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Amateur Radio

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JUNE 1999

CQ

In This Issue:

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[redacted]

On the cover: Richard King, K5NA, Cottekill, NY

U.S. $3.99 / Canada $5.50

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THE RADIO AMATEUR'S JOURNAL

ICOM Connect 2000

IC-2100H

IC-207H

IC-2800H

IC-2100H Rugged 2M • 55 Watts • Easy to Use • Full Function Mic • CTCSS Encode/Decode • IMD Fighter • MIL SPEC 810[11] • Green/Amber LCD • PC Programmable*

IC-207H Super Compact, Detachable Control Panel* • 2M/440MHz • 2M (45W)/440 MHz (35W) • Work One Band at a Time • Up to 9600 bps Packet* • Air Band RX[†] • CTCSS Encode/Decode • MIL SPEC 810[11]

NEW IC-2800H Audio Excellence and Video Excitement • 2M/440MHz • 3" (d) TFT Color LCD Screen • NTSC External Video Input • WFM & AM (Rx Only), FM • 50W/2M, 35W/70CM • 9600 bps Packet Data Port • V/U, U/V, Dual Band, Cross Band Repeat • Independent Band Controls • CTCSS Encode /Decode • Air Band Rx[†] • Duplexer • Attenuator • Full Function Mic

LEGACY

IC-706 SERIES

The most versatile series of compact, multi-band rigs ever made.

NEW IC-706MKIIG THE BEST LITTLE RIG GETS EVEN BETTER

More power, 440 MHz, and still more features! The new IC-706MKIIG adds 50 watts on 2 meters, 20 watts on 440 MHz, AF-DSP, auto repeater, CTCSS encode/decode, and backlit keys. Tried, tested and proven, the'706 series is your best choice for a complete ham rig.

IC-706MKII PROVEN PERFORMANCE

"Upgrade" of the wildly popular IC-706, the IC-706MKII continues to take the world by storm. 100 Watts on HF & 6M, 20 Watts on 2M. Incredible features. The '706 series has earned a reputation as rugged, hard working rigs that perform as well on a serious DX'pedition as they do in a car or shack.

NOW WITH DSP AS STANDARD EQUIPMENT

IC-821H

IC-821H 2M/440MHz • All Mod • REAL Satellite & Digital Performanc with Continuous Adjustable Tx Powe • Sub Band Tx, Independent Rx • 960 bps Packet Data Port • Noise Blanker & IF Shift on Main/Sub • Satellite Trackin with Doppler Correction • Compact Size

IC-707 Extra Class Performance at a Novice Price • 100W (AM 25W) • All Mode • Simple to Use • Big Well Spaced Keys and Dials • Large Backlit LCD Display • 500 kHz–30.0 MHz General Coverage Receive • Full Duty Cycle • Large, Front Facing Speake • PC Programmable*

IC-707

IC-746 HF/6M/2M • 100W • All Mode • Full Duty Cycle • Quad Conversion Receiver • IF-DSP • Front Panel Adjustable NR • Audio Peak Filter • Auto Notch Filter • 3 Optional Filter Positions • Twin Passband Tuning • 4.9" LCD/Dot Matrix Display Shows All Operating Conditions, Metering and Spectrum Scope • CW Memory Keyer • VOX • Automatic Antenna Tuner • PC Controllable*

IC-746

IC-756 HF/6M • 100W • All Mode • Full Duty Cycle • Quad Conversion Receiver • Dual Watch • IF-DSP • Front Panel Adjustable NR • Audio Peak Filter • Auto Notch Filter • 2 Optional Filter Positions • Twin Passband Tuning • 4.9" LCD/Dot Matrix Display Shows All Operating Conditions and Spectrum Scope • CW Memory Keyer • VOX • Auto Antenna Tuner • PC Controllable*

IC-756

IC-775DSP HF • 200W • All Mode • IF-DSP with Noise Reduction, Auto Notch, Audio Peak Filter, Manual Notch and Twin Passband Tuning • Adjustable Noise Blanker • Dual Watch • Adjustable AGC • CW Keyer • Auto Antenna Tuner • VOX • CTCSS Encoder • PC Controllable*

IC-775DSP

IC-781 The Ham's Ultimate 150W HF Rig • Features all the Bells and Whistles • Built-in Power Supply • All Mode • CRT Display with Band Scope • PC Controllable*

IC-781

NEW IC-T81A World's First QUAD HT • Easy to Use • 6M/2M/440MHz/1.2GHz • AM & WFM (Rx Only), FM • 5W@13.5VDC*, 1W/1.2 GHz • Ni-Mh Battery • CTCSS Encode/Decode • Auto Repeater • JIS-4 Water Resistant • PC Programmable*

IC-T8A Easy to Use, Compact 6M/2M/440MHz Tri Bander • AM & WFM (Rx Only), FM • 5W@13.5VDC* • Ni-Mh Battery • CTCSS Encode/Decode • Auto Repeater • MIL SPEC 810[11] • PC Programmable*

IC-W32A 2M/440MHz • 5W Out of Box • Easy! No Function Key • 200 Memories with Alphanumeric Display & Paging • V/V, V/U, U/V, U/U • Backlit Keypad • Wide Band Rx[†] • CTCSS Encode/Decode • MIL SPEC 810[11] • PC Programmable*

Most ICOM rigs are PC programmable with select ICOM options

PC Ready!

NEW IC-T7H 2M/70CM • Easy to Use • Up to 6 Watts* • Air Band Rx[†] • CTCSS Encode/Decode • Pocket Beep • Auto Repeater • Work One Band at a Time • MIL SPEC 810[11] • PC Programmable*

IC-Q7A 2M/70cm Mini Size • Big Audio • 30 to 1300 MHz Rx[†] (Cell Blocked) • 200 Memories • CTCSS Encode/Decode • Advanced Scanning • MIL SPEC 810[11] • Includes 2 "AA" Ni-Cds & Charger • PC Programmable*

IC-T22A 2M • Fun, Shirt Pocket Small and Easy to Use • Large Alphanumeric Display • Wide Rx Coverage Includes Air Band[†] • 5W@13.5V* • 3W@9.6V Standard • MIL SPEC 810[11] • 80 Memory Channels

NEW IC-T2H 2M • Super Rugged Construction • 6W@9.6V Standard • 500 mW Audio • MIL SPEC 810[11] • 8 Front Panel or PC Programmable* Keys • Includes "AA" Ni-Cds and Charger

ALL MIL SPEC[11] HTs

Too new! IC-T81A's MIL SPEC test is pending

IC-T81A IC-T8A IC-W32A IC-T7H IC-Q7A IC-T22A IC-T2H

Enter ICOM's Connect 2000 monthl giveaway and you could win a ne IC-2800H or IC-706MKIIG. It's easy Once a month, ICOM will post question on its Website, at authorize ICOM dealers, in the ICOM Funmo bile, and at ICOM attended har events. Your job is to find the correc answer and mail it in. Once month, ICOM will select at randor one correctly answered entry an reward the sender with that month' new radio. See your authorize ICOM dealer or the ICOM Americ Website for complete rules. N purchase necessary. Void wher prohibited. Contest ends 3/31/00.

ICOM Connect 2000

*Optional equipment required. †Reception guaranteed on ham bands only. ††MIL STD 810 C/D/E for shock/vibration. ©1999 ICOM America, Inc. 2380 116th Ave NE, Bellevue, WA 98004 • 425-454-8155. The ICOM logo is a registered trademark of ICOM, Inc. All specifications are subject to change without notice or obligation. Questions? Contact your authorized ICOM dealer, or contact ICOM America Tech Support on CompuServe's® HamNet forum at 75540,525, or send e-mail to <75540.525@compuserve.com>. CompuServe is a registered trademark of CompuServe, Inc. DAYTON499Y

Now, more than ever before...

Nothing else comes close to an ALPHA 87A!

The *87A* has earned a worldwide reputation as *The Ultimate Linear*, the *very finest* hf amplifier available for use by demanding amateurs. Now *ALPHA/POWER* introduces two more big performance breakthroughs.

***AlphaTrim™ adaptive tuning and matching** delivers ultimate efficiency, power and convenience.* **It *automatically* fine-tunes and loads your *87A* to maximum efficiency and power output, into *your* antenna on the frequency actually in use.**

AlphaTrim™ quietly optimizes *87A* tuning and matching after band or antenna changes...in seconds, as you transmit.

AlphaTrim™ prevents distortion due to amplifier overdrive. Detecting the onset of non-linearity, it automatically readjusts *87A* loading to avert "flattopping."

***AlphaRemote™ controls your 87A** from a compact toolbar at the side of your Windows desktop.™* **It brings a new level of intuitive remote-control convenience because it's *Windows™* based and compatible with *Windows™ 95, 98,* and *NT*.**

AlphaRemote™ permits control and monitoring of all basic functions, providing detailed *87A* status information in addition to simultaneous real time metering of major parameters such as Ig, Ip, Pout and Prefl.

AlphaRemote™ can be customized to show more or less detail, and supports multiple ***ALPHA 87A*** amplifiers.

Call *ALPHA/POWER* to order your new *ALPHA 87A* with standard *AlphaTrim™* and *AlphaRemote.™*
Or order firmware to retrofit your own *87A*.

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FEATURES

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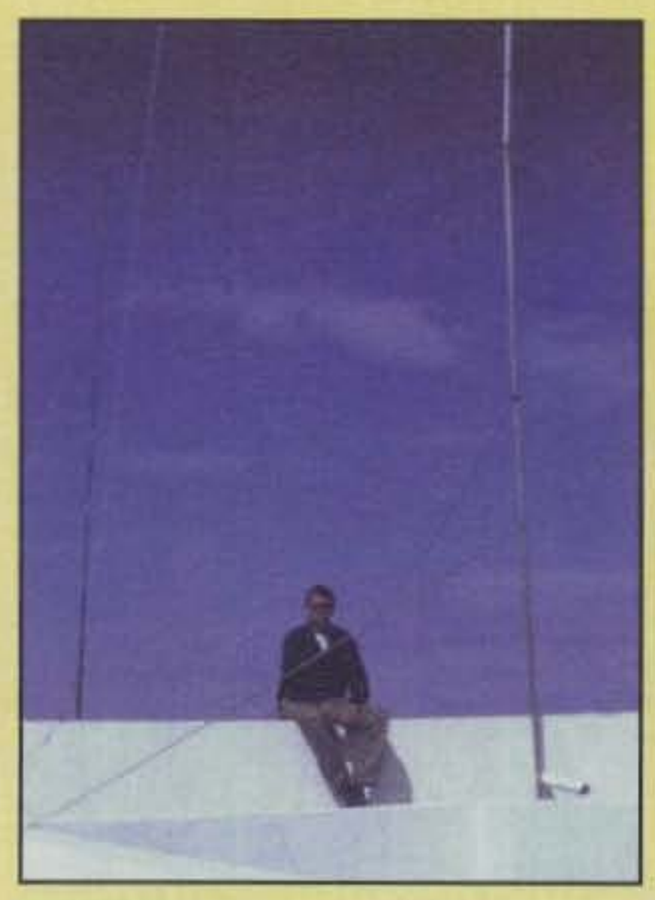
DEPARTMENTS



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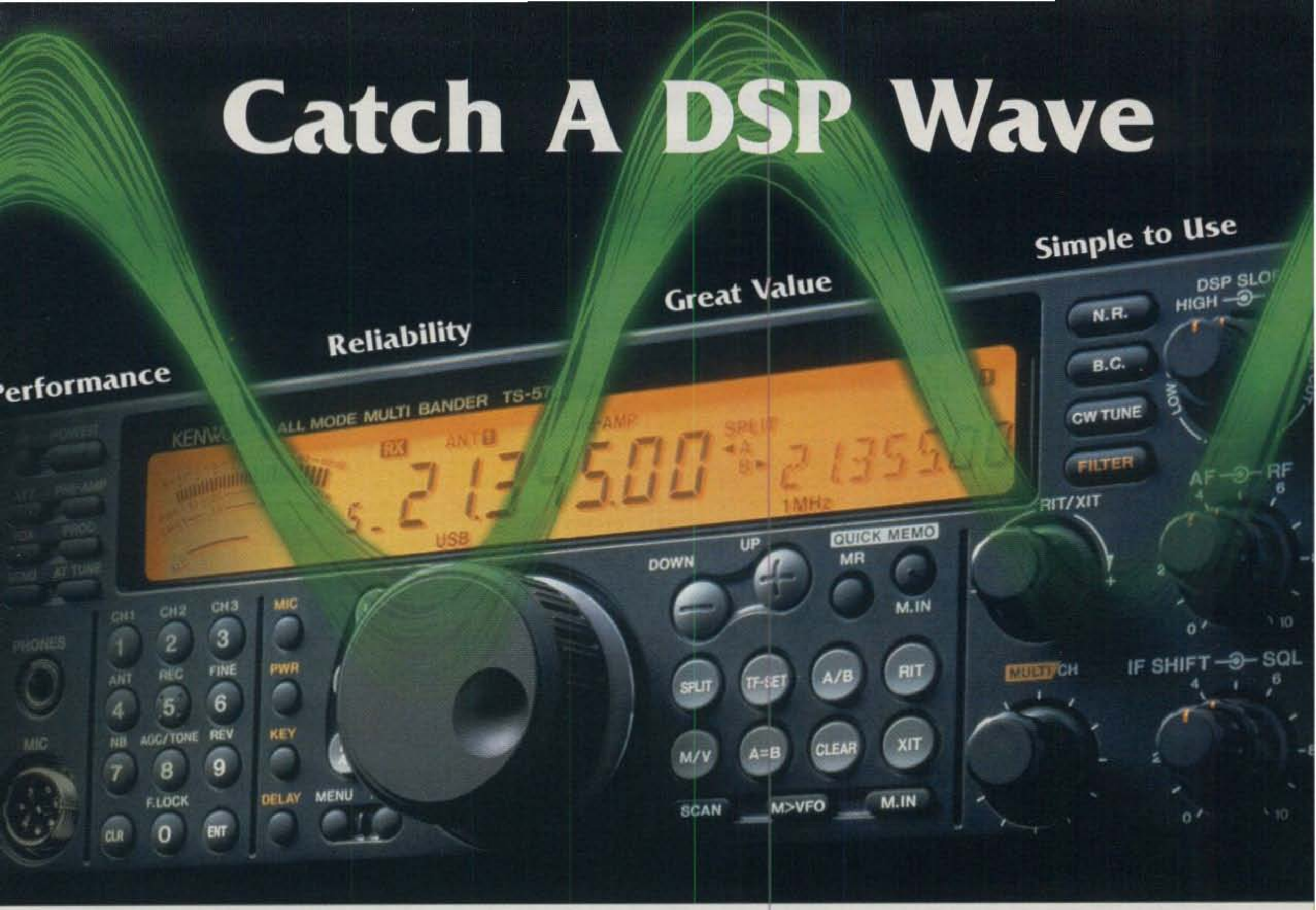
ON THE COVER: How often have you wished that you had a ready supply of antenna materials at hand for those weekend assaults on the antenna farm? It sure looks as if Richard King, N5NA, enjoyed one of those dream antenna "boneyards" at his former QTH in Cottekill, New York. N5NA is now back home in Manor, Texas. (Photo by Larry Mulvehill, WB2ZPI)

Catch A DSP Wave



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.

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

TS-570D/S (G) new features

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

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

ISO 9001
JQA-1205
Communications Equipment Division
Kenwood Corporation
ISO9001 certification

KENWOOD
Amateur Radio Products Group

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ZERO BIAS

AN EDITORIAL

On a reasonably quiet day, while listening to a reasonably moribund band, a ray of aural sunshine appeared in the form of a reasonably strong DX signal. It didn't take long for the DX station to organize all those (and there were a lot) stations suddenly awake and trying to work him. It was an oasis, an island in the middle of a lot of quiet, and in fact one kept listening after the contact just to have something to hear.

Whomfff! Suddenly a signal appeared, a mighty big signal, calling CQ amidst a sea of specific concentrated activity. When the operator was informed by a number of fellow amateurs that he was interfering with the DX station and the adjacent pile-up, he countered with a string of invectives, each ending with all of the participants being unworthy no-coders, and that he had the right to be wherever he wanted to be. I would assume that all he heard was this sudden activity (without the focus), and before his brain could engage, he wanted to work some of it. He did eventually move after trying to tough it out for a bit.

Judging from the interloper's call, it was obvious that he had been around for a while and that he had no need of a vanity call. The age of his own was vanity enough. In fact, if one looked in the dictionary under curmudgeon, you would see this person's call letters as an apt definition. Now of all the hundreds of people taking part in this amazingly orderly DX frenzy, both foreign and domestic, none by definition were no-code. The allusion was more akin to who was "real" and who wasn't. He, by virtue of his octogenarian status, was certainly "real," and anyone with less wasn't. By existing longer, one had more rights than those who hadn't existed as long. The only question, therefore, was which code mattered to someone of his stature? The Napoleonic Code or the Code of Hammurabi?

I guess a lot of us don't age well or become the kind of people we expect our youth to venerate. In a way, it's no different now than it was in 1953 when I got my license. I became interested enough in amateur radio to pursue a license through peers, friends from school who obviously were having a good time. I joined two amateur radio clubs and quickly found out that young amateurs were good for schlepping stuff at Field Day, paying dues, and listening to other "more mature" amateurs (much like our friend above) tell us how things should be, how great the good old days were, and how they basically had the only valid opinions. We were young, inexperienced, had never stormed a beach nor lived through the Great Depression, and even worse, some of us actually had store-bought equipment.

So the years go by, and some of us by virtue of good genes have lived long enough to outlive the "old guys," have paid endless years worth of club and life's dues, perhaps stormed a beach or two, and now feel it's our turn to reap the same reward on today's young. The only problem with that is that we may have waited a little too long to assert ourselves and think that the rules haven't changed.

Somewhere along the way the rules have changed, and young people in general see little or no benefit in the hobbies and pastimes of our generation. It's not just amateur radio, but most things that involve belonging to a group, going to meetings, paying dues, and spending an inordinate amount of time with exotic minutiae and paraphernalia. No, computers are somewhat different, and you certainly don't need a group identity for a singular activity. With regard to amateur radio specifically, it's becoming more common in foreign publications to read about declining membership in national organizations. When we had big increases in the total number of amateurs licensed, our national organization didn't track this increase with an increase in membership, and in fact has reported a drop in overall membership. If we grant that a small percentage might not renew membership over some dissatisfaction, it still doesn't explain the apparent worldwide phenomenon. We have more licensed amateurs in the world now than we have had at any other time in our history, and certainly some of the most exciting technology at our fingertips, so what's the problem?

One of the problems is that the dynamics, both cultural and social, of young people have changed. It most likely has changed for older people too, but that's hardly been noticed over time. Amateur radio as a hobby, as well as many other traditional pastimes, has always had an aura of singular activity—things you did for enjoyment that really involved few if any other people. Consider, though, that most activities or hobbies are really "tribal" in nature and require a bonding of sorts and an extended series of contacts with other like-minded individuals. It's the people who sell and service the paraphernalia, the people in organizations, the people who produce the literature, and the people with whom we interact when the activity involves both cooperation and competition. As individuals we may not like all of these people, but they are part and parcel of the activity and make up part of the "tribe." We learn to interact, socialize, and in some measure become part of the "tribe." We belong.

To me, what seems to be happening in amateur radio, in other pastimes, and perhaps in the world at large is that we're developing some sense of comfort and belonging from virtual people rather than real face-to-face people. We can work at home, bank at home, shop for goods at home, and even do weekly food shopping without ever leaving the nest. There are probably long lists of places we no longer have to go. We're becoming minimalists in the art of socialization. The display, or screen, is our doorway to the world—accepting, non-judgmental, and relatively safe, except for the occasional miscreant. We can be soothed by feelings of connection, participation, education, and yet feel tremendously alienated and isolated. There is no apparent comfort or joy gained in dealing with real people.

I don't know why more young people aren't attracted to amateur radio in the same manner as we were, or why young people have similar feelings about other hobbies and interests. Perhaps it's as simple as having had enough of older people telling them pedantically how to do things, what they should do, and how to be more like us. As I write this, most of the country is still trying to make sense out of the horrific incident in Littleton, Colorado. Predictably, there are the assorted quick-fix cries of "Moral Values," "Gun Control," and who should have noticed what and when. If you beat a dead horse long enough, will it eventually get up and breathe? If you further regulate the vast majority of the population, will the aberrant miniscule minority suddenly change their ways? Historically and statistically, the overwhelming majority of young people don't commit heinous crimes and are perfectly safe in their schools. The methods by which we look at young people and appeal to them to see certain benefits has to change. There are a lot of things that haven't worked in a long time, and yet we keep doing them over and over, hoping and expecting that this time it will be different.

Do we need young people in the hobby and more young people studying technical subjects in school? Of course we do to ensure both the future of the hobby and a broad technical base for industry. At the moment, there is no Professor Hill from *The Music Man* who can bring us a marching band to make it all happen and keep trouble out of River City. At the moment, among our median-aged amateurs we have enough disenfranchised, alienated, angry, hostile people with whom we can't deal without looking for greater governmental intervention.

Somehow, the electronic age was supposed to make everything better, plus eliminate the need for paper. Well, socially, at least, it hasn't worked out, and we use a lot more paper. It doesn't make it bad, just different. Computers and the Internet haven't really taken "our" potential youth away from amateur radio (or any other hobby). They've evolved into an endeavor that's attracted people of all ages for its promise of instant education on millions of subjects, worldwide communications, and virtually no human contact. It's instantly satisfying without the hassle, and if it's on the screen, it must be real, true, and safe.

For amateur radio to attract more young people, as it should, part of the process is to be ready to teach, foster, and encourage socialization and the value of people to the hobby. Some of us should also rethink those values and the value of public service to the community. It's real people doing real things with other real people for everyone's benefit that gives meaning to the hobby. Otherwise, it seems to me, we have something resembling what Timothy Leary postulated in the late '60s: "Turn On, Tune In, Drop Out." Dr. Leary envisioned this via a chemical process, but it's just as easy to envision this as an electronic metaphor, whereby life becomes a continual celebration of one's id via a keyboard.

Since I received my license, the basics haven't changed. People become interested in amateur radio by seeing and experiencing other people having a good time doing what they enjoy. It looks like fun, it might be fun, I think I'd like to give it a try. It's as simple as that. It requires exposure, encouragement, and reinforcement to make it stick. The equation is balanced on both sides by people, people who care about the hobby and each other. If you learn in a vacuum, you tend to stay in that vacuum, and you have less to pass on to the next person. That's one of the reasons why I've urged you for years to get out of the shack every so often and attend a local hamfest. We tend to look at equipment and forget that it's a people hobby. It's hard to marginalize someone or something you've spent time with and gotten to know. There's also the very good chance that you can have a good time and enjoy yourself with a real, rather than a virtual experience.

73, Alan, K2EEK

HF MULTIBAND VERTICAL ANTENNAS

NO GROUND RADIALS

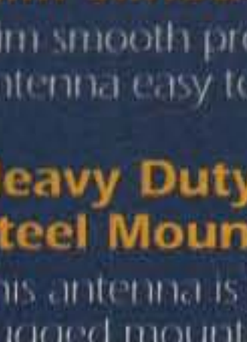
Cushcraft's HF Multiband vertical antennas are designed to meet your needs. Cushcraft has a wealth of experience designing and manufacturing HF vertical antennas that do not require ground radials. These antennas feature excellent performance, automatic band changing and mechanical integrity that is unmatched.

The R7000 is the hobby's premier multiband vertical antenna. This antenna covers 7 bands, 10 through 40 meters and is expandable to 80 meters with the **R80** add-on kit.

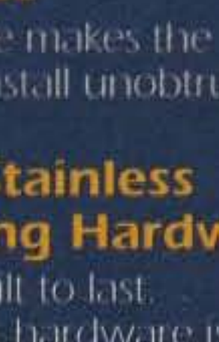
- **Reliable**
  High performance trap design, long lasting antennas requiring less tuning during installation and offering better power handling capability.
- **Slim Silhouette**
  Slim smooth profile makes the antenna easy to install unobtrusively
- **Heavy Duty Stainless Steel Mounting Hardware**
  This antenna is built to last. Rugged mounting hardware is easy to install and withstands harsh environments.

R7000 SPECIFICATIONS

FREQUENCY
10, 12, 15, 17, 20,30,40 M
(80 M with optional add-on)
HEIGHT
R7000 -24 feet (7.3 M)
R7000+ -32 feet (9.8 M)



Mounting Hardware



High Performance Trap

The R6000 is the newest member of the now famous Cushcraft family of HF multiband vertical antennas. This antenna covers 6 bands, 6 through 20 meters offering outstanding performance and value in an attractively sized package.

- **6 Meter Operation**
  Join the fun on 6 meters and take advantage of the new 50 MHz transceivers.
- **Affordable Price**
  Quality and performance at a price no one else can match.
- **Easy to Install and Hide**
  This antenna is a snap to install and short enough to be concealed
- **Heavy Duty Stainless Steel Mounting Hardware**
  Rugged, easy to install mounting hardware.

R6000 SPECIFICATIONS

FREQUENCY
6, 10, 12, 15, 17, 20 M
HEIGHT
R6000 - 19 feet (5.8 M)

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

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COMMUNICATIONS ANTENNAS
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(Tel) 1-603-627-7877 • (Fax) 1-603-627-1764

ANNOUNCEMENTS

• These Special Events are during June:

W2MO, from Civil War Reenactment Weekend, Peterboro, NY; Madison-Oneida ARC; 1400–2000Z June 12; 7.275, 14.275, 28.375, 144.55. Certificate send SASE to MOARC, Box 241, Verona, NY 13478.

W2WSC, to honor radio pioneer Roberto Clemens Galletti, Tuckerton Historical Society Museum, Tuckerton, NJ; Tuckerton Wireless ARC; 1400–2200Z June 5; SSB 14.290, 21.390, 28.490. For QSL send SASE, or SAE and 1 IRC, to Tuckerton Wireless ARC, P.O. Box 531, Tuckerton, NJ 08087.

W3OK and 400 members of the Delaware Lehigh ARC, from Easton, Bethlehem, and Allentown, PA area, to enable hams to earn Worked All DLARC certificate; June 5–6 on the low bands (i.e., 3550, 3870, 3970, 7070, 7270 kHz. For more info contact Bill Goodman, K3ANS, days 610-253-2745, home 610-258-5063; e-mail: <goodmancpa@enter.net>; DX packet cluster at K3ANS > W3MM; on W3OK/R 146.70 MHz; or on HF in the DX pileups.

KB4ALC, from National Corvette Homecoming, Bowling Green, KY; W. Kentucky DX Assn.; 0001Z June 4 to 2359Z June 5; on 28.345, 21.345, 14.275, 7.245. Certificate send QSL & SASE to Kenneth Newman, 505 Emmett Ave., Bowling Green, KY 42101.

W4ZBB, from Billy Bowlegs Pirate Festival, Fort Walton Beach, FL; Playground ARC; June 5 (no times given); on 10, 15, 20, 40 meters. For certificate send SASE and $1.00 to Charles Moody, N4PI, Playground ARC, P.O. Box 873, Fort Walton Beach, FL 32549.

N5C, from Chaco Canyon, Chaco Culture National Historical Park, NM (DM66ba); 1600–2400Z June 19 and 20; CW, SSB, AMTOR, FM, 2–40 meters (QRO and QRP) in Novice/Tech/General portions of bands. Send QSL & SASE to N5C, Jay Miller, WA5WHN, P.O. Box 6552, Albuquerque, NM 87197-6552.

W5A, from Sabine Valley ARA Field Day, Greenville, TX; 0000Z June 15 to 2359Z June 30; 80–10 meters in General portion of bands. QSL to SVARC, P.O. Box 8122, Greenville, TX 75401.

W9R, from 75th anniversary of the Great Rondout Train Robbery, Rondout, IL; Lake County, IL RACES; 1400–2300Z June 12; on SSB 7.283, 14.283, 28.383; CW 7.037, 14.037, 28.037; 146.490 simplex. For certificate send SASE to Lake County RACES, 1303 N. Milwaukee Ave., Libertyville, IL 60048. Check <www.aces.org> for last-minute updates.

L75CB, from 75th anniversary of QSO between Carlos Braggio, r-CB8, Buenos Aires, Argentina, and Ivan O'Meara, Z2AC, Gisborne, New Zealand, and 1924 world record of distance; Radio Club Argentino; May 16–23 special prefixes L2 (LU stations), L3 (LW stations), and L4 (AZ stations) with special QSL card to all; May 21 on CW with award for all stations who work L75B on that day. QSL via LU4AA, Bureau, or P.O. Box 97-1000 Buenos Aires, Argentina.

VE3MIS, from 27th Streetsville Founders Bread & Honey Festival, Mississauga, Ontario, Canada; Mississauga ARC; 1400–2000Z June 5–6; on SSB 7.230, 14.240, and 28.340 MHz ±QRM. For QSL send QSL & SASE to MARC, c/o M. Brickell, 2801 Bucklepost Cres., Mississauga, ON Can., L5N 1X6. (Note: U.S. stamps cannot be used to send mail from Canada to the U.S.)

•The following hamfests, etc., are in June:

June 4–5, **1999 Hamboree 21 & Iowa State Convention**, Marina Inn, **South Sioux City, NE**. Contact Mike Nickolaus, NFØN, 316 East 23rd St., South Sioux City, NE 68776 (phone 402-494-6070; e-mail: <nføn@avalon.net>). (Exams; handicapped accessible)

June 5, **Annual Spring Hamfest**, Fairleigh Dickinson University, **Teaneck, NJ**. Call Jim Joyce, K2ZO, 201-664-6725 (no calls after 10 PM). (Exams)

June 5, **Hamfest**, Illinois State Fairgrounds, **Springfield, IL**. Contact Ed Gaffney, KA9ETP, 13997 Frazee Rd., Box 14A, Divernon, IL 62530 (phone 271-628-3697; e-mail: <egaffney@fgi.net>. (Exams)

June 5, **Picnic & Tailgate Hamfest**, Bronco Club, **Courtland, VA**. Contact Stewart Tyler, WA4JUO, 801 Normandy Dr., Suffolk, VA 23434-2907 (e-mail: <Stu.Tyler@juno. com>).

June 5, **12 Annual Bangor Hamfest**, Hermon High School, **Bangor, ME**. Contact Roger W. Doyle, KA1TKS, RR #2 Box 730, Bangor, ME 04401 (207- 848-3846). (Exams)

June 5, **19th Annual IRA Hamfestival**, Hudsonville Fairgrounds, **Grand Rapids, MI**. Contact Kathy Werkema, KB8KZH, 616-698-6627, 4–7 PM.

June 6, **Starved Rock R.C. Princeton Hamfest**, Bureau County Fairgrounds, **Princeton, IL**. For information, e-mail: <w9mks@qsl.net>, call 815-856-3773, or web: <http://www.qsl.net/w9mks/>.

June 6, **Hall of Science ARClub Hamfest,** New York Hall of Science parking lot, Flushing Meadow Corona Park, **Queens, NY**. Contact Stephen Greenbaum, WB2KDG, at 718-898-5599 (evenings); or e-mail: <WB2KDG@bigfoot.com>.

June 6, **45th Breezeshooters' Hamfest**, Butler Farm Show Grounds, **Butler, PA**. For information, send an SASE to Rey Whagner, W3BIS, Hamfest Chairman, 5430 Cove Run Road, Cheswick, PA 15024, or call 412-828-9383, or e-mail: <w3bis @ freewwweb.com>. (Handicapped accessible)

June 6, **Manassas Hamfest, Electronics, Computer Show**, Prince William County Fairgrounds, **Manassas, VA**. Contact Mary Lu, KB4EEP, 703-369-2877 for hamfest details, or visit web site: <http://www.qsl.net/olevahams>.

June 6, **Medina 15th Year Hamfest**, Medina County Fairgrounds Community Center, **Medina, OH**. Contact Mike at 330-273-1519; e-mail: <m2mgroup@aol.com>. (Exams)

June 6, **31st Annual Wabash Hamfest & Computer Show**, Wabash County 4-H Fairgrounds, **Wabash, IN**. Send SASE to WABASH, County ARC, c/o Ralph Frank, 4010 N. 700 W. Wabash, IN 46992; office phone 219-563-8487; fax: 219-563-8489; home 765-833-7372; web: <www.netusal.net/~qrziota/>.

June 11–12, **Albany Hamfest**, Hasan Temple, **Albany, GA**. Contact Ricky McCrary, KD4OZR, AARC, P.O.Box 70601, Albany, GA 31708-0601 (912-438-9714; e-mail: <rmccray@planttel.net>. (Exams)

June 12, **Macon, Missouri Hamfest & Fleamarket**, Macon Vo-Tech School, **Macon, MO**. Contact KØKY, Dale Bagley, P.O.B. 13, Macon, MO 63552; e-mail: <dbagley1@istmacon.net>; web: <http:// www.istmacon.net~kfoster/hamfest.htm>. (Exams)

June 12, **1999 Winston-Salem Classic Hamfest**, Dixie Classic Fairgrounds, **Winston-Salem, NC**. Contact FARC Hamfest, P.O. Box 11361, Winston-Salem, NC 27116-1361 (336-723-7388; on web: <http: //members.xoom.com/w4nc/hamfest.htm>.

June 12, **25th Annual Fleamarket**, Fergus Community Center, **Fergus, Ontario, Canada**. Contact Bill Smith, VE3WHS, 32 McElderry Rd., Guelph, ON, Canada N1G 4K6 (phone 519-821-6642; packet: <VE3WHS@VA3SED.#SWON.ON.CA.NA>; web <smith.ve3whs@sympatico.ca>.

June 12–13, **Moose Swappers Hamfest & Computer Fleamarket**, Lancaster Fairgrounds, **Lancaster, NH**. Contact Russ, N1YZE, at 603-922-5514; e-mail: <custv@together.net>. (Exams)

June 13, **Wheaton Ham Radio & Electronic Fleamarket** (also vintage radios), DuPage County Fairgrounds, **Wheaton, IL**. Call 708-442-4961. (Exams)

June 13, **Ham-O-Rama'99**, Summit View Middle School, **Independence, KY**. Contact N8JVM, c/o NKARC, P.O. Box 1062, Covington, KY 41022.

June 13, **Hamfest & Electronics Fleamarke/t ARRL Tennessee State Convention**, National Guard Armory, **Knoxville, TN**. Contact David Bower, K4PZT, at 423-974-5064 (work), 423-670-1503 (home), or write to P.O. Box 50514, Knoxville, TN 37950-0514, e-mail: <rack@korrnet.org>. (Exams)

June 13, **Hamfair, Ham Radio & Computer Fleamarket**, Briarcliffe College, **Bethpage, NY**. For more information, contact the Long Island Mobile Amateur Radio Club at 516-520-9311; e-mail: <hamfest@limarc.org>; web: <http://www.limarc.org>. (Exams)

June 13, **Akron Hamfest/Family Picnic**, Wingfoot Lake Park, **Akron, OH**. Contact Dave White, KA8KNP, 719 Notredame Ave., Cuyahoya Falls, OH 44221 (330-928-7625; e-mail <rjtaylor@akron.infi.net>.

June 18–20, **Alberta Picnic & Hamfest**, Burbank Campsite, **Alberta, Canada**. Contact Bob, VE6BLD, 5540 54th Ave, Lacombe, AL, Canada, T4L 1L6, or call 403-782-3438 (evenings); e-mail <kingel@telusplanet.net>.

June 19, **OCARC Electronic Flea Market**, Rutland United Church Hall, **Kelowna, BC, Canada**. Call OCARC at 250-766-2179; on web: <http://www.okanagan.net/ocarc/>; e-mail: <ve7kng@rac.ca>.

June 19, **MARC Hamfest**, Gerstacker Fair Center, Midland County Fairgrounds, **Midland, MI**. Contact MARC Hamfest, P.O. Box 1049, Midland, MI 48641-1049; or call Del, WB8FYR, at 517-636-5097; e-mail: <lafevordel@aol.com>; on web: <http://www.qsl.net/w8kea/ MARCSWAP.htm>. (Exams)

June 19, **Eastern Ontario Hamfest & Computer Fleamarket**, Marmora Area Curling Club, Marmora, Ontario. Call Paul, VE3UUM, 613- 472-3449, or Pete, VA3PGB, 613-473-1171; e-mail: <rhobson@blvl.igs.net>; web: <www.redden.on.ca/~tcarc/ tricnty.htm>.

June 19, **Dunellen Hamfest**, Columbia Park, **Dunellen, NJ**. Contact Bob Pearson, WB2CVL, at 732-846-2056, or Fred Werner, KB2HZO, at 732-968-7789 before 8 PM.

June 19, **Bluefield Computer Show & Hamfest,** East River ARC, **Bluefield, WV**. Contact Bob Frazier, 505 Eads Mill Rd, Princeton, WV 24740 (304-425-8464; e-mail: <wb8nrk @arrl.org>; web: <www.inetone.net/erarc/hamfest/>).

June 20, **Monroe Hamfest & Computer Show**, Monroe County Fairgrounds, **Monroe, MI**. Contact Fred VanDaele, KA8EBI, 4 Carl Drive, Monroe, MI 48162, or call 734-242-9487 after 5 PM.

June 20, **Tailgate Electronics, Computer & Ham Radio Fleamarket**, Albany & Main St., **Cambridge, MA**. Contact W1GSL, P.O.B. 397082 MIT BR., Cambridge, MA 02139-7082. (Handicapped accessible)

June 26–27, **FieldStar 99**, astronomy/ham radio event, also NWAG Ham Radio Field Day; Vernonia Peak Observatory, Vernonia, Oregon. For more information, contact Sandy Mikalow, 503-429-2430.

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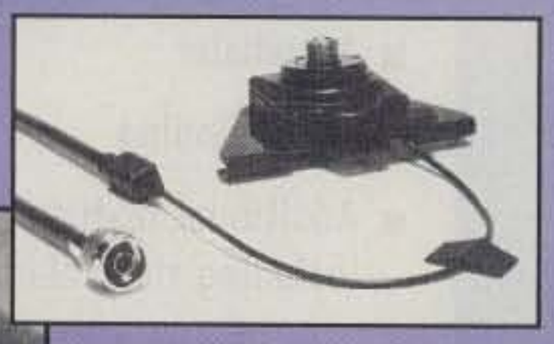
A

B



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C

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B-10 **B-10NMO** • Dual-band 146/446MHz w/fold-over
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It felt like a Christmas present in February. E44DX, a brand new country and prefix to work, came on the air, and even the most wizened of us could feel the adrenaline flowing mightily. OH2BH tells us about the team that activated E44DX and operated from Palestine.

E44DX

Palestine A New Amateur Radio Country is Born

BY MARTTI LAINE*, OH2BH

For a long time the DX world has been aware that once the Middle East peace process begins to bring a settlement to the longstanding problems facing the Holy Land, there will be great jubilation in the DX world as well, and the possibility of a new country. However, it was felt that peace talks are an ongoing, everlasting process, and thus there were no high hopes of this one happening to work out in the immediate future.

It was a very far-sighted decision by the International Telecommunication Union (ITU) to allow Palestine a new telephone country code plus a prefix indicator. But since the ITU is a specialized United Nations agency and not a political body, and because even during the peace process it was an unlikely proposition to consider Palestine as coming under Israeli jurisdiction, the ITU October 1998 decision turned out to be well founded.

The amateur radio country E4 thus was born, and under the "new DXCC terms" that means automatically another DXCC counter. With an announced implementation date of February 1, 1999, it was just a matter of being there fully licensed and ready to make the opening QSOs!

The release of the first two licenses to Ali Yashruti, E44A (ex-ZC6A), and Sami Tarazi, E44B (ex-ZC6B), was slightly put on hold because of the death of H.M. King Hussein, JY1, while the Ministry of Posts

*e-mail: <martti.laine@nmp.nokia.com>

Only dipoles and verticals were used at E44DX, and yet the resulting strong signals worldwide were good for almost 34,000 QSOs.

The team behind the first E44 DXpedition with their host Dr. Sami Tarazi, E44B. Back row left to right: OH2BH, OH1RY, W3UR, and OH2TA.

The Gaza City provided a historical setting for the E44DX operation. Many sites are a treasure for those who want to experience history, not just DX.

The E44DX team was given a grand reception in Israel upon their return. These three "on the air" friends had never met before, although they all have a long history in DX and more than 1000 DXCC countries under their belts. From left to right: 4X4DK, OH2BH, and 4X4JU.

The Yaesu FT1000MP radio was presented to the Palestinian Amateur Wireless Society (PAWS) on behalf of Yaesu Musen Co. Ltd.

Bernie, W3UR, of ARRL QST fame, joined E44DX to take the story back to the United States and to experience the DX experience for the second time.

and Telecommunications needed some time to structure the basic amateur radio regulations and the licensing regime. But several parties were ready to activate Palestine as soon as an opportunity arose.

First DXpedition in the Making

In 1996 an accord was signed between the South China Sea DX Team of Finland and Palestinian government representatives to launch amateur radio in Palestine. The agreement was endorsed by President Yasser Arafat. Based on that original document, an invitation was received to conduct the first E44 DXpedition.

The Finnish team of OH1RY, OH2TA, and OH2BH was formed, while the efforts of Bernie McClenny, W3UR, established cooperation with E44A and E44B so as to ensure an atmosphere of true amateur spirit and mutual collaboration. W3UR joined the team to represent the ARRL and to take the story of Palestine to the United States in his capacity as DX Editor of *QST*. Further, a message was sent to the JA1UT team offering cooperation and full assistance now that the Palestine government was able to receive many nationalities teaming up in Palestine. A positive reply was received from the Japanese team. Thus, all potential conflicts of interest were eliminated, and Palestine was ready for its first DXCC activation.

E44DX Hits the Airwaves

The licenses, numbers 1 through 4, were obtained on February 16, and on that same day E44DX was making QSOs and capturing the attention of the whole amateur world. The activity was conducted from the Palestine Hotel in the Gaza Strip with two Yaesu FT-1000MP stations and solid-state FinnFet amplifiers.

Special emphasis was placed on serving all major amateur population areas in a fair manner. Accordingly, particular efforts were made to provide Japan and all parts of the United States with a reasonable opportunity as well. Europe lay just next to Palestine, so there was propagation into Europe 24 hours a day. The overall QSO tally reached 33,775 in seven days of operation, including 7430 QSOs to the United States and 3720 to Japan.

Amateur Radio Exposure To Society

With the birth of a new DXCC entity, it was also reasonable to consider the impression that these first operations would leave behind in Palestine as a whole. In many developing countries amateur radio has had a definite role to play in society at large. Palestine was no exception.

It was very important to work closely with the local operators to protect their interests and to respond positively to our social responsibilities to the Palestine government, so as to make absolutely sure that amateur radio would be looked upon favorably as another valuable resource in society. There were ample opportunities in Palestine for this kind of activity on several levels.

The highlight was our meeting with President Arafat, coupled with a press interview and a get-together with Palestine government representatives in a relaxed barbecue setting in the heart of Gaza.

Full cooperation was secured between the operators of the two teams, partially active at the same time. Here are Yoshi, JA1UT, with his XYL, and Martti, OH2BH, standing behind for a good common cause, Palestine.

Pekka Holstila, OH2TA, operated both SSB and CW at E44DX. Two stations were located in a suite of the Palestine Hotel in Gaza.

A highlight of the E44DX operation was a meeting with Palestinian President Yasser Arafat, who sent his personal greetings to the whole amateur community. Here OH2TA is up for a historic handshake.

A presentation was made on behalf of Mr. Jun Hasegawa, President of Yaesu Musen Co. Ltd, to donate a FT-1000MP to the Palestine Amateur Wireless Society (PAWS). E44DX is now the permanent callsign of PAWS. Speeches were made by OH2BH, W3UR, JA1UT, and E44B, all extending the warm greetings and congratulations to those present from the societies represented by them.

On that historic Monday evening in Gaza, international amateur radio was projected in a spirit of good harmony, making a positive impact on the key people who attended the barbecue.

Political Constraints Moved Aside

In the course of our DXpedition to Palestine, the political nature there could not be ignored. Entry into Palestine assumed that you would travel to and carry your equipment through Israel, which made the situation somewhat sensitive. Security measures were undertaken at each and every point of the journey. Entering that part of the world with a full line-up of radio communications equipment was not designed to make life any easier.

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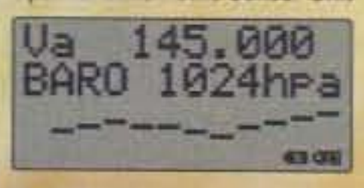

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At this historic occasion Deputy Minister Allaham released the first-ever E44 licenses. The E44DX callsign also was released for the first E44 DXpedition.

The majestic and traditional Palestine Hotel is on the Mediterranean Sea. It was established in 1993 for the peace negotiations and was used to provide those worldwide QSOs at E44DX.

With openness and honesty, these constraints were overcome without difficulty. The people in Palestine were found to be extremely hospitable and friendly toward foreigners. Hence, the group felt quite safe throughout the journey. This was true not only in Palestine; the Israeli amateurs showed a similar sense of true amateur spirit by keeping in touch with the E44DX team and providing news and propagation reporting assistance to the team during the entire operation.

That true amateur spirit culminated in two very special events. The first was a gathering of Israeli DXers in Tel Aviv upon the group's return to salute the E44DX team, and the second was taking the group to see the holy sites in Jerusalem plus the other half of E44-land in the West Bank. These warm efforts were hosted by 4X4DK and 4X6UO.

The closing highlight of that historic week was an invitation extended to Dr. Sami Tarazi, E44B, to attend the Israeli Amateur Radio Club Annual Convention that same week, an invitation Sami gladly accepted. Indeed, amateur radio helped to bring these two troubled nations together DX-wise in what is the best spirit of amateur radio.

Everyone who was a part of the E44DX experience was fully convinced that if the world were governed in the true spirit of DX and amateur radio, it would be a much more enjoyable and safe place to live.

Another historic amateur radio activation was thus completed. The wonderful new friendships established along the way, augmented by "on-the-air excitement" together with colorful E44DX QSL cards sent to the Deserving, gave added momentum to this memorable week of a first-ever DXpedition to E44-land. (E44DX QSLs via Jarmo J. Jaakola, OH2BN.) ■

Ayar, E44/OZ6ACD, attended the reception in Gaza and received his callsign. The E44DX team donated to him the ICOM IC-706 and the antennas used at E44DX. Here Ayar is pictured with Martti, OH2BH.

Ali, E44A, was very supportive of the E44DX operations. Martti presented him with his book Where Do We Go Next? *to make Ali one of the Deserving.*

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THE INFORMA NEWSLETTER
A SUMMARY OF INFORMATION FOR POTENTIAL US TOWER BUYERS.

Welcome to the premiere issue of The Informa, a quarterly newsletter by First Call Communications designed exclusively for both the novice and the experienced tower buyer. This premiere issue of The Informa is unique and intended to take "THE WORRY OUT" of first time tower purchases. If you already have a tower or are experienced in this area, we are sure you will find this material on rebar, masts, rotators, concrete specifications, purchasing, etc invaluable.

Look over our catalog and newsletter. Discuss with us what you desire and we will provide you with the best or lowest prices on any US Tower and back it with our fourteen years of tower experience and personal care. We'll help you with your questions, address your concerns and allow you all the talk time you need to feel comfortable.

First Call Communications, Inc. is one of four authorized direct dealers for US Tower Corporation. We are different in that we are not a "walk-in store" or a ham radio mail order company. The only product we sell is the US Tower line and we pass our knowledge and savings along to you.

We hope you enjoy this premiere issue of THE INFORMA and look forward to sending more information on our complete turnkey systems and our special US Tower pricing.

IN THIS ISSUE...
- Three different ways to buy a tower
- Rules for installing rebar and lightning protection
- Mast specifications
- Choosing the right rotator
- Stress analysis booklet available
- Actual tower permit application model

FIRST CALL COMMUNICATIONS, INC.

First Call Communications "The Informa" Newsletter

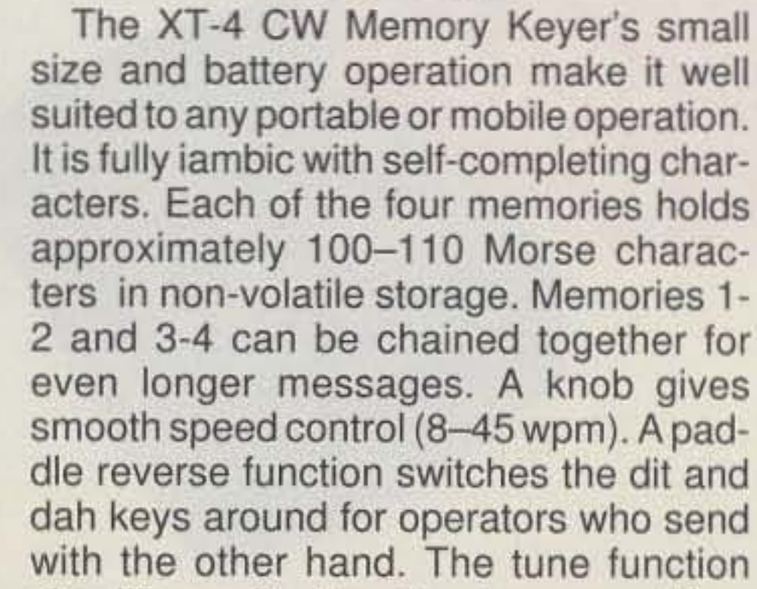
First Call Communications, Inc. has announced issue #1 of their first newsletter, called "The Informa," a summary of information for potential US Tower buyers, both the novice and experienced person. Various sections cover maintenance of wire rope, obtaining town approval for a tower, model of a tower permit application, complete mast specifications, lightning protection, rebar application, and an entire section on rotators. Another part of the newsletter offers the potential tower buyer three unique ways to buy a tower, all the way up to a complete tower "Turnkey System."

The newsletter is free and can be obtained by sending an SASE to First Call Communications, Inc., 28 Grove Street, Spring Valley, NY 10977, or by accessing their web page at <www.firstcallcom.net>, or by circling number 102 on the reader service card.

MFJ Boom-Mic Headphones

MFJ's Boom-Mic Headphones set features 3/4 inch leatherette padding on ear pieces and on the headband, which is adjustable to fit to keep out external noise. Frequency response is enhanced for communications, and the flexible microphone boom lets the used position the microphone at a comfortable, optimum distance to minimize silibant sounds. Included is 9 2/3 feet of cable, plus standard 1/4 inch jack for headphones and 3.5 mm jack for microphone. The MFJ-5396 Y/K/I (Yaesu, Kenwood, ICOM) is priced at $14.95 each.

For more information, contact MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (601-323-5869; fax 601-323-6551; <http://www.mfjenterprises.com>), or circle number 108 on the reader service card.



Unified Microsystems XT-4 CW Memory Keyer

The XT-4 CW Memory Keyer's small size and battery operation make it well suited to any portable or mobile operation. It is fully iambic with self-completing characters. Each of the four memories holds approximately 100–110 Morse characters in non-volatile storage. Memories 1-2 and 3-4 can be chained together for even longer messages. A knob gives smooth speed control (8–45 wpm). A paddle reverse function switches the dit and dah keys around for operators who send with the other hand. The tune function simplifies adjusting the rig or amplifier. Although the XT-4 will run for several hundred hours on a single 9V battery, an automatic power-down feature kicks in after 30 minutes of inactivity.

List price of the XT-4 is $79.95. An optional cable set with cables to the paddle and rig is available for $9.95. For more info, contact Unified Microsystems, P.O. Box 133, Singer, WI 53086 (414-644-9036; <www.qth.com/w9xt>), or circle number 106 on the reader service card.

New *RAC Operating Manual*

Radio Amateurs of Canada has announced the new 200-page *RAC Operating Manual*. Edited by Doug Leach, VE3XK, it is a complete survival guide with sections covering all aspects of amateur radio operation in Canada. Major segments include: The Amateur Radio Service—the national and international perspective; Licensing—the Canadian

structure and how it works; Privileges and Restrictions—what you can and can't do; Operating the Amateur Radio Station—procedures and hints; Amateur Radio Station Equipment—what you need to know; Specialized Communications—the digital modes, television, satellites; and Propagation—what to expect on the HF, VHF, and UHF bands.

For more information, visit the RAC Web site at: <http://www.rac.ca>.

Creative Services Software Expands Product Line

CSS has acquired all rights and source code to the TNC product PC PakRatt 2.0 for Windows 3.1, PC PakRatt for DOS, and PC PakRatt Lite for DOS. CSS produces 32-bit Windows products for Kantronics, Timewave, and MFJ TNCs, and will be adding HAL and SCS to the supported line-up. PacTerm '98 and PK-Term '99 are the staples of CSS's software products. Timewave and CSS have also announced that an update to PC PakRatt for Windows 3.x with fixes for the Y2K problem was planned for a May release.

For more information, contact Creative Services Software, 503 West State St. Suite 4, Muscle Shoals, AL 35661 (256-767-3739; fax 256-381-6121; <http://www.cssincorp.com>), or circle number 110 on the reader service card.

