internet web-server program. It listens for incoming web-page requests and serves them up to the radio network, using JNOS as a gateway to the radio network. It is worthy of note that JNOS has a web server built into it, too.

You may be asking why we are using a separate program for web service when JNOS has a server built in? The answer is simple—capabilities. It is possible to put *Apache* on an entirely different computer and link it to JNOS through a wired network (which our first trial did). This would allow even more services and computers to be linked to the radio network. *Apache* also has some enhanced security features, as well as enhanced capabilities that make it appealing for our use.

JNOS talks to a TNC running KISS at a radio speed of 9600 bps. This TNC talks to a radio network through a 9600 bps LAN node, which in turn is linked to a 9600 bps backbone node and 1200 bps LAN node.

The client side is somewhat similar to the server side in that it also uses JNOS running on Linux. Of course, we don't need *Apache*; this is a "client only" computer. Instead, we use one of the client browser software packages such as Lynx, Netscape, Arena, or Opera, to name just a few. (*Internet Explorer is not available for Linux—ed.*) Again, we are using JNOS to talk to the 9600 bps KISS TNC.

The web pages themselves are written in HTML, the language of the web. To maintain reasonable performance at 9600 bps, they are simple text in content, with no graphics. The system operates just as you might be accustomed to: It supports linking to other pages and other sites. Our server was not set up to link to other sites, but there is no reason why it could not be configured to do so. In fact, any legal application supported on the Internet World Wide Web can be used on the radio network.

Graphics and other data can be sent as well, but it was decided that the heavy download time needed would not be suitable for a radio path that is shared with others. However, a web page with mostly text content goes fairly fast at 9600 bps if the radio network is not too busy.

Are There Other Ways To Do This?

Linux is the best choice for a server operating system, as it is made to do server work. Setting up a DOS-based server would be very difficult, and probably would limit its utility, assuming you

could find something that can run effectively under DOS. Clever people most likely can use Windows NT as a server, but I don't like it, so I chose Linux.

The client side is a little more flexible, however. There are two methods to do this: One is through the addition of a software program, while the other uses a special, new version of a TNC.

The software solution consists of two versions of a program that was written to allow Windows computers to operate their TCP/IP systems with a TNC. The program is called ETHRAX25. One version is for Windows 3.x and the other is for Windows 95/98. They wrap the TCP/IP packets from your browser into AX.25 packets and send them to your TNC through your serial port. Both of these versions of the program are available on the World Wide Web (see the resources section at the end of this article for the URL). This would allow the use of Internet Explorer and other Microsoft resources.

You will need a TCP/IP address in order to use this system. It is free for the asking from your local or state IP address coordinator (again, see the resources section).

One possible hardware solution involves the MCB-152 TNC that was developed by a group of European hams. This microcontroller-based TNC is unique in that *it behaves like a telephone modem*, ready for your favorite browser software to use. The disadvantage is that you have to buy another piece of hardware. The big advantage is that you don't have to set up any special software. If you have more money than time, then the MCB-152 might be for you. Information on the MCB-152 is provided in the resources section at the end of this article.

Web Servers

If you prefer to run the built-in WWW server in JNOS, it's not hard to set up and it does allow you to control all of your facilities with one program.

We use *Apache* operating as a separate program for a few reasons. One is that at some point, the web-server software may be moved to another computer on my home Ethernet. Another reason is flexibility: We can upgrade server software without changing the JNOS packet radio software, and vice versa. *Apache* also supports a lot more of the newer web plug-ins, and it will doubtless support newer web applications faster than JNOS can support them. Yet another reason is that at some point we hope to implement Dy-

Down East Microwave Inc.

We are your #1 source for 50MHz to 10GHz components, kits and assemblies for all your amateur radio and satellite projects.

Transverters and Down Converters,
Linear Power Amplifiers,
Low Noise Preamps,
Loop Yagi and other antennas,
Power Dividers, Coaxial Components,
Hybrid Power Modules, Relays,
GaAsFET, PHEMT's & FET's, MMIC's,
Mixers, Chip Components, and other
hard to find items for small signal and
low noise applications.

We can interface our transverters
with most radios.

Please call, write or see
our web page
www.downeastmicrowave.com
for Catalog, Detailed Product
Descriptions and Interfacing Details.

Down East Microwave Inc.

954 Rt. 519

Frenchtown, NJ 08825

Tel. (908) 996-3584

Fax. (908) 996-3702

CIRCLE 56 ON READER SERVICE CARD

WEATHER STATIONS



Professional-quality weather stations for home or industry. Read barometric pressure, temperature, humidity, wind speed and direction, rainfall, solar radiation, UV index, and more. Wireless and cabled options start at just \$195. Call or write for FREE catalog.

DAVIS Davis Instruments

3465 Diablo Ave, Hayward, CA 94545
800-678-3669 • www.davisnet.com

CQR0600

CIRCLE 52 ON READER SERVICE CARD

June 2000 • CQ • 63

Emergency POWER from the Sun



Charge your hand-held or Ni-cad batteries. Small to large solar panels (1-100 watt) available.



**ALTERNATIVE
ENERGY
ENGINEERING, Inc.**

P.O. Box 339 • Redway, CA 95560 USA
707-923-2277 or in the US 1-800-777-6609
Visit our web site: alt-energy.com

CIRCLE 35 ON READER SERVICE CARD

**FREE
SAMPLE
COPY!**





ANTIQUE RADIO CLASSIFIED

*Antique Radio's Largest-Circulation
Monthly Magazine*

Articles - Classifieds - Ads for Parts & Services
Also: Early TV, Ham Equip., Books,
Telegraph, 40's & 50's Radios & more...

Free 20-word ad each month. Don't miss out!

 1-Year: \$39.49 (\$57.95 by 1st Class) 
6-Month Trial - \$19.95. Foreign - Write.

A.R.C., P.O. Box 802-C19, Carlisle, MA 01741
Phone: (978) 371-0512; Fax: (978) 371-7129
Web: www.antiqueradio.com

Fast!.. Powerful!.. Flexible!..

DX4WIN/32

The way logging software *should* be!

Windows 95/98 and NT

Interfaces easily to most radios.
Supports major awards.
Interfaces with packet and DX spotting
networks w/ voice announcements.
CW keyboard w/ memories.

Multi-Function World
Map Window
Only \$89.95

DX4WIN \$69.95 (WIN 3.1 & 95)
Shipping \$6.95/US, \$11.00/DX
Printed Users Guide \$12.00

Rapidan Data Systems
P.O. Box 418, Locust Grove, VA 22508
540-785-2669 or FAX 540-786-0658
Demo disk \$5 or free at website
<http://www.erols.com/pvander>
e-mail: NJ4F@erols.com

CIRCLE 57 ON READER SERVICE CARD

dynamic Host Control Protocol (DHCP), which assigns a temporary IP address to those who don't have a permanent one. Linux handles this, but JNOS does not right now. For most applications, configuring the JNOS WWW server may be all you need, however.

The Future

As I mentioned above, we plan to implement DHCP at some point in the future. In addition, we have already invited users to put their own web pages on the server, and at least one local ham has done so. Eventually, the plan is to make the BBS and web server part of an amateur radio "Internet Service Providing Host" for the Green Bay and northeastern Wisconsin area.

Another future plan doesn't involve software, clients, servers, or other such things. It is our network infrastructure. We will be converting, on a trial basis, to 19.2 kbps radio speed. The hope is that we can convert our backbone to operate at this speed, possibly providing faster service to more of the state's networked TCP/IP host computers that live on packet radio. Other ideas revolve around TAPR's spread spectrum radios, with their faster-than-ISDN speeds.

In Closing

This was an especially fun project that I recommend to technically minded packeteers. I also recommend a good radio network for the task, and at least 9600 bps speed. It is especially important to consider the content and size of the web pages and the time of day you decide to test. Other users of the packet radio network in your area will be glad you did.

Special thanks to Linus Torvalds; the many Linux contributors; the Apache team; James Dugal, N5KNX, for carrying on the work on the JNOS program; Steve Mc Donough, KE9LZ; and finally, to Ron Nelson, N9CFN. I thank them all for their work in making this possible. I welcome your questions and comments on this. If you do decide to undertake this project, good luck and 73, Andy, KB9ALN.

Next time in "Computers and Internet" we'll take a look at some interesting and unusual ways of using the World Wide Web and other Internet resources to not only *enhance* amateur radio operating, but to *actually operate*. Until then...

73 de N2IRZ

Resources

Apache Web Server Software: User guides and downloadables are available from the source at <http://www.apache.org>.

ETHRAX25 Software: A great how-to guide written by Mark Frey, VE3DTE, can be found at <http://www.ampr.torun.pl/packet/howto95.html>. The ETHRAX25 software itself is available from Gary Grebus, K8LT's web site at <http://www.mv.com/users/grebus/>.

JNOS Software: A good source for the latest JNOS software is the Tucson Amateur Packet Radio web site: <http://www.tapr.org>. Follow the "software" link to the "TCP/IP" area and select the latest version of JNOS. If you aren't already a member, the annual dues of \$20 is a bargain. Tucson Amateur Packet Radio, 8987-309 E. Tanque Verde Rd. #337, Tucson AZ 85749-9399, USA (phone: 940-383-0000; fax: 940-566-2544; e-mail: tapr@tapr.org).

TCP/IP Coordinators: An up-to-date listing of local IP address coordinators is maintained at: <ftp://ftp.ucsd.edu/hamradio/amprnets>. Contact the one in your area for an IP address assignment.

The MCB-152 Project: Information on the European MCB-152 project, which is a microcontroller board that interfaces with a variety of radio modems (including some very high-speed ones), is available at <http://www.caseconsole.com/mcb152/>. Scroll down a little to the packet radio project.

Some background information on this project is available at the Wisconsin Amateur Packet Radio web site: <http://netnet.net/~ke9lz>. Especially interesting is the "Using the Wisconsin Network" series, parts 10, 23, 24, and 40. Contact info: Wisconsin Amateur Packet Radio Association, c/o Bob Gedemer, KA9JAC, 609 Wilson St., Neenah, WI 54956. Membership is \$20/year, or \$15 without the subscription to "Badger State Smoke Signals," a combined newsletter for many area ham clubs. Write for details.

Contact the author, Andy Nemec, KB9ALN, 453 Cottage Grove Ave., Green Bay, WI 54304 (e-mail: kb9aln@juno.com).

Reader Feedback

The One Degree Rule

Dear CQ:

I am writing in reference to the "EZ-J J-Pole Antenna" article in the January 2000 issue of CQ. A J-pole for 2 meters is a dysfunctional antenna. The J-pole antenna was designed for HF frequencies and not for VHF. Its purpose was to provide a much lower vertical radiation angle than the vertical quarter-wave ground-plane antenna. It will accomplish the same low radiation angle at HF frequencies as a $5/8$ -wave vertical attached to an infinite ground plane. The J-pole radiation must come from the top $1/2$ -wave section and not from the bottom $1/4$ -wave matching section. If radiation occurs from the bottom matching section, maximum radiation will not be perpendicular to the vertical and therefore its low-angle radiation will be lost.

The EZ-J J-pole, as described, violates a simple rule which Arthur Collins imposed as a design goal for his company. He called it his "one degree rule," and it applied to all RF circuits in Collins equipment where inductance was not intended or wanted. Specifically, the rule applies to inductive (or capacitive) reactance, which is expressed in degrees of a wavelength. When a full sine wave is projected onto a circle, the circle can be divided into 360 degrees. The objective is to design for less than 1 degree.

One degree of a 30 MHz full wave can be remembered as 1 inch. The easy to remember 468 factor (without the K) for one half wavelength can be used with reasonable accuracy.

One 30 MHz wave length = $(468 \times 2)/30 = 31.2$ ft. = $>31.2 \times 12 = 374$ inches.

374 inches \div 360 degrees @ 1 degree per inch

one degree at 10 meters @ 1 inch

one degree at 20 meters @ 2 inches

one degree at 40 meters @ 4 inches

one degree at 80 meters @ 8 inches

one degree at 160 meters @ 16 inches

one degree at 2 meters (150 MHz) @ $1/5$ inch

It can be seen that the spacing of the J-pole matching section for 2 meters becomes difficult to match to one degree or less. If the 180-degree out-of-phase currents do not radiate from the quarter-wave matching section as if both currents originated from the same source point (less than 1 degree), the opposing fields will not arrive at the same distance at the same time and there will be no cancellation. There will be radiation from the bottom $1/4$ -wave section and that radiation will combine with the top $1/2$ -wave section and the radiation will not be perpendicular to the

vertical. Therefore, the J-pole low-angle design objective is lost. That is why a $1/4$ -wave coaxial sleeve is the proper choice for a match to the vertical radiating portion of a VHF antenna.

The radiation pattern distortion of the EZ-J J-pole could be reduced to some extent by decreasing the stub spacing. It would then perhaps outperform a $1/4$ -wave ground plane antenna, which has a vertical radiation angle upwards to 40 or 45 degrees.

Incidentally, the $5/8$ -wave antenna requires an infinite ground plane, which most manufacturers do not specify. Some of the gain of the roof-top $5/8$ wave is the result of height gain. The sleeve-matched antenna has all of the good features of an HF J-Pole.

The very useful "one degree rule" design goal can be applied to antenna length, coax length (with factor V), open-wire feeder spacing, neutralizing capacitor lead length (where 180-degree phase cancellation is absolutely essential), wire lengths in antenna switches, lead dressing in coax connectors, and gaps or holes in an RF shielded compartment. A time domain reflectometer begins to show a discontinuity at only a few tenths of a degree error.

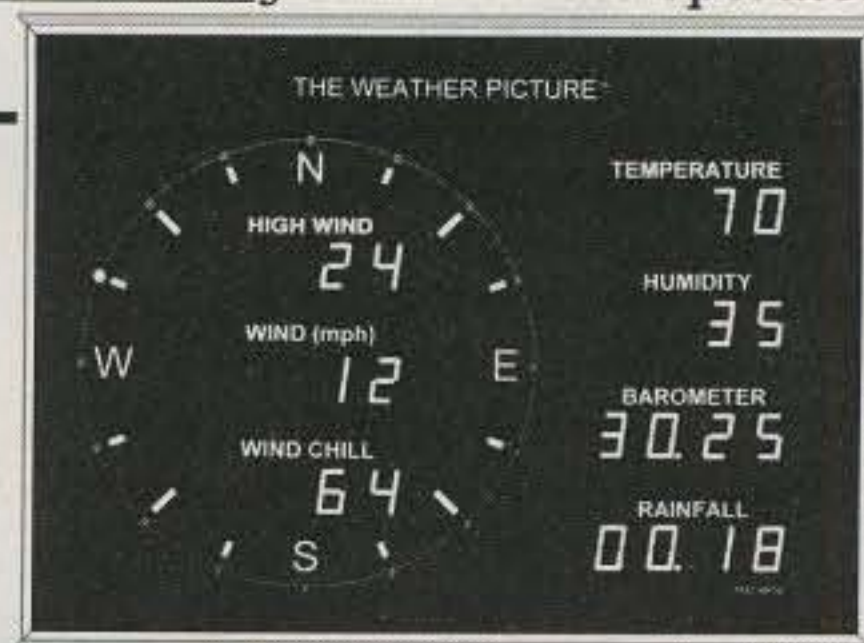
The rule also explains why an AM broadcast signal is not received while driving through a steel girder bridge, while an FM signal is received. Not enough degrees of the long AM wave length arrive at the antenna.

The "one degree rule" is as useful as Ohm's Law and has been applied by all antenna and RF engineers, perhaps unknowingly in some cases. However, this writer has never heard it expressed except by Arthur A. Collins.

Warren U. Amfahr, W0WL
Fairbank, Iowa

Warren: Thank you for your letter. Mr. Collins's one-degree rule certainly seems like a good one for any RF designer to follow (it's certainly hard to argue with it, considering the quality of Collins radios). And the HF genesis of the J-pole is certainly fascinating, since every article and antenna reference I have ever seen deals with the J-pole only as a VHF (primarily 2 meter) antenna. My only other comment is that for a "dysfunctional" antenna, it sure is popular! Of course, as we know from election results, being popular doesn't necessarily mean you work very well! — W2VU

THE BEST for ham radio operators!



Shown: Large size (15 1/4" x 11 1/4")
in aluminum frame, fully expanded.



Put the weather on your wall

The most popular accessory for our precision weather systems, **The Weather Picture®** continuously displays all the vital weather data you've pre-selected from your **ULTIMETER®** Weather Station. Big red numerals are easy to read from across the room, day or night. Available in 2 sizes, in brushed aluminum, traditional oak or elegant solid teak frame.

ULTIMETER Weather Systems are simple to install and easy to use, yet accurate enough for the pros. Select the one that best fits your needs and budget.

Wireless displays now available!

For full details, write or call us **TOLL-FREE** at **1-800-USA-PEET**. Or visit our Web Site to see and *actually try* a system:

www.peetbros.com

Phone: 1-800-USA-PEET Fax (407) 892-8552

PEET BROS COMPANY

Dept. CQ, 31 E.17th Street, St. Cloud FL 34769
Our 25th year ©2000 Peet Bros.

GORDON WEST

HAM TEST PREP TAPES

BOOKS SOFTWARE VIDEOS

• Prepare for your ham test with "Gordo" WB6NOA as your personal instructor.

• **THE NEW THEORY** on audio cassettes
No-Code Technician (4 tapes)\$19.95
General Class (4 tapes)\$19.95
Amateur Extra Class (4 tapes)\$19.95

• **THE CODE** on audio cassettes
Learning CW (0-7wpm 6 tapes)\$29.95
Speed Builder (5-16wpm 6 tapes) .\$.29.95
Speed Builder (10-28wpm 6 tapes) \$29.95

• **NEW STUDY MANUALS** by "Gordo"
No-Code Technician (**Element 2**) .\$.11.95
General Class (**Element 3**)\$12.95
Extra Class (**Element 4**).....\$14.95

• **PC SOFTWARE** with study manuals
No Code Technician (**Element 2**)\$34.95
Tech/Tech+/Gen. (+ Code, Windows) \$49.95
General Class (**3+Code, Windows**).....\$34.95
Extra Class (**4 + Code Windows**).....\$34.95
Ham Operator (**Tech.-Extra + Code**)...\$59.95
Morse Software Only\$12.95

• **VIDEO** VHS with study manual
No-Code Tech Video Course\$31.95

Add \$4.00 shipping 1st item, \$1.50 each additional
Priority Mail 2-3 day service available
VISA, MasterCard, Discover & AMEX Accepted

The W5YI Group, Inc.

P.O. Box 565101 • Dallas, TX 75356

Call Toll Free **1-800-669-9594**

CIRCLE 95 ON READER SERVICE CARD

Powerful. Small. Quiet.



WWW.**ALINCO**.com

Alinco amateur radio products are available at the following dealers:

Advanced Specialties
Lodi, NJ
800-926-9426

AES
Las Vegas, NV
800-634-6227

AES
Milwaukee, WI
800-558-0411

AES
Orlando, FL
800-327-1917

AES
Wickliffe, OH
800-321-3594

Alabama Radio
Anniston, AL
888-613-8061

All Com
Mesquite, TX
887-426-7883

ALQ Electronics
Woodstock, NB
506-328-1115

Anvil Electronics
Nome, AK
907-443-5304

Associated Radio
Overland Park, KS
800-497-1457

Austin Amateur Radio
Austin, TX
800-423-2604

BamCom
Raceland, LA
800-283-8696

Barry Electronics
New York, NY
212-925-7000

Brownville Sales, Inc.
Stanley, WI
800-646-RICH

Burnaby Radio
Burnaby, BC
604-298-5444

Burghardt Amateur
Watertown, SD
800-927-4261

ComDaC
St. Joseph, MI
800-382-2562

Com-West Radio Systems, Ltd.
Vancouver, BC
604-321-3200

Communications City
Miami, FL
305-579-9709

CT Morgan
Chattanooga, TN
800-251-1373

Dentronics, Inc.
Flushing, MI
810-659-1776

Durham Radio Sales & Service
Whitby, ON
888-426-1688

East Coast Amateur Radio
N. Tonawanda, NY
800-995-1787

G&W Communications
Virginia Beach, VA
757-499-9217

Gateway Electronics
St. Louis, MO
800-669-5810

Grove Enterprises
Brasstown, NC
828-837-9200

Ham Central
Poughkeepsie, NY
800-721-4426

Ham and Electronics
Veradale, WA
509-928-4387

Henry Radio
West L.A., CA
310-820-1234

Honolulu Electronics
Honolulu, HI
808-593-8777

Hooper Electronics Supply
Biloxi, MS
228-432-0584

Houston Amateur Radio
Spring, TX
800-471-7373

Ham Radio Outlet
Anaheim, CA
800-854-6046

Ham Radio Outlet
Atlanta, GA
800-444-7927

Ham Radio Outlet
Burbank, CA
800-854-6046

Ham Radio Outlet
New Castle, DE
800-644-4476

Ham Radio Outlet
Denver, CO
800-444-9476

Ham Radio Outlet
Salem, NH
800-444-0047

Ham Radio Outlet
Oakland, CA
800-854-6046

Ham Radio Outlet
Phoenix, AZ
800-444-9476

Ham Radio Outlet
Portland, OR
800-854-6046

Ham Radio Outlet
San Diego, CA
800-854-6046

Ham Radio Outlet
Sunnyvale, CA
800-854-6046

Ham Radio Outlet
Woodbridge, VA
800-444-4799

Indy Net
Indianapolis, IN
800-850-7667

IRI Amateur Electronics
Jamestown, NC
336-454-2012

Jun's Electronics
Culver City, CA
800-882-1343

Kcomm
San Antonio, TX
800-344-3144

Lentini Communications
Newington, CT
800-666-0908

MacFarlane Electronics Ltd
Battersea, ON
613-353-2800

Memphis Amateur
Memphis, TN
800-238-6168

NSI Communications
Federal Way, WA
800-977-0448

NTF Communications, Inc.
Calgary, AB
403-219-0555

R & L Electronics
Hamilton, OH
800-221-7735

Rad Comm Radio
Lubbock, TX
800-588-2426

Radio City, Inc.
Mounds View, MN
800-426-2891

Radio Depot
Seattle, WA
800-291-9067

Radio Place
Sacramento, CA
916-387-0730

Radio World
Boulder City, NV
702-294-2666

RadioWorld Inc. of Canada
Toronto, ON
416-667-1000

RLS Electronics
Morriston, AR
888-315-7388

Rogus Electronics, Inc.
Southington, CT
860-621-2252

Ross Distribution co.
Preston, ID
208-852-0830

RT Systems
Huntsville, AL
800-723-6922

RT Systems, Florida
Brandon, FL
800-387-8570

Soundnorth
International Falls, MN
218-283-9290

That Radio Place, Inc.
Oxford, PA
610-932-3300

Texas 2 Way
San Juan, TX
888-289-9752

Universal Radio, Inc.
Reynoldsburgh, OH
800-431-3939

Virginia Ham Radio
Christiansburgh, VA
800-298-6153

YV-5 Communications
Miami, FL
305-577-9960

also available at Fry's Electronics stores and radioshack.com stores

Simple ■ Clean ■ Dependable

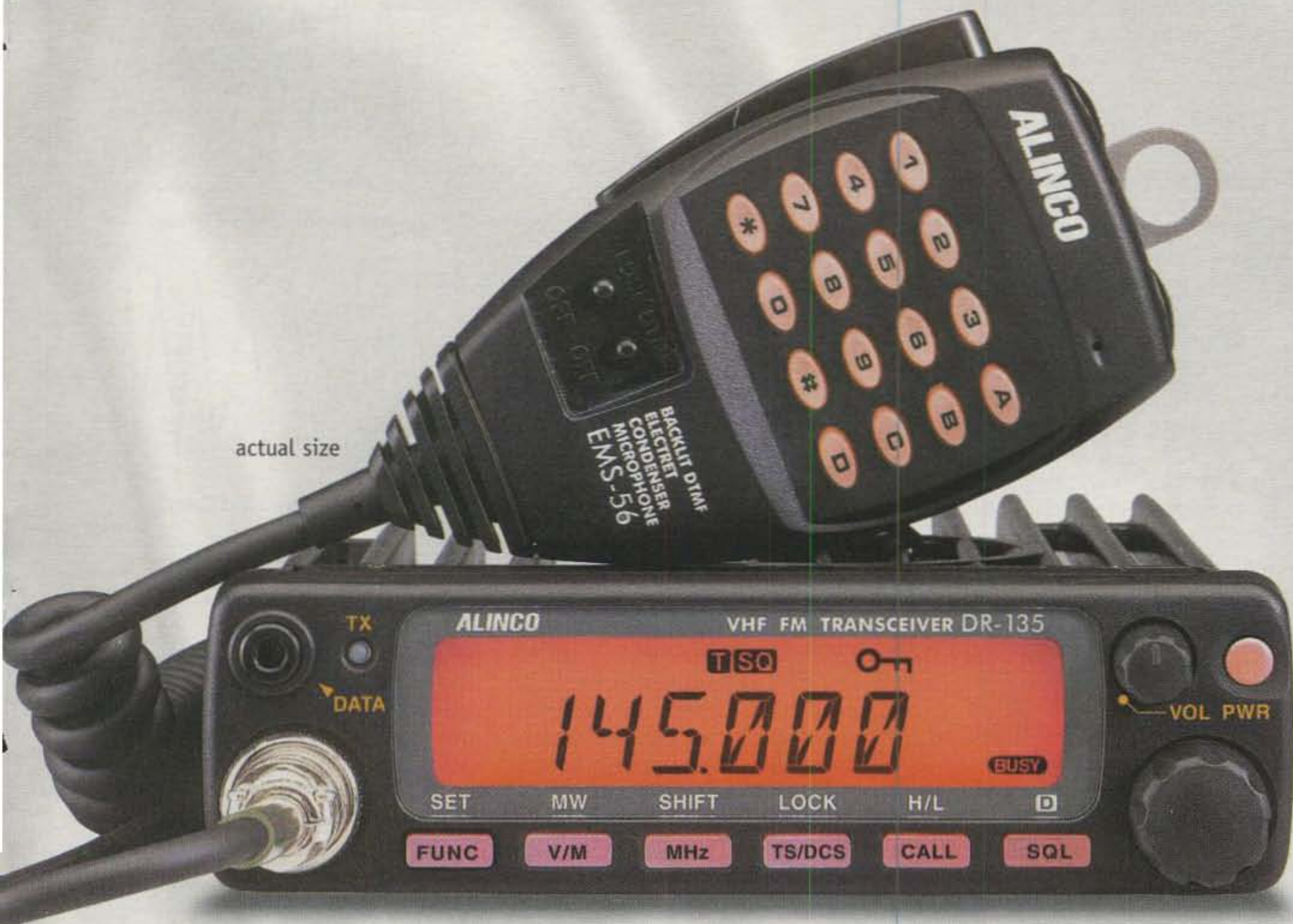
ALINCO
AMATEUR RADIO'S VALUE LEADER™

U.S.A. Alinco Branch: 438 Amapola Ave.
Suite 130 • Torrance, CA 90501
Phone: (310) 618-8616 • Fax: (310) 618-8758
Internet: <http://www.alinco.com>

Specifications subject to change without notice or obligation. Performance specifications apply only to Amateur bands. Permit required for MARS/CAP use. Transceivers intended for use only by properly licensed Amateur Radio operators.

DR-135TP. Two Meters. Features Not Seen Before.

INTERNAL TNC FOR PACKET AND APRS®



- Choose black (DR-135TP) or pewter (DR-135TPG) front panel color
- DR-135T can be purchased without TNC; EJ-41U TNC board can be added later
- 50 watts, H/M/L power settings
- 100 memory channels
- TNC board operates 1200 and 9600 bps
- Front panel GPS input for APRS
- Rear panel DSUB9 computer connection
- No need to remove mic for packet operation
- Ignition key on/off feature
- CTCSS and DCS encode+decode
- Clean, clear Alinco audio
- Super-wide 7 character alphanumeric display
- Wide and narrow FM modes
- Theft alarm feature
- AM airband receive
- Backlit microphone
- Stays in mode you select (voice/packet) through power off cycles
- Ten autodial memories
- Low Alinco price

WWW.**ALINCO**.com

U.S.A. Alinco Branch: 438 Amapola Ave. • Suite 130 • Torrance, CA 90501

Product intended for properly licensed operators. Permits required for MARS/CAP use. Specifications subject to change without notice or obligation.

Performance specifications only apply to amateur bands. APRS is a registered trademark of Bob Bruninga, WB4APR.

This radio has not yet been type accepted by the FCC. It may not be offered for sale or lease until the approval of the FCC has been obtained.

CIRCLE 119 ON READER SERVICE CARD

A Digital Primer

There is no doubt that our analog world is slowly (or maybe not so slowly, for that matter) becoming digitized. Audio certainly has become digital with DATs and CDs, and video is quickly following suit with HDTV and the various MPEG standards. The personal computer that we all "know and love" has, of course, always been purely digital. However, the non-computer-related digital revolution is very real and truly among us. As a result of this continuing metamorphosis, we thought it would be a good idea to present a short primer on the various techniques employed to convert analog signals into digital ones (and vice versa) so that experimenters can have a somewhat better idea of what is going on.

An analog transmission system (as we all should know) is one in which information is used to modulate a carrier in direct step with the signal to be conveyed. This can be AM, where the amplitude of the carrier is varied, or FM, where the frequency of the carrier is varied. In either case, the variation of the carrier matches the signal to be transmitted as closely as possible. Any deviation results in nonlinear signals or distortion. Fig. 1 shows both AM and FM modulation of a simple sine wave. A digital signal, on the other hand, consists only of two discrete levels—full carrier or no carrier, as shown in fig. 2. Signal matching or encoding is accomplished by a totally different method.

In the "old days" most information transmission was by means of Morse Code (or CW, as it was and still is affectionately called) and consisted of transmitting dots and dashes by turning an RF carrier on and off. This mode is still very much in use, and as we all know, information (in the form of individual letters) is transmitted as various combinations of dots and dashes. The received amplitude or linearity (distortion) of the carrier is not important. All that is necessary is that the dots be distinguishable from the dashes. The beauty of this technique is that if you can receive any signal at all, the complete transmitted information (words or letters) can almost always be derived.

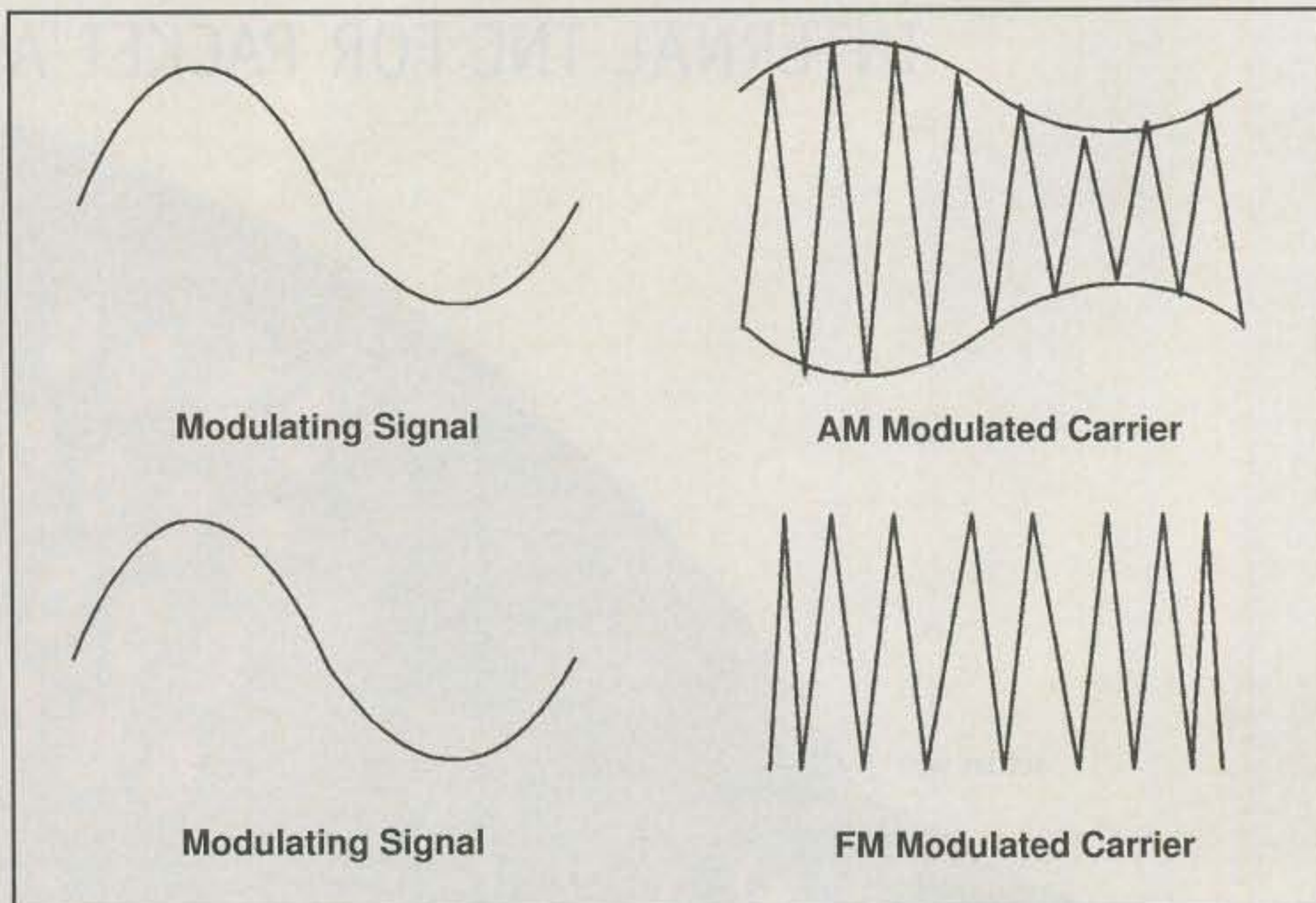


Fig. 1—Analog modulation methods.

This type of transmission is purely digital and only requires that there be some discernible difference between the transmitted signal (carrier) and no signal (absence of carrier or noise). Even noise or other interference can be present to the point where it is practically equal in strength to the signal itself. As long as there is any difference at all, all of the information can be recovered, because it is the code that contains the information, not the fidelity of the carrier. In a pure analog transmission, however, even a moderate amount of noise

means buzzing, crackling, static, and in the case of video, "snow" or loss of lock (rolling) in the picture. To sum up, a digital transmission system has the very great advantage that if you receive anything at all, all the information originally transmitted is completely recoverable.

Digital information therefore uses a code to transmit information. In the case of CW, the code consists of just predefined long- and short-duration pulses. For other signals it is not quite so straightforward. Sine waves, for example, vary smoothly from zero to some

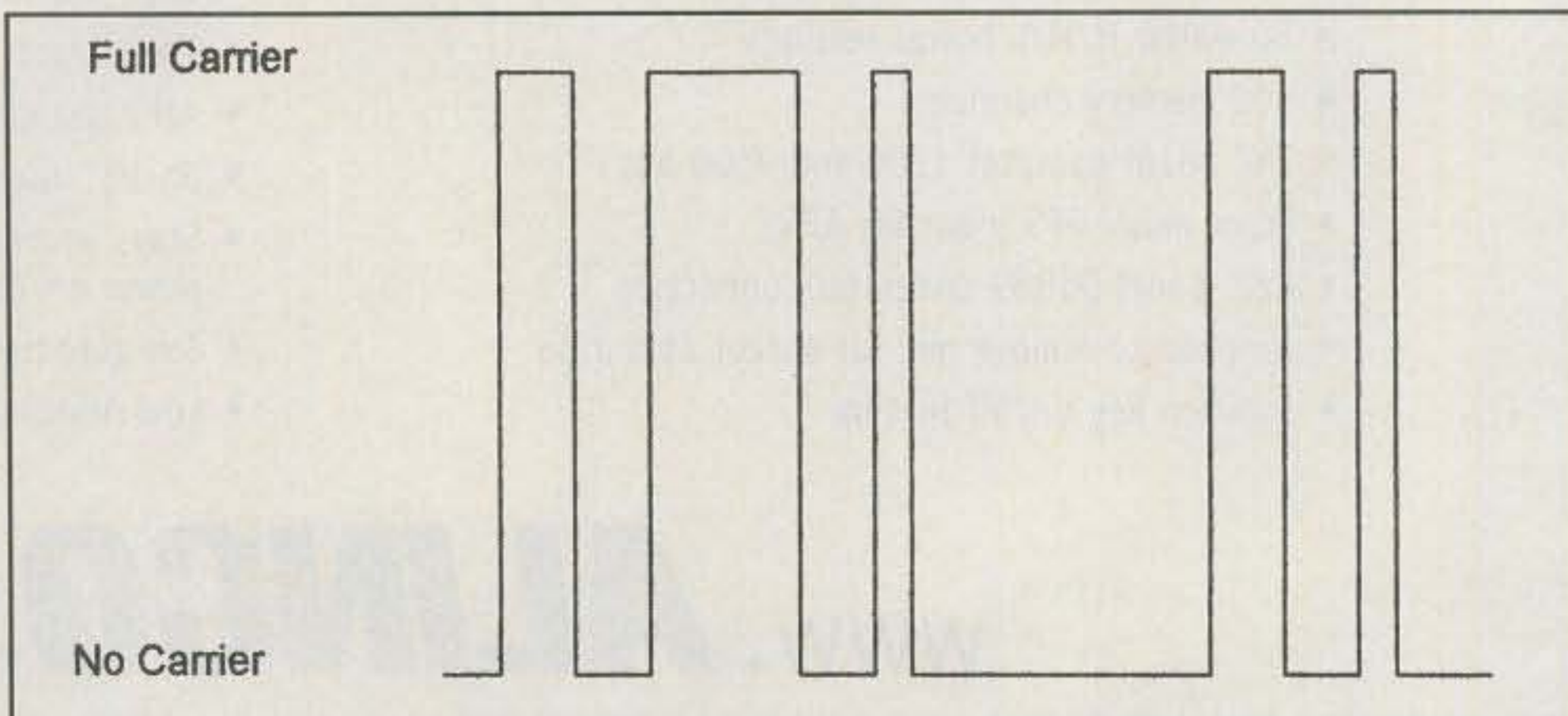


Fig. 2—A digitally modulated signal is either on or off, with no in-between state.

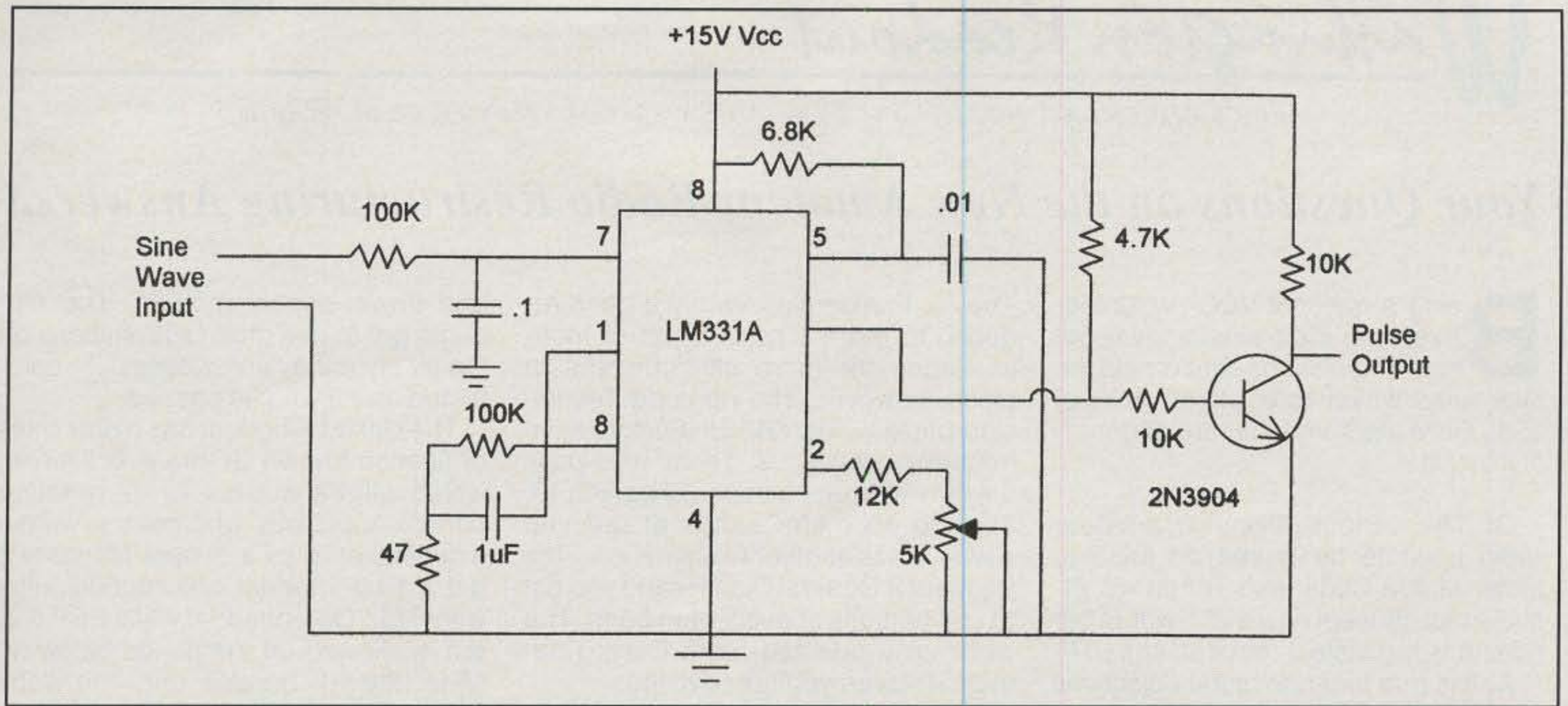


Fig. 3— Simple voltage-to-frequency analog-to-digital converter.

positive peak, back to zero, and then on to a negative peak. There are an infinite number of points to consider, so a more complex code is needed.

One solution is to convert the sine wave to a number of pulses that are a function of the amplitude of each point on the wave. This means that zero volts would be represented by some "quiescent" number of pulses per second. As the sine wave increased in amplitude, the number of pulses per second would increase. When it decreased, the number of pulses per second would also decrease. This procedure can be accomplished by a voltage-to-frequency converter and is somewhat similar to FM, but with the exception that only the number of pulses per second at any given time (or instantaneous frequency) need be detected. To do this we would only need to distinguish the pulse peaks from the noise as long as all pulses were of the same width.

Fig. 3 shows the details of such a converter using an LM331 voltage-to-frequency converter chip. This device has a transfer function of 1 kHz per volt and an input amplitude range of 0 to 10 volts. A 10 volt input therefore produces an output of 10 kHz (or 10,000 pulses per second), a 5 volt input produces 5 kHz (5000 pulses per second), and a 0.1 volt input produces 0.1 kHz (100 pulses per second). As you can see from the schematic, the output pulses are of a fixed width and amplitude (V_{cc}) and can be used to modulate whatever carrier you wish, from RF to light. The type of analog signal that can be "converted" by this scheme is limited to slow-moving sig-

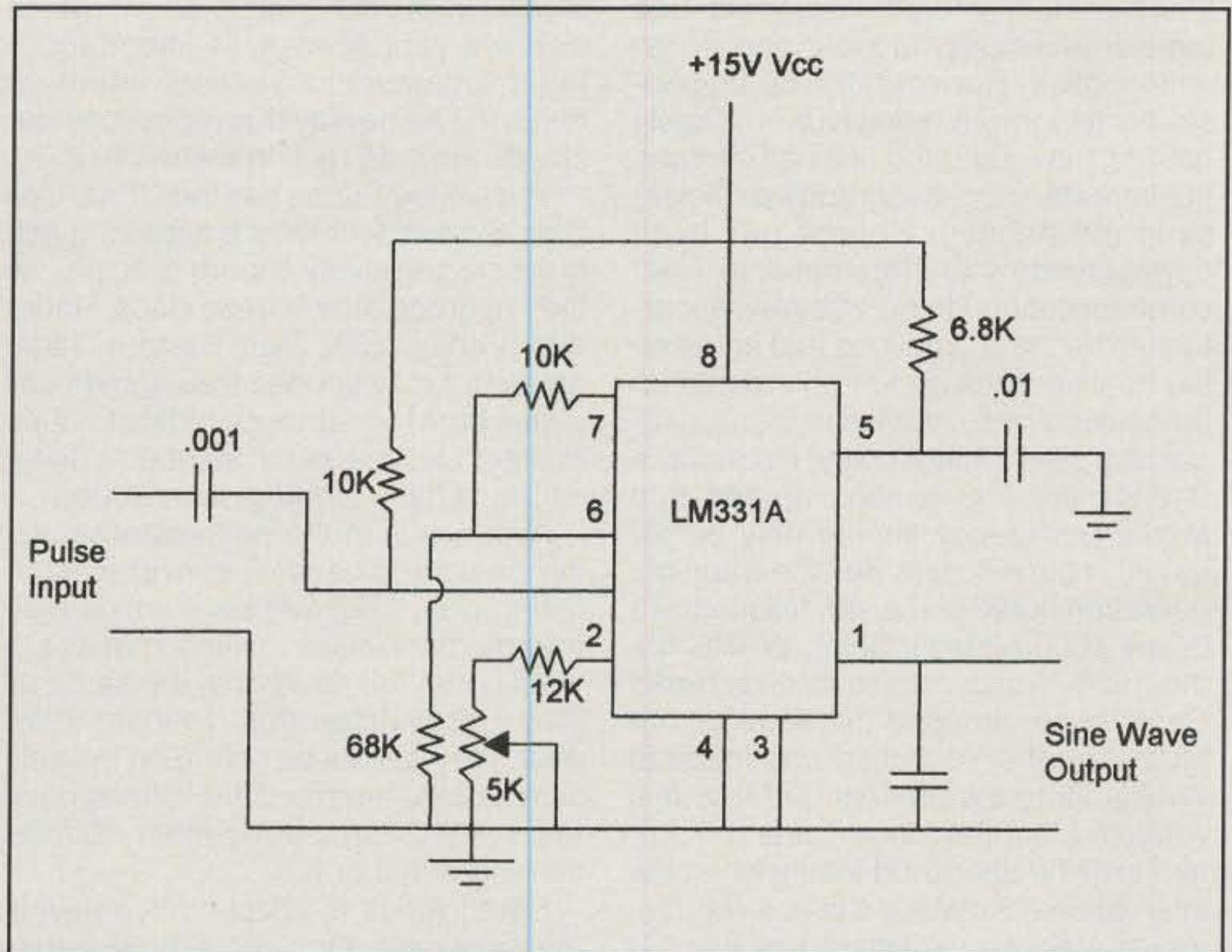


Fig. 4— Frequency-to-voltage digital-to-analog converter.

nals, since the input time constant, formed by the 100K resistor and 0.1 μ F capacitor, is long. Also, the range of 0 to 10 kHz limits the resolution to 0.001 volt (1000 pulses per second = 1.000 volt). To transmit speech, a faster scheme is needed. However, if you build the circuit, you will see clearly how the conversion principle actually works.

On the receiving side of such a system, counting the received pulses (as a function of time) allows the original sig-

nal to be reproduced. Fig. 4 shows how the same chip can be used to perform this function. The circuits shown will work if you wish to build them. If you do, you certainly will learn about the technique, and you can use the circuits to transmit analog information for a variety of purposes. For actual speech, video, and faster moving analog signals, as we mentioned, a different scheme is used. We will look at that next month.

73, Irwin, WA2NDM

Your Questions on the New Amateur Radio Restructuring Answered

Being a national VEC (Volunteer Examiner Coordinator), we get tons of questions concerning the new rules which took effect on April 15th. Here are some that are of general interest.

Q: The various levels in amateur radio used to be based on passing faster Morse Code tests. What will replace that concept now that 5 words per minute is the fastest required speed?

A: It is true that one of the objectives of amateur radio is to stimulate people to improve their communication skills and technical knowledge. More expertise generally meant you could use more frequencies, modes, and transmitter power. However, the de-emphasis on telegraphy knowledge is really nothing new. Over the last half century, the importance of telegraphy proficiency in the Amateur Service has been downplayed by the International Telecommunication Union at every opportunity. It is the ITU nations that agree on the qualifications and requirements for the various radio services.

At the 1947 (Atlantic City) Radio Conference the ITU nations agreed that Morse proficiency should only be required in the Amateur Service when the operation took place on frequencies below 1000 MHz (1 GHz). WARC-59, the 1959 World Administrative Radio Conference, dropped this level to 144 MHz. A further reduction was made at WARC-79 to the present 30 MHz. It is expected that the Morse code requirement will be abolished totally when the international Amateur Service requirements are next considered by the ITU nations in the 2002–2003 time frame.

Up until this past April the United States had a very complicated amateur radio licensing scheme. There were eight separate examinations—five written examinations and three telegraphy tests at 5, 13, and 20 wpm administered to obtain six different licenses. This has now been cut in half to three written tests and one Morse exam at 5 wpm.

*National Volunteer Examiner Coordinator,
P.O. Box 565101, Dallas, TX 75356-5101
(telephone 817-461-6443)
e-mail: <w5yi@cq-amateur-radio.com>*

The six license classes have been reduced to three. The concept of more privileges for more skill remains in place, however. The no-code Technician Class yields VHF/UHF/microwave frequency privileges. Techs who pass 5 wpm get to use portions of the 80, 40, 15, and 10 meter bands at reduced power. Pass another examination—the Element 3 General Class—and you get to use portions of every ham band. The technically oriented Extra Class (Element 4) gives you full privileges.

An increasing number of countries are using station callsign formats as the incentive to upgrade. Being able to get a callsign of your choice, or one which displays your license, is important to radio amateurs. It reflects status in much the same way that more shoulder stripes indicate rank in the military.

The United States has the Group Call Sign System whereby amateurs qualify for progressively shorter callsigns as they upgrade their license class. Under the "Vanity" Call Sign System, radio amateurs may choose their station call letters from formats appropriate for their license class. Nearly 30,000 "Vanity" callsigns have already been issued.

Australia is in the process of reducing the code speed to 5 wpm in an interesting way. They will be granting their Intermediate class (which requires 5 wpm code) full privileges, the same as their Unrestricted (full) license. However, they will not be changing the callsign blocks. Intermediate license holders will still have three-letter suffixes starting with J or K.

South Africa is adopting two new license classes. One offers all HF bands with 5 wpm code. The other is a novel new Student license that offers certain HF, 2 meter, and 70 cm privileges. Again the speed is 5 wpm. Each of their four classes gets a different station callsign prefix: ZS for Grade A1, ZR for Grade A2, ZT for Grade A3, and ZU for the new Student Grade B license.

South Africa's new student license is to be directed toward youngsters at the ten-year age level in schools. Their teacher will give them a grade on "modules" that they must construct from electronic parts. The components will consist of an antenna, transmitter, receiver,

and power-supply module. The students get to use their QRP stations on the air once they are successfully completed and 5 wpm is passed.

The United Kingdom has a new class of license known as the A/B license, which allows access to all amateur bands. Applicants who pass a written examination plus a 5 wpm Morse test get a 1-by-3 format callsign beginning with "M5." One-hundred watts PEP output is allowed on the bands below 30 MHz (the HF bands); and 400 watts PEP output is allowed above 30 MHz.

Q: How do I obtain a station callsign for my amateur radio club?

A: The FCC is in the process of assigning "Amateur Service Club and Military Recreation Station Call Sign Administrators." At present, amateur radio clubs wishing to obtain a station callsign must submit an FCC Form 610-B to the FCC, 1270 Fairfield Road, Gettysburg, PA 17325-7245. Once the Club Call Sign Administrators (CCSA) have been appointed, ham clubs must submit NCVEC Form 605 (April 2000 edition) to one of the appointed CCSAs. This form is available from any VEC, but not from the FCC, since it is an internal VEC form.

Q: Why does it cost \$6.65 to take an amateur radio examination? Isn't that an odd amount? Where did this figure come from?

A: The examination fee (or application fee, if you upgrade without taking a test) is to reimburse Volunteer Examiners and their coordinators for costs involved in conducting the amateur radio testing program. The fee's history is kind of interesting. As originally envisioned, there was to be no fee charged to examinees taking a ham license examination. The Novice exam program was being handled by volunteers back in the early 1980s without charge, and Congress anticipated that the other examinations would also be handled this way.

Until 1984 all ham radio license exams were conducted by the FCC at their district offices or at hamfests. The campaign to privatize ham exams began in 1982, when President Ronald

Reagan approved a bill (Public Law 97-259) providing for using the "...voluntary and uncompensated services of amateur radio operators to prepare and administer license examinations."

In their comments the ARRL said that the Commission must permit the VEC to charge a nominal mandatory fee to cover expenses of running the program. "...surely it was never the intent of Congress that volunteers should suffer unreimbursed expenses in the course of volunteering their services," the League said. On January 20, 1983 the FCC generally accepted the American Radio Relay League's proposal to handle testing on a national basis. However, no examination fees could be collected because the law specifically said the services had to be "voluntary and uncompensated." The League flatly said they would require such a fee in order to participate in the program as a VEC.

The FCC issued a Report and Order authorizing the amateur license examination system on September 22, 1993. The big surprise was that the FCC provided for examinations to be administered by three-person teams of examiners who would report to regional Volunteer Examiner Coordinators "...to get a significant amount of participation in the program." No expenses could be recouped. "VECs must assemble, print, and distribute written examinations designed by the FCC at their own cost." The Report and Order became effective December 1, 1983. The regions would coincide with the amateur licensing call-sign districts. The thinking was that if the ARRL would not handle the program, other organizations might be interested in doing so. They were right.

At the request of the ARRL, on November 3, 1983 Senator Barry Goldwater, K7UGA, introduced Senate Bill 1045, which would "...permit the volunteers to be reimbursed by the applicants for their out-of-pocket expenses." It provided "...recoverable costs of \$4.00 per examinee—adjusted for inflation." The bill was signed by President Reagan on December 8, 1983. The Novice examination, already being administered by volunteers, was not included.

On February 24, 1984 the FCC's Private Radio Bureau simultaneously assigned the first five amateur radio organizations to be Regional VECs. The first VEC approved was the Anchorage Amateur Radio Club in Alaska. None could collect fees of any sort, however. On March 9, 1984 the FCC issued a Notice of Proposed Rulemaking seeking to implement expense reimbursement. The comment period closed on May 1,

1984. The first widespread volunteer-administered examinations took place at the Dayton HamVention on April 28–29, 1984, when some 350 applicants took the first volunteer-administered ham tests. By mid-1984 more than a dozen organizations had applied to become a VEC—including the W5YI-VEC, the first to be accepted in all regions.

On July 12, 1984 the FCC implemented "...reimbursement of expenses incurred by VEs or VECs in connection with the preparation, processing, or administration of examinations for amateur station licenses..." The maximum amount recoverable was \$4.00, which

would be adjusted annually for changes in the Department of Labor consumer price index. On July 21, with a provision for expense reimbursement now in place, the ARRL applied to be a VEC in all regions. They began administering examinations in November 1984.

At the end of every fiscal year the FCC adjusts the ham exam expense reimbursement figure by the rate of inflation, which has been running around 2 or 3 percent annually. The original \$4.00 figure is now up to \$6.67 for this year. This is the maximum amount that may be charged to take an amateur radio operator examination under the VEC Sys-

<p>THE ORIGINAL WD4BUM HAM STICK™ ANTENNAS for HF MOBILE OPERATION \$24⁹⁵ each</p> <p>The only lightweight HF mobile antenna recommended by noted author Gordon West, WB6NOA</p> <ul style="list-style-type: none"> • Monobanders for 75 to 6 meters. • Very rugged fiberglass & stainless steel. • Telescopes for easy adjustment. • 3/8 x 24 TPI base fits most mounts. • Low profile & low wind load. • Needs no springs or guys. • Complete tuning & matching instructions included. • Approximately 7 ft. tall. • 600 watts. <table border="1"> <thead> <tr> <th>Cat.#</th> <th>Band</th> <th>Cat.#</th> <th>Band</th> </tr> </thead> <tbody> <tr> <td>9175</td> <td>75 meters</td> <td>9115</td> <td>15 meters</td> </tr> <tr> <td>9140</td> <td>40 meters</td> <td>9112</td> <td>12 meters</td> </tr> <tr> <td>9130</td> <td>30 meters</td> <td>9110</td> <td>10 meters</td> </tr> <tr> <td>9120</td> <td>20 meters</td> <td>9106</td> <td>6 meters</td> </tr> <tr> <td>9117</td> <td>17 meters</td> <td></td> <td></td> </tr> </tbody> </table>	Cat.#	Band	Cat.#	Band	9175	75 meters	9115	15 meters	9140	40 meters	9112	12 meters	9130	30 meters	9110	10 meters	9120	20 meters	9106	6 meters	9117	17 meters			<p>LICENSE PLATE MOUNT</p> <ul style="list-style-type: none"> • Mounts behind license plate • Mount is constructed of type 304 Stainless Steel • Complete with S/S hardware • For Antenna's with 3/8" x 24 Thread • Accepts PL-259 Direct • Ground strap included • Complete mounting instructions included <p>100% MADE IN USA</p> <p>\$44⁹⁵ CAT. #TM-1</p> 	<p>MOBILE COLINEAR ANTENNAS THE ULTIMATE PERFORMER</p> <ul style="list-style-type: none"> • Honest 4.5dB gain. • 1000 watts DC. • 17-7 ph stainless steel top sec. • Rugged fiberglass base station. • Base fitting is std. 3/8 x 24 TPI. <p>Length 9007 - 146 MHz 7'2" • 9038 - 220 MHz 4'9" 9440 - 440 MHz 2'5"</p> <p>\$24⁹⁵</p> <p>Base station version available \$34⁹⁵ 9007-B • 9038-B • 9440-B</p>
Cat.#	Band	Cat.#	Band																							
9175	75 meters	9115	15 meters																							
9140	40 meters	9112	12 meters																							
9130	30 meters	9110	10 meters																							
9120	20 meters	9106	6 meters																							
9117	17 meters																									
<p>Lakeview Company, Inc. 3620-9A Whitehall Rd., Anderson, SC 29626 • 864-226-6990 FAX: 864-225-4565 • E Mail: hamstick@hamstick.com • www.hamstick.com</p> <p>ALL 100% MADE IN USA Add \$7.50 per order for S/H</p>																										

CIRCLE 68 ON READER SERVICE CARD



NEW  **IC-756 PRO**
32 Bit Floating Point DSP
HF thru 6M

New Pricing  **IC-706 MKIIG**
HF + 6M + 2M + 440MHz

Call For Alinco Specials  **Hi, To All The Folks At SEAPAC**

 **DX-70TH** Compact, 100W, HF

 **DR-610T**
2M/440MHz Mobile/Base

 **DJ-V5TH**
V/UHF, FM Handheld

RADCOMM RADIO 3300 82nd St. #E, Lubbock, TX 79423
1-800-588-2426
806-792-3669 FAX 806-785-3699
www.rad-comm.com

tem. This amount, which is shared by both the VEC and VE team, has been rounded off to \$6.65 to make collection easier to handle. While most VECs do charge \$6.65 to take a ham exam, not all of them do. A few charge less. There are currently 14 different VEC organizations which conduct amateur radio operator testing. Over the years the FCC has done away with the "regional-in-scope" VEC, and all may conduct examinations anywhere.

Q: How do I renew my RACES station license?

A: Effective April 15, 2000, RACES (Radio Amateur Civil Emergency Service) station licenses may not be renewed. There are currently 223 RACES station callsigns. The FCC said that when RACES originally was authorized back in 1952, it was contemplated as a temporary service designed to afford radio communications for civil defense purposes.

