ICD 08241

Amateur Radio

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JUNE 1998

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In This Issue:

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e cover: Mick Brafford, W4YV, Goode, VA

THE RADIO AMATEUR'S JOURNAL

VHF & UHF

HANDHELDS

IC-T2A

2 Meter Single Bander • 4.5 W • Rugged Aluminum Chassis & Polycarbonate Case • Built-In Tone Squelch with Pocket Beep and Tone Scan • 8 Programmable Keys • 43 Memory Channels • Uses 8 "AA" Ni-Cd (included) or Alkaline Batteries • Affordable • 2.3"(W), 5.5"(H), 1.3"(D), 10.9 oz

IC-T22A/IC-T42A (2M/440 MHz)

Single Bander • Fun, Shirt Pocket Small and Easy to Use • Large Alphanumeric Display • Wide Receive Coverage, Including Air Band • 5 W@13.5 V (3 W Out of Box) • Air Band Receive • 80 Memory Channels (40 w/Alpha Display) • 2.3"(W), 4.3"(H), 1.1"(D), 10.9 oz

IC-T7AHP

2 Meter/440 MHz Dual Bander • Dual Bands at a Single Bander Size & Price • Very Easy to Use–No Function Key • Works One Band at a Time, Switch Between Bands with One Touch of the Band Key • Now 4 W (2M)/3 W (440) Out of the Box with BP-173 • "Intuitive" Help Display • CTCSS Encode/Decode• Very Affordable • 2.5"(W), 4.8"(H), 1.1"(D), 11.3 oz

IC-Q7*

2 Meter/440 MHz Dual Bander • Extended Rx 30-1300 MHz (cellular blocked), Airband Receive Broadcast FM and AM Receive (most TV stations, too) • 300 Mw Transmitter • 200 Memories • Uses "AA" Alkaline or Ni-Cd Batteries • Rugged Construction • Tone Squelch • Easy to Use • Splash Resistant • 6-25 KHz Channel Step • Full Scanning Capability • Receiver Attenuator • Power Save Feature • 2.3"(W), 3.4"(H), 0.98"(D) (Shown with optional antenna)

IC-W32A

2 Meter/440 MHz Dual Bander • 5 W Out of the Box • No Function Key • PC Programmable • 200 Memories with Alphanumeric Display , Messaging & Paging • "Intuitive" Help Display • Backlit Display and Keypad • Wide Band RX (Including Air Band) • V/V, V/U, U/U Operation with VHF/UHF Tuning Knob Exchange • Encode/Decode • PC/Radio-to-Radio Cloning • 2.2"(W), 4.9"(H), 1.2"(D), 12.0 oz

IC-T8A

6 Meter/2 Meter/440 MHz Tri Bander Handheld • Worlds Smallest! • Super Thin Profile/Lightweight Design • Up to 5 Watts Power on All Bands (13.5 V DC) • 4.5 Watts Out of Box with Supplied BP-200 Battery • One-Touch Band Switching • Ni-MH Powered! • RX (MHz): 50-54 (6 meters), 118 - 174 (2 meters), 400 - 470 (440 MHz) Broadcast FM and AM Receive (most TV stations, too) • Airband Receive • 123 Memory Channels with 10 Scan Edges and 1 Call for Each Band • MIL SPEC 810 C/D/E • Tone Squelch with Pocket Beep • Backlit Display with Timer • Built in Guide Function • JIS Grade 4 Water Resistance • Wall Charger Included • DTMF Encoder with 9 DTMF Memories • Handheld to Handheld Cloning Capability or PC Programming Capability** • 2.3 (W), 4.3 (H), 1.2 (D), 9.9 oz

MOBILES

Optional Infrared Wireless Mic

*The HM-90 infrared optional wireless mic works with the new IC-2100H, IC-207H** and the more advanced IC-2710H. Enjoy cable-free operation on the GO!*

IC-2100H

2 Meter • 55/10/5 Watts (selectable) • TX 144-148 MHz • RX 136-174 MHz† • 75 db/93 db IMD • 113 Memory Channels • Heavy Duty, One Piece, Die Cast Aluminum Chassis • MIL SPEC 810 C/D/E Shock/Vibration • Front Panel Programmable Alphanumeric Display • PC or Radio to Radio Cloning** • DTMF Microphone (HM-98S) • CTCSS Encode/Decode Standard – 50 Tone Frequencies • Independently Programmable Tx/Rx • Tone Scan • Auto Repeater with Busy Lockout • Priority Watch (3 types) • 5.5"(W) x 1.6"(H) x 7.1"(D), 2 lb 10 oz

IC-2710H

2M/440 MHz Advanced Dual Bander • 2M (50 W)/440 MHz (35 W) • Detachable Control Panel** • Fast Scanning • 220 Memory Channels • PC Programmable • CTCSS Encode (decode optional) • RF Attenuator • 8 DTMF Memory Switches • v/v, u/u Simultaneous RX • Built-In Duplexer • 3 Selectable Power Levels: 50 (35), 10, 5 • 5.5"(W), 1.6"(H), 8.4"(D), 3.1 lb

IC-207H

2M/440MHz Dual Bander • 2M (45 W)/440 MHz (35 W) • Super Compact Detachable Control Panel** with Big Keys, Big Knobs and a Big Display • Work One Band at a Time • 9600 Baud Ready • Wide Band RX (Includes Air Band) • CTCSS Encode/Decode • Very Affordable • 5.5"(W), 1.6"(H), 8.1"(D), 2.6 lb

BASE STATIONS

IC-821H 2M/440 MHz Advanced Satellite & Digital Base Station • All Modes • Easy to Use! • Continuous Adjustable Transmit Power • Sub Band Transmit • 9600 Full Compatibility Out of the Box • 160 Memories • Noise Blanker & IF Shift on Main & Sub Bands (independent main/sub RX) • Built-In Electronic Keyer • Satellite Tracking with Doppler Correction • Compact! 9.5"(W), 3.7"(H), 9.4"(D), 11.0 lb

"By far the easiest to use satellite radio on the market today. In less than 10 minutes after unpacking the 821H, I was on the air at 9600 baud with KO-23"

– Michael Wyrick, N4USI, AO-27
Control Operator

Solar Cycle 23 is here. Now's the best time to upgrade your license... or your shack. When you upgrade to General Class or higher, mail us a copy of your amateur radio license. **ICOM is giving away one IC-706MKII each month,** between April 1998 and March 1999. For complete details, visit your authorized ICOM dealer today.

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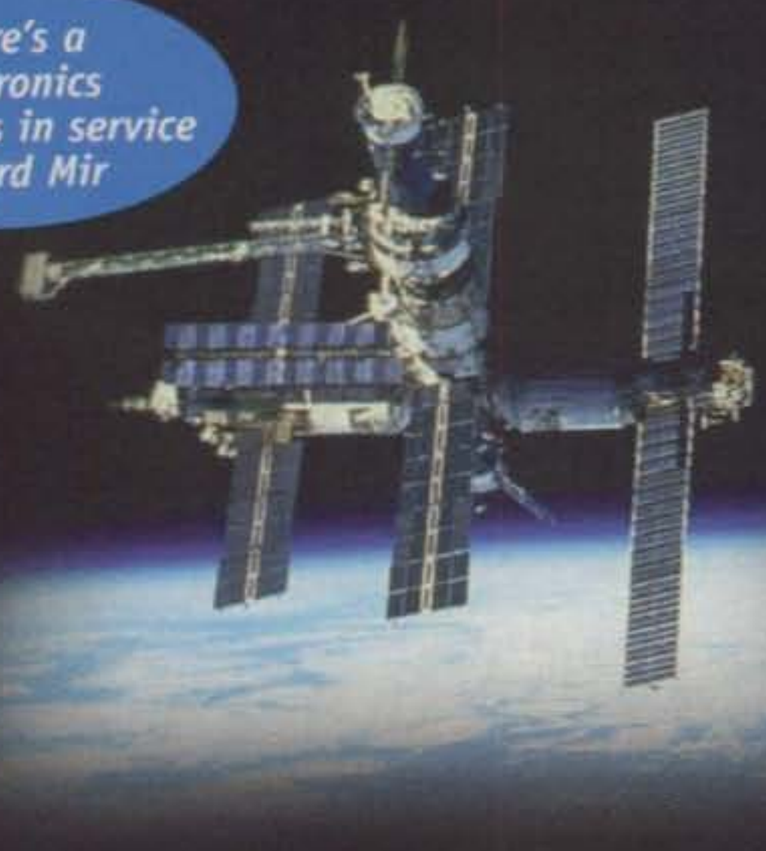
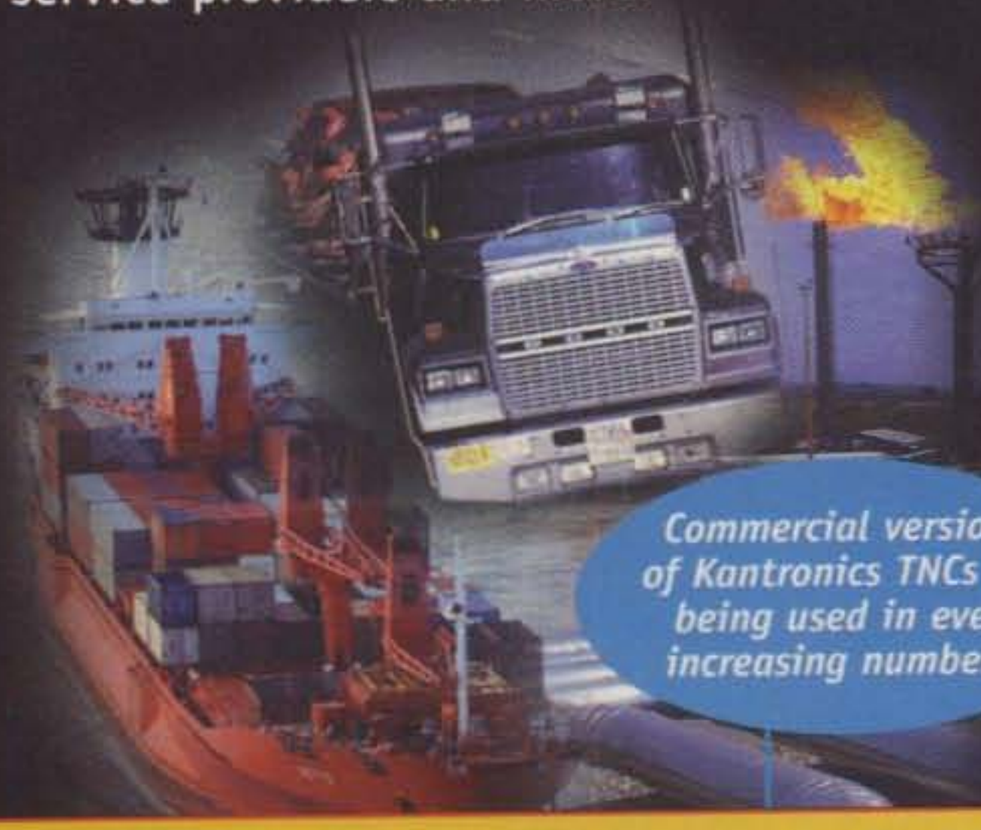
There's a Kantronics 9612 Plus in service aboard Mir



There's a world of digital communications fun and adventure that *only hams can enjoy* and Kantronics makes it possible for you to explore it. No matter if you call our products TNCs, wireless modems or digital controllers, the "Outernet™" offers a world of adventure, including satellite communications, APRS®, DX spotting, BBS operations, WEFAX, EMWIN, TCP/IP links, remote control and sensing, telemetry, HF e-mail with ham gateways or commercial service providers and more!



Commercial versions of Kantronics TNCs are being used in ever-increasing numbers!

Kantronics offers a number of ways to enjoy the growing field of digital communications. Choose the unit that suits your interests and budget. All Kantronics units come with a one-year limited warranty and can be upgraded when firmware updates become available.

KPC-3 Plus

8.2 Firmware now with Advanced GPS/APRS UI digipeating available for all 4 models!

- 1200 bps - Now with more features!
- Packet, GPS/APRS, Host, KISS and WEFAX modes, use with EMWIN
- Personal Mailbox (PBBS) now supports multiple calls
- Remote access, sensing and control with two A/D and two control lines
- PBBS 100k, expandable with optional 512k RAM
- Uses external power or internal 9v battery
- NEWUSER mode and online help

KPC-9612 Plus

Optional 1200 or 9600 third port expansion boards now available

- 1200 port AND second port of 4800 ~ 38,400 bps
- Most modes/capabilities of the KPC-3 Plus and POCSAG (paging)
- Unique design allows the addition of *another port, high or low speed*
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- Telemetry transmission capability

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- **Single Port** multimode TNC for HF or VHF use
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KAM Plus

- Dual port VHF/HF (1200/<=300 bps) multimode TNC
- Packet, GPS/APRS, Host, KISS, WEFAX, CW, RTTY, AMTOR, PACTOR, G-TOR™, TOR, and Free Signal Detection for HF e-mail
- 100k personal mailbox standard, expandable with optional 512k RAM
- Remote access capability
- NEWUSER mode and online help

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CQ Amateur Radio

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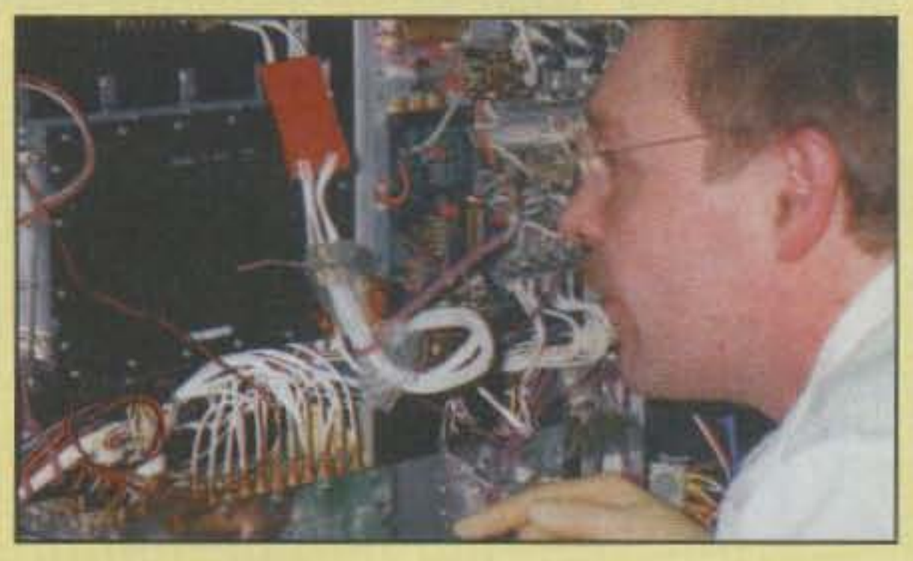
FEATURES



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DEPARTMENTS

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ON THE COVER: The gently rolling hills of Virginia provide a backdrop for Mick Brafford's stacked multi-band Yagi antenna setup as well as this very neat and well-organized station layout. W4YV has earned his share of recognition in both DXing and contesting as the wall decorations will attest (his WAZ and DXCC Awards and 5BDXCC plaque are obscured by the *CQ* logo, unfortunately). (Photo by Larry Mulvehill, WB2ZPI)

Shoot for the Stars

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

NEW!
Sky Command Operating System
(See your dealer for details)

Advanced Technology Upgrade

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

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

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

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

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

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

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

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

TS-570D/S (G) new features

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

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

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JQA-1205

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Kenwood Corporation
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ZERO BIAS

AN EDITORIAL

The mystery is solved! At least, I think so. No wonder I didn't know about it. It all happened about two years before I was born. If my folks knew, they never said a word to me about the whole incident 17 years later when I received my Novice license.

This past March I was reading Fred Maia's "W5YI Report," and he deftly handled the origins of the 13 wpm code test. I had always thought it was an odd and arbitrary number, but I assumed that it was one of those things that had always been. Well, I was chagrined to find out that the original testing speed prior to June 1936 was 10 wpm, and on June 3, 1936 the Commission, acting on a recommendation by the ARRL, increased the speed to 13 wpm. The League's stated opinion said that the amateur bands were approaching saturation with 46,000 licensed amateurs and that since the written part "may be mastered with relative ease, the chief opportunity for a better selective process resides with the code examination." So, I guess the first official "us" and "them" discussions were held 62 years ago this month. The League's noble position was that they wanted to ensure that amateur radio wouldn't be populated by the undeserving as they saw it. I don't know if there was a mountain and a source of stone tablets nearby 38 LaSalle Road at the time, but K. B. Warner brought the law down anyway.

The process then as well as now is virtually the same. It is far easier and far more expedient to pass laws restricting access to something than to enforce those laws which already exist. Enforcement of any kind takes determination, money, and time. It also means that on some level the individual is actually responsible and held accountable for his actions, a concept that is becoming more and more foreign to our thinking. It should also be noted that in 1936 the ARRL did put forth a request for greater FCC monitoring and enforcement efforts with regard to amateur radio. The official response then could have been written last month—lack of funds and lack of personnel.

In a sense, then, we "get around" more stringent laws by increasing the scope and number of license classes until there are a lot of "us" and "them" groups and everybody is fractionalized. It would seem to me that if you're one of the folks who took and passed your license exam prior to June 3, 1936, you have perhaps only the right to call yourselves "real." Everything since then was done to some degree to protect the core hobby and "real" amateurs from "us." Each new class of license or subset of rules simply becomes a larger neon sign stating that something is wrong with the system.

It's not just amateur radio where the logic becomes fuzzy. Recently there were two separate moves also designed to "help society" and protect us from ourselves. One group would like to cleanse our movies of characters who smoke and drink. While this may be a noble ambition, the trickle-down effect hoped for among our young will evaporate once someone leaves the theater and sees real life. People do have nasty habits and do terrible things in real life. The other "common good" idea put forward was to sanitize our dictionaries, removing offensive words so that in years to come they will fall out of use. All of these laudable causes presuppose that the individual or even groups of individuals are not responsible for their actions and that a bit more legislation will (this time) bring the cream to the top. Yes, we all can recognize things we shouldn't do and certainly more things other people shouldn't do. The fact is, though, that both we and they still do them.

Within amateur radio we know the things we should and shouldn't do. It's in the rules, Part 97, and we all should have a copy handy. When each of us took our license exam (regardless of class), part of that test involved rules and regulations. On the other hand, there is no requirement that we answer *all* of those questions correctly in order to pass, even though that's what we're responsible for. In fact, most, if not all, of us are strictly concerned with whether we passed or failed and not the specific questions we got wrong. It truly would be noble if we could not only review the exam afterwards, but study those things we missed so as to improve ourselves. Somehow I don't see a lot of us opting for that much improvement. We passed, and that's good enough. Seeking a passing grade of 100% doesn't seem too practical a goal.

Was there a great need in 1936 to increase the code speed portion of the exam? No. As was stated in a quote by Clinton B. DeSoto in his book *Two Hundred Meters and Down, The Story of Amateur Radio,* "The total number of licensed amateur operators has remained relatively constant during the past two years." This was the two years prior to 1936. So the ARRL was looking ahead to the future to "improve the breed." I have to keep in mind that during that period everything revolved around CW and for the most part the written test was a given. An amateur radio *operator* of 1936 was judged not so much on what he knew, but on his code speed. A good *operator* was someone who could easily send and receive 25 to 30 wpm, and 10 wpm was just too easy and not enough of a screen to weed out potentially poor *operators*. Maybe, as far as 1936 went, they were right in that it really didn't matter too much what you knew as long as you could send and receive the code at a good clip.

Well, it's 62 years later, and we've been through several wars, numerous technological revolutions, ups and downs in the economy, and a far lesser dependence on CW. No, I'm not advocating removing our traditional requirement, just stating a fact. With almost 700,000 licensed amateurs out there, do we or any group want to advocate a further "improvement" and increase the speed arbitrarily to, say, 17 wpm and the Extra to 28 wpm? Would this be good for our collective amateur radio soul? Perhaps if knowledge of the code is such a worthwhile tradition, we should go back to the speed of the "real" amateurs prior to 1936—10 wpm. Obviously, the speed is arbitrary. It's the skill that's tradition. That's probably the rationale behind international law which requires the skill, but doesn't delineate the speed.

Now, I still don't know how they got to 10 wpm or how (the real *how*) 5 wpm was selected for the Novice license when that started. Why not 7 wpm or 6½ wpm? I guess it's only really important to appreciate that the numbers were in fact arbitrary and that some person or persons picked them for the perceived betterment of the species. I don't know if anyone bothered to do follow-up studies over the ensuing 62 years to prove that better operators were produced or whether they stayed the same. These days all we have to judge a person by is what they do, since about 57% of us have a license with little or no code. Enforcement of our rules has always been a sensitive subject with far more emphasis placed on threat than on actual litigation. Most of us, including the government, are more interested in promulgating new laws rather than enforcing old ones. Maybe it's as simple as the old story of the emperor who has no clothes, and most of the old laws are unenforceable. I certainly don't know, and I'm not about to test any.

I can't speak about society in general, but amateur radio is not headed towards anarchy. If anything, amateur radio is headed for anonymity, with less than 13% of our little to no code licensees joining our national organization, and of all license classes only about 23% of us belonging. It doesn't say much for the scope of our representation. We, the approximately 23% (that includes me) who do belong, tend to think or sometimes act as though we know what's in the best interests of not only us, but certainly of the 77% who don't belong. It's that same certainty that takes words out of dictionaries or sanitizes behavior in the media to "protect" some value, either real or imagined.

If conventional wisdom and certainty had held, there would be no digital modes, no computers, and no wondrous transceivers and HTs today. Today we just moralize as to who can use what and where and how we can enforce it—a far cry from the choices of June 1936. About 40 years ago Laurens Van der Post wrote: "Human beings are perhaps never more frightening than when they are convinced beyond doubt that they are right."

73, Alan, K2EEK

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OS456 / OS535:
Computer control scanning interface board for the popular RadioShack Pro 2005/6 and Pro 2035/42.

Optolinx
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Optolinx Universal Interface:
PC interface for downloading frequencies from Scout to a PC, or computer control the ICOM R7000, R7100, R8500, R9000, R10 and also the AOR AR8000. Use built-in data slicer circuit for use with Trunker® software. (Trunker® software not included with Optolinx)

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Handheld frequency counters, all incorporating patented Digital Filter and Digital Auto Capture. All counters come with initial accuracy of +/- 1ppm. High impedance amplifiers standard on M1 and 3000APlus. Call for additional features on all three counters.

*Antenna's sold separately for Scout, Cub, M1, and 3000APlus

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ANNOUNCEMENTS

• The following Special Events will take place during June:

W2MO, from Peterboro, New York; 6th annual Civil War Reenactment Weekend; 1300–2100Z June 13; on 3.925, 7.275, 14.275, 21.375, 28.375, 146.55 MHz. For certificate send QSL and SASE to MOARC, Box 241, Verona, NY 13478.

W3GR, from Baltimore, Maryland; to commemorate contributions of electronics to success of D-Day Normandy invasion; Historical Electronics Museum ARC; 1500–2100Z June 6 & 7; on 7.115, 7.245, 14.245, 21.115 MHz. For a certificate send 8 × 11 SASE to Historical Electronics Museum, MS 4015, W3GR, Box 746, Baltimore, MD 21203.

KB4ALC, from Bowling Green, Kentucky, annual Corvette Homecoming; Western Kentucky DX Assn.; 0001Z June 6 to 2359Z June 7; on 7280, 14280, 21380, 28480 MHz (within 20 kHz). For certificate send QSL to Kenneth E. Newman, KB4ALC, 505 Emmett Drive, Bowling Green, KY 42101.

W5P, from Rio Rancho, New Mexico; New Mexico Star Party; 1600–2400Z June 20 & 21; CW SSB, RTTY, FM, 2–40 meters (QRO and QRP) in Novice, Tech, General portion of the bands. Send QSL and SASE to W5P, Jay Miller, WA5WHN, P.O. Box 6552, Albuquerque, NM 87197-6552. For more info e-mail <wa5whn@rt66.com> or web <http://www.swcp.com/~n5zgt/>.

W9A, from Adams County, Wisconsin; Adams County and Wisconsin Sesquicentennial; Pinery Road ARC; 8 AM to 8 PM June 20; on 40, 15, 2 meters, 21.325(±), 7.230(±), 146.52 calling frequency. For certificate send 9 x 12 SASE and QSL to Pinery Road ARC, 950 East Trout Valley Rd., Friendship, WI 53934-9672. For special Adams County Friendship Post Office cancellation on July 5, certificate requests must be received no later than July 3. For more information call 608-564-7887 or e-mail <kratzham@maqs.net>.

VE3MIS, from Mississauga, Ontario, Canada; 26th Streetsville Founders Bread and Honey Festival; Mississauga ARC; 1300–2200Z June 6–7; on SSB 3.930, 7.230, 14.240, 18.130, 21.330, 24.940, 28.340 MHz ±QRM, plus repeater 145.43-. For QSL send QSL and SASE to MARC, c/o Michael Brickell, 2801 Bucklepost Crescent, Mississauga, ON Canada L5N 1X6. (Note: US stamps cannot be used to send mail from Canada to the US.)

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

June 6, **Bergen ARA Annual Hamfest**, Fairleigh Dickinson University, Teaneck, NJ. Call Jim Joyce, K2ZO, 201-664-6725 (no calls after 10 PM). (Exams.)

June 6, **18th Annual IRA Hamfestival**, Hudsonville Fairgrounds, Grand Rapids, MI. Call Randy Chelette, N8KQX, 616-532-5450 after 4 PM.

June 6, **Hamfest Nashville**, Agriculture Building and adjoining building at Tennessee State Fairgrounds, Nashville, TN. Contact Bill Pingley, KTØC, 4823 Shoshone Dr., Old Hickory, TN 37138-4109 (615-889-7376).

June 6, **Bangor Hamfest**, Hermon High School, Bangor, ME. Contact Roger W. Dole, KA1TKS, RR #2 Box 730, Bangor, ME 04401 (207-848-3846. (Exams.)

June 6, **6th Annual Charlotte ARC Hamfest & Computer Fair,** Roll-A-Round Skating Center, Charlotte, North Carolina. Contact Charlotte ARC, P.O. Box 33582, Charlotte, NC 28233-3582 (SASE); e-mail <w4cq@qsl.net>; or web site <http://www.qsl.net/w4cq/>.

June 7, **Breezeshooters Hamfest & Computer Show**, Butler Farm Show Grounds, between Evans City and Butler, Pennsylvania. Contact Kurt Schreiber, KA3LNG, 104 Forrest Grove Rd., Coraopolis, PA 15108 (412-859-3969). (Forums)

June 7, **Hall of Science Hamfest**, New York Hall of Science parking lot, Flushing Meadow Corona Park, Queens, NY. Call Stephen Greenbaum, WB2KDG, 718-898-5599 evenings only; e-mail: <WB2KDG@bigfoot.com>.

June 7, **21st Annual Swapfest and Auction**, U.S. Army Reserve Center, Junction City, WI. Contact John Feltz, W9JN, 973 E. First St., Junction City, WI 54443-9614; or call 715-457-2506; e-mail: <jfw9jn@tznet.com>. (Exams.)

June 7, **1998 Medina County Hamfest**, Medina County Fairgrounds Community Center, Medina, OH. Call Medina 2 Meter Group Hamfest Committee 330-273-1519. (Exams.)

June 12–13, **ARRL Georgia Section Convention/16th Annual Albany Hamfest**, Hasan Temple, Albany, GA. Contact Arthur Shipley, N4GPJ, c/o AARC, P.O. Box 70601, Albany, GA 31708-0601, or call 912-439-7055; e-mail: <ashpley@isoa.net>. (Exams.)

June 13, **Barnstable ARC Tailgate Swapfest**, Cape Cod, Dennis, MA. Call Don Haaker, WA1AIC, 508-760-1571. Rain date June 20. (Exams.)

June 13, **24th Annual Central Ontario Amateur Radio Fleamarket**, Fergus Community Center, Fergus, Ontario, Canada. Contact Bill Smith, VE3WHS, 32 McElderry Rd., Guelph, Ontario Canada N1G 4K6 (519-821-6642); packet: <VE3WHS@VA3SED.#SWON.ON.CA.NA>; or <smith.ve3whs@sympatico.ca>.

June 13, **Paducah ARA Hamfest**, Executive Inn Convention Center, downtown Paducah, KY. Contact Paducah ARA, P.O. Box 1022, Paducah, KY 42002-1022; or e-mail: <KC4ENA@Apex.Net>. (Exams.)

June 14, **Goodyear ARC 31st Annual Hamfest & Family Picnic**, Goodyear's Wingfoot Lake Park, near Suffield, OH. Contact Don Longshore, 1834 Esther Ave., Akron, OH 44312-1014 (330-733-7989. (Exams.)

June 14, **Egyptian Fest-Hamfest**, **Computer Fair & Fleamarket,** Granite City Campus of Belleville Area College, Granite City, IL. Contact Egyptian Radio Club, P.O. Box 562, Granite City, IL 62040 or call Bill Dusenberry, N9OQK, 618-398-1456.

June 14, **Long Island Hamfair**, Briarcliffe College, Bethpage, NY. Call the LIMARC 24 hour infoline: 516-520-9311. (Exams.)

June 14, **Ham-O-Rama '98**, Lions' Park, Erlanger, KY. Contact N8JMV c/o NKARC, P.O. Box 1062, Covington, KY 41012 or call 513-797-7252 (evenings).

June 14, **Six Meter Club of Chicago 41st Annual Hamfest**, DuPage County Fairgrounds, Wheaton, IL. Call the 24-hour infoline: 708- 442-4961. (Exams.)

June 19–21, **Central Alberta Radio League 28th Annual Picnic & Hamfest**, Burbank Campsite, northeast of Red Deer, Alberta, Canada. Contact Bob, VE6BLD, 5540 54th Ave., Lacombe, Alberta, Canada T4L 1L6; call 403-782-3438 evenings; packet: <VE6BLD@ VE6RDR.AB.CA>; or via e-mail: <kingel@ telusplanet.net>.

June 20, **Raritan Valley RC '98 Hamfest**, Columbia Park, Dunellen, NJ. Contact Bob Pearson, WB2CVL, 908-846-2056; e-mail: <rwpearson-wb2cvl@worldnet.att.net>.

June 20, **Bluefield Hamfest**, Brushfork Armory, Bluefield, WV. Send SASE to Bluefield Hamfest, Inc., 412 Ridgeway Dr., Bluefield, VA 24605-1630, or call Don Williams, WA4K, 540-326-3338, e-mail: <wa4k@amsat.org>; internet: <http://www.inetone.net/erarc/hamfest/>. (Exams.)

June 20, **1998 Eastern Ontario Hamfest & Computer Fleamarket**, Marmora Area Curling Club, Marmora, Ontario, Canada. Call Pete, VA3PGB, 613-473-1171, or Paul, VE3UUM, 613-472-3449; e-mail: <rhobson@blvl.igs.net>; on the web <www.redden.on.ca/~tcarc/tricnty.htm>; packet: <ve3uum@ve3hqr.#econ.on. can.na>.

June 20, **Midland ARC Hamfest**, Gerstacker Fair Center, Midland County Fairgrounds, Midland, MI. Contact MARC Hamfest, P.O. Box 1049, Midland, MI 48641; or call Jeff, W8CQ (w) 517-636-0643, (h) 517-839-9371; e-mail: <w8cq@bytethis.com>. (Exams.)

June 21, **Monroe Hamfest**, Monroe County Fairgrounds, Monroe, MI. Call Fred VanDaele, KA8EBI, 313-242-9487 after 5 PM.

June 21, **"Dad's Day" Hamfest**, Lake County Fairgrounds, Crown Point, IN. Contact Malcom Lunsford, W9MAL, 6721 Harrison Ct., Merrillville, IN 46410-3323, or call 219-769-3925; e-mail: <w9mal@cris.com>. (Exams.)

June 21, **Tailgate Electronics, Computer & Amateur Radio Fleamarket**, Albany & Main Street, Cambridge, MA. For advance registration, etc., info, call 617-253-3776.

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

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

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B-1016-G Great for ICOM IC-706!

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100 Watts for 2 Meter HTs

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Power Curve -- typical B-310-G output power							
Watts Out	*25*	*50*	*75*	*95*	*100*	*100+*	*100+*
Watts In	*¼*	*½*	*1*	*2*	*4*	*6*	*8*

- *100 Watts out with all handhelds up to 8 watts*
- *All modes: FM, SSB, CW*
- *Great for ICOM IC-706*
- *15 dB low noise GaAsFET preamp*
- *Reverse polarity protection/SWR Protection*
- *FREE mobile bracket* • *Auto T/R switch*
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- *Ultra-compact 4¾x1¾x7¾ inches, 2½ pounds*
- *One year MIRAGE warranty*

***Boost** your 2 Meter handheld to 100 Watts!* Ultra-compact all mode B-310-G amp is perfect for *all* handhelds up to 8 watts and multimode SSB/CW /FM 2 Meter rigs. *Great for ICOM IC-706!*

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Power Curve -- typical B-34-G output power								
Watts Out	*18*	*30*	*33*	*35+*	*35+*	*35+*	*35+*	*35+*
Watts In	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*

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

MIRAGE RUGGED!

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

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MIRAGE RUGGED!

Power Curve -- typical BD-35 output power							
Watts Out (2Meters)	*30*	*40*	*45*	*45+*	*45+*	*45+*	*45+*
Watts Out (440 MHz)	*16*	*26*	*32*	*35+*	*35+*	*35+*	*35+*
Watts In	*1*	*2*	*3*	*4*	*5*	*6*	*7*

- *45 Watts on 2 Meters/35W on 440 MHz*
- *Auto Band Selection* • *Auto T/R switch*
- *Full Duplex Operation* • *5x1¾x5 inches*
- *FREE mobile bracket* • *"On Air" LEDs*
- *Single Connector for dual band radios and antennas*
- *Reverse polarity protection*
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- *One year MIRAGE warranty*

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6 Meter Amplifier

FCC Type Accepted

The A-1015-G, $389, is the *world's most popular* all mode FM/SSB/CW 6 Meter amplifier. 150 watts out for 10 in. For 1 to 15 watt transceivers.

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D-3010-N, $365, -- 100 W out/30 in. For 5 to 45 watt *mobile/base*. **D-1010-N, $395**, 100 W out/10 in. *Dual purpose* -- for handhelds or mobile/base. **D-26-N, $269**, 60 W out/2 in, for *handhelds*.

Amateur TV Amps

Industry standard ATV amps -- **D-1010-ATVN, $414**, 82 watts PEP out / 10 in. **D-100-ATVN, $414**, 82 watts PEP out/2 in. (without sync compression).

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KP-1

KP-2

High gain *ultra low noise* GaAsFET preamps for receiving weak signals. Selectable gain prevents receiver intermod. 15 to 22 dB gain. Less than 0.8 dB noise figure. Automatic RF switching up to 160 Watts. **Choose** In-*Shack* model or *Mast-Mount* (includes remote control) model to reduce loss. Rugged die-cast enclosure.

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50-54	KP-1/6M	KP-2/6M
144-148	KP-1/2M	KP-2/2M
220-225	KP-1/220	KP-2/220
430-450	KP-1/440	KP-2/440

1¼ Meter Amps (223-225 MHz)

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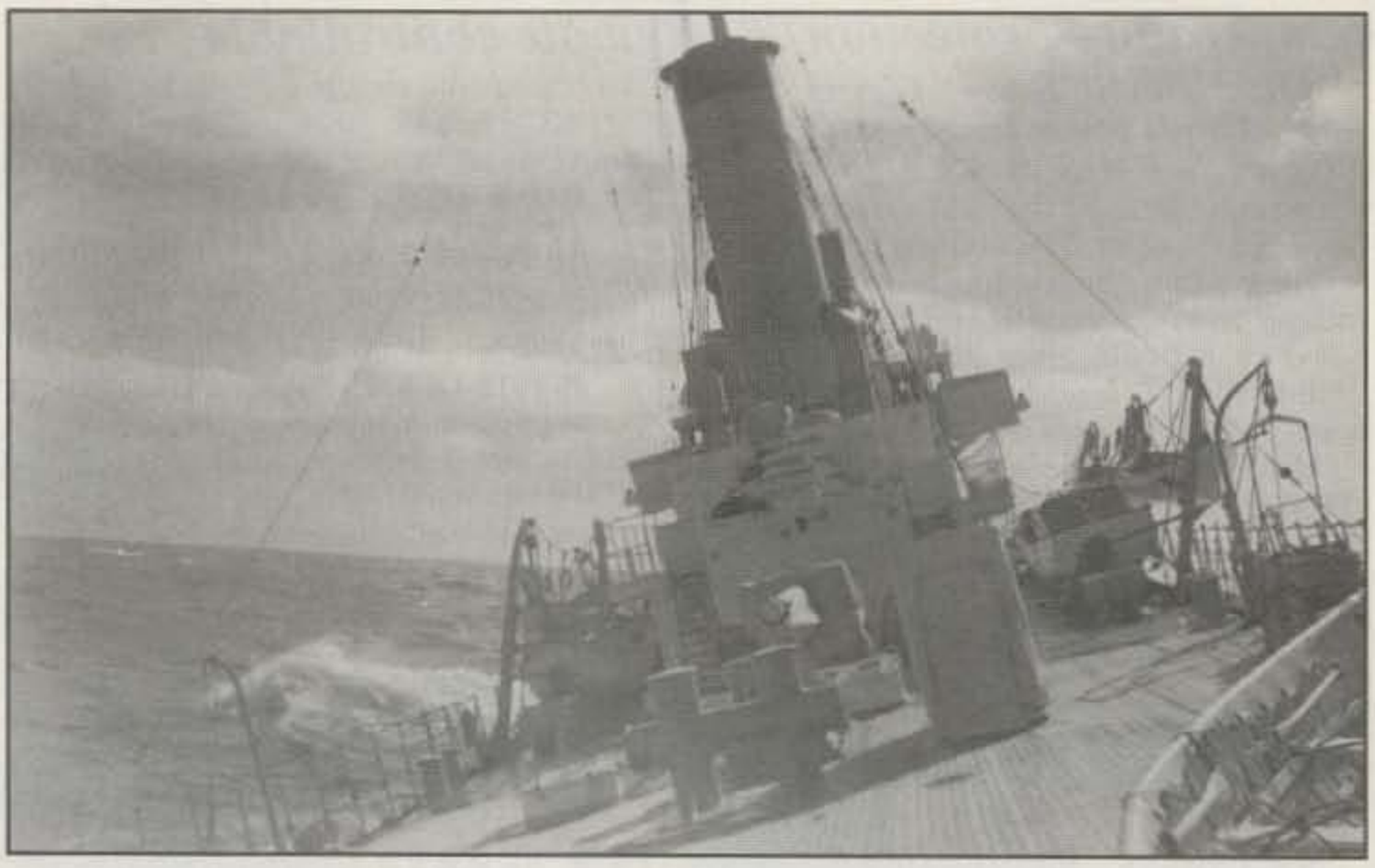


This photo was taken from the stern of the USS Itasca *CG while in a rolling sea. (Photo via K7WYQ)*

Keeping The Record Straight

Editor, *CQ*:

In reference to Bill Orr's article in the April issue of *CQ* ("Radio Fundamentals," p. 52), I imagine you are going to get some flak over the name of the USCG ship that was involved in attempting to locate Amelia Earhart, so here is my two-bits worth. The name of the CG ship was the *Itasca* and it was named after a lake in northern Minnesota. I was a crew member on that ship from late 1939 to late 1940. At that time it was home ported in San Diego. Sometime during WW II it was taken to some port on the North African coast and sunk as part of a breakwater construction project. Hope this helps to keep the record straight.

I like Bill's column and the magazine. Keep up the good work.

James M. Gast, K7WYQ
Snohomish, WA

A Note of Caution

Editor *CQ*:

Having operated QRP in several ARRL Field Days, and being a scrounger for parts, I really appreciate the letter and spirit of an article like George's in March 1998 *CQ* on "QRP Antenna Cheapware." It stimulates the inventive quality in us, which helps radio amateurs feel they can contribute something fresh without heavy investment.

At the same time I would like to add a note of caution which I feel should be observed by those who implement George's plan for QRP antenna ideas. It surely is true, as he points out, that heavy-duty hardware is not necessary, and 5 watts (maybe even 100 watts) of RF is not likely to burn up the steel filament antenna and associated parts. The total power lost as heat will be small. However, it is also true that the antenna losses are proportional to ohmic resistance of the system, and the slender wires and steel material will increase those ohmic losses. This loss will represent a certain decibel loss which applies to QRP as well as to higher power. (While the power loss is small, so is the total RF power supplied, and a QRP user may wish to minimize losses in the antenna.) The amateur wishing to get the most out of his rig in terms of performance will do well to consider no compromise on the antenna. A 5 watter will work better with a 14-gauge copper full-size antenna at good altitude (or an HF beam) than with the more modest antenna described in George's article. (Of course, there are times and places where the light-weight antenna will be wonderful —on vacations, for example.)

Thanks again for George's work!

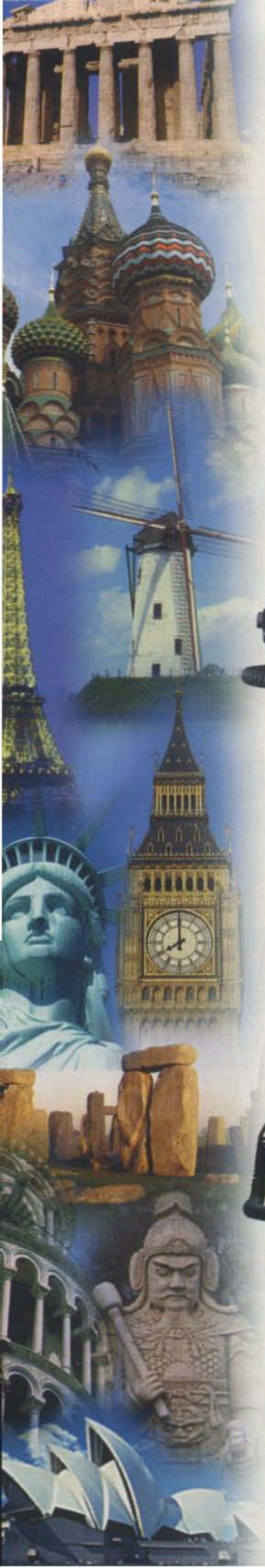
Dave Cornell, W9LD, Ph.D.
Chairman, Department of Physics
Principia College
Elsah, IL

It Makes Sense

Editor, *CQ*:

I really enjoyed the *CQ* article "The 160 Meter Band: An enigma shrouded in a mystery, Parts I and II," by Cary Oler and Ted Cohen, N4XX, March and April 1998

(Continued on page 98)



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KØSR has come up with a five-band quad for all seasons, especially Cycle 23. The weather is just about right to add this to your antenna farm.

A Five-Band Cubical Quad For Cycle 23

BY STEVE ROOT*, KØSR

This quad was designed to take advantage of the improved propagation we can expect from the next sunspot maximum. Conditions have already improved since last year, and I wanted to upgrade my antenna situation on 12 and 17 meters. Also, there were mechanical problems with my previous quad[1], and it was time to resolve them.

Design Goals

The objective was to build a quad that would cover all five bands between 20 and 10 meters. It should use the simplest feed system possible, avoiding the use of complicated matching networks or transformers. The design of the antenna should allow it to be constructed by one person. Due to the length of a typical Minnesota winter, it should be rugged enough to not require continued maintenance.

Electrical Design

There are three active elements on 20, 17, and 15 meters. On 12 and 10 meters there are four elements. The previous antenna didn't work as well as I had hoped on 10 meters, since the elements were spaced to wide. Adding the fourth element on 10 meters has made a *good* antenna into a *very good* one. While

*243 14th Avenue S., South St. Paul, MN 55075

This is the completed beauty, and it performs every bit as good as it looks. (Photos in the article by Ramona Root)

Boom support and turnbuckles for boom sag adjustment.

Quad Element Dimensions

20 meters	Reflector	Driven	Director
Total length	73'	71'	68' 4 1/2"
Side length	18' 3"	17' 9"	17' 1 1/8"
Attachment	12' 10 7/8"	12' 6 5/8"	12' 1"
17 meters	**Reflector**	**Driven**	**Director**
Total length	57' 5 1/2"	55' 6 1/4"	53' 10 1/4"
Side length	14' 4 3/8"	13' 10 1/2"	13' 5 1/2"
Attachment	10' 1 7/8"	9' 9 3/4"	9' 6 1/4"
15 meters	**Reflector**	**Driven**	**Director**
Total length	49' 1"	47' 1"	46' 3"
Side length	12' 3 1/4"	11' 9 1/4"	11' 6 3/4"
Attachment	8' 8 1/8"	8' 3 7/8"	8' 2 1/8"
12 meters	**Reflector**	**Driven**	**Director**
Total length	41' 8 7/8"	40' 3 7/8"	38' 10 7/8"
Side length	10' 5 1/4"	10' 1"	9' 8 3/4"
Attachment	7' 4 1/2"	7' 1 1/2"	6' 10 1/2"
10 meters	**Reflector**	**Driven**	**Director**
Total length	36' 6 1/2"	35' 2 1/4"	34' 5"
Side length	9' 1 5/8"	8' 9 1/2"	8' 7 1/4"
Attachment	6' 5 1/2"	6' 2 5/8"	6' 1"

Total: The circumference of the element.
Side length: The total length divided by 4.
Attachment: The distance out on the spreader where the wire attaches, measured from the center of the structure.

Table I– These are the element dimensions.

SWR—HF Bands

Frequency	20 meters	15 meters	10 meters
0.	1.4	1.3	1.4
0.1	1.3	1	1.4
0.2	1	1.3	1.3
0.3	1.25	1.6	1.15
0.4	2.4	1.8	1
0.5	—	—	1.2
0.6	—	—	1.3
0.7	—	—	1.4
0.8	—	—	1.5

Table II– SWR for the HF bands.

the first director has to be spaced fairly close (.12 to .15 wavelength) for a quad to work, the second director can have wider spacing.

In practice the pattern on 12 and 10 meters is outstanding. In addition, by choosing the appropriate spacing, the feed point impedance is close enough to 50 ohms to allow direct feed with coax. There aren't any transformers, gamma matches, or other devices required. A remote antenna switch is used at the feedpoint. Experience has shown that the common practice of tying the different feedpoints together results in matching problems and hurts the pattern of the antenna. The remote antenna switch effectively means that there are separate feedlines running to each driven element. In the past, I used different types of baluns in an attempt to keep currents from flowing on the outside of the feedline. They were either difficult to construct, heavy, or expensive, and in most cases they didn't help! I have to thank Lew McCoy for enlightening me on this subject.

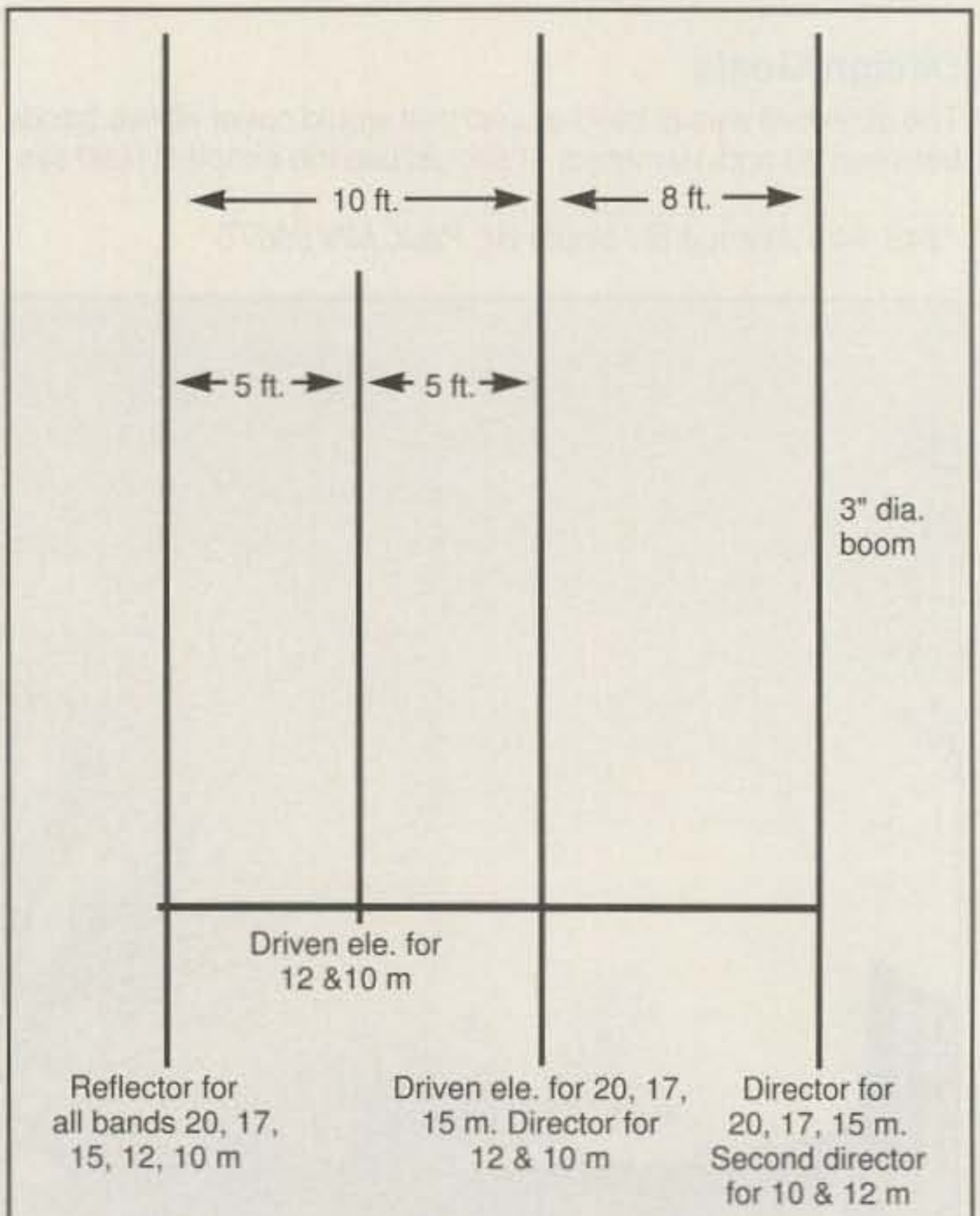
The element lengths I use have more or less become traditional with me. A slight adjustment was made to the 15 meter driven element length to move resonance up the band slightly. The 17 and 12 meter element lengths were extrapolated from the 15 meter element lengths. The resonant frequencies of the parasitic elements are 3% above and below the design frequency of the array. This is due to the lower Q nature of a loop element. Yagi antennas, with their higher Q elements, use more offset.

Mechanical Design/Materials

This antenna, like the last one, is based on an 18 foot boom. There isn't anything magic about this boom length. My tower happens to be 10 feet away from the edge of my roof, so I can reach the end of the boom quite easily during construction and tuning of the antenna. I also favor short booms because long booms are hard on rotors. The boom is a three inch diameter piece of irrigation pipe.

There are two possible orientations for a quad element—square or diamond. Each has its advantages. The square configuration doesn't hang as far down the tower, while the diamond shape seems to hold up better if icing is a possibility. The downward pointing spreader of the diamond also provides a convenient support for the feedlines. I chose the diamond configuration because of my climate.

The previous antenna suffered two spreader failures. Both incidents occurred during violent summer thunderstorms, and in both cases the spreaders failed right above the spreader clamp. It was obvious that there was some movement between the spreader and the clamp, which resulted in a weakening of the spreader wall. As a spreader flexes in the wind, the force is concentrated at that point. Increasing the wall thickness at the



Spacings in Wavelengths

20 meters:	Reflector to Driven = .150 λ	Driven to Director = .119 λ
17 meters:	Reflector to Driven = .192 λ	Driven to Director = .153 λ
15 meters:	Reflector to Driven = .224 λ	Driven to Director = .179 λ
12 meters:	Reflector to Driven = .132 λ	Driven to 1st Director = .132 λ
		1st Director to 2nd Director = .211 λ
10 meters:	Reflector to Driven = .150 λ	Driven to 1st Director = .150 λ
		1st Director to 2nd Director = .241 λ

Fig. 1– Element locations and spacings, side view.

One end of the boom showing the truss end and spreader clamp.

base helps considerably, and the new spreaders do just that. These spreaders were purchased from Max Gain Systems[2] in Marietta, Georgia. They are two-piece fiberglass spreaders made from 8 foot sections that have .125 inch wall thickness. With a 12 inch overlap at the splice, this results in a spreader

SWR—WARC Bands			
Frequency	17 meters	Frequency	12 meters
0.06	1.4	0.89	1.1
0.08	1.3	0.91	1.05
0.1	1.2	0.93	1
0.12	1.3	0.95	1
0.14	1.4	0.97	1.05
0.16	1.6	0.99	1.1
0.18	1.9	—	—

Table III– SWR for the WARC bands.

that is longer than necessary for the 20 meter elements. The excess length was cut off and epoxied into the butt end, giving it a wall thickness of .25 inches. These spreaders are very rigid and behave themselves quite well in the wind.

The wire was purchased from The Wireman[3]—their type #CQ-18. This is #18 stranded, copper-covered steel wire that is very light and strong. Compared to the previous antenna, the spreaders are stiffer and the wire is lighter. This one doesn't flop around! The wire in a quad presents a fair amount of windload all by itself, so going to smaller diameter wire is beneficial.

The spreader clamps are Cubex models. On the three larger elements I doubled up on the clamps. This is probably overkill, but I had them available so I used them. Stainless-steel hose clamps and screws were used throughout the antenna. The boom-to-mast plate was fabricated from 5/16 inch thick aluminum plate. To add stiffness to the boom, and to compensate for the weight of ice loading in a winter storm, the boom was double trussed. A short cross boom was mounted to the top of the mast and truss lines were run out to the ends of the quad boom. A single truss would have rubbed against the upright spreader of each element.

Construction

The spreaders are two-piece fiberglass poles that telescope together. The junction of the two pieces is secured with two #6 bolts. As mentioned earlier, a 12 inch section was cut off the far end of the spreader and epoxied into the butt end of the spreader. The end product is very rigid and tough, and that extra wall thickness at the base should eliminate failures. The manufacturer recommends a thorough cleaning followed by spray painting to protect them from ultraviolet radiation. I cleaned the spreaders with acetone and then spray-painted the spreaders flat black. As always, safety first! Do this in a well-ventilated area.

Each element was built on the ground and mounted on the boom one at a time. A calculation was done for each loop to determine side length and also the attachment point on the spreader. The side length is obviously the total length divided by four. The attachment point out on the spreader can be calculated by dividing the side length by the square root of two. Doing this will result in a nice, symmetrical-looking element (it ends up square!). It also helps maintain the correct current distribution in the element, which contributes to a clean pattern.

The wires are attached by tying them down with string, followed by electrical tape, then two cable ties criss-crossed over the top. Drilling holes through the spreader will weaken it and is really a poor way to do things. It is hard to estimate how tight the wires are while the element is lying on the ground. This attachment method allows you to pull a bit of wire one way or the other once the element is in its normal orientation. The wires are tight enough to look good, but not under a lot of tension.

The feedlines were attached to the driven elements while they were on the ground. Soldering the connections is a lot harder to do on the tower. Excess flux was removed, and Coax Seal® was applied liberally to waterproof the assembly.

Individual elements are light enough for one person to carry. I used the roof of my house as a scaffold to reach the end of the boom. No, my tower isn't that short; it's a crank-up! After all four elements were on the boom, they were lined up for appearance sake.

Tuning

A grid dip meter was used to verify the resonant frequency of each element. This is an approximation only, as the proximity to ground will affect resonance, and there isn't any practical way to reach the elements with the tower cranked up. **Don't climb a crank-up tower that isn't all the way down!** In general, the resonant frequency will move up as an antenna is raised. The general shape of the SWR curves shows that the parasitic elements are resonant in the right places.

Results

Physically, the antenna seems to be very sturdy. Unlike other quads I have built, this one doesn't move very much during strong, gusty winds. My old Ham-IV rotor turns this antenna without difficulty.

Initially, I was very concerned about interaction, with all five bands represented on the same structure. The 10 and 12 meter elements in particular are fairly close to each other. It was a pleasant surprise to see all five bands act the way they should. Because loops radiate in a broadside direction, the concentric elements aren't "in the way." This is different than an interlaced Yagi design, where all of the elements are coplanar. This antenna acts like five monobanders.

The SWR is below 2:1 across all five bands. On the three lower bands, where the antenna has three elements, the pattern is good. On 12 and 10 meters, with four elements, the pattern is very sharp. After the quad was first put into service, I stumbled onto a good sporadic-E opening on 10 meters. It was amazing to see an S-9 signal in Florida drop several S-units simply by swinging the antenna from 135 degrees up to 90 degrees. Having this kind of a pattern is wonderful, as it reduces interference from other directions quite a bit.

Performance during contests this past fall exceeded expectations, especially in the ARRL 10 Meter Contest, where the new quad really worked well. Come on, Cycle 23! ■

Footnotes

1. S. Root, "A Compact, 4 band Quad Array," *CQ*, July 1994, p. 22.
2. Max-Gain Systems, Inc., 221 Greencrest Ct., Marietta, GA 30068 (770-973-6251).
3. The Wireman, Inc., 261 Pittman Rd., Landrum, SC 29356 (803-895-4195).