ClearSpeech-Speaker™ From NCT Group

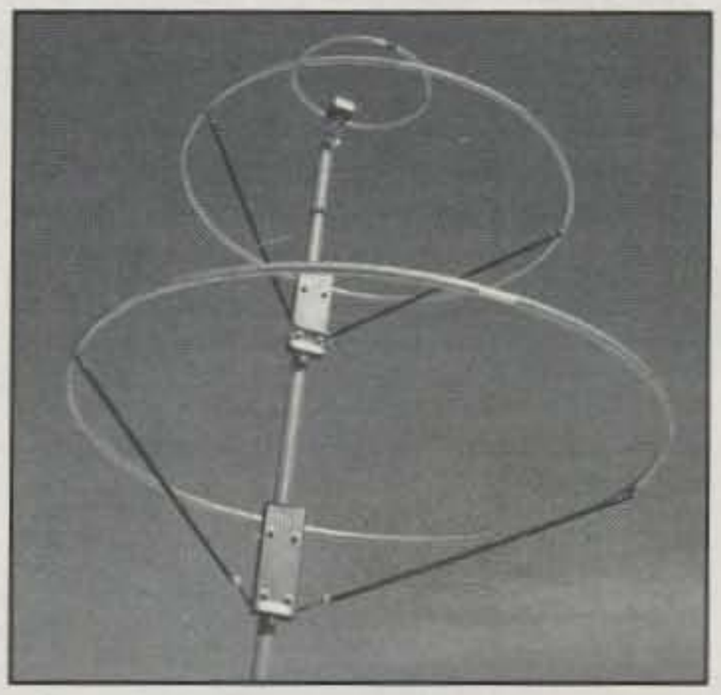
NCT Group's ClearSpeech-Speaker™ is a digital speaker product that incorporates NCT's patented algorithm to clean background noise from incoming speech signals. It removes up to 95% of stationary or constant noise from a signal containing noise and speech. It is suited to CW, SSB, and FM and eliminates heterodynes from AM stations, plus it greatly improves receiver performance of older radios, maker says.

For more information, contact Noise Cancellation Technologies, Inc., One Dock St., Suite 300, Stamford, CT 06902 (203-961-0500; fax 203-348-4106; web: <www.nct-active.com>), or circle number 103 on the reader service card.

KB6KQ Antennas

KB6KQ Antennas has released a complete new line with greater power-handling capability, more bandwidth, greater strength, and virtually no weather detuning. All antenna models are now rated at 750 watts, have larger main loop diameters and the inner loop and all external connections have been eliminated.

The new models can be viewed on the company's new website <www.kb6kq.com>, which includes specs, pictures, and pricing, or contact KB6KQ Antennas, Norm Pedersen, 70 Arrowhead Drive, Carson City, NV 89706 (775-885-7885; e-mail: <kb6kqnorm@aol.com>), or circle number 107 on the reader service card.



Results of the 1999 WW CQ/RJ RTTY WPX Contest

BY RON STAILEY, K5DJ, CONTEST DIRECTOR
AND EDDIE SCHNEIDER, W6/GØAZT, CONTEST MANAGER

On behalf of our sponsors, CQ Communications Inc. and *The New RTTY Journal, and* log checkers Wayne, K7WM, and John, NH6XM, whose invaluable assistance made it possible to produce the results in record time, we wish to thank all contestants for their participaction in what has become an extremely well-supported contest in its short five-year history. Some of the statistics of this year's contest are:

•Seven world and 37 area records were broken. Congratulations to these stations for a job well done.

•Grand total of logs received for the 1999 contest was 564.

• The total number of electronic logs received was 430.

• Snail-mail paper and floppy-disk logs accounted for 134 of the logs received.

• The total number of WPX-related e-mails generated by W6/GØAZT was 947.

• The number of unnecessary e-mail messagess required to obtain correct information was 350. (The large number of unnecessary e-mails was required because of unreadable or missing files, incorrect e-mail and/or log formats, omission of essential log information, and the occassional repeat request because a vital file had been lost—make that deleted.)

• Twenty-four checklogs and four SWL submissions were included in the grand total.

73, Eddie, W6/GØAZT

(Editor's note: Eddie has a *lot* more to say on the topic of log file formats! Drop by the *RTTY Journal* web page at <www.rttyjournal.com> for the full text. Let's all give our thanks to Eddie for a great job!)

(Note: R = reward, P = plaque, C = certificate, Rec = record holder.)

Multi-Operator, Multi-Transmitter (MM)

Call	QSOs	Pts	Mults	Score	Rec	R
LY8X	1456	4477	429	1,920,633		P(Wrld)
RK3AH	1216	3623	385	1,394,855		P(EU)
SK6NP	913	2845	335	953,075		C SM
RK6AWJ	900	2353	321	755,313		C UA
S53MJ	737	1960	332	650,720		C S5
SV1AFA	597	1744	266	463,904		C SV
SP5ZCC	516	1551	268	415,668		C SP
RK1OWZ	465	1353	215	290,895		
WB8SKP	337	664	155	102,920		C W8

Operators
LY8X: LY1FF, LY1FR, LY2BIL, LY2BKF, LY3NFW
RK3AH: RK3AH, RK3AW, RV3BA & Ross
SK6NP: SM6FUD, SM6FUD, SM6WQB, SM6PIS, SM6WWK, SM6BUV, SM6WQA, SM6WET, SM6FKF & Tobias
RK6AWJ: UA6AF, UA6AN, UA6AHF
S53MJ: S53MJ & XYL Maria
SV1AFA: SV1CIB, SV1DPX
SP5ZCC: SP5TAT, SP5UAF, CQ5BPM, SQ5EBJ, 3Z5AAN
RK1OWZ: RA1OJ, UA1OZ, UA1OSS, UA1OMZ
WB8SKP: WB8SKP, ??

Multi-Operator, Two Transmitters (M2)

Call	QSOs	Pts	Mults	Score	Rec	R
WS7I	2386	5410	574	3,105,340	WR+US	P(Wrld)
KH7R	1844	6465	441	2,851,065	OC	P(OC)
RKØAXX	1685	6112	418	2,554,816	AS	P(AS)
RW6AWT	1826	5249	449	2,356,801	EU	P(EU)
KP2D	1763	4895	453	2,201,127	NA	P(NA)
OL5Q	1213	3926	402	1,578,252		C OM
K8AA	1334	3285	407	1,336,995		P(US)
JA6ZPR	512	1450	345	500,250	JA	C JA6

Operators
WS7I: WS7I, WT4I, K5DJ
KH7R: KH7R, KH7U, KH7L, KH6ND, AH6OZ
RAØAXX: RAØAM, RUØAAN, RUØAB, RUØAM, RUØAT, RVØAR, RVØAR, UAØANW
RW6AWT: RN6BN, RA6CO, RA6AX, RA6YY, RV6BA, RU6AB
KP2D: KP2N, NP2E, NP2W, NP2DZ, NP2GM, W5TTY
OL5Q: OK1HRA, OK1FLC, OK1INC, OK1FFU
K8AA: K8AA, KG8CO, KI8GM, NU8Z
JA6ZPR: JH6JSR, JH6SQI, JR6CKK

NB. Many scores in the following categories will not be correct if pts x wpx are calculated. This is due to the 10% penalty incurred for not marking off times in the actual log, as per para XIV of the 1999 rules.

Multi-Operator, Single Transmitter (MS)

Call	QSOs	Pts	Mults	Score	Rec	R
HC8N	1837	5466	522	2,853,252	WR+SA	P(Wrld)
RY9C	1322	4748	388	1,658,001	AS	P(AS)
DLØGK	894	2800	364	1,019,200		P (EU)
AF4Z	1053	2546	382	972,572	US	P(NA)
IK2SGF	891	2815	348	881,658		C I
VE3FJB	751	2260	307	624,438	VE	P(VE)
UT7Z	533	1875	259	485,625		C UR
KJ7TH	787	1406	286	402,116		P(US)
K8UC	580	1440	242	348,480		C W8
9A7P	507	1686	217	329,275		C 9A
RK1OWZ	465	1353	215	290,895		C UA
K9TSM	344	810	291	235,710		C W9
VE3UR	228	608	235	142,880		C VE3
RK9JWZ	240	709	134	95,006		C UA9
N7IZM	272	491	131	64,321		
LA1K	23	90	23	2,070		

Operators
HC8N: N5KO, K6AW
RY9C: UA9CGA, UA9CR, RW9CF
AF4Z: AF4Z, KC4HW, KE4MMI, K4PX, K4QD
IK2SGF: IK2GSF, IK2BUF, IZ2AVK, IK2UCK
VE3FJB: VE3FJB, VE3IJM, VE3DDG, VE3THR, VE3VSM
UT7Z: UR7ZZ, UT4ZO
KJ7TH: KJ7TH, W7II, KW7N, KD7AKN
K8UC: K8UC, K8LEM
9A7P: 9A6NHH, 9A5AEI
RK1OZW: RA1OJ, UA1OZ, UA1OSS, UA1OMZ
K9TSM: WZ9M, N9VUH, KB9RUB, WN9NDU, KA9SYE, KB9BIF, N1LL, WD9AKG, WB9ZEZ, KB9SDU, KE4RIT, N9HZ, KB9MOH, KB9NTY, KB9ATR, N9SPI, W9OKD
VE3UR: VE3UR (Uncle Ray), VE3PKA, VE3JPT, VE3FRD & Nancy (logger).
RK9JWZ: RA9JX, ??
N7IZM: N7IZM, N7PWZ
LA1K: LA1K, ??

Single Operator, All Bands, High Power (SOABH)

Call	QSOs	Pts	Mults	Score	Rec	R
KF3P	1614	4946	423	2,092,158	WR+US	P(Wrld) (op: K3MM)
UP5P	1201	4308	399	1,718,892	AS	P(AS) (op: UN5PR)
EMØI	1406	4072	426	1,534,366	EU	P(EU) (op: UT2IZ)
EA3NY	1086	3588	402	1,298,138		C EU
OH1MM	1105	3043	408	1,241,544		C OH
UXØZ	1049	3343	378	1,137,288		C UR (op: UTØZZ)
W2KI	1006	2880	350	1,008,000		P(NA)
VA3DX	951	3074	358	990,442		P(VE)
LY6M	953	2943	365	966,775		C LY
YL8M	947	3060	351	966,654		C YL (op: YL2KL)
HA3LI	840	2564	370	948,680		C HA
OH1F	1016	2867	366	944,389		(op: OH1MDR)
NO2T	1077	2681	373	900,011		P(USA)
K4GMH	970	2331	362	843,822		C W4
YU7YG	894	2777	337	842,264		C YU
I1COB	803	2521	339	769,157		C I
OH2BP	844	2321	329	763,609		
VE6AGJ	846	2231	341	760,771		C VE6
DL4MCF	805	2557	325	747,922		C DL
RX3DCX	900	2416	339	737,121		C UA
SN7N	777	2459	325	719,257		C SP
SM4RGD	712	2155	324	698,220		C SM
GW4KHQ	800	2331	330	692,307		C GW
W4GKM	604	2421	265	641,565		
OH2GI	680	1979	305	603,595		
UA9CLB	698	2236	265	592,540		C UA9
RX9SR	708	2481	265	591,718		
OH6XY	703	2001	294	588,294		
SP4CHY	665	2014	290	584,060		
KG6OK	934	1882	341	577,585		C W6
OH3FM	702	2008	284	570,272		
VE7IN	669	1905	299	569,595		C VE7
W9OL	719	1769	312	551,928		C W9
I2UIY	580	1980	277	548,460		
IK2HKT	620	1970	266	524,020		
UA4HTT	748	1898	272	516,256		
K4SB	701	1660	305	506,300		
W7WW	872	1613	308	496,804		C W7
N2WK	644	1673	287	480,151		
DJ6QT	596	1784	288	462,412		
EA3RH	564	1465	305	446,825		

VE3WQ	538	1770	249	440,730	C VE3
W8KX	562	1419	286	405,834	C W8
VK6GOM	534	1612	240	386,880	OC P(OC)
NE3H	514	1359	248	337,032	C W3
MIØBME	530	1394	237	330,378	C GI
RU3AT	492	1341	232	311,112	
NØMLJ	559	1252	276	310,996	P(Rookie)
OK2BXW	437	1344	229	307,776	C OK
KE1AK	542	1279	234	299,286	C W1
RW6BQ	447	1452	203	294,756	
W2JGR	607	1152	253	291,456	
ZX2A	400	1179	236	278,244	P(SA)
OK1CF	353	1256	208	261,248	
KC7V	500	988	253	249,964	
RK9BZ	431	1317	184	242,328	
JA1BWA	364	1163	199	231,437	P(JA)
WA9ALS	510	1052	219	230,388	
JL6HKJ	380	1056	214	225,984	C JA6
K8VT	487	1068	220	224,960	
ZL2AMI	299	1041	205	213,405	C ZL
W1ZT	394	940	220	206,800	
SM5FUG	309	999	192	191,808	
NH6XM	347	1028	180	185,040	C KH6
N4AN	356	800	221	176,800	
K5ZD	329	963	182	175,266	C W5
I2HWI	311	916	191	174,956	
DL3GA	308	870	186	161,820	
N2ED	325	789	189	149,121	
KF6BIR	449	780	187	145,860	
K1SM	302	843	172	144,996	
W7NN	359	710	197	139,870	
W2YE	307	784	174	136,416	
KØIR	301	683	176	120,208	
AJ3M	311	651	182	118,482	
RA3BB	260	694	168	116,592	
TY1PS	241	715	156	111,540	P(AF)
K7ZO	353	644	173	111,412	
K6HGF	447	623	168	104,664	
ND5S	264	650	157	102,050	
NA2M	263	607	168	101,976	
W6JOX	311	609	150	91,350	
JA3LDH	203	626	132	82,632	C JA3
ED3TTY	193	600	135	81,000	
					(op: EA3GIP)
DJ2YE	183	621	125	77,625	
8S4BX	213	533	131	69,823	
NA4M	228	502	138	69,276	
KC1F	200	488	136	66,368	
IK4MTF	196	553	119	65,807	
W8PT	186	520	124	64,480	
KB5BOB	211	436	113	49,268	
LZ1BJ	213	339	133	45,087	C LZ
DL5YAS	154	442	102	45,084	
N1AU	135	401	101	40,501	
IK2AUK	145	389	104	40,456	
W3DAD	165	375	104	39,000	
RAØFU	147	386	99	38,214	
SM5EIT	100	367	81	29,727	
DM3XRF	124	302	98	29,596	
KØBX	125	300	96	28,800	
OZ6EI	104	247	85	20,995	C OZ
AG4W	100	257	79	20,303	
JA2AXB	92	274	63	17,262	C JA2
W9AX	76	202	60	12,120	
AA9RR	87	174	67	11,658	
DJ2IA	80	160	70	11,200	
WO9S	47	99	38	3,626	
EA2AVM	43	155	20	3,100	
UA9OSV	28	76	24	1,824	

Single Operator, All Bands, Low Power (SOABL)

Call	QSOs	Pts	Mults	Score	Rec	R
EU1AZ	1102	3233	416	1,210,435	WR+EU	
						P(Wrld)
N1RCT	1153	2766	373	1,031,718	US	P(NA)
AA5AU	1215	2725	384	941,760		P(US)
WA2ETU	934	2423	361	874,703		C W2
HA2SX	811	2689	340	822,834		P(EU)
TMØFSK	824	2589	349	813,204		C F
						(op: F5CVI)
RZ9WZ/4	953	2525	306	695,385		C UA
LTØH	770	2269	336	68,6145		P(SA)
						(op: LU3HY)
S57U	697	2104	314	660,656		C S5
YU7AM	743	2309	312	648,365		C YU
4Z5CP	710	2360	259	611,240	AS	P(AS)
NX4W	873	1966	335	592,749		C W4
RA4HT	771	2003	287	57,4861		
9A6D	633	1983	286	567,138		C 9A
LV5V	647	1918	314	542,026		
EA4CI	700	1967	300	531,090		C EA
G5LP	563	1854	272	504,288		C G
RZ9OU	581	1785	265	473,025		C UA9
VP2V/W8JAY	606	1778	263	467,614		C VP2V
WB8YJF	670	1733	297	463,230		C W8
KK5OQ	704	1593	282	449,226		
RU3QW	660	1680	295	446,040		
KIØLO	780	1682	291	440,515		C WØ
W1TY/2	652	1560	275	429,000		
TMØP	620	1481	318	423,862		
						(op: F6AUS)
VK4UC	498	1474	280	412,720	OC	P(OC)
IK4WMH	544	1663	245	407,435		C I
KI6DY/Ø	833	1604	275	3969,90		
DK3VN	490	1483	261	387,063		C DL
H22H	606	1783	232	372,290		C 5B4
						(op: 5B4MF)
RAØFF	517	1525	270	370,575		
WB2UEF/4	576	1449	255	369,495		
JE2UFF	477	1650	245	363,825		C JA2
VE6RAJ	644	1597	245	352,138	VE	P(VE)
AP2TJ	493	1558	250	350,550		C AP
N6OJ	720	1378	282	349,736		C W6
EI4DW	518	1514	255	347,463		C EI
UT7I	558	1729	221	343,898		
						(op: UT2IO)
S51F	510	1493	250	335,925		
PY2MNL	452	1340	245	328,300		C PY
DJ3NG	475	1439	227	326,653		
VE4COZ	572	1280	253	323,840		C VE4
EW1EA	499	1511	238	323656		C EU
UAØAGI	467	1645	218	322,749		
KT1O	579	1364	258	316,720		C W1
OM3IAG	435	1459	217	316,603		C OM
N9THC	671	1371	255	314,644		C W9
UA4CJJ	584	1505	230	311,535		
KA2CYN	499	1350	253	307,395		
S57IIO	424	1380	222	306,360		
DK3WW	429	1274	240	305,760		
AH6OM						
/HI8	498	1282	236	302,552		C HI8
SP9UNX	462	1308	231	302,148		C SP
HA4YF	425	1351	223	301,273		
SM7BHM	414	1383	216	298,728		C SM
RA9MY	437	1428	204	291,312		
OK2WH	427	1236	229	283,044		C OK
WØHW	565	1163	231	268,653		
OH3NGB	465	1263	207	261,441		C OH
OH6AAH	429	1162	220	255,640		
OZ5MJ	395	1152	221	254,592		C OZ
UT2UZ	415	998	253	252,494		
CO8LY	434	1126	223	251,098		C CO
KD4RGB	524	1148	218	250,264		
IK7YUA	300	1240	200	248,000		
JR4GPA	401	1136	218	247,648		C JA4
N9CK	507	1055	222	234,210		
JA2BY	352	1053	216	227,448		
PA3EMN	382	1096	202	221,392		C PA
SM3ETC	400	1117	192	214,464		
WA8RPK	448	970	214	207,580		
DL3AYJ	331	1022	194	198,268		
EU1DX	339	1015	194	196,910		
F5PVJ	250	624	159	195,750		
KG9X	449	995	190	189,050		
OH3KOK	325	966	194	187,404		
UA4LU	364	980	188	184,240		
OK1HFP	302	984	186	183,024		
VE3AIY	337	1079	164	176,956		C VE3
SV1DNW	372	882	197	173,754		C SV
AB7LU	503	866	194	168,004		C W7
SP9LKS	314	921	179	164,859		
DM5GI	302	951	173	164,523		
SP5ALV	301	893	184	164,312		
W3MR	327	851	192	163,392		C W3
I2BJS	308	887	184	163,208		
W4UK	401	845	193	163,085		
SP2EIW	253	781	208	162,488		
IK3ASM	313	941	172	161,852		
GUØSUP	300	733	218	159,794		C GU
RA4CTR	371	872	182	158,704		
SP4MPH	300	880	180	158,400		
SP5ELA	283	903	174	157,122		
UX1IL	300	923	168	155,064		
IK1NEM	317	822	186	152,892		
KB9MCM	399	828	184	152,352		
MMØBYC	329	875	171	150,500		C GM
N1NVX	376	829	181	150,049		
RA6AEL	324	926	162	150,012		
K5HP	400	811	184	149,224		
PB5KT	284	759	196	148,764		
OH5TF	338	801	180	144,180		
N6GG	327	719	198	142,362		
4X/TF1MM	303	902	155	139,810		C 4X
KT1M	335	739	189	139,671		
KJ5SF	326	752	185	139,120		
EA1BD	275	759	182	138,138		
DL7VBO	271	868	159	138,012		
K1JE	315	782	170	132,940		
KY7M	352	720	182	131,040		
HB9AWS	278	867	146	126,582		C HB9
W2GE	319	696	178	123,888		
DM3ML	250	813	151	122,763		
KC8BI	306	731	167	122,077		
WB3D	312	714	163	116,382		
KC3LV	311	713	162	115,506		
SM4LLN	231	783	146	114,318		
DL1ARJ	242	746	152	113,392		
SP8AQA	400	1244	90	111,960		
WZ1Q	282	699	160	111,840		
DL8SDC	270	703	159	111,777		
IK1ZFO	260	750	149	111,750		
AD1C	256	656	168	110,208		
OK2VWB	230	681	160	108,960		
EA8						
/DJ1OJ	226	719	149	107,131		P(AF)
IK1DFH	228	748	142	106,216		
WN6HYX	410	663	160	106,080		
F5TEU	238	697	144	100,368		
VE7QO	275	663	150	99,450		C VE7
DL8MFY	217	650	153	99,450		
ON4AME	249	553	175	96,775		C ON
GI4KSH	211	650	141	91,650		C GI
GØMTN	224	626	137	85,762		
IOØKHP	185	630	136	85,680		
VE6CKG	227	535	154	83,390		
I4HRH	215	576	143	82,368		
AE5P	313	583	141	82,203		
K2YG	233	550	147	80,850		
SP4BOS	191	601	128	76,928		
ES4BG	200	560	137	76,720		C ES
S57KM	200	619	120	74,280		
SP6DNZ	210	626	118	73,868		
KB7N	250	533	134	71,422		
KN3P	204	496	143	70,928		
IK7RVY	198	505	140	70,700		
PAØRCT	175	524	129	69,596		
KF6EDK	314	519	134	69,546		
VE6RRD	228	586	115	67,390		
AC6JT	298	529	126	66,654		
DL3KUD	184	527	124	65,348		
K8RS	215	481	135	64,935		
IK1GCD	181	538	120	64,560		
JR1KSK	202	504	109	63,656		C JA1
W4JLS	200	496	128	63,488		
LZ1JH	226	416	149	61,984		
DL9MBZ	197	437	141	61,617		
KB4IJ	238	488	124	60,512		
OK2BMC	176	480	121	58,080		
K8OSF	213	449	128	57,472		
DL3YEI	169	519	110	57,090		
N6TQS	234	435	129	56,115		
A92GD	143	446	119	53,074		C A92
OK1BMW	161	410	125	51,250		
W5KI	180	417	121	50,457		
N1AFC	150	444	112	49,728		
DH9FAJ	159	439	113	49,607		
WA8AA	179	433	114	49,362		
N8YYS	168	426	113	48,138		
LA7CL	163	428	112	47,936		C LA
W4AUI	181	379	120	45,480		
AD6EN	223	436	104	45,344		
ZL2JON	140	415	103	43,745		C ZL
KO2FB	162	378	115	43,470		
DL8ZAJ	147	421	103	43,363		
LA5TFA	153	401	108	43,308		
IK2NCF	150	420	101	42,840		
OK1JN	186	336	125	42,000		
W8DN	150	385	105	40,425		
W7DPW	199	377	106	39,962		

AMERITRON *True Legal Limit™* Tuner

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

Call your dealer for your best price!

AMERITRON ATR-30

$599

Suggested Retail

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

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

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

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

Super High Current Roller Inductor

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

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

Two 500 pf Tuning Capacitors

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

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

Super Balun, 6 position Antenna Switch

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

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

Read *true* Peak Power

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

Roomy Cabinet maintains High-Q

Roomy extra-strong .080 inch thick aluminum cabinet gives highest efficiency and lowest loss. 13¼Wx5⅝Hx17½D inches.

AMERITRON ATR-15 Antenna Tuner

ATR-15, $399. Handles 1500 Watts RF output. Slightly less on 160 Meters. Bandswitched T-Network, peak reading SWR/ Wattmeter, covers 1.8-30 MHz, 6 pos. antenna switch, balun. 13½ W x5½x13¼ in. Perfect for AL-80B/AL572.

Ameritron has the best selection of *TrueLegalLimit™* HF Amplifiers

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

Ameritron's *most powerful* Amp

with Eimac® 8877 ceramic tube

AL-1500

$2795

Suggested Retail

TrueLegalLimit™

Ameritron's *most powerful* amplifier uses the herculean Eimac® 8877 ceramic tube. It's so powerful that 65 Watts drive gives you the full output power -- and it's just loafing because the power supply is capable of 2500 Watts PEP. All HF bands, all modes. 77 pounds, 18½Dx17Wx10H in.

Ameritron's *toughest* Amp

with Eimac® 3CX1200A7 tube

AL-1200

$2295

Suggested Retail

TrueLegalLimit™

Get ham radio's *toughest* tube with AL-1200. The Eimac® 3CX1200A7 has a 50 Watt control grid dissipation and the lowest history of field replacement of any modern transmitting tube that we use. 90 Watts in gives you full power out. All HF bands, all modes. 76 pounds, 18½Dx17Wx10H in.

Ameritron's *classic* Amp

with 2 graphite plate Amperex® 3-500ZG tubes

AL-82

$2295

Suggested Retail

TrueLegalLimit™

Most linears using 3-500s can't give you 1500 Watts because their lightweight power supplies *can't* use these tubes to their full potential. AL-82 is ham radio's *only* super 3-500 amp! 100 Watts in gives you full power out. All HF bands, all modes. Hefty 76 pounds, 18½Dx17Wx10H inches.

1.5 *plus* kW SSB HF Amp

with 2 Eimac® 3CX800A7 tubes

AL-800H, $2295 suggested retail. Two Eimac® 3CX800A7 tubes produces 1500 *plus* Watts SSB PEP with 55 Watts drive. 52 lbs., 8½Hx16½Dx14¼W in. **AL-800, $1595** suggested retail, single 3CX800A7, 1250 Watts out with 70 Watts drive.

NearLegalLimit™ Amp

with four Svetlana® 572B tubes

AL-572, $1395 suggested retail. New class of *Near Legal Limit™* amplifier gives you 1300 Watts SSB PEP power output (70 Watts drive) for 65% of price of full legal limit amps! Instant 3-second warm-up. 40 lbs. 8½Hx15½Dx14½W inches.

1 kW Desktop HF Amp

with Amperex® 3-500ZG tube

AL-80B, $1295 suggested retail. Gives you full kilowatt SSB PEP output (85 Watts in) from a whisper quiet compact desk- top linear. 8½x14x15½ in. Plugs into 120 VAC outlet. Graphite plate *Amperex®* 3-500ZG tube. Nearly 70% efficiency. Weighs 48 lbs.

Precision SWR/Wattmeter

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

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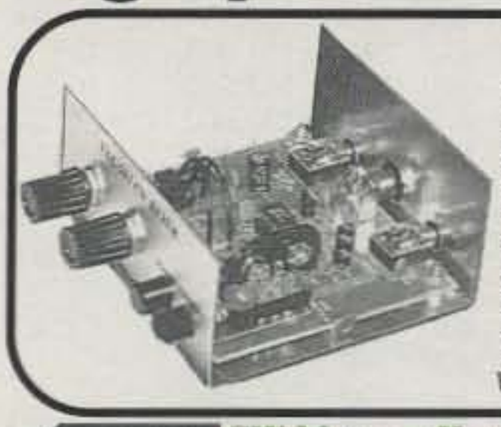


Full featured CW Keyer Kit, $24.95!

VEC-201K, the best electronic keyer bargain in ham radio! Send beautiful sounding Morse Code. Self-completing dot-dashes and dot-dash memory forgive timing errors -- makes sending CW easy and accurate. Front panel volume/speed (3-65 wpm) controls. Weight adjusts 25-75%. Sidetone (300 -1000Hz) has LM386 audio amp for external speaker/phones. Select Iambic A or B, fully automatic or semi-auto "bug" mode. Tune mode for tuning rig. RF proof. Sleep Mode battery saver. Use 9V battery. 1¾x4x3½ in. *Simple skill level.*

VEC-201K shown in optional case (vinyl cover top not shown). VEC-201KC, $14.95

CW Memory Keyer Kit stores 512 characters in four 128 character non-volatile EEPROM message memories. *Carry on entire QSOs by just pressing memory message buttons.* True sinewave sidetone with soft rise and fall time eliminates harsh keyclicks. Has all features of VEC-201K CW Keyer Kit. 1¾x 6¼x5¼ in. *Simple skill level.* Order **VEC-221K, $69.95.**

20/30/40/80 Meter Receiver Kits give high performance! Covers entire band or tailor to cover desired portion. Copy CW/SSB/AM. NE602/ 612 mixer-oscillator, LM386 high gain audio amplifier. 1¾x4¾x 5¼ in. *Moderate skill level.* Order **VEC-1120K** (20 Meters),**VEC-1130K**(30 Meters),**VEC-1140K** (40 Meters), **VEC-1180K** (80 Meters), **$29.95 ea.**

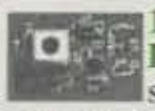
20/30/40/80 Meter QRP CW transmitter Kits let you work the world! Variable crystal oscillator tuning, front panel switch selects 1 of 2 crystals. 1 crystal for popular frequency included. Transmit/Receive switch lets you connect receiver. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-1220K** (20 Meters), **VEC-1230K** (30 Meters), **VEC-1240K** (40 Meters), **VEC-1280K** (80 Meters), **$29.95 ea.**

Tunable SSB/CW Audio Filter Kit has sharp *four* pole peak and notch filters. Eliminate interference. Zero in with frequency control and adjust bandwidth for best response. Extra steep skirts. Tune frequency from 300 to 3000 Hz. Vary bandwidth from 80 Hz to nearly flat. Notch is an outstanding 50 dB. 1 Watt amplifier. Speaker/Phone jacks. 12 VDC at 300 mA. 1¾x4¾x5¼ inches. *Intermediate skill level.* Order **VEC-841K, $34.95.**

Super CW Audio Filter Kit gives you three bandwidths: 80, 110, 180 Hz. Eight poles gives super steep skirts with no ringing. Pull CW QSOs out of terrible QRM! Plugs into phone jack to drive phones. QRM down 60 dB one octave from center frequency (750 Hz) for 80 Hz bandwidth. Improves S/N ratio 15 dB. Use 9V battery. 1¾x4x 3½ in. *Simple skill level.* Order **VEC-820K, $19.95.**

Super CW filter/amplifier Kit has powerful 1 watt audio amplifier to drive speaker. Pull CW signals out of QRM with extremely narrow 80 Hz bandwidth without ringing. 8 poles active IC filtering uses cascaded low-Q stages. Razor sharp selectivity. 3 bandwidths: 80,110, 180 Hz. Center frequency: 750 Hz. Up to 15 dB of noise reduction. Auto noise limiter knocks down static crashes, impulse noises. Use 9-18VDC, 300 mA max. 1¾x4 x3½ in. *Simple skill level.* Order **VEC-821K, $29.95.**

Super SSB Audio Filter Kit dramatically improves readability with 8 poles. Optimizes audio bandwidth, reduces sideband splatter, low, high pitched interference, hiss, static crashes, background noise, 60/120 Hz hum. 375 Hz highpass cutoff. 2.5, 2, 1.5 kHz low-pass cutoffs. Plugs into phone jack to drive head phones. Use 9V battery. 1¾x4x 3½ in. *Simple skill level.* Order **VEC-830K, $19.95.**



144/220/440 MHz Low-Noise Preamplifier Kits soup up your antenna system. Helps pull in weak signals. Works wonders for scanner or ham-band receiver. Quality microwave type bipolar device gives great low-noise performance and immunity from damaging electrostatic discharge. 1x1½ in. *Simple skill level.* Order **VEC-1402K** (144 MHz),**VEC-1422K** (220 MHz), **VEC-1444K** (440 MHz), **$17.95.**

High-performance 2 Meter Preamp Kit pulls weak signals out of noise. Solves three reception problems -- boosts signals using a 1-dB noise figure microwave transistor, provides razor-sharp bandpass filtering, eliminates unwanted electrical noises with built-in balun. Uses 9-14 volts DC. Tiny 1½x3x1 in. fits in any size box. *Intermediate skill level.* Order **VEC-1402DK, $59.95.**

2/6/10 Meter FM Receiver Kits let you tune into the world of ham radio. Catch all the action! Each covers the entire FM sub-band and runs off your 9 volt battery. Plug in speaker or headphones for loud clear reception. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-1002K** (2 Meters), **VEC-1006K** (6 Meters), **VEC-1010K** (10 Meters), **$34.95 each.**

2 Meter Monitor Kit receives 144-148 MHz. Low noise, high gain RF preamp gives you excellent 0.1 uV sensitivity. Air variable tuning capacitor has 8:1 reduction. Dual conversion superhet provides selectivity and stability. Automatically eliminates squelch tails. Built-in speaker, squelch, tone, volume controls. 19¼ in. telescopic whip. 9V battery. 2x4¼x4 in. *Intermediate skill level.* Order **VEC-104K, $79.95.**

5 Watt 2 Meter FM transmitter Kit lets you transmit voice and data -- AFSK data (up to 1200 baud) and FSK data (up to 9600 baud). Jumper select reactance or direct FM modulators. Reliable Motorola NBFM transmitter IC and PA transistor. Crystal controlled (x8 frequency multiplication). -60 dBc spurs and harmonics. Use 12-14 VDC, 1.5 amps. 5-pin DIN microphone jack. 1¾x4¾x5¼ in. *Difficult skill level.* Order **VEC-1202K, $99.95.**

All purpose Ni-Cad/Ni-MH Rapid Battery Conditioner Kit safely quick charges expensive batteries -- no overcharging -- many in less than an hour. HTs, cell phones, camcorders, lap top computers. Handles 1 to 12 cells. Charging status LEDs. Discharge before charge function reconditions batteries. Also removes memory effect. Runs on 12-15 VDC. 1¾x4¾x5¼ in. *Moderate skill level.* Order **VEC-412K, $49.95.**

Crystal radio set Kit lets you relive the experience of early radio pioneers. This baby really works! Wind your own inductor, wire up the earliest radio circuit without soldering a thing and listen to the magic of radio that needs no power. Put up an antenna, connect a ground. Stations come in amazingly loud and clear. Includes antenna wire, sensitive earphone. 1¾x5x6½ in. *Simple skill level.* Order **VEC-121K, $19.95.**

Shortwave Receiver Kit lets you listen to the world! Covers 75/80, 49, 40, 30, 31, 20, 25, 22, 19, 17, 16, 15 and 13 Meter bands. Explore AM, SSB, CW, WWV, RTTY and Packet signals. Vernier reduction drive, smooth regeneration control, RF stage. *Includes all metal cabinet.* 2 earphone jacks. Use 9V battery. 2½x7x6 in. *Intermediate skill level.* Order **VEC-102K, $59.95.**

Shortwave Converter Kit converts AM or AM/FM radios to shortwave receivers at a push of a button. Hear stations all over the world at various times of the day and year. Choose two 1 MHz bands between 3 and 22 MHz. Popular 13, 16, 19, 25, 31, 41, 49 and 60 Meters international broadcast bands. On/off bypass, NE-602/612 mixer-oscillator IC and tuned input circuit. Use 9 V battery. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-101K, $27.95.**

Aircraft Receiver Kit tunes entire voice aircraft band 118-136 MHz. Picks up air traffic 100 miles away. Track progress of incoming/outgoing traffic in your area, gain advanced weather information, and discover how the National Air Traffic System really works. Great way to learn about aviation. Use 9V battery. Drives external speaker/phones. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-131K, $29.95.**

AM Radio Transmitter Kit lets you set up your own AM station and broadcast crystal clear programming from your studio with *you* as the disc jockey or talk show host. Play music from CD player, tape deck or other source. Choose clear frequency from 530-1750 KHz. Standard line level or microphone input. Easy to connect to CD, tape deck or mike mixers. Audio level adjustment. Has high level AM modulation for low distortion. 1¾x4x3½ in. *Simple skill level.* Order **VEC-1290K, $29.95.**

TV Transmitter Kit lets you plug in camcorders, VCRs or TV cameras and transmit high quality audio/video to nearby TV sets. Imagine watching your favorite movie on a portable TV by the pool with a tape playing indoors. Create your own personal TV station for some great neighborhood fun! Use a hidden video camera to monitor remote areas. Adjustable to channels 3-6. 1¾x4¾x5¼ in. *Moderate skill level.* Order **VEC-1294K, $27.95.**

SCA Decoder Kit tunes in SCA programming hidden in FM broadcast signals. You'll find commercial free background music, all news programs, weather reports, stock quotes, digital data, ethnic programs, reading services for the blind! Tunes entire SCA band 50-100 KHz with front panel tuning/volume control. Drives external speaker. 1¾x4¾x 5¼ in. *Simple skill level.* Order **VEC-422K, $27.95.**

The *GIANT* Book of Electronic Projects, Volume I. Project book includes 19 kits on this page. Has building tips, complete parts lists, parts placement and PC board layouts, test and alignment, operating instructions, in case of difficulty, theory and specs, schematics, cabinet layout. Order **VEC-1901, $19.95.**

Inspect and download our manuals from:

http://www.vectronics.com

Vectronics kits feature a professional quality epoxy glass PC board with solder mask and component legend, simple step-by-step instructions and highest quality components.

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WY7/AL7L	192	365	109	39,785		
IK2REA	176	384	103	39,552		
JH7AJD/1	138	398	92	36,432		
IK2WFN	136	380	93	35,340		
YO3APJ	135	319	198	33,452		C YO
RW4LE	128	352	95	33,440		
SM5VZY	126	359	93	33,387		
JA1WSK	114	323	100	32,300		
WB9BSH	139	321	97	31,137		
NØIBT	173	279	111	30,969		
KD8FS	143	315	98	30,870		
K6ANP	148	287	106	30,422		
DJ6WC	106	352	86	30,272		
N3UE	134	300	93	27,900		
WN1E	130	304	90	27,360		
W8IDM	135	295	91	26,845		
RA3DRA	107	331	74	24,494		
N4DXS	122	278	84	23,352		
K9YO	140	270	85	22,950		
UA9DD	100	292	78	22,776		
IK7WPD	105	277	82	22,714		
OZ7XE	120	256	88	22,528		
W9ILY	112	267	83	22,161		
W6IHG	109	234	92	21,528		
WAØSXV	152	235	88	20,680		
SK5UM	100	275	75	20,625		
AA1SU	137	233	91	20,293		
JAØAXA	92	264	73	19,008		C JAØ
PAØEHF	86	261	70	18,270		
N3NZ	115	227	74	17,798		
AA9UF	118	206	77	15,862		
WA6BOB	116	210	74	15,540		
DK7FP	69	236	60	14,160		
K9EMG	98	182	76	13,832		
IK8SCR	72	211	63	13,293		
EA4AZJ	120	251	41	12,801		
VE3EVV	84	213	60	12,780		
UT6I	77	206	61	12,566		
RA6AR	83	190	62	11,780		
IK4YNR	81	180	65	11,700		
VE9WH	75	190	61	11,590		C VE9
IK7YUC	75	185	60	11,100		
IT9STG	72	162	58	9,396		
SP9NWB	56	157	56	8,792		
JA2BHJ	61	169	50	8,450		
IKØQDB	54	185	45	8,325		
US2ITU	57	176	46	8,096		
IKØMIB	54	170	47	7,990		
RX9AM	53	179	43	7,697		
MØAEJ	55	139	49	6,811		
N5ZM	63	144	47	6,768		
OH5VL	54	126	53	6,678		
W3AG	53	132	46	6,072		
KHØAS	51	150	39	5,850		C KHØ
SP3FAR	45	127	44	5,588		
W1EM	53	105	44	4,620		
EA4BNQ	43	97	41	3,977		
LZ1ZC	61	73	54	3,942		
KB9LGJ /QRP	60	72	46	3,312		
AD7U	37	83	35	2,905		
VE3FU	27	95	27	2,565		
DH2RAL	30	88	29	2,552		
JA3MIB	28	78	25	1,950		C JA3
9A6ACY	30	78	24	1,872		
VE2FFE	29	71	24	1,704		
PS7ZZ	22	77	21	1,617		
DL4RU	27	70	23	1,610		
W3FQE	29	57	26	1,482		
N2ALE/6	30	56	25	1,320		
JF2VAX	18	52	18	936		
US4ICJ	18	33	12	396		

Single Band, 10 Meters (SB10)

Call	QSOs	Pts	Mults	Score	Rec	R
XQ8ABF	796	2380	388	831,096	WR+SA	P(Wrld)
HK3TAS	471	1372	274	338,335		C HK
W2UP	508	1308	264	310,780	US	C W2
LW9EPB	430	1233	275	305,167		C LU
HG1W	468	1252	262	295,221	EU	C HA
					(op: HA1WD)	
ON4AOI	369	1004	214	214,856		C ON
EA7FTR	393	833	228	170,931		C EA
LR7H	293	846	205	156,087		
					(op: LU7HVH)	
S52SK	249	677	179	109,064		C S5
UX2HO	254	637	165	94,594		C UR
IK2ZVU	240	613	151	92,563		C I
WIØCW	220	553	146	80,738		C WØ
N6EE	260	445	164	72,980		C W6
RW9OX	135	392	91	35,672	AS	C RA9
JA1SJV	111	301	90	27,090	JA	C JA1
WA4JQS	103	256	86	22,016		C W4
DL1SWB	98	270	76	20,520		C DL
EA1AAA	82	184	72	13,248		
DL1LH	78	188	66	12,408		
OK2MPS	71	202	59	11,918		C OK
UA3XBB	77	193	60	11,580		C UA
LA7AJ	67	182	57	10,374		C LA
EU1SA	64	175	56	9,800		C EU
WC4CW	61	146	55	8,030		
					(op: KS4DU)	
YU7AE	56	160	47	7,520		C YU
JA7LMZ	49	136	47	6,392		C JA7
ES4LBO	20	52	18	1,040		C ES
LZ4BU	17	51	16	867		C LZ
DL1FDT /HI8	20	40	15	800	NA	C HI

Single Band, 15 Meters (SB15)

Call	QSOs	Pts	Mults	Score	Rec	R
SP5GRM	789	2099	401	766,974	EU	P(Wrld)
EO6F	829	2067	382	710,634		C UR
CX7BF	656	1924	344	595,670	SA	C CX
Z30M	700	1741	357	559,383		C Z3
					(op: Z32PT)	
UA4LCQ	698	1225	228	503,146		C UA
GØLII	597	1564	327	460,285		C G
ON7UI	423	1087	257	279,359		C ON
RK6AXS	477	1092	270	265,356		
					(op: UA6AJU)	
KM6SA/7	521	951	280	266,280	C	W7
					(op: K7WM)	
VE6JY	495	1137	259	265,034	VE	C VE6
9A7R	429	1081	255	248,089		C 9A
UAØCA	372	1020	239	219,402	AS	CUAØ
UP6F	401	1115	209	209,731		C UN
					(op: UN7FZ)	
OH5HCK	386	881	234	206,154		C OH
EA7DBO	366	872	221	192,712		C EA
LZ2AU	366	863	222	191,585		C LZ
FK8VHN	303	898	199	178,702	OC	C FK
LY2FN	305	768	215	165,120		C LY
LU8HWD	298	878	186	163,308		C LU
YO3JF	327	778	202	157,156		C YO
CM2KC	329	765	192	146,880		C CO
EA2AKP	287	715	202	144,430		
NK4P	284	713	193	137,609		C W4
					(op: K4WW)	
ER5OK	300	686	185	126,910		C ER
W6 /JA3EVZ	308	575	196	112,700		C W6
SM7GXR	232	590	165	97,350		C SM
SM6BSK	219	551	175	96,425		
HK3WGQ	341	673	133	89,505		C HK
JA3VXH	203	562	150	84,300		C JA3
W4LC	214	532	153	81,396		
EA7ALO	195	477	159	75,843		
VK2KM	176	511	137	70,007		C VK2
OK2SG	182	450	142	63900		C OK
VE6FU	202	427	127	54,229		
N7GC	207	367	139	51,013		
UAØFDX	161	425	119	50,575		
JH7QXJ	151	431	111	47,841		C JA7
UX1KR	138	399	133	44,688		
RA1ACJ	151	357	121	43,197		
US5EVD	133	292	99	28,900		
K7ON	122	268	103	27,604		
OM3PR	56	133	42	5,586		C OM
LY3IT	38	90	32	2,880		
JR3RIY	33	87	32	2,784		
SP2UUU	20	58	20	1,160		
DL2ZBN /HI8	22	48	20	960		C HI8
9M2TO	14	48	16	768		C 9M2
OK2PMS	10	30	10	300		

Single Band, 20 Meters (SB20)

Call	QSOs	Pts	Mults	Score	Rec	R
I2EOW	767	1866	406	681,836	EU	P(Wrld)
9A9A	730	1813	390	636,363		C 9A
9A5W	704	1697	369	626,193		
S58T	636	1573	359	508,236		C S5
CT4NH	673	1566	337	474,967		C CT
LRØH	498	1449	270	352,107	SA	C LU
					(op: LU9HS)	
OH2LU	447	1030	276	284,280		C OH
LY4AA	435	998	259	232,633		C LY
WQ6 /GØAZT	434	674	239	161,086		C W6
4X6UO	303	892	198	158,954		C 4X
GW4SKA	343	716	211	151,076		C GW
UT9NA	351	760	210	143,640		C UR
UA3AFS	321	672	201	133,800		C UA
DN1JC	297	664	199	128,156		C DL
IK2DPP	292	666	206	123,476		C I
RA1AW	317	681	193	118,289		
VK6WR	182	538	145	78,010	OC	CVK6
I7PXV	226	470	161	75,670		
Z31GB	208	433	145	62,785		C Z3
DJ6TK	204	437	142	62,054		
UX6F	220	447	132	59,004		
YU1NR	180	391	134	52,394		C YU
UR3IMM	182	385	135	51,975		
SM3DXC	164	353	126	44,478		C SM
W4PA	197	325	136	44,200		C W4
7K4QOK	122	332	105	34,860		C JA1
AKØA	200	264	132	34,848		C WØ
UA6LO	132	279	115	32,085		
YL3FW	137	287	103	29,561		C YL
VE7OR	117	264	95	25,080		C VE7
JM1NKT	73	211	66	13926		
SP8MI	136	279	49	13,671		C SP
IK1ROV	55	129	51	6,579		
SP9GNB	54	114	50	5,700		
VK2BQS	15	37	13	481		C VK2
AH6YL/HI8	13	27	12	324	NA	C HI8

Single Band, 40 Meters (SB40)

Call	QSOs	Pts	Mults	Score	Rec	R
ED8WPX	718	4298	360	1,547,280	WR+AF	P(Wrld)
					(op: EA8PP)	
S57AW	580	2912	323	950,576	EU	C S5
YZ7ED	554	2742	350	863,730		C YU
S51DX	437	2040	274	558,960		
F/OK1EE	406	1782	241	429,462		C F
F5NZO	306	1322	197	234,390		
W3SE	229	670	135	90,450		C W3
SP2HPD	173	694	128	88,832		C SP
AE5B	212	528	126	66,528		C W5
VE4AIY	159	604	91	55,328		C VE4
VE2AXO	32	128	28	3,584		
LY2GF	20	82	18	1,476		
N6RT	3	12	3	36		

Single Band, 80 Meters (SB80)

Call	QSOs	Pts	Mults	Score	Rec	R
S57CQ	378	1516	207	313,812	WR+EU	P(Wrld)
9A5Y	363	1478	198	263,379		C 9A
OH7WW	303	1204	176	190,713		C OH
DL4RCK	280	1012	167	152,213		C DL
LZ/OL5Y	239	964	148	142,376		C LZ
CT1AOZ	191	798	133	95,520		C CT
SP9MAX	194	744	123	91,512		C SP
OK2PHI	160	630	112	70,560		C OK
IK3SSJ	143	542	99	53,658		C I
OK2EQ	136	432	102	44,064		
KQ4QM	174	396	98	38,808		C W4
W5WYN	179	386	98	37,828		C W5
UT1II	78	314	63	19,782		C UR
S59D	77	294	58	17,052		
OH5KUY	58	220	49	10,780		
LZ/OK1DF	29	168	26	4,368		

SWL

Call	QSOs	Pts	Mults	Score	Rec	R
ONL383	935	2997	360	1,078,920	EU	C EU
F11676	217	667	126	85,302		C F
UA3-155-776	32	110	32	3,520		C UA
OH1-688	6	10	10	60		

Checklogs

DL6UAM, LA1FW, LA5YW, KB7SLJ, EA7ESH, SP3JHR, SP2IU, DL5ZB, EU1SA, IK1ZOE, LZ4BU, OZ1OXB, OZ6TL, RK3BY, RW3XA, SP6AOI, UAØFDX, UT1YV, W4CQE, W7BWI, KE6QR, KO2FB, IL3/IK3PQH, YU7AE (15, 20, 40, 80) DE1DGD, K3SWZ.

Results prepared by Eddie Schneider, W6/GØAZT, CQ/RJ RTTY WPX Contest Manager, 5th April 1999.

MFJ *Switching* Power Supplies

Power your HF transceiver, 2 Meter/440 MHz mobile/base and accessories with these new 25 or 45 Amp MFJ MightyLite™ Switching Power Supplies!

No RF hash . . . Super lightweight . . . Super small . . . Volt/Amp Meters . . .

NEW!

MFJ-4225MV **$149.95** Add s/h
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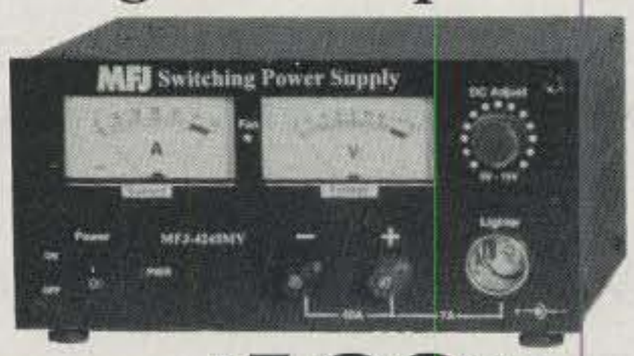
These babies are clean . . .

Your buddies won't hear *any* RF hash on your signal! *You* won't hear any in your receiver either!



MFJ-4245MV **$199.95** Add s/h
45 Amp

Some competing switching power supplies generate objectionable RF hash in your transmitted and received signal.

These super clean MFJ *MightyLites*™ meet all FCC Class B regulations.

Low ripple . . . Highly Regulated

Less than 35 mV peak-to-peak ripple under 25 or 45 amp full load. Load regulation is better than 1.5% under full load.

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You won't burn up these power supplies! They are fully protected with Over Voltage and Over Current protection circuits.

Worldwide Versatility

MFJ *MightyLites*™ can be used anywhere in the world! They have switchable AC input voltage and work from 85 to 135 VAC or 170 to 260 VAC. Easily replaceable fuse.

MightyLites™ . . . Mighty Features

MFJ *MightyLites*™ feature a front-panel voltage control. It lets you vary the output voltage from 9 to 15 Volts DC and gives you a highly regulated voltage output.

You get an easy access front-panel with five-way binding posts for heavy duty use and a cigarette lighter socket for mobile accessories. The MFJ-4245MV has two sets of quick-connects on the rear for accessories.

Large 3 inch dual meters are brightly illuminated to make it easy to monitor load voltage and current.

A *whisper quiet* internal fan efficiently cools your power supply for long life.

Two models to choose from . . .

MFJ-4225MV, $149.95. 25 Amps maximum or 22 Amps continuous. Weighs 3.7 pounds. Measures 5¾Wx4½Hx6D inches.

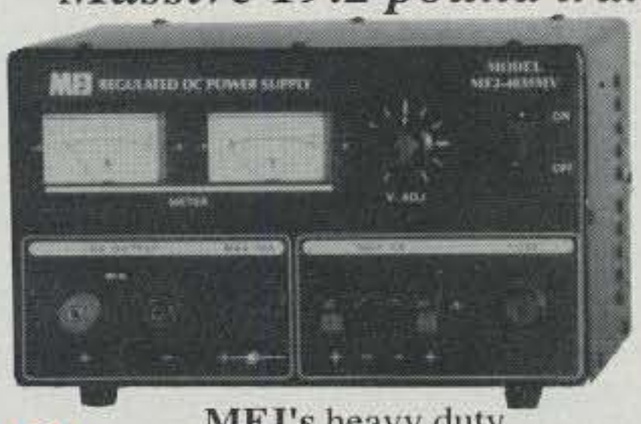
MFJ-4245MV, $199.95. 45 Amps maximum or 40 Amps continuous. Weighs 5.5 pounds. Measures 7½Wx4¾Hx9D inches.

MFJ No Matter What™ Warranty

MightyLites™ are covered by MFJ's famous *No Matter What*™ one year limited warranty. MFJ will repair or replace (at our option) your power supply for one full year.

MFJ 35/30 Amp *Adjustable* Regulated DC Power Supply

Massive 19.2 pound transformer . . . No RF hash . . . Adjustable 1 to 14 VDC . . .



NEW!

MFJ-4035MV **$149.95** Add s/h

MFJ's heavy duty conventional power supply is excellent for powering your HF or 2 Meter/440 MHz transceiver and accessories.

A massive 19.2 pound transformer makes this power supply super heavy duty! It delivers 35 amps maximum and 30 amps continuous without even flexing its muscles. Plugs into any 110 VAC wall outlet.

It's highly regulated with load regulation better than 1%. Ripple voltage is less than 30 mV. *No RF hash* -- it's super clean!

Fully protected -- has over voltage protection, fold back short circuit protection and over-temperature protection.