Since any amateur station may operate as a RACES station, it is not necessary to have a RACES station license or callsign. The FCC says they will phase out RACES station callsigns by not renewing them. No new RACES station licenses have been granted since July 14, 1980.

Q: What happens to my Advanced Class license which expires next month? I heard the FCC is no longer granting them.

A: Even though only new Technician, General, and Amateur Extra Class licenses are being granted, existing Novice and Advanced Class licenses may be renewed indefinitely. All current operator licenses will be continued in the FCC's Amateur Service database. The FCC plans to phase out Tech Plus licenses by not renewing them as such. Instead, Tech Plus operators will receive a Technician Class license but with permanent Morse Code examination and operating credit.

Effective April 15, 2000 a Technician Class applicant who passes 5 wpm must permanently retain his or her Certificate of Successful Completion of Examination (CSCE) as evidence of having passed a Morse Code examination. The CSCE authorizes CW operation at 3.675–3.725 MHz, 7.100–7.150 MHz, 21.100–21.200 MHz, 28.1200–28.500 MHz...and SSB (phone) operation between 28.3–28.5 MHz. It will be difficult to determine which operators identified in the FCC's database as "Technician Class" have passed a code exam and therefore have limited HF privileges.

The impact on the mix of operators will be that the Novice, Tech Plus, and Advanced Classes will continually be shrinking in size.

Q: My first ham license was General Class. It expired in 1997 and I want to rejoin the hobby. Why don't I get exam credit for the Morse Code Element 1? I note that a Novice operator in a similar situation gets code credit.

A: The ARRL wants to know the same thing. They have filed a Petition for Reconsideration asking the FCC to specify that any amateur who has ever passed a CW examination be entitled to receive exam credit for the Element 1 (5 wpm code) when applying for future licenses. As it is now, the rules provide permanent telegraphy exam credit to anyone who has ever held a Novice or a Technician license issued prior to February 14, 1991, including those whose license expired more than two years ago.

However, amateurs who begin their ham radio career at the General or higher level do not receive telegraphy examination credit, even though they had to pass a higher speed CW exam. The FCC said that essentially all radio amateurs begin at either the Novice or Technician level and that their rules cover nearly everyone who has passed a code exam. Still, the ARRL wants the few amateurs, like yourself, who never held a Novice or Technician Plus Class ticket to get Element 1 (code) credit also. We will have to wait and see what the FCC does with the ARRL's request.

Q: The new rules turn the amateur radio written exam program over to the examining community. What does that mean? Will each VEC organization have its own questions or will VE teams be able to make up their own questions? Will some VE teams have easier tests?

A: There appears to be a lot of confusion on this subject. There is basically no change in the way the written examinations will be handled. There still will be a standard, publicly available question pool for each of the three remaining license classes. These question pools are still required to have a minimum of ten times the number of questions as will appear in an examination.

Each VEC organization will be using the same question pools, multiple choices, and answers and will be administering the same number of questions from each of these pools. The Technician (Element 2) and General (Element 3) exams will have 35 questions each. The Extra (Element 4) will

have 50. The change that the FCC made is to allow the VECs' Question Pool Committee (QPC) to determine the topics on which the various classes will be examined and the number of questions asked on each of these subjects. Effective April 15th the ten topics are no longer mandated by the FCC in the Part 97 rules.

Since there was so little time between when the new rules were issued and when the new questions had to be ready, the QPC elected to continue with the current ten topics until more time could be devoted in later years to overhauling the topics. The QPC will be completing a major revision of the Extra Class topics and questions next year. The Technician and General Class questions will be revised in the following years.

Each VEC organization must conform to the new "rearrangement" developed by the QPC. The plans are for the new written examinations to have more emphasis on rules, practices, and operating procedures at the Technician and General Class levels, and the Extra Class exam will be more technically oriented. Actually, examinees will perceive very little or no change in the way the written examinations are handled.

Q: The Part 97 Rules say that a Technician Class operator may prepare the new Element 2. I thought you had to hold a General Class license to handle Technician examinations.

A: There are two types of volunteer examiners—Preparing VEs and Administering VEs. Each has separate functions. A Preparing VE (referred to in Sec. 97.507) is an amateur who may participate in the development of the amateur radio operator license examination questions or the construction of actual examinations. An Administering VE (referred to in Sec. 97.509) is one of three VEs who actually conduct the examinations. A Technician Class radio amateur may prepare a Technician written examination, but he/she may not administer it.

Effective April 15, 2000 Amateur Extra, Advanced, or General Class VEs may administer the new Element 2, the Technician Class operator license examination. Amateur Extra or Advanced Class VEs are required to administer the new Element 3 (General written exam). Only amateur Extra Class VEs may administer the Element 4, Extra Class written exam. The Element 1 (5 wpm Morse Code) examination may only be given by General, Advanced, and Extra Class examiners.

73, Fred, W5YI

The Art of Low-Power Hamming

A New Cub in the Den—An EZ Brew Project

One of the most attractive aspects of QRP is homebrewing small, fun projects and building neat low-power rigs for go-anywhere hamming. This "pursuit within a pursuit," so to speak, fills an irresistible desire many of us have to assemble at least some of the gear we use for casual QSOs and weekend contests. It also lets us enjoy hitting the airwaves with some exciting new radio goodies at reasonable cost, which is always an appreciated fringe benefit. The hectic pace of modern lifestyles tends to limit our spare time, however, so easy-brew projects that can be completed in only two or three hours have become hot items of the day.

A recently introduced mini rig in that category is the MFJ "Cub" monoband CW transceiver shown in photo 1. A number of readers have been anxiously awaiting a first report on how the Cub performs and also have been asking if it is a good "first project" for homebrewing. Let's kick off this month's column with a quick reply to those inquiries. We then will use a few notes and photos taken during the Cub's assembly as a show-and-tell guide for successfully building any rig kit. Overall, this "something for everyone" approach should prove most enlightening. Get comfortable and read on!

Kits 'n Kits

Two types of kits are popular in the world of QRP: club-produced kits and commercially produced kits. What is the difference? Club kits usually are intended for homebrewing gear at the lowest possible cost and often lack hardware, controls, sockets, and a mating enclosure. Club-produced kits are also susceptible to endless modifications and expansions by club members and "dink specialists" building the kits. By comparison, commercially produced kits usually include everything needed to finish the kit except a soldering iron, solder, and hand tools. Commercial kits are slightly more expensive, but they eliminate scavenger hunts for "completing pieces." (You pay more up front, but you get the short route to on-the-air



Photo 1—Go-anywhere hamming is a blast of fun with the new MFJ Cub monoband QRP transceiver. The little gem measures only 1.5"H x 3.75"W x 4.5"D and is available in kit or wired and tested form. It can be powered from a talkie's 12 volt battery pack or a heavy-duty wall adapter such as the MFJ-4110. (Photo courtesy Richard Stubbs of MFJ Enterprises)

fun with the unit.) Several examples of club-produced gear you may recognize are the 38 Special presented a couple of years ago by NorCal and the Rainbow Tuner recently offered by The New Jersey QRP Club. Examples of commercial kits are MFJ's Cub and Ten-Tec's "1300 series" monoband transceivers.

A full list of kit suppliers, incidentally, is presently being compiled for inclusion in an upcoming column. If your club or company is producing or plans to produce a QRP-related kit, this column in CQ is the ideal place to introduce it to the QRP community at large. Please do not take a "wait and see if Dave includes

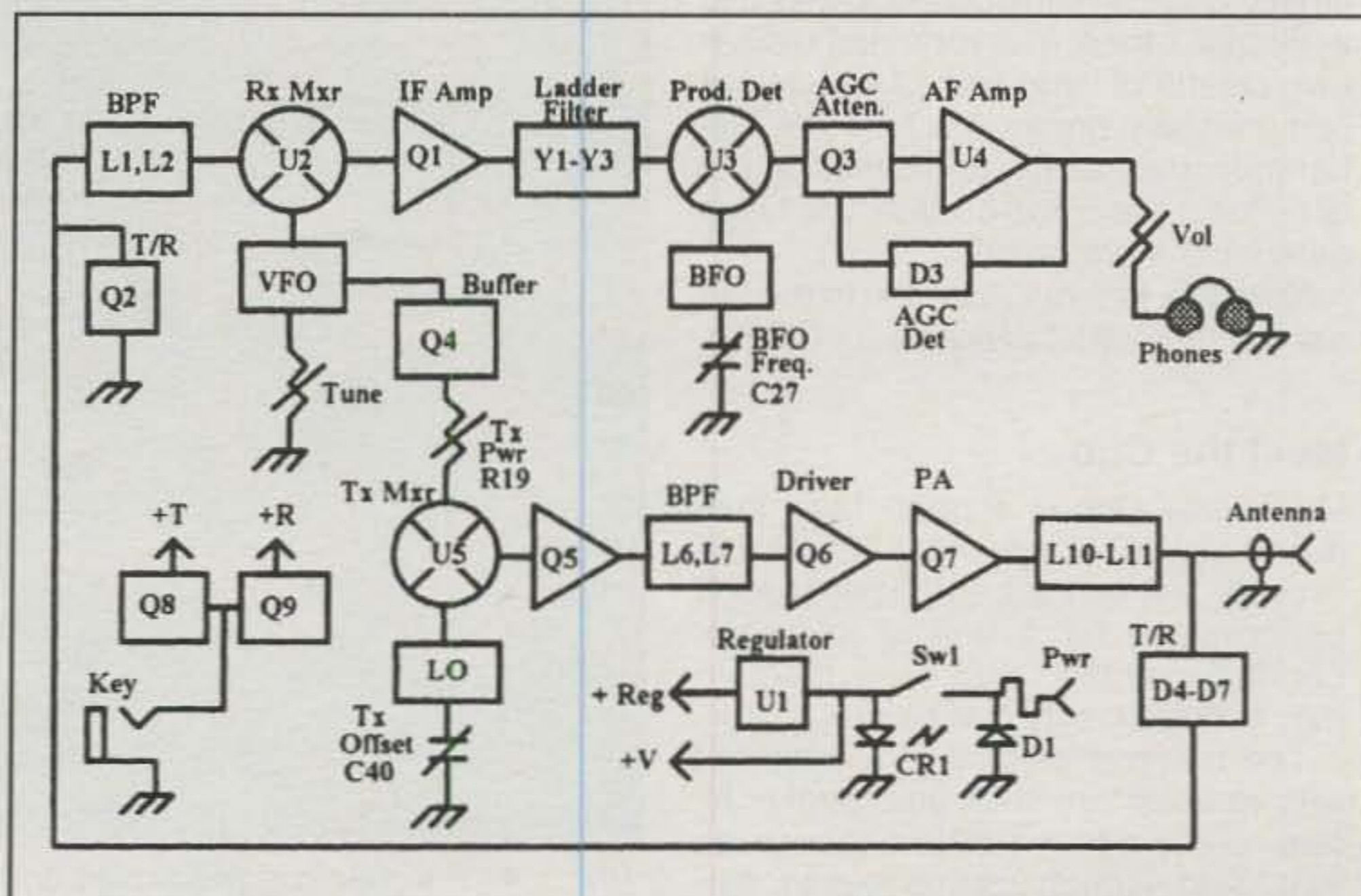


Fig. 1—Block diagram of the little MFJ Cub shows that it packs an impressive amount of "big rig" circuitry in a small package. (Details in text)

4941 Scenic View Drive, Birmingham, AL 35210

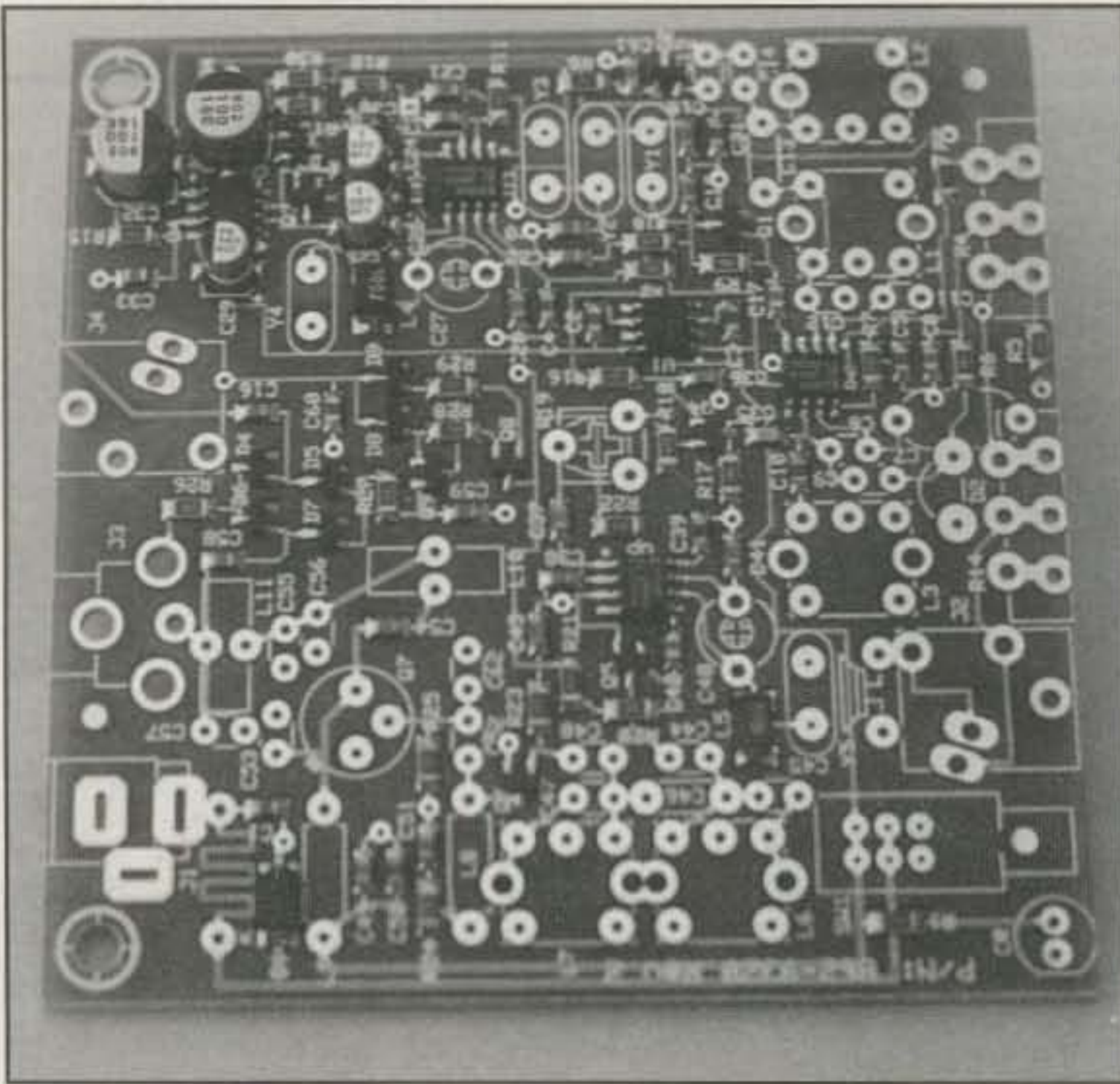


Photo 2— Here is how the Cub's PC board looks before you begin kit assembly. Its surface-mount components (approximately 80 small parts) are preinstalled. You just complete the kit by adding a small number of full-size parts, align the rig, and hit the airwaves.



Photo 3— Here you see the Cub as received and laid out for assembly. The kit's parts are contained in three clear bags: knobs and mounting hardware, controls and connectors, and band-related components. The manual shown on the left explains assembly, while the one on the right describes operation.

me" attitude here. I may accidentally have overlooked you or I may not have on hand info/specs on your unit. Send me details (and a couple of good photos—not off the web views) plus authorization to highlight your gems right now while this invitation is fresh in your mind. Remember, too, the more I know about your kit, the better I can describe it to others, and the more folks who will build it. Finally, I think everyone has his/her own criteria of what type of kit (club or commercially produced) best fits his/her particular needs, and checking out or building one or two of each type helps determine a preference.

Now let's turn our attention to the latest commercial kit available for QRP'n.

Meet the Cub

MFJ's new Cub is a small, fairly low-priced rig, but it has some impressive circuitry and exhibits surprisingly good performance for a unit of its class. Looking over the Cub's block diagram (fig. 1) helps clarify that point.

The receiver section is a superhet with varactor tuning, three crystal IF filters, audio derived differential mode AGC, and enough volume to drive earphones or a small speaker as desired. The Cub's transmitter section sports an adjustable CW offset, full break-in oper-

ation, and fully adjustable output for battery power or QRPp pursuits. Sidetone monitoring is accomplished by allowing the receiver to stay "on" during transmit and reducing its input sensitivity with T/R switch Q2 when keying

the transmitter. This arrangement also lets you hear the Cub's actual on-the-air signal while transmitting, so you are the first to know if it is clean or raspy.

You might think the Cub has slightly too much circuitry for quick and easy

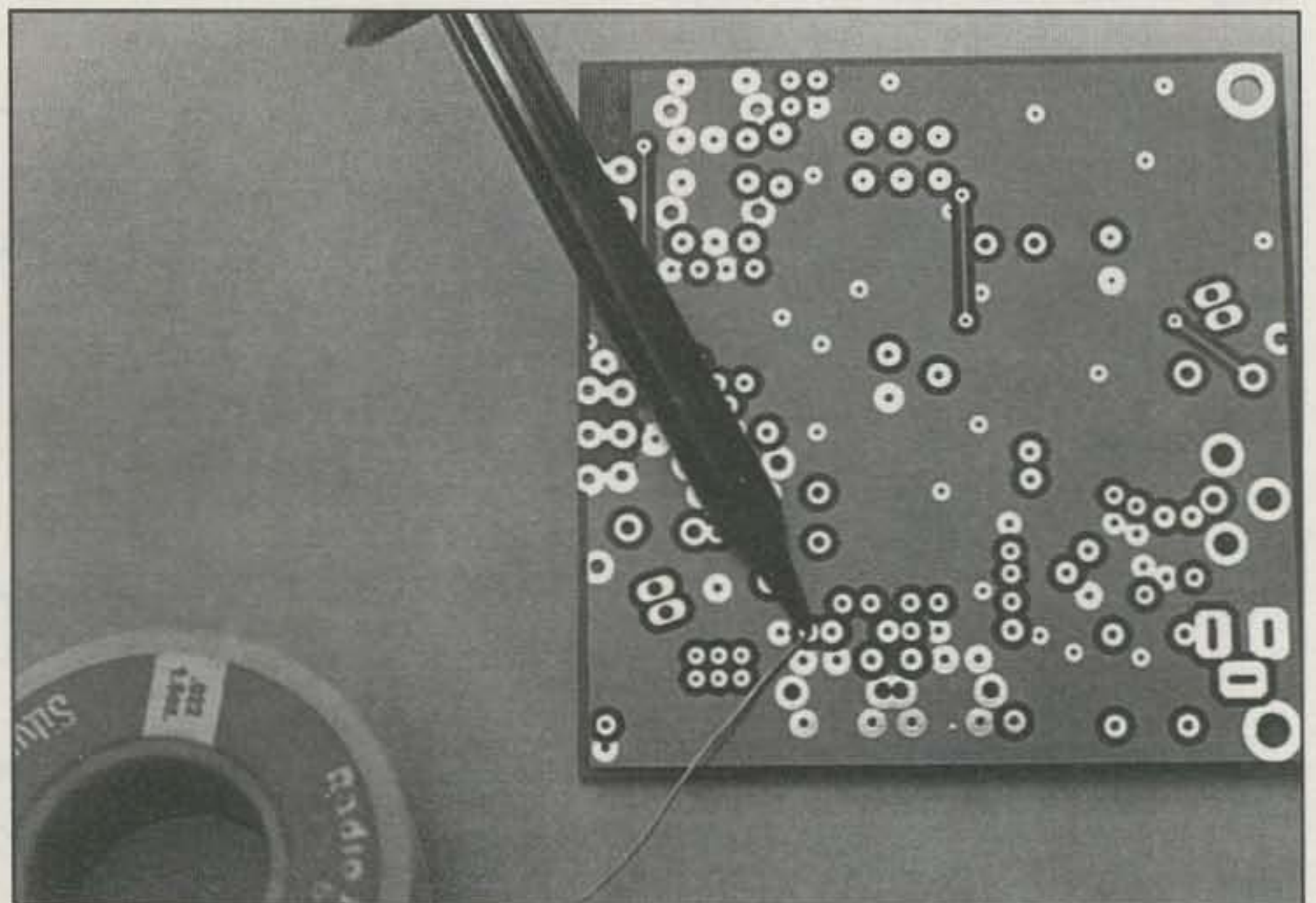


Photo 4— Prechecking every part or component in any kit from any company or club is always a good starting point. This simple first step helps you become familiar with the kit and also adds a healthy dose of "assembly confidence." (Discussion in text.)

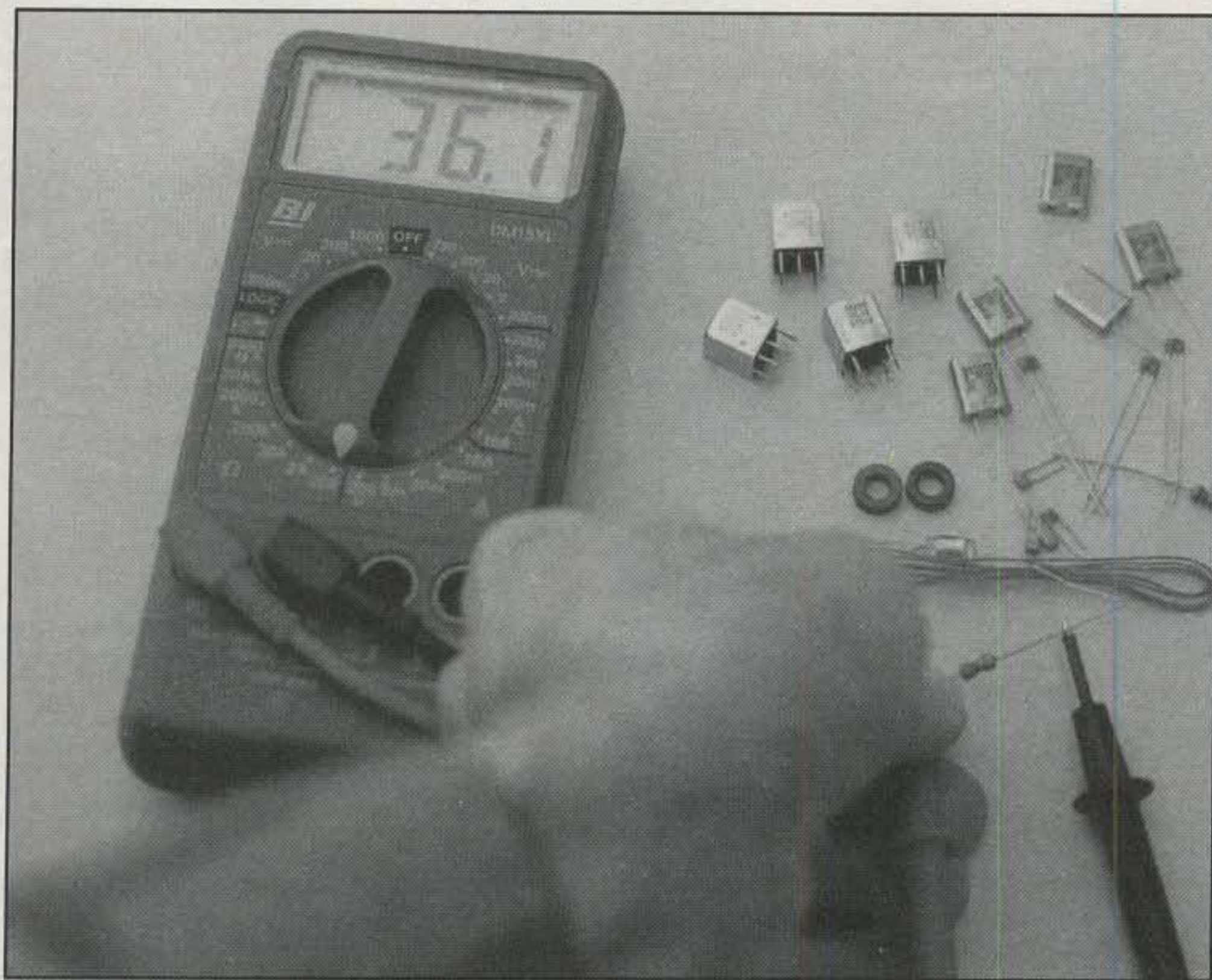


Photo 5— Before heating up the soldering iron, compare its tip with the solder's size and the PC board's pads to ensure everything is approximately the same size. Compare this "flip side" of the board view with photo 2, and you can also see only the connections you must solder to complete the Cub kit.

assembly or for a new homebrewer to build, but this is not really true. It has a clever "simplify the process" surprise on its PC board. As you will see, the little rig is a hybrid unit comprised of both very tiny surface-mount components and regular-size "leaded" component. In addition, all surface-mount components have been pre-installed by machine for you (photo 2). All you do is add 14 "full-size" coils, trimmer capacitors and connectors, plus 32 full-size band-related components (capacitors, IF cans, crystals, etc.), wind two toroids, and perform a six-step alignment. All component locations are marked (silk screened) on the PC board, and all holes are "plated through" to ensure successful assembly. Total building time is roughly two to three hours, depending on how many breaks you take and how meticulously you work.

When finished, you have a monoband CW transceiver for 80, 40, 30, 20, 17, or 15 meters. It works approximately the lower 60 kHz range of its respective band (20 kHz on 30 meters) and produces around 2 watts output (slightly less on 17 or 15 meters). In reading through the Cub's manual, I noticed MFJ is also attuned to the "mod squad" and included details on transistor swaps for doubling output power.

Incidentally, if you are too busy or hesitant about building your own Cub, take heart: The little critter is also available in pre-assembled, tested, and ready-to-operate form.

Tips for New Kit Builders

Over the years many of us have learned a few tricks and techniques that help make homebrewing and kit building an enjoyable rather than an exasperating experience. By combining and sharing some of that knowledge, we can learn from each other and continue to move forward rather than always starting over from ground zero or "reinventing the wheel." In light of that thought, some helpful tips for successful homebrewing follow. Understand these notes are only intended to supplement a kit's assembly instructions, not replace them.

Generally speaking, there are two basic ways you can go wrong when building a known to be good kit or project on a proven-correct PC board: by installing an improper value component or by installing a bad component. Many years ago I learned never to accept any component at face value just because it is new. Trust me: An improperly marked resistor, shorted capacitor, or internally open-circuited transistor is

NEW

DUAL BAND WITH GAIN!

PRE-TUNED ANTENNA

For

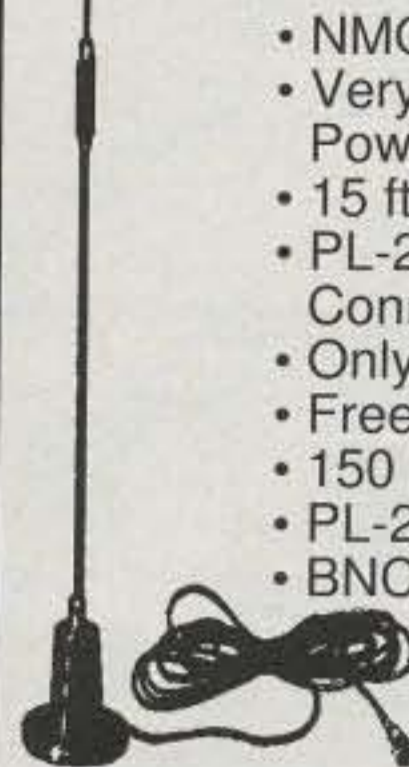
144 MHz to 148 MHz

440 MHz to 450 MHz

3.7DB Gain on VHF

6.0DB Gain on UHF

- NMO Mount
- Very Strong Black Powder Coated Magnet
- 15 ft. RG-58 Coax
- PL-259 or BNC Connector Installed
- Only 37" Tall
- Free Magnet Pad
- 150 Watts
- PL-259 CAT# DB-5
- BNC CAT# DB-6



\$49.95

Whip only \$29.95

Add \$7.50 UPS S/H
AK & HI Higher



LAKEVIEW COMPANY, INC.

3620-9A Whitehall Rd.

Anderson, SC 29626

(864) 226-6990 • FAX (864) 225-4565

e-mail: hamstick@hamstick.com

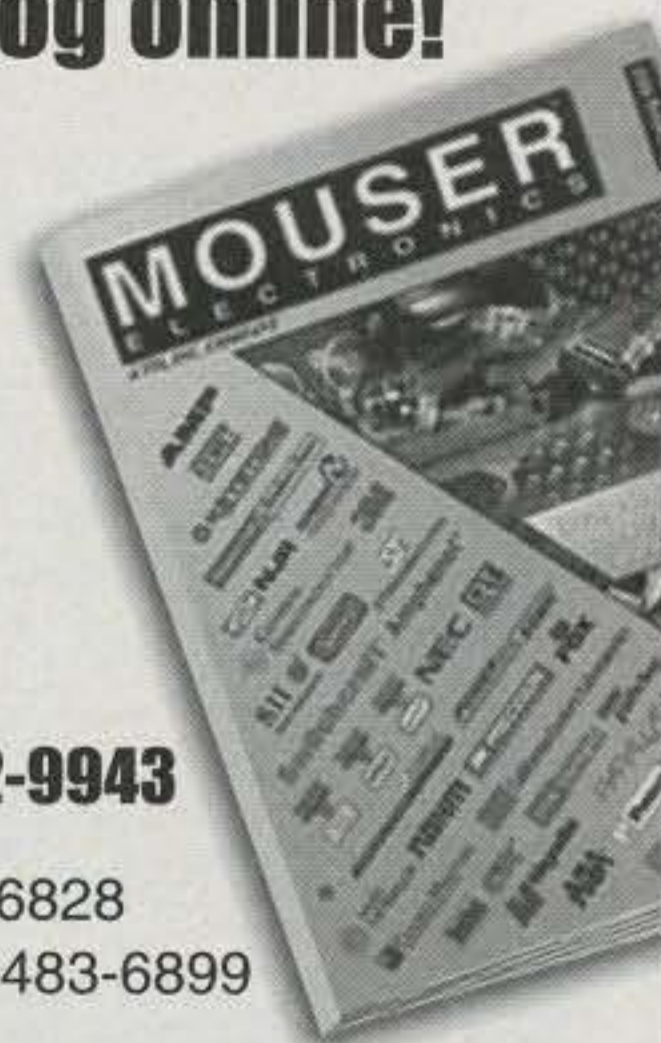
www.hamstick.com

"The Hamstick People"

CIRCLE 69 ON READER SERVICE CARD

www.mouser.com

**Subscribe,
download, or view
catalog online!**



800-992-9943

817-483-6828

Fax: 817-483-6899

catalog@mouser.com

958 N. Main St., Mansfield, TX 76063

MOUSER
ELECTRONICS

CIRCLE 73 ON READER SERVICE CARD

June 2000 • CQ • 75

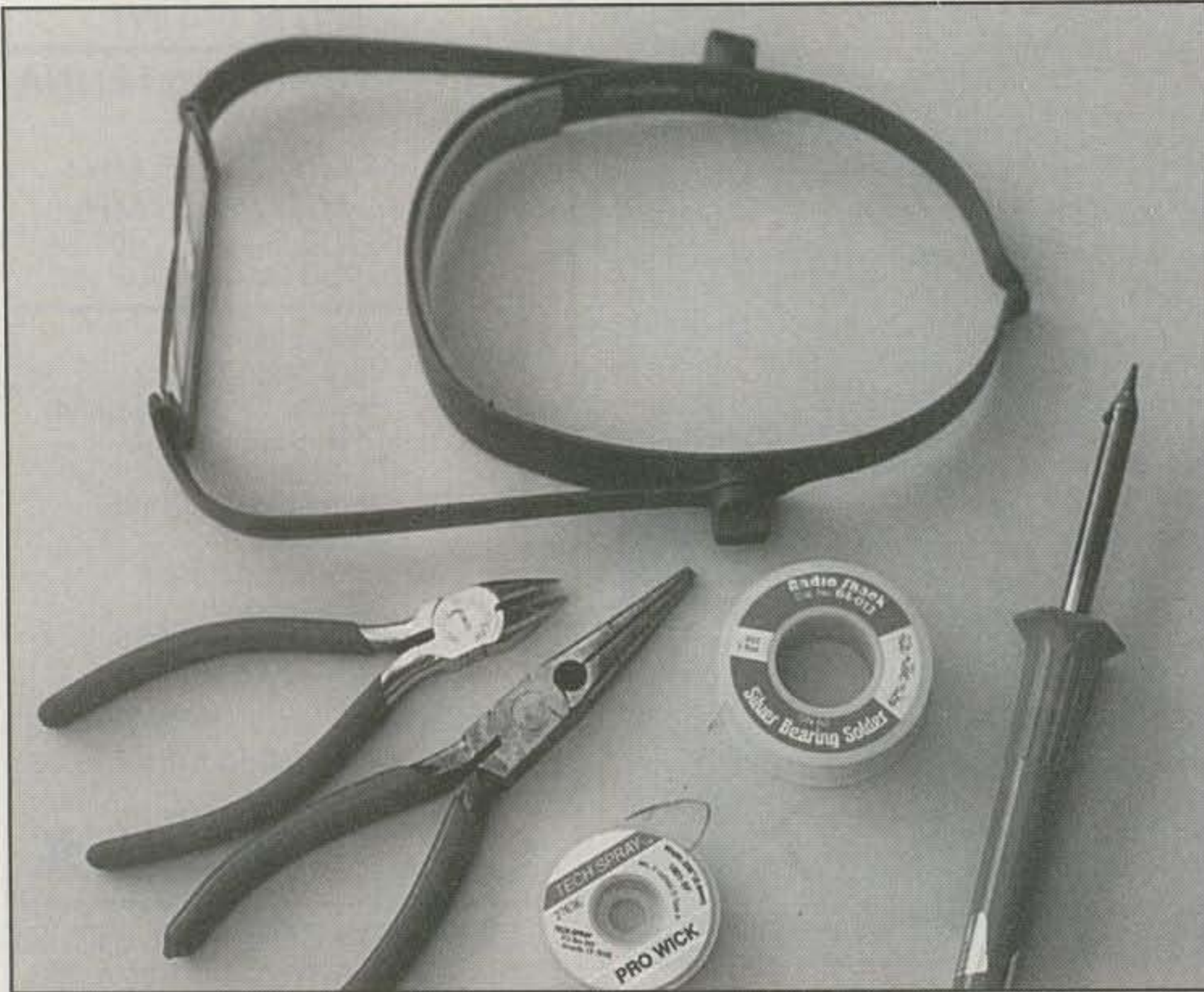


Photo 6—Some beneficial tools and accessories for easy homebrewing small projects include a low-wattage soldering iron, thin silver-bearing solder, a desoldering wick for correcting mistakes, and a pair of slip-on “Mag Eyes” type magnifiers.

rare, but it is also much easier to find and replace before installation rather than after.

First take a couple of minutes to look over the entire kit and ensure that all parts are on hand (photo 3). Check resistors with an ohmmeter to ensure

their manual listings, color codes, and actual values are correct (photo 4). Next check transistors to ensure they exhibit continuity with high resistance and/or diode-type action between their leads. Check capacitors to ensure they are not shorted. Check them again after PC

board installation, especially if they are tapped with an iron’s hot tip, as some insulating materials are very heat sensitive. Capacitors above .5 mF in value will also show a momentary “kick,” or varying internal resistance (actually their ability to “charge up”), when being checked by swapping positive and negative test leads.

Next scrutinize the PC board and components to visualize where everything fits. In other words, first “build it in your mind” so actual assembly will be like doing it the second time. Finally, compare your iron’s tip, solder, and PC board pads (while all three are cold!) to ensure they all are in the same size category and pad connections will not short to each other (photo 5). You may now be a few minutes behind a fast, solder-slinging homebrewer, but you have the confidence of knowing your project should work at first fire up.

With respect to kit-building tools, a low-wattage, fine-tip soldering iron and ultra-thin silver-bearing solder (62% tin, 36% lead, 2% silver, and .022 diameter) are ideal for good “PC boarding.” Thermostat-controlled soldering irons/stations are great, especially if you homebrew all day long, but an inexpensive iron is quite adequate for one- or two-hour-a-day soldering sessions. The tip may widen or become blunt after building a few projects and new tips may be difficult to find, but if it is cheap enough you can file it sharp again and keep going (not great, but it works fine!).

Finally, using a pair of slip-on-the-

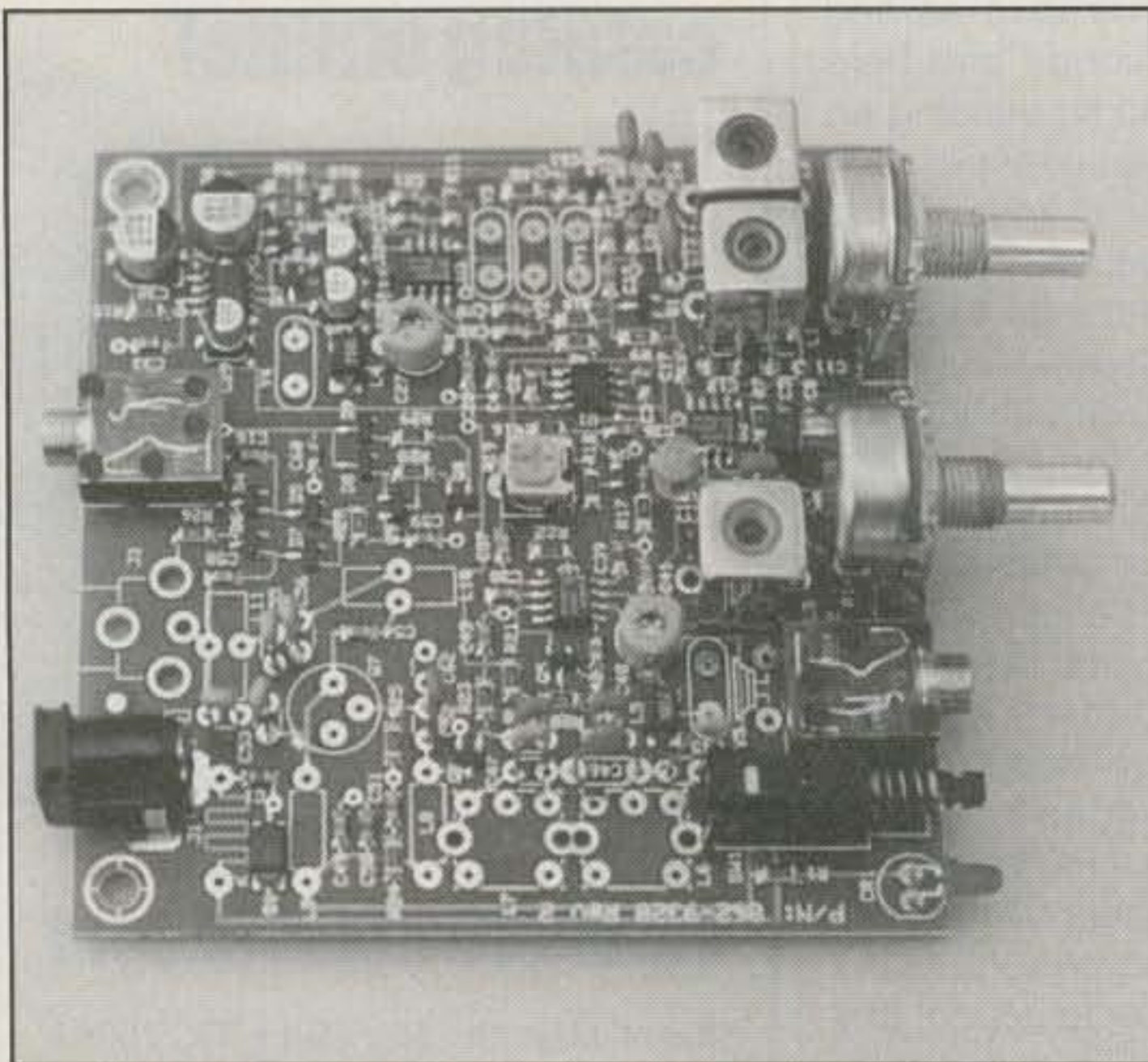


Photo 7—This photo was taken approximately one hour into assembly of the Cub. The little transceiver is approximately halfway to completion and going together like clockwork.

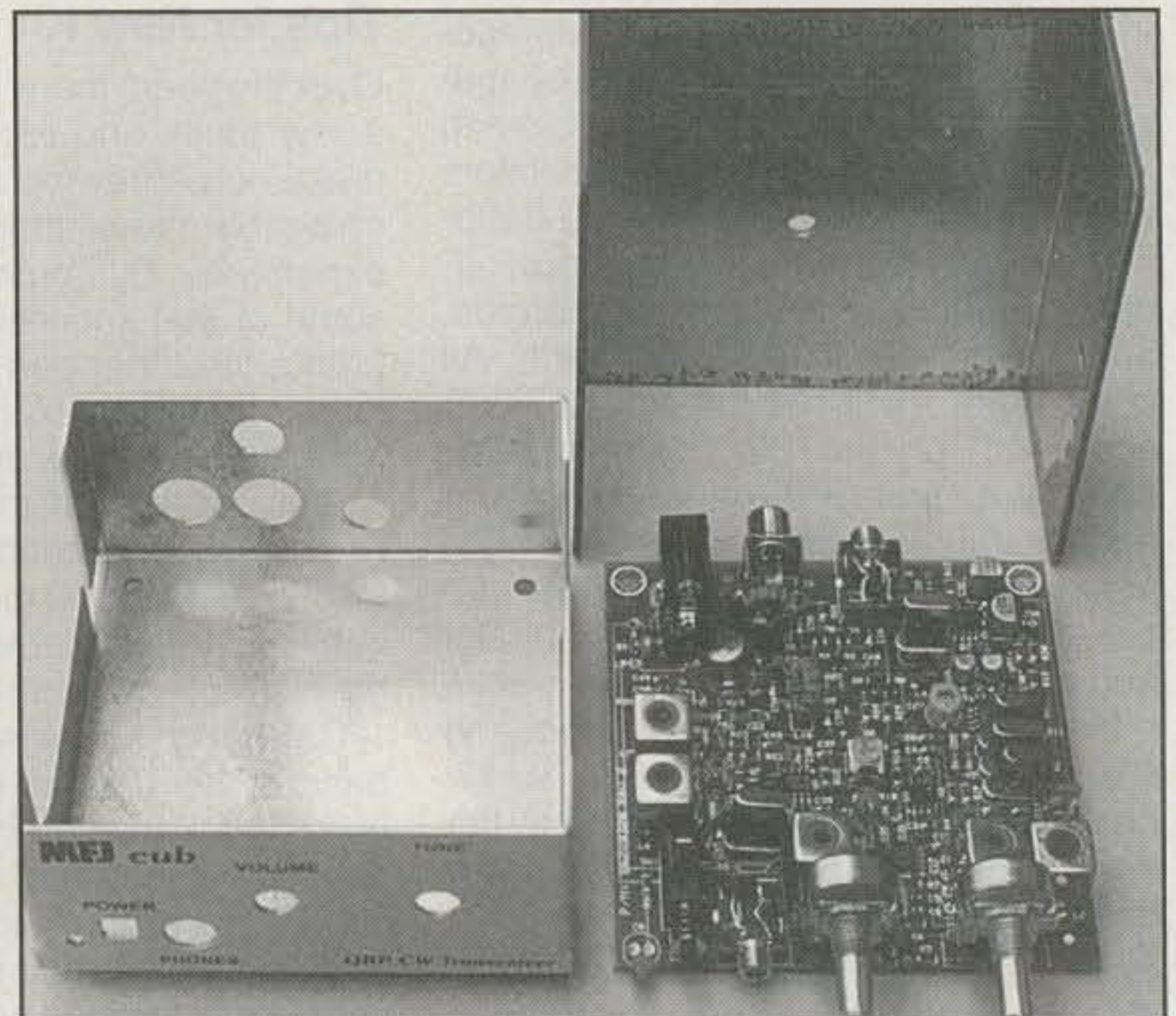


Photo 8—Another hour later and the fully assembled Cub is ready to slip into its enclosure. Notice all the controls, switches, and sockets are mounted directly on the PC board and no off-board wiring is necessary. Nice!

head "Mag Eyes" (see photo 6) to enlarge your work makes PC board work and precision soldering easy. These things are worth their weight in gold, especially if you do a lot of reading or typing all day and homebrew with tired eyes at night. "Mag Eyes" are available from various sewing suppliers. I purchased mine for around \$25 from Nancy's Notions, P.O. Box 683, Beaver Dam, WI 53916 (1-800-833-0690).

During PC board assembly, pause occasionally to check your work and soldering technique. Poor connections can often be avoided on the spot using the following technique:

First touch one ohmmeter lead to an installed component's wire right where it enters the component's case. Touch the ohmmeter's other lead to the same "wire entering component's case" spot on another component connected to it through a PC board "run" and read continuity. This way, you read through the component's wire, through the soldered connection, and through PC board wires all in one shot. Next move one test lead to one of the component's other wires and recheck for continuity. If a connection is poor or a component was damaged during soldering, you often can spot it immediately.

Once you are in the habit of performing these checks "on the fly," they become second nature. Want to take bets on your project working on the first try? Chances are good you will win!

Folks like to see a kit being put together, so I took a couple of time-lapse photos of the Cub during assembly (photos 7 and 8). The real fun and excitement, however, took place after the assembly was completed. While tweaking its VFO's range and adjusting its TX offset, I worked a station in South America. Less than 30 minutes later I worked England, Slovenia, Canada, and a couple of neat Caribbean stations. I was using a hefty MFJ-4110 wall-adaptor power supply and a near-ground-mounted vertical antenna, but I just as easily could have been stretched out on a warm beach using an FM talkie's 5 watt battery pack and a vertical on the salt water's edge. Now that truly would be QRP'n in style! The Cub is perfect for such impromptu operating.

Wrap Up

We could continue with more QRP tales and tips, but the closing wire once again approaches and there is only room left to squeeze in a couple of final notes.

A week passed by while writing this column, and the Cub has now proven

to be a worthy addition to the den (and the patio, the car, . . .). I have also changed its RF output transistor from a 2N5109 to a Motorola MRF237 (mentioned in the assembly manual), and it is pumping out slightly more than 3 watts of sheer DX power. It's a fun rig. Check out one soon!

Next time we plan to highlight happenings and new ideas that emerged from the Atlanticon 2000 QRP convention plus check out some neat homebrewed rigs. Stay tuned!

73, Dave, K4TWJ

Oops...

Some gremlins infiltrated our April QRP column. Please note these corrections:

The U.S. contact for membership in the G-QRP Club and subscriptions to *Sprat* is Bill Kelsey, N8ET, 3521 Spring Lake Drive, Findlay, OH 45840. Dues/subscriptions are \$14/year.

Under contests, "QRP Afield" is sponsored by the NE QRP Club and NN1G; "QRP to the Field" (QRPTTF) is sponsored by NorCal and was held this year on April 29; "Run for the Border" was the theme of 1999's QRPTTF and is not a separate contest; and "Bubba" is sponsored by the Arizona ScQRPions.

Please pardon our errors. Tnx to NA5N, N4SO, and K5QLF for bringing them to our attention. — K4TWJ

From MILLIWATTS
to KILOWATTS™

rfparts.com

an address to remember

Svetlana • Motorola • Eimac • Taylor
Toshiba • Mitsubishi

Complete line of tubes, transistors,
rf power modules for Broadcast,
Marine, 2-Way & Amateur Radio service.

Tel: 760-744-0700 800-737-2787
Fax: 760-744-1943 888-744-1943
E-Mail: rfp@rfparts.com



RF PARTS™
435 SOUTH PACIFIC STREET
SAN MARCOS, CA 92069

CIRCLE 79 ON READER SERVICE CARD



Check out our
Web site at:
www.cq-amateur-radio.com

SKINNY MINI MOTOR \$1.95

Originally designed for vibrating pagers, this 1.5VDC motor measures only about 0.6" in length, and 0.25" diameter! (The shaft is just 0.2" long, and 0.031" dia.) Features a removable counter weight, and can be easily extracted from its protective sheath. Great for all kinds of hobby applications.



www.gatewayelex.com

110V TIMER WITH CLOCK \$6.95

Digital LED clock display can be programmed to activate at a specified time (hours, minutes, am/pm). Ideal for turning things on while you are sleeping, so you can turn them off when you wake up! Features 3 position (off/on/auto) rotary switch. Approx. size 2-3/8" x 2-3/16" x 2-3/8"



120V AC - 7.5KV DC IONIZER \$6.95

Originally designed as an ion air generator, this unit is ideal for experiments. 120VAC 60 cycle input, 7500VDC output. Can be used for all kinds of high voltage projects.

THE FINE PRINT: * PRICES SUBJECT TO CHANGE WITHOUT NOTICE * GATEWAY IS NOT RESPONSIBLE FOR PRINTING ERRORS * MASTERCARD, VISA AND DISCOVER ACCEPTED * YES, WE'LL TAKE YOUR CHECK - SORRY, NO C.O.D.s * \$10 MERCHANDISE MINIMUM ON MAIL ORDERS * SUPPLY OF SOME ITEMS IS LIMITED * PRICES DO NOT INCLUDE SHIPPING * UPS GROUND SHIPPING/HANDLING WITHIN THE CONTIGUOUS U.S. (ITEMS REQUIRING ADDITIONAL AMOUNTS ARE NOTED). \$5.00 FOR THE FIRST ITEM, \$0.50 FOR EACH ADDITIONAL ITEM. RESTOCKING CHARGE MAY BE ASSESSED ON RETURNED ITEMS.

gateway
ELECTRONICS, INC.

8123 PAGE BLVD • ST. LOUIS, MO 63130 • (314)427-6116
9222 CHESAPEAKE DR. • SAN DIEGO, CA 92123 • (858)279-6802
2525 FEDERAL BLVD. • DENVER, CO 80211 • (303)458-5444
MAIL ORDERS CALL TOLL-FREE 1-800-669-5810
FAX ORDERS (314)427-3147

CIRCLE 61 ON READER SERVICE CARD

Results of the 2000 WW CQ/RJ RTTY WPX Contest

BY RON STALEY, K5DJ, CONTEST DIRECTOR
AND EDDIE SCHNEIDER, W6/GØAZT, CONTEST MANAGER

Single Op, All Band, High Power (SOABH)					Single Op, All Band, Low Power (SOABLP)				
Call	Qs	Pts	WPX	Score	Call	Qs	Pts	WPX	Score
CT3BX	1268	4994	445	2222330	UP5P	1246	4170	439	1830630
EMØI	1458	4055	464	1881520	(Op: UN5PR)				
				(Op: UT2IZ)	ZX2B	1066	3172	410	1300520
HK3WGO	1216	4143	443	1835349	(Op: PY2MNL)				
LU6ETB	1187	3420	454	1552680	HA2A	1082	3218	392	1261456
FM5CD	1215	3336	448	1345075	PW2A	982	2877	414	1191078
I22AVK	1164	3459	430	1338633	(Op: PT2BW)				
OM3RM	1105	3191	440	1263636	AA5AU	1212	2539	418	1061302
IK1GPG	1103	3072	452	1249690	LTØH	915	2864	399	1028462
JH4UYB	1065	3262	417	1224254	(Op: LU3HY)				
DKØEE	1066	3246	412	1203617	VP2V/W8JAY	891	2590	364	942760
				(Op: DL4MDO)	4Z5CP	836	2672	322	860384
K4GMH	1058	2787	408	1137096	EA1CRB	850	2391	348	832068
YU7YG	1030	2879	388	1117052	EU1DX	801	2251	369	830619
8S4RY	993	2851	381	1086231	3Z9U	814	2290	351	803790
				(Op: SM4RGD)	(Op: SP9UNX)				
K5YG	1145	2512	420	1042480	YU7AM	760	2238	337	754206
HA3LI	890	2758	365	1006670	DA2OOO	773	2268	330	748440
WW7OR	1162	2413	405	977265	(Op: DL4RCK)				
RX9SR	803	2708	323	874684	OK2WY	732	2136	335	708404
NO2T	895	2336	368	856733	EA8/DJ1OJ	698	2123	345	659191
OG6XY	838	2574	368	852508	S57U	727	2044	338	621784
RM4W	1075	2490	378	847098	DK3WW	683	1966	329	582133
K3NC	871	2245	357	801456	F6AUS	663	1848	348	578794
DL7VOG	796	2445	360	792180	RA1ACJ	690	1707	326	556482
LY3BH	859	2356	367	778186	9A6D	610	1855	292	541660
JH6ETS	722	2259	343	774837	RX9JM	666	2069	288	536284
OH2GI	829	2372	350	749315	N6OJ	904	1645	319	524755
OH2LU	788	2218	336	745248	OH3NGB	673	1903	275	523325
GW4KHQ	761	2042	350	714700s	KIØLO	791	1671	312	521352
S56A	760	2216	358	713995	RSØF	628	1740	299	520260
EA3RH	924	2184	363	713513	(Op: UØØFZ)				
N2WK	782	2001	349	698349	MMØBYC	688	1810	287	519470
VK4UC	618	2024	305	617320	EØDW	653	1840	311	515016
NE3H	690	1858	331	614998	KQ4/KL7Q	741	1647	309	508923
RA3ANI	734	2036	301	612836					
JA1BWA	659	1929	314	605706					
W1RY	752	1903	339	580605					
W8JGU	659	1707	324	553068					
SM6WQB	621	1796	289	519044					
KE6YTT	917	1601	303	485103					
N5JR	623	1402	325	455650					
N6HC	782	1553	289	448817					
UV5U	532	1563	271	423573					
				(Op: UX1UA)					
RK6BZ	600	1679	248	416392					
N2FF	570	1406	295	414552					
ZL6QH	469	1596	255	406980					
				(Op: ZL2AMI)					
OK2WO	510	1433	280	401240					
NN6XX	656	1296	309	400464					
RZ1AZ	555	1416	276	394128					
W9OL	620	1322	296	391312					
LA7CL	517	1435	264	378840					
W5ER	641	1354	276	373704					
SV/ØK1YM	490	1413	251	354663					
W8KX	514	1241	285	353685					
KB3TS	511	1277	276	352452					
EU1MM	476	1352	256	346112					
UAØAGI	464	1502	229	343958					
RU3AT	495	1322	257	339754					
VE5CPU	519	1319	245	323155					
AA7A	579	1197	264	316008					
UA4LY	528	1194	256	305664					
IK1HSR	400	1297	219	284043					
UA4RC	500	1172	237	277764					
EU1SA	400	1210	218	263780					
K8AA	390	910	271	246610					
K5AM	539	1027	238	244426					
VE7BTO	422	1118	234	239252					
WØYR	417	953	249	237297					
EA2BWM	383	983	225	220950					
SI5SSA	361	1018	207	210726					
				(Op: SM5EIT)					
AJ3M	443	881	237	208797					
OG3RM	359	862	231	183084					
YBØUNC	300	101	179	179179					

N3SL	217	421	144	60624	LW3EIC	602	1770	354	626580
K9BJM	212	453	132	59796	ED7FTR	654	1507	343	516901
W8DN	193	455	130	59150	LT1A	547	1621	317	513857
UU9JQ/QRP	148	573	103	59019	EO1I	634	1432	321	459672
JA1BUI	177	465	125	58125	(Op: UT11A)				
LA5QIA	202	469	123	57687	EO6F	561	1387	327	453549
OG1MM	171	503	114	57342	(Op: UX0FF)				
9V1XE	195	488	117	57096	UA6AJU	600	1349	317	427633
K3GH	207	462	120	55440	LZ2K	466	1177	308	362516
DL6UAA	146	535	101	54035	(Op: LZ2VL)				
RW0BG	164	423	127	53721	LW9EPB	434	1215	297	360855
K7ZO	208	455	118	53690	JA2IVY	420	1142	280	319760
VA3SB	173	459	116	53244	OG9MM	436	1052	275	289300
DL6NDN	160	451	118	53218	IBUZA	310	793	214	169702
DL7VBO	151	458	110	50380	IK4ZIF	290	728	217	157976
JA3MIB	157	430	114	49020	UW7U	294	715	208	148720
PA7RCE	165	414	114	47196	(Op: UT2UJ)				
IK7RVY	149	329	141	46389	ON7NQ	277	736	201	147936
OK2KV	156	429	108	46332	JA1SJV	253	691	192	132672
JR3RIY	154	411	112	46032	CT2HMM	290	646	190	122740
UA6ACK	170	409	109	44581	DL7VXX	241	612	191	116892
N9CK	158	352	126	44352	4X6UO	225	666	154	102564
DL5IAM	153	369	116	42804	W0WA	251	554	168	93072
N6TQS	182	369	113	41697	JH1OAI	204	551	168	92568
IK2WFN	145	372	110	40920	UN7FZ	210	564	141	79524
HL2AMO	138	385	106	40810	G0NWFY	205	507	154	78078
SP2EIW	137	353	114	40242	LZ1CF	189	462	152	70224
WA9AFM/5	201	388	99	38412	N1MGO	187	441	148	65268
PS7ZZ	128	372	102	37944	YU7AE	174	439	147	64533
N5RFX	214	307	123	37761	AB8K	191	451	141	63591
XE2XX	157	381	98	37338	K4WW	142	355	113	40115
EA2AVM	128	378	98	37044	SP8NR	133	358	111	39738
DL1EJD	137	333	105	34965	LZ1MC	135	335	116	38860
WB9VGO	150	338	100	33800	IK2LOL	127	341	105	35805
ON7YP	127	349	95	33155	YL2GTD	105	268	93	24924
VE6RRD	161	358	92	32936	SP4FOV	102	260	90	23400
DH9FAJ	133	344	94	32336	SP2JPG	98	264	83	21912
VO1HP	118	338	95	32110	OK2PMS	90	261	82	21402
W1EZ	131	333	94	31302	SQ4CUM	142	377	37	13949
RN2FA	152	290	107	31030	OM3PR	77	187	71	13277
DL4SDT	129	317	94	29798	IK5WGK	67	172	64	11008
SP3JHR	216	613	47	28811	RW0LZ	66	172	62	10664
RA6ABW	137	273	102	27846	LU6DAT	59	175	57	9975
DL9YP	126	292	95	27740	MOAEJ	87	107	81	8667
IS0YTA	114	259	107	27713	CG2PIJ	45	110	39	4290
YO3FRI	144	232	113	26216	LZ4BU	33	84	33	2772
KE6QR	132	277	94	26038	PY1KS	18	53	16	848
KI0F	126	290	89	25810	KM5TY	14	41	11	451
K8CV	120	270	93	25650					
JA0AXA	109	301	84	25284					
LZ2AU	111	257	91	23387					
RA4AFZ	121	253	92	23276					
N2UM	115	244	95	23180					
CG3RHJ	114	275	84	23100					
JH5OXF	98	280	80	22400					
SP2JLR	94	257	87	22359					
UA9JMS	100	276	81	22356					
SP2JPG	98	264	83	21912					
IV3KSE	98	291	74	21534					
HL3AHQ	102	281	75	21075					
HS0GBI	103	276	76	20976					
N4CU	116	226	89	20114					
AF8C	122	235	85	19975					
KO2FB	127	252	78	19656					
DL3ARK	103	245	79	19355					
SP2GWZ	138	311	62	19282					
LA9QL	154	423	44	18612					
WB9BSH	90	206	87	17922					
I1JNZ	100	229	78	17862					
M0CFV	89	221	76	16796					
KF6RY	119	200	81	16200					
AA4RP	99	207	76	16146					
K2CY	104	220	73	16060					
WP4LNY	74	225	68	15300					
N4CW	110	182	82	14924					
SP2EWQ	64	202	56	11312					
UT1UA	70	176	59	10384					
SP3CUG	102	287	36	10332					
W3AG	64	186	54	10044					
W8IDM	72	167	60	10020					
W7GTO	72	158	58	9164					
N2ALE/6	87	151	58	8758					
W3FQE	62	134	52	6968					
CX9AU	52	143	48	6864					
WB7QBO	74	121	56	6776					
IK0MIB	53	135	50	6750					
IK2EBP	51	125	51	6375					
KA9NZI	60	114	51	5814					
VE9DX	50	111	45	4995					
PA0EHF	44	131	37	4847					
SP7GAQ	24	81	27	2187					
K2YG	35	77	28	2156					
JK2VOC	32	79	24	1896					
EA7AAW	25	50	23	1150					
NN2T	26	50	23	1150					

Single Op, 10 meters

LV5V	815	2401	419	1006019
LU3FZW	674	1993	377	751361

Single Op, 15 meters

9A7R	692	1684	395	665180
HA9OA	702	1723	410	635787
S57IO	631	1568	391	551779
T94MZ	643	1558	376	524858
CE8SFG	531	1567	309	479502
YU1NR	566	1398	358	450435
S52SK	481	1169	325	379915
W7WW	524	1058	317	335386
LU8HWD	423	1251	266	332766
SN7N	463	1132	317	322959

(Op: SP7NMF)

UA0CA	423	1130	277	281709
EC2ADR	449	1037	292	272523
K3GP	365	859	244	209596
ON7UI	353	858	241	206778
KG9X	337	743	247	183521
4F3XX	318	942	202	171255
LZ2JA	356	796	234	167637
YB5QZ	308	916	203	167353
OK2LC	310	750	233	157275
JA3EVZ	263	724	214	154936
SW1W	369	778	220	154044

(Op: SV1CIB)

UX6F	332	726	217	141787
JG1GGU	232	627	182	114114
HC1JQ	237	703	154	108208
OH5TF	260	571	183	104493
DL1LH	216	504	182	91728
JH7QXJ	200	563	154	86702
LY2CG	206	450	159	71550
ON4VV	185	443	149	66007
WG7Y	233	348	160	55680
IK2DHU	111	251	93	23343
SM7GXR	88	219	83	18177
R3/DL7BO	95	205	79	16195
G0MTN	120	160	100	16000
JH1HRJ	55	140	52	7280
RN3FT	77	99	69	6831
SP9JCN	48	110	48	5280
UA3DJY	5	9	5	45

Single Op, 20 meters

Call	Os	Pts	WPX	Score
S58T	825	2024	460	931040
9A5W	842	2032	446	906272
DJ7AA	797	1928	454	875312
9A8A	766	1872	398	670550
G5G	722	1651	380	627380
CF3MM	674	1613	374	603262

UA4LCQ	673	1570	396	559548
LY1BZB	530	1197	316	340426
SP7IIT	468	1045	300	313500
IK2DPP	426	983	291	286053
UA9CKP	413	1175	265	280238
EA1AHY	455	1056	293	278467
T97M	401	918	269	222247
WQ6/G0AZT	448	753	263	198039
W3UR	363	826	239	197414
DN1JC	370	793	256	182707
NH6XM	309	911	184	167072
S51MM	311	664	217	144088
W6IWO	353	587	227	133249
SM3LBP	291	655	215	126742
UT7FP	273	588	196	115248
DL9MBZ	236	490	177	86740
UA9ULU	195	516	158	81528
8S3A	204	434	154	66836

(Op: SM3DXC)

RA0FF	155	399	130	51870
UA6AHF	176	360	140	50400
OZ1IIRL	162	357	133	47481
KF2XF	147	308	126	38808
PR7AR	109	306	100	30600
7K4QOK	103	271	95	25745
SP2GNB	97	209	82	17138
K9MRQ	118	165	89	14685
VE6JY	68	158	62	9796
DL9GMC	64	74	57	4218
OG1UP	48	46	71	3266
Z31GB	19	51	19	969

Single Op, 40 meters

ED8WPX	573	3416	338	1154608
(Op: EA8PP)				
UT9NA	415	1756	252	442512
F/OK1EE	421	1758	250	439500
UW5Y	342	1438	221	318682
(Op: US2YW)				
SP4TXI	264	1092	186	203112
UR5FFC	247	1006	175	176050
RK6CZ	208	854	143	122122
OK2EQ	187	772	141	108852
W3SE	240	656	143	93808
W4CI	236	624	141	87984
4L1BR	101	578	29	16762
PA3EWP	57	248	52	12896

Single Op, 80 meters

For the Newcomer to Ham Radio

Hurricane Season—What Can You Do if the Worst Happens?