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The Kachina 505DSP Computer-Controlled HF Transceiver

BY BUCK ROGERS*, K4ABT

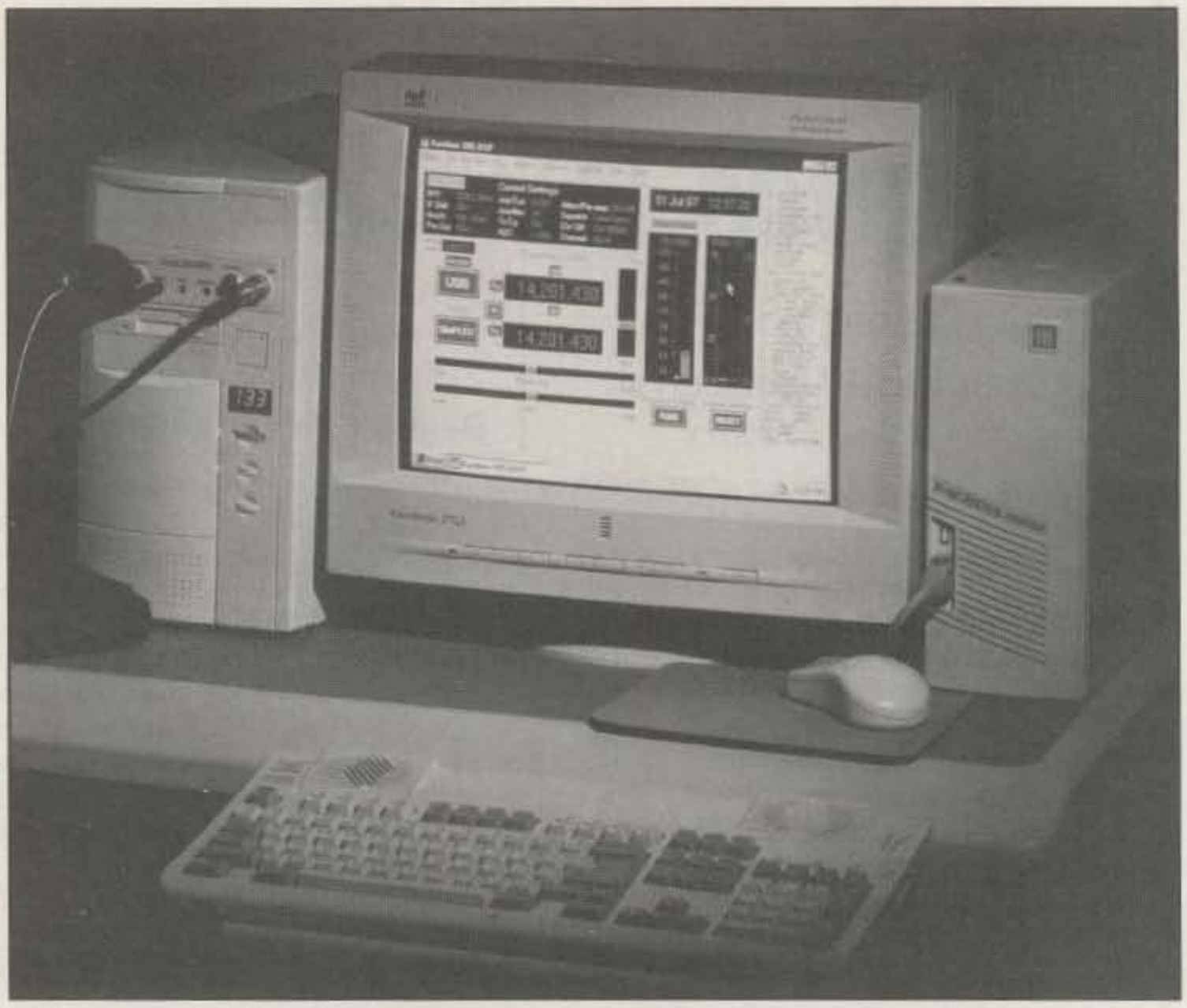
When you begin to enjoy this next generation in HF amateur radio transceivers, you feel as if you've made a quantum leap into the 25th century. There is one part of this subject, however, that is out of step with the "Buck Rogers" of the year 2525. The HF transceiver we are about to introduce you to is here now, today, less than two years away from the 21st century.

I would like to introduce you to the Kachina 505DSP HF Transceiver. The unit is designed to be controlled entirely by your personal computer—*no knobs*, only an ON/OFF switch. Everything else is controlled using a mouse. If you don't have a mouse, control is via keyboard entry. Why use knobs if you have Windows?

The Kachina 505DSP introduces a completely new approach to HF radios. This new HF transceiver has the following features:

- 100% PC controlled under Windows 3.1™ or Windows 95™ mouse or keyboard operation.
- All amateur HF bands with general-coverage receiver.
- High dynamic-range receiver, with dual-conversion analog front end for excellent adjacent channel selection.
- 11 "brick-wall" receiver filters from 3.5 kHz to 100 Hz, 6 kHz on AM.
- Commercial quality and specifications; plug-in modular construction.
- IF stage 16/24 bit DSP processing.
- DSP noise reduction.
- 1 Hz DDS tuning.
- Adjustable CW waveform for "soft" or "hard" keying.
- Digitally compensated reference oscillator.
- Built-in test and frequency calibration functions.
- Built-in band sweep with "point and click" Transceiver tuning.
- Includes on-screen antenna "Smith" Chart and logging software.
- Remote controllable by PC up to 75 feet (23 meters) away.

By combining a state-of-the-art DSP transceiver with the processing power and graphics capabilities of our PC, we have a product with increased performance and features that rival a similarly priced conventional HF transceiver. No more fiddling with multifunction knobs and tiny LCD displays. The Kachina 505DSP marks the beginning of an exciting new era in amateur radio.



The Kachina 505DSP Computer-Controlled HF Transceiver.

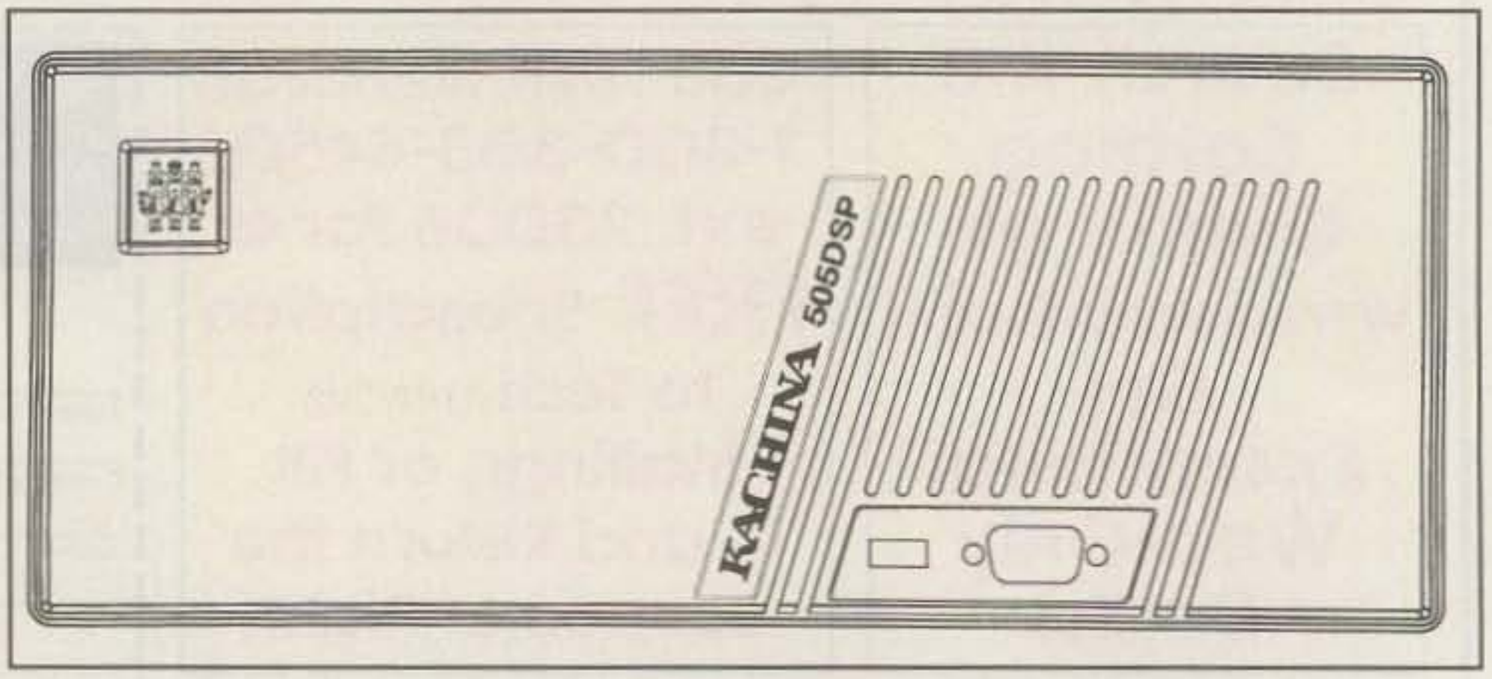


Fig. 1– No knobs! Everything is controlled using your mouse. If you don't have a mouse, then control is via keyboard entry. Why use knobs if you have Windows? The Kachina 505DSP introduces a completely new approach to HF radio. This new HF transceiver is 100 percent PC controlled under Windows 3.1™ or Windows 95™ mouse or keyboard operation.

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

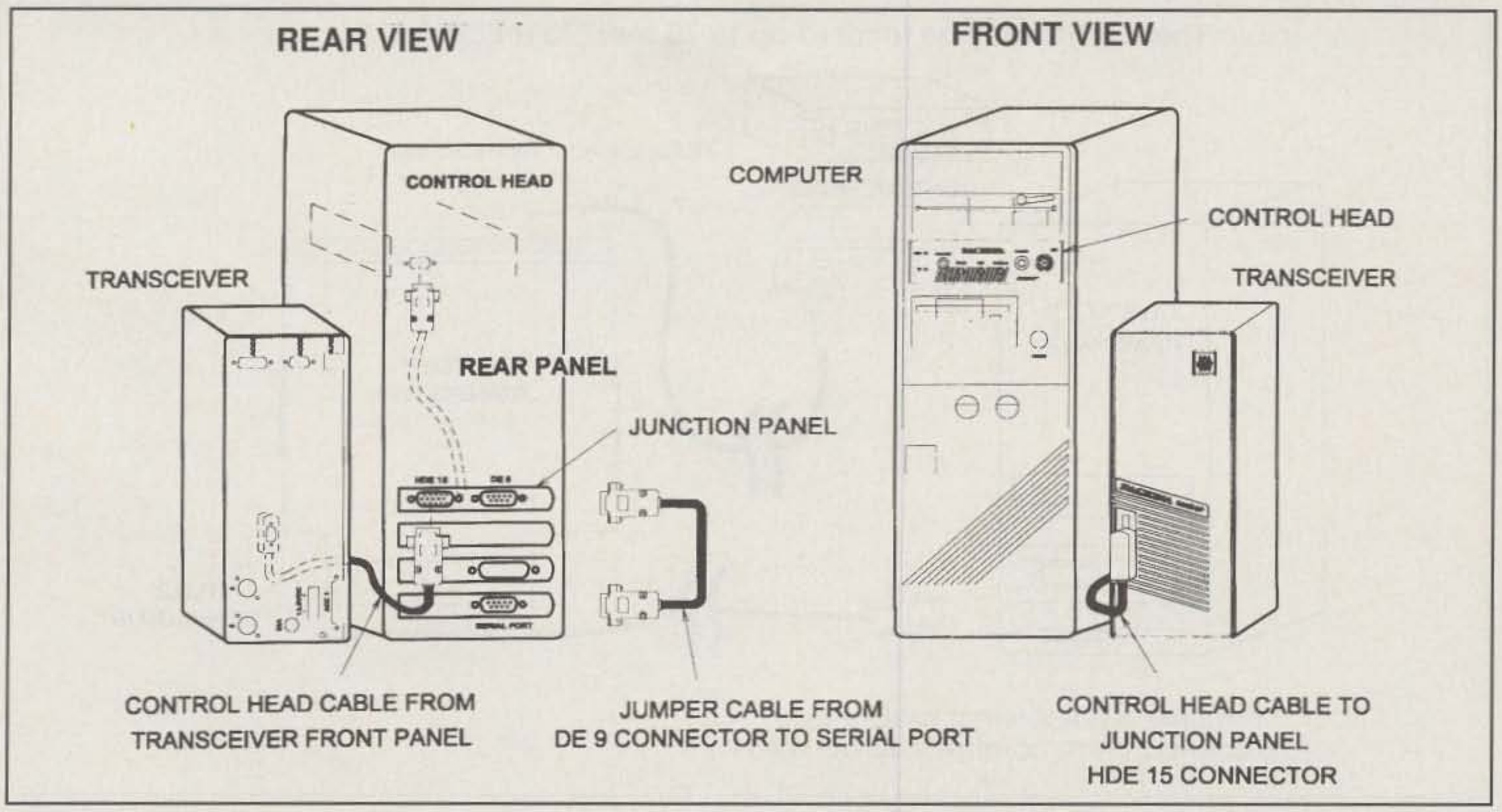


Fig. 2– Here we get an idea of how easy it is to install the cabling between the serial port of the PC and the transceiver. If you prefer not to install the control head in your computer, or if you don't have spare drive bays, for example, an accessory kit (P/N 505ECH) is available that allows the control head to sit on a desk top. This kit includes a finished (painted) cover for the control head, rubber mounting feet, and a cable that connects the RJ-12 port on the rear panel of the transceiver to your computer's serial port.

The radio control software is very user-friendly and accommodates both mouse and keyboard users. Even frequency tuning, a function that some believe will always require a knob, has been resolved to the satisfaction of most diehard knob fans. To give you some idea, look at the panel illustration at fig. 1. This is the transceiver's front panel.

Look at fig. 2 and you can see how easy it is to install the cabling between the serial port of the PC and the transceiver. From there we move to fig. 3, where we make the link from the transceiver to the control head.

The Control Head

The 505DSP is supplied with a control head containing the main power switch and microphone, speaker, Morse key, and phone jacks. Cables are provided to install it in an unused drive bay of your PC, while cables allowing outboard use are available from Kachina.

If you prefer not to install the control head in your computer—if you don't have any spare drive bays, for example—an accessory kit (P/N 505ECH) is available which allows the control head to sit on a desktop. This kit includes a finished (painted) cover for the control head, rubber mounting feet, and a cable that connects the RJ-12 port on the rear panel of the transceiver to your computer's serial port. When this RJ-12 cable is used, the two-port junction panel and jumper cable described earlier are not used.

For external use of the control head, connect the 2.5 m (8 ft.) control head cable (included with the 505DSP) and the optional RJ I 2 cable (supplied with the 505ECH kit) according to the diagram in fig. 3.

The first thing we look at when we are considering a new transceiver is the general specifications (see Table I).After reading all the information presented here, the only thing left is to get a Kachina 505DSP and begin having fun in the 21st century manner.

System and Software Requirements

As we've already established, the Kachina 505DSP transceiver is controlled by software residing on your PC. The software will operate with any computer running Windows 3.1, Windows 95, or Windows NT. Microsoft requires a 386DX or higher processor and a minimum of 4 megabytes (MB) of memory (8 MB recommended) for Windows 95. Your computer must have at least 2 MB of free hard drive space, to store the 505DSP control software, and a spare serial port. You will also need a 4 ohm external speaker unless your computer is equipped with a sound card and speakers. A 4 ohm external speaker is recommended.

In my installation I use the sound card AUX input and the computer audio system/speakers. The drive from the EXT SPKR jack on the Kachina drives it well, with no noticeable distortion. The 505DSP operates from 12 volts D.C. The power supply must be capable of delivering at least 25 amps continuous duty. Use of small power supplies may result in distorted audio, low power output, erratic operation, or all of the above.

Control Head Front-Panel Connections

The control head contains the main power switch, microphone, speaker, Morse key, and phone jacks (see fig. 4). Following are the connectors/jacks located in the control head:

Microphone Connector: The 505DSP's microphone uses an 8-pin DIN connector. The microphone input impedance is approximately 2000 ohms. The microphone amplifier will accommodate low- or medium-impedance dynamic microphones providing 5 to 20 millivolts of output. The microphone supplied with the 505DSP is prewired. Wire your microphone according to fig. 5 if you plan to use a different microphone.

Paddle, Morse Key Input Jacks: The PADDLE input jack allows connection of a CW paddle (not supplied) having two switches, a "dit" and a "dah." The common wire is grounded. Wire the paddle to one of the included 3.5 mm stereo phone plugs, connecting the tip to the right side of the key and the ring to the left. The outer part of the jack is the switch common. Left-handed operators should use the same wiring connection, then select "left-hand" from the CW menu, CW Keyer Mode sub-menu in the control software (see fig. 6).

Morse Key Input Jack: This jack allows the separate connection of a "straight" key. Connect the key between the tip and outer portions of the included 3.5 mm stereo phone plug. Select "straight" from the CW Keyer Mode submenu. Note that the "straight" key may remain connected to the control head at the same time as the paddle, but that the straight key is always "alive," in left-hand or right-hand iambic keyer modes.

Speaker Jack: To connect to the control head, your external speaker must be wired to the tip and outer portions of a 3.5 mm stereo phone jack. The speaker amplifier is designed to accommodate 4 or 8 ohm speakers. The 4 ohm speaker will give twice the audio output, assuming both speakers are equally efficient. If you want to route the audio through your com-

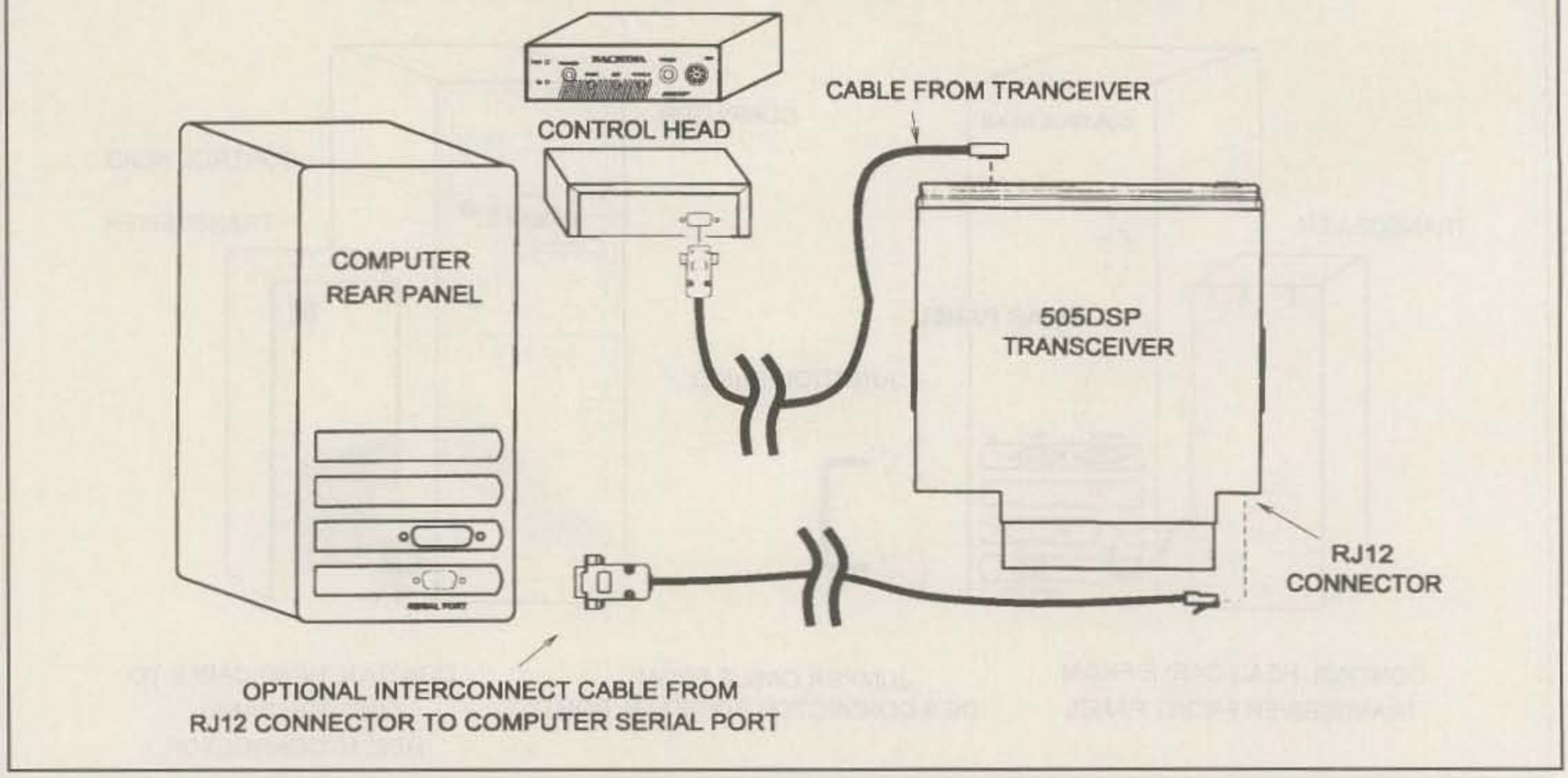


Fig. 3– Cables are provided to install it in an unused drive bay of your PC, while cables allowing outboard use are available from Kachina.

puter's sound card, you will need to run a cable (not supplied) from the control head's speaker jack to the audio input jack on your sound card. You must then connect the speaker to your sound card's audio output jack.

Phone Jack:- Headphones in the 4 to 2000 ohm impedance range may be plugged into the phone jack. A series resistor automatically compensates for various impedance levels. The external speaker is disabled when the phones are plugged into the control head.

Before I tried to interface a packet radio TNC or multimode controller to the microphone connector, I realized that the Kachina designers had thought about that also (see fig. 7).

Fig. 4– The ON/OFF switch is the only moving part you'll be concerned with. Control is via the mouse and the onscreen menu. If you prefer, keyboard entry/control is an immediate option. The 505DSP is supplied with a control head containing the main power switch and microphone, speaker, Morse key, and phone jacks.

Rear Panel

Three rear panel connectors are provided to allow the use of power amplifiers, antenna tuners, and audio accessories.

ACC1 Audio Accessory Connector: This 25-pin sub-D connector is for use with audio accessories such as an external modem or telephone coupler (see fig. 7). Audio input and output levels are nominally 0 dBm at 600 ohms (2 volts p-p). Lower levels may not allow full transmitter power output. Maximum input level is 4 volts p-p. Unbalanced input pins are pin 17 (Bal +) and ground. Balanced input pins are 5 and 17.

The PTT line must be grounded to activate the transmitter. The line will source approximately 12 mA of current.

ACC2 External Antenna Tuner Connector: A 9-pin sub-D connector provides connections to an external automatic antenna tuner. ATUINIT is a 5 volt logic signal toggled by the transceiver's microprocessor when the TUNE control is activated. ATUKEY is a signal to be grounded by the tuner when 20 watts of CW carrier is desired to tune the antenna tuner. The tuner must sink approximately 12 mA of current to activate this function. A source of +12 VDC at up to 2 A is provided.

ACC3 External Power Amplifier Connector: A 15-pin sub-D connector provides connection and control to an external power amplifier. Six lowpass filter signals, A through F, are output for the automatic selection of corresponding lowpass filters in external solid-state amplifiers. These lines will sink a maximum of 80 mA when activated. A 20 millisecond delay is provided to allow closure of the external relays prior to the output of RF.

The AMP PTT line (Pin 13 is AMP PTT) sinks up to 250 mA of current to activate the external amplifier. This output may be disabled using the Amplifier Off selection in the TX menu.

EXT ALC accepts a signal from an external output power detector to control the output power of the transceiver-amplifier system. An increasing voltage on this line will result in a decreasing transceiver power output. The detector output needs to have a positive "sense." The gain of the detector is dependent upon the drive requirement of the amplifier.

VR accepts a DC input signal provided by an external directional coupler. This signal will direct the transceiver to reduce the transmitter power output during conditions of antenna mismatch. The sense of the signal is similar to the EXT ALC signal above. If the reflected power is greater than 10 watts, the forward power will be reduced by whatever amount necessary until the reflected power is 10 watts.

The following are also located on the transceiver rear panel:

RJ12 Accessory Connector: The RJ 12 connector on the rear panel of the transceiver provides connection to the computer serial port when the control head is mounted outside of the computer (see fig. 3). The mating cable to this connector is not supplied standard with the transceiver, but is available from Kachina as part of the 505ECH kit.

Antenna Ports: Two antenna ports, labeled A and B, are located on the rear panel of the transceiver. The active port is determined by the software setting within the KC505 control software. Antenna port data is stored with the memory channel and "snapshot" key settings (see "Operation" below). The antenna port that was active when the channel or setup was stored will be reselected whenever the same channel/setup is recalled.

Ground Terminal: The transceiver should

be properly grounded to a water pipe or buried ground rod. This is especially important if the transceiver is equipped with the automatic antenna tuner module. The system may perform poorly unless the transceiver is properly grounded.

D.C. Power Connector: The 505DSP transceiver operates from 11–15 volts D.C. Connect the 4-conductor D.C. power cable to the D.C. power connector on one end and to your power supply on the other, making sure to connect both red conductors to the "+" side of your power supply and both black conductors to the "–" side. Distorted audio or low power output may result unless all four conductors are used.

Fuse: The transceiver is fuse-protected against short circuits or reversed DC power polarity. In the event the fuse blows, it should be replaced only with a type SFE 25 amp. Use of larger fuses may void the factory warranty. Continual fuse failure indicates a fault within the transceiver, D.C. power cable, or power supply.

Control Software Installation

Installation of the Kachina 505DSP software is a piece of cake. Install the new software by placing the 3.5 in. disk in drive A (or B). From Windows select RUN. Enter A:install (or 8:install). Follow the on-screen installation instructions. A new group called Kachina Communications will be created. I advise letting the Kachina software control the directory and program group where it wishes to install itself. By allowing this kind of installation, if you ever change computers and want to remove or "uninstall" the software, the uninstall will remove both the program group and subdirectories. The installation software will install three programs in the Kachina Communications Group. These include the 505DSP radio control program (KC505), a radio callsign logging program (KCLOG), and an uninstall program, should you later decide to remove the Kachina software from your computer.

KC505 and KCLOG are started by selecting the Kachina Communications Group. Then select KC505 or KCLOG, or choose RUN and enter the path to KC505.EXE or KCLOG.EXE. The first time the control program runs, a prompt will request the port number connecting your PC to the radio. The port number is stored in file KC505.CFG with other configuration data.

If an older version of the KC505 software resides on your PC and you plan to install the new software in the same directory or use the same program group, you must uninstall the older version first. Remove the older software using the uninstall program supplied with the original version.

Here Comes the Fun Part

In lieu of knobs, the radio's many functions are operated from either the keyboard or the mouse. You may find the mouse easier to use until you become familiar with the various features and functions. Menu selection is accomplished by clicking the left mouse button on the highlighted item. Full details of all radio functions are provided in an on-screen User Guide (see fig. 8[A]).

At fig. 8(B) is the pride of every 505DSP owner: the "Smith Chart" that I use to analyze my antenna condition, performance, and match. As you become familiar with the use of the Smith Chart feature, you will begin to make your antenna system into the "perfect" match ahead of the 505DSP.

SPECIFICATIONS OF THE KACHINA 505DSP HF TRANSCEIVER

GENERAL	
Frequency Coverage, Tx:	1.8-2.0, 3.5-4.0. 7.0-7.3, 10.1-10.15, 14.0-14.35, 18.068-18.168, 21.0-21.45, 24.895-24.995, 28.0-29.7 MHz
Frequency Coverage, Rx:	0.1-30 MHz
Frequency Stability, short term:	Can be automatically calibrated to within ±10 Hz of WWV or other external standard.
Modes:	USB, LSB, AM, CW
Power Requirements:	+13.8 VDC nominal, 25A maximum (TX) 2 Amps maximum (Rx)
Operating Temperature Range:	–10 to +50 C
Transceiver Dimensions/Weight:	Length: 32 cm, height: 29.5 cm, width: 11.5 cm (12.5 × 11.5 × 4.5 in.), weight: 5.27 kg (11.6 lbs.)
Control Head Dimensions:	Length: l 7.5 cm, height: 4.5 cm, width: l5.0 cm
RECEIVER	
SSB Sensitivity:	0. 18 uV (2.4 kHz filter,10 dB SINAD, pre-amp on) 0.35 uV typical (2.4 kHz filter, 10 dB SINAD, pre-amp off)
AM Sensitivity:	0.6 uV (pre-amp on), 1.0 uV typical (pre-amp off)
Audio Power (5 uV input):	> 2 Watts into 8 Ohms, >4 Watts into 4 Ohms
Spurious Rejection:	>80 dB
Image Rejection:	>80 dB
IF Rejection:	>80 dB
3rd-order Intercept Point:	+18 dBm typical @ 20 kHz (pre-amp off)
3rd-order IMD Dynamic Range:	96 dB typical (pre-amp off)
2nd-order Intercept Point:	+49 dBm typical
Blocking Dynamic Range:	115 dB typical @ 20 kHz (pre-amp off). 118 dB typical @ 50 kHz
Audio THD:	<5% @ 2 Watts into 4 Ohms
Manual Notch Depth:	>–50 dB
TRANSMITTER	
Output Power:	SSB: 100 Watts ±1 dB into 50 Ohms AM: 25 Watts carrier nominal
Spurious, Harmonics:	<60 dBc @ 100 Watts into 50 Ohms
Carrier, Opposite Sideband Suppression:	SSB: <–55 dBc
CW Keyer Speed:	5-80 WPM adjustable

Table I– Specifications of the Kachina 505DSP Computer-Controlled HF Transceiver.

Some of the Basic Features Of the 505DSP

Main Power Switch: The transceiver power switch is located on the front panel of the control head. The LED located on the front panel of the transceiver will illuminate when the transceiver is switched on. The meters on the on-screen control panel will read "OFF LINE" if the radio is switched off or if for any reason, such as a loose or faulty control cable, the control software is unable to communicate with the radio.

Current Settings Window: When in the KC505 control program, a window showing the current transceiver settings is displayed. Beginning with software version 1.x3, most of the listed settings can be changed simply by clicking on the item you wish to access. Within this window you must click on the green or yellow text to initiate a change. Clicking on white or gray text will have no effect. These settings can also be changed using the pull-down menus and many also have dedicated "shortcut" keys, explained elsewhere.

A word of caution: When you have several windows active at the same time—i.e. the control program, antenna Smith Chart, KCLOG, etc.—it is a Windows convention to select a window by clicking your mouse anywhere in the window. However, you must be careful not to click on these settings when you intend only to activate the control panel window.

Slide Bars: Two horizontal slide bars are provided on-screen to control various transceiver functions. Only one slider at a time is active, as indicated by a flashing display. Clicking the left mouse button on the inactive slider will cause it to become active and the other slide bar to become inactive. Since there are many functions that use slide bars, but only two slide bars on-screen, slide bars are displayed for only the two most recently selected functions. For example, if you select Tx Power Out, one of the slide bars will become active for this function, while the last function selected will become the inactive slide bar. Slide bar adjustments are made by clicking the left mouse button and dragging the mouse, or using the less- than/greater-than keys (< >). When using the < > keys, the <shift> key is optional. Use of the <shift> key will increase the speed of the slide bar by a factor of 5.

Volume Control: A vertical slide bar is dedicated full-time for controlling receiver volume. Volume is adjusted by clicking the left mouse button on the slide bar and dragging the mouse

(Continued on page100)

ON4WW spent 2 1/2 years living and working in Rwanda, Central Africa. Here he relates a little of what it was like to give a number of you your first 9X contact.

9X4WW

Amateur Radio from the Great Lakes Region of Rwanda

BY MARK DEMEULENEERE*, ON4WW

I'm writing this in March 1998. It's been seven months since I left Rwanda after a 2 1/2 year assignment as a telecommunications consultant. In a little while I'll be heading out to my next assignment, which will take me to Algeria, close to the Western Sahara border.

The Great Lakes Operation has been one of the biggest humanitarian efforts ever, starting after the 1994 Rwanda genocide. The operation is still going on, although it's begun to downsize in scope. Rwanda, known as "the land of a thousand hills," is situated just below the Equator, in Central Africa. The popular movie *Gorillas in the Mist* was filmed in northwestern Rwanda, where even today there is still unrest between various populations.

I arrived in Rwanda in April 1995, and was met by Alex, 9X5EE (PA3DZN). He gave me the grand tour of Kigali, which over the next two years I repeated for several newly arrived colleagues. The main roads between major towns are usually paved in asphalt. However, the secondary roads are typically a red/brown colored sand. The sand road conditions vary according to the several rainy seasons throughout the year.

The climate in Kigali is very pleasant, with temperatures ranging between 70° and 90°F during the daytime and cooling off comfortably after sunset, which ensures a good night's rest—if you're not addicted to 160 meter operation. These comfortable temperatures in Kigali are due to its height above sea level (about 5400 feet). Elsewhere in the country, at lower levels, it can and does get very hot.

The local flora and fauna are a feast for the eyes. The birdlife is really fascinating. They have no natural fear of man, as yet.

*Rosdamstr. 12, B-9051 Gent/SDW, Belgium

Here the author points out that with 100 watts and simple antennas, CW is the way to go.

You can easily observe birds of prey and small songbirds at distances as close as 6 feet. While enjoying all of the scenery, I was also privileged to put up some antennas and reach out to the DXing world. It was truly impossible to be bored under these conditions.

I put up two inverted-L antennas and a vertical at the first house at which I stayed. One inverted-L was for 80 meters and the other covered 160 meters. Those two antennas with a Cushcraft R7 gave me coverage on all nine HF bands. 9X/ON4WW was on the air at last.

My first 160 meter contact, running only 30 watts, will stay etched in my memory forever. Right on schedule, one call, and ON4UN came right back to me. The 160 meter inverted-L with only six radials varying in length from 45 foot to 90 feet was indeed getting out. This promised to be some great amateur radio fun, and it truly was. During the next two months I made about 20,000 contacts all over the globe. Some Europeans made it into the log 17 times—9 bands CW and 8 bands SSB.

After a quick break back home, I returned and moved to a new house, restrung the antennas, and added a Telex Hy-Gain DX-77 vertical for 10 through 40 meters. At about this time my work load increased and my amateur radio time became quite limited. In 1996 my wife and son came out to visit and to enjoy much

Real life sometimes interrupts our amateur radio pursuits. Mark heads out to work as a telecommunications consultant.

of what Africa has to offer. Naturally, family like took precedence over my amateur radio activity, and so my operating time was once again cut short. They did, however, manage to bring along a few items which would make top band operating a bit easier. During the 1996–97 160 meter season some 1200 stations made it into my log, including some JA and west coast US stations. I could also hear the SA and VK beacons on top band. What a thrill!

I finally got my new callsign, 9X4WW, which facilitated things quite a bit. However, the licensing system got quite a bit stricter, and at that time I had to pay the same amount for my license as various official agencies—namely, $330 per frequency. I therefore "bought" 14.118 (not a particularly good choice) and 1827.5 kHz, and remained on those two frequencies until I left Rwanda in August 1997.

During the last few months of my assignment, I tried to get more of the local inhabitants interested in amateur radio. A few local technicians organized meetings which I attended along with DL8BAX. We gave a demonstration of amateur radio at one of the meetings for the military and they were favorably impressed. The person in charge of the country's communications department gave the okay for starting up a radio club to further the interest in amateur radio. Unfortunately, at about that time both DL8BAX and I were leaving the country for good, and we couldn't leave any of our equipment to be used at a club station. There were no licenses or callsigns issued prior to our leaving. I hope to make contact with these fine people on the radio one day. The licensing system has been liberalized once again for foreigners residing in Rwanda, and there have been numerous stations quite active on the bands. While Rwanda is probably off the amateur radio most wanted list, it's always a thrill to contact Central Africa.

I would like to wish the people of Rwanda good luck and peace and thank them for their generous hospitality. A special thanks also goes to my family and to all of you who made me happy with those big pile-ups. Thanks also to Ghis, ON5NT, who made a lot of you happy by answering your QSL requests either direct or via the bureau.

73 and CU from another location. ■

It's simple and most of all it works. This is the feed point of the 160 meter inverted-L antenna.

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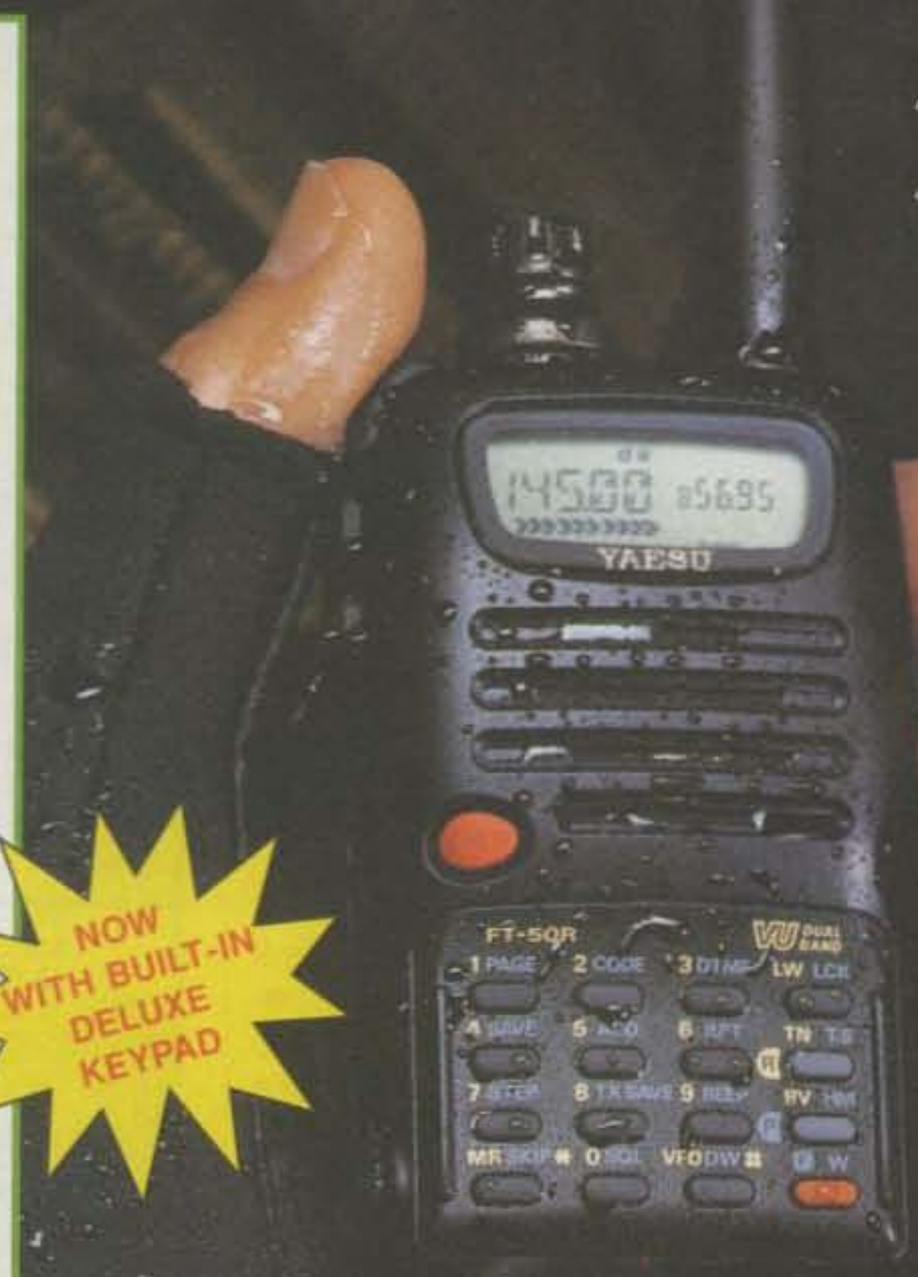

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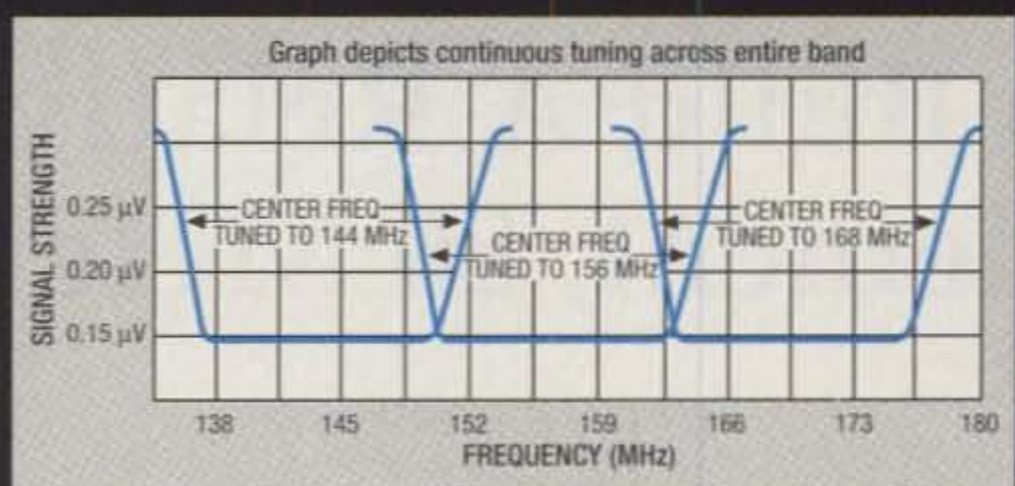

3-Stage Advance Track Tuning (ATT) – The exclusive 3-Stage Advance Track tuning front end automatically adjusts band width sensitivity across the entire receiver range, while maintaining selectivity specifications. ATT significantly reduces interference from inter-modulation and front end overload.

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  FT-7400H 35/15/5 Watts
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*800 MHz Cellular blocked

When it comes to 80 meters, many of us never look beyond wire antennas for very practical and logistical reasons. While reality may put a crimp on our dreams, it's certainly nice to see some of us make our dreams come true.

How To Build A Relatively Small 2-Element, 80 Meter Yagi

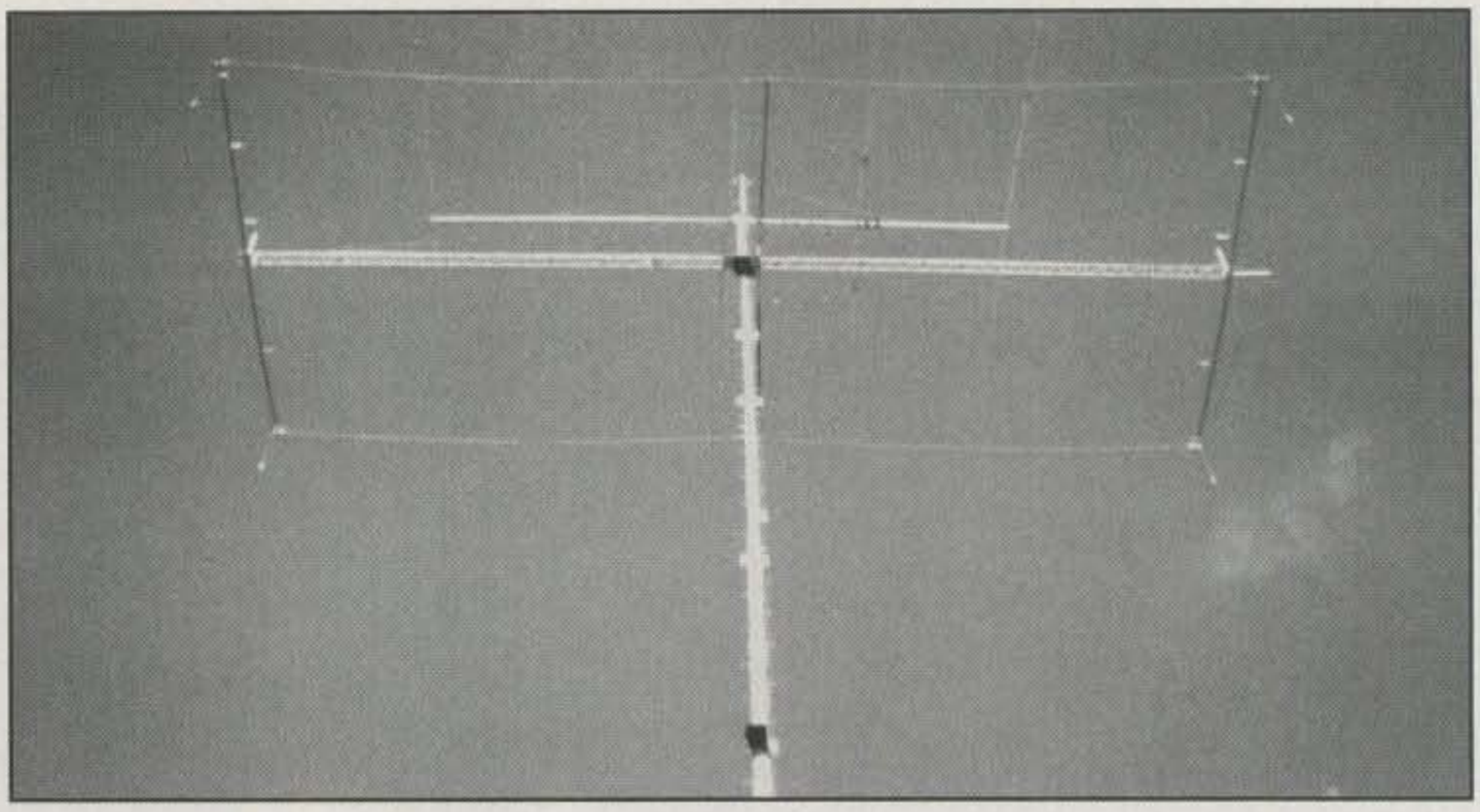
BY DALE HOPPE*, K6UA

I have been active in numerous facets of amateur radio for many, many years. No matter what I try, however, in my eyes nothing matches the fascination and challenge of DX and contesting. These two competitive arenas have drawn me into their clutches on a regular basis since my early days in the hobby. As a result, I have explored and tried every concept, technique, and equipment I possibly could to improve my performance and my success. Fortunately, I have a very understanding and supportive wife, Sue, who has rarely, if ever, objected when new equipment crossed our threshold, or when new towers started to rise behind our home, or if I spent excessive time installing and integrating these items into my radio station. Her constant support extended through this antenna project and is thoroughly appreciated.

Through the years I have found that the best way to maintain an effective station is by installing and using efficient antennas. In this respect, I am very fortunate in having a 10 acre ranch in the country, which provides plenty of space to experiment. As a result, I have developed a farm (i.e., antenna farm) within my ranch. My setup, six towers with stacked Yagis on all bands, has been a source of pride.

The band which has always troubled me, however, is 80 meters. Last year I decided to design and build an efficient effective 80 meter antenna. The objectives I established were small in size, rotatable, efficient, good gain and good front-to-back ratios, wide bandwidth, inexpensive, and easily constructed. I met all of these requirements with a rotatable 2-element Yagi.

Before going into construction details and performance results, let me explain why I selected the design approach I used. I was determined to avoid the use of loading coils because they introduce losses which would fundamentally eliminate, or at best minimize, any possibility of achieving efficiency. I decided to try linear loading even though I knew that some antenna manufacturers were having difficulty making their linear-loaded antennas work properly. An appropriately designed linear load introduces very little loss, will not impair radiation patterns, and can achieve a low enough Q to allow reasonably good bandwidth. These points alone were almost enough to reach my overall objectives.



A view of the 80 meter antenna mounted on a Telrex pole. The "smaller" beam above is a 5-element, 20 meter Yagi at 110 feet.

Fortunately, I had outstanding support and technical help from two very good friends. One, Rod Mack, W7CY, used his AO computer program to project performance, and the other, Wayne Lorance, W6ZA, used some of his exotic programs (NEC2) to confirm Rod's calculations. Their guidance was instrumental in making the antenna work properly almost at the outset.

Construction

An overall top view is shown in fig. 1. The boom is a 73 foot triangular aluminum tower, 13 inches per side, with a 3 foot horizontal extension (2 inch aluminum angle) at each end used for back bracing. It also includes a 3 foot vertical extension at each end (not shown in fig. 1) to provide vertical bracing. Attached to the boom are six 16 foot pole-vaulting poles (rejects I purchased a number of years ago from the manufacturer for $2.00 each). Two each are fastened at each end to provide a 30 foot spread for the antenna wire, and two are fastened to the center of the boom to maintain the 30 foot spacing.

Assembly of the wire elements is reasonably straightforward. The top view is a

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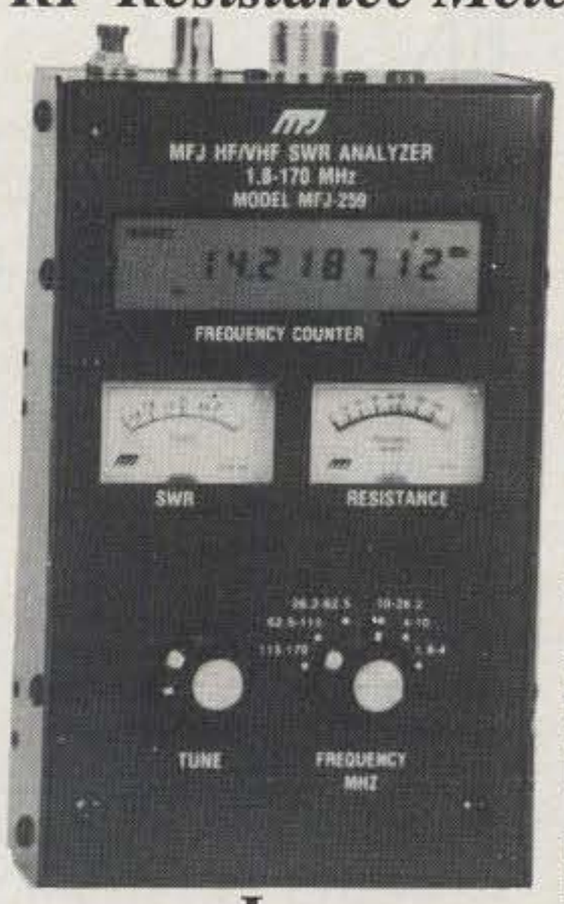

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Take the guesswork out of building matching networks and baluns for your antennas.

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Find your antenna's true resonant frequency from the shack.

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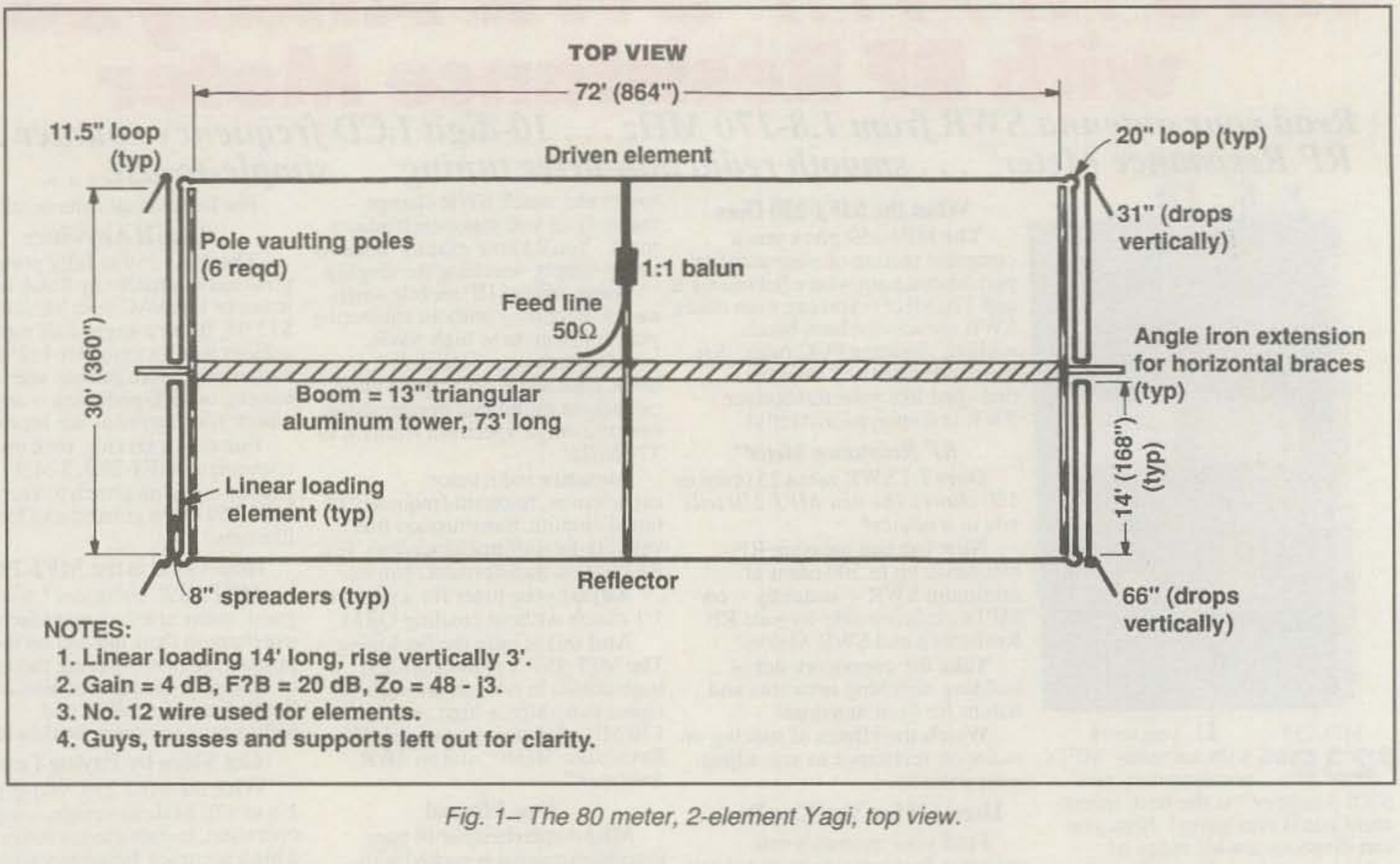

Fig. 1– The 80 meter, 2-element Yagi, top view.

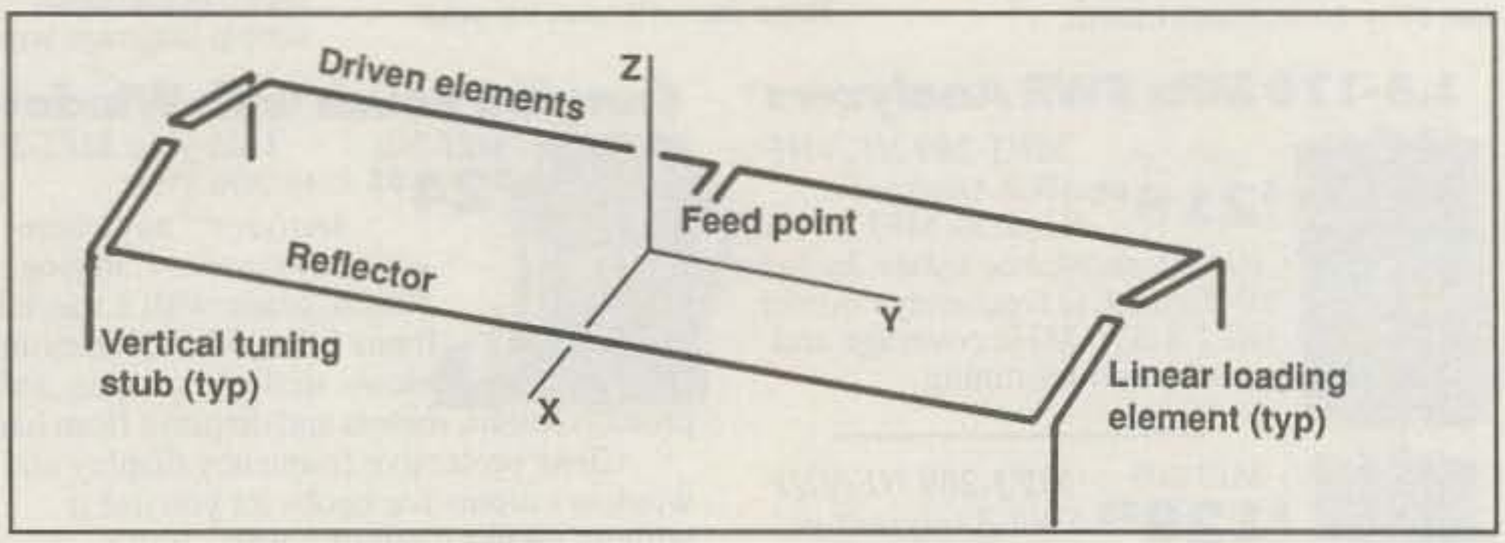

Fig. 2– Antenna in free space.

complete picture of the electrical elements of the antenna. If it is difficult to envision any portion of the antenna, see fig. 2 for a sketch of the antenna wires in free space. The 20 inch loops and the 11.5 inch loops were established to permit fastening elements together using compression fittings installed by a *Nike Press™*, but any other method of assembly is acceptable. Be sure to keep the vertical tuning stubs longer than indicated at the outset. These will be trimmed to tune the antenna as described later.

Details of the linear loading elements are shown in fig. 3. The 11.5 inch loops are attached to the vertical tuning stub, and the 20 inch loops are attached to the 72 foot horizontal elements. To calculate the length of wire used, include the vertical stubs, linear loading elements, *all loops*, as well as the horizontal radiator and reflector. On that basis the driven element is 139.75 feet long (1677 inches) and the reflector is 145.583 feet long (1747 inches).

The center of the linear loading element is elevated 3 feet above the pole-vaulting pole cross supports (as shown in fig. 4) by attachment to the top of the 3 foot vertical support. That elevation is a critical dimen-

Fig. 3– The linear loading element (four required).

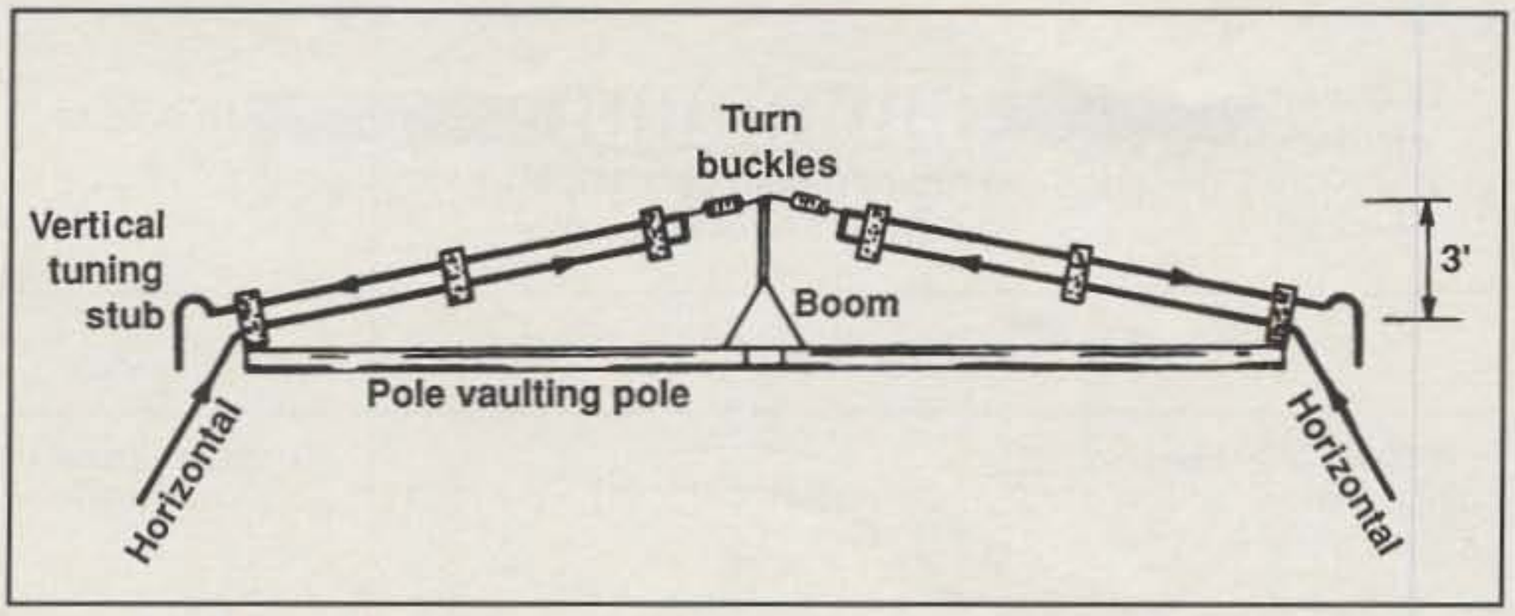

Fig. 4– End view.