You get front panel adjustable voltage from 1 to 14 VDC with a convenient detent set at 13.8 VDC. A pair of front-panel meters let you monitor voltage and current.

Three sets of output terminals include a pair of heavy duty five-way binding posts for HF/VHF radios, two pairs of quick-connects for shack accessories and a covered cigarette lighter socket for mobile accessories.

A front-panel fuse holder makes fuse replacement easy. Whisper quiet fan speed increases as load current increases -- keeps components cool. 9½Wx6Hx9¾ inches.

Your MFJ-4035MV is protected by MFJ's famous *No Matter What*™ one year limited warranty. MFJ will repair or replace (at our option) your power supply for one full year.

MFJ *High Current* Multiple DC Power Outlets

Power two HF/VHF transceivers and six or more accessories from your 12 VDC power supply

MFJ-1118 **$69.95** Add s/h

MFJ-1118, $69.95. This is MFJ's most versatile and highest current *Deluxe Multiple DC Power Outlet*. It lets you power two HF and/or VHF transceivers and six or more accessories from your transceiver's main 12 VDC power supply.

Two pairs of *super* heavy duty 30 amp 5-way binding posts connect your transceivers. Each pair is fused and RF bypassed. Handles 35 Amps total. "ON" LED.

Six pairs of heavy duty, RF bypassed 5-way binding posts let you power your accessories. They handle 15 Amps total, are protected by a master fuse and have an ON/OFF switch with an "ON" LED indicator.

Built-in 0-25 VDC voltmeter. You get 6 feet of super heavy duty eight gauge color-coded cable with ring tongue terminals. Binding posts are spaced for standard dual banana plugs.

Heavy duty aluminum construction. 12½x2¾x2½ inches.

MFJ-1116, $44.95. Similar to MFJ-1118. No 30 amp posts. Has "ON" LED and 0-25 VDC voltmeter. 15 amps total.

MFJ-1112, $29.95. Similar to MFJ-1116. No on/off switch, LED, meter, fuse.

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To this day, when people talk about building high-power projects, the ideal project always includes vacuum variables and vacuum relays. They've never been cheap, by amateur standards, and even at fleamarkets they represent a sizable investment. However, no one has ever disputed their quality, and what they can add to a project. It's always been worthwhile. W6MZ tells us about the man who made these components that we all seem to want.

Jo Emmett Jennings, W6EI

By Jack Quinn*, W6MZ

Jo Emmett Jennings was always a very uncomplicated, kind, and generous man with an almost child-like enthusiasm for tinkering. He was the famous founder of the Jennings Manufacturing Company in San Jose, California, the world's first major producer of vacuum capacitors, large and small, for amateur, commercial, and government markets.

In 1937 Jo joined Bill Eitel and Jack McCullough at EIMAC during the end of the great depression. In addition to a new line of amateur triodes, Bill and Jack were also the inventors of the vacuum capacitor. Jo was put in charge of manufacturing and development. Then in the early 1940s he wanted to go into business for himself, so they gave him the patent rights for vacuum capacitors and wished him well. Bill and Jack started EIMAC in an old San Bruno butcher shop, Hewlett and Packard started in a Palo Alto garage, and believe it or not, Jo started the company in one of his mother's large chicken coop buildings in San Jose. Things were pretty basic in Silicon Valley at the time.

I first met Jo in 1945 when he came to CBS/VOA shortwave stations in Delano, California for a visit. He had heard that the 100 microFarad fixed-vacuum capacitors made by Federal Telephone and radio had a high failure rate in our 200 KW shortwave transmitter. Incidentally, each failure sounded like a discharged 12-gauge shotgun. They were made with the usual thin concentric copper cups with a glass envelope approximately 12 inches in diameter by 16 inches in length. However, each had a built-in filament and a getter.[1] During the transmitter shut-down period, the filament would be turned on, heating the getter to 500°C or more, a temperature that would absorb hydrogen and gasses released when the capacitor arced internally. Then we could go back on the air at full power. However, many failed catastrophically, burning huge holes through the thin copper cups and even melting and fusing the two halves together.

There aren't too many pictures of Jo around, and we're at a loss to explain what was going on here at the time. However, this picture shows Jo atop a railroad car operating 2 meters with an early Gonset Communicator and T-17 microphone.

Jo came back a couple of weeks later with a capacitor he had designed and designated the JC-3. It was made of glass, about half the size of the Federal units, no internal filament or getters, but with two very thick, heavy, concentric oxygen-free copper pipes. The heavier material was better able to dissipate the heat from an arc and prevent internal melting prior to opening the overload relay. In those days, the speed at which you could remove power depended entirely on a relay. Jo had developed a "secret" formula for cleaning the inside of the capacitor before it was exhausted on a vacuum manifold. That allowed his capacitors to operate at

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[1] *A getter is a small piece of metal, such as magnesium, that is flashed or vaporized by an external RF field while it is in a vacuum tube. The procedure absorbs gases during the tube's evacuation process.*

higher peak RF operating voltages, which more or less solved our problem. But just as it is today, *heat was always the main killer* of electronic components, vacuum capacitors, and tubes.

In those days, the Delano engineers were almost all amateur radio operators. Each time Jo visited, he brought a large carton filled with slightly out of spec variable vacuum capacitors for the staff. Amateurs made their own amplifiers then, and these expensive components were well beyond their budgets. They were most welcome, and some beautiful, innovative amplifiers were constructed.

Until the day Jo died, he never lost any of his enthusiasm. His interests ranged from making the best and highest power vacuum capacitors possible, to things such as a mobile 1 KW amateur amplifier built into the base of a bumper-mounted whip antenna that used a water-cooled 4CX300A, to buying a surplus Navy LST landing craft which he used for a dummy load. He mounted the LST on insulators and filled it with salt water. Then he discharged several megawatts of Pacific Gas & Electric energy into it to test his new line of 120–240 KV high-voltage power- line vacuum switches. Each time he dumped into the load, the lights in San Jose dimmed. I kid you not. The city eventually made him stop. People got used to the dimming lights, but the unwelcome transients and line surges were not appreciated.

The Jennings Manufacturing Company in San Jose was built and jointly owned by Jo and his partner Cal Townsend. It was a great team, for Jo had no interest in administration nor financial management. He was still just an innocent, full-steam-ahead tinkerer. Cal was an excellent manager and put it all together.

Eventually, Jo and Cal sold the company, and it became ITT Jennings. Jo retired and built a beautiful beach home atop a 150 foot sand cliff in Aptos, California overlooking the Monterey Bay. There he built one of the world's best amateur radio stations with nothing but water between him and the African and European continents via the long path. It was not at all unusual to exchange signal reports of S9 plus 40 dB. Jo had a wonderful life, and he obviously loved every minute of it, even in his retirement.

Soon thereafter, Jo fell ill. Even the cliff on which his house stood eroded until the foundation was hanging out in thin air. Being an eternal optimist, Jo tried desperately to rebuild the cliff. Against all odds, he failed. A motel had been constructed on the beach below, and for safety reasons, the city made him tear down his house. Shortly thereafter, Jo died.

Jo Jennings was unquestionably one of the most innovative, nicest, and kindest people on earth. There will never, ever again be another Jo Emmett Jennings.■

The SGC SG-2020 SSB/CW HF Transceiver

BY DAVE INGRAM*, K4TWJ

Feeling a bit bored with uneventful daily routines? Want to experience new amateur radio thrills and excitement? Gear up with a new rig, hit the bands in high style, and start living the good life!

Dumb advice? Not at all. It works great and turns good results every time. Really! But new transceivers with a respectable number of fancy features cost a bundle, right? Not necessarily. All-out deluxe units are expensive, true, but look beyond that "front line" of gear and you will discover some real treats at surprisingly affordable prices. Yes, and generally speaking, these less-expensive rigs are capable of working almost anything the "super rigs" can work.

One good example of this fact is the subject of this *CQ* review: SGC's new SG-2020 SSB/CW transceiver. This is a high-calibre rig with a proven, solid background. It makes a very nice unit for home, mobile, or portable operation, and it sports a fair and square price tag to boot. Sound appealing? Read on!

The new SGC SG-2020 HF transceiver is small, rugged, and built for action with an impressive array of big-time features which include 20 memories, built-in keyer, digital SCAF filters, SWR monitor, SSB speech compressor, and more.

The Basic Facts

SGC's new SG-2020 checks in with measurements of 2.75"H×6"W×7"D, a weight of 4.5 pounds, and a blue-gray color case that seems impervious to rough handling or abuse. It has a well-balanced, rubberized tuning knob, backlit multifunction frequency readout, LED-type bar meter, front flip-up foot, and hefty top-mounted speaker. Recessed front-panel LEDs indicate when the rig is operating transceive or split frequencies, when its noise blanker and/or RIT is on, and when it is in transmit mode. Combined with the meter's green and red LEDs, this produces a captivating "bright lights and glamour" look during use.

The SG-2020 operates SSB and CW on all nine HF bands with up to 20 watts output and receives (SSB and CW only) from 1.8 to 30.0 MHz with very good sensitivity and selectivity (additional specs of interest are listed in Table I). It requires 12 to 14 volts DC at 4 to 5 amps for operation at 20 watts output or approximately 1.5 amps for QRP operation at the 4 or 5 watt level. Receive-only current is around 400 ma with the readout's backlight switched off—just right for battery-powered QRP field operations.

Speaking of QRP, I should also mention Bruce Franklin, KG7CR, of Index Labs and father of the now-famous QRP Plus transceiver was a key member of the SG-2020's design team. As such, it is an even more elaborate and feature-packed version of that popular unit. This is a real compliment to the SG-2020, because QRPers traditionally thrive on copying weak DX-like signals through QRM and adverse band conditions. And since the little rig's power is front-panel adjustable from 1 watt to full output, it addresses both traditional amateur and QRP markets very effectively.

Deluxe and Special Features

Touring the SG-2020's front panel and punching some of its rubberized buttons hints at more special features and functions in this ultra-compact transceiver than first meet the eye. The little tiger has 20 fully tunable memories, digital SCAF CW filters from 2.7 kHz to 100 Hz, built-in iambic keyer, passband tuning, RIT, split-frequency capability, and SWR monitoring—all in one box. These features are first accessed by pushbuttons, and then changed by rotating the main tuning knob. Band selection, for example, involves using that two-step process for recalling a memory to the VFO. Any desired frequency can then be tuned in plus programmed back into memory for quick access to a favored operating spot.

Here's the special kicker. You can recall a memorized frequency and check activity, tune the band for more activity, punch the "MEM" button to recheck or operate the memorized frequency, then punch "MEM" again for toggling frequencies. Even a third frequency can be included in this toggling concept, or favorite frequencies can be programmed into adjacent

*4941 Scenic View Drive, Birmingham, AL 35210

Optional snap-on front and rear covers convert the SG-2020 into a self-contained station that goes with you anywhere and anytime. Batteries install in rear, and microphone and key store in front. (Photo courtesy SGC, Inc.)

memories for quick-check access. Overall flexibility is remarkable.

Selection of narrow-band filters, keyer speed, passband tuning adjustments, and separate receive frequencies are handled in a similar "push related button and rotate main tuning knob" manner. In each case, the SG-2020's frequency readout changes to indicate your selection when accessed, and shifts back to your operating frequency when the related button is released. Adjusting the passband tuning with the main knob while watching the display show minus or plus 1, 2, or 3 may seem unusual, but after a few minutes of use it actually proves very clever and convenient. Some functions, incidentally, are accessed by simultaneously pressing two buttons—for example, by holding in the BandWidth and REVerse buttons to switch operating modes.

The SG-2020's SCAF filters deserve favorable mention, as they work great for cutting QRM and can even narrow receive bandwidth down to 100 Hz without ringing. Did I mention this transceiver also has band and memory scanning to help you find the action requiring narrow filters and sharp operating savvy? Indeed, the SG-2020 is a lot of rig for the money.

Inclusion of SWR metering and an iambic keyer complete with speed display give the SG-2020 very good flexibility and portability. (Why fumble with extra pieces if you get them built into your transceiver?!) Both keying and sidetone, incidentally, are clean and pleasant to copy. Whether the rig works full or semi CW break-in depends, in my opinion, on your keying speed. At slow hand-key speeds the T/R relay switches between dots and dashes for full QSK action. At higher bug or keyer speeds, it switches between letters or words for semi QSK. T/R delay is not readily adjustable. T/R relay noise is between "barely noticeable" and "rather noticeable," depending on your personal point of reference. I do not find it overly objectionable, but I also appreciate the heartwarming sounds of a classic telegraph office in the shack. Amateur radio life should be flashy and fun, right?

Taking It With You

If you travel or pursue outdoor hamming to any reasonable degree, the SG-2020 has one option worthy of your investigation: snap-on front and rear covers with integral shoulder strap for easy carrying. A bank of 10 D cells for power fit in the rear cover, and the rig's included hand microphone (plus maybe a scratch pad and small key or paddle of your choice) can be stored in the front cover. Wrap a

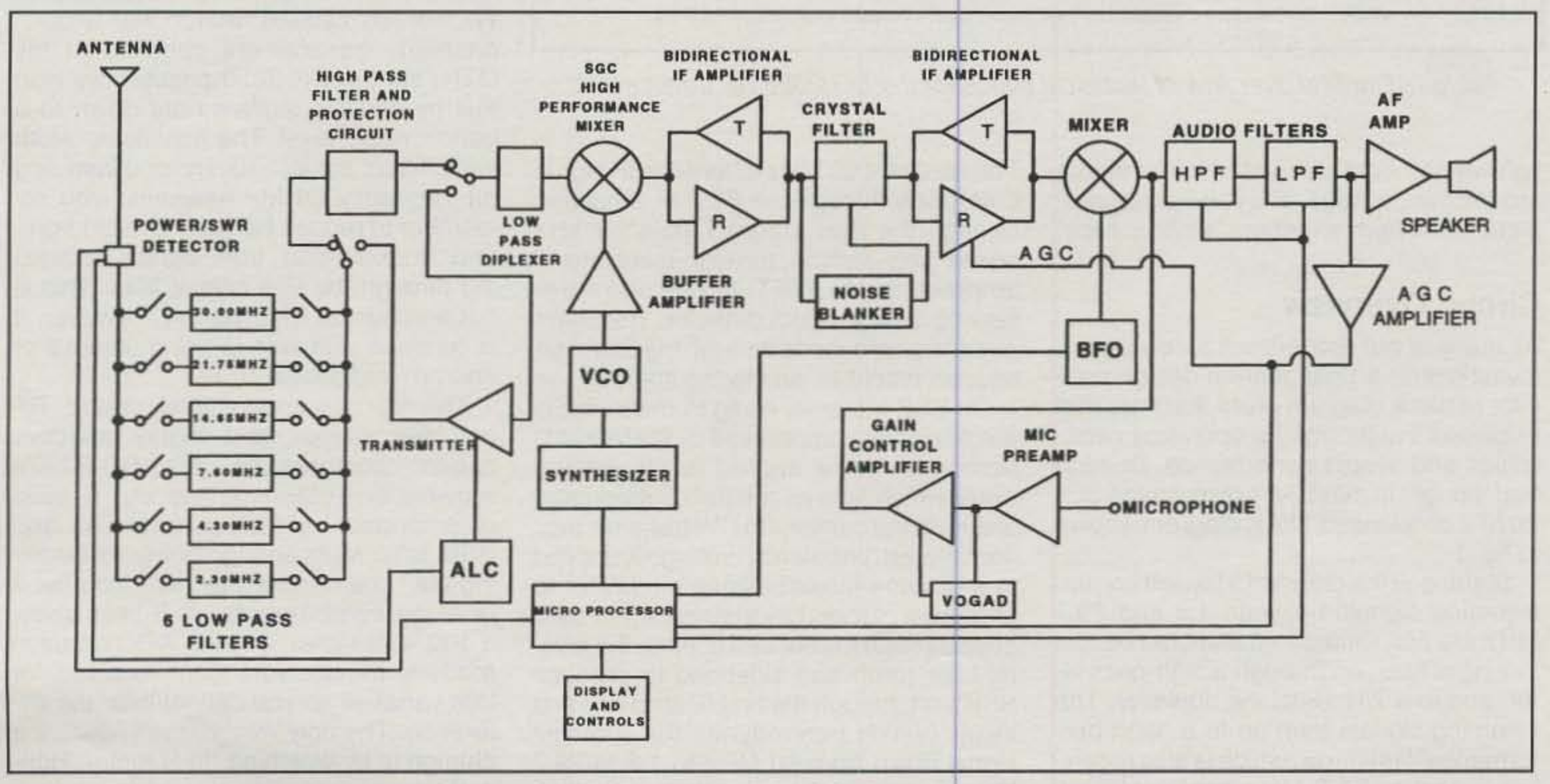


Fig. 1– Conceptual block diagram of the SG-2020. (See full discussion text.)

Specifications of the SGC SG-2020 SSB HF Transceiver

GENERAL

General Operating Modes:	USB, LSB, and CW
Receiver frequency range:	1.8 to 30.0 MHz, general coverage (400 kHz to1600 kHz with broadcast filter bypassed)
	1.8 to 29.7 MHz (U.S. ham bands only)
Transmit frequency range:	1.8 to 29.7 MHz (U.S. ham bands only)
	1.8 TO 30.0 MHz (general coverage, export)
Operational temperature range:	–30 to +70°C
Microprocessor:	MC68HC711E9
Frequency stability:	3ppm per 10°C* (see example below)
Frequency resolution:	10 Hz
Frequency display:	100 Hz
Rx/Tx changeover:	less than 10 ms
Memories:	20 (factory preset, user definable)
Reflected power metering:	built in
LCD:	back light selectable
Keyer:	fully adjustable iambic mode "B," 5 to 60 wpm
Memory scan:	adjustable
Dimensions:	2.75H × 6W × 7L
Approximate weight:	4.4 lbs.
Microphone:	fist, dynamic
Battery voltmeter:	digital; front-panel controlled

RECEIVER

Sensitivity:	better than .5µV for 10 dB S/N+N
Intermodulation:	+18 dBm third order intercept
Selectable AF bandpass:	100 Hz to 2700 Hz
Audio output:	1 watt RMS
AF distortion at nominal output power:	less than 3%
Internal speaker:	5 watts maximum, 4 ohms
Noise blanker:	pulse/ignition
RF gain:	front panel controllable
BFO:	processor controlled
Total power consumption:	less than 400 ma (receive only)

TRANSMITTER

Output power:	front panel adjustable, 0 to 20 watts PEP
RF speech processing:	VOGAD baseband and RF clipping
Transmit current consumption:	maximum output power, 4 amperes
Transmit intermods, 20 watts:	–28 dB or better
Transmit spurious:	–50 dB (ham bands)

*Example: At 14.2 MHz = 14.2 x 3 + 42.6 Hz. A total frequency drift of 42.6 Hz for a temperature change of 10°C. If the ambient temperature changes from 20° to 30°C, there could be a drift of 42.6 Hz.

Table I– General overview of technical specs for the SG-2020 HF transceiver.

lightweight and insulated-wire dipole around this package, and you have a complete "work from anywhere" station. Nice!

Circuit Overview

As many of our readers will surely agree, investigating a rig's general design concept or block diagram gives accurate and unbiased insight into its operating capabilities and overall performance. Bearing that thought in mind, let's discuss the SG-2020's condensed block diagram shown in fig. 1.

Starting at the diagram's top left corner, incoming signals between 1.8 and 29.7 MHz are first routed to a selected band's low-pass filter, on through a high-pass filter, and to a T/R switching duplexer. The incoming signals then go to a "high performance" first mixer, which is also receiving a 61.8 to 87.9 MHz local oscillator/injection signal frequency synthesizer. The resultant 60 MHz difference/IF signal then goes through an FET IF amplifier, through the (two stage) 7 pole/2.7 kHz crystal filter section, through a second IF amplifier, and to a BFO-fed second mixer serving as a product detector. Resultant audio then proceeds through the SCAF filters, an amplifier, and to the speaker.

On SSB transmit, audio from the mic is amplified and compressed by the VOGAD section and then applied to the second mixer which acts as a balance modulator and nulls the carrier. On CW transmit, incidentally, an "unbalance" voltage is applied to this same mixer/balance modulator to produce a carrier. The transmit signal then goes through the second IF amp, the crystal filter (drop one sideband to produce SSB), on through the first IF amp and first mixer (which heterodynes the transmit signal down from 60 MHz to 1.8 to 29.7 MHz), and to the transmitter's amplifier. This section is shown as one block/triangle, but actually consists of four broadband stages complete with a pair of 40-watt rated transistors in its output. From there, the signal passes through a band's related filter and to the output. Now let's quickly discuss a couple of fine points.

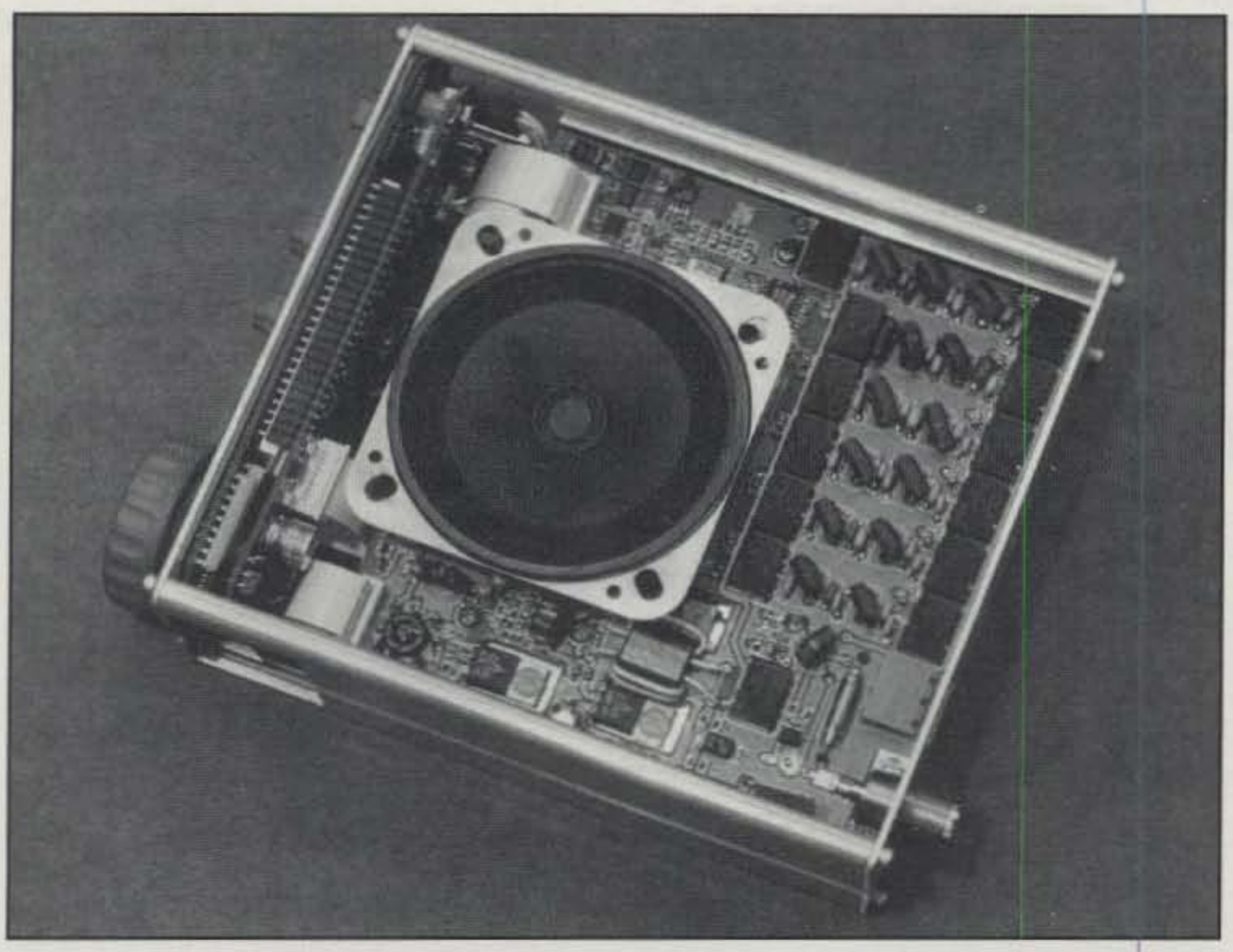
Both first and second mixer stages use diode ring-type circuits rather than active ICS (like an NE 602, for example). This is a prime reason why the receiver exhibits wide dynamic range and a low noise floor. Also, many "birdies" are eliminated by the use of up conversion and a 60 MHz IF (incoming signal minus local oscillator equals IF). AGC voltage is derived at the SCAF filter output and fed back to the second IF amp to maintain a stable audio output level. You control overall receiver sensitivity with the (front panel) RF gain. Finally, the SSB's VOGAD circuit acts like audio speech compression, while the ALC circuit serves double duty in RF speech compression and SWR protection.

Overall, the SG-2020's circuitry is simple enough to be understandable, but elaborate enough to "do the job" without unnecessary shortcuts or compromises. An interior view of the SG-2020's circuit boards, etc., incidentally, is included in the accompanying photo.

On The Air

So how does the SG-2020 rate in actual operation and performance, you ask? "Exceeds expectations" is, in my opinion, a good quick reply. All of the rig's features except its non-adjustable T/R delay are terrific. The receiver section is particularly good, not just in sensitivity and selectivity, but also in high intermod immunity. Interference from shortwave superstation WEWN has caused "wall to wall birdies" on many transceivers checked at my QTH, but the SG-2020 passed this acid test by copying signals right down to a band's noise level. The adjustable-width audio filters are also dandy for minimizing on-frequency QRM—assuming you remember to reduce RF gain to avoid front-end "buckshotting" from signals squeezing through the IF's crystal filter. This is not an unusual idiosyncrasy, however. It is common with any rig using (internal or add-on) audio-level DSP.

Thanks to conservatively rated RF amplifier stages and highly effective speech compression, the SG-2020's transmitter section pumps out a most commendable signal on both CW and SSB. Is 20 watts enough power for "working out" in a reliable manner? You bet it is! At the worst, it is only two S-units below a 100 watt signal, and the AGC circuit in modern transceivers compensates for that variation so you cannot hear the difference. The only way you will notice the change is by watching an S-meter. Honest! Check my words of wisdom on your own rig and see for yourself! High-power-



Interior view of SG-2020 reveals a stouthearted layout with "breathing room" for cool operation under hot conditions.

or-nothing devotees will discover T/R connections for keying an external linear amplifier are not included in the SG-2020, but alas, everything old is new again. Just insert a shorting plug in your amplifier's external T/R socket and then use its front-panel standby/operate switch for manual T/R switching. It works just as good in "Y2K" as it did in the fabulous '50s.

I gave the SG-2020 a hearty multiband workout during a recent DX contest and filled two log pages with contacts on all continents in less than an hour. The little rig ran cool and calm and handled just like a big rig. It is nice!

Conclusion

All aspects considered, I would say the SG-2020 is an outstanding, rugged little transceiver with an affordable price tag. It has more than enough big-time operating features to please any amateur—at home or in the car. The transceiver's operating manual, quick start guide, and support booklets are also well-detailed and very helpful in initially setting up the transceiver or a full station. SGC, incidentally, is an acronym for Stoner Goral Corporation, a company founded by Don Stoner, W6TNS, and Pierre Goral, KI7UA, for the purpose of producing high-grade communications gear made and serviced in the U.S.

The SGC SG-2020 is available in stand-alone form or with a wide variety of special accessories. Suggested retail price of the transceiver alone is $675, or $1195 with its optional "PortaPak" front and rear covers/containers.

For more information, contact SGC, 13737 S.E. 26th Street, P.O. Box 3526, Bellevue, WA 98005 (425-746-6310). ■

In this concluding part, K4EJQ wrings out the last bit of utility from his wire antenna farm. Ingenuity, curiosity, and a bit of research can make this a great antenna season for all of us.

The Aerial Here Is . . . Part III—Conclusion

BY J. G. "BUNKY" BOTTS*, K4EJQ

Having completed the multi-band modifications to the 160 and 30 meter wire aerial, I began to spend more time on 80, 40, 30, and 20 meters either ragchewing or chasing a bit of DX during the winter of 1996–97. Band conditions during this period were quite poor for DXing to say the least, as solar activity (sunspots) was at minimal levels. However, I began to notice that during this period I was still working "my share" of whatever Mother Nature would propagate, especially on 80, 40, 30, and 20 meters.

Since the multi-band wire had proven itself far superior to my old inverted-Vees on 80 and 30 meters, I took down the inverted-Vees, using the wire from them to add additional radials to the multi-band wire. Much to my surprise, the wire on 40 meters was holding its own with my trusty old 4-element vertical phased array when working into Europe and Africa! Since I did not have any reference antenna left for 80 or 30 meters, I could not make any type of comparison of the wire's performance on those bands—a situation I vowed to rectify when spring came.

As soon as the spring weather permitted I was out building a new antenna system for 80 and 30 meters to see how it would compare with the wire. I built a pair of 5/8-wave vertical antennas for 30 meters and installed them over a decent radial system on the same east-west line as the wire antenna. Those same 5/8-wave 30 meter antennas are also 1/4 wave 80 meter antennas! Again, two bands for the cost of one. I love it!

I spaced the verticals about 3/16 wavelength apart at 80 meters (about 50 feet, which just happens to be 1/2 wavelength at 30 meters). I fed the vertical array through two equal-length feeder cables that connected back to the direction-changing relay box that inserts the coaxial phasing lines into the circuit to control direction. I also added a coaxial impedance matching transformer to minimize the SWR. The 2-element vertical array seemed to work quite nicely on both 80 and 30 meters, especially for DX. The only "fly in the ointment " was *the multi-band wire worked better!* This was true not only for DX, but also for working the shorter daytime skip zones as well!

I tried changing the spacing of the vertical elements of the array for the different bands; setting up the verticals as a single-band array; and a better, more elaborate radial system for the verticals. The fact remained: The vertical array, when set up to operate in a unidirectional "end-fired" mode, beamed either east or west, was no better than the multi-band wire antenna.

For most of the summer of 1997 I compared the two aerials using readily available and reliable signals from stations WWV, "N.Y. Overseas Radio," the multiple commercial digital stations, as well as the local amateurs on the 30 meter band. On 80 meters I did likewise using the W1AW code practice and bulletin transmissions, as well as the many amateurs I worked and ran comparison checks with.

I could understand the reason the wire, with its long horizontal span, was better than the vertical during the daytime and why the wire was less prone to pick up manmade noise such as power-line hash. There was no doubt in my mind that all things considered, the wire was the better of the two antennas. The wire also worked on 20, 17, and 15 meters, but not as well as my home brewed 3-element tri-bander Yagi. This pretty much proved the theory about longwire antennas having their line of maximum radiation off the ends of the wire, in my case east and west. This is the same direction the two 5/8-wave phased verticals for 80/30 meters, and the 4-element 40 meter array, were oriented for "end-fire" or unidirectional operation.

Well, if one antenna is good, why not add a second? In this instance the thought of trying to come up with a workable phasing network for a pair of multi-band wires was a bit staggering. It could be very complicated, and more than likely, expensive to boot. Besides, I had been working on this project for over a year, and I must admit I wanted to move on to other things. However, I figured that I might be on to something worthwhile if I pursued this project just a bit more. I thought it would be interesting to see just how much directivity could be obtained by adding a duplicate wire—this one run at right angles to the original wire. I could use the same tuner for both, as only one wire would be connected at any one time. I also would not have to construct a complicated phasing or switching system using only one wire at a time. I hung a second wire of equal dimensions off the yardarm of the tower and brought both wires over to a centrally located relay switch box that was also remotely controlled from the shack.

The results were astounding! I could hardly believe how much directivity could be achieved by " rotating" a longwire antenna 90 degrees. I double-checked my receiver's "S" meter accuracy using "lab-grade" precision attenuators; the meters were accurate. You could hear the improvement in the signal-to-noise ratio as the antenna was "rotated" electrically. Since both antenna wires were the same dimensions and about the same height above ground, I seldom had to do any re-tuning after switching from one to the other.

One thing bothered me: Those two longwires were being supported from a steel tower. Would I still get the same

*220 Hillsboro Rd., Blountville, TN 37617

results if I used a tall tree for this supporting structure? Was the tower or the unused vertical portion of the other wire antenna acting as reflector element in the array? I wanted to know.

I began moving the entire system over to a tall tulip poplar that was close by—ground system, radials, the "whole nine yards." I also built up a "rotor" box that contained relays to switch in the desired leg of the antenna. I now had only one vertical wire in the array which ran from the tuner on the ground to the "rotor" box suspended by a rope from the top of the tree. A control cable from the "rotor" unit returns to the main control line that operates the tuner (see block diagram in fig. 1).

The results were pretty much the same using the tree as the support structure. The only noticeable difference was that the tuning on 160, 17, and 15 meters was less critical under varying weather conditions, which was an added benefit.

Again I spent considerable time conducting both receiving and transmitting tests under different band conditions. There were times during the day and evening when skip zones changed and signals began arriving at different skip angles that caused the amount of directivity change noted when the array was "rotated" to increase or decrease. On some bands, under certain conditions, the directivity seemed to switch from off the ends of the wires to perpendicular to the side of the antenna. I have seen this same condition with about every type HF antenna I've used at some time or the other. But the array was still directive, and that's what counted as far as I was concerned.

Was this project finally finished? Oh, no! I wanted to make just one more modification before calling it "quits." I wanted to add two more identical length wires to the system to allow just a bit more "resolution" to the array's directivity. Besides, everything was already in place, as I had installed extra relays and other components in the rotor unit "just in case." All I had to do was add some extra switch contacts in the control unit and string up two more wires between the "rotor unit" and some handy trees that would allow me to switch direction in increments of 45 degrees rather than 90 degrees. (Remember back when I advised you to allow for system expansion when running the control cable out to the tuner?)

Was it worth installing these two extra wires? I think so. Would it be worthwhile to have more than four "legs"in the array? I don't believe it would, as the beamwidth of each leg is not that narrow. Of course, you can add as many as you like as long as each horizontal span is the same length. There is always room for experimentation when it comes to amateur radio and aerials!

The "rotor" unit is constructed in (what

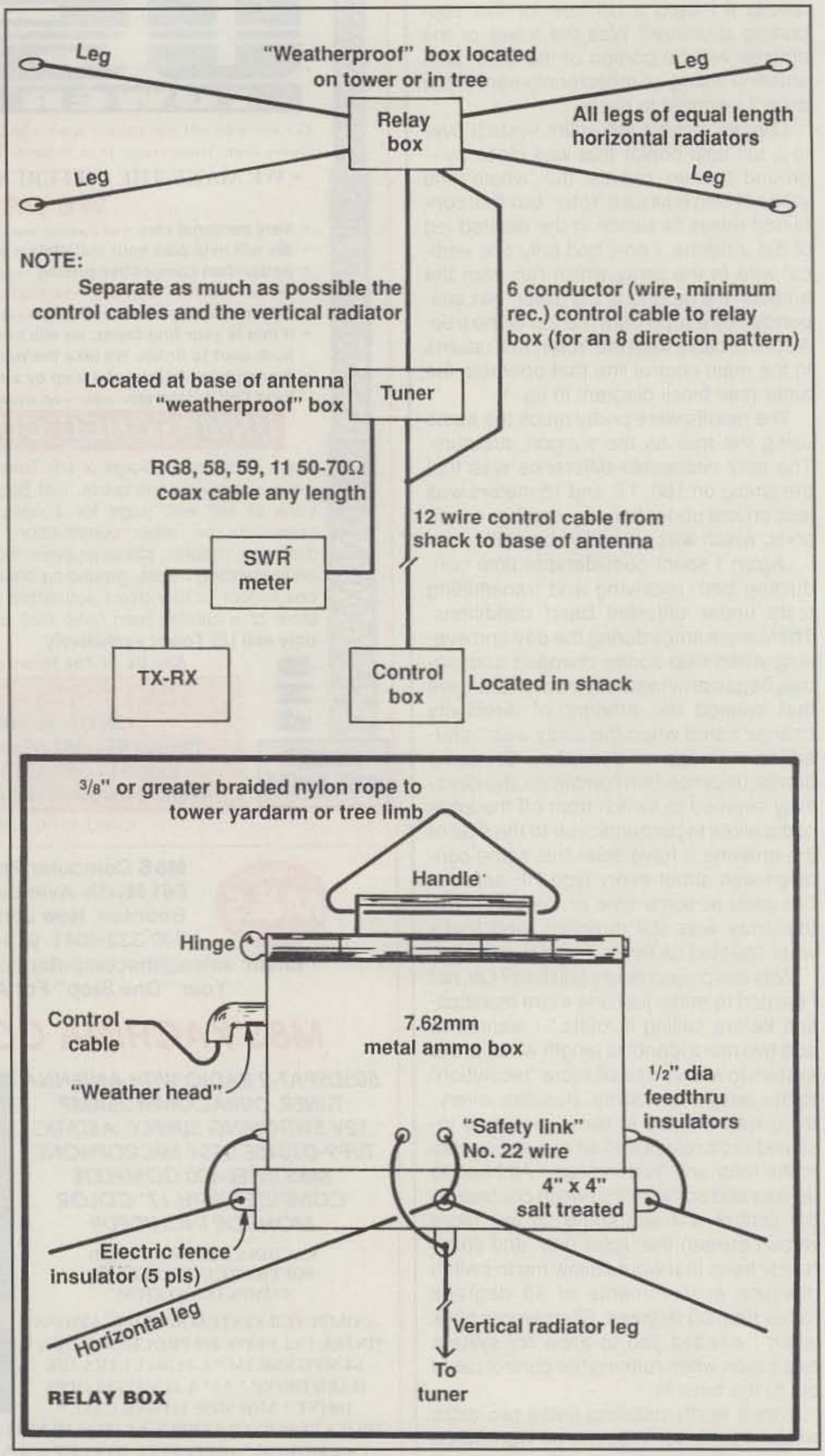


Fig. 1– A block diagram of the final-version multi-band, directional wire antenna. At the bottom is a general mechanical view of the ammo box reconfigured as the relay box.

else) a 7.62 mm metal ammo box. This somewhat smaller box is sufficient to house the relays which are located inside. The ammo box is attached to a box-length piece of "salt-treated" 4" × 4" wood post using six 1 1/2" wood screws through the bottom of the box. To the 4" × 4" wooden post are attached (as in my model) five heavy-duty porcelain electric fence-post insulators, the type with a long

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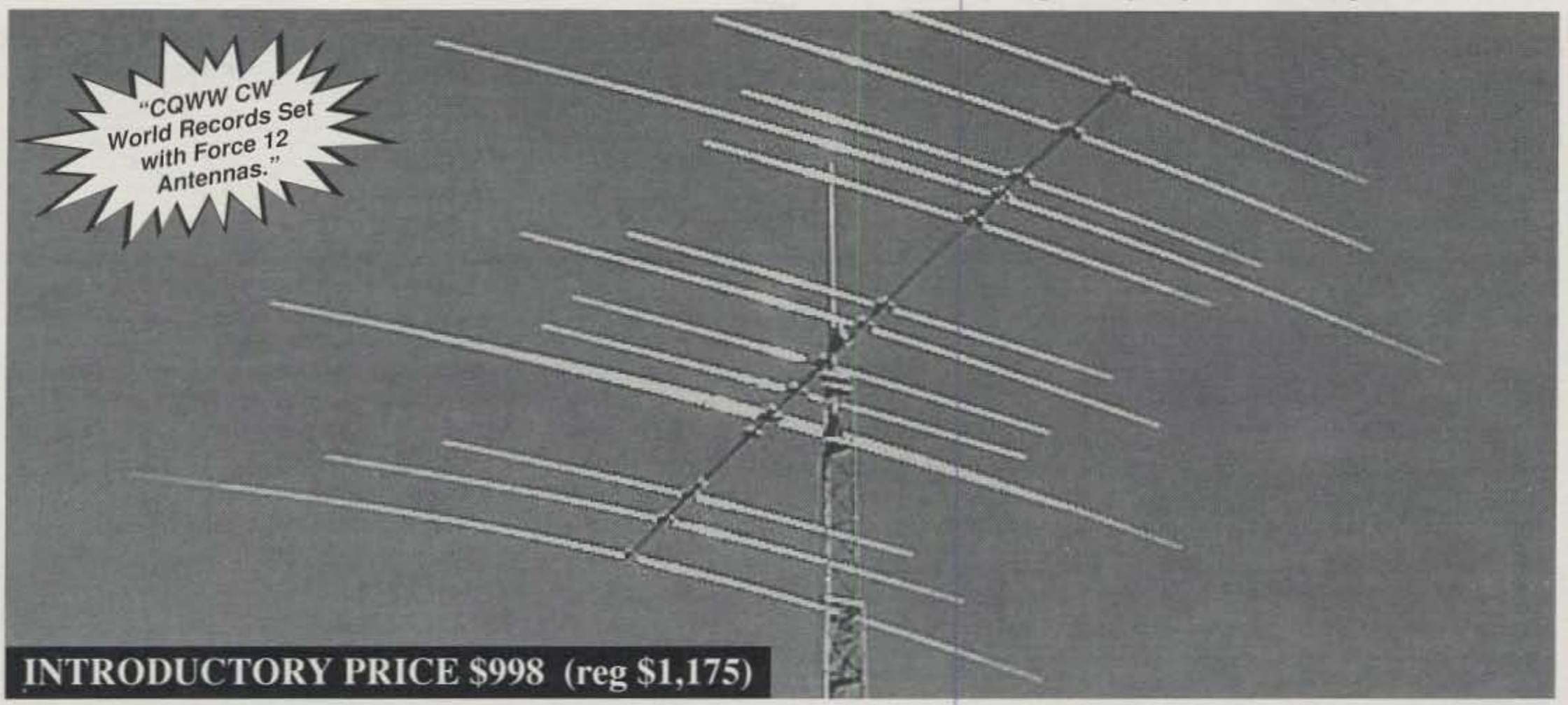

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6Y2A set a new Multi-Multi CW World Record using all Force 12 antennas, primarily verticals. This is especially impressive, as it is from a 2-point country, with 18,000 QSO's (on CW!!).
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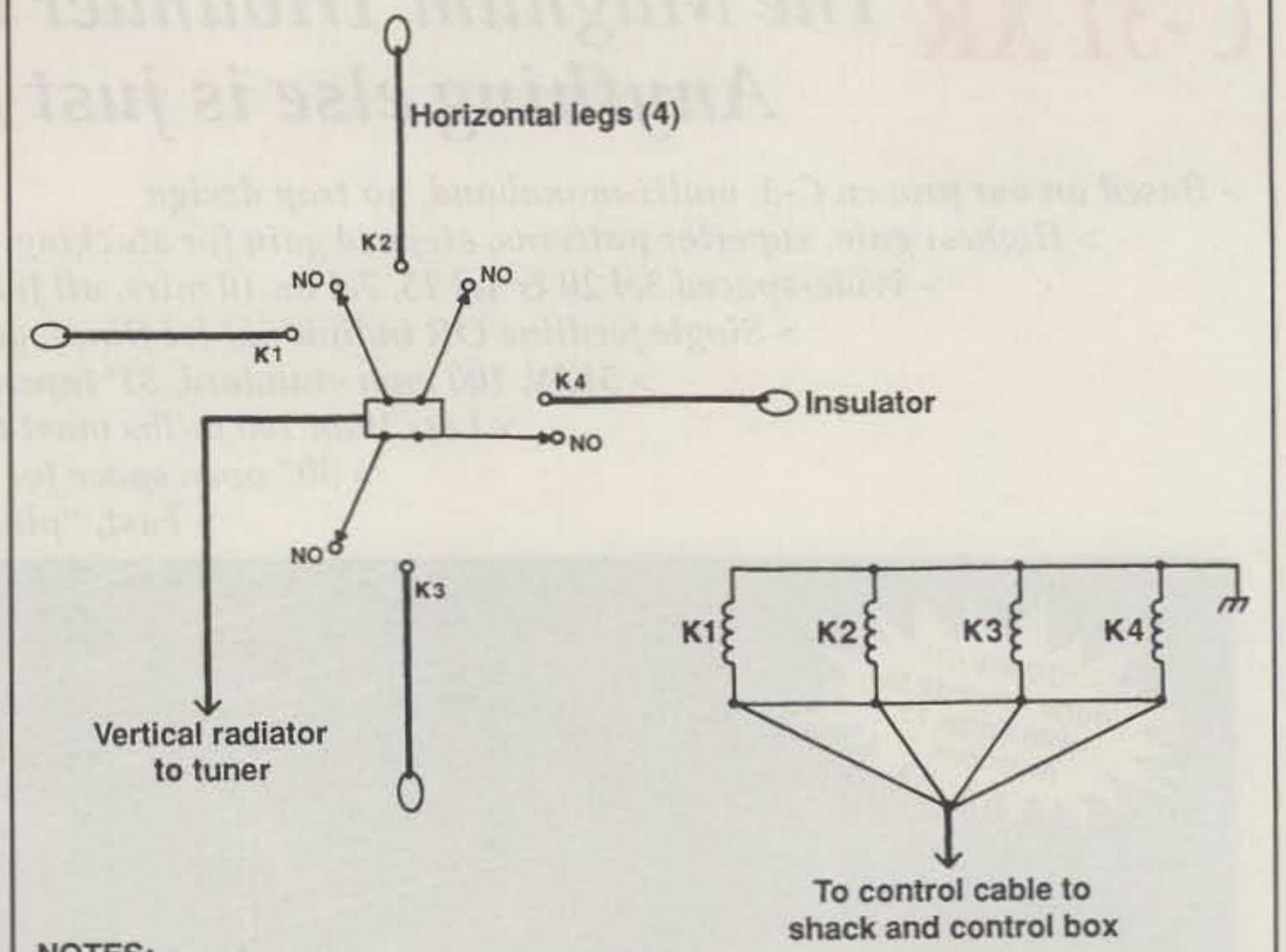

NOTES:
1. All relays: Midtex model #296-11B300 sold by Hosfelt Electronics (Ohio) as Cat. No. 45-556 12V DC coils @ 35mA. Contact ratings: 10A @ 250V AC.
2. Relays shown in the "relaxed" or power off configuration.
3. Never transmit while switching relays.
4. Any number of relays and horizontal legs may be used.

Fig. 2– The basic wiring diagram for the relay box. The idea can be expanded to accommodate any number of horizontal legs.

wood screw in one end, one insulator on each side of the post, and one on the bottom. These insulators can be obtained from most farm-supply outlets at a minimal cost. The wooden post serves to take the lateral stress of the horizontal legs off the metal box, thus preventing the box from becoming out of shape and subsequent water leaks. One horizontal leg attaches to each of the side-mounted fence-post insulators, and the vertical wire from the tuner will attach to the bottom insulator.

Above each of the five fence-post insulators, on the sidewalls of the ammo box about 1 to 2 inches from the junction of box and post, mount five feedthrough insulators. These can be the smaller size, perhaps 1/4 to 1/2 inch in diameter, if that's what's handy. A short piece of insulated No. 22 stranded (for flexibility) hookup wire is used to connect between the horizontal wires where they attach to the fence-post insulators and the corresponding feedthrough insulator on the metal box. The purpose of this jumper wire is to act as a "safety link" in case one of the fence-post insulators should, for whatever reason, break or pull out of the wooden post. The safety link will break (hopefully), preventing damage to the feedthrough insulator, side of the metal box, or the contents of the box.

All that is housed in the "rotor" box is the switching relays. These are mounted "upside down," with their pins accessible, to a piece of PC or "proto" board using quick-drying epoxy cement or "Super Glue." The PC or "proto" board is mounted, using 1 inch porcelain standoff insulators, to one of the two longer sides of the box. This will allow ready access to the board for final wiring of the relays or for maintenance later.

The relays should be mounted to the board in such a manner as to minimize the length of interconnecting wiring, which can also be No. 22 stranded, insulated hookup wire for flexibility. The relays used in this unit are the Midtex model number 296-11B300 which have contact ratings of 10 amperes @ 250 VAC. They are designed to operate from 12 VDC @ approximately 35 milliamperes. They are encapsulated units which should help prevent moisture from being a problem.

The rotor box is wired so that each horizontal leg has its own relay, so order accordingly, and some *spares*. These relays can be had from Hosfelt Electronics

Inc. of Steubensville, Ohio (800-524-6464 or 888-264-6464). They are listed as catalog item No. 45-556 and sell for $1.99 each plus shipping (see fig. 2).

The multi-conductor control cable, which should contain at least six wires, is brought into the "rotor" unit through a homemade "weather head." It is made using a 1/2 inch copper water-pipe "elbow" soldered to a 2 inch square piece of 14- or 16-gauge brass shim-stock with a 1/2 inch hole in its center. The weather head, with the elbow pointed toward the bottom of the box, is attached to one of the shorter side walls of the metal box about 2 1/2 inches below its top rim over a corresponding 1/2 inch diameter hole drilled in the box using either 8-32 or 10-32 galvanized machine screws. A cable strain-relief clamp is mounted inside the box using one of these screws to anchor it and the control cable securely. Leave enough slack inside the box to make the connections to the relays.

Once this circuitry is checked out and before the box is hoisted aloft, you can seal the end of the weather head with caulking or whatever you have to keep moisture out. It is also a good idea to make a "drip loop" in the control cable and then attach it securely to the rope that will support the ammo box. This rope, which should be of good-quality braided nylon or other material that does not deteriorate when used outdoors, should be no smaller than 3/8 inch in diameter—with 1/2 inch diameter being preferred. The rope is attached to the ammo box lengthwise through its handle. A pulley and counterweight should be used with the rope supporting the rotor box. This is especially true if you are using a tall tree to support the box.

After the ammo box is hoisted aloft and secured, the horizontal legs of the antenna can be run to their supports. I highly recommend using pulleys and counterweights on all wire antennas regardless of the type of structure used for support. It saves a lot of hard work and dangerous climbing, permits a good deal of slack to be taken out of the wire span (increasing its height above ground), and helps prevents wire failure due to adverse weather conditions.

It would be great if all of the horizontal legs of the array could be at the same height above ground. Unfortunately, in the real world we have to use whatever is handy for support.

Try to keep these outer ends as high as possible, although they all do not have to be the same height. In my array some of the horizontal wires slope down from the rotor box, which is located 55 feet above the ground, to pine trees that are only 25 feet in height. When switching from one leg (direction) to another, I seldom have to retune. This might not be the case if, in your array, the ends of the wires come down closer to the ground at different levels. This is due to the same effect you get when using an "inverted Vee" with its ends near the ground. (It makes the antenna "electrically" longer, in effect lowering its resonant frequency.) Let me stress again, *all horizontal wires must be the same length.* If you find your wire a bit longer than the distance from the rotor box to the that wires' support structure, you can shorten up the wires' span where it connects to the insulator, letting the excess length hang vertically. **Do not cut off the excess wire!**

Keep one thing in mind when switching in the different legs to change direction of the array—**Do not switch directions while you are transmitting! It will ruin the relay contacts quickly.**

I have used these relays with more than 500 watts of power under periods of high temperature, humidity, and heavy icing without any problems. Be careful, have fun, and enjoy the benefits of a multi-band directional aerial! ■

Results of the 1998 CQ/RJ WW RTTY DX Contest

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

This year conditions caused things to improve by a very large margin. New world records were set in almost all categories. It sure is nice to see good conditions again! The level of activity from all parts of the globe grew, bringing a new record number of participants in the contest, with over 600 logs received.

In these results some of you will notice changes in the scores you submitted. With new methods of checking logs, typos, broken calls, the wrong zone, states, etc., are much easier to catch. For this reason I remind you to **check your logs before you send them in.**

I arrived home on the Monday just after the 1998 CQ/RJ WW RTTY DX Contest to find quite a few logs already submitted for checking. Some were quite large. Contesting software is only a tool for you to use during the contest, and naturally software writers try to write mistake-free software. It's still your responsibility to check your log for mistakes, typos, etc.

In the past it was easy for log checkers to let slip by calls that were listed in logs in the wrong state, etc. Nowadays these mistakes are caught much more easily. If K7WM was worked and logged as a Montana contact, log-checking software will know K7WM is almost always in Arizona. We also check other logs to see if he changed QTHs for this contest or we may even check with him if we can't find his call in any other logs. However, in this case he was sitting next to me in Texas in this year's contest. It stuck out like a sore thumb. As my dear old Pappy used to say, "It ain't gonna work anymore." Plus we check that log much more closely, looking for other things.

With large numbers of logs coming in as they are these days, and checking these logs in time to get results back to the magazines for print, I'm sure it won't be much longer before printed logs will be used as check logs only. Printed logs take three times the amount of time to check as compared to e-mailed logs. Over 90% of the logs are sent via e-mail or on disk. We are going to have to do something sooner or later.

JA1BWA, a 21 MHz entry from Japan.

We have received numerous comments about how nice the CQ/RJ WW and CQ/RJ WPX plaques look. We will keep these plaques as you requested. The only additions will be both the *CQ* magazine and *The New RTTY Journal* logos will be on both plaques.