Andrew, Camille, George, Gloria: They're back. Unwanted, uninvited, vicious, and destructive, but we give them names in an effort to bring some sense of sanity to nature's fury. Hurricane season is here.

What can a new ham do to help out? Plenty. When a massive storm hits, as Andrew did in 1992, large areas are devastated with monumental property damage, large numbers of people injured, and some fatalities. Normal communications *may be* disrupted (read, totally knocked out). But what about cell phones? Haven't they changed everything? In such cases, cellular telephones typically are of little use. If the towers are still standing, chances are that power is out. Few, if any, cell towers seem to have emergency power. Without a fully functioning tower in range a cell phone could not be more useless.

Last year we had a "near miss" here. We were without electric power at our house for only about an hour. Cell phone service, however, was disrupted for nearly a day. Incidentally, the local repeaters stayed up. And that was just a near miss. Regular phone service to some of the islands that took direct hits was not totally restored for months. According to local news reports, the only reliable information circuit to some of the islands was ham radio.

Historically, the weather patterns needed to generate these behemoth storms in locations likely to affect the US occur in mid-August to late October. Officially, though, the season runs from June through November. If you live near the eastern seaboard or Gulf coast, you already know this. Even if you do not live in a "target" area, you'll probably hear or see something about one or more of these major storms in the next couple of months.

You do not have to be an alarmist to realize that we are in the midst of a major shift in weather patterns. Statistics bear this out. What we do not know is just what the new emerging patterns will be. More or fewer hurricanes? This comes at a time when our ability to "predict" seems to be improving. Meteorologists

A hurricane is a type of tropical cyclone, which is the general term for all circulating weather systems over tropical waters. Tropical cyclones are classified as follows:

Tropical Depression: An organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 38 mph (33 knots) or less.

Tropical Storm: An organized system of strong thunderstorms with a defined circulation and maximum sustained winds of 39 to 73 mph (34–63 knots).

Hurricane: An intense tropical weather system with a well-defined circulation and maximum sustained winds of 74 mph (64 knots) or higher. These same storms go by the name "typhoon" in the western Pacific and "cyclone" in the Indian Ocean.

Table I—NOAA Storm Classification.

have determined that slight shifts in wind patterns in the Pacific seem to be associated with the formation of hurricanes in the Caribbean 10 to 15 days later. We do live in interesting times. Regardless, once a hurricane (or any other natural disaster) hits, ham radio comes to the forefront.

During disasters, standard public-service circuits (police radio, etc.) quickly become overloaded. That's where ham radio comes in. Hams often provide communications services for law-enforcement and civil authorities on the scene. Here two things are of paramount importance: Your equipment (including antennas) has to be reliable, and you have to be accurate. Officials are only going to come to you if they have to, and that means their circuits have failed or are overloaded. There-

fore, your equipment has to be reliable or they will dump you. In addition, your communication has to be accurate. Inaccurate or ambiguous communications may be worse than none at all.

If you live in an area that is a potential target of one of these monsters, you need to think ahead to what you will need for yourself—auxiliary power (long-lasting batteries or generators), replacement antennas with feedline and connectors ready to go, tools (for instance, a little butane soldering iron could prove invaluable), string, tape, and some large zipper-lock bags are just some of the obvious things that come to mind. In fact, if you have participated in the ARRL's Field Day, you should have a good idea of what you need. If you haven't, a good idea is to join a local club that mounts a Field Day effort each year and volunteer to help.

If you read this just after Field Day this year, there is no need to wait a year. Go join a local club that is active in public-service functions. Most of these groups have checklists prepared that will quickly tell you what you are most likely to need in your area. They also conduct regular training exercises in which you will want to take part. Practice sessions give you experience so you know how to handle almost any communications situation that might come up. That's the key to getting the job done efficiently and accurately when the real thing comes along.

One of the best resources for learning about emergency communications is the ARRL's *Public Service Communications Manual*. It is only \$1 plus shipping and handling from the ARRL (225

Scale Number (category)	Sustained Winds (mph)	Damage	Examples (states affected)
1	74–95	Minimal	Florence 1988 LA Charley 1988 NC
2	96–110	Moderate	Kate 1985 FL Bob 1991 RI
3	111–130	Extensive	Alicia 1983 TX Emily 1993 NC
4	131–155	Extreme	Andrew 1992 FL Hugo 1989 SC
5	>155	Catastrophic	Camille 1969 LA/MS unnamed 1935 FL Keys

Table II—Saffir-Simpson Hurricane Scale.

*123 NW 13th Street, Suite 313, Boca Raton, FL 33432
e-mail: <wb2d@cq-amateur-radio.com>

Test Your "RQ"

Amateur radio has a long tradition of hams taking their responsibility seriously. How responsible are you? How much have you learned already, and on what areas do you need to focus? Patrick E. Hamel, W5THT, devised this tool to help you assess your RQ—responsibility quotient. Test your knowledge of the responsibilities you accepted when you signed your license.

1. You are traveling on an interstate in a car equipped with amateur radio and see a serious accident without police or other trained help at the scene. As a licensed amateur radio operator, it is your responsibility to:

- A. Stop on the side of the interstate and administer CPR.
- B. Keep going and stay out of the way.
- C. Exit at the next off-ramp and get help.
- D. Use any legal frequency or repeater autopatch to summon help.
- E. Change frequency to the local sheriff's department and call them directly.

2. You are in a QSO on your club repeater and an unfamiliar third station calls "Break Break." As an amateur radio operator your responsibility is:

- A. Stop everything and help in the emergency.
- B. Talk over the "CBer with the Stolen Rig."
- C. Tell the new station to stand by until you finish your conversation with the other station.
- D. Ask the new station if they have paid their repeater dues to the club.
- E. Shut down the repeater until the non-member goes away.

3. Assume there has been a hurricane or earthquake in another part of the country. You have a family member in the affected area. The telephones are broken or overloaded. As a ham radio operator you should:

- A. Tune around and call CQ to find someone who can make a call for you.
- B. Check into your local traffic net and see if there are health and welfare messages you can relay or deliver after sending your own message (if incoming health/welfare messages are being accepted).
- C. Fire up the amplifier and try to break into the emergency net to have someone find out if your relative in the affected area is OK.
- D. Keep redialing the telephone to be the first to get through to your relative in the affected area.
- E. File a complaint with the public service commission about the poor telephone service.

4. Assume a disaster has happened in another part of the country. The FCC has declared your normal operating frequency to be for disaster use only. As a licensed amateur radio operator you should:

- A. Call everybody on the original frequency, then move frequency.
- B. Every five minutes, announce on the original frequency which new frequency your net will use.
- C. Listen and see if you can relay messages for the emergency net.
- D. Hold your net as scheduled, just don't use the linear amplifiers.
- E. All of the above.

5. In a disaster situation, what is the purpose of an emergency net?

- A. To provide communications to prevent loss of life and property.
- B. To provide the Red Cross with free communications.
- C. To provide volunteers to go out in the storm and find out if your relatives are OK.
- D. To provide a way for the Civil Defense Director to stay employed.
- E. All of the above.

6. Should a war ever happen, your self-training as an amateur radio operator would allow you to:

- A. Learn to operate a military radio much more quickly if you are drafted.
- B. Listen in on the armies.
- C. Operate a spy radio.
- D. All of the above.
- E. None of the above.

7. Your self-training as a licensed amateur radio operator can:

- A. Save you money by allowing you to build or repair your radios.
- B. Make you money as a broadcast announcer.
- C. Make you money by sending messages to ships at sea.
- D. Let your relatives talk to the "old country" for free.
- E. All of the above.

8. What is "Incoming Health and Welfare Traffic" in a disaster situation?

- A. Requests for blankets and food from Civil Defense in the affected area.
- B. Reports of available blankets and food from Civil Defense outside the affected area.
- C. Lists of names of injured people going to Civil Defense.
- D. Requests from outside the affected area for an operator to check on the status of someone inside the affected area.
- E. All of the above.

9. What is "Formal Traffic" in ham radio?

- A. Messages used as unique wedding announcements.
- B. Messages written down and signed before being sent in a standard way.
- C. Pre-recorded news for amateur operators about amateur radio subjects.
- D. Messages sent by computer-to-radio hookups.
- E. All of the above.

10. In a hurricane, forest fire, or flood disaster, when and for what reason are amateur radio operators most needed?

- A. During the disaster, to man the sandbags.
- B. During the disaster, to drive the professionals around.
- C. After the disaster to fix the cell phone towers.
- D. After the disaster, until the phones are fixed, to provide communications.
- E. During and after the disaster to find local people and answer health and welfare messages.

Answers: 1 = D, 2 = A, 3 = B, 4 = C, 5 = A, 6 = D, 7 = A, 8 = D, 9 = B, 10 = D

(Reprinted courtesy Patrick E. Hamel, W5THT, <phamel@data-sync.com>)

Main Street, Newington, CT 06111). Order a copy of it today and ask them also to send you the free handouts that they have for message handling, net operation, and such. This booklet may be the best buy in ham radio today.

You will need to learn, too, how to properly handle message traffic. ARRL Sections sponsor phone traffic nets (usually on 75 meters in the General portion of the band). Many local groups sponsor 2 meter FM nets that are part

of the ARRL National Traffic System (NTS). A few hours of listening to either of these will give you the basics. After you have listened and gotten the hang of it, check in. Traffic handling is easy and fun, but there is a right way to do it. It just takes a little bit of practice to get it right. You don't have to become a fanatic traffic handler. You do, however, need to learn the basics—now. When a disaster hits, it is really too late to take a cram course.

Maybe you have a packet station already. If so, start looking around on the local BBSes for what is going on in your area. In some areas a lot of the message traffic is handled by packet. Get the hang of sending and receiving messages this way if you haven't already done so. Your local BBS also may be a wealth of information. Some will have files on emergency preparation and disaster drills. You'll probably find other useful resources, too. There are

CQ Amateur Radio

If you enjoy Amateur Radio,
you'll enjoy CQ.



It's a different kind of ham magazine.

Fun to read, interesting from cover to cover, written so you can understand it. That's CQ. Read and enjoyed by over 90,000 people each month in 116 countries around the world.

It's more than just a magazine.
It's an institution.

CQ also sponsors these fourteen world-famous award programs and contests: The CQ World-Wide DX Phone and CW Contests, the CQ WAZ Award, the CQ World-Wide WPX Phone and CW Contests, the CQ World-Wide VHF Contest, the CQ USA-CA Award, the CQ WPX Award, the CQ World-Wide 160 Meter Phone and CW Contests, the CQ World-Wide RTTY Contest, the CQ 5 Band WAZ Award, the CQ DX Award, and the highly acclaimed CQ DX Hall of Fame.

Accept the challenge. Join the fun. Read CQ.

Also available in the Spanish language edition. Write for rates and details

SUBSCRIBE TODAY!

CQ The Radio Amateur's Journal
25 Newbridge Road
Hicksville, New York 11801

Please start my CQ subscription with the next available issue.

Enclose payment or charge information with order. Term and rate (check one):

	USA	VE/XE	Foreign
1 Year	<input type="checkbox"/> 27.95	<input type="checkbox"/> 40.95	<input type="checkbox"/> 52.95
2 Years	<input type="checkbox"/> 49.95	<input type="checkbox"/> 75.95	<input type="checkbox"/> 99.95
3 Years	<input type="checkbox"/> 71.95	<input type="checkbox"/> 110.95	<input type="checkbox"/> 146.95

Name _____

Address _____

City _____

State _____ Zip _____

() Check () M/C () VISA () AMEX () Discover

Card No. _____

Expires _____

Signature _____

(Signature required on all charge orders)

Please allow 6-8 weeks for delivery of first issue.

Phone 516-681-2922

FAX 516-681-2926

www.arrl.org ARRL. Among other things, you can pick up message forms to pass out. You will also get the latest status of communications in and out of the stricken area.

www.redcross.org The Red Cross. Updates on the disaster area and what supplies are needed.

www.nhc.noaa.gov/index.html National Hurricane Center. Most of the TV news departments pick up many of their graphics here. Includes the watch, warning, and strike probability charts, as well as forecasts, technical articles, and historical data.

www.cwbol.com/hurr.html Charles Boley's Hurricanes and Tropical Storms page. This is a wealth of links and storm trivia—worth looking over before you make your appearance on "Who Wants To Be A Millionaire."

www.nws.fsu.edu/buoy Interactive Marine Observations page by the National Weather Service office in Tallahassee, FL. Click on an offshore buoy and find out what the wind speed and wave height are at that location.

www.srh.noaa.gov/tlh/tropical/ The National Weather Service, Tallahassee, FL office Atlantic Tropical Season Page. Provides the current forecast and a "hall of shame" of storms.

goeshp.wwb.noaa.gov National Oceanographic and Atmospheric Administration's Geostationary Satellite Browse Server. Continuously updated photos of the western Atlantic and Caribbean taken from satellites.

www.hurricanehunters.com Hurricane Hunters. Information on the airplanes and crews that fly through tropical storms to gather data for forecasts.

Other useful sites to visit include The Weather Channel, CNN, and newspaper home pages from the major newspapers in the targeted areas. Check out one of the search engines for other significant sources of information.

Table III— Web addresses for storm watchers. (If you have an old-version web browser, you will need to add the http:// prefix.)

a number of simple programs around to track storms, for instance. This would be a good time to download one and learn to use it.

What if you are in the middle of Iowa? Hurricanes hardly ever happen in that area. However, you or your neighbors probably have relatives living in a target zone. When the big one hits, the Smiths are going to want to know how Uncle Bob is doing down in Miami. When the phone lines are out or totally overloaded in the affected area, hams get the messages through. Remember, though, health and welfare messages have the lowest priority in an emergency situation. If things are really bad, such messages will be passed only when the circuits are free of Emergency or Priority messages. They do get through, however, and usually well before the phone lines get restored. In the meantime, Uncle Bob may already have sent messages out of the area to friends and relatives he knew would be concerned about his welfare. There will be messages coming into your area from afar.

We've been focusing on hurricanes, but they are not the only disasters just waiting to happen. In the last two years at least three tornadoes have touched down near the heart of central cities. In two cases (Salt Lake City and Ft. Worth) major damage, injuries, and even fatalities occurred. Until these events happened, weather forecasters believed

that central cities were largely immune to twisters. Again, we see evidence that weather patterns are changing.

If you are going to be involved in disaster preparedness and communications, it would be wise to do a little research on the topic. As with most things in our world, the Internet provides tremendous information resources. In addition to the obvious pages (The Weather Channel and CNN, for instance), there are other pages that will provide you with a wealth of information. Table III lists some of the more interesting ones.

Who knows? Maybe there will be fewer major storms this year. But just in case, why not follow the Boy Scout adage: Be Prepared!

73, Pete, WB2D

Call for Photos and Stories

We'd like to hear from you about your experiences as a newcomer. If you have questions, we'll try to incorporate them into future columns. If you have photos (color prints or slides okay) of your station or antennas, please send them along and we'll publish the best ones. If you have a solution to a common problem that new hams experience, we'd like to hear about it so we can pass it along. You can contact me at <wb2d@cq-amateur-radio.com> or Peter O'Dell, WB2D, Beginner's Corner, 123 NW 13th St., Suite 313, Boca Raton, FL 33432.

Public Service and Emergency Communications

Getting Those Bonus Field Day Points

By far one of the most popular amateur radio operating events is Field Day. While we all know that clubs set up stations in remote locations using emergency power, many do not know how to get those extra bonus points to add to their score. This month we'll take a look at some message-handling techniques for the non-traffic handler that will help your group get up to 200 bonus points, plus other bonuses.

Message Origination

According to the ARRL Field Day rules you get 100 bonus points for origination of a National Traffic System (NTS) style formal message by your group from its site to the ARRL Section Manager or Section Emergency Coordinator. The message should include the club name, number of participants, Field Day location, and number of ARES operators involved with the station.

How many terms in the above paragraph aren't you familiar with? NTS? Formal message? Let's see if we can take the mystery out of some of this.

NTS

Possibly one of the simplest explanations of the National Traffic System is that it is a message relay system designed to pass information accurately from the person sending the message to the person intended to receive the message. Through a series of amateur radio nets, the message is relayed on behalf of the originator to an operator who will be able to deliver the message to the intended receiver. Messages have been passed via the NTS since it was established in 1949.

Message Form

An NTS message form requires specific information in order to have the message delivered. The ARRL NTS form is shown in fig. 1. You don't have to purchase these forms, but it is important that you follow the message format. You'll notice a lot of blocks to be filled in at the top of the form. This is called the "preamble" of the message. It's not an IRS form, so don't get nervous.

c/o CQ magazine

e-mail: <wa3pzo@cq-amateur-radio.com>

NR	PRECEDENCE	HX	CALL	CHECK	PLACE OF ORIGIN	TIME	DATE
1	R		WM3PEN	23	Jenkintown, PA		6/24/00

Joe Ham
Section Manager
123 Main Street
Anytown, PA 19083

Twenty five members of the Holmesburg Amateur Radio Club are operating from Avelthorp Park in Jenkintown Pennsylvania X There are 21 ARES members.

Fig. 1— NTS Message Form. You don't need to buy them from the ARRL; just be sure to follow this format.

Message Number: All messages have a number. The number is assigned by the first amateur putting the message into the National Traffic System. Many people active in traffic handling start with message number one each January. For some club calls this is the only message they originate each year. Just remember the sequence of numbers is not important. If you are receiving a message from another ham radio operator, then you must use the number given to you. You do not put in your own number.

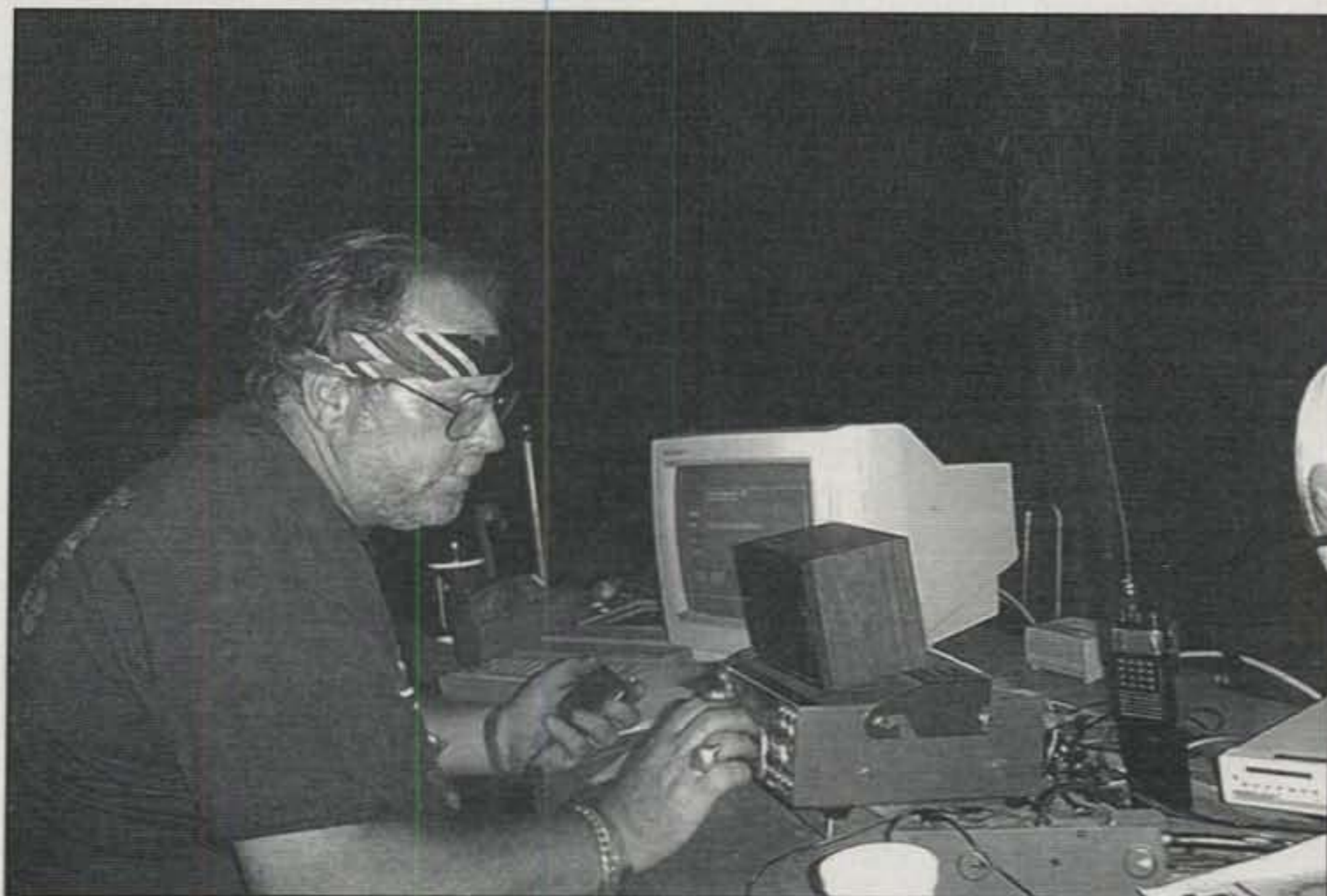
Precedence: This tells you how important the message is. Most messages

passed are *routine* in nature; in that case you would put an "R" in the box.

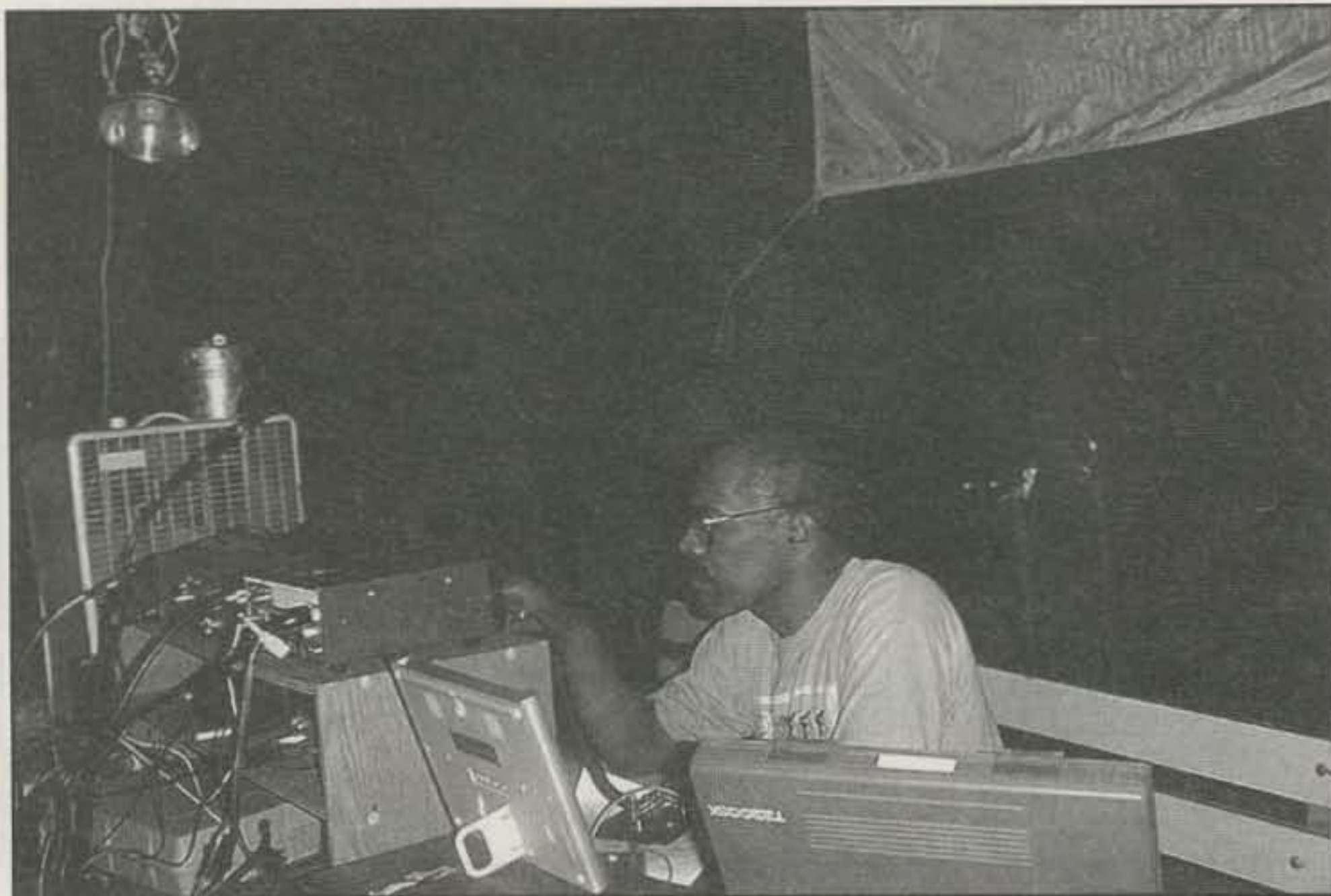
Handling Instructions: This is an optional box and is not needed for Field Day activity.

Station of Origin: This is the callsign of the amateur who first introduces the message into the NTS System. For Field Day put your club call there.

Check: This is a count of the number of words in the message. Only count the underlined words in our example (fig. 1). If your message has several sentences in it, the letter "X" is used in place of a period. Let's figure out what we put in the Check box.



Ron Slattery, KB3AAJ, makes contacts from a public park pavilion. (WA3PZO photo)



Fans, computers, and radios, etc., all should be considered when calculating generator loads. Operator is Charlye Johnson, K3CJ. (WA3PZO photo)

Twenty five members of the Holmesburg Amateur Radio Club are operating from Avelthorp Park in Jenkintown Pennsylvania X There are 21 ARES members.

There are 23 words in the above message. The "X" is counted as a word. Notice the difference in count when a number is spelled out (twenty five counts as two words) and when it is written as a figure (21 counts as one).

Place of Origin: This is the city and state of the party originating the message. For Field Day this is the town from which you are operating. In our example it's Jenkintown, Pennsylvania.

Time Filed: This is UTC/GMT time the message is placed into the National Traffic System. Many operators consider this field to be optional for routine messages.

Date: Just like the time, this is the date the message is first placed into the system. Make sure the date matches the UTC time.

Well, that took care of the hardest part of the message. If you understood everything so far, the rest will be easy.

Where's the Message Going?

This is where you put the address of the person to whom you are sending the message. If you don't know who the ARRL Section Manager or Section Emergency Coordinator for your ARRL Section is, you can find the Section Manager information in the beginning of *QST* magazine or on the ARRL web site: <www.arrl.org>. The Section Emer-

gency Coordinator generally can be found in the "Section Activities" column.

Prior to Field Day many Section Managers and Section Emergency Coordinators will supply information as to what club call they will be using, or they might supply a packet address to send their messages to. Remember, they also may be participating in Field Day and probably are not home. Chances are the Net Control Station will know where to send the message even if you don't.

For your message to count, use a message similar to our example. The important thing is to remember to include all of the required information. As a final step, the message should be signed by the club president, the Field Day chairman, or the operator passing the message.

Sending the Message

At this point you have your message all written out and you are ready to send the message to get your bonus points. Now what?

Most ARRL sections have their section or state net on 75 meters. If you are not familiar with CW net operation, stick with the phone nets. Many of the nets meet around the dinner hour. Again, if you are not sure when your section net meets, check with your Section Manager. You can also look up the information in the *ARRL Net Directory*. Maybe there is a local ham who regularly passes traffic. If the net time isn't convenient, you might be able to make arrangements to send the message at another

time. Local VHF nets may also be able to handle your message. Remember, this is a quick 100 bonus points, so it's worth some planning.

Picking Up a Microphone

You found a traffic net that's in the phone portion of the band. You don't have to worry that your CW is a "little rusty." For the past several hours you have been yelling into the mic "CQ Field Day! CQ Field Day!" You've been writing down those calls as fast as you can and exchanging reports with other Field Day stations. You've stopped to pass the 100-point bonus message, but you really want to get back to making contacts. What is the biggest mistake you are going to make?...

Talking Too Fast

This is by far one of the biggest mistakes that newcomers to traffic handling make. Remember that the person to whom you are sending the message is writing down the information. He (or she) probably is not experienced in shorthand. The again, those who are aware that the person is writing down the information seem to send the information too slowly.

There are two ways of pacing yourself. One is to listen to an experienced operator and follow his lead. The other is to write down your own message while you are sending it. If you can write it down, you probably are speaking at the right pace.

Don't read the message from one end to the other without pausing between each section. There is going to be a lot of activity on the band, and the receiving station may need a "fill" or repeat of a certain section of the message. If a fill is needed, the receiving operator will ask that you repeat or fill in all specific words, such as "all after Pennsylvania" or "word before Park." Just repeat that part of the message and go on with the remainder of the message.

Packet Passing

Here's an area to check on with the sysop of your local packet bulletin board. Each bulletin board software has its own way of doing things. Here are two ways that should work, but again, check in advance.

The easy way is if the Section Manager supplies his packet address. Your packet message header might look like ST W3XYZ@WA3BBS. For local messages this is all the first line of your packet message should need. The *Subject* could be Field Day message, and the

Bonus Points (from the ARRL Field Day rules)

7.3.1. 100% Emergency Power: 100 bonus points per transmitter classification if all contacts are made only using an emergency power source. Free transmitters that do not count towards the group's total do not qualify for bonus point credit. All transmitting equipment at the site must operate from a power source completely independent of the commercial power mains to qualify. (Example: A club operating three transmitters plus a Novice station and using 100% emergency power receives 300 bonus points.)

7.3.2. Media Publicity: 100 bonus points may be earned for attempting to obtain publicity from the local media. A copy of the press release, or a copy of the actual media publicity received (newspaper article, etc.) must be submitted to claim the points.

7.3.3. 100 bonus points for physically locating the Field Day operation in a public place (shopping center, community park, school campus). The intent is for amateur radio to be on display to the public.

7.3.4. 100 bonus points for a Public Information Table at the Field Day site. The purpose is to make appropriate handouts and information available to the visiting public at the site. Submission of a visitor's log, copies of club handouts, or photos are sufficient evidence for claiming this bonus.

7.3.5. Message Origination: 100 bonus points for origination of a National Traffic System (NTS) style formal message to the ARRL Section Manager or Section Emergency Coordinator by your group from its site. You should include the club name, number of participants, Field Day location, and number of ARES operators involved with your station. The message must be transmitted during the Field Day period, and a fully serviced copy of it must be included in your submission, in standard ARRL NTS format, or no credit will be given.

7.3.6. Message Relay: 10 points for each formal NTS-style message received and relayed during the Field Day period, up to a maximum of 100 points total. Properly serviced copies of each message must be included with the Field Day report.

Body of the message has to be the complete NTS format we covered above.

If you're not sure of the packet address of the Section Manager, you can send a packet message to his zip code @NTSST (where ST is the two-letter postal code of your state)—for example, ST 19083@NTSPA. The subject and body of the message are the same.

E-Mail A No-No!

Remember we are getting credit for sending the message via amateur radio. Do not get on your favorite computer and send the message directly to the Section Manager's e-mail address.

It's Easy...

Okay, we gave you a real quick and basic guide to sending that Field Day message. Listen around on the Traffic Nets. Ask some questions. If you have any last-minute questions on traffic handling you can send me an e-mail.

Even if you never learn any more about traffic handling and the National Traffic System, you will do just fine. By the time you send and receive a few messages you will have the procedures memorized. When Field Day is over, you can learn more about one of amateur radio's traditions—passing messages.

Additional Bonus Points

Originating a Field day message is only

one way in which your club can earn bonus points during this event. See the box "Bonus Points," taken from the ARRL's Field Day rules, for all the ways in which you can earn these points.

Probably the most basic of Field Day bonus points is achieved through the use of emergency power. For some this might be your first exposure to using a generator. Make sure you know how to handle your group's generator. Know ahead of time if it uses oil. What type of gas does it use? How many gallons of gas are used per hour? You want to keep extra gas on hand, but store it in a safe place. Power cords running from the generator to an operating position should be designed for outdoor use and for carrying the electrical load that will be on the line. When figuring out your amperage needs, make sure you include all equipment, not just the radios. Are you using a lamp, computer, fan, or refrigerator? How about a broadcast radio to monitor weather conditions? All of these additional items have to be considered when evaluating your power requirements.

A public information table set up at the Field Day site will earn you 100 bonus points, and it is fairly simple to put together. Have available some general information on ham radio and your club. The ARRL has information available on its web site: <www.arrl.org>. If you are looking for ideas for a club

brochure, take a look at the Brightleaf Amateur Radio Club (North Carolina) web site: <<http://www.qsl.net/w4amc/#Brochure>>. Here they have their brochure, which can be printed out.

I hope this very quick tour of Field Day bonus points has helped. Let me know how you made out.

Mini Activations

As you are having fun on Field Day, remember that you are participating in a "mini-activation." You'll have fun, get some fresh air, have a few good laughs, and tell the story about the one contact that got away. Let's remember, though, that we're going out into the field to learn how to operate in an emergency situation. A fun day on a marathon could all of a sudden turn into a communication emergency as a runner falls to the ground from exhaustion or worse. A simple parade could have an older band member collapse and die on the parade route. Public-service events are one of the best forms of training for responding to emergency situations.

Have a good time operating Field Day, and keep your stories and photos coming in. Until next time...

73, Bob, WA3PZO

Shortwave Receivers Past & Present

Communications Receivers 1942-1997



- New 3rd Ed.
- 108 Chapters
- 472 Pages
- 840 Photos
- Printed 03/98
- Covers 1942 to 1997.
- 770 Receivers
- 660 Variants
- Includes 98 U.S. and Intl. manufacturers
- Only \$24.95

This huge 472 page Third Edition includes over 770 shortwave and amateur communications receivers made from 1942 to 1997. Here is everything you need to know as a radio collector or informed receiver buyer. Entry information includes: receiver type, date sold, photograph, size & weight, features, reviews, specifications, new & used values, variants, value rating and availability. Ninety eight worldwide manufacturers are represented. 840 Photos. Become an instant receiver expert!

**universal
radio inc.**

Universal Radio

6830 Americana Pkwy.
Reynoldsburg, OH 43068

◆ Orders: 800 431-3939

◆ Info: 614 866-4267

www.universal-radio.com

Have You Tried Silent Sport Mobiling?

Looking to experience something a bit different and unique in your amateur radio activities? Like to go a few steps beyond traditional mobiling and enjoy some good, health-conscious exercise in the process? Well, friends, bicycle mobiling could easily be the perfect answer. It's a terrific way to enjoy the back-road and off-road beauties of nature, plus there are no problems with ignition noise or on-board computers to hamper your operations. Yes, and being a bicycle mobile station really captures attention on the air. It's almost like being DX!

You say you've heard some folks talk about two-wheel mobiling but assumed they just were using a handheld FM talkie while biking? That's only one of the many aspects of silent sport hamming. Working the HF bands is a world of its own, and it is rapidly growing in popularity. How do you set up and operate a bicycle mobile station? That's the focus of this month's column, and thanks to our guests John Cumming, VE3JC, and Mike Mauldin, K5NU, we have some outstanding "show and tell" views of two different concepts in bicycle mobiling to share with you. It promises to be a captivating study, so let's get rolling, so to speak!

The Why and How Of Bicycle Mobile

In addition to the fresh-air and health-promoting aspects of two-wheel mobiling, many amateurs find it an ideal answer for getting on the air from an antenna-restricted apartment or condo. The overall concept here is simple yet effective: You just charge the setup's battery, and then roll a pre-tuned and ready-to-operate station out the door and go for the QSOs. A brief jaunt to a nearby rise or hilltop gives your signal a mild boost, plus you can hit the bands with far less distractions than when motoring on busy roads. It's like a micro vacation for hamming!

Although every bicycle mobile setup is different, they all have some similarities and they all fall into one or two gen-



Photo 1— The trim, effective bicycle mobile setup of John Cumming, VE3JC, Ontario, Canada. The QRP Plus transceiver fits in the handlebar bag, and the 7 amp rechargeable battery rides in a rear pannier bag. The Outbacker antenna is mounted to an aluminum extension tube made from a surplus antenna element. Two black clamps visible between the seat and handlebar secure the tube to the frame. (Photos 1–4 courtesy VE3JC)



Photo 2— John, VE3JC, with his bicycle mobile setup in operation. The boom mic attached to the helmet supports hands-free operation, and an audio deflector atop the transceiver directs sound toward John's ears.

eral categories: VHF/UHF setups and HF or "low band" setups. In the VHF/UHF category, the quickest and easiest to use arrangement is a belt-strapped FM talkie and a lapel-clipped speaker microphone for communicating "hamfest shopper style." This "body mounted rig" concept ensures maximum shock absorption, protects your prized rig, and gives you the flexibility to continue a QSO when leaving the bicycle.

In a more elaborate VHF/UHF setup, a talkie or a fancy mobile transceiver is carried in a padded travel bag attached

to the bicycle's handlebar. A mobile antenna and a rechargeable gel cell or sealed lead-acid battery are also attached to the bicycle's frame, and right-interconnecting cables are strapped to the bicycle. A boom-mounted microphone affixed to a bicycle helmet, an earbud microphone or two for no-strain listening, and a Push-to-Talk switch on the handlebar round out the setup. The latter idea of mounting an antenna, battery, and interconnecting cables directly to the bicycle also works great for HF mobiling. Think about those two rig-

4941 Scenic View Drive, Birmingham, AL 35210



Photo 3— This rear view shows the Outbacker, its mount, and the extension tube from another angle. Notice the PL259 at the antenna's base for quick removal. Look carefully, and you can see the antenna and battery cables secured to the frame.

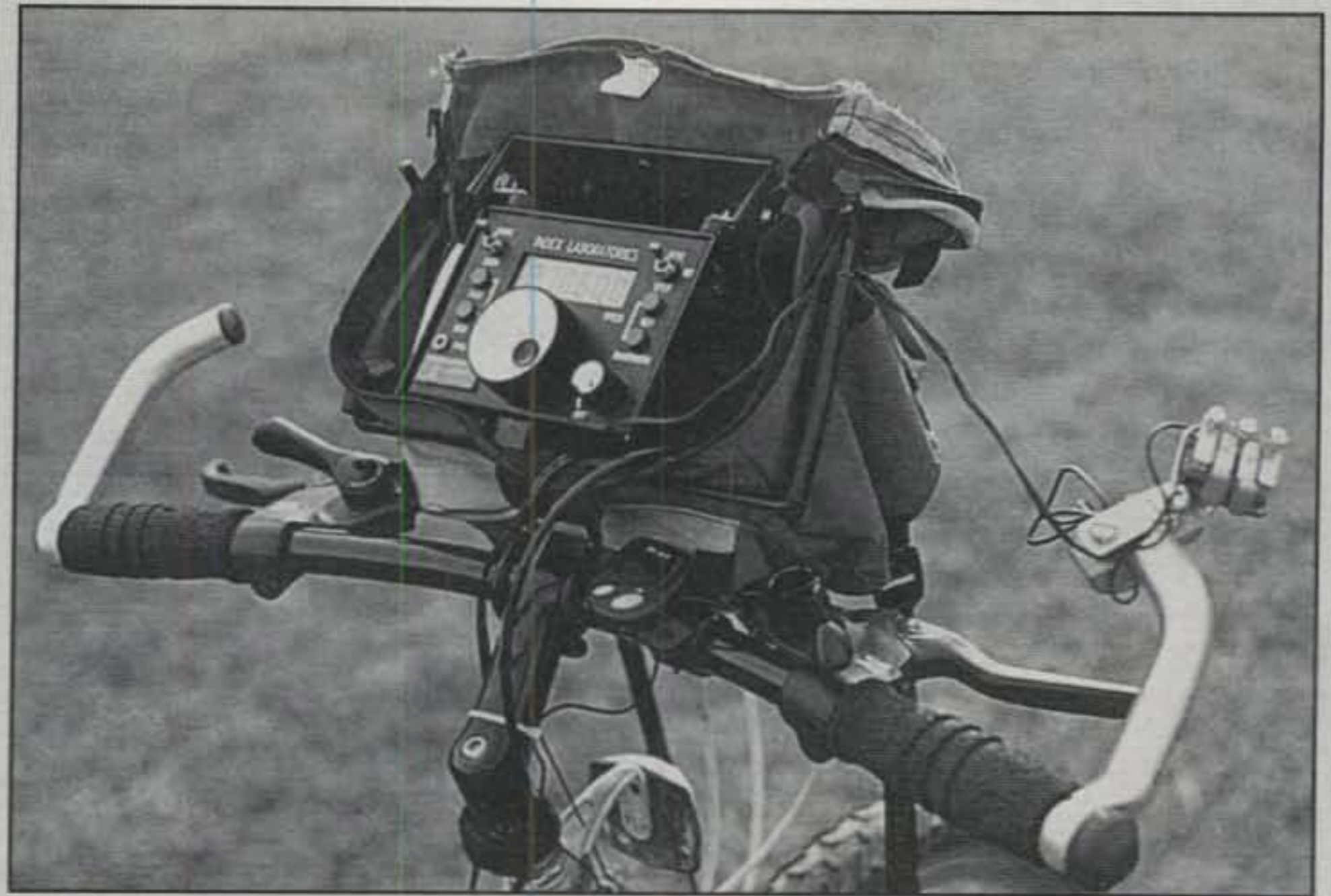


Photo 4— The rider's view of this setup shows the QRP Plus with top-mounted audio deflector and a "Little Red Paddle" from W3MKE next to the brake lever on the handlebar.

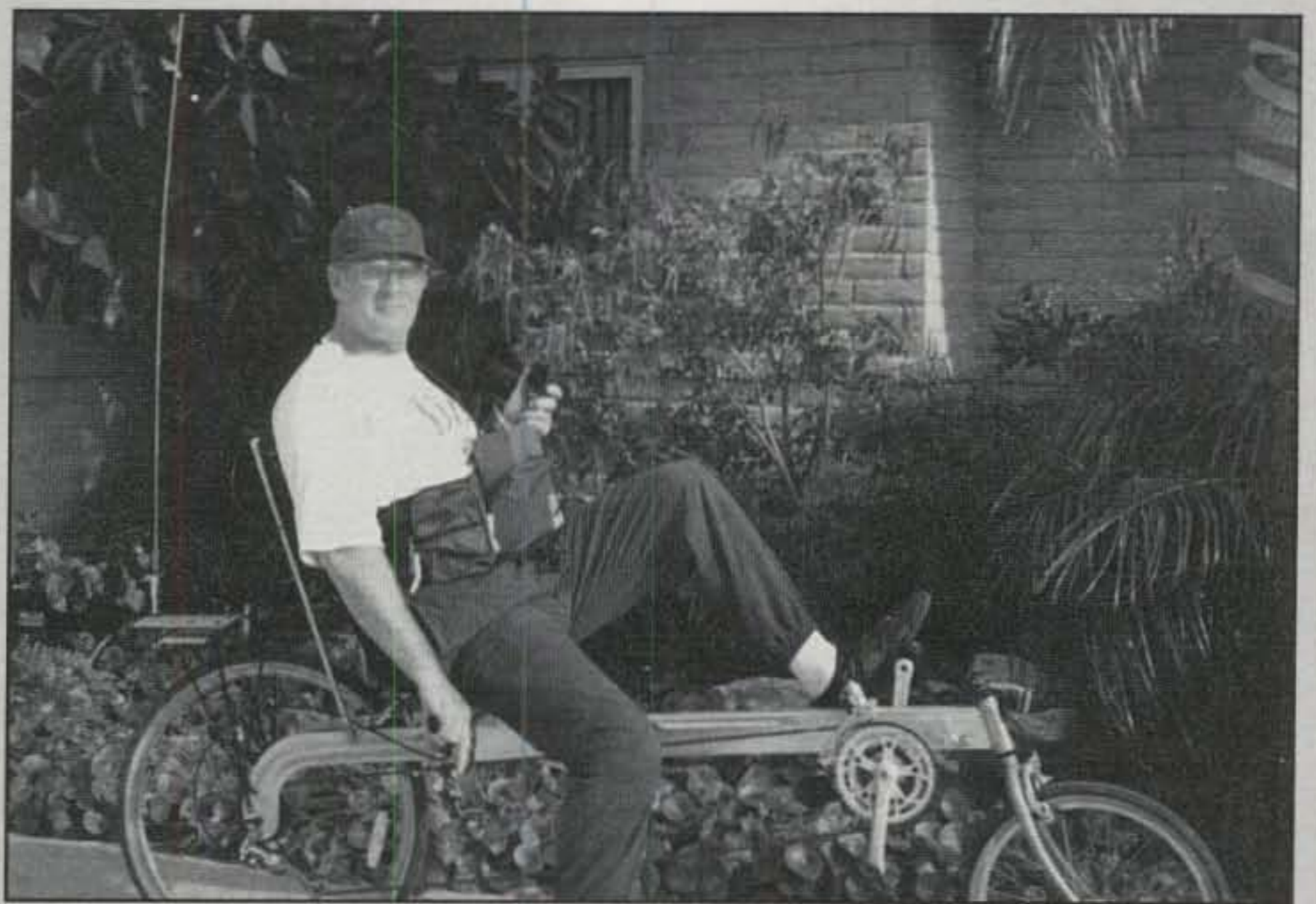


Photo 5— The Linear recumbent bicycle mobile setup of Mike Mauldin, K5NU, captures attention while "working out" like a champ. Mike rides the bike with his legs extended forward and his arms dropped down to the below-seat handlebar. (Photos 5–8 courtesy K5NU)

mounting options, and then decide if your own transceiver can survive mild vibrations or if it should be cushioned by a body strap or mount.

What type of battery is used with an HF setup? That depends on the rig's output power and your estimated operating time between battery charges. That also explains why most bicycle mobileers favor QRP. A small 7 or 8 amp gel cell usually will power a 5 watt rig for a full weekend of hamming. A larger and much heavier 30 or 40 amp lead-acid battery is required to power even an ultra-compact 100 watt transceiver for three or four hours of operation. Balancing bicycle weight and avoiding exposure to excessive RF radiation also becomes challenging at this point, so most folks take the QRP trail. They report very good success, too. (That bicycle mobile designation adds 10 dB of clout to calls!) Is there a bicycle mobile setup in your future? The best way to answer that question is by

looking at a couple of neat bicycle mobiles and considering how their owners did it. Read on!

Rolling Out with VE3JC

By combining an 18-speed "Canadian Tire" bicycle, the Index Labs QRP Plus SSB/CW transceiver, and Outbacker's "Perth" antenna, John Cumming, VE3JC, put together the neat setup you

see in photos 1, 2, 3, and 4. The rig and antenna work 80 through 10 meters, including the WARC bands, pumping out a clean 5 watt signal on CW and 2 watts on SSB. With this setup John has made QSOs on all eight bands, many of them two-way QRP, with most U.S. states and a number of DX areas. Some contacts were on SSB and some were on CW; some were while he was in

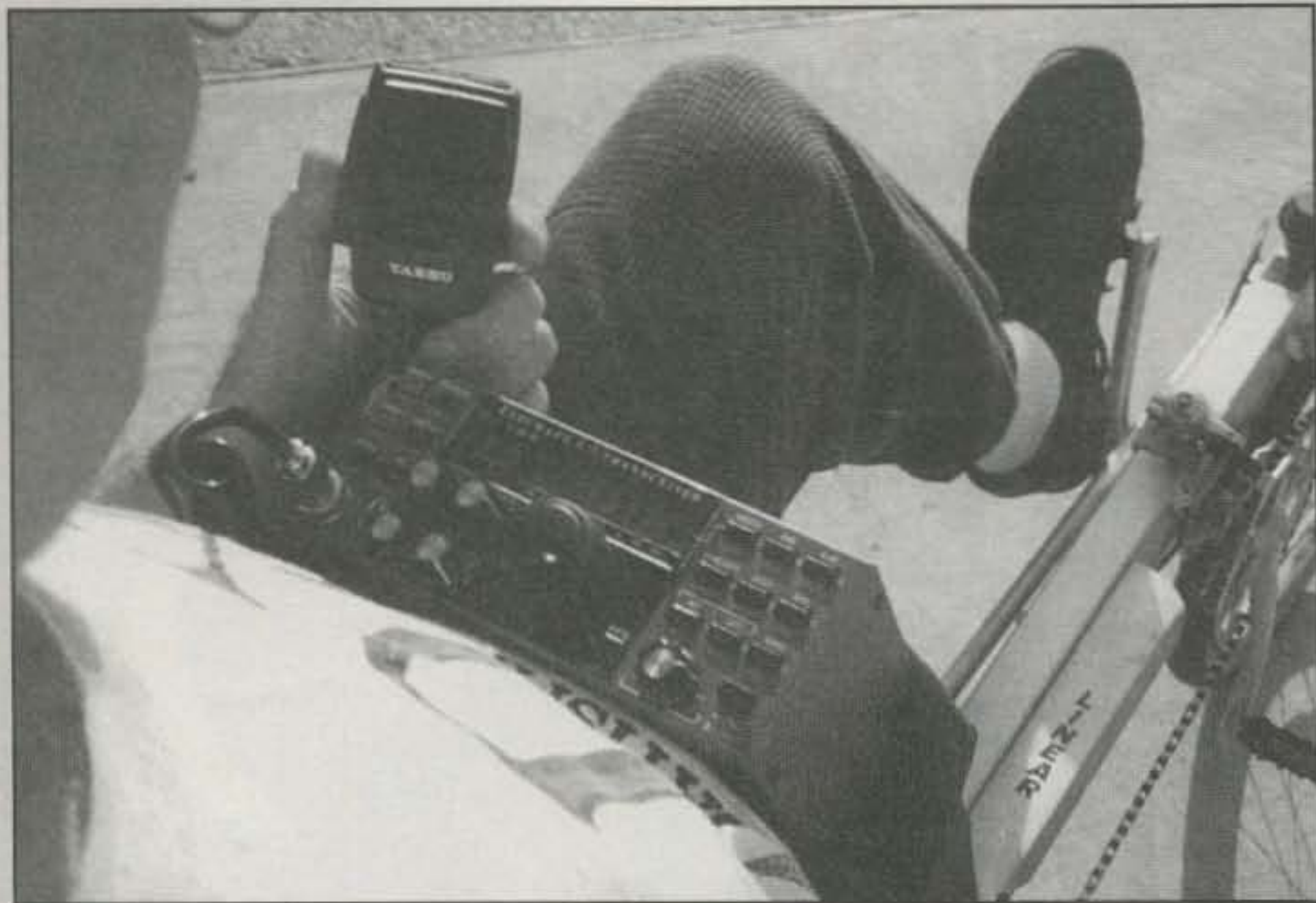


Photo 6—As this over-the-shoulder view reveals, Mike carries his new Elecraft K2 transceiver in a waist-strapped pouch rather than mounting it on the bicycle. Mike's body thus cushions the rig from road vibrations.

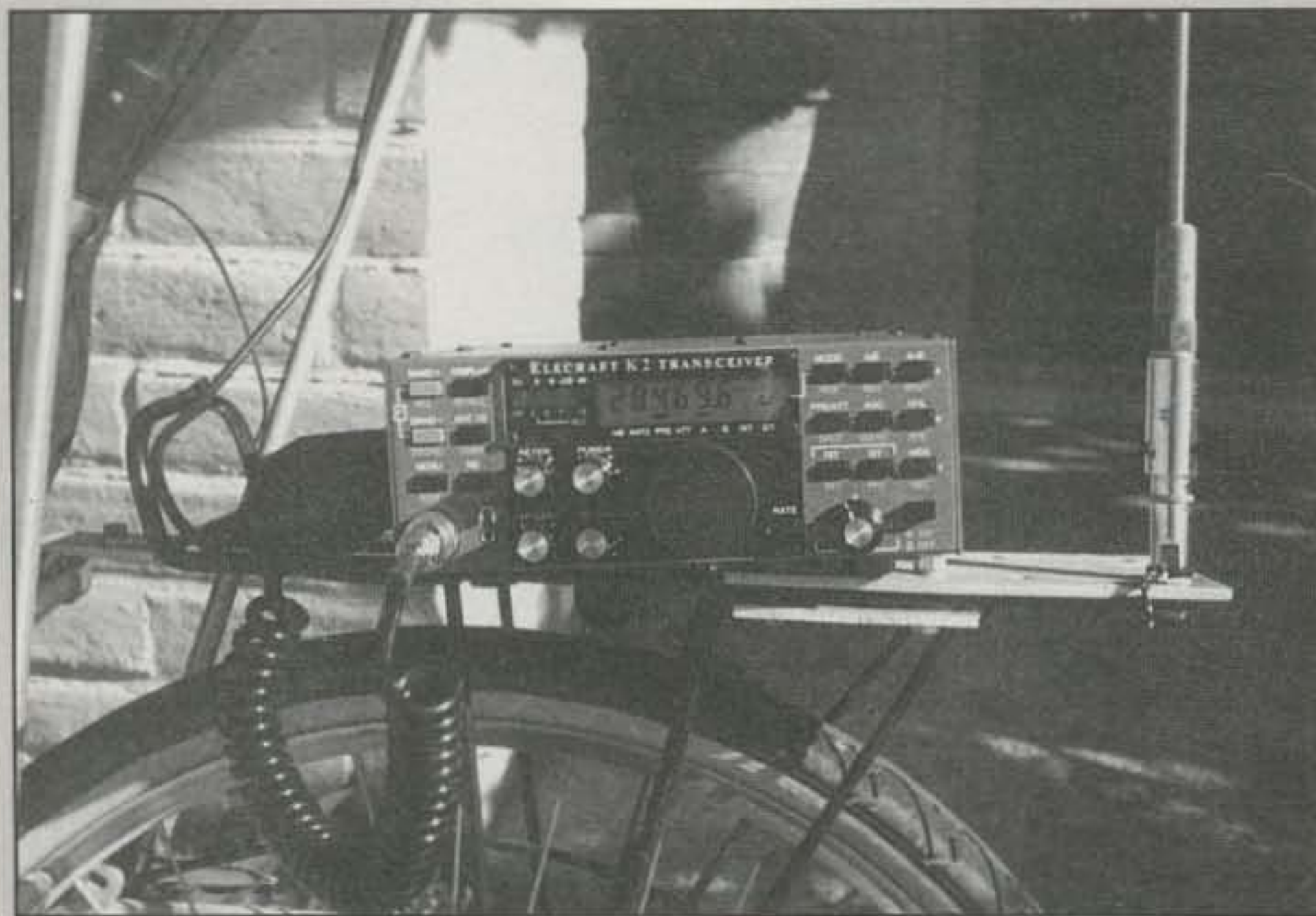


Photo 7—K5NU shows us the elegant simplicity of bicycle mobiling. All you need is a transceiver with built-in battery pack, microphone, whip antenna—and a bicycle. In addition to the Elecraft K2, MFJ's "9000 series" transceivers and Wilderness Radio's "SSTs" also have room for a small internal battery pack.

motion, and some were while he was stopped along country roads.