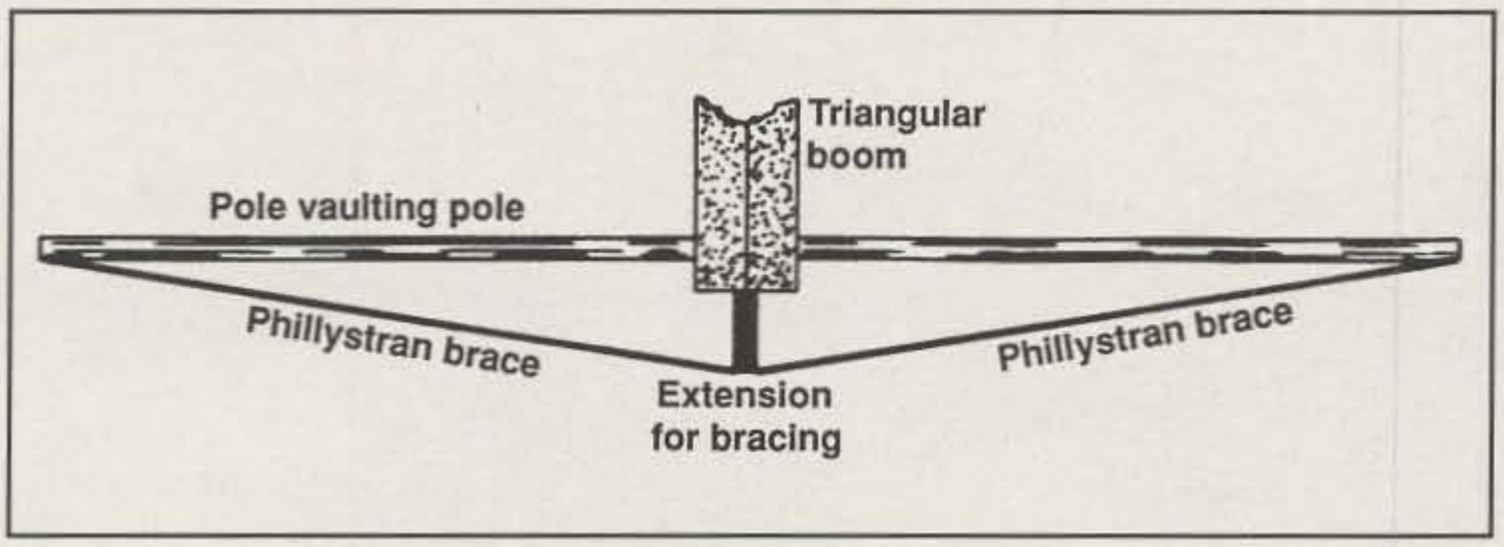

Fig. 5– Top view showing horizontal bracing.

sion. The linear loading element also serves as a vertical brace supporting the tips of the pole-vaulting poles. It is tightened by turnbuckles as shown in fig. 4.

The end poles are also braced in the horizontal plane as shown in fig. 5 to prevent the poles from flexing towards the center. Phillystran(R) was used to provide the support because of its strength and light weight.

The antenna is fed with RG8 via a 1:1 balun attached to the center pole-vaulting pole about 7 feet from the boom as shown in fig. 1. The balun is homemade and construction details are shown in fig. 6. For the final assembly the 15 Amidon™ beads were covered by plastic tubing and the entire assembly was sealed.

Installation

My antenna is mounted on a rotating Telrex pole at a height of 100 feet. The actual installation is shown in the photo. Just above the 80 meter antenna is a 5-element 20 meter Yagi at 110 feet. There is no interaction or degradation between these two antennas. The entire tower is rotated by a one-third horsepower motor located at the base of the pole. An electrical winch is mounted on the side of the Telrex pole and is used to raise and lower

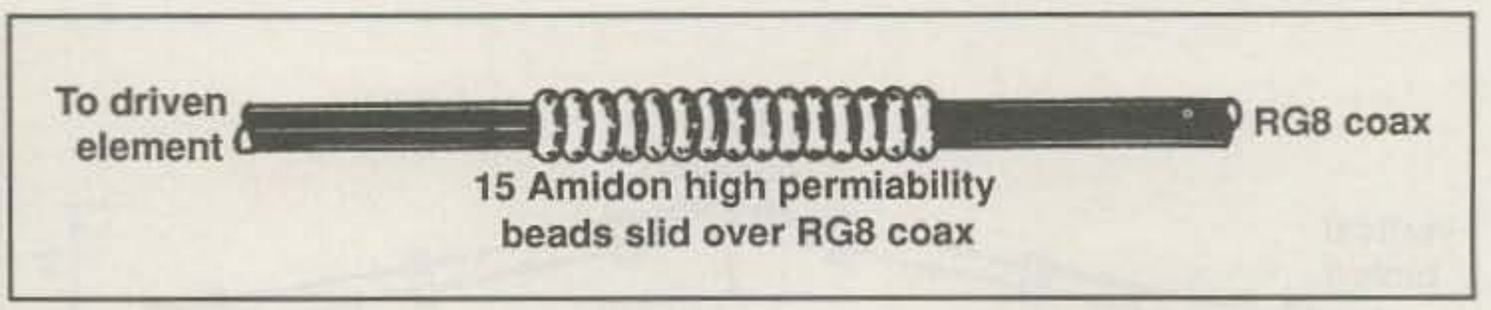

Fig. 6– Balun for 1:1 match.

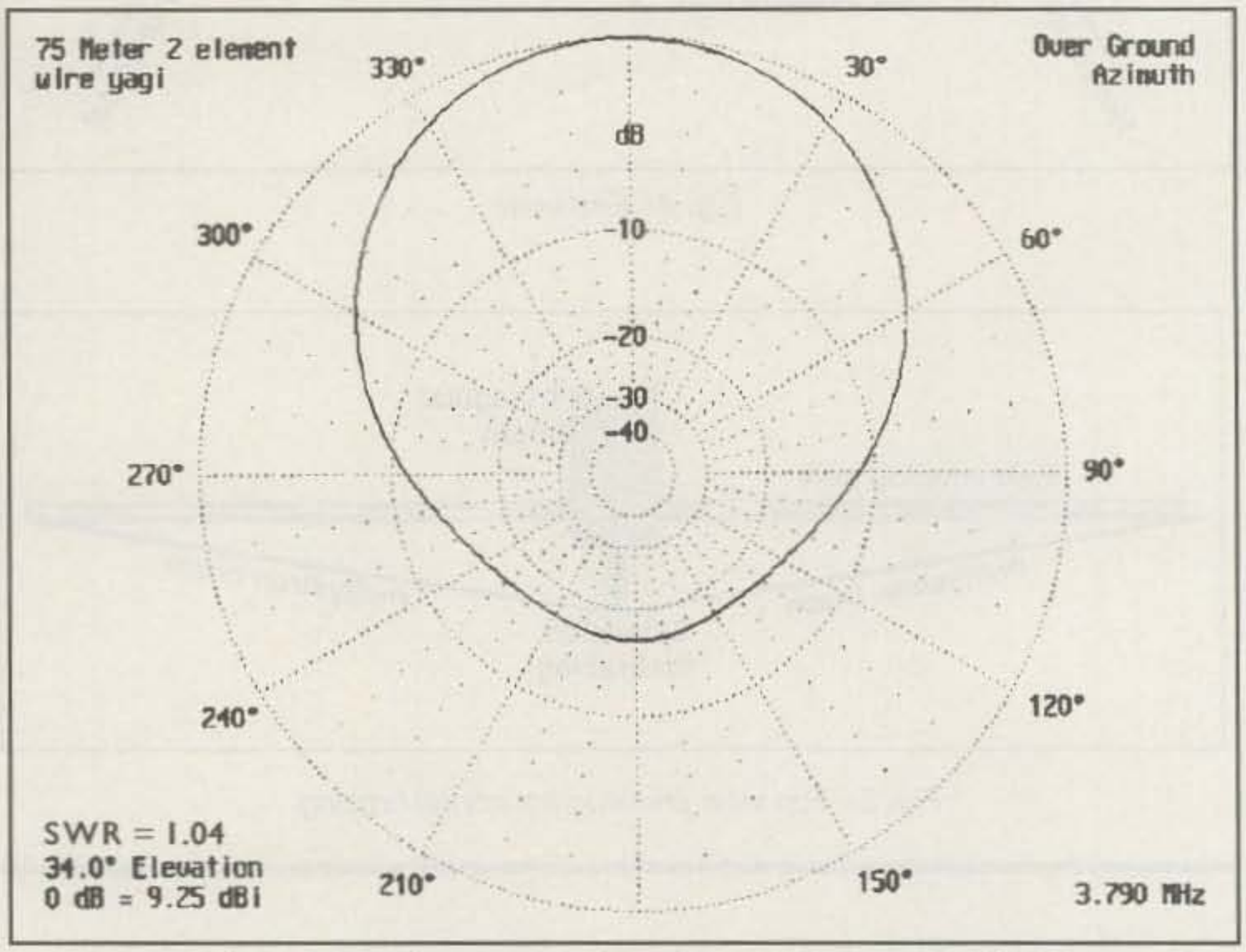

Fig. 7– Radiation patterns from 3.790 MHz to 3.960 MHz.

the antenna. This feature of my installation was a god-send when it came to tuning the antenna, since the performance at ground level changes significantly at altitude. In fact, the characteristics are very different at 70 feet and at 100 feet.

Tuning

The tuning process is tedious but relatively simple. Because of the change in performance at different altitudes, for me the entire process was cut-and-try. The only test equipment used was an MFJ Analyzer to verify SWR and a Yaesu FT1000D to measure front-to-back ratios. The front-to-back ratio was checked at ground level and then checked at 100 feet to determine the direction and amount of change which occurred.

The antenna was lowered and the vertical tuning stubs were trimmed slightly. It was noticed that a change to the driven-element stubs affected the performance of the reflector and vice-versa. The antenna was raised and lowered five times before I achieved the current level of performance. It is important to make small changes to the vertical tuning stubs and to determine the extent of the change after it is elevated. A pattern of differences can be established which may simplify the overall process.

The dimensions shown in fig. 1 are the ones currently used in my prototype installation. If you make an installation on a different type of tower and/or at a different height, these dimensions probably will be different.

It is conceivable that instead of using wire for the vertical tuning stubs, telescoping aluminum tubing could be installed. This would simplify the trimming and tuning process. I will not be surprised to hear of an enterprising amateur out there installing a motor-driven tuning capability for these stubs.

Performance

The antenna was designed to have an impedance of approximately 50 ohms. This parameter was verified by actual measurement. Thus, the 1:1 balun was acceptable.

Radiation patterns projected by Rod Mack and Wayne Lorance for a range of frequencies are shown in figs. 7 and 8. The center design frequency was 3.790 MHz, and at that point the SWR was 1.04 and the gain 9.25 dBi (or 6.75 dBd, if you prefer). My measurements showed the front-to-back ratio to be at least 18 dB and sometimes 20 dB on all frequencies. From 3.790 MHz to 3.960 MHz the SWR changed from

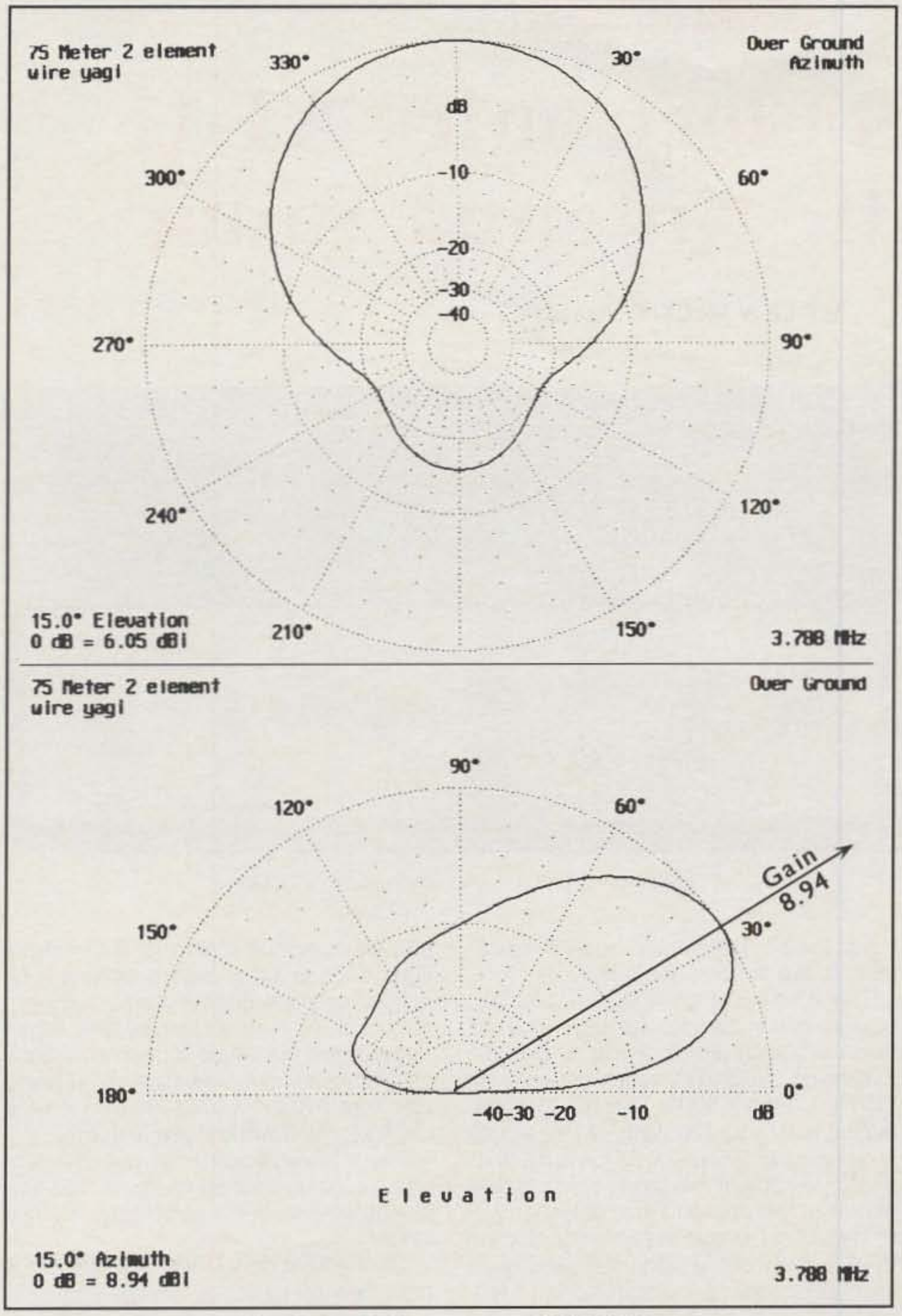

Fig. 8– Radiation pattern at 3.788 MHz.

1.04 to 1.88 and the gain went from 9.25 dBi to 7.76 dBi. This is "short" antenna performs beautifully. Fig. 8 shows the radiation pattern at 3.788 MHz.

Conclusion

I can only say that the 80 meter Yagi is wonderful. It has the gain, bandwidth, and front-to-back ratios I had hoped for and matches 50 ohms directly. I have no trouble working Europe from my California QTH even when they transmit on 3.725 and listen on 3.870. I can bust pile-ups with ease, and every contact asks for details on the antenna. I highly recommend this design to anyone interested in 80 meters who has the tower and the real estate required.

To summarize the primary points:

- It is a small, rotatable 80 meter Yagi (one-half size)
- Good gain
- Good F/B (18 to 20 dB)
- Great bandwidth
- Inexpensive
- Easy construction

I wish you luck if you decide to build it. I cannot imagine anyone not being able to achieve the same performance levels I did. If you do try it, let me know how it works. If you hear me on 80 meters, give me a shout. I'd be glad to discuss this great antenna with you. ■

The LDG Electronics AT-11 Automatic Antenna Tuner

BY LEW McCOY*, W1ICP

I think that in my career I have probably described, built, tested, and worked with more Transmatches (antenna tuners) than just about any amateur around. This product review is about the AT-11, which is an automatic Transmatch (antenna tuner) that will electronically and automatically match practically any antenna system load to your transceiver output.

I realize, of course, that these days many of the transceivers have built-in Transmatches. However, if the antenna system presents a load with a standing wave ratio (SWR) of more than 3 to 1, the modern solid-state transceiver will shut down to prevent the final amplifier stage from being destroyed. Keep in mind that regardless of what you may read or think, some multi-band antenna systems that are advertised as being a 50 ohm load are not, and they will present a load of more than 3 to 1 in many cases. A great deal depends on the SWR bandwidth of an antenna system.

For clarification, the SWR bandwidth that is usually given (but not always) is the 2 to 1, SWR bandwidth, frequency range. To make that a little clearer to understand, assume we have an antenna system for the 80 meter band, or 3500 to 4000 MHz. We design the antenna for, say, 3800 kHz. We find that in measuring the antenna, our SWR is 1 to 1 at 3800 kHz, and it stays at less than 2 to 1 all the way down to 3700 kHz. Likewise, going up in frequency we stay below 2 to 1 SWR up to 3900 kHz. Therefore, we have a 2 to 1 SWR (or less) bandwidth of 200 kHz. Our modern transceivers will work fine in the 2 to 1 band range (even 3 to 1 is satisfactory). However, if we drop below 3700 kHz, the SWR can rapidly rise above 3 to 1, and our transceiver shuts off. What to do?

You can adjust your Transmatch to present a 50 ohm load to the transceiver. The AT-11 does this electronically and very quickly and very accurately. It thus provides the user with a solid operating aid.

In doing this review I elected to go the kit route, as LDG Electronics makes either kits or complete, already-built units. And I might add, I would give a very high rating to the kit. The printed board is excellent, as are the components.

This view show the unit enclosed in its cabinet.

The AT-11 is a full-featured automatic or semi-automatic antenna tuner. The unit is taken from a design article by Dwayne L. Kincaid, WD8OYG, which appeared in *QST* in January 1996. The AT-11 is designed to handle 100 watts of RF, actually rated at 2 to 100 watts. (LDG also makes a QRP version of this tuner. I plan to do a review of this postcard-size unit soon.)

The AT-11 circuit uses a very efficient dual L network which can set up in 250,000 possible combinations! Frequency coverage is from 1.8 through 29.7 MHz. (It will work on MARS frequencies.)

After I completed the kit (I chose the kit route to familiarize myself with the circuit), I followed the instructions for initial tune-up of the device. This only took a few minutes. Before going further, let me again say that the kit and components are excellent. All parts are of superior quality. Wiring time for me was about six hours from start to completion. If you decide to build the kit, I strongly recommend getting a pencil-type, small-tip soldering iron.

There are lots of components and the board is crowded, so care is required in doing the soldering. I would suggest being particularly careful to avoid solder bridges —shorts between two points. The directions are not step by step, but anyone who got past grammar school should have no problems. Just be sure to read all instructions once or twice before starting. The instructions are certainly clear enough, but again, they are not step by step. When I completed the wiring, I used a magnifier to carefully examine my work. (I found no errors. In fact, when I turned on the unit the first time it worked like a charm.)

I have several different types of antennas, including beams, verticals, and horizontal wire dipoles. I had plenty of things to test.

On the front panel there are four LEDs (and several switches). In the unit's circuit there are seventeen single-pole, double-throw relays, plus eight inductors and the associated circuitry. The heart of the circuit is a CPU microprocessor, a 68HC11. When a radio signal is applied to the input, an SWR sensor sends a signal to the CPU, and it in turns applies power to the various relays and coils to find a matching condition that will bring the SWR at the output of the tuner down to below 3 to 1. What floored me was that when this unit has a signal applied, there is a quick zip or buzz as the relays move in and out, the LEDS on the front panel blink. Within a fraction of a second or slightly longer, your transmitter is working into a very close to 50 ohm load. The longest "matching" time encountered is on the order of only 6 seconds!

To give you an idea, I tested several

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

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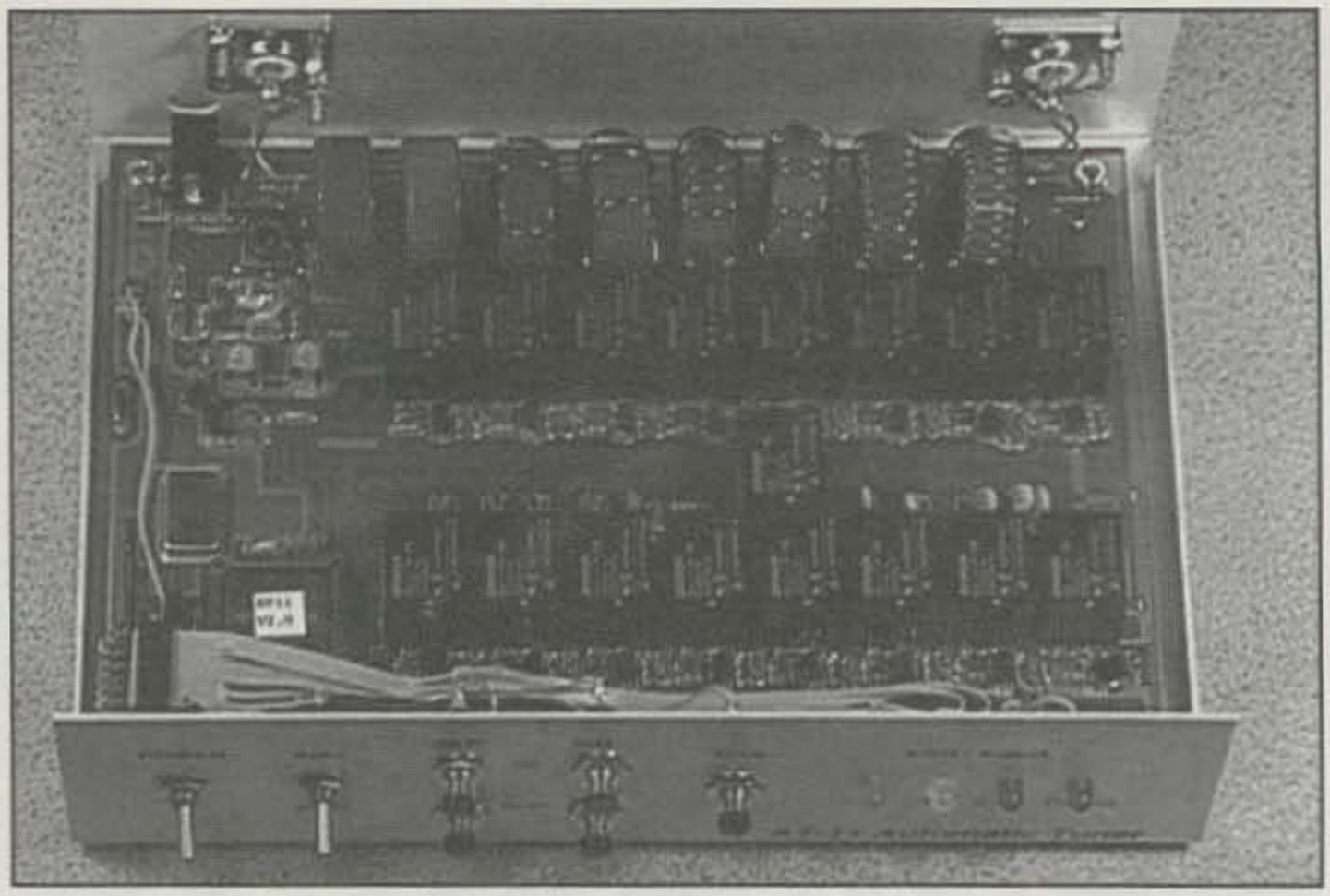

The inside of the tuner. The coils along the rear cover from 10 meters up through 160. Keep in mind that these will also cover the MARS frequencies. If you assemble the kit, be sure to use a fine-point, pencil-type soldering iron.

antennas. My beam, which covers 40 through 10 meters, has a couple of spots where the SWR is over 3 to 1. The AT-11 never took more than a second or two to come up with a complete match of less than 2 to 1. Another antenna is a multiband vertical that covers a small portion of 160, a little more on 80, plus 40 and 18 MHz. Even though this vertical is not supposed to work on 15 or 10 meters, the tuner put it there with a matched condition. I used two additional bridges—a Bird Wattmeter and an RF Applications unit—to double-check the match. The RF Applications bridge was installed directly in the coax feed line and it read the true SWR, so I was observing the input to the AT-11 plus the actual loads it was matching. On 160 I could get off resonant antenna loads of as high as 8 to 1, and those 8 to 1 readings had plenty of capacitive reactance. The AT-11 produced a 1.5 to 1 SWR load and did so in just a fraction of a second.

I next tried a G5RV fed with open-wire ladder line. I used a 4 to 1 step-down balun to connect the coax to the antenna. I realize that this was a very hard test for a tuner, but it quickly showed me how well designed the AT-11 really is. It only took seconds to go through the bands. In one or two cases, I fine-adjusted the match with the controls provided. I'm sure that I'm safe in saying that this is truly a universal, automatic Transmatch.

Continuing with the circuit description, the front panel has a series of switches and four LEDs to show the match and condition of the match. When you attach an antenna and apply power, or on SSB speak into the microphone or key the rig, the unit instantly finds a match of less than 3 to 1—all in no more than one or two seconds. There is a Breune-type SWR bridge at the input of the unit. This bridge detects the SWR. The information then goes to the microprocessor, which in turn analyzes the information and in turn sends signals to activate the relays and circuits to find a match.

I need to re-emphasize that with all my different antennas and different bands, this unit took only seconds or fractions of a second to come up with a good match. While I didn't encounter any tough matching situations, the instructions that come with the unit describe how to use the additional switches to add or subtract circuit components as needed.

One switch handles two functions—either SEMI-AUTO or just AUTO. In the AUTO position the unit will seek a 1.5 to 1 match when the SWR is above 3 to 1. In the SEMI mode the tuner will seek a match when the panel pushbutton is touched. Three of the LEDs show the match conditions: green indicates a match of SWR less than 1.5 to 1; green/yellow is 1.5 to 2 to 1; yellow is 2.0 to 2.5; yellow/red is 2.5 to 3.0; and red indicates an SWR of more than 3 to 1.

The instructions caution the builder to avoid touching any components with the power turned on. One-hundred watts of RF can cause a serious RF burn, and potentially high RF voltages can develop around the toroid coils.

The unit, either wired or in kit form, is available from LDG Electronics, 1445 Parran Road, Leonard, MD 20685 (e-mail <ldg@radix.net>). Kit price is $190.00 including shipping; the complete wired AT-11 as shown in this review is available for $229, including shipping. ■

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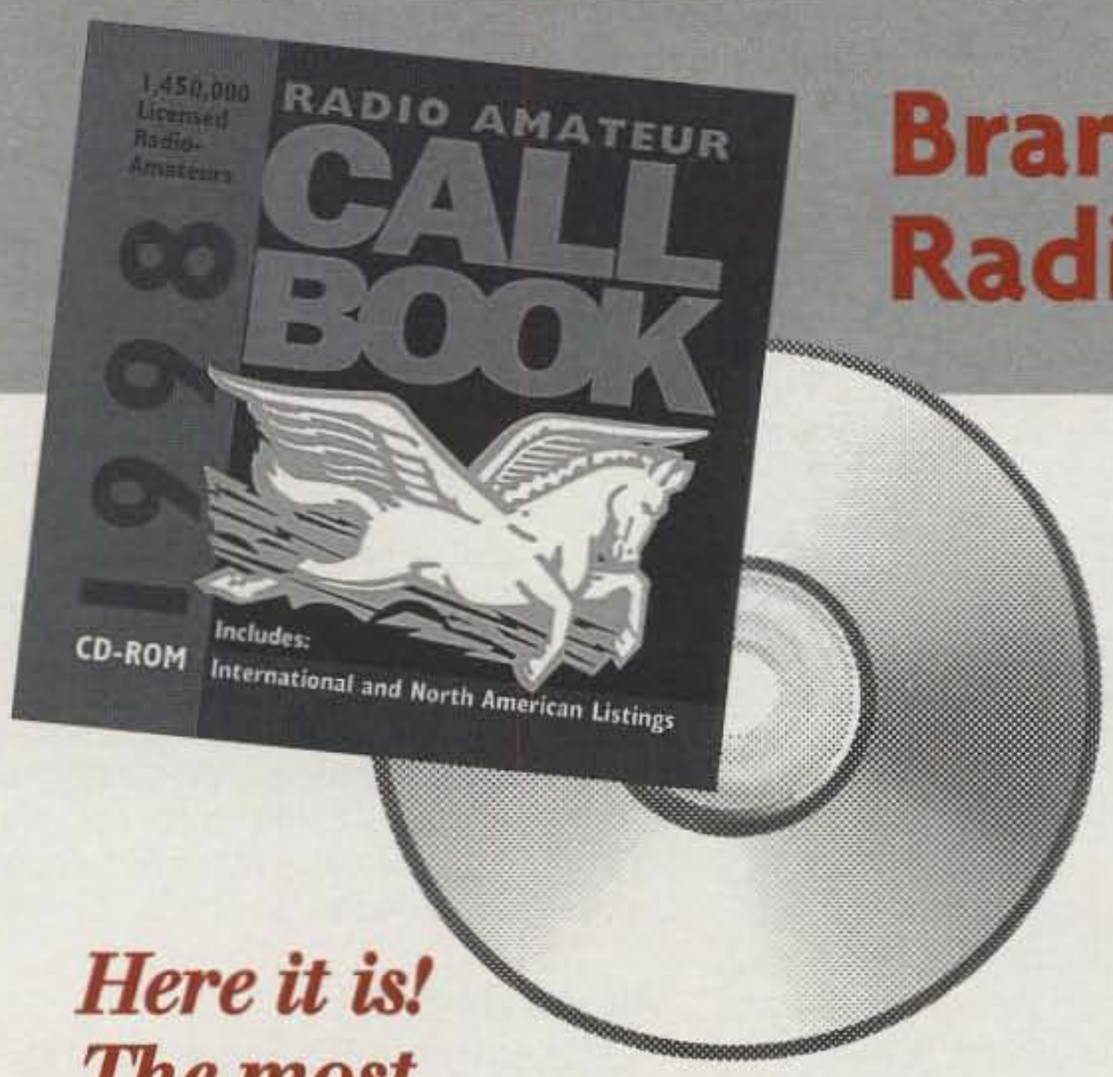

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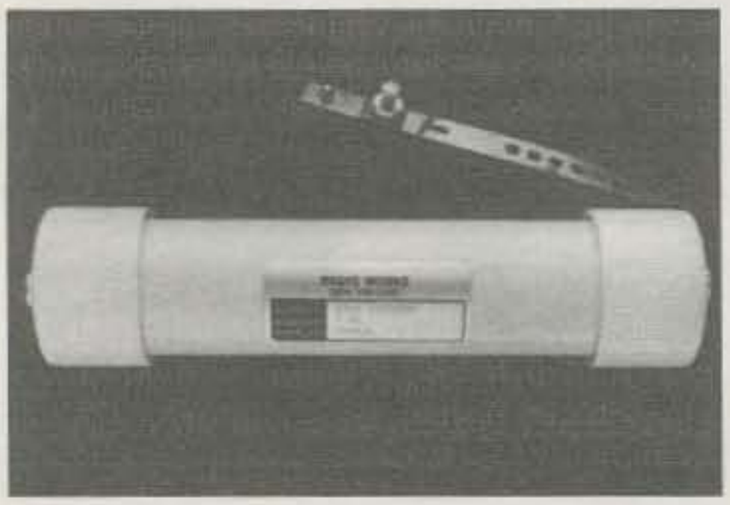


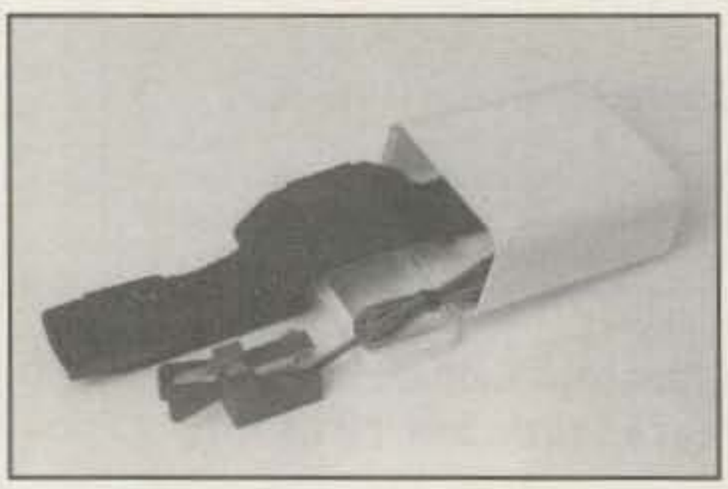
Radio Works T-4G Grounded Line Isolator™

The T-4G Line Isolator™ is an unbalanced, current-type device for reducing stray RF on a coaxial cable's shield. It provides a direct path to ground for stray RF traveling along the outer surface of the shield of coaxial feedlines. Winding reactance is as much as 50% higher than with previous models. The T-4 is inserted in series with coaxial cable connecting the transmitter to the linear and between the linear and the transmatch. The T-4 replaces the 4KRF-LI, 4KV-LI, and T-3.

Introductory price of the T-4G is $33.95;and the T-4 is $29.95. For more information, contact The Radio Works, Box 6159, Portsmouth, VA 23703 (757-484-0140; fax 757-483-1873; e-mail <jim @radioworks.com>; on the world wide web <radioworks.com>), or circle number 100 on the reader service card.

Paddlette Sub-miniature Iambic Paddle Key

Paddlette Company has introduced a subminiature iambic paddle key half the size of the company's miniature key. Designed with QRP, mobile, and backpacking amateurs in mind, the footprint is 3/4" × 1 1/4" and weight is 0.8 ounce, including the attached 3 ft. cable. The base is precision machined from a solid block of Type 1 PVC. All electrical parts are solid brass, and all hardware is 18-8 stainless steel. There is only one moving part per paddle. Fifty-six pitch adjusting screws allow precise setting of contact gap; 20° rotation changes gap only 0.001 in. The key is held solidly in place by the mating of its magnetic bottom with a similar magnetic element on a knee mount or bench.



The companion knee mount weighs 1.2 ounces and uses a powder-coated, 22-gauge aluminum piece formed to fit the leg just above the knee. Both key and knee mount stow in the compact polypropylene carrying case provided. Price of the complete outfit—key, knee mount, and carrying case—is $47 plus $2.50 s/h. For more information, contact Paddlette Company, P.O. Box 6036, Edmonds, WA 98026 (425-743-1429), or circle number 101 on the reader service card.

MFJ MightyLite™ Switching Power Supplies

MFJ's new switching power supplies, the 25 amp MFJ-4225MV and 45 amp MFJ-4245MV, are small and lightweight; the 25 amp model is 3.7 lbs. (5 3/4" × 4 1/2" × 6")and the 45 amp model is 5.5 lbs (7 1/2" × 4 3/4" × 9"). They feature a front-panel voltage control that lets the user vary the output voltage from 9 to 15 VDC and gives a highly regulated voltage output. There is less than 35 mV of peak-to-peak ripple under a 25 or 45 amp full load. Load regulation is better than 1.5% under a full load. There also is no RF hash. The units are protected with over voltage and over current protection circuits. They are fused and have switchable AC input voltage, and work from 85 to 135 VAC or from 170 to 260 VAC.

The MFJ-4225MV MightyLite™ is 25 amps maximum or 22 amps continuous and is priced at $149.95. The MFJ-4245MV is 45 amps maximum or 40 amps continuous and is priced at $199.95. They both are covered by MFJ's "No Matter What™" one-year limited warranty. For more information, contact MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (for orders or nearest dealer call 800-647-1800; fax 601-323-6551; e-mail <mfj@mfjenterprises.com>; web <http://www.mfjenterprises,com>), or circle number 102 on the reader service card.

Datamatrix ProLog98 for Windows

ProLog98 for Windows, a comprehensive database listing over 65,000 QSL routes, is now coupled with the point-and-shoot Windows95™. All operational functions are located on pushbutton accessible with a single click or through the use of keyboard shortcuts. The built-in text editor allows adding new, or modify existing route information. ProLog98 supports all of the major CD-ROM callbook databases, including Flying Horse, Buckmaster, SAM, and QRZ with the ability to transfer information directly into the ProLog98 database or to print an address label. The programs categorized database indexing permits the grouping and display of records with common callsign or category. The built-in DXCC prefix database provides information on the DX station's continent, CQ Zone, ITU Zone, third-party restriction status, bureau availability, and beam heading/distance from the user's QTH.

ProLog98 is priced at $26. A one-year (six issue) database update subscription service is offered for an additional $36. Package price is $58. For more information, contact Datamatrix, 5560 Jackson Loop NE, Rio Rancho, NM 87124 (505-892-5669; on the web <http://www.qth.com/prolog>), or circle number 103 on the reader service card.

Alinco DJ-S46 HT

Alinco has announced the DJ-S46 handheld transceiver designed to operate on the Family Radio Service (FRS) band. About the size of a paging "beeper," the unit features all 14 FRS channels and uses AA batteries and transmits with an output power of 340 milliwatts. The unique pivoting "swing up" antenna allows the radio to remain compact without detach-

ing the antenna. In addition to ample audio, the HT features a rechargeable nickel-cadmium battery with the option of using AA batteries, large illuminated display, pager "alert" alarm, hi/low transmit power setting, programmable auto power off feature, and more. The radio comes with a belt clip and carry strap. Options are available.

For more information, contact Alinco, 438 Amapola Ave., Suite 130, Torrance, CA 90501 (phone 310-618-8616; fax 310-618-8758), or circle number 104 on the reader service card.

Patcomm PC-9000 HF Transceiver

The new PC-9000 HF transceiver from Patcomm is small (8"W × 2 3/4"H × 7 1/2"D), all aluminum, and simple to operate. It features a 5 watt setting for QRP, a 40 watt position for most communication, and 6 meter capability. Other features include three selectable tuning rates (1.2 Hz, 1.2 kHz, and 120 kHz), noise blanker, frequency lock button, low noise high selectivity receiver design, RIT/Split capability, amplifier control jack, built-in keyer and keyboard interface for CW, plug-in FM module (option), and more.

Tentative prices at press time were PC-9000 $799; FM module $79; and RTTY/Decode/Memory $149. For more information, contact Patcomm Corp., 7 Flower Field M100, St. James, NY 11780 (516-862-6511), or circle number 107 on the reader service card.

Mirage Docking Boosters

Mirage's B-24-G (for 2 meter handhelds) and BD-25 (for dual band, 2 meter/440 MHz handhelds) docking boosters boost RF power to mobile or base station levels, up to 50 watts. They have selectable HT voltages and require 13.8 VDC. It can be placed on a dashboard or table or mounted with their mounting bracket and tilted.

The B-24-G for 2 meter handhelds gives up to 50 watts output with .5 to 8 watts input. It has 18 dB GaAsFET preamp with on/off switch, preamp on, on air, and transmit LEDs. It measures 3 1/4" × 3 1/4" × 4 1/4" and is priced at $114.95. Adapters to fit the user's handheld are $9.95.

The BD-25 for dual-band HTs gives up

to 45 watts on 2 meters and 35 watts on 440MHz with .5 to 8 watts input. Mirage's *FullDuplexAMP™* lets the user talk on one band and listen on the other at the same time. Requires a compatible HT. It also has automatic band selection, frequency band and power on LEDs, reverse polarity protection, and measures 3 1/4" × 3 1/4" × 5 1/4". Adapters to fit handheld are $9.95.

For more information, contact Mirage Communications Equipment, 300 Industrial Park Rd., Starkville, MS 39759 (for nearest dealer call 800-647-1800; fax 601-323-6551; e-mail <mirage@mfj@mfjenterprises.com>; web <http://www.mirageamp.com>), or circle number 108 on the reader service card.

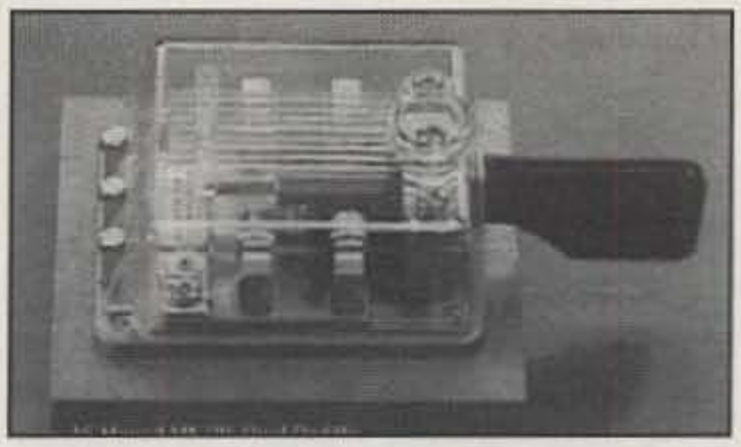
Mirage 2 Meter Amplifier

The new Mirage B-510-G features front-panel adjustable output power from 5 to 100 watts. The LED PowerGraph™ indicator tells you when you are at the power level you need. Two meter handheld or mobile transceivers can be used in any mode, FM/SSB/CW. You can select an adjustable gain (5 to 15 dB) low noise GaAsFET preamp for weak stations, a 15 dB attenuator to reduce intermod, or bypass. All protection modes are provided: high SWR; Over Temperature; and Reverse Polarity.

Included are a mobile mounting bracket and PL-259 to BNC handheld patch cable. The unit is compact (6 1/2" × 2 1/4" × 9") and features a wrap-around heatsink and quiet cooling fan. The B-510-G is priced at $224.95. For more info, contact Mirage Communications Equipment, 300 Industrial Park Road, Starkville, MS 39759 (800-647-1800; fax 601-323-6551; e-mail <mirage@mfj@mfjenterprises.com>; on web <http://www.mirageamp.com>), or circle number 106 on the reader service card.

Hi-Mound Keys, Paddles, Bugs From Milestone Technologies

The Hi-Mound line of Morse keys, paddles, and bugs is again available from Japan through Milestone Technologies. The line features a range of keying equipment from the simple and inexpensive to the "work of art" pieces. All feature silver or gold contacts. The MK-706 dual paddle is an example of the line, and it features adjustable arm tension and gold-plated contacts. It is priced at $89.95.



For more information, contact Milestone Technologies, 3140 S. Peoria St. Unit K-156, Aurora, CO 80014-3155 (303-752-3382), or circle number 109 on the reader service card.

SGC SG-2020 HF SSB Transceiver

The SG-2020 from SGC is designed as a small, low power, low cost HF companion to the user's current radiotelephone. It is suited to long-range cruising sailboats and coastal cruising and power boats. Current consumption is less than 300 ma in receive mode. A "D" cell dlashlight battery pack is available as an option. Transmitter power of the SG-2020 is adjustable from 0 to 20 watts PEP output and covers the full marine frequency range 1.8–30 MHz. A portable version, the SG-PortaPak, comes with battery pack, microphone case, and shoulder strap.

Retail price of the SG-2020 is $625. For more information, contact SGC, Inc., SGC Building, 13737 SE 26th St., Bellevue, WA 98009 (1-800-259-7331; fax 425-746-6384; e-mail <sgcmktg@aol.com>), or circle 105 on the reader service card.

What did one radio amateur's work have to do with the introduction of commercial, two-way mobile communications? With the introduction of a VLF Distress Frequency during WW II? With the invention of FSK RTTY? The answers to these questions can be found in . . .

The Life and Times of J. Harvey (Harv) McCoy, W2IYX (SK)

As told to

DR. THEODORE J. (TED) COHEN*, N4XX

In 1984 CQ published a series of interviews conducted by Ted Cohen, N4XX, with radio pioneers such as William J. (Bill) Halligan, W9AC/W4AK (SK), founder of Hallicrafters, Inc.; Fred M. Link, W2ALU, founder of Link Radio, Inc.; and David Talley, W2PF (SK), a well-recognized Telecommunications Consultant. During that year, Ted repeatedly beseeched his good friend, Harvey McCoy, W2IYX (SK), to participate in an interview for CQ that would cover his long and distinguished career in radio. Whether out of modesty or lack of time (he then was the editor of "The Long Island DX Bulletin"), Harvey refused to do an interview. Some years later, when Ted again raised the question of an interview, Harvey relented. At Harvey's request, Ted provided a list of the topic areas that were to be covered during the interview. Instead of entering into the give-and-take of a telephone interview, however, Harvey responded to the topic areas listed by preparing a letter containing stories about his many accomplishments in the field of radio communications. However, he made Ted promise that none of the stories would be published while he was alive.

Harvey, as many know, passed away in 1994. And so, it is with a deep sense of loss, and with a great appreciation for his many and varied contributions to the radio art, that we are pleased to present, in Harvey's own words, descriptions of notable events and accomplishments in Harvey's life—events and accomplishments that even today, in some cases, affect your lives and mine. —K2EEK

**8603 Conover Place, Alexandria, VA 22308-2515*

While attending Brooklyn Polytech in the late 1920s, I took a part-time job constructing the transmitter, studio, and remote equipment for newly licensed WLTH. When we put the station on the air, I continued to work with them first as the "studio operator" (now known as a "disc jockey") and then as an announcer. The station's Chief Engineer was Dave Winter, W2AUF. With his help, I learned the International Morse code, and in 1930 I was licensed as W2IYX.

The Beginnings of Commercial, Two-Way Mobile Communications

My first "real job" after I graduated from college with an BSEE was as a Cadet Engineer with the Brooklyn Edison Company. For the first two years I was assigned to work a short period of time in each of their several engineering branches in order to learn the company's practices and procedures.

One day, while riding around with the foreman of an Underground Maintenance Team (who periodically stopped at a pay telephone to give the dispatcher his location and to receive any instructions that had been left for him by his supervisor), I suddenly realized that while I and other amateur radio operators had two-way 5 meter rigs in our personal cars, commercial and municipal vehicles, including police cars, were limited at that time to receive-only radios. When I got back to the office, I phoned a fellow amateur, who at the time was Chief Electrical Engineer of the then-separate New York Edison Company. I suggested that we demonstrate two-way mobile radio to both utilities. He agreed.

The following day I visited the local FCC Office in downtown Manhattan and obtained written approval to demonstrate two-way commercial communications on the amateur 5 meter band. My friend installed his home rig in the dispatcher's office of the Brooklyn Edison Company, and I installed my mobile rig in the car of the foreman to whom I was temporarily assigned. For several days we used these two mobile stations to chat back and forth, ham-style, as we checked our coverage. On the fourth morning of our test, the dispatcher came on the air and asked for our precise location. Moments later he directed us to a manhole about three blocks away from our location. Further, he told us that once we arrived on the scene, we were to cut an underground feeder that had developed a short circuit and that was blowing manhole covers roof-high along its path.

Moments later we were at the prescribed location and our crew proceeded to make the cut. I got on the air and reported the completed assignment to the dispatcher. A few minutes later I was called and told to report to the office of the Brooklyn Edison Chief Electrical Engineer at 9 AM the following morning.

Upon arrival there the next morning, the office was crowded with men who subsequently were introduced to me as members of the Board of Directors of the company. I received all sorts of compliments and was told that the previous day's almost instantaneous response had saved the company hundreds of thousands of dollars. I was directed to get quotes on the transmitters, receivers, and antennas needed to equip the entire Brooklyn Edison Company emergency fleet with two-way radios!

You will recall that while 6 volt battery-powered portable receivers were available at that time, no one was producing mobile transmitters. Therefore, I first re-

visited the local FCC office and obtained a list of high-frequency allocations for commercial use. I also obtained quotes on the equipment I needed from the Western Electric Company (WEC), who agreed to add mobile systems to their product line. But when WEC's quote was delivered to my company, it was rejected as being astronomically high (even though it was less than the amount of money that the Board of Directors had told me we had saved the company in the incident described above).

Determined to fulfill my objective, I visited an executive of the New York Telephone Company and explained how they could develop an entirely new source of revenue through the sale of commercial mobile (and marine) two-way radiotelephone equipment and airtime. I even went so far as to suggest that they consider adding this as a new product line. About a month later they submitted a rate schedule to my company that included the installation of leased WEC mobile equipment. The bid was accepted, and that was the beginning of commercial two-way mobile radio.

World War II, VLF Communications, and Dr. Harold Beverage

At the outbreak of WW II, my friend—the Chief Engineer of the NY Edison Company, who now was a Reserve Colonel in the Signal Corps—offered me an Army commission to join him in his outfit. I visited the Office of the Chief Signal Officer, U.S. Army, in Washington, D.C., to accept the commission. On arrival there, I was escorted to the office of the Commanding Officer, and was shocked to find him to be the very same New York Telephone Company gentleman with whom I had negotiated the mobile radio project. After showing him the telegram I had received from my friend, he said, "Why are you interested in donning a monkey suit? I need a Senior Engineer in this office. Reject the Commission, and come aboard as a Civil Service Employee for much more money than you would get as a Major." I accepted his recommendation on the spot!

About two months later, I was called into the office of General Stoner, the Chief Signal Officer. He told me to be ready to go on a highly classified mission starting two days thereafter. On the appointed day, I was picked up and flown to our base at Presque Isle, Maine. Overnighting in the Officers' Quarters, I was awakened at 4 AM and flown to Gander Lake, Newfoundland, where I was put into a jeep and driven down to the docks. There I boarded a Navy tugboat, which took me out to sea and eventually brought me alongside a big U.S. Navy cruiser. I was strapped into a boson's chair and hoisted aboard the cruiser. Once aboard, I was escorted to the Officers' Wardroom. There, seated at the head of a big table, was President Franklin Delano Roosevelt; alongside him was Winston Churchill, Pierre de Lavalle, and so forth. *All the heads of state of the Allied countries were there.* I was escorted to a seat behind my boss, General Stoner.

The meeting concerned the German submarine menace to our North Atlantic convoys, and specifically was to address ways to combat it. After listening to more than an hour of rhetoric, I whispered to General Stoner, "How much more of this garbage do we have to listen to?" He said, "That's why you're here. What's your idea?" I whispered back. "If we would change the official Distress Frequency to somewhere in the VLF band, our bases would be able to hear the SOS signals from the ships and respond quickly."

At the next break in the discussion, the General stood up and said, "Mr. Commander-in-Chief, my Chief Engineer, Mr. McCoy, has a proposal." FDR said, "Mr.

McCoy, your proposal!" (Mind you, I had nothing prepared, so I decided to begin with an explanation of radio propagation.)

I explained that we were at the bottom of a solar cycle, which resulted in erratic propagation, even at 500 kHz. If, on the other hand, we lowered the official Distress Frequency so as to enable signals to hug the Earth's surface, our numerous bases along the North Atlantic Convoy Route would definitely hear, and be in a position to respond to, the distress calls that were going out. I proposed we change the Distress Frequency from 500 kHz to somewhere in the range 80 to 100 kHz.

When I concluded my 10-minute, off-the-cuff speech, all of the conferees began pounding on the table. FDR said, "Sir, as you can see, your proposal has the unanimous endorsement of this body. Sir, you are herewith authorized all of the needed funds and manpower necessary to implement your proposal at the earliest possible moment. Sir, how soon can you accomplish this project?"

Thoughts raced through my mind. With no VLF equipment available, it meant that I had to redesign and convert existing marine and fixed-station equipment for operation on the new Distress Frequency.

I said, "Mr. President, I estimate three to four months."

FDR responded, "Sir, I double my previous offer of funding and manpower. Please recognize the urgency of the implementation of this project. Sir, you are excused from this meeting to implement your proposal as quickly as possible. Thank you."

Back aboard the tugboat, I realized that I had no experience with VLF! But I knew that Dr. Harold Beverage (of "Beverage antenna" fame) was with the Radio Corporation of America at that time and that he was continuously working with VLF systems for use on their transatlantic radio circuits. I decided to try to get him to assist me. As soon as I got ashore at our base in Newfoundland, I telephoned RCA, spoke with their executive vice president, and arranged a meeting with him and Dr. Beverage that was to take place the following morning in New York. I then called my office in Washington and asked them to have a car awaiting my arrival that evening in New York.

Doc Beverage had a smile from ear to ear as I outlined my proposal for RCA to accept a Government contract that would engage his services for three months to assist me in the VLF project. So important was this project, that while I was there, the RCA contracts manager negotiated the terms of the contract via telephone with the Army Contracting Office in Washington.

I returned to Washington that afternoon, drew up the specifications for the marine and base station VLF receivers and transmitters, and had my engineers coordinate the preparation of formal Invitations to Bid with a maximum 60-day delivery schedule on each solicitation. Following the delivery of the shipboard VLF equipment, installation aboard key Allied ships was begun. Meanwhile, Doc Beverage and I began a tour of our North Atlantic bases. These included Gander Lake, Newfoundland; Goose Bay, Labrador; Julienhaab, Greenland; Reykjavik, Iceland; Prestwick, Scotland; North Cape, Norway; and Murmansk, USSR. We inspected each base in an attempt to find the optimum locations for the big Beverage antennas to be installed. Once prime locations were identified, we instructed each base's Signal Corps crew on the details of Beverage antenna installation as well as on how to install and connect the VLF radios, once they arrived. Because space was usually at a premium, most of the long, horizontal wire antennas were strung atop 25 ft. poles (enabling trucks to pass under them).

The first leg of our return flight took us from Marmansk to Julienhaab. Upon our arrival there, the base commander informed me that a Hammarlund receiver, addressed to me, had arrived that morning. Within a few minutes after connecting the receiver to a Beverage antenna at Julienhaab, *we heard an SOS, the designator of a convoy, the ship's latitude and longitude, and the phrase "Wolfpack 2."* (The convoy was the first to be equipped with the new VLF equipment.) The base immediately dispatched anti-submarine aircraft to the convey, and one submarine was destroyed. Both Doc Beverage and I received Presidential Citations for the part we played in curbing the German submarine menace.

The Invention of Frequency-Shift Keying (FSK)

Shortly after returning from my tour of the North Atlantic bases, I again was summoned to General Stoner's office. The General explained that there was a shortage of telegraph operators in the European Theater.

"Is there any way," he asked, "to automate our several intercontinental radio circuits and thereby enable the transfer of hundreds of Stateside telegraph operators to various overseas assignments?"

"I had heard that Hearst Publications in New York City was experimenting with radio-teletype, but that they had abandoned the effort because they frequently lost entire transmissions. I visited their facility and found that they were "make-break keying" the teletype code. Following a demonstration of their system, it was immediately obvious to me that typical fading on all high-frequency radio circuits was the culprit behind the lost transmissions.

Remembering that the radio fading phenomenon was highly frequency-selective

(meaning that adjacent frequencies did not fade concurrently), I decided to try sending the respective "MARK" and "SPACE" elements of each character on separate frequencies spaced 1000 cycles apart. A test conducted on a circuit between radio communications station WAR at Beltsville, Maryland and our station outside London, England proved that frequency diversity was the key to maintaining communications. During the two-month test we occasionally got a misprinted character, but *we never lost sync.*

In the experimental radioteletype receiver converters used for the test described above, I employed narrow passband audio filters that were obtained from the Army Signal Laboratory at Fort Monmouth, New Jersey. For the MARK signal I had used a 2000 cycle filter, and for the SPACE signal a 3000 cycle filter. However, when the Army put out the Invitations to Bid on a quantity of the systems I had designed, the various manufacturers who responded all reported that there would be extensive production delays because of the commercial unavailability of the specified 2000- and 3000-cycle narrow passband filters. Western Electric Company advised me, however, that they had a stock of 2125- and 2975-cycle audio filters that they used in their multi-channel telephone circuits. *This was the reason why I finally had to settle on an 850-cycle frequency-shift RTTY standard.* My U.S. Patent #2,672,509, entitled "Teletypewriter Frequency Shift Transmission," was filed on November 12, 1943. It was immediately put under wraps as Classified Material. The patent was then declassified on March 16, 1954, and although it was still in my name, it was assigned to the United States of America, as represented by the Secretary of the Army.

Epilogue (by N4XX)

Following WW II, Harvey was offered—and accepted—the position of Chief Communications Engineer with Pan American Airways (PAA). He roamed the world, visiting many countries on all continents, where he excelled in helping them to update their international radio communications and air navigation systems.

After having seen most of the world, Harvey quit PAA and started his own consulting engineering company. His first contract, with Piper Aircraft, was for design and fabrication of the first air navigation-autopilot system for private aircraft. The system was introduced in the Piper Cub.

At this time, too, Harvey became active in local, state, and national politics. During the Eisenhower Campaign, for example, he was called upon to be the "advance man" for Ike's famous Whistle-Stop Campaign. Harvey's job was to visit each city on the agenda a couple of weeks before Ike's scheduled arrival, meet with the local leadership, learn about their problems and suggested cures, and then write a few paragraphs that Ike would include in his speech, thus proving that he was well aware of each city's needs.

Independently, Harvey submitted to New York State a plan for the computerization of the records of the Boards of Election. His proposal also included provisions for the computerization of voting machines so that it would be possible to obtain automatic readout and recording of election returns as well as total vote tabulations in each county. For this and other contributions, Harvey earned a position with the Suffolk County Board of Elections. (Although the state computerized all of the state's Boards of Elections records, they never were able to obtain funding for the computerization of the individual voting machines.)

Finally, in his later years, while Editor of "The Long Island DX Bulletin," Harvey continued to update a Navy SONAR patent (U.S. Patent #3,038,551) for another of his inventions. For this work, and upon the Navy's recommendation, Harvey was awarded an Honorary Doctorate in Electronic Engineering. ■

1997 CQWW DX SSB Contest High-Claimed Scores

Following are raw scores only and are subject to verification.