Single Operator Category

Single Operator High Power (SOH): First and second place both topped two million points, with the next seven slots all being over one million points. I'm sure it's safe to say that logs with only one million points won't take top seating anymore. Eddie, FG5BG (Opr: EA3NY), took the world plaque and set a new world record in the SOH category with 2000 QSOs and a final score of 2,617,904. Nice job, Eddie. In second place, and not very far behind the leader, was last year's winner, Alejandro, XQ8ABF, with 1807 QSOs and a score of 2,342,141, picking up the South American plaque and setting a new SA record. Third place went to Vitaly, UXØZ (Opr: UTØZZ), with 1471 QSOs and 1,926,768 points, picking up the Europe plaque and setting a new European record. Romeo, UN5PR, took the Asia plaque and setting a new Asian record with 1114 QSOs and a score of 1,344,966. John, VA3MM, picked up the North American plaque with 958 QSOs for a score of 977,262. Dave, N2DL, grabbed the USA plaque with 924 QSOs and 891,240 points. Larry, AH8GL, won the Oceania plaque with 661 QSOs and a score of 461,244.

Single Operator High Power Assisted (SOA): Nick, EMØI (Opr: UTØIZ), decided to get very serious this year and finished over half a million points ahead of everyone in the Assisted category. Nick finished with 2016 QSOs for a score of 2,544,066, picking up the world plaque and setting a new world record in the SOA category. Real nice job, Nick. In second place was Branislav, OM5M, who won the Europe plaque and set a new European record as well with 1439 QSOs for a score of 2,020,607. In third place was (normally "Mr. 40 Meters") Barry, W2UP, who took

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the North America plaque and also set a new NA record with 1465 QSOs and 2,014,608 points. Hiro, JS3CTQ, took the Asia plaque with 1082 QSOs and a score of 1,196,800. Jack, W9MU, won the USA plaque with 731 QSOs and a score of 641,277.

Single Operator Low Power (SOL): The world plaque went to Luis, CE8SFG, with a score of 1,561,751 and 1031 QSOs. North America went again to Jody, VP5JM, a regular in the CQ WW RTTY since its inception. She made just over 1300 QSOs and a final score of 1,298,460. Dick, N1RCT, put in a great effort, making 1150 contacts and winning the USA plaque with a score of 1,258,254. Oceania was won by Rolando, DU3RCM, with a score of 314,339 with 506 QSOs, which is a great effort from Oceania. Gellens, F5NBU, took the Europe plaque with a score of 1,085,580, and RZ9WZ won Asia with 1102 QSOs and a final score of 1,049,510.

Single Band 28 MHz: Rodrico, PW2C (Opr: PY2KC,) took the 10 meter plaque with 801 QSOs and a score of 323,058, setting a new 10 meter record. Congratulations, Rodrico. In second place was Nestor, LU6AM, with 645 QSOs and 251,520 points. In third place was Carlos, LW9EPB, with 753 QSOs and a score of 205,068. The top six 10 meter stations all were above the old world record. Looks like 1999 will be a big year for 10 meters!

Single Band 21 MHz: Nikola, 9A5W, picked up the 15 meter plaque with 800 QSOs and 371,664 points. Second place went to Luca, IY4W (Opr: IK2NCJ), with 887 QSOs and a score of 367,744. In third place was Antonio, CT1DVV, with 775 QSOs, score 281,634.

Single Band 14 MHz: This category went to last year's second-place winner, Zelimir, 9A2DQ, who took the 20 meter plaque with 912 QSOs, score 376,950. Second place went to Johan, ON4ANT, with 802 QSOs for a score 324,162. Third is Fabio, IT9GSF, who had 790 QSOs and a score of 307,314.

Single Band 7 MHz: Juan, EA8PP, took the plaque, setting a new 40 meter record with 529 QSOs and a score of 212,220. Congratulations, Juan. Second place went to Stjepan, 9A8A, with 574 QSOs and 164,000 points. In third place was Peter, HA2SX, with 444 QSOs and 114,777 points.

Single Band 3.5 MHz: Zdravko, 9A9A, took the plaque with 336 QSOs and 50,850 points. Second place went to José, CT1AOZ, with 217 QSOs and 36,150 points. Third place went to Dane, S57CQ, with 254 QSOs and a score of 27,030. All 80 meter logs submitted complained about band conditions this year.

Multi-Operator Category

Multi-Operator High Power (MOH): This

1998 CQ/RJ WW RTTY DX CONTEST PLAQUE WINNERS

Single Operator, High Power (SOH)

World: Sponsored by Dunestar Systems. Winner: **FG5BG (Opr: Eduardo Stark, EA3NY).**
USA: Sponsored by NA4M. Winner: **David Lemm, N2DL.**
North America: Sponsored by TG9VT (by K1RY/W2JGR). Winner: **John Hutchison, VA3MM.**
South America: Sponsor Elmers plaque by N3KW. Winner: **Alejandro Fernandez Anichich, XQ8ABF.**
Oceania: Sponsored by HamStuff by W7NN. Winner: **Larry Gandy, AH8GL.**
Africa: Open.
Europe: Sponsored by Hal Communications Corp. Winner: **UZØZ (Opr: UTØZZ)**
Asia: Sponsor N5JJ Memorial (by K5AAD). Winner: **Romeo Loparev, UN5PR.**

Single Operator, High Power (SOA)

World: Sponsored by *CQ* magazine. Winner: **Nick Mikitjuk, EMØI.**
USA: Sponsored by RTTY by WF1B. Winner: **John Hudson, W9MU.**
North America: Sponsored by K1AM. Winner: **Barry Kutner, W2UP.**
South America: Sponsored by Great Lakes DX & Contest Club. No Entry.
Oceania: Open.
Europe: Sponsored by *The New RTTY Journal.* Winner: **Branislav Panak, OM5M.**
Asia: Open.
Africa: Open.

Single Band

World 10 Mtrs: Sponsored by N1JJ, Johnson Joules Contest Club. Winner: **Rodrico Isola Tarikian, PW2C.**
World 15 Mtrs: Sponsored by W4DC & KA4RRU. Winner: **Nikola Percin, 9A5W.**
World 20 Mtrs: Sponsored by JH1QDB. Winner: **Zelimir Klasan, 9A2DQ.**
World 40 Mtrs: Sponsored by Tri-County DX Assoc. Winner: **Peraza Rodriquez, EA8PP.**
World 80 Mtrs: Sponsored by N3NC. Winner: **Zdravko Balen, 9A9A.**

Low Power, All Band

World: Sponsored by Amateur Radio Trader. Winner: **Luis Prado Nunez, CE8SFG.**
USA: Sponsored by *The New RTTY Journal.* Winner: **Richard Stevens, N1RCT.**
North America: Sponsored by N1RCT. Winner: **Jody Millspaugh, VP5JM.**
South America: Open.
Oceania: Sponsored by K2YG. Winner: **Rolando Mallari, DU3RCM.**
Africa: Sponsored by W4WX. Winner: **Antonio Gutierrez Ramirez, EA9JZ.**
Europe: Sponsored by AA5AU. Winner: **Gellens Yann, F5NBU.**
Asia: Sponsored by KD6WW. Winner: **Ural Abdulins, RZ9WZ.**

Multi-Single High Power

World: Sponsored by Amateur Radio Trader. Winner: **HC8N (Oprs: N5KO, W6OTC, K6AU).**
USA: Sponsored by WriteLog for Windows (by K5DJ). Winner: **K4QD (Oprs: KD4HHF, KE4MMI, KT4DI, KT4FY, PA3DPO, WA4HDS, WT4I).**
North America: Sponsored by GØAZT. Winner: **K5DJ (Oprs: K5DJ, K7WM, WS7I).**
South America: Sponsored by The Florida Boys. Winner: **LT1F (Oprs: LU1FKR, LU3FZW, LU5CW, LU5FHM, LW1DX).**
Oceania: Sponsored by K6CT. No Entry.
Europe: Sponsored by K5DJ/K7WM. Winner: **YL8M (Oprs: YL2KL, YL2KA, YL2KF, YL3DW, YL3GDJ, RZ3BW).**
Asia: Sponsored by WB8RPK. Winner: **XX9TYD (Oprs: K8PYD & WB8YJF).**
Africa: Open.

Multi-Single Low Power

World: Sponsored by Hal Communications Corp. Winner: **P40RY (Oprs: WF1B, GØAZT, KA1JGB).**
USA: Sponsored by Platinum Coast Amateur Radio Society. Winner: **K5ED (Oprs: K5ED, K5VI, K9RU).**
North America: Sponsored by AA5AU/GØAZT. Winner: **KE1FO (Oprs: KE1FO & K1TTT).**
Oceania: Open.
South America: Open.
Europe: Sponsored by Euraf Communications, Benin (TY1PS). Winner: **RK3AH (Oprs: RK3AH, RK3AW, RV3BA, RK3AWL, UA3QDX).**
Asia: Open.
Africa: Open.

Multi-Multi

World: Sponsored by *CQ* Magazine. Winner: **W3LPL (Oprs: NO2T, N3OC, NE3H, N3UN, K3MM, ND3F, N8YYS, W2GG, K4GMH, N3KTV).**
North America: Sponsored by *The New RTTY Journal* . Winner: **VE7CFD (Oprs: VE7CFD, VE7SOD, VE8SZ, VE7ON).**
Europe: Sponsored by W3LPL RTTY Contest Group. Winner: **RW2F (Oprs: RA2FA, RN2FA, UA2FB, UA2FF, UA2FM, UA2FX, UA2FZ).**

Rodrico, PY2KC, operator of PW2C, top score world 28 MHz.

year's Multi-Operator HP category was quite interesting. We had one slam dunk and the rest were pretty close. This year's winner was the slam dunk crew of HC8N, who took the world plaque with ease and set a new world record, breaking the old record by almost a million points. HC8N had 2580 QSOs and 4,384,908 points. Congratulations to the HC8N crew. An outstanding job, fellows. In second place was YL8M, who picked up the Europe plaque with 1751 QSOs and a score of 2,383,107. Third place went to I2EOW with 1579 QSOs and 2,288,387 points. LT1F took the South America plaque with 1689 QSOs and 2,248,092 points. K5DJ grabbed the North America plaque with 1697 QSOs and a score of 2,130,278. The Florida Boys made a showing this year using the call K4QD, picking up the USA plaque with 1569 QSOs and 1,763,320 points. XX9TYD earned the Asia plaque with 923 QSOs and 681,392 points.

Multi-Operator Low Power (MOL): Ray, WF1B, joined by his wife, Suzanne, KA1JGB, and Eddie, GØAZT, put in a huge effort and won the world with 2313 QSOs and 3,741,387 points. Al, KEFO, and Dave, K1TTT, teamed up and won the North America plaque with a final score of 1,070,831, making 1028 QSOs in the process. K5ED teamed up with K5VIO

Roberto, IK1DFH, a SOL entry.

TOP SCORES

SINGLE OP HIGH POWER

FG5BG	2,617,904	UN5PR	1,344,966
XQ8ABF	2,342,141	YU7AM	1,232,840
UXØZ (Op:UTØZZ)	1,926,768	RX3DCX	1,099,956
		SP6YAQ (Op: SP6NR)	1,058,841
ERØF (Op: UXØFF)	1,842,515	VA3MM	977,262
DL5AXX	1,838,720		

SINGLE OP LOW POWER

CE8SFG	1,561,751	F5NBU	1,085,580
LU3HY	1,360,836	RZ9WZ	1,049,510
VP5JM	1,298,460	NX4W	889,575
LU5VV	1,258,864	EA9JZ	813,696
N1RCT	1,258,254	DL2ZAE	703,832

MULTI-OP HIGH POWER

HC8N	4,384,908	TM1C	2,187,634
YL8M	2,383,107	RM6A	2,137,820
I2EOW	2,288,387	K5DJ	2,130,278
DL6RAI	2,251,470	LZ5W	1,885,926
LT1F	2,248,092	K4QD	1,763,320

MULTI-OP LOW POWER

P40RY	3,741,387	OL5Q	966,896
KE1FO	1,070,831	LZ9A	792,512
RK3AH	1,049,016		

SINGLE OP ASSISTED

EMØI (Op: UT2IZ)	2,544,066	UA6LO	1,880,840
		DK3GI	1,602,325
OM5M	2,020,607	DF3CB	1,316,612
W2UP	2,014,608	JS3CTQ	1,196,800

3.5 MHz

9A9A	50,850	S57CQ	27,030
CT1AOZ	36,150		

7.0 MHz

EA8PP	212,220	HA2SX	114,777
9A8A	164,000		

14 MHz

9A2DQ	376,950	G8G (Op: GØNUP)	237,728
ON4ANT	324,162		
IT9GSF	307,314	S53MJ	237,440
IT9STX	285,950	PT2BW	184,576
HC1JQ	281,792	US9Q	151,320
YU1NR	258,750		

21 MHz

9A5W	371,664	VE3XO	253,099
IY4W (Op: IK2NCJ)	367,744	S50U	251,379
		9A5Y (Op: 9A3LG)	243,022
CT1DVV	281,634		
UA4LCQ	268,647	LU8EKC	202,917
Z30M	266,832	DJ5JK	199,980

28 MHz

PW2C	323,058	LU8HWD	187,698
LU6AM	251,520	ZS6RVG	185,402
LW9EPB	205,068	9K2HN	161,816

MULTI-MULTI

W3LPL	4,193,775	RWØA	2,283,876
RW2F	4,102,650	VE7CFD	843,024
KH7R	2,850,391	SK6TY	356,979
HG1W/3	2,527,096		

and K9RU to win the USA plaque with a score of 499,772, just missing the half-million mark.

Multi-Multi (MOM): This year we received quite a few more logs in the Multi-Multi category. I might add, it was really nice to see more than three or four stations in this category. Let's keep it up! Once again this year's winning crew was superstation W3LPL, picking up the world plaque with 2869 QSOs and 4,193,775 points. Once again, job well done, fellows. Second place went to the crew of RW2F, who took the Europe plaque (I might add, the Europe plaque was sponsored by the W3LPL RTTY Contest Group.) with 2533 QSOs and a score of 4,102,650. Next was VE7CFD, who won the North America plaque with 982 QSOs and 842,024 points.

Summary

Thanks to all the participants. DXCC was possible to work in one weekend this year. We are not publishing the soapbox this year due to limited space with the WPX results in this issue also. Thanks to Gail at CQ who as always was a great help to us. See you all the last weekend in September for the next CQ/RJ RTTY WW Contest, September 25–26, 1999.

73, Roy, K1RY, and Ron, K5DJ

Soapbox Around the World

4X/TF1MM: My first time on RTTY; enjoyed it very much. *7K4QOK:* 20m was poor. I only got half of the points of last year. *9A6ACY:* Nice working easy operation; lots of ham spirit. *9A7P:* Very nice contest, my first CQWW, fun to work so many stations on RTTY. *9A9A:* 80m was very noisy and poor band conditions. *DF3CB:* The high bands were full of surprises!

DJ2OE: Had to work with damaged beam due to bad storm in DL land. *DJ6QT:* First time in a RTTY contest. I had to run low power due to lightning strike on amp. There is only one thing I will say: "Life is too short to run low power on RTTY." *EA7TV:* After five years QRT during contest for work, back with happiness. A fantastic contest. *EI4DW:* Thanks to the few NA stations who beamed over the pole to copy my weak signals. I enjoyed this contest! *F6IFY:* S & P with two radios is really a plus. *GU0SUP:* A very enjoyable contest. Nice to work so many on 10. *HA/W0YR:* Biggest thrill being called by XX9. *I0KHP:* Only 9 hrs operating. Had 1000 km train ride on Saturday from Bologna.

IT9ORA: Signals coming from everywhere. It was fun. *K5CWR:* This was my first RTTY contest. I saw a lot of plain old courtesy. *KA4RRU:* Orchestra auditions Saturday, kidney stones on Sunday, hope to be back next year. *KC6G:* I am hooked! See you next year. *KE1FO:* Great contest, increased score by 250K, thanks to all who worked us. *KO0ST:* Still a marvel to see the Old Model 15 in action. *LU3XQC:* My first RTTY contest. *LU5VV:* The first time in my life that I did more than 1000 Q's in a RTTY test. *LU8EKC:* Wind blew the antenna first day. After 6 hours of repair I returned. Again a great event.

LY2CG: Some strange propagation. Writelog worked without problems; nice software. *N0QT:* I am really hooked on RTTY. Thanks. *N2FF:* This was the most QSOs for me in any RTTY contest. I hope to break 1000 next year. *N6OJ:* My first RTTY contest. *NX4W:* My first contest with over a 1000 Q's. *OH0MZA/1:* Propagation was like a dream on Saturday morning. 10m was booming into Japan/Far East/USA/South America. *OH2LU:* Pleasure participating in this contest with great activity and for a change; all HF bands open long hours.

OK2PCL: My second CQWW; very good. See you next year. *PI4COM:* Second day conditions were great until 20Z. *SK4RY:* Very nice condx and many new stations in my log. *SN1I:* This was our worst contest this year; many problems. See you next year for sure. *SN7N:* This year was my best RTTY score yet. *VE3X0:* Signals coming in from every where. It was fun. *W1VXV:* First contest with a new HAL ST-8000 and 80 meter vertical; happy with both.

W6IWO: Lost amp on Saturday; no Europe without amp. Maybe next year. *W6KNB:* This was the best I have ever done in a CQWW RTTY test so far; with a new beam I know what it was like to run a freq. *W7GG:* Almost threw in the towel on Friday with A-index at 97. Things picked up and worked 46 mults with 61 QSOs. Lots of fun. *W9RY:* First in a RTTY contest since 1978. Sure a lot better than an old noisy machines. *WA8RPK:* Spent the day fishing and contesting. *WF5T:* The only benefit of having packet was finding XX9. *Z30M:* Strong winds Friday morning brought down all the antennas except the 15m 2-el quad. No Multi-Op for us.

Station Operators

DK0IU: DJ4KW, DJ6TK, DL2SWW. **DL6RAI:** DF7RX, DL2NBU, DL6RAI. **EA3BT:** EA3BT, EA3AOK. **F8KCF:** F6FNL, F6BXL, F4CFR, F5UAM, F1BGO, F1ADG & SWL Roxanne. **HA/W0YR:** HA5WE & HA/N9NC. **HC8N:** N5KO, W6OTC, K6AW. **HG1W/3:** HA3UU, HA1YA, HA1WD, HA1VQ, HA1FF, HG1DLZ. **I2EOW:** IK2CHZ, IK2PZC, IK2QEI, IK4MTF, I2EOW. **IK1HXN:** AF4Z, WT4I, AH8R, K4AW, K4PX, K4QD, KC4HW, IK1HSR. **IK2HKT:** I2IFT, IK2ANI, IK2CIO, IK2XPW, IK2YCN.

K4EA & KU4OZ. **K4QD:** KD4HHF, KE4MMI, KT4DI, KT4FY, PA3DPO, WA4HDS, WT4I. **K5DJ:** K5DJ, K7WM, WS7I. **K5ED:** K5ED, K5VI, K9RU. **K9OSH** & KB9OBQ. **KE1FO** & K1TTT. **KH7R:** KH7R, KH7U, KH6ND, WH6XR, KH7L, AH6R, AH6OZ. **KQ4QM** & KF4KL. **LT1F:** LU1FKR, LU3FZW, LU5CW, LU5FHM, LW1DX. **LZ5W:** LZ1MC, LZ2US, LZ5DB. **LZ9A:** LZ2NP & LZ2JE. **N7GC:** N7GC & KC7QJV. **N7IZM:** N7IZM, KC7SRK, KB7YEB, KB7YEE. **N7MB** & KC7V. **N9NCX:** KS9W, N9BR, N9NCX. **NG7M:** K07X, W7CT, NG7M. **OL5Q:** OK1HRA, OK1FFU, OK1INC.

P40RY: WF1B, G0AZT, KA1JGB. **PA3AQL** & PD0RSF. **PI4CC:** PA0VHA, PA3BAG, PA3EPD, PB0ATT, PB0AIU, PB0ALB. **PI4COM:** PA3BBP, PA3BWD, PA3ERC, PA3EWP, PA2FQA. **PY3MHZ:** PY3AFS, PU3AGP, PY3BZA, PY3MRZ, PY3PAZ. **RK2AH** & RK3AW, RV3BA, RK3AWL, UA3QDX. **RM6A:** RN6BN, RA6CO, RA6CM. **RW0A:** RA0AM, RU0AB, RU0AM, RU0AT, RV0AEV, RV0AR, UA0AGI, UA0ANW. **RW2F:** RA2FA, RN2FA, UA2FB, UA2FF, UA2FM, UA2FX, UA2FZ.

SK6TY: SM6FUD, SK6TY, SK6NP. **SN1I:** SP1MHV & SP1-304-KO. **TM1C:** F6CTT, F5ITK, F8AKS, F5TRO, F5PSG. **VE3FJB:** VE3FJB, VE3IJM, VE3VSM. **VE5RI:** VE5FN, VE5WI, VE6BBP, VE6EZ, VE6FW, VE6HMG, VE6VAC, Mason (son of VE6FW). **VE6RAJ:** VE6CKG & Carol. **VE7CFD:** VE7CFD, VE7SOD, VE8SZ, VE7ON. **W3LPL:** NO2T, N3OC, NE3H, N3UN, K3MM, ND3F, N8YYS, W2GG, K4GMH, N3KTV. **XX9TYD:** K8PYD & WB8YJF. **YL8M:** YL2KL, YL2KA, YL2KF, YL3DW, YL3GDJ, RZ3BW. **YU7AL:** YZ7EM & 4N7RGH.

Note: Following the call is the Class of Operation, Final Score, QSOs, Points, Zones, Countries, and US/VE. Winners are listed in boldface.

AFRICA

CANARY ISLANDS

EA8PP	**7**	**212,220**	**529**	**1,572**	**23**	**72**	**40**
EA8AG	**14**	**78,560**	**331**	**982**	**19**	**56**	**5**
EA8KK	28	22,977	112	333	13	28	28

CEUTA & MELILLA

EA9JZ	**SOL**	**813,696**	**837**	**2,496**	**59**	**210**	**57**

MADAGASCAR

5R8FU	SOL	8,536	77	194	17	26	1

SOUTH AFRICA

ZS6RVG	**28**	**185,402**	**467**	**1,394**	**28**	**72**	**33**
ZS2BWB	SOL	3,168	33	99	9	23	0

ASIA

ASIATIC RUSSIA

RWØA	**MOM**	**2,283,876**	**1,741**	**4,788**	**106**	**307**	**64**
RZ9WZ	**SOL**	**1,049,510**	**1,102**	**3,190**	**71**	**223**	**35**
UAØFZ	**SOA**	**534,972**	**613**	**1,636**	**88**	**192**	**47**
RAØFF	SOL	278,760	403	1,010	84	159	33
RA9MY	SOL	275,808	459	1,248	58	154	9
RZ9OU	SOL	103,968	461	456	65	149	14
RZ9CX	**14**	**23,188**	**134**	**374**	**15**	**44**	**3**
UAØFDX	21	16,348	85	244	18	29	20
RW9RF	SOL	10,230	60	155	22	44	0

GEORGIA

4L8A	**SOL**	**133,052**	**404**	**1,147**	**32**	**84**	**0**

HONG KONG

VR98BG	**SOH**	**457,240**	**724**	**1,633**	**75**	**167**	**38**
					(Opr: VR2BG)		
VR2KF	SOH	188,328	402	1,064	51	122	4

ISRAEL

4X6UO	**SOL**	**128,495**	**282**	**829**	**39**	**95**	**21**
4X/TF1MM	SOL	12,596	134	268	8	39	0

JAPAN

JS3CTQ	**SOA**	**1,196,800**	**1,082**	**2,992**	**92**	**223**	**85**
JE3UFF	**SOL**	**445,470**	**530**	**1,437**	**84**	**193**	**33**
JA1WSK	SOL	220,033	335	913	69	132	40
JA2BY	SOL	182,336	295	814	64	129	31
JH1OAI	SOL	173,264	260	728	72	150	16
JH5OXF	SOL	158,562	301	766	65	124	18
JH3SIF	SOL	129,823	244	659	59	122	16
JA2AXB	**SOH**	**120,120**	**229**	**616**	**64**	**109**	**22**
JR1KSK	SOL	97,650	222	525	65	104	17
JA3LDH	SOA	84,750	200	565	47	85	18
JH3CUL	SOL	72,210	168	435	57	102	7
7K4QOK	**14**	**60,384**	**198**	**544**	**26**	**68**	**17**
					(Opr: JR2BFN)		
JR4GPA	**21**	**56,781**	**247**	**701**	**20**	**55**	**6**
JA6CM	SOL	56,280	145	402	44	87	9
JH7AJD/1	SOL	52,920	150	378	48	75	17
JA1BWA	21	49,440	167	480	28	23	52
JA5FP	SOL	43,888	156	422	0	94	10
JA7KM	SOL	31,270	110	295	36	58	12
JA2KPV	SOL	29,041	96	257	51	52	10
JJ1VEZ	SOH	24,035	93	253	35	48	12
JA2HBK	SOL	19,089	68	189	36	53	12
JA3BSH	SOL	15,624	77	217	25	34	13
JA1YNE	SOA	12,780	70	180	26	33	12
					(Opr: JP1OGL)		
JR3PZW/1	SOL	9,316	51	137	24	36	8
JA3MIB	21	5,194	38	98	22	31	0
JA1SJV	28	4,400	41	110	15	25	0
JA2NNF	28	1,809	27	67	12	15	0
JF5FGY	14	1,170	17	45	11	15	0
JN1MSO	SOL	832	15	32	12	14	0
JM1NKT	28	820	18	41	8	12	0
JA2MOG	28	620	13	31	10	10	0
JI6JSD	28	160	7	16	5	5	0

JORDAN

JY9QJ	**SOH**	**623,210**	**708**	**2,030**	**72**	**202**	**33**

KAZAKHISTAN

UN5PR	**SOH**	**1,344,966**	**1,114**	**3,099**	**103**	**286**	**45**
UP6F	**SOL**	**124,168**	**278**	**748**	**49**	**114**	**3**
					(Opr: UN7FZ)		
UPØF	**21**	**21,471**	**169**	**421**	**14**	**37**	**0**

KUWAIT

9K2HN	**28**	**161,816**	**487**	**1,432**	**25**	**70**	**18**

MACAO

XX9TYD	MOH	681,392	923	2,302	75	173	48

SINGAPORE

9V8ZB	**SOL**	**363,200**	**625**	**1,600**	**59**	**149**	**19**

TAJIKISTAN

EY8MM	**SOA**	**419,250**	**626**	**1,677**	**67**	**170**	**13**

WESTERN MALAYSIA

9M2TO	**SOL**	**296,520**	**547**	**1,412**	**55**	**154**	**1**

EUROPE

AUSTRIA

OE1TKW	**SOL**	**7,980**	**61**	**105**	**27**	**49**	**0**

BELARUS

EW2CR	**SOL**	**574,190**	**725**	**1,714**	**88**	**205**	**42**
EW1EA	SOL	98,264	247	568	64	94	15

BELGIUM

ON4ANT	**14**	**324,162**	**802**	**2,001**	**28**	**83**	**51**
ON4CAS	**SOA**	**91,656**	**218**	**536**	**0**	**171**	**0**
ON4CBA	**21**	**84,032**	**305**	**808**	**18**	**43**	**43**
ON4KMB	**SOL**	**20,664**	**118**	**252**	**22**	**53**	**7**

BOSNIA & HERZEGOVINA

T91EZC	**SOL**	**90,922**	**228**	**538**	**49**	**100**	**20**

BULGARIA

LZ5W	**MOH**	**1,885,926**	**1,572**	**3,787**	**100**	**268**	**130**
LZ9A	**MOL**	**792,512**	**805**	**1,952**	**91**	**224**	**91**
LZ1CF	28	9,860	73	170	23	35	0
LZ4BU	SOL	1,540	19	55	13	15	0

CROATIA

9A6D	**SOA**	**954,930**	**920**	**2,290**	**84**	**216**	**117**
9A2DQ	**14**	**376,950**	**912**	**2,154**	**31**	**95**	**49**
9A5W	**21**	**371,664**	**800**	**2,088**	**34**	**93**	**51**
9A7P	**SOL**	**270,101**	**460**	**1,027**	**57**	**155**	**51**
					(Opr: 9A5AEI)		
9A5Y	21	243,022	546	1,438	30	89	50
					(Opr: 9A3LG)		
9A8A	**7**	**164,000**	**574**	**1,312**	**22**	**72**	**31**
9A9A	**3.5**	**50,850**	**336**	**678**	**12**	**50**	**13**
9A6ACY	SOL	10,266	82	177	14	37	7

CYPRUS

5B4AGE	**SOL**	**619,840**	**958**	**2,080**	**72**	**204**	**22**

CZECH REPUBLIC

OL5Q	**MOL**	**966,896**	**1,012**	**2,492**	**83**	**209**	**96**
OK1CM	**SOH**	**650,430**	**735**	**1,782**	**88**	**203**	**74**
OK2SG	SOH	369,600	471	1,120	85	197	48
OK2PCL	**SOL**	**258,960**	**400**	**1,040**	**57**	**141**	**51**
OK2BXW	SOH	211,091	353	841	67	143	41
OK2VWB	SOL	211,002	353	834	64	152	37
OK1BMW	SOL	84,249	143	333	156	97	0
OK2PMS	SOL	62,592	205	489	33	81	14
OK1DWC	SOL	34,983	126	299	38	70	9
OK2PDM	**21**	**34,689**	**143**	**373**	**21**	**53**	**19**
OK2BMC	SOL	29,997	139	297	26	56	19
OK1MP	**28**	**27,664**	**120**	**304**	**24**	**56**	**11**
OK1DKS	SOL	17,200	86	200	26	60	0
OK1CMN	21	11,685	82	205	16	26	15

DENMARK

OZ5MJ	**SOL**	**207,872**	**347**	**812**	**69**	**160**	**27**
OZ2ZB	SOL	33,390	118	265	40	76	10
OZ6TL	SOL	21,037	132	193	32	77	0

ENGLAND

G8G	**14**	**237,728**	**659**	**1,564**	**27**	**79**	**46**
					(Opr: GØNUP)		
GØPCA/1	**SOL**	**43,709**	**196**	**401**	**28**	**74**	**7**
GØMTN	SOL	41,124	190	276	30	74	45

EUROPEAN RUSSIA

RM6A	**MOH**	**2,137,820**	**1,658**	**3,845**	**115**	**335**	**106**
UA6LO	**SOA**	**1,880,840**	**1,580**	**3,617**	**111**	**307**	**102**
RX3DCX	**SOH**	**1,099,956**	**1,142**	**2,564**	**100**	**263**	**66**
RK3AH	**MOL**	**1,049,016**	**1,044**	**2,406**	**104**	**264**	**68**
UA6AHF	SOH	524,064	747	1,648	74	213	31
UA6AN	SOH	455,805	635	1,447	72	194	49
UA4LCQ	**21**	**268,647**	**780**	**1,803**	**30**	**90**	**29**
RA3BT	SOH	249,260	541	1,133	54	153	13
RA1AW	**14**	**72,944**	**339**	**752**	**21**	**57**	**19**
RA3BB	14	39,176	215	472	22	56	5
U1SE	SOL	29,128	159	331	23	63	2
RK3BY	SOL	27,132	145	323	22	62	0
UA3XBB	14	23,147	133	293	21	52	6

FINLAND

OHØMZA/1	**MOH**	**845,596**	**1,009**	**2,362**	**78**	**208**	**72**
OH2GI	**SOA**	**632,880**	**738**	**1,758**	**85**	**219**	**56**
OH2LU	SOA	417,600	571	1,305	78	210	32
OH3NGB	**SOL**	**139,293**	**335**	**737**	**51**	**128**	**10**
OH3KOK	SOL	51,520	183	448	36	76	3
OH2OM	SOL	30,067	123	281	35	72	0
OH5HCK	SOL	17,622	122	267	22	41	3
OH3RM	14	2,632	43	94	7	21	0

FRANCE

TM1C	**MOH**	**2,187,634**	**1,679**	**4,159**	**100**	**251**	**175**
F5NBU	**SOL**	**1,085,580**	**1,017**	**2,445**	**100**	**238**	**106**
F8KCF	MOH	500,472	650	1,512	74	190	67
F6IFY	**SOA**	**335,376**	**475**	**1,096**	**76**	**185**	**45**
F2AR	**SOH**	**203,875**	**400**	**875**	**61**	**149**	**23**
F5KDC	**MOL**	**151,463**	**353**	**793**	**40**	**108**	**43**
F5NZO	**21**	**78,648**	**264**	**678**	**23**	**66**	**27**
F/OK1EE	**7**	**60,896**	**347**	**692**	**17**	**58**	**13**
F5OZF	SOL	60,000	162	375	39	100	21
F5DXN	SOL	17,708	100	233	26	50	0
F6DZD	SOL	2,368	30	64	11	24	2

GERMANY

DL6RAI	**MOH**	**2,251,470**	**1,537**	**3,765**	**113**	**324**	**161**
DL5AXX	**SOH**	**1,838,720**	**1,404**	**3,536**	**105**	**271**	**144**
DK3GI	**SOA**	**1,602,325**	**1,205**	**2,995**	**114**	**289**	**132**
DF3CB	SOA	1,316,612	1,043	2,602	115	273	118
DKØEE	SOA	877,608	919	2,151	94	233	81
						(Opr: DL4MDO)	
DL4MCF	SOH	772,620	869	1,956	85	247	63
DL2ZAE	**SOL**	**703,832**	**728**	**1,814**	**86**	**215**	**87**
DJ6QT	SOL	611,420	635	1,609	90	231	59
DKØIU	**MOL**	**373,860**	**513**	**1,206**	**74**	**184**	**52**
DK3VN	SOL	373,451	535	1,249	71	177	51
DJ5JK	**21**	**199,980**	**470**	**1,212**	**33**	**85**	**47**
DL7VBJ	SOL	178,374	350	822	60	130	27
DJ2YE	SOH	153,081	315	699	59	143	17
DL1SWB	SOH	143,877	336	723	59	127	13
DL1JPL	SOH	135,340	289	670	51	121	30
DJ3NG	SOL	131,652	268	636	54	126	27
DL8SDC	SOL	129,117	263	669	52	101	40
DL3GA	SOL	96,950	223	554	29	97	49
DL6BE	SOL	95,049	244	537	49	117	11
DL1ARJ	SOL	93,781	215	491	57	117	17
DL3ARK	SOL	90,584	230	536	49	107	13
DK5MV	SOL	85,432	200	472	51	109	21
DL4MFP	SOL	83,237	200	517	43	80	38
DL6MDT	SOL	81,015	202	491	44	89	32
DL2HX	SOL	78,403	217	481	46	111	6
DL9FBS	21	63,210	235	602	19	50	36
DL2AL	SOL	57,816	194	438	35	80	17
DL3AYJ	SOL	57,183	170	389	39	93	15
DJ2OE	SOL	56,000	162	400	44	75	21
DL4RU	SOL	46,284	150	348	37	78	18
DLØDX	SOL	43,754	150	334	41	77	13
						(Opr: DK2OY)	
DL9NDV	21	41,642	172	443	23	44	27
DL5MFF	SOA	38,988	151	342	34	68	12
DL1EMH	SOH	33,108	103	267	42	63	19
DL9MBZ	**14**	**29,440**	**172**	**368**	**14**	**54**	**12**
DL2YAK	SOL	24,174	100	237	34	63	5
DK6CQ	SOH	22,795	87	235	33	44	20
DL4RCK	**3.5**	**22,207**	**230**	**419**	**8**	**38**	**7**
DJ9XB	28	11,977	72	203	19	30	10
DH7DJ	14	5,616	60	156	9	27	0
DL7ET	SOL	3,612	37	86	13	27	2
DL7MAE	SOL	3,600	37	80	19	26	0

GREECE

SV1DNW	**SOL**	**212,443**	**463**	**979**	**55**	**147**	**15**

GUERNSEY

GUØSUP	**SOL**	**181,888**	**345**	**784**	**54**	**146**	**32**

HUNGARY

HG1W/3	**MOM**	**2,527,096**	**1,874**	**4,418**	**119**	**322**	**131**
HA3LI	**SOH**	**740,250**	**907**	**2,115**	**89**	**214**	**47**
HA5BSW	**SOL**	**656,214**	**786**	**1,833**	**87**	**216**	**55**
HA/WØYR	**MOL**	**590,292**	**748**	**1,726**	**80**	**206**	**56**
HA4YF	SOH	354,450	569	1,275	62	186	30
HA2SX	**7**	**114,777**	**444**	**981**	**23**	**70**	**24**

ICELAND

TF3BR	**SOL**	**116,983**	**433**	**893**	**24**	**97**	**10**

IRELAND

EI4DW	**SOL**	**98,088**	**233**	**536**	**49**	**113**	**21**

ITALY

I2EOW	**MOH**	**2,288,387**	**1,579**	**3,859**	**117**	**325**	**151**
IK2HKT	MOH	1,447,596	953	2,844	103	275	131
I1COB	**SOH**	**932,553**	**977**	**2,349**	**80**	**198**	**119**
IK1HXN	**MOL**	**745,324**	**829**	**1,916**	**83**	**230**	**76**
IY4W	**21**	**367,744**	**887**	**2,176**	**30**	**85**	**54**
						(Opr: IK2NCJ)	
I2HWI	SOL	232,224	422	984	53	140	43
IK1YLL	SOH	158,928	319	616	67	146	45
IK1DFH	SOL	136,077	307	677	46	131	24
IK6OIN	SOL	125,716	320	593	66	120	26
IK4WMH	SOL	101,612	211	532	53	103	35
IK1NEM	SOL	88,391	231	563	38	78	41
IK2DHU	SOL	79,826	205	478	48	90	29
IK3SSJ	SOL	78,900	251	526	34	95	21
IK4ZHH	SOH	71,188	226	481	56	92	0
IK2DPP	14	61,152	269	624	18	58	22
IK2XZB	SOL	60,214	160	374	48	92	21
I7PXV	14	52,922	258	563	21	56	17
IØKHP	SOL	50,410	143	355	39	69	34
IK7XCW	SOL	46,863	160	369	32	74	21
I4HRH	SOL	34,317	121	279	34	77	12
IK1GDC	SOL	33,925	125	295	39	73	3
IK2NCF	SOL	31,301	125	277	33	68	12
I7ICU	SOL	31,212	133	289	30	66	12
IK4YNR	SOL	23,647	94	221	32	67	8
IØZUT	SOL	20,696	83	199	30	58	16
IV3KSE	SOL	15,721	94	199	21	56	2
IK8WEI	SOL	14,268	68	174	33	33	16
IZ3BQT	14	12,485	108	227	11	39	5
IK2AUK	SOL	8,514	62	129	23	43	0

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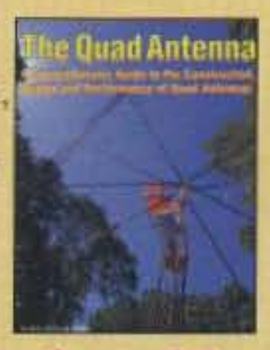

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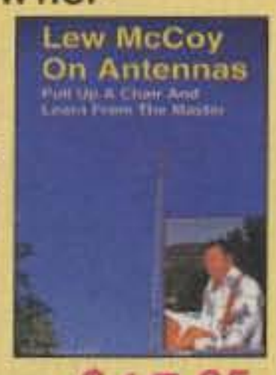

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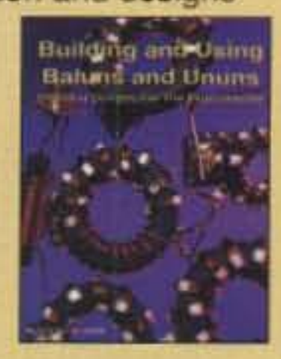

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ITU GENEVA

4U1ITU	SOA	282,880	463	1,105	60	143	53

KALININGRAD

RW2F	MOM	4,102,650	2,533	6,078	136	387	152

LATVIA

YL8M	MOH	2,383,107	1,751	4,159	120	341	112

LITHUANIA

LY2CG	SOL	140,295	308	705	58	117	24
LY4AA	14	102,190	414	929	21	61	28

LUXEMBOURG

LX1TO	SOL	433,672	595	1,436	68	177	57
LX1JH	SOL	15,433	126	253	18	43	0

MACEDONIA

Z30M	21	266,832	757	1,853	24	73	47
Z31GB	14	73,304	336	748	20	64	14

MOLDAVIA

ERØF	SOH	1,842,515	1,696	3,799	110	275	100
					(Opr: UXØFF)		

NORTHERN IRELAND

MIØBME	SOL	114,560	293	640	43	118	18

NORWAY

LA6MP	SOA	461,235	636	1,455	72	209	36
LA5TFA	SOL	126,063	367	783	33	110	18
LA7AJ	SOH	110,390	233	581	62	89	39
LA7CL	SOL	101,412	292	626	47	107	8
LA1PHA	SOL	6,156	52	108	17	39	1

POLAND

SP6YAQ	SOH	1,058,841	984	2,401	101	245	95
					(Opr: SP8NR)		
SN7N	SOH	656,640	732	1,710	98	238	48
					(Opr: SP7NMW)		
SP4TXI	SOL	331,643	565	1,261	61	173	29
SP2EWQ	SOL	304,876	473	1,066	72	183	31
SP9LKS	SOL	140,097	310	697	56	124	21
SP2UUU	SOA	102,869	234	533	47	126	20
SN1I	MOL	101,010	244	555	49	124	9
SP8FHJ	SOL	79,599	223	507	47	108	2
SP2EIW	SOL	68,586	185	426	54	93	14
SP3CUG	SOL	62,730	167	410	42	85	26
3ZØXR	SOL	60,060	180	420	43	88	12
SP3RBT	21	38,313	151	387	23	54	22
SP4BOS	SOL	17,200	103	215	20	60	0
SP4OZ	14	8,613	125	261	6	14	13
SP3JHR	14	5,408	70	169	8	24	0
SP2GNB	14	4,862	68	143	7	27	0
SP6NVK	SOL	4,182	45	102	14	16	11
SP2GWZ	SOL	3,616	49	113	15	14	3
SP1MHV	SOH	1,271	16	41	15	16	0

PORTUGAL

CT1DVV	21	281,634	775	1,929	28	70	48
CT1FRN	14	68,120	293	655	20	63	21
CT1AOZ	3.5	36,150	217	482	13	44	18

ROMANIA

YO3APJ	SOL	676,498	705	1,717	79	234	81
YO3JF	SOL	207,760	402	980	55	126	31
YO8FR	SOL	96,854	286	613	40	118	0
YO3FRI	SOL	73,944	259	468	47	111	0
YO5AY	SOL	9,734	67	157	17	40	5
YO5TP	14	8,235	100	135	16	35	10

SICILY

IT9GSF	14	307,314	790	1,897	32	85	45
IT9STX	14	285,950	690	1,634	35	87	53
IT9STG	21	136,502	441	1,042	27	70	34
IT9ENB	14	79,891	357	791	19	58	24
IT9JOF	SOH	64,972	181	439	36	81	31
IT9AJP	SOL	54,275	135	325	71	75	21
IT9ORA	21	609	24	29	5	10	6

SLOVAK REPUBLIC

OM5M	SOA	2,020,607	1,439	3,589	113	311	139

SLOVENIA

S56A	SOH	945,228	859	2,082	93	247	114
S58T	SOH	805,910	836	1,985	85	234	87
S57U	SOL	552,036	667	1,542	78	211	69
S50U	21	251,379	628	1,643	30	78	45
S53MJ	14	237,440	638	1,484	30	88	42
S55A	SOH	135,459	325	783	40	87	46
S51AY	28	105,705	315	783	31	60	44
S51DX	7	99,299	413	911	20	67	22
S57AW	SOL	94,380	262	572	34	112	19
S52SK	28	81,732	225	588	28	87	24
S57XX	SOL	73,920	199	448	44	104	17
S57NW	SOL	31,970	134	278	37	66	12
S57CQ	3.5	27,030	254	510	14	27	12
S54A	3.5	13,728	155	312	7	37	0

SPAIN

EA3BT	MOH	866,984	886	2,146	82	229	93
EA1MV	SOH	778,302	905	2,059	84	224	70
EA3RH	SOH	617,118	808	1,893	67	183	76
EA4CI	SOL	451,152	605	1,446	65	177	70
EA3BHK	SOA	430,140	535	1,340	72	175	74
EA1BAF	SOL	359,936	523	1,184	65	186	53
EA2ASB	SOH	357,084	558	1,308	57	158	58
EA7TV	SOL	330,225	547	1,275	53	139	67
EA3TB	SOL	328,848	507	1,209	59	153	60
EA3DUW	SOL	231,467	515	1,097	48	137	26
EA1AHA	SOL	113,032	249	568	45	124	30
EA7ALO	SOL	81,280	210	508	35	76	49
EA7FTR	28	76,788	394	948	21	60	0
EA2AKP	21	73,656	294	682	22	56	30
EA5AFH	SOL	63,558	184	321	44	110	44
EA2IA	21	60,162	203	542	21	48	42
EA3QP	21	42,400	230	530	14	43	23
EA5YJ	SOL	22,500	118	180	35	75	15
EA7ESH	21	21,516	212	326	16	50	0
EA4BNQ	SOL	16,632	90	198	22	55	7
EA7BDL	14	6,440	81	161	7	29	4
EA2SN	SOL	4,895	39	89	17	35	3

SWEDEN

SM5FQQ	SOH	940,443	989	2,357	91	236	72
SK4RY	SOH	683,436	863	2,022	73	208	57
					(Opr: SM4RGD)		
SM5FUG	SOH	382,540	532	1,234	75	190	45
SK6TY	MOM	356,979	611	1,337	66	175	26
SM3AFR	SOH	310,487	527	1,237	63	148	40
SM5GVR	SOH	248,611	454	1,067	56	144	33
SM6BSK	SOL	236,652	421	962	58	168	20
SM7BHM	SOL	180,061	397	887	47	129	27
SM7GXR	SOL	88,183	225	541	44	103	16
SM7ATL	SOL	72,600	208	484	40	96	14
SM5LNS	SOL	48,832	190	436	33	75	4
SL4ZAE	SOL	22,100	124	260	22	60	3
SM6NJK	SOL	12,342	86	187	22	42	2
SM7BUN	SOL	63	3	9	3	3	1

SWITZERLAND

HB9CRV	SOL	102,935	279	595	43	119	11
HB9DOD	SOL	65,395	201	451	38	91	16
HB9AWS	SOL	56,126	200	422	32	96	5
HB9HQX	SOL	30,870	140	294	27	76	2

THE NETHERLANDS

PI4COM	MOH	1,678,512	1,290	3,179	108	291	129
PI4CC	MOH	940,032	1,022	2,448	80	223	81
PI4EUR	SOL	266,500	469	1,066	61	155	34
PA3EMN	SOL	152,352	318	736	53	125	29
PA3EVY	SOL	107,322	239	577	50	106	30
PA3AQL	MOL	86,337	247	543	38	104	17
PA3GKT	SOL	58,374	181	423	39	72	27
PAØEHF	SOL	8,911	49	133	29	35	3
PAØJED	28	1,863	26	69	10	17	0

UKRAINE

EMØI	SOA	2,544,066	2,016	4,634	110	329	110
					(Opr: UT2IZ)		
UXØZ	SOH	1,926,768	1,471	3,516	116	310	122
					(Opr: UTØZZ)		
US9Q	14	151,320	559	1,261	26	78	16
UX1UA	SOH	130,380	414	615	54	158	0
UT7EF	14	17,862	151	229	20	58	0

WALES

GW5KHQ	SOH	593,928	705	1,752	69	169	101
GW4SKA	14	148,336	514	1,168	25	69	33
GW3JBQ	SOL	87,906	294	598	29	115	3
GW5NF	28	24,016	123	316	20	40	16
GW3YVC	SOL	4,046	55	119	10	14	10

YUGOSLAVIA

YU7AM	SOH	1,232,840	1,004	2,380	99	338	81
YU7AL	MOL	311,253	444	1,077	69	165	55
YU7AE	SOL	284,856	425	1,144	60	171	18
YU1NR	14	258,750	747	1,725	29	84	37
YU1BO	SOL	97,650	312	651	30	109	11
YU7KMN	21	29,600	144	370	16	24	40
YZ7ED	7.0	17,272	111	254	12	48	8
YU7YZ	21	7,315	54	133	12	30	13

NORTH AMERICA

ALASKA

AL7L	SOH	21,762	104	186	31	36	50

CANADA

VA3MM	SOH	977,262	958	2,431	81	181	140
VE7CFD	MOM	843,024	982	2,184	83	118	185
VE3FJB	MOH	629,280	703	1,840	74	169	99
VE5TR	MOH	479,297	700	1,603	61	110	128
VE3WQ	SOH	452,452	570	1,469	70	149	89
VE7AGJ	SOH	376,380	567	1,394	59	112	99
VA3DX	SOL	347,928	425	1,064	75	159	93
VE3XO	21	253,099	703	1,903	25	75	33
VE5RI	MOH	246,440	444	1,010	61	88	95
VE6RAJ	MOL	236,555	428	935	53	83	117
VE5CPU	SOH	175,340	358	797	50	77	93
VE7TLK	SOL	161,710	373	785	44	52	110
VE7BTO	SOH	113,344	281	616	45	56	83
VE2BOB	SOL	95,914	211	527	45	86	51
VE5SF	SOH	78,456	216	467	42	50	76
VE3BUC	SOL	72,420	221	510	30	61	51
VE2JR	SOL	45,902	152	389	29	67	22
VE1AOE	SOL	35,904	130	352	27	56	19
VE2AXO	SOL	29,280	114	305	28	53	15
VE6JY	14	14,140	75	202	22	36	12

CUBA

CO2KG	SOH	107,666	435	1,066	25	76	0
CO8LY	SOL	87,265	243	563	27	45	83

GUADELOUPE

FG5BG	SOH	2,617,904	2,000	4,996	85	232	207

MEXICO

XE2DV	14	88,704	409	896	18	32	49
XE1FES	28	72,409	345	703	18	41	44

PANAMA

HP1KZ	SOL	158,598	399	891	26	50	102

TURKS & CAICOS

VP5JM	SOL	1,298,460	1,315	3,230	61	165	176

UNITED STATES

W3LPL	MOM	4,193,775	2,869	6,213	121	329	225
K5DJ	MOH	2,130,278	1,697	3,403	116	280	230
W2UP	SOA	2,014,608	1,465	3,572	105	293	166
K4QD	MOH	1,763,320	1,569	3,391	94	236	190
N1RCT	SOL	1,258,254	1,150	2,589	85	230	171
KE1FO	MOL	1,070,831	1,028	2,293	89	228	150
N9NCX	MOH	1,008,432	1,022	2,256	94	213	140
K4EA	MOH	978,132	970	2,203	87	209	148
N2DL	SOH	891,240	924	2,122	83	212	125
NX4W	SOL	889,575	1,021	2,175	77	189	143
K2PS	SOH	874,499	878	2,029	84	206	141
N2FF	SOH	810,328	878	2,036	77	188	133
W7GG	SOH	641,752	888	1,654	83	141	164
W9MU	SOA	641,277	731	1,701	82	183	112
K8MM	SOH	606,760	757	1,576	78	172	135
K3KO	SOH	604,844	680	1,699	83	180	93
W2KI	SOH	543,444	686	1,518	68	167	123
K5ED	MOL	499,772	819	1,373	75	120	169
K4WW	SOH	466,140	621	1,371	78	160	102
KI6DY/Ø	SOL	454,599	772	1,341	67	126	146
K2YG	SOL	420,672	531	1,252	73	167	96
K5YAA	SOH	412,764	597	1,298	69	142	107
KQ4QM	MOH	407,875	535	1,255	81	153	91
K5ZD	SOH	406,722	544	1,279	64	157	97
ND5S	SOH	392,689	536	1,231	72	152	95
N7MB	MOH	355,020	618	1,164	74	121	110
WØWH	SOH	353,296	582	1,136	67	128	116
N6GG	SOH	349,798	499	1,073	80	138	108
KJ7TH	SOL	340,561	726	1,139	57	103	139
W3GG	MOL	307,338	502	1,086	64	129	90
WF5T	SOA	304,386	572	1,046	66	109	116
KØMP	SOH	287,970	3,270	993	55	113	122
NA4M	SOA	279,279	565	1,001	54	102	123
K8RS	SOH	269,552	440	991	62	133	77
KJ5SF	SOL	268,362	450	877	68	125	113
AG4W	SOL	262,542	451	893	64	123	107
WS1F	SOH	250,900	403	965	58	132	70
WBØBBY	SOH	247,748	460	964	56	117	84
N5XUS	SOL	247,084	554	892	60	95	122
KL7Q/4	SOL	236,130	369	926	59	110	86
W2JGR/Ø	SOH	229,880	341	821	57	109	114
N7UJJ	SOL	227,832	488	863	56	89	119
WO9S	SOA	224,664	367	814	67	127	82
KC1YF	SOL	221,400	400	900	50	117	79
W6ZL	SOH	209,484	407	759	67	90	119
W1VXV	SOL	200,460	331	780	63	124	70
NN6XX	SOH	199,329	459	807	56	85	106
W4LC	SOL	193,018	355	811	54	110	74
W8EB	SOL	189,230	319	745	64	119	71
KC4SAW	SOL	183,883	340	763	59	113	69
N3DL	SOA	157,400	291	787	52	120	28
N7GC	MOH	154,375	346	625	59	81	107
WA1EHK	SOL	149,110	308	806	42	104	39
WA8RPK	SOH	146,016	334	624	50	87	97
N6XJ	SOL	140,732	311	604	57	83	93
N8PS	SOL	140,220	261	570	64	114	68
N6VH	SOH	139,416	309	628	59	73	90
KR4U	SOL	132,510	300	631	55	99	56
N4SR	21	128,996	446	1,084	21	66	32
NG7M	MOH	124,392	351	584	47	64	102
KK5OQ	SOL	124,384	369	598	36	67	105
K1KU	SOL	123,578	255	637	48	107	39
AA7CP	SOL	119,777	359	497	52	61	128
W7NN	SOL	117,688	342	626	41	49	98
NA2M	SOH	115,227	268	531	50	89	78
AB8K	14	114,532	406	836	24	68	45
WØGJ	SOA	109,908	238	516	62	101	50
N5RXF	SOL	109,630	381	577	40	65	85
K1SM	SOH	109,494	308	711	31	82	41
W6KNB	SOH	109,052	289	548	48	68	83
AA9RR	SOH	108,254	251	479	57	86	83
K5CWR	SOH	101,504	208	488	48	61	99
K9RB	SOL	92,685	184	501	61	100	24
W3KV	SOH	90,000	183	500	51	101	28
KIØOLO	SOL	87,696	339	464	37	46	106
K4FPF	SOL	87,320	197	472	50	95	40
AE5P	SOL	87,162	272	438	44	59	96
W1EM	SOL	86,450	202	455	50	86	54
WB4UBA	SOH	86,289	200	587	42	44	61
W1BYH	SOL	84,611	205	401	54	80	77
AA7UN	14	82,560	396	645	23	57	48
WA6BOB	SOL	81,812	301	452	41	40	100
KC8BI	SOL	79,605	220	435	44	73	66
W6JOX	SOH	77,411	214	389	54	67	78
KF6BIR	SOH	76,728	231	417	47	59	78