When asked about some of his more memorable QSOs, John recalled working Russ, KB8U/Bicycle Mobile, for a two-way bicycle mobile QSO. Considering the rarity of two-wheel mobiles, that bike-to-bike QSO had to be something very special! Six months later, John met Russ at the famed

Bicycle Mobile Hams of America bike ride held during the Dayton Hamvention. They were two of 16 participants at that annual event (which, incidentally, attracts bicycle mobileers from all over). John says that due to heavy business demands, his biking is limited to occasional rides during weekends and early evenings. He strives, however, to make a few QSOs

every week—even through the cold Canadian winters.

Looking at John's setup, we find some quite interesting points of study. Notice in photos 1 and 2, for example, how the handlebar-located transceiver is protected from inclement weather by an insulated carry bag. Notice, too, that the padded bag is the rig's primary form of shock absorption. Operating power is supplied by a 12 volt, 7 amp-hour battery nestled into one of the rear pannier bags. The Outbacker antenna is located behind the bicycle's rear wheel. It is supported by an aluminum extension tube that acts as a counterpoise and improves overall antenna efficiency. The aluminum extension also gives the antenna a bit more clear space to radiate plus minimizes kicking its lower section when getting on and off the bicycle. It is secured to the bicycle's frame with accessory clamps originally used for carrying bicycle "U" locks used on wheels. By releasing the clamps and disconnecting the PL259 at the antenna's base, the complete antenna and extension tube assembly can be removed in less than a minute.

After making a series of checks and comparisons, John reports his bicycle mobile setup usually works out as well as a regular QRP station at the home QTH—and that's a good recommendation from any standpoint.

K5NU "Easy Rider" Mobile

Next up is the Linear recumbent bicycle mobile setup of Mike Mauldin, K5NU, shown in photos 5, 6, 7, and 8. What is a Linear recumbent bike?

"Linear" is the bicycle manufacturer's name, and "recumbent" refers to its position for riding—sitting slightly reclined with feet forward for pedaling. Where is the handlebar on this two-wheel wonder? It's below the seat. The rider's arms drop down vertically to steer the bike. Mike says it may look unusual, but it actually is quite a comfortable position, especially for riding long distances and operating a rig. Needless to say, it really catches attention, especially with that tall whip swinging on the back. That's real radio fun for sure!

Rather than mounting the transceiver directly to the bicycle and subjecting it to bumps in the road, Mike wears his rig in a waist-strapped pouch-type mount. His body thus cushions vibrations so the transceiver is protected like it is on a feather (tummy?) bed. The setup, incidentally, consists of a little Elecraft K2 all-band transceiver with optional built-in battery pack, microphone, and whip antenna.

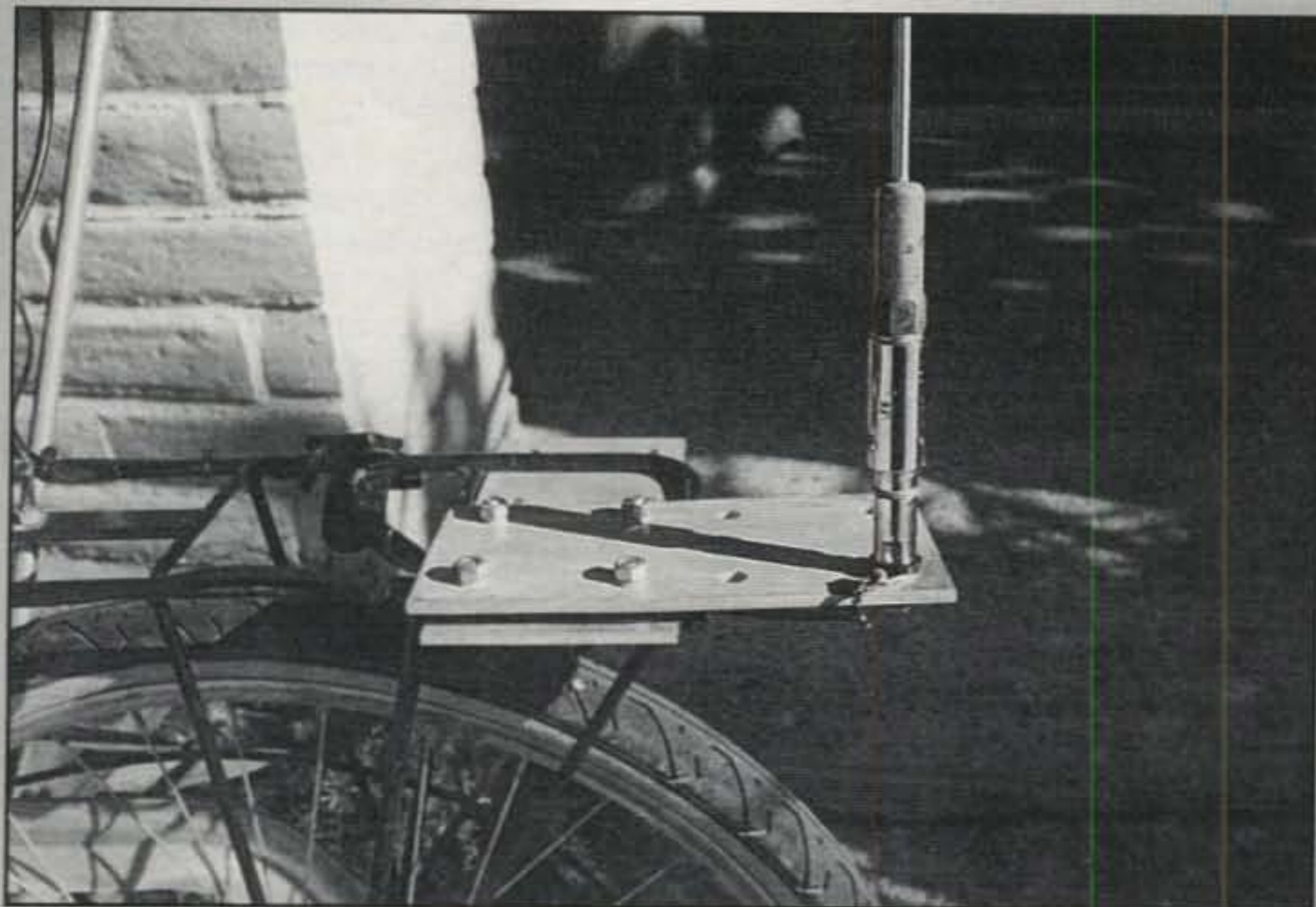


Photo 8— The bicycle's antenna mount is fabricated from two boom-to-mast plates from a surplus antenna. It bolts to the bicycle's rear rack, and its mating coax feedline is strapped to the frame. Note the quick disconnect on whip for easy removal.



Photo 9— Want to go for a big glitz and glamour image (need we ask)? Here is the perfect starting point—a genuine Mercedes-Benz "Sport Cruiser" bicycle. This two-wheel masterpiece boasts attractive retro design, full suspension system, and tilt handlebar, and it even breaks down to fit in a compact carry case. Add rig, battery, and antenna, and you have a dream setup!

Notice the versatility of this arrangement. With a battery inside the K2's cabinet, the rig is capable of "stand alone" operation almost anywhere. Mike simply connects the antenna and microphone, and he's ready for big-time hamming. When he returns home from an afternoon ride, he just disconnects the

antenna cable from the transceiver and walks indoors. He can even sit down in an easy chair, connect an extension cable from his home rig's beam, and continue an ongoing QSO or chase DX on the spot.

Speaking of DX, Mike is doing very well with his bicycle mobile setup. As of

Champion Radio Wear

High Quality T-Shirts,
made in U.S.A.,
pre-shrunk 100% cotton



RADIO
SWEATSHIRTS
ARE NOW
AVAILABLE!

Now you can order your favorite CQ shirt design in a high-quality sweatshirt!

All sizes and designs are available



To Order Toll Free
Call (888) 833-3104

or visit
<http://www.championradio.com>
for additional designs

December 1999 he had been on only six rides, but he had worked all continents and 18 countries. Remember, too, that was with 5 watts and a whip. Mike also echoes VE3JC in that most folks say he is the first bicycle mobile they have heard or worked. That reminds me of those unique submarine maritime mobile stations. You might hear one in ten years if you are lucky, and working one is a fascinating experience—especially if a photo of the ship is on the QSL.

Mike says he is having a ball with his unusual setup, and we agree whole

heartedly. The first time I heard him on the air, he was working DX like a big wheel on 10 meters SSB. What was the secret? His antenna was a full quarter-wave tall whip on the bike and its full frame was serving as a counterpoise. Now that's what we call an effective signal radiator. Good show, Mike!

Going First Class

Thinking about putting together a blowout bicycle mobile setup "from the ground up"? Well, friends, the perfect starting point beckons to you from photo

9. This most attractive bicycle is a genuine Mercedes Benz "Sport Cruiser." It is built with the same precision, reliability, and sheer "clout" of a Mercedes automobile, and it is available through Mercedes dealers worldwide. All it takes to own one is money—\$2800, to be exact. Yes, and for a few dollars more you can add the optional riding jacket with cargo pockets, utility rack and pack with Mercedes emblem, and official Mercedes sunglasses with interchangeable lenses in the deal. Complement that with a new K2 transceiver with all the trimmings plus an Outbacker antenna, and you're ready to knock 'em dead in person or on the bands. The total cost? Don't ask. I lost count back at the bicycle!

BMHA

Want to learn more about bicycle mobiling and meet some really terrific folks at the same time? Check out the Bicycle Mobile Hams of America. This group is into two-wheel hamming in a big way, and its quarterly club newsletter is always loaded with great tips and clever antenna ideas. In fact, several of their recent articles on "no ground required" 2 meter J-pole antennas are dandy for bicycles and non-metallic/composite-body cars alike. Other ideas on keys, boom mics, and various homebrew antennas, plus bicycle maintenance and events such as the annual BMHA ride held during the Dayton Hamvention are also in the newsletter. The BMHA net meets on the first and third Sundays of each month on 14.253 MHz at 2000 UTC and again at 0000 UTC. Net control is usually Mike, NFØN, or Jim, AE6N. BMHA also meets informally each Tuesday evening at 2000 UTC on 7.042 MHz. This CW net especially listens for weak signals that may be new bicycle mobileers.

Club membership is \$10 a year and goes to BMHA, Box 4009, Boulder, CO 80306. Send a large SASE with two stamps to BMHA for a sample newsletter, look for their big forum at Dayton annually, and join the fun!

Wrap Up

That winds down our views for this time, gang, and we trust it inspired your creative thinking on the diverse possibilities of unique mobiling. Hopefully it also motivated you to listen carefully for weaker than usual mobiles and bicycle mobileers. Stay tuned for Part II next month, as we'll have some notes on setting up a "vehicle" mobile station.

73, Dave, K4TWJ

Amplifiers. ATU Down Converters & Hard to Find Parts

Celebrating 20 Years 1979-1999

<p>LINEAR AMPLIFIERS</p> <p>HF Amplifiers PC board and complete parts list for HF amplifiers described in the Motorola Application Notes and Engineering Bulletins:</p> <p>AN779H (20W) AN 758 (300W) AN779L (20W) AR313 (300W) AN 762 (140W) EB27A (300W) EB63 (140W) EB104 (600W) AR305 (300W) AR347 (1000W)</p>	<p>2 Meter Amplifiers (144-148 MHz) (Kit or Wired and Tested)</p> <p>35W - Model 335A, \$79.95/\$109.95 75W - Model 875A, \$119.95/\$159.95</p>	<p>HARD TO FIND PARTS</p> <ul style="list-style-type: none"> • RF Power Transistors • Broadband HF Transformers • Chip Caps - Kemet/ATC • Metalclad Mica Caps - Unelco/Semco • ARCO/SPRAGUE Trimmer Capacitors <p>We can get you virtually any RF transistor! Call us for "strange" hard to find parts!</p>
--	--	---

ATU Down Converters
(Kit or Wired and Tested)

Model ATV-3 (420-450)
(Ga AS - FET) \$49.95/\$69.95
Model ATV-4 (902-926)
(GaAS - FET) \$59.95/\$79.95

ADDITIONAL ITEMS

Heat Sink Material
Model 99 Heat Sink (6.5" x 12" x 1.6"), \$25
CHS-8 Copper Spreader (8" x 6" x 3/8"), \$24
Low Pass Filters (up to 300W)
for harmonics \$12.95
Specify 10M, 15M, 20M, 40M, 80M or 160M
HF Splitters and Combiners up to 2KW

For detailed information and prices call or write for our free catalog!

Phone (937) 426-8600
FAX (937) 429-3811

508 Millstone Drive • Beavercreek, Ohio 45434-5840
e-mail: cci.dayton@pobox.com
www.communication-concepts.com

CIRCLE 47 ON READER SERVICE CARD

LARGEST HAMFEST IN THE NORTHEAST U.S.A. MONROE COUNTY FAIRGROUNDS - ROCHESTER, NY

1200
Flea Market
Spaces!

Rochester HAMFEST

150
Exhibitor
Booths

Atlantic Division ARRL Convention June 2-3-4

HQ HOTEL: Marriott Thruway Hotel
Call Marriott direct for reservations: 716-359-1800
For all other hotels call our travel office: 800-724-2046

FLEA MARKET: \$10 per 10' x 20' space for all 3 days
TICKETS: \$7 Advance, \$9 Door

Mail Ticket Orders To: Jack Tripp, N2SNL, 51 Musket Lane, Pittsford, NY 14534
Make checks payable: Rochester Hamfest. Visa and Mastercard accepted.

EXHIBIT SPACE: Call the Hamfest Office during business hours

PHONE: 716-424-7184 FAX: 716-424-7130

Rochester Hamfest 300 White Spruce Blvd., Rochester, NY 14623

WEB SITE: www.rochesterhamfest.org

Email: info@rochesterhamfest.org

Flea Market & Exhibitor Booths Now Open All 3 Days!
Flea Market open for setup at 6a.m. Friday - Come early and stay late!

A New Column for A New Century

In case you missed the last two months of *CQ*, we'd like to remind you that the "Digital Dipole" column has a new name. As we explained, we'll no longer focus strictly on antennas, antenna accessories, software, computers, and books. Instead, we'll tackle a broad array of exciting products and items of interest as we examine "What's New" in amateur radio.

This month we'll focus on radio gear, antennas and accessories for the shack, portable and mobile goodies, new stuff on the Internet, and books. Once again, a hearty welcome to "What's New"!

Radio Gear You Can Use

Kachina Communications 505RC Remote Control System. In trying to answer the question "Why use knobs if you have Windows®?" the computer-based Kachina 505DSP HF Transceiver is making quite an impression in amateur radio circles, as it substitutes mouse clicks and menus for conventional radio tuning knobs.

Now Kachina Communications offers an advanced accessory for the transceiver, the 505RC Remote Control System. The unit lets you exercise full remote control of the Kachina 505DSP HF Transceiver and the KC105 Computer-Controlled Transceiver over dial-up telephone lines or wire links. The 505RC supports most 505DSP transceiver functions; extra ports allow control of up to two serial accessories, such as an amplifier, antenna rotor, or other serially-controlled device, simultaneously. This considerable capability lets you locate your transceiver far from your control site, with all the potential benefits from doing so.

With the new unit, control data are interleaved with digitized audio and passed through the telephone network using standard V.34 external modems. The good news is you don't have to modify your Kachina radio; you can have remote control of your rig just by attaching the 505RC to it.

The basic 505RC Remote Control System is \$298. For additional information, contact Kachina Communications, Inc., P.O. Box 1949, Cottonwood, AZ 86326 (520-634-7828; e-mail:

*289 Poplar Drive, Millbrook, AL 35054-1674
e-mail: <w8fx@cq-amateur-radio.com>



Kachina Communications offers an advanced accessory for its transceivers, the 505RC Remote Control System. The unit lets you exercise full remote control of the Kachina 505DSP and the KC105 Computer-Controlled Transceiver over dial-up telephone lines. This capability lets you locate your transceiver far from the control site, if you so choose (Photo from the Kachina Communications website at <<http://www.kachina-az.com>>)

<sales@kachina-az.com>; web: <<http://www.kachina-az.com>>).

Palstar R30 World Band Radio Receiver. As we noted in August 1998, Paul Hrivnak, VE3UP/W8, for more than 20 years has offered a variety of electronic products for the TV and amateur markets through several of his companies. In 1979 Paul started Viewstar, which produced cable TV devices and an amateur HF amplifier. He founded Vectronics in 1988, and in so doing produced several "private branded" products for AEA and MFJ.

Paul got back into the amateur radio manufacturing business with Palstar, Inc. It makes a number of quality amateur products—notably antenna tuners, filters, baluns, dummy loads, variable capacitors, turns counters, and other RF accessories. Now Palstar has branched out with its introduction of the R30 World Band Shortwave Receiver. The R30 is a compact, high-performance radio capable of receiving multimode signals in the range 100 kHz through 30 MHz. The radio offers excellent strong-signal handling capability, high sensitivity, and dynamic range sufficient to eliminate annoying intermodulation interference. The radio also features 100 programmable memories, variable rate tuning, and switchable bandwidths in all modes.

The R30 receiver is well-suited to portable use, as it's equipped with an



Palstar has introduced the new R30 World Band Shortwave Receiver. The R30 is a compact, high-performance radio capable of receiving multimode signals in the range 100 kHz through 30 MHz. It provides excellent strong-signal handling, high sensitivity, and dynamic range to eliminate annoying intermodulation interference. The radio also features 100 programmable memories, variable rate tuning, and switchable bandwidths in all modes. (Photo from the Palstar website at <<http://www.palstarinc.com>>)

internal battery pack consisting of ten AA cells that automatically connect to the radio when the external adapter plug is disconnected. The R30's suggested retail price is \$499.95; the R30C, with Collins filters, is \$599.95.

For more info, contact Palstar, Inc., 9676 N. Looney Road, P.O. Box 1136, Piqua, OH 45356 (937-773-6255; e-mail: <Palstar@erinet.com>; web: <<http://www.palstarinc.com>>). Many new products, in addition to the R30 receiver, are profiled on the attractive Palstar website.

Antennas and Accessories For the Shack

NCG/Comet RF Bug™. Japan-based Comet Antennas and its American distributor, NCG Companies, have been doing business with radio amateurs for years. NCG has a large manufacturing and distribution center in Anaheim, California. The extensive amateur product line includes monoband, dualband, and triband antennas along with band combiners (splitters, duplexers, and triplexers) for all combinations of frequency splits. Other products offered by NCG include power/SWR meters and NCG's own Power Pocket, a special battery pack and charger combination.

In March we reported on NCG's expanded online presence. Now we'd

Now In Seattle!
RADIO DEPOT

ALINCO
ELECTRONICS INC.

KENWOOD

ICOM

YAESU

ADI ASTRON BENCHER
COMET CUSHCRAFT
HEIL KANTRONICS LARSEN
MAHA MIRAGE MFJ
AND MORE

www.hammall.com
1-800-291-9067

(206)763-2936 Local/Info

Competitive prices • Friendly service
Prompt shipping at reasonable cost
5963 Corson Ave. South, #176
Seattle, WA 98108

M-F 10:00am-6:00pm Pacific
Sat. 10:00am-5:00pm

CIRCLE 83 ON READER SERVICE CARD

IT'S HERE!!!

PROLOG2K

For Windows 95/98/2000

You've been waiting, and now, here it is! ProLog2K for Windows with: 36 Logbooks, tracking for all major awards, Rig Control, DX Packet Cluster, support for all CDROM databases, our exclusive 71,000 QSL Route Database and much more! Visit our website and see it for yourself. ProLog2K: \$49.95. With QSL Route Database: \$64.00. DOS ProLog upgrade to ProLog2K for Windows: \$25.00. DX add \$6.00. VISA, MC, AMEX and Discover accepted.

DATAMATRIX

5560 Jackson Loop NE Rio Rancho, NM 87124
Info: (505)-892-5669 Orders Only: 1-(800)-373-6564
Email: prolog@rt66.com
Web: <http://www.qth.com/prolog>

NEW! PK-232/DSP
Multi-Mode Data Controller

For the Best Copy from
Weak Signals in Heavy QRM

- Twin Peak RTTY filters
- Adaptive Pactor filters
- Brickwall filters for Amtor, CW & Packet

Upgrade your PK-232 or PK-232MBX to get the same DSP performance as the new PK-232/DSP.

PK-900/DSP UPGRADE KITS NOW AVAILABLE!

No Y2K problems with PK-Term'99!

New terminal program for all Timewave/AEA TNCs

Timewave's DSP-599zx and the
NEW PK-232/DSP offer DSP technology
that your DSP radio can't match!

TIMEWAVE
TECHNOLOGY INC.

58 E. Plato Blvd., St. Paul, MN 55107 USA
sales@timewave.com • www.timewave.com
651-222-4858 • FAX 651-222-4861

CIRCLE 90 ON READER SERVICE CARD

like to draw your attention to a small, inexpensive device, the RF Bug, which the company recently introduced. The interesting little gizmo is silent but provides clear visual confirmation of strong RF signals around us, from about 2 MHz up. The unit "gets excited" when it detects RF, setting in motion six "chasing LEDs" to visually announce its presence, such as RF from nearby cell phones, cordless telephones, amateur radio or other transmitters, some remote controls and garage-door openers, and the like. You can even use the RF Bug to sniff out and expose nearby hidden transmitters.

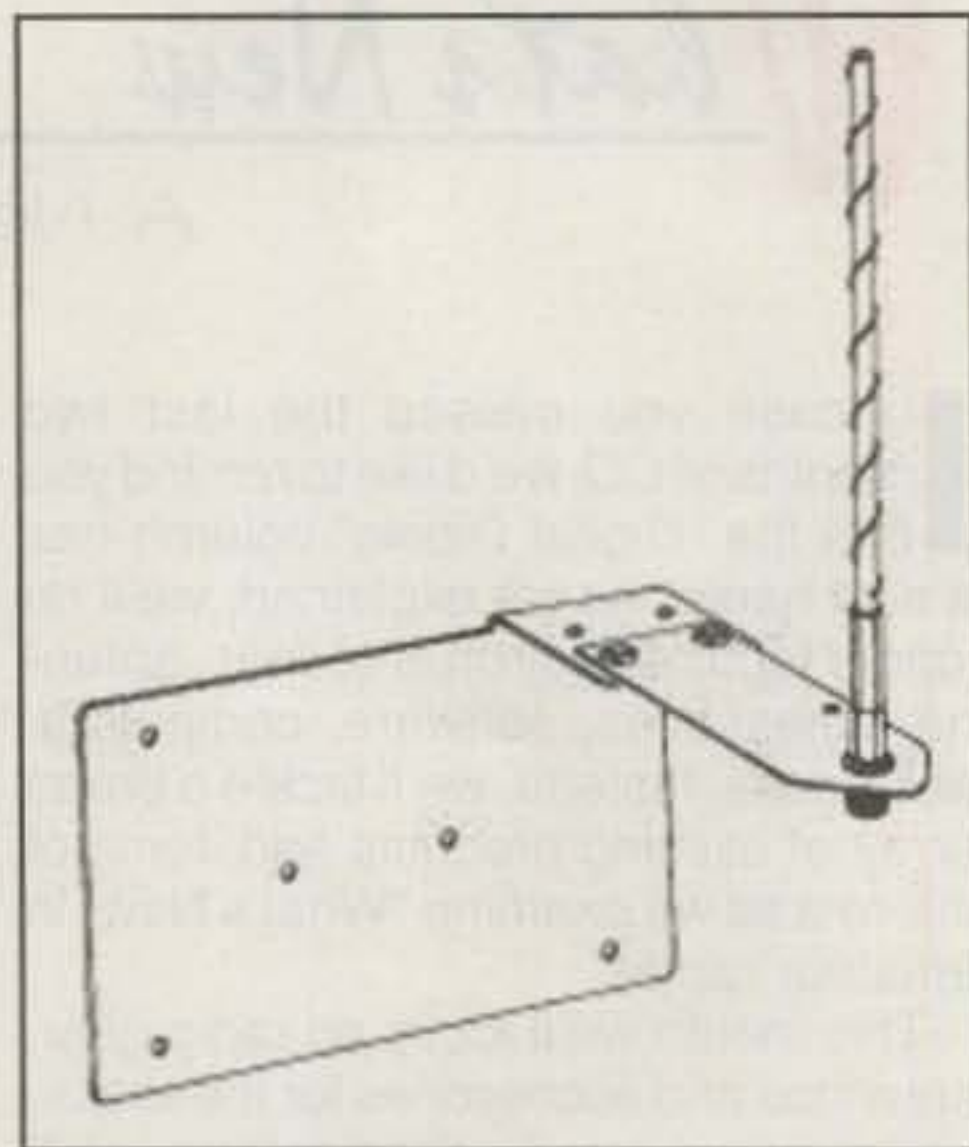
Laptop computer users with digital messaging can use the RF Bug to detect messages. The device can detect the laptop's reply to the sender, setting the unit's lights in motion; ditto for cell and PCS phones. You might also use the RF Bug as a coaxial-cable or microwave-oven RF leak detector, among other uses.

The RF Bug is available direct from NCG Company or from selected dealers at a suggested list price of \$15.95. You can get it with either a red case or a blue case; a carry strap is provided with the RF Bug. Contact NCG Companies, 1275 North Grove Street, Anaheim, CA 92806 (phone 714-630-4541; e-mail: <micks@cometantenna.com>; on the web: <<http://www.cometantenna.com>>).

Note: The RF Bug has its own e-mail address and website. Check out <micks@rffbug.com> or <micks@www.rffbug.com>, respectively, for information.

Hi-Res Communications Universal Peak Detector Circuit. Hi-Res Communications probably is best known to most readers as the publisher of the Collins Video Library series. The videotape series includes a number of general-interest, repair, maintenance, modification, restoration, and operating videos on legendary Collins radio equipment.

Now proprietor Floyd Soo, W8RO, has come up with the new PDC-1 Universal Peak Detector Circuit, designed for use with analog wattmeters. The unit can be especially useful for QRP and AM enthusiasts, who may find such circuitry practically indispensable for obtaining accurate voice peak readings. The new, universal peak-hold circuit converts any averaging type wattmeter to a peak-reading wattmeter. The circuit has an adjustable time constant ("hang time") for the meter's needle, over the range 1/10 second to 10 seconds. Meter calibration and accuracy remain unchanged after you insert the PDC-1 circuit inside your wattmeter. Installation



The Lakeview Company's TM-1 License Plate Mount is a timely product, what with the increasing difficulty of effectively, safely, and easily attaching amateur antennas to modern automobiles. The mount attaches to your vehicle behind the license plate, in a place that is unlikely to cause any damage. (Photo from Lakeview's website at <<http://www.hamstick.com>>)

is simple: All that's required is a DPDT switch to switch the circuit in and out of the line from the wattmeter's circuitry to the meter itself, and a power connection (6.3 VAC for use with Collins 312B-4/5 station consoles, or 6-12 VDC for use with other meters). The small unit fits neatly inside most wattmeters without any modification.

The PDC-1 circuit was designed by C. J. Hawley, KE9UW, for use in Collins 312B-4/5 consoles, but it can be matched to any conventional average-reading wattmeter. Floyd, W8RO, reports that many PDC-1's have been installed successfully in Bird, Drake, MFJ, Daiwa, Ten-Tec, Heathkit, and Nye Viking wattmeters, among others. The unit is available in ready-to-assemble form directly from Hi-Res Communications for \$19.99 postpaid in the USA.

For more info, contact Hi-Res Communications, Inc., 8232 Woodview Dr., Clarkston, MI 48348-4058 (248-391-6660; e-mail: <info@hi-rescom.com>; web: <<http://www.hi-rescom.com>>).

Portable and Mobile Goodies

Lakeview Company TM-1 License Plate Mount. On several occasions we've profiled the extensive product line of inexpensive, high-quality fixed-station and mobile antennas and accessories made by Lakeview Company of Anderson, South Carolina, currently un-



Billed as "the world's most reliable flashlight," Light Technology, Inc. has introduced a new, miniature flashlight that has no conventional light bulb to burn out when you most need it. Instead, the palm-size, 3 inch long flashlight uses a white LED. Known as the PAL Survival Light, it weighs less than 3 ounces, yet it throws an intense beam of almost pure white light. (Photo courtesy Light Technology, Inc.)

der the direction of Mike Swass, KJ6XE. The company's latest eight-page flyer features several new or improved products of interest to antenna buffs.

One of the most promising among them is the new TM-1 License Plate

Mount. This, indeed, is a product whose time has come, what with the increasing difficulty of effectively, safely, and easily attaching amateur antennas to modern automobiles. The mount attaches to most vehicles fairly easily. The TM-1's main plate attaches securely between the license plate and the bumper or trunk lid, in a place that is unlikely to cause any damage to the vehicle. The unit is made from heavy-duty stainless steel; a sturdy horizontal "tongue," or lip, protrudes from the bottom of the TM-1, which accommodates a standard 3/8 inch x 24 threaded antenna connector.

The provided connector includes an SO-239 type coax jack on the opposite end to accept a standard PL-259 coax connector. The package also contains a ground strap, an assortment of nuts and bolts, and a "short and sweet" set of assembly instructions.

Does the TM-1 do the job? Yes, indeed, and it's of rugged battleship construction. However, depending on your vehicle, you may have to improvise some installation details, or in some circumstances drill a hole in your bumper

or the license-plate-mount assembly.

The TM-1 is \$44.95 plus s/h. For more information or a catalog, contact Lakeview Co., Inc., 3620-9A Whitehall Rd., Anderson, SC 29626 (864-226-6990; e-mail: <hamstick@hamstick.com>; web: <http://www.hamstick.com>.

PALight Miniature Flashlights. The world certainly is changing. Now we have what might properly be described as "hi-tech flashlights"! Billed as "the world's most reliable flashlight," Light Technology, Inc., of Sarasota, Florida, has introduced a new, miniature flashlight that has no conventional light bulb to burn out when you most need it. Instead, the palm-size, 3 inch long flashlight uses a white LED.

Known as the PAL Survival Light, it weighs less than 3 ounces, yet it throws an intense beam of almost pure white light. Small enough for purse, pocket, glove compartment, toolbox, or briefcase, it features four distinct light modes: low beam, high beam, flashing strobe light (for location and emergency signaling purposes), and a standby mode (which provides a sort of "pilot light" function that remains illuminated while the switch is turned off, as it would be in a purse or darkened room).

Using built-in proprietary microcircuitry to regulate power consumption, the moisture- and shock-resistant PAL Survival Light's standard 9 volt battery reportedly will last more than 20 times as long as the batteries in a standard flashlight. It has a textured, rubber-like casing that makes it easy to hold onto.

The \$19.95 light (plus s/h and applicable tax) comes with a 9 volt battery and a limited lifetime warranty covering the LED light source and associated circuitry. It's standard with a black casing; five other colors also are available. A similar "Sure Model" has slightly different features; it lacks the flashing strobe light and is \$17.95. A black web holster, black lanyard case, and engraving services also are available.

For more information, contact Light Technology, Inc., 571 Interstate Blvd., Sarasota, FL 34240 (1-888-593-7873; e-mail: <PalLights@aol.com>; web: <http://www.lighttechnology.com>).

Pickup Truck Antenna Mount For Trucks with Stake Pockets
The Ideal Pickup Mount
Maximum Radiation
Maximum Strength
No Visible Drilling
Works with ATAS-100,
Outbacker, Hamstick, Hustler
CB Whip, Comet, Diamond, Loops, etc.
Anchors Securely in Stake Pocket

GeoTool
PMB 414 - 1280 Bison Ave B-9
Newport Beach, CA 92660
(949) 759-3166
http://www.geotool.com
info@geotool.com

**Ford-Chevy
Dodge-Ranger
Mazda-Toyota**
3/8"24, NMO, SO-239
Grounded Stud Mounts
\$44.95
to
\$59.95

CIRCLE 62 ON READER SERVICE CARD

5 BAND QUAD
\$289 2 Element Complete
Complete Antennas From 20 Meters Through 70cm
Many Models To Choose From
UPS Shippable

Lightning Bolt Antennas
RD#2, RT 19, Volant, PA 16156
724-530-7396 FAX 724-530-6796
http://lbq.isrv.com

- Microprocessor Controlled
- 150 Watts
- 160 to 10 Meters
- Dual Cross Needle Meters
- 3 Seconds Average Tune Time
- IC-706 Interface
- 12 VDC, 500mA
- Tunes All Coax Fed Antennas
- Optional Remote Control Head
- Optional Balun Tunes Long Wire, Random Length Antennas

AT-11MP Antenna Tuner
"The new standard in desktop autotuners!"

LDG ELECTRONICS
Secure Ordering Online:
www.ldgelectronics.com

LDG Electronics, Inc.
1445 Parran Rd.
St. Leonard, MD 20685
Toll Free Sales: 877-890-3003
Support: 410-586-2177
Fax: 410-586-8475
E-Mail: ldg@ldgelectronics.com

Only From

Kit: \$169
Kit with Enclosures: \$199
Fully Assembled: \$239
Remote Head Kit: \$29
Remote Head Assembled: \$39
Balun Kit / Assembled: \$25 / \$30

CIRCLE 70 ON READER SERVICE CARD

New on the Net

QSLCard.Com™. What will they think of next? QSL cards on the Internet? Yes, they're here, a couple of thousand of them already having been posted online, and for some good reasons.

As the QSLCard.com website suggests, there are some things about conventional QSL cards that are inconvenient. They cost you money to print and

mail out; you often have to wait a long time for stations to send you their card; and if your address or any characteristics of your station change, you have to reprint your cards. You know the drill, which is not technology-intensive.

Now there is at least one all-purpose alternative means of creating, sending, and receiving QSL cards—electronically. You can use QSLCard.Com, in which you invite stations to "QSL via QSLCard.Com" and then enter the information about the QSO into the personal online logbook the website provides.

The idea is that the radio amateurs you talk with will come to the website, enter the date and band of your QSO, and retrieve your QSL card for their contact. The cards are standard-size, and they can be printed out. You, of course, can do the same with the other fellow's card. The site includes a growing collection of free and moderately-priced photos and logos for your cards.

Check out the QSLCard.Com website at, of course, <<http://qslcard.com>>.

From the Bookshelf

Harley Hahn Teaches the Internet, Second Edition. In recent columns

we've noted the many excellent books Macmillan Publishing USA offers to help you become familiar with almost any aspect of PCs, software, and the Internet. Macmillan, with its many trademarked imprints (Que, Sams Publishing, New Riders, etc.), is rapidly introducing a bevy of new net-related titles.

This month we'd like to mention a title of special interest to new Internet users, one we initially profiled in June of last year and which recently has been updated to reflect rapidly changing Internet technology. It's an exceptionally readable Que® book, *Harley Hahn Teaches the Internet, Second Edition*. The 501-page, year 2000 book is by respected Internet guru Harley Hahn. He's the bestselling author of *Harley Hahn's Internet & Web Yellow Pages*, and reportedly has sold more than 2,000,000 computer and Internet books to date.

As one of the books in Macmillan's popular "author teaches" series, the new edition, priced at \$19.99, delivers straightforward, humorous, and informal advice on ramping up on the Internet. Included in the updated edition is "Harley Hahn's Internet Sampler," a 30-page

catalog of 100 useful but fun items to help you get started on the net. The sampler is intended to give new Internet users a real taste of what the net and the millions of people who use it have to offer.

The Hahn book, which I especially recommend if you've yet to seriously test the Internet waters, is available in local bookstores, or contact Macmillan Publishing USA, 201 West 103rd St., Indianapolis, IN 46290-1097 (1-800-858-7674) for a free computer books catalog. E-mail: <info@mcp.com>; web: <<http://www.mcp.com>>.

Note: The book's author also has a personal website at <<http://www.harley.com>>. There you'll find many interesting supplemental resources, including an "Internet Exploration Station" and "Navigation Center" to help you cruise around the net.

Wrap-Up

That's all for this time, gang. Next time more "What's New." See you then.

Overheard: Having trouble "getting ahead" of the power curve? Well, bear in mind that you can't really get ahead until you actually get started!

73, Karl, W8FX

Antenna Books Special!

Get all 4 for \$54.95

McCoy on Antennas

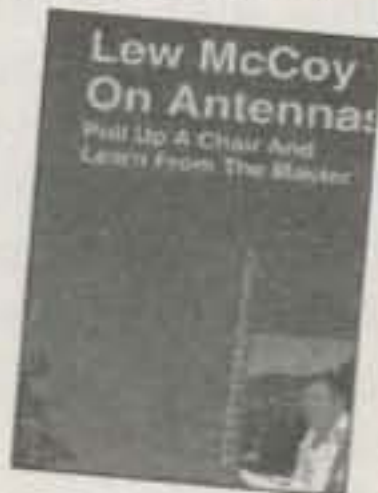
by Lew McCoy, W1ICP

Unlike many technical publications, Lew presents his invaluable antenna information in a casual, non-intimidating way for anyone!

Order No. MCCOY

Usually

\$15.95



The Quad Antenna

by Bob Haviland, W4MB

Second Printing

An authoritative book on the design, construction, characteristics and applications of quad antennas.

Usually

\$15.95



W6SAI HF Antenna Handbook

by Bill Orr, W6SAI

Inexpensive, practical antenna projects that work! Guides you through the building of wire, loop, Yagi and vertical antennas.

Usually

\$19.95

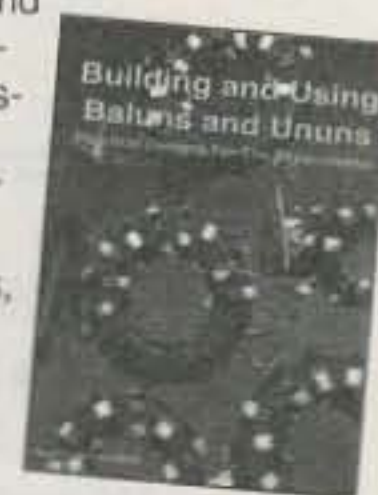
Building and Using Baluns and Ununs

by Jerry Sevick, W2FMI

This volume is the source for the latest information and designs on transmission line transformer theory. Discover new applications for dipoles, yagis, log periodics, beverages, antenna tuners, and countless other examples.

Usually

\$19.95



Name _____ Callsign _____

Street Address _____

City _____ State _____ Zip _____

Qty	Item #	Description	Price	Total Price
	ANT4	All 4 Antenna Books		
U.S. and possessions - add \$4 shipping/handling. Foreign - shipping/handling charges are calculated by order weight & destination and added to your total.			Shipping/Handling	
			Total	

Method of payment Check Money Order Visa MasterCard Discover American Express

Credit Card No. _____ Expiration date _____



CQ Communications Inc., 25 Newbridge Rd., Hicksville, NY 11801/516-681-2922; Fax 516-681-2926

All About The World Above HF

Six Meters Starts To Play Big Time!

The most excitement during the months of March and April was the increased activity on 6 meters. Due to the increase in solar activity, 6 meters is finally showing some life. Among the reports I have received (both directly and via the internet) are the following:

Steve, VE7SL: "Finally the 'real' 6 meter black hole was treated to some short, but exciting F2 the weekend (of March 15). Worked the following from CN88: ZL2TPY, ZL2AGI, ZL4AAA, HK3YH, LU3DZK, LU9AEA, LU2DEK, LU3EMK, LU2EG, LU1DZK, LU6DRV, LU6DLB (59+20 dB with 10 watts), CX2AAL, CX1DDO, CX6ACY, CX8BE."

John, W5UWB (EL17ax): "April continues to be good to the south/southwest. On March 28 I worked LW5EJU, CX9DK, ZL2AGI, and ZL2KT."

Mike Foubister, ZL3TIC (RE66): "At 2100Z March 15, ZL2KT and ZL2AGI worked EH8BYR on 50.115 MHz. The distance was 18210 km! The band also was open to KP4. I worked WP4O."

On April 2 Mike wrote: "Gentlemen, good opening into ZL today. I worked the following: WP4O, KP4EKG, heard PY5CC in a major pile-up, KP4JN, KB6SL/KP4, TG9NX, ZF1DC, ZL3TY, ZL2TPY (all on backscatter); heard ZL4AAA, ZL2KT, and ZL2AGI all working EH7KW but no sign of EH7KW here. Also worked KG6KH, N5WS, W5OF, W3XO, W5FF, KC8CC, AA7A, KF7NP, KC6NDI, K7NSI, WB8VLC, N6LCI, N6CA, K6DV, XE2EED, and KP4UK." The next day Mike worked another two dozen stations, including NØJK/KH8 and V31PC, and he also heard H44PT very weakly.

On the other end of the circuit, **John, W5UWB**, worked about a dozen ZL stations and LU1YBB. He reported that ZL4LV was into his QTH (EL17) for over an hour.

On 5 April **Oscar Morales, CO2OJ**, wrote the following: "Today in the afternoon I got my first-ever F2 opening. Worked several stations from New Zealand and one from Australia, including ZL3TY, VK3AMG, ZL3ADT, ZL3GS,

VHF Plus Calendar

June 2	New Moon and Moon perigee.
June 2-4	HamCom Convention, Arlington, TX (see text)
June 4	Highest Moon declination; Moderate EME conditions
June 8	First quarter Moon
June 9	Arietids and Zeta Perseids meteor shower peaks
June 10-12	ARRL VHF QSO Party
June 11	Moderate EME conditions
June 16	Full Moon
June 17	Moon apogee
June 17-18	SMIRK 6 meter contest (see text)
June 18	Lowest Moon declination; very poor EME conditions
June 24	Last quarter Moon
June 24-25	ARRL Field Day (see text)
June 25	Moderate EME conditions

• EME conditions courtesy W5LUU.

ZL3AAU, ZL4LV, ZL3TIC, and ZL3JT. For the last several weeks I have been reading all the posts from Ed, WP4O, so today, as soon as I got home from work, I turned on the 6 meter rig, pointed the antenna to the Pacific, and called CQ. Almost immediately ZL3TY answered my call and gave me a fantastic 55. And the fun started. I'm really excited. Hope everybody made the big QSO today too. PS: All QSOs were with only 15 watts into a 4-element Yagi."

April 6-7 Aurora-F2 Opening Excites 2 and 6 meter Ops

Elsewhere in this month's column you will find a sidebar from Ken Neubeck, WB2AMU, commenting on his successful activities during the night of April 6th through the early morning hours of the 7th. It was, indeed, a great time for those fortunate enough to be on the air on these two bands during that evening. Here are some of the other reports to surface.

Frank Moorhus, AA2DR, faxed me the following: "Worked the following on aurora: VE3TMG, VE3MZZ, K8TQK, and K8DAZ. Worked the following on F2: KH3TSA, KH3PJ, KH3GKE, HP3XUG, HP2CWB, HC5K, and HK4SAN. All contacts on 6 meters."

Doug Beck, K6ZX (CN82gm): "Best aurora ever. I worked K7IEY, N7NW, K7NQ, AA7VT, W7FHI, N7EPD, and K7CW. Pretty well worked out Seattle. Heard K7ND, N6YM, and K7AYP."

Jerry, W9FS: "How about having a two-way on voice while mobile? I worked W3EP running the M² Squalo and an IC-706 at 100W; got a 5x2. I have never heard of anyone working a two-way via voice, with one being a mobile."

Mark Brown, KBØPYO: "Interesting AU conditions tonight. Heard several of the East Coast stations (K1UHF, K1TEO, W3EP, etc.), but very weak. Heard K4QI in FM06 and swung the antennas back and forth and found the peak reflection at 100 degrees from here in EN24. He was 55a and a nice contact. Heard K4AR several times on the same heading but couldn't get his attention this way. Around 0045 UTC or so 6 meters opened up with HK3YH and HC5K in for 15 minutes working the East Coast (both stations 59+)."

Dave Batcho, N5JHV: "Second aurora ever from this QTH 40 miles north of the Mexican border (DM62of). It started off on 6 meters around 2325 UTC with a huge signal from W6OAL and then many other Colorado stations. I copied the following beacons: NØLL (EM09), WØIJR (DM79), WBØRMO (EN10), W7HAH (DN28), and KØETC (EM27). I went to 2 meters at 2355 and immediately worked KØRI (DM78) and then W7SAO (DM79) and WA7GSK (DN13). Probably could have worked more on 2 meters, but had bad line noise. Quite a thrill to hear the 'buzz' down here. Before the aurora started, worked several ZL's around 2300 UTC. ZL2KT was strongest about S7. Also ZL audio on 50.760 MHz was quite strong. After the aurora I heard many HK, YV, HC, and HP stations. They were mostly working the East Coast."

John, W5UMB: "Worked the following during the F2 opening: ZL4AAA, ZL2KT, ZL1ADP, 3D2AG, NØJK/KH8, HP3XUG, J87AB, TI5KD, HK3YH, HP2CWB, YV5LIX, PY5CC, YV4FKM, HP2CWB, HK3PDX, HC5K, YV1DIG. Worked the following during the aurora opening on 2 meters: K5YY, W7FG (heard), WØVD (heard), WØRRY, N5FAC, and W7SAO. Worked the fol-

"I must still be dreaming..." — An Aurora-F2 Report

By Ken Neubeck, WB2AMU

Editor's note: With his writings, Ken has the ability from time to time to be a bit ironic. In June 1998 he wrote an article about working 6 meters at Field Day for CQ VHF. One of the best 6 meter openings in the history of Field Day occurred later that month. This past April Ken wrote an article on aurora and F2 propagation for CQ. As if on cue, the best aurora and F2 combined openings for this cycle occurred early in that month. What follows is his report.

My April aurora-F2 DX odyssey began during the day of April 6, when I received an e-mail from my friend Dave Ripton, K2SIX, kidding me about when the next big aurora event would occur. Dave's e-mail was really timely, as I was about to find out.

During my lunch hour at my work QTH I listened on both 6 and 10 meters with nothing heard on 6 meters. While talking with Ted, G4UPS, on the 6 meter liaison frequency on 10 meters (28.885 MHz), he stated that nothing yet was happening on 6 meters in the UK.

After lunch, when I checked on the UK 6-Meter Club website, I saw that some of the western European stations were posting reports of aurora activity. This caused me to think that maybe something would happen this evening at my Long Island QTH (Grid FN30).

As I started my 20 minute drive home from work, I began hearing the familiar sound of aurora buzz on 6 meters. I reasoned that this could be the first big aurora event of the sunspot peak and that I better get home very fast. About five minutes from my house I was able to make out the callsign of W1TE from FN42. While driving, using a straight key in my lap, I work him on CW using 50 watts and my mag-mount vertical antenna.

When I got home, I prepared to work as many stations as possible, using CW as my primary mode. I had to use the full 150 watts supplied by my Mirage amplifier, as 10 watts was not getting anyone's attention. The aurora was wide coverage with moderate-strength signals, but the distortion was pretty bad, making SSB a bit tough.

For my part, I worked lots of grid squares that were in that "in-between" zone of sporadic-E skip coverage and tropo coverage. Over the next two hours I worked six new grids in this zone, FN10, FN13, FN24, FN55, FM18, and EN92. In total I worked 28 stations in 18 grids during the 4 hour opening. Of my 28 QSOs, 25 were made via CW, the most CW contacts that I have made during any 24-hour period on 6 meters. Perhaps the code is not dead after all! Also, I heard many other grids (see fig. 1).

The best part was I was able to work several stations from new grids I had heard in the last big aurora opening that took place on Sept. 22, 1999. This included NQ2O from grid FN13, whom I could not get in the earlier opening.

I especially was pleased to work several other stations from FN10 and FN13, including K2CS from FN13, whom I worked during my 6 meter QRP expedition from Bermuda last summer. It was gratifying to work four different stations from FN10, a very tough one for me to work via any other means. With these tough close-in grids, my grid-square map will be filled in for this area! The best DX QSO I made was with station K9CS in Indiana, grid square EN60.

The aurora zone extended far south, as a number of stations from the southern states were benefiting from aurora conditions. It was fun to work a lot of the stations in my area in

FN30 that were less than 30 miles away via the bistatic path (antennas of both stations pointed north) as opposed to the direct path. It also was very interesting to hear the low-power beacons, such as W1RA (FN41) and W3HH (EN90), coming in with distorted signals.

While the aurora opening still was underway, I wondered whether some auroral E- or F-layer activity would occur. The aurora opening started breaking up at 8 PM local time (0000 UTC, April 7). At around 0015 UTC I started listening in the beacon portion of the band, between 50.060 to 50.090 MHz. Immediately I heard the HC2FG beacon coming in on 50.088 MHz with a 559 signal. By hearing this beacon, I knew that the aurora was changing to heavy F2 ionization. A few minutes later, as if a light switch was turned on I heard HC5K, HK3TAS, HK3PJ, HK3YH, and HP3XUG on SSB between 50.105 and 50.140 MHz.

Unfortunately, by the time I heard these stations they already had been working many stations in the US that had skip to that area first. The pile-ups were tremendous. I couldn't break into them even when using 150 watts.

For me, the band gave out at around 0200 UTC. In spite of my not breaking the pile-ups, I consoled myself thinking that at least I had worked some new grids that evening and had heard some DX on 6 meters. However, my story did not end there.

Awakening at around 12:20 AM, I figured I would take a quick listen to see if the aurora had returned. I was surprised to hear a CW signal on 50.125, which turned out to be Louis, HP3XUG (EJ88). Unfortunately, I could not use the high power of the 150 watt amplifier, as the signal is picked up by the answering

lowing on extended tropo: AC4TO, KB4DFO, and KB4DFO (432 MHz). All in all, an exciting day/evening! First aurora this far south for me since 1989."

Sam Whitley, K5SW: "I got in late and 50 MHz was wall to wall with F2-TEP signals—from 0030 to 0230 UTC signals peaking 150 degrees, most had TEP flutter, but good strength. Able to worked or heard (big pile-ups): HK3YH, HK3GKE, HK3TAS, HC2FG/B, HC8GR/B, HC5K, YV1DIG, YV4FZM, HP2CWB, HK3PDX, and TI5KD.

John, NE0P: "What a great aurora. I had to teach a night class, so I missed everything after 2315 UTC, which is when it was really picking up. Such is the life of a professor. This happened to me last fall also, when AU hit 6 big, but I had to teach. Did not hear much on 6,

but 2 was hopping. W0VD (EM27) was S8 here at times. I did work FM06, EM55, EM76, and EN82 (first VE on 2) for new grids. The FM06 was NC, a new state here also. I heard FM02 and FN41, but they were calling someone else. Can't wait til the next one. This is a great propagation mode."

Ralph, K6TSK: "Heard N6YM calling CQ AU and also heard N6YM working W6TOD on CW at around 5:30 to 6:00 PM local time on April 6 in DM03."

John, W8PAT: "The leading edge of low TEC was when the aurora started here in EN81 at 2130 UTC on April 6. Strangely around 1700 to 2000 it looked good for F2 from here, but it wasn't. Then by 0000 to 0200 UTC on April 7th we had propagation to South and Central America. From 1600 to 1800 UTC

again brought signals from the south and as far west as VP6 before disappearing again. I would like to live in the red zone, at least for a while."

Darryl, KD0PY (EN41): "Had a great time. Nice to hear some activity. Thanks to the following for the contacts: K4AR, W0JRP, K4ETC, N4SC, W4SP, KK4CA, W8DOM, W0VD, W9YCV, W0RRY, and K5CM."

Mike, KM0T (EN13): "Worked a bunch on 2 meter CW, basically coast to coast from NW Iowa, two new states also, so that was really neat. Signals were very good for a long period. Then I went to have chow and came back late to see posts of Central America stations coming in on 6 meters around 0500, very late from my experience. I ended up working four folks down there."

EN65	EN75	EN85	EN95	FN05	FN15	FN25	FN35	FN45	FN55	FN65
EN64	EN74	EN84	EN94	FN04	FN14	FN24	FN34	FN44	FN54	
EN63	EN73	EN83	EN93	FN03	FN13	FN23	FN33	FN43	FN 53	
EN62	EN72	EN82	EN92	FN02	FN12	FN22	FN32	FN42	FN 52	
EN61	EN71	EN81	EN91	FN01	FN11	FN21	FN31	FN41	FN51	
EN60	EN70	EN80	EN90	FN00	FN10	FN20	FN30	FN40	FN50	
EM69	EM79	EM89	EM99	FM09	FM19	FM29				
EM68	EM78	EM88	EM98	FM08	FM18	FM28				
EM67	EM77	EM87	EM97	FM07	FM17					
EM66	EM76	EM86	EM96	FM06	FM16					
EM65	EM75	EM85	EM95	FM05	FM15					

Grids worked

 Grids heard

 Home grid

Fig. 1— Grids worked and heard by WB2AMU during aurora opening (April 6, 2000, 3:30 to 8:15 PM local time).

machine, which would have awakened my wife. With that in mind, at 0428 UTC I called Louis once using only 10 watts and a dipole. I fell over when he came back to me with a 529 report! I thought maybe I either was still dreaming or maybe I had died and gone to Magic Band heaven!

After this QSO I heard HK3YH (FJ24) on 50.102 MHz, who was working stations all over the US. I finally got him at 0512 UTC using the same 10 watts and dipole! He was 599, an absolutely incredible signal!

There were two success factors for me during this opening. First, I was monitoring 6 meters in my car on the way home when I first

started hearing the aurora signals. This put me in the position of getting home as soon as possible. Second, I got up after midnight to see if the aurora had come back. I was rewarded with the QRP contacts with HP3XUG and HK3YH.

According to Don Herzog of the US Geological Survey, this storm would be classified as a moderate magnetic storm. Also there were pictures of the aurora as far south as North Carolina. It was a red-type aurora.

The K_p values show the planetary K_p values reaching as high as 8 and the Boulder K_p values averaging around 6 during the time period of the 4 hour aurora opening. At the

point the K_p reached 8 at Boulder, the F skip to South America began.

Both the solar flux and the sunspot count were under 200, so it is interesting to see that $F2$ type propagation can occur when these values are not optimum and that a major aurora event can trigger this type of propagation.

I received many similar reports of both the aurora opening and the subsequent F opening from AA2DR, K2OVS, K2SIX, WB4WXE, WL7AZB/4, as well as from stations in the northwest US. It was very good to see so many hams on the 6 meter band who were able to cash in on the interesting conditions.

Bert, K4AR: "Nice to have AU in Tennessee. From EM76, I worked 45 stations in 26 grids on 144 MHz, 1 new grid."

8P9JO 6 Meter Report

The following is from Jon Jones, NØJK:

I operated from the 8P9Z station at Warleigh Plantation in Barbados Dec. 8–13, 1999. My gear consisted of an MFJ-9406, a 3-element Yagi at 15 ft., and a 100 watt amp.

I experienced a TEP opening every evening like clockwork from Barbados to South America at 2230–0300 UTC. Worked 45 CXs, LUs, and PYs, including CX1CCC running 5 watts to a vertical. The TEP was often very loud and the flutter is unique to hear. The ZP5AA/b was often loud but no ZP QSOs.

I tried 2 meters with PY5CC Dec. 8 during an extremely strong 6 meter TEP open-

ing, but nothing heard. Around 0100 UTC daily seemed to be $F2$ or E_s to Ecuador. I worked HC1MD on Dec. 8. Rick said it was his first 6 meter contact in 20+ years! He runs 10 watts to a dipole in the jungle. Rick was very active as HC8VHF in the early 80s, and told me he made over 2000 QSOs from the Galapagos. HC5K was worked Dec. 10.

I had two openings to the United States and Canada—one on Dec. 10 and the other on Dec. 13. First, the Dec. 10 opening: spotty opening around 1500 UTC. I worked KA9CFD EN40, NØEOQ EN24, AA5XE EM00, W3XO/5 EM00, and W5UWB EL17. I suspect this was double-hop E_s rather than $F2$ based on arriving wave angle, the limited footprint, and weak signals. Dean, 8P6SH, visited the shack during the opening and watched me work W5UWB. Maybe I recruited a new 6 meter op from Barbados.

On Dec. 13 I experienced a major $F2$ opening to the United States and Canada.

The solar flux was 150, but the K-index was 6. VE1ZZ in FN89 started things off at 1316 UTC. Despite the 6 meter amp failing, I worked 240 stations in the US and Canada over the next couple of hours.

Going to 8 watts didn't seem to hurt. Stations said I was still 59+-. The $F2$ favored the eastern half of North America from 1300 to 1500 UTC with very loud signals from 1s, 2s, 3s, 4s, and 8s. Numerous mobile contacts; some were ops such as AC4TO at work who went out to their cars, and KØFF managed a QSO using a "screwdriver" for an antenna at 1438 UTC. I had internet access while in Barbados, and it was interesting to post comments and receive feedback via the 'net in real time while the opening was in progress.

Signals faded out at 1455 UTC then returned at 1530 with the Midwest coming in. In all, 5s, 8s, 9s, and 0s were worked up to 1633 UTC, when W9XT was the last sta-

Log-EQF

THE EASY TO USE
LOGGING SOFTWARE.

LOG-EQF VERSION 9

- Complete station control for rig, TNC, antenna switch, and rotator.
- CW keyboard and memory keyer.
- Works with major callsign database CD's and the GOLIST QSL Manager Program (GOLIST starter database included).
- Award tracking, QSL and address labels, DX cluster spotting, beam headings, and more.
- Log-EQF Version 9 runs on 80286 PC or better, in DOS, Windows, or OS/2.
- Price \$49.95 (add \$3 shipping outside North America). VISA and MasterCard accepted.

EQF Software

Tom Dandrea, N3EQF • 547 Sautter Drive • Crescent, PA 15046
Phone/FAX: 1-724-457-2584 e-mail: n3eqf@usaor.net
web site: <http://www.itis.net/eqf>

CIRCLE 58 ON READER SERVICE CARD

Interested In Satellite Communications?

Subscribe to:

OSCAR Satellite Report

Published twice a month to keep you informed of what is happening in space communications, DX, Keps, What's Up!
USA \$35 - Canada \$38 - DX \$46

Interested in Amateur Television?

Subscribe to:

Amateur Television Quarterly

Everything you need to know to get started and use Amateur Television, SSTV, ATV Activities, Technical Info, and MORE!
USA \$18 - Canada \$20 - DX \$26

ORDERS 1-800-557-9469 ORDERS

815-398-2683 VOICE 815-398-2688 FAX

VISA - M/C - AMEX

ATVQ@hampubs.com OSR@hampubs.com

visit our site → <http://www.hampubs.com>

Harlan Technologies - 5931 Alma Dr. - Rockford, IL 61108

CIRCLE 64 ON READER SERVICE CARD

LOW PROFILE HF ANTENNAS THAT REALLY WORK!

"Work the World Without Working Up the Neighborhood"

ISOTRON

BILAL COMPANY

Call for a FREE Catalog:

719/687-0650

137 Manchester Dr.
Florissant, CO 80816

www.rayfield.net/isotron



CIRCLE 40 ON READER SERVICE CARD

YAGI SPOKEN HERE

Directive Systems, the leader in design, construction, sales, and worldwide distribution of loop yagi antennas is now producing the incomparable K1FO yagi with models for 144, 222, 432 MHz & ATV

Let us direct your signals forward with total performance.

Write or call for a brochure

WE DIRECT RF

DIRECTIVE SYSTEMS

RR#1 Box 282 Dixon Road
Lebanon, ME 04027

Tel: (207) 658-7758 Fax: (207) 658-4337
www.directivesystems.com

CIRCLE 55 ON READER SERVICE CARD

tion logged. K5LLL/m was worked driving home after visiting Bill, W3XO/5.

It was neat to work VHF local buds K5CM/mobile, K5SW, NØKQY, and NØLL from Barbados. Best 6 meter F2 DX was N5JHV, DM62 3266 miles; NØKQY, DM98, 3107 miles; and W7XU/NØQJM, EN13, 3066 miles. Really a thrill to work a major 6 meter F2 opening from the DX side and glad I decided to stay one extra day. I left the 3-element M² 6 meter Yagi at the 8P9Z; hopefully it will be used by other visiting ops. For those needing a card, QSL via NØJK.

My apologies to Jon for somehow misplacing this report in my e-mail out box, thus not publishing it before now.