WORLD SINGLE OP ALL BAND

ZD8Z 14,254,844
EA8BH 14,216,172
P40W 13,462,820
3V8BB.....9,475,761
VE3EJ.....8,766,120
FG5BG.....7,736,040
V8EA.....7,018,892
P40E 6,898,920
5NØT 6,616,485
FR5DX 6,269,179
K5ZD/1.....5,825,763
4N9BW.....5,332,964
5X1Z 5,087,165
FM5BH.....4,894,500
NH7A 4,643,618
9K2HN 4,629,960
YT1BB.....4,528,188
HC5C 4,517,271
N6BV/1.....4,229,806
HH2PK.....4,059,048
YT1AD 4,022,275
S59ZA.....4,018,278
YB1AQS....3,972,738
GW4BLE...3,934,656
DL6FBL.....3,823,540
VO1MP 3,756,466
W4AN.....3,751,272
K3ZO.....3,638,880
V47KP.....3,513,930
UT4UZ 3,468,300
EA4KD 3,463,350
VE2QRZ....3,460,050
RN6BY 3,401,262
JY9QJ 3,394,344
W3BGN.....3,377,005
DJ4PT 3,348,357
K4ZW 3,337,274
DL2NBU....3,297,852
JH4UYB 3,146,862
W9RE.....3,103,580
JAØQNJ 3,044,100

28 MHz

AY7D.....1,525,272
LU6ETB 1,439,744
9XØA.....1,373,556
5X4F 1,202,612
PP5UB 1,056,188
ZZ2B 972,490
5B4MF 832,473
9HØA.....753,228
ZS6SA.....671,370
CX8DX.....628,866
LU4VZ.....562,440
ZP6CC 517,086
4X1VF 493,167
CE6ABC.....479,160

21 MHz

ZX5J.....3,373,068
5X1T 1,812,780
ZP5XF.....1,661,660
P43A 1,621,368
II3T.....1,418,131
EA9KB 1,373,436
4O6A.....1,256,346
S53R.....1,067,040
ZV8C.....1,042,866
9A4D 1,038,510
YU9A.....927,736
CT1DIZ 927,424
WHØAAV.....906,660
IQ6F 865,536
UX2MM.....858,690
F6EZV.....804,270
V47NS.....788,964
S50U 782,694
N5LT 773,280
KH2D 772,543
WP3A.....758,559
S50L.....751,512

14 MHz

5B4AGC....2,295,160
8R1K.....1,904,252
9Y4NZ.....1,443,772
9M8R 1,419,690
YW1A.....1,419,520
IR4T 1,369,235
M7Z.....1,349,205
S50K 1,317,709
OM5DX 1,169,450
IG9STG.....1,166,607
HA3UU.....1,128,744
4N7B.....1,078,365
PQ5W 1,060,144
OM5M 1,048,610
V29NR 996,156
S58AB.....992,155
OF5LF.....937,392
OF5LF.....937,392
S53M.....917,488

7 MHz

IG9GSF.....1,323,966
OK1RI 882,180
HA3O 664,326
9Y4VU.....607,257
HA9RE.....560,616
IR1A.....487,329
LU6MFD.....366,786
OY3JE.....360,932
RW4AA 346,005
AH8A.....340,761
N7DD 340,308

3.7 MHz

SP3GEM.....331,898
IG9EQO 251,327
VX3BY 234,850
IR4T 230,078
OM2TW.....175,381
G3WGN 156,832
S50Y 140,389
ON5LL.....131,223
W6RJ 125,832
OE9MON 114,120
N2KK/6.....108,222
IT9BLB.....107,590
UT2IY.....104,198

1.8 MHz

VX3BMV/1 ...154,230
YU1EA 85,448
SV8CS 75,096
SM6DOI 70,048
UA2FJ 62,693
S54DL.....61,950
IK2DED 59,644
S50C.....56,232
OZ3SK 52,466
S57M.....45,114
RZ3QU.....38,520
CU2CE.....36,108
GW7J 24,388
YV2IF 21,942
K8MK 20,735

LOW POWER ALL BAND

TI1C 8,045,625
VP9ID.....3,301,644
OD5NJ 2,986,772
LQØN 2,806,680
EA7WA 2,183,990
TR8IG 2,102,376
G4KIV 1,730,541
LY3BA.....1,529,178
4M5E.....1,480,608
S57DX.....1,428,496
LU8ADX....1,344,020
UAØJB.....1,331,704
ATØMB.....1,327,700
LX1KC.....1,324,708
TM6A 1,306,119
S52ZW 1,263,675
LU8HLI.....1,190,681
OE2S 1,120,842
S59AA.....1,116,445
IR4R.....1,112,952
K2AZ 1,095,300
WP4NHM ..1,083,486
KC5WCO ..1,076,589
WD5K.....1,046,150
J3/DL5MAE 1,045,845
LU3FMR....1,044,702
WA1S.....1,043,118
EA3BKI 1,023,268
NP2Q 1,011,600
IV3UHL 1,011,318
W2GG/3 1,009,584
VE3FU 1,009,052

28 MHz

LU3HYS.....936,225
LU3MDO.....819,200
PU2RUX 701,820
LU4DX 659,432
AZ9W.....594,750
LU7HTJ.....563,024
PU2MHB.....558,486
LW3HAD.....526,713
LU4FCZ 469,452
VP2VF.....451,638
CV1T.....438,239
PY2SR 435,625
ZX2A.....403,512
LU8FXF.....350,773
PY2GY.....343,970
LU6FJZ 329,770
S53X.....318,231
LU4DZ.....311,661

21 MHz

UA4LCQ.....656,022
CN8NK.....592,491
9G1BJ.....577,318
UA4POL.....530,090
LU7FJD.....506,940
UN5PR.....475,952
S57J.....396,984
RZ6HX.....380,052
YZ4IZ 355,360
JS2LGN 326,886
JH6RFT/1.....315,468
CT1ELP 310,453
T91ENS 305,634
SP3SLA 289,296
RA6LW.....287,973
S53ZO.....286,104
CX8AT 280,904
Z32BU.....259,882
ON5JS 255,024

14 MHz

IT9STX.....811,502
HA5BSW.....660,919
LS9F 592,204
ES2RJ.....534,131
YO4GAO.....532,504
PP5JD.....495,963
IQ7A.....452,574
IR2R.....451,440
YV5NNW.....390,888
JR4PMX/1 284,456
S57U 258,128
LY2BTA.....226,200
LU1UD 221,578
N4MO.....205,128
YU1EL.....203,796

7 MHz

XM7A 331,300
CT1AOZ.....204,720
YY5OHI.....176,336
U5WF.....90,530
UR7TZ 72,600
S54A 71,303
UR6EA 62,752
YC8UYB.....62,464
T95A 50,320
KW4T.....44,440
JM4WUZ.....37,720

3.7 MHz

4L5O 90,624
Z39Z.....77,176
S51TA.....73,050
9A4RU 62,548
S50Q.....54,432
IQ5Q 48,357
OM5KM.....41,230
OK1FPS.....38,676
S57CBS 29,463
UX2MF.....29,376
LZ1DM 28,672
OM7AB 27,848
G3XTT 25,452

1.8 MHz

HA8BE 36,224
S54E 29,951
ES6MO 21,200
UU4JMG 20,349
PA2SWL 16,200
YU1RA.....13,950
LY1FW.....8,897
SP2EXN.....7,250
YU1AST.....7,224

QRP ALL BAND

YU1KN.....427,074
KD2TT.....373,910
KH6/NØKE ...338,070
YU1LM.....204,120
S59D.....169,257
N7VY.....153,792
N9SXT 133,584
W6YJ 112,216
N8XA.....110,112
SM3CCT 100,097
OK1DKS 100,045

ASSISTED ALL BAND

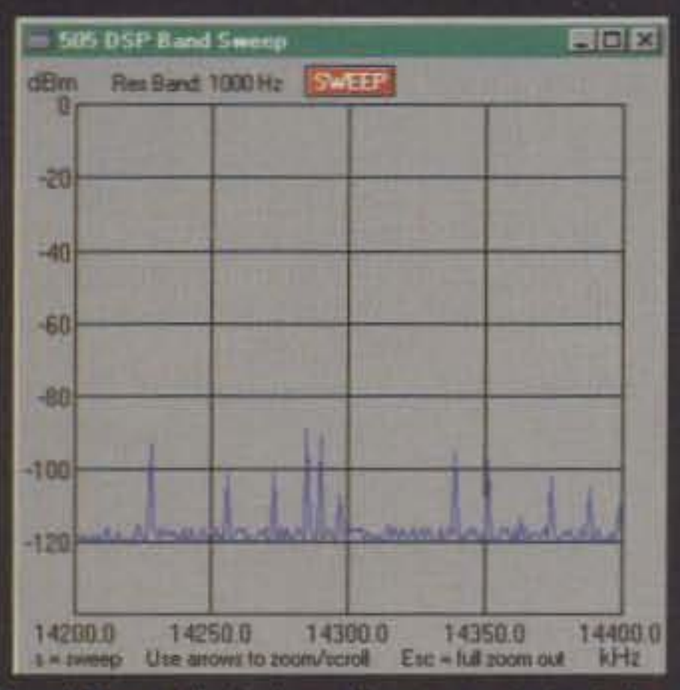
TM2V 4,564,890
DLØWW 3,470,103
KS1L 3,300,346
K3WW.....2,906,602
N3AD 2,896,250
Z38G 2,849,244
K3NZ.....2,553,216
N2MM 2,313,224
RA3AUU ...2,141,018
IKØHBN.....2,134,400
AA3B.....2,008,864
IN3ZNR.....2,007,148
S54ZZ 2,001,915
LY5W 1,998,405
VK5GN.....1,956,039
VD3DX.....1,919,331
IO4A.....1,829,880
K1MY 1,817,376
K3ND 1,814,674
W1GD 1,792,450
N3MKZ.....1,752,597
DJ2YA.....1,680,262
W4WA.....1,666,008
K1AM 1,637,661
VR97BG....1,622,680
K4ZAM.....1,569,267
AA3JU.....1,550,619
K3OO 1,543,479
K3SW/4.....1,526,280
K2TW.....1,511,776

MULTI-SINGLE

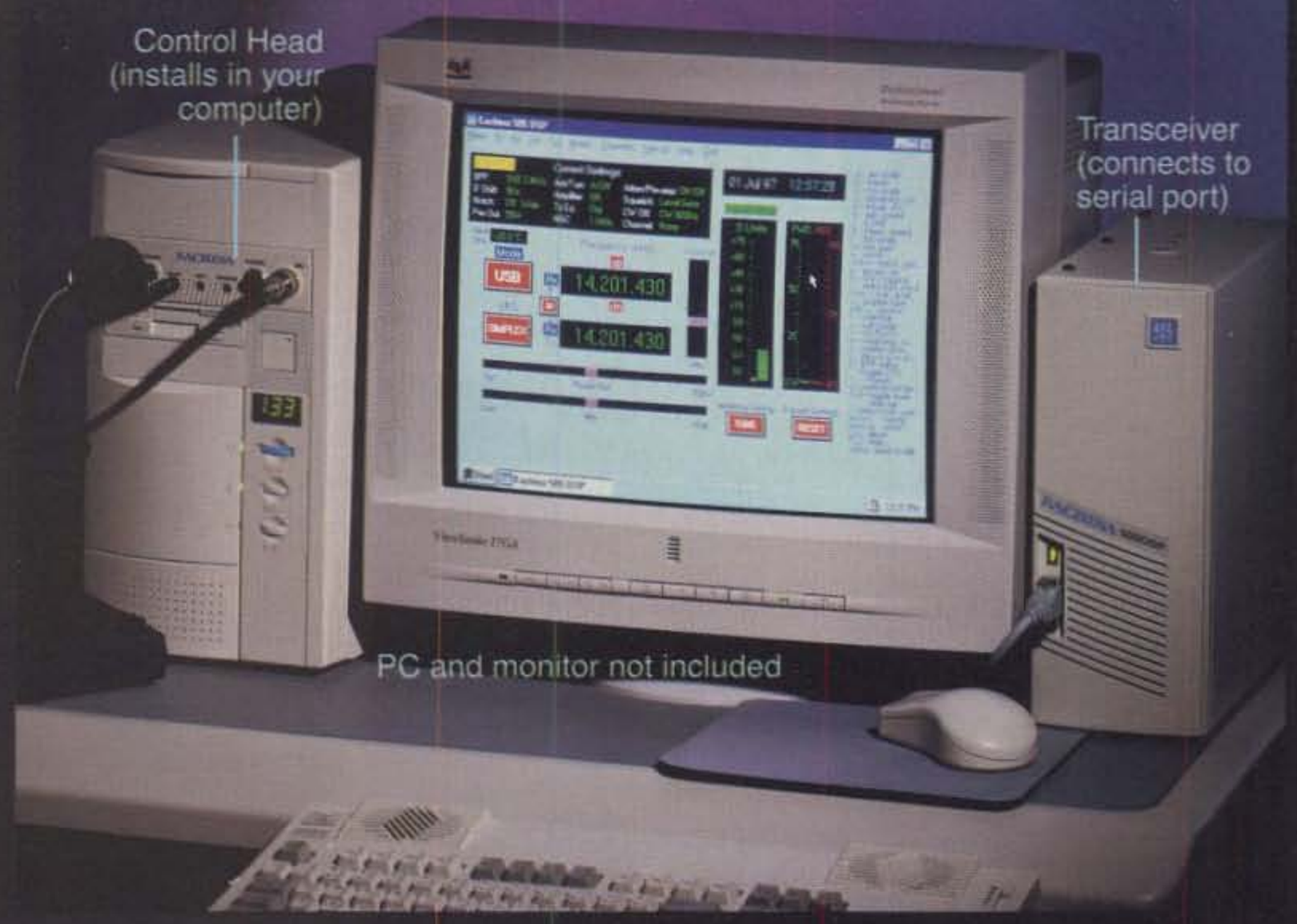
ZXØF 21,387,930
P3A 21,004,373
HC8N 19,285,252
EA8ZS.....15,330,926
8P9Z 15,160,509
ZW5B 14,236,040
CT3BX 12,559,956
IQ4A.....12,395,108
6D2X.....11,496,320
IH9/OL5Y 10,784,466
HG1S 9,990,888
TM2Y 9,911,676
NH2C 9,082,482
VP5DX 8,678,475
OT7T 8,420,440
LT1F.....8,012,984
LZ5Z.....7,877,216
TM1C 7,650,432
RZ9AZA 7,579,015
LZ9A 7,565,432
IR2W 7,126,665
XE2DV 7,075,834
L40H 7,028,970
W2A 6,796,688
LU6FBI.....6,439,356
RZ3Q 6,322,290
N2NU 6,297,798
RU6LWZ ...6,258,519
FO8DX 6,196,104
UA2AA 6,105,748
ZPØR.....6,095,736

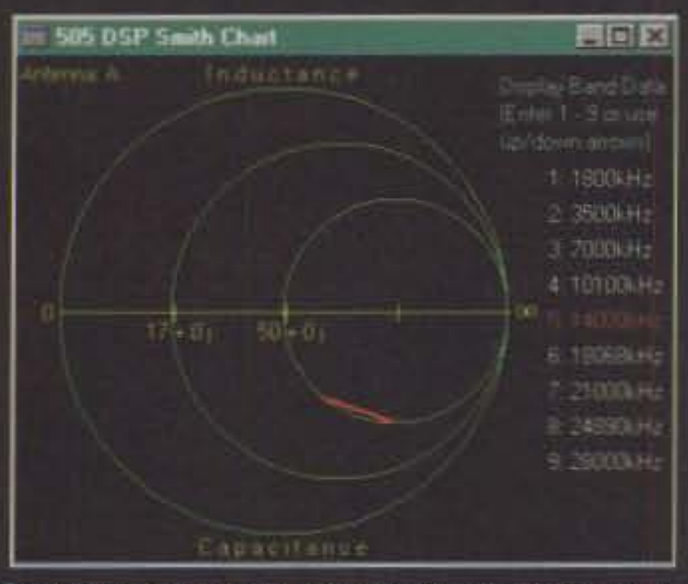
MULTI-MULTI

PJ9B 40,373,934
V26B 30,802,086
TK5NN 24,099,951
9A1A 21,190,080
CI9DH 18,587,540
N2RM.....16,213,924
P29AS.....16,198,270
KH7R 15,681,216
L70FM.....15,239,688
K3LR.....14,914,872
KC1XX 14,904,428
OT7A.....14,802,800
J3A.....14,269,640
W3LPL 13,995,570
K1KI 12,850,640



"Band Sweep" window allows you to look for the pile-ups. "Point and click" the mouse to instantly change frequency and join in.





"Smith" chart window instantly displays your antenna Z for the entire band.

Built-in logging software lets you keep track of your QSOs.

The New Approach to HF Radio!

The Kachina 505DSP Computer Controlled Transceiver

Features:

- Operates with any Computer Running Windows 3.1, 95 or NT. (Computer need not be dedicated to 505DSP control)
- 100 Watts PEP Output
- Covers all Amateur HF Bands on TX, plus 30 kHz-30 MHz Receive
- IF Stage 16/24 Bit DSP
- 11 DSP Bandpass Filters
- CW Keyboard Transmission and 9 CW Buffers
- 2 Antenna Ports and 3 Accessory Ports to Interface with External Amplifiers, Antenna Tuners and TNCs
- Automatic Frequency Calibration from WWV or other External Standard
- "Snapshot" Keys for Instant Recall of Frequencies and Settings
- Optional Internal or External Antenna Tuners

You will have heard about the revolutionary new Kachina 505DSP Computer Controlled Transceiver by now. Perhaps you're in the market for a new rig, and wondering if computer control is really the way to go.

If the other 100 watt radios on the market could draw you a graph of band activity, antenna impedance, calibrate meters to show S-units, volts, dBm, ALC, VSWR, forward power or reflected power, let you type your CW messages from a keyboard, or calibrate themselves from WWV, you wouldn't need a 505DSP. But the simple fact is, most other rigs don't have any of these features.

Even without the extras afforded by computer control, the 505DSP is a heck of a rig, above all, built in the USA to commercial standards. With sophisticated IF stage, 16/24 bit DSP technology, 11 "brick-wall" bandpass voice/CW/data filters down to 100 Hz wide (no ringing), excellent receiver sensitivity, carrier and opposite-sideband suppression and a low distortion P.A.; you'll soon wonder why all radios aren't designed this way.

To ensure that your 505DSP stays current for years to come, Kachina has a policy of providing free software upgrades from our internet website, so you won't be stuck with "last years model" as revisions are made.

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CIRCLE 126 ON READER SERVICE CARD

OH2HE....10,306,928
JH5ZJS ...10,119,870
VP5T 10,102,392

USA
ALL BAND
HIGH POWER

K5ZD/1.....5,825,763
N6BV/1.....4,229,806
W4AN.....3,751,272
K3ZO.....3,638,880
W3BGN.....3,377,005
K4ZW.....3,337,274
W9RE.....3,103,580
W1WEF.....2,655,939
WB9Z.....2,624,852
K4AB.....2,485,219
N2IC/Ø.....2,476,868
W2RE.....2,358,545
K2DM.....2,246,199
W6XR/2.....2,184,556
W7AT.....2,067,625
K6NA.....1,870,579
K5MA/1 1,618,694
K6GX 1,578,558
W7VJ 1,525,490
W6NL.....1,399,279
NY3Y.....1,351,058
W9LT/8 1,306,612
K9GD 1,297,100
K8LN.....1,295,649

28 MHz

KZ5MM 223,695
W6AX.....121,500
N4BP.....111,280
K4VUD 75,828
KKØSS 59,049
KF6JFG.....48,774
N7DR/Ø 22,356
WB4UBD.....19,251
W8CO 17,892
N6EE.....15,174

21 MHz

N5LT 773,280
N4UK 614,592
WC4E.....610,641
W5WMU.....519,168
KC2X/4.....490,282
K3ZJ/8.....479,067
K4JYO.....437,716
K9IG.....394,128
NA5B.....385,212
NØNR 308,560

14 MHz

K8DX.....782,946
N3HBX.....547,638
K9JF/7.....525,000
KØKX.....461,198
W9IW 393,914
WØUN 330,720
K4NO 249,787
W8TWA.....226,780
W8UD 181,951
W9OF.....172,568

7 MHz

N7DD 340,308
K5UZ.....241,332
N3RS 199,728
WQ2M.....167,580
KVØQ 153,855
NJ6D/7.....139,440
N2PP.....84,240
KF9YT.....78,934
KD9ST 72,500
KZ2I/4 70,918

3.7 MHz

W6RJ 125,832
N2KK/6.....108,222
W4DC 37,222
W8UVZ 25,860
W2LU 20,800
K7ZZZ.....12,670
W5FO.....10,395
W9RN 8,928
WB7EWC.....6,708

1.8 MHz

K8MK 20,735
W4DR 10,788
K1VW.....9,231
W2VO 9,204
KN2T.....5,166
AA4MM 2,788
AD4Z.....1,652
K3SV.....1,035

LOW POWER
ALL BAND

K2AZ.....1,095,300
KC5WCO ..1,076,589
WD5K.....1,046,150
WA1S.....1,043,118
W2GG/3 1,009,584
WO4O.....895,898
KQ3V 851,096
N4DL.....848,861
KC6ETY/2 783,835
AA1BU 750,550
WS1A.....744,016
N9VVV 738,290
WW3S.....683,886
WA7BNM/6 ..683,552
KR4QI 634,900
ACØW 625,100
K1HT.....531,897
WA2C/3.....525,000
KE8GG.....513,925
KA2CDJ 512,454

28 MHz

KC3PZ 95,418
AI2C/4 83,821
WB2BZR/3 53,756
W3EP/1 49,538
WB4HFL 36,062
K7CK.....36,046
AC6WD 33,800
WJ7S 31,598
WM9G.....24,766
N8FWA 23,166
AAØMQ 21,982

21 MHz

K4SN.....155,610
WA1FCN.....125,580
KB8IBS 116,487
KF8K.....110,565
K6RO 100,470
K1VSJ 98,010
K4WW.....78,383
K4PC.....71,415
W9HV.....63,657
K8KM 62,730
KA2JEM 62,177

14 MHz

N4MO.....205,128
K2MFY 176,045
K1VUT 168,704
AA7UN 126,000
W7FP.....119,888
WD4CNZ.....113,283
WB2QVA/1...102,776
K2AW.....92,664
K1VR.....61,506
NY3C 51,300

7 MHz

KW4T 44,440
WØAH 34,380
WA4QDM.....15,343
N9ENA 3,520

3.7 MHz

W1MK 4,515
KD5BXQ 1,860

1.8 MHz

None

QRP ALL BAND

KD2TT.....373,910
N7VY.....153,792
N9SXT 133,584
W6YJ 112,216
N8XA.....110,112
WA8AGH 97,792
W3ECU 40,836

ASSISTED
ALL BAND

KS1L 3,300,346
K3WW.....2,906,602
N3AD 2,896,250
K3NZ.....2,553,216
N2MM 2,313,224
K1MY 1,817,376
K3ND 1,814,674
W1GD 1,792,450
N3MKZ.....1,752,597
W4WA.....1,666,008
K1AM 1,637,661
K4ZAM 1,569,267
AA3JU.....1,550,619
K3OO 1,543,479
K3SW/4.....1,526,280
K2TW 1,511,776
W3MM.....1,425,081
N4VZ.....1,421,564

MULTI-SINGLE

W2A 6,796,688
N2NU 6,297,798
K1NG 5,389,056
W9JA 5,118,141
K2TR.....4,952,080
K4ISV.....4,835,596
K4FCC 3,572,705
K6IDX.....3,539,025
W3GNQ 3,336,552
KØRF.....3,166,956
KB1SO 3,075,644

MULTI-MULTI

N2RM.....16,213,924
K3LR 14,914,872
KC1XX 14,904,428
W3LPL 13,995,570
K1KI 12,850,640
W1FJ.....7,648,835
K1NU 7,307,154
N4ZC.....7,062,138
K1RO 6,509,921
W2AX.....5,987,410
W3EA.....5,943,700
K1RX.....5,838,058
NQ4I.....5,781,140
W4MYA.....5,740,970

EUROPE
ALL BAND
HIGH POWER

4N9BW.....5,332,964
YT1BB.....4,528,188
YT1AD 4,022,275
S59ZA 4,018,278
GW4BLE ...3,934,656
DL6FBL.....3,823,540
UT4UZ 3,468,300
EA4KD 3,463,350
RN6BY 3,401,262
DJ4PT 3,348,357
DL2NBU....3,297,852
UTØD 2,472,666
OHØTA.....2,416,254
OF1MM 2,367,495
IK4ADE 1,719,010

28 MHz

9HØA.....753,228
CT4NH.....384,489
YT1R.....356,265
IO4LCK 347,679
S50R.....302,604
I8KPV.....268,736
S53O.....222,780
S52OT.....189,198
DF9XV 181,125
GØAEV.....152,148

21 MHz

II3T.....1,418,131
4O6A.....1,256,346
S53R.....1,067,040
9A4D.....1,038,510
YU9A.....927,736
CT1DIZ 927,424
IQ6F.....865,536
UX2MM 858,690
F6EZV.....804,270
S50U.....782,694

14 MHz

IR4T 1,369,235
M7Z.....1,349,205
S50K 1,317,709
OM5DX 1,169,450
HA3UU.....1,128,744
4N7B.....1,078,365
OM5M 1,048,610
S58AB.....992,155
OF5LF.....937,392
S53M.....917,488

7 MHz

OK1RI 882,180
HA3O 664,326
HA9RE 560,616
IR1A.....487,329
OY3JE.....360,932
RW4AA 346,005
SP4EEZ 242,808
YT4D.....180,090
LY3BX.....166,496
SM2DMU 165,416

3.7 MHz

SP3GEM 331,898
IR4T 230,078
OM2TW.....175,381
G3WGN 156,832
S50Y 140,389
ON5LL.....131,223
OE9MON 114,120
IT9BLB.....107,590
UT2IY.....104,198
UUØJM.....96,418

1.8 MHz

YU1EA 85,448
SV8CS 75,096
SM6DOI 70,048
UA2FJ.....62,693
S54DL.....61,950
IK2DED.....59,644
S50C.....56,232
OZ3SK.....52,466
S57M.....45,114
RZ3QU.....38,520

LOW POWER
ALL BAND

EA7WA 2,183,990
G4KIV 1,730,541
LY3BA.....1,529,178
S57DX.....1,428,496
LX1KC.....1,324,708
TM6A 1,306,119
S52ZW 1,263,675
OE2S 1,120,842
S59AA.....1,116,445
IR4R.....1,112,952
EA3BKI 1,023,268
IV3UHL 1,011,318
HA1CW.....979,490
HAØIT.....954,585
F5NZO 906,752

28 MHz

S53X.....318,231
SP9W.....231,132
EA7HBP.....170,300
YU1CV.....165,048
EA7GTF.....149,406
EA7FUN.....146,484
ISØNHT.....140,063
ISØGYW.....137,917
OM5FA.....130,875
UX8I.....106,000
S51MA 102,240

21 MHz

UA4LCQ.....656,022
UA4POL.....530,090
S57J.....396,984
RZ6HX 380,052
YZ4IZ 355,360
CT1ELP 310,453
T91ENS 305,634
SP3SLA 289,296
RA6LW.....287,973
S53ZO.....286,104

14 MHz

IT9STX.....811,502
HA5BSW.....660,919
ES2RJ.....534,131
YO4GAO.....532,504
IQ7A.....452,574
IR2R.....451,440
S57U 258,128
LY2BTA.....226,200
YU1EL.....203,796
ON4CAN 179,685

7 MHz

CT1AOZ.....204,720
U5WF.....90,530
UR7TZ 72,600
S54A 71,303
UR6EA 62,752
T95A 50,320
UX3M.....22,576
DL4VBS 21,375
SP9ABU.....17,710
UT1WW 11,385

3.7 MHz

Z39Z.....77,176
S51TA.....73,050
9A4RU 62,548
S50Q.....54,432
IQ5Q 48,357
OM5KM.....41,230
OK1FPS.....38,676
S57CBS 29,463
UX2MF.....29,376
LZ1DM 28,672

1.8 MHz

HA8BE 36,224
S54E 29,951
ES6MO 21,200
UU4JMG 20,349
PA2SWL 16,200
YU1RA 13,950
LY1FW 8,897
SP2EXN.....7,250
EA4AV 6,528

QRP
ALL BAND

YU1KN.....427,074
YU1LM.....204,120
S59D.....169,257
SM3CCT 100,097
OK1DKS 100,045
EA1GT 97,328
IØKHP 93,758
CT1ETT 91,950
RW3AI.....91,304
EA7AQV.....52,524
RA3DGH.....47,320
I3MDU.....40,217
ON7CC 31,460

ASSISTED
ALL BAND

TM2V 4,564,890
DLØWW 3,470,103
Z38G 2,849,244
RA3AUU ...2,141,018
IKØHBN.....2,134,400
IN3ZNR.....2,007,148
S54ZZ 2,001,915
LY5W 1,998,405
IO4A.....1,829,880
DJ2YA.....1,680,262
G4OJH.....1,455,180
DL5IC.....1,152,440
DK9DA 1,131,669
SM2EKM...1,117,030

MULTI-SINGLE

IQ4A.....12,395,108
HG1S 9,990,888
TM2Y 9,911,676
OT7T 8,420,440
LZ5Z.....7,877,216
TM1C 7,650,432
LZ9A 7,565,432
IR2W 7,126,665
RZ3Q 6,322,290
RU6LWZ ...6,258,519

MULTI-MULTI

TK5NN 24,099,951
9A1A 21,190,080
OT7A.....14,802,800
OH2HE....10,306,928
RW6AWT ..9,783,876
GM7V.....9,342,648
PI4COM 8,782,246
EA4URE....8,410,840
HBØ/
HB9AON .5,507,465
LY7A 4,603,188

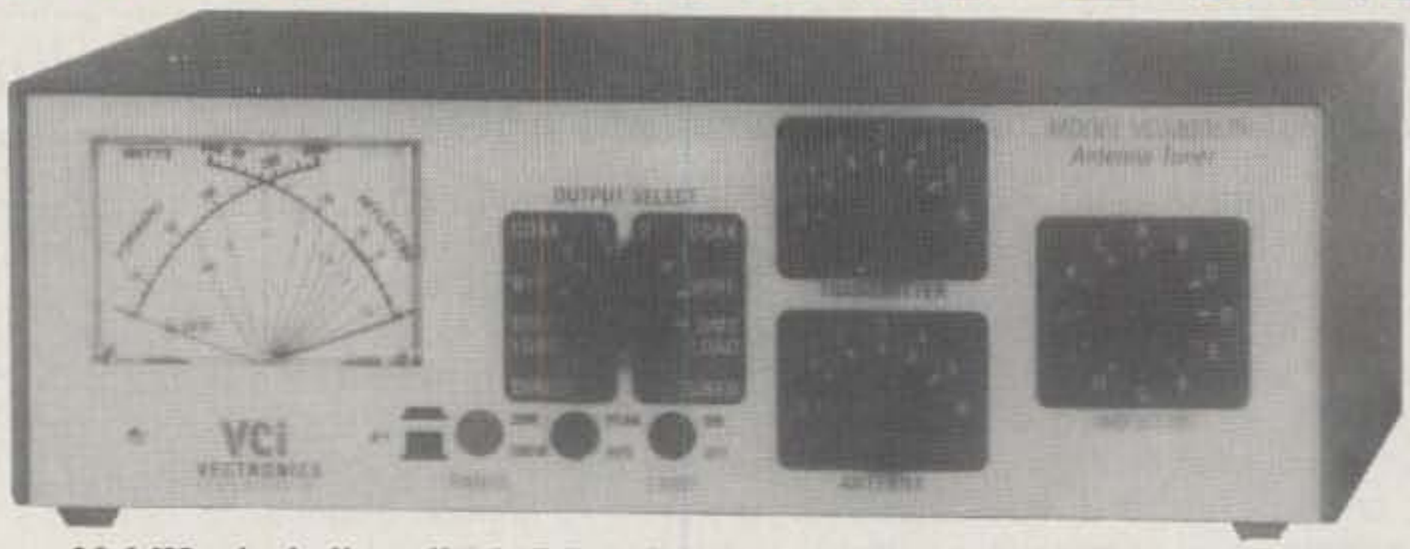
THE VECTRONICS VC-300DLP . . .

300 WATT ANTENNA TUNER

- *Multi48™ Inductor*
- *Cross-Needle Meter*
- *8 Position Antenna Switch*
- *Built-in Dummy Load*
- *1.8 to 30 MHz Coverage*

VC-300DLP

$159.95



The VECTRONICS VC-300DLP is the world's most versatile 300 Watt antenna tuner!

You'll get everything you've ever wanted . . . precise inductance control that rivals roller inductors . . . the ability to match any real antenna . . . full 1.8-30 MHz coverage . . . peak reading backlit Cross-Needle Meter . . . 8 position antenna switch . . . built-in 50 Ohm dummy load . . . finest components available and world class quality.

Precise Inductance Control

VECTRONICS' exclusive *Multi48™* inductor gives you *forty-eight* inductance values -- you'll get precision tuning that rivals the most expensive roller inductors.

Tune any antenna 1.8-30 MHz

You can tune any real antenna from 1.8 to 30 MHz, including all MARS and WARC bands. Use verticals, dipoles, inverted vees, yagis, quads, long-wires, whips, G5RVs, etc.

Has 4:1 balun for balanced line antennas.

Handles up to 300 Watts SSB PEP, 200 watts continuous (150 Watts on 1.8 MHz).

Peak Reading Cross-Needle Meter

The VC-300DLP backlit Cross-Needle meter displays SWR, forward and reflected power simultaneously. Reads both peak and average power on 30/300 watt scales. Meter lamp has front panel switch and uses 12 VDC or 110 VAC with AC-12 adaptor, $12.95.

Versatile Antenna Switch

The VC-300DLP eight position antenna switch lets you select two coax fed antennas, random wire/balanced line or built-in dummy load for use through your tuner or direct to your transceiver. Bypass position bypasses your tuner but keeps your SWR Power meter in line.

Built-in Dummy Load

A built-in 50 Ohm dummy load makes tuning up your rig easy! Use it for testing and repairing your rig, setting power level, adjusting your mic gain and more.

World Class Quality

The finest components available and the highest quality construction gives you the *best* 300 Watt antenna tuner that you can buy.

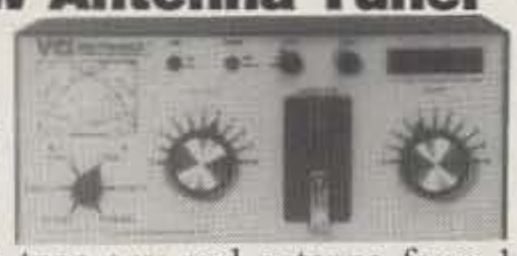
A chemically treated aluminum case with durable baked-on paint and scratch-proof multi-color Lexan front panel looks great for years of dependable service.

Try any product for 30 days

Call toll-free 800-363-2922 and order any product from VECTRONICS. Try it for 30 days. If you're not completely satisfied return it for a full refund, less shipping and handling -- no hassles. All VECTRONICS products come with a one year warranty.

2 kW Antenna Tuner

HFT-1500
$459.95



You can tune any real antenna from 1.8 to 30 MHz for absolute minimum SWR.

The HFT-1500 is crafted of the finest components available . . . two *heavy duty* 4.5 kV transmitting variable capacitors and a *high current* roller inductor with a precision 5 digit *gear* driven turns counter. Gives you arc-free operation up to 2 kW PEP SSB.

Has backlit, peak-reading Cross-Needle SWR/Power meter, *SSB✻Analyzer Bargraph™*, 6 position *ceramic* antenna switch, 4:1 Ruthroff balun for balanced line. Scratch-proof Lexan front panel. 5.5x12.5x12 inches.

300 Watt *Mobile* Tuner

VC-300M
$109.95

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 1.8-30 MHz. Handles 300 Watts SSB PEP, 200 Watts continuous, (150 Watts on 1.8 MHz.). 7.25x8.75x3.6 in. Weighs 3.4 lbs.

SWR/Power Meters

PM-30
$79.95
PM-30UV
$89.95

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.

1500 Watt *dry* Dummy Load

DL-650M, $64.95. Handles 100 watts continuous, 1500 Watts for 10 seconds to 650 MHz. Ceramic resistor. SWR < 1.3. SO-239 connector. **DL-650MN, $69.95** has N connector.

Low Pass TVI Filter

LP-30, $69.95. Eliminates TVI by attenuating harmonics at the source. Plugs between transmitter and antenna or tuner. Handles 1500 watts.

High Pass TVI Filter

HPF-2, $24.95. Installs between VCR/TV and cable TV or antenna lead-in cable. Eliminates or reduces interference caused by nearby HF transmitters.

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CIRCLE 157 ON READER SERVICE CARD

BY IRWIN MATH, WA2NDM

MATH'S NOTES

WHAT'S NEW AND HOW TO USE IT

Some Pointers on Shielding

Almost every project that we as experimenters build gets mounted in some sort of housing or enclosure. Often it is desirable to shield these projects so that they do not pick up unwanted signals nor radiate unwanted RF. However, enclosures are not perfect. There is always a seam, crack, connector access hole, ventilation grille, or other similar opening that may allow RF to leak in or out. In addition, the materials available for the construction of such housings often range from aluminum to steel to copper. How do we deal with all of this? The purpose of this month's column is to try to shed some light on this subject.

When the frequency range to be blocked is low—such as audio, sensitive DC circuits, very low speed digital logic, and random magnetic fields—only iron- or ferrous-based materials will do the right job. This material has what is termed a high "permeability" to such fields and is used around most commercial microphones, low-level audio preamplifiers, and the like.

c/o CQ magazine

If you try to pick up a paper clip with a magnet through a piece of thin iron or steel, you quickly will see what I mean. The magnet easily will attract the paper clip through thin aluminum foil, but not through any iron-based material, no matter how thin. As the frequency rises, aluminum and copper become more and more effective, and in the true RF region both work quite well. The only problem here, as already mentioned, is that any enclosure has openings of one sort or another, especially around the edges if the enclosure is made of sheet metal or PC board material. The problem now becomes how to deal with such openings.

Fig. 1 is a simple table of frequency versus wavelength for some of the RF regions of interest to experimenters. It should be noted that if an opening is longer than a particular wavelength, it will function as a slot antenna and actually radiate (as well as receive) RF. If it is shorter, it will attenuate the RF to a degree that is a function of the ratio of the slot length to the wavelength. At one quarter the wavelength (1.5 meters for the 6 meter band) the slot will attenuate a signal passing through it by 6 dB. At one eighth the wavelength, as shown on the chart, the attenuation factor will drop to 20 dB, and at one sixteenth of the operating wavelength (also shown) it will be attenuated by 26 dB. This means, for example, that to build a good 6 meter enclosure, there should not be any openings longer than 150 mm, or 5.9 inches. While this may seem a large opening, remember that its attenuation factor is only 26 dB. A sensitive receiver may require 80 or 90 (or more) dB of attenuation, which means that the opening has to be practically non-existent. When we consider normal construction practices, particularly the way in

Frequency	λ	–20 dB	–26 dB
28 MHz	10.7 m	536 mm	268 mm
50 MHz	6 m	300 mm	150 mm
150 MHz	2 m	100 mm	50 mm
220 MHz	1.36 m	68 mm	34 mm
450 MHz	0.66 m	33 mm	17 mm

Fig. 1– Chart of signal attenuation by various size slots.

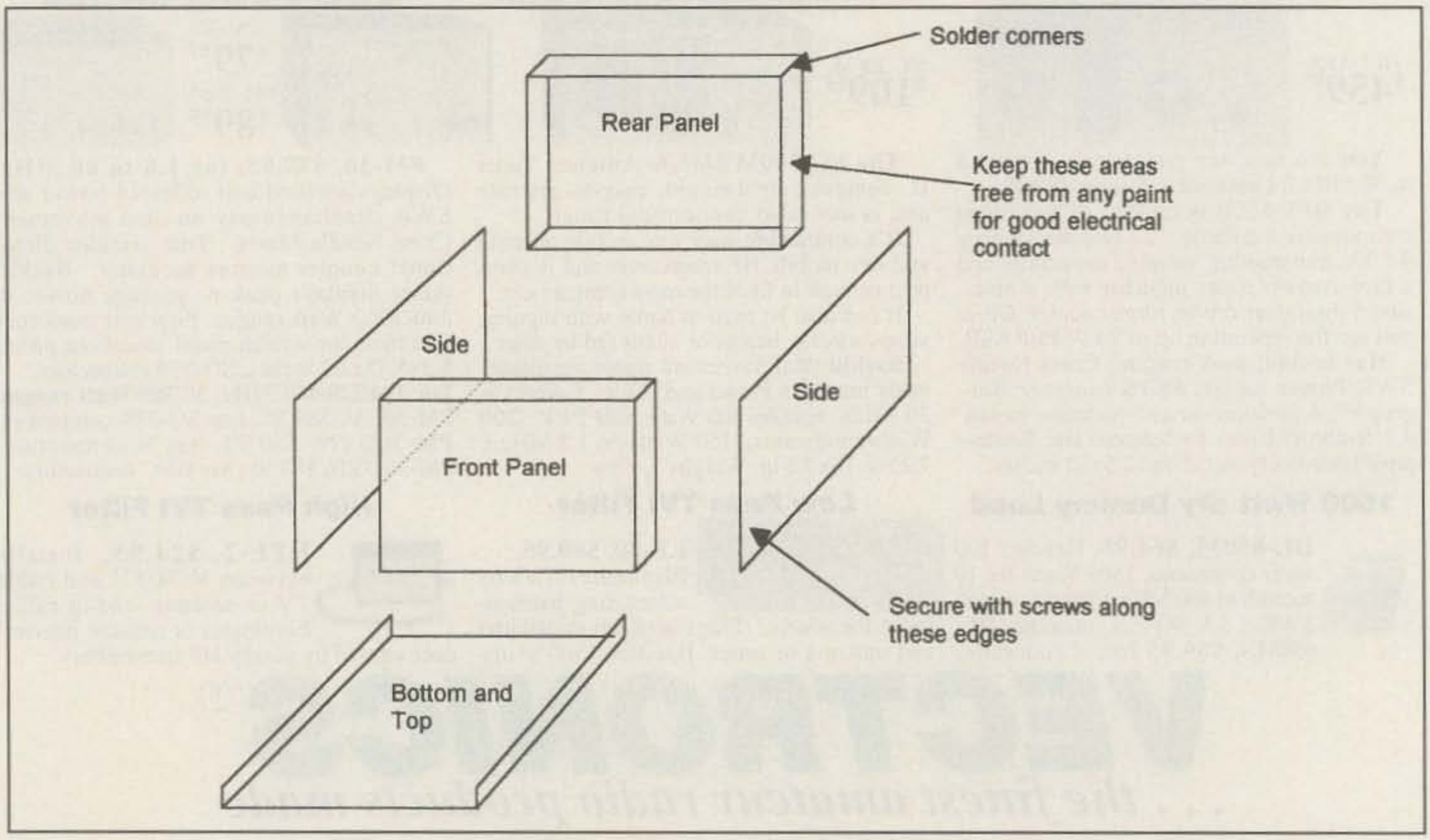


Fig. 2– Basic construction of aluminum or copper-clad housing.

which amateurs bend aluminum, the problem can seem insurmountable at first.

Fig. 2 is a sketch of a type of construction that the amateur should consider when building an enclosure from sheet metal where attenuation is important. As you can see, overlapping flaps are used, thereby minimizing gaps. Any paint is left off mating pieces, and the use of numerous screws for shielding as well as mechanical strength is greatly encouraged.

Building housings of PC board material is also permissible if the corners are soldered continuously. Simply tack-soldering at each corner can leave a gap that easily will pass a harmonic of what you want to shield against. The same holds true of a shield on a PC board. The board layout should be such that the shield is soldered to the ground plane at as many points a practical.

When rotating shafts have to pass through a panel, the gap needed for proper clearance of these shafts can be a problem. In "the old days" you could purchase so-called panel-bearing devices which you would then mount on your enclosure. These bearings allowed a 1/4 inch shaft to pass through while making decent enough contact along the portion of the shaft passing through them for fairly good shielding purposes. Today these are not so readily available, so you must improvise. A good substitute you might consider is to secure a small piece of steel wool or copper wool (look in the cleaning supplies section of your local supermarket) around the hole. Another material that might be of use is the conductive foam/plastic often used for protecting the pins of some integrated circuits. All of these could be attached with conductive epoxy or a simple mechanical clamp. Even ordinary solder might work with copper wool.

Wires passing into and out of a shielded enclosure also pose problems. After all, they are conductors and easily can carry unwanted signals in addition to the ones they are supposed to carry. The method here is to use feed-through capacitors and inductors for power supplies, as well as RF chokes made of some of the readily available ferrite cores now on the market for AC line cords.

When all is said and done, a simple method of RFI susceptibility testing is to place the whip antenna of an HT in close proximity to the shielded equipment. Keying the HT for a second or two quickly can show how well your shielding job actually is. To test for radiated emissions, a general-purpose shortwave communications receiver with a small loop of wire at the end of a piece of coaxial cable connected to the antenna terminals will do. In a pinch, even a sensitive field strength meter can be used.

73, Irwin, WA2NDM

BY KARL T. THURBER, JR., W8FX

THE DIGITAL DIPOLE

FROM SOFTWARE THROUGH ANTENNAS FOR THE SHACK

More Books '98

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

Correction: WXØB StackMatch. In last November's column we highlighted products from Dunestar Systems, including several transceiver RF bandpass filters and various other products. We incorrectly associated Jay Terleski, WXØB, with Dunestar Systems. We weren't aware at the time that he had formed his own firm, Array Solutions, to directly manufacture and sell the classic WXØB StackMatch, which formerly was sold by Dunestar. Our apologies, Jay!

We profiled the WXØB StackMatch in several previous columns. To briefly recall, the device and its controller are used to stack, match, and power-split to two or three HF beam antennas, either monoband or multiband, that are mounted on a single tower. The device lets you select one, two, or all three antennas; with no power applied to it, it selects all antennas. The StackMatch also can be used to phase and match vertical antennas.

For more information on the StackMatch, contact Jay Terleski, WXØB, at Array Solutions, 350 Gloria Rd., Sunnyvale, TX 75182 (972-203-8810; e-mail <wx0b@arraysolutions.com>; on the web <http://www.arraysolutions.com>).

From the Bookshelf

The ARRL Antenna Book. The ARRL offers a number of "must have" publications that form the core of a basic radio hamshack reference library. Of these, besides bedrock classic *The ARRL Antenna Book,* there are about a dozen or so ARRL books oriented to antennas and transmission lines, plus *The ARRL Handbook,* which has chapters related to antennas.

Today, *The ARRL Antenna Book* still is the authoritative hobbyist source of information on modern antenna and transmission-line theory and construction. The newest edition off the press is the recently issued 18th edition, edited by R. Dean Straw, N6BV. Dean was assisted by a very capable team of contributing editors in producing a 728-page, large format (8" × 11") book.

The 18th edition offers definitive coverage of antenna fundamentals, propagation, antenna system planning, transmission lines, Yagis, quads, low-frequency and multiband antennas, and much more. Antenna computer-modeling techniques and Smith chart procedures are prominently featured.

Also included is a 3.5", 1.44 MB diskette with software for Yagi analysis, a full-fledged transmission-line program, an antenna-tuner analysis routine, and an HF terrain analysis program, among others. Also included on the diskette are detailed, month-by-month propagation predictions for U.S. transmitting sites for the whole 11-year solar cycle.

The new antenna handbook is $30, including the bundled software diskette. Contact The American Radio Relay League (ARRL), 225 Main Street, Newington, CT 06111-1494 (1-888-277-5289; e-mail <pubsales@arrl.org>; web <http://www.arrl.org>).

Six Meters: A Guide to the Magic Band. Although as a 1994 book it's not *really* new, Ken Neubeck, WB2AMU's *Six Meters: A Guide to the Magic Band* is enjoying new popularity as radio conditions improve significantly with the welcomed sunspot Cycle 23's rise, and amateurs rediscover all 6 meters has to offer.

Sure, I know no band is "magic," but the 50–54 MHz band truly is unique. Why so? Positioned where it is between HF and VHF, you can experience almost any kind of propagation conditions. As a result, you literally can "work the world" under the right conditions, with very low power and a simple antenna.

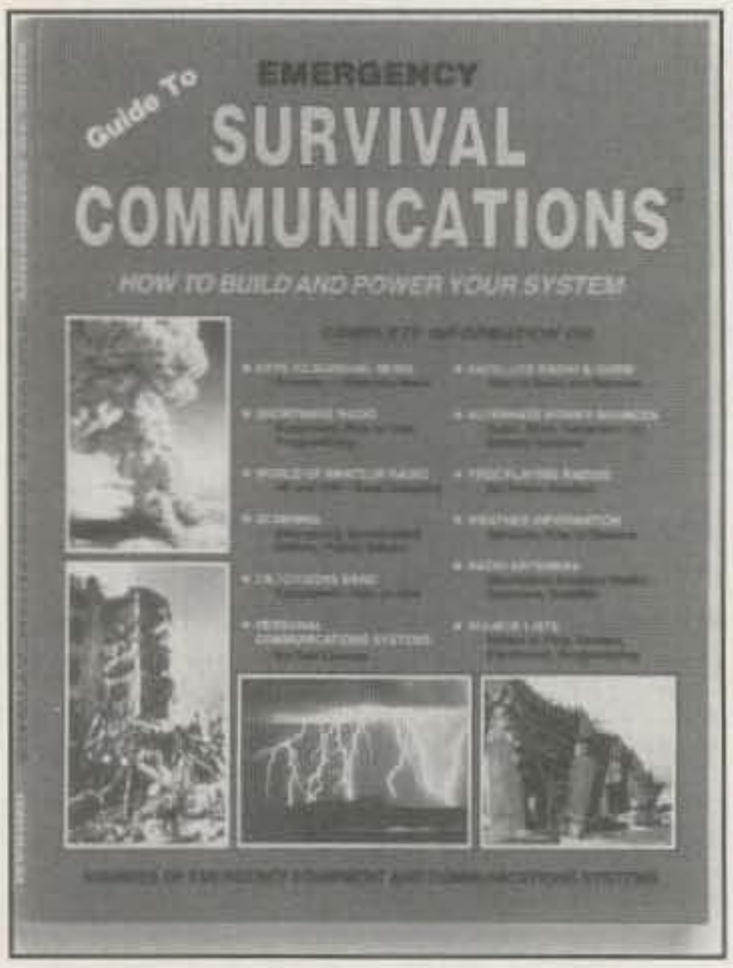
Ken's book is an excellent guide to 6 meters. Its 11 chapters include information on various types of propagation, antennas, mobile and mountaintopping operation, television interference (TVI), esoteric operating modes, and the band's likely future.

The large-format (8½" × 11"), 72-page book is $12 plus $2 s/h from Worldradio Books, P.O. Box 189490, Sacramento, CA 95818 (916-457-3655; e-mail <kb6hp@ns.net>).

Communications Receivers, Fourth Edition. In several previous columns we reviewed Ray Moore, ex-K1DBR's *Communications Receivers,* from the 1987 first edition up through the third edition, reviewed in July 1994. As you may recall, Ray's book is an authoritative guide to classic American communications receivers from 1932 to 1981, which we fondly recall as the vacuum tube era. As such, the book covers all major manufacturers, including Hallicrafters, National, Hammarlund, Collins, Morrow, RME, and others.

Marty Moore at RSM Communications let us know that last spring, they ran out of copies of the third edition. They decided that rather than reprint the book, they would go with a fourth edition, since they never were completely satisfied with the book and really wanted to redo it, especially to improve the photos.

The new edition has a number of changes and improvements. It has new typesetting; improved photos; and extensive revisions, corrections, and new information. The large-format, 136-page fourth edition covers 750 receivers and boasts



CQ colleague Dave Ingram, K4TWJ, is the author of Guide to Emergency Survival Communications. *The subject matter of Dave's book is quite important, since accurate and timely information in times of crisis indeed can be lifesaving. You'll find the book to be much broader in scope than just amateur radio in that it also touches on shortwave radio, CB, weather services, and more.*

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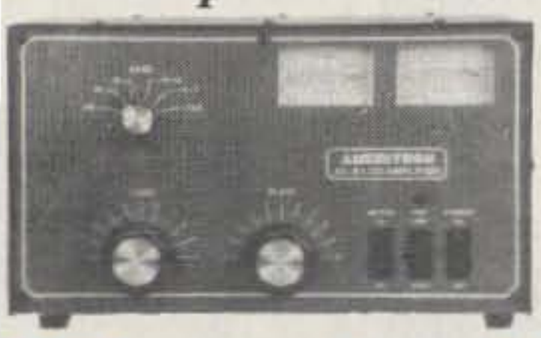
Ameritron AL-811H gives you four 811A tubes, 800 watts, superior quality -- for less money -- than the competitor's 3 tube 600 watt unit . . . Why settle for less power, less quality and pay more money?



AL-811H
$795
Suggested Retail

AL-811
$649
Suggested Retail

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

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

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

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

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

Kilowatt Amplifier

AL-80B
$1249
Suggested Retail

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

NearLegalLimit™ Amp

AL-572
$1395
Suggested Retail

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

AMERITRON HF Linear Amps with Eimac™ 3CX800A7

AL-800H
$2295
Two tubes
1500 Watts plus

Suggested Retail
Call your dealer for your best price!

AL-800
$1595
Single tube
1250 Watts

AMERITRON's new AL-800/H amps cover 160-15 Meters including WARC bands. The AL-800 has a single Eimac™ 3CX800A7 tube and produces 1250 Watts PEP. The AL-800H has two 3CX800A7s giving 1500 Watts *plus*.

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

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

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

AMERITRON offers the best selection of legal limit amplifiers

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

Ameritron's most powerful Amplifier

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

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

Ameritron's toughest legal limit Amp

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

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

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

AL-82 *Amperex® 3-500ZG tubes*
$2195
Suggested Retail

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

AMERITRON no tune Solid State Amplifiers

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

ALS-500M
$799
Suggested Retail

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

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

ALS-600
$1299
Suggested Retail

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

AMERITRON brings you the finest high power accessories!

RCS-8V Remote Coax Switch . . . $149

Replace 5 coax feedlines with a single coax. 1.2 SWR at 250 MHz. Useable to 450 MHz. 1kW at 150 MHz. **RCS-4, $139.** 4 position remote HF switch.

ADL-1500 Dummy Load with oil . . . $59.95

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

ICP-120/240 Inrush Current Protector . . . $79

Stops power-up inrush current and absorbs momentary high voltage spikes to your amplifier. 120 or 220VAC models.

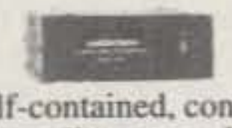
ATR-15 Legal Limit Antenna Tuner . . . $399

Designed for legal limit amplifiers! Covers 1.8-30 MHz, peak reading SWR/Wattmeter, 6 pos. antenna switch, 1:1 or 4:1 balun.

ARB-700/702 amp-to-radio interface . . . $39.95

Protects your costly transceiver from damage by *keying line transients*, steady state current and excessive voltages.

QSK-5 Pin Diode T/R Switch . . . $349



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

ATP-100 Tuning Pulser lets you safely tune your amplifier . . . $49.95

Pulse tuning lets you *safely* tune up your amplifier for full power output and best linearity. Keeps average power to low safe level to prevent overheating, tube damage, power supply stress and premature component failure.

ADL-2500 fan cooled 2500 Watt dry dummy load . . . $199.95

Whisper quiet fan. Handles any legal limit amplifier -- 2500 Watts average power for 1 minute on, ten off. 300 Watts continuous. SWR below 1.25 to 30 MHz and SWR below 1.4 to 60 MHz.

Free Catalog: 800-713-3550

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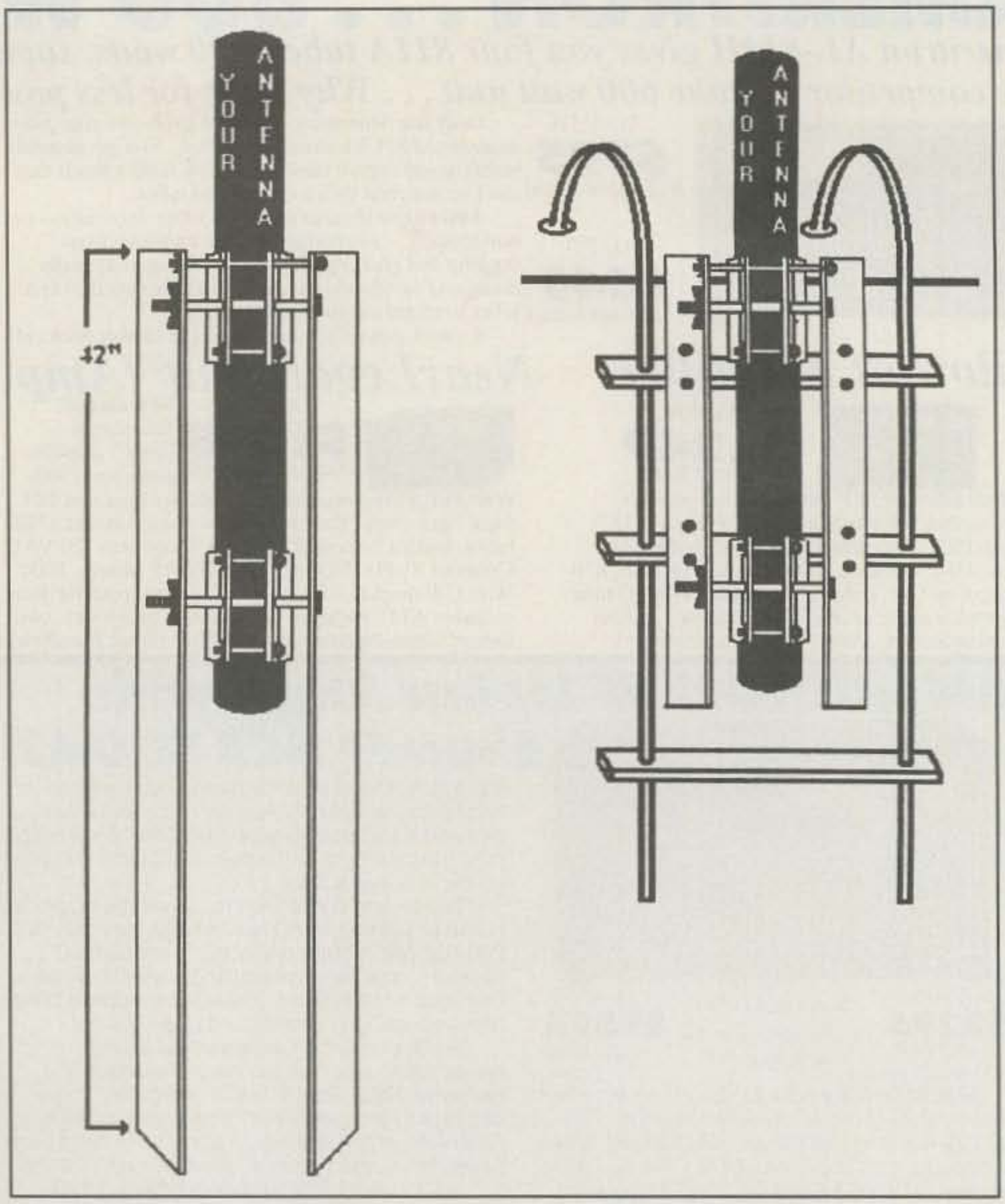

Fig. 1– GAP Antenna Products now offers a variety of accessories. These include the Quick Tilt Ground Mount, for Field Day and temporary operating locations, shown at left; the Quick Tilt Ladder Mount, especially for campers and motorhomes, shown at right; a guy bracket; guy material; counterpoises sets; coax and connectors; and other necessary items.

some 448 photos. It's perfect bound and printed on high-quality coated paper.

The book is $19.95 plus $3 s/h from RSM Communications, P.O. Box 27, LaBelle, FL 33975-0027 (941-675-2923).

Guide to Emergency Survival Communications. Are you ready when "the lights go out"? Our *CQ* colleague Dave Ingram, K4TWJ, has come up with an interesting, preparedness-oriented book, *Guide to Emergency Survival Communications* (see photo). It seems the book is the result of several years of consumer demand for information on communications in times of need, and the upshot is a highly readable text in nontechnical, easy "how-to" format.

Dave's treatise is a comprehensive treatment dealing with "survival communications," important since accurate and timely information in times of crisis can be lifesaving. The book is much broader in scope than just amateur radio in that it also touches on shortwave radio, CB, weather services, and much more.

The book's 12 chapters and supplement total about 200 pages; although not indexed, it has a very detailed table of contents. The book shows you where to find the necessary equipment, how to choose the proper equipment and antennas, and how to build your communications system. It also helps you build and set up systems using emergency power sources, showing many types of inexpensive solar power systems, small generators, and backup emergency battery systems that work when the power grid goes down. A variety of alternate power sources are covered.

Dave's *Guide to Emergency Survival Communications* is $20 plus $4 s/h from Universal Electronics, Inc., 4555 Groves Road, Suite 12, Columbus, OH 43232-4135 (614-866-4605).

Netscape Communicator for Busy People. We've profiled several "Busy People" computer books from Osborne/McGraw Hill. In this series the publisher has built a library of similarly structured PC and application software oriented titles to guide you even if you know little or nothing about PCs or software. The books in the series assume you are intelligent and literate, but don't have time to learn as you would like. Sound familiar?

The book, by Christian Crumlish and Jeff Hadfield, is designed to be an "ultimate quick-start guide" to Netscape Communicator 4. The book focuses on Communicator's powerful suite of tools that deal with web exploration and page design, e-mail, newsgroup management, online meeting capabilities, and so-called "push" technology that lets you receive custom news feeds.

The book contains many helpful features that characterize the *Busy People* series. "Blueprints" at the beginning of the book show important software features. Every chapter is prefaced with a "Fast Forward" section that previews the pages that follow, while "Step-by-Step" boxes clarify complicated features. Series hallmarks such as "Shortcuts" and "Cautions," as well as "Definitions" and "Stuff to Do Once," review and reinforce essential skills.