KØBX	SOA	75,601	181	437	47	87	39
KK2M	SOH	75,046	197	478	45	76	36
N6OJ	SOL	74,226	194	417	52	68	58
WØML	SOH	72,600	168	440	49	92	24
N8PR	SOH	70,784	183	448	43	75	40
KE6YTT	14	69,440	370	560	25	51	48
K8VT	SOH	67,981	195	433	39	74	44
K8CV	SOL	67,735	171	437	43	84	28
K6HGF	SOL	62,834	262	353	36	36	106
N7IZM	MOL	61,950	184	350	46	62	69
W9RY	SOH	61,620	130	395	34	95	27
K8OSF	SOL	58,752	191	459	34	64	30
WDØBNC	SOH	57,904	159	376	44	75	35
K2QMF	SOL	57,816	168	396	37	74	35
KA8YQL	SOL	57,760	191	361	41	63	56
KIØBF	SOL	56,953	180	337	63	62	44
W9TY	SOL	54,872	151	361	47	73	32
KIØIV	SOL	54,579	169	339	38	64	59
W8IDM	SOL	50,100	159	334	41	65	44
W3MF	SOH	45,450	158	303	38	61	51
W3AG	SOA	45,080	117	322	48	79	13
WA1FCN	14	42,336	185	441	19	51	26
KØBJ	SOH	40,176	154	324	32	52	40
KC6G	SOL	37,752	150	264	39	43	61
WT3P	SOL	36,704	128	296	36	59	29
NM1W	SOL	35,432	119	344	31	68	4
W6CN	SOH	32,725	108	275	40	57	22
K9OSH	MOL	32,604	125	247	43	51	38
KA4RRU	**7**	**28,796**	**171**	**313**	**17**	**37**	**38**
AA2GS/4	SOA	28,792	157	244	32	38	48
W4JLS	SOL	28,304	123	244	34	47	35
AJ3M	SOH	27,522	142	278	20	39	40
WB9NOV	SOL	26,010	89	255	34	68	0
NØQT	SOL	22,386	95	182	44	44	35
ACØM	SOH	21,412	93	212	34	45	22
W9ISC	SOL	19,425	103	175	32	35	44
N2CQ	SOL	19,224	97	267	22	43	7
N3UE	SOL	18,042	98	194	26	36	31
KR4XM	SOL	17,766	76	189	30	48	16
K5HDU	SOL	17,496	90	162	32	36	40
NØIU	SOL	17,372	102	172	27	33	41
WØQDL	28	17,325	119	231	17	29	29
KK5CA	SOL	16,320	84	160	27	37	38
N7VGO	SOH	15,554	100	154	28	26	47
AD6EN	SOL	15,476	95	146	28	24	54
KC6AWX	SOL	15,379	107	169	28	31	32
KA5LGP	SOL	14,469	86	159	21	30	40
N3RC	SOL	12,665	73	149	26	34	25
NF6R	SOH	12,250	86	175	33	5	32
W6IWO	14	10,362	98	157	14	19	33
K7DSR	7	9,344	105	146	14	13	37
KOØST	SOL	9,035	52	139	20	36	9
KO2FB	SOL	8,748	63	108	24	27	30
K6CT	SOA	7,519	50	103	28	28	17
AC4HF	SOL	3,360	34	70	17	19	12
AAØCY	SOL	3,300	40	66	16	14	20
K7ED	SOL	1,739	22	47	15	14	8
N2ALE	14	1,683	30	51	9	9	15
W5AJ	3.5	380	13	19	5	4	11
W3ZF	SOL	306	10	17	7	6	5

OCEANIA

AMERICAN SAMOA

AH8GL	**SOH**	**461,244**	**661**	**1,938**	**52**	**69**	**117**

AUSTRALIA

VK4AXM	**SOL**	**5,300**	**35**	**100**	**21**	**30**	**2**

GUAM

KH2D	**SOH**	**47,736**	**155**	**442**	**39**	**67**	**2**

HAWAII

KH7R	**MOM**	**2,850,391**	**1,870**	**5,471**	**115**	**183**	**223**
KH6GMP	21	5,934	45	129	16	17	13

NEW ZEALAND

ZL2AMI	**SOH**	**132,581**	**231**	**673**	**62**	**99**	**36**
ZL2JON	**SOL**	**43,560**	**116**	**330**	**51**	**70**	**11**

PHILIPPINES

DU3RCM	**SOL**	**324,339**	**506**	**1,481**	**63**	**137**	**19**
DU1SAN	**SOH**	**21,318**	**63**	**187**	**35**	**63**	**16**

SOUTH AMERICA

ARGENTINA

LT1F	**MOH**	**2,248,092**	**1,689**	**4,866**	**88**	**232**	**142**
LU3HY	**SOL**	**1,360,836**	**1,256**	**3,708**	**72**	**163**	**132**
LU5VV	SOL	1,258,864	1,081	3,116	82	188	134
LU8FDZ	SOL	581,436	518	1,563	112	148	112
LU6AM	**28**	**251,520**	**654**	**1,920**	**22**	**64**	**45**
LW9EPB	28	205,068	753	2,229	23	69	0
LU8EKC	**21**	**202,917**	**484**	**1,419**	**27**	**71**	**45**
LU8HWD	28	187,698	539	1,526	20	56	47
LW7EIC	28	100,152	319	936	17	51	39
LU9HS	**14**	**61,304**	**233**	**632**	**19**	**36**	**42**
LU3XQC	14	1,628	29	74	6	10	6

ARUBA

P40RY	**MOL**	**3,741,387**	**2,313**	**6,693**	**91**	**245**	**223**

BRAZIL

PW2C	**28**	**323,058**	**801**	**2,341**	**25**	**67**	**46**
					(Opr:	PY2KC)	
PT2BW	**14**	**184,576**	**495**	**1,442**	**43**	**61**	**24**
PU2LCD	28	100,872	321	934	17	54	37
PY2MNL	**21**	**50,512**	**196**	**574**	**20**	**46**	**22**
PY3MHZ	MOL	11,592	57	161	22	22	28

CHILE

XQ8ABF	**SOH**	**2,342,141**	**1,807**	**5,287**	**75**	**204**	**164**
CE8SFG	**SOL**	**1,561,751**	**1,031**	**4,187**	**69**	**186**	**118**

COLOMBIA

HK3YH	**SOL**	**544,004**	**609**	**1,772**	**63**	**137**	**107**
5K3W	SOL	243,810	396	1,161	35	71	104
HK3SGP	SOL	129,048	288	849	23	58	71
HJ6VKH	**21**	**110,670**	**368**	**1,085**	**12**	**44**	**46**

EQUADOR

HC1JQ	**14**	**281,792**	**642**	**1,904**	**25**	**71**	**52**

FALKLAND ISLANDS

VP8CEH	**SOL**	**344,540**	**548**	**1,498**	**40**	**129**	**61**

GALAPAGOS ISLANDS

HC8N	**MOH**	**4,384,908**	**2,580**	**7,382**	**107**	**269**	**218**

PARAGUAY

ZP6CC	**21**	**180,810**	**489**	**1,435**	**20**	**60**	**46**
ZP5MAL	**SOH**	**89,370**	**229**	**662**	**25**	**50**	**60**

PERU

OA4BR	SOH	6,804	27	189	7	6	23

URUGUAY

CX7BF	**SOH**	**922,284**	**1,060**	**3,014**	**50**	**145**	**111**
CX9BAG	**28**	**38,442**	**160**	**447**	**16**	**35**	**35**
CX3DAT	14	32,400	41	120	6	21	0

Check logs: Z31GX, N4AN, SP9NWB, EU1DX, NØAO/6, VE4COZ, IZ5BSA, UAØCA, SP3QDU, AA5RF, DL5ZB, DL9GGA, EA8AVR, K2SZ, N5LUQ, OK-2-21478, PI4DTC, DJ5NN, W3JRY, LA5YW, K9EMG, W4NTI, DJ2IA, AE4ZQ, IKØHBN.

Disqualified: RK9CWA for too many unverifiable multipliers and contacts; exceeded rules limitations.

BY IRWIN MATH, WA2NDM

MATH'S NOTES

WHAT'S NEW AND HOW TO USE IT

Transformers or Not Transformers? That is the Question.

Those of us who have built quite a bit in the way of audio circuitry are familiar with balanced and unbalanced inputs. By way of review, the basics of these two coupling approaches are shown in fig. 1.

An unbalanced input is one that is referenced to ground and is the simplest way to interface with common shielded cable (and RCA phono jacks, for example). An unbalanced input often is transformer coupled and interfaced with XLR-type audio connectors. Balanced inputs are normally used to reduce or eliminate unwanted signals such as 60 Hz hum in professional audio installations. A center tap in the transformer winding is also sometimes added for shielding purposes. Incidentally, a balanced transformer input can be converted to an unbalanced input simply by grounding one side of the transformer (and not grounding the center-tap if it is present, obviously). Usually, circuits using balanced inputs tend to be more expensive than unbalanced ones due to the use of the transformer.

There is a practical problem regarding the use of transformers for the experimenter on a budget, however. The low frequency response of any transformer is dictated by the amount of iron in the core, and as the frequency drops to less than 20 Hz or so, all sorts of phase shifts and loss of signal amplitudes soon come into play. Also, at frequencies higher than 15 kHz or so, the efficiency of the iron core begins to suffer and similar problems occur.

Only expensive transformers, specially designed for high-quality audio applications, can usually make the grade. This is true, by the way, for both input as well as line driving output circuitry. So what can one do?

The solution is to use an all-electronic input and/or output circuit. For the input side, fig. 2 shows how an operational amplifier can be used for both the balanced and unbalanced function. In the circuit shown, all resistors are 10 K 1/4 watt 1% devices. A signal applied to the A input appears inverted at the op-amp output, a signal applied to the B input appears non-inverted at the output, and a balanced signal, applied between the A and B inputs, appears single-ended at the output. Unwanted signals applied to both A and B with respect to ground are canceled (the main reason one uses a balanced input).

c/o CQ magazine

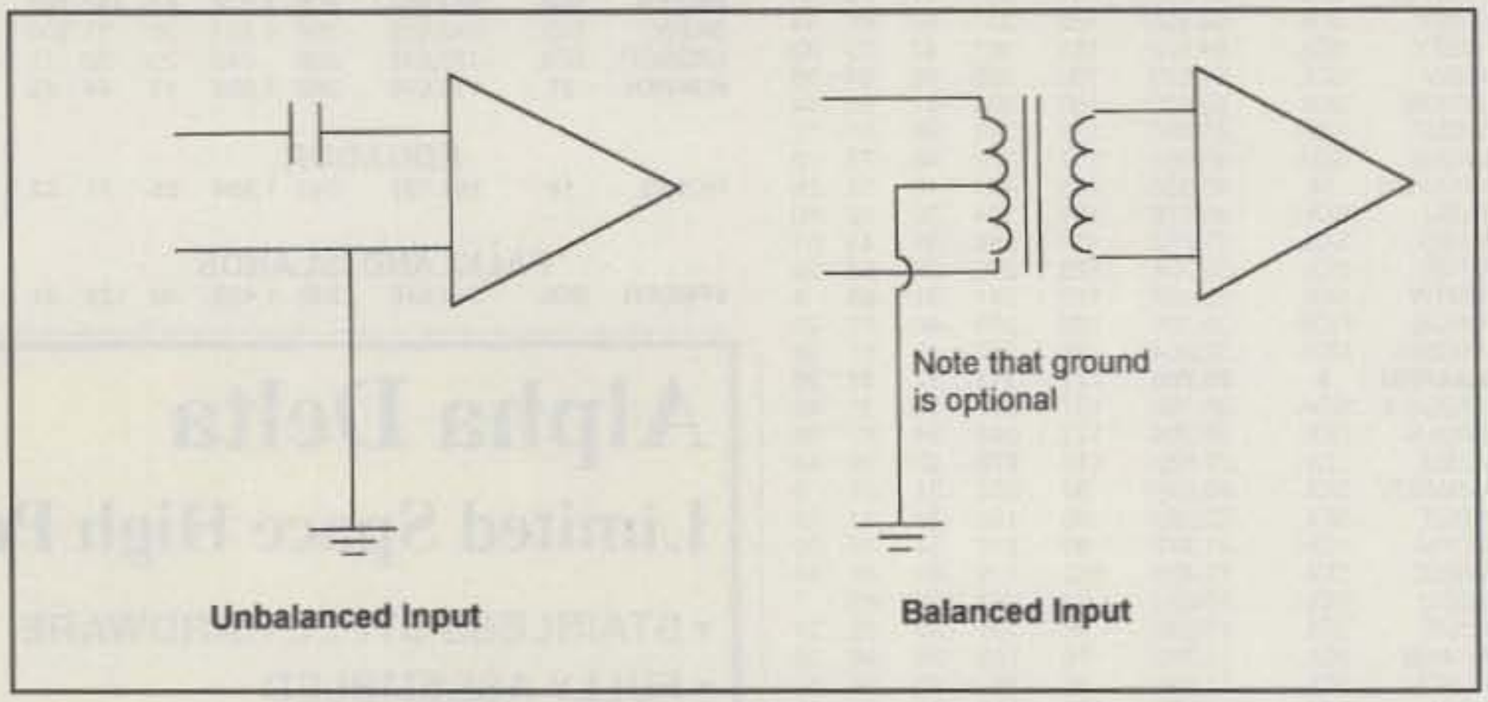

Fig. 1– Unbalanced vs. balanced input configurations.

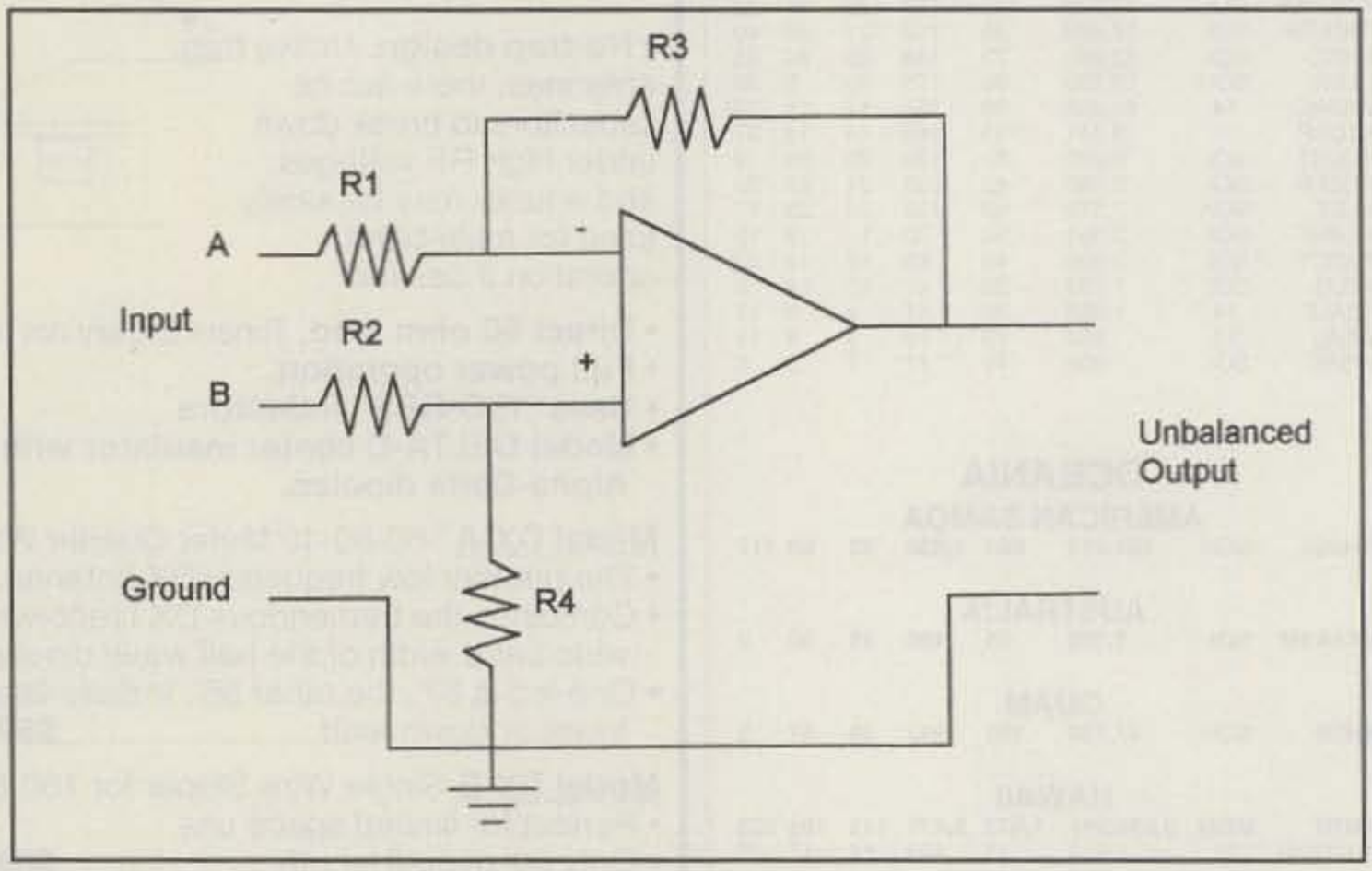

Fig. 2– Balanced/unbalanced op-amp input configuration. Note that all resistors are 10K 1/4 watt @ 1% tolerance.

In this way, a balanced signal is easily converted to an unbalanced one without the need for a transformer.

The high level of precision of the resistors is necessary to assure that the positive and negative portions of the input signal are equally amplified. Any significant difference in gain between the inverting and non-inverting inputs will result in distortion and poor rejection of common mode (or unwanted) signals.

In commercial equipment these resistors are usually chosen to be as close to a perfect match as possible, and common mode rejection ratios of more than 1000 times are easily achieved.

When an unbalanced input is desired, simple connect the B input to ground and apply the unbalanced signal between the A input and ground. Note, however, that the common mode rejection factor is lost in a single-ended configuration.

The input impedance of this circuit, as shown, is high due to the 10 K resistors. When a lower value is desired, simply connect an appropriate value resistor between the A and B input pins. If you connect a 600 ohm resistor between these points, for example, the circuit will appear as a low-impedance 600 ohm input in either the balanced or the unbalanced configuration.

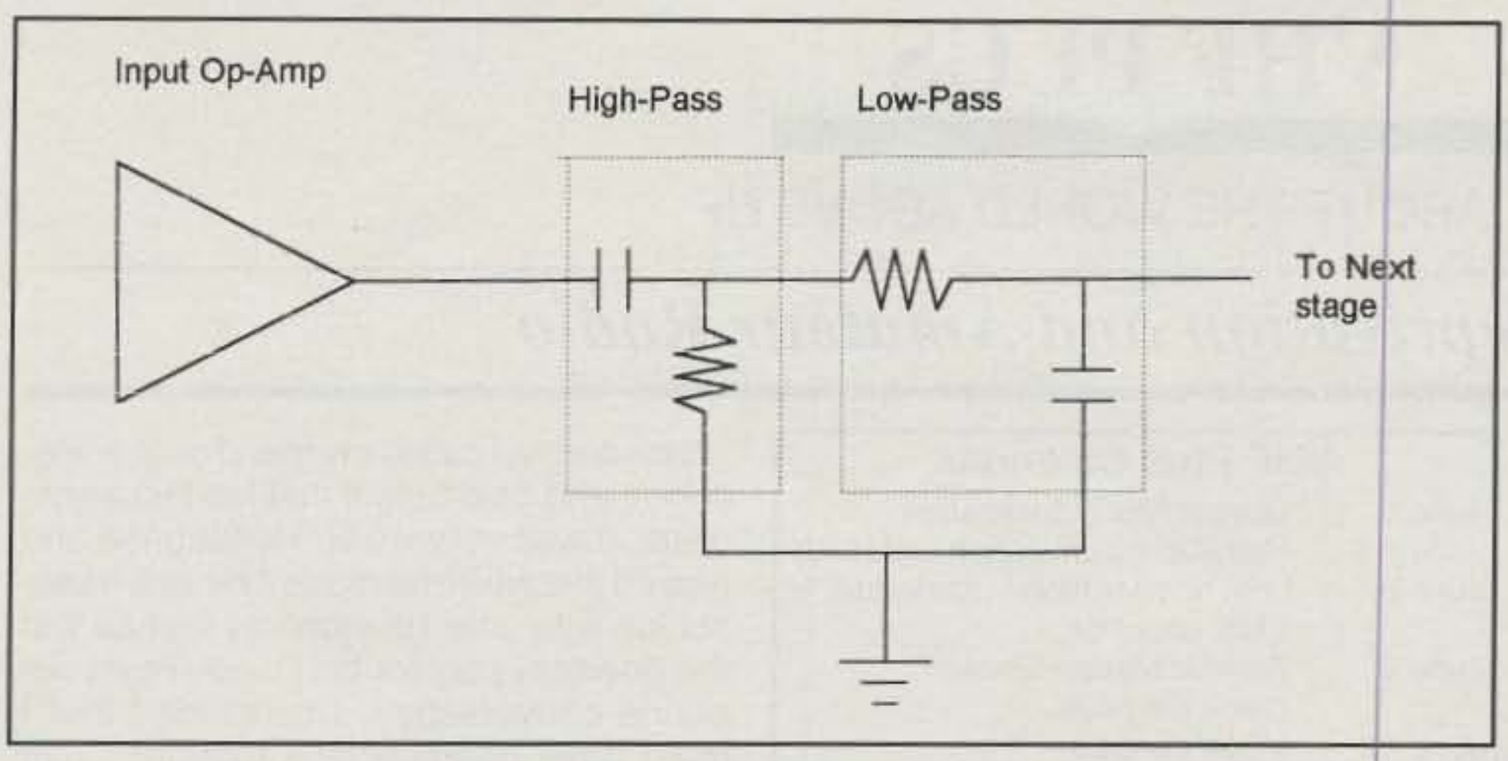

Fig. 3– Input filtering network configuration.

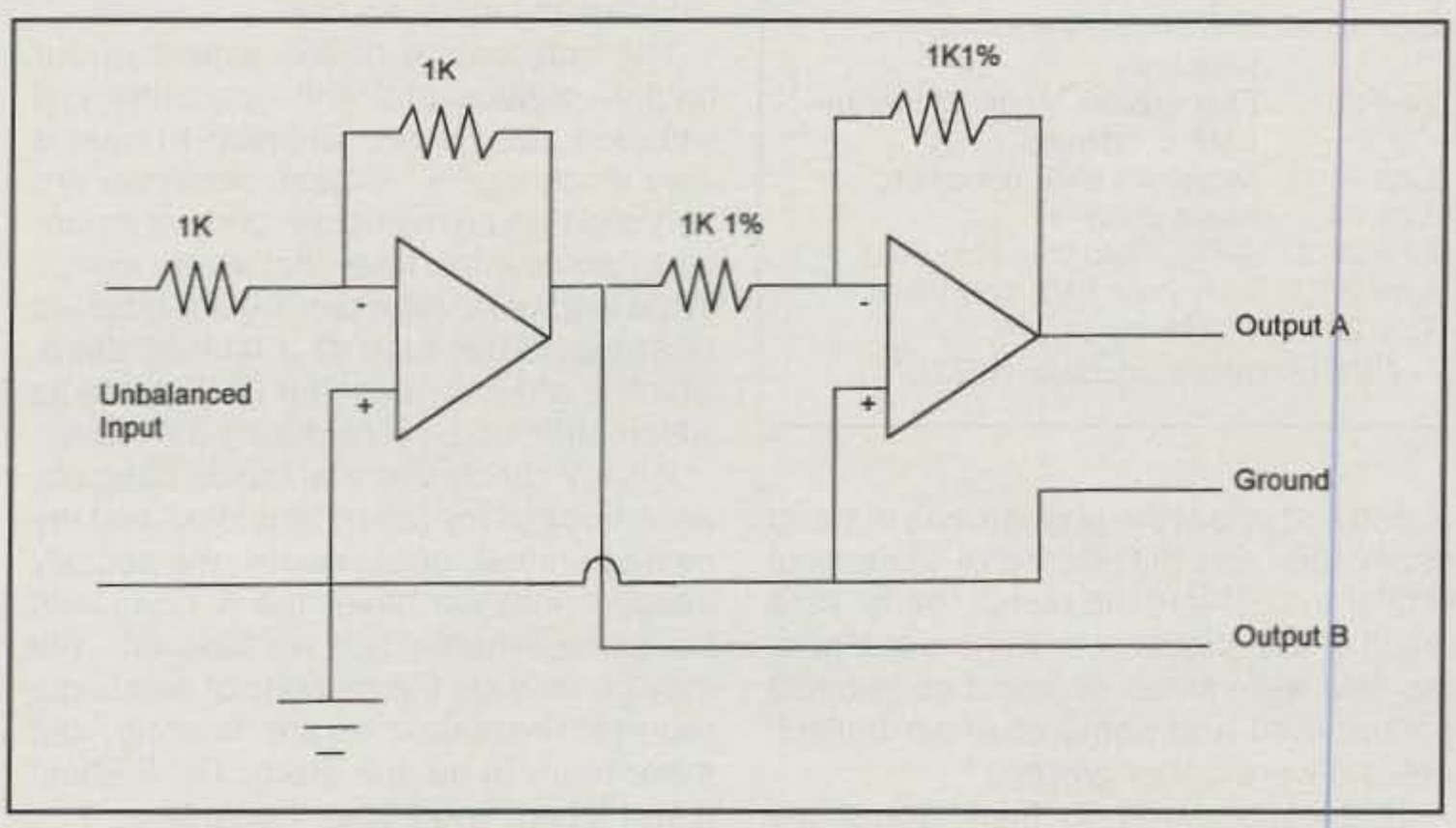

Fig. 4– Balanced/unbalanced output configuration.

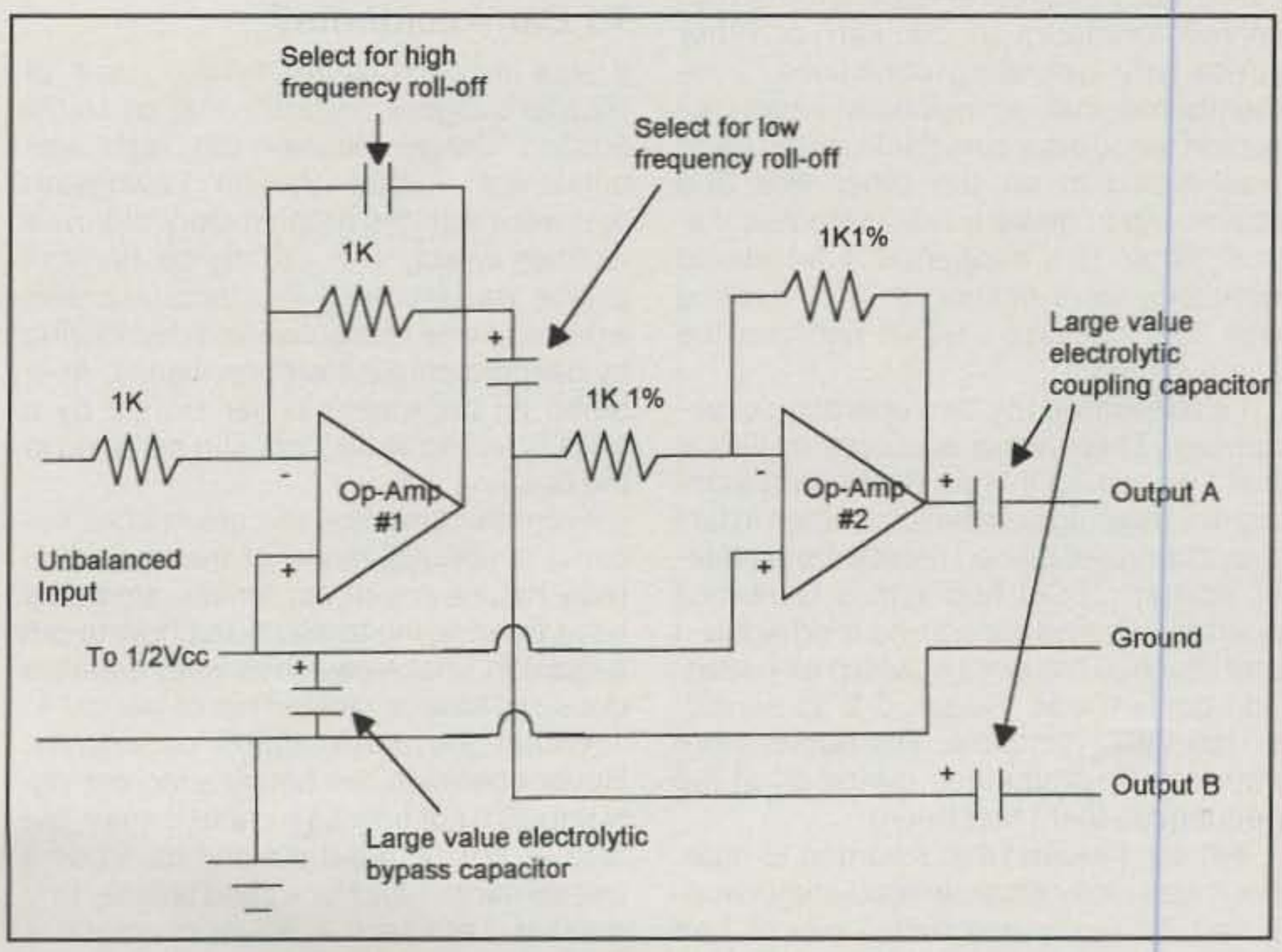

Fig. 5– AC-coupled balanced/unbalanced output configuration.

In addition to the elimination of the transformer, you will also note that this circuit is DC coupled. This means that frequency response will extend from DC to the upper limit of the op-amp. As a result, even with a low-frequency op-amp, response easily will extend well above and below the normal audio range. In fact, the response of such a circuit is so wide that you almost certainly will have to "tailor" it with a filter network of some sort. Fig. 3 shows one way to do this.

The high-pass section of the filter shown is chosen so that the low-frequency roll-off is at the lower limit of the audio pass band desired. For high-fidelity applications this point usually will be around 15 to 20 Hz. For radio communications equipment, 300 to 500 Hz usually will suffice. The low-pass section of the filter is similarly chosen for the high-frequency roll-off desired. Again for high fidelity, this usually will be 20 kHz, while for communications, 5 kHz is adequate. Actual values for these filters can easily be determined experimentally.

Fig. 4 shows how to configure a balanced/unbalanced output circuit. In this circuit both op-amps have been configured to give a gain of one (1), although the op-amp #2 stage is the critical one. Op-amp #2 inverts the output of op-amp #1 as accurately as possible (which is why 1% resistors are used). When a balanced output is desired, it is taken directly between outputs A and B. When an unbalanced output is desired, it is taken from either the A or B output with respect to ground. The only requirement for both of these op-amps is that they have enough oomph to drive the desired load. Most op-amps designed for audio applications usually can drive 600 ohms, so these are not hard to find.

In fig. 4 we have shown the op-amps DC coupled. As in the case of the input circuits, frequency response is quite wide and frequency "shaping" will probably be necessary. To use the DC coupling as shown, by the way, requires that the op-amps be provided with a positive as well as a negative power supply. If this is not critical, single supply op-amps can be used with coupling capacitors between the op-amps and the outputs as shown in fig. 5. If this is done, then the coupling capacitors can be chosen to select the low-frequency roll-off point and the feedback resistor of op-amp #1 shunted with a capacitor to determine the high-frequency limit. This is also shown in fig. 5.

Be careful of the op-amp #2 stage, however. It must be as close to a perfect "inverting mirror" as possible, and the output capacitors must be the same value and capable of passing frequencies at least 10 times lower than the desired lower limit of the equipment. Now you can have your cake and eat it, too! 73 Irwin, WA2NDM

BY JOE LYNCH, N6CL

VHF PLUS

ALL ABOUT THE WORLD ABOVE HF

Sleep Deprivation and Amateur Radio

Several years ago I quoted a British amateur who decided to drop out of EME operations because of what he perceived to be a lack of integrity in that aspect of the hobby. He complained that over the course of the short time that he had been on EME he had received a number of QSL cards for QSOs that never took place. He felt that these people who had sent him QSLs had less than ethical motivations in hoping to receive a QSL card from him for these QSOs. At the time I published his letter, which had appeared in the "432 MHz EME Newsletter," I could identify with him because I had received a few QSL cards from people claiming bogus QSOs with me when I operated as a DX station. Therefore, I thought I was doing a service to alert us to consider a certain lack of integrity within our hobby.

However, even as I published the letter, I had my concerns that all of the incidents of bogus QSOs were motivated by a lack of integrity. After all, I reasoned, this fellow was in Britain, to me not particularly rare. Why would people be so interested in a QSO with him? The obvious answer was that as a new operator on EME, other EMEers, particularly the old timers, would be interested in initial contacts with him to boost their initial contact tallies. Yet I am acquainted with quite a number of these people, and I know they have a great deal of integrity when making contacts. I just could not imagine that these same people would be risking their integrity over one contact.

It's been several years now since that letter was published. Along the way I have acquired a bit of life experience, including my years of intensive study at graduate school, that has led me to a different conclusion. It is this: I believe that what this amateur operator friend was experiencing had to do not so much with a lack of integrity, but more with a lack of sleep!

During my three years of sleep-deprived studying at seminary, I sometimes noticed that my brain seemed to just freewheel with uncontrolled thoughts. I wondered at times if I were going insane or if I had made a wrong decision to go to seminary later in life—that my brain was just not capable of taking the stress. I had these concerns until one day I came across a report on sleep deprivation. It stated that one of the phenomena of sleep deprivation was the release of a chemical similar to LSD into the human body. As a result of the effects of this chemical, people who were sleep-deprived sometimes hallucinated and some of these hallucinations were rather graphic.

This caused me to think about my hobby and my British friend's letter. I wondered if there might be a connection. I recalled many different times when I had observed amateurs in contest- or other stress-type operating conditions. I remembered that occasionally I had observed these amateurs thinking that there was a station on the other end and attempting to make a QSO with that station. When this happened, I wondered what they were hearing or if my hearing was bad, because I would not hear the same station.

I also recalled my own operating experiences. There were a couple of QSOs that I wondered if I had not been dreaming or imagining completions, when in fact they didn't take place. I recalled one meteor scatter QSO I had with a California operator. During our half-hour schedule I had reached the point in which all I needed from him was "Roger, S-2" to consider the QSO complete. His bursts were consistently pretty loud during all of the sequences that I had heard.

Finally, I heard what I wanted to hear, but it was really weak. Immediately I wondered if I really had heard him or had dreamt or imagined that I had heard him. was so tired that I wasn't sure.

Hesitantly, I called my friend on the telephone and said to him that his last transmission was very weak. He laughed and replied that when he made it he was transmitting with only 10 watts, as he had lost the power supply for his linear. From our phone conversation, I concluded that I must have heard what I thought I had heard. However, because I had previously experienced such imaginations, I did have my initial doubts.

The very nature of this aspect of our hobby—weak signal VHF—puts us into a situation that we are straining to hear a very weak signal. At best, when we are very alert we are using our body at its limits to sometimes hear that weak signal. What are we doing when we are fatigued or stressed because of a lack of sleep, which is often the case for EME contacts which often take place during the night?

It is my conclusion that based upon observations of my fellow amateurs and my own operating, occasionally, we actually imagine that we have had a QSO with someone, when in fact we have not. We may go through the motions of sending a report to the station we are "hearing," but there really is no one there. Think about it and let me know your thoughts.

VHF Plus Calendar

June 1	Lowest Moon declination
June 4-6	Ham-Com convention (see text)
June 6	Last quarter moon, moderate EME condition.
June 9	*Arietids* Meteor Shower predicted peak
June 12	Moon perigee
June 12-14	ARRL VHF QSO Party (see text)
June 13	New Moon. Poor EME conditions
June 14	Highest Mood declination
June 19-20	SMIRK 6-Meter Contest (see text)
June 20	First quarter Moon. Moderate EME conditions
June 21	Moderate EME condition.
June 24	Moon apogee
June 26-27	ARRL Field Day (see text)
June 27	Very poor EME conditions
June 28	Full Moon

— EME conditions courtesy W5LUU

Are Amateurs More Prone To Car Accidents?

It was in the November 1998 issue of *Reader's Digest* magazine that an article entitled "Danger Beneath the Dash" was published. Author Steven Levingston opened it with the graphic story of how a woman driving and talking on her cell phone was involved in a fatal accident when she was distracted from her driving by her conversation with her fiancé. After being hit broadside in her Honda by a truck traveling at 50 mph, she perished in the ensuing fire.

From the time that the automobile became a popular mode of transportation (way before any of our times), amateurs have been trying to figure out how to put a radio in one. Nowadays what amateur does *not* have a radio in his or her car?

Within the weak signal community, Rover operation has become increasingly popular, not only as a contest entry, but also as a way to get out and round up a few contacts—and for a short time be very popular. Let's face it: Rover operation is kind of a cheap way to get the DX thrill! And, because of the number of contests

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and the generally good weather across the country, this month is by far the most popular month for Rover operation.

So why am I writing about this *Reader's Digest* article in my column? It is because of the vast similarity to our operating a radio and driving and the general public's operating a cell phone and driving.

In the article Levingston indicates that talking on a car phone is more distracting than listening to the radio or tape deck. Additionally, he states, "[I]t's a greater drain on our mental facilities than chatting with a passenger, experts say." He goes on to state that according to Rodger Koppa of the Texas Transportation Institute, by contrast of talking to someone on a cell phone, talking to your passenger can be beneficial, as your passenger can also alert you to potential traffic hazards.

Levingston also cites expert Walter Wierville, a fellow at Virginia Tech's Center for Transportation Research as saying "a driver may be looking at the road while talking on the phone, but still missing important clues." He indicates that often objects in one's peripheral vision tend to be suppressed.

In an article that was published in the February 13, 1997 issue of the *New England Journal of Medicine* entitled "Association between Cellular-Telephone Calls and Motor Vehicle Collisions," authors University of Toronto researchers Donald A. Redelmeier and Robert J. Tibshirani studied 699 Toronto drivers who had cellular telephones and who were involved in auto accidents resulting in substantial property damage but no personal injury to see if there was a direct correlation between operating a cellular telephone while operating an automobile and accidents.

As part of their method of examination, each person's cellular-telephone calls on the day of the collision and during the previous week were analyzed through the use of detailed billing records. They discovered that a total of 26,798 cellular-telephone calls were made during the 14-month study period.

The findings were astounding! Among them was people who operate cellular-telephones while operating an automobile were *four times* as likely to be involved in an accident as people who were not operating a cellular-telephone. This statistic is on par with driving drunk!

The article also pointed out that it was not the operating of the cellular telephone that was at fault, because they found that there was no significant difference between those who operated a handheld phone and those who operated hands-

free. The significance was in what the operators were doing with their brains at the time of the accident. They were *not* concentrating on their driving.

In an "ABC Evening News" report highlighting the *NEJM* article, Medical Reporter Dr. Timothy Johnson pointed out that the operators of two vehicles traveling at each other a half-mile apart at 60 mph have only a fraction of a second to make a decision to move out of the way, and that is if either operator of the vehicles is paying attention—which is not likely the case of someone coming at someone else in his or her lane!

As part of his report, Dr. Johnson interviewed a couple who had been involved in a head-on collision where the driver of the other vehicle was clearly operating a cellular telephone at the time of the accident. Both of the couple received multiple injuries, with the man suffering permanent partial paralysis of one of his legs.

The one redeeming feature of the report was that the *NEJM* article didn't recommend banning the use of cellular telephones, because 39 percent of the time they were used by the motorists to phone in the accidents after they were involved them! Even so, a small community in Ohio has recently outlawed the use of cell phones while operating a vehicle in motion.

So what does this have to do with us? Plenty! We too operate a radio (after all, we do know that a cellular telephone is a radio) while we drive. We too are not as fully attentive to our driving as we should be while we are operating our radios and driving down the road. By definition, "fully attentive" means that you are fully concentrating on your driving with both hands on the wheel.

By clear inference, considering the results of the *NEJM* article, we can claim similar statistics to what were cited in it. We need to be aware of this danger both to ourselves and to those around us on the road. When we operate a radio while in motion, we clearly up the risk for us to be in an accident and potentially to involve others with us, as was graphically illustrated in the "ABC Evening News" report.

CP1/N6XQ

Jack Henry, N6XQ, made a two-week DX-pedition trip to Bolivia early in March. Here is a report from his home page: "The island I operated from (Isla Del Sol, on Lake Titicaca) is rather interesting. It was like living in the past. The island has approximately 5000 inhabitants who are descendants of the Incas. All transportation on the island is the same as it was thousands of years ago, by foot. Some of the pictures on my home page show the rock-terraced hills planted as they were centuries ago.

"The people live at an altitude of 13,000 feet and enjoy weather similar to southern California in the afternoons and near freezing when the sun sets. We had rain every evening and morning when I was there. I hope you enjoy the photos. I had 6 meter propagation into the southern U.S. states almost daily. Unfortunately, it didn't extend into the northern states. Thanks to all those who worked me.

"I returned home okay after two weeks of travelling. I had a great trip and hope that I can work CP some day myself! Final total was about 300 QSOs for the trip . . . amazing considering solar conditions."

The QSL cards are ordered. Be sure to include an SASE for your QSL to Jack, as he spent quite a bit of money on this trip to give us all a new country.

Current DXpeditions

The following is from the ARRL DX Bulletin service: Tonga, A3. Paul, A35RK, is now QRV on 6 meters. He checks 28885 kHz and monitors 50110 kHz. Look for him CW on 50120 kHz. QSL via W7TSQ.

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 should be among them, sporting our club callsign 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 from 0000Z June 19, 1999 through 2400Z June 20, 1999. Contacts must be on 6 meters only, voice and/or CW. No contacts involving another band for one side of the contact count.

One need not be a SMIRK member to take part. For the purpose of this contest, a SMIRK member is anyone who has ever been issued a SMIRK number, whether or not he or she has paid dues in recent years. Of course, all 6 meter operators are encouraged to join SMIRK or renew. Renewals may be obtained by sending $6 to W5OZI (address below), noting the SMIRK number. Anyone not a member may join by sending a list of six SMIRK members worked on 6 meters, along with $6 to W5OZI. An attempt will be made to issue a SMIRK number to each new member applying in time to fully participate in this year's SMIRK QSO Party.

No contacts between stations in the 48 contiguous U.S. states and lower tier Canada (VE1 through VE7) are allowed between 50.100 and 50.150. Only contacts with and between stations outside of these areas may take place in this band segment. All contacts must be made by a single operator. There is no multi-operator category in this contest. All contacts must be made via natural propagation. No contacts using repeaters, or any man-

made device for relaying transmissions, are allowed.

Exchange is callsign, SMIRK number if the station worked has one, and grid. Partial contacts in which one of the above pieces of info is missing do not count.

Scoring is as follows: Count 1 point for each completed contact. If station worked provides a SMIRK number, multiply by 2. Final score is contact points times grids worked.

All participants must observe the rules governing amateur radio operation in the participant's country. Certificates will be issued to the highest scoring participant submitting a valid log, in each ARRL section, the Maritime provinces, and each of the remaining Canadian provinces and each other DXCC country. If different from the above, a certificate will also be awarded to the highest scoring SMIRK member from each of these areas submitting a valid log. To be valid, logs must include the above location information.

New log forms are available from W5OZI at the above address, or on the SMIRK Web site at <http://www.smirk.org/>. Logs must be postmarked no later than August 1, 1999 and sent to Pat Rose W5OZI, P.O. Box 393, Junction, TX 76849 USA.

Field Day: ARRL's classic, Field Day, will be held on 26–27 June. Complete rules for this contest can 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 gang from the North Texas Microwave Society will present a couple of programs during the convention. For more information about registration at Ham-Com, contact them at: 6208 Preston Road, Dallas, TX 75205-1655, or call 214-522-5003 (fax 214-521-0016). A number of hotels, within easy driving distance, are priced between $30 (Motel 6) and $110.00 (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 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 at approximately 2110Z another daytime shower, 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 stream of activity. However, according to the book *Meteors* by Neil Bone, this and the *Arietids* are two of the more active *radio* showers of the year. Peak activity for this shower seems to favor a north-south path. As you can see, there are plenty of showers from which to choose this month.

MIR Orbital Milestone

The following is from Ken Carlstrom, N1WED, via the AMSAT home page: Ken reports that pending course correction maneuvers, MIR in its current orbit plane passed a milestone of 75,000 orbits on April 5, 1999. MIR's Core was launched February 19, 1986 at 2128:23 UTC. The present total weight of the seven modules that make up MIR at the present time is 248,600 pounds, or 124.8 tons (U.S.). Because of the probable deorbit, it will not make the 100,000 orbit, which would occur around August 12, 2003. As a comparison, Vanguard 1, which was launched March 17, 1958, as of a few weeks ago has completed just over 36,200 orbits. It is the oldest (unclassified) space object in Earth orbit.

And Finally . . .

It was a year ago this month when I announced my marriage to Carol King, K5CPZ. Now, a year later, she has updated her callsign to one that is an initial callsign. She is now W6CL.

It was several years ago when Bert Ayers, the original holder of the call, became a Silent Key when he suffered a fatal heart attack at an ARRL Southwestern Division Convention in Scottsdale, Arizona. Even though he is now QRV in the hereafter, his earth-based callsign remained on the active list because the FCC was never officially notified of his death. Because he died in Arizona, a state that will only issue copies of its death certificates to immediate relatives, we could not obtain one and do our notification to the FCC. As a result, we had to patiently wait for the lapse of the two years after his call expired before we could apply. It finally came on 27 January.

Under the Vanity Callsign program we immediately applied for the call, but got the application back about a month later canceled because the fee for the application had not been received within the required ten days. It seems that the post office lost the mail containing the postal money order for the application!

We again immediately applied for the call, this time sending a credit card authorization via Express Mail. Every day after I assumed that the FCC would have received the authorization, I checked my credit card balance. Finally, the debit appeared. I then began checking QRZ's home page for any posting of the issuance of the callsign to Carol. On March 26 the posting finally appeared. Carol's name had replaced Bert's. We now have matching callsigns!

Unfortunately, our schedules and lack of a fixed station have kept us from being able to get on the air. Perhaps over this summer we will be able to break it in. In the meantime, however, look for us operating our club callsign WRØVER, during the various VHF contests. After purchasing our new Saturn, I moved my N6CL vanity plate to it and was able to obtain a vanity plate with the club call on it for the van. If you see us rovering, you will know us by our license plate—WRØVER. Give us a shout! Hopefully, we might even give you a new grid locator for your log. Until next month . . . 73, Joe, N6CL

BY KARL T. THURBER, JR., W8FX

THE DIGITAL DIPOLE

FROM SOFTWARE THROUGH ANTENNAS FOR THE SHACK

From The Notebook—Part V

This month we'll again open the "Digital Dipole" notebook for a variety of antenna, software, and book topics. As is our usual custom, we'll kick things off this month by opening the notebook first to antennas.

Antenna Notes

New Broadband Loops from M² Antenna Systems. M² Antenna Systems is well-known among radio amateurs as an antenna innovator. As we have pointed out previously, their antennas are based on designs by Mike Staal, K6MYC, a KLM Electronics cofounder and until 1986 KLM's antenna designer. The name "M²" stands for Mike and Myrna Staal, the company having been started by the two a few years before Mike left KLM (Myrna, WA6GXF, is the company's President, while Mike is the Secretary, Treasurer, and Designer). The woman- and family-owned firm prides itself on the high quality of the machined parts used and the antennas' excellent mechanical features.

Recently, M² introduced a new line of broadband VHF-UHF "HO" Loops. The new loops are designed to produce excellent omnidirectional performance, especially in mobile and portable applications. Separate, single-band versions are available for 6 and 2 meters, 222 MHz, and 432 MHz, and the loops can easily be stacked. The HO Loops are of heavy-duty construction and handle more than 1 kW RF, yet they can be broken down for easy transport. Each is furnished with an SO-239 connector, except an "N" type connector is provided on the 432 MHz model. Also available for the new loops are several different-length mobile masts, as well as the heavy-duty "Big Foot" four-point magnet mount designed to handle even stacked loops and heavy HF antennas.

Among other new M² antenna products is the "Monster Positioner" az-el positioner/rotator system, which is characterized by the firm as "a machine strong enough to rotate an 18-wheeler."

For a free catalog and price list, contact M² Antenna Systems, Inc., 7560 N. Del Mar Ave., Fresno, CA 93711 (209-432-8873; e-mail: <m2inc@m2inc.com>; web: <http://www.m2inc.com>).

GeoTool Pickup Truck Antenna Mounts. GeoTool has introduced a new series of patent-pending Pickup Truck Antenna Mounts. These are available in several different versions, designed to accommodate a variety of difficult truck-mounting situations.

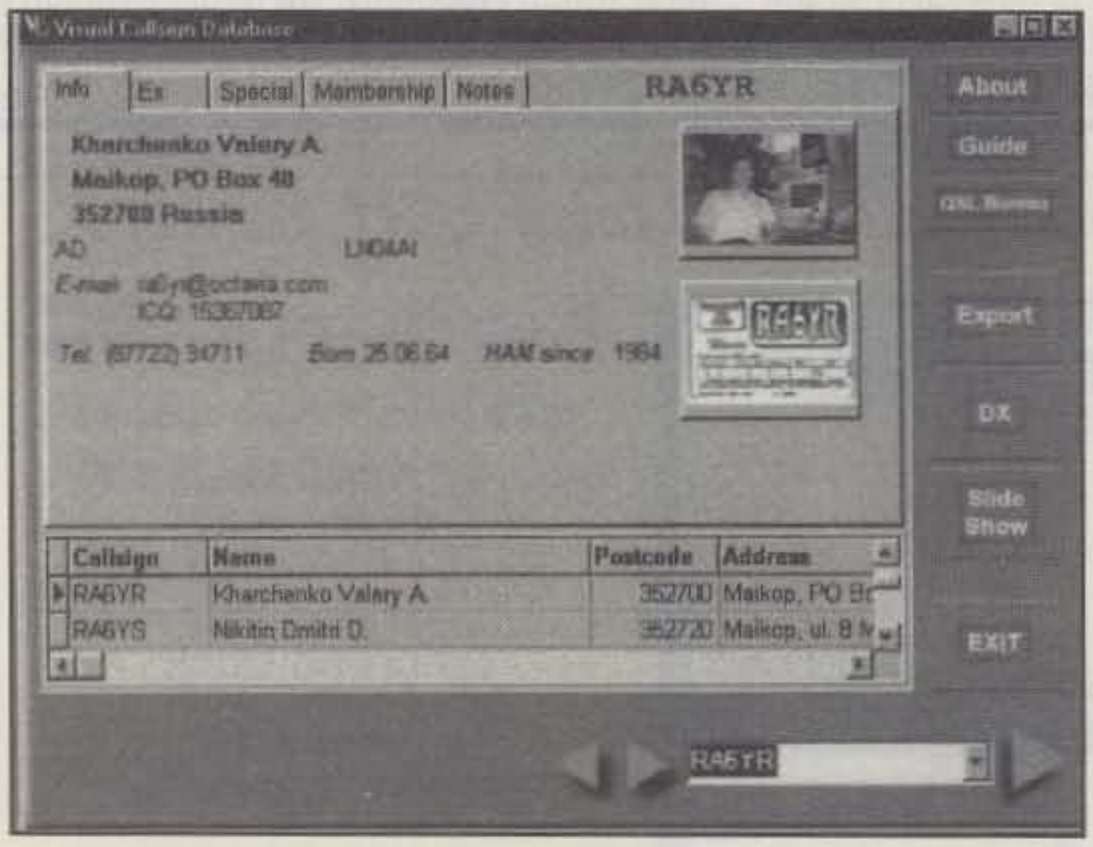
The GeoTool mounts are billed as ideal for trucks with "stake pockets," and they can be used on many other trucks with some modification or additional shimming materials. The devices attach inside the stake pocket with a hollow, 9/16 inch diameter bolt.