KH8/NØJK 6 meter Report

The following is from Jon Jones, NØJK: "My best DX was JY9NX at 1825 UTC on April 7 via long path. All contacts were made using an MFJ-9406 at 10 watts to a 3-element M² Yagi up 50 feet. I have posted pictures from the KH8 DXpedition at: <<http://communities.msn.com/6MDX>>."

Jon operated from American Samoa between April 2-8. Among the more than 260 contacts were a few North American stations and quite a number of South American stations, including some from Brazil, Argentina, Venezuela, Paraguay, and Uruguay. He also worked dozens of stations from Japan, Australia, and New Zealand, and a smattering of other Pacific Island stations. Jon has asked me not to list his entire log here in order to respect the integrity of the DXCC award. Therefore, I refrained from listing any calls, save the one above which was his best DX.

Ironically, Jon stayed at the home of Don Barclay, KH8/N5OLS, who is a long-time friend of mine. We know each other from when he was taking his air-traffic-controller training in Oklahoma City. Perhaps Jon created a bit of incentive for my old buddy Don to get on 6 meters. We'll see.

Current Contests

Summertime begins in June with three contests which all provide VHF-plus operating opportunities.

ARRL June VHF QSO Party: The dates for this contest are June 10-12. Complete rules are in the May issue of *QST*. Many are making plans to activate rare grids. For the latest information on grid expeditions, check the VHF reflector <vhf@w6yx.stanford.edu> on the internet. This is by far the most popular VHF contest. For weeks in the run up to the contest postings are made on the VHF reflector announcing Rover operations and grid expeditions. It is a con-

test that will create plenty of opportunities to introduce the hobby to friends who are not presently working the VHF-plus bands or who are not hams.

Perhaps the most fun I have had in the hobby was when I operated Rover with a partner. One year it was with Jim Rudniki, NZ7T, and the next it was with Oscar Morales, CO2OJ. Both times were fun for me, but were inspirational for the other fellow. Jim went back to Utah and for a number of years was active on the VHF-plus bands. To date Oscar continues to put out plenty of contacts from Cuba, being the most active VHFer at present.

SMIRK Contest: The SMIRK 2000 QSO Party, sponsored by the Six Meter International Radio Klub, will be held from 0000 UTC June 17 to 2400 UTC June 18. This is a 6 meter only contest. All phone contacts within the lower 48 states and Canada must be made above 50.150 MHz; only DX QSOs may be made between 50.100 and 50.150. Exchange SMIRK number and grid square. Score 2 points per QSO with SMIRK members and 1 point per QSO with nonmembers. Multiply points times grid squares for final score. Awards for top scorer in each ARRL section and country. Send a legal-size SASE for a copy of the log forms. Log requests and logs should be sent to Pat Rose, W5OZI, P.O. Box 393, Junction, TX 76849-0393. Logs must be postmarked by August 1st. For more information see SMIRK's URL at <www.smirk.org>. Incidentally, the 1999 SMIRK Contest results also can be found at <www.smirk.org>. K5IUA, W4WRL, and AA5XE posted the top three scores.

Field Day: The ARRL's classic Field Day will be held on June 24-25. Complete rules for this contest are in *QST*. In years past tremendous European openings have occurred on 6 meters. Also, as happened in 1998, great sporadic-E openings can occur. Certainly, this is one of the best club-related events in which to involve new people. I cannot remember the number of Field Days I have been on or the amount of fun that I have had on each one of them.

I do remember my first, however. I was with the South Bay Amateur Radio Society in Chula Vista, California. At that time they did not have the club call K6QHQ, so it was the privilege of the newest General class operator to use his or her call for the Field Day operation. I was the newest. At 13, I was quite enthralled to hear my fellow hams use my callsign on all the bands, including 6 and 2 meters. It was really exciting for me to hear guys work up the coast on

6 meters during the annually expected sporadic-E opening. As a young teenager, my first Field Day operation made an indelible impression on me. You too can make an indelible impression on someone new to the hobby by inviting him or her along for the fun.

Current Conferences

Ham-Com is scheduled for the first weekend in June. As usual, the gang from the North Texas Microwave Society will present a couple of programs during the convention.

For more information about registration at Ham-Com, contact them at: 6208 Preston Road, Dallas, TX 75205-1655, or call 214-522-5003 (fax 214-521-0016). A number of hotels within easy driving distance are priced between \$30 (Motel 6) and \$110 (Marriott) per night.

Current Meteor Showers

From June 3-11, the *Arietids* meteor shower will once again be evident. This is a daytime shower with the peak predicted to occur around 1500 UTC on June 9. Activity from this shower will be evident for around eight days, centered around the peak. At the shower's peak you can expect around 60 meteors per hour traveling at a velocity of around 37 km/sec (23 miles per second).

The *Zeta Perseids* is expected to peak on June 9. At its maximum it produces around 40 meteors per hour. On June 28 the *Delta Aquarids* shower is expected to peak. The *Beta Taurids* is expected to peak on June 29. Because the *Beta Taurids* is a daytime shower, not much is known about the stream of activity. However, according to the book *Meteors* by Neil Bone, this and the *Arietids* are two of the more active radio showers of the year. Peak activity for this shower seems to favor a north-south path.

As you can see, there are plenty of showers from which to choose.

And Finally . . .

Did you see the ABC television network show *20/20* on April 12, in which the ham-radio-assisted odyssey of the Van Tuijl family of Holland was featured? Better yet, did you tape it? If you did, you now have a wonderful show-and-tell piece for your next ham club meeting. Better yet, you have an excellent source of publicity to promote ham radio within your community. (See the feature article "Hams Coordinate High-Seas Rescue" in this issue also.)

For the past several months (including this one) I have been promoting

The CQ WW VHF Contest Reborn!

Over the last few years the CQ WW VHF Contest has languished. However, with some significant changes in the rules (for detailed rules see page 102 in this issue) and under the guidance and direction of Gene Zommerman, W3ZZ, assisted by Bob Cox, K3EST, the CQ VHF Contest is now back this year in full force and better than ever!

The reborn VHF Contest will take place on July 8 and 9 this year. The contest will be new in several important aspects. First of all, it will take place on 6 and 2 meters only. This will allow maximum participation on a worldwide basis. Second, contacts on 2 meters will count twice as much as those on 6 meters. Third, participants will find that they can operate from home successfully and have a great time. And last but not least, the rover rules have been rewritten.

In addition, the results of the contest will be announced in *CQ* magazine and awards will be sent in a timely manner.

So sit back, turn on your rig on July 8 and 9th and join the fun. Questions concerning the contest may be sent to: <questions@cqww.com>.

growth of our hobby. To put action to my words, the week following my writing this column I will be speaking at the Tulsa Amateur Radio Club. My topic essentially will be last month's lead topic in this column—ten sure-fire ways to increase club membership. If you want to use last month's column as a basis for a talk at your local club, please feel free to do so (actually, I "borrowed" the ideas for my article and talk from a book on church growth!).

Early reports concerning the FCC licensing changes that took effect on April 15 indicate excitement over the new privileges plus lots of incentive to upgrade. Despite the prognostications to the contrary, it appears that the FCC's actions have had a decidedly positive effect on the hobby.

With this positive interest, now is the time to recruit—and I mean *now!* People are fickle. In a few months the incentives created by the new license structure will have faded in people's minds as they focus on other things. Therefore, now is the time for all good hams to come to the aid of their hobby!

As you have them, please let me hear about your successes in the hobby as I want to report on them via this, your column. Until next month...

73, Joe, N6CL

BOOTH 112, Dayton 2000 INCREDIBLE!

All this for one low price!!!

THE DIGITAL TRIO CD PACKAGE!

- Pacterm '98 for Kantronics or
- PKTerm '99 for AEA/Timewave Windows 95, 98, NT and 2000

and

LogWindows

The first and still the best Windows logging program!

and

Wefax '99

HF Fax program for Kantronics and AEA/TimewaveTNCs

All three in one package

\$129.95

Icom Radio Computer control cable \$20 with software purchase

Purchase from your favorite ham dealer or direct
Creative Services Software

503 West State St, Ste 4, Muscle Shoals, AL 35661
256-381-6100

<http://www.cssincorp.com>

ELECTRONIC MILITARY SURPLUS

FAIR RADIO SALES

30 FT MAST KIT

AB-1244/ GRC, 12 aluminum alloy on steel sections form sturdy, lightweight 30 ft 1.7" dia mast. Kit includes 5 each lower and upper sections, 1 ea lower and upper adapter sections, gin pole swivel base, 4 ea 36 and 42 ft guy ropes, 4 guy stakes, 2 guy rings plus 2.5 pound sledge hammer. Part of OE-254/ GRC antenna set; 30 lb sh. New, \$139.50 plus shpg NYLON BAG for above. New, \$39.50; See Web.

WEBSITE: fairradio.com

E-MAIL: fairradio@wcoil.com

PHONE: 419-227-6573 - FAX: 419-227-1313

1016 E. Eureka - Box 1105 Lima, OH 45802

VISA, MASTERCARD, DISCOVER accepted

Write for latest Catalog - Address Dept. CQ

CIRCLE 59 ON READER SERVICE CARD

Capacitors - Motors - Tubes - Test Equipment

Radios - Antennas - Inductors - Transformers

Antenna Software by W7EL

EZNEC ("Easy-NEC") captures the power of the NEC-2 calculating engine while offering the same friendly, easy-to-use operation that made ELNEC famous. EZNEC lets you analyze nearly any kind of antenna - including quads, long Yagis, and antennas within inches of the ground - in its actual operating environment. Press a key and see its pattern. Another, its gain, beamwidth, and front/back ratio. See the SWR, feedpoint impedance, a 3-D view of the antenna, and much, much more. With 500 segment capability, you can model extremely complex antennas and their surroundings. Includes true current source and transmission line models. Requires 80386 or higher with coprocessor, 486DX, or Pentium; 2Mb available extended RAM; and EGA/VGA/SVGA graphics.

ELNEC is a MININEC-based program with nearly all the features of EZNEC except transmission line models and a limitation of about 127 segments (6-8 total wavelengths of wire). Not recommended for quads, long Yagis, or antennas with horizontal wires lower than 0.2 wavelength; excellent results with other types. Runs on any PC-compatible with 640k RAM, CGA/EGA/VGA/Hercules graphics. Specify coprocessor or non-coprocessor type.

Both programs support Epson-compatible dot-matrix, and HP-compatible laser and ink jet printers.

Prices - U.S. & Canada - EZNEC \$89, ELNEC \$49, postpaid. Other countries, add \$3. VISA AND MASTERCARD ACCEPTED.

Roy Lewallen, W7EL phone 503-646-2885

P.O. Box 6658 fax 503-671-9046

Beaverton, OR 97007 email w7el@teleport.com

CIRCLE 71 ON READER SERVICE CARD

Announcing:

The 2000 CQ World-Wide VHF Contest

Starts: 1800 UTC Saturday, July 8, 2000
Ends: 2100 UTC Sunday, July 9, 2000

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

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

III. Bands: All authorized amateur radio frequencies on 50 MHz (6 meters) and 144.00 MHz (2 meters) may be used as authorized by local law and license class.

IV. Class of Competition:

For all categories: Transmitters and receivers must be located within a 500 meter diameter circle or within the property limits of the station licensee's address, whichever is greater. All antennas used by the entrant must be physically connected by wires to the transmitters and receivers used by the entrant. Only the entrant's callsign may be used to aid the entrant's score.

1. Single Op—All Band. Only one signal allowed at any one time; the operator may change bands at any time.

2. Single Op—Single Band. Only one signal allowed at any one time.

3. Multi-Op. A multi-op station is one with two or more operators and may operate 6 and 2 meters simultaneously with only one signal per band.

4. Rover station. A rover station is one that is manned by no more than two operators, must travel to more than one grid locator, and must sign "rover" or /R. The spirit of this class is to encourage operation from rare grid locators by persons who are inclined to do so. It is not the intent of this class to encourage one operator to move from one super station to another super station in another grid locator in order to compete in this category.

5. QRP station. Anyone operating a station running 25 watts output, or less, is eligible to enter this category. There are no location restrictions. You may operate from your home QTH or from the highest mountain you can find.

V. Exchange: Callsign and Maidenhead locator grid locator (4 digits, e.g., EM15). Signal reports are optional and need not be included in the log entry.

VI. Multipliers: The multiplier is the number of different grid locators worked per band. A "grid locator" is counted once per band. Exception: The rover who moves into a new grid locator may count the same grid locator more than once per band as long as the rover is himself or herself in a new grid locator location. Such change in location must be clearly indicated in the rover's log. It is required that rover category operators maintain separate logs for each grid locator location.

A. The rover who changes location during the course of the contest is free to contact as many other stations as he or she wishes. The rover becomes a new QSO to the stations working him or her when that rover changes grid locator.

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

VII. Scoring: One (1) point per QSO on 50 MHz and two (2) points per QSO on 144 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times total number of grid locators (GL) worked. Contest entrants may not transmit on 146.52 MHz, or your country's national 2 meter FM simplex calling frequencies, or commonly recognized repeater frequencies for the purpose of making or requesting contacts. Contacts made within your own country, in the DX window of 50.100–50.125 MHz, are discouraged. Contacts made on the SSB calling frequencies of 50.110 MHz, 50.125 MHz, and 144.200 MHz are discouraged. Contest participants are required to use UTC as the logging time.

Example: W1XX works stations as follows:

50 QSOs ($50 \times 1 = 50$) and 25 GL's (25 multipliers) on 50 MHz.

35 QSOs ($35 \times 2 = 70$) and 8 GL's (8 multipliers) on 144 MHz.

W1XX has 120 QSO points ($50 + 70 = 120$) \times 33 multipliers ($25 + 8 = 33$) = 3,960 total points.

VIII. Awards: Certificates suitable for

framing will be awarded to the top-scoring stations in each category in each continent. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Certificates will be awarded to top-scoring stations in each category in geographic areas where warranted.

Geographic areas include states (U.S.), call areas (Japan), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries.

IX. Miscellaneous: An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location.

A station located exactly on a dividing line of a grid locator must choose only one grid locator from which to operate for exchange purposes.

A different multiplier cannot be given out without moving the complete station at least 100 meters.

X. Log Submissions: You may request log sheets from: CQ VHF Contest, 25 Newbridge Road, Hicksville, NY 11801. Include an SASE with your request.

Completed logs must be postmarked no later than September 1, 2000 to be eligible for awards. All logs should be mailed to: CQ VHF Contest, 25 Newbridge Road, Hicksville, NY 11801.

We encourage logs to be submitted on disk or sent via e-mail. We prefer an electronic log.

Disks: If you use a computer, please send your IBM, MS-DOS compatible computer disk. A disk containing your files may be submitted in lieu of a paper log. All disks **must** be accompanied by a **paper** summary sheet satisfying all logging instructions. Label your disk clearly with your call and category.

If you submit your log in electronic form, we prefer one of the commonly available logging programs.

You may submit your electronic log via e-mail to <cqvhf@kkn.net>. Questions may be sent to <questions@cqww.com>.

Official ISS Callsign: RZ3DZR

The ARISS (Amateur Radio on International Space Station) working group announced that the initial international space station callsign will be RZ3DZR. Why a Russian call? Simple. The initial amateur radio rig will be located in the Service Module, which was built and funded by Russia. Presumably, the more sophisticated permanent ham setup in the U.S.-built Hab

ing from a Russian-licensed ham station.

On Mir temporary third-party waivers were obtained for astronauts John Blaha, Jerry Linenger, Mike Foale, Dave Wolf, and Andy Thomas. Those waivers permitted the US astronauts to talk to non-licensed people within the United States, provided a US-licensed control operator was available. However, the waivers expired when each

try to contact the station to add an additional country, causing more QRM.

As we go to press, the Russian Service Module (Zvezda) is scheduled for launch in July. Once in orbit, it will be the passive docking target for the FGB (Zarya) and Node (Unity) already in space. FGB automatically will dock with Service Module. A Progress resupply ship will be launched about a week later and automatically will dock with the Service Module's aft docking port. The STS-106 space shuttle flight will follow shortly afterward in mid-August and will carry the preliminary amateur radio station.

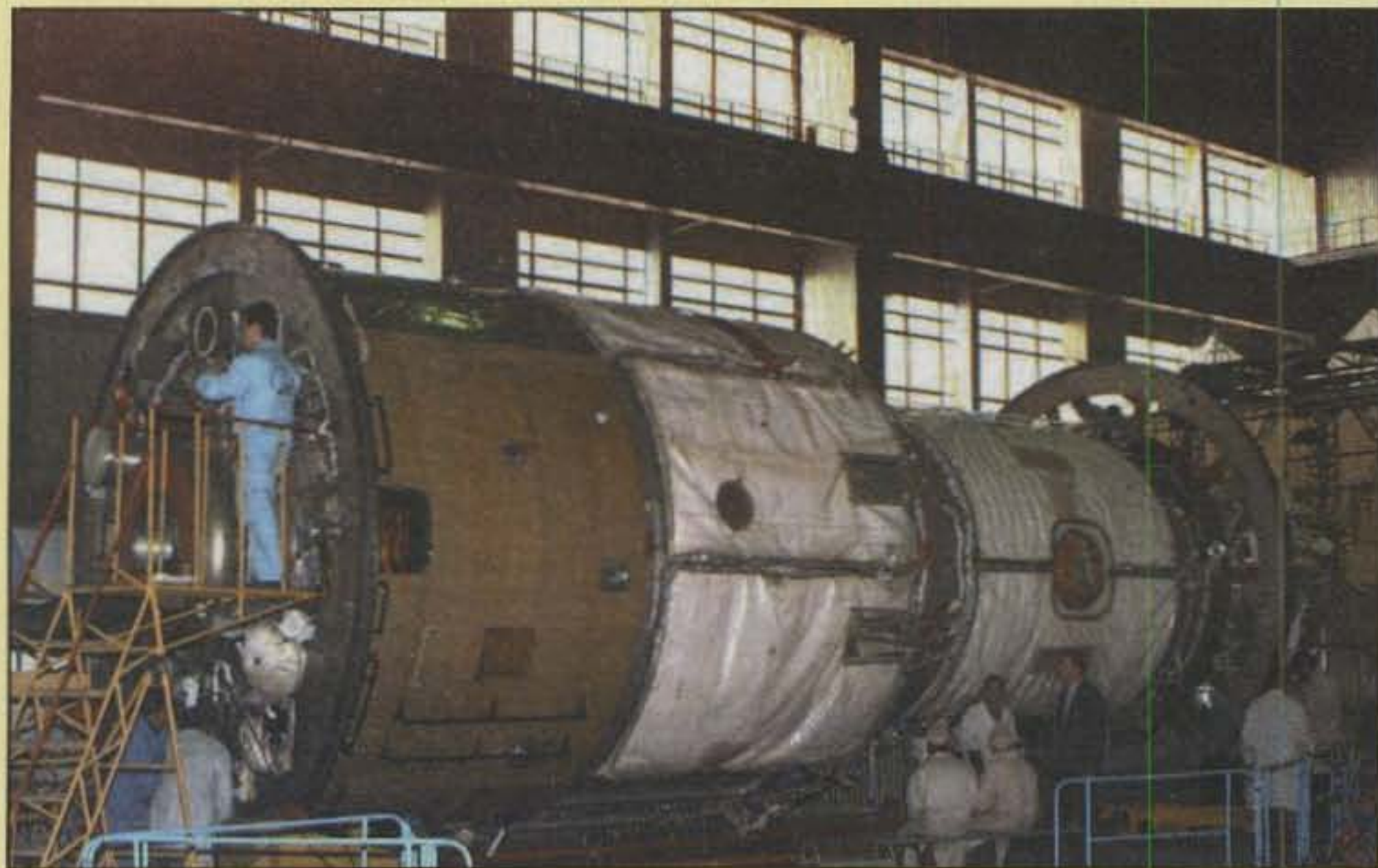
The STS-106 crew consists of commander Terry Wilcutt; pilot Scott Altman; mission specialists Edward Lu, KC5WKJ, Daniel Burbank, KC5ZSX, and Richard Mastracchio, KC5ZTE; and Russian cosmonauts Yuri Malenchenko and Boris Morukov. Ed Lu earned his amateur license while training for the STS-84 shuttle-Mir mission. Yuri Malenchenko used Mir's amateur radio callsign, R0MIR, during his four month stay aboard Mir in 1994. Dan Burbank and Richard Mastracchio earned their licenses after they became astronauts. None of the American astronauts have been active as amateur radio operators.

The first permanent space station crew—Bill Shepherd, Sergei Krikalev, and Yuri Gidzenko—is scheduled for launch on October 30th.

UO-14 FM Repeater

The disappointment in the failure of the picosats, ASUSat, and Jawsat was offset by the return to amateur radio operations for UO-14. What's special is UO-14 is now in operation as a "bent-pipe" FM repeater and can easily be accessed with an off-the-shelf, dual-band handheld radio!

UO-14's uplink is 145.975 MHz; its downlink is 435.070 MHz. Due to an excellent power budget, UO-14 is on continuously. Whenever it's above your horizon, you can use it to communicate with hams hundreds of miles from your location. What's even more amazing is you can hear its downlink with a handheld radio and a rubber-duckie antenna. In space line-of-sight really does mean line-of-sight!



The Russian Service Module for the International Space Station (ISS), seen here under construction, will house the initial amateur radio station aboard the ISS. It is scheduled for launch in July. (NASA photo)

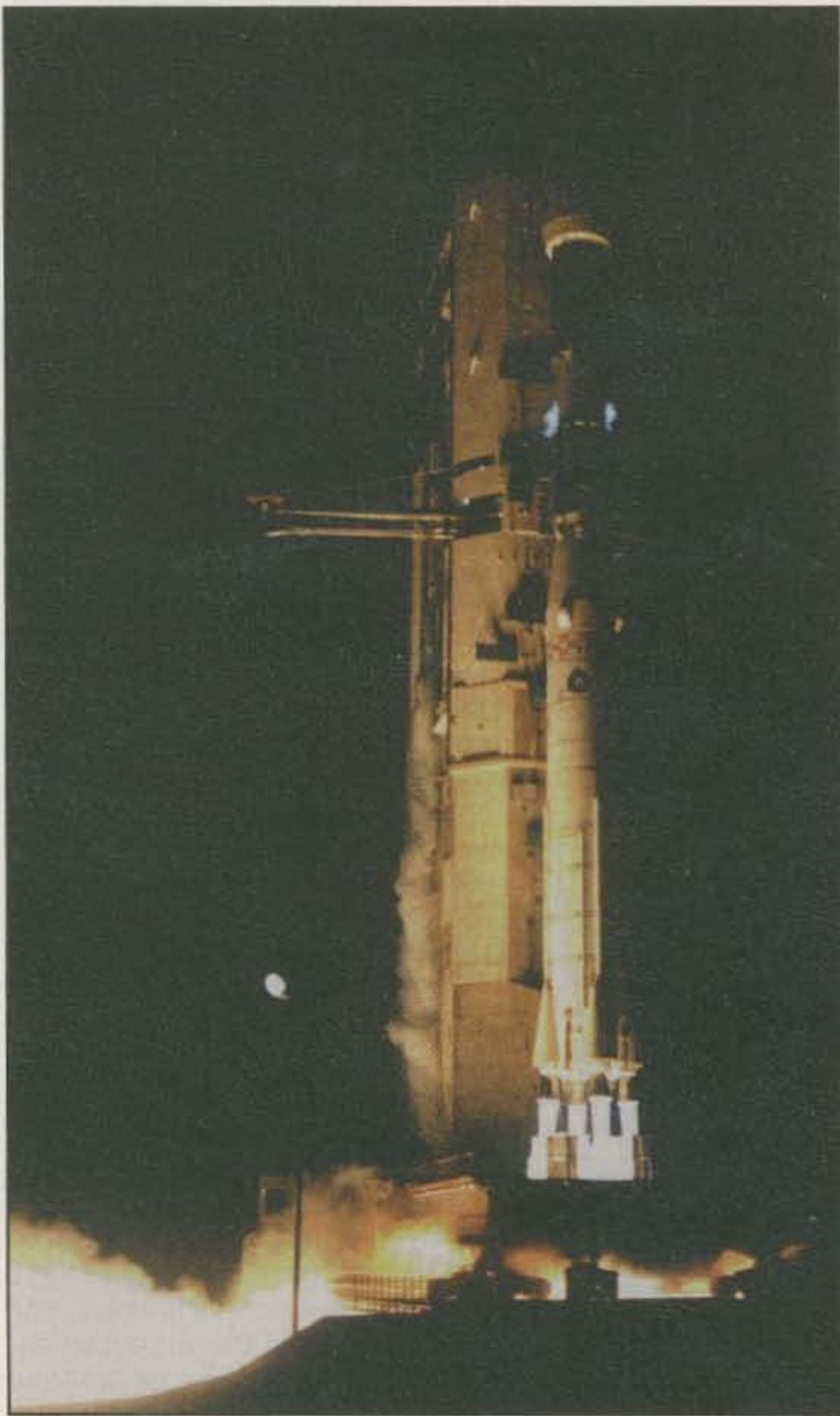
(habitation) module, scheduled for launch in 2005, will have a US callsign.

The US and Russia do not have a third-party agreement. Any licensed amateur radio operator is permitted to talk to any other licensed amateur radio operator. Thus, if you have a license you can talk to any of the crew on the space station. The problem is non-hams, if you want to let a family member, friend, or students without a license talk to the astronauts aboard the station. Unfortunately, by strict definition of the international third-party regulations it currently is not legal for a non-licensed person to talk to someone communicat-

person returned from Mir, and a new waiver had to be obtained for each new astronaut. It is hoped that the space-station situation won't be so confusing, and a permanent third-party agreement can be obtained for all space travelers.

Some hams have suggested that a United Nations callsign or a new DXCC country would be more appropriate for an international effort. Both of these suggestions have major problems. The United Nations is not involved in the International Space Station, and only a small percentage of the UN's member states are actually involved in the space station's construction and operations. A new country prefix could be seen as taking away credit from the countries involved in the space station's construction. More important, many hams interested in DXCC awards might just

779 Merritt Island Causeway #808, Merritt Island, FL 32952
e-mail: <kc4yer@cq-amateur-radio.com>



Launch of Ariane V35 carrying six amateur radio satellites including UO-14, plus Spot-2. (Courtesy Arianespace)

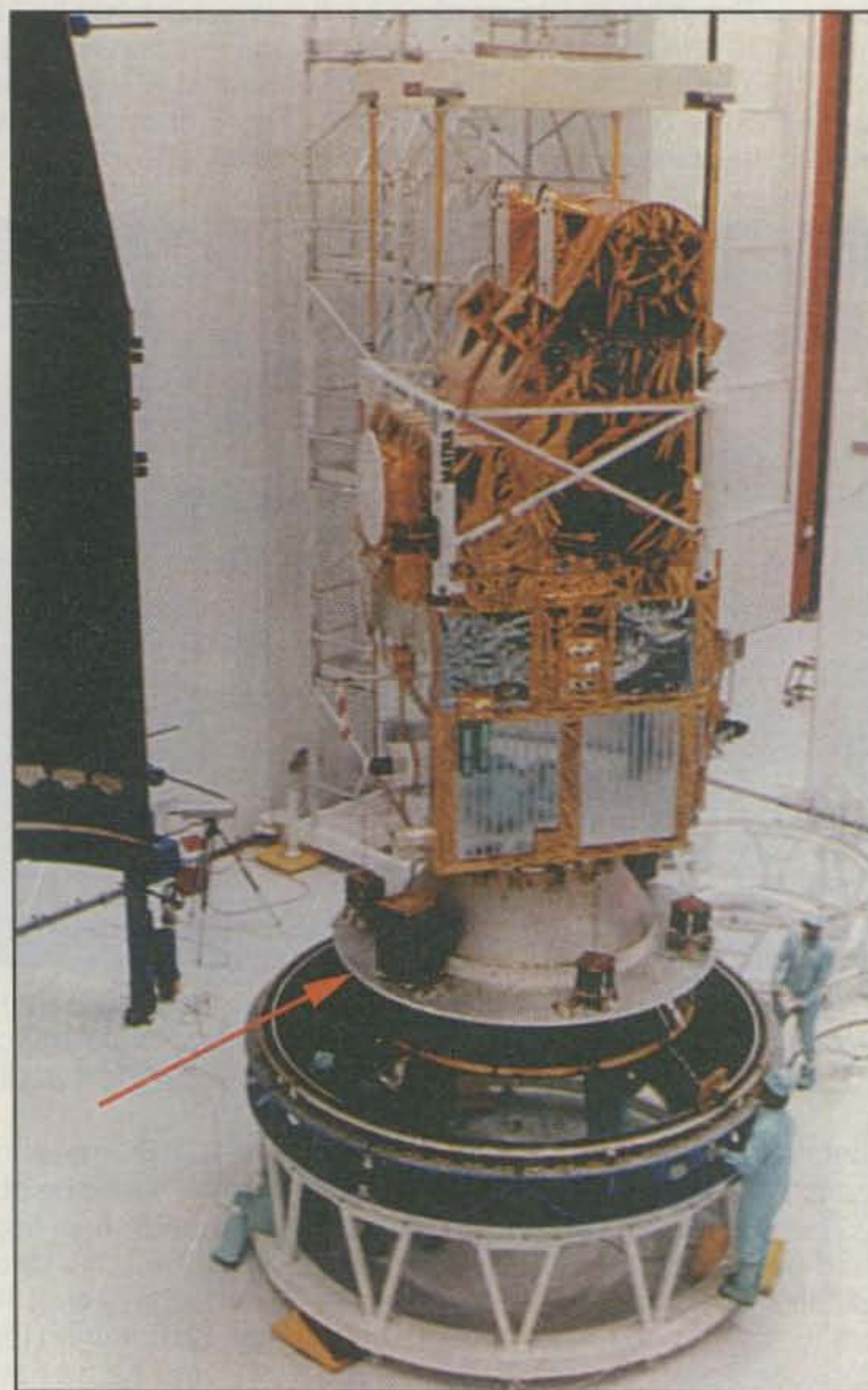
Contrary to the popular myth, satellite operations do not have to be difficult. Yes, many OSCAR ground stations are extremely sophisticated, multi-thousand-dollar setups with 22-element, circularly polarized Yagi antennas on computer-controlled rotors. However, an amateur satellite station can also consist of a handheld radio with a long whip antenna.

For many hams in antenna-restricted locations a portable DX station consisting of a handheld radio with a handheld gain antenna is an excellent, affordable choice. Also, if you're working on your WAS (Worked All States) award, there are more hams with FM equipment in rare states such as South Dakota, Arkansas, and Delaware than there are those with the SSB rigs required for the ham satellites with linear transponders.

UO-14 is extremely popular and is almost always filled with activity. Yes, only one person at a time can use an FM satellite, and a power-hog alligator easily can prevent others from getting in. However, the number of hams who can use an FM satellite is far greater than the few who can afford the more sophisticated SSB setups required to operate satellites with linear transponders.

"An amateur satellite station can also consist of a handheld radio with a long whip antenna."

No, you won't get through every time you try, especially with a QRP setup. That's part of the fun of trying to make contacts with new hams at distant locations or from rare grid squares. It's unusual for UO-14 to be empty enough for a couple of hams to have a long conversation. Think of UO-14 as a busy repeater during rush hour: As long as everybody is polite and nobody tries to hog the bird, many people can enjoy using it on each pass.



The Spot-2 Earth observation satellite with its six secondary passengers. The arrow at the lower left indicates one of the UOSATs. (Courtesy Arianespace)

UO-14 and UO-15 were launched on Ariane flight V35 with the Spot-2 Earth observation satellite on February 22, 1990. Also flying on that mission were the first four microsats: AO-16, DO-17, WO-18, and LO-19. Unfortunately, UO-15 failed, but the other satellites all were highly successful.

UO-14, also known as UOSAT-3, spent 18 months as an amateur store-and-forward packet satellite. When UO-22 was launched, UO-14 was switched to non-amateur fre-

quencies for use by VITA (Volunteers In Technical Assistance). VITA used it to transmit packet messages to Africa. In that role UOSAT-3, now named VITASAT, was used to transmit critical medical data and other "quality of life" messages to remote villages. The ground stations were quite similar to ham radio OSCAR setups. Since the satellite didn't use amateur frequencies, it could be used for commercial traffic, third-party messages, and other transmissions prohibited on amateur frequencies.

UOSAT-3 was used by VITA for eight years (from February 1992 until February 2000). A computer crash on the spacecraft, now well beyond its planned lifetime in orbit, made it unusable as a store-and-forward satellite. Control operator Chris Jackson, G7UPN/ZL2TPO, thus made the decision to switch the satellite back to amateur radio operations as a repeater.



Two University of Surrey satellites, UO-14 and UO-15, and the four microsats—AO-16, DO-17, WO-18, and LO-19—on their Ariane Structure for Auxiliary Payloads (ASAP) before mating with the primary payload. (Courtesy Arianespace)

It is extremely fortunate that UOSAT-3 was designed as a multi-mode spacecraft and its owners made the choice to make it available to the amateur radio community around the world in a simple, easy-to-use mode.

Phase 3-D Status

Arianespace announced that the Phase 3-D satellites will launch on the Ariane 507 launch vehicle in late July. Phase 3-D will be the first large secondary payload on an Ariane 5 mission. In addition, two small secondaries, STRV 1C and STRV 1D, will be along for the ride. The primary passenger will either be Panamsat's PAS-1R or Europe*Star FM1. The previous Phase 3 satellite, OSCAR 13, flew with the original PAS-1 satellite.

73, Phil, KC4YER

ANTENNA FARM DREAM?

... small space? ... limited budget?

— MANY MODELS —

www.hexbeam.com

HX-5B

5 MONO-BANDERS • 1 ARRAY
10-12-15-17-20M • LEGAL LIMIT
20 LBS.

\$599



Traffie Technology

421 JONES HILL ROAD ASHBY, MA 01341-1801
978-386-7900 Phone/Fax 1-888-599-BEAM Toll Free USA

Photo by: ADIY

Want To Try Something New?

Join The Fun On The
AMATEUR RADIO
SATELLITES

It's Easier And
Cheaper Than
You Think

**TIRED OF THE LOCAL
REPEATER?**

**JOIN
AMSAT**

TODAY At

The 1988

Membership

Price* -Dues

Are Going Up July 1, 2000

Members receive the bimonthly
32-page AMSAT Journal. Beginners
guides and tracking software are
available from AMSAT.



The Radio Amateur Satellite Corporation
850 Sligo Avenue, Suite 600
Silver Spring, Maryland 20910
Hours: M-F 10-6 eastern (15-23 Z)
Phone: 301-589-6062, Fax: 301-608-3410
<http://www.amsat.org>
e-mail: martha@amsat.org
*Dues are USA \$30; VE & XE \$36;
Others \$45

CIRCLE 37 ON READER SERVICE CARD

Company's Coming!

Here's a very warm welcome to the amateur radio operators now enjoying HF privileges for the first time. I hope you are discovering the joys of contacts with faraway places and the interesting people in those places. That is indeed the essence of the "Magic in the Sky."

To those experienced operators now sharing the bands with the newbies, please welcome them with the graciousness and courtesy that ham radio has always demonstrated through its best operators. Nothing is more welcome to the newcomer than a kind, friendly operator at the other end of a QSO. You experienced "old hands" read along and see if my advice to the newcomers is sound.

The Art of Conversation

Heek! What do I talk about?! All too often, hams fall into "routine" conversations—signal reports, weather, rig, antenna. Those niceties may be customary to some extent, but your challenge is to break out beyond the "canned" formula and engage the other person in some meaningful dialog. I have enjoyed being drawn into conversations about a number of interesting topics; some I knew something about, some were total learning experiences.

Here's a tip that may help: Think of your ham radio contact as the guest on your very own talk show. Draw out the person. Ask questions, particularly those which require something more than a "yes" or "no" response. Plant seeds. "What other hobbies do you have beside ham radio?" Key a question to the person's occupation if it has been revealed to you. If you want some hints, listen to a skilled talk-show host and study the techniques.

I think of questions all the time. I don't know much about farming, but there are many farmers who are hams. What do they grow? What are the biggest challenges in their section of the country? How do they stay on top of the complex machinery and advancements in farming technology?

59045 Lake Lindero Drive, Agoura Hills, CA 91301
e-mail: <aa6jr@cq-amateur-radio.com>



CW Goes Hollywood: Look closely at this photo taken at Mann's (formerly Graumann's) Chinese Theater in Hollywood. Movie star Edward Arnold put a "V" in the concrete along with his foot and hand impressions. He also included the Morse Code notation for V under the letter. The date shows that his ceremony was held in the early, dark days of the USA's involvement in World War II, and "V" for Victory was a popular slogan. There's another Hollywood CW connection, too: The red beacon atop the Capitol Records building spells out HOLLYWOOD in Morse Code!

Turn Offs!

Try to keep things positive as much as possible. Tempting as it may be, please remember the advice your mom gave you and avoid engaging in conversations about religion or politics. I figure I have mine, you have yours, neither of us is going to change, so let's get on to something we both enjoy. Same holds with conversations about failing health; I find them depressing, as do many others. It's not that I'm insensitive or uncaring, but honestly, I didn't come into the radio room to hear about someone's treatments, medications, operations, or terminal illness. If I wanted that kind of "entertainment," I'd be watching *ER*. I've had people tell me things about their health on ham radio that they wouldn't tell close relatives, some of it pretty graphic. Hey, I'll say a prayer and hope it all turns out okay, but I'm off to seek a more enjoyable QSO. Face it: We won't attract and hold many lively young people to the bands by telling them about the new truss. We can do better.

Fascinating People

Some of the memorable conversations I recall have been with people who seemed ordinary but they're not. One was a person who owns a large manufacturing company, while another has traveled much of the world as a passenger on a tramp steamer. There was a real rocket scientist, a scientist at the South Pole, a teacher on a small South Pacific Island, a guy in Austria who is just a great conversationalist, a shopkeeper in Northern Ireland, an operating engineer for the Alaska pipeline, a farmer in North Dakota, an instructor at my alma mater, several people who share my interests in travel, cars, motorcycles, baseball, and photography and many, many more. The lesson is that just about everyone has something to offer. You only need to look for it!

Nets

Nets are a deceiving name for a specialized interest or mode of operation. There are operating nets for DX,

Worked All States, County Hunting, for contacting ships, mobiles, Hawaii, Alaska, Australia, and more. There are special-interest nets on almost everything from Slow Scan TV and RTTY to Collins owners, YLs, fraternal organizations, even joke telling (don't quit your day job!). Chances are, whether you're a newbie or a seasoned operator looking for new ideas, there's a net somewhere that you will find interesting.

The "rag chew" is similar to a net, usually made up of folks who are friends and share some common interests. They'll shoot the breeze about anything. Very often the conversation will turn to politics. Some are friendly to outsiders and some are not.

Clubs, Take Note!

So far this column has done your job for you! Now it's your turn. Clubs across this great country should schedule HF orientation meetings for newcomers. I was delighted to hear a California DX club engaging in outreach by contacting club presidents and offering to put on a program keyed to the HF newcomer on how to "chase" DX. Similar opportunities are there for CW, SSTV, digital operators (PSK31, AMTOR, PACTOR, RTTY, etc.) and "paper chasers" (the breed who likes to collect certificates of operating achievement). It's likely there's a person in your club who can speak with some expertise on one or more of these topics. The *big* challenge is to invite HF newcomers to the meeting. There's a good chance they will become new and valued club members.

We Got Mail!

Thank you to the many folks who took a moment to share some thoughts on the first "Magic in the Sky" column. A writer from Florida told me the magic for him comes from building radios and seeing them come to life. Amen! Several folks have written to share some special moments that came about through amateur radio. I will share these and other stories in future installments of "MITS."

A sentimental favorite for me was a note from Henry Kuhn, W2IRU, of Amherst, New York. Henry took the time to send a note with good wishes. He was one of those who inspired me to become a ham (whether he knew it or not!). Hank is now a retired broadcast engineer, but in the 1970s we worked together at WEBR, a now-departed radio station in Buffalo, New York. Henry kept the 5 KW transmitters humming and occasionally smiled, if not politely,

at my mindless disc-jockey prattle. Sometimes we'd get to chatting about his ham radio hobby and some radio theory, which he always made interesting. He could also work magic with old radios in need of repairs, seldom needing a schematic to bring a garage-sale antique back to life or restring a tuner. He's still one of the best radio techs around. One day we were talking about the effects of EMFs, and I teased that

the only effect of long-term RF exposure I could discover was that it made broadcast engineers hate disc jockeys and the music we played! Hank just smiled and reloaded his pipe.

Hello? FCC? Are You There?

One might think an organization with the word "communications" in its name might be good at it. Recently I tried to

CALL TOLL FREE
(800) 292-7711
Orders Only

Se Habla Español

C&S SALES

Order On-Line @ www.cs-sales.com

CALL, E-MAIL OR WRITE FOR OUR FREE

64 PAGE CATALOG!
(800) 445-3201

Digital Multimeters

<p>Elenco Model M-1740</p>  <p>\$39.95</p> <p>11 Functions: • Freq. to 20MHz • Cap. to 20µF • AC/DC Voltage • AC/DC Current • Resistor • Diode Test • Transistor Test • Auto UL 124 safety spec. Model M-2750 - \$24.95 (3 functions)</p>	<p>Elenco Model LCR-1810</p>  <p>\$99.95</p> <p>• Capacitance: 10pF to 20µF • Inductance: 1µH to 25H • Resistance: 0.1Ω to 200MΩ • Temperature: 32°C to 75°C • DC volts: 0.1 to 200V • Frequency: 10Hz to 10kHz • Diode/LED/Transistor Continuity Test • Signal Output Function • 3 1/2 Digit Display</p>	<p>Fluke 87III</p>  <p>\$319</p> <p>Features high performance AC/DC voltage and current measurement, frequency, duty cycle, resistance, conductance, and capacitance measurement.</p>
--	--	--

Elenco Oscilloscopes

Free Dust Cover and X1, X2 Probes



2 year Warranty

S-1325	25MHz	Dual Trace	\$325
S-1330	25MHz	Delayed Sweep	\$439
S-1340	40MHz	Dual Trace	\$475
S-1345	40MHz	Delayed Sweep	\$569
S-1360	60MHz	Delayed Sweep	\$749
S-1390	100MHz	Delayed Sweep	\$995

Generators and Counters

<p>Elenco Sweep Function Generator With Built-In 60MHz Frequency Counter Model GF-8046</p>  <p>\$229</p> <p>This sweep function generator with counter is an instrument capable of generating square, triangle, and sine waveforms, and TTL, CMOS pulse over a frequency range from 0.2Hz to 3MHz.</p>	<p>Elenco Handheld Universal Counter Model F-2000</p>  <p>\$99</p> <p>Sensitivity: • 0.1µV @ 100kHz • 1µV @ 10kHz • 10µV @ 1kHz • 100µV @ 100Hz</p> <p>Features 10 digit display, 16 segment and RF signal strength bargraph. Includes antenna, NiCad battery, and AC adapter. Resolution to 10Hz.</p>	<p>B&K Frequency Counter Model BK-1875</p>  <p>\$189</p> <p>50Hz - 2.8GHz 3 Channels</p> <p>Sensitivity: • 0.1µV @ 100MHz • 1µV @ 300MHz • 10µV @ 10Hz • 100µV @ 30Hz</p> <p>Ultra sensitive synchronous detector bargraph and RF strength.</p>
--	---	--

Soldering Irons

Weller WLC100 LOW COST SOLDERING IRON



\$34.95

- Variable power control produces 5-40 watts.
- Ideal for hobbyists, DIYers and students.
- Complete with 40W iron.

20MHz Sweep / Function Generator with Frequency Counter Model 4040



\$445

- 0.2Hz to 20MHz
- AM & FM modulation
- Burst Operation
- External Frequency counter to 30MHz
- Linear and Log sweep

10MHz Model 4017	\$325
5MHz Model 4011	\$239

Elenco RF Generator with Counter Model SG-9500



\$225

Features internal AM mod. of 10Hz, RF output 100W - 100MHz. Audio output 10W @ 1V RMS. RG-58B (including w/c counter) \$224

Elenco 10Hz - 1MHz Digital Audio Generator Model SG-9300



\$225

Features built-in 150MHz frequency counter, low distortion and sine/square waves. SG-9200 (w/c counter) \$124

Tekk Radios

Pro-Sport FRS Two-Way Radio Model PRO-SPORT+



\$79 each
OR
\$125
Set of 2

- 14 Channels
- Battery Monitor
- Key Lockout
- Monitor Button
- Lightweight
- Palm Sized
- Large LCD Display
- Removable Belt Clip
- Removable Antenna
- Two Radio Call Tones
- Busy Channel Lockout
- Accessory Connector
- Highly Water Resistant

Talk up to 2 miles!

Miscellaneous

<p>B&K High Current DC Power Supply</p> <ul style="list-style-type: none"> • Variable 0-14VDC • Thermal Protection • Current Limiting <table style="width: 100%; border-collapse: collapse;"> <tr><td>Model 1000 12A</td><td>\$169</td></tr> <tr><td>Model 1000 25A</td><td>\$249</td></tr> <tr><td>B&K 0.5V Fixed DC Power Supplies</td><td></td></tr> <tr><td>Model 1000 5A</td><td>\$40</td></tr> <tr><td>Model 1000 15A</td><td>\$75</td></tr> </table>	Model 1000 12A	\$169	Model 1000 25A	\$249	B&K 0.5V Fixed DC Power Supplies		Model 1000 5A	\$40	Model 1000 15A	\$75	<p>Elenco Power Supply Kit Model XP-720K</p> <ul style="list-style-type: none"> • 0.5VDC - 10VDC @ 1A • 1.5VDC - 10VDC • 5VDC @ 5A • 8.2VAC @ 1A and 12.6VAC center tapped 2A <p>\$54.95 Assembled \$89.95</p>
Model 1000 12A	\$169										
Model 1000 25A	\$249										
B&K 0.5V Fixed DC Power Supplies											
Model 1000 5A	\$40										
Model 1000 15A	\$75										

Elenco Educational Kits

<p>Model AR-2N6K</p>  <p>\$34.95</p> <p>2 Meter / 6 Meter Amateur Radio Kit</p>	<p>Model AM/FM-108K</p>  <p>\$30.95</p> <p>Transistor Radio Kit</p>
<p>Model M-1005K</p>  <p>\$19.95</p> <p>Digital Multimeter Kit</p> <ul style="list-style-type: none"> • 18 Ranges • 3 1/2 Digit LCD • Transistor Test • Diode Test 	<p>Model RCC-7K</p>  <p>\$29.95</p> <p>Radio Controlled Race Car Kit</p>

Guaranteed Lowest Prices

UPS SHIPPING - 48 STATES 5%
OTHERS CALL FOR DETAILS
IL Residents add 8.25% Sales Tax

SEE US ON THE WEB

C&S SALES, INC.

150 W. CARPENTER AVENUE
WHEELING, IL 60090
FAX: (847) 541-9904 (847) 541-0710
<http://www.cs-sales.com>
e-mail: sales@cs-sales.com

15 DAY MONEY BACK GUARANTEE

2 YEAR FACTORY WARRANTY

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

www.cq-amateur-radio.com

CIRCLE 43 ON READER SERVICE CARD

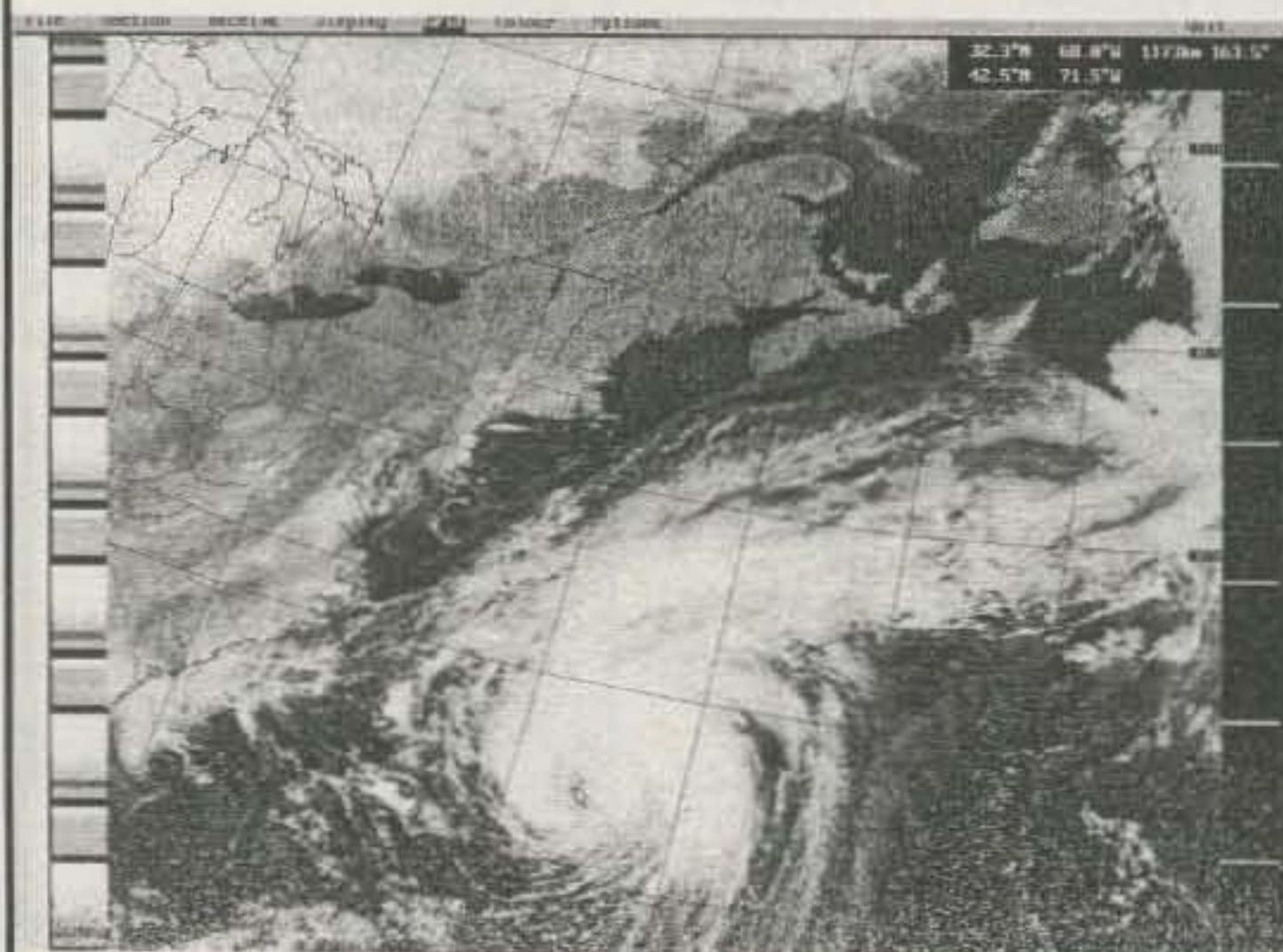
June 2000 • CQ • 107

call the FCC on a matter pertaining to local government. I know we have (or had?) an office in southern California, so I dug out a phone book and looked in the government pages. I called the number and got a recording saying it's a bad number. I thought maybe the area code had changed. We seem to have a new area code around here every week.

I called information, and they couldn't find a number. I was transferred to a supervisor who said they had moved, but I finally was given a toll-free number. I called the number expecting to get the local FCC office. Instead I got a recording that said the FCC maintains office hours on Eastern Time, and that my call was past those hours. It was 3:15 PM in Los Angeles. Apparently, the FCC is routing all calls through Washington.

I next went to the FCC web site, thinking they may have Field Offices listed. Wrong again.

WEATHER SATELLITE SYSTEMS



Track sun-shine, clouds, local storms, hurricanes on your IBM-PC style computer. Predict your weather. High Quality, Low Cost Systems, from TIMESTEP.

Systems include antenna, pre-amp, coax, receiver, decoder card & software

137MHz NOAA 1691 MHz GOES

PROsat for WINDOWS Systems from \$758.00 from \$1119.00
PROsat for DOS Systems from \$668.00 from \$1029.00

Systems for METEOSAT and GMS satellites.
Advanced High Resolution HRPT and PDUS systems.

All systems FCC Class B approved
Many options available. Write for details.



Shipping FOB Concord MA



Prices Subject To Change Without Notice

SPECTRUM INTERNATIONAL, INC.



P.O. Box 1084, Dept. Q
Concord, MA 01742 USA
Phone 978-263-2145
Fax 978-263-7008

CIRCLE 87 ON READER SERVICE CARD

I wonder if the Pentagon works the same way? Just imagine attacking troops storming the shores in Oregon. "You have reached the Pentagon. We are presently closed. If you are calling to report an attack, press 1. If you are calling to report an enemy sighting or UFO, press 2. If you're calling to bid on a contract for toilet seats, press 3. If you're calling to only threaten an attack, please call the State Department."

I realize the demands on government are many and the folks at the FCC are probably working very hard. However, I think having unlisted phone numbers is a bit much, particularly if the "home office" is unreachable for a large part of the country that does not happen to observe Eastern Time. Not having hours beyond 4 Central, 3 Mountain, 2 Pacific, and 11 AM Hawaiian (!) Time is a major disservice to the majority of states not on Eastern Time (the number varies with daylight savings adjustments).

The point of all this is that hams, citizens, and other radio services need more support from the FCC, not less. The popularity of Mr. Hollingsworth and his activities is well documented. It may be time for Congress to re-examine downsizing/rightsizing or whatever and at least allow the Commission to do its job with the proper resources. The airwaves could be a much more "magical" place as a result.

Club Idea

If you live in an area where there is more than one radio club, consider a joint meeting where each club presents a program for an hour. The cross-pollination of ideas may be just what both clubs need for an infusion of fresh ideas. I'll get you started: Your club provides the cookies, the other one brings the coffee.

You Gotta "Do" Dayton!

I'm planning to be at the Dayton HamVention again this year. If you've never been there, it's "ham heaven"—a virtual electronic smorgasbord with something to offer every licensee. It's a "must do" at least once for every ham.

A few years back, three of us did a "road trip" from Los Angeles to Dayton, and we have many happy memories of the journey (see below). There's more to see and do than time allows. Plan your trip, write down your shopping list, and don't forget to have some fun at the fleamarket. Also be sure to visit some of the "meeting room" sessions and "kick the tires" at the manufacturer's displays. In the meantime, pray for good Dayton weather, as we had last year!

P.S.

The car we drove from Los Angeles to Dayton (mentioned above) was a fairly new (at the time) Taurus wagon, all black with blacked out windows and blackwall tires. It bore a strong resemblance to the Stealth Bomber and the name stuck.

We had mounted a Spyder antenna on the roof rack to work HF to and from Dayton. Along with the VHF antennas, it was quite a sight; several truckers were overheard commenting about it on the CB. At a crowded desert-outpost fuel stop near Needles, California the young lady working the register asked, "What are all those antennas for?" In a moment of weakness one of our party deadpanned, "Government UFO project. I can't say anything more." Her jaw dropped and the place went silent. Our entourage politely took our Doritos and headed for the door, feeling the eyes follow us to the car. We laughed for the next 50 miles.

Have a fun trip. See you at Dayton. Until then, put some "Magic in the Sky."

73, Jeff, AA6JR

Summer Sale

Books, Videos, Calendars, Cards!

Playing Cards

Top quality, plastic coated playing cards.



~~\$7.95~~
Now only \$4.95 per deck



CQ Award Pins

If you've earned any of CQ's Awards, you can also display the corresponding CQ Award pin. Available for WAZ, 5 Band WAZ, 160 Meter WAZ, CQ DX, CQ DX Honor Roll, WPX, WPX Honor Roll, and USA-CA awards. **ONLY \$5.00 EACH.**

Visit Our Web Site
www.cq-amateur-radio.com

Getting Started Videos - "How-To," Tips, Techniques & More!



- Ham Radio Horizons: The Video Order No. VHOR
- Getting Started in VHF Order No. VVHF
- Getting Started in Ham Radio Order No. VHR
- Getting Started in DXing Order No. VDX
- Getting Started in Packet Radio Order No. VPAC
- Getting Started in Amateur Satellites Order No. VSAT
- Getting Started in Contesting Order No. VCON

Video Special
\$12.95 each

Buy all 7 for your Club
for only **\$69.95**



Summer Special!
\$5.95

1999/2000 Calendars

Fifteen month calendars
January 2000 through
March 2001

Please specify
Amateur Radio or Classic Radio

Fax us at

516-681-2926

Call us toll free at

1-800-853-9797

Keys, Keys, Keys

by Dave Ingram, K4TWJ

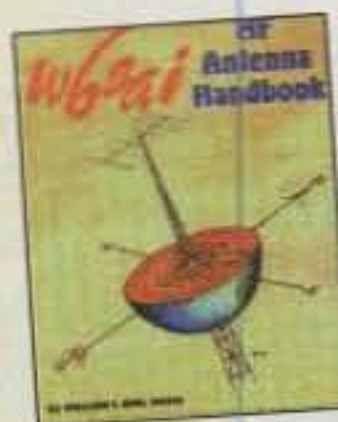


You'll enjoy nostalgia with this visual celebration of amateur radio's favorite accessory. This book is full of pictures and historical insight.

Order No. KEYS

~~\$8.95~~

ONLY \$5.95



W6SAI HF Antenna Handbook

by Bill Orr, W6SAI

Inexpensive, practical antenna projects that work! Guides

you through the building of wire, loop, Yagi and vertical antennas.

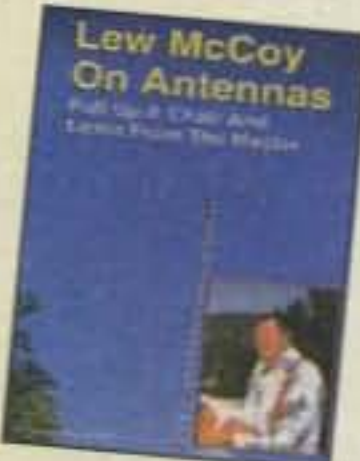
Order No. HFANT..... **\$19.95**

McCoy on Antennas

by Lew McCoy, W1ICP

Unlike many technical publications, Lew presents his invaluable antenna information in a casual, non-intimidating way for anyone!

Order No. MCCOY
..... **\$15.95**



33 Simple Weekend Projects

by Dave Ingram, K4TWJ

Do-it-yourself electronics projects from the most basic to the fairly sophisticated. You'll find:

station accessories for VHF FMing, working OSCAR satellites, fun on HF, trying CW, building simple antennas, even a complete working HF station you can build for \$100. Also includes practical tips and techniques on how to create your own electronic projects.

Order No. 33PROJ..... ~~\$15.95~~

ONLY \$9.95

Building and Using Baluns and Ununs

by Jerry Sevick, W2FMI

This volume is the source for the latest information and designs on transmission line transformer theory.

Discover new applications for dipoles, yagis, log periodics, beverages, antenna tuners, and countless other examples.

Order No. BALUN..... **\$19.95**



The Quad Antenna

by Bob Haviland, W4MB



Second Printing

An authoritative book on the design, construction, characteristics and applications of quad antennas.

Order No. QUAD..... **\$15.95**

Antenna Special! These 4-great books for only \$54.95!

- W6SAI HF Antenna Handbook
 - McCoy on Antennas
 - Building and Using Baluns and Ununs
 - The Quad Antenna
- Order No. ANT4

Amateur Radio Equipment Buyer's Guide

This 144-page book is your single source for detailed information on practically every piece of Amateur Radio equipment and accessory item currently offered for sale in the USA complete with specs and prices. Also includes the most comprehensive directory of Ham product manufacturers and dealers in the USA.