The well-illustrated, 320-page book is $24.99 from booksellers. For more information or a catalog, contact Osborne/McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710 (1-800-262-4729; web <http://www.osborne.com>).

Harley Hahn's Internet & Web Yellow Pages, Fifth Anniversary Edition. In the last five years the Internet has become the fastest-growing information resource around. At this point, you might ask the question "Has the Net grown too big to be helpful?" A fair question. Anyone who uses the Net knows that looking for information can be time-consuming and frustrating. However, you can get help locating what you need from Harley Hahn's *Internet & Web Yellow Pages,* Fifth (1998) Anniversary Edition, earlier editions of which we profiled here in the column.

In the book Harley Hahn, author of the original *Internet Yellow Pages,* sorts the interesting from the mundane and the informative from the stagnant, to provide a guide to the best, most interesting, and most useful sites. The 904-page softcover is $34.99 and includes a CD-ROM with a hot-linked version of the book that lets you review resources before logging onto the Net. It's from Osborne/McGraw-Hill, contact points as noted above.

1998 Communications Catalog. Recently we received a copy of Universal Radio's illustrated, large-format communications catalog. The new, 110-page catalog once again is an excellent ordering and reference resource that covers equipment for the amateur radio, shortwave, and scanner enthusiast. An impressive selection of antennas, books, and accessories of all types also is featured. Some new gear includes the Japan Radio Company NRD-545 DSP receiver, Garmin GPS units, Alinco DX-77T HF transceiver, ICOM 746 transceiver, and Sony ICF-B200 emergency radio.

For a copy, contact Universal Radio, Inc., 6830 Americana Parkway, Reynoldsburg, OH 43068-4113 (1-800-431-3939; e-mail <dx@universal-radio.com>; web <http://www.universal-radio.com>). The catalog is free by fourth-class mail, or $1 by first-class mail. Outside North America, send five IRCs for postage.

Antenna Notes

GAP Antenna Products™ Accessory Update. In several columns we described the popular GAP multiband vertical antennas with their patented "elevated launch technology." To reiterate, the antennas have no traps, coils, matching transformers, baluns, or resistors. The antennas are not fed at the base, but are fed at a point that is some distance up from the base.

According to GAP, with this design, ver-

tical antenna resistance is no longer fixed at around 36 ohms, but now can be preselected. The reasoning is that since the base impedance of a vertical is about 36 ohms while the top is several thousand ohms, somewhere in between is 52 ohms. It's here that the antenna is fed, or as GAP puts it, the point where RF is launched.

The high feedpoint is said to significantly reduce earth loss, which happens to be a major problem with verticals. The GAP verticals are largely ground independent as a result, and they simply use several short radials as counterpoises. Overall GAP antenna efficiency is claimed by the manufacturer to approach 90 percent, with low earth loss.

Several HF vertical antennas implementing the GAP elevated launch technology are offered, as we have noted in several columns. These include the Challenger DX (which also covers 6 and 2 meters); Voyager DX; Eagle DX; and Titan DX, which covers 10 through 80 meters plus all the WARC bands in between.

Also, GAP now carries a complete line of accessories. These include two new "Quick Mounts," billed as "the easy way to raise and lower your antenna." These are the Quick Tilt Ground Mount, for Field Day and temporary operating locations, and the Quick Tilt Ladder Mount, especially for campers and motorhomes. Both accommodate 1 1/4 inch to 2 inch masts. Also offered are a guy bracket, guy material, counterpoise sets, coax and connectors, and other necessary items (see fig. 1 for sketches of the two mounts).

Antenna specs, some theoretical details, an accessory list, and pricing are available from GAP Antenna Products, 6010 Bldg. B, N. Old Dixie Highway, Vero Beach, FL 32967 (561-778-3728; web <http://www.gapantenna.com>).

Antenna Specialists Catalog. Antenna Specialists, a division of Allen Telecom Group, Inc., long has been known for its diversified professional- and amateur-oriented lines of base-station and mobile communications antennas and accessories. The firm offers an 18-page Amateur Antennas catalog. It shows a variety of 2 and 6 meter, 220 MHz, 70 cm, and higher band base-station and mobile antennas, including the popular mobile "On-Glass"® windshield-mount antenna systems. Included in the catalog are On-Glass cellular lookalike antennas, broadband repeater antennas, gain-type collinear base station antennas, monitor antennas, On-Glass installation kits, couplers, mounting brackets, and a field strength meter (FSM).

Interestingly, the catalog even includes a special "Glass Tester" capacitance probe that lets you evaluate auto window glass for properties that could impair the performance of On-Glass antennas. The probe also can help you locate the prop-

er position for On-Glass antennas. You can use the probe with most hand-held digital capacitance meters (not supplied).

For a catalog, contact Allen Telecom Group, Inc., Antenna Specialists Division, 30500 Bruce Industrial Parkway, Cleveland, OH 44139-3996 (216-349-8400; web <http://www.allentele.com>).

Soft Stuff

VHF-DX 4.0 Logging Software. Over several years we've followed the progress of the DOS-based VHF-DX VHF/UHF Logging Software, designed by Mark Hoersten, N8VEA, for VHF and higher operation and logging. On several occasions we reported on the program and its capabilities in the column. To recall, previous versions supported various popular VHF/UHF contests, tracked grid squares, and logged OSCAR satellite contacts.

Now Mark has introduced VHF-DX 4.0, VHF/UHF Logging Software for Windows 95. Like its predecessor, VHF-DX for DOS, VHF-DX 4.0 is a VHF/UHF/microwave and EME logging program designed for all aspects of 50 MHz and above operation. The new version supports major North American VHF/UHF contests, from dupe checking and scoring to final report generation.

Award tracking for VHF/UHF Century Club (VUCC), WAS, and DXCC is provided on each band; the DXCC country is determined automatically from the callsign. Amateur bands from 50 MHz to 10 GHz, including OSCAR satellite bands, are covered. EME operation also is supported on each band.

VHF-DX 4.0 is shareware that you can download from Mark's Web site at <http://www.qsl.net/n8vea>. The site contains the latest program version; as new features are added, Mark posts upgrade files to let you take advantage of the new features without going through a full download.

Program registration fee is $10. If you don't have Web access, Mark will send you the two-disk set via regular mail for $13, which includes registration. Also, the DOS version still is available for $19 postpaid, including a printed manual.

For more details, contact VHF Products, Inc., P.O. Box 23391, Chagrin Falls, OH 44023-0391 (e-mail <vhfdx@iName.com>; web <http://www.qsl.net/n8vea>).

HAMCALC Update. In several previous columns, most recently in this January's column, we followed the progress of George "Murph" Murphy, VE3ERP's free, DOS-based HAMCALC software program, which he bills as providing "painless calculations for amateur radio operators." Murph notes that the freeware program continues to grow and prosper since Murph first introduced the software in 1993.

HAMCALC started off as a personal collection of programs Murph wrote to lessen the drudgery of doing complicated calculations. Each time he's faced with a new calculation, he adds it to HAMCALC. A few years ago he happened to mention HAMCALC in some articles he had published in *QST* and *CQ*, and the reader response was such that he decided to share the software with anyone who wanted it.

HAMCALC now includes over 170 "painless" math and design programs. These programs are reference and learning tools used by radio amateurs, professional engineers, and university faculties worldwide. The program constantly is being upgraded; it's up over Version 30 now, probably even higher by the time you read this. The Main Menu helps you keep track; it has a history option that lists major changes made in the most recent previous versions.

For a free 3.5 inch, 1.44 MB program disk, send $5 (U.S. funds) check or money order (no stamps or IRCs) to cover materials and airmail anywhere in the world, to George Murphy, VE3ERP, 77 McKenzie St., Orillia, ON L3V 6A6, Canada.

Wrap-Up

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

Overheard: One thing is for sure: you can't judge a person by what they sound like on the telephone—or over the air.

73, Karl, W8FX

BY DAVE INGRAM, K4TWJ

WORLD OF IDEAS

A LOOK AT THE WORLD AROUND US

Mobiling '98—and More

Everything seemed to flourish like crazy in the spring of 1998: flowers, trees, sunspot counts, and a captivating variety of neat amateur radio goodies. QRP once again set the pace, but some new mid-size transceivers and heartwarming "build 'em" classic rigs from the famous Frank Jones handbook of yesteryear also surfaced in high style. Describing all of these special treats and exciting developments will be our main focus during the coming months, but summer is now in full swing, and outdoor activities such as mobiling, vacationing, and operating portable are hot interests of the day. Since keeping you informed of present-day happenings is our main focus, let's quickly tour the overall scene and then delve into mobiling '98 news.

First, we have some "just-in" notes regarding our April "Keys Special" column. I understand Bencher recently made an agreement with (Mrs.) Steve Nurkiewicz (SK) and will pick up production of the glamorous N2DAN "Mercury" paddle. As you will recall, this is the round-base, triple-chrome-plated, and magnetically tensioned iambic paddle with unbelievably smooth action. No word yet on any possible changes, pricing, or availability, so telephone Bencher (630-238-1183) or watch their ads for more details.

Also in our April column I mentioned Dennis Foster, KK5PY, was developing a miniature vertical Ne Ke paddle and promised to share a first view of the little gem when it was completed. Okay, check out photo 1. The paddle is 3 inches high with a 2 inch square horseshoe-type base, and sports a reflective top-mounted jewel for glitz. A brass arm swings or pivots from the top, and an angle bracket with attached fingerpieces activates dot/dash-springs and contacts on each side of the Ne Ke. The vertical paddle costs only a few dollars more than a regular leg-strapped Ne Ke. It is supplied with a 3 foot cable and stereo mini plug, and it is ideal for those "close quarters" mobile activities. Want more information? Contact Dennis Foster, KK5PY, 61700 E. 180 Rd., Fairland, OK 74343.

Remember those multi-featured Tick Keyer kits highlighted in our August and September 1997 columns? Embedded Research has just added two new ver-

4941 Scenic View Dr., Birmingham, AL 35210

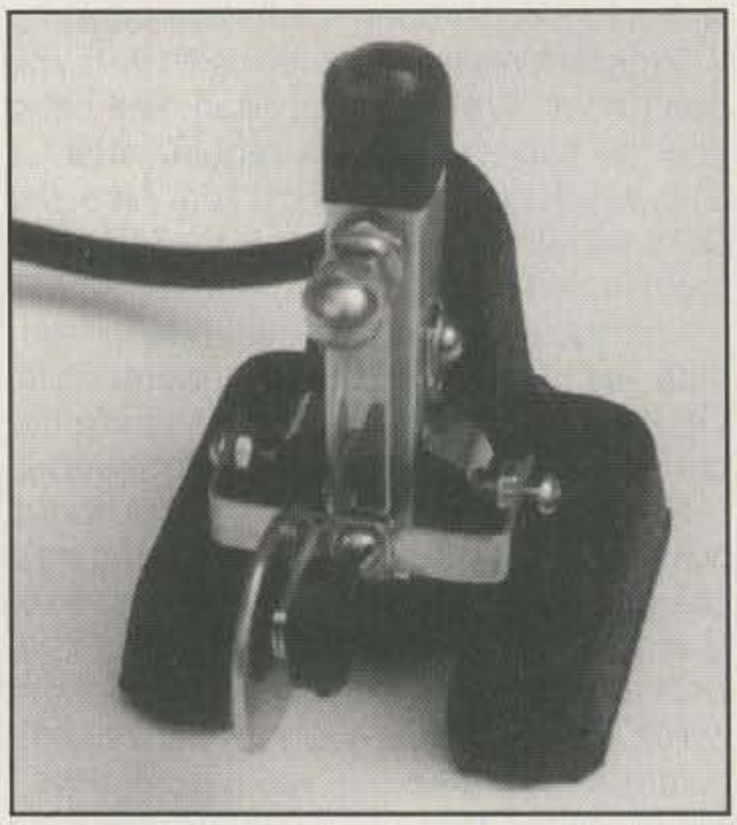

Photo 1– Looking for a small, unique single-lever paddle for mobile or portable operations? This miniature vertical Ne Ke made by Dennis Foster, KK5PY, has a 2 inch-square footprint and fits anywhere. Horseshoe-type base and upright design really draw attention, too!

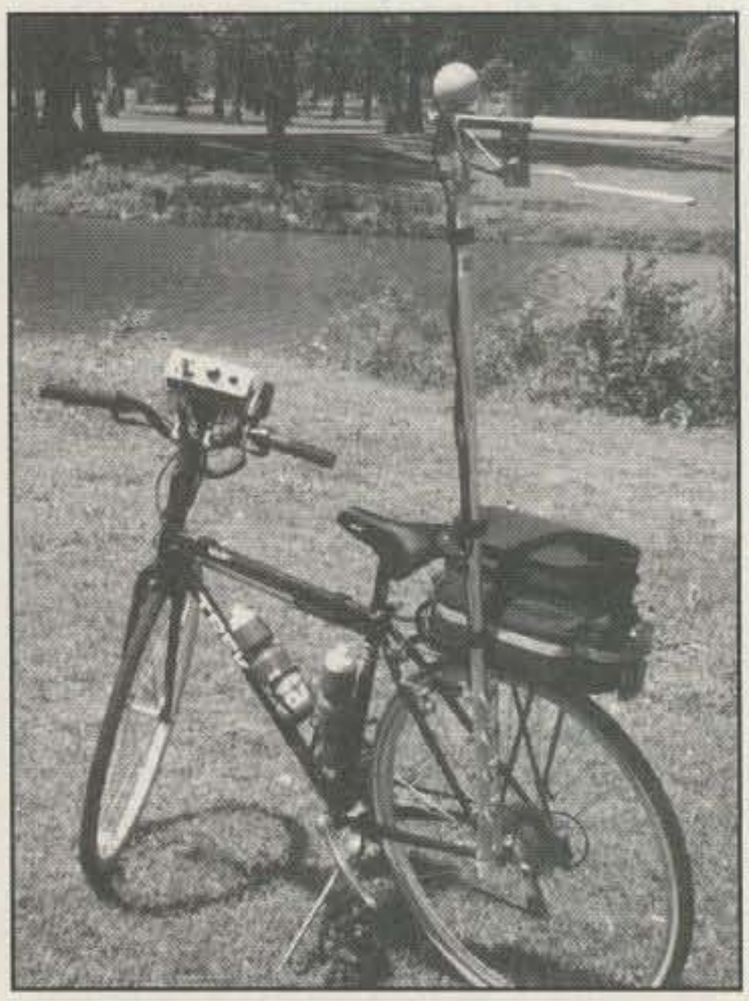

Photo 2– "Make a statement" bicycle mobile setup of Dennis Foster, KK5PY, consists of an MFJ 20 meter SSB transceiver, 7 amp battery, and Isotron antenna. Its track record includes Worked All States in 35 days plus contacts with Sweden, Italy, and W6OKS, in a Boeing 757 30,000 feet over Georgia, plus WAØNZO super tractor mobile—all with only 10 watts and a compact antenna! (Photo courtesy KK5PY)

sions plus a QRP transceiver kit to the line. One is a Tick-2B that includes a beacon or auto-transmit mode in its list of functions. The other is a Tick-2EMB kit that makes a complete keyer with memory-backup lithium battery, input/output sockets, and function-controlling pushbutton mounted on a 2" × 2.25" PC board. The third treat is a combination Tick-2B and a rapidly rising in popularity Pixie 500 mw CW transceiver kit on a single 3 inch-square PC board. This "Tixie kit" is supplied with the board and Tick keyer chip (plus circuit diagram and several "help sheets" of assembly notes), but less components to minimize costs, and it promises to be a winner (more details coming soon). Meanwhile, check with Embedded Research (P.O. Box 92492, Rochester, NY 14692; telephone 716-359-3941) for pricing and ordering information.

Have you begun homebrewing "surface mount style" yet, friends? It is the wave of the future, you know, and low-cost "chip components" kits make getting started in the game easy. Some tried and proven tips to ensure your success are lined up to share with you in a future column. Meanwhile, the Knightlites QRP Club is offering a deal too good to miss. Club guru Bob Kellogg, AE4IC (4708 Charlottesville Rd., Greensboro, NC 27410), is selling complete surface-mount Pixie II transceiver kits called KnightSMiTes at the ridiculously low introductory price of $13 postpaid (in the U.S.). After assembly, the rig's (1" × 1.75") board can slip into a microcassette case (or similar enclosure) to produce the world's smallest transceiver. Standard Pixies and Tixies work 80 meters, but they can be shifted to 40 or 30 meters by changing their crystal and tank components.

More tidbits of good news warrant quick mention. If you missed last year's "super sale" of 38 Special transceiver kits, don't fret; just smile. They are coming back better than ever (improved IF filtering and T/R switching plus solid 5 watts output). The new version will be the 44 Magnum, and the new company producing the kit is HB Electronics, 43 Rector St., East Green-

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SWITCH SELECTABLE

OUTPUT VOLTAGE: 13.8 VDC

MODEL	CONT. AMP	ICS	SIZE (Inches)	WT.(LBS)
SS-10	7	10	2.3 x 6 x 9	3.2
SS-12	10	12	2.3 x 6 x 9	3.4
SS-18	15	18	2.3 x 6 x 9	3.6
SS-25	20	25	2 7/8 x 7 x 9 3/8	4.2
SS-30	25	30	3 3/4 x 7 x 9 5/8	5
SS-25M*	20	25	2 7/8 x 7 x 9 3/8	4.2
SS-30M*	25	30	3 3/4 x 7 x 9 5/8	5

- *with separate volt & amp meters
- All SS power supplies are available in a RACK MOUNT VERSION (3.5 x 19 x 9 3/8)
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wich, RI 02818. Inside views on all of the previously mentioned goodies (plus much more!), incidentally, are included in my new self-published book *QRP Now!* Copies are $15 plus postage ($2 regular mail, $3 priority mail) from Dave Ingram, K4TWJ, 4941 Scenic View Dr., Birmingham, AL 35210. Enough! More good news and tidbits next time. Now let's shift into mobiling '98.

Unique Mobiles

Feeling stifled by restrictive condo living and crowded freeway travels? Want to enjoy outdoor life and a unique amateur radio pursuit to boot? Take a creative-thinking cue from Dennis Foster, KK5PY (photos 2 and 3). He combined SSB QRPing with bicycle mobiling, and the results have been a blowout success—really! Dennis started off with a little MFJ 20 meter transceiver and a homebrewed loop antenna, and worked several states plus WAØNZO "super tractor" mobile (photo 4) and WL7MA in Alaska right off the bat. Tuning the loop and maneuvering it into operating position proved a mite cumbersome, so Dennis switched to another ground-independent HF antenna—the compact "Isotron" made by Ralph Bilal. Could such a mild-mannered setup turn a sheltered life into true ham happiness, you ask? In only 35 days and 895 miles of sport bicycling, Dennis worked all states plus several countries—on 20 meters SSB, QRP—and at the bottom of the sunspot cycle. If that does not get your adrenalin pumping, nothing will!

Looking closer at Dennis's setup, his transceiver is mounted between the handle bars with a homemade bracket, while coax and battery cables are routed along the bicycle's frame to the rear wheel area. A 7 amp gel cell battery and a few accessories are fitted into the rear rack bag. The Isotron antenna is supported by a "Mr. Longarm-type" extendable paint roller pole that raises to 8 feet or retracts to 4 feet. In turn, the pole is secured to the bicycle with four snap-in broom holders (obtained from a variety store) mounted on a homebrew aluminum support bracket. Nice? You bet! Here is a complete station that easily stows in the house and rolls out a door to hit the airwaves in a minute.

In talking with Dennis, I sensed his regular/full-time job is somewhat demanding, and QRPing from a quiet outdoor spot was a perfect break from the tension. As Dennis also pointed out, enjoying unique pursuits in amateur radio need not be complex or expensive to be thrilling. How true indeed! If you wish to learn more about two-wheel or "silent sport" mobiling, incidentally, check with the Bicycle Mobile Hams of America group which meets on the first and third Sunday of each month at 2000 and again at 0000 UTC on 14.253 MHz. Net controls are Mike, NFØN, Jim, NU8N, and/or John, K7RO. As an alternative, drop an SASE to BMHA, Box 4009, Boulder, CO 80306-4009. BMHA holds their annual meeting at the Dayton Hamvention, and they also have a newsletter filled with articles on bike trips, antennas, gear notes, and operating tips. Membership in BMHA is $10 a year and includes their quarterly newsletter.

Mobile Antenna Solutions

As you probably have noticed, an increasing number of vehicles are being made with "composite material" rather than good old conductive metal. Yes, and such "plastic cars" can prove quite challenging to amateurs with aspirations of big-time HF and/or VHF/UHF mobiling. How so? Mobile whips need a span of metal near (or under) their base to act as a ground plane. Otherwise, the antenna cannot be properly tuned, resultant SWR will be abnormally high, and the mated transceiver will reduce its power output for self-protection.

After experiencing that dilemma with my '96 Camaro, I installed several long strips of "TapeTenna" and copper foil under the car and inside the rear bumper section. The "fix" worked great for HF mobiling (my tall "Stealth" antenna and custom mount from KN4TV at Fortex Enterprises, Inc. in Virginia eats bugcatchers for lunch). Every 2 meter/70 cm antenna I tried in that same mount and socket, however, would not radiate a signal out of my front yard. I tried 1/4 wave and 5/8 wave whips, tall collinears, and through-glass antennas. I even added pruned radials at the base as an alternative to the HF ground straps. Zilch. A 2 meter talkie with a tall duckie inside the car worked better.

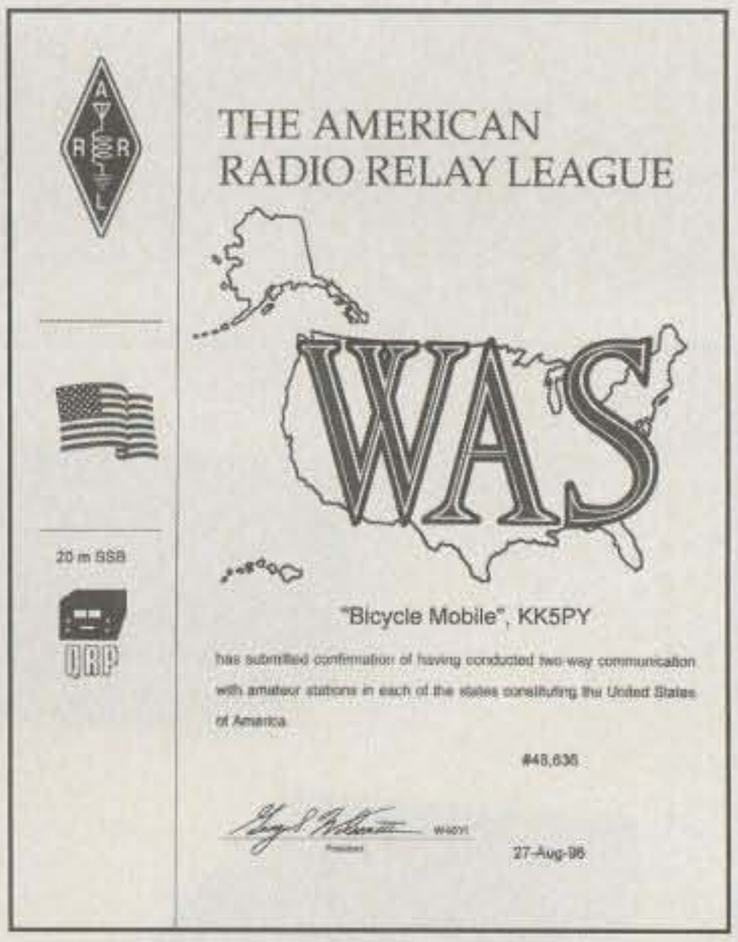

Photo 3– Success confirmed! This Worked All States certificate stands as tangible proof that the QRP bicycle mobile setup of KK5PY really works.

In desperation, I drew up plans to homebrew a J-Pole antenna connected to its own "routed direct to rig" coax cable. As you know, a J-Pole is a completely ground-independent and gain-type antenna. No doubt about it; that idea would work. Then Rocky Mountain Antennas saved the day with an announcement of their new JP-2M two meter/70 cm J-Pole shown in photos 5 and 6. I installed one

Photo 4– "Little buddy" truly met "big daddy" when KK5PY bicycle mobile worked Leon, WAØNZO, "super tractor" mobile. Leon's big eight-wheel setup consists of a Hustler antenna, an ICOM 706, and an air-conditioned cab that's high enough to be a mobile penthouse. Awesome!

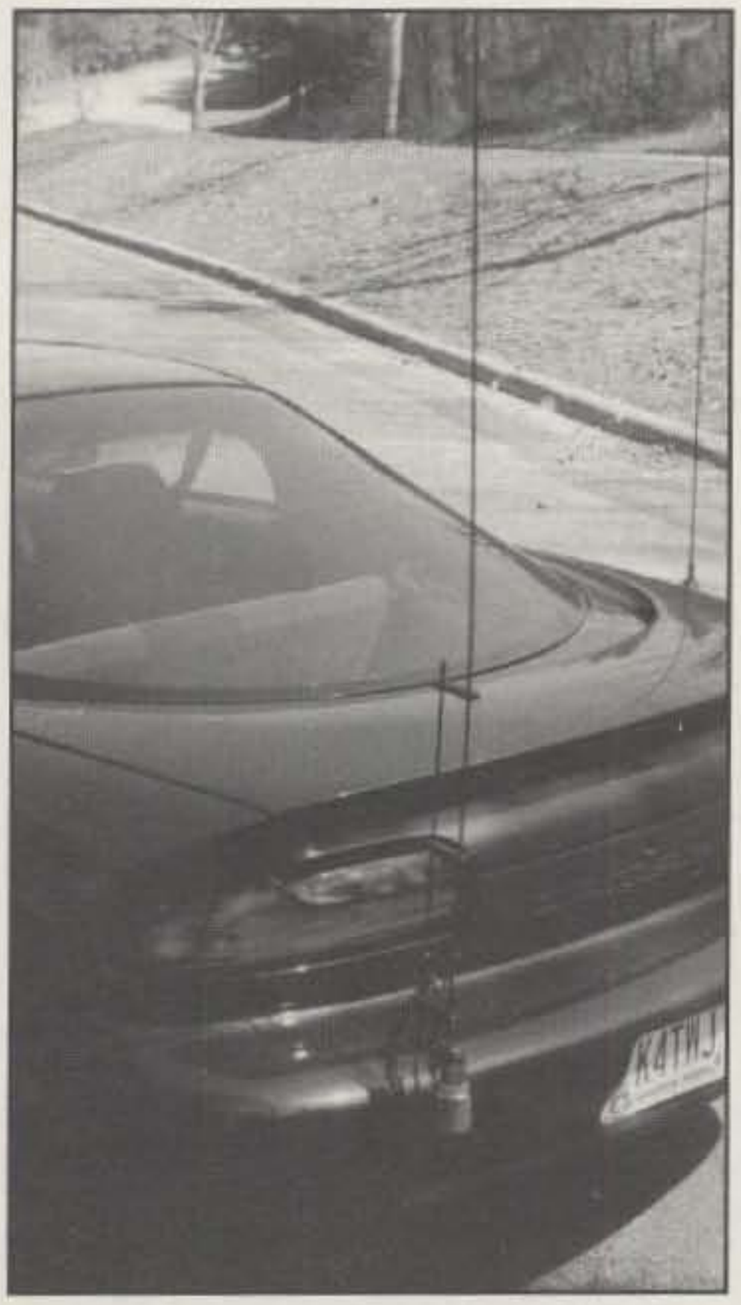

Photo 5– The new Rocky Mountain Antenna JP-2M two meter/70 cm J-Pole is perfect for mobiling with a modern "composite body" car and any vehicle lacking a metal structure. Antenna stands 58 inches tall, comes pretuned, and works like a champ.

Photo 6– Close-up view of the base-mounting assembly and coax-connection method on the Rocky Mountain JP-2M antenna. Bolts for fitting the antenna into the mount are supplied.

on the mount, and bingo—full transceiver output, low SWR, and great range. Problems solved! Friends, this antenna works! It works on everything from cars and canoes to bicycles and backpacks. You can even mount it on a wood pole and reach fringe area repeaters with ease. Happy days are here again!

Quickly checking with Jerry Bustin, WA7SIC, of Rocky Mountain Antennas revealed the "inside story" and some interesting details on the JP-2M. It exhibits 4 dB gain on 2 meters and 6 dB gain on 70 cm, covers both bands with low SWR, comes pretuned and ready to use, and is built to last for many years. The antenna has a special coil inductive network rather than direct coax connections for matching, and each antenna is checked with an AEA Analyzer after assembly. The standard antenna (JP-2M) has stainless-color radiators. Another version that is available by special order, the JP-2MB, has black-coated radiators. Rocky Mountain Antennas also has universal trunk-lip mounts for the J-Poles. If you want to really romp the VHF/UHF bands, get two antennas and mount one on each side of your car's trunk. Interconnect them with a CB co-phasing harness from RadioShack (2 to 9 ft. lengths of RG-58, one routed to each antenna, and "Tee"-connected to a 17 foot length of RG-58 routed to your transceiver). Want one (or two!)? Write or call toll-free Rocky Mountain Antennas at 1400 Pine Street, Everett, WA 98201 (1-888-277-4643). I also suggest moving quickly, as once the word gets out, they probably will be snowed under with orders.

Closing Notes

That winds down the views for this month, gang. Before signing off, however, I would like to add a couple of final notes. Remember that hamming outdoors is not limited to traveling busy freeways. Think creatively and you will find unique ideas everywhere—mobiling on a motorscooter at the beach, in a hot-air balloon, aboard a paddleboat on the river, etc. In fact, a pocket-size and battery-powered transceiver goes anywhere you go, and as this column has pointed out, they really work. Sunspots are increasing and the bands are sounding great. Get on the air and join the action! Stay tuned for more hot news in the world of QRP. Meanwhile, let's QSO one week night on 30 meters.

73, Dave, K4TWJ

BY BUCK ROGERS, K4ABT

PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

Playing Catch Up

I got a lot of snail mail and e-mail last month. Yes, I read it and I'm responding. Most of the letters and e-mail touched on the whereabouts of the interface and wiring diagrams that I (should) always include in each month's "Packet Users Notebook." Talk about surprised: I was! We sometimes take a lot of things for granted, but this time I really thought I was going about "business as usual." I assumed that each of the last seven or eight months' articles, which contained various radio and transceiver conversions and modifications, was "an interface." Included with each article/column was the TNC-to-radio interface for the accompanying radio conversion.

Just so no one feels that I've not covered enough radio-to-TNC interfaces, I'm going to play catch up by providing you with several TNC-to-transceiver diagrams in this month's column.

First Things First

Several issues ago I detailed the construction of a simple dipole antenna for 6 meters. Since then, I've made some changes in the design and construction of this antenna. The antenna was nothing fancy. It was built mostly from metal parts.

In some of the antennas being built today, I find material that used to be difficult to locate is now readily available to us all. I took for granted that everyone knows about this kind of material availability. Not so, say some. Okay, think "Lowe's" building materials or almost any large hardware and home building supply vendor.

Improving the Performance Of the 6 Meter Dipole

If you built or plan to build one of these 6 meter dipoles, you can make it more efficient and improve its performance by adding six or seven turns of (inline) coax near the feed point of the elements. The seven turns of (RG-58) coax act as a "decoupling" choke (balun) and help prevent backwash (VSWR) standing waves. You will notice an immediate improvement in the overall transmit and receive performance after making this change/addition.

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e-mail: K4ABT@PacketRadio.com

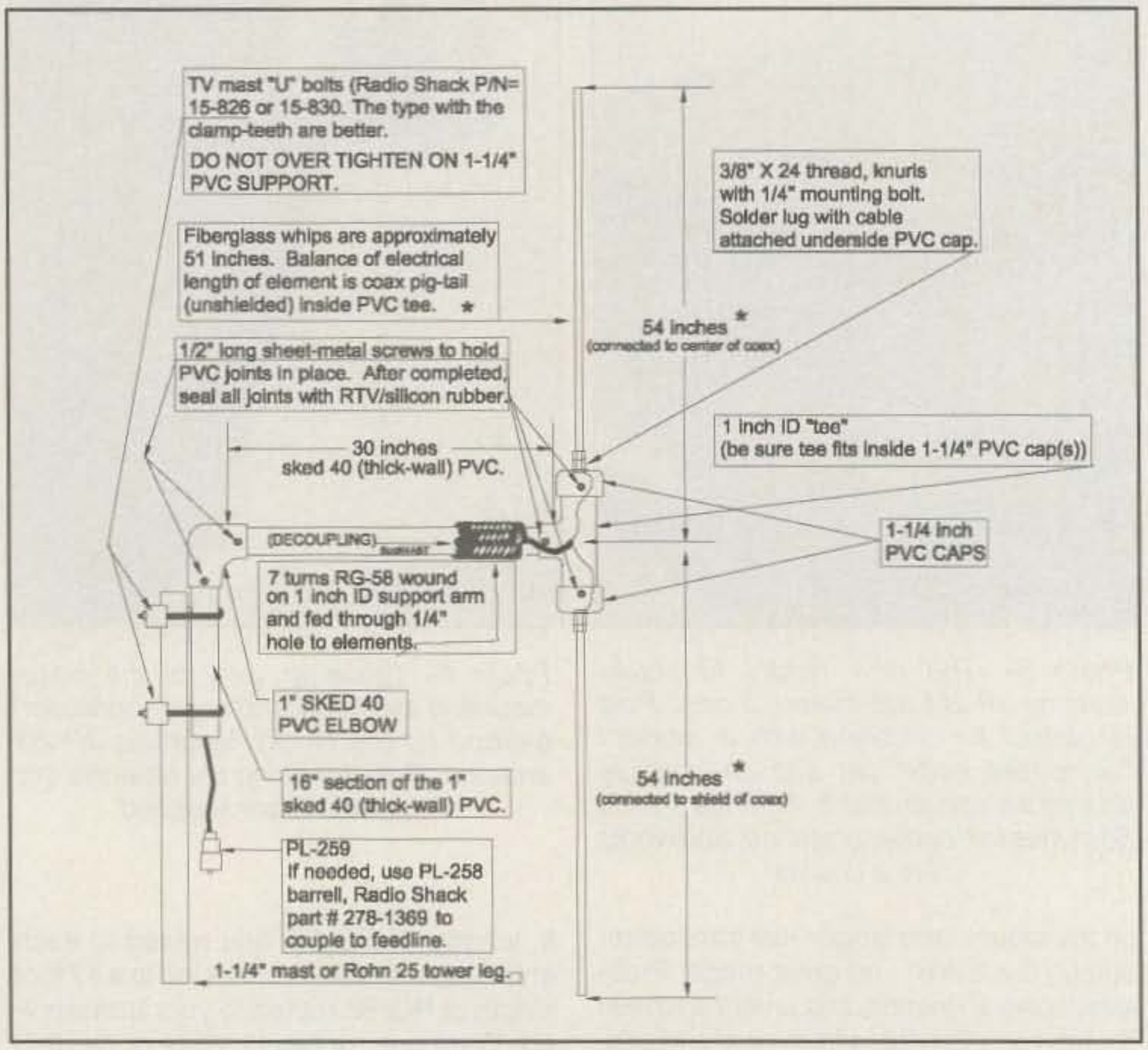

Fig. 1– Later version of the 6 meter dipole.

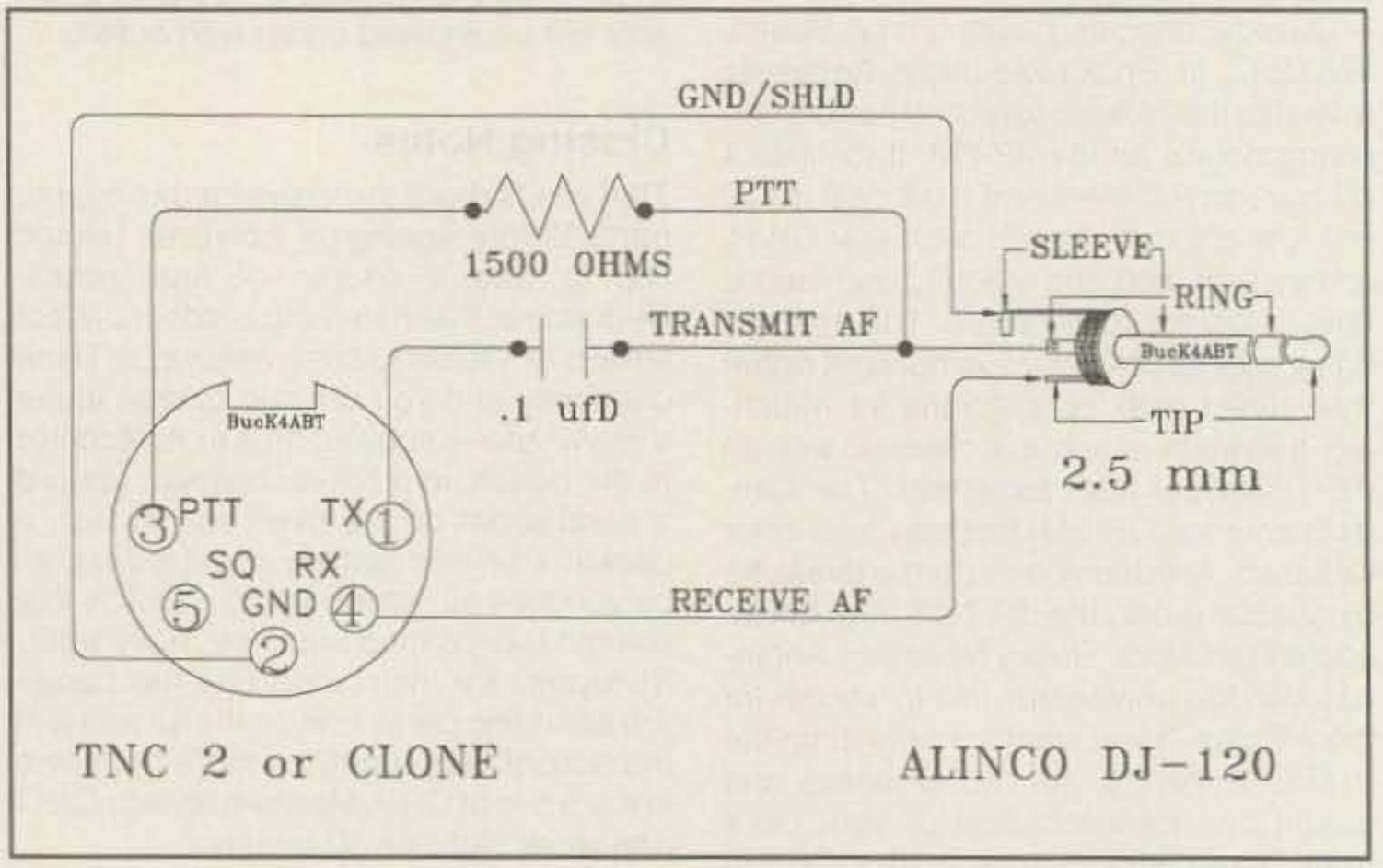

Fig. 2– Alinco DJ-120 to TNC2 interface.

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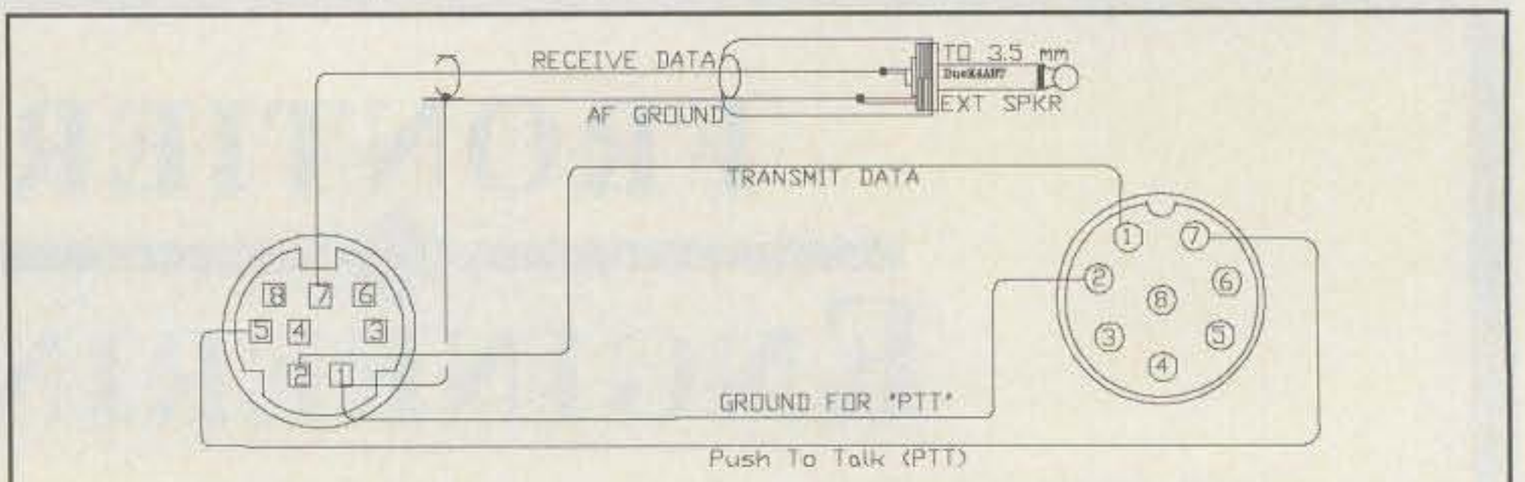

Fig. 3– Interfacing the PacComm Handi-Packet™ to several Azden transceivers.

If you are feeding your dipole with RG-11 (large 75 ohm) coax, then build a 4 turn, 4 inch coil of the feed line near the feed point of the dipole to form the decoupling choke.

In fig. 1 I've drawn a more recent version of the dipole we described in an earlier issue. The total length of the coax that reaches from the element connecting points to the PL-259 as shown is about one-half wavelength, or approximately 110 inches (51 MHz). Although my drawing notation is for RG-58, I used RG-59 (72 ohm) coax on my latest 6 meter dipole.

The seven turn decoupling coil on the PVC near the feed point is part of the 110 inches of coax. I drilled 1/4 inch holes 2 inches apart and threaded the RG-59 out, wound the 7 turns, and threaded the coax back into the PVC to the "Tee" section, where I made the element connections. The length of the coax threaded out the first hole (before the 7 turns are wound) is approximately 2 feet.

What a Wake-Up Call!

Not a week goes by that we don't hear about another storm disaster in Alabama, Georgia, South Carolina, North Carolina, Virginia, West Virginia, Kentucky, Minnesota, Texas, California. . . . Just about all of the United States is seeing some form of disaster from this awful storm generator. As a matter of fact, *El Niño* is leaving its mark all over the Earth. As one letter stated, "*El Niño* is not finished yet . . ." If this is the case, then let this be the wake-up call that reminds us, "It's time we made use of every kind, shape, form, and description of emergency preparedness communications equipment we have or can muster."

In a recent message from Dennis Willmon, KT4BT, the SEDAN network coordinator for Alabama, he noted some of the items he was keeping close by "just in case." To make it more easily understood, I'll borrow from the text of his message:

With the onslaught of *El Niño* we are starting to really appreciate how important it is to be ready in a moment's notice, to be able to get a message through for help and supplies to those in affected areas, or to have a path for storm spotter reports to flow smoothly to the National Weather Service. During the recent bad weather we have been experiencing, the SEDAN has

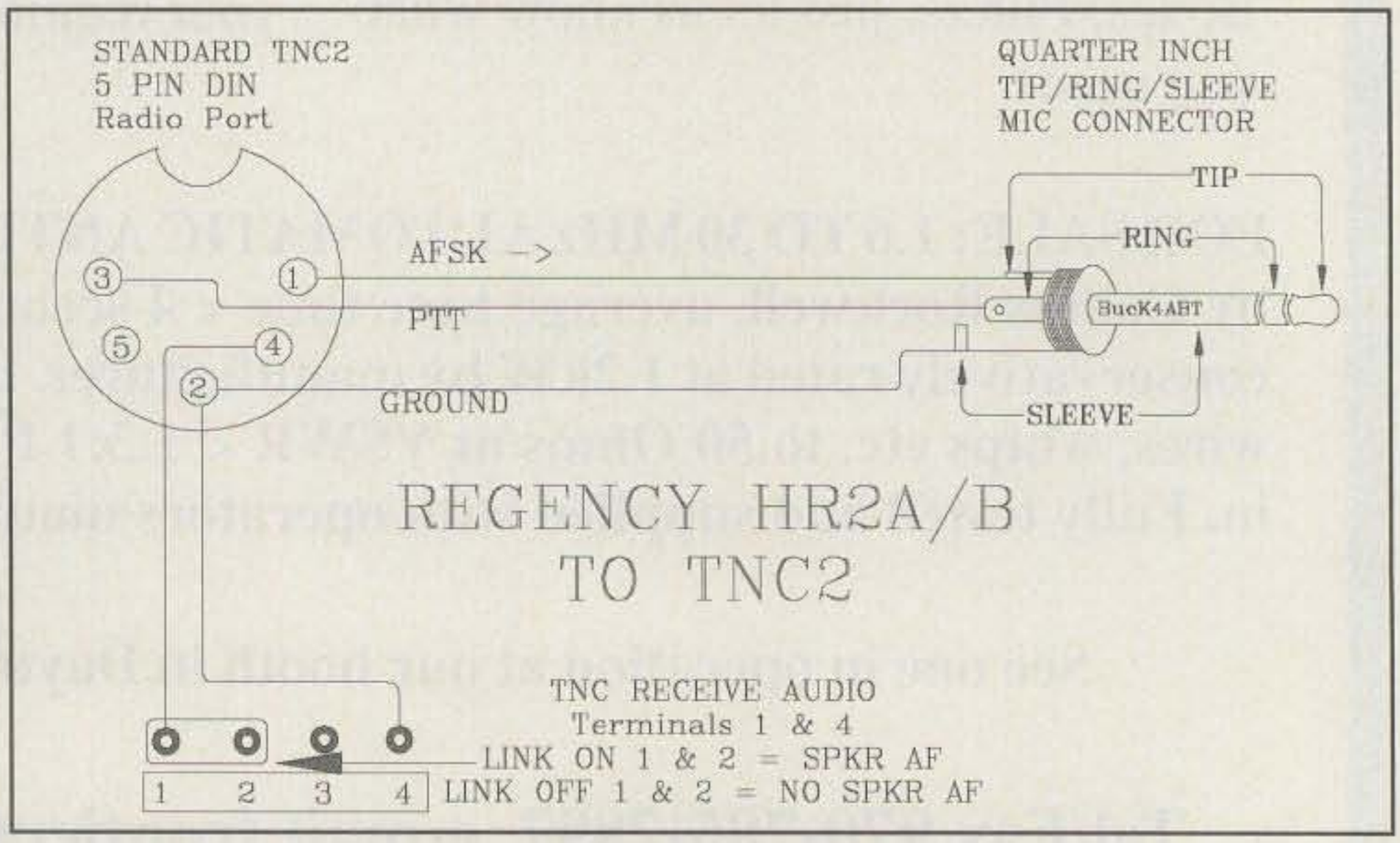

Fig. 4– For node operation, the older radios still make good hilltop transceivers. Shown here is the interface for a Regency HR2A/B to a TNC2.

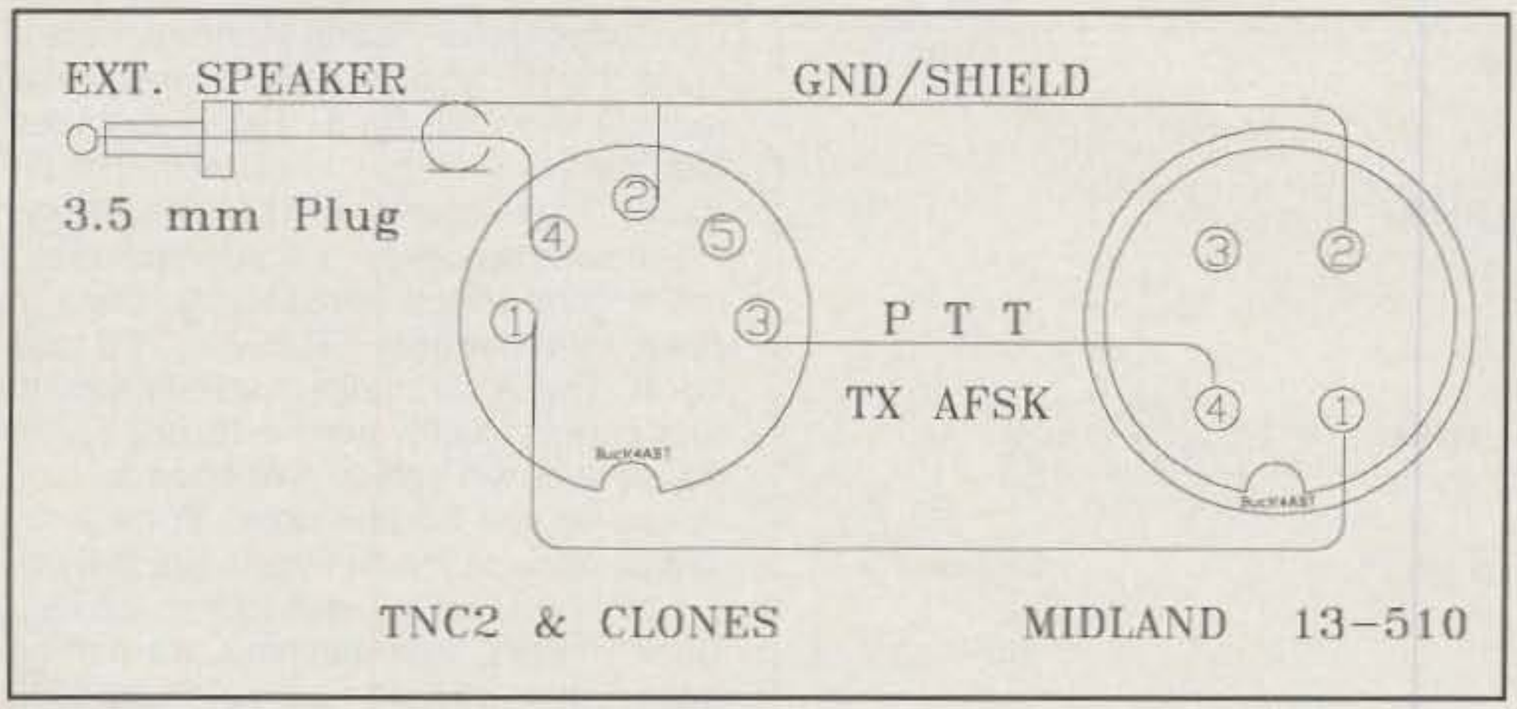

Fig. 5– Another oldie but goodie, here the Midland 13-510 is interfaced to a TNC2.

proven to be a useful and needed tool to traffic reports and aid coordination efforts into and out of Selma, Alabama.

John Farmer, KF4RKK, the system node operator (SNO) of node RKK uses SEDAN exclusively, as it is his only digital link to the world. Otherwise, John has only VHF FM voice. John and I have found that packet is well suited to behind-the-scenes communication during weather events and emergency nets on VHF. Given the formal nature of the voice net, it is not appropriate to take up valuable net time with conversations between ourselves as we try to get the information to those parties involved in traffic handling. Packet allows us to move ahead at a faster pace, with no errors, and with no time wasted with repeats. Also, our traffic doesn't get paraphrased by several net controls who relay to each other over a three or four hop route!

During the recent flooding in south Alabama, John was able to use packet to get river levels to the state Emergency Management Office in Clanton, Alabama.

Given the severity of the storms we are starting to see this year, I think the most important piece of emergency equipment we can have at our disposal is a reliable network through which we can communicate requests for help, supplies, emergency response teams, and emergency medical teams, to mention only a few that still communicate when the lines go down!

I think one of the most important things we as system node operators in one of the largest emergency packet radio networks on Earth can do is to keep our equipment ready and in top-notch operating condition. This means checking the batteries on the nodes periodically, getting on the network at least once a week, and making sure your node will connect to its neighbors. Learn to connect across the network and find someone who is on. During a crisis this may be your *only* way to get help!

There are a few things that I keep at my disposal to use (just in case): batteries, Hts, antennas, extra HF rig, pliers, laptop computer, spare TNC, candles, fuel for kerosene heaters and generators, and a full tank of gas in the car at all times (If the big one hits, the stations won't be able to pump gas without electricity.). The list continues, but you get the idea. By the way, common sense helps, too.

In closing, I would like to remind each and every system node operator that when a disaster strikes, we all have to "sing from the same sheet." This is so our efforts can be effective in whatever mission we undertake while helping

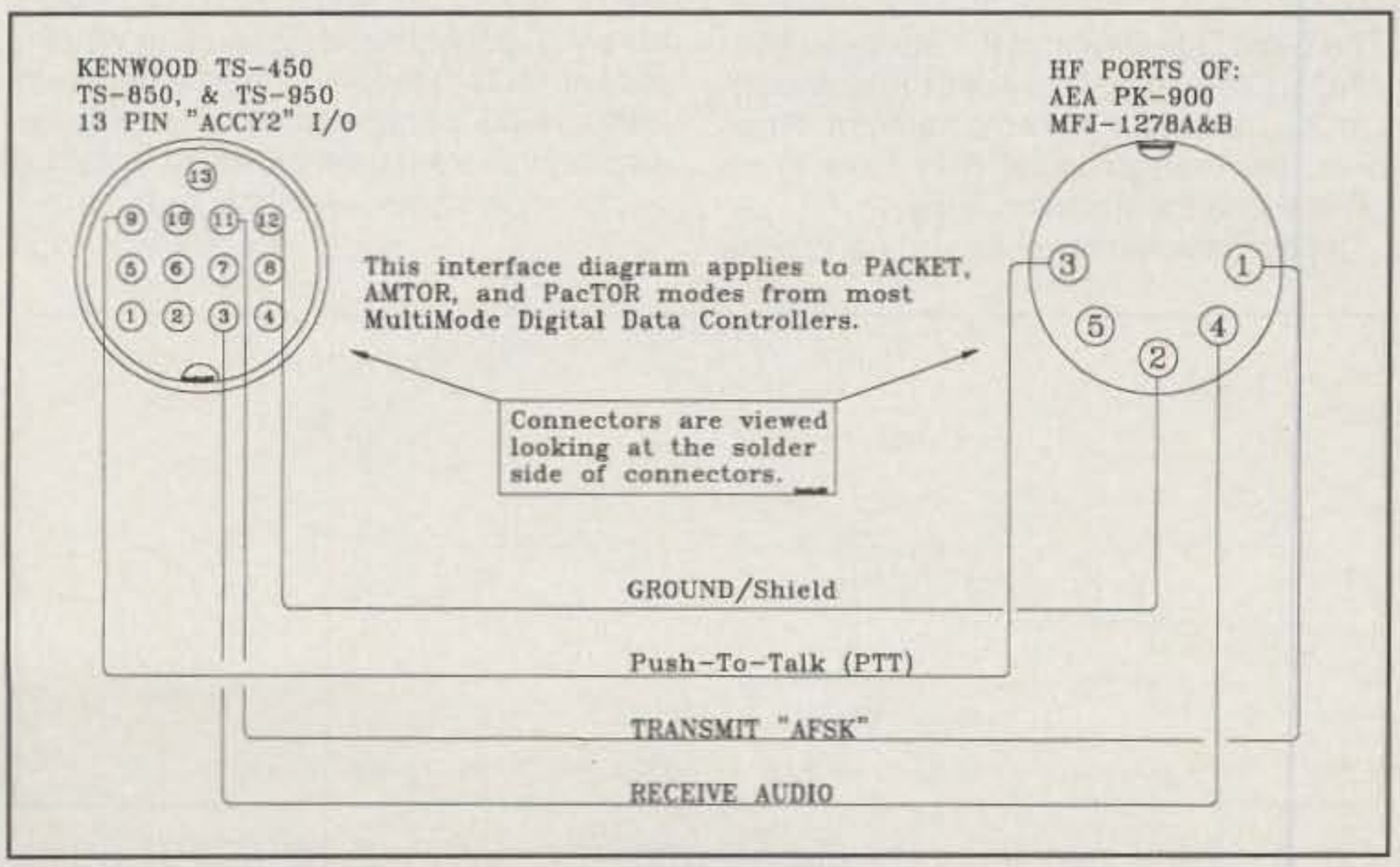

Fig. 6– An interface for the HF AMTOR, PacTOR, and 300 baud packet operation.

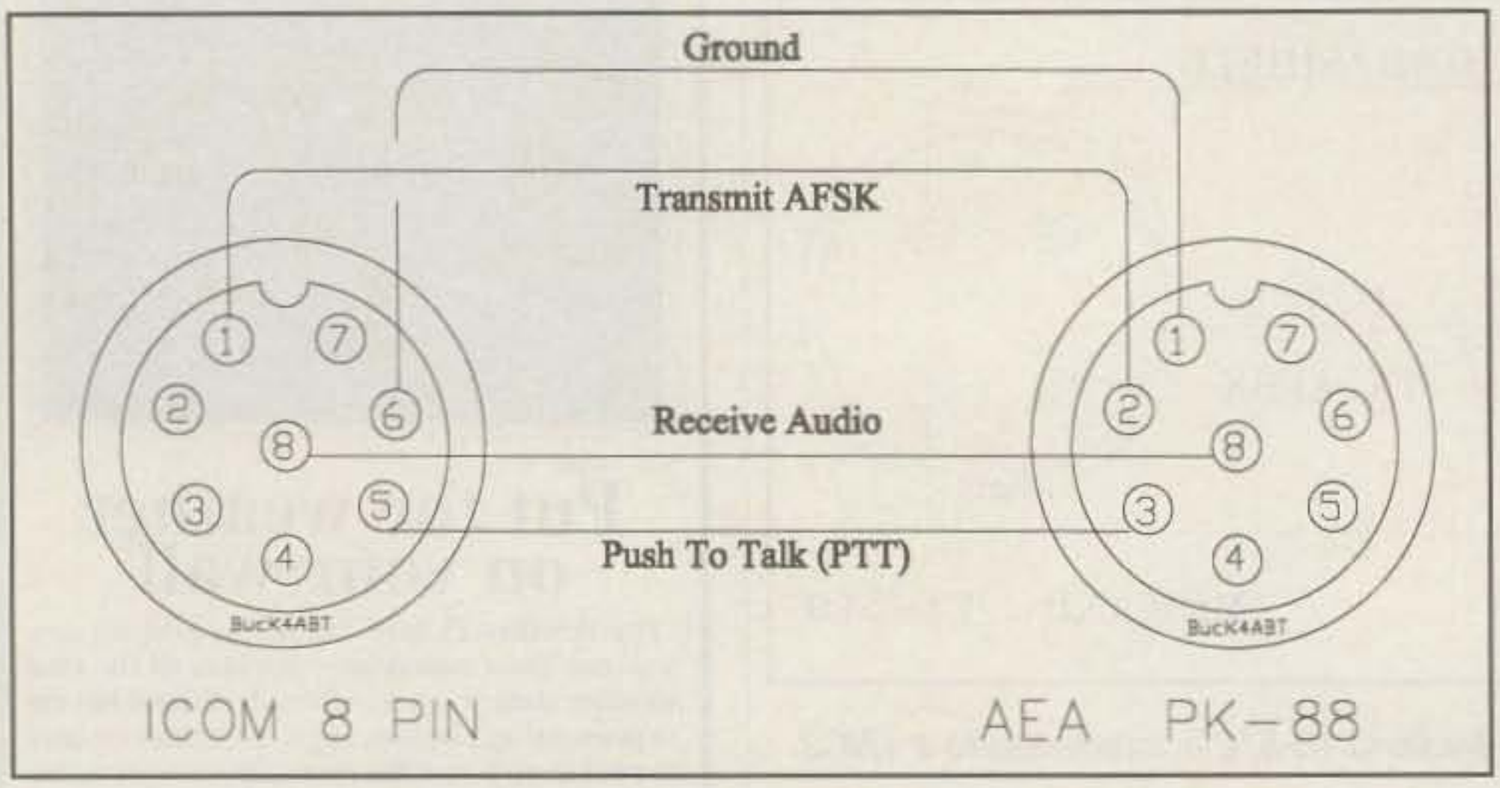

Fig. 7– Interface for the ICOM 8-pin microphone connector to the older AEA PK-88 TNC.

our neighbors who are "under the gun" when disaster strikes.