Two HF Mount models are offered for compatibility with different truck lines: one version is $44.95, for full-size pickups, such as Chevy, GMC, Ford, and Dodge; another is $49.95, for small-size pickups, such as Mazda and the Ford Ranger. The VHF/UHF Mount model is $59.95 and fits all trucks, although you still need to specify the truck when ordering.

For more information, contactGeoTool, 1280 Bison Avenue B9 #414, Newport Beach, CA 92660 (949-759-3166; e-mail: <info@geotool.com>; web: <http://www.geotool.com/antmount.htm>).

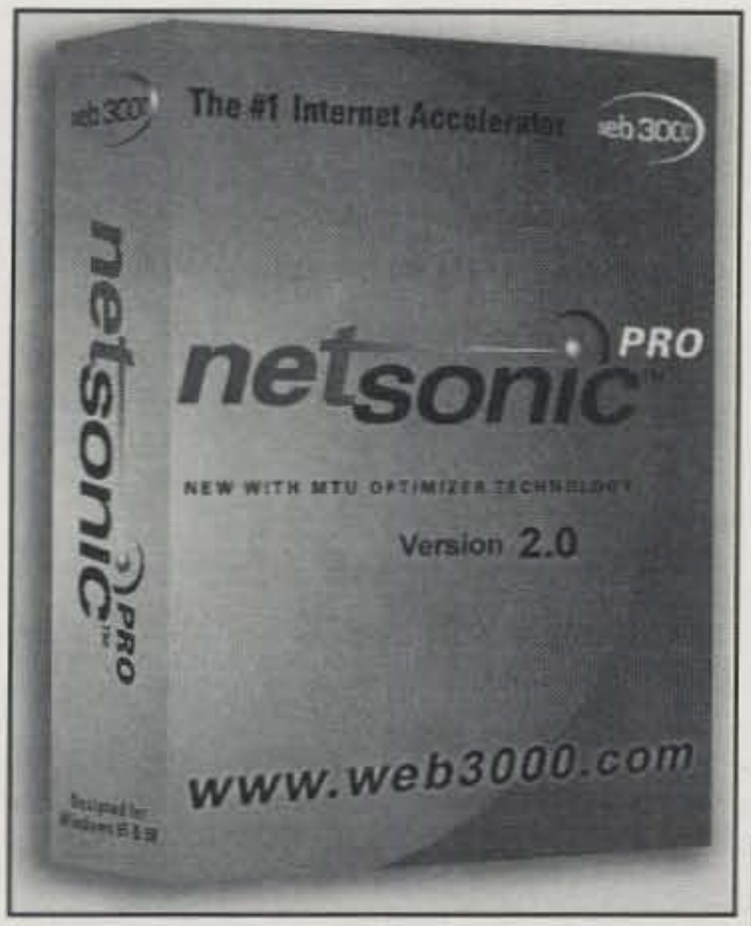
I should point out that several instructive literature and photo downloads are available from the GeoTool website. I also suggest you consult the website before placing an order, especially since tapered

289 Poplar Drive, Millbrook, AL 36054-1674



This Visual Callsign Database (VCD) 2.0 Info screen shows in-shack photo and QSL "thumbnails" of VCD developer, Octavia CEO Valery Kharchenko, RA6YR. His company has been providing callsign database information, software development, various amateur radio related publications, QSL card printing, and an online lookup service to amateurs since 1989. (Photo courtesy Octavia Company, Ltd.)

The Visual Callsign Database (VCD) 2.0 CD-ROM offers instant access to over 62,000 licensed amateurs in the Commonwealth of Independent States (CIS). It sports a variety of convenient features, including over 1000 high-resolution personal and DX photographs, QSL card images with a slideshow facility, and the ability to print addresses directly onto an envelope. This program screen shows one of three hamshack photos submitted by Andy, UA3AB. (Photo courtesy Octavia Company, Ltd.)



One new PC Internet-related software product that really helps in correcting many of the problems of inherently slow Internet connections is NetSonic™ Pro. It's an advanced version of the award-winning (and free) NetSonic Internet Accelerator. The product's primary function is the "intelligent caching" of web pages visited using a specialized technology and preloading web pages based on user-defined settings. See the text for details. (Photo courtesy Web 3000, Inc.)

stake pockets, which sometimes are found in the center of longbed trucks, will not allow the GeoTool mount to enter properly. You should check all dimensions and truck compatibility carefully to ensure a proper fit.

New from Jade Products. In previous columns, most recently in February 1997, we discussed several Jade Products antennas offered by proprietors Jane, KA1FUN, and Dennis, K1YPP, Blanchard. The centerpiece of Jade's HF product lineup is their line of single-band Twin-Lead Ladder Line Marconis for 160, 80, or 40 meters, designed for low- and medium-power applications.

Recently, Jade introduced new High-Power Marconis rated at 1500 watts, being constructed of 450 ohm ladderline and terminated in an SO-239 connector. The new heavy-duty versions range in price from $44.95 to $79.95, depending on band. A variety of innovative, indoor and outdoor, VHF/UHF "Jade-Pole"® amateur antennas also are offered, the designs being based on the classic J-pole vertical. Also offered is a non-amateur Marine Jade-Pole for 156 MHz marine band use.

The firm also has introduced a line of inexpensive but sensitive Shielded Loop Receivers (SLRs) for 30, 40, or 80 meters, based on the cover construction article in the October 1997 *QST* by Dan Wissell, N1BYT. Reportedly, when used in conjunction with a companion directional loop antenna, the SLRs exhibit excellent performance in noisy locations. Two receiver kits are available (one for 30 or 40 meters and the other for 80 meters). They come complete with a detailed manual and the companion indoor antenna; each receiver kit is $95.

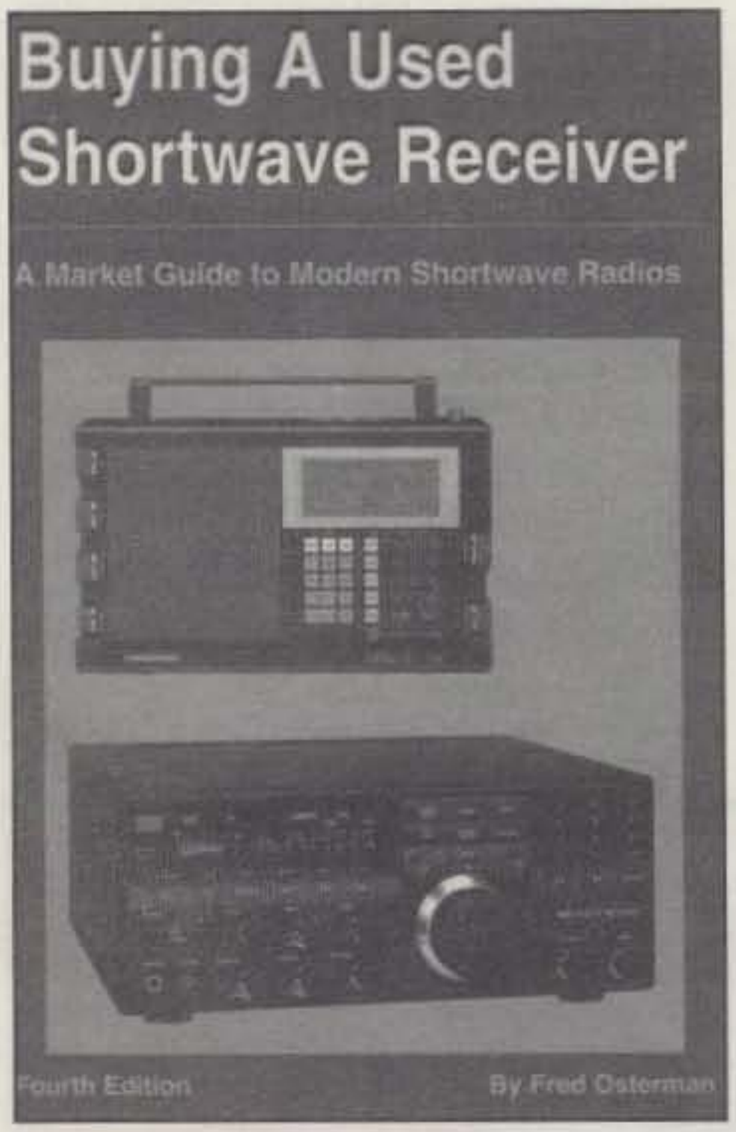
Jade Products also offers several non-antenna items. These include a 40 meter, all-mode optically coupled regenerative receiver (OCR), also by Dan, N1BYT, described in June 1998 *QST*; several keys and keyers; battery chargers; and various electronic components and parts.

For more information or a catalog, contact Jade Products, Inc., P.O. Box 368, East Hampstead, NH 03826-0368 (1-800-523-3776; e-mail: <jadepro@jadeprod.com>; web: <http://www.jadeprod/com>).

Soft Stuff

Visual Callsign Database 2.0 CDROM. In several previous columns, most recently July 1996, we profiled the R&R Electronic Callbook, developed by Valery A. Kharchenko, RA6YR. It was the computer version of the Russian and Independent Republics Callbook, published by Valery's firm, the Octavia Company, Ltd., P.O. Box 40, 352700, Maykop, Russia (phone +7 (87722) 34711; e-mail: <ra6yr@octavia.com>).

Now Valery has a slick, new Windows-based product to offer. It's Octavia's fast,



Subtitled "A Market Guide to Modern Shortwave Radios," Fred J. Osterman, N8EKU's Buying a Used Shortwave Receiver, 4th Edition, *has as its thesis "buying a used shortwave radio can provide great savings if you have the facts." Fred's short, concisely written book does a very creditable job of providing you with the information you need to intelligently select he right used radio at the right price.*

32-bit Visual Callsign Database 2.0 CD-ROM, for the Windows 95, 98, and NT operating systems. VCD is a comprehensive electronic source of Commonwealth of Independent States (CIS) callsign information. First released in June 1997, VCD is designed to help amateurs in successfully QSLing the CIS countries of the old Soviet Union. The newly upgraded product, V2.0, offers more photos as well as new, convenient features.

VCD covers the CIS and provides instant access to over 62,000 licensed amateurs in Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine, Uzbekistan, Tajikistan, and Turkmenistan. The program covers current, contest, and special-event callsigns; radio clubs; and silent keys. It also includes some 13,000 cross-references from old to new calls. Other impressive VCD features include over 1000 photos; e-mail and packet radio addresses; website listings; telephone numbers; club membership information; date of birth and year-first-licensed data; and grid locator information. The program offers powerful searching capabilities using several criteria, and it is supported by the popular DX4WIN logging program.

VCD lists at $25 U.S. plus $5 shipping and handling (a Cyrillic version also is available). Valery tells me that in North America you can purchase VCD using a major credit card through Universal Commerce, Inc., Attn: Orders, Product ID 1608-1, P.O. Box 1816, Issaquah, WA 98027 (1-877-353-7297). You also can purchase VCD over the Internet through Universal Commerce's secure server at <http://www.octavia.com/secorder.htm>; e-mail: <info@octavia.com>; web: <http://www.octavia.com>.

NetSonic Pro Internet Accelerator. Are you satisfied with the speed of your Internet connection? Probably not, unless you're in that lucky group of folks who has access to a high-speed T1 Internet connection at work or a fast cable-modem connection at home. I have neither type of access, and so have been looking to improve my effective connection speed for some time. I've found an interesting product that does a great deal to ameliorate the problems of slow Internet connection speed.

The product I've found that really helps in minimizing many of the problems of slow Internet connection is NetSonic(TM) Pro. It's an advanced, user-customizable version of the award-winning (and freely downloadable) NetSonic Internet Accelerator. Both products, the basic version of which is available free of charge for download at the publisher's website, are popularly known as Internet accelerators, software designed to effectively "soup up" your Internet connection's performance. Their primary functions are the speed-increasing "intelligent caching" of web pages visited using a highly specialized technology and the preloading of Web pages based on user-defined settings.

While all Web browsers make use of a storage folder called a cache, NetSonic Pro makes use of a special cache that allows for rapid display of websites you previously visited without the annoying delays you would encounter with a browser running alone. Besides its caching ability, the program allows for preloading of content from previously visited pages or pages you haven't visited yet, depending on how you configure the program.

Preloaded pages are displayed almost instantly from the special NetSonic Pro cache. Other features of the program that can help you "maximize your Internet experience" include offline browsing; the Maximum Transfer Unit (MTU) Optimizer, which lets you tweak Internet-related Windows Registry settings; and an "exclude site" feature that lets you designate websites that you don't want to be cached by the program.

NetSonic Pro is $29.95 by download from the secure Web 3000, Inc. website, using a major credit card for payment. You also can download a free, somewhat less-capable (but still quite impressive) version, NetSonic, that has most of the basic features of NetSonic Pro.

For more information, contact Web 3000, Inc., 7525-166th Ave. NE, Suite D-230, Redmond, WA 98052 (425-836-3000; e-mail: <info@web3000.com>; web: <http://www.web3000.com>).

From the Bookshelf

Hiram Percy Maxim. Most of us are passingly familiar with the man known as the "Father of Amateur Radio." As we know, Maxim didn't invent radio itself, but he almost singlehandedly created amateur radio as a hobby. Around Maxim swirls the fascinating legend of "The Old Man," or "T.O.M." This, of course, is a reference to Maxim, who, with Clarence D. Tuska, co-founded the American Radio Relay League (ARRL) in 1914. Maxim was the League's president for 22 years until his death in 1936, but most amateurs, myself included, know little else about the man.

Alice Clink Schumacher's Maxim biography originally was published by the ARRL in 1970, but it has been out of print for about 20 years. Recently, Barry R. Wiseman, N6CSW's Electric Radio Press (publisher of *Electric Radio* magazine) picked up the publishing rights. Barry, however, did more than simply reprint the book; instead he and the author introduced a great deal of new material in a 90+ page appendix, including numerous *QST* excerpts concerning Maxim and considerable material by "The Old Man" himself. We found the book to be very interesting and instructive—and we realized that many of Maxim's commentaries are as relevant today as when they first were committed to paper over 60 years ago.

The 216-page, 1998 book is $19.95 plus $3 s/h from Electric Radio Press, 14643 County Road G, Cortez, CO 81321-9575 (phone 970-564-9185; e-mail: <er@frontier.net>).

Buying a Used Shortwave Receiver, 4th Edition. Subtitled "A Market Guide to Modern Shortwave Radios," Fred J. Osterman, N8EKU's *Buying a Used Shortwave Receiver, 4th Edition,* has as its thesis "buying a used shortwave radio can provide great savings if you have the facts." Fred's short (78 page) but concisely written book does a very creditable job of providing you with the information you need to intelligently select the right used radio at the right price. For the shortwave listener (SWL) who's looking for a good, used, solid-state set, the author starts off by discussing the merits of buying a set privately, at flea markets/hamfests, at radio stores, and via the Internet.

Fred also provides concise information on 100 most-sought-after sets, including portable and desktop models. Data provided include coverage, specifications, features, new and used prices, photographs, size and weight, overall ratings,

commentary, and other factors, for most popular used receivers.

For details, contact Universal Radio, Inc., 6830 Americana Pkwy., Reynoldsburg, OH 43068-4113 (1-800-431-3939; e-mail: <dx@universal-radio.com>; web: <http://www.universal-radio.com>).

New From Klingenfuss Publications. In September 1997 we noted the rapidly expanding line of shortwave and Internet publications from the German firm Klingenfuss Publications. In that column we profiled the *1997 Internet Radio Guide,* noting that finding the radio resources available to you on the Internet can be a daunting, even overwhelming task and indicating that the German-based Klingenfuss Publications has done a great deal of the spade work for you. Klingenfuss has been well known among SWLs for some 30 years for the accuracy and thoroughgoing nature of their publications.

The 1997 book we profiled reportedly was the first manual specifically dealing with radio resources on the Internet. Topical areas of interest it covered included amateur radio, aviation, equipment, geography, intelligence, navigation, organizations and services, the press, publications, clubs, radio newsgroups, radio stations, and solar and geophysical data.

Now several new additions have been made to Joerg Klingenfuss's very comprehensive line of shortwave guides. These pubs include the *1999 Guide to Utility Radio Stations, 1999 Shortwave Frequency Guide, Radiotelex Messages 1974-1978, Encyclopedia of Intelligence and Secret Services, 1998/1999 Guide to Worldwide Weather Services,* and *1999 Super Frequency List on CD-ROM.* Klingenfuss also publishes a number of other guides and reference books.

For a free catalog of radio publications contact Klingenfuss Publications, Hagenloher Str. 14, D-72070 Tuebingen, Germany (<klingenfuss@compuserve.com>; web: <http://ourworld.compuserve.com/homepages/Klingenfuss>). (The Klingenfuss website provides a number of handy links to some of the most important relevant sites; it also has a large list of authoritative shortwave radio references.)

Harley Hahn Teaches the Internet. In recent columns we've noted the many excellent books Macmillan Publishing USA offers that can help you become familiar with almost any aspect of PCs, software, computing, and the Internet. Macmillan, with its large stable of trademarked imprints (Que, Sams Publishing, New Riders, etc.), is introducing many new Windows 98- and Internet-related titles, several of which we've already reported.

This month we'd like to mention one additional title of special interest to new Internet users. It's an exceptionally readable Que(R) book, *Harley Hahn Teaches the Internet.* The 422-page, 1999 book is by respected "Internet guru" Harley Hahn, who is the bestselling author of *Harley Hahn's Internet & Web Yellow Pages,* reportedly the first Internet book to sell more than 1 million copies. One of the first books in the firm's "author teaches" series, the book delivers expertly written, straightforward, humorous, and above all informal advice on gearing up on the Internet. The $19.99 book, which many consider to be a definitive guide to understanding the Internet, constitutes the author's "personal guided tour" through everyday Internet use. In it, he shows you how to productively access and interact with various aspects of the Net. It's designed for beginning and intermediate users alike.

The book is available in local bookstores, or contact Macmillan Publishing USA, 201 West 103rd St., Indianapolis, IN 46290-1097 (1-800-858-7674) for a free computer books catalog. E-mail: <info@mcp.com>; web: <http://www.mcp.com>.

Wrap-Up

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

Overheard: In amateur radio contesting as well as in most anything else, you can't realistically expect to be perfect your first time out of the box. 73, Karl, W8FX

1998 CQ WW SSB Contest High-Claimed Scores

BY THE CQ WW CONTEST COMMITTEE
e-mail: <questions@cqww.com>

The following scores represent those logs received at CQ WW HQ. A list of all 1998 SSB callsigns with claimed category plus operator can be found at <http://www.cqww.com>. If you notice an error concerning your entry, please contact the CQ WW CC at the above e-mail address.

WORLD

ALL BAND

HC8A	17,656,326
PTØF	17,630,518
EA8AH	16,642,357
CN8WW	15,877,664
P40W	15,108,380
ZD8Z	13,826,532
SU2MT	12,148,125
3V8BB	12,063,837
C4A	10,231,452
PJ8Z	9,474,032
C4W	9,110,286
EA9AM	9,005,504
9M6AAC	8,856,781
P40B	8,134,192
GIØKOW	7,738,776
OT8T	7,281,024
8P9V	6,846,675
K1AR	6,677,181
4N9BW	5,700,125
K5ZD/1	5,670,574
A61AC	5,656,886
9K2HN	5,643,748
OK1RI	5,576,556
HK6KKK	5,408,778
W4AN	5,377,394
PT7BZ	5,293,889
GW4BLE	4,757,460
P43T	4,721,784
FS/K7ZUM	4,702,475
DL4NAC	4,671,095
NH7A	4,605,375
KHØI	4,464,713
EX8W	4,350,070
K3ZO	3,961,095
N2IC/Ø	3,909,568
OHØZ	3,831,040

28 MHz

ZX5J	3,601,896
5X1T	2,581,986
LU6ETB	2,514,706
6V1C	1,844,748
CX8CP	1,754,773
ZV2Z	1,673,707
ZP5XF	1,643,830
LT3C	1,639,449
FK8HC	1,600,200
L2F	1,584,044
CX5X	1,527,244
CV4Y	1,468,698
LU2FA	1,387,584
XR8Y	1,319,956
LU5MM	1,258,989
4X4DZ	1,188,824
4X6ZK	1,108,016
P43W	963,409
9HØA	934,440
CT4NH	911,174
TZ6DX	901,168
LV4V	893,651
KH6T	855,470
V47NS	847,865

21 MHz

9J2A	3,510,296
ZX9A	2,784,978
TL5A	2,340,834
9M8R	2,047,989
LT1F	1,992,104
9Y4VU	1,884,025
P43A	1,855,053
5B4AGC	1,711,710
9A9A	1,622,616
PQ5W	1,616,992
IG9T	1,455,300
FK8GM	1,394,536
ZP6T	1,170,691
IY4W	1,109,442
OE6Z	1,109,292
JA5OVU	1,053,860
S50C	1,052,062
SP5GRM	1,014,420
S50U	983,892
GM4FDM	942,480
CX7BY	886,108
VA3MG	857,556
IO4L	848,904
DF9ZP	841,896
VR98BG	838,420
VE3KZ	837,725
OE1EMS	809,590

14 MHz

CT3BX	1,456,845
RZ9UA	1,333,371
SN2B	1,262,151
DJ7AA	1,185,771
9Y4NZ	1,165,120
LU5HM	1,129,254
GM8V	1,085,750
7L1GVE	970,644
HC1JQ	953,168
ZF2DR	943,572
LU3HY	929,070
OHØMM	867,603
W7WA	857,468
EA3ATM	849,400
S53M	837,900
YZ9A	825,930
S50K	824,356
II3T	808,000
LQ4I	807,612
K4XS	771,900
U5IZ	751,488
YO4NF	735,040
HG5J	734,142
VA3MM	704,561
CT3HG	703,872

7 MHz

IG9T	1,080,156
LZ3ZZ	731,850
9A5Y	566,610
YT1BB	529,750
HG9X	425,941
IK2NCJ/4	401,672
K7EM	375,164
OM5M	373,527
KVØQ	298,408
KH6FKG	234,952
UY5ZZ	205,442
VK4EMM	138,250
LY3BX	130,425
YO3KPA	125,976
RK4FD	120,879
JH1RFM	97,520
JH7LRS	95,285
UN7TX	85,056
KZ2I/4	78,240
K2WE	73,284
IK7YTT	63,498
YO3GOD	63,388

3.7 MHz

IG9T	511,346
9A6A	371,628
5B4/NP3D	306,208
OK2RZ	266,112
K1FZ	249,340
K4ZW	196,125
KM2P	187,376
K1LZ	166,957
SP7GIQ	165,138
KE1Y	163,936
HG5A	161,929
LY61FW	123,656
W6KW	116,272
KR1G	80,031
RAØCG	75,330
OK1FC	67,236
VA2BY	60,415

1.8 MHz

VE1BY	180,378
IG9T	134,628
SV8CS	101,835
LY3BS	98,272
4O6A	63,336
YZ6A	60,900
OZ3SK	55,626
S57M	52,632
S50R	45,560
IQ5B	41,884
OH5VT	35,200
LY2HM	31,620
EA5AT	22,176
OK2ZC	20,910

LOW POWER
ALL BAND

HC1OT	6,028,506
XL7A	3,748,500
YS1RR	3,236,310
E31AA	2,878,748
T99W	2,296,385
DL2NBU	2,091,013
EA8AD	2,072,406
LY63BA	1,842,848
UAØJH	1,840,752
LU5VV	1,822,518
LY2BTA	1,771,380
LU2UE	1,695,340
4X0F	1,592,264
WA1S	1,564,059
LU1UM	1,561,626
9A2EU	1,545,076
EK6CC	1,516,000
4M5E	1,477,824
ON7RN	1,462,720
YU7AL	1,428,288
NA2U	1,387,282
FK8VHN	1,385,024
S59AA	1,373,736
LU7HN	1,371,918
JL1ARF	1,371,306
DF7RX	1,360,632
LU9HO	1,353,501
K1VUT	1,303,808
KQ3V	1,237,320
K1VW	1,227,876
EA5ARC	1,201,122
EA3BKI	1,193,400
IT9RDG	1,156,896
DL1MGB	1,138,407
RX3RC	1,126,400
WA7BNM/6	1,125,180
IV3UHL	1,114,416
CX9AU	1,109,273
OE2S	1,097,208
WS1A	1,084,232
WT1O	1,061,302
YO3APJ	1,032,731

28 MHz

9G1BJ	1,483,482
LRØH	1,346,889
XE2DV	1,114,470
LU3HIP	1,022,532
5B4/EW1AR	1,015,272
P40N	997,899
4X1VF	972,848
VP2VF	900,360
PY2XE	788,256
PY2MNL	778,500
PP5UA	749,160
LU7EC	730,306
PY5HSD	657,765
LU7VCH	652,612
LU4FCZ	573,396
HR6/VE3BW	491,862
XE1FES	478,688

21 MHz

OK1AUT /5NØ	1,686,360
5X1Z	1,157,436
CT3DZ	891,114
LU2BA	588,588
UA4LCQ	578,578
LU5HCI	568,890
Z31GX	561,118
RU4PL	514,539
V31MX	484,536
UN5PR	455,390
XO7X	401,996
LU1FNH	380,443
LU3FR	374,400
EA7DBO	369,334
JR3RIY	335,440
9G1YR	310,996
F5BMK	307,720
YR9P	303,940
JL3VUL/3	300,951

14 MHz

LU2NI	760,214
LU3MDO	712,960
FK8FI	696,927
DU3RCM	666,216
RJ9J	500,867
Z39Z	493,503
9A/WA4IMC	488,898
ES2RJ	409,974
Z31JA	396,660
IQ7A	361,224
S58WW	286,974
VK3TZ	282,600
L44D	232,812
K4PC	232,260
K4PC	227,075
JR4PMX/1	221,008
UU7JX	200,825

7 MHz

S57DX	195,481
CT1BWW	117,882
T95A	114,546
LU4DX	110,664
S54A	98,800
UT1T	70,656
IR7S	67,422
G3XWZ	60,928
SP9NLK	41,452
W4UM	36,524
JM4WUZ	33,176

3.7 MHz

4L5O	173,376
SV2CWY	132,300
YM75TA	94,520
UA9JLJ	75,584
Z31RU	61,090
IK3SSJ	57,424
YU1CC	55,280
EC1CFD	55,080
F2EE	54,199
YO2KAB	51,170
S57CQ	50,542
4N1A	50,232
P4/W5AJ	46,250
HA3LN	43,355
T91EXA	39,410
UA9ACJ	35,328

1.8 MHz

HA8BE	39,270
YU1RA	16,302
EA1DVY	8,084
SP9RPW	7,009
EI7IU	6,806
YU1AST	5,699
DL1KZA	5,617

QRP

N6MU	627,644
YU1KN	618,580
LU1VK	557,359
NØKE	546,128
K2PS	539,925
JR4DAH	432,824
EA1GT	329,250
JA2DLM	328,526
S59D	322,380
LY2PE	312,741
YU1LM	294,175
HA7YS	251,085
W6YJ	230,144
N1TM	205,332
N4IJ	151,008

ASSISTED

K1ZM	5,646,645
TM2V	5,130,124
DLØWW	5,051,532
KI1G	4,766,212
KS1L	4,471,936
K3WW	3,681,228
K3NZ	3,333,584
8P6SH	3,247,200
N3AD	3,140,166
W2RE	3,090,100
OE8SKQ	3,042,288
K1VR	2,973,392
W1GD/2	2,915,362
K5KG/2	2,840,211
S57S	2,771,608
W1NG	2,764,684
K4MA	2,675,256
W3EEE	2,635,800
OK2FD	2,604,092
K2XA	2,521,062
OL6X	2,517,386
DJ2YA	2,514,487
N4ZC	2,414,080
AA3B	2,365,086
IO4A	2,256,240
N3MKZ	2,205,372
N2QT/4	2,161,718
NN3Q	2,129,148
N1DG	2,001,536

MULTI-SINGLE

C56T	20,615,145
9Y4NW	19,261,284
FG5BG	13,261,584
CQ9K	12,044,686
IR4T	11,914,560
HG1S	10,892,700
TM2Y	10,741,864
EA8ZS	10,703,880
FM5BH	10,651,362
CE3F	10,285,118
KC1XX	9,407,928
HI8/DK8YY	8,832,744
TM1C	8,757,504
VP2V/K7AR	8,534,680
VP5DX	8,471,480
WP2Z	8,358,868
OK5W	7,523,740
3E1DX	7,238,000
9A7A	7,008,834
CU2V	6,837,600
SQ6Z	6,826,210
IR9T	6,649,024
RM6A	6,505,540
UPØL	6,355,548
WP3A	6,295,640
EA4ML	6,088,173

LZ9A.....6,066,684
RZ9AZA.....6,049,148
T32MP.....5,825,440
HB5H.....5,780,765
OM3A.....5,718,692
K4ISV.....5,714,576
RK9CWW.....5,685,708
LU1NF.....5,629,680
4U1ITU.....5,546,511
S50G.....5,534,369

MULTI-MULTI

PJ9B.....58,355,968
V26B.....35,521,374
EA9EA.....35,208,292
P3A.....34,225,675
IH9P.....29,707,743
J3A.....29,153,182
KH7R.....28,552,374
AH2R.....24,764,410
VE3EJ.....21,733,220
VY2SS.....18,622,710
M8T.....17,791,520
OT8A.....17,220,588
K3LR.....17,214,635
N2RM.....16,299,116
LU4FM.....15,654,408
W3LPL.....15,263,465
JA5BJC.....13,523,250
VP5T.....13,412,708
HG6Y.....12,870,524
T88X.....12,250,953
RW2F.....12,082,599
XX9X.....11,632,668
W2A.....11,186,462
B1A.....11,131,934
OH2HE.....10,990,240
W1FJ.....10,905,495
K9NS.....10,059,552

USA

ALL BAND

K1AR.....6,677,181
K5ZD/1.....5,670,574
W4AN.....5,377,394
K3ZO.....3,961,095
N2IC/0.....3,909,568
N2LT.....3,778,900
W9RE.....3,778,040
W3BGN.....3,724,050
N3BB/5.....3,530,593
WB9Z.....3,310,057
K2DM.....3,191,805
W1WEF.....3,127,408
KØRF.....3,092,436
W7AT.....2,945,280
WC6H.....2,926,440
K4AB.....2,921,090
W7GG.....2,825,487
K7RI.....2,494,082
N7TT.....2,185,299
N6AR/4.....2,153,935
N4KW.....2,059,680
N4VZ.....2,044,149
KQ2M/1.....2,038,410
AA4S.....1,978,965
K6GX.....1,829,940
K5MA/1.....1,756,280
NX9T/4.....1,598,849
KE2VB.....1,582,644
WA2C.....1,550,485
W1TE.....1,544,500
W5WMU.....1,542,240
K9BGL.....1,528,672

28 MHz

KZ5MM.....659,564
W6YA.....438,210
W5OB.....411,464
N4BP.....404,227
W6NL.....400,128
KØKE.....322,010
N2BA.....321,606
N8II.....311,388
N7RT.....255,840
WS1M.....243,090
KA6BIM.....209,760
K6JOX.....202,909
KØRS.....185,875
AI2C/4.....179,262

21 MHz

WØUN.....759,360
NØNR.....603,849
NN4T.....597,753
W4MR.....430,050
K6AW.....416,005
W6PU/5.....406,700
N4PN.....382,235
WA2QNW.....365,440
NA4M/5.....272,180
W6BSY.....270,256
K9IG.....258,874
W9OF.....232,716
W3KHQ.....215,577
WØRA.....203,112
W8LR.....168,140
K3MD.....160,868
WB2YQH.....151,788
AI3Q.....150,920

14 MHz

W7WA.....857,468
K4XS.....771,900
K3CR.....575,736
W7IL.....322,414
W4RRR.....246,015
W5FO.....231,876
W8JGU.....210,084
K2MGA.....184,731
W8TWA.....166,855
K8WK/4.....161,304
K9YNF.....97,071
AD7U.....95,146
K2JLA.....58,647

7 MHz

K7EM.....375,164
KVØQ.....298,408
KZ2I/4.....78,240
K2WE.....73,284
K4DN.....59,000
NC4NC.....57,178
W7CB/6.....39,783
KD9DX.....36,162
KQ2O.....21,708

3.7 MHz

K1FZ.....249,340
K4ZW.....196,125
KM2P.....187,376
K1LZ.....166,957
KE1Y.....163,936
W6KW.....116,272
KR1G.....80,031
W4DC.....48,594
W8AEF/7.....20,493

1.8 MHz

W8LRL.....10,672
AA1BU.....5,850
N6RO.....2,626
KØCS.....1,452
AA4MM.....1,254
K8SM.....465

LOW POWER

ALL BAND

WA1S.....1,564,059
NA2U.....1,387,282
K1VUT.....1,303,808
KQ3V.....1,237,320
K1VW.....1,227,876
WA7BNM/6...1,125,180
WS1A.....1,084,232
WT1O.....1,061,302
KS1J.....959,400
N4DL.....958,398
WW3S.....942,180
ACØW.....938,667
WO4O.....897,151
W3UJ.....760,034
N1GPA.....755,136
N5TJ.....670,824
W1EQ.....651,000
K7ZZ.....602,426
N5AW.....599,747
N9SXT.....569,280
K7HBN.....563,277
W1NT.....559,975
W4PJ.....548,064
WA1FCN.....538,896
K2UF.....536,860
K1HT.....526,990
K4IE.....525,133
AA1QD.....519,288

28 MHz

K7JA.....252,285
K6KAY.....196,350
K6RO.....185,433
KT3RR.....185,220
KR5V.....171,236
KC2KU/4.....164,418
K2MFY.....159,330
NY1E.....137,718
AJ4Y.....135,198
W7USA.....126,720
WO9S.....118,472
K4TMC.....109,896
AC6WD.....103,000
N3RW.....100,464
W3EP/1.....100,125

21 MHz

N4MO.....274,309
NY5B.....226,778
KF8K.....180,815
N6WLX/8.....169,491
K4SN.....155,520
N7RQ.....98,273
K2BQW.....97,818
W3CP.....61,812
K9AB.....56,100
NY4T.....54,060
KU6T.....51,765
K7CW.....50,940

14 MHz

K4PC.....232,260
WD4CNZ.....69,084
KG7RZ.....51,120
K1EFI/3.....50,000
WA2ASQ.....28,884
AF8C.....27,552

7 MHz

W4UM.....36,524
WB2ZTH.....12,350
WG1Z.....9,460
KQ6ES.....7,869
K4LDR.....4,366

3.7 MHz

WT3W.....9,196
W9LYN.....2,871

QRP

N6MU.....627,644
NØKE.....546,128
K2PS.....539,925
W6YJ.....230,144
N1TM.....205,332
N4IJ.....151,008
W8QZA/6.....149,580
NØFW.....145,314
WA3NKO.....145,169
NQ7X.....70,680

ASSISTED

K1ZM.....5,646,645
KI1G.....4,766,212
KS1L.....4,471,936
K3WW.....3,681,228
K3NZ.....3,333,584
N3AD.....3,140,166
W2RE.....3,090,100
K1VR.....2,973,392
W1GD/2.....2,915,362
K5KG/2.....2,840,211
W1NG.....2,764,684
K4MA.....2,675,256
W3EEE.....2,635,800
K2XA.....2,521,062
N4ZC.....2,414,080
AA3B.....2,365,086
N3MKZ.....2,205,372
N2QT/4.....2,161,718
NN3Q.....2,129,148
N1DG.....2,001,536

MULTI-SINGLE

KC1XX.....9,407,928
K4ISV.....5,714,576
W9JA.....5,418,288
N4TO.....5,223,492
K5MR.....5,075,180
K1RO.....4,922,805
K2TR.....4,921,932
K2NG.....4,545,028
NK7U.....4,081,426
N3DL.....3,734,032
NØNI.....3,667,760
W9LT/8.....3,526,123
KØDU.....3,464,308
K2KV.....3,327,538
AA8U.....3,316,140
KC7V.....3,064,626
W3GNQ.....2,831,723
N4RV.....2,794,800
K3OO.....2,749,006
N8PR/4.....2,548,186

MULTI-MULTI

K3LR.....17,214,635
N2RM.....16,299,116
W3LPL.....15,263,465
W2A.....11,186,462
W1FJ.....10,905,495
K9NS.....10,059,552
W1GQ.....9,194,835
W3PP.....8,850,460
W4MYA.....8,440,077
W2AX/1.....8,086,566
NQ4I.....7,669,872
K1RX.....7,636,860
N6AW.....6,923,975
KV1W.....6,451,700
W7RM.....5,577,063
K3II.....5,441,600
K3ANS.....5,040,106
N98ITU.....4,395,936
K2RD/1.....3,698,253
KB1H.....3,046,480

EUROPE

ALL BAND

GIØKOW.....7,738,776
OT8T.....7,281,024
4N9BW.....5,700,125
OK1RI.....5,576,556
GW4BLE.....4,757,460
DL4NAC.....4,671,095
OHØZ.....3,831,040
DJ4PT.....3,651,140
YT1AD.....3,378,135
F5NBX.....3,194,928
RW4AA.....3,047,968
LY5W.....2,305,574
UT7DX.....2,061,320
YZ7AA.....1,988,692
UA4HTT.....1,930,551
GØIVZ.....1,916,304
IZ8Z.....1,869,984
IK4ADE.....1,839,390
DL8PC.....1,715,736
IK8NWK.....1,709,985
DJ6QT.....1,666,056
RK4WWA.....1,588,008
GWØGEI.....1,568,640
HA2SX.....1,567,924
OZ9Y.....1,559,681
LY2BM.....1,510,500
II6T.....1,481,000
UT4UO.....1,456,825
EA1UX.....1,400,223
UTØU.....1,362,500

DL2DX.....1,349,756
HAØIT.....1,321,452
S53MA.....1,298,037

28 MHz

9HØA.....934,440
CT4NH.....911,174
TM6P.....614,510
4O6A.....529,438
S53R.....481,899
CT1AHU.....448,890
9A4X.....437,760
S50L.....420,784
9A7R.....340,197
F6EMA.....308,308
EA6AEQ.....297,256
TM1W.....278,238
IR5T.....255,002
S51TA.....253,344
ISØNHT.....231,288
UT5UGR.....220,607
9A4D.....200,592
9A2AJ.....184,160
IR4B.....180,575
SP7VC/7.....157,052
LY2GF.....151,765

21 MHz

9A9A.....1,622,616
IY4W.....1,109,442
OE6Z.....1,109,292
S50C.....1,052,062
SP5GRM.....1,014,420
S50U.....983,892
GM4FDM.....942,480
IO4L.....848,904
DF9ZP.....841,896
OE1EMS.....809,590
GM4YXI.....726,244
CT8T.....710,940
YU1KX.....708,124
OM7M.....670,982
S52EZ.....670,488
F6HLC.....624,958
GW8GT.....547,740
IR3R.....545,844
EA3BCP.....498,454
G3TBK.....346,368
SP3SLA.....344,292
OM6NM.....312,200

14 MHz

SN2B.....1,262,151
DJ7AA.....1,185,771
GM8V.....1,085,750
OHØMM.....867,603
EA3ATM.....849,400
S53M.....837,900
YZ9A.....825,930
S50K.....824,356
II3T.....808,000
U5IZ.....751,488
YO4NF.....735,040
HG5J.....734,142
IT9STX.....691,477
ON4DPP.....590,712
T97M.....544,016
F6CQU.....523,680
S57MW.....522,576
ES5TV.....489,605
GW3JXN.....447,606
CT1AOZ.....385,968
IK2SAU.....347,990

7 MHz

LZ3ZZ.....731,850
9A5Y.....566,610
YT1BB.....529,750
HG9X.....425,941
IK2NCJ/4.....401,672
OM5M.....373,527
UY5ZZ.....205,442
LY3BX.....130,425
YO3KPA.....125,976
RK4FD.....120,879
IK7YTT.....63,498
YO3GOD.....63,388

3.7 MHz

S50A.....409,368
OK2RZ.....266,112
SP7GIQ.....165,138
HG5A.....161,929
S51OI.....132,986
LY61FW.....123,656
OK1FC.....67,236
UX7MM.....59,640
OK1FPS.....55,860
YU7ABN.....54,912
DL7ALM.....53,054

1.8 MHz

SV8CS.....101,835
LY3BS.....98,272
4O6A.....63,336
YZ6A.....60,900
OZ3SK.....55,626
S57M.....52,632
S50R.....45,560
IQ5B.....41,884
OH5VT.....35,200
LY2HM.....31,620
EA5AT.....22,176
OK2ZC.....20,910
S54E.....18,525

LOW POWER ALL BAND

T99W.....2,296,385
DL2NBU.....2,091,013
LY63BA.....1,842,848
LY2BTA.....1,771,380
9A2EU.....1,545,076
ON7RN.....1,462,720
YU7AL.....1,428,288
S59AA.....1,373,736
DF7RX.....1,360,632
EA5ARC.....1,201,122
EA3BKI.....1,193,400
IT9RDG.....1,156,896
DL1MGB.....1,138,407
RX3RC.....1,126,400
IV3UHL.....1,114,416
OE2S.....1,097,208
YO3APJ.....1,032,731
IV3ARJ.....939,608
EA3GEG.....878,940
F5NZO.....840,886
EA3GHZ.....810,811
UA3BL.....773,079
S59KW.....752,500
EA7AKK.....664,930
PA3GCV.....621,230
YO3FRI.....608,396
S57U.....601,293
EA3DUW.....516,030
DF3QG.....501,025

28 MHz

EA7GTF.....435,600
CT1ESO.....419,347
EA7FTR.....403,480
EA7HBP.....390,887
CT1ELP.....378,714
SV2AEL.....374,352
EA1FDI.....333,697
ISØGYW.....330,992
CT1EAT.....203,585
OM5FA.....196,992
EA1CBX.....178,920
S52OT.....167,268
EA3FCQ.....164,076
9A5Y.....163,280

21 MHz

UA4LCQ.....578,578
Z31GX.....561,118
RU4PL.....514,539
EA7DBO.....369,334
F5BMK.....307,720
YR9P.....303,940
EA3QP.....244,224
IT9RYJ.....230,740
9A2RD.....229,067
YO4CIS.....228,300
S50Q.....222,832
SP9XCN.....213,408
EA1CVY.....193,110
T91ENS.....187,200
OK1FKM.....176,172
UT7QF.....162,426

14 MHz

Z39Z.....493,503
9A/WA4IMC.....488,898
ES2RJ.....409,974
Z31JA.....396,660
IQ7A.....361,224
S58WW.....286,974
UU7JX.....200,825
I3MLU.....168,454
EA4BL.....164,580
IT9ICS.....155,703
ER3DW.....139,842
II8C.....137,085

7 MHz

S57DX.....195,481
CT1BWW.....117,882
T95A.....114,546
S54A.....98,800
UT1T.....70,656
IR7S.....67,422
G3XWZ.....60,928
SP9NLK.....41,452

3.7 MHz

SV2CWY.....132,300
Z31RU.....61,090
IK3SSJ.....57,424
YU1CC.....55,280
EC1CFD.....55,080
F2EE.....54,199
YO2KAB.....51,170
S57CQ.....50,542
4N1A.....50,232

1.8 MHz

HA8BE.....39,270
YU1RA.....16,302
EA1DVY.....8,084
SP9RPW.....7,009
EI7IU.....6,806
YU1AST.....5,699
DL1KZA.....5,617

QRP

YU1KN.....618,580
EA1GT.....329,250
S59D.....322,380
LY2PE.....312,741
YU1LM.....294,175
HA7YS.....251,085
SM3CCT.....132,020
IK5RUN.....100,656
OK1DKS.....93,312
IØKHP.....70,020
HB9AYZ.....55,875
SP1MVG.....50,728

ASSISTED

TM2V.....5,130,124
DLØWW.....5,051,532
OE8SKQ.....3,042,288
S57S.....2,771,608
OK2FD.....2,604,092
OL6X.....2,517,386
DJ2YA.....2,514,487
IO4A.....2,256,240
DL1MFL.....1,995,995
IN3ZNR.....1,900,661
IK1SLE.....1,540,868
DL5RBK.....1,531,615
S56A.....1,300,131
DK9DA.....1,258,638
SM2EKM.....1,126,700
IT9JOF.....1,114,350
ON5GQ.....1,046,994
OH6NIO.....1,040,256
LX1TI.....1,026,660

MULTI-SINGLE

IR4T.....11,914,560
HG1S.....10,892,700
TM2Y.....10,741,864
TM1C.....8,757,504
OK5W.....7,523,740
9A7A.....7,008,834
CU2V.....6,837,600
SQ6Z.....6,826,210
IR9T.....6,649,024
RM6A.....6,505,540
EA4ML.....6,088,173
LZ9A.....6,066,684
HB5H.....5,780,765
OM3A.....5,718,692
4U1ITU.....5,546,511
S50G.....5,534,369
UD6N.....5,455,856
EA5BY.....5,269,194
UT7Z.....5,251,587
S50S.....4,871,934
DHØDX.....4,752,972
T70A.....4,530,931
UR3IWA.....4,341,613
OH1AF.....4,302,249
DF3CB.....4,269,818
YL8M.....4,229,156
IO2A.....4,127,720
M8P.....4,095,224

MULTI-MULTI

M8T.....17,791,520
OT8A.....17,220,588
HG6Y.....12,870,524
RW2F.....12,082,599
OH2HE.....10,990,240
LY5A.....8,808,310
DLØCS.....8,696,520
RN3D.....7,946,820
DFØHQ.....7,640,248
PI4COM.....7,017,836
HBØ/
HB9AON.....6,816,866
EA3CCN.....5,919,797
LZ5Z.....5,566,848
LY7A.....5,550,184

Announcing:

The 1999 CQ World-Wide VHF Contest

Starts: 1800 UTC Saturday, July 10, 1999
Ends: 2100 UTC Sunday, July 11, 1999

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 eligible 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.

Example: W1XX works stations as follows:

37 QSOs, with 3 QSOs on CW ($34 \times 1 = 34$; $3 \times 2 = 6$; $34 + 6 = 40$) and 10 GL's (10 multipliers) on 50 MHz.

45 QSOs ($45 \times 1 = 45$) and 8 GL's (8 multipliers) on 144 MHz.

26 QSOs ($26 \times 2 = 52$) and 4 GL's (4 multipliers) on 222 MHz.

38 QSOs ($38 \times 2 = 76$) and 5 GL's (5 multipliers) on 432 MHz.

2 QSOs ($2 \times 4 = 8$) and 2 GL's (2 multipliers) on 903 MHz.

6 QSOs ($6 \times 4 = 24$) and 2 GL's (2 multipliers) on 1296 MHz.

W1XX has 245 QSO points ($40 + 45 + 52 + 76 + 8 + 24 = 245$) $\times$ 21 multipliers ($8 + 4 + 5 + 2 + 3 = 21$) = 5,145 total points.

VIII. Awards: Certificates suitable for framing will be awarded to the top-scoring stations in each category in each continent. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Certificates will be awarded to top-scoring stations in each category in geographic areas where warranted. Geographic areas include states (U.S.), call areas (Japan), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries.

IX. Miscellaneous: An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location. 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: Request log sheets from: CQ VHF Contest, CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801. Include an SASE with your request. Completed logs must be postmarked no later than August 31, 1999 to be eligible for awards. All logs should be mailed to: Joe Lynch, N6CL, VHF Contest Chairman, P.O. Box 73, Oklahoma City, OK 73101.

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 BUCK ROGERS, K4ABT

PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

A New Delta Use Dawning

Looking down the barrel of a great time at Dayton, you can always tell that spring has arrived when you see the amateur community digging out the radio relics to use as Dayton "swap fodder" or to sell for a pittance to recover some funds to reinvest in new ham gear.

There is no exception to this rule, as I too like to pursue the "good deals" in the bone yard at Dayton (or any hamfest, for that matter). Here I find acres and acres of wall-to-wall amateur radio gear that to some is considered obsolete, while to others, it is a treasure. This kind of activity brings to life the true meaning of "One man's trash is another man's treasure."

Why Re-invent the Wheel?

To keep the opening text of this month's "Packet User's Notebook" to a minimum so we can have more room to cover the real meat of this article, I'll be brief.

For those who are not familiar with the Southeastern Emergency Digital Association Networks (SEDAN), it is a network of more than 200 nodes that cover 11 states. The primary purpose of this network is for disaster and emergency communications when and if a disaster or impending danger threatens an area within earshot of one of the SEDAN local access nodes. The SEDAN operates as a keyboard-to-keyboard packet radio network when not in emergency communications use. By allowing it to be used for keyboard-to-keyboard use, we are always assured of the continuity of the SEDAN. If a discontinuity appears in the network, the users quickly alert the local System Node Operator (SNO) of the failed node, so that repairs can quickly be made to return the system to full service.

The network has more than fifty 60 watt, 9600 baud backbone nodes operating on 6 meters. The local access (1200 baud) nodes are operating at 145.770 MHz with a few local access nodes and gateways to the 9600 baud backbone on other 2 meter and 440 MHz frequencies.

Delta Dawn

I was scouting around for some GE Phoenix SX transceivers and found that New London Technology had a few for sale. I was in need of replacing several of

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

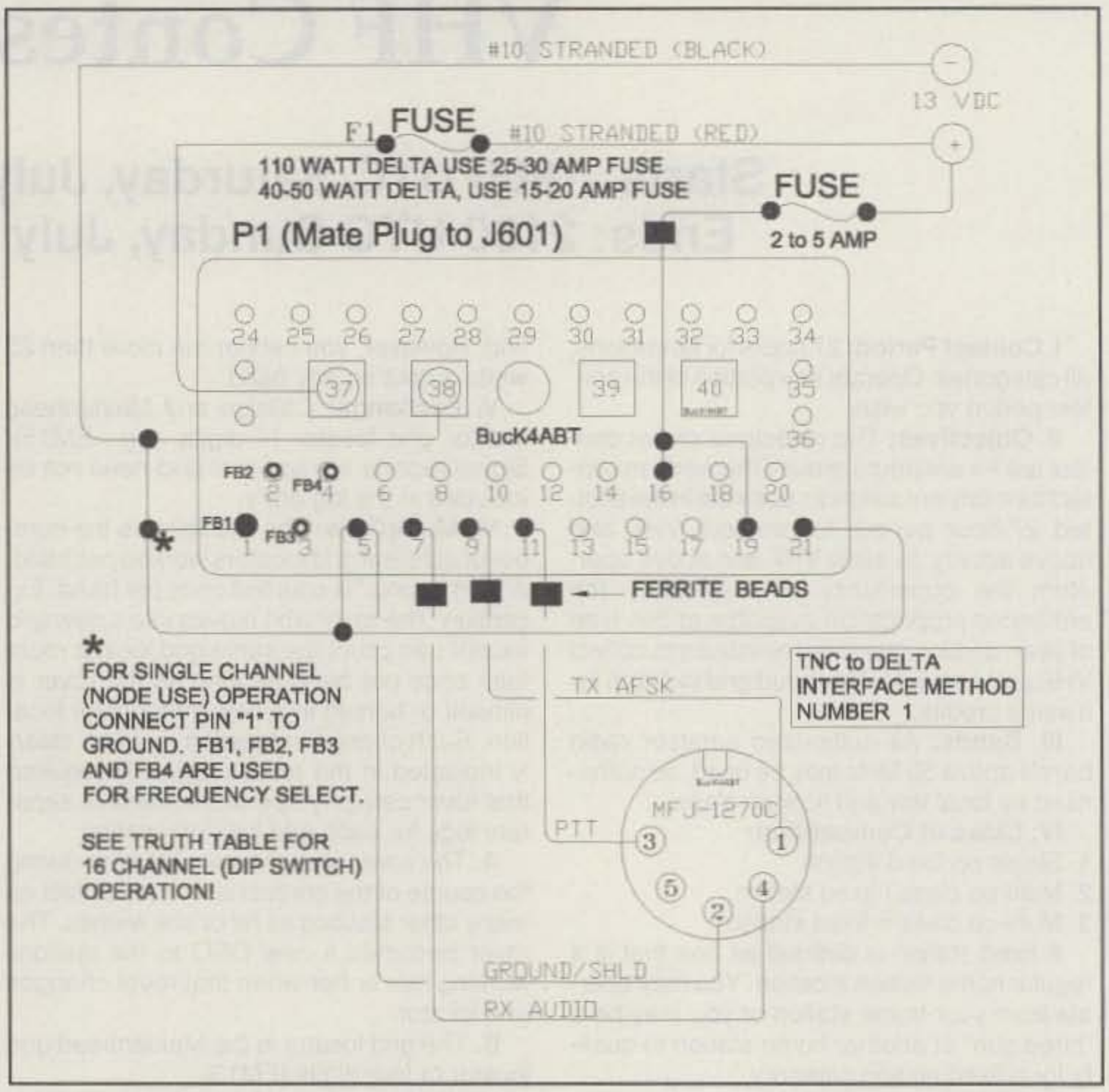


Fig. 1– I first check the radio to ensure that I have a "working" radio. Then I begin my modifications. You can test the Delta by building an interface cable similar to the one shown here. The connector (P1) is the made up of three Ericsson part number(s): cover 19C850508P1, connector 19D900037P1, and housing 19D900015P1.

the SEDAN low-power, 10 to 25 watt (node) radios with some 50+ watt transceivers. Bill Glahn, AD4YY, the CEO of New London Technology, pointed out some interesting features of a recent vintage GE transceiver called the GE (Ericsson) "Delta."