Order No. EBG..... ~~\$15.95~~

NOW ONLY \$9.95



The NEW Shortwave Propagation Handbook

by W3ASK, N4XX & K6GKU

A comprehensive source of HF propagation principles, sunspots, ionospheric predictions, with photography, charts and tables galore!

Order No. SWP
..... **\$19.95**



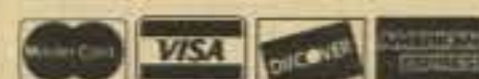
SUMMER SALE

Name _____ Callsign _____
Street Address _____
City _____ State _____ Zip _____

Qty	Item #	Description	Price	Total Price
U.S. and possessions - add \$4 shipping/handling. Foreign - shipping/handling charges are calculated by order weight & destination.			Shipping/Handling	
			Total	

Method of payment Check Money Order Visa MasterCard Discover American Express

Credit Card No. _____ Expiration date _____



CQ Communications Inc., 25 Newbridge Rd., Hicksville, NY 11801/516-681-2922; Fax 516-681-2926

News Of Communication Around The World

Bhutan, A5 DXpedition Planned

The year 2000 is shaping up to be one of the, if not *the*, best in a long time for DXing, new countries, and DXpeditions. So far we have had the Clipperton (FO0AAA) DXpedition; the new one, TX0DX, from Chesterfield; the opening up of amateur radio in East Timor on March 13th; and the BQ9P DXpedition. Then in late March there came the surprise announcement of a major DXpedition to Bhutan, A5 scheduled for May 1–12.

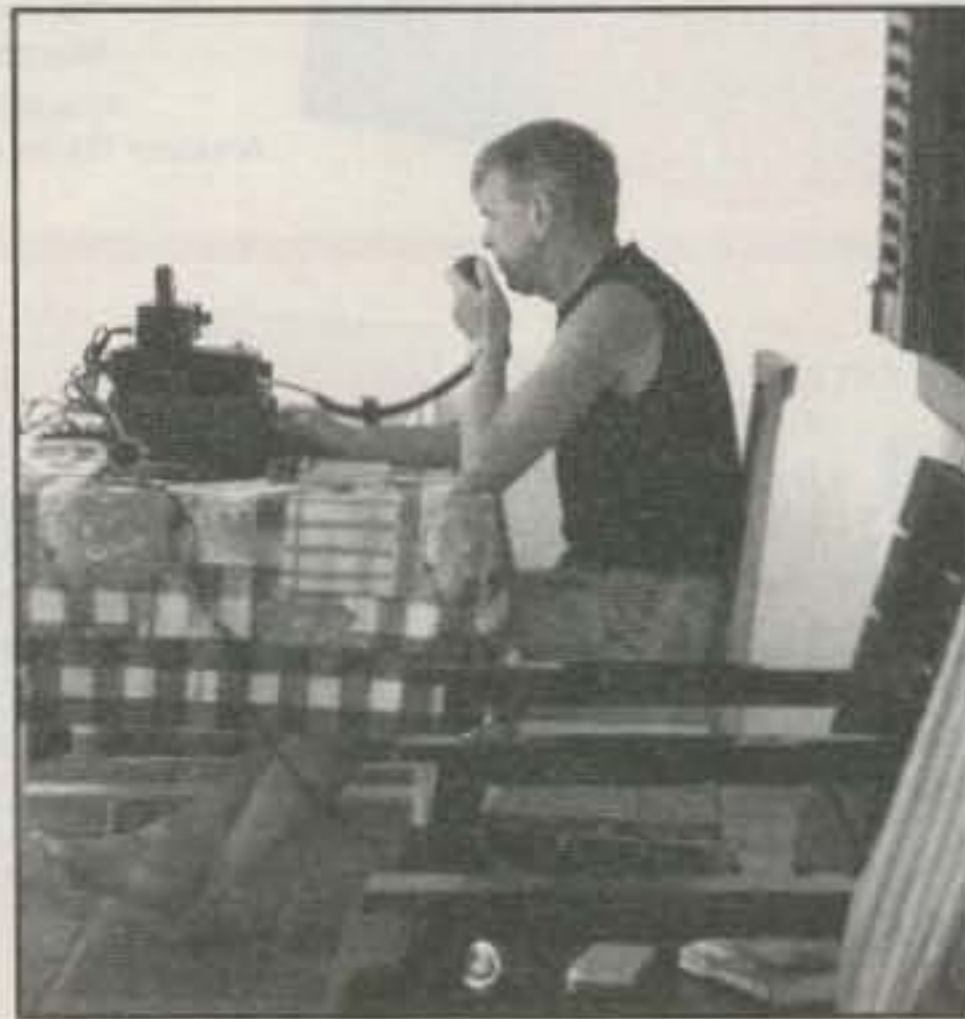
A5 has been at the top of the Most Wanted list for several years, so this was great news for most DXers, especially the newcomers who had never had a chance to work this one. The team of 14 very experienced DXpeditioners is expected to do their typical outstanding job of providing this one. By the time you read this, the operation will have ended. I hope all of you had a chance to put A5 in your log. Now that the door has been opened, we can expect to hear other A5 stations on the air in the future. I'm sure I speak for the entire amateur community in saying thank you to the Bhutan MOC and all the others who were involved in the process of making amateur radio in Bhutan possible.

All things considered, there has been a tremendous amount of DX activity in the first half of the year. Who knows what else might be added to the list before the year is over? Congratulations and thanks to all those involved in these operations.

CADXA Anniversary

The Central Arizona DX Association is celebrating its 25th anniversary this year. To commemorate this occasion, each monthly meeting of the CADXA will devote time to a historical-information presentation by Bob Davies, K7BHM, CADXA historian. Included will be the early days of organizing the club and some background on the first members (including NN6R, W7XA, KD6VS, N6NR, N7RP, N7RR, and eight others). QSLs, the logo design, and DXpeditions sponsored by CADXA will also be reviewed.

The highlight of the anniversary activities will be a 25th anniversary reunion



Bert, PA3GIO, operating as S79GI from Desroches (AF-033) in September 1999.

for members from 1975, 1976, and early 1977, which will be held in Tempe, Arizona in conjunction with the September 7th CADXA business meeting. Further information can be obtained by contacting K7BHM at: <bdavies@sfamipec.com> or by phone 480-839-3728 (Tempe).

FR/T – Tromelin DXpedition

Tromelin Island is another place that consistently has been ranked quite high on the 100 Most Wanted list, especially in the US. The Lyon DX Gang has

been working on this DXpedition for some time and is taking it quite seriously. The group recently conducted an online survey to determine who needs Tromelin. The results of that survey—organized by band, mode, and area of the world—are included in Table I.

The web site for this operation is <<http://perso.easynet.fr/~f6jjx/menu.htm>>. The following information was taken from that site.

The expedition is planned for two weeks in early August 2000. Three stations will be active simultaneously (with amplifiers). Operators will be F5PXT, F5PYI, F6JJ, and F5NOD (CW F5NOD and F6JJX).

Bands: 160, 80, 40, 30, 20, 17, 15, 12, 10, and 6 meters.

Modes: SSB, CW, and RTTY.

Antennas: A 3-el beam for 10 meters; two 3-el beams for 10/15/20 meters (thanks to DX System Radio); a 2x3-el for 12/17 meters; two verticals for the low bands—160/80/40/30 (Titanex Antenna System); and a 5-el beam for 6 meters (tnx F1NGP).

The operators plan to pay special attention to the low bands and WARC bands—for everyone.

Donations for the expedition may be made to: Account No. 022 9 62086 L, CIC Lyonnaise de Banque (France), or via the club's treasurer (pay to the order of Lyon DX Gang only), Eric Blanchard,



Well-known DXer Eli, PT7BZ, is 47 years old and has been licensed since 1980. He has an impressive array of awards to his credit. With everything confirmed (except P5), he now enjoys IOTA (Islands On The Air) hunting, with about 450 of those confirmed.

SURVEY RESULTS

"On which bands/modes do you need FR/Tromelin Island?"

	160		80		40		30		20		17		15		12		10	
	CW	SSB	CW	SSB	CW	SSB	CW	-	CW	SSB	CW	SSB	CW	SSB	CW	SSB	CW	SSB
USA EAST	A	B	A	B	A	A	A	C	B	B	A	B	A	A	A	B	A	B
USA WEST	B	B	A	A	A	A	B	C	B	B	B	B	A	A	A	A	A	A
EUROPE	A	B	A	B	A	C	A	C	A	C	A	C	A	C	A	C	A	B
S. AMERICA	B	A	A	A	A	A	A	C	A	A	A	A	A	A	A	A	A	A
ASIA/OCEANIA	A	B	A	A	A	B	A	C	B	B	B	B	B	B	A	A	A	B

Key

A = 80%>100%

B = 50%>79%

C = 0%>49%

Six meters and RTTY were not included! The reason? Needed everywhere!

Table I—The Lyon DX Gang recently conducted an online survey to determine who needed Tromelin by band, mode, and area of the world. Here are the results of that survey.

F5PXT, 2, Rue Bichat, Allée 32, 69002 Lyon - France.

For US residents: Checks should be made out to NCDXF. Please note FR/T DXpedition on the check and send it to: Bruce Butler, W6OSP, 4220 Chardonay Court, Napa, CA 94558.

The Lyon DX Gang wishes to thank the Northern California DX Foundation (NCDXF) for their help in this venture.

DXpedition to PYØS Delayed

In the Most Needed survey for 1999, St. Peter & St. Paul Rocks was ranked number 35 in the World, 55 in Europe, and 59 in the US. An operation from there has been in the works for some

time, but as the following message shows, it is not easy to get there.

The Natal DX Group says the Brazilian Navy advised them that the trip for two radio operators to the Archipelago St. Peter & St. Paul PYØS, scheduled for the first week in April, has been moved forward again (but *not* cancelled). New repairs and increased maintenance of the wooden building on the site became necessary, and the vessel (the *Comandante Manhaes*) carrying the needed personnel would not have room for the two operators. The group was told that the next maintenance trip will be in July, and it is possible that the two operators can be accommodated at that time.

The Natal DX Group will be making

the necessary contacts in June to confirm the operation, which has already been delayed twice. The Navy is the only means of making this trip, since they control access to the Rocks. On a positive note, everything is ready to go, and all expenses connected with the trip will be met.

DX Operating—Both Ways

I sat back trying to determine what to

The WPX Program

CW

3035.....JA2OLJ 3036.....JA9DOK

Award of Excellence: W9IAL

CW: 350 JA2OLJ. 400 JA2OLJ. 450 JA2OLJ. 500 JA2OLJ. 2200 KS3F.

SSB: 750 KX1A. 850 AA1KS. 900 AA1KS. 950 AA1KS. 1000 AA1KS. 1050 AA1KS. 1100 AA1KS. 1550 IK2AEQ. 1600 IK2AEQ.

MIXED: 1000 KX1A. 1550 ON4CAS. 1600 ON4CAS. 1650 ON4CAS. 1900 JN3SAC. 1950 JN3SAC. 3800 SM3EVR. 3850 SM3EVR.

Africa: IK2AEQ

Award of Excellence Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, I8JX, WA1JMP, K8JN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, ABØP, 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, NB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1PO, K9LNJ, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW,

VE3MC, 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, KZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, KØDEQ, KUØA, DJ1YH, OE6CLD, VR2UW, 9A9R, UAØFZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL.

Award of Excellence with 160 meter Endorsement: K6JG, N4MM, W4CR2, N5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK3AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N8JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, WBØDD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA5CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, KØDE1, DJ1YH, OE6CLE, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, UAØFZ, CT4NH, W1CU, EA7TV.

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 USA.

THE QSL MAN Our 20th Year!!

FREE samples - Write, phone, fax or Email
Wayne Carroll, W4MPY
682 Mt. Pleasant Road
Monetta, SC 29105 U.S.A.
Phone or FAX (803) 685-7117
Email: W4MPY@w4mpy.com
Web site: www.w4mpy.com



TOROID CORES

Ferrite and iron powder cores. Free catalog and RFI Tip Sheet. Our RFI kit gets RFI out of TV's, telephones, stereos, etc.
Model RFI-4 \$25.00
+ \$6 S&H U.S./Canada. Tax in Calif.
Use MASTERCARD or VISA

PALOMAR
BOX 462222, ESCONDIDO, CA 92046
TEL: 760-747-3343 FAX: 760-747-3346
e-mail: Palomar@compuserve.com
www.Palomar-Engineers.com

WWW.ANTENNA.IT

E. MAIL: giovannini@antenna.it

Model D2T 1.5-200MHz

- Properly designed for use in highly restricted space
 - 1.5 - 200 MHz CONTINUOUS COVERAGE, 1 KW PEP
 - Requires only one 50Ω cable,
 - Boom 6.6 ft, 2 elements 19.8 ft each, weight 19 lbs
- FIBERGLASS MAST
24.6 ft. high 2 3/8" O.D. 3/32" wall thickness
LOW BAND VERTICAL WIRE ANTENNAS-LOW BAND "DXing"

US DISTRIBUTOR AND AGENT:

Murray Neece K5MDM "Murray's Radio Ranch"
Odessa, TEXAS - WWW.QTH.COM/K5MDM - EMAIL: antennas@qth.com
PH/FAX: 915 580 9051 Mobile Phone: 915 553 5621

"Specialist in RF Connectors and Coax"

Part No.	Description	Price
PL-259/USA	UHF Male Phenolic, USA made	\$.75
PL-259/AGT	UHF Male Silver Teflon, Gold Pin	1.00 10/\$9.00
UG-21D/U	N Male RG-8, 213, 214 Delta	3.25
UG-21B/U	N Male RG-8, 213, 214 Kings	5.00
9913/PIN	N Male Pin for 9913, 9086, 8214	
	Fits UG-21 D/U & UG-21 B/U's	1.50
UG-21D/9913	N Male for RG-8 with 9913 Pin	4.00
UG-21B/9913	N Male for RG-8 with 9913 Pin	6.00
UG-146A/U	N Male to SO-239, Teflon USA	7.50
UG-83B/U	N Female to PL-259, Teflon USA	7.50

Celebrating our 20th Year!

The R.F. Connection

213 North Frederick Ave., #11 CQ
Gaithersburg, MD 20877 - (301) 840-5477
800-783-2666 FAX 301-869-3680
www.therc.com

Complete Selection Of MIL-SPEC Coax, RF Connectors And Relays

208-852-0830

http://www.rossdist.com

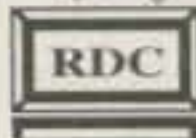
In Stock!



KENWOOD

TM-G707A

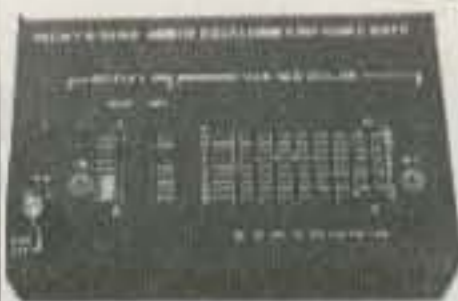
Under \$330.00



Check Out Our Specials! We're On The Web.

Over 9000 HAM items in Stock. All Prices Cash FOB Preston
ROSS DISTRIBUTING, 78 South State Street, Preston, ID 83263
Hours: Tue.-Fri. 9-12 / 2:30-6 • Mondays 9-2. Closed Saturday & Sunday

W2IHY 8 BAND AUDIO EQUALIZER AND NOISE GATE \$229.99 Assembled + \$8 S&H



optional cable to radio \$15.00 each

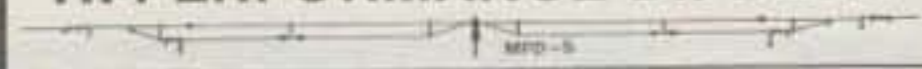
OPTIONS

- 8 bands Equalizer
- Noise Gate
- MIC IN
 - 600 ohm & HI-Z
 - XLR, 8 Pin Mic, RCA,
 - Supports popular rigs
- MIC OUTPUTS
 - Dual Outputs
 - 600 ohm +HI-Z
- Built In Monitor
- Price includes power supply

Julius D. Jones, 19 Vanessa Lane, Staatsburg, NY 12580
tel: 914-889-4933 E-Mail: W2IHY@prodigy.net
homepage: http://pages.prodigy.net/w2ihy
30 day money back guarantee

CIRCLE 93 ON READER SERVICE CARD

HI-PERFORMANCE DIPOLES



Antennas that work! Custom assembled to your center freq. ex. band - advise 1/2 of center and each end - using an inverted "V" - horizontal, vert dipole, sloping dipole - commercial quality - stainless hardware - legal power - no-trap, high-efficiency design. Personal check, MO or C.O.D. (E3)

MPD-5*	80-40-20-15-10M Max-Performance Dipole, 87' or 78' long	-\$125
MPD-2*	80-40M Max-Performance Dipole, 85' long-\$77, 105' long	-\$80
MPD-3712	30-17-12M Max-Performance Dipole, 31 ft. long	-\$50
HPD-3*	160-80-40M Hi-Performance Dipole, select 113 ft. or 125 ft.	-\$95
SSD-6	160-80-40-20-15-10M Space-Saver Dipole, 71 ft. long	-\$179
SSD-5*	80-40-20-15-10M, .42" R. long - \$125 60" R. long	-\$130

*Times 9-Bands with Wide-Matching-Range-Tuner, S&H PER ANTENNA-\$7.00

(2) Stamp SASE for 30 Dipoles, Slings, & Unique ANts. catalogue.

847-394-3414 3919N ANTENNAS
BOX 393 MI. PROSPECT, IL 60056

CIRCLE 99 ON READER SERVICE CARD

CALL (800) 727-WIRE (9473)

That's All You Need to Know About Wire, Cable and Accessories!

20 Years of Quality & Service!

Web Site: http://www.thewireman.com

Email: n8ug@thewireman.com

TECHNICAL HELP: (864) 895-4195

THE WIREMAN™ INC.

The WAZ Program

Single Band WAZ

10 Meter SSB

498.....W6SHY

12 Meter SSB

15.....EA8PP

12 Meter CW

19.....DK2GZ

15 Meter SSB

531.....W6SHY

20 Meter SSB

1058.....W6SHY 1059.....AL7HX

20 Meter CW

505.....JA1TAA

40 Meter CW

205.....NW4N 206.....K5MC

80 Meter CW

54.....PY2BW

160 Meters

149.....RU1AO (32 zones)
12.....W0CD (38 zones endorsement)
125.....OM2XW (40 zones endorsement)

All Band WAZ

RTTY

119.....EA8PP

All CW

162.....G0EHO 164.....EA3DW
163.....WT3P

SSB

4544.....KK9M 4547.....EA3AM
4545.....KK5LO 4548.....KF8PM
4546.....DS2BGV 4549.....KU4UC

CW/Phone

7925.....NX7U 7930.....EA3AM
7926.....W7ACC 7931.....LZ1CY
7927.....K3BSA 7932.....VP5/K7JI
7928.....HB9DDO 7933.....KE2UK
7929.....F5MNMK 7934.....K7VO

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 Award, CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801. 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 CQ WAZ Award. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. The WAZ Award Manager is Paul Blumhardt, K5RT, 2805 Toler Road, Rowlett, TX 75088; e-mail: <k5rt@cq-amateur-radio.com>.

write this month. Drawing a blank, I decided to take a break and go into the shack to see what was going on with the DX activities of the day. Logging onto my Internet-based cluster connection, I saw several "good" spots and tuned the FT-1000 to one of the frequencies. I immediately heard the station a good S-8 or better. Then I tuned up to the pile of signals calling him, which covered about 10 kHz. This was on CW, by the way, the mode I've always favored.

After pushing the right buttons for "split operation" and "dual receive," I went back to the DX station's frequen-

cy. There he was blazing away at about 30 wpm or so, working stations rapidly. I kept waiting for him to sign his call—and waiting and waiting. This went on for at least 10 minutes or so, and I still had not heard him give his call. What do I do next, I wondered. Do I jump in the pile-up and throw my call at him? What if he comes back to me? I don't even know if the cluster spot was right about his call. If he does come back to me and I work him, whom did I work anyway? Do I ask him for his call when I work him? Will he even hear my query through the QRM of others calling? Will he give his call even if he does hear my query?

The above scenario is common during a contest. Most DX stations in a contest give their call every few minutes. Well, most of them do! However, during routine DXing or DXpedition operations

5 Band WAZ

As of 1 April 2000, 515 stations have attained the 200 Zone level and 1128 stations have attained the 150 Zone level.

New recipients of 5 Band WAZ with all 200 Zones confirmed:
CT1EEB

The top contenders for 5 Band WAZ (zones needed, 80 meters):

N4WW, 199 (26)	W3NO, 199 (26)
W4LI (AA4KY), 199 (26)	K4UTE, 199 (18)
K7UR, 199 (34)	K4PI, 199 (23)
W0PGI, 199 (26)	HB9DDZ, 199 (31)
W2YY, 199 (26)	N3UN, 199 (18)
VE7AHA, 199 (34)	N0TN, 199 (6 on 40)
IK8BQE, 199 (31)	K4IQJ, 199 (23)
JA2IVK, 199 (34 on 40m)	UA3AGW, 198 (1,12)
K1ST, 199 (26)	EA5BCK, 198 (27,39)
AB0P, 199 (23)	G3KDB, 198 (1,12)
KL7Y, 199 (34)	KG9N, 198 (18,22)
NN7X, 199 (34)	K0SR, 198 (22,23)
OE6MKG, 199 (31)	K3NW, 198 (23,26)
HA8IB, 199 (2 on 15)	UA4PO, 198 (1,2)
IK1AOD, 199 (1)	JA1DM, 198 (2,40)
DF3CB, 199 (1)	9A5I, 198 (1,16)
F6CPO, 199 (1)	K4ZW, 198 (18,23)
W6SR, 199 (37)	OH2VZ, 198 (1,31)
W3UR, 199 (23)	RA0FA, 198 (2 on 10,15)
KC7V, 199 (34)	LA7FD, 198 (3,4)
GM3YOR, 199 (31)	K5PC, 198 (18,23)
VO1FB, 199 (19)	NT5C, 198 (18,23 on 40)
KZ4V, 199 (26)	VE3XO, 198 (23,23 on 40)
N4CH, 199 (18 on 10)	K4CN, 198 (23,26)
OE1ZL, 199 (1)	KF2O, 198 (24,26)
W6DN, 199 (17)	OH2VZ, 198 (31,18 on 10)

K1NU (155 zones)
W5RQ (162 zones)

Endorsements:
PY2BW, 200 zones
K4IQJ, 199 zones
OH2VZ, 198 zones
VE5KX/W0, 195 zones
DF2IS, 191 zones
RW9SG, 186 zones
EA3EQT, 165 zones

**Please note: Cost of the 5 Band WAZ Plaque is \$80 (\$100 if airmail shipping is requested).

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 Award, CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801. 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 CQ WAZ Award. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. The WAZ Award Manager is Paul Blumhardt, K5RT, 2805 Toler Road, Rowlett, TX 75088; e-mail: <k5rt@cq-amateur-radio.com>.

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

4846.....9A2AA	3621.....N6JV	3101...WA8YTM	2696.....K0DEQ	2289.....9A4W	2155.....W4UW	1656.....AA1KS	1389.....VE6BF	1089...OK1DWC
4177.....W2FXA	3501.....N4MM	3042.....YU7SF	2640.....IK2ILH	2280.....W6OUL	1921.....DJ1YH	1589.....W7CB	1329.....N1KC	1003...EA2BNU
3901.....EA2IA	3472.....SM3EVR	2974.....I2MQP	2636.....S53EO	2272.....N6JM	1919.....N3XX	1565...I1J-21171	1295.....W2EZ	995.....F5RRS
3884.....W1CU	3448.....9A2NA	2903.....KF2O	2597.....HA5NK	2268.....W8UMR	1882.....OZ1ACB	1544.....Z35M	1264.....VE6FR	983.....KX1A
3828.....K6JG	3426.....I2PJA	2898...WB2YQH	2477...YU7GMN	2267...WA1JMP	1872...JN3SAC	1476...YU1ZD	1263...VE6BMX	812.....K6UXO
3863.....F2YT	3324...YU1AB	2894.....W9HA	2381.....S58MU	2256.....KS4S	1847...PY2DBU	1441.....AI6Z	1251...KW5USA	741.....KU6J
3772.....UA3FT	3333.....N5JR	2870.....W2WC	2342.....K2XF	2242...YU7JDE	1744.....I2EAY	1430...WT3W	1195...W2CF	601.....JH2IEE
3673.....N4NO	3269...IT9QDS	2799.....I2EOW	2301.....W9IL	2237.....K5UR	1687.....KC6X	1396.....NH6T	1146...JR3TOE	
3629.....VE3XN	3101...PA0SNG	2753.....HA0IT						

SSB

4235.....I0ZV	2997...OZ5EV	2579...CT1AHU	2213...CX6BZ	1712...I8LEL	1536...LU5DV	1369...SV3AQR	1007...I2EAY	734...VE6BMX
3778...ZL3NS	2992...EA8AKN	2473...UA3FT	2162...K5RPC	1704...EA7TV	1522...I3ZSX	1357...W2FKF	1001...EA7CD	719...F5RRS
3568...K6JG	2867...I4CSP	2464...LU8ESU	2056...IN3QCI	1668...KS4S	1518...W2ME	1314...KC6X	996...N1KC	716...KX1A
3513...F6DZU	2838...N4NO	2440...KF2O	2048...HA0IT	1634...HA5NK	1495...IK2AEQ	1175...LU3HBO	972...AI6Z	683...OK1DWC
3416...I2PJA	2784...N5JR	2422...WA8YTM	1954...W4UW	1609...W6OUL	1440...W9IL	1121...WT3W	896...JR3TOE	642...BD4DW
3149...CT4NH	2755...I2MQP	2401...PY4OY	1910...K5UR	1606...DK5WQ	1432...N3XX	1104...EA5DCL	892...AG4W	641...F5LIW
3077...N4MM	2708...PA0SNG	2391...I8KCI	1813...N6FX	1599...K3IXD	1419...DF7HX	1066...NH6T	790...N3DRO	635...F5UTE
3019...F2VX	2696...9A2NA	2307...KF7RU	1774...K2XF	1572...CT1BWW	1411...T30JH	1060...KI7AO	780...JN3SAC	608...KE4SCY
3017...EA2IA	2600...I2EOW	2230...EA1JG	1752...YU7SF	1549...K8MDU	1386...I3UBL	1015...DL8AAV		

CW

3895...WA2HZR	2734...YU7SF	2357...YU7BCD	1982...N6FX	1744...W6OUL	1564...JA1GTF	1312...W9IL	1091...LU7EAR	930...PY4WS
3614...N6JV	2593...VE7DP	2300...W2WC	1926...OZ5UR	1670...N3XX	1553...EA7AAW	1265...EA2CIN	1058...9A3UF	888...VE6BMX
3300...VE7CNE	2527...LZ1XL	2173...HA0IT	1905...G4SSH	1668...9A2HF	1509...EA5YU	1245...I2MQP	1055...W4UW	799...WT3W
3249...N4NO	2490...N5JR	2135...KA7T	1853...I7PXV	1658...DJ1YH	1498...I23EAY	1240...AC5K	995...YU1TR	791...K6UXO
3100...K6JG	2470...N4MM	2102...EA7AZA	1823...K2XF	1639...KS4S	1487...9A3SM	1174...KC6X	994...K2LUQ	651...N1KC
2998...K9QVB	2445...G4UOL	2083...S58MU	1800...K5UR	1626...IK3GER	1482...IK5TSS	1161...I2EOW	967...EA2BNU	648...WA2VQV
2961...EA2IA	2410...9A2NA	2057...KF2O	1783...LU2YA	1625...JN3SAC	1348...LU3DSI	1159...AI6Z	965...NH6T	614...F5RRS
2960...YU7LS	2399...WA8YTM	2026...G3VQO	1782...IT9VDO	1577...EA6BD				

On The Cover

Congratulations to Larry Tyree, N6TR, of Boring, Oregon, one of the newest inductees to the CQ Contest Hall of Fame! Larry's callsign is perhaps better known to contesters in connection with his "TR" contest logging program than with on-the-air contacts, since he most often operates contests using K7RAT, the callsign of the Boring Amateur Radio Club (BARC). However, Larry may be best known as founder of the "Kids' Day" operating event, which BARC sponsors in association with the ARRL and which is in its sixth year.



Each January and June hams everywhere are encouraged to put their microphones into their kids' hands and let the kids talk on the radio to other kids (and the occasional grownup). This year's summer running of Kids' Day is on June 17 (see page 118 of this issue for details). With lots of newly-minted Generals out there among dads and moms, we should see a big uptick in activity.

Larry is also a member of the CQ Contest Committee, and his shack is set up for two-radio contesting. He's active on 160 through 6 meters, with significant accomplishments at both ends of that spectrum—185 countries worked on 160 meters and three QSOs on 6 meter EME (Earth-Moon-Earth). If three QSOs doesn't sound like a big deal, just ask any other 6 meter EME op—if you can find one! The only thing harder than working EME on this band is finding other stations with stations capable of "going the distance."

When he's not on the radio, working on his logging program, or doing "family stuff," Larry is a quality and reliability engineer for Intel. He lives on 14 acres with his wife, three daughters, and several horses. (Cover photo by Larry Mulvehill, WB2ZPI)

DXP38

DSP HF Radio Modem
CLOVER-II, RTTY, AMTOR, P-Mode



The DXP38 is a stand-alone DSP HF Modem featuring a built-in tuning indicator with selectable "Crossed X" and "Center Tuning" displays. Multi-screen, menu-driven HAL software for both DOS and Windows (95, 98, NT 4.0) is included with each DXP38 modem.

Installing the DXP38 is easy. Connect a standard DB9 serial cable to your PC and three phono cables to your radio, hook up 12VDC, and install the software. Now you are ready for some serious HF digital communications with sharp DSP filtering and Motorola micro-processor control. You win with the DXP38.

Call Now!

\$395⁰⁰

In Stock!



HAL COMMUNICATIONS CORP.

1201 W. Kenyon Road, P.O. Box 365
Urbana, IL 61801-0365
Phone: (217) 367-7373 • FAX: (217) 367-1701
www.halcomm.com • halcomm@halcomm.com

CIRCLE 53 ON READER SERVICE CARD

CQ DX Awards Program

SSB

2305.....XE1D 2306.....KC5LZY

CW

1005.....OE2KBP 1006.....YU1JU

SSB Endorsements

320.....EA4DO/331 320.....K6BZ/324
 320.....K9FYZ/331 320.....VE4ROY/324
 320.....W8ZET/330 300.....K7HG/309
 320.....K9PP/328 275.....OA4EI/292
 320.....W6SHY/328

CW Endorsements

320.....IT9QDS/329 200.....YU1JU/210
 320.....N5HB/321 150.....OE2KBP/150
 310.....N8FW/317 3.5/7 MHz.....YU1JU
 310.....K9FYZ/313

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 each plus SASE. Updates not involving the issuance of a sticker are free. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 331 active countries. Please make all checks payable to the award manager.

it really isn't all that easy. In the case cited above, the guy finally gave his call one time after I had been listening for



The operating location of Jukka, VP6BR/OH2BR. Earlier this year Jukka spent several months on Pitcairn handing out thousands of contacts on all bands, especially 160 and 80 meters.

about 15 minutes. I don't know how long it had been before that.

The "standard" DXpedition frequencies of 14195, 21295, 28495 kHz, etc., can cause a problem, too. If there are a couple of DXpeditions operating at the same time and the operator at the DX end doesn't make it perfectly clear what his call is, you easily can fall into the trap of logging the wrong one. I was listening for BQ9P on 21295 kHz, and there

was a station on that frequency running DXpedition style. He was not giving his call, and there probably are some who worked this station thinking it was BQ9P. He finally did give his call, and it definitely was not BQ9P.

When I heard Paul, BV4FH, on 21295 kHz one morning, I noted with pleasure that he was saying BQ9P on almost every contact. There was absolutely no doubt who was operating on that fre-

Getting Started Videos

Getting Started in Ham Radio



Getting Started in Ham Radio covers the eleven through setting up the first station, including the antenna, and gets you on the air.

Getting Started in Ham Radio—

How to select equipment, antennas, bands, use repeater stations, grounding, basic soldering.

Getting Started in Packet Radio



Getting Started in Packet Radio covers how to set up the necessary equipment and actually get on the air on Packet. No theory—just the nuts and bolts of how to do it.

Getting Started in Packet—

De-mystify packet. Info on making contacts, bulletin boards, networks, satellites.



Ham Radio Horizons—Step-by-step instructions for the prospective ham on how to get involved.

\$19.95 each—

Buy more and save!

Buy 2 or 3 for \$17.95 each

Buy 4 to 6 for \$15.95 each

Buy all 7 for your Club for only \$99.95!!

Getting Started in VHF—

Intro to VHF. Repeater usage, packet, satellites and more exotic VHF op modes.



Getting Started in Amateur Satellites—

How ops set up stations. Locate and track ham satellites.



Getting Started in DXing—Top DXers share experiences with equipment, antennas, op skills and QSLing.



Getting Started in Contesting—Advice and op tips from Ken Wolf, K1EA, K1AR and others!

Name _____
 Address _____
 City _____
 State _____ Zip _____

Qty _____
 _____ Getting Started in Ham Radio
 _____ Getting Started in VHF
 _____ Getting Started in DXing
 _____ Getting Started in Packet Radio
 _____ Getting Started in Ham Satellites
 _____ Getting Started in Contesting
 _____ Ham Radio Horizons
 _____ Total Videos X \$ _____ = \$ _____
 Shipping/ handling \$ _____
 Total \$ _____

Also available in PAL format.

U.S. and possessions - add \$4 shipping/handling. *FREE S/H on orders \$50 and over.

Foreign - shipping/handling charges are calculated by order weight & destination. *A \$4 credit will be applied for Foreign orders over \$50.

Credit Card No. _____ Expiration date _____

Method of payment Check Money Order Visa MasterCard Discover American Express

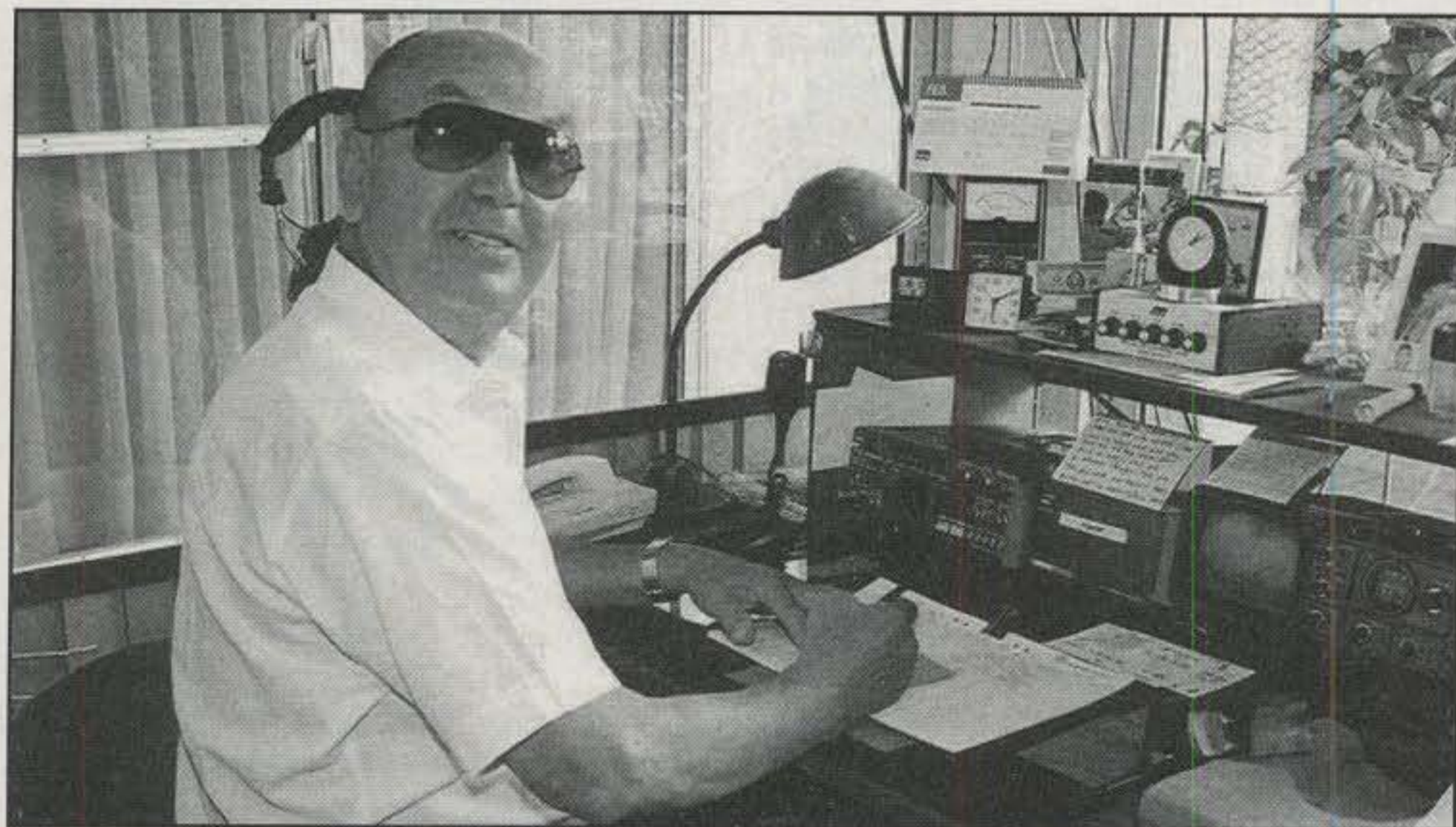


QSL INFORMATION

K2B to NO2T
 KC0GPO/KH0 to JE1RXJ
 KC4AAA to K1IED
 KC4AAD to K4MZU
 KG4AS to N4SIA
 KH0/AE4SU to JA3KWZ
 KH0AC to K7ZA
 KH2K/AH0 to JA1RJU
 KP2AD to OK1TN (1998 CQWW DX CW)
 L29AY to LU9AY
 LA/OK5DX to OK1TN
 LA7MFA to KK6HC
 LM7SKI to LA7M
 LU/KY0C to G4VGO
 LX2PA to PA3DKC
 LY/UC2ABO to EU1EU
 LY2OX to IS0LYN
 LY7A to LY2ZO
 M2000A to G4DFI
 M2I to WW2R
 NP2/K7BV to KU9C
 NP4R to W3HNC
 OD5/OK1MU to OK1TN
 OG2R to OH2BH
 OH/OK5DX to OK1TN
 OH2MXS/CE0Z to OH2BOZ
 OH2NSM/CE0Z to OH2BOZ
 OH3JF/CE0Z to OH2BOZ
 OK1KPX to OK1TN
 OK9TZA to OK1TN
 OL5X to OK1TN
 OM9ATN to OK1TN
 OX/N6AA to K6VNX
 OY3QN to OZ1ACB
 P29KPH to K5YG
 P29WK to KE1BT
 P40MH to OH2BAD

PJ/XE1L to WA3HUP
 PJ2I to ON4CFD
 PR8/PS2NF to PS8NF
 PS2V to PY2AA
 R1ANA to RU1ZC
 R1ANJ to RU1ZC
 R1ANZ to RU1ZC
 R1FJV to UA3AGS —
CIS Countries: via P.O. Box 1,
 Moscow 109387, Russia
All others: via P.O. Box 196,
 Pepperell, MA, 01463-0196 USA
 R3RRC to RW3GW
 RA9LI/9 to DL6ZFG
 S21AR to JA1UT
 S21YJ to SM4AIO
 S52000 to S51DQ
 S79LE to DL8LE
 S79SXW to G3SXF
 S79TXF to G3TXX
 SM/OK5DX to OK1TN
 SO5MFA to KK6HAC
 SO7TN/1 to OK1TN
 SU9ZZ to OM3TZZ
 SV/OK1YM to OK1TN
 T24DX to EA4CP (1999)
 T30HC to DL9HCU
 T32DA to W4ZVY
 T92000 to T93Y
 T99RM to DL2JRM
 T99W to DL1QQ
 TE8CH to TI5KD
 TI2WGO/4 to N5BUS
 TM5SIA to F2WS
 TU5IJ to I2AOX
 TYD11 to FK8VHU
 TZ6YV to WA1ECA
 UK8CK to RW6HS QSL Service,

P.O. Box 0, Novopavlovsk,
 Stavropolkiy kr., 357830 Russia
 UX0ZZ to KF3CD
 V29TU to HB9TU
 V44KJ to WB2TSL
 V47XK to LA7XK
 VP8NJS to GM3VLB
 VQ9NL to W4NML
 VQ9PH to W2JDK
 VQ9PO to W3PO
 VY0TA to VE2BQB
 WH7C/DU3 to JG1OUT
 WY2000 to K4MQG
 XE1NVX to EA5XX
 XE1UN to EA5XX
 XQ3IDY to CE4NV
 XT2DR to F6BZH
 XU7AAV to G4ZVJ
 XU7AKM to ES1AKM
 XV6JP to JA1IED
 XV7TH to SK7AX
 XX9TUH to 7N2KUH
 XZ0A to W1XT (Jan. 2000)
 YC9MKF to VK4FW
 YI2CL — pirate
 YM2ZW to OK1TN
 YS1ECB to EA7BO
 YS1X to DJ9ZB
 Z24S to W3HNC
 ZC4CM to G14OYG
 ZD9BV to W4FRU
 ZF2MU to K4BI
 ZF2ZZ to SM7DZZ
 ZK1GNW to I2YSB
 ZK1TNN to OK1TN
 ZK1XXC to HB9BMV
 ZV4D to PY4AUN



Henry, XQ0YAF, is the only "native" ham on Easter Island. He is quite active on a number of bands.

quency at the time. Another station I heard "doing it right" was Thor, 4W6MM. Although I didn't count them, he was giving his call every fourth or fifth contact. There was absolutely no doubt whom you were working.

The point here is a warning, particularly to newcomers, to be quite cautious in taking too much for granted. I also hope this brings to the attention of DX stations the necessity of giving their callsign more than once every 10 or 15

minutes. How are we supposed to know who you are if you don't tell us?

In Closing . . .

The summer is upon us, and it's time to get out and fix those antennas, bury those radials, put up the new WARC antenna, and do all those other outside projects that have been piling up all winter long. I know I have some work to do around my place, and I had better get to it! 73 and Good DXing, Carl, N4AA

CUBEX QUAD ANTENNA CO.

40 YEARS OF QUALITY ANTENNAS
SKYMASTER H.F. KITS FROM \$295.95
PRE-TUNED H.F. QUADS FROM \$439.95
 Quad Antennas From 2 Through 40 Meters
2 METER 4 EL. PRE-TUNED \$49.95 + S&H
6 METER 2 EL. PRE-TUNED \$69.95 + S & H
BEST PRICES ON DOUBLE BRAIDED "DACRON" ANTENNA ROPE
 visit our new web site <http://www.cubex.com>
 Write Or Call For Free Catalog
 228 HIBISCUS STREET, JUPITER, FL 33458
 (561) 748-2830 FAX (561) 748-2831

CIRCLE 51 ON READER SERVICE CARD

WIRE/CABLE Multi-Band AERIALS. Comrol/marine, insulators, baluns.
"FLEX-WEAVE"™ hybrid, "Cadillac" aerial wire: 168 strand cop. bare or U.V. PVC. \$.14/ft. avg. 8X, RG213, RG8 w/U.V. NONCONTAM. LOW PRICES. **"BURY-FLEX"**™ LOW LOSS flex/bury cable \$.57/ft. avg. (Why pay more for flex LMR?). LMR 400: 53/ft. Ladder Line. **ROPE ROPE ROPE** ANTENNA/TOWER SUPPORTS: WHY RISK COSTLY FAILURES? DACRON DOUBLE braided, \$.06/11/16 for 3/32", 3/16", 5/16", 1,000ft. discounts. -Full Satisfaction Gty. FRIENDLY SERVICE: Dealers welcome. QUALITY prevents costly failure & replacements.

DAVIS RF Co.

P.O. Box 730
 Carlisle, MA 01741

DAVIS RF

24 Hour Orders:

1-800-328-4773

TECH/INFO:

1-978-369-1738

<http://www.davisRFinc.com>
 (Commercial wire/cable please call our 800 #)

K2AW'S FAMOUS HI-VOLTAGE MODULES

20,000 IN USE IN
 OVER
 50 COUNTRIES



SAME DAY
 SHIPPING
 MADE IN U.S.A.

HV14-1	14KV-1A	250A.SURGE	\$15.00
HV10-1	10KV-1A	250A.SURGE	12.00
HV 8-1	8KV-1A	250A.SURGE	10.00
HV 6-1	6KV-1A	150A.SURGE	5.00

Plus \$4.00 SHIPPING—NY RESIDENTS ADD 8% SALES TAX

K2AW's "SILICON ALLEY"

175 FRIENDS LANE WESTBURY, NY 11590

516-334-7024

QUALITY QSLs by WX9X

WX9X

from
\$18⁹⁵

E-Mail: wx9x@hoosier.com
<http://QTH.COM/WX9X>

Write or Call for
FREE SAMPLES!
 55¢ SASE appreciated.

354 West Street - Valparaiso, IN 46383
 Voice (219)465-7128 Fax (219)464-7333

Aluminum Towers

Over 20 Years Experience in Meeting
 Amateur & Commercial Tower Needs.

- Crank-up Towers 40' to 100'
- All Aluminum Construction
- Light-Weight-Easy to Install

ALUMA
 TOWER COMPANY, INC.

P.O. Box 2806-CQ
 Vero Beach, Florida 32961 USA
 e-mail: atc@alumatower.com
<http://www.alumatower.com>
 Voice (561)567-3423 Fax (561)567-3432



World's Best Selling

Amateur Radio License
 Computer Aided
 Instruction Software

\$39⁹⁵ \$4 Shipping

- Learn right at your PC! 3.5 disks and CD cover all written and Morse code exams Tech through Extra. Review all 1434 questions, take sample exams, learn Morse code, build speed and more!
- free Bonus...Part 97 Rule Book and 258 page question pool book!

CALL TOLL FREE **The W5YI Group**
1-800-669-9594 POB 565101
 VISA/MC/DISC/AmEx Dallas, TX 75356



CIRCLE 97 ON READER SERVICE CARD

Appreciation for the Little Pistols

June's Contest Tip

Here's a great tip to help hone your operating skills. The next time you enter a DX pile-up, try calling the station with just 100 watts, instead of instinctively turning on the amplifier. The idea is to try to let operating skill prevail over brute force. It's amazing how differently you will operate (and how you can improve your skills) when you know you're not the loudest guy in the pack!

Let's face it: In most of life, a common scenario seems to play out. More often than not, highly successful, visible individuals tend to have a silent supporting cast that is the catalyst to their success. Whether it's a popular singer, sports star, politician, or corporate CEO, the story is the same. You're only as good as the people with which you surround yourself.

Believe it or not, the same is true in contesting circles. As contesters, we are fortunate to have an incredible number of unsung heroes, individuals who never get the appropriate amount of credit or attention, but who contribute in tremendous ways to our sport. I'd like to devote this month's column to these people—the "real" members of contesting's elite.

Let's begin by acknowledging contesting's "small pistols." You know who you are—a tenacious majority of hams in contesting who don't have the resources or experience to win most contests, but simply operate for the sport of it. An amazing fact from last year's CQ WW Contest is that over 8000 logs were submitted, far and away a new record for the contest. More amazing, however, was the huge number of low power entries and relatively low scores. Why do all of these individuals operate and submit a score? They know they don't stand a chance of even winning a certificate, much less an operating category. For some, they operate just to work some needed DX. Others are caught up in the moment and simply enjoy the operating event itself. Still others want to help out the serious com-

Calendar of Events

May 20-21	Baltic Contest
May 27-28	CQ WW WPX CW Contest
June 3-4	IARU Region 1 Field Day
June 10	Portugal Day Contest
June 10-11	ANARTS WW RTTY Contest
June 10-12	ARRL June VHF QSO Party
June 11	Asia-Pacific Sprint
June 17	Kid's Day Operating Event
June 17-18	All Asian CW DX Contest
June 24-25	ARRL Field Day
June 24-25	Marconi Memorial Contest
July 1	Canada Day Contest
July 1-2	Venezuela SSB DX Contest
July 8-9	CQ WW VHF Contest
July 8-9	IARU HF Championship
July 15-16	SEANET Contest
July 15-16	North American RTTY QSO Party
July 22-23	Venezuela CW DX Contest
July 22-23	Georgia QSO Party
July 29-30	IOTA Contest
Aug. 5-6	ARRL UHF Contest

petitors by "handing out a few points." What's amazing is that this esteemed group also takes the time to submit a log and be part of the process. I really don't have any empirical evidence, but I'd be willing to say that over 75% of the guys I work in a contest fall into this category. They are the unsung operating mass who makes contesting work. For that, we serious guys say, "Thank you!"

The next group I would like to recognize is the log checkers who support the scores of contests around the world. While many contest committees have their share of high-profile contesters working the process of contest adjudication, there is an innumerable group of others of whom you probably have never heard. These are the guys who painstakingly type multi-thousand QSO handwritten logs into contest-checking databases. They are the folks who process thousands of contest awards, including printing certificates, addressing envelopes, affixing stamps, making runs to the post office, etc. The list of menial tasks is endless, yet there's a wonderful group of fellows from around the world who are willing to help out. It's not just the CQ WW Contest. It's nearly every contest you read about in this column and elsewhere.

Now on to the contest club. When you think of organizations such as the Yankee Clipper Contest Club or the

Frankford Radio Club, you often think of their high-profile members or officers. However, the success of these groups has little to do with their big guns. The glue of contest clubs is the little guys. These are the new contesters who are eager to learn the ropes from experienced peers. They are the members who volunteer to be an area coordinator for one of the club's subgroups, or they are the team members who organize the club's social events, put Field Day together, print the club's QSLs, etc. If you're a big gun, take a look around the room at your next club meeting. You wouldn't have a meeting if it weren't for the enthusiasm of the majority in the room who probably will never win a major contest. However, you will have a great meeting because they are there.

Finally, I'd like to acknowledge the supporting staff of the major contest stations. If you are the proud owner of a large contest station, you probably will agree that your station would never have come together without the support of a large number of assistants—individuals who bring practical experience and resources to the table.

A great example of this point is the team of W3LPL. Frank has been blessed to have a wonderful supporting staff in building his station over the years. In the early period of his station's construction, there literally was a time when every single weekend was consumed by a group of dedicated hams who wanted to see the miracle of W3LPL come to be. They were not the typical high-profile contester in many cases. Rather, they simply were a group of good friends who enjoy contesting as a sport and wanted to be part of a bigger experience in assembling Frank's station.

This story is replicated in so many ways. When I finally get to building my station this summer, I won't be limited to contesting's "top 10" to help me with the tower work. More likely, I'll be fortunate to have the help of the "guys around town" to put together the K1AR antenna farm.

I'd like to suggest a mandate that the big guns of contesting adopt. Go out of your way to thank a small gun for his or her contribution to contesting. The next time you order that club T-shirt or work

a small gun for the 25th time, take the opportunity to thank that person for his or her contesting efforts. Small pistols of the contest world, *you* are contesting! Thanks for your support of the hobby we enjoy so much.

Final Comments

That's it for this month. It's been another crazy month for me from a business commitment standpoint, so I appreciate your patience in my delayed responses to e-mail inquiries and other matters.

Remember that all contest calendar submissions for the September column must reach me by July 1st. You are advised to send your contest information to me directly and not to Hicksville (e-mail is absolutely the best way!). There have been some late comers recently, so please take note of these dates to ensure that your event gets published.

73, John, K1AR

Portugal Day Contest 0000-2400Z Sat., June 10

This is the tenth running of the Portugal Day Contest sponsored by Rede dos Emissores Portugueses. It is on SSB, 80-10 meters (no WARC bands) with recommended operation limited to the IARU's Region 1 band plan.

Classes: Single Operator, All Band, SSB.

Exchange: Portuguese stations send signal report and their District/Region. All others use signal report and sequential number.

Scoring: QSOs with non-Portuguese stations are worth 3 points. Contacts with Portuguese stations are worth 6 points. You may QSO the same station on different bands.

Multipliers: You may take multiplier credit for each Portuguese District and DXCC country you work. Contacts within your own DXCC country only count for multiplier credit. Final score is total QSO points from all bands times the sum of all multipliers.

Awards: Plaques will be awarded to the top five world-high scorers. Certificates are also available, including a nice participation award to any station working 25 or more Portuguese and/or EA stations.

Logs must be postmarked no later than July 31st and should be sent to: REP Award/Contest Manager, P.O. Box 2483, 1112 Lisboa Codex, Portugal.

KACHINA FACTORY STORE

ORDER ON-LINE 24 HOURS A DAY AT FACTORY-DIRECT SAVINGS!



SALE PRICE
\$249.00

SAVE \$50 ON YOUR CHOICE OF COMPUTERIZED ROTOR CONTROLLERS →

505ARX (shown). Full on-screen control. Now \$249 (reg. \$298). Software included.
505AR - Same device on internal ISA PC card. Now just \$189 (reg. \$239).

USE WITH ALL RADIOS & MOST ROTORS!

← SAVE UP TO \$200 ON REMOTE CONTROL!

505RC - Remotely control your Kachina 505DSP over telephone lines or wireless link. On sale now for \$249 each (reg. \$298). Two required.
505RCP - Complete package of two RCs with tel. modems on sale for \$695 (reg. \$895).

900 MHz WIRELESS PACKAGE AVAILABLE TOO!



SALE PRICE
\$249.00

More specials: Heil Goldline mic \$109; AT-250 Broadband Dipole (1-30 MHz) \$199

Order on-line at www.kachina-az.com/factory.htm or call 520-634-7828

505AR/ARX require installation of relay card in your existing controller. Some controllers may require modification. Sale ends 6/30/00. Prices quoted do not include tax (where applicable) or shipping.



E-mail: kachina@sedona.net

KACHINA
COMMUNICATIONS, INC.

P.O. Box 1949, Cottonwood, Arizona 86326

CIRCLE 67 ON READER SERVICE CARD

Be a Winner with CQ Contest!

No matter how you look at it, *CQ Contest* is the contesters' magazine. We've assembled some of the best contesters in the world to produce a publication that's informative and fun to read. Edited by Bob Cox, K3EST, it offers fascinating articles from fellow contesters OH2MM, N6KT, S50A, I2UIY, W3ZZ, KU2Q, JH4NMT and others!

People

Fascinating features about experiences of contesters around the world such as Contesting Under Communism or the PJ1B story.

Analysis

In-depth analysis of Contest results. Detailed information about contesting that will never be found in the results!

Technology

Practical reporting on contest-specific technology and its applications. Read about multi-op filters, station design, product reviews and more.

Techniques

Advice from the experts on operating and ways to improve your score including phone pileup techniques, basic operating tips and much more!

Reporting

Up-to-date, worldwide coverage of contests and events.

U.S.: 1-year, (10 issues) \$30.00, 2-years (20 issues) \$57.00.
Canada/Mexico: 1-year \$40.00, 2-years \$77.00.
Foreign Air Post: 1-year \$42.95, 2-years \$82.95.
Please allow 6-8 weeks for your first issue.



CQ Communications, Inc.
25 Newbridge Road, Hicksville, New York 11801 Ph: 516-681-2922 Fax: 516-681-2926
(include check, money order or credit card information)



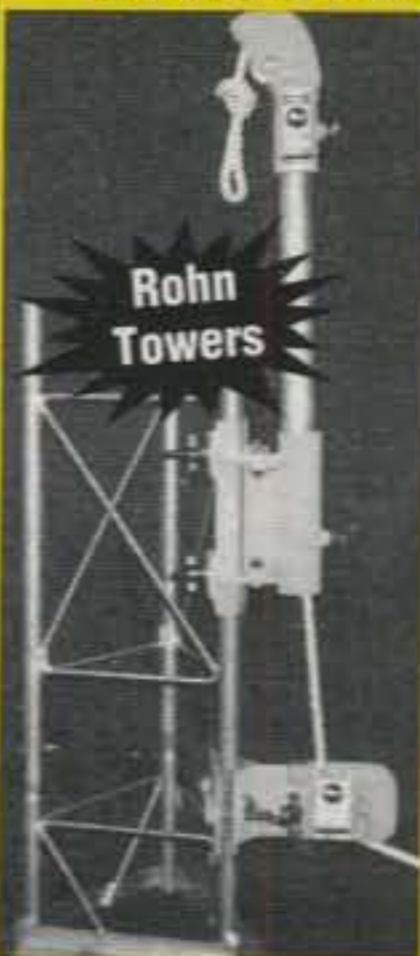
WBØW, Inc.

Call 1-800-626-0834 or 816-364-2692

FAX: 816-364-2619 • E-Mail: WBØW@ATTGLOBAL.NET

Web Site: www.wbøw.com

Ginpoles, Tower Jacks, Rohn towers and accessories, Hazer, Belden coax, Flexweave, Copperweld, Hy-Gain rotors and antennas, Larsen, Cushcraft, Comet, Diamond and Valor antennas, MFJ, Ramsey kits and RF Connectors. Also radios now!



Rohn Towers
Ginpole for Rohn 25-55 and round leg towers up to 2" O.D. Shown here with optional base pulley. Also ginpoles for BX type towers.

Check these RED HOTS Hy-Gain

AV-620/AV-640 \$239/309

HAM IV, T2X ROTORS...SCALLS

CUSHCRAFT

RS New 40-6M Vertical ...\$374.95

X7/X9 \$519/799

R6000/R7000 \$254/349

MASB \$259

A270-6S/A270-10S \$58/75

I3B2/I7B2/26B2 \$107/189/299

MFJ

POWER SUPPLIES

MFJ 4245MV\$165

MFJ 4225MV\$127

MFJ 4125\$93

MFJ 4035MV\$129

TUNERS

MFJ 989C\$279

MFJ 969\$157

MFJ 949E\$124

AMERITRON ATR-30\$499

AMERITRON AMPLIFIERS

AL-811H, 800 Watts...Special \$5

All Ameritron Amps at SUPER PRICES!

P.O. Box 8547, St. Joseph, MO 64508

Prices do not include shipping. Price & availability subject to change without notice. Most orders shipped the same day. C.O.D.'s Welcome.

MFJ-2598
\$199

MFJ
QRP
Cubs are Here



B&W Folded Dipoles
1.8-30MHz, 90' Long
CALL!

CIRCLE 101 ON READER SERVICE CARD

ARRL VHF Contest

1800–0300Z Sat. to Mon., June 10–12

Action will be found on the 50, 144, 220, and 420 MHz bands, and even higher up in the spectrum. The scoring varies with the different bands used, and there are certain requirements and restrictions in the rules. The complete rules can be found on the ARRL web site at <http://www.arrl.org/contests/announcements/rules-06vhf.html>.

It is recommended that you write to ARRL headquarters for official forms or download them off their web site. Include an SASE with your request to: ARRL VHF Contest, 225 Main Street, Newington, CT 06111.

Kid's Day Operating Event

1800–2400Z Sat., June 17

Sponsored by the Boring Amateur Radio Club, the Kid's Day Operating Event is intended to encourage amateur radio activity by younger people (licensed or not). The goal is to give unlicensed young people some hands-on, on-the-air experience in the hopes that they might develop an interest in pursuing a license. It is also intended to give hams a chance to share their stations with their children.

Exchange: Name, age, location, and favorite color. You are encouraged to work the same station again if either operator has changed. Call "CQ KIDS DAY."

Frequencies: 28350–28400, 21380–21400, and 14270–14300 kHz.