73, Dennis Willmon, KT4BT
SNO SEDAN node LMN, & 9650
SEDAN Alabama Network Coordinator
(Editor's note: You may e-mail comments to Dennis at: <denniskt4bt@tallassee. net>.)

Let's Connect 'em Up And Be Prepared

Not to replace voice, but to serve as an adjunct to other emergency services, packet radio does have its place. As Dennis noted, links to and from the National Weather Service are one means of providing essential information and data. Passing traffic of a medical nature via packet radio assures that error-free messages are passed and received. Also, a packet message can be sent to the printer and a hardcopy made for recording or for duplication to other dispatchers.

As Dennis also pointed out, "making sure the network nodes and the network as a whole is ready when our neighbors are placed in harm's way" is of utmost importance when it comes to network maintenance and testing.

To make more systems available, let's connect as many radios and TNCs and support our emergency systems and networks. This month we have some updated and new interface diagrams to help build such support systems.

For the operator who has a handheld radio and wishes to interface it to a TNC, use the interface shown in fig. 2. This interface utilizes the Alinco DJ-120 and an MFJ-1270, or a PacComm Tiny-2 Mark 2. The 5-pin DIN shown is the same on both TNCs. Other radios may use the same single 2.5 millimeter stereo connector. However, the resistor value may have to be greater than that shown in fig. 2.

If you really want to get compact, use the PacComm Handi-Packet™ and interface it using the HT type as in fig. 2, or with the radio(s) shown in fig. 3. Fig. 3 illustrates the interface of the PacComm Handi-Packet™ and several Azden transceivers.

For node operation, the older radios still make good hilltop transceivers. Case in point is the Regency HR-2, 2A, & 2B (see fig. 4). These old clunkers are still around and perform well where a 15 or 25 watt transceiver will suffice. We have several in use on the Southeastern Emergency Digital Association Networks (SEDAN).

Now if you really want to step into the Buck Roger's time machine, we can go back further and dig up an old relic such as the Midland 13-510. Glynn, WB4RHO, has one still operating packet on a hilltop in southern Alabama. It is a 25 to 30 watt transceiver that withstands a lot of abuse. It too is easy to interface (see fig. 5) to the TNC2 types and makes a good hilltop node transceiver.

So that we don't slight the HF operator, I'm including an interface for the HF AMTOR, PacTOR, and 300 baud packet operation at fig. 6. The TimeWave/AEA PK-900 and the MFJ-1278"B" both support the 5-pin DIN connector(s). Both controllers also have dual port connections.

In fig. 7 I've drawn the interface for the ICOM 8-pin microphone connector to the older AEA PK-88 TNC. Both the PK-88 and many ICOM transceivers have the same type connector. Please note: For the ICOM user, the receive audio is available from either the external speaker (3.5 mm) jack or from pin 8 of the microphone connector.

So that I cover all the TNC (and KPC/KAM) OEMs, at fig. 8 I've drawn the wiring diagram of the RadioShack transceivers with RJ-45 microphone connectors as interfaced to the Kantronics KPC-2, KPC-3, and KAM.

That's It for This Month

We're having fun and helping our neighbors with packet radio. Be sure to visit the packet radio networking home pages at: <http://www.packetradio.com>. My e-mail address(es) areas follows: <k4abt@packetradio.com>; <k4abt@sedan.org>.

73 de BucK4ABT

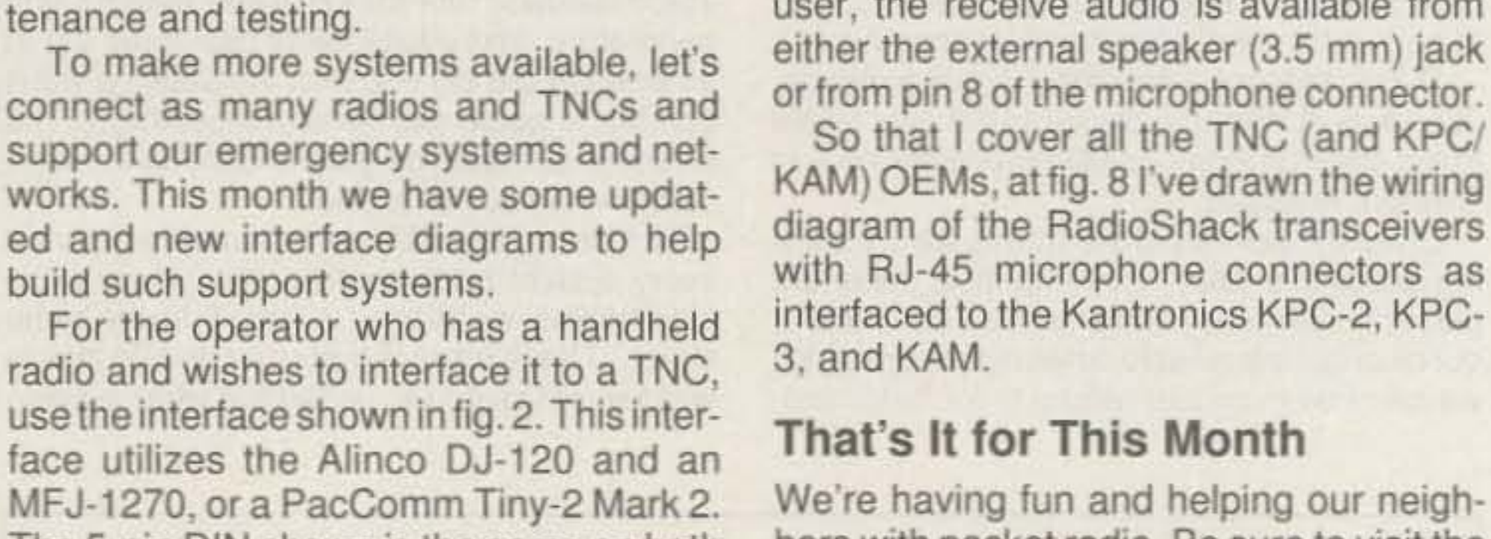

Fig. 8– Wiring diagram of the RadioShack transceivers with RJ-45 microphone connectors as interfaced to the Kantronics KPC- 2, KPC-3, and KAM.

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BY JOE LYNCH, N6CL

VHF PLUS

ALL ABOUT THE WORLD ABOVE HF

Phase 3-D Final Integration Continues

The long-awaited Phase 3-D satellite continues to be longer awaited. Hopefully, it will be a reality by this year's end. What follows is the latest from an AMSAT press release:

"AMSAT teams from a number of countries recently converged on the Phase 3-D Integration Lab in Orlando, Florida to install the remaining electronic and communications modules into the new Phase 3-D International Satellite and make it 'flight ready' for launch.

"In a joint statement issued just prior to their departure from Orlando on March 18th, Dr. Karl Meinzer, DJ4ZC, AMSAT-DL President and Phase 3-D Project Leader, and Bill Tynan, W3XO, AMSAT-NA President, outlined recent progress made on the satellite. 'We are most happy to be here and to again participate with our international partners in the final integration of Phase 3-D,' said Karl. 'The cooperation with the American integration team in Orlando remains excellent.' Karl went on to note that, 'I am happy to say that after successfully recovering from the setbacks caused by the major structural reworks of last summer and fall, the spacecraft is now once again rapidly nearing flight readiness.' Karl also expressed his gratitude to Stan Wood, WA4NFY, AMSAT-NA's VP Engineering, Lou McFadin, W5DID, P3-D Integration Laboratory Manager, and the other members of the Orlando Lab team including Dick Jansson, WD4FAB, Rick Leon, KA1RHL, and Bob Davis, KF4KSS, for their hard work in preparing the satellite for the final integration phase.

"Soon after his arrival, Peter Guelzow, DB2OS, AMSAT-DL's Digital Integration Manager, performed a number of checks and measurements on the spacecraft's Internal Housekeeping Unit (IHU). The IHU is the spacecraft's main computer. Following this extensive checkout, Peter then successfully accomplished a major integration milestone by sending and receiving commands from the spacecraft via radio uplink. This was a critical task that had to be accomplished before each of the individual flight electronic modules could be commanded on and tested for flight readiness. Dr. Stacey Mills, W4SM, P3-D's North American Command Station, was also present in Orlando to assist the integration team by putting the finishing touches on software to format and decode the telemetry stream from the satellite. Needless to say, there were big smiles all around when, once again, P3-D team members heard the familiar 'growl' of 400 baud PSK telemetry coming from the new 'bird.'

"In addition to his duties as AMSAT-DL's Vice President, Werner Haas, DJ5KQ, is responsible for coordinating the entire communications suite for Phase 3-D. While in Orlando, Werner performed yet another bench test on each of the flight electronic modules just prior to their reinstallation into the satellite. Then, Werner directed other members of the communications team, including Freddy de Guchteneire, ON6UG, and Dr. Matjaz Vidmar, S53MV, in successfully powering up each of the onboard flight electronic modules. Michael Fletcher, OH2AUE, and Harri Leskinen, OH2JMS, were also on hand in Orlando during this time to reinstall the 10 GHz transmitter hardware. In addition, Stefaan Burger, ON4FG, assisted the communications team by connecting and powering up the 24 GHz transmitter. It performed 'as advertised,' delivering its designed 1 watt output into its 26 dB gain feed-horn antenna.

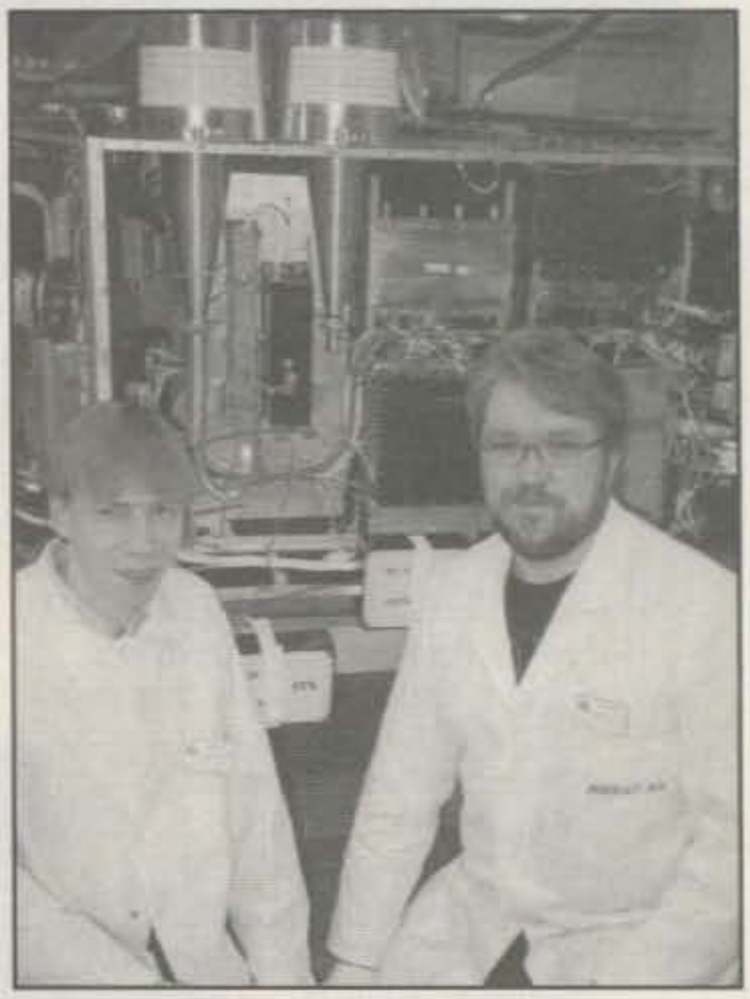
"The RUDAK team was well represented in Orlando by Peter Guelzow, DB2OS, Bdale Garbee, N3EUA, Jim White, WDØE, Chuck Green, NØADI, and Harold Price, NK6K. They gave the RUDAK digital experiment module a thorough checkout and declared it 'electrically flight ready.' Bdale also performed a complete check of the JAMSAT SCOPE camera. In addition, Gerd Schrick, WB8IFM, was on hand in Orlando to help the P3-D team put the final touches on the satellite's all-important Earth and Sun sensors. These instruments will help ground controllers determine Phase 3-D's physical orientation in orbit for tracking and motor burn considerations.

"Meanwhile, Konrad Mueller, DG7FDQ, AMSAT-DL's Structural Specialist, and his team consisting of Horst Wagner, DB2ZB, and the P3-D Lab's Bob Davis, were busy preparing the second Specific Bearing Structure (SBS) for flight. The SBS is the large cylindrical structure that will ulti-

VHF Plus Calendar

June 1	First quarter moon.
June 4	Moon apogee.
June 5-7	Ham-Com convention. *(See text for details.)*
June 7	Poor EME conditions.
June 9	Full Moon. *Arietids* meteor shower predicted peak.
June 11	Lowest Moon declination.
June 13–15	ARRL VHF QSO Party. *(See text for details.)*
June 14	Moderate EME conditions.
June 17	Last quarter Moon.
June 20	Moon perigee.
June 20-21	SMIRK 6-Meter Contest. *(See last month's column for rules.)*
June 21	Moderate EME conditions.
June 23	New Moon.
June 27–28	ARRL Field Day. *(See text for details.)*
June 28	Moderate EME conditions.

EME conditions courtesy W5LUU.



Michael Fletcher, OH2AUE (right), and Harri Leskinen, OH2JMS, pause for a moment just after reinstalling and testing Phase-3D's 10 GHz transmitter and Traveling Wave Tube (TWT) amplifier during recent integration efforts at the Phase 3-D International Satellite Integration Laboratory in Orlando. The TWT, procured by AMSAT-DL for the project, delivered nearly 60 watts output into its "upside down paint bucket" dummy load (top center) during tests. (AMSAT-NA photos by Keith Baker, KB1SF)

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mately carry the Phase 3-D spacecraft to orbit. In addition, Phase 3-D's Documentation Manager, AMSAT-DL's Wilfred Gladish, was also present in Orlando to ensure that all the spacecraft's documentation, including each of the spacecraft's drawings and photos, match the 'as built' spacecraft.

"Despite the very good progress made in this most recent integration effort, a definitive launch opportunity for Phase 3-D remains unsure. However, negotiations with the European Space Agency for a ride to orbit are continuing in earnest, and all remain optimistic that Phase 3-D will be successfully launched, hopefully sometime this year."

Your editor and the AMSAT News Service would like to thank AMSAT-NA VP Keith Baker, KB1SF, for the information that went into this piece.

1998 Central States VHF Society Conference

The following is from Denise Hagedorn, AJØE, President of the Central States VHF Society:

The 32nd Annual Central States VHF Society Conference will be held in Kansas City, Missouri, from July 23–26 at the Adam's Mark Hotel, located near the intersection of I-70 and I-435, across from the Truman Sports Complex. A block of rooms has been reserved for the conference at the special rate of $82 + tax per night. These rates are for single, double, triple and quadruple occupancy during the conference date. Discount air fare information is on the CSVHF Society home page: <http://www.csvhfs.org>.

Technical Programs: Tom Bishop, KØTLM, is in charge of the technical program and the proceedings. If you are interested in presenting a talk, contact Tom immediately at <k0tlm@juno.com> or at 4936 N. Kansas Ave., Kansas City, MO (816-452-6953). *[Ed. note: Deadline for submissions for the proceedings was May 15. Notice of this was received past our deadline for publication.]*

Antenna Gain, Noise Figure Measurements and Flea Market: Antenna gain measurements are scheduled in a reserved area of the hotel's parking lot for Friday morning and noise figure measurements will be held Friday evening along with the flea market.

Family Program: Charles Hensley, KAØOGU, is in charge of the family program. Baby-sitting will be available as well as a youth/teen banquet, indoor/outdoor pools, whirlpool, sauna, and health club.

CSVHF Society members are requested to submit nominations for the Chambers and Wilson Awards. Nominations may be sent to Kent Britain, WA5VJB. The Chambers Award honors those who have made outstanding technical contributions to the VHF/UHF/Microwave art. The Wilson Award is for other kinds of contributions to the amateur world above 50 MHz, including service to the society.

The prizes are being handled by Jon Jones, NØJK. Let him know if you can help him out or have suggestions (phone 316-681-1033 or e-mail <jkjones@fn.net>).

Up-to-date information is available on the society's home page. If you have not been a member in the last three years and want to be on the mailing list for conference info, send your name and address to Denise, at <AJ0E@csvhfs.org>.

Current Contests

ARRL June VHF QSO Party: The dates for this contest are 13–15 June. Complete rules are in the May issue of *QST*. Many are making plans to activate rare grids. Your editor is among them, sporting our new call of WRØVER. For the latest information on grid expeditions, check the VHF reflector <vhf@w6yx.stanford.edu> on the Internet.

SMIRK Contest: The SMIRK QSO Party, sponsored by the Six Meter International Radio Klub, will be held 0000Z June 20 to 2400Z June 21 (48 hours). This is a 6 meter operation, and all contacts between the 48 contiguous states must be made above 50.200 MHz. Complete rules were in last month's column. However, here is a brief summary:

Exchange is your callsign, SMIRK number, and grid square. No cross-band or partial contacts allowed. Score 2 points for each contact with a SMIRK member and 1 point for each contact with a non-SMIRK member. Your final score is the total number of points multiplied by the total number of grid squares worked. Certificates will be issued to the high scorer in each state, province, or foreign geographical division. Non-SMIRK members will receive awards if no entry is received from a SMIRK member in their geographical division.

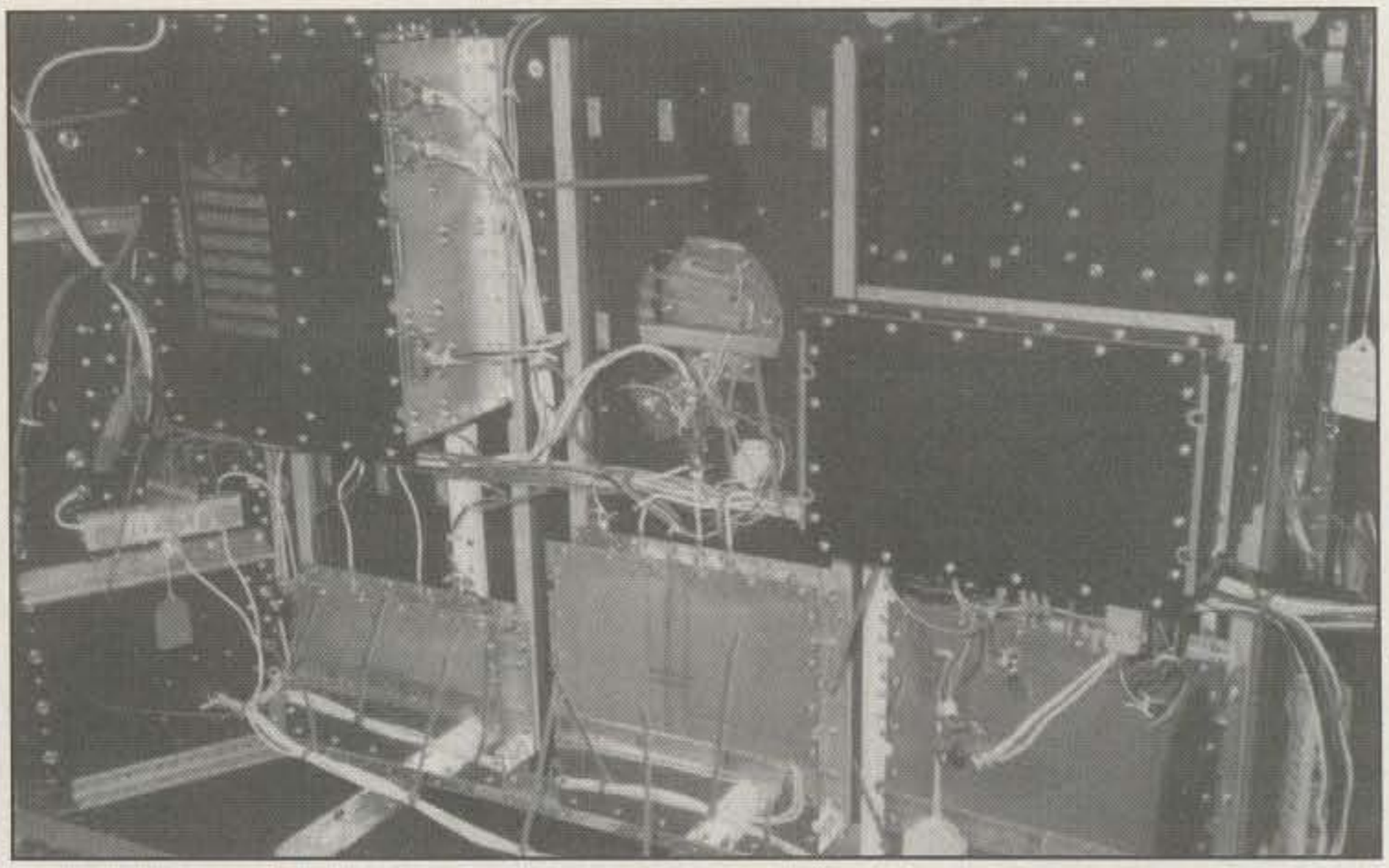
Note: they have deleted the requirement to be a paid-up member to receive an award. The idea is to have a fun contest and encourage everyone to participate and try for an award.

Send a legal-sized 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.

Field Day: ARRL's classic, Field Day, will be held on 27–28 June. Complete rules for this contest can also be found in *QST*. In years past tremendous European openings have occurred on 6 meters.

Current Conferences

Ham-Com is scheduled for the first weekend in June. As usual, the North Texas Microwave Society will present a couple



Some of Phase 3-D's "flight-ready" electronic modules are visible in this photo of the satellite's Equipment Bay Number 2 during recent integration efforts at the P3-D Laboratory in Orlando. Shown from the top left are JAMSAT's SCOPE camera experiment and the satellite's second S-Band transmitter. Shown along the bottom (from left) are the spacecraft's receivers for L-Band, S-Band, HF-Band, and C-Band.

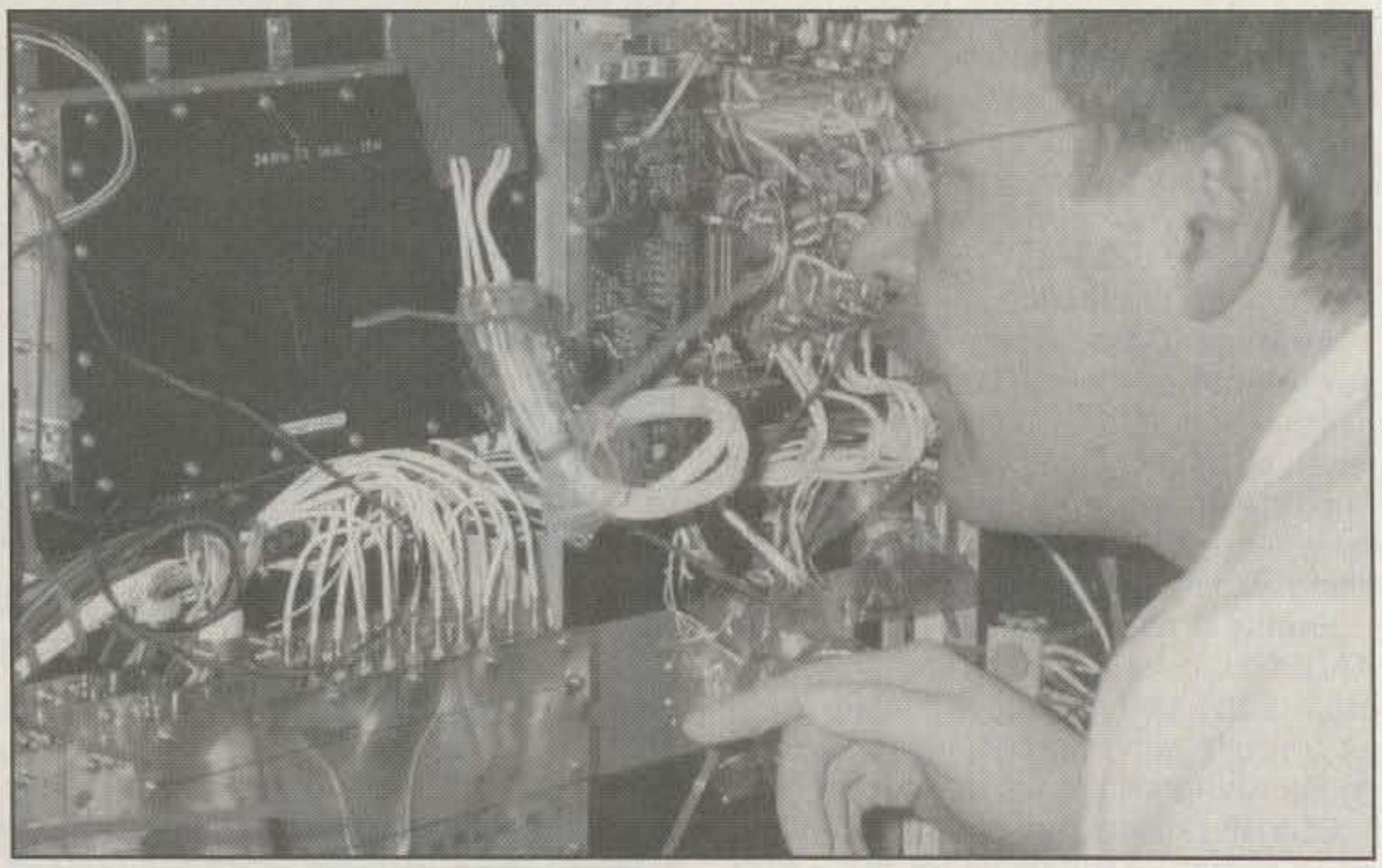
of programs during the convention.

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

Between 3 and 11 June, the *Arietids* meteor shower will once again be evident. This is a daytime shower with the peak predicted to occur around 1500Z on 9 June. Activity from this shower will be evident for around eight days, centered around the peak. At its peak you can expect around 60 meteors per hour traveling at a velocity of around 37 km/sec (23 miles per second).

On 9 June the *Zeta Perseids* is expected to peak. At its maximum it produces around 40 meteors per hour. On 28 June the *Delta Aquarids S* shower is expected to peak. On 29 June the *Beta Taurids* is expected to peak. Because it is a daytime shower, not much is known about the



Stafaan Burger, ON4FG, uses a rubber-gloved hand to carefully inspect adjacent wire clearances between Phase 3-D's 24 GHz (K-Band) transmitter oscillator module (upper left) and the satellite's IF Matrix module (lower left). Phase 3-D's power switching unit (the satellite's remotely controlled "power control panel") is shown at top center.

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 the *Beta Taurids* shower seems to favor a north-south path.

As you can see, there are plenty of showers from which to choose.

Love at First Dit with a Long-Delayed Echo

Occasionally, your editor goes off the subject of this column—that of VHF weak signal activity. When I do, I invariably get some negative mail, which I dutifully ignore. What follows is another one of those forays. So if you don't want to read it, you can stop reading this column now. However, if you are married, or have a significant other in your life, and you have not forgotten what romance is all about, read on. You might also want to share this part of the column with your significant other.

It was over the summer of 1963 that your editor, then WA6PDE, and a teenager, living in Bonita, California, got a call from an amateur radio operator living in Imperial Beach. "How would you like to spend a week with me, have all that you can eat, and $30 to boot? The only catch is you have to help me to prepare for my General Class license exam." What young teenager would not jump at that chance?

I said sure I would. So, off to my friend's house I went. I spent that week drilling my friend on the questions and answers and sending him the Morse code. In the evenings after a few hours of practice I had time to operate his station. One evening I heard an operator calling CQ. I responded and a QSO ensued. That op was Carol King, K5CPZ, who at that time was living in Drumright, Oklahoma.

From that QSO, a correspondence evolved. Because of Carol's sensitivity about her disability and how it might be perceived by others, she quickly revealed that she was blind. I told her that didn't matter to me because I had friends in San Diego in the hobby who were blind. Yet finding out about her disability caused me to delve a bit deeper into her world.

After learning about her disability, I went to the San Diego Braille Transcriber's Guild and purchase a slate and stylus and borrowed a basic Braille instruction book. Along with this equipment came a stack of Braille paper. I set out to teach myself Braille and began corresponding with Carol with it, much to her delight.

This teenage infatuation continued until a while after the following Valentine's Day. I sent Carol a box of See's chocolates (the best in the world!). Expecting to hear some sort of thank-you response from her, I waited and waited. Weeks passed and I did not hear anything. I assumed the worst. This long-distance relationship was

too much to maintain and she decided to drop me. Trouble is, she had sent me a response, but it was lost in the mail!

After several weeks of *her* not hearing from *me,* she started to think the same. Yet she did not give up hope entirely. One summer her family decided to take a trip to the west coast to do the tourist sites. Along with this was a stop to see her cousin, who was stationed aboard a destroyer in San Diego. While Carol was in San Diego, she tried to look me up. However, I was in Viet Nam!

In the ensuing years, neither of us thought much about the other except to occasionally wonder whatever happened to the other—that is, until the fall of 1974.

One day a tornado tore through Drumright. The news of this tornado made it to *NBC Nightly News*. I watched, stunned, wondering what, if anything, had happened to Carol. I decided to call. The phone lines were down and I couldn't get through. I dropped the idea in fairly short order. However, I could not entirely shake my curiosity. To satisfy it, several months later I called again. This time I reached Carol's mother and learned that Carol was working in Little Rock, Arkansas.

After getting Carol's number from her mother, I called her later that day. My phone called floored her. From this contact, we renewed our acquaintances via amateur radio.

We kept in touch over the years. Finally, on the way back home from Nebraska to see my sister, who was living there at the time, I went via Carol's QTH, which was still in Arkansas. I had an eyeball QSO with her and several of her friends.

It was a few years later, in 1984, that, after my divorce, I decided to move away from San Diego in order to start a new life. Part of that restart had to do with going to graduate school and working on an MBA. I chose Oklahoma City University, as it was a church-related school with similar denominational ties to the church I attended in San Diego.

I moved on campus at OCU and got involved in a large church in Oklahoma City which reminded me of the church I had left in San Diego. Because Carol was working in the Oklahoma City area as a high school teacher, I kept in touch with her as a friend—someone who I knew in my new QTH. Yet, as someone in whom I could become romantically interested, I had my doubts for two reasons: First, I was still shell-shocked from my divorce, and second, she was dating two guys at the time! Busy gal!

It took me about three years to complete my MBA and take some other post graduate courses in education. After completing my schooling, I worked for the FAA as a contract instructor. I was starting to show some stability. At the same time Carol's boy friends were starting to disappear.

AMSAT-NA's VP of Engineering, Stan Wood, WA4NFY (right), uses a machinist's level to precisely balance the Phase 3-D spacecraft in its construction cradle while Lou McFadin, W5DID, P3-D Integration Laboratory Manager (far left) and Konrad Mueller, DG7FDQ, AMSAT-DL's Structural Specialist, assist. The "upside down paint bucket" on the top of the spacecraft is a dummy load that covers the opening on one of Phase 3-D's 10 GHz horn antennas during testing.

First one of them, then the other, found someone else and got married.

Seeing that Carol was now available, I started to take a romantic interest in her. She kept me at arm's length, though, because she was not sure if I had recovered from my divorce. She also wanted to see me in a more stable job situation. As a contract instructor, my job was well-paying but temporary. It could end at any time, which it eventually did with a change in the mission of the FAA as it pertained to their use of contract instructors.

This loss of employment also represented a setback in my being able to establish myself as a stable person in Carol's opinion. I was not sure what to do about it, as the Oklahoma City job market was not great for my skills. I thought of going to another city in another state to get a "real job," but I also knew that if I did, I would be losing my opportunity to pursue a relationship with Carol. I was caught in a dilemma. Do I stay or do I move?

Eventually I was hired by the QCWA to produce their magazine. This presented some stability, but not nearly enough income. Because of this, Carol remained uncommitted to a permanent relationship.

While I was performing my duties as the QCWA's journal editor-publisher, something else was gnawing at me. Something inside of me was pressing me in a different direction. I had noticed altruistic motives occasionally surfacing. They would come to the surface especially when I took a short-term mission trip via my church. Over the years, those of you who have been long-term readers of this column have read about these trips. Something seemed to be telling me, though, that I needed to consider some sort of full-time commitment. These thoughts also challenged my feelings for Carol. They presented me with a dilemma: I wondered if I were in some type of full-time service which would also allow me to continue in my pursuit of a relationship with her. I also knew that what was at work in me would somehow lead me to figure out that aspect of my life as well.

Because of my increasing altruistic feelings, I advised the leadership of QCWA that I would not edit their magazine for more than two years. It was a bit short of two years when they decided to take another direction after the Oklahoma City bombing essentially put the Journal Record Publishing Company, the printer I used, out of the contract printing business. Because of these and other changes, my contract was cancelled. I was disappointed but relieved. I was disappointed in no longer having a part of that magazine, but relieved because I was now free to pursue my altruistic interests.

My direction for this pursuit came from a friend of mine who challenged me to go to seminary. I decided that this was what I needed to do. I applied and was accepted at Perkins School of Theology in Dallas, Texas. Perkins is a graduate school of Southern Methodist University. I also began the process for becoming ordained as a United Methodist minister.

All of these changes bewildered Carol. On the one hand, she was glad to see me go after a new career that I was really interested in pursuing. On the other hand, because I was in Dallas, I would now be away

from her for extensive amounts of time. This was something that neither one of us really liked. Yet, there was not a suitable seminary in the Oklahoma City area. So, off to Dallas I went, knowing it put at risk the future of my relationship with Carol.

A curious thing was happening within Carol. While, this forced-distancing myself from Carol presented a set of problems to her, it also seemed to convince her that I was finally going to be the stable person she knew that I could be—and had hoped that eventually I would become. Because of her positive shift in feelings for me, we now began to talk in terms of making a permanent commitment to each other. From that, we seemed to feel confirmation in our relationship with each other. Over the next three years we increasingly realized that we needed to be together in the ministry.

As I was able to—and Carol's job permitted her—I involved her in my seminary training. When she could, she participated in my classes, once guest lecturing in one of them on the church's ministry to the disabled. During my year-long internship in Ft. Worth, I brought her to church with me almost every week. This entailed making two round trips to Oklahoma City from Ft. Worth each week. I started adding 1000 miles of driving per week to make it possible. While we had been best friends for years, we discovered that from these activities, we were falling in love—with each other and with the new career that I was pursuing. We decided that eventually we would be married. But when?

The "when" came this past February. What seemed to be the end of our budding friendship 34 years earlier, Valentine's Day, became the beginning of our married life together. We were married by a friend of mine—a former seminary roommate—late in the afternoon of that romantic day of days. As I am writing this, we have just celebrated our two-month anniversary. We are happy to be married and to be beginning our new life together.

Recently, we interviewed together for my position as a new associate pastor at the First United Methodist Church in Bixby, Oklahoma, south of Tulsa. This month I begin working there, relocating from Oklahoma City. Carol has one more year to retirement from her job in the Oklahoma City public school system. Because she is in the Oklahoma state retirement system, she is hoping to get a job in the Bixby school district. As of this writing that detail is still being worked out.

There you have it: my story of love at first dit,which had a very long, delayed echo.

And Finally . . .

As I am writing this column, I am in the last month of my seminary training. As I mentioned above, I am relocating to another part of Oklahoma. As far as amateur radio is concerned, I expect that as soon as I find a suitable QTH, I will be back on the air. I will have to start over for my WAS on 2 meters and my VUCC on 2 meters and 70 cm, as I had not completed them from Oklahoma City. However, from this new QTH, I find that I am within that magic circle where it is theoretically possible to work all 48 contiguous states terrestrially on 2 meters.

In our new QTH Carol and I will be much closer to one of my good friends, Tommy Henderson, WD5AGO, a very active EMEer. Carol got her first taste of EME from Tommy's QTH when she made a 23 cm QSO with a station in France. She has never forgotten that experience.

Speaking of a long-delayed echoes (LDE), as I eluded to above with regard to my marriage to Carol, along with Carol came her guide dog, Echo. Now when we travel together to ham radio conferences and we are with EMEers, we can say to them that we have brought our own Echo.

Regarding the subject of LDEs, I will be echoing comments which appeared on the Moon-Net VHF reflector concerning their seeming effect on EME communications in a future column. This controversial phenomenon has generated a considerable amount of discussion and is worth pursing at length.

Until next month, however . . .

73 es 88 de Joe, N6CL,
and Carol Lynch, K5CPZ

DX

BY CHOD HARRIS, VP2ML

NEWS OF COMMUNICATION AROUND THE WORLD

New DXCC "Entities"

The revised DX Century Club rules went into effect at 0000Z on April 1, 1998. Within seconds, an international group of experienced new-country operators was on the air from what most likely will be the first new "entity" to be added to the DXCC countries list under the new rules. (Among the changes in the DXCC rules adopted by the ARRL Board of Directors at their January meeting was a change in the name of the DXCC "countries" to "entities" to reflect the fact that many of the so-called "countries" on the list are not what most non-DXers would consider to be a "country.")

The South China Sea DX Team (SCSDXT) took advantage of the metrication of the DXCC distance criteria to locate a potential New One in the Pacific. Part of the change in the DXCC country criteria was to convert the separation requirements for separate country status from miles to kilometers. The 225 mile minimum for separating islands was changed to 350 kilometers. While 225 miles is actually closer to 362.1 kilometers, the DXCC 2000 committee rounded this down to 350 kilometers. The 225 mile distance was totally arbitrary in the first place, being based on an average of previous decisions. The change in measurement units meant that some possible new DXCC entities that were less than 225 miles, but more than 350 kilometers, from their parent "country" would now be eligible for separate DXCC status.

The Temotu Islands are part of the Solomon Islands, but lie more than 350 kilometers east of the main island group of the Solomons. As such, they appear to meet the revised DXCC country criteria as a separate DXCC "entity," as the Solomons clearly are a Point 1 country (by reason of government). Under the revised rules, a DXCC entity is a Point 1 country if it belongs to the United Nations, has a official ITU-assigned prefix block, or has its own IARU member society. The Solomons meet all three requirements, when only one is necessary. Thus, the Solomons are clearly a Point 1 country under the revised rules. The Temotu Islands lie the required distance from the parent "entity" and thus clearly should qualify as a separate "entity" effective with the change in the DXCC rules on April 1, 1998.

The SCSDXT wanted to give everyone a good chance to work this probable New One. The team first arranged to be in the Temotu Islands from the very start of the implementation of the new DXCC rules. In fact, several members of the team flew to the Temotu Islands several days prior to April 1, and even entered the CQ WPX SSB test March 27–28. Note that these operations from the Temotu Islands prior to April 1 will count for the DXCC country of the Solomons, and not for the New One of Temotu.

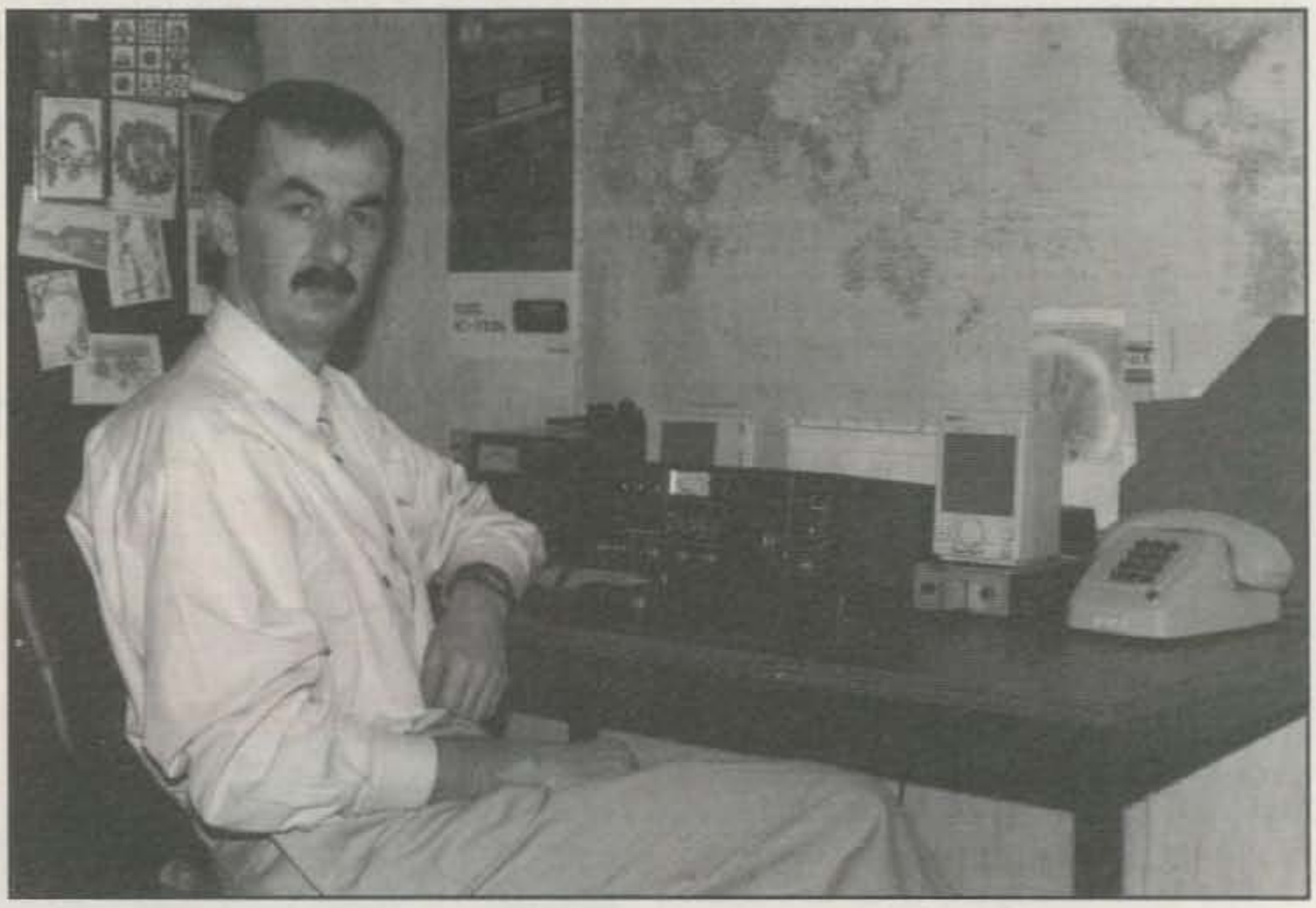
On April 1 the team inaugurated the new call sign of **H40AA** and the probable New One was on the air. The early pileups were as large and as tightly contested as any in recent memory. In order to maintain a reasonable rate of working the Deserving, the SCSDXT had to resort to rather wide listening spreads and going "by the numbers." (The latter generated the usual collection of cheaters who added a portable designator to their real callsigns to call out of their own call area.) However, within a couple of days the pileups had subsided to the point where normal DXpedition spreads prevailed. The team aimed for a two-week operation, in sharp contrast to two recent additions to the DXCC countries list: North Korea and Scarborough Reef. The three new countries on the DXCC added since 1994 are in the top five Most Wanted in the 1997 *The DX Magazine*'s Most Wanted survey. North Korea and Scarborough rank first and second on that list, with Pratas at fifth. Thanks to the planning and skills of the SCSDXT, Temotu should debut well down on the Most Wanted list.

After a few days of operation, the SCSDXT issued the following new release:

"The H40AA DXpedition reached the 35,000 QSO mark at 0000 UTC, April 6 after five days of operating. This activity will run through April 13, when the first Temotu operation will be history.

"While the first five days were spent on selected bands only—primarily 15 meters—the operation will be extended to cover a variety of bands and modes at this point on Monday, April 6. Bands such as 160 meters were tested last night, and eleven East Coast DXers were logged immediately, including K1ZZX, W4DR, and others. The limited initial bands were chosen to provide a maximum number of DXers with an early opportunity to capture this new country.

"The first wave of operators—OH2BE, OH2BH, OH2TA, and JA5DQH—have now left the island to be replaced by 9V1YC, N4GN, and W6OSP. The core group of OH1RY, OHØXX, and N7NG remains on the island for the full duration of H40AA. Transportation for these changeovers was provided by Solomon Airlines charter operations.



Sesmo, PA3GIP, is ex-T94S. (Thanks to Z32KY for the photo.)

P.O. Box 50, Fulton, CA 95439
e-mail: chod@compuserve.com

The WPX Program

SSB

2666 .....UA3LIU 2668 .....DL2CHN
2667 .....HB9BIN

CW

2979 .....N2SU 2980 .....HB9BIN

Mixed

1803 .....N2SU 1804 .....HB9BIN

Award of Excellence: HB9BIN with 160m bar

CW: 350 N2SU, HB9BIN. 400 AE5B, N2SU, HB9BIN. 450 N2SU, HB9BIN. 500 N2SU, HB9BIN. 550 N2SU, AA1KS, HB9BIN. 600 N2SU, HB9BIN. 650 N2SU, HB9BIN. 700 F5YJ, HB9BIN. 750 F5YJ, HB9BIN. 800 HB9BIN. 850 HB9BIN. 900 HB9BIN. 950 HB9BIN. 1000 HB9BIN. 2050 KS3F. 2200 KF2O.

SSB: 350 HB9BIN. 400 HB9BIN. 450 HB9BIN. 500 HB9BIN. 550 HB9BIN. 600 HB9BIN. 650 HB9BIN. 700 OK1DKS. 750 OK1DKS. 800 OK1DKS. 900 OK1DKS. 950 OK1DKS. 1000 OK1DKS. 1050 OK1DKS. 1100 OK1DKS. 1150 OK1DKS. 1200 OK1DKS. 1250 OK1DKS. 1300 OK1DKS. 1350 OK1DKS. 1400 OK1DKS. 1450 OK1DKS. 1500 OK1DKS. 1550 OK1DKS. 1600 OK1DKS, AE5B. 1650 OK1DKS. 1700 OK1DKS. 1750 OK1DKS. 1800 OK1DKS. 1850 OK1DKS.

Mixed: 450 N2SU, HB9BIN. 500 N2SU, HB9BIN. 550 N2SU, HB9BIN. 600 N2SU, HB9BIN. 650 N2SU, HB9BIN. 700 HB9BIN. 750 HB9BIN. 800 HB9BIN. 850 PAØAEB, HB9BIN. 900 HB9BIN. 950 HB9BIN, ON4CAS. 1000 HB9BIN, ON4CAS. 1050 HB9BIN. 1100 HB9BIN. 1150 HB9BIN. 1200 HB9BIN. 1250 AA1KS, HB9BIN. 1300 HB9BIN. 1350 HB9BIN. 1400 HB9BIN. 1450 HB9BIN. 1500 HB9BIN. 1550 HB9BIN. 1600 HB9BIN. 1650 HB9BIN. 1700 HB9BIN. 1750 HB9BIN. 1800 HB9BIN. 3050 WB2YQH.

10 meters: OK1DKS, HB9BIN
15 meters: OK1DKS, HB9BIN
20 meters: OK1DKS, HB9BIN
40 meters: OK1DKS, HB9BIN, ON4CAS
80 meters: OK1DKS, ON4CAS, HB9BIN
160 meters: OK1DKS, HB9BIN

Asia: OK1DKS, HB9BIN
Africa: HB9BIN
No. America: OK1DKS, HB9BIN
So. America: OK1DKS, W9IAL, HB9BIN
Europe: OK1DKS, HB9BIN, DL2CHN
Oceania: GHB9BIN

Award of Excellence Plaque Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS. I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, YU2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD. IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, S57J, EA8BM, DL1EY, KUØA, KØDEQ, VR2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLD, HB9BIN.

Award of Excellence Plaque Holders with 160 Meter Endorsement: K6JG, N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, K9BG, W1BWS, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, KØDEQ, VR2UW, DJ3JSW, OE6CLD, HB9BIN.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 593, Clovis, NM 88101-9511 USA.

"The group is most grateful to the Temotu administration for supplying needed facilities and power for H40AA. Two stations stand almost a mile apart, thus giving an opportunity to put two H40AA signals on 15 meters simultaneously. The CW station is located at the private home of New Zealand personnel who offer voluntary services in an effort to develop meaningful projects for the 1500 people who live on this remote island. Both stations are situated in the main village of Lata, which is partly supplied by the island's 60 kW generator.

"The Temotu province of the Solomons is the least developed and the most outlying province within the Solomons group, and the lifestyle of its people is still very basic. With a supply of a variety of fruits as well as fishing in the ocean, this group is self-sufficient in their daily needs. From the sad end of the story, it was discovered that the Temotu area suffers from extremely high malaria rates, currently the highest in the world. Some 40 percent of the people are affected. Special measures had to be taken to ensure the successful operation of H40AA in such hazardous conditions.

"The H40AA team is the largest foreign group of visitors that Temotu has experienced in its recent history. The DXpedition was welcomed by members of the entire local community, who were most hospitable.

"Part of the expedition antennas will be stored in Temotu for future operations, and a complete Yaesu station and an associated tribander were donated to The Solomon Islands Radio Association (SIRS) by Yaesu Musen Ltd. and the Northern California DX Foundation (NCDXF). This DXpedition assists the SIRS in preparing a DXCC Country application for submission to the ARRL. All needed maps were obtained from the Ministry of Lands in Honiara, the capital of Solomon Islands. It is now officially confirmed that the distance between the main Solomon Islands and the most remote Temotu Province is more than 350 kilometers, thus qualifying the H40-land for another DXCC entity."

T. Naranbaatar, JT1BV, handles QSL cards for many Mongolian Special Event stations.

By April 13 the team had made more than 65,000 contacts, and most DXers should have had a good chance to get this New One in their log. QSL H40AA to Jarmo Jaakola, OH2BN, Kiilletie 5C30, Helsinki 00710, Finland. Cards via the OH bureau will be answered after the direct cards are handled. Please do *not* send H40AA cards to the Solomon bureau.

The WAZ Program

Single Band WAZ

20 Meter SSB

1022 ..... N3NY 1023 ..... AA9RN

20 Meter RTTY

44 ..... JA1GRM

RTTY

108 ..... K6YUI

All Band WAZ

SSB

4423 ..... EA2CLU 4425 ..... VE2BDC
4424 ..... EA3CYM

CW/Phone

7783 ..... KK6T 7786 ..... JR2TRC
7784 ..... GMØVRP 7787 ..... EA8PP(CW) ...
7785 ..... YU1RA

All CW

115 ..... JA7IFT

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all *CQ* awards is $4.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

The SCSDXT would like to recognize the valuable support of Yaesu Musen Co. Ltd., Mikrolog Ltd., FinnFet Ltd., The Northern California DX Foundation, and INDEXA.

The amateur radio history of the Temotu Islands dates back to 1989–1990, when Martti Laine, OH2BH, spent long hours in Fresno University Library's Map Room researching potential new entities in the Pacific. Initial measurements seem to suggest that Temotu met the then-225-mile separation distance. Martti teamed with Stuart Honeysett, H44SH, to stage the first-ever operation from Temotu. However, the Solomons Ministry of Lands indicated that the true separation distance was just a mile or so short of the 225 miles needed for a New One. It took the metrication of the DXCC separation distances to add Temotu to the DXCC countries list.

The Temotu Islands won't be the only new entity added to the DXCC countries list based on the recent rules revision. As I predicted when discussing the reasons behind the rules revision, especially the simplification of the Point 1 requirement, the separate DXCC status of the Austral and Marquesas island groups in French Polynesia is again before the DX Advisory Committee (DXAC).

Paul Granger, F6EXV, has issued the following statement: "On April 1, 1998 a petition has been filed by F6EXV on behalf of the Clipperton DX Club for the addition of two new counters to the DXCC list, namely the Marquesas Islands and the Austral Islands.

"Under the new definitions of what constitutes a 'political entity,' namely IARU membership, French Polynesia is clearly a 'Point 1 country.' Furthermore, any island of the Marquesas group is situated more than 350 km away from any other island of the parent country. Any island of the Australs is situated more than 350 km away from any other island of the parent country, and more than 800 km away from any island of the Marquesas.

"The submission asks for addition to the list as of June 2, 1983, the date when the CORA, representing French Polynesia, joined the International Amateur Radio Union (IARU)."

This will be the third petition to add these two island groups to the DXCC list in the past ten years. F6EXV first filed for separate DXCC status for these two island groups in 1989. The two groups clearly meet the distance requirements under DXCC country Criterion 2: separation by water. However, under the old DXCC rules, Criterion 2 applies only when the parent entity is a Point 1 country. French Polynesia is an Overseas Territory of France, a status that the DXAC twice felt fell short of Point 1 status.

DXAC carefully considered F6EXV's original 1989 petition, but voted against adding the two island groups of the DXCC list by a split decision. Prior to that decision Paul had operated as FOØEXV from both island groups, accompanied by F2CW, who operated as FOØCW.

Then in 1994 JA1BK and NX1L tried again to have the Austral and Marquesas Islands added to the DXCC countries list. Again, the petitioners argued that French Polynesia was indeed a Point 1 country, according to the then-current country criteria. The petitioners declined to share their petition with this writer, but they apparently didn't uncover any definitive new facts. The DXAC voted 14 to 2 against adding the two islands groups to the DXCC list, saying very strongly that French Polynesia was *not* a Point 1 country.

One positive aspect that came out of this second attempt to provide two New Ones for DXCC was the realization that the existing DXCC country criteria, especially Point 1, were flawed and difficult to administer. Along with other considerations, this led to the formation of the DXCC 2000 committee and the subsequent revision of the country criteria.

Under the new rules, French Polynesia is clearly a point 1 country, as it has its own IARU member society—CORA. There has never been any serious question that the two island groups met the distance requirements of Point 2. Now that the question of Point 1 status for French Polynesia is resolved, it would appear that both the Marquesas and Austral groups will be added to the list of DXCC entities in the near future.

There is one important decision the DXAC and ARRL Awards Committee will have to make, however. The Temotu

5 Band WAZ

As of January 31, 1998, 472 stations have attained the 200 Zone level.

New recipients of 5 Band WAZ Award with all 200 Zones confirmed:

None

The top contenders for 5 Band WAZ (zones needed, 80 meters):

N4WW, 199 (26)
AA4KT, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
W9WAQ, 199 (26)
VE7AHA, 199 (34)
W9CH, 199 (26)
IK8BQE, 199 (31)
JA2IVK,199 (34,40m)
K1ST, 199 (26)
ABØP, 199 (23)
KL7Y, 199 (34)
UY5XE, 199 (27)
NN7X, 199 (34)
OE6MKG, 199 (31)
HA8IB, 199 (2 on 15)
OH2DW, 199 (1)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
W6SR, 199 (37)
S57J, 199 (2)
W3UR, 199 (23)
KC7V, 199 (34)
GM3YOR, 199 (31)
KZ4V, 199 (26)
W8DX, 199 (34)
N4CH, 199 (18 on 10)
N6AW, 199 (34)
UA3AGW, 198 (1, 12)
VO1FB, 198 (19, 27)
EA5BCK, 198 (27, 39)
K4PI, 198 (23, 26)
G3KDB, 198 (1, 12)
KG9N, 198 (18, 22)
KM2P, 198 (22, 26)
DKØEE, 198 (19,31)
KØSR, 198 (22, 23)
K3NW, 198 (23, 26)
UA4PO, 198 (1, 2)
K5RT, 198 (22, 23)
JA1DM, 198 (2, 40)
OE1ZL, 198 (1,31)
9A5I, 198 (1, 16)
K4ZW, 198 (18, 23)
DJ4GJ, 198 (1, 31)
OH2VZ, 198 (1, 31)
W2YC, 198 (24, 26)
W6DN, 198 (17, 34)
N5KO (18, 18 on 40)

The following have qualified for the basic 5 Band WAZ Award:

None

Endorsements: None

1067 Stations have attained the 150 Zone level as of December 31, 1997.

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all *CQ* awards is $4.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

Island petition for separate entity status will very clearly indicate that the start date for the new country should be the effective date for the revised DXCC country criteria—April 1, 1998. The Temotu Islands did not meet the Point 2 distance requirements in the old rules. In other words, the Temotu Islands would not have been approved as a separate DXCC entity prior to the change in the criteria.

F6EXV is asking for a start date for the Austral and Marquesas Islands of June 2, 1983, the date that CORA joined the IARU. Such a start date would mean that the previous operations of FOØEXV, FOØCW, FOØAKI, and FOØMIZ (and a handful of minor operations) would then count for the New One. F6EXV will argue that the DXAC and Awards Committee has applied new DXCC country criteria retroactively in past decisions, such as in the case of Rotuma and Banaba islands.

However, a major consideration in changing the DXCC country criteria was

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive. Lifetime Honor Roll fee is $4.00 (U.S.) for each mode, with no fee for additions.