He first told me about how the GE Delta "S" (narrow-band) with an "SX" (wide-band) PROM would function very well in a high RF environment, mostly because the "S" utilizes cavity resonators in the front-end (receive RF section). That with the "SX" Micro (PROM) would move the 150–174 MHz version into the 136–155 MHz region. This part of our eyeball QSO got my attention, but then he dropped a Patriot missile into my pocket! He mentioned 110+ watts! Boing! My ears became tuned to his voice and synced to his dialog within point 03 (.03) nanoseconds.

What!? Here I've been with Ericsson for seven years, and I had forgotten the Delta power-house. How could this be? Well, mostly it was because I thought many of them were still in commercial, conventional service. Not so, as Ericsson has been replacing many conventional systems with Ericsson Enhanced Digital Access Communication Systems (EDACS) which operate in the UHF and 800 MHz spectrum.

The transition to an 800 MHz EDACS has enabled us to find some of the transceivers once used in the conventional commercial service available on the surplus market. In turn, we are able to plow them into a new crop of emergency net-

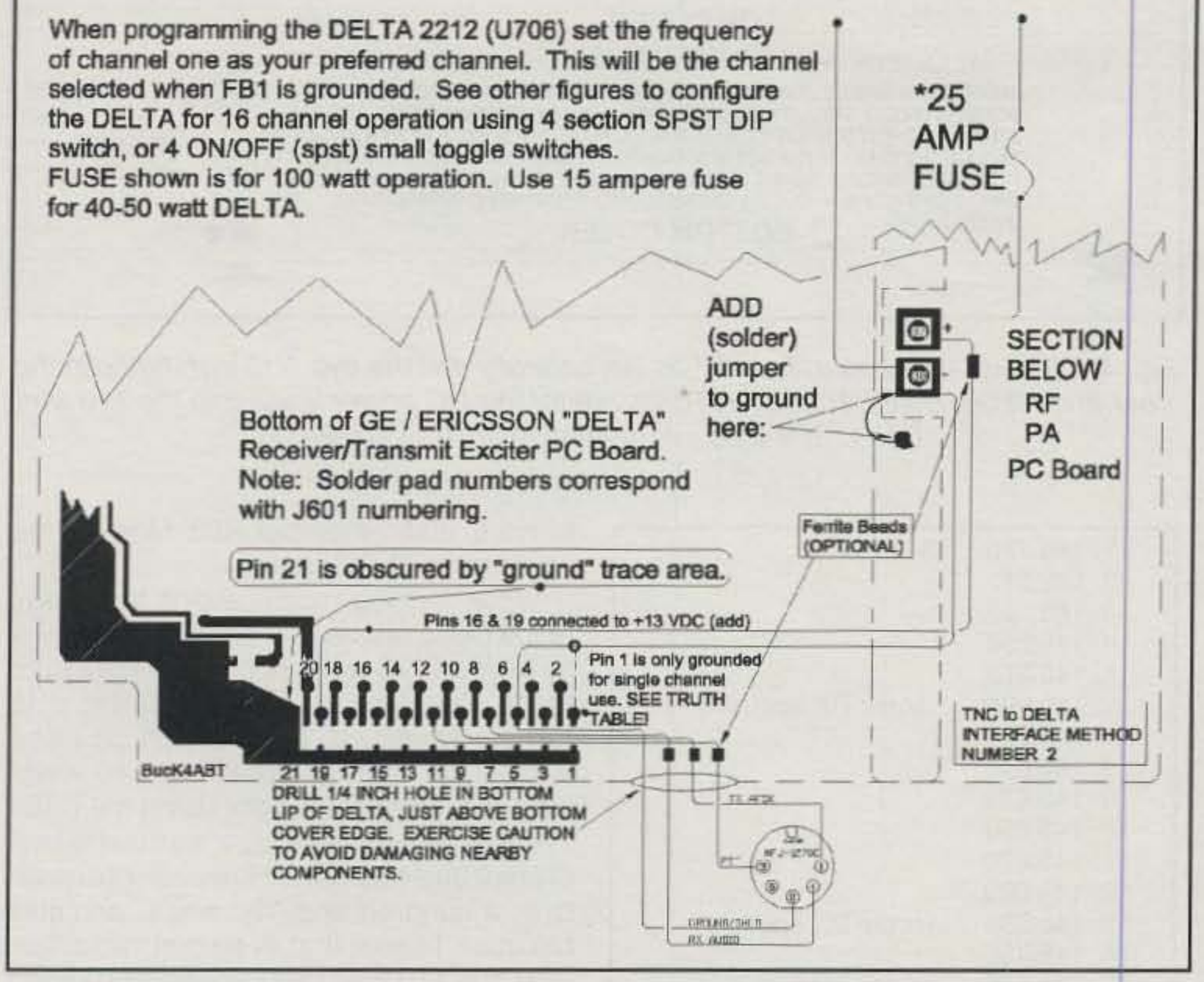


Fig. 2– I don't use the "P1" connector; Instead I build the interface I've drawn here. I do a bit of surgery to the front of the Delta to insert the TNC and a couple of 3/16 inch holes in its rear end for the DC power input wires.

work nodes radios with real signal punch. Here we can make good use of them in an amateur radio disaster communications network such as the SEDAN, not to mention other related repeater applications.

Many amateurs and many GE/Ericsson dealers and technicians remember with great pride the work-horse of the commercial communications industry during the 1980s. The Delta "S" and "SX" were built for all three band cuts—e.g., low band (29 to 50 MHz); high band low split 136– 155 MHz, high split 152–174 MHz; and UHF. The Delta is best remembered because it came in two power levels for VHF and because it was built like a Sherman tank. The two VHF versions were 40 watt and 110 watts "output." Yes, and there was that UHF version that delivered 100 watts to the antenna.

Here's the kicker, though: The Delta was somewhat ahead of its time because it applied the same surface-mount-device assembly techniques that are used in today's production applications.

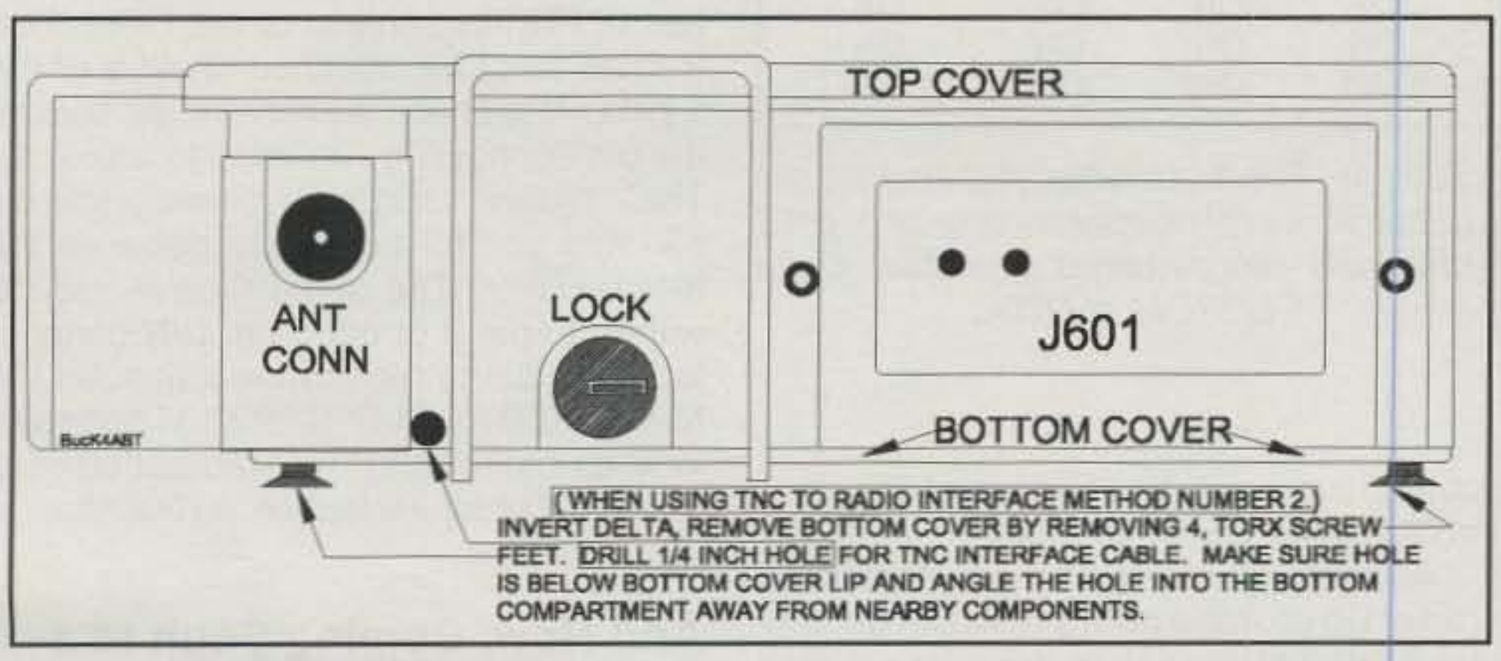


Fig. 3– Here is where I exercise an ounce of caution when I drill the 1/4 inch hole for the TNC cable entry into the bottom section of the Delta. I use this method of interface instead of using the P1 and J601 connector interface.

Now New London Technology buys a lot of the surplus and discarded conventional radio systems. Bill then has a supply of conventional radios for the amateurs, dealers, and users who are still servicing or using these conventional radios. Bill, AD4YY, will have many of the Deltas and other GE and Ericsson radios at Dayton "under the big tent" at booths 204 and 205. He also will have some of the interface drawings that I've drawn for this month's column.

For the record, New London Technology's address is 752 Alum Springs Road, Forest, VA 24551 (phone 804-525-4171; fax 804-525-0078). To check out their web site go to: <www.newlondontech.com>.

First Things First

First we must obtain the Delta "S" or "SX." For the record, I bought a few of the 110 watt, Delta "S" versions with the "SX" micro installed from New London Technology. By using the narrow-band "S" Delta with the "SX" prom, I can set it for single frequency node use and tune the helical resonators in the RF section for a "hot" front end that works great in an RF-rich environment. In a similar fashion, but with a few more parts and tuning procedures, I can make it into a full-blown, 110 watt, 16-channel packet radio. More on the 16-channel mod later in this article.

I first check the radio to ensure that I have a "working" radio. Then I begin my modifications. The maintenance manuals that I use for the Delta-SX are labeled LBI-31538B (wide band) or LBI-31516 (narrow band). New London Technology can supply the Delta radios, but no manuals. They can supply the accessories if you have a need for them. However, if you are performing the modifications shown in this article, you will *not* need to purchase the accessories for the Delta.

You can test the Delta by building an interface cable similar to that shown in fig. 1. This connector (P1) uses GE/ Ericsson part numbers: cover 19C850508P1, connector 19D900037P1, and housing 19D900015P1. I do not use the "P1" connector. Instead I build the interface I've drawn as fig. 2. I do a bit of surgery to the front of the Delta (see fig. 3) and insert the TNC cable at the Delta front. Then I make a couple of 3/16 inch holes for the DC power input wires at the rear (see fig. 4).

There is POW! Power In the Delta

If you know the "personality" (frequency, usually 16 channels) of the radio with which you are working, you can build the simple test interface that I have drawn in fig. 1. Although I am showing the Delta "P1" plug interfaced to the MFJ-1270 connector, this same plug and five-pin DIN

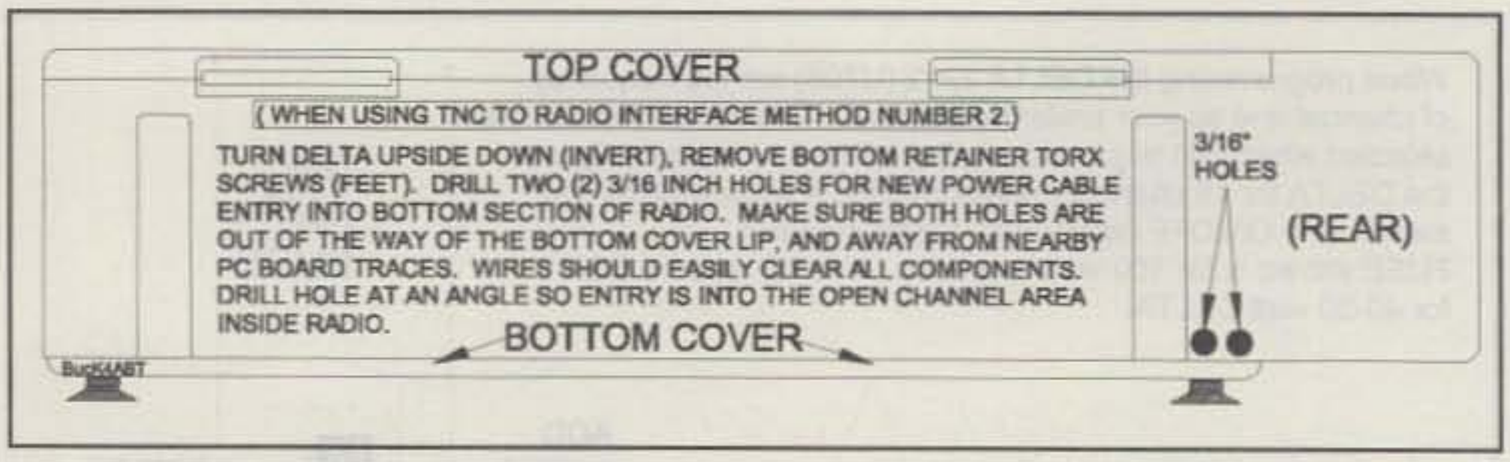


Fig. 4– Now for the preparation "R" as we carefully drill the two 3/16 inch holes in the "rear end" of our Delta. These two holes are for the DC power leads into the 110 watt Delta. See fuse information in fig. 1 or fig. 2.

1. 145.770	SEDAN
2. 145.010	
3. 145.030	
4. 145.050	
5. 145.070	
6. 145.090	(some DX spotters)
7. 145.570	
8. 145.610	
9. 145.630	
10. 145.650	
11. 145.670	
12. 145.690	
13. 145.730	(some DX spotters)
14. 145.750	
15. 144.390	APRS (new)
16. 145.790	APRS (old)

Table I– K4ABT's 16 frequencies that he has programmed into his 2212 EEPROM.

FB1	FB2	FB3	FB4
ON	OFF	OFF	OFF
OFF	ON	OFF	OFF
ON	ON	OFF	OFF
OFF	OFF	ON	OFF
ON	OFF	ON	OFF
OFF	ON	ON	OFF
ON	ON	ON	OFF
OFF	OFF	OFF	ON
ON	OFF	OFF	ON
OFF	ON	OFF	ON
ON	ON	OFF	ON
OFF	OFF	ON	ON
ON	OFF	ON	ON
OFF	ON	ON	ON
ON	ON	ON	ON
OFF	OFF	OFF	OFF

Table II– The "truth table" that enables the users to switch between any of the 16 channels programmed into their Delta EEPROM at U706.

combo can easily be used to test the operability of the GE Delta radios.

Always perform a preliminary test of the radio! Do so into a purely resistive dummy load rated at more than the power output of the radio—e.g., 110 watts *plus*. Just so you know, I've seen much more than 150 watts out of some of these radios! Do beware, and remember R23. More on the application of R23 later.

While making modifications to several of the Delta radios, I've been able to crank as high as 175 watts of power output from them. Yes, I know. The temptation is to run the power up, but the high-powered VHF Delta radio is spec'd at 110 watts output. Of course, we are using the Delta in the packet radio service, so maybe I will crank it up a tad more. However, not much over a hundred and "rty" watts, *and* only because I know that in packet radio service "the 110 watt Delta will only be keyed for a few seconds at time." Let's keep in mind that if 110 watts doesn't get you there, then the target node or packet station is (1) deaf or (2) too far away. FYI, the low-powered (40 watt) version of the Delta can easily run 50 watts output, but here again, you're on your own!

Here is how to maintain power control of the Delta 110 watt radio. If the radio is running over, let's say, 120 watts, the power can be reduced by turning R23 counter-clockwise. R23 is located in the RF PA compartment on the left side of the Delta (component side up) radio. If the metal cover is in place on the RF PA, there will be a single hole near the right front of the RF PA cover. R23 is directly below via this hole, or if the cover is removed, R23 is fully visible in the right front corner of the RF PA compartment.

Use pin 3 of the 5-pin DIN to ground to test (PTT) the transmit of the Delta. Use a small amplifier attached to pin 4 of the 5-pin DIN to check the receive. As shown, the pin connection I've used to attach for TNC receive audio is "unsquelched," allowing you to hear white noise on the test speaker. The audio receive ground will be to pin 2 of the 5-pin DIN connector. This is one reason I recommend the MFJ-1270B (or C) TNC for X1J4 node service, as it will operate with radios that have "open" or unsquelched receive audio.

And Now, Coming Soon to a CQ Magazine Near You

For those readers who are asking what about 9600 baud, I have an article com-

CH	Freq.	FB1	FB2	FB3	FB4
1.	145.770	ON	OFF	OFF	OFF
2.	145.010	OFF	ON	OFF	OFF
3.	145.030	ON	ON	OFF	OFF
4.	145.050	OFF	OFF	ON	OFF
5.	145.070	ON	OFF	ON	OFF
6.	145.090	OFF	ON	ON	OFF
7.	145.570	ON	ON	ON	OFF
8.	145.610	OFF	OFF	OFF	ON
9.	145.630	ON	OFF	OFF	ON
10.	145.650	OFF	ON	OFF	ON
11.	145.670	ON	ON	OFF	ON
12.	145.690	OFF	OFF	ON	ON
13.	145.730	ON	OFF	ON	ON
14.	145.750	OFF	ON	ON	ON
15.	144.390	ON	ON	ON	ON
16.	145.790	OFF	OFF	OFF	OFF

Table III– Relationship between the switch configuration for the "truth table" and the list of frequencies K4ABT uses for packet operation in the Delta.

ing very soon here in the "Packet User's Notebook." Yes, I do have some Deltas running at 9600 baud with the MFJ-1270CQ Turbos. These mods are made somewhat differently and require internal component changes. With the higher power, and even though they are synthesized, the Delta does exhibit a fast rise-time to full power. They also have a very fast antenna change-over relay.

With packet radio coming to life in a big way, I'm packing as much information into each month's column as I possibly can without having Alan, K2EEK, having a duck because I'm using up too much space. For this reason, I'm defraying the 9k6 baud article for a later column, as it too will be a lengthy article.

An Alternate Method

An alternate method to interface the Delta to an MFJ-1270B or C TNC is shown in fig. 2. This is how I interface all my Delta to X1J4 nodes. One caveat: If you make the mod as I have, using the interface at fig. 2, then be sure to cover (or use heat-shrink tubing to cover) pins 37, 16, and 19 on the front (J601) radio connector. The location of these pins is shown and labeled in fig. 1.

After you're confident that you have a good, working Delta, the next step is to remove power and remove any tone (Channel Guard) board from the radio. Toss it away—far away. You will no longer have a use for this PC board. To remove the CG PC board, open the top of the Delta. Located on the front of the Delta on the right portion is a PC board with the solder traces exposed or facing up. Remove the four TORX retaining screws, and lift—that is, it may need a slight tug—and remove the CG PC board. Remove the "extender" PC board also.

Next locate jumper pins J608 and J609. These pins will be directly below where the CG PC board was located. If the radio was equipped with channel guard, then a jumper (strapping option) will be present on J609. Move (remove) the jumper (P609) from pins J609 and (move it left to J608) place it on jumper J608, where it becomes "P608."

Addressing the EEPROM

At socket U706 is the IC 2212 EEPROM. This is where the "personality" of the Delta is stored. If you have a friend who has the GE "suitcase" programmer, you can obtain the 2212 EEPROM and have the friend burn the 16 packet channels of your choice into it. Or, you can call New London Technology and give them the 16 VHF packet frequencies you want in the EEPROM and they will provide the EEPROM, program it, and mail it to you for $30 (USA only!).

When making the program selection in the "suitcase programmer," I use the "high-split" (152–174) version selection. We can force the radio (EEPROM) to accept frequencies down to 144.5 MHz. To do this, use the "insert" key on the programmer instead of the <Enter> key.

We've Got "Personality"

In Table I, I have provided a set of the frequencies that I use. I program these 16 channels into my 2212 EEPROM. This set of frequencies includes the SEDAN frequency of 145.770 as channel 1, and both the old and the new APRS frequencies at channels 15 and 16 in the table.

You can configure your radio "personality" in whatever sequence you wish. As most packet radio frequencies are simplex, this makes it easy to make your EEPROM. Since there are several more than 16 VHF packet radio frequencies, I have a couple of 2212 EEPROMs handy. One of them has a set of frequencies that includes some of the more popular frequencies in both, but the second EEPROM has the set of frequencies that I left out of the first EEPROM.

System Alignment

Now that you have the EEPROM programmed and installed at U706, it's time to do the final touch-up on the Delta. You may wish to make a copy of this article so you can switch between artwork and text to verify where the next alignment procedure is that you are to follow.

I am a strong believer in the saying that goes something like "A picture is worth

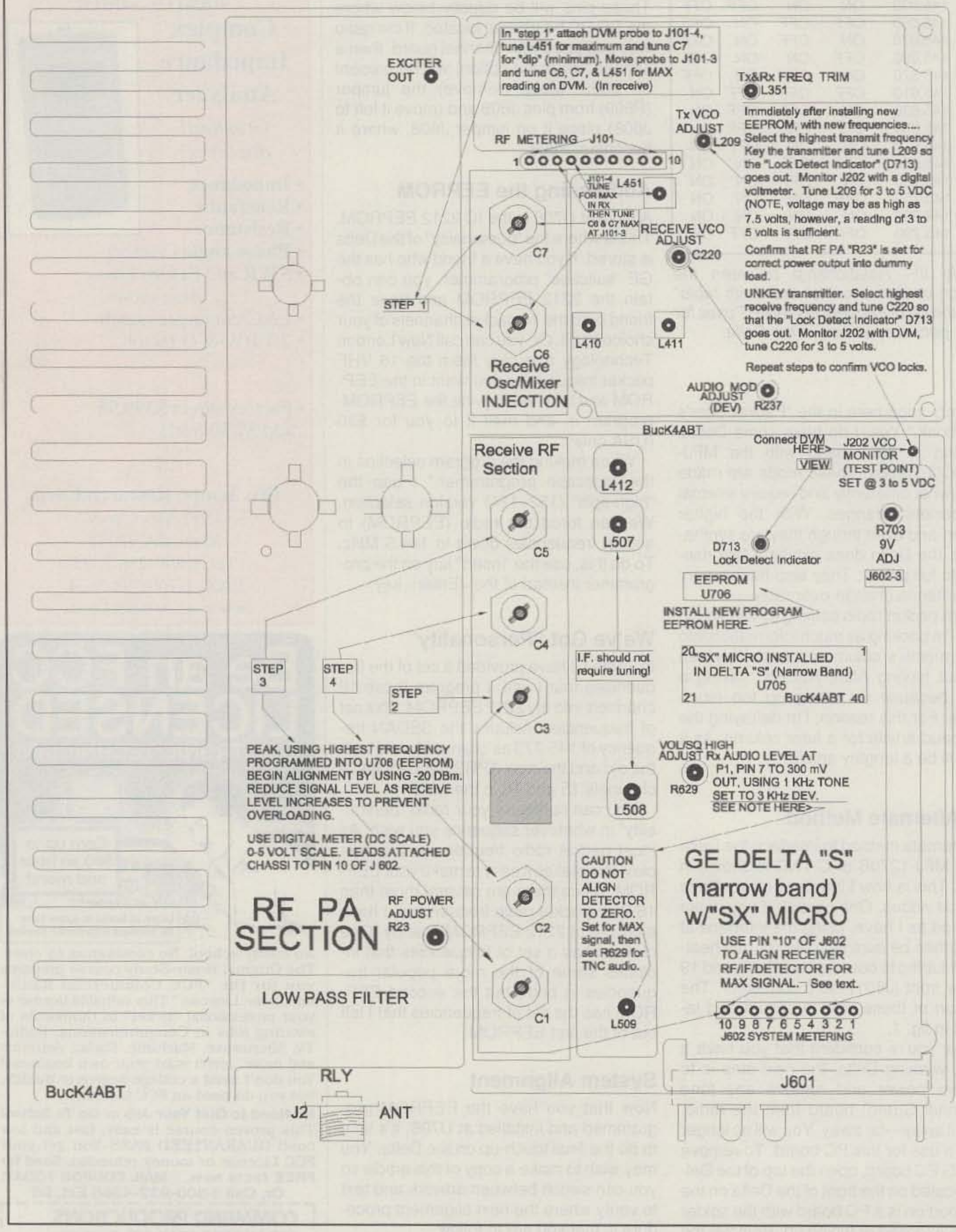


Fig. 5– This drawing illustrates the test-point locations and tuning-step procedures. Note: Set the 9 volt regulator R703 while reading 9 volt test point at J602, pin 3. The next step is to confirm (adjust C220 and L209) receive and transmit VCO lock.

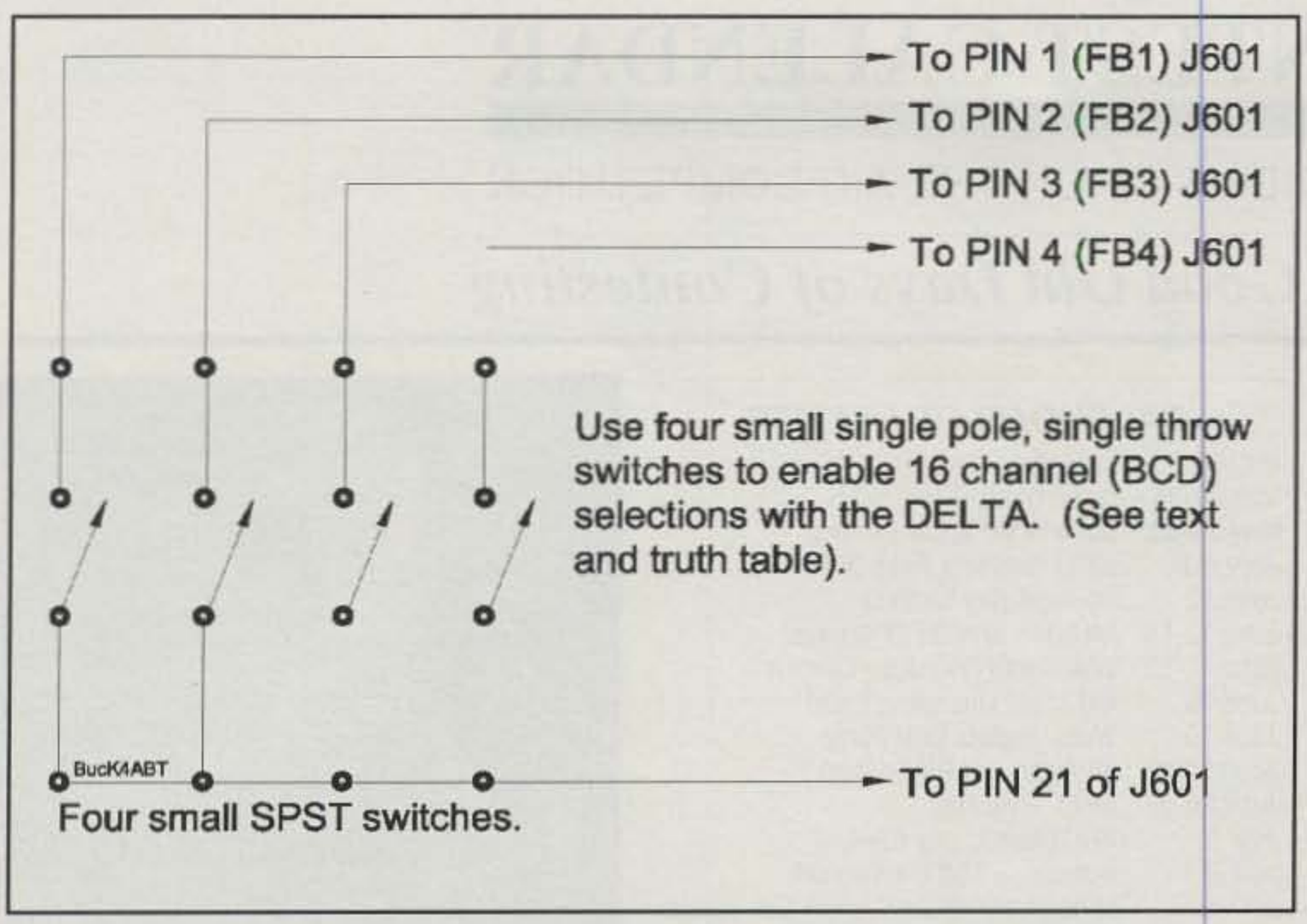


Fig. 6– Here I've outlined a simple BCD switching arrangement that will enable switching to any one of the 16 channels you may have programmed into your Delta's EEPROM. In Table II I've included the "truth table" that enables the user to understand how the 16 channels are selected.

10,000 words." So to make your life easier, I have drawn an extensive overview of the Delta radio tuning points and voltage monitoring points within the radio (see fig. 5). Stop for a moment and study fig. 5 and the steps I have outlined. By reviewing this drawing now, may save some time later when you get into the nitty-gritty of the modification.

First and foremost, read the text box shown in the upper right-hand corner of fig. 5. This section is first because you must be sure you have frequency lock of both the Delta receive and transmit VCOs.

It is important that you use a DVM with the readout set for the 1 to 10 volt "DC" scale, or that the DVM will auto-range to the scale you require.

Sixteen Candles

As you become more familiar with your Delta radio, you will soon learn how easy it is to make the Delta into a 32-channel, 110 watt packet radio.

We've discussed the use of the Delta as a single-channel mountaintop node radio, but now let's talk about utilizing the fuller potential of the Delta's 16-channel capability.

In fig. 6 I've outlined a simple BCD switching arrangement that will enable you to "switch" to any one of the 16 channels you may have programmed into your 2212 EEPROM. In Table II, I'm including the "truth table" that enables the user to switch between any of the 16 channels programmed into their Delta EEPROM at U706. FB1, FB2, FB3, and FB4 are the pin identifiers for pins 1, 2, 3, and 4 at J601.

Now that we are beginning to see the relationship between the channel numbers and the truth table, look at the switch configuration for the truth table and the list of frequencies that I use for packet operation in the Delta in Table III.

Just in Case . . .

In the event you find that you want to circumvent all the fun of building the Delta packet radio, then consider writing or calling New London Technology, 752 Alum Springs Road, Forest, VA 24551 (804-525-4171; fax 804-525-0078) and ask about the Delta radios they have already modified, ready to plug and play.

My thanks go to George Rose, W4GCE; Ben Jones, KB4MPX; Bill Glahn, AD4YY; and Pete Lascell, W4WWQ, for their contribution to this month's column.

Until next month, Have Fun Packeting!

de BucK4ABT
e-mail: <k4abt@PacketRadio.com>
visit: <www.PacketRadio.com>

BY JOHN DORR, K1AR

CONTEST CALENDAR

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Those Good Old Days of Contesting

June's Contest Tip

Operating in a disadvantaged mode is good practice for the real event. In my case, that's using a dipole at home (tower going up this summer—really!), resulting in huge benefits when operating from more capable stations in major contests. If you have a bigger station, try calling guys without your amplifier. No matter how you choose to reduce your signal (and for many of us, that comes naturally), the result is that working guys in this mode sharpens your skills, requiring you to emphasize operating vs. brute force methods. I guarantee these "learned" techniques will pay off in the next contest you go after for real!

Let's face it: There are a lot of pessimistic comments about the future of our hobby that are being thrown around amateur radio circles these days. And with the average age of the typical amateur radio operator approaching 240 years, there may be some justification for these concerns. Of course, there are all the other factors we keep hearing about, too: the Internet, cell phones, computer games, etc. The world is now affordably available to our fingertips.

Have you walked through a consumer electronics store lately? It's particularly interesting to look at the computer gaming section of a typical consumer electronics store. This may not surprise you, but it sure doesn't look like a Dayton Hamvention hospitality room. The average age of the customer is probably 15, dominated by a group of youngsters that have at least as much enthusiasm for their sport as we did for ours in our youth. Yes, my fellow contester, we have serious competition indeed.

Well, now that I've gotten you to the point of wanting to sell your equipment while there's still a marginal market of buyers available, let's shift gears and focus on an attribute of contesting that's very curious—especially in light of my earlier comments. Why is it that in a period of seemingly stagnant or declining growth, we continue to see contest scores escalating? Haven't we already established that the population of available HF contesters is declining? With the average age of amateurs rising, isn't the number of "contest hours" operated by a typical competitor less than ever before? It seems that we have all of the ingredients to witness a *decline* in overall scores, and not an *increase.*

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CALENDAR OF EVENTS

May 22-23	Texas QSO Party
May 22-23	Baltic Contest
May 29-30	**CQ WW WPX CW Contest**
June 5-6	IARU Region 1 Field Day
June 12	Portugal Day Contest
June 12-13	ANARTS WW RTTY Contest
June 12-13	WW South American Contest
June 19	Kid's Day Operating Event
June 19	West Virginia QSO Party
June 19-20	All Asian CW DX Contest
June 26-27	ARRL Field Day
July 1	RAC Canada Day Contest
July 3-4	Venezuela SSB DX Contest
July 4-5	Michigan QRP Club July 4 CW Sprint
July 10-11	**CQ WW VHF Contest**
July 11-12	IARU HF Championship
July 17-18	SEANET CW Contest
July 17-18	North American RTTY QSO Party
July 24-25	Venezuela CW DX Contest
July 24-25	IOTA Contest
Aug. 1	YO DX Contest
Aug. 7-8	North American CW QSO Party
Aug. 14-15	WAE CW Contest
Aug. 21-22	North American SSB QSO Party
Aug. 21-23	New Jersey QSO Party
Aug. 28-29	Hawaii QSO Party

Karin Greene really gets into her dad's contesting setup for Kid's Day, sponsored by the Boring Amateur Radio Club. Karin's dad is Clarke Greene, K1JX. (Photo by Virginia Greene, WB1AVA)

Well, I believe there are a number of factors to consider here. For starters, let's be thankful for that big, yellow disc in the sky that we call the Sun. While its brightness never wanes, its impact on propagation certainly does. And thankfully, amateur radio needs, more than ever, an infusion of good conditions to spark our hobby. In the past year, good conditions have been delivered in spades. What was once a dead 10 meter band is now one which makes finding a clear frequency a challenge anywhere from 28300–28700 in many contests. Now even small pistols can enjoy contesting again (witness my 1200 QSO part-time effort in last year's 10 meter contest while operating from my new QTH with an 80 meter dipole in the trees). As with club scores and many other areas, small pistols are the keys to the contesting kingdom. Without them, there is no contesting. Quite simply put, good conditions make for more guys out there to work—period!

Another factor to consider is the improvement in equipment, especially overseas. Certainly it can't hurt scores now that more operators have better equipment to use when operating. That not only makes them more accessible to serious contest operators, it increases their interest so that they operate more hours in a given contest. The result: higher scores.

Yet another aspect to this debate has to do with the number of available stations to work. Now this may seem contradictory to my opening points, but while amateur radio growth is declining, there are pockets of seemingly dramatic increases. You can determine this in many ways, but an obvious one is to think about a country's newly issued callsigns. Consider what's happening in countries such as England (with the MØ block now widely in use) or Germany (yes, the DM block is back, not to mention a hoard of new DH callsigns). To be fair, some of this callsign jockeying is a result of local "vanity" programs, but there's no denying that many countries are seeing an influx of new HF operators. For those competitors who benefit most from the availability of Europeans, these new fellows are a boon to contest scores. When combined with other hot spots such as LU, JA, and I, the picture may not be as bleak as we think.

Finally, it's apparent that the quality of operating is increasing, too. There once was a day when I was concerned about setting my keyer speed too high. Would I miss out on stations calling me because I was sending too fast? Now, admittedly

coming from an East Coast perspective, we can't send fast enough at peak rate times. The volume of quality operators has markedly increased for sustainable periods. This translates into higher rates and higher scores. Certainly, too, a quality piece of operating gear on the other end doesn't hurt from this perspective either. And this is not just a CW issue. SSB rates have climbed to staggering levels as well. The fact is that there are just more stations to work on any mode, in any contest, at any time of the year. This is true for both DX and domestic contests (take a look at ARRL Sweepstakes results if you doubt me). That's good for us and great for the hobby in general!

So what can be concluded here? As active participants in our hobby, we certainly have cause for concern about its future. Yet there are ways to measure activity and interest, and fortunately one of them is contest operating. Contesting has a lot of gusto and momentum. It's always been an aspect of amateur radio with which many amateurs have dabbled. Why? Because it's easy and addresses the interests of most amateurs, whether their focus is on DXing, station performance, or just wanting to make an intriguing QSO. There's no scientific way to understand the phenomenon of contest score escalation. I'm just glad that it is happening!

Final Comments

That's it for this month. You can look forward to my summary of the 1999 CQ Contest Survey in a future column this summer. A hearty thanks to all who participated.

Remember that all Contest Calendar submissions for the September column must reach me by July 1. You're advised to send your contest information to me directly and not to Hicksville (e-mail to me at <K1AR@contesting.com> is absolutely the best way!). There have been some latecomers recently, so please take note of these dates to ensure that your event's announcement gets published.

73, John, K1AR

1998 WPX SSB Contest Corrections

The following single op entrants were inadvertently omitted from the SSB score listings. Low power is denoted with an asterisk after the call; A = all band.

ED1JJ*	21	1,280,241	
JT1CJ*	A	63,220	(1st place Mongolia)
OM5AW	A	2,122,932	(1st place Slovakia)
RA9JP	21	546,120	
RK9JWV	28	3,652	
RW4YA	A	113,623	

In addition, K6ZX/8 should have been listed as KZ6X/8.

Portugal Day Contest

0000–2400Z Sat., June 12

This is the ninth running of the Portugal Day Contest sponsored by Rede dos Emissores Portugueses. It is on 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 participation award for 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 12–13

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 S.A. 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 12–14

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 that you write to ARRL Headquarters for official forms or download them off their web site. Include a SASE with your request to: ARRL VHF Contest, 225 Main Street, Newington, CT 06111.

Kid's Day Operating Event

1800Z to 2400Z Sat., June 19

Sponsored by the Boring Amateur Radio Club, the Kid's Day Operating Event is intended to encourage activity by younger people (licensed or not) using amateur radio. The goal is to give unlicensed young people some hands-on, on-the-air experience so they might develop an interest in pursuing a license in the future. It is also intended to give amateurs a chance to share their station with their children.

Exchange: Name, age, location, and favorite color. You are encouraged to work the same station again if either operator has changed. Call "CQ KIDS DAY."

Frequencies: 28350 to 28400 kHz and 14270 to 14300 kHz.

Logs, comments, and funny stories may be posted via the Internet to <kids@contesting.com>. You may review these postings at <http://www.contesting.com/kids/> with your web browser. All verified participants will receive a colorful certificate. Send an SASE to BARC, P.O. Box 1357, Boring, OR 97009. More details may be obtained from the Boring Amateur Radio Club at the above address or at <http://www.jzap.com/k7rat/>.

West Virginia QSO Party

1800–2400Z Sat., June 19

Sponsored by the West Virginia State ARC, work stations once per band per mode, 160–2 meters (no WARC bands). No repeater or net QSOs.

Classes: Single Op., Multi-Op., Multi-Multi, and Mobile.

Exchange: WV stations send RST and county; others send RST and state/province/or DXCC country.

Suggested Frequencies: CW—1.810 and 35 kHz up; SSB—35 kHz up in the General subband; Novice portion of 10 meters. No WARC bands.

Scoring: 2 points CW, 1 point phone QSOs. Work mobile stations once for 3 point QSO credit and as multiplier credit thereafter. Add 50 points per mode for working W8WVA on all modes.

Final Score: QSO points × WV counties (maximum 55). WV stations use WV counties, states, and provinces, and DXCC countries for multipliers. Add bonus points to final score.

Awards: Plaques to the high scorers in each category in and out of state. Certificates of appreciation will be sent to all who submit an SASE.

Send all logs no later than July 20, 1999 to: Richard Fowler, N8FMD, Route 3 Box 52, Clarksburg, WV 26301. Electronic logs may be sent to <n8fmd@neumedia.net>. An e-mail confirmation will be sent to all entrants who send electronic logs.

All Asian DX Contest

CW: June 19–20 Phone: Sept. 4–5
0000Z Sat., to 2400Z Sun.

This is the 40th 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 their 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. Also 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. 30 for the phone section and July 30 for CW. They 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.

ARRL Field Day

1800–2100 Sat. to Sun., June 26–27

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 sponsor the Canada Day Contest. Amateurs from around the world are invited to Canada's birthday party on the air.

Classes: Single Operator All Band (high power, 100 watts, and QRP) and 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 (13 maximum). Final score is total QSO points times your multiplier. At press time, it appears that the new VYØ multiplier will be active. Check out <www.rac.ca> for the latest information.

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 will be sent to category winners around the world as well.

Entrants must submit a summary sheet showing scoring 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 further information) and will be sent to all certificate winners. ■

BY DAVE INGRAM, K4TWJ

WORLD OF IDEAS

A LOOK AT THE WORLD AROUND US

QRP '99: More New Kits and Neat Ideas—Part II

It happened again, friends! The bands were quiet and calm, so I retired to the den and casually flipped on a little 30 meter QRP rig by my easy chair. Within a few short minutes DX stations began rising above the noise like fish jumping on a lake! At least three of the world's six continents were represented in only 15 kHz. A European station was calling CQ near 10.100 kHz. I answered him and received an immediate reply. Bang! The scenario replayed for two more intercontinental QSOs. I was running the band like Minnesota Fats ran pool tables!

I briefly considered returning to the shack and firing up the big (100 watt) rig, but why argue with success? Indeed, the happy hamming power of QRP is amazing! Don't just take my word here, gang. Try it in your own shack and experience the thrill of QRP for yourself!

New to QRP? No problem. My self-published book *QRP Now!* will get you going with dozens of tried-and-proven operating tips plus info on all the popular mini-rigs and goodies of the day. Copies are available direct from my house to yours for $16 plus $2 regular mail, $3 priority mail. Check it out and join us around 7.040, 10.110, 14.060, or 28.060 MHz!

My enthusiasm is once again slipping into sideshow barker mode. What can I say? When you're hot, you're hot! Now let's continue our sojourn down the QRP trail with a special slant on "lighthearted hamming" here with QRP '99, Part II.

New Jersey Fireball 40 Kit

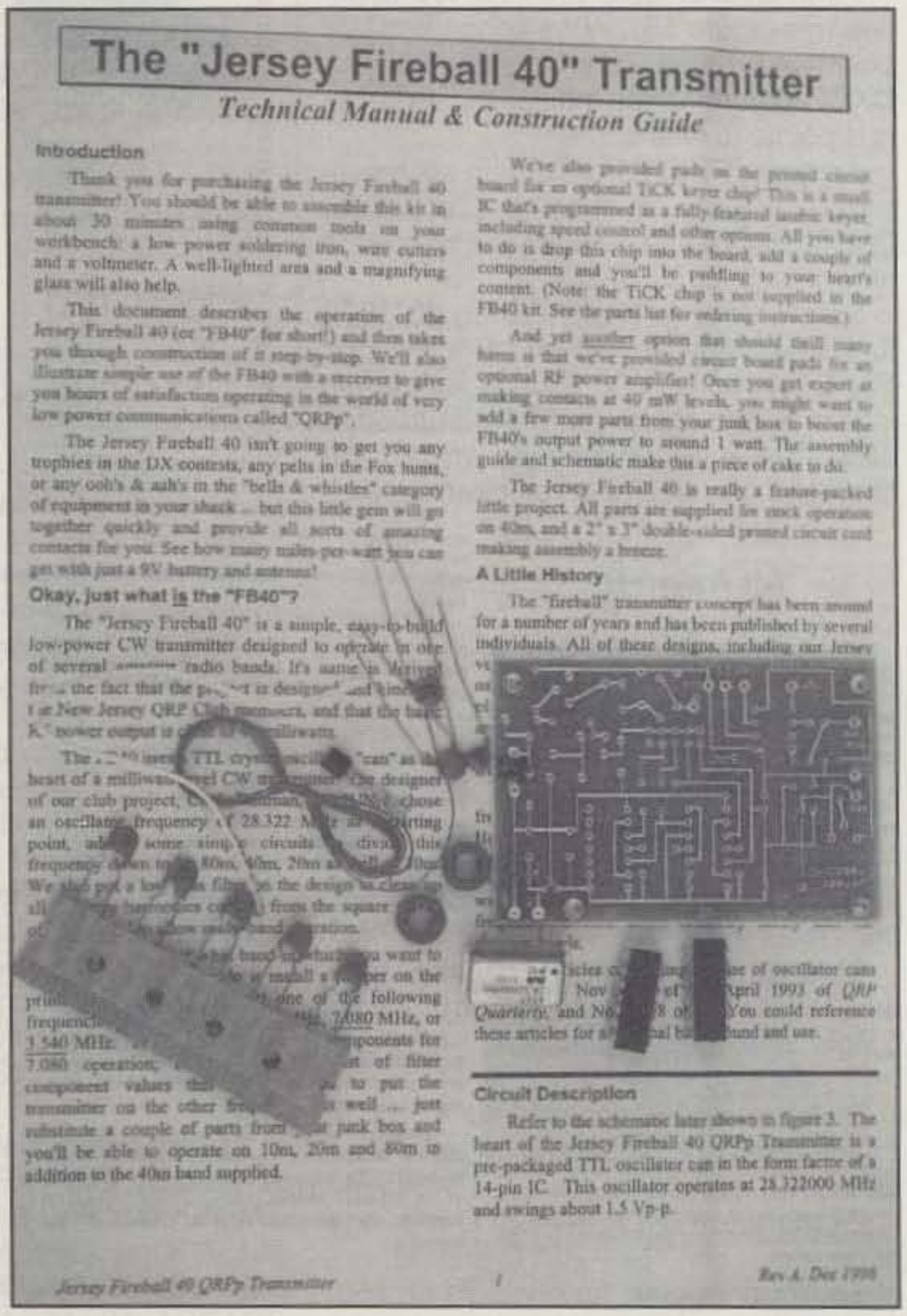
George Heron, N2APB, and the New Jersey QRP Club are back in the spotlight again, this time with a quick-brew fun project called the Jersey Fireball 40. This little critter is a 40 milliwatt QRPp transmitter that can be jumper-configured to operate on the 10, 20, 40, or 80 meter band.

The "JF-40" is supplied with a computer-type TTL crystal oscillator "can IC" set to 28.322 MHz and a couple of 74LS74 TTL flip-flop ICs for dividing that frequency down to 14.161, 7.080, or 3.540 MHz, as desired. These frequencies initially may seem a tad off the beaten path, but after serious investigation, I found them good for both scheduled and unplanned activities. Further, crystal oscillator cans for other frequencies are available from "bargain basement" outlets such as Mouser Electronics and can be substituted in the JF-40. Additional kit-supplied items include all components for 40 meter operation (you add output capacitors for other bands plus cable connectors and a case), instruction booklet, and PC board, and cost is only $10 post-paid in the U.S. That is a fair amount of QRP fun for a small amount of dollars from any viewpoint. As a special touch, the JF-40's PC board also has wiring runs for three easy-add options: a Tick keyer, a T/R switch, and a two-transistor RF power amplifier. Nice!

The JF-40 kit is shown laid out and ready for assembly in fig. 1, and its circuit diagram is shown in fig. 2. The crystal oscillator can is keyed in its negative lead, and output from its pin 8 can be directlyt routed to the low-pass/output filter for 10 meter operation, or taken from U2 or U3 for 20, 40, or 80 meter operation. Since all chips are 5 volt items, an LM78L05Z 3-pin regulator and a 9 or 12 volt battery are used to power the JF-40.

The Tick keyer option is shown in the lower left of fig. 2, and addition of only a half-dozen parts bring it into action. This is a neat and quite elaborate little electronic "keyer on a chip" with numerous functions accessed by a single pushbutton wired between its "Pgm" pin and ground. Installing a basic Tick 1 chip will get you going in high style, but as I will discuss later, opting for a Tick 2B or a new Super Tick (3B) offers some special rewards such as auto CQing or beaconing. The FB-40's optional RF amplifier section (in the lower right of fig. 2) also warrants mention at this point. It uses a 2N2222 driving a 2N3553, and kicks the power output to around 1.5 watts for some real oomph.

Some time-lapse photos of a JF-40 "going together" (compliments of George, N2APB) are shown in figs. 3 and 4. Approximately 12 parts are installed (a 20 or 30 minute process). Then the board is mounted in an Altoids can (pure QRP for sure!), and it's ready for action. The only time-consuming step is 5 or 10 minutes for winding two toroid coils used in the output filter.


The "Jersey Fireball 40" Transmitter

Technical Manual & Construction Guide

Introduction

Thank you for purchasing the Jersey Fireball 40 transmitter! You should be able to assemble this kit in about 30 minutes using common tools on your workbench: a low power soldering iron, wire cutters and a voltmeter. A well-lighted area and a magnifying glass will also help.

This document describes the operation of the Jersey Fireball 40 (or "FB40" for short!) and then takes you through construction of it step-by-step. We'll also illustrate simple use of the FB40 with a receiver to give you hours of satisfaction operating in the world of very low power communications called "QRPp".

The Jersey Fireball 40 isn't going to get you any trophies in the DX contests, any pelts in the Fox hunts, or any ooh's & aah's in the "bells & whistles" category of equipment in your shack ... but this little gem will get together quickly and provide all sorts of amazing contacts for you. See how many miles-per-watt you can get with just a 9V battery and antenna!

Okay, just what is the "FB40"?

The "Jersey Fireball 40" is a simple, easy-to-build low-power CW transmitter designed to operate in one of several [illegible] radio bands. It's name is derived fr[illegible] the fact that the p[illegible]ct is designed and i[illegible] t at New Jersey QRP Club members, and that the basic K[illegible] power output is [illegible] milliwatts.

The [illegible] TTL crys[illegible] "can" as the heart of a milliwa[illegible]vel CW tr[illegible]. The designer of our club project, C[illegible] Fishman, [illegible] chose an oscillator frequency of 28.322 M[illegible] as a starting point, add[illegible] some simple circuits to divide this frequency down to 80m, 40m, 20m and 10m. [illegible] We also put a low-pass filter on the design to clean up all [illegible] harmonics created from the square [illegible] of the [illegible] and operation.

[illegible] the band you want to [illegible] or install a jumper on the [illegible] one of the following frequencies: [illegible] MHz, 7.080 MHz, or 3.540 MHz. [illegible] components for 7.080 operation; [illegible] set of filter component values that [illegible] to put the transmitter on the other frequencies as well ... just substitute a couple of parts from your junk box and you'll be able to operate on 10m, 20m and 80m in addition to the 40m band supplied.

We've also provided pads on the printed circuit board for an optional TiCK keyer chip! This is a small IC that's programmed as a fully-featured iambic keyer, including speed control and other options. All you have to do is drop this chip into the board, add a couple of components and you'll be paddling to your heart's content. (Note: the TiCK chip is not supplied in the FB40 kit. See the parts list for ordering instructions.)

And yet another option that should thrill many hams is that we've provided circuit board pads for an optional RF power amplifier! Once you get expert at making contacts at 40 mW levels, you might want to add a few more parts from your junk box to boost the FB40's output power to around 1 watt. The assembly guide and schematic make this a piece of cake to do.

The Jersey Fireball 40 is really a feature-packed little project. All parts are supplied for quick operation on 40m, and a 2" x 3" double-sided printed circuit cost making assembly a breeze.

A Little History

The "fireball" transmitter concept has been around for a number of years and has been published by several individuals. All of these designs, including our Jersey [illegible]

[illegible] of oscillator cans [illegible] Nov[illegible] of [illegible] April 1993 of *QRP Quarterly*, and N[illegible]8 of [illegible]. You could reference these articles for a[illegible] bo[illegible]ound and use.

Circuit Description

Refer to the schematic later shown in figure 3. The heart of the Jersey Fireball 40 QRPp Transmitter is a pre-packaged TTL oscillator can in the form factor of a 14-pin IC. This oscillator operates at 28.322000 MHz and swings about 1.5 Vp-p.

Jersey Fireball 40 QRPp Transmitter 1 *Rev A, Dec 1998*

Fig. 1– One Jersey Fireball coming up! This easy-brew transmitter project was devised by Clark Fishman, WA2UNN, and is being made available in kit form by the New Jersey QRP Club. Its basic design is similar to the original Fireball described in November 1990 73 Magazine, but this expanded version works 10, 20, 40, or 80 meters and includes options such as full QSK, Tick keyer, and 1.5 watt RF amplifier.