Logs, comments, and funny stories can be posted via the internet to kids@contesting.com. You can review these postings at <http://www.contesting.com/kids/> with your web browser. All verified participants will receive a colorful certificate. Send an SASE to BARC, P.O. Box 1357, Boring, OR 97009. More details are available from the Boring Amateur Radio Club or at <http://www.jzap.com/k7rat/>.

All Asian DX Contest

CW: June 17–18 Phone: Sept. 4–5
0000Z Sat. to 2400Z Sun.

This is the 41st year of this activity sponsored by the JARL. Contest operation is between Asian countries and the rest of the world.

Classes: Single Operator, both Single- and Multi-Band. Multi-Operator, both Single- and Multi-Transmitter, All Band only (one signal per band only).

Club stations are classified as multi-

operator and each operator will give his/her age in the exchange.

Exchange: For OMs—RS(T) plus age of operator. For YLs—RS(T) and 00.

Scoring: 3 points for contacts on 160; 2 points for contacts on 80; 1 point on all other bands.

Multiplier: Asians credit one multiplier for each different DXCC country worked per band. Non-Asians use the number of Asian prefixes worked on each band (CQ WPX list).

Final Score: Total QSO points from all bands times the total number of multipliers worked.

Note: JD1 stations on Ogasawara are in Asia, and JD1 stations on Minamitori Shima are in Oceania.

Awards: Certificates to the top scorers both phone and CW in each country and U.S. call area. In each class, both single band and all band, up to the fifth rank, depending on the number of log returns. Medals will be awarded to the all-band continental leaders both single and multi-operator.

Logs: Keep all times in GMT. Use a separate column for the country or prefix multiplier, and fill in only the first time it is worked. Use a separate log for each band. Include a summary sheet showing the scoring and other information, and a signed declaration that all rules and regulations have been observed.

There is a strict disqualification clause for taking credit for duplicate contacts in excess of 2% of the total on each band, as well as other infractions.

Logs must be received no later than October 30th for the Phone section and July 30th for CW. They go to: JARL, All Asia DX Contest, P.O. Box 377, Tokyo Central, Japan.

Asian Country List: A4, A5, A6, A7, A9, AP, BV, BY, XX9, EP, HL/HM/DS, HS, HZ/7Z, JA–JS, JD1, JT, JY, OD, S2, TA, All C.I.S. DXCC Countries, VR2, VU, VU4, VU7, XU, XV/3W, XW, XZ, YA, YI, YK, ZC4/5B4, 1S, 4S, 4X/4Z, 7L-N, 70, 8Q, 9K, 9M2, 9N, 9V.

ARRL Field Day

1800–2100 Sat. to Sun., June 24–25

Without a doubt this activity generates more stateside participation in manpower than any other amateur radio activity. It is mostly a club-organized event and requires that the coordinator be knowledgeable about all the various operating/technical requirements.

Entries are separated into many classes. Rules and requirements are quite extensive and will be found on the ARRL's web site at [\[fd.html\]\(http://www.arrl.org/contests/announcements/rules-fd.html\). It is advisable that you read them thoroughly.](http://www.arrl.org/contests/announcements/rules-</p></div><div data-bbox=)

In the absence of computer logging, official log forms are a must. Direct your request with a large SASE to the ARRL, ARRL Field Day, 225 Main Street, Newington, CT 06111. Electronic logs may be submitted to FieldDay@arrl.org and should include, as attachments to the e-mail, the required summary sheet and log files as well as documents and/or .jpg/.gif files that support claimed bonus points. All entries are due by July 24th.

Canada Day Contest

0000–2359Z, Sat., July 1

Each year on July 1st, the anniversary of Canada's confederation, the Radio Amateurs of Canada sponsors the Canada Day Contest. Amateurs from around the world are invited to Canada's birthday party on the air.

Classes: Single Operator—All Band (high power, 100 watts and QRP), Single Band and Multi-Operator.

Exchange: Canadians sent RS(T) and province/territory. Foreign entries send RS(T) and serial number beginning with 001.

Points: Any station may work any other station for credit. A QSO with a Canadian station is worth 10 points. Canadian stations with a RAC suffix is worth 20 points. Stations outside of Canada are worth 2 points.

Multipliers: Credit one multiplier per band and mode worked for Canadian provinces and territories (13 maximum). Final score is total QSO points times your multiplier. At press time it appears that the new VY0 multiplier will be active. Check out <http://www.rac.ca/CAN-DAY.htm> for the latest information.

Awards: There are a number of plaques available, including the Jorge Bozzo, LU8DQ, award donated by Alan Goodacre, VE3HX, for the highest non-Canadian score. Certificates will be sent to category winners around the world as well.

Entrants must submit a summary sheet showing the score calculation as well as a dupe sheet, multiplier checklist, and logs. Send entries to: RAC, 720 Belfast Road., Suite 217, Ottawa, Ontario K1G 0Z5, Canada by July 31st. Entries may also be sent by e-mail to Gord Kosmenko, RAC Canada Day Contest Manager, at gkosmenko@arrowspeed.com.

The results will be published in the November issue of the Canadian *TCA Journal* (contact RAC for further information) and will be sent to all certificate winners.

News Of Certificate And Award Collecting

Why would you want to get involved in county hunting? How do you get started? These are questions Terrie Tenney, AB7PX, asked himself. Here's how he got hooked on chasing counties and achieved USA-CA All Counties #997, March 6, 2000.

How does one get started in county hunting? Why would one want to? I asked myself those very same questions one day as I wandered across the 20 meter band, landing on the county hunter's net. At the time I was trying for my WAS (Worked All States). There was a mobile in a state I needed, so I threw in my call, capturing another state. I listened awhile and was intrigued. It had never occurred to me to work for counties. A few months later I went back to the net. That was it for me. I was hooked.

I got my first "ticket" in 1995, a Technician class. I enjoyed 2 meters for a time before deciding I could meet the challenge of Morse code. I set to work, and three months after my first code test I had achieved my Extra class ticket.

I have enjoyed the many facets of HF, DXing, island chasing, and special events. I work a contest now and again, all very satisfying. However, the challenge of collecting all 3076 counties in the United States of America has a draw of its own.

Many times I almost threw in the towel. I would ask myself what I was doing it for, as I would never get them all. I stayed away from the radio only to come back looking for counties. I found myself getting up in the wee hours of the morning for that elusive county.

There are many counties not populated by amateur radio operators. Some very seldom even see a ham in them. That's where the mobile operator comes in. This is not your typical mobile, the one on his way to work or traveling across country. This is a special breed of mobile operator—a dedicated county hunter. He or she will go miles out of the way for that rare county, or maybe it's a last county in the state. Many mobiles plan their vacations around the needed counties.

There have been many highlights in my county hunting: completing my first state; getting the rare one here and there; the feeling of achievement as the counties I needed became fewer and fewer; watching my *Counties Award Record Book* fill up. The highest point for me isn't in what I've done, though. It's when Ed, WA0SBR, gave out Lenawee, Michigan, his last county, #3076, as a mobile. It was a pleasure for me to work him and share in such a great feat. So few have accomplished this. Congratulations, Ed.

I have been asked what I will do now that I have completed my quest. Well, I will give

USA-CA Special Honor Roll

Lee Duncan, N0LN,
USA-CA All Counties #996
February 26, 2000

Terrie Tenney, AB7PX
USA-CA All Counties #997
March 6, 2000

time back to my family. They haven't seen much of me. Since I started county hunting, two of our daughters got married and another presented us with our second grandchild. Summers have come and gone. It's not easy to plant a garden with one ear bent toward the radio. I phrase often heard in my house is "I'll be right there, just one more county."

Will I chase counties again? You bet I will. I'll even go mobile now and again.—AB7PX

This and That

Here are some brief items from recent e-mail inquiries and other sources.

USA-CA: Use of the *CQ Counties Award Record Book* is optional. You may submit any kind of listing as long as it contains the same data in the same order as in the booklet. Contacts may have been made under *any* of your call-signs, as long as you were the operator.

GCR: This stands for General Certification Rule and is used by most award sponsors who don't require seeing your cards. You must submit a signed list/statement that you possess the required cards and have this signed and witnessed by two licensed amateurs. This works in most cases.

A New County (not): Jim Leonard, WA6TFZ, informs us that the proposal to form High Desert County out of Kern County, California is shelved, as the proposal did not get sufficient votes.

Discovery of Brazil Award

This award commemorates the 500th anniversary of the discovery of Brazil by Portuguese navigators. It is available for contacts made from January 1 to December 31, 2000. Brazilian amateurs need 200 QSOs made with Brazilian stations plus 10 made with continental Portuguese stations (CT). Asian and Oceania amateurs need 20 QSOs with Brazilians plus 10 with CT stations. All others need 50 QSOs with Brazilians plus 10 CT QSOs. The same station may be contacted one additional time but on a different band, with a minimum of 24 hours between the QSOs.

USA-CA Honor Roll

500	2000
AB7PX.....3112	N0LN.....1183
W9FRC.....3113	AB7PX.....1184
K0EVE.....3114	SM6TEU.....1185
1000	2500
AB7PX.....1543	N0LN.....1100
	AB7PX.....1111
1500	3000
N0LN.....1284	N0LN.....1014
AB7PX.....1285	AB7PX.....1015

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, 25 Newbridge Road, 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.



Award celebrating the 500th anniversary of the discovery of Brazil by Portuguese navigators.

For DX (not Brazilian) stations, a certified log entry will be accepted instead of cards. Send the list of stations contacted with a signed declaration by an official of your radio club or two other licensed stations that the QSOs are registered in your log. You must also sign the following declaration: "I declare, for my honor, that the contacts for obtaining the Discovery of Brazil Award, with the related stations in GCR log, were indeed accomplished" [date, signature, callsign].

Fees: Brazilians R\$5.00; all others \$US5.00. Apply to the custodian: Ronaldo Bastos Reis, PS7AB, P.O. Box

65 Glebe Road, Spofford, NH 03462-4411
e-mail: <k1bv@cq-amateur-radio.com>

2021, 59094-970 Natal, RN, Brazil (e-mail: <ps7ab@qsl.net>).

Canadian QRP Award

Working all of Canada with QRP is a challenge due to the small physical size of Prince Edward Island and the sparsely populated northerly Yukon, Northwest, and Nunavut Territories. Jeff, VA3JFF, the sponsor of this award, also sponsors a similar award requiring all such contacts to be made during the year 2000. See his website for details on both awards.



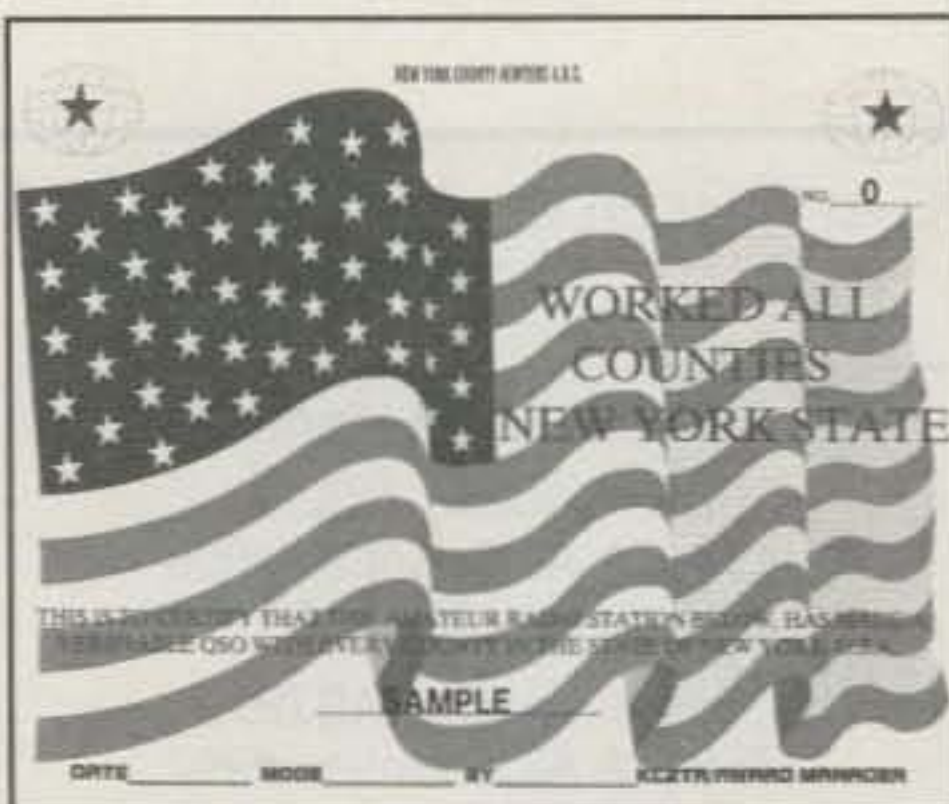
The challenging Canadian QRP Award.

Contact all 13 provinces and territories of Canada two-way QRP. QRP is defined as using not more than 5 watts CW or 10 watts PEP SSB. Send GCR list and fee of \$C2 or 2 IRCs to: Jeff Heatherington, VA3JFF, 3399 Cardinal Drive, Niagara Falls, Ont., Canada L2H 3A6 (web: <<http://www.geocities.com/Colosseum/2572/QRP.htm>>).

Worked All Counties New York State

Through this award you quickly learn that New York is not just New York City and the densely populated counties at the southern end of the Empire State. There are no beginning levels, just one for all of the 62 counties, which makes an additional challenge. The annual New York State QSO Party is a great way to make a big dent in the counties or to pick up a few rare ones. That's what I did for several years prior to finishing the state.

Work each of the 62 counties in New York State. SWL okay. No time limit.



The Worked All Counties New York State award.

All bands may be used; repeater QSOs are OK. Provide a GCR list of the counties which must include call, time, date, signal report, mode, band and the county. Endorsements for single band, QRP, SWL, and single mode on request. Fee for US/VE stations is \$US6; DX stations 5 IRCs. Award is a colorful image of the Stars and Stripes on heavy-grade paper. Apply to: Award Manager KC2TR, P.O. Box 185, Conesus, NY 14435-0185.

Ecuador's DX-TA-SEA DX Club Series

Dr. Rick Dorsch, NE8Z/HC1MD, offers two colorful, well-designed certificates for contacting Ecuadorian stations. The Equatorial Line Diploma shows the stone monument built right on the equator at 0 degrees, and everyone knows about the Galapagos turtle featured on the Galapagos Islands certificate. The requirements for both awards are moderate enough so that even the casual DXer can earn at least the entry-level certificate. Every DX contest seems to have at least one HC8 operation, so even if you don't have a Galapagos station, it isn't hard to get the three needed. They'll appreciate the points in the contest, too.

General Requirements: Sponsored by DX-TA-SEA Club (WW8DX), the awards are available to amateurs/SWLs. Contacts must be after 20 November 1945. They may have been made under different personal call-signs, but all must have been made from same country. Endorsements by band, mode, or QRP (less than 5 watts). Send GCR list and fee of \$US5 (or equivalent foreign currency accepted at current rates) or 10 IRCs. For endorsements send an SAE and \$US2 or 4 IRCs. All of the awards are free to Ecuadorean stations and SWLs. Apply to Dr. Rick

Dorsch, NE8Z/HC1MD, P.O. Box 616, Hamburg, MI 48139-0616 (e-mail: <ne8z@yahoo.com>)

Equatorial Line Diploma. Confirm contacts with the 20 different Ecuadorean HC and HD prefix areas HC1-0 and HD1-0, including HC8/HD8 Galapagos Islands and HC9/HD9 and HC0/HD0 special event and contest stations.

Class D—Brass, contacts with 1-5 prefixes.

Class C—Bronze, 6-10 prefixes.

Class B—Silver, 11-15 prefixes.

Class A—Gold, 16-20 prefixes.

A trophy will be awarded free of charge to those holding the Class A Gold Diploma and confirming all 20 prefixes.

HC8/HD8 Galapagos DX Diploma. Confirm contacts with a minimum of three different HC8/HD8 stations in the Galapagos islands. An endorsement is available for confirmation of contact with eight different Galapagos stations, one of which must be an HD8 callsign.

Isle of Wight County Award

This award is a handsome example of a traditional, conservative design. It is printed on heavy parchment-like paper and individualized for the applicant by means of hand tinting of the official Isle of Wight coat of arms, plus listing the stations on the island that you used in your application. A sample of the official GX0BAR QSL card lists interesting facts about the island. One of these facts is that it is a haven for red squirrels. Actually, so is my backyard in rural New Hampshire, and I wouldn't brag about that.

The award is sponsored by the Brickfields ARS for contacts with Isle of Wight stations on or after 1 January 1985. SWL okay. The headquarters stations noted below are G0BAR and GX0BAR.

HF—contact 5 stations on the Isle of Wight plus one HQ station.

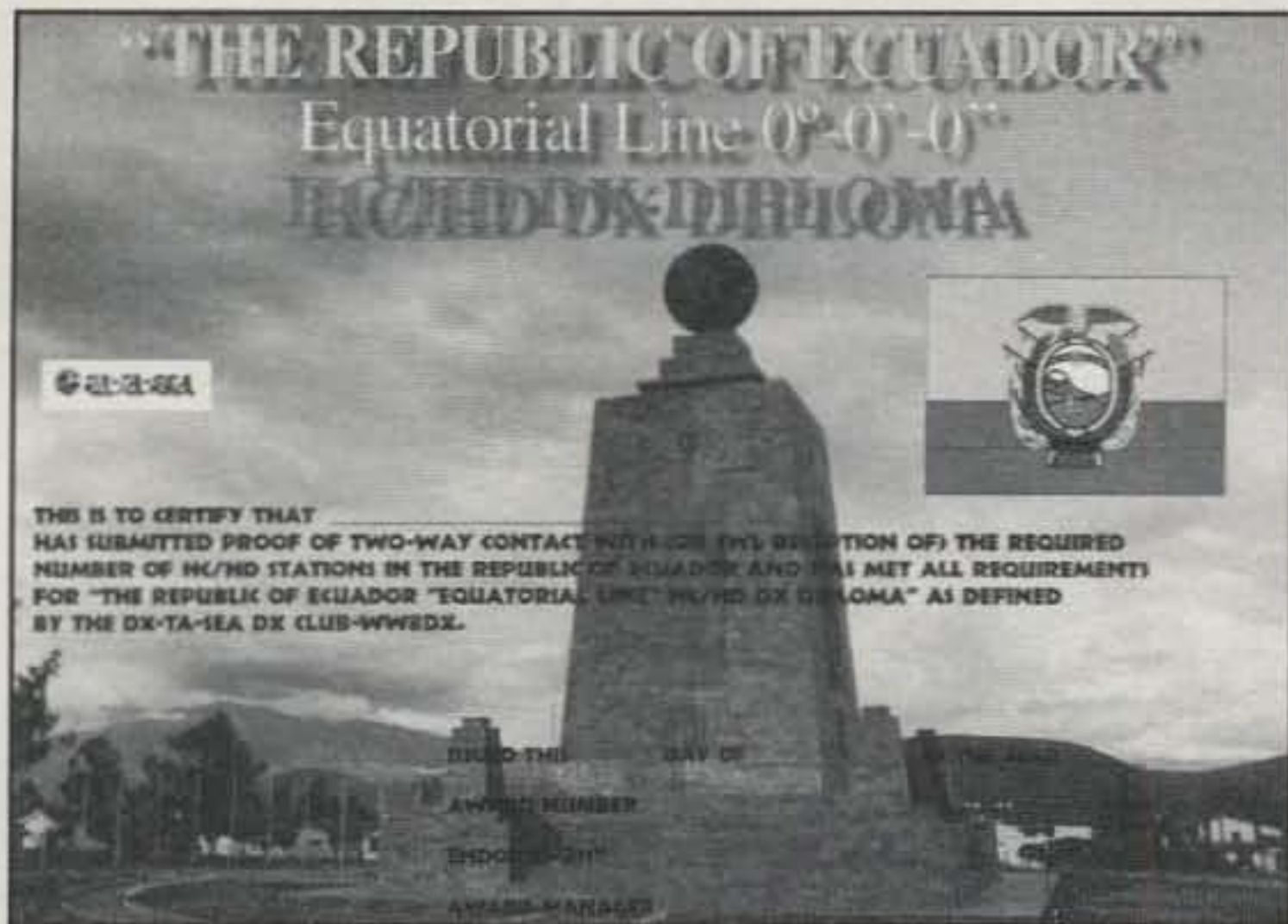
VHF/UHF—contact 10 stations on the Isle of Wight plus one HQ station.

Packet—as above, appropriate to band.

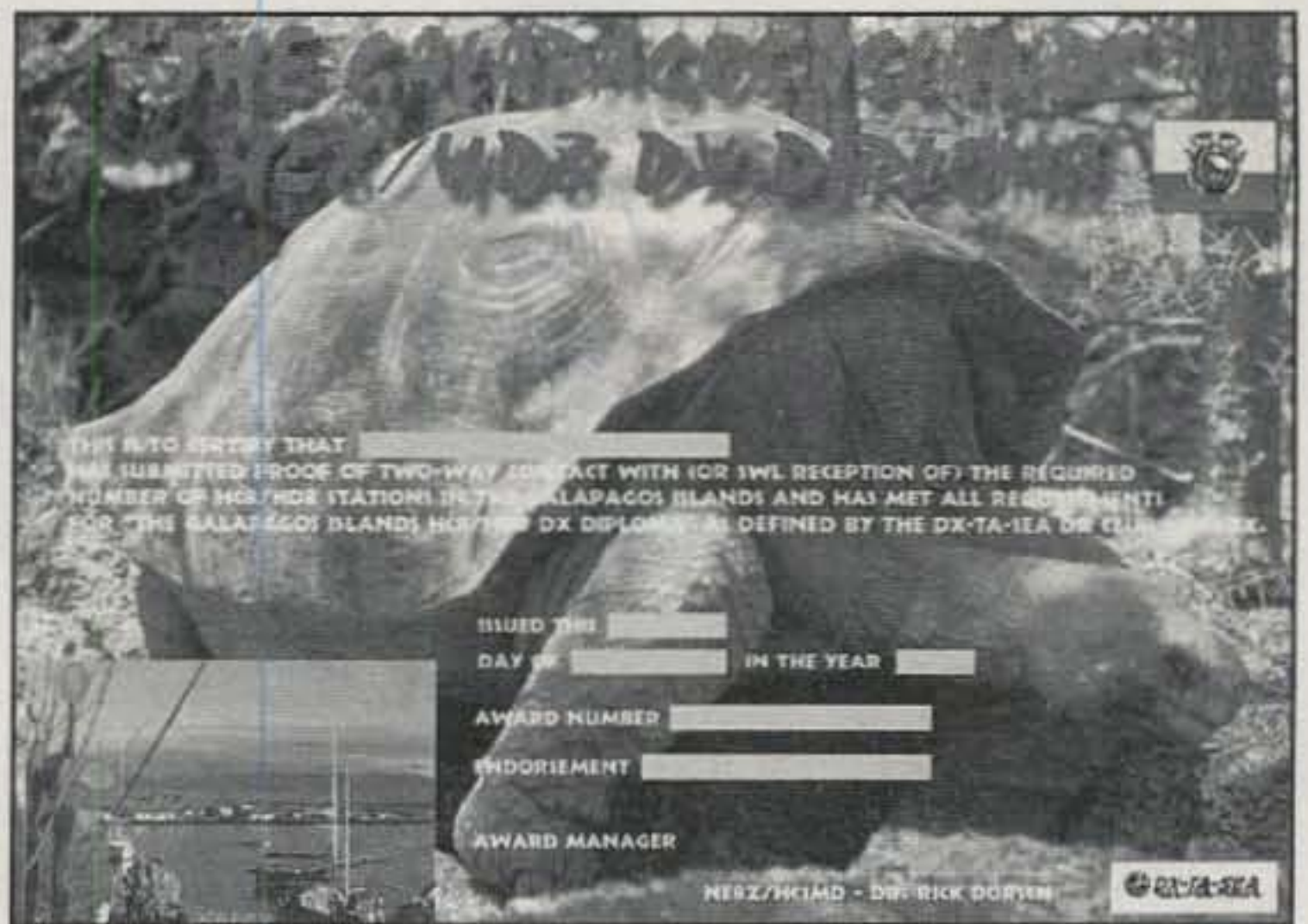
Send GCR list and fee of UK£3.25 or \$US5 to: Awards Manager, Brickfields ARS, Newnham Road, Binstead, Ryde, Isle of Wight, England PO33 3TH.

Diplome des Prefixes Français D.PX.F

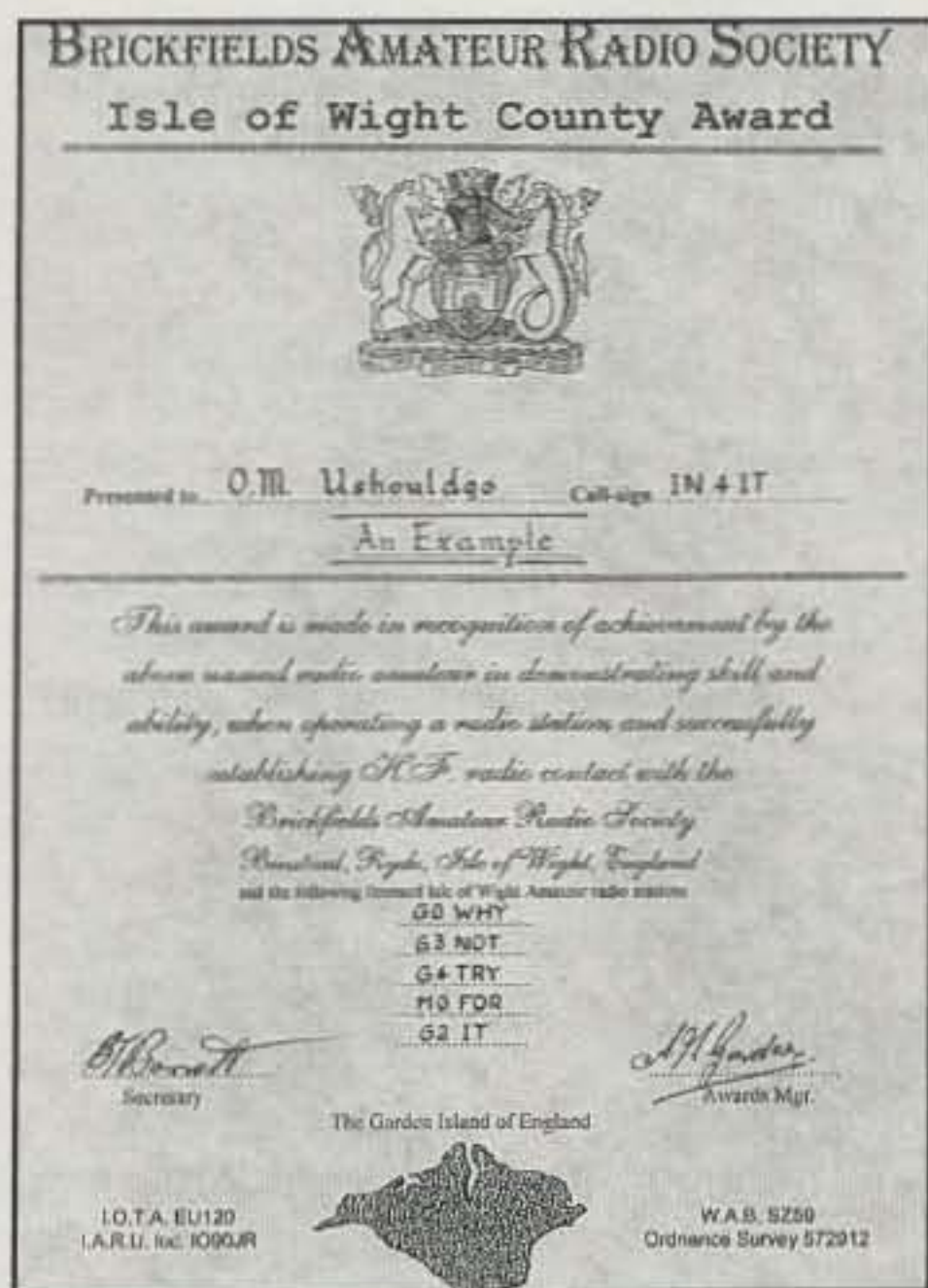
The French Prefix Award is relatively easy to attain at the beginning level and is quite difficult at Class 1. Most DXers with a good QSL card collection should be able to qualify for Class 3.



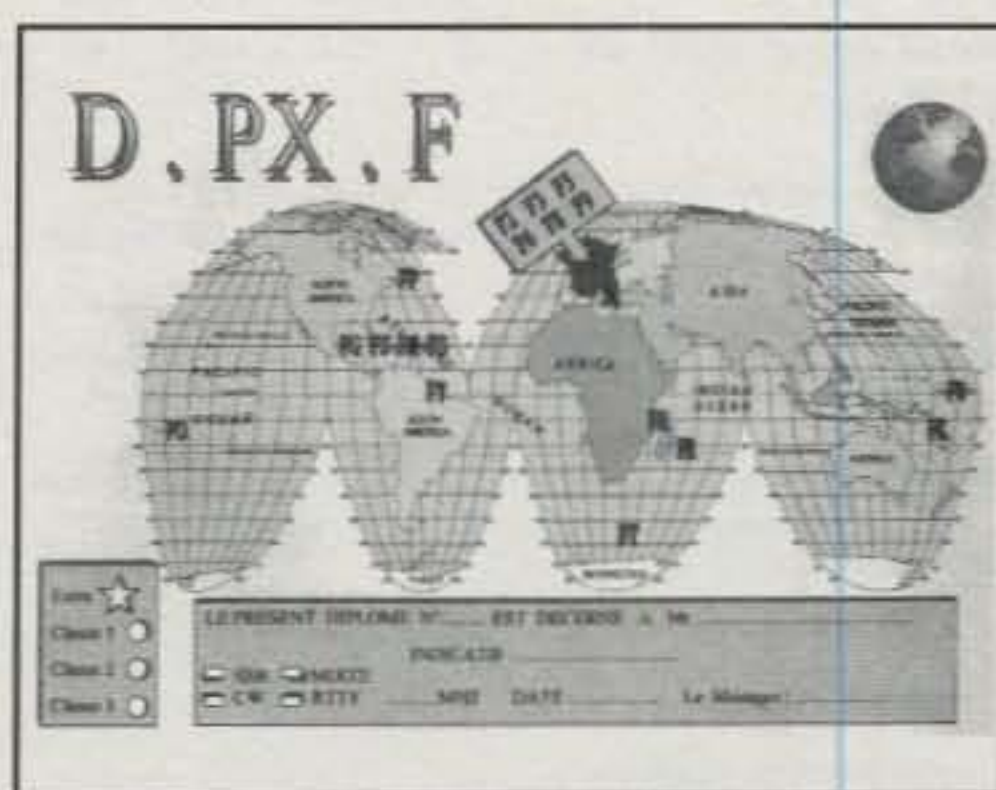
The Equatorial Line Diploma, one of the DX-TA-SEA DX Club award series.



The HC8/HD8 Galapagos DX Diploma featuring the famous Galapagos turtle.



The Isle of Wight County Award is sponsored by the Brickfields ARS.



The French Prefix Award.

Pierre Fournier F-10095, 3 Bis Av. De Porchefontaine, F-78000 Versailles, France.

Internet Sites of the Month

The Chiltern DX Group administers the IOTA 2000 award on behalf of the RSGB. The official stated purpose of the award is to celebrate the millennium, to promote IOTA activity, and best of all, to have fun on the HF bands. You can get a full copy of the rules of the award and download a list of the qualifying islands by going to: <http://www.cdxc.org.uk/>.

A large selection of Italian awards rules is archived by the 425 DX Group. The rules are in both Italian and English language at: <http://www.425dxn.org/awards/awards.htm>. The 425 DX Group is well known for its famous DX activity bulletin, which is available on DX reflectors or as a subscription. It's one of the really good DX info sites to permanently bookmark in your browser.

I continue to look for awards rules and samples from any clubs, groups

or individuals who are seeking publicity. If they are of a short term nature (couple months to earn the requirements), please send at least 3 months ahead of the beginning of the effective period.

73, Ted, K1BV

VACUUM TUBES!

- Svetlana amateur & transmitting tubes
- Over 3000 types of NOS tubes
- Parts • Supplies • Books • Stuff!

Write or call for our free 72 page catalog

ANTIQUE ELECTRONIC SUPPLY™
LIMITED PARTNERSHIP

6221 S. MAPLE AVE. • TEMPE, AZ 85283
(602) 820-5411 • FAX (602) 820-4643 or (800) 706-6789

Is Your Shack Grounded?

Ground It

Helps Protect Expensive Equipment and Reduces QRM.

1/8" x 1/2" Solid 110 Copper Custom Lengths Available

Solid Copper Buss - Stainless Steel Hardware - Grounding Stud Every 6 Inches - Ground all of your equipment chassis's to a single earth ground in one easy installation.

2 ft. \$24.95 3 ft. \$29.95 4 ft. \$35.95
Plus Shipping & Handling

Flexible Rope Wire Straps w/Terminal Ends, All Solid Copper \$2.50 per ft. Plus S&H

Price Includes CT & NY Sales Tax - Money Back Guarantee

J. Martin Systems
35 Hilltop Ave. Dept. C, Stamford, CT USA 06907
(24 hr voice mail) or FAX: 203-461-8768
<http://www.jmsystem.com>

Surge in Sunspot Activity

The 12-month smoothed sunspot number, the measure of solar cycle activity, surged upward by four points from the previous month's level. The latest smoothed number, averaged between March 1999 and February 2000 and centered on August 1999, is 98. Sunspot Cycle 23 is slowly but surely approaching the peak of its cycle. A smoothed sunspot number of 111 is forecast for June 2000.

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 112 for February 2000. The daily sunspot level peaked with a count of 153 on February 29th and dipped to a low of 64 on the 2nd.

The Dominion Radio Astrophysical Observatory at Penticton, British Columbia reports a mean value of 169 for the 10.7 cm solar flux level recorded during February 2000. This results in a smoothed value of 158 centered on August 1999. A smoothed level on the order of 160 is forecast for June 2000.

June Propagation

The near peak level of sunspot count expected during June should produce some pleasant surprises on the HF bands, particularly on 10, 15, 17, and 20 meters.

Although normally dead for DX openings during the summer months of low sunspot count, look for considerable DX on the 10 meter band during this June and throughout the summer months of 2000. True, there will be fewer east-west openings than took place during the winter and spring months, but there should be plenty of good openings to more southerly and tropical areas. DX conditions are expected to be best during the late afternoon, and the band should remain open until shortly after sundown.

Look for some nice surprises on 12, 15, and 17 meters. Expect the bands to open for DX shortly after sunrise and to

11307 Clara Street, Silver Spring, MD 20902
e-mail: <george@gjainc.com>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for June 2000

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 2, 4-6, 18-20 25	A	A	B	C
High Normal: 3, 7-10, 16, 21, 29-30	A	B	C	C-D
Low Normal: 12-15, 18, 22-24 26-27	B	C-B	C-D	D-E
Below Normal: 11, 17, 28	C	C-D	D-E	E
Disturbed: 1	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 poor (D) on June 1st, excellent (A) on the 2nd, good (B) on the 3rd, excellent (A) on the 4th-6th, etc.

remain open well into the evening hours. These should be the best DX bands during the hours of daylight, with openings possible to just about all areas of the world. Peak conditions should occur during the late afternoon hours, and to many parts of the world expect the 15 and 17 meter bands to remain open until midnight! It's been a long time since 15 meters has been a *nighttime* DX band, but expect it to be this June and during the summer months as well.

What's the surprise on 20 meters? Well, while this band is often thought of as *the* daytime DX band, this June it will provide the best in *nighttime* DX. While the band will open for DX shortly after sunrise, conditions are expected to be spotty until the late afternoon. Then like a switch being thrown on, the band should come to life, with signal levels

becoming louder and louder as sundown approaches. Expect conditions to peak an hour or two after sundown, and to remain excellent to most parts of the world to midnight and beyond. From sundown to well past midnight you are likely to hear DX signals on 20 meters like you haven't heard in nearly 20 years!

Fewer hours of darkness and an expected sharp seasonal increase in static levels will mask any improvement in 30, 40, 80, and 160 meter DX propagation conditions. Yet some excellent openings can be expected this month on 40 and 30 meters to many parts of the world during the hours of darkness. The bands won't sound as good as they did during the spring months, but signals often will be exceptionally strong. DX openings to many areas of the world are forecast for 80 meters this June during the hours of darkness, but signals often will be weak and noisy. Not much DX is expected on 160 meters until the fall, but an occasional opening may be possible during the hours of darkness, with chances best just before sunrise on the *eastern* terminal of a path.

Expect plenty of *short-skip* openings on the shortwave bands this month. For distances less than 250 miles, try 40 and 80 meters during the day and 80 and 160 meters at night. For openings between 250 and 750 miles, 30 and 40 meters should be best during the day, with 20 meters a close second. Try 80 meters at night, with 40 meters a second choice. Twenty meters should be best for daytime openings between 750 and 1300 miles, with 30 and 40 meters best at night, backed up by 80 meters. Between distances of 1300 and 2300 miles, use 20 meters during the day, with 17 and 15 as second choices. Thirty and 40 meters are expected to be best for for this distance range at night. Frequent short-skip openings, resulting from an expected seasonal increase in sporadic-E ionization, should also be possible on 10, 12, 15, and 17 meters over distances ranging between approximately 450 and 1300 miles. As its name implies, sporadic-E ionization can occur at any time, but it is usually

most prevalent between 10 AM and 2 PM and again between 6 and 10 PM local daylight time.

This month's propagation charts contain DX predictions for the period June 15 through August 15, 2000. Short-skip charts for June, for openings between 50 and 2300 miles, and for Hawaii and Alaska, appeared last month.

VHF Ionospheric Propagation

June should be a good month for ionospheric openings on the VHF bands resulting from the high level of solar activity, increased sporadic-E propagation, meteor showers, trans-equatorial propagation, and auroral activity.

F-layer DX

Solar activity is now high enough that some F-layer DX openings should be possible on the 6 meter band during the daylight hours. Conditions are best for transcontinental openings, openings between the western states and Hawaii, and openings toward the Caribbean and Central and South America. The best time to look for these openings is during the afternoon hours, particularly when conditions are High Normal or better.

Sporadic-E

Sporadic-E ionization is expected to increase considerably during June, and fairly frequent 6 meter short-skip openings should be possible. These are most likely to occur over distances of approximately 1000 to 1400 miles. Although sporadic-E openings can take place at just about any time, the best time to check is between 10 AM and 2 PM, and again between 6 and 10 PM local daylight time.

During periods of intense and widespread sporadic-E ionization, two-hop openings considerably beyond 1400 miles should be possible on 6 meters, and short-skip openings between approximately 1200 and 1400 miles may also be possible on 2 meters.

Here is a useful tip for predicting 50 MHz short-skip E_s openings. The geometry of propagation is such that as the skip distance *decreases* on the 21 and 28 MHz bands, the highest frequency that will be reflected by a sporadic-E cloud *increases*. By observing the minimum ionospheric skip distance heard on 21 or 28 MHz during an E_s opening, and using the graph shown in fig. 1, it should be possible to tell whether 50 MHz is open and what the skip distance might be.

To demonstrate how this technique works, consider the following example.

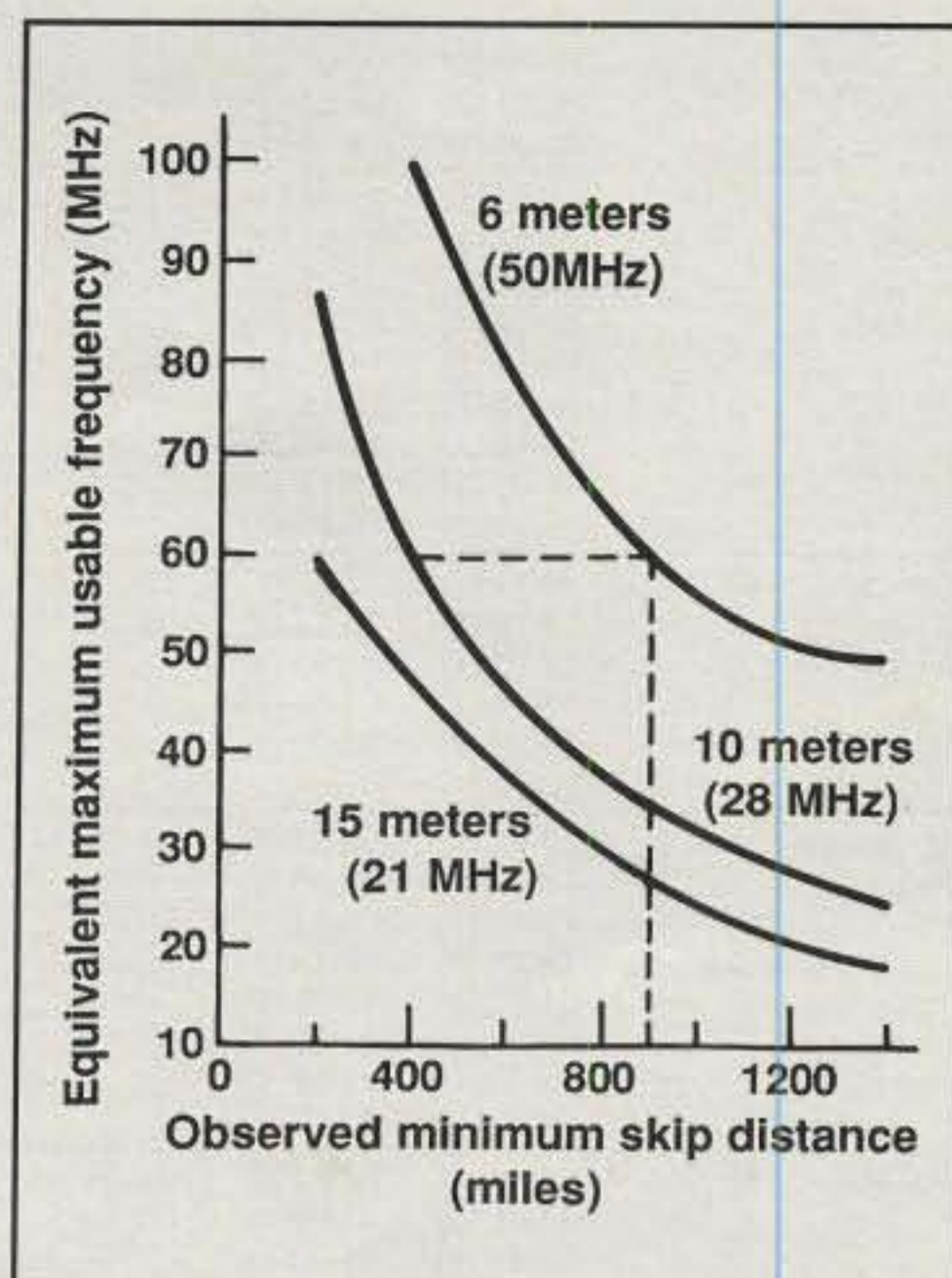


Fig. 1— Graph describing the correlation between sporadic-E openings on the 10 and 15 meter bands and possible 6 meter openings at the same time. The example shows a minimum skip distance of 400 miles observed on 10 meters. From the graph, 6 meters should be open with a skip distance of greater than 900 miles.

Suppose the minimum skip distance observed on 28 MHz in a southwesterly direction is 400 miles (It is the distance to the nearest skip station heard that is important.). From fig. 1, the intersection between 400 miles and the 28 MHz curve corresponds to an MUF of 60 MHz. This means that 50 MHz short-skip openings in a southwesterly direction are very likely to occur. The minimum skip distance expected on 50 MHz can now be found from fig. 1 by locating the intersection of 60 MHz on the ordinate (vertical scale) and the 50 MHz curve. The resulting distance is found to be 900 miles. A useful rule of thumb to remember is that when skip stations are heard less than 500 miles away on 28 MHz, or less than 250 miles away on 21 MHz, the chances are very good that 50 MHz will open in the same general direction.

From most locations in the continental United States 1300 mile E_s openings should extend into both Canada and Mexico. From the southern third of the country it should also be possible to work a rather large number of countries in Central America and the West Indies during 15, 10, and 6 meter sporadic-E openings. Long-distance (DX) television reception also improves considerably during the summer months as a

result of sporadic-E ionization. Signals from low-band VHF TV stations (Channels 2–5), which normally cannot be received more than 75 to 100 miles away, suddenly are propagated up to 1300 miles, often with very strong signal levels.

Meteors

Not much meteor activity is expected during June, but some minor showers may occur. The daytime *zeta-Perseids* is expected to take place during the first two weeks of the month, peaking at around 03 UT on June 9th. The *Arietids* shower, also occurring during the first week or so of June, is expected to peak at approximately 03 UT on June 7th. The *beta-Taurids* shower should begin about the last week in June, peaking at around 02 UT on the 28th. A surprise shower, the *Bootids*, may begin in June and continue into the first days of July. It is expected to peak near 01 UT on June 27th. This shower returned in 1998 after its previous appearance in 1927! While the dynamics of this shower are not well understood, it may appear again this year.

For updated meteor shower information, check the website of the International Meteor Organization (IMO) at <<http://www.imo.net/calendar>>.

Transequatorial Propagation

There is usually a seasonal decline in TE propagation during the summer months, but some 6 meter openings may still be possible during June. TE openings must cross the geomagnetic equator at or near a right angle, and the best time for such openings is between 8 and 11 PM local daylight time. Conditions favor openings deep into South America from the Central American and Caribbean areas in this hemisphere, as well as from the southern tier states in the US. Openings can, however, extend at times into more northern states as well. Similar north-south TE openings are possible in other areas of the world.

Aurora

Some auroral activity may be possible during June, resulting in short-skip auroral-scatter-type openings on VHF. Such activity is most likely to occur during periods of ionospheric storminess. Check the Last-Minute Forecast at the beginning of this column for those days that are likely to be Below Normal or Disturbed during June.

73, George, W3ASK

HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in () after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate daylight time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

June 15 to August 15, 2000 Time Zone: EDT EASTERN USA TO:

To:	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Central	16-18 (1)	08-09 (1)	09-15 (1)	20-21 (1)
Europe & North Africa	12-15 (1)	16-18 (3)	22-23 (3)	23-01 (4)
Africa	15-17 (2)	18-00 (4)	23-01 (4)	23-03 (4)
	17-18 (3)	00-03 (3)	01-02 (3)	01-02 (3)
	18-19 (2)	03-05 (2)	02-03 (2)	02-03 (2)
	19-21 (1)	05-07 (3)	03-04 (1)	03-04 (1)
		07-09 (2)	21-22 (1)*	21-22 (1)*
			22-23 (2)*	22-23 (2)*
			23-00 (3)*	23-00 (3)*
			00-01 (2)*	00-01 (2)*
			01-02 (1)*	01-02 (1)*
Northern Europe & European CIS	15-17 (1)	11-15 (1)	09-15 (1)	21-22 (1)
		15-18 (2)	15-17 (2)	22-23 (2)
		18-19 (1)	17-19 (3)	23-00 (3)
			19-22 (4)	00-01 (2)
			22-01 (3)	01-02 (1)
			01-03 (2)	22-01 (1)*
			03-06 (1)	03-06 (1)
			06-09 (2)	06-09 (2)
Eastern Mediterranean & Middle East	16-18 (1)	11-13 (1)	12-16 (1)	20-22 (1)
		13-17 (2)	16-18 (2)	22-00 (2)
		17-18 (3)	18-20 (3)	00-01 (1)
		18-19 (4)	20-00 (4)	22-00 (1)*
		19-20 (3)	00-01 (3)	00-01 (3)
		20-21 (2)	01-03 (2)	01-03 (2)
		21-22 (1)	03-06 (1)	03-06 (1)
			06-08 (2)	06-08 (2)
			08-09 (1)	08-09 (1)
Western Africa	11-13 (1)	10-12 (1)	14-16 (1)	20-22 (1)
	15-17 (1)	12-15 (2)	16-17 (2)	22-00 (2)
	17-19 (2)	15-17 (3)	17-18 (3)	00-02 (1)
	19-21 (1)	17-23 (4)	18-03 (4)	22-00 (1)*
		23-03 (3)	03-04 (3)	03-04 (3)
		03-04 (2)	04-05 (2)	04-05 (2)
		04-05 (1)	05-07 (1)	05-07 (1)
Eastern & Central Africa	17-19 (1)	09-12 (1)	14-16 (1)	21-00 (1)
		12-14 (2)	16-18 (2)	22-00 (2)
		14-17 (3)	18-20 (3)	22-00 (3)

17-19 (4)
19-22 (3)
22-23 (2)
23-00 (1)

Southern Africa	10-13 (1)	08-10 (1)	23-01 (1)	21-22 (1)
		10-11 (2)	01-03 (3)	22-00 (2)
		11-12 (3)	03-05 (2)	00-02 (1)
		12-13 (4)	05-08 (1)	23-01 (1)*
		13-14 (3)	14-15 (1)	14-15 (1)
		14-15 (2)	15-16 (2)	15-16 (2)
		15-16 (1)	16-18 (3)	16-18 (3)
		01-03 (1)	18-19 (2)	18-19 (2)
			19-20 (1)	19-20 (1)

Central & South Asia	Nil	09-10 (1)	17-20 (1)	19-21 (1)
		10-12 (2)	20-23 (2)	04-06 (1)
		12-13 (1)	23-03 (1)	23-03 (1)
		17-19 (1)	03-06 (2)	03-06 (2)
		19-22 (2)	06-08 (1)	06-08 (1)
		22-23 (1)		22-23 (1)

Southeast Asia	Nil	10-14 (1)	06-07 (1)	04-06 (1)
		14-16 (2)	07-09 (2)	07-09 (2)
		16-19 (1)	09-11 (1)	09-11 (1)
		19-21 (2)	16-19 (1)	16-19 (1)
		21-22 (1)	19-21 (2)	19-21 (2)
			21-23 (1)	21-23 (1)
			23-02 (2)	23-02 (2)
			02-03 (1)	02-03 (1)

Far East	Nil	09-10 (1)	06-07 (2)	04-06 (1)
		10-12 (2)	07-09 (3)	07-09 (3)
		12-18 (1)	09-10 (2)	09-10 (2)
		18-20 (2)	10-12 (1)	10-12 (1)
		20-22 (1)	18-21 (1)	18-21 (1)
			21-23 (2)	21-23 (2)
			23-02 (3)	23-02 (3)
			02-04 (2)	02-04 (2)
			04-06 (1)	04-06 (1)

South Pacific & New Zealand	16-18 (1)	09-11 (1)	18-20 (1)	01-03 (1)
	18-20 (2)	14-16 (1)	20-23 (2)	03-05 (2)
	20-22 (1)	16-18 (2)	23-01 (3)	05-06 (3)
		18-19 (3)	01-04 (4)	06-07 (2)
		19-21 (4)	04-05 (3)	07-08 (1)
		21-22 (3)	05-06 (2)	04-06 (1)*
		22-00 (2)	06-09 (3)	06-09 (3)
		00-01 (1)	09-10 (2)	09-10 (2)
			10-12 (1)	10-12 (1)

Australasia	18-19 (1)	10-12 (1)	21-23 (1)	03-04 (1)
	19-21 (2)	17-18 (1)	23-01 (2)	04-06 (2)
	21-22 (1)	18-20 (2)	01-03 (3)	06-07 (1)
		20-22 (3)	03-05 (4)	04-06 (1)*
		22-23 (2)	05-07 (2)	05-07 (2)
		23-00 (1)	07-09 (3)	07-09 (3)
			09-10 (2)	09-10 (2)
			10-11 (1)	10-11 (1)
			16-18 (1)	16-18 (1)

Caribbean, Central America & Northern Countries of South America	09-13 (1)	08-09 (2)	06-07 (3)	19-20 (1)
	13-15 (2)	09-12 (4)	07-10 (4)	20-21 (2)
	15-16 (3)	12-14 (3)	10-11 (3)	21-23 (3)
	16-18 (4)	14-21 (4)	11-15 (2)	23-03 (4)
	18-19 (3)	21-01 (3)	15-17 (3)	03-04 (3)
	19-20 (2)	01-03 (2)	17-03 (4)	04-05 (2)
	20-21 (1)	03-08 (1)	03-05 (3)	05-06 (1)
			22-23 (1)*	22-23 (1)*
			23-04 (2)*	23-04 (2)*
			04-05 (1)*	04-05 (1)*

Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1)	07-08 (1)	10-16 (1)	20-21 (1)
	14-16 (2)	08-11 (2)	16-18 (2)	21-22 (2)
	16-17 (3)	11-15 (1)	18-19 (3)	22-02 (3)
	17-18 (4)	15-16 (2)	19-02 (4)	02-04 (2)
	18-19 (3)	16-17 (3)	02-04 (3)	04-05 (1)
	19-21 (2)	17-23 (4)	04-07 (2)	22-03 (1)*
	21-22 (1)	23-01 (3)	07-09 (3)	07-09 (3)
		01-02 (2)	09-10 (2)	09-10 (2)
		02-03 (1)		02-03 (1)

McMurdo Sound, Antarctica	15-17 (1)	16-18 (1)	17-19 (1)	02-05 (1)
		18-21 (2)	19-22 (2)	19-22 (2)
		21-22 (1)	22-03 (3)	22-03 (3)
			03-05 (2)	03-05 (2)
			05-06 (1)	05-06 (1)
			07-09 (1)	07-09 (1)

Time Zones: CDT & MDT (24-Hour Time) CENTRAL USA TO:

To:	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Southern Europe & North Africa	Nil	11-15 (1)	05-08 (2)	20-23 (1)
		15-17 (2)	08-15 (1)	23-01 (2)
		17-18 (3)	15-17 (2)	01-02 (1)
		18-19 (2)	17-18 (3)	22-00 (1)*
		19-20 (1)	18-22 (4)	18-22 (4)

23-01 (1)
22-02 (3)
02-03 (2)
03-05 (1)

Northern & Central Europe & European CIS	Nil	10-15 (1)	02-06 (1)	20-21 (1)
		15-17 (2)	06-09 (2)	21-23 (2)
		17-18 (1)	09-15 (1)	23-00 (1)
			15-18 (2)	21-23 (1)*
			18-19 (3)	18-19 (3)
			19-21 (4)	19-21 (4)
			21-00 (3)	21-00 (3)
			00-02 (2)	00-02 (2)

Eastern Mediterranean & Middle East	15-17 (1)	11-16 (1)	13-16 (1)	21-23 (1)
		16-17 (2)	16-18 (2)	16-18 (2)
		17-19 (3)	18-20 (3)	18-20 (3)
		19-20 (2)	20-22 (4)	20-22 (4)
		20-21 (1)	22-23 (3)	22-23 (3)
			23-00 (2)	23-00 (2)
			00-02 (1)	00-02 (1)
			07-09 (1)	07-09 (1)

Western Africa	10-12 (1)	10-12 (1)	14-15 (1)	20-00 (1)
	15-16 (1)	12-15 (2)	15-16 (2)	22-00 (1)*
	16-18 (2)	15-17 (3)	16-18 (3)	16-18 (3)
	18-20 (1)	17-21 (4)	18-00 (4)	18-00 (4)
		21-00 (3)	00-02 (3)	00-02 (3)
			00-02 (2)	00-02 (2)
			02-03 (1)	02-03 (1)
			04-06 (1)	04-06 (1)

Eastern & Central Africa	16-18 (1)	10-14 (1)	15-17 (1)	21-23 (1)
		14-16 (2)	17-18 (2)	17-18 (2)
		16-17 (3)	18-19 (3)	18-19 (3)
		17-18 (4)	19-22 (4)	19-22 (4)
		18-19 (3)	22-00 (3)	22-00 (3)
		19-20 (2)	00-02 (2)	00-02 (2)
		20-22 (1)	02-04 (1)	02-04 (1)

Southern Africa	09-12 (1)	08-10 (1)	23-00 (1)	21-22 (1)
		10-11 (2)	00-02 (3)	22-00 (2)
		11-12 (4)	02-04 (2)	00-01 (1)
		12-13 (3)	04-06 (1)	22-00 (1)*
		13-14 (2)	12-14 (1)	12-14 (1)
		14-15 (1)	14-15 (2)	14-15 (2)
		00-02 (1)	15-17 (3)	15-17 (3)
			17-18 (2)	17-18 (2)
			18-19 (1)	18-19 (1)

Central & South Asia	Nil	09-11 (1)	17-19 (1)	19-21 (1)
		11-12 (2)	19-22 (2)	05-07 (1)
		12-13 (1)	22-02 (1)	22-02 (1)
		15-18 (1)	02-06 (2)	02-06 (2)
		18-21 (2)	06-08 (3)	06-08 (3)
		21-23 (1)	08-09 (2)	08-09 (2)
			09-10 (1)	09-10 (1)

Southeast Asia	Nil	10-11 (1)	07-09 (2)	03-05 (1)
		11-14 (2)	09-11 (1)	09-11 (1)
		14-19 (1)	16-18 (1)	16-18 (1)
		19-22 (2)	18-20 (2)	18-20 (2)
		22-00 (1)	20-23 (1)	20-23 (1)
			23-00 (2)	23-00 (2)
			00-01 (3)	00-01 (3)
			01-02 (2)	01-02 (2)
			02-03 (1)	02-03 (1)

Far East	Nil	09-11 (1)	05-07 (2)	04-05 (1)
		13-15 (1)	07-09 (3)	05-06 (2)
		17-19 (1)	09-10 (2)	06-07 (1)
		19-20 (2)	10-12 (1)	04-06 (1)*</

Peru,	09-13 (1)	07-08 (1)	10-15 (1)	20-21 (1)
Bolivia,	13-15 (2)	08-10 (2)	15-17 (2)	21-22 (2)
Paraguay,	15-16 (3)	10-14 (1)	17-18 (3)	22-02 (3)
Brazil,	16-18 (4)	14-15 (2)	18-01 (4)	02-03 (2)
Chile,	18-19 (3)	15-16 (3)	01-03 (3)	03-05 (1)
Argentina	19-20 (2)	16-22 (4)	03-07 (2)	20-03 (1)*
& Uruguay	20-21 (1)	22-00 (3)	07-09 (3)	
		00-01 (2)	09-10 (2)	
		01-02 (1)		
McMurdo	15-18 (1)	14-16 (1)	17-19 (1)	02-06 (1)
Sound		16-17 (2)	19-22 (2)	
Antarctica		17-18 (3)	22-02 (3)	
		18-19 (2)	02-04 (2)	
		19-21 (1)	04-07 (1)	
			07-09 (2)	
			09-10 (1)	

**Time Zones PDT (24-Hour Time)
WESTERN USA TO:**

To:	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Southern	Nil	08-09 (1)	23-01 (3)	20-23 (1)
Europe & North		09-11 (2)	01-06 (1)	
Africa		11-15 (1)	06-08 (2)	
		15-17 (2)	08-14 (1)	
		17-18 (1)	14-16 (2)	
		21-23 (1)	16-21 (3)	
			21-23 (2)	
Central Northern	Nil	07-09 (1)	13-15 (1)	20-22 (1)
Europe & CIS		13-14 (1)	15-19 (2)	
		14-16 (2)	19-00 (3)	
		16-17 (1)	00-01 (2)	
			01-06 (1)	
			06-08 (2)	
			08-10 (1)	
Eastern Mediter-ranean & Middle East	Nil	07-09 (1)	13-16 (1)	20-21 (1)
		11-15 (1)	16-20 (2)	
		15-17 (2)	20-22 (3)	
		17-18 (1)	22-00 (2)	
		22-00 (1)	00-02 (1)	
			06-08 (1)	
Western & Central Africa	09-14 (1)	07-11 (1)	13-15 (1)	20-22 (1)
	14-16 (2)	11-13 (2)	15-17 (2)	
	16-18 (1)	13-17 (3)	17-19 (3)	
		17-19 (2)	19-22 (4)	
		19-21 (1)	22-00 (3)	
			00-04 (2)	
			04-08 (1)	
Eastern Africa	Nil	09-14 (1)	15-17 (1)	Nil
		14-16 (2)	17-19 (2)	
		16-17 (3)	19-22 (3)	
		17-18 (2)	22-00 (2)	
		18-19 (1)	00-02 (1)	
		00-02 (1)		
Southern Africa	09-12 (1)	08-10 (1)	14-15 (1)	20-23 (1)
		10-11 (2)	15-17 (2)	
		11-12 (3)	17-18 (1)	
		12-14 (2)	22-23 (1)	
		14-15 (1)	23-00 (2)	
			00-02 (3)	
			02-03 (2)	
			03-06 (1)	
			06-08 (2)	
			08-10 (1)	
Central & South Asia	Nil	08-10 (1)	05-07 (2)	05-07 (1)
		10-12 (2)	07-09 (3)	19-20 (1)
		12-14 (1)	09-10 (2)	
		17-19 (1)	10-11 (1)	
		19-22 (2)		
		22-23 (1)		
Southeast Asia	11-15 (1)	08-09 (1)	23-01 (1)	03-07 (1)
		09-11 (3)	01-03 (2)	
		11-13 (2)	03-05 (3)	
		13-16 (1)	05-07 (2)	
		20-22 (1)	07-09 (3)	
		22-00 (2)	09-11 (2)	
		00-02 (1)	11-14 (1)	
Far East	14-16 (1)	09-10 (1)	19-21 (1)	01-02 (1)
		10-12 (2)	21-23 (2)	02-03 (2)
		12-15 (1)	23-01 (3)	03-05 (3)
		15-17 (2)	01-04 (4)	05-06 (2)
		17-19 (3)	04-06 (3)	06-07 (1)
		19-21 (2)	06-07 (2)	03-05 (1)*
		21-23 (1)	07-09 (3)	
			09-11 (2)	
			11-14 (1)	
South Pacific & New Zealand	12-14 (1)	11-13 (1)	17-19 (1)	22-23 (1)
	14-16 (2)	13-15 (2)	19-21 (2)	23-01 (2)
	16-18 (3)	15-18 (3)	21-03 (4)	01-06 (3)
	18-20 (4)	18-21 (4)	03-05 (3)	06-07 (2)
	20-21 (2)	21-22 (3)	05-07 (2)	07-08 (1)

	21-22 (1)	22-23 (2)	07-09 (3)	23-02 (1)*
		23-01 (1)	09-11 (2)	02-05 (2)*
			11-13 (1)	05-06 (1)*
Australasia	14-17 (1)	07-09 (1)	20-22 (1)	22-00 (1)
	17-19 (2)	13-17 (1)	22-00 (2)	00-01 (2)
	19-21 (3)	17-19 (2)	00-05 (4)	01-05 (3)
	21-22 (2)	19-22 (3)	05-07 (3)	05-06 (2)
	22-23 (1)	22-00 (4)	07-09 (4)	06-08 (1)
		00-01 (3)	09-10 (2)	01-04 (1)*
		01-02 (2)	10-13 (1)	
		02-03 (1)	13-15 (2)	
			15-17 (1)	
Caribbean, Central America & Northern Countries of South America	09-11 (1)	08-09 (2)	08-11 (3)	19-21 (1)
	11-12 (2)	09-10 (3)	11-15 (2)	21-22 (2)
	12-14 (3)	10-12 (4)	15-17 (3)	22-00 (3)
	14-16 (4)	12-14 (3)	17-01 (4)	00-03 (2)
	16-17 (3)	14-19 (4)	01-04 (3)	03-04 (3)
	17-18 (2)	19-21 (3)	04-05 (2)	04-05 (2)
	18-19 (1)	21-00 (2)	05-06 (3)	05-06 (1)
		00-08 (1)	06-08 (4)	21-23 (1)*
				23-03 (2)*
				03-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-12 (1)	06-07 (1)	09-15 (1)	20-21 (1)
	12-15 (2)	07-09 (2)	15-17 (2)	21-00 (2)
	15-16 (3)	09-13 (1)	17-18 (3)	00-02 (1)
	16-18 (4)	13-15 (2)	18-01 (4)	02-03 (3)
	18-19 (3)	15-16 (3)	01-03 (3)	03-04 (2)
	19-20 (2)	16-23 (4)	03-06 (2)	04-05 (1)
	20-21 (1)	23-00 (3)	06-08 (3)	02-04 (1)*
		00-01 (2)	08-09 (2)	
		01-02 (1)		
McMurdo Sound, Antarctica	17-19 (1)	14-16 (1)	16-18 (1)	00-23 (1)
		16-17 (2)	18-19 (2)	23-01 (2)
		17-19 (3)	19-02 (3)	01-04 (1)
		19-21 (2)	02-04 (2)	04-06 (2)
		21-22 (1)	04-06 (1)	06-07 (1)
			06-08 (2)	
			08-10 (1)	

*Best times to check for 80 meter openings. Openings on 160 meters are likely to occur during times when 80 meter openings are shown with a propagation index of (2) or higher. Openings on 6 meters may be possible at times. Ten meter openings are shown with a propagation index greater than (3). For 12 meter openings, interpolate between 10 and 15 meters. For 17 meter openings interpolate between 15 and 20 meters. For 30 meter openings interpolate between 40 and 20 meter openings.