MIXED

4773 F9RM	3363 N4MM	3005 PAØSNG	2660 4N7ZZ	2376 HAØIT	2128 W4UW	1718 VE4ACY	1396 YU1ZD	1198 S52QM
4740 9A2AA	3345 SM3EVR	2990 HA8XX	2645 I2EOW	2229 K5UR	2111 W9IL	1696 PY2DBU	1378 Z32KV	1192 KW5USA
3932 W2FXA	3258 N9AF	2966 YU7SF	2574 S53EO	2218 F6IGF	2087 KS4S	1691 EA5BM	1371 F6HMJ	1151 VE6BMX
3812 EA2IA	3253 I2PJA	2927 F2YT	2546 SM6DHU	2187 9A4RU	2019 G4OBK	1656 I2EAY	1356 NG9L	1100 KB5OHT
3675 UA3FT	3249 N4UU	2880 YU7BCD	2520 IK2ILH	2185 K2XF	2001 OE6CLD	1653 AE5B	1328 W9IAL	1098 VE6FR
3629 K6JG	3183 YU1AB	2848 K9BG	2512 JH8BOE	2169 W8UMR	1919 SM6CST	1628 JN3SAC	1299 N3ED	1088 HB9BIN
3585 W1CU	3154 N5JR	2831 KF2O	2500 HA5NK	2168 N6JM	1778 DJ1YH	1625 KØNL	1293 WØIZV	1074 W2EZ
3523 N4NO	3114 9A2NA	2779 I2MQP	2496 KØDEQ	2165 S58MU	1767 IØAOF	1607 OZ1ACB	1257 WT3W	1073 JR3TOE
3504 N6JV	3103 I1EEW	2776 W2ME	2484 K8LJG	2140 YU7JDE	1765 K5IID	1533 W7CB	1245 N1KC	1064 WB2PCF
3413 VE3XN	3017 WA8YTM	2699 WB2YQH	2377 W2WC	2165 W6OUL	1732 LU8DY	1478 I1-21171	1224 AA1KS	1059 RBØFU

SSB

4688 F9RM	2855 F2VX	2390 EA3AQC	2203 KD9OT	1760 HAØIT	1522 W6OUL	1353 K5IID	1127 EA8AG	869 N3ED
4122 IØZV	2757 I4CSP	2378 KF2O	2189 KF7RU	1754 W2WC	1518 AE5B	1346 W89IL	1016 WT3W	869 JR3TOE
3743 VE1YX	2745 OZ5EV	2367 WA8YTM	2097 EA1JG	1703 N6FX	1497 DK5WQ	1336 G4OBK	101P KI7AO	837 N1RT
3656 ZL3NS	2731 HA8XX	2349 UA3FT	2088 K5RPC	1703 KBØC	1489 K3IXD	1288 I3UBL	1004 LU3HBO	836 EA3EQT
3405 F6DZU	2725 I1EEW	2324 CT1AHU	2063 CX6BZ	1681 YU7SF	1473 K8MDU	1243 DF7HX	954 EA1AX	804 AG4W
3371 K6JG	2707 N4NO	2301 4X6DK	1958 IN3QCI	1659 K8LKJG	1451 IT9XVJ	1241 SV3AQR	933 DF1IC	792 EA5GMB
3246 I2PJA	2638 N5JR	2296 I8KCI	1906 K5UR	1649 EA5CGU	1450 K2EEK	1229 YC2OK	924 N1KC	778 N3DRO
2949 N4MM	2612 PAØSNG	2281 I2EOW	1881 SM6DHU	1639 K2XF	1415 IKØEIM	1196 KØNL	924 EA1MK	615 VE6BMX
2935 EA8AKN	2581 I2MQP	2274 EA5AT	1867 OE6CLD	1590 KS4S	1398 IK2AEQ	1182 WA2FKF	922 DL8AAV	613 SM5DAC
2913 CT4NH	2434 LU8ESU	2267 YU7BCD	1809 LU8DY	1536 HA5NK	1396 I3ZSX	1175 LU5EWO	919 CP1FF	608 LU3HL
2911 EA2IA	2411 9A2NA	2265 PY4OY	1802 OE2EGL	1535 CT1BWW	1395 EA5KY	1145 K4CN	873 I2EAY	605 N7VY

CW

4081 IT9TQH	2468 W2ME	2050 KA7T	1867 S58MU	1730 IT9VDQ	1510 KS4S	1270 K5IID	1058 DF6SW	884 PY4WS
3790 WA2HZR	2401 G4UOL	2046 HA8XX	1863 N6FX	1695 K2XF	1454 EA5YU	1230 EA6AA	1041 W9IAL	821 RAØFU
3489 N6JV	2350 N4MM	2035 HA5NK	1857 G4SSH	1690 DJ1YH	1416 9A3SM	1168 AC5K	1033 I2EOW	820 K3WWP
3098 UA3FT	2337 N5JR	1980 KF2O	1816 SM6CST	1641 G4OBK	1411 SM5DAC	1136 I2MQP	1032 W4UW	759 VE6BMX
3073 N4NO	2314 YU7BCD	1973 G3VQO	1798 W2WC	1641 W6OUL	1389 I2EAY	1133 EA2CIN	983 9A3UF	730 WT3W
2895 K6JG	2312 WA8YTM	1956 K8LJG	1795 W1WAI	1594 I1EEW	1346 9ØA2HF	1124 LU3DSI	982 LU7EAR	725 KØNL
2881 N4UU	2247 LZ1XL	1927 SM6DHU	1777 OZ5UR	1588 LU2YA	1317 N1TA	1083 4X6DK	949 K2LUQ	623 LY3BY
2872 EA2IA	2196 VR2UW	1900 TI4SU	1755 K5UR	1538 IK3GER	1293 IK5TSS	1074 W9IL	906 YU1TR	603 OE6CLD
2674 YU7SF	2124 JA9CDWJ	1876 HAØIT	1744 I7PXV	1527 EA6BD	1280 ZB2EO	1066 N3ED	890 KB5OHT	600 N1KC
2600 K9QVB	2104 9A2NA							

Luis Gomes, CT1ESO, finally made it to Pessegueiro Island (EU-167) in March by swimming to the island!

to make the rules less ambiguous and easier to interpret and administer. To apply a start date retroactively in one case and not in another (Temotu) would eliminate this important reason for the rules revision. The only way these committees can send a strong signal to the DX community that they are serious about making the DXCC rules easier to interpret would be to pick April 1, 1998 as the start date for all three new entities. While this would mean that the previous Austral and Marquesas operations would have IOTA value only, it would remove a major ambiguity in interpretation. Such a decision would also simplify the decision-making process of the two committees.

There are several other reasons favoring April 1, 1998 as the appropriate start date for the Australs and Marquesas. F6EXV argued in favor of such a date in his initial, 1989, petition: "These two groups of islands should, in our opinion, be added to the DXCC Country List from the **date of publication of the new criteria** in *QST*, since the new **wording of the definition** of a parent country does seem to apply in this particular instance." So Paul argued in 1989 that if the change in the definition is what adds the new entities to the DXCC Country List, the start date should be that of the change in the rules—i.e., April 1, 1998 in this case.

Further, the DXCC desk set a specific effective date for the new DXCC rules to take effect. It would be foolish to set such a start date, and then ignore same in the first important decision around that date. Kan, JA1BK, co-author of the 1994 petition, also believes in the April 1, 1998 start date, as he returned to the Marquesas as FOØMIZ in mid-April this year. Two other DXers are also betting on the April 1, 1998 start date. W6RJ/FOØFI and W6KR/FOØFR fired up from the Austral group on April 13, 1998 for a one-week operation, followed by another week in the Marquesas. Their press release concludes with: "These two island groups meet all requirements for new country status effective April 1, 1998."

Finally, while some DXers might argue that the change in the Point 1 criteria is *clarification* of the existing rule, most DXers recognize that the new rules are real *changes* from the previous criteria, again pointing to an April 1, 1998 start date.

The DXAC would be very hard pressed to justify a start date prior to April 1. After all, they twice considered the island groups under the previous rules, and twice turned it down. How can a change in DXCC rules in 1998 affect country status previously? Unfortunately, there are a

CQ DX Awards Program

SSB

2244 ..... CE3HA	2246 ..... SM3GBA
2245 ..... WB8ZRV	2247 ..... K6CF

CW

971 ..... AA2CB	973 ..... YU1RA
972 ..... RN9HM	974 ..... UA9SG

SSB Endorsements

320 ..... I8KCI/328	320 ..... N4HK/320
320 ..... XE1VIC/328	310 ..... K6BZ/315
320 ..... PAØXPQ/328	310 ..... WB8ZRV/314
320 ..... W7BOK/327	310 ..... WA2FKF/313
320 ..... 4N7ZZ/327	300 ..... K6CF/304
320 ..... OE7SEL/324	150 ..... CE3HA/185
320 ..... W2JZK/323	

CW Endorsements

320 ..... PAØXPQ/328	300 ..... IKØADY/302
320 ..... N7RO/327	150 ..... YU1RA/194
320 ..... 4N7ZZ/323	150 ..... UA9SG/154
310 ..... G3KMQ/317	

Total number of active countries is 328. The basic award fee for subscribers to *CQ* is $4. For non-subscribers, it is $10. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for airmail reply. Please make all checks payable to the awards manager.

couple of precedents in the form of Banaba and Rotuma. Let's hope the DXAC and Awards Committee recognize that those previous decisions were mistakes, and not compound their error by retroactively applying the new country criteria. Your opinion may be shared with the DXAC by sending a message to the DXAC, c/o ARRL headquarters.

Southern Sudan STØ Deleted

I mentioned last month that the DXAC had voted to delete Southern Sudan from the DXCC Country List. Here is the full text of the news release on that topic:

"The ARRL Membership Services Committee announced that both the ARRL DXAC and Awards Committee have voted to delete Southern Sudan STØ.

"While the status in Southern Sudan changed in 1983, QSOs made before January 1, 1995 will count for the deleted entity. There are two reasons for that.

"First, there have been accredited operations since 1983, and that raises a fairness issue. Second, the DXCC Desk has processed cards from those operations—many of them onto paper records. Because each STØ credit would have to be individually checked, it would be very costly to the League in terms of time and money to search and remove post-1983 STØ QSOs from the records. In fact, it might not be possible to do the job completely and accurately.

"At the same time as the STØ vote, both committees agreed to make no change in the status of Fernando de Noronha PYØF and Kure Island KH7K."

New Orleans International DX Convention

The seventh annual New Orleans International DX Convention is August 14–15 at the Royal Sonesta Hotel on Bourbon Street in the historic French Quarter. Early registration (before July 31) is $60 for amateurs and $40 for guests, including the excellent banquet and evening hospitality suites. (Registration after July 31 is $70 and $50, respectively.) Make checks payable to the New Orleans International DX Convention, c/o Michael Mayer, W5ZPA, 5836 Marcia Ave., New Orleans, LA 70124. Call the hotel directly at 504-586-0300 and ask for the special DX rate.

Up-Coming DX Operations

Lew Jenkins, N6VV, is leading an operation to a New One for the Islands On The Air program: Mokil Atoll in the Federated States of Micronesia. Mike, NG7S, and Dan, W7DR, will first meet up with Lew in

QSL INFORMATION

3V5I to I5JHW
3XY7A to VE6DYS
4F3CV to HB9CXZ
4KØCW to DL6KVA
4K5ØØW to DL6KVA
4K9W to DL6KVA
4KA4CW to 4K9C
4XØA to WB3CQN
4X5ØFB/SK to WB3CQN
5H1AX to pirate
5R8FU to SMØDJZ
5WØVD to OKDXF
7J3AXQ to WV9I
9J2BO to W6ORD
9K2IC to DG2SBW
9N1AT to JH8XIX
9N1CU to JH8XIX
9N1IZ to JH8XIX
9N1OW to JH8XIX
9N1XI to JH8XIX
A35FT to DL7FT
A35RK to W7TSQ
A43DI to A47RS
AH8K to OKDXF
BNØA to JH3DPB
C6A/KM9D to OM2SA
CT98BNW to CT3BNW
CV8D to CX8AT
DL6KVA/6Y5 to DL6KVA
E2ØAT to HSØ/KA3TDZ
ED8CTM to DL7VRO
EM1LV to UR8LV
EY2Q to DJ1SJO
FK8GM to WB2RAJ
FM5JY to F5JYD
FP5AA to K2RW
FP5EJ to K2RW
GB5TI to GMØKVI
GB8FF to GMØKVI
GHØSTH/P to G4DIY
GJ4DIY/P to G4DIY
H4ØAA to OH2BN
H44RY to OH1RY
HKØHEU to HKØFBF
HR6/WP3A to W4DN
HSØA to HSØ/KA3TDZ
HSØB to HSØ/KA3TDZ
IR2A to IK2HTW
IR4B to IK4AUY
IR4J to IK8WEJ
J41TEN to SV1DNW
J43PTR to SV3AQN
J87CJG to WV9T
JW5HE to OZ8RO
JW7EHA to LA7EHA
JW7NHA to LA8NHA
JY9RU to F6ARU
KG6SL to JH1AJT
KH6T to N2AU
KH6X to N2AU
KH6XT to N2AU
KH8/AA5BL to N5JA
KP4TQ to W4DN
LZØL to LZ1KCP
LZ5Z to LZ1KDP
LZ8A to LZ1KDP
P29PL to VK9NS
P49M to VE3MR
PJ8DM to KF4KRZ
PJ9/K2NG to WA2NHA
PJ9JT to W1AX
SØ8R to EA2JG
SØRASD to EA2JG
S79MAD to GW4WVO
S79MX to HB9MX
SO2DBO to DL5DBO
SO4WW to ON5NT
STØAP to DJ6SI
SU1HM/6A to IK3ZAW
T2ØJC to N6FF
T32RT to W6UC
T88AN to DF8AN
T99DX to DL3NCI
TI2IDX to WA9BXB
TJ1HP to F6FNU
TL8CD to F5THR
TL8CK to F6EWM
TM5FRA to F5FLO
TP4CE to F6FQK
TP4CW to F6FQK
TPS4CW to F6FQK
TU2XP to F6AXP
UDØ/DL6KVA to DL6KVA
UD5ØØW to DL6KVA
UD6D/Y42DA to DL6KVA
UD6DKW to DL6KVA
UD85ØDKW to DL6KVA
UN9LX to DL6KVA
V26XX to GMØGAV
V63AJ to DF8AN
VI4WIA to VK4XA
VK4CPA to W6ORD
VK4CSP/P to HB9CQK
VP8CEO to N6FF
VQ9KK to KBØQKK
VQ9RU to KH2RU
VR6YL to K6RPF
VR98LC to VR2LC
WP3A to W4DN
XF4CIS to XE1BEF
XQ8ABF to CE8ABF
YB2GBZ to WB3CQN
YI1HK to KK3S
ZD8SA to GØWSA
ZD9BV to W4FRU
ZF1RD to G4RWD
ZF2JB to KK9A
ZF2JX to KB1HY
ZL4LZ to W6ORD
ZL7IR to K8VIR
5B4/UA9LAC to Boris A. Shabaev, P.O. Box 935, Tyumen 625000, Russia
6W1RE to Didier Senmartin, B. P. 3024/DAT, Dakar, Senegal
8P6DP to Courtney Catwell, P.O. Box 518, Bridgetown, Barbados
BA4ASL to Ora S. L. Lee, P.O. Box 085-227, Shanghai 200085, China
BA4TA to B. F. Jin, P.O. Box 219, Wuxi 214001, China
BD4ED to Ed X. Y. Huang, P.O. Box 085-299, Shanghai 200085, China
HS5AYO to Niwes Suwanboos, P.O. Box 73, Lampang 52000, Thailand
J69EE to Rufinus Baptiste, P.O. Box 1298, Castries, St. Lucia
JH8XIX to Sigemi Harada, 6-3-23 Midorigaoka, Kitami, Hokkaido 090-0067, Japan
JU2DX to Mongolian Radio Sports Federation, P.O. Box 639, Ulaanbaatar-13, Mongolia, via Japan
KG4NW to Chuck Harding, 4545 Greenlaw Drive, Virginia Beach, VA 23464
SU3YM to Yasser M. Hamdy, P.O. Box 545, Port Said 42111, Egypt
SV3AQT to Thanasis Tsigas, Arch. Makariou 10, GR-264 41 Patras, Greece
VU2JRO to Manikant Lodaya, 236 KMC Quarters, Manipal 576 119, Karnataka, India

The table of QSL managers is courtesy of John Shelton, K1XN, editor of The GOLIST, P.O. Box 3071, Paris, TN 38242, phone 901-641-0109; e-mail: <golist@wk.net>.

The three DXers most responsible for bringing you Heard Island VKØIR (left to right): Ralph, KØIR; Bob, KK6EK; and Peter, ON6TT.

Pohnpei and operate the CQ WPX CW May 30–31 as V63VV in a multi-op. Then on June 1 they travel to Mokil with a Yaesu FT-1000MP rig, FinnFet solid-state kilowatt amplifier, Force 12 Yagi, and various vertical and wire antennas. QSL V63VV to N6VV direct or via the W6 bureau, and W7DR and NG7S's V63 calls to their respective home calls.

The WestNet DX Group teams with the Saltee Dog DX Group will operate from Great Saltee Island EU-103 June 25–29. They'll be on all bands and modes, 160–2 meters. QSL **EJ7NET** via EI2GX. The groups plan to automatically QSL all contacts via the bureau system.

Carlos, LA9PJA, will be on as **JW9PJA** June 12–16 from Svalbard. Ted, NH6YK, returns to Midway KH4 in June. He made about 900 QSOs during his March operation from Midway.

Finally, Mark, ON4WW, returns to Africa for another six-month stay, this time in Algeria. He has requested **7XØWW** for his Algerian callsign, and may attempt to operate from Western Sahara as SØ4WW during his stay. Mark prefers CW on the lower bands. He'll run 100 watts from a rig provided by Yaesu of Europe, into a G5RV antenna from ON4MA. QSL via ON5NT.

Thanks to "The Daily DX" for the DX news. For more information on this electronic DX newsletter, contact <bernie.mcclenny@mail.wdn.com>.

73, Chod, VP2ML

BY JOHN DORR, K1AR

CONTEST CALENDAR

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Do We Have Enough Contest Rules?

June's Contest Tip

Given that the subject of this month's column is rules, I thought I'd share a story and contest tip for you to consider. In the 1998 ARRL DX Contest I forgot about the new multi-op rule change that eliminated the 10-minute rule in lieu of six band changes per hour. If I had not had an impromptu conversation with someone right before the contest, I would have operated incorrectly the entire weekend. Even old dogs should take a look at a contest's rules—just to be sure!

As you might imagine, there are very few contesters who get the "opportunity" to peruse contest rules like I do. Every month I pore over scores of Web sites, e-mail messages, letters, faxes, and handwritten requests for rules to be included in this column, and in most cases I'm glad to oblige.

While most rules tend to follow a somewhat standard format, there is quite a bit of variance when looking at the extremes. The ARRL Straight Key Night, reported this month, limits its primary rules to the simple requirement of a hand key. Use of keyer, it is rumored, is punishable by having to write *QST*'s Section News on the blackboard 100 times! The other end of the rulemaking spectrum is *CQ*'s World-Wide DX Contest rules. Three printed pages are needed to detail all of the intricacies of the contest (including trophies). The question this month is: When have you said enough in "the rules"?

Sponsors of major contests (i.e., CQ WW, ARRL DX, ARRL SS, CQ WPX) have a dilemma when publishing their rules. They have to constantly mediate between the need for completeness and the desire to not require participants to hire an attorney for interpretation. The past five years or so have seen this unfortunate scenario dramatically escalate. With the advent of technology and the creative thinking of many operators, it's become necessary to fine-tune rules time and time again.

Let me suggest some guidelines that I hope all rulemaking bodies will consider. For starters, rules should be written with the general operating population in mind. A rule designed for one individual situation is a bad rule in my opinion. Second, rules should never be written in a vacuum. One of the benefits of the *CQ* and ARRL structures is that this cannot happen. Rules written "by committee" provide a fighting chance to avoid confusing language or other inconsistencies. *CQ*'s committee, in particular, does a very good job of using the committee structure to manage its rules. Not only is there significant consideration given to any rule suggestion, they also employ international input from virtually every area of the world in active dialogue during the proposal period. A philosophy of "less rules is better" seems to be emerging, which is good in my book.

Another area to consider is bad rules. Despite the best intentions at a given point in time, some rules are either poorly written or have become obsolete. It's perfectly acceptable to eliminate bad rules for whatever reason.

One of the strengths and liabilities of the CQ WW contest (and many others) is its longstanding collection of records. Many world-class operators have gone to great lengths to keep or break category records. I personally feel that everything possible should be done to preserve these records when considering scoring changes in *CQ*'s rules. Having said that, however, changes that ultimately make the contest better should never be rejected outright just because of tradition.

Speaking of tradition, one of the most-asked questions of the CQ WW committee is why we continue to sponsor our CW WW contest on Thanksgiving weekend. If we're honest, tradition does play a part. A very full contest calendar is also a major contributor. And, there is the reality that the CQ WW is, by its very name, a world-wide contest in which many participants do not celebrate the U.S. Thanksgiving holiday. I'd say there are some pretty strong arguments for keeping things the way they are.

Well, let's get to some conclusions. To be honest, I'm bothered by the complexity of some contest rules. I'm even more bothered by those who seemingly spend most of their waking hours looking for ways to circumvent the intent of rules, thus generating the need for more rules. I've always had a very simplistic view of operating. I can honestly say that I haven't really reviewed a set of contest rules in years with my own personal contest operation in mind. Contest operating to me and many others is nothing more than "getting on and working the boys (and girls!)." My focus is in areas such as station, propagation, activity, preparation, and drive, and most important "copying the callsigns and exchanges, and getting them into my log without errors." Sure, you can call that "W1 mentality," where the need to find an extra operating edge is less necessary, but I think it's a good model for everyone to follow.

Has the proliferation of contest rule growth gone too far? Probably not, but it's sure getting there. I'd like to know what you think!

CQ Contest Magazine

Just in case you're not among the thousands of readers who have found this gem, I wanted to take a moment this month to feature *CQ Contest* magazine, published by CQ Communications. Edited by our very own CQ World-Wide Contest Director, Bob Cox, K3EST, one of the principal goals of *CQ Contest* is its international focus, scope, and depth. The magazine also concentrates on coverage of people, analysis, techniques, reporting, and technology. The bottom line: A contest magazine written by contesters for contesters.

If you haven't had the time to check it out, I'd encourage you to subscribe to *CQ Contest*. It's truly a different look at contesting that's worth a read every month. For additional information (including or-

CALENDAR OF EVENTS

May	23-24	Texas QSO Party
May	**30-31**	**CQ WW WPX CW Contest**
June	6-7	IARU Region I Field Day
June	13	Portugal Day Contest
June	13-14	South America CW Contest
June	13-15	ARRL June VHF QSO Party
June	20-21	All Asia DX CW Contest
June	21	West Virginia QSO Party
June	27-28	ARRL Field Day
June	27-28	Marconi Memorial Contest
July	1	RAC Canada Day Contest
July	4-5	Venezuela SSB DX Contest
July	11-12	IARU HF Championship
July	11-12	Internet 6-Meter DX Contest
July	18-19	NAQP RTTY Contest
July	18-19	SEANET CW Contest
July	25-26	IOTA Contest
July	25-26	Venezuela CW DX Contest
Aug.	1-2	NA CW QSO Party
Aug.	2	YO DX Contest
Aug.	8-9	WAE CW Contest
Aug.	15-16	NA SSB QSO Party
Aug.	15-16	SEANET SSB Contest
Aug.	15-16	SARTG RTTY Contest
Aug.	15-17	New Jersey QSO Party
Aug.	29-30	Hawaii QSO Party

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

dering info), see the *CQ Contest* advertisement found elsewhere in this issue or contact CQ Communications directly at 516-681-2922.

Final Comments

With the insanity of my work schedule over the past few weeks, I haven't had time to complete the analysis for last year's *CQ* Contest Survey. The good news, however, is that I'm almost done. The results are fascinating and will be the subject of next month's column.

Remember, all Contest Calendar submissions for the September column must reach me by July 1st. You're 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 your announcement gets published.

73, John, K1AR

Portugal Day Contest

0000–2400Z Sat., June 13

This is the 8th running of the Portugal Day Contest sponsored by Rede dos Emissores Portugueses. It is SSB only on 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.

World-Wide South American CW Contest

1200–1800Z Sat. to Sun., June 13–14

First run in 1982, the WWSA CW Contest is sponsored by *Antenna-Electronica Popular* magazine. It is a superb opportunity to work valuable stations, prefixes, and countries for many international CW awards.

Classes: Single Op/All Band or Single Band, Multi-Single, and QRP.

Exchange: RST and continent.

Scoring: Stations may be worked once per band (80-10 meters). For S.A. stations: Credit 2 points for all QSOs with other SA stations (including same country); QSOs with other continents are worth 10 points. Credit 2 multipliers for each prefix worked with other stations. For non-S.A. stations: Credit 10 points for S.A. QSOs and 2 points for all others. Credit 2 multipliers for each S.A. prefix worked. Band score is determined by multiplying total QSO points times multiplier. Final score is the sum of all valid band scores.

Logs must be received no later than October 30th and should be sent to: WWSA Contest Committee, P.O. Box 282, Rio de Janeiro, RJ, Brazil 20001-970.

ARRL VHF Contest

1800–0300Z Sat. to Mon., June 13–15

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. Complete rules can be found on the ARRL web site at <www.arrl.org>.

I recommend 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 St., Newington, CT 06111.

All Asian DX Contest

CW: June 20–21 Phone: Sept. 5–6
0000Z Sat., to 2400Z Sun.

This is the 39th year of this activity sponsored by the JARL. Rules were not received as of the time of this announcement in *CQ*, so I'm running last year's information found on the Internet. The exchange 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 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 Sept. 30th for the Phone section, July 30th for CW, and go to: JARL, Contest Committee, P.O. Box 377, Tokyo Central, Japan.

Asian Country List: A4, A5, A6, A7, A9, AP, BV, BY, CR9, EP, HL/HM, HS, HZ/7Z, JA-JS, JD1, JT, JY, OD, S2, TA, all C.I.S. DXCC countries, VS6/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.

West Virginia QSO Party

1800Z to 2400Z Sun., June 21

Sponsored by the West Virginia State Amateur Radio Council, you're invited to take part in celebrating the birthday of the United States' 35th state, which joined the Union on June 20, 1863. Stations may be worked once per band/mode. No repeater QSOs are permitted.

Exchange: WV stations exchange signal report and county; all others signal report and state/province/DXCC country.

Frequencies: CW—1810 and 35 kHz above the lower band edge; Phone—1860, 3860, 7260, 14260, 21360, 28360 kHz; Novices use 25 kHz above the lower novice band edge.

Scoring: Score one point for phone QSOs and two point for CW contacts. Credit 25 bonus points (one time only) for working W8WVA, the official WV ARC station. Final score is QSO points times total WV counties worked. Add bonus points after all other calculations.

Logs entries with summary sheet are

due by July 24th and should be sent to: WVQP, Dave Ellis, WA8WV, 610 Hillsdale Drive, Charleston, WV 25302. Include SASE for results. You may also submit your entry via the Internet (ASCII format only) to <WA8WV@aol.com>. Receipt of log will be acknowledged.

ARRL Field Day

1800–2100 Sat. to Sun., June 27–28

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 <www.arrl.org>. It is advisable that you read them thoroughly.

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.

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, 100W, and QRP), Single Band, and Multi-Operator.

Exchange: Canadians send 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 an RAC suffix are worth 20 points. Stations outside of Canada are worth 2 points.

Multipliers: Credit 1 multiplier per band and mode worked for Canadian provinces and territories (12 maximum). Final score is total QSO points times your multiplier.

Awards: There are a number of plaques available, including the Jorge Bozzo, LU8DQ, award donated by Alan Goodacre, VE3HX, for highest non-Canadian score. Certificates also will be sent to category winners around the world.

Entries must submit a summary sheet showing score calculation as well as a dupe sheet, multiplier checklist, and logs. Send entries to: RAC, 720 Belfast Rd. #217, Ottawa, ON K1G 0Z5, Canada by July 31st. Results will be published in the November issue of the Canadian *TCA Journal* (contact RAC for more info) and will be sent to all certificate winners.

BY TED MELINOSKY, K1BV

AWARDS

NEWS OF CERTIFICATE AND AWARD COLLECTING

Along with awards available from the B&B Shop, Brazil, and France, this month we pay tribute to Frank L. Yohe, Jr., AA9JJ, USA-CA All Counties award #935.

Frank L. Yohe, Jr., AA9JJ
USA-CA All Counties #935

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

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

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

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

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

"I have so many people I need to thnak for all the help I have received all along in county hunting, and especially as I have been finishing up. I don't feel that I can do justice to that here, but I will be thanking them in person as I get the chance. Along this line, I think the best part of county hunting is the activity where the participants are working together to help each other rather than selfishly competing against one other."—*AA9JJ*

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

USA-CA Honor Roll

500

K1NU 3014
SM6TEU 3015
GØLRS.....3016

1000

N1CP 1469
SM6TEU 1470
EA8AKN 1471

1500

SM6TEU 1225

Note: For those who keep track, the 1000 endorsement numbering has been corrected effective with the above listings.
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.

VKs Chasing U.S. Counties

The following is taken from an e-mail on the County Hunters Internet Reflector from Rex, VK3ATZ: "Our net has been reactivated now that propagation on 20 meters between VK/ZL and the U.S. is returning. We meet daily at 0330Z on 14255. Any U.S. stations—fixed, mobile, or portable—are most welcome to join us. We have quite an active bunch of county hunters trying to get the 3076. They vary from new ones starting out to those with only a few hundred to go. So please, if you hear us and have a few minutes to spare, we would welcome the opportunity to work you and get your county in the log. Mobiles are very welcome, and if heard are given priority so as not to disrupt their journey."

Indeed, conditions have improved to the point where here on the East Coast, listening to 14336 in the early evening, I have heard G, GI, JH8, KL7, and VK stations successfully working mobiles on the principal CH frequency."

Awards Available

Nth Time Around Awards. The *CQ* USA-CA program recognizes the accomplishment of working all the counties for the first time. Perhaps when the award was conceived many years ago, the founder never realized that numerous stations would find the activity so rewarding that they would stick around and do it again . . . and again . . . and again. Bill Nash, WØOWY, and his B&B Shop, which specializes in County Hunter supplies, sponsors a certificate honoring multiple all county champions from the second to the fifth time around. B&B Shop is located at 13212 N. 37th Ave., Phoenix, AZ 85029.

The All Counties Fourth Time Around certificate of Roy Glasscock, KCØJG. These certificates, available for the second through the fifth time around, are made available by the B&B Shop, Phoenix, Arizona.

At the time this column was written, 31 stations had been around five times: WØAYL, NFØX, KZ2P, N3DRO, WA3TUC, WA3ZMY, W4RKV, NV4Z, KG5J, K5KDG, NV6L, WA6VJP, N7AKT, N7BKW, W7LQT, WB7WBZ, AK8A, K8IXU, W9ABM, N9BDM, W9CRN, K9DCJ, N9HRX, NG9L, WA9QNI, NT9V, WDX4KEF, WDX9DCJ, G4KHG, VE2MS, and VE3RN. Picture this month is the recent fourth time around certificate of Roy Glasscock, KCØJG. There certainly must be something about the people who congregate on 7238, 14056, and 14336 daily that presents an enjoyable operating experience. With all the coarseness and poor operating afflicting the bands these days, the county hunters present a wholesome and fun experience.

Brazil's Grupo CW Sao Paulo (CWSP) Awards. When I first started chasing certificates, I happened to notice that many of my Brazilian bureau cards had little ads attached promoting that member's club awards. Quite a few of the awards were limited to CW contacts. Many of these clubs are still active, and judging from my bureau QSLs some 30

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years later, they are still keen on CW. The Sao Paulo CW Group awards are described here. The three samples I was given are printed in several colors each on heavy card stock. Thanks to Ademir Moreira, PY2SP, for sending the samples.

General Requirements: The fee for each of their awards is 10 IRCs; endorsements are 2 IRCs. SWL okay. Send a certified list to: CWSP, P.O. Box 1807, 01059-970 Sao Paulo, SP, Brazil.

The Brazil CW Award is sponsored by the Sao Paulo CW Group.

Brazil CW Award (BRCW). Work 15 different states as shown below, including Fernando de Noronha and Trindade Islands. Only those who have received the CWSP Award may apply. You must notify this group of the CWSP award number when applying. Contacts must have been made after 15 October 1976.

States/Territories: PYØ (Fernando de Noronha and Trinidade Isl.), PP1, PY1, PP2, PY2, PY3, PY4, PP5, PY5, PP6, PY6, PP7, PR7, PS7, PT7, PY7, PP8, PQ2, PQ8, PR8, PS8, PT8, PU8, PV8, PW8, PY8, PT9, and PY9.

The CWSP Award is issued for contacting five members of the Grupo de CW de Sao Paulo of Brazil.

CWSP Award. Contact 5 different members of the Grupo de CW de Sao Paulo in CW mode after 15 October 1976. Endorsement seals for every additional 10 members. The following list is not too recent, so a check of the card for affiliations will probably reveal many more.

Eligible stations: PP2WV, PP5AS, PP8WHL, PP8IW, PQ2CW, PR8GM, PS8AUJ, PT2CW, PY1BUL, PY1BVY, PY1CFN, PY1CRP, PY1DG, PY1EWN, PY1QN, PY1SL, PY1VMV, PY2AA, PY2AC, PY2ADI, PY2ARX, PY2ASI, PY2BTR, PY2DCP, PY2DHP, PY2DSQ, PY2FX, PY2FRN, PY2GCW, PY2GPA, PY2IAT, PY2JN, PY2KP, PY2LMA, PY2LN, PY2LPI, PY2LQB, PY2MT, PY2NPP, PY2NZP, PY2OE, PY2OO, PY2RO, PY2RRG, PY2SI, PY2TO, PY2TUO, PY3CJI, PY4DD, PY4WAS, PY5AKW, PY5FB, PY5PX, PY8ATL.

CWYL Award. For the basic award, work three different Brazilian YLs using the CW mode after 1 May 1984. Endorsement is available for each three different YLs, including YLs of different countries.

Basic CWYL Award is issued for contacting three different Brazilian YLs on CW.

France's Diplome du Limousin 2000. This handsome plaque-style award was created in 1997 by the REF's departmental division of Correze. Their purpose in offering it is to develop and encourage contacts with amateurs of the Limousin region. The award may be earned by amateurs and SWLs who have contacted or heard Limousin stations as follows.

Basic Award: One contact with the amateurs in each of the three departments of the Limousin Region (three contacts).

Diplome du Limousin 2000 is issued by REF's departmental division of Correze.

Award of Excellence: Five contacts with amateurs of each of the three departments of the Limousin Region (total of 15 contacts).

The three departments of the Limousin region are defined as Correze (19), Creuse (23), and Haute-Vienne (87). All bands and modes may be used. However, repeater contacts do not count. This is a sort of short-term award in that the contacts must be made between the period October 19, 1997 and midnight of December 31, 1999 (just in time for Y2K as computers go crashing around the world). Applications must be sent to the award manager prior to December 31, 2000. Cards are not needed. Just send your certification in a letter format, dated and signed, including your name and address and declaration that you have fully respected the laws and regulations of your license and exercised good sportsmanship in making the contacts. Enclose a detailed list of the contacts including callsigns, date, frequency, RS/T, and mode of contacts made. The award is a handmade varnished wooden plaque (20 X 20 cm) representing the Limousin region with its three departments. The first 50 winners will also receive a key ring.

Send the letter, list of contacts, and fee of 80FF or 20 IRCs to: Frederic Donati, F5NBX, Rue du 11 Novembre, F-87380 Meuzac, France.

Internet Site of the Month

The classic method of determining what county a fixed station is in has long been the use of the Post Office Directory Publication #65. Effective with the 1998 edition, the price has been increased to $21 (Superintendent of Documents, US Government Printing Office, Washington, DC 20402; publication ISBN #039-000-00291-4). Just like the old call books, the size type used is almost guaranteed to ruin your eyesight. A better alternative is found on the Internet at the US Post Office site. The "ZIP+4 Code Lookup" page is at the following URL: <http://www.usps.gov/ncsc/lookups/lookup_zip+4.htm>. It is well laid out and designed, and when I tried it, the response time was very good. The folks at the Post Office have done a good job at this site, and it's one well worth bookmarking.

In Closing

I'm starting to get award samples, but I need a continuous flow to keep this column chock full of certificates and the rules. Please send those awards issued by your club or organization to the address shown at the beginning of this column.

73, Ted, K1BV

BY FREDERICK O. MAIA, W5YI

WASHINGTON READOUT

REGULATORY NEWS IN THE WORLD OF AMATEUR RADIO

Details of New ULS System; FCC Proposes to Reduce Vanity Fee

Last month we mentioned that the Amateur Service would be part of the Universal Licensing System (ULS). We wrote last month's column based on an FCC press release and a short interview with the FCC. We have now reviewed the massive Universal Licensing System (ULS) plan and a proposal to reduce Vanity station callsigns in the amateur service. Here is what you can expect.

The Notice of Proposed Rulemaking (NPRM) in Docket WT 98-20, "To Facilitate the Development and Use of the Universal Licensing System in the Wireless Telecommunications Services," runs to nearly 400 pages. Most of it is new, discontinued, and amended application rules. ULS represents a monumental change in how the FCC will license all wireless radio services in the future. Proposed are many rule amendments that will completely change how amateur radio stations and operators are licensed.

For example, the new rules seek to privatize the licensing of amateur radio clubs and eliminate the current application procedure for foreign amateurs operating in the U.S. or its possessions under a bilateral (reciprocal) arrangement. New information collection requirements are being proposed along with a new streamlined FCC Form 605 (with an attached Schedule "C") that would replace the decades-old amateur radio FCC Form 610 application. All FCC license applicants will now be required to supply their taxpayer identification number (TIN, Social Security Number) and to file electronically. The FCC wants to discontinue submission of paper documents to the FCC.

In a nutshell, the NPRM proposes to consolidate, revise, and streamline FCC rules governing license application procedures for all radio services licensed by the FCC's Wireless Telecommunications Bureau (WTB), including the Amateur, Commercial, and Personal Radio Services.

The FCC wants to:

• Replace over 40 existing wireless application forms (including all four versions of the FCC Form 610) with just five new forms;

• Consolidate the procedural rules relating to applications contained in each set of service-specific rules (including commercial, aviation, ship, business, personal, and amateur radio) into a single set of FCC rules and update references to FCC form numbers throughout the FCC rules;

• require applicants and licensees in most wireless radio services to file applications and other documents electronically using new ULS;

• streamline wireless radio equipment authorization and application processing;

• require the submission of a Taxpayer Identification Number (TIN) by applicants and licensees using ULS, consistent with the requirements of the Debt Collection Improvement Act of 1996; and

• eliminate hundreds of unnecessary or duplicative filing requirements.

The proposed rule changes are basically designed to facilitate the implementation of the FCC's new Universal Licensing System. ULS is a new integrated licensing database that will become fully operational later this year.

Universal Licensing, which has been under development for nearly two years, represents a major breakthrough in the Commission's use of state-of-the-art technology to support its regulatory functions. Until now, wireless applicants and licensees have been required to use more than forty different application forms for various wireless services and types of requests, and the information provided on these applications has been collected in a multitude of separate databases, each for a different group of services. In most cases, "the right hand did not know what the left hand was doing."

The Commission noted that the present " . . . service-specific approach to application and licensing causes a significant waste of time and resources on the part of applicants and licensees, who must often file the same information in different databases following varying procedures. The maintenance of multiple databases also impeded the Commission's ability to carry out its licensing responsibilities efficiently." In addition, the patchwork nature of the FCC's existing database made it difficult for the public to access licensing data, because the information was scattered and frequently not available in an easily usable form.

The new integrated ULS database addresses these problems in several ways. First, this single database will replace the eleven separate licensing systems presently in use in Gettysburg. It will provide a single technological platform for information collection and will enable licensees to file all applications electronically, thus increasing the speed and efficiency of the application process.

ULS will also make licensing information more accessible and usable by Commission staff in carrying out its regulatory responsibilities. And for the first time, John Q. Public will be able to access all wireless licensing data on-line by dialing into the Commission's wide area network (WAN) and using any World Wide Web (WWW) browser from a home PC.

In addition, the cost of filing applications and obtaining information will greatly be reduced. License applicants will be charged normal filing fees for filing applications under ULS, but will save time and resources by filing electronically. Amateur radio operators will only pay a fee for a Vanity callsign, which has been proposed by the FCC's Office of Managing Director to be reduced from $50 to only $12.90—probably beginning in September! That was a shock!

Vanity Callsign Fee to Drop!

In a stunning reversal of previous policy, the FCC is in the process of reducing the Regulatory Fee associated with the issuance of a "Vanity" amateur station callsign. At present, requests for a specific amateur Vanity station callsign require a payment of $50 to the Federal Communications Commission payable by check or credit card. Although the FCC has been ordered by Congress to recover an additional $10 million in Regulatory Fees from its constituents during FY-1998, a substantially decreased amount obviously will come from amateur radio. That was a surprise!

In MD Docket No. 98-36 released on March 25, 1998, the FCC's Office of Managing Director said that it would be reducing the cost of an amateur Vanity station callsign from an annual charge of $5 to $1.29!

According to the rules, payment of small fees must be made in advance—that is, the fee amount due for the current fiscal year multiplied by the number of years in the license term. That means the current

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (telephone 817-461-6443 e-mail <fmaia@internetMCI.com>)

$50 cost for a full ten-year license term Vanity callsign will be reduced to $12.90.

The only FCC fee charged amateur radio operators is for a Vanity callsign which is selected by the user, who must conform to certain guidelines. The cost of a Vanity callsign was raised to $50 just last year.

"Vanity" callsign fees were added to the list of Regulatory Fees in 1993, when it was determined that amateurs were willing to pay for station callsigns that had a user-selected format. The initial fee was to have been $7 per year, or $70 for a ten-year term amateur license. This was later reduced to $3, then increased to $5 last year. The American Radio Relay League originally wanted the FCC to charge $150—probably so that new amateurs would not be able to enjoy the exclusivity of callsigns issued decades ago to their membership!

Each year's new Regulatory Fees are presented to the public in March in the form of a Notice of Proposed Rulemaking. A Report and Order revising the Schedule of Regulatory Fees stating the fees is issued around July 1st. In August is issued a Public Notice outlining the procedures for paying the new Regulatory Fees which are effective in September. At least this has been the practice for the past three years (1995–97). It all happens quickly.

For Fiscal Year 1997 Congress mandated that the FCC collect $152,523,000 in Regulatory Fees—21% more than for FY-1996. For FY-1998 Congress is requiring the FCC to recover $162,523,000.

The calculation of user fees is fairly complicated. The fees are based on the actual direct and indirect support costs to provide the FCC regulatory services, which are divided by the anticipated number of payment units (users). Suggestions made by the Commission staff are also evaluated. Any overage or shortfall is generally prorated.

Since an additional $10 million must be recovered, most FCC licensees will receive an increased Regulatory Fee for FY-1998. For example, the Regulatory Fee applying to ship, aircraft, and GMRS licensees was increased from $5 per year in FY-1997 to $6 per year for FY-1998.

Here is what the NPRM says about amateur radio (and we are quoting from the NPRM):

13. Amateur Vanity Callsigns: This category covers voluntary requests for specific callsigns in the Amateur Radio Service authorized under part 97 of the Commission's Rules. Applicants for Amateur Vanity Callsigns will continue to pay a $5 annual Regulatory Fee per callsign, as prescribed in the FY-1997 fee schedule, payable for an entire ten-year license term at the time of application for a vanity callsign until the FY-1998 fee schedule becomes effective. The total Regulatory Fee due would be $50 per license for the ten-year license term. Section 9(h) exempts amateur radio operator licenses under Part 97 of the Commission's rules (47 CFR Part 97) from the requirement. However, section 9(g)'s fee schedule explicitly includes "Amateur vanity callsigns" as a category subject to the payment of a Regulatory Fee.

For FY-1998, Amateur Vanity Callsign applicants will pay a $1.29 annual Regulatory Fee per callsign, payable for an entire ten-year term at the time of application for a new, renewal, or reinstatement license. The total Regulatory Fee due is $12.90 per callsign for the ten-year license term. We propose that there will be no refunds to applicants who submit applications before implementation of the FY-1998 fee.

The FCC is estimating that 10,000 radio amateurs will want a Vanity callsign in FY-1998. The proceeding is now in the Notice of Proposed Rulemaking stage and on a fast track. Historically, the new fees for vanity callsigns go into effect in September. The Fiscal Year 1997 Regulatory Fees were effective September 15, 1997, and we anticipate a similar date for 1998.

Unless something changes—and we doubt that it will—amateurs might want to consider waiting until September to get that spanking new callsign! We will keep you posted on how this proceeding progresses.

Getting the New Licensing System Underway

To fully implement ULS for all wireless radio services, the FCC is proposing to make several corresponding changes to their wireless licensing rules to reflect new electronic filing procedures, new electronic forms, and other technical changes in the licensing process.

All wireless licensing rules are now being consolidated in a single section of Part 1, and duplicate rules in other service-specific rule parts are being eliminated. The FCC said that their goal in this proceeding is to establish a simplified set of rules that:

(1) minimizes filing requirements as much as possible;

(2) eliminates redundant, inconsistent, or unnecessary submission requirements; and

(3) assures ongoing collection of reliable licensing and ownership data.

"Accordingly, we propose to revise our regulations to efficiently collect from wireless radio services applicants and licensees only the data necessary to carry out our statutory spectrum management and compliance responsibilities," the FCC said.

The Commission pointed out that the initial ULS proposal is only one of a number of proceedings that will be initiated to streamline FCC rules and to take advantage of new technology to perform their regulatory functions more efficiently.

Toward that end, the FCC recently announced that they would be amending the

FCC Part 97 rules to further privatize the administration of the Amateur Radio Services. While no further information is available on that initiative, the two new ULS forms to be used by amateurs have needed information missing. That might indicate this data might be contained in a privatized database.

Only Five New FCC Forms Will Be Used

The FCC will be replacing 41 application forms with only 5—FCC Forms 601 through 605. The FCC Form 605 (Quick-Form Application) would be used as a short-form application for applicants who are not presently required to submit extensive technical data to receive a license, such as General Mobile Radio Service, Amateurs, Ships, Aircraft, and Commercial Radio Operators.

The FCC will be using an application form system similar to that used by the IRS—that is, a main form with an attached "schedule." Amateur Service applicants would submit the short FCC Form 605 in conjunction with a Schedule "C." There are four other schedules: "A" for the Ship Radio Service, "B" Aviation Radio Service, "D" Commercial Radio, and "E" for GMRS. The FCC asked the public to suggest any needed modifications to these forms, and in the case of the Amateur Service there appear to be many needed.

For example, strangely missing from both the Form 605 and its attachment "C" is the newly required statement where an amateur certifies that he/she has read OST/OET Bulletin 65 and will comply with the FCC's new RF radiation safety rules.

Another interesting point is that there was not a provision in the FCC's new database to indicate the class of the applicant! The schedule basically asks only whether an individual wants either a sequential or Vanity callsign assigned. There is also no provision for VE certification signatures or telegraphy exam waivers for severely handicapped amateurs on either form. We believe this information was inadvertently left off of the Form 605's Schedule "C," and we have sent the FCC a new suggested layout.

The Commission said that "While we propose to establish mandatory electronic filing for all wireless radio services, we seek comment on whether manual filing should continue as an option for certain services or classes of applicants."

Use of Taxpayer ID Numbers

In 1996 Congress enacted the Debt Collection Improvement Act as part of an effort to increase collection of delinquent government debts from private entities. As a result of DCIA, government agencies are now required to monitor and provide information about the public to the U.S. Treasury. This provision includes a requirement that the FCC collect Taxpayer Identification Numbers (TIN) and share them with the U.S. Treasury to ensure that the Commission does not refund monies to entities that have an outstanding debt with the federal government.

TINs are 9-digit identifiers required of all individuals and employers to identify their tax accounts. For individuals, the TIN is an applicant's Social Security Number (SSN). Commercial license applicants would generally use the Employer Identification Number (EIN) issued by the IRS to all employers. But since all amateur radio operators are individuals, only the SSN would be submitted. TINs are an integral part of the DCIA system and are necessary for the collection of delinquent debt owed to federal agencies.

The TIN matches payment requests with delinquent information. As a result, federal agencies have been required to share the TINs of benefit recipients since April 26, 1996, the effective date of DCIA. The U.S. Treasury wants all government agencies to obtain the TIN when an agency first has direct contact with a person.

The FCC routinely will collect the TINs from parties seeking to make filings using ULS. The FCC has received approval from its Office of Management and Budget (OMB) to require existing licensees to register their TIN using online FCC Form 606 until the ULS is operational. Once functional, the online form will be abolished and its information transferred into the single database. On November 4, 1997 the FCC's Wireless Bureau released a public notice announcing that existing licensees (including amateurs) could register their TIN and associated callsigns on-line.

Anyone filing an application through ULS will be required to submit a TIN as a prerequisite for using the system, and the FCC will use TINs as the unique identifier for its licensees. As far as ULS is concerned, amateurs now primarily will be identified through Social Security Numbers rather than callsigns. Applicants submitting manually filed applications (and these instances will be few—and perhaps nonexistent) will also be required to supply their TIN on their application form, because all applications will be placed in the ULS and a TIN is necessary for tracking. The TIN number would not be available to the general public, only to FCC personnel or their agents.

Commercial Radio Operator Licensing

Commission-licensed Commercial Radio Operators serve as radio officers aboard U.S. vessels, repair and maintain maritime or aviation radio equipment, and use international maritime and aviation frequencies to communicate with foreign stations. With the exception of the Restricted

Radiotelephone Operator Permit, applicants must pass a written examination prior to obtaining a Commercial Radio Operator license or permit.

In order to obtain a license, an applicant must contact a Commission-certified commercial examination manager (COLEM), pass one or more written tests, obtain a Proof-of-Passing Certificate (PPC) from the examination manager, and provide the original PPC to the Commission upon application for a license.

In order to facilitate electronic filing of Commercial Radio Operator licenses, the FCC is considering alternative means of verifying that applicants have passed the requisite written examinations under the supervision of a Commission-certified examination manager.

"One way to automate the verification of applicants' PPCs would be for examination managers to electronically file with the Commission data showing which examination elements an examinee has passed." Currently, examination managers may submit applications for examinees or other individuals. This service, however, is a non-regulated service, separate from their activities as an examination manager. National Radio Examiners, a subsidiary of the W5YI Group, already electronically files Commercial Radio licenses, but the balance of the COLEMs generally do not.

Amateur Service Reciprocal Licensing

The United States has reciprocal arrangements with 65 countries to allow amateur operators to operate their stations temporarily in the other country. The Commission currently grants annually some 2000 reciprocal permits for alien amateur licenses (FCC Form 610-AL) to amateur operators from those countries. The visitor must obtain the application form (FCC Form 610-A), which is often difficult to do in a foreign country, and file it with the Commission. No standards are required of these applicants other than possession of the license document issued by their country of citizenship. There is no fee. The FCC-issued permit, therefore, simply confirms that the holder of the permit also holds a license from his or her home country. For Canadian amateur operators who visit the United States, no permit is required because they are authorized to operate by rule.

The FCC said it tentatively concludes that there is little or no need to continue issuing the reciprocal permit for alien amateur licensees because the license from any foreign country with which the United States has reciprocity would stand as the proof that the foreign operator is qualified for the reciprocal operating authority.

The FCC is proposing to automatically authorize all reciprocal operation by rule. As is now the case, however, no citizen of the United States—regardless of any other citizenship held—would be eligible under this authorization procedure. United States citizens would continue to have to acquire an FCC-issued amateur operator license by passing the requisite examinations.

Amateur Radio Club Licensing

Currently, the Commission annually processes some 1500 applications for new, renewed, and modified amateur service club, military recreation, and radio amateur civil emergency service ("RACES") station grants. Application is made on FCC Form 610-B. There is no fee. The resulting license grant simply authorizes the use of a unique callsign in the station identification procedure. It does not authorize any operating privileges.

Section 4(g)(3)(B) of the Communications Act authorizes the Commission, for purposes of providing club and military recreation station callsigns, to use the voluntary, uncompensated, and unreimbursed services of amateur radio organizations that have tax-exempt status under section 501(c)(3) of the Internal Revenue Code of 1986. The Commission's rules were amended in 1995 to administer the club callsign system under the Commission's then-new automated licensing process. *(See Amendment of the Amateur Service Rules to Implement a Vanity Call*

Sign System, PR Docket No. 93-305.)

The FCC said, "We believe that the ULS provides an opportunity to utilize the electronic batch filing services provided by the private sector. We propose, therefore, to accept the services of any organization meeting the minimum requirements of section 4(g)(3)(B) of the Communications Act that completes a pilot electronic autogrant batch filing project similar to that completed by the 15 volunteer-examiner coordinators ('VECs'). Moreover, we anticipate that many VECs would be likely to volunteer their services as club station callsign administrators."

General Mobile Radio Service Licensing

The GMRS is a Part 95 UHF land mobile radio service for short-distance two-way communications. It is used to facilitate the business or personal activities of licensees and their immediate family members. Under the current rules, there are 15 frequencies allocated to this service. Applicants may be authorized to use up to ten of these channels. Applicants are currently required to submit technical information and location information for control points and small base stations.

"All GMRS frequencies are shared and no frequency coordination is required; therefore, we propose to revise the rules for GMRS to limit the data collection required of individuals applying for a license to contact information, such as name, address, and telephone number. Additionally, we propose to authorize stations to transmit on any authorized channel from any geographical location where the FCC regulates communication without the need for temporary licensing."

The FCC said they believe that there is no regulatory purpose to be served by limiting the number of frequencies for which a licensee may be authorized or by collecting technical information from applicants. The Commission asked the public to comment on their proposals.

Conclusion

Here is how the Commission summed up ULS: "Our goal is to establish a streamlined set of rules that minimizes filing requirements as much as possible; eliminates redundant, inconsistent, or unnecessary submission requirements; and assures ongoing collection of reliable licensing and ownership data. We believe that these consolidated rules will eliminate duplication and inconsistencies that exist in our rules and will make it easier for applicants to determine our application requirements by referencing a single set of licensing rules. We find that such consolidation will allow the ULS to function more efficiently. A more efficient and fully functional ULS will mean that licensing information will be widely available to members of the public. We also believe that development of full electronic filing and universally available databases for the wireless radio services will shorten application filing times for applicants, make the most recent data available to them concerning other spectrum uses, and relieve the administrative burden on this Commission, enabling us to operate with greater efficiency. Accordingly, we tentatively conclude that it is in the public interest to implement the electronic filing of applications and other documents, and that ULS implementation, as well as the combined application and processing rules proposed herein, will help achieve that goal."

The Notice of Proposed Rule Making carried an extremely short comment period—only 30 days after publication in the Federal Register. Replies closed 15 days later. Short public comment periods generally mean the FCC wants to act quickly.

You can read the FCC's proposal for their new Universal Licensing System online. Three different versions of WT Docket 98-20 are available at <http://www.fcc.gov/Bureaus/Wireless/Notices/1998/> or you can link to the document from the FCC home page. The proposal was released to the public on March 20.

73, Fred, W5YI

Announcing:

The 1998 CQ World-Wide VHF Contest

Starts: 1800 UTC Saturday, July 11, 1998

Ends: 2100 UTC Sunday, July 12, 1998

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

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

III. Bands: All authorized amateur radio bands above 50 MHz may be used, as authorized by local law and license class.

IV. Class of Competition: (1) Single op fixed station. (2) Multi-op class I fixed station. (3) Multi-op class II fixed station. A fixed station is defined as one that is a regular home station location. You may operate from your home station or you may be a "hired gun" at another home station to qualify for a fixed station category. A multi-op class I station is one that operates five or more transmitters simultaneously on all authorized amateur frequencies above 50 MHz. A multi-op class II station is one that operates four or less transmitters simultaneously on all amateur frequencies above 50 MHz. (4) Single op portable station. (5) Multi-op class I portable station. (6) Multi-op class II portable station. A portable station is defined as one that you set up away from a regular home station location. (7) 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. (8) QRP station. Anyone operating a station running 25 watts output, or less, is elgible to enter this category. There are no location restrictions. You can operate from your home QTH, or from the highest mountain you can find. However, you cannot run more than 25 watts output on any band.

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 can 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 point per QSO on 50, 70, and 144 MHz; 2 points per QSO on 222 and 432 MHz; 4 points per QSO on 903 and 1296 MHz; 6 points per QSO on 2.3 GHz and above. Work stations once per band, regardless of mode. Multiply total QSO points times total number of 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.

Incentive scoring: Operators completing two-way CW or MCW contacts may add one point to the QSO value for each contact. As an example, W1XX works stations as follows:

37 QSOs, with 3 QSOs on CW (34 × 1 = 34; 3 × 2 = 6; 34 + 6 = 40) and 10 GL's (10 multipliers) on 50 MHz.

45 QSOs (45 × 1 = 45) and 8 GL's (8 multipliers) on 144 MHz.

26 QSOs (26 × 2 = 52) and 4 GL's (4 multipliers) on 222 MHz.

38 QSOs (38 × 2 = 76) and 5 GL's (5 multipliers) on 432 MHz.

2 QSOs (2 × 4 = 8) and 2 GL's (2 multipliers) on 903 MHz.

6 QSOs (6 x 4 = 24) and 2 GL's (2 multipliers) on 1296 MHz.

W1XX therefore has 245 QSO points (40 + 45 + 52 + 76 + 8 + 24 = 245) × 21 multipliers (8 + 4 + 5 + 2 + 3 = 21) = 5,145 total points.

VIII. Awards: Certificates suitable for framing will awarded to the top-scoring stations in each category in each continent. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Certificates will be awarded to top-scoring stations in each category in geographic areas where warranted. Geographic areas include states (U.S.), call areas (Japan), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries.

IX. Miscellaneous: An operator can sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location. All contacts above 300 GHz must use coherent radiation on transmissions and employ at least one stage of electronic detection on receive. A station located exactly on a dividing line of a 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 at the address below. Include an SASE with your request. Completed logs must be postmarked no later than August 31, 1998 to be eligible for awards. All logs should be mailed to: CQ VHF Contest, CQ Magazine, 25 Newbridge Rd., Hicksville, NY 11801. Logs may be submitted on disk, provided a hard copy of the log is sent with the disk and the data is in an ASCII format compatible with an IBM-PC type computer. ■

BY GEORGE JACOBS, W3ASK

PROPAGATION

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Cycle 23 Enters High Solar Phase!

The Royal Observatory of Belgium reports a mean sunspot number of 40.7 for February 1998. Daily sunspot levels varied between a low of 15 on February 2 and a high of 76 on the 14th.

February's mean value results in a 12-month running smoothed sunspot number of 25 centered on August 1997. This is an increase of two numbers from the previous month's smoothed level. The cycle is now expected to increase at a more rapid pace, with a smoothed level in the lower 60s forecast for June 1998.

A sunspot cycle is arbitrarily divided into the following phases:

Solar Phase	Smoothed Sunspot Range
Low	0–30
Moderate	30–60
High	60–90
Very High	90–120
Extremely High	>120

This means that the present cycle, Cycle 23, is expected to enter its High phase during June 1998. A considerable improvement in HF propagation conditions is expected during the High solar phase, as compared to the Low and Moderate phases.

The cycle is expected to remain in the High phase, and it is likely to climb to the Very High and possibly even to the Extremely High phase, over the next five years or so, with a continuing improvement in HF propagation conditions.

The Dominion Radio Astrophysical Observatory at Penticton, British Columbia reports a mean value of 91 for the February, 1998 10.7 cm solar flux level. This results in a smoothed value of 84 centered on August 1997. A level on the order of 118 is expected during June 1998.

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for June 1998

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 7, 19-20, 23	A	A	B	C
High Normal: 8, 12, 18, 21-22	A	B	C	C-D
Low Normal: 2-3, 5-6, 9, 11, 13-17, 26-27, 29-30	B	C-B	C-D	D-E
Below Normal: 1, 4, 10, 24, 28	C	C-D	D-E	E
Disturbed: 25	C-D	D	E	E

Where expected signal quality is:

A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9+, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S9, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S6, with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing on the following pages.

2. With the *propagation index,* use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of (3) will be fair-to-poor (C-D) on June 1st, fair-to-good (C-B) on the 2nd and 3rd, fair-to-poor (C-D) on the 4th, fair-to-good (C-B) on the 5th and 6th, good (B) on the 7th, etc.

Salting the Ionosphere

About this time of the year I usually make plans for my annual "salting the ionosphere" pilgrimage. Usually I go to places where physical or natural conditions are conducive for symbolically asking Mother Nature to "salt the ionosphere" so that good propagation conditions will occur during the annual CQ World-Wide DX Contest periods in the fall. While there are no scientific grounds to explain it, this appears to have produced favorable results during the past seven contest periods, and especially so during last year's, after our visit to Stonehenge in England.