HIGH SIERRA ANTENNAS
New mobile antennas

MODEL 1500
MODEL 1600
RV SPECIALS

\$275

Price includes control panel and mounting hardware kits

For details, check out our web pages or request a copy of our all new brochure. Call our toll free number today:

1-888-273-3415

High Sierra Antennas, Box 2389
Nevada City, CA 95959 USA
Tel: 530-273-3415, fax: 530-273-7561
<http://www.hsantennas.com/info>
e-mail: cobler@hsantennas.com

We can solve your mounting problems. Call

MAX RESEARCH

BRINGING YOU THE MAGIC OF RADIO IN TWO NEW BOOKS!

The *Magic* And *Mystery* Of Antennas And Radio Waves Are Unravelled For You, The Inquisitive Amateur Or Experimenter

THE SCIENCE OF ANTENNAS
A comprehensive 105 pages explaining why antennas radiate and receive. Written in a clear, understandable style, it is meant to bring antenna science to the amateur.

ANTENNA SYSTEM OPTIMIZATION
Masterfully shows you how to get the most signal into or out of your antenna. 80 pages that clearly explain the basics of antenna systems, highlighting the aspects that significantly effect signal strength.

NOT YOUR TYPICAL ANTENNA BOOKS.
14.95 EACH PPD.

MAX RESEARCH GROUP AR, PO BOX 1306
EAST NORTHPORT, NY 11731

CIRCLE 72 ON READER SERVICE CARD

CB-TO-10 METERS

We specialize in CB radio modification plans and hardware. Frequency and FM conversion kits, repair books, plans, high-performance accessories. Thousands of satisfied customers since 1976! Catalog \$3.

CBC INTERNATIONAL
LOU FRANKLIN/K6NH - Owner
P.O. BOX 1898CQ, MONTEREY, CA 93942

Put your next wire antenna up the **EZ Hang** way!

\$49.95 + \$5.95 s&h

EZ Hang, Inc.

8645 Tower Dr., Code C, Laurel, MD 20723
Phone: 540-286-0176 www.ezhang.com

WORLD FAMOUS!!
"TINY-TENNA"

Indoor Amplified Shortwave Antenna
Great for apartment/condo, traveling, camping!
(requires 9V battery or AC adapter-not included)
credit card orders welcome at:

1-517-563-2613
DWM Communications
P.O. Box 87-CQ, Hanover, MI 49241

\$19.95
(\$4.95 s&h)

SHORTY AND THE RADIO MEN
by Myron Sutton

THE SHORT WAVE WAR!
A Combat Radio Man's Light-Hearted Encounter with World War II, Written in 1946 and Not Released Until Now. Authentic, Richly Detailed, and Definitely Not Sanitized.

\$16.95 US
plus \$2 Shipping & Handling

To order, send check or money order to:

SILVER RIVER BOOKS & PHOTOS

1619 Meadowview Drive • Medford, Oregon 97504
541-857-6668 • Fax: 541-779-8048 • silverriv@aol.com • www.silverriver.com

uled Ariane-5 launch—the one *before* the mission that's supposed to take AMSAT's Phase 3D satellite into orbit—has been delayed from late May until July because part of its payload is not ready. P3D is also slated for a possible July launch. At press time, there'd been no word from Ariane-space as to what effect, if any, the delay of AR-506 might have on the P3D launch.

SunSat Operating Mode B FM

South Africa's SunSat satellite was reported in mid-April to be operating in FM repeater mode, with an uplink on 436.291 MHz and a downlink on 145.825 MHz, both plus or minus Doppler shift. The AMSAT News Service says the satellite is available for amateur use on most weekday evenings. For current schedules, see <http://sunsat.ee.sun.ac.za/ham1.htm>. For general information on SunSat, use the same address minus the "/ham1.htm."

New Satellite Software Released

"SpaceNews" Editor John Magliacane, KD2BD, has released a new version of PREDICT, his freeware satellite tracking software. Versions are available for DOS and Linux operating systems. For more information, go to <http://www.linuxfan.com/~predict>.

In addition, Doug Quagliana, KA2UPW, has released software that will allow hams to use computer soundcards to uplink APRS-style messages to 1200 baud packet satellites (AO-16, LO-19, and IO-26). A zipped version of the program, UPW version 1.05, may be downloaded from <http://members.aol.com/dquagliana/upw/upw105.zip>; documentation is available at the same address, substituting [/index.html](http://members.aol.com/dquagliana/upw/upw105.zip) for [/upw105.zip](http://members.aol.com/dquagliana/upw/upw105.zip) after [/upw/](http://members.aol.com/dquagliana/upw/upw105.zip).

YHOTY Reminder

Finally, a reminder that nominations for the 2000 Young Ham of the Year Award are due by May 30. Candidates must be 18 or younger, and must have made a significant contribution to their community or to ham radio, via the use of amateur radio. The award is sponsored by *Amateur Radio Newline*, and co-sponsored by *CQ* magazine and Yaesu USA. Official nomination forms and more information are available on the Newline website at <http://www.arnewline.org>, or by mail (with SASE) from Newline, 28197 Robin Ave., Santa Clarita, CA 91350.

Our Readers Say

QRM on the Bands

Editor, *CQ*:

Some days ago I had a QSO with a fellow ham. We agreed on several things, but when the discussion turned to the QRM, we had somewhat different opinions. I told him about the deliberate interference on the frequency of rare DXpeditions and I wondered how these QRM-makers always know to crawl out from their holes just on these occasions. For his part, he was annoyed about the behavior of the stations who call these DXpeditions in split and come over anybody who is having a QSO there without listening first to that frequency.

Obviously, at least some of these stations who come on the DXpedition frequency are just those who have been disturbed in their QSOs and come to disturb others in turn. There are also those twisted-minded hams who just enjoy making QRM. However, there certainly also are some who do not know about working DX and where it is concentrated.

The most usual frequencies for the DXpeditions, on the 14, 21, and 28 MHz bands, are 14195, 21295, and 28495 on SSB, and 14025, 21025, and 28025 on CW. Splits of 5–10 kHz up from the DXpedition frequency have mostly been enough, although some DXpeditions in very rare spots have created bigger splits (20 kHz or even bigger) as a result of bigger pile-ups. These happenings can be heard only a few times a year, and their duration very seldom exceeds a week.

This information about working DX could be published regularly in the magazines of the biggest leagues. In that way it could reach the non-DX-interested hams, too. Also it should be given in the training courses for new hams. I must say that I have been very surprised that sometimes even some older radio amateurs are ignorant about the usual DXpedition frequencies and they may have sked frequencies there—e.g., on 14200 kHz.

This means that, in most cases, if somebody hears a DXpedition working and if he tries to avoid working just on their frequency or 10–20 kHz, he should be able to have his QSO without QRM. Stations making a deliberate disturbance on a DX frequency should be ignored. If they do not get any attention, they stop QRMing sooner or later. Reacting to them does not stop them but leads to what we call a "European circus" on the DX frequency. Nobody hears anything through it.

Poor discipline on the DXpedition frequency (calling without listening, long calls, asking of call?, QSL via?) is also a problem and should be cured, but how?

To some DXpeditioners, I would like say

that signing more often (not, for example, once in 5 minutes) could reduce the QRM and duplicate QSOs on the same bands. The longest intervals have been about 25 minutes between signing. Is it because the operator thinks everybody should know that just *he* is operating on that frequency?

Pertti Kantanen, OH2VZ

Pertti: First of all, thank you for filling us in on the most common DXpedition frequencies. Non-DXers would be well-advised to avoid those areas to keep from being clobbered by pile-ups. And while deliberate QRM is never acceptable, it's important to remember that there are no such things as "DX frequencies," just as there are no "net frequencies." All of our frequencies are shared. I agree that education is important in preventing conflicts. With a large influx of hams with HF privileges expected in the US due to license restructuring, that becomes even more important. We are planning to publish a "survival guide" for newcomers to HF with just the sort of information you suggest.

Finally, behavior on a DXpedition frequency is often dictated by the DX operator. Those who are good at crowd control keep everything orderly; those who are not often have chaos on their hands. As you point out, many DXpedition operators make their own problems. The better operators identify often and repeat their QSL information at regular intervals. Some even go so far as to tell people where they are! Perhaps we need a how-to article on running a pileup from the DX end of the circuit.

—W2VU

Tips His Hat

Editor, *CQ*:

My name is Frank Staffa and my call is KB2CWN. I have been an amateur radio operator since 1986 and hold a General Class ticket. I would like to express my feelings on some of the comments you made in the "Deja Vu All Over Again" editorial (March issue). You seem to come down very hard on our "seniors" in the hobby who worked very hard to get their General and Extra tickets. As an Extra yourself, you very well know how difficult 20 wpm was to master to get your ticket. You may have not liked it very much, studying hard to get those "Extra Privileges," but since your love of the hobby outweighed your desire to learn code, you stuck with it and succeeded!

This is the picture you paint of yourself in my eyes because of comments you made like, "The whiners on the internet" and "Get 20 wpm Extra tattooed on your

forehead." Well, I tip my hat off to all those Extra Class "20 wpm" operators for a job well done! And for their job well done they deserve Extra privileges. When the "No Code" Tech ticket came out years ago, I can't say I have met a "No Coder" who actually went any further than "No Code." Now, I am sure there are many who have, but everyone I have ever spoken with, and there are thousands down here in Florida, say they're content to stay where they are.

Don't you feel that if they would have had to come up the ranks from Novice, that maybe if they had gotten a taste of the code, maybe they would have continued with it and upgraded? I think so, I know I did. I love CW and I love SSB. I have had QSOs in many situations where QSB was horrible and our ability to continue was coming to an end, but as soon as we went on CW, it was a whole new ball game and I continued my QSO without interruption by the fading band conditions. You know this to be true; I am not fooling you. You have been a ham longer than me. When all else fails, CW gets through. My answer from a No Code Tech is, "When all else fails, use your cell phone!"

I disagree with your attitude and feel that the FCC should have left everything alone. Anyone can guess a written test, but code? I don't think so. Now, what we need to do is get some kind of law passed so no one can purchase amateur radio equipment unless you can produce your ticket. That would have been the smarter regulation to change, not the code requirements! Be proud of what you hold and stop downgrading yourself for working hard at something you wanted. There is nothing wrong with having "20 wpm" tattooed on your forehead. You worked hard for it; wear it proudly!

Frank Staffa, KB2CWN

Frank: I'm sorry if you felt I was coming down hard on long-time hams, particularly Extras. What I meant to take issue with, and what I will continue to take issue with, is the attitude that the speed at which you know Morse code determines how good a ham you are. There is simply no connection between the two. I know plenty of very good hams who either don't know code at all or who have never advanced beyond Tech Plus because they couldn't increase their code speed enough. And Mr. Hollingsworth at the FCC can tell you about lots of 20 wpm Extras whom he's had occasion to meet because of their illegal operating practices. Just as clothes don't make the man, code doesn't make the ham.

As for not being able to guess on a code test, I have to disagree. You can guess on any multiple-choice test, and if there are four choices, you have a 1-in-4 chance of guessing correctly on every question.

Finally, I have never questioned the

Looking Ahead in

Here are some of the articles that we are working on for upcoming issues of CQ:

- "Global Optimization of Yagis," by K6ST1
- "An Earth-Moon-Earth Primer" by WB2AMU
- "CQ Reviews: Ten-Tec Pegasus," by N7NB

Plus...

- "Turn the Tower, Hold the Antenna," by W8CM
- "Antenna in the Sky ... and Power From It," by K8WPI
- "A Microwave Vacation" by WA0QII
- "A 'Flying Solo' Cable Tester," by KB2YTN

Writers wanted: If you have a ham radio story to tell, we'd like to hear about it and consider sharing it with our readers. If you'd like to write for CQ, please send a request for writers' guidelines, along with a self-addressed, stamped envelope (SASE) to: CQ Writers' Guidelines, 25 Newbridge Road, Hicksville, NY 11801. An on-line version is available on our website: <<http://www.cq-amateur-radio.com>>.

value of CW as an operating mode. Everything you say about its ability to get through is 100% correct, and that's the best reason for people to learn it, not just because the FCC says you have to.—W2VU

Color TV via Laser

Editor, CQ:

I enthusiastically read the article "Tripping the Light Fantastic" in your February issue, in which Jim Hatton describes a modulated diode laser system which transmits Morse code over long distances.

The educational division of Metrologic Instruments has already patented a modulated diode laser-based system for transmitting color video and audio signals over long distances. We have circuitry that can modulate the diode intensity up to a 5 MHz bandwidth. This system encodes the analog signal as a modulation of laser output, and a silicon photodiode based receiver box converts the modulated light back into a waveform which is appropriate for the video input of a color monitor or television. For those interested, our Laser Communications Kit (part #45-290, \$216) is detailed in our free catalog, available from Metrologic Instruments, 90 Coles Rd., Blackwood, NJ 08012.

Charles M. Phillips, Ph.D.
Product Manager, Educational Products
Metrologic Instruments, Inc.

Sales Order Line
1-800-927-4261

Burghardt INC.
AMATEUR CENTER



Proud to be
**"AMERICA'S MOST
RELIABLE AMATEUR
RADIO DEALER"**

Serving Amateur Radio
Operators Since 1937

We Want To Be "YOUR" Radio Dealer.
Write for our updated Used Equipment Listing!

Technical & Info. (605) 886-7314

Fax (605) 886-3444

(Internet Connections)

E-Mail - hamsales@burghardt-amateur.com

See Our Catalog/Specials On Our Home Page

<http://www.burghardt-amateur.com>

710 10th Street SW

Watertown, SD 57201

HRS: MON.-FRI. 8-5p.m.; SAT. 9-1 p.m. CLOSED SUNS./HOLIDAYS

CIRCLE 41 ON READER SERVICE CARD

Quality Built RF Amplifiers...

Look no further for the best amplifiers, RF tuners and power supplies. We build **QUALITY** equipment to last more than a lifetime.

Check us out on our Web Page

CTIComTec.com or

Call us at 904 445 5545 or

Fax at 904 446 0964

CTI ComTec, Inc.

1 Classic Court, North,
Palm Coast, FL 32137

CIRCLE 50 ON READER SERVICE CARD

NEW! ALL 1300 ACTUAL QUESTIONS!

**FCC Commercial
General Radiotelephone
Operator License (GROL)
Plus Ship Radar**

Only **\$39⁹⁵** Plus \$4.00 shipping

Complete FCC Element 1, 3 and 8 Question Pools

Become FCC licensed

Electronic Technician

- 496-page fully-illustrated textbook covers everything you need to know to get your FCC commercial radiotelephone operator license w/radar endorsement.
- Contains every possible word-for-word examination question (including the new updates), multiple choices, and answers with explanation of the answer.
- Complete information on every commercial radio license examination ...and how you can qualify.
- FCC Commercial radio regulations included!
- Commercial radio operator testing available.



National Radio Examiners

Div., The W5YI Group, Inc.

P.O. Box 565206, Dallas, TX 75356

Visa, MasterCard, or Discover

CIRCLE 96 ON READER SERVICE CARD

VISIT OUR NEW WEBSITE
<http://website.lineone.net/~g4zpy/index.htm>

G4ZPY PADDLE KEYS INTERNATIONAL

41 Mill Dam Lane, Burscough, Ormskirk L40 7TG,
ENGLAND
PH/FAX 0044 1704 894299 E-MAIL g4zpy@lineone.net
2 I.R.C.'s or \$2 US for hard copy Brochure.

Need Ham Radio Equipment Insurance?

HRIA

www.hamradioinsurance.com

800-545-8881

P.O. Box 201 • Canonsburg, PA 15317

FACTORY AUTHORIZED REPAIR OF

YAESU KENWOOD ALINCO

Factory trained technicians using state of the art test gear to insure the highest quality of service for your radio.

High-Performance Modifications.

1-888-767-9997

Website & Reconditioned Gear List
<http://www.kk7tv.com>

KK7TV Communications

2350 W Mission Lane #7, Phoenix, AZ 85021

Fax: 602-371-0522

Ask For Randy, KK7TV



NEW
for 2000

Miniature Iambic Keyer Model K-4



A 12 function keyer with 4 year battery life, two 50 character memories and beacon. Size 3/4" x 1 1/2" x 2" Weight 1 ounce. Uses latest TICK-4 chip and FET output. Has 1/8" input and output jacks and is very easy to use.

\$48.95 plus \$2.25 s/h Check or MO

Paddlette Co.

PO Box 6036, Edmonds, WA 98026

Bob, K1TVY, Tel. 425-743-1429

e-mail: bham379627@aol.com

CIRCLE 77 ON READER SERVICE CARD



Visit us at
www.hosenose.com
for free demos & more product info.

LOGic 5 - the best software package for your shack! Complete logging, online awards tracking for any award, prints QSL cards/labels, contesting, radio interfacing, antenna rotor control, digital communications for all modes, unequalled packet spotting, CW keyer, sound card support, customizable screens and reports, prints graphics and color, superb documentation, printed manual, unsurpassed tech support, grayline AZ-EQ map, interface to callbook databases, customizable for foreign languages, and much more. Free infopak! No gimmicks, simply the best. Specs: Pentium-class, CD ROM drive, Win 95/98/00 or NT 4.0. \$129. Foreign shipping extra. GA residents add 7% tax. Also available: PDA QSL Route List, SARtek rotor interface, rig and keyer interfaces. A great hobby deserves state-of-the-art!

Personal Database Applications, Dept C, 1323 Center Dr.,
Auburn, GA 30011, 770-307-1511,
770-307-0760 fax, 770-307-1496 tech supt.
sales.cq@hosenose.com
hours: 9-6 M-Th, 9-noon Fri.

Our 10th
year

Ham Shop

Advertising Rates: Non-commercial ads are 20 cents per word including abbreviations and addresses. Commercial and organization ads are \$1.00 per word. Boldface words are \$1.50 each (specify which words). Minimum charge \$2.00. No ad will be printed unless accompanied by full remittance. All ads must be typewritten double-spaced.

Closing Date: The 10th day in the third month preceding date of publication (example: Jan. 10th for the March issue). Because the advertisers and equipment contained in Ham Shop have not been investigated, the Publisher of CQ cannot vouch for the merchandise listed therein. The publisher reserves the right to reject any advertisement. Direct all correspondence and ad copy to: CQ Ham Shop, 25 Newbridge Road, Hicksville, NY 11801.

CB-TO-10M CONVERSIONS: Frequency modifications, FM, books, plans, kits, high-performance CB accessories. Catalog \$3. CBCI, Box 1898A, Monterey, CA 93942. <www.cbintl.com>

FOREIGN AIRMAIL POSTAGE for successful QSLing! Many countries, monthly bargains, plus **EUROPEAN NESTING AIRMAIL ENVELOPES!** We offer **QSLs**, **EYEBALL CARDS**, **QSL ALBUMS**, **WALLHANGERS**. Bill Plum, 12 Glenn Road, Flemington, NJ 08822-3322 (weekdays: 908-788-1020; fax: 908-782-2612).

QSLs FOR DX STATIONS: Our new "International Division" was established to handle QSL needs of DX hams. We understand the problems of packaging, shipping, and dealing with the customs problems. You can trust us to deliver a quality QSL, usually much cheaper than you can find locally. Write, call or FAX for free samples and ordering information. "The QSL Man—W4MPY," 682 Mount Pleasant Road, Monetta, SC 29105 USA. Phone or FAX 803-685-7117.

"QRZ DX"—since 1979: Available as an Adobe PDF file each Wednesday or by regular mail. Your best source for weekly DX information. Send #10 SASE for sample/rates. **"The DX Magazine"**—since 1989: Bi-monthly - Full of DXpedition reports, QSL Information, Awards, DX news, technical articles, and more. Send \$2.00 for sample/rates. DX Publishing, Inc., P.O. Box DX, Leicester, NC 28748-0249. Phone/Fax: 704-683-0709; e-mail: <DX@dxpub.com>; WEB PAGE: <<http://www.dxpub.com>>.

WANTED TO COMPLETE PHOTOGRAPHY FOR BOOK: Ham transmitters manufactured prior to World War II and receivers from the same era by companies other than Hallicrafters, Hammarlund, or National. I will travel to your location to do photography. Please contact Joe Veras, N4QB. Telephone: 205-967-2384; e-mail: <n4qb@cq-amateur-radio.com>; or P.O. Box 1041, Birmingham, AL 35201.

CALLBOOK 2000 Summer Edition CD-ROM: \$38.95 POSTPAID. ARRL items discounted: <AA6EE@amsat.org> <<http://www.radiodan.com/aa6ee/>>.

CERTIFICATE for proven contacts with all ten American districts. SASE to W6DDB, 45527 Third Street East, Lancaster, CA 93535-1802.

TOWER HARDWARE, SAFETY EQUIPMENT, weatherproofing, T-shirts, and MORE. Champion Radio Products, telephone 888-883-3104, or <www.championradio.com>.

ALUMINUM CHASSIS-CABINET KITS, UHF and VHF Antenna Parts. K3IWK, 5120 Harmony Grove Rd, Dover, PA 17315-3016; <www.flash.net/~k3iwk>.

B&B WITH A HAMI! Enjoy hamming from Hawaii. Join those who have chased DX from beautiful upcountry Maui! (Non-smokers only, thanks.) "SEA Q MAUI," call 808-572-7914; <kh6sq@seaqmaui.com> <<http://www.seaqmaui.com>>.

HALLICRAFTERS Service Manuals. Amateur and SWL Write for prices. Specify Model Numbers desired. Ardco Electronics, P.O. Box 95, Dept. C, Berwyn, IL 60402.

FREE IBM DISK CATALOG! Ham Radio, Shareware, and CD-ROMs. MOM 'N POP'S SOFTWARE, P.O. Box 15003-HE, Springhill, FL 34609-0111 (phone 1-352-688-9108; e-mail: <momnpop@webcombo.net>; web-site: <www.momnpopshare.com>).

TRYLON SELF-SUPPORTING TOWERS: Steel towers available up to 96 ft. Terrific value and reliability. The popular T-500 72-footer will take 45 square feet of antennas at 70 mph and is only \$1825.00. <www.championradio.com> or 888-833-3104 for more info.

ESCAPE from the HORDES! Phone bands unbearable? Move up to CW with **CW MENTAL BLOCKBUSTER III**. Completely redesigned for Generals, Advanceds, and Extras who once knew enough code to pass the exams. **FREE INFO.** 1-800-425-2552. WWW.SUCCESS-IS-EASY.COM.

NEW CD-ROM release for 1999, for the PC with the PicturePacket (LITE) program ready to install on your Windows 95, 98, or NT based PC. The CD also contains many of K4ABT's articles, PacketRadio Handbooks, and hundreds of TNC to transceiver drawings, transceiver modifications (both 9600 baud and some commercial radio conversions), TNC to node conversions, and text file radio modifications. Some documents are in MSWord format. Here is a library of files and drawings from 15 years of the "Packet User's Notebook." Most drawings are in GIF and JPG formats. All orders are shipped PRIORITY, FIRST-CLASS MAIL within 24 hours of received order. Send check or MO (\$20.00 US) payable to Buck Rogers, K4ABT, 115 Luenburg Drive, Evington, VA 24550.

THE DAILY DX - Do you still have e-mail? Get two free weeks of the most up-to-date DX news. Send an e-mail to <cq@dailydx.com> or visit <<http://www.dailydx.com>>.

KNOW FIRST! Ham radio fanatics—you need THE W5YI REPORT, a twice-monthly award-winning Hot Insider Newsletter Acclaimed best! Confidential facts, ideas, insights, nationwide news, technology, predictions, alerts. Quoted coast-to-coast! We print what you don't get elsewhere! \$19.50 annually to new subscribers! Money-back guarantee! FREE sample for SASE (two stamps). W5YI, P.O. Box 565101, Dallas, Texas 75356.

W7FG Vintage Manuals and Ladder Line: Most manuals in stock. SASE for catalog. 600 ohm Ladder Line. Visa/MasterCard accepted. **402731 W. 2155 Dr.**, Bartlesville, OK 74006 (918-333-3754 or 800-807-6146) <<http://www.w7fg.com>>

FREE Ham Gospel Tracts, SASE. KW3A, 265 West Ave., Springfield, PA 19064.

ANTENNA HARDWARE - S.S. "U" bolts, Aluminum Saddles, Element and Boom Plates, S.S. Hose Clamps. Write for list to **HARBACH ELECTRONICS** - WA4DRU, 2318 S. Country Club Road, Melbourne, FL 32901-5809 (<http://www.harbach.com>).

WANTED: Older model bugs, unusual bugs, and miniature hand keys. State price, condition. Dave Ingram, K4TWJ, 4941 Scenic View Drive, Birmingham, AL 35210.

Advertiser's Index

now including websites

ADI/Premier Communications	8	www.adi-radio.com
Advanced Specialties, Inc.	16	home.att.net/~advancedspec/
AEA (Division of Tempo Research) ..	46	www.aea-wireless.com
Alinco Electronics	66,67	www.alinco.com
Alternative Energy Engineering	64	alt-energy.com
Aluma Towers	115	www.alumatower.com
Ameritron	11	www.ameritron.com
AMSAT	105	www.amsat.org
Antique Electronic Supply	121	www.aesham.com
Antique Radio Classified	64	www.antiqueradio.com
AOR, Inc.	51	www.aorusa.com
Associated Radio	44	www.associatedradio.com
Astron Corp	9	www.astroncorp.com
Atomic Time, Inc.	23	www.atomictime.com
Batteries America/E.H.Yost	131	www.batteriesamerica.com
Bilal Co./Isotron Ants	100	www.catalogcity.com
Burghardt Amateur Center	127	www.burghardt-amateur.com
C & S Sales	107	www.cs-sales.com
CBC International	125	
Champion Radio Products	129	www.championradio.com
Champion Radio Wear	91	www.championradio.com
Command Productions	46	www.command1.com
Communication Concepts Inc	92	www.communication-concepts.com
Communications Electronics Inc	25	www.usascan.com
Communications Specialists	16	www.com-spec.com
Creative Services Software	101	www.cssincorp.com
CTI Com Tec, Inc	127	www.CTIComTec.com
Cubex Quad Antennas	115	www.cubex.com
Cushcraft	7	www.cushcraft.com
Davis Instruments	63	www.davisnet.com
Davis RF	115	www.davisrf.com
Denver Amateur Radio Supply	21	www.denverradio.com
Directive Systems	100	www.directivesystems.com
Down East Microwave	63	www.downeastmicrowave.com
DWM Communications	125	
DX4WIN(Rapidan Data Systems)	64	www.erols.com/pvander
EQF Software	100	www.itis.net/eqf
EZ Hang, Inc	125	www.ezhang.com
Fair Radio Sales	101	www.fairradio.com
First Call Communications	27	www.firstcallcom.net
G4ZPY Paddle Keys	128	website.lineone.net/~g4zpy/index.htm
Gateway Electronics	77	www.gatewayelex.com
Gem Quad	129	www.escape.ca/~gemquad
Geo Tool	95	www.geotool.com
Giovannini Antenna Systems	112	www.antenna.it
Glen Martin Engineering, Inc	35	www.glenmartin.com
Hal Communications	113	www.halcomm.com
Ham Radio Outlet	12	www.hamradio.com
Ham Radio Insurance Assoc.	128	www.hamradioinsurance.com
Harlan Technologies	100	www.hampubs.com
High Sierra Antennas	125	www.hsantennas.com/info
Hustler Antennas	10	www.new-tronics.com
ICOM America, Inc ... Cov. II,Cov.IV,1		www.icomamerica.com
J. Martin Systems	121	www.jmsystems.com
Juns Electronics	33	www.jun's.com
K2AW's "Silicon Alley"	115	

\$\$\$SAVE\$\$\$

Boom mic headset with optional connector/preamp installation. Available for "plug and play" on new and old -

- ALINCO
- COLLINS
- DRAKE
- ICOM
- JRC
- KENWOOD
- TENTEC
- YAESU, more!

*Prices less connectors, plus S&H. Credit card phone orders accepted!



CALL NOW TOLL-FREE
1-800-634-0094
 30-DAY MONEY-BACK GUARANTEE!

WARREN GREGOIRE & ASSOCIATES LLC
 229 EL PUEBLO PLACE, CLAYTON, CA 94517, USA
 VOICE 925-673-9393 • FAX 925-673-0538
 WEBSITE www.warregregoire.com



Check out our
 Web site at:
www.cq-amateur-radio.com

CHAMPION RADIO PRODUCTS

Loos Guy Wire Tensioners • Safety Equipment
 Rohn Catalogs • Tower Hardware
 Tylon Self-Supporting Towers
 —steel towers up to 96 feet! Only \$1974.00

T-Shirts • Tribander Comparison Report
 CQ Worldwide Contest Products

Call Toll Free (888) 833-3104  
 Order online • www.championradio.com

BOOMLESS QUADS

\$239⁹⁵ - 3 Band - 2 Element HF

3-4 Elements available.
 Also W.A.R.C. Bands. 2 meter loop FREE.
 Sold world wide for over 15 years.

GEM QUAD

Box 291, Boissevain, Manitoba, Canada R0K 0E0
 Telephone 1-204-534-6184 Price F.O.B. Factory
<http://www.escape.ca/~gemquad>
 Fax: 204-534-6492

"KACHINA"

THE \$4000 HF TRANSCEIVER
 AT HALF THE PRICE, \$1995
 SEE: www.kachinaradio.com

ORDERS: 800-333-9041
 M&S COMPUTER PRODUCTS

FOR SALE: CQ/Ham Radio/QST/73 magazines and binders. SASE brings data sheet. W6DDB, 45527 Third Street East, Lancaster, CA 93535-1802.

FREE HAM RADIO GOSPEL TRACTS: Christian youth leaders needed for out-reach areas. Membership is free. Send #10 SASE with call letters for details. Ray Bohmer, W1REZ, P.O. Box 8, Harmony, ME 04942.

GROUND IT Ham Station Grounding Accessories. **J. Martin Systems**, 35 Hilltop Ave., Stamford, CT 06907. Voicemail/Fax 203-461-8768; web: <http://www.jmsystem.com>

P49V's ARUBA COTTAGE FOR RENT with 2 bedrooms, rig, and antennas. For info write Carl Cook, 2191 Empire Ave., Brentwood, CA 94513.

IMRA-International Mission Radio Assn. helps missionaries—equipment loaned; weekday net, 14.280 MHz, 1:00–3:00 PM Eastern. Sr. Noreen Perelli, KE2LT, 2755 Woodhull Ave., Bronx, NY 10469.

ASTRON Power Supply, brand new w/warranty, RS20M \$99, RS35M \$145, RS50M \$209, RS70M \$249. Call for other models, AVT 626-286-0118 <www.aventrade.com>.

ATTENTION SB-200 & SB-220 OWNERS: Restore and up-grade your tired old amplifier with our parts and kits. Power supply boards, soft keys, soft starts, new fans & motors, many more items. Write for details—**Please specify the model.** Harbach Electronics—WA4DRU, 2318 S. Country Club Rd., Melbourne, FL 32901-5809 (<http://www.harbach.com>).

TRIBANDER COMPARISON REPORT: Find out the real lowdown on HF antenna performance. K7LXC and N0AX test the KT34XA, TH7, TH11, C-3, Skyhawk, and more. Over 60 pages. \$15 plus \$3.00 s/h. <www.championradio.com> or 888-833-3104.



**Order Your
Back Issues
Today!**

\$4.00 per issue

CQ Communications
25 Newbridge Road
Hicksville, NY 11801

Phone: 516-681-2922
FAX: 516-681-2926

**NEW Revolutionary New
"STEALTH"
Ham/Radio Antenna**

36" x 2" Hoop - "CTHA" Design
Covers 3-30 MHz (with tuner)
Replaces Ugly, Visible 66' Dipole Ants.
Transmits & Receives while hidden in
car trunk, pick-up shell, RV, boats,
attic, office or Anywhere!

30 Day Money Back Guarantee!
\$289.95 + \$9.95 S&H + COD
(With This Ad - Retail Price \$389.95)

Check/MO to JWM, Box 533, Red River, NM 87558

1-800-435-SHOW

CTHA - Contrawound Toroidal Helical Antenna - Pat. 1997
See Our Web Site at: www.nomosno.com/satellite

CIRCLE 88 ON READER SERVICE CARD

WANTED: HAM EQUIPMENT AND RELATED ITEMS. Donate your excess gear—new, old, in any condition—to the Radio Club of Junior High School 22, the Nation's only full time non-profit organization working to get Ham Radio into schools around the country as a teaching tool using our EDUCOM—Education Thru Communication—program. Send your radio to school. Your donated material will be picked up ANYWHERE or shipping arranged, and this means a tax deduction to the full extent of the law for you as we are an IRS 501(c)(3) charity in our 18th year of service. It is always easier to donate and usually more financially rewarding, BUT MOST IMPORTANT your gift will mean a whole new world of educational opportunity for children nationwide. Radios you can write off; kids you can't. Make 2000 the year to help a child and yourself. Write, phone, or FAX the WB2JKJ "22 Crew" today: The RC of JHS 22, P.O. Box 1052, New York, NY 10002. Twenty-four hours call 516-674-4072; fax 516-674-9600; or e-mail <wb2jkj@juno.com>. Join us on the WB2JKJ Classroom Net, 7.238 MHz, 1200–1330 UTC daily and 21.395 MHz from 1400 to 2000 UTC.

ANSWER THE DOOR FROM ANY PHONE—ONLY \$140.00 (US): SIMPLE TO USE, EASY TO INSTALL, 2-wire design allows easy retrofit to door chime wire. When a visitor presses the door button, all your phones ring. Pick up any phone to connect to the door. VISCOUNT 1-800-476-3774 <www.enterphonesolo.com>

FOR SALE: **Transmission Line Transformers** (Baluns and Ununs). Due to QTH downsizing, I have to dispose of the many transformers used in my study of these broadband and highly efficient matching transformers. A suggested price is \$20, covering labor, packaging, and shipping. Oldest transformers will be shipped first. They will include a short personal note on the particular experiment. Please, no special requests. Most transformers are uncased. Jerry Seveck, W2FMI, 32 Granville Way, Basking Ridge, NJ 07920 (908-766-6122). **Note:** These are one of a kind, for experimental use only.

PHASED ARRAY NETWORKS by COMTEK SYSTEMS deliver gain and front to back. Call 704-542-4808; fax 704-542-9652. COMTEK SYSTEMS, P.O. Box 470565, Charlotte, NC 28247.

LOW BAND DXers K1FZ Beverage antenna transformers. Single wire and two wire switchable two direction types. <www.qsl.net/k1fz/> e-mail: <k1fz@agate.net> Clark Electronics, 207-338-0474.

FREE GUIDE "THE TEN MOST COMMON TOWER BUILDING MISTAKES": Written by well-known tower expert Steve Morris, K7LXC, this guide will help you avoid dangerous mistakes. TOWER TECH, Box 572, Woodinville, WA 98072; e-mail <UpTheTower@aol.com> or call 800-TOWERS8 or on the web: <www.championradio.com>.

VP5 - Be DX: Newly constructed 2BR/2BA villa with rig and antennas overlooking north coast of beautiful Middle Caicos. Telephone 904-282-0158, or e-mail <islands@southeast.net>.

OVER 2500 DIFFERENT DX AWARDS from 122 DXCC countries listed. K1BV DX Awards Directory. Put your QSLs to work for you! \$21 postpaid. Ted Melinosky, 65 Glebe Road, Spofford, NH 03462-4411. <<http://top.monad.net/~k1bv>>.

HEARD ISLAND commemorative T-shirts, same shirt as team is wearing on QSL card. Proceeds benefit VKØIR DXpedition. Personal checks on U.S. banks okay. Please no credit cards. Sizes remaining: large, extra-large. 100% cotton, U.S. made. \$20 Priority Mail stateside, \$25 DX Air Mail, postage included. Tom Anderson, WW5L, 3505 Cliffwood Drive, Bedford, Texas 76021-2043 (phone 817-498-2820; e-mail <WW5L@gte.net>).

CASH FOR COLLINS: Buy any Collins Equipment. Leo, KJ6HI, phone/fax 310-670-6969; <radioleo@earthlink.net>

RAINBOW AMATEUR RADIO Association, the gay/lesbian club. Active weekly HF nets, monthly newsletter, e-mail reflector, web page: <www.rara.org>. Chat room. Privacy respected. E-mail: <rara@qsl.net>, or P.O. Box 191, Chesterland, OH 44026-0191.

KK7TV COMMUNICATIONS: See our display ad.

GREAT CIRCLE MAPS computer generated for your exact QTH, \$20 ppd worldwide. Printouts \$12 ppd. SASE for info. Bill Johnston, K5ZI, Box 640, Organ, NM 88052 (505-382-7804).

Join the LAMBDA AMATEUR RADIO CLUB (LARC) since 1975, the only open and visible public-service oriented ham club for gay and lesbian hams. Monthly newsletter, HF skeds, internet listserv and IRC, hamfest meetings, chapters, DXpeditions. Write LARC, P.O. Box 56069, Philadelphia, PA 19130-6069 or e-mail <lambda-arc@geocities.com>; <<http://www.geocities.com/WestHollywood/1686>>.

PACKET RADIO AND MORE! Join TAPR, connect with the largest amateur radio digital group in the U.S. Creators of the TNC-2 standard, working on Spread Spectrum technology. Benefits: newsletter, software, discounts on kits and publications. For membership prices contact TAPR, 8987-309 E. Tanque Verde Road, #337, Tucson, AZ 85749-9399 (phone 940-383-0000; fax 940-566-2544; internet <tapr@tapr.org>; web: <<http://www.tapr.org>>).

200+ PROJECTS. Secure WEB ordering @ <www.matcopublishing.com/plans1.htm> or send \$1.00 (refundable) Matco-5E, P.O. Box 509, Roseville, MI 48066-0509 USA.

STRAT (Magazine of G-QRP-Club) issues 1–100 on CD-ROM. \$25.00 including s&h. Member price \$20.00 only! Pay by MC, VISA, Amex, cash or check. FUNKAMATEUR, Box 73, 10122 Berlin, Germany; fax ++49-30-44669469; <www.qsl-shop.com>.

TUBES 1/s - M/p of ge 6jb6a or 6146w & driver \$38.00. M/p 6js6c & driver \$70.00. Other amateur-related tubes are available. Website <<http://www.internetbci.net/tubes>>. E-mail: <tubes@internetbci.net>. Bob Bieker 219-924-0945.

ICOM IC-706G The little BIG giant among transceivers. Includes power supply and speaker, \$1200.00. Inquiries to Hank Sedlak, 414-764-3680; e-mail: <hjsedlak@ameritech.net>.

WANTED: Amateur Radio equipment, good/bad/price. Large list \$1.00, SASE. Joseph Bedlovics, POB 139, Stratford, CT 06615.

ALUMINUM ANTENNA/MAST TUBING: Stackable 4 foot sections, 1.78 inch diameter, 0.11 inch wall. <WWW.geocities.com/TMastCo>, or The Mast Co., P.O. Box 1932, Raleigh, NC 27602.

OLD-TIME RADIO PROGRAMS: Over 100 thirty-minute programs per computer CD (in MP3 or Real Audio). WWW.SCANCAT.COM 1-888-722-6228

COUNTY HUNTERS: Worked All Texas Award. Beautiful Certificate. Temple Amateur Radio Club, P.O. Box 616, Temple, TX 76503 <www.tarc.org>

ARIZONA STATE CONVENTION AND HAMFEST: Largest FREE ADMISSION hamfest in the Southwest. July 28, 29, and 30, 2000. I-17 exit 337 (Ft. Tuthill), Flagstaff, Arizona. Our 49th consecutive year. Manufacturers, Dealers, Exhibits, Seminars, VE Testing, Huge Swap, Camping, and more. Gordon West, WB6NOA, will present two of his famous seminars and will be the (TBA) guest speaker at the Saturday night BBQ. Other speakers, seminars, and forums include Dan Miller from ARRL HQ and Bill Pasternak from Newsline. AMSAT, APRS, Ten-Ten Int'l, QRP, ladies programs, and ARRL Forum. For more info, contact Amateur Radio Council of Arizona, POB 312, 16845 N. 29th Ave., Suite 1, Phoenix, AZ 85080-2003, or e-mail: <arcathill@aol.com>. Voice mail 1-602-779-2722; website: <<http://www.Hamsrus.com>>. Enjoy cool weather and the pines. An ARRL sanctioned event.

Advertiser's Index

now including websites

Kachina Communications	117	www.kachina-az.com
Kenwood, USA.....	3	www.kenwood.net
KK7TV Communications.....	128	www.kk7tv.com
Lakeview Company	71,75	www.hamstick.com
LDG Electronics.....	95	www.ldgelectronics.com
Lightning Bolt Antennas.....	95	lbq.isrv.com
Lewallen, Roy, W7EL	101	
M&S Computer	129	www.mscomputer.com
MFJ Enterprises.....	17,41	www.mfjenterprises.com
Max Research.....	125	
Mouser Electronics	75	www.mouser.com
Nemal Electronics.....	47	www.nemal.com
Paddlette.....	128	
Palomar Engineers	111	www.palomar-engineers.com
Peet Brothers.....	65	www.peetbros.com
Personal Database Applic.	128	www.hosenose.com
Peter Dahl Co.	31	www.pwdahl.com
PROLOG2K/Datamatrix.....	94	www.qth.com/prolog
QSLs by W4MPY.....	111	www.w4mpy.com
QSLs by WX9X.....	115	www.qth.com/wx9x
RF Applications.....	59	www.rfrfapps.com
RF Connection.....	112	www.therfc.com
RF Parts.....	77	www.rfparts.com
Radcomm Radio	71	www.rad-comm.com
Radio Amateur Callbook.....	61	www.callbook.com
Radio Club of JHS 22	54	www.wb2jkj.org
Radio Depot.....	94	www.hammall.com
Radio Engineers	60	
Radio Works	23	www.radioworks.com
Raibeam Antennas	43	www.raibeam.com
Rochester Hamfest.....	92	www.rochesterhamfest.org
Ross Distributing.....	112	www.rossdist.com
Silver River Books	125	www.silverriver.com
Spectrum International.....	108	
Stealth Antennas	130	www.nomosno.com/satellite
Surplus Sales of Nebraska	43	www.surplussales.com
Tennadyne Corporation.....	31	www.tennadyne.com
Timewave Technology.....	94	www.timewave.com
Traffie Technology	105	www.hexbeam.com
Universal Radio	87	www.universal-radio.com
Vectronics	5	www.vectronics.com
Vibroplex.....	60	www.vibroplex.com
W2IHY, Julius Jones.....	112	pages.prodigy.net/w2ihy
W5YI Marketing	60,65,115,127	www.w5yi.org
W9INN Antennas.....	112	
W & W Associates	55	www.wassociates.com
Warren Gregoire & Assoc.....	129	www.warregregoire.com
WBØW, Inc.....	117	www.wbow.com
Wireman, The	112	www.thewireman.com
Yaesu Electronics.....	CovIII,28,29,132	www.yaesu.com

It's easy to advertise in CQ.

Let me know what I can do to help.

Arnie Sposato, N2IQO

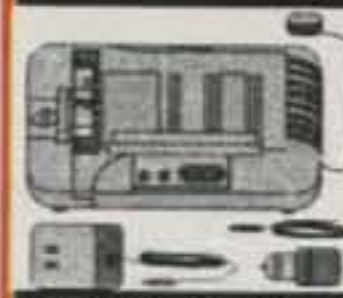
(516) 681-2922 or FAX (516) 681-2926

e-mail:arniecq@aol.com

Mr. NiCd's BATTERIES AMERICA

JUNE 2000 SPECIALS!

www.batteriesamerica.com



New! The UBC-9000 Charger!
Charges / Conditions your NiCd or NiMH battery packs!
Adjustable sensor contacts!
Operates from wall outlet or Car cigarette lighter!
Smart quick charge with Automatic shut-off!
\$ 49.95

NEW for ICOM IC-T8A / T8A-HP / T81A:

BP-200 5w NiMH pk. 9.6v 700mAh **\$49.95**

BC-601f Rapid/Trickle Charger **\$54.95**

NEW for KENWOOD TH-G71A / TH-D7A:

PB-39 NiMH pk. 9.6v 1050mAh **\$46.95**

NEW for ALINCO DJ-195 / 195HP:

EBP-48h NiMH pk. 9.6v 1200mAh **\$39.95**

For ALINCO DJ-G5TD, TH-TY / 190T, TD, TH / 191T, TD, TH:

EBP-34xh NiMH pk. 4.8v 2400mAh **\$39.95**

EBP-36 5w NiMH pk. 9.6v 650mAh **\$36.95**

NEW for ADI HT-600 & REALISTIC HTX-204:

ADI-600x 6w NiMH pk. 12.0v 1000mAh **\$39.95**

For ICOM IC-Z1A / T22A / T42A / W31A / W32A / TTA:

BP-180xh NiMH pk. 7.2v 1000mAh **\$39.95**

BP-173 5w NiMH pk. 9.6v 700mAh **\$49.95**

BC-601d Rapid/Trickle Charger **\$54.95**

For ICOM IC-W21A / 2GXAT / V21AT(Black or Gray)

BP-131xs NiMH pk. 7.2v 1800mAh **\$39.95**

BP-132s 5w NiMH pk. 12.0v 1600mAh **\$49.95**

For ICOM IC-2SAT / W2A / 3SAT / 4SAT etc.:

BP-83xh NiMH pk. 7.2v 1600mAh **\$39.95**

BP-84x NiMH pk. 7.2v 1800mAh **\$43.95**

BC-79A Rapid/Trickle Charger **\$52.95**

For ICOM 02AT etc & Radio Shack HTX-202 / 404:

BP-8h NiMH pk. 8.4v 1400mAh **\$32.95**

BP-202h pk (HTX-202) 7.2v 1400mAh **\$29.95**

IC-8 8-Cell AA NiCd/Alkaline Case **\$15.95**

BC-350 Rapid Charger **\$49.95**

For KENWOOD TH-79A / 42A / 22A etc.:

PB-33xh NiMH pk. 6.0v 2000mAh **\$39.95**

PB-34xh 5w NiMH pk. 9.6v 1000mAh **\$39.95**

For KENWOOD TH-78A / 48 / 28 / 27 etc.:

PB-13x (orig. size pk, NiMH) 7.2v 1200mAh **\$34.95**

PB-13xh NiMH pk. 7.2v 1600mAh **\$39.95**

For KENWOOD TH-77, 75, 55, 46, 45, 26, 25 etc.:

PB-6x (NiMH, w/ chg jack) 7.2v 1200mAh **\$34.95**

NEW for KENWOOD TH-205 / 215 / 225 / 315 etc.:

PB-2h NiMH pk. 8.4v 1200mAh **\$39.95**

PB-12 5w NiMH pk. 12.0v 1000mAh **\$49.95**

NEW for KENWOOD TH-2500 / 2600: EXCLUSIVE!

PB-25s NiMH pk. 8.4v 1200mAh **\$39.95**

For YAESU FT-50R / 50RD / 40R / 10R etc.:

FNB-47xh NiMH pk. 7.2v 1800mAh **\$49.95**

FNB-41xh NiMH pk. 9.6v 1000mAh **\$45.95**

For YAESU FT-51R / 41R / 11R etc.:

FNB-33xh NiMH pk. 4.8v 2000mAh **\$39.95**

FNB-38 5w NiMH pk. 9.6v 700mAh **\$39.95**

For YAESU FT-530 / 416 / 415 / 816 / 76 / 26 etc.:

FNB-25x NiMH pk. 7.2v 1000mAh **\$28.95**

FNB-26xs NiMH pk. 7.2v 1800mAh **\$36.95**

FNB-27x NiMH pk. 12.0v 1100mAh **\$45.95**

For YAESU FT-411 / 470 / 73 / 33 / 23 etc.:

FNB-10 NiCd pk. 7.2v 600mAh **\$20.95**

FNB-11 5w NiCd pk. 12.0v 600mAh **\$24.95**

FBA-10 6-Cell AA case **\$14.95**

Packs for ALINCO DJ-580 / 580T / 582 / 180 / 280T etc.:

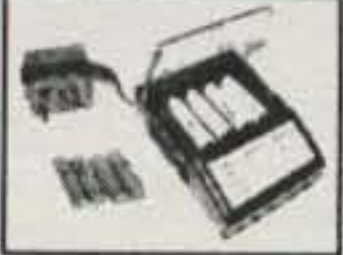
EBP-20nh NiMH pk. 7.2v 1800mAh **\$32.95**

EBP-22nh 5w NiMH pk. 12.0v 1100mAh **\$36.95**

EDH-11 6-Cell AA case **\$14.95**

SANYO Nickel Metal Hydride AA Cells (Long Life):

HR-3u Button top 1.2v 1600mAh **\$ 3.50**



NEW- the IQ-9000 Charger & \$22.95
Conditioner for AA & AAA batteries!
(1) Desktop unit can charge or condition up to 4 NiMH or NiCd cells!
(2) Has selectable conditioning feature!
(3) Provides safe, quick charge for cells!
(4) Automatic shut-off at end of charge!
(5) UL-listed power supply included!

Mail, E-mail, Phone, or Fax your order! We welcome MasterCard / VISA / DISCOVER / AMERICAN EXPRESS

Call, write, e-mail, or Fax us for our FREE CATALOG!

Mr. NiCd's BATTERIES AMERICA

2211-D Parview Rd., Middleton, WI 53562

Order Toll Free: 800-308-4805

Fax: 608-831-1082 E-mail: ehyost@midplains.net



VX-150
Compact yet incredibly rugged 2-meter handheld is designed to perform under the most difficult operating conditions. And it's packed with the leading-edge features you've come to expect from a Yaesu product. Five Watt power-output, 209 memories, DCS/CTCSS, 7 digit alphanumeric display, automatic repeater shift and much more.



FT-50RD
This durable, multi-featured 5 Watt Dual Bander is manufactured to rigid MIL-810 standards. Featuring wideband frequency coverage,* CTCSS/DCS operation, Dual Watch, 112 memory channels, and Digital Voice Storage.



FT23RMKII/FT33R
These ultra-compact, 5 Watt VHF FM Handhelds feature rugged die-cast aluminum cases, 10 memory channels, optional CTCSS, and multiple scan modes. The FT23RMKII (2M) and the FT-33R (222 MHz) are easy to operate, and give outstanding performance.



VX-110
This incredibly rugged 5 Watt VHF handheld features 209 memories, Smart Search™, DCS/CTCSS, simple 8 key operation and Omni Glow™ display illumination for night time operation.



VX-1R
The pocket-sized VX-1R is small in size only. Featuring Smart Search™, DCS/CTCSS, Dual Watch, ARTS™ wide-band coverage (76-999* MHz plus AM BC). The VX-1R provides 291 memory channels, and puts out 1/2 Watt (1 Watt w/optional E-DC-15 DC Adapter).

* Cellular Blocked



FT411MKII
The affordable FT411MKII is compact and durable. This 5 Watt VHF FM Handheld features a die-cast case, 40 memory channels, 10 DTMF memories, built-in VOX, CTCSS, and multiple scan modes.



VR-500
This miniature Handheld Receiver provides FM, AM, SSB and CW reception on 100 kHz-1300 MHz, with 1091 memory channels, Smart Search™, versatile Dot Matrix display, Band Scope, and Dual Watch.



VX-5R
Although Yaesu's newest Tri-Band Handheld Transceiver is the world's smallest, it offers the performance of a full-size unit. The VX-5R operates on the 50 MHz, 144 MHz and 430 MHz bands with 5 Watts of power output, along with ultra-wide receive coverage of the VHF and UHF spectrum, plus AM medium- and short-wave broadcast reception. The VX-5R is military rated, so its durable, lightweight design allows you to take it anywhere. It is equally suited to walking through the concrete jungle as it is to forging the raging rivers of a real one. Along with a temperature display, the optional barometer pressure sensor unit gives a read-out of barometric pressure and altitude.

TOUGH GUYS.

When you're small, you get picked on. Isn't that how it goes? Well not in Yaesu territory, because not only do we design compact handhelds for efficiency, but we give these clever little guys plenty of muscle. Yaesu handheld transceivers have earned the bragging rights for being the smallest handhelds with the most durable water resistant casings ever created. And packed inside the brawn are engineering accomplishments in performance that are unmatched in the industry. Our high-tech handheld transceivers provide clean power output on the VHF and UHF bands and offer revolutionary features that allows these tough guys to continually outperform the competition. Learn more about Yaesu products on the web at www.yaesu.com

YAESU ...leading the way.

©2000 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703, (562) 404-2700. Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with you local Yaesu dealer for specific details.

Raising The Standard for Toughness

Solid As A Rock



Actual Size

Yaesu's FT-1500M represents a technological breakthrough in radio transceiver design! New advances in power amplifier technology combine to provide you with 50 Watts of clean transmit power with enhanced current consumption efficiency. Yaesu's patent pending aluminum die-cast shell construction dissipates heat throughout the entire transceiver chassis and eliminates the need for a cooling fan. This allows the FT-1500 to fit in an incredibly small case size: less than 5 inches square X 1.4 inches high and offer superior operating specifications as well!



FT-1500M


50 W 2-m FM Mobile Transceiver

YAESU
Choice of the World's top DX'ers™

©2000 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703. (562) 404-2700
Specifications subject to change without notice. Specifications guaranteed only within Amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

For the latest news, hottest products:
Visit us on the Internet! <http://www.yaesu.com>

WORK THE MAGIC



Save \$150

IC-706MKIIG

Special savings are limited time offers. See dealer for details

Save \$180

IC-706MKIIG/AH-4 COMBO

Save \$200

IC-706MKIIG/AT-180 COMBO

FREE

World Time Clock while supplies last. See dealer for details

Special savings are limited time offers. See dealer for details

Save \$200

IC-746



There's something magical about amateur radio. The fact that you can speak into a little box and communicate with someone else on the other side of town, or even on the other side of the world, with nothing between you and that person but thin air...what an incredible, powerful feeling. It feels like magic.

Work the magic.

Many operators refer to 6 meters as the "magic band". 6 meters can take you surprising distances – or nowhere at all. While most bands have predictable openings, 6 meters remains aloof and rather mysterious.

Work the magic.

There's something magical about the latest ICOM radios, too. Take, for example, the new IC-756PRO with its awesome, 32-bit DSP processing. The way this rig pulls faint signals out of strong interference is incredible. The all new, easy to use IC-718 is no less exciting, offering newer hams an affordable introduction to the world of HF without skimping on features. The technological advances of today's ICOM rigs are like magic.

Work the magic.




ICOM[®]

www.icomamerica.com