This year I am asking readers of this column to make some suggestions for the 1998 salting of the ionosphere, giving me the reason for the suggestion. Send your thoughts to my e-mail address at <gja@gjainc.com>.

11307 Clara Street, Silver Spring, MD 20902
e-mail: gja@gjainc.com

June Propagation

Typical summertime ionospheric propagation conditions are expected on the HF bands during June. With the sun at its highest point in the northern sky, solar absorption is expected to be at a near seasonal peak in the northern hemisphere. This should mean considerably weaker signals during daytime DX openings. On the other hand, much improved conditions are expected during the early evening hours and through the period of darkness. This a normal summertime condition—better DX conditions during the period of darkness than during the daylight hours. However, there should also be ample opportunity for some good DX openings during the daylight hours as well.

Thunderstorm activity peaks during the summer months, and this is expected to result in considerably higher static levels on the HF bands during June.

With the High level of solar activity expected this summer, DX conditions should be considerably better than they've been for the past several summer seasons.

Despite a seasonal decrease in DX propagation on 10 and 12 meters, some fairly good openings should be possible during June to southern and tropical areas. Expect the bands to peak for DX openings during the late afternoon hours.

The best daytime DX band during June should be 15 meters, with 17 meters not far behind. Worldwide openings should be possible, but conditions will be best towards southern and tropical areas. Expect the bands to peak for DX signals during the late afternoon and early evening hours. Due to the increase in solar activity, DX should be possible on these bands well into the evening hours.

While DX openings to one area of the world or another are forecast almost around the clock on 20 meters, optimum conditions are expected during the early evening hours, with good conditions throughout the entire period of darkness. During June and the summer months, expect 20 meters to be the best DX band during the nighttime hours, with 30 meters a good second. This also results from the increase in solar activity, and while it may take some getting used to, the signals will be there on 20 and 30 meters from sundown to sunrise, from many areas of the world, and often with exceptionally strong signal levels!

With fewer hours of darkness and a sharp seasonal increase expected in the level of static, DX conditions on 40 meters are not expected to be as good during June as they were earlier this year. Nevertheless, the band should open to many parts of the world from shortly before sunset and remain open to just after sunrise, often with exceptionally strong signals. This should be a good DX backup band to 20 and 30 meters during most of the period of darkness.

The shorter hours of darkness and seasonally high static levels are expected to adversely affect DX propagation on both the 80 and 160 meter bands during June and the summer months. DX openings to some areas of the world are forecast for 80 meters during the hours of darkness, but signals will often be weak and noisy. Not much DX is expected on 160 meters

HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

June 15 - August 15, 1998
Time Zone: EST (24-Hour Time)
EASTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe & North Africa	*Nil*	11-16 (1) 16-18 (2) 18-19 (1)	06-09 (2) 09-13 (1) 13-15 (2) 15-17 (3) 17-22 (4) 22-00 (3) 00-03 (2) 03-06 (1)	20-22 (1) 22-23 (2) 23-01 (3) 01-02 (2) 02-03 (1) 22-00 (1)* 00-01 (2)* 01-02 (1)*
Northern Europe & CIS	*Nil*	14-18 (1)	09-15 (1) 15-18 (2) 18-19 (3) 19-21 (4) 21-23 (3) 23-02 (2) 02-07 (1) 07-09 (2)	21-22 (1) 22-00 (2) 00-02 (1) 21-00 (1)*
Eastern Mediter-ranean & Middle East	*Nil*	11-16 (1) 16-18 (2) 18-19 (1)	12-14 (1) 14-17 (2) 17-19 (3) 19-23 (4) 23-01 (3) 01-03 (2) 03-06 (1) 06-08 (2)	20-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Western Africa	16-18 (1)	08-09 (1) 10-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	03-07 (1) 07-09 (2) 09-15 (1) 15-16 (2) 16-17 (3) 17-23 (4) 23-01 (3) 01-03 (2)	20-22 (1) 22-00 (2) 00-02 (1) 22-00 (1)*
Eastern & Central Africa	16-17 (1)	11-14 (1) 14-15 (2) 15-16 (3) 16-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-21 (4) 21-23 (3) 23-02 (2) 02-06 (1)	21-00 (1)
Southern Africa	10-13 (1)	09-11 (1) 11-12 (2) 12-13 (3) 13-14 (2) 14-15 (1)	00-01 (1) 01-05 (2) 05-07 (1) 15-16 (1) 16-18 (2) 18-19 (1)	21-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*
Central & South Asia	*Nil*	10-12 (1) 19-22 (1)	17-20 (1) 20-23 (2) 23-03 (1) 06-09 (1)	19-21 (1)
Southeast Asia	*Nil*	10-12 (1) 19-21 (1)	19-21 (2) 21-23 (1) 23-01 (2) 01-02 (1) 06-07 (1) 07-09 (2) 09-11 (1)	*Nil*
Far East	*Nil*	10-12 (1) 17-18 (1) 18-20 (2) 20-21 (1)	06-07 (1) 07-09 (3) 09-10 (2) 10-12 (1) 19-20 (1) 20-23 (2) 23-00 (1)	*Nil*
South Pacific & New Zealand	18-21 (1)	15-17 (1) 17-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	18-21 (1) 21-23 (2) 23-01 (3) 01-03 (4) 03-04 (3) 04-07 (2) 07-09 (3) 09-10 (2) 10-12 (1)	01-03 (1) 03-06 (2) 06-08 (1) 04-06 (1)*
Austral-asia	18-20 (1)	10-12 (1) 18-19 (1) 19-20 (2) 20-21 (3) 21-22 (2) 22-23 (1)	23-01 (1) 01-02 (2) 02-04 (3) 04-05 (2) 05-07 (1) 07-09 (2) 09-10 (1) 16-18 (1)	03-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Carib-bean, Central America & Northern Countries of South America	09-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	08-09 (1) 09-11 (2) 11-20 (4) 20-21 (3) 21-22 (2) 22-23 (1)	07-10 (4) 10-16 (3) 16-00 (4) 00-03 (3) 03-06 (2) 06-07 (3)	19-21 (1) 21-23 (2) 23-03 (3) 03-05 (2) 05-06 (1) 22-23 (1)* 23-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	12-14 (1) 14-16 (2) 16-18 (3) 18-19 (1)	08-09 (1) 09-11 (2) 11-15 (1) 15-16 (2) 16-17 (3) 17-20 (4) 20-22 (3) 22-23 (2)	11-16 (1) 16-17 (2) 17-18 (3) 18-02 (4) 02-04 (3) 04-07 (2) 07-09 (3) 09-11 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-04 (2) 04-05 (1) 22-03 (1)*
McMurdo Sound, Antarctica	*Nil*	16-20 (1)	17-19 (1) 19-23 (2) 23-01 (3) 01-03 (2) 03-05 (1) 07-09 (1)	02-05 (1)

**Predicted times of 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a forecast rating of (2), or higher.*

Time Zones: CST & MST
(24-Hour Time)
CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	*Nil*	15-18 (1)	05-06 (1) 06-08 (2) 08-15 (1) 15-17 (2) 17-18 (3) 18-20 (4) 20-22 (3) 22-00 (2) 00-02 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-00 (1)*
Northern Europe & CIS	*Nil*	13-17 (1)	05-06 (1) 06-09 (2) 09-15 15-18 (2) 18-21 (3) 21-00 (2) 00-01	20-00 (1)

Eastern Mediter-ranean & Middle East	*Nil*	15-18 (1)	13-16 (1) 16-18 (2) 18-22 (3) 22-00 (2) 00-01 (1) 07-09 (1)	21-23 (1)
Western Africa	16-18 (1)	10-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	14-15 (1) 15-16 (2) 16-18 (3) 18-21 (4) 21-23 (3) 23-01 (2) 01-03 (1)	20-00 (1) 22-00 (1)*
Eastern & Central Africa	16-18 (1)	13-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1)	15-17 (1) 17-18 (2) 18-21 (4) 21-23 (2) 23-01 (1)	20-23 (1)
Southern Africa	10-12 (1)	09-10 (1) 10-12 (2) 12-13 (1)	22-00 (1) 00-03 (2) 03-07 (1) 13-15 (1) 15-17 (2) 17-19 (1)	21-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Central & South Asia	*Nil*	10-12 (1) 18-21 (1)	17-19 (1) 19-22 (2) 22-03 (1) 05-07 (1) 07-09 (2) 09-10 (1)	*Nil*
South-east Asia	*Nil*	10-12 (1) 19-22 (1)	04-07 (1) 07-09 (2) 09-10 (1) 22-23 (1) 23-01 (2) 01-02 (1)	03-05 (1)
Far East	*Nil*	10-15 (1) 18-20 (1) 20-22 (2) 22-23 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 20-22 (1) 22-00 (2) 00-02 (3) 02-03 (2) 03-05 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)*
South Pacific & New Zealand	18-20 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	17-19 (1) 19-23 (2) 23-01 (4) 01-05 (3) 05-07 (2) 07-09 (4) 09-11 (2) 11-13 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-08 (1) 01-04 (1)* 04-06 (2)* 06-07 (1)*
Austral-asia	17-20 (1)	14-15 (1) 15-17 (2) 17-19 (1) 19-20 (2) 20-21 (3) 21-22 (2) 22-23 (1)	22-00 (1) 00-01 (2) 01-05 (3) 05-07 (2) 07-09 (4) 09-11 (2) 11-12 (1)	01-03 (1) 03-07 (2) 07-08 (1) 03-06 (1)*
Caribbean, Central America & Northern Countries of South America	10-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	07-09 (1) 09-10 (2) 10-11 (3) 11-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	02-05 (2) 05-07 (3) 07-10 (4) 10-11 (3) 11-13 (2) 13-16 (3) 16-22 (4) 22-02 (3)	19-20 (1) 20-23 (4) 23-00 (3) 00-03 (2) 03-05 (3) 05-06 (1) 20-21 (1)* 21-23 (2)* 23-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	12-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-10 (2) 10-14 (1) 14-16 (2) 16-19 (4) 19-20 (3) 20-22 (2) 22-23 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-23 (4) 23-02 (3) 02-05 (1) 05-07 (2) 07-10 (1)	20-21 (1) 21-22 (2) 22-02 (3) 02-03 (2) 03-05 (1) 20-03 (1)*
McMurdo Sound, Antarctica	*Nil*	15-16 (1) 16-19 (2) 19-21 (1)	17-19 (1) 19-23 (2) 23-01 (3) 01-03 (2) 03-05 (1) 07-09 (1)	03-06 (1)

Time Zone: PST (24-Hour Time)
WESTERN USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	*Nil*	09-11 (1) 15-17 (1)	05-06 (1) 06-08 (2) 08-15 (1) 15-21 (3) 21-23 (2) 23-03 (1)	20-23 (1)
Northern Europe & CIS	*Nil*	14-16 (1)	00-06 (1) 06-08 (2) 08-10 (1) 13-16 (1) 16-20 (2) 20-22 (3) 22-00 (2)	20-22 (1)
Eastern Mediter-ranean & Middle East	*Nil*	13-15 (1)	14-16 (1) 16-20 (2) 20-22 (3) 22-23 (2) 23-00 (1) 06-08 (1)	20-21 (1)
Western & Central Africa	14-16 (1)	07-09 (1) 11-13 (1) 13-17 (2) 17-18 (1)	14-16 (1) 16-18 (2) 18-20 (3) 20-21 (4) 21-23 (3) 23-03 (2) 03-04 (1) 07-09	20-22 (1)
Eastern Africa	*Nil*	13-16 (1)	16-19 (1) 19-22 (2) 22-00 (1)	*Nil*
Southern Africa	09-11 (1)	09-10 (1) 10-12 (2) 12-13 (1)	15-17 (1) 22-23 (1) 23-01 (2) 01-03 (1) 06-08 (1)	20-23 (1)
Central & South Asia	*Nil*	10-12 (1) 19-21 (1)	05-07 (1) 07-09 (2) 09-11 (1) 16-19 (1) 21-23 (1) 23-01 (2) 01-02 (1)	05-07 (1) 19-20 (1)
South-east Asia	*Nil*	10-12 (1) 19-21 (1)	23-01 (1) 01-03 (2) 03-06 (3) 06-07 (2) 07-10 (1) 16-19 (1)	02-06 (1)
Far East	*Nil*	13-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-20 (1)	19-21 (1) 21-23 (2) 23-02 (3) 02-04 (4) 04-07 (2) 07-09 (3) 09-11 (2) 11-13 (1)	01-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 03-05 (1)*
South Pacific & New Zealand	13-15 (1) 15-18 (2) 18-20 (1)	10-12 (1) 12-15 (2) 15-18 (3) 18-20 (4) 20-21 (3) 21-22 (2) 22-23 (1)	17-19 (1) 19-21 (2) 21-02 (4) 02-06 (2) 06-08 (4) 08-10 (3) 10-11 (2) 11-12 (1)	22-23 (1) 23-01 (2) 01-06 (3) 06-07 (2) 07-08 (1) 23-02 (1)* 02-05 (2)* 05-06 (1)*
Austral-asia	15-17 (1) 17-20 (2) 20-21 (1)	13-15 (1) 15-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	20-22 (1) 22-23 (2) 23-00 (3) 00-03 (4) 03-05 (3) 05-06 (2) 06-08 (3) 08-09 (2) 09-13 (1) 13-15 (2) 15-17 (1)	22-00 (1) 00-01 (2) 01-05 (3) 05-06 (2) 06-08 (1) 01-04 (1)*
Caribbean, Central America & Northern Countries of South America	09-11 (1) 11-13 (2) 13-15 (1) 15-17 (2) 17-18 (1)	09-11 (1) 11-14 (2) 14-16 (3) 16-19 (4) 19-20 (2) 20-21 (1)	18-01 (4) 01-03 (3) 03-05 (2) 05-08 (3) 08-11 (2) 11-14 (1) 14-16 (2) 16-18 (3)	19-21 (1) 21-23 (3) 23-04 (2) 04-05 (1) 20-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	13-15 (1) 15-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	08-11 (1) 11-16 (2) 16-17 (3) 17-19 (4) 19-20 (2) 20-21 (1)	14-16 (1) 16-18 (2) 18-19 (3) 19-23 (4) 23-01 (3) 01-02 (2) 02-05 (1) 05-07 (2) 07-10 (1)	20-21 (1) 21-00 (2) 00-02 (1) 02-03 (3) 03-04 (2) 04-05 (1) 02-04 (1)*
McMurdo Sound, Antarctica	*Nil*	17-21 (1)	16-18 (1) 18-19 (2) 19-24 (3) 24-03 (2) 03-07 (1)	00-06 (1)

** Indicates best times to listen for 80 meter openings. Openings on 160 meters ar also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.*
For 12 meter openings interpolate between 10 and 15 meter openings.
For 17 meter openings interpolate between 15 and 20 meter openings.
For 30 meter openings interpolate between 40 and 20 meter openings.

until the fall season, but an occasional opening may be possible during the hours of darkness.

Plenty of good short-skip openings are expected on the HF bands during the month. For distances less than 250 miles, try 80 meters during the day and 160 meters at night. For openings between 250 and 750 miles, 40 and 30 meters should be best during the day and 80 meters at night. Twenty meters should be optimum for openings during the day between 750 and 1300 miles, with 40 and 30 meters best from sundown to midnight and 80 meters from midnight to sunrise. Between distances of 1300 and 2300 miles check 20 and 17 meters during the day and 40 and 30 meters at night. Frequent short-skip openings, resulting from sporadic-*E* propagation, are also expected on 10, 12, 15, and 17 meters over distances between approximately 600 and 1300 miles. Fifteen and 17 meters should open over longer distances, up to 2300 miles, during the afternoon hours.

This month's *CQ* Propagation Charts contain DX predictions for the period of June 15 through August 15, 1998. Short-Skip Charts for June for openings between 50 and 2300 miles and from Hawaii and Alaska appeared last month.

Mail Bag

Here are excerpts from an e-mail received recently from Edgar Heinen, VE3TQU:

"[I believe] there is a typo in *CQ* magazine in the Last-Minute Forecast in your column. For example, it shows *C* as a fair signal, S-3 to S-9. It shows *B* as a good signal, S-6 to S-9. Shouldn't *C* correctly read S-3 to S-6? You have the best propagation charts. They are more useful than the ones in *QST*, I think. I read your first-ever column in the March 1951 *CQ*. Quite a change and improvement."

Edgar also writes about calculating signal-to-noise ratios, and about my good friend Peter Saveskie's contribution to the field of radio propagation. These will be discussed in a future column. Here is my reply to VE3TQU:

"Dear Edgar: Many thanks for the very interesting e-mail. I much appreciate the nice comments, especially that you were one of the readers of my first column in *CQ* over 47 years ago!

"The overlap in the Last-Minute Forecast definitions of *C* (fair) and *B* (good) is intentional. This means that it is possible for the upper signal levels of a *C* rating between S6 and S9 can compare with the lower signal range of a *B* rating. Even when in the same signal range, however, there is a difference in the definitions. A *C* rating shows "some fading and noise," while a *B* rating shows "little fading or noise." So while a fair rating in the upper range might have the same signal strength as a good rating in the lower range, the noise and fading levels will be different, favoring the good rating.

"Incidentally, I very much appreciated your remarks about Peter Saveskie. He was a very dear friend of mine. He was an outstanding international communication engineer and a world expert in the field of wave propagation. We both began our radio experience with WKNY, NY in 1941. We both flew as radar officers from the same B-17 Bomber Group in England during WW II. Peter went on to become an engineer with Radio Free Europe, while I went to the Voice of America. In the 1960s he was in South Vietnam tying the country together with microwave systems, while I was there attempting to form a national broadcasting network. I last met with him in San Francisco about 25 years ago, just a week or so before his untimely death. Incidentally, while working for many years in Spain, Peter became one of the leading non-Spanish professional bull fighters! I intend to discuss your comments about Pete Saveskie and signal-to-noise ratios in a future column.—73s, George, W3ASK."

VHF Ionospheric Openings

Sporadic-*E* propagation increases considerably during June and the summer months, and this is expected to result in fairly frequent 6 meter short-skip openings over a range of 1000 to 1400 miles. During periods of widespread and intense sporadic-*E* ionization, two-hop 6 meter openings may occasionally be possible up to distances of approximately 2500 miles.

An occasional sporadic-*E* opening on 2 meters can occur, particularly when ionization is very intense, over distances between approximately 1200 and 1400 miles.

While sporadic-*E* propagation can occur at any time, hence its name, it is most likely to take place between 10 AM and 2 PM and again between 6 and 10 PM local daylight time.

Meteors from the *Herculids* and *Scorpiids* showers are likely to enter the Earth's atmosphere during the first half of June. Although classified as minor showers, some meteor-type propagation should be possible on the VHF bands between June 3 and 5, when both showers are expected to peak in intensity.

Little auroral activity is expected during June, but some may be possible when HF conditions are Below Normal or Disturbed. Check the Last-Minute Forecast at the beginning of this column for those days during June that are expected to be in these categories. These are the days on which auroral and perhaps other types of unusual short-skip ionospheric propagation are most likely to occur on the VHF bands.

73, George, W3ASK

Letters *(from page 8)*

CQ. I have often observed the things Cary and Ted explained, and I commented on *many* of them in my book on Topboard (*Dx'ing on the Edge . . . The Thrill of 160M!*). What I principally did, though, was note them as observations, with a modicum of explanation only. The authors *really* helped explain my observations with charts and a rationale that makes sense—for which many of us are most grateful! Thanks to them for what they have done!

Jeff Briggs, K1ZM
Hopewell Junction, NY

The Antarctic Remembered

Editor, *CQ:*

Having read your March editorial, I suddenly felt the urge to do something that I often think of doing, but seldom do: write in reference to an editorial. This could really be a many-paged letter, but I feel that interest in the Antartic has dwindled in the past 30 or so years to the point that it will be no more than a footnote in history. This is apparent from the fact that ATM machines now are located at McMurdo, and in excess of 9000 visitors have been there in the past few years. Another interesting by-note is the information that the Navy has ended their presence in the Antarctic recently, and has turned their jobs over to the New York Air National Guard and civilian contractors. I am quite sure this was done for any number of reasons, but the biggest one of course is fiscal. Operation Deep-Freeze will now only live in the minds of those of us who were a part of it.

I am finding this letter rather difficult to write, because there are so many facets of it, and the ice is a place that is dear to my heart.

Let me start with the statement that I was in the wintering-over party for the years of 1959–1960 and spent almost 14 months of that at the geographical South Pole—aptly named the Amundsen-Scott Station. During that time we used the services of Jules M. J. Meady, K2KGJ, in Rahway, New Jersey quite often. When the '59-60 wintering-over party formed up in Davisville, Rhode Island, Jules had already been awarded the Edison Award. Because I was already an amateur, I was aware that there was a great deal of hate and discontent among the amateur fraternity concerning the award. Many claimed that the stations on the ice used his station to the exclusion of all others who volunteered their services for phone patches. This was not true in its entirety, but when you are trying to contact a loved one from so remote a location, of course you try to use the best signal you can get. Jules's signal was consistently a good 20 over 9, except during auroral blackouts and other natural phenomena. There were many who claimed that he ran a "California-Gallon" or more. Nothing could be further from the truth. His consistency was because of his tremendous antenna farm and excellent operating practices, such as closely watching changing band conditions, etc. Because I was the only licensed ham going to the ice in that year, I held classes daily at K1NAP in Davisville for those who wanted to acquire a conditional license so the stations could be operated. I did so with the understanding that at least for that year, stations other than K2KGJ would be used for phone patches and service messages.

I was in contact with Jules many times during this period, and explained my philosophy of getting as many amateurs involved as we possibly could. He thought it was an excellent idea, and we went forward with that. As a result, many stations that had in previous years tried to just work the Antarctic were able to, and phone patches cost a geat deal less because they were placed from the closest point to the home of the caller. We not only operated on bands other than 20 meters, we did a great deal of CW work that year. At Pole Station alone, we made and QSLed around 30,000 new contacts around the world. All in all, it made for an excellent year for us and for the guys and gals stateside who handled our traffic. Some of them who come to mind are K6MZT, Bill Peters in Pasadena, CA; W6QPI, Betty Fields in San Diego, CA; W6DG, Doc in San Francisco, CA; K4PJJ, Jacksonville, FL; W7's; W9's; WØ's; W5's; W1's; and the litany just goes on and on. Names and callsigns escape me now, after all these years, but they were there and they all helped.

One footnote and I will get out of your hair: Before leaving for Pole Station (KC4USN), I was operating at KC4USV, when Jules walked into the station. One of the things the Navy did was fly him down to the ice to visit—a rather nice piece of PR. This young man, during the period when I knew him, was enrolled at Rutgers with a major in pre-med and a minor in EE and maintained a 4.0 GPA. Not bad when you consider that most of the good band conditions for quality phone patches were from around 2300-0400 EST. I feel that he deserved the award, and had no qualms about telling anyone who tried to detract from it.

There are many more stories that I have stored in the ole' memory bank that I would be proud and happy to share with you should you desire them. Thanks for being patient amd 73's for now.

William D. O'Quin, WB4IBZ
Earleton, FL

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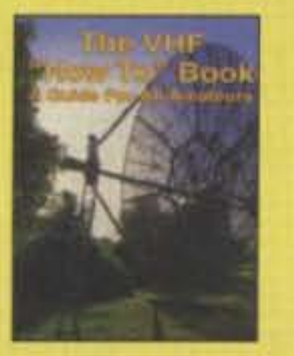

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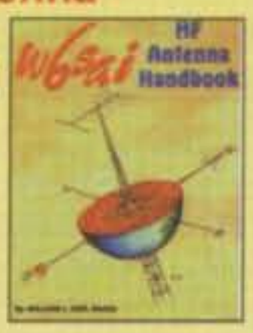

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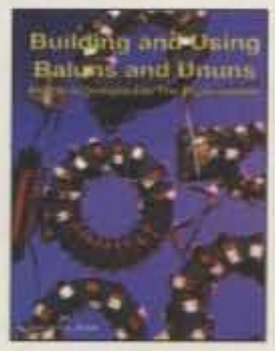

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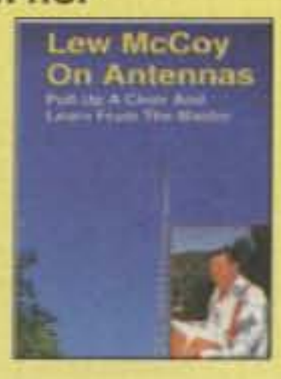

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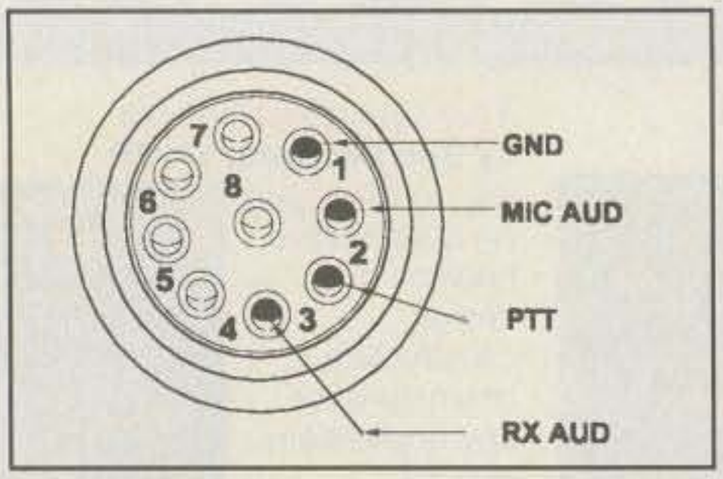

Fig. 5– The 505DSP's microphone uses an 8-pin DIN connector. The microphone input impedance is approximately 2000 ohms. This value enables the use of low- or medium-impedance dynamic microphones providing 5 to 20 millivolts of output. The microphone supplied with the 505DSP is pre-wired. If you plan to use a different microphone, wire it according to the illustration shown here.

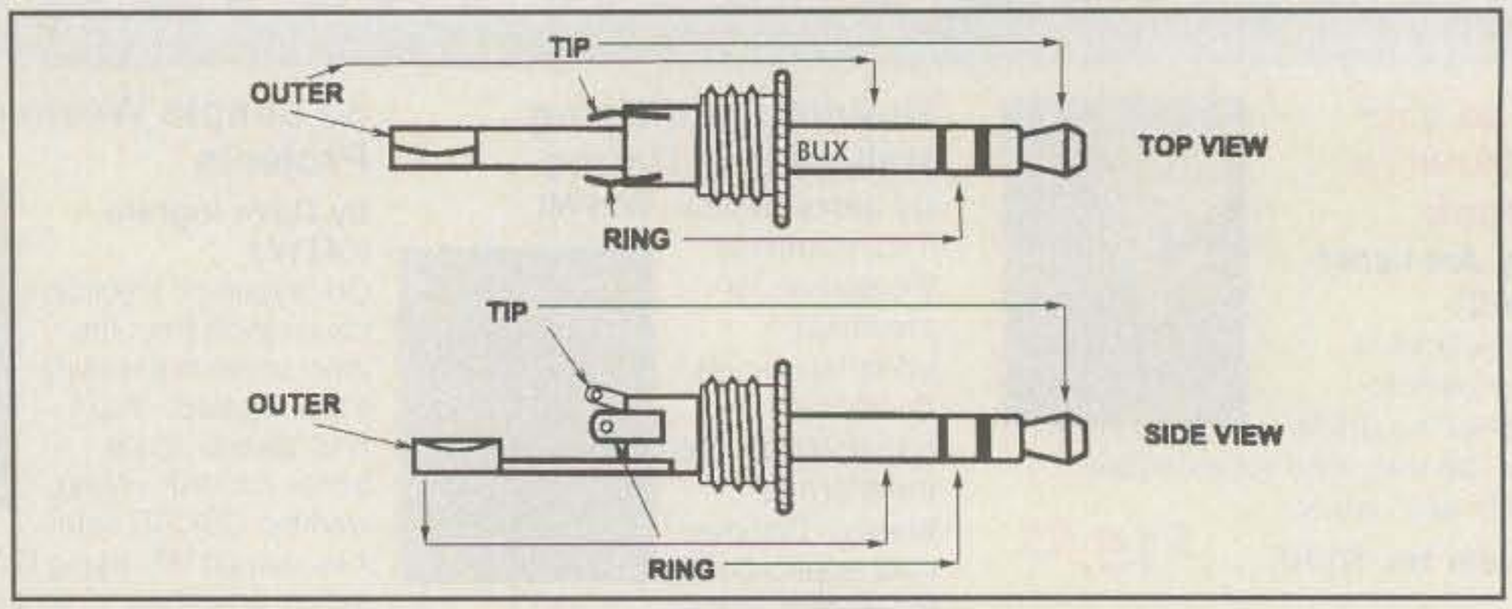

Fig. 6– For electronic keyers and CW applications, wire the paddle to one of the included 3.5 mm stereo phone plugs, connecting the tip to the right side of the key and the ring to the left. The outer part of the jack is the switch common. Left-handed operators should use the same wiring connection, then select "left-hand" from the CW menu, CW Keyer Mode sub-menu in the onscreen control software.

up or down. Volume may also be changed using the numeric keypad + or – keys. Volume setting has no effect on the transmitted signal.

Frequency Selection: The Rx and Tx operating frequencies are displayed in separate windows. The top window displays the Rx frequency, while the bottom window displays Tx. Frequencies may be changed using either the mouse or the arrow keys. Clicking the left mouse button on a digit in the frequency window will cause "up/down" boxes to appear above and below the selected digit. You may then click the left mouse button on one of these boxes to move the frequency up or down. Using the arrow keys, the left and right arrows are used to select the digit, while the up/down arrow keys are used to move the selected digit up or down. Note that when operating Simplex, the Rx and Tx frequencies will always track each other.

Mode Button: Clicking on the mode button will toggle the transceiver between USB, LSB, AM, and CW modes.

Shortcut Keys: After becoming familiar with the 505DSP, many users prefer to use the keyboard "shortcut" keys instead of the mouse. Shortcut keys are keys that are permanently assigned to specific functions.

Example: Upper sideband = U

The functions of the shortcut keys cannot be changed from the factory settings. A menu of shortcut keys can be displayed on screen by selecting Shortcut key legend ON from the Help menu.

Snapshot Keys: Keys F1 through F8 are the "snapshot" keys, so named because pressing <shift> plus one of these keys stores all of your current radio settings into memory—i.e., like taking a snapshot of your current setup. You may then change mode, frequency, bandpass filter width, etc., and return to your previous settings simply by pressing the same snapshot key again. You will soon find many uses for these keys. For example, you might use the F1 key for 20 meters, F2 for 40 meters, and so on, to quickly change between bands.

Remember: Press <shift> key plus snapshot key to save. Snapshot key only (no <shift>) to retrieve.

Eight additional snapshot memories are available by simultaneously pressing the ctrl key while storing or recalling.

Backspace Key: The backspace key functions as an "undo" key. Pressing it will revert the radio settings to those in effect prior to the last key stroke (or mouse click).

Numeric Keypad: The numeric keypad (the block of keys to the right of the keyboard) is dedicated to the selection of DSP bandpass filters. The NUM LOCK key, however, *must* be on for the numeric keypad to function properly. By pressing 0 on the numeric keypad, a selection of DSP bandpass filters will be displayed. Press the keypad number corresponding to the desired filter. (The number keys on the keyboard may also be used.) You will find you can very quickly call up the filter menu and select a filter this way.

Help: The 505DSP User Guide is provided on-screen. To view the User Guide or Help files on the radio's features, select Help from the main menu.

Keyboard Repeat Rate L Mouse Click Speed: The keyboard arrow keys, or the mouse, are used to tune the radio. The keyboard repeat rate, or the mouse double-click rate, if set too slow may be readjusted under Windows.

Computer and Monitor Noise: The 505DSP radio is well shielded. However, like any other radio operated near a computer, it may pick up computer or monitor noise via the antenna. To see whether the noise is entering the radio through the antenna, disconnect the antenna from the rear panel of the radio. Experience has shown that most radiated noise is emitted by the monitor.

Interfacing the 505DSP HF Data Modems, 300 Baud Packet, RTTY, etc.

External H.F. data modems or "TNCs" may be interfaced to the 505DSP using the transceiver's ACC1 connector. Provision is made for audio input and output (I/O) at a nominal level of 0 dBm (1 mW), and at an impedance of 600 ohms. This means the receiver audio appears at pin 16 with an available level of approximately 2 volts peak-to-peak, or 0.707 volts RMS. This level is independent of the volume control setting of the transceiver. The external device must provide the equivalent level into pin 17 to drive the transmitter to full output power.

If selectable, the external modem should be set to its "high level" output mode. If the modem isn't capable of providing audio drive over 1 volt peak-to-peak, it should be set to around 10 mV;

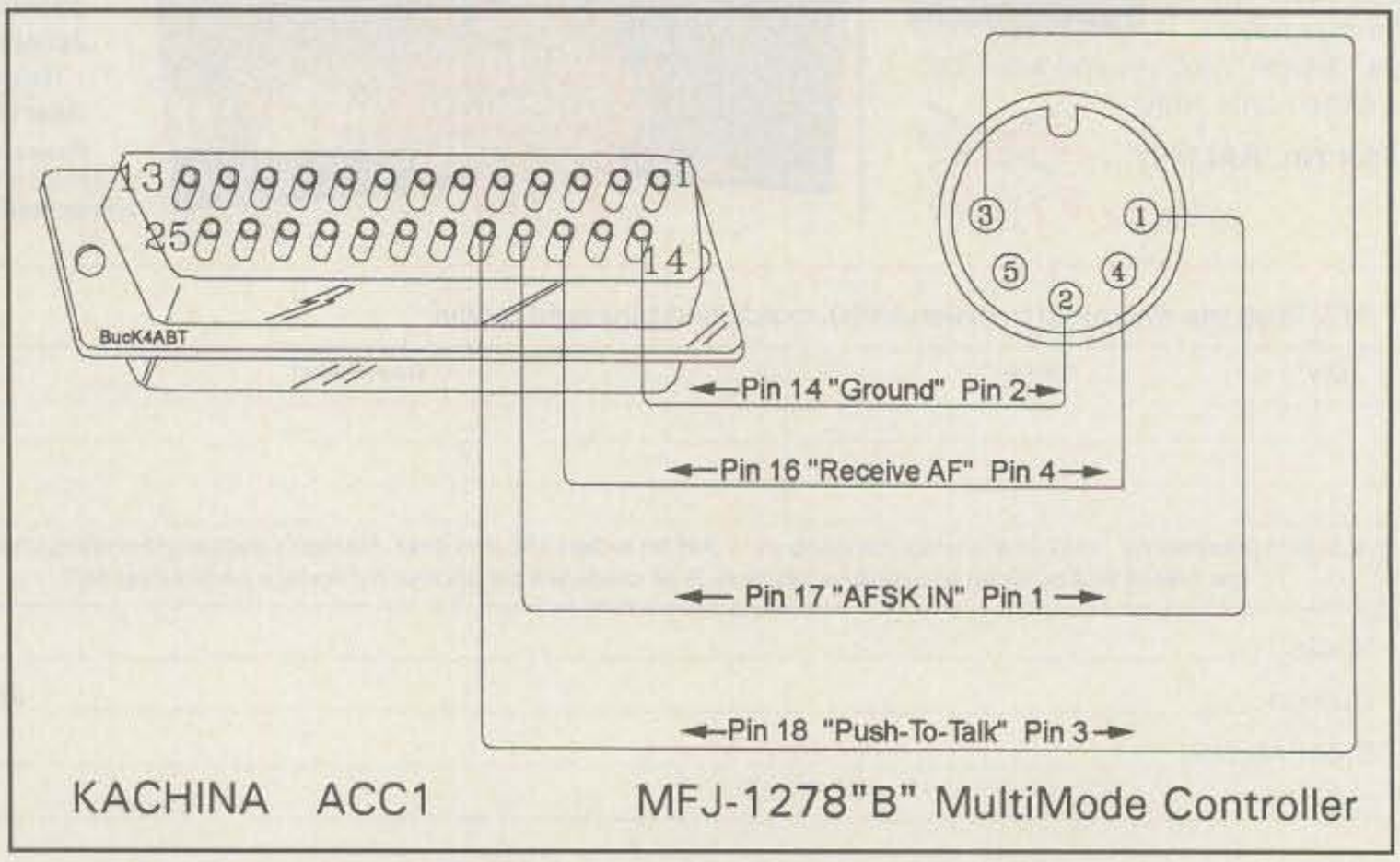

Fig. 7– Gotta give it a run for all the digital modes, so here goes with the "PacTOR" plunge using the MFJ-1278"B" multimode controller.

THE 505DSP AND THE SMITH CHART

The 505DSP Using the Internal Automatic Antenna Tuner and Smith Chart Display. Most transmitters are designed to operate into a load which looks electrically like a 50 ohm resistor. When the antenna isn't exactly 50 ohms, some of the power is reflected back to the transmitter, where it may produce deleterious effects. The reflected energy may increase the heating in the output devices to dangerous levels, or it may cause voltages there to exceed breakdown limits. Also, operating an amplifier into a load very different from the design value may destroy its linearity because of alteration of the output load line. Finally, some of the transmitter's output power will obviously be lost because of the mismatch.

The goal of the ATU is to provide the transmitter with a constant 50 ohm load. It does this by inserting a network of reactance values which transforms the antenna impedance.

Complex Impedances and the Smith Chart. The Smith Chart, invented by Philip H. Smith more than half a century ago, is simply a graph for plotting complex impedances. The chart consists of a circle, the center point of which represents the characteristic resistance of interest, usually 50 ohms. A zero-reactance line is drawn horizontally through the center. All points on this line are pure resistances. The point at the right end represents infinity, or an open circuit; the point at the left end represents zero, or a short circuit.

Other circles or arcs can be drawn on the chart to describe all points having either the same resistance or the same admittance. Constant-resistance circles always pass through the infinity point, and have diameters smaller than the chart diameter. Constant admittance arcs pass through the zero point, and also have diameters smaller than the chart diameter. The beauty of the Smith Chart is that as circuit elements are adjusted, the plotted impedance follows a predictable circular curve. This property is extremely useful in planning antenna tuner strategies.

Getting Around the Chart. From any starting impedance point, the addition of series reactance transforms the impedance along a constant-resistance circle. A series inductance takes us clockwise along such a circle. A shunt capacitance takes us counter-clockwise along a constant-admittance circle. These two element types can be used to build an ATU which provides a conjugate match between any impedance and the characteristic resistance.

Now that we know how to get around the Smith Chart, we need an algorithm, under microprocessor control, which steers the network toward a match.

"Fuzzy Reasoning" ATU Algorithms. Fuzzy reasoning is a process, like those in the human mind, which assesses a situation in relative terms—e.g., if we see the antenna is capacitive, we know inductance must be added; if inductive, capacitance must be used. Further, if the antenna is very capacitive, more inductance must be inserted. A fuzzy-reasoning system employs transfer functions which describe how much adjustment to make based on detector inputs. The transfer functions can represent not only the theoretical requirements of the system, but can also incorporate any predictable errors from the detectors and other sources. Fuzzy reasoning tends to overcome errors in systems which can provide only roughly accurate absolute measurements, but which produce good relative resolution.

In the case of the ATU, the accuracy of the phase detector is likely to degrade rapidly below VSWR = 1.3:1, and we must rely solely on the reflection coefficient to guide us. A certain amount of "thrashing about" must be employed to find the minimum VSWR. Above this level, the phase information is useful in steering toward the goal. Transfer functions are developed which embody the matching rules, and a fuzzy-reasoning engine is created which adjusts circuit elements on a step-by-step basis until minimum VSWR is reached.

Step size must be determined by the degree of correlation between the transfer functions and the actual performance of the circuit. Tuning speed is the parameter which suffers because of inaccuracies. In actual practice, with measure-and-adjust cycles of around 25 ms, tuning times well under one second are obtained. The use of adaptive, memory-tuning techniques enhances performance. Refer to Kachina AN106 for further information.

Acknowledgement. Some of this material appears in "Smith, D. T., Signals, Samples, and Stuff," a series of articles published in 1998 issues of *QEX, the ARRL's Forum for Communications Experimenters.* For subscription information, contact the ARRL, 225 Main Street, Newington, CT 06111, or via e-mail :<qex@arrl.org>.

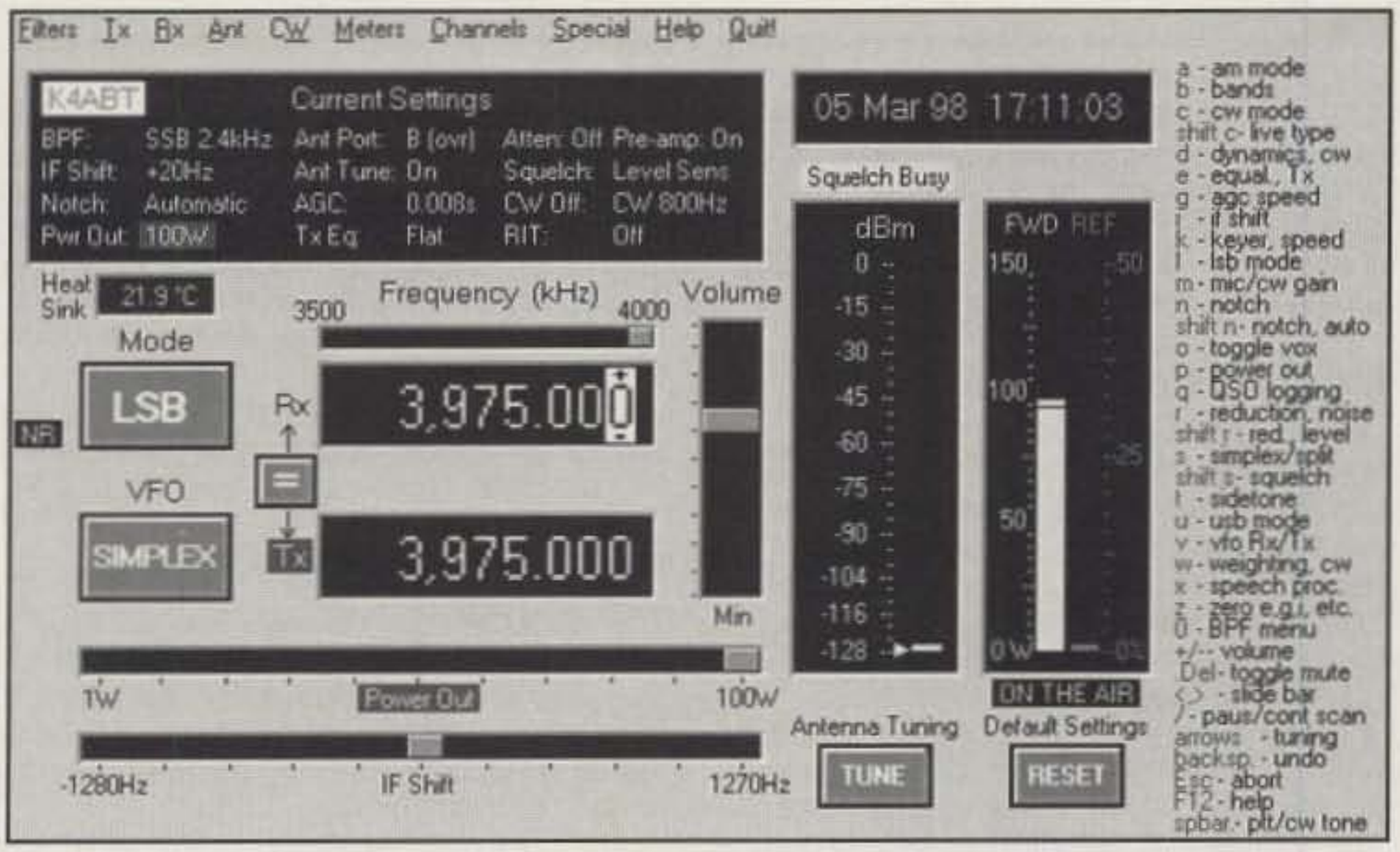

Fig. 8(A)– In lieu of knobs, the radio's many features and functions are controlled from this menu using the keyboard or the mouse. You may find the mouse easier to use until you become familiar with the various features and functions. Menu selection is accomplished by clicking the left mouse button on the highlighted item. Full details of all radio functions are provided in an on-screen User Help Guide.

the output should then be connected directly to the microphone audio input on the control head. Refer to the 505DSP Installation Manual for pin assignments.

The 505DSP PTT line assumes a voltage near the main supply voltage when not active. To activate the transmitter, this line must be grounded. Approximately 12 mA of current must be "sinked" by the external device to bring on the transmitter.

A delay between the activation of transceiver PTT and the onset of transmitter R.F. energy is necessary to prevent "hot-switching" of relays both internally and in any external amplifier. This delay is slightly more than 20 ms, so the external modem must be set to accommodate it.

A delay between the de-assertion of PTT and the onset of receiver audio occurs because the transceiver must reset itself for receiver operation by toggling relays, re-programming filters, etc. This delay is slightly less than 20 ms.

RTTY Filters and Frequency Offsets

Two special filters are provided in the 505DSP receiver to accommodate audio frequency-shift keying (AFSK) RTTY operation. The "Data Med" filter has a passband centered on 1700 Hz, and the "Data Hi" filter is centered at 2210 Hz. The bandwidth of each of these filters is 500 Hz. The transmitter always has a passband from 180 Hz to around 3 kHz. The use of tone pairs above 1600 Hz is mandatory to avoid transmitting audio second harmonics appearing on the transmit passband.

To calculate the actual transmitted frequencies, the audio mark and space tone frequencies must be known. Most amateur HF modems use the high tones, at mark frequency 2295 Hz, and space frequency 2125 Hz. With this arrangement amateurs must use LSB mode to transmit and receive signals that are "right-way up". It is possible to command the modem to reverse its tones, then to use USB mode and still be right-side up.

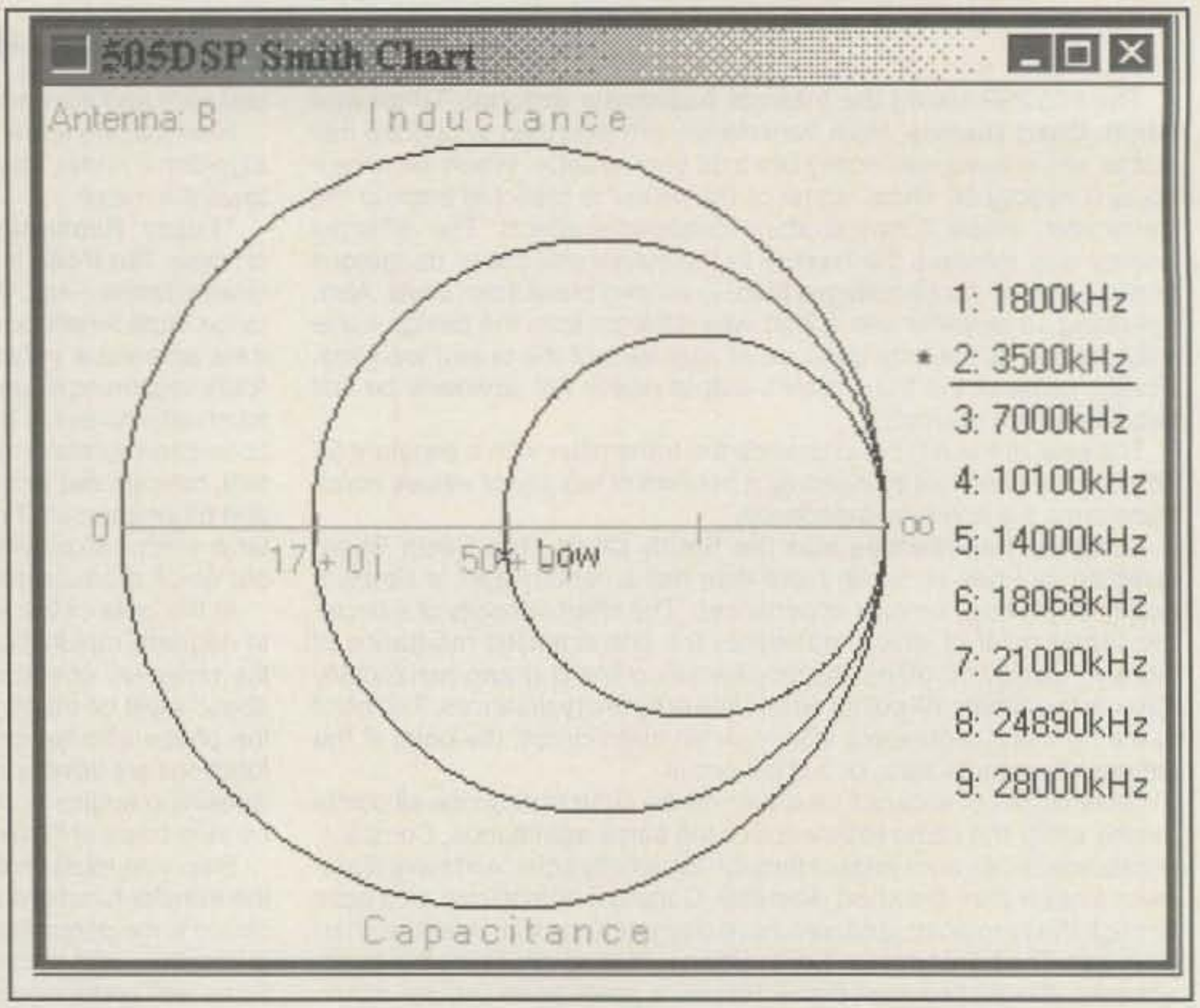

Fig. 8(B)– I cannot say enough about this high-tech feature of the Kachina 505DSP. Here is the pride of every 505DSP owner. I used the 505DSP "Smith Chart" to analyze my antenna condition, performance, and match. As I became more familiar with the use of the built-in Smith Chart feature, I began to make my antenna system into the "perfect" match ahead of the 505DSP. Smith Chart calculations and display can be made with or without the automatic antenna tuner. The Smith Chart may also be sent to your printer for hard copy. Add the date to the file for future reference.

To compute the transmitted mark frequency using LSB mode, subtract the audio mark frequency from the transceiver's dial frequency. In USB mode, add the two frequencies together. Inversely, to find the dial frequency from a given mark frequency, add the AFSK mark frequency to the R.F. mark frequency using LSB. Subtract them for USB operation.

My First Love—CW

Many features of the 505DSP are designed especially for the CW operator. Narrow IF-DSP bandpass filters are available for the tops in receiver selectivity on crowded portions of the band(s). An offset frequency can be selected to suit the preference of the operator, and a CW spotting tone is provided for "zero-beating" received signals.

In transmit, the keyer has been designed with lots of flexibility. Keyer speed and weighting are continuously adjustable, and the rise and fall times of the output waveform can be altered using a dynamics control. Full break-in, or "QSK," operation is possible beyond 30 WPM. Alternatively, semi-break-in operation may be selected with a continuously adjustable hang time.

CW Spotting Tone: In CW mode, the spotting tone may be activated by depressing the "space bar" on the PC keyboard. A tone will be audible at the level set by the "sidetone" level control, and at the frequency selected by the "CW offset" control. The tone represents the transceiver's actual transmit frequency, and is extremely useful in setting the frequency equal to that of a received signal. After some practice, it's easy to tune the transceiver to within several Hz of the desired signal.

Selecting an Offset Frequency: While the "dial" frequency of the transceiver always indicates the actual transmitted or received frequency, the CW offset changes the audio tone coming out of the loudspeaker or headphones. The tone frequency may be altered from 300–800 Hz in 100 Hz steps to suit the liking of individual operators. The received signal will appear at the same frequency as the transmitter's sidetone.

Now, The Voice of Kachina

The 505DSP on Phone: The 505DSP's advanced IF-DSP processing is used in transmit mode as well as in receive. This makes it possible to alter the transmitter's frequency response by changing the characteristics of the digital, bandwidth-limiting filters.

The nominal frequency response of the transmitter in SSB modes is approximately 180–3,000 Hz at the 6 dB points. The response between these points is symmetrical, and between 400 and 2800 Hz, and flat to within approximately 0.75 dB. The flat audio response and the low-distortion phasing-method modulator mean that the actual transmitted audio quality is dependent mostly on the quality of microphone used.

Tailoring The Transmitter's Audio Response: The Kachina hand microphone is designed for the highest voice intelligibility, and so has a response which matches the response

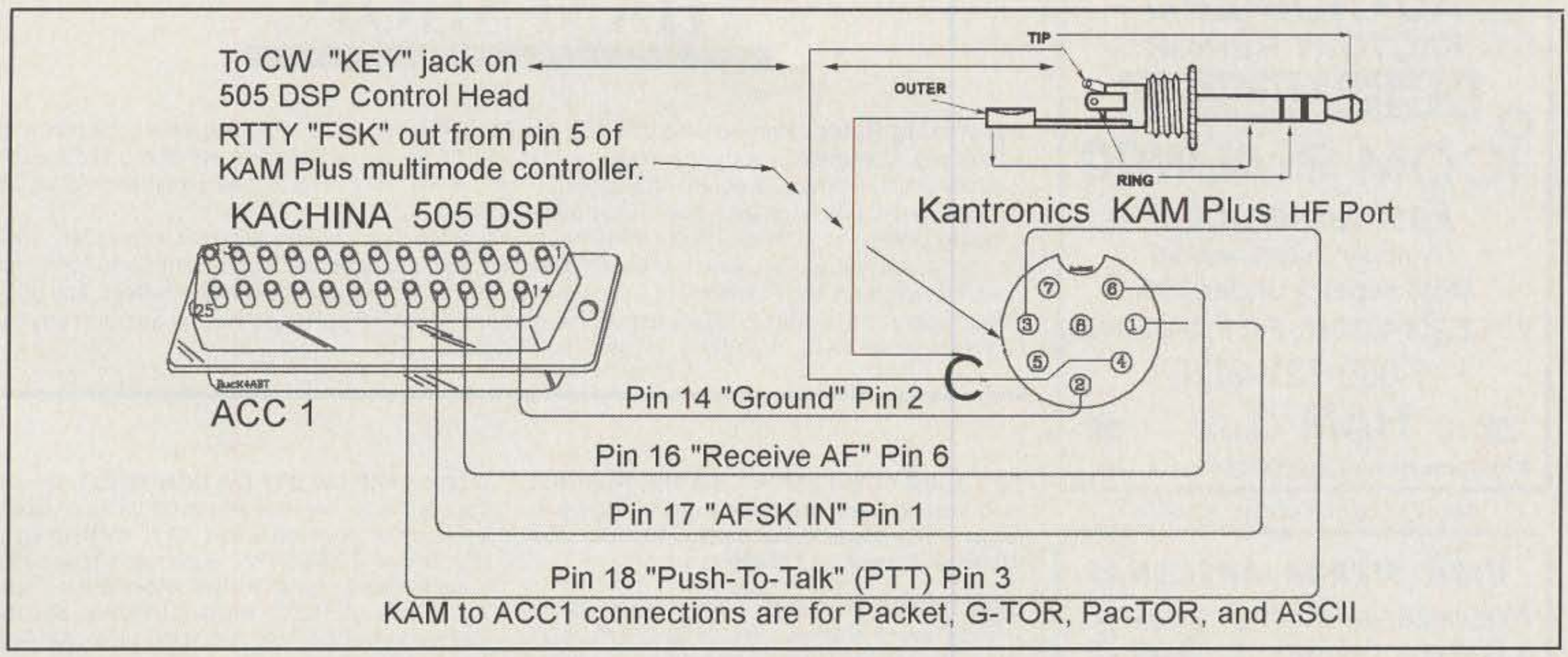

Fig. 9– RTTY, CW, AMTOR, G-TOR, PacTOR, HF packet, anyone? Just a few more minutes and as soon as the soldering iron is hot, we'll have the 505DSP on the air in the popular digital modes.

of the human ear. The response has a mid-range peak corresponding to the peak sensitivity of the human auditory system. This characteristic does not necessarily produce the most natural sound with all voices.

Other microphones have similar responses, yet others are flatter. We find that transmitter audio quality can be highly variable, and depends on the nature of a person's voice, the dynamics of speech, the proximity to the microphone, and propagation conditions; in short, it is a complex function of many factors which are difficult to measure and control.

To allow the operator to alter his or her transmitted audio attributes, the 505DSP has a transmit audio equalizer. This control allows up to 12 dB of bass or treble boost, just as is found in the "tone" controls of other audio devices. The equalizer can be quite effective in compensating for different voice traits under varying conditions. As an example, in a DX "pile-up" more treble is effective in producing a "piercing" signal. Alternatively, a setting on the "bass" side can be more pleasing for "rag-chewing."

The 505DSP provides a speech monitor to allow operators to get a better idea of the sound of their transmitted signal. The monitor output is a replica of the actual filtered, processed, and equalized audio applied to the modulator. It's useful in setting the relative levels of bass, treble, and speech processing applied.

Microphone audio in the 505DSP is amplified and then digitized using a 10-bit analog-to-digital converter (ADC). This signal is applied to a 16-bit IF-DSP modulator. The dynamic range of the system exceeds 60 dB with respect to the audio input. Because the speech monitor output is generated using 8-bit pulse width modulation (PWM) techniques, its dynamic range lags the actual transmitted signal by at least 12 dB.

Also note that the signal-to-noise ratio, distortion, and frequency response of a signal depend heavily on the characteristics of the receiver used to evaluate it. For example, most receivers don't have a frequency response down to 180 Hz unless the IF shift is used. And quite often, the intermodulation distortion (IMD) introduced in the receiver is actually greater than that produced by the transmitter on the other end.

The microphone gain setting in the 505DSP isn't as critical to audio quality as in other transceivers. The digital ALC compensates effectively for audio inputs which would otherwise drive the transmitter above the set power limit. Little difference will be noticed in quality, as the "mic gain" is adjusted above the point where ALC action occurs.

Transmitter gain is precisely set using the "mic gain" control. Excess gain is registered on the ALC meter in dB. A mic gain setting of 50% provides exactly 6 dB less gain than at full. As the power output setting is reduced, the transmit gain is automatically reduced in proportion; the IF-DSP system regulates its output precisely to keep transmit gain within reason, according to power output.

Space does not allow me to go into the KCLOGging program, which is another of the Kachina support softwares. As a matter of fact, I've only touched on a few of the many high-tech features of the Kachina 505DSP. For now, I'm having fun and building the PacTor interface for the multimode controller at fig. 9. Look for me on PacTor in a few minutes.

Summary

Established in 1975, Kachina manufactures HF/SSB radio communication products for the worldwide commercial, military, and amateur markets. Kachina Communications was established in 1975 by Lester A. Earnshaw, ZL1AAX, KB7FA. Mr. Earnshaw is a well-known pioneer in the design of solid-state radio and has authored many technical articles and reference books on the subject. Since emigrating to the United States from New Zealand in 1961, he has designed commercial, military, and amateur communication products for numerous U.S. companies. He was founder and president of Southcom International, Inc. of Escondido, California until his sale of the company in 1974. During that time, Mr. Earnshaw originated many new HF/SSB designs, including the Southcom SC120 and SC130/URC-87V military packsets.

The 505DSP is a product of Kachina Communications, Inc., 30 N. Alamos Drive, Cottonwood, AZ 86326 (telephone 520-634-7828; fax 520-634-8053). The 505DSP is priced at $1995.00. The 505AT automatic antenna tuner sells for $239.00. A new accessory product just announced (but not included in this review) is the 505TK, which is priced at $199.00. The 505 TK is a tuning knob control which plugs into a serial port and allows the user to control frequency selection. ■

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