4941 Scenic View Dr., Birmingham, AL 35210

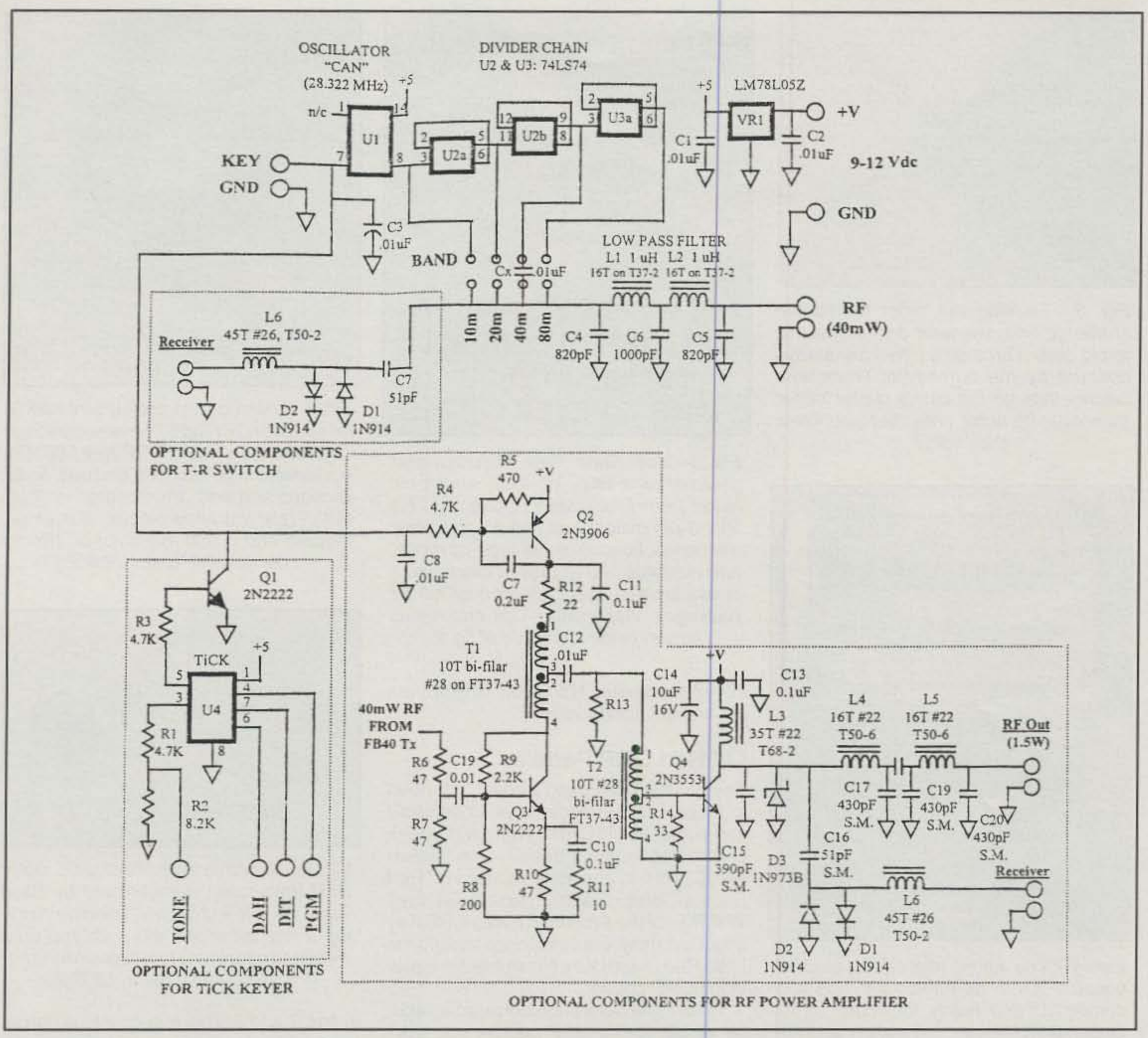


Fig. 2– Circuit diagram of the Jersey Fireball 40, including its add-on options. All this is contained on a single 2 by 3 inch PC board. Note Tick Keyer (U4) requires only a few components to interface with Fireball or any other rig.

While assembling my JF-40, I tuned my big rig to 7.080 MHz and speaker-monitored on-frequency activities "SETI style" (Is anyone out there?). After 5 minutes of hearing only background, a CO7 came on frequency and called CQ—with no takers. He called CQ again, and a third time. Still no takers. (Oh, if I had only started assembling the JF-40 sooner!) I could have called him with the big rig, true, but it just would not have the glitz and glamour of working him with the JF-40. Just one Fireball QSO would qualify for a 1000 mile-per-watt award!

Basically, 7.080 MHz seems like a fairly open frequency and good spot for some experimental QRP'n work. Maybe a micro beacon network on 7.080 MHz similar to the NCDXF beacon network on 14.100 MHz holds merit. The new Super Tick keyers and an external timer could get FB-40s beaconing like crazy. Once activated with Fireballs, 7.080 MHz would probably become the international calling/working/ distress/tune-up frequency, but that's besides the point.

Ready to start smoking the bands with your own Jersey Fireball? Zip a check or money order for $10 to G. Heron, N2APB, c/o The NJ-QRP Club, 45 Fieldstone Trail, Sparta, NJ 07871, and start emptying another Altoids can for an enclosure.

E.R. Keeps on Tickin'!

If you have followed this column's ongoing discussions of new gadgets and goodies, you know the new Tick keyer chips from Embedded Research are hot items of the day. Yes, and E.R. continues to pump out new versions of Ticks with an amazing number of features and functions for their tiny size (fig. 5). If you are unfamiliar with Ticks (a sheltered life for sure!), here are the details in a nutshell.

First, the basic ($5) Tick 1 chip features speed adjust, tune/keydown mode, sidetone on/off, iambic A or B operation, left- or right-hand paddle select and hand key mode, with all functions controlled by a single pushbutton. A Tick 2 adds a 25- character memory to that list of functions, a Tick 2B adds a beacon mode, and a Super Tick 3 adds two 50-character memories to that cumulative list.

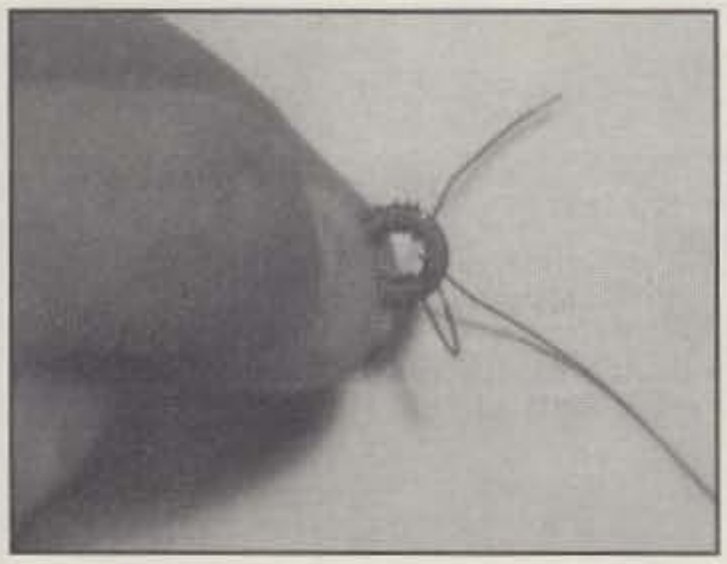


Fig. 3– Tackling the most formidable challenge first, we wind one of the two toroid coils. Turns on a toroid are always counted by the number of times wire passes through the core's center rather than over its outer area, but you knew that, right?

Fig. 4– You know this critter is QRP because it's in an Altoids tin! This is a completed and ready for action JF40. Optional Tick keyer, T/R switch, and RF amplifier have yet to be added, but it is still a gem. (JF40 photos courtesy George Heron, N2APB.)

Here is the Super Tick's real kicker. After programming, momentarily grounding its "CMD" line/pin enables memory recall. If the keyer is connected to a timer and transmitter, it could beacon every few minutes or on the hour. If the Tick's Beacon mode is used, it could repeat memory contents continuously until a connected paddle is touched. Think about that idea for a few minutes and visualize the possibilities!

Ticks are available in chip and datasheet-only form, in full kits (chip, PC board, parts, and manual), and in an extra-small surface-mount package at prices from $5 (Tick 1 chip) to $25 (full Super Tick kit). Checks, money orders, and/or info queries go to Embedded Research, P.O. Box

Fig. 5– Meet Super Tick, the latest and greatest one-chip, do-it-all electronic keyer from Embedded Research. This little 8-pin delight has two 50-character memories, beacon mode, tune-up mode, and numerous other built-in functions. It is available in chip-only form or full kit packages. Associated Tick circuitry is shown in the lower left of fig. 2.

92492, Rochester, NY 14692. Check them out and get ticking soon!

Li'l Red QRP Paddle

Say you have a rig and a keyer, but need a genuine QRP paddle to be undeniably and authentically QRP? Well, take a peek behind door number three . . . errr, look at fig. 6. This is the new miniature "Red Rooster" iambic paddle made by Gil Kost, W3MKE, of the American Radio QRP Key Mfg. Company, the same chap making the Little Red (hand) Key highlighted in a previous QRP column.

What's the difference between a regular paddle and a QRP paddle, you ask? Basically, they are the same. (I tried a big rig paddle with my QRP rig to confirm that fact, and it worked!) A QRP paddle is just QRP-size and priced.

Gil says his new paddle is quite popular among the "take it with you" QRP crowd, as it is rugged, tiny, and, like his Li'l Red Key, sports a unique and personalized feel. Gil sells the keys mainly through hamfest displays, but you can get one without even leaving home by contacting Gil at 3710 Buckingham Rd., Baltimore, MD 21207 (410-484-7951).

More Show and Tell

Friends around the world continue to share tales and views of their adventures in QRP, and some of the associated rigs really pique the enthusiasm for low-power hamming. Consider, for example, the little 80 meter SSB transceiver made from scratch by Stein Torp, LA7MI, and shown

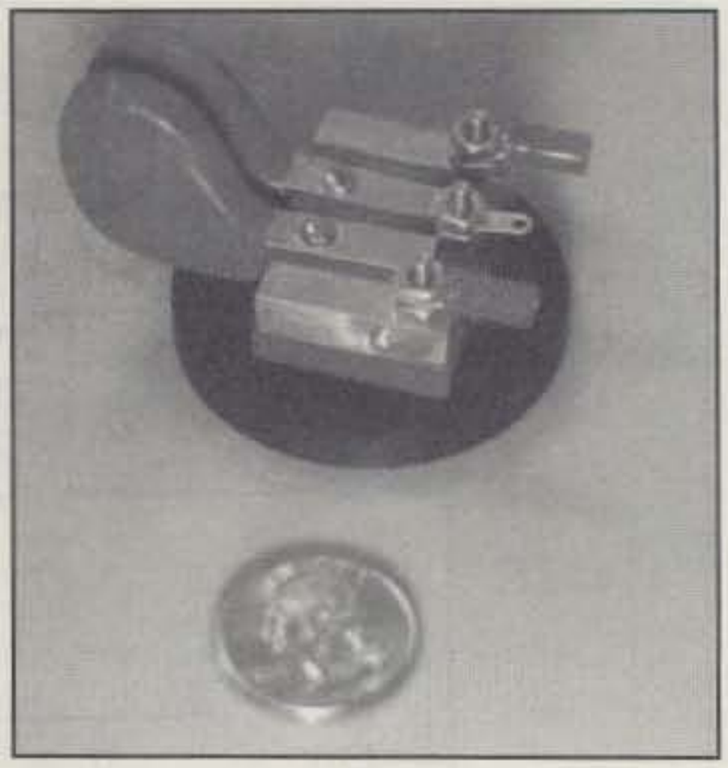


Fig. 6– Looking for a pocket-size paddle for portable QRPing? This new gem from The American Radio QRP Key Mfg. Co. is available in both single- and dual-lever versions and with "thumbeater" or "butterfly" (shown) fingerpieces. It is small, rugged, and a real eye catcher. (Photo courtesy Gil Kost, K3MKE.)

Fig. 7– The amazing palm-size 75 meter SSB transceiver homebrewed by Stein Torp, LA7MI, in Norway. Imagine carrying a tiny talker like this with you on a weekend getaway. Ham heaven for sure! (Photo courtesy Stein, LA7MI.)

in figs. 7 and 8. This one-of-a-kind delight uses a mix of U.S., European, and Japanese surface-mount and "leaded" components on homebrewed PC boards, and delivers a solid 10 watts output from a pair of 2SC1969 transistors in push-pull. Other points of interest include 10.7 MHz IF transformers padded down to 9 MHz by extra capacitors (a point worth remembering!), a steep-skirted 9 MHz IF/SSB filter, and a variable capacitor-tuned VFO with a gear reduction drive for accuracy. Stein is an electronic designer for a microwave company in Norway, and he enjoys building ultra-compact rigs almost as much as using them. Congratulations, Stein. This one is a real heartthrob!

Space is now running short, so our next true tale of QRP will be brief. Wendell, AD4EI, answered one of my 20 meter QRP CQs with a quite respectable signal, and then knocked me over by stating his rig was an MFJ-9020 running 2 watts to a G5RV antenna (fig. 9). His rig is also self-

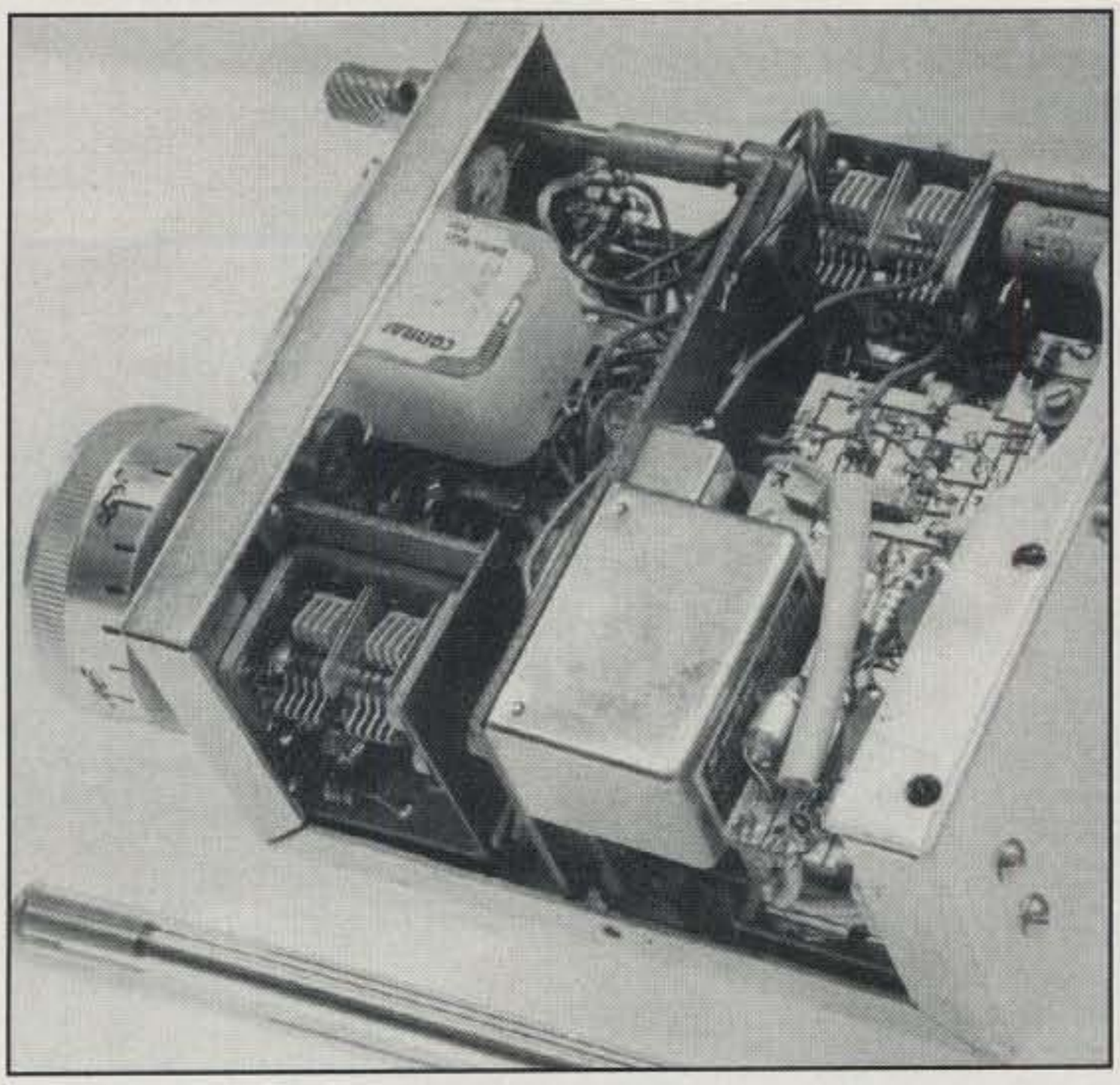


Fig. 8– Interior view of the QRP SSB transceiver made by LA7MI. The VFO module and main tuning capacitor are mounted directly to the front panel, with the SSB filter on the main PC board behind it. The microphone amp, carrier oscillator, and balanced modulator stages are below the meter. The output PA section is mounted against the back wall. Look carefully and you can see frequency marks around the tuning dial's outer edge. (Photo courtesy Stein, LA7MI.)

contained with antenna tuner, SWR meter, and battery case and works just as well sitting in the yard as sitting on the shack desk. That's "lift and go" hamming supreme! Good show, Wendell!

Sign-Off Time Again!

We're down to the closing wire once again, but the good news and irresistible goodies just keep on coming! We will return with more QRP notes, news and tips, more show 'n tell, etc., in a few months. Meanwhile, stay tuned for some blowout columns on other favorite subjects, get out and work some QRP from the wide-open spaces, and listen for me on 30 CW or 20 SSB. I will be the weak one running QRP. 73, and may the force of good signs be with you!

Dave, K4TWJ

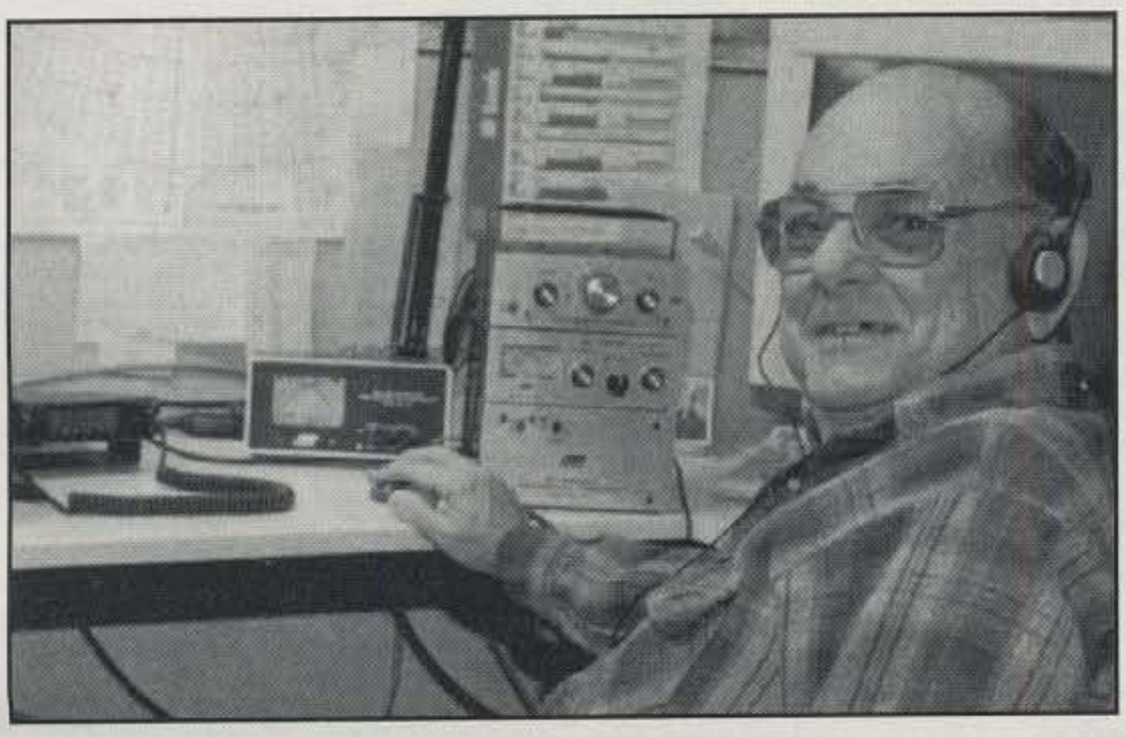


Fig. 9– Wendell, AD4EI, rocks 20 meters with his triple-stack MFJ QRP setup and simple G5RV antenna. He has worked 125 countries, all states, and all Canadian provinces, and is still going strong with QRP. (Photo courtesy KE4KRN.)

BY TED MELINOSKY, K1BV

AWARDS

NEWS OF CERTIFICATE AND AWARD COLLECTING

Orville Duecker, NKØN, All Counties #968, January 9, 1999, has been an amateur radio operator for 25 years. Fourteen years ago he was introduced to County Hunting by Gordie, KØTVY. Here is Orville's story.

"When I was introduced to County Hunting by Gordie, KØTVY, fourteen years ago, he was down to about five, and I thought he was a man not playing with a full deck. About a month later I was the one not playing with a full deck. I am a pharmacist, and as a result I didn't have a lot of time to spend on the net. But I was there at every opportunity. What a great bunch of people! I worked a lot of DX. As everyone knows, you hear a lot of new vocabulary. Some of it has no place in ham radio. I spent a lot of time on the weekends with the YL bringing my meals to me. Without her understanding I would never have pulled this off.

"As everyone knows, the first 1000 goes fairly fast. I thought this wouldn't take long. What a big mistake. Things started getting slower and slower. I was off the air for some time as my father was taken ill and passed on. Later I retired, and then County Hunting became more fun than ever. I bought a Kenwood TS50 and started putting out some counties mobile along with picking up a few. The YL became more involved, and she got so she could pick out a call in a pile-up, especially on the county lines. The whole family knew I was a County Hunter, and if they didn't, the YL emphatically informed them of it.

"I don't run mobile in any state other than Iowa. I did get over to Nebraska once, but I suppose everyone has had the same experience of being lost in his or her state. I have had that happen a couple of times. The first one I ended up on the state line.

"I was just getting into the flow of things and we moved from Waterloo to the small town of Frederika. I was off the air for some time before getting settled, with the antennas and tower up and working. I use a Hustler mobile antenna and was on the interstate when everything that was mounted on the trunk came off, broke the coax, and flying down the highway with traffic whizzing by so there was no chance to retrieve it. That was some more down time.

"Finally I got down to that last one, which was Lincoln, Mississippi. After a lot of listening, I finally came to the conclusion that it had been blown off the map. I have a callbook on CD, and after looking at Lincoln, I decided that there are very few hams there. I started making several long-distance calls, and found Homer, WB5ASP, who was more than glad to help. We got on 80 meters and had a 5/5 QSO. I could hardly believe I had finished with the whole ball. I just sat back in my chair and reminisced about all the good times I had had and all the fine people I had met on the net.

"The next morning I had everything in Kwiklog and was ready to print out the log. Everything worked as it should. I got my cards, log, etc., in an envelope and off to the post office. Now to wait for the return of the certificate. Priority mail finally got to Ted, and after sanding his driveway he got the logs. The next day I got my #968. Thanks, Ted.

"I would like to thank everyone on the net, those who spend their time and money putting out the mobile counties, and the people who act as net control, keeping their cool when everything seems to be getting out of control.73, Orv, NKØN"

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

USA-CA Special Honor Roll

Robert H. Buckley, W6HOR
USA-CA All Counties #970
March 19, 1999

USA-CA Honor Roll

500		1500	
4X1VF	3066	W4ZAA	1254
ON7DR	3067	W6HOR	1155
JH3KAI	3068		
IK1SLE	3069	**2000**	
UA4RZ	3070	W4ZAA	1154
W6HOR	3071	W6HOR	1156
		2500	
		W4ZAA	1077
1000		W6HOR	1078
W4ZAA	1505		
UA4RZ	1506	**3000**	
W6HOR	1507	W6HOR	987

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.

DX Awards

Five Argentine Islands Certificate. Another of the IOTA inspired island oriented awards comes from Argentina. Note the requirement that all of the contacts must be made using CW.

Sponsored by the CW Group Argentina, work five different stations on Argentine Islands, two of which must be valid for DXCC using the CW mode only. Islands that count for DXCC include: LU–Z Malvinas Is., LU–Z South Orkney, LU–Z South Shetland Is., LU–Z San Pedro (Georgia) Is., LU–Z South Sandwich Is. and all the Antarctic islands. Non-DXCC Argentine islands include: LU–X Staten Is., LU–X Tierra del Fuego Is., LU–X Becasses Is., LU–X Pavon Is., and all the Argentine Oceanic islands. SWL okay. Send photocopy of QSLs received and fee of 5 IRCs to Grupo Argentino de Radiotelegrafia, P.O. Box 1875, Wilde, Buenos Aires, Argentina.

The Five Argentine Islands award sponsored by the CW Group Argentina.

Naomi Uemura's Obihiro Outward Bound School Award. Japanese mountaineer and adventurer Naomi Uemura's history and heritage are honored by the following award. Born in early 1941, he soon developed a love of mountain climbing, and starting in the mid-1960s, he commenced a record-setting series of solo climbs of European, African, and South American mountains. He was the first Japanese citizen to ascend Mount Everest, in May 1970. In 1971 he walked the entire length of the Japanese archipelago, and then became the first person to succeed in reaching the North Pole by dog sled. On Feb 12, 1984 he became the first person ever to make a winter season climb of Mount MacKinley. He disappeared on the mountain on February 13.

The radio club of his Outward Bound

Naomi Uemura's Obihiro Outward Bound School Award.

School sponsors a handsome multi-colored certificate recognizing this intrepid adventurer. It may be earned under three challenging sets of conditions:

The award is available to licensed amateurs and SWLs. There are no restrictions on date of the contacts. All contacts must be made from the same country. A certified list of the contacts signed by one witness and a fee of 5 IRCs or $US5 should be sent to: Tsutomu Sakamori, JE8JSX, 2-21 Minami-ku, Yuuhigaoka, Otofuke-cho, kato-gun, Hokkaido 080-0333 Japan.

The three different ways to earn the award are:

1. Contact CQ Zones 1, 11, 13, 14, 22, 37, and 40. You will need two contacts in each of these zones, and the contacts must be made on different bands or modes. These zones include the five continents where Uemura was successful in climbing the highest peak in that continent. (Total of 14 contacts.)

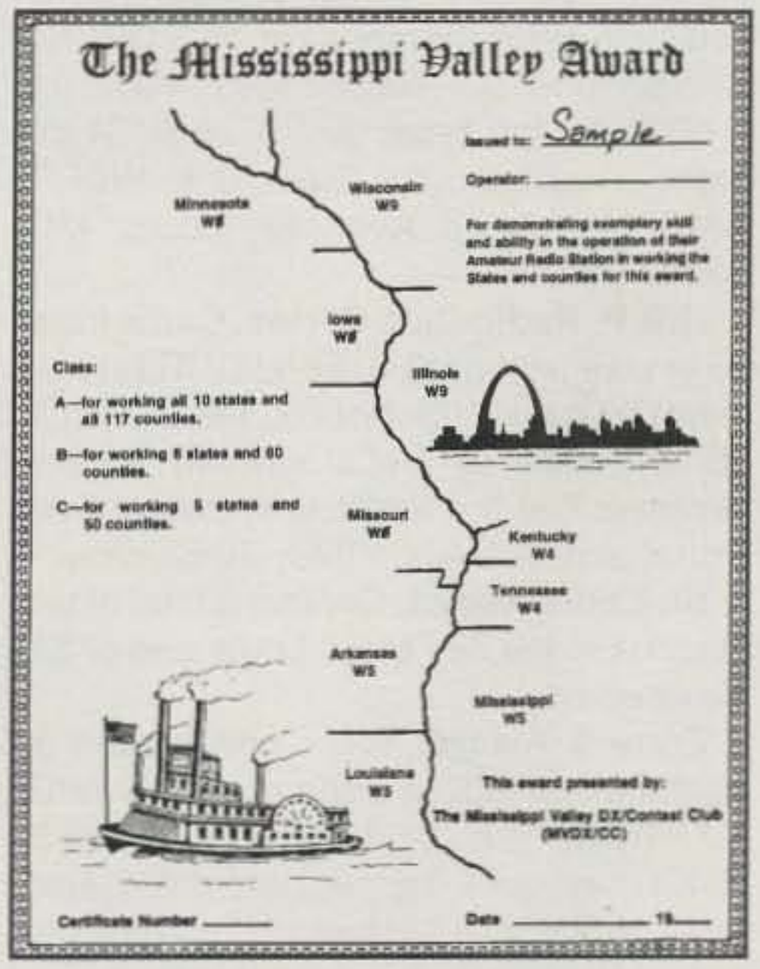
2. Contact each of the 10 call areas of JA in a calendar year. At least two bands or modes must be used. In addition, you will need one contact in each of the following Japanese areas: Obihiro-shi, Hokkaido (JCC-0107), Itabashi-ku, Tokyo (JCK100119), and Kinosaki-gun, Hyogo (JCG-27012). (Total 13 contacts.)

3. Using VHF, obtain 12 cards spelling the phrase "UEMURA SPIRIT" by using the first and last letters of the suffix—i.e., to spell Uemura: JA1U?E, JL1E?M, JE1M?U, JG1U?R, JL1R?A.

WØFF Awards

The next three awards are administered by Jim Glasscock, WØFF. In a recent letter, Jim says that he responds to all applications on the day that they are received, or there is not more than a few days delay if he's out of town. Congratulations to custodians such as Jim.

USA Mississippi Valley Award. Sponsored by the Mississippi Valley DX/Contest Club, work states and counties which



The Mississippi Valley Award sponsored by WØFF.

border the Mississippi River after 1 January 1990. All bands and modes. No endorsements. Class C: 5 states and 50 counties along the river; Class B: 8/80; Class A: 10 states/all 117 counties. States involved are Arkansas, Illinois, Iowa, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Wisconsin, and Tennessee. A good road map will help you identify the counties. A list of counties is available from the sponsor or K1BV for SASE. Send GCR list and fee of $US2 (or 5 IRCs) for the basic award, or $US1 for higher levels to: Jim Glasscock, WØFF, 3416 Manhattan Ave., St. Louis, MO 63143-3523.

O.B.P. Radio Club Series. Cards must be in your possession. Send GCR list and fee of 50 cents U.S. (for DX, fee is 3 IRCs surface mail, 5 IRCs airmail) to Jim Glasscock at the address shown above. Endorsement fee is 1 IRC. SWLs okay.

St. Louis Award. Contact a total of ten stations in the city of St. Louis and/or St. Louis county.

Zone 4 Award. Work one station in each call district of Zone 4 on the WAZ list. These are: VE3, VE4, VE5, VE6, W/K4 (Kentucky, Tennessee, or Alabama only), W/K5, W/K7 (Montana or Wyoming only), W/K8 (Ohio or Michigan only), W/K9, and W/KØ for a total of ten cards.

The next three awards are sponsored by Steve Wamback N2VPI and promote the contacts associated with the Lake Erie area and name.

Lake Erie Awards Series

All bands and modes may be used. SWL okay. Endorsements are available for band, mode, YL, SWL, QRP contacts upon request. Send a GCR list or photocopies of the cards and a fee of $US3 or 6 IRCs to: Steve Wamback, N2VPI, 9130 Brown Rd., Angola, NY 14006-9665.

WØFF's St. Louis Award.

The Zone 4 Award from WØFF.

Lake Erie Award. Contact the four states of New York, Pennsylvania, Ohio, and Michigan as well as the Canadian province of Ontario. Continental USA and VE stations need two contacts in each named area for a total of ten contacts. DX stations—including KP4, KL7, KH6—only need one contact each for a total of five contacts.

The Lake Erie Award from N2VPI.

Lake Erie Counties Award. Contact each of the 18 US and Canadian counties which border Lake Erie. They include the following:

New York: Erie, Chautauqua

Pennsylvania: Erie

Ohio: Ashtabula, Lake, Cuyahoga, Lorain, Erie, Sandusky, Ottawa, Lucas

Michigan—Monroe, Wayne

Ontario Province: Essex, Kent, Elgin, Haldimand-Norfolk RM, Niagara RM.

A total of 18 contacts is required for all applicants.

The Three Erie Counties Award. Contact and confirm two contacts in each of the three counties named *Erie* in the states of New York, Pennsylvania, and Ohio which border Lake Erie. A total of six contacts is needed.

Internet Site of the Month

This month we present an excellent site publicizing the Worked All Norwegian Communes Award, which is sponsored by NIHRAC, a Norwegian interest-group open to all who want to work for the interest of handicapped hams. It turns out that Norway has 450 Communes. Norway has a county system, but there are many communes in each of the 19 counties. The site contains the rules for the award, an online record book listing each of the valid communes within the county, and a listing of award winners—a surprisingly large list. Look them up at: <http://home.sol.no/~ljohanse/wanca>. Don't mistype the next to the last word following the tilde. It is easier to see in capital letters: LJOHANSE.

My requests for award samples is bearing dividends. I've got enough to get me through another issue or two, but I'm very interested in receiving yours for future publication. Good hunting!

73, Ted, K1BV

DX

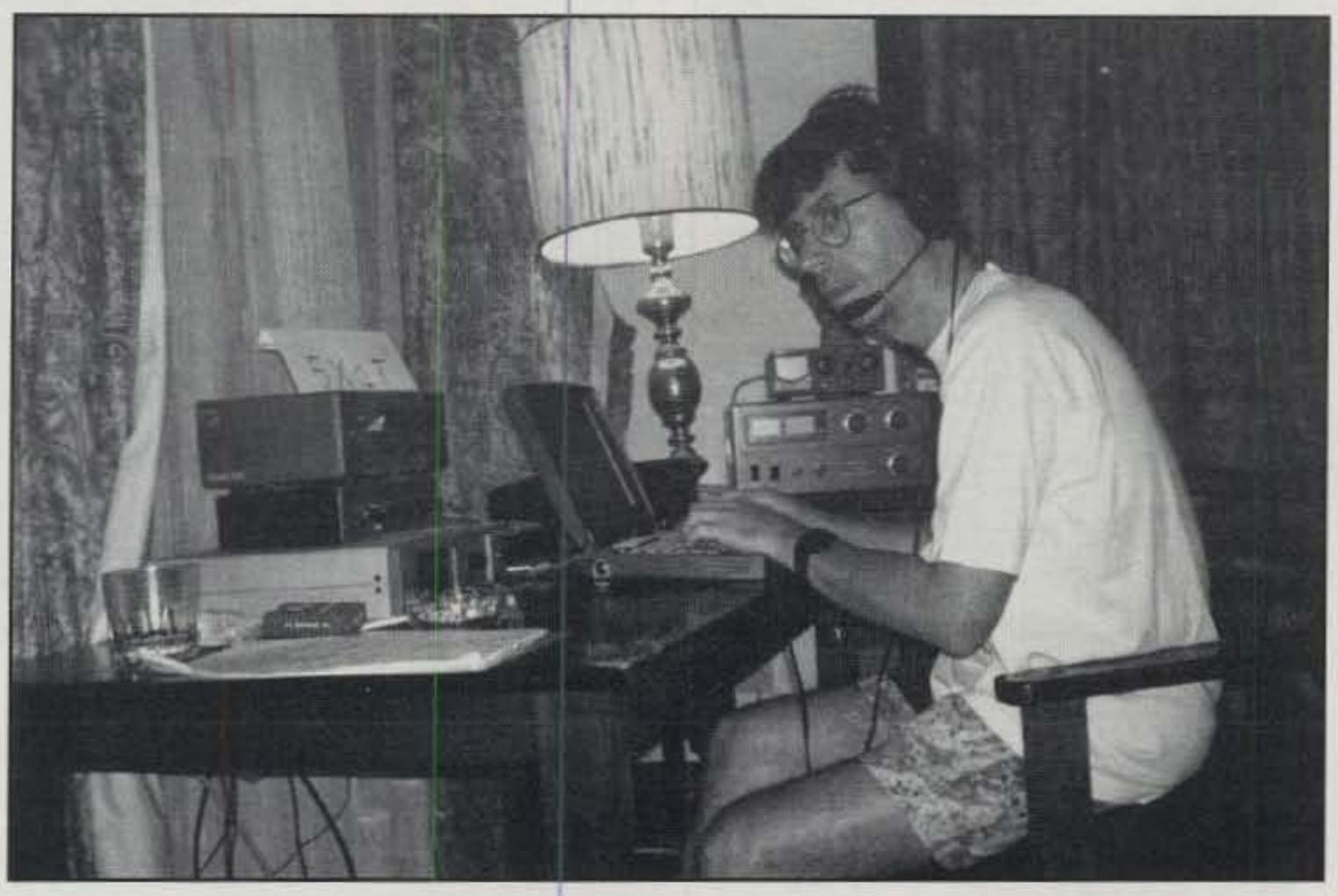
BY CHOD HARRIS, VP2ML

NEWS OF COMMUNICATION AROUND THE WORLD

Beyond The Paper QSL

Now DXing is becoming a real-time activity. Thanks to modern computer networks and satellite communications systems, even DXpeditions to far-away places such as Heard Island can provide worldwide access to log information within hours or even minutes of the contact. No longer does a DXer have to wait months to determine if he or she is "in the log." A quick check of the on-line log via the Internet shows within minutes if the contact was successfully logged.

One aspect of DXing, however, remains mired in a 50+ year-old system—the exchange of paper QSL cards. QSL cards have been exchanged by regular mail (and the bureau system, which also uses the postal system) since the very first contacts, years before the modern DXCC program began in 1945. Even with computer logging and all the other improvements in DXing over the past 50 years, the exchange of QSL cards by mail is still widely practiced. As we approach the new millennium, it is time to explore alternatives to the paper QSL card.



Peter, ON6TT, operating as 5X1T from Uganda.

As described below by Walt, DJØFX, there are many potential problems associated with the exchange of paper QSL cards. And for those DXers seeking confirmations of multiple contacts (on different modes and bands, of course), the postage costs can quickly add up. A DXer can easily run up a postage bill into thousands of dollars to amass the cards necessary for 5-band DXCC, for example.

QSLing by mail is also slow. While faster than the typical multi-year turnaround on bureau cards, direct-mail QSLing can still take several months for the cards to be designed, approved, printed, checked, and mailed. In an activity where contacts are made at the speed of light and electronic confirmation of a contact may be available within hours or days, the time-consuming exchange of paper QSLs by mail seems seriously dated. What alternatives might exist?

In order for the ARRL DXCC desk to accept an electronic confirmation (as opposed to a paper QSL card), any new system must meet three criteria. First, it must be secure. That is, a DXer cannot add or alter the QSO information. This is the stumbling block on most alternatives suggested previously. The ARRL has built the DXCC program into the premier DX program in the world by setting and maintaining very high standards, especially in accepting cards. Even with field checking, many QSL cards must pass the personal scrutiny of a member of the paid DXCC staff. The slightest irregularity is enough to reject a card. To maintain this same level of integrity with electronic alternatives to paper QSLing is difficult.

Membership Services Manager Bill Kennamer, K5FUV, has rejected several proposed electronic QSLing methods because he could hack the program or file to give him a confirmation for a non-existent contact. As long as that potential exists, the ARRL will not compromise the DXCC program by allowing computer experts to get DXCC credits without making the contacts.

The second requirement for a substitute QSLing system is that it is fast. The DXCC program already costs the ARRL many thousands of dollars each year. Any system must reduce, or at least not increase, the time it takes a DXCC staff member to verify the confirmation.

This is a major problem with on-line DXpedition databases. Anyone who has used the Internet knows "fast" and "Internet" have little in common. While an individual DXer can tolerate a significant delay between request of a log search and the result, the DXCC desk cannot hang on-line indefinitely waiting for the confirmation.

A solution might be for DXpeditions to provide their logs to the DXCC desk in some standardized form. The ARRL could keep these logs in a dedicated, separate DXCC computer network that provides rapid access to the files. When the DXer submits a DXCC application on computer disk, a program could scan for claimed DXCC credits for which the DXCC desk has logs. These contacts would be verified electronically, probably in a background setting, while the paper cards are checked and entered.

One significant drawback to this system is that it uses a lot of computer memory, as some of the log databases are huge. Fortunately, the price of computer hard-drive storage has plummeted in recent years, and $25/gigabyte drives should make this economically reasonable. (Maybe the DXCC desk should charge an additional fee for DXers seeking electronic confirmations, to pay for the added convenience of not having to obtain the paper QSLs.) The DXCC desk would have to restrict access to the system, but they must do this in any case to prevent tampering with existing computerized individual DXCC records.

This really is not a new idea for DXCC. Many years ago, DXers could request up to five DXCC confirmations based on contacts in the ARRL DX Contest. Here's how it worked: Once the contest results were published, a DXer could scan the results for stations worked during the contest who submitted logs to the ARRL. The DXer

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

Frank, VK2EKY, operating from Lord Howe Island.

would pick up to five contacts for which the ARRL contest branch had the logs. Then some low-level staffer would pore through boxes of logs in the hot attic of ARRL HQ, verifying the claimed contacts. No computerized logging here; just masses of dusty paper (sounds like something I had to do during my first days working at ARRL HQ). The clumsy system was shut down when too many DXers took advantage of this membership service.

This brings us to the third major requirement of any electronic QSLing process: It must be cheap—cheap to use and cheap to administer. Again, the DXCC program costs the ARRL an amount far out of proportion to the percentage of members in the program. Any additional QSLing sys-

The WPX Program

SSB

2696	EA2ASJ	2699	KO4YB
2697	TG8WA	2700	N7VPN
2698	VK2FMN		

Mixed

1829	JH2IEE	1831	TJ1RA
1830	OK2BUT		

WPNX

282 ..... WN6HYX

CW: 1000.EA2BNU. 1050 EA2BNU. 1100 EA2BNU. 2250 KF2O.
SSB: 350 TG8WA, VK2FHN, KO4YB, N7VPN. 450 N3TA. 650 KE4SCY. 700 KE4SCY. 750 KE4SCY. 800 JN3SAC, LU4DA. 850 LU4DA. 900 LU4DA. 950 LU4DA. 2550 KS3F. 2600. KF2O. 2650.LU8ESU. 2700.LU8ESU.
Mixed: 450 JH2IEE, N3TA. 500 JH2IEE. 550 JH2IEE. 800 WZ4P. 1100 EA2BNU. 1150 EA2BNU, K2YJL. 1200 K2YJL. 3050 KF2O. 3100 KF2O.

15 meters: JH3SAC
20 meters: JH3SAC
80 meters: OK2BUT

Asia: LU4DA
No. America: KE4SCY
Europe: OK2BUT, LU4DA, TJ1RA, KE4SCY

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, W1CU, 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, ABØP, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV. W2HG, ONL-4ØØ3, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MC, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, IQWXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, KZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP. OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, KØDEQ, KUØA, DJ1YH, OE6CLD, VR2UW, 9A9R, UAØFZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS.

Award of Excellence Plaque Holders with 160 Meter Endorsement: K6JG, N4MM, W4CRW, N5UR, VE3XN, DL3RK, OKMP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BU, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N8JV, ONL-4ØØ3, 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, DJ1YH, OE6CLE, HB9BIN, N1KC, SM5DAC, S51U.

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

tem must be economical for the DXCC desk. Ideally, it should even save the ARRL some money, by reducing the handling of the paper cards.

Secure, fast, and inexpensive. These are tough requirements for any system, much less for one which has to handle tens of thousands of records and millions of individual DXCC credits. Fortunately, these are very similar to the requirements to maintain the DXCC program on computer, so the ARRL has some experience in this field.

There are many questions that need to be addressed in such a system, but the current levels of computer technology suggest that some time in the relatively near future, DXers will be able to get DXCC credit for at least some contacts without having to obtain a paper QSL.

There is another way to bypass the paper QSL: electronic QSL cards. What if you could send an e-mail message to the DXpedition log and receive back, by e-mail, an electronic verification of your contacts that would be accepted by DXCC? Sound far fetched? While such a system is not likely to be implemented in the near future, several DXers are working on just such a program.

Thanks to advances in digital signatures and cryptography (and the computers necessary), it is now possible to electronically verify signatures over e-mail. Most states have accepted such electronic signatures as legally binding proof of contract, according to Dick Green, WC1M, one of the DXers working with the DXCC desk on electronic QSLs.

Here's how such a system might work, according to Dick. After making the DX contact, the DX sends an e-mail with QSO data to the DXpedition's log site. An automated program there checks the digital signature against a master file, checks the log for the contact information, and prints this to a file that cannot be altered without obvious detection. This file comes back to the DXer via e-mail, where it can be added to a DXCC submission. The trick is to make the resulting electronic QSL "card" hack-proof, as well as set up the system for verifying the digital signatures.

Dick has put a lot of thought into his ideas, and the DXCC desk is taking his suggestions seriously. However, there is much more work to be done to set up an electronic QSL card system than for internal verification from logs at ARRL HQ. For more information, contact Dick at <dick.green@valley.net>.

Will we see the demise of the paper QSL card in the next millennium? Probably not, as many DXers will want to continue the practice of obtaining, displaying, and bragging about various cards. (It's hard to get much bragging rights out of a floppy disc.) Further, DXpeditioners all count on the contributions that come in with the post-DXpedition QSL card requests for much of their funding. This may be the major stumbling block for this program, once security and costs issues are surmounted. Look for paper QSL cards to last well into the 21st century.

DX News

Dennis Motschenbacher, K7BV, editor of the *National Contest Journal,* will operate the Aland Island **OHØZ** station in the CQ WPX CW Contest, May 29–30. Outside the contest, Dennis will operate as **OHØ/K7BV**. QSL the latter operation via KU9C, and OHØZ via Ari Korhonen, OH1EH, Kreetalank. 9 As 1, FIN-29200 Harjavalta, Finland. Dennis will be in the region May 23 to June 3, operating mainly CW on the HF bands, including the new bands. Dennis reports that there is a high probability of operating from Market Reef OJØ as **OJØ/K7BV** before the contest, thanks to the assistance of Seppo, OH1VR.

The "OPDX Bulletin" reports that another Market Reef operation is scheduled for the end of June. LA3KIA, LAØCX, LA1SJA, and OHØRJ are the operators who will sign **OJØ**/ home call during the 96-hour operation. They will operate CW on 160–6 meters, concentrating on 12 meters, with at least one station on the air 24 hours a day. QSL via the operators' home calls.

Market Reef is one of the DXCC's more unusual entities. It is essentially a large rock that sits astride the border between Sweden and Finland. The Swedish side counts, for the purposes of DXCC, as Sweden. However, the Finnish side, where the lighthouse and other buildings are located, is separated from the rest of Finland by Swedish territory, and thus counted as a separate DXCC entity under the old rules. (Market Reef would not count as a DXCC entity under the new rules, but previous entities were grandfathered onto the DXCC list and will not be deleted because of a change in the country criteria.)

Under calm conditions, Market Reef may be approached by boat, but most visitors to the reef use the helicopter service from nearby Aland. The reef can be dangerous, as at least one DXpeditioner had to be airlifted to a hospital after a nasty fall. The well-constructed lighthouse and other building provide shelter and protection from the occasional heavy surf. While the lighthouse is solar-powered, DXpeditioners must bring their own generators to power their rigs. Because of the logistical difficulties, Market Reef is only on the air for a few days at a time every few years. Make the most of these 1999 operations.

Marion Island ZS8 will be back on the air for the next year. **ZS8D** began his one-year tour of duty on Marion in April. The big permanent antenna farm has been

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

4892 9A2AA	3424 N4MM	2966 YU7SF	2669 S53EO	2264 K2XF	1919 SM6CST	1628 JN3SAC	1371 F6HMJ	1198 S52QM
4773 F9RM	3405 YU1AB	2940 K9BG	2660 4N7ZZ	2259 W9IL	1875 HA9PP	1625 KØNL	1328 W9IAL	1162 JR3TOE
4155 W2FXA	3390 I2PJA	2936 YU7NVF	2631 IK2ILH	2238 9A4RU	1871 DJ1YH	1607 OZ1ACB	1319 WT3W	1142 VE6FR
3891 EA2IA	3386 N9AF	2926 KF2O	2606 KØDEQ	2237 W6OUL	1851 VE4ACY	1591 W7CB	1311 WB2AQC	1110 W2CF
3817 F2YT	3364 SM3EVR	2906 I2MQP	2546 SM6DHU	2229 K5UR	1836 F5NBX	1580 I1-21171	1308 WØIZV	1100 KB5OHT
3797 UA3FT	3262 N5JR	2834 WB2YQH	2512 JH8BOE	2224 W8UMR	1802 PY2DBU	1499 YU1ZD	1307 NH6T	1059 RAØFU
3775 W1CU	3240 9A2NA	2832 HA5NK	2484 K8LJG	2218 F6IGF	1767 IØAOF	1485 Z32KV	1268 KW5USA	989 US7MM
3747 K6JG	3103 I1EEW	2787 W9HA	2376 HAØIT	2159 W4UW	1765 K5IID	1473 AA1KS	1264 VE6BF	906 W3KR
3623 N4NO	3066 WA8YTM	2776 N2AC	2346 S58MU	2019 G4OBK	1759 I2EAY	1389 KØKG	1223 VE6BMX	764 K6UXO
3554 N6JV	3059 PAØSNG	2776 I1POR	2281 N6JM	2018 N3XX	1732 LU8DY	1339 N1KC	1207 W2EZ	611 JH2IEE
3472 VE3XN	2990 HA8XX	2745 I2EOW	2273 YU7JDE	2001 OE6CLD	1653 AE5B			

SSB

4180 IØZV	2827 I4CSP	2401 PY4OY	2131 CX6BZ	1714 K2XF	1518 AE5B	1288 I3UBL	1017 IK4HPU	836 AG4W
3743 VE1YX	2802 I2MQP	2397 WA8YTM	2033 IN3QCI	1681 YU7SF	1489 I3ZSX	1261 W2FJF	1010 EA7CD	792 EA5GMB
3715 ZL3NS	2772 N4NO	2396 I8KCI	1975 W4UW	1659 K8LJG	1452 LU5DV	1252 T30JH	1002 N1KC	786 JN3SAC
3485 K6JG	2731 HA8XX	2385 4X6DK	1906 K5UR	1650 HA5NK	1451 IT9SVJ	1229 YC2OK	965 DJ4GJ	778 N3DRO
3476 F6DZU	2725 I1EEW	2380 I2EOW	1881 SM6DHU	1649 EA5CGU	1450 K2EEK	1196 KØNL	954 EA1AX	703 VE6BMX
3384 I2PJA	2714 N5JR	2360 EA5AT	1867 OE6CLD	1590 KS4S	1443 N3XX	1145 K4CN	936 I2EAY	697 I2VGW
2993 N4MM	2657 PAØSNG	2291 YU7BCD	1809 LU8DY	1569 K3IXD	1396 W9IL	1127 EA8AG	933 DF1IC	660 F5LIW
2978 EA2IA	2507 9A2NA	2287 KF7RU	1802 OE2EGL	1570 W6OUL	1395 EA5KY	1090 LU3HBO	921 HA9PP	643 BD4DW
2976 F2VX	2491 LU8ESU	2260 KD9OIT	1760 HAØIT	1567 CT1BWW	1366 DF7HX	1061 KI7AO	919 CP1FF	613 SM5DAC
2835 EA8AKN	2487 UA3FT	2257 I1POR	1757 N6FX	1546 K8MDU	1353 K5IID	1061 WT3W	896 JR3TOE	608 LU3HL
2921 OZ5EV	2446 CT1AHU	2213 EA1JG	1754 W2WC	1544 DK5WQ	1336 G4OBK	1030 NH6T	894 EA3EQT	608 KE4SCY
2913 CT4NH	2446 KF2O	2134 K5RPC	1741 KBØC	1525 W2ME	1299 SV3AQR	1028 DL8AAV	894 EA5DCL	605 N7VY

CW

3912 WA2HZR	2613 VE7DP	2124 JA9CWJ	1876 HAØIT	1711 W6OUL	1513 IK5TSS	1268 DJ4GJ	1033 LU7EAR	821 RAØFU
3539 N6JV	2479 G4UOL	2089 KA7T	1871 OZ5UR	1694 N3XX	1509 9A3SM	1249 VE6BF	1006 9A3UF	820 K3WWP
3251 UA3FT	2468 W2ME	2079 KF2O	1816 SM6CST	1641 G4OBK	1482 EA7AAW	1217 AC5K	998 K2LUQ	815 WT3W
3176 N4NO	2423 N5JR	2046 HA8XX	1799 I7PXV	1626 DJ1YH	1457 I2EAY	1211 I2MQP	973 HA9PP	741 N3NEO
3119 VE7CNE	2415 LZ1XL	2043 S58MU	1798 W2WC	1603 IK3GER	1411 SM5DAC	1175 EA2CIN	906 YU1TR	741 K6UXO
3005 K6JG	2409 N4MM	1083 G3VQO	1795 W1WAI	1599 EA6BD	1349 N1IA	1156 4X6DK	884 PY4WS	725 KØNL
2940 EA2IA	2362 YU7BCD	1956 K8LJG	1755 K5UR	1590 JA1GTF	1298 EA6AA	1083 I2EOW	870 HB9CSM	678 IK8VRP
2926 YU7LS	2358 WA8YTM	1954 TI4SU	1755 LU2YA	1546 9A2HF	1271 LU3DSI	1058 DF6SW	847 NH6T	659 N1KC
2881 N4UU	2196 VR2UW	1927 SM6DHU	1750 K2XF	1537 JN3SAC	1270 K5IID	1055 W4UW	844 JK1AJX	603 OE6CLD
2811 K9QVB	2194 9A2NA	1927 N6FX	1730 IT9VDQ	1514 EA5YU	1270 W9IL	1041 W9IAL	823 VE6BMX	
2674 YU7SF	2179 HA5NK	1906 G4SSH						

taken down, so ZS8D will use conventional amateur radio antennas. There was a last-minute scare when someone broke into the container being shipped to Marion and stole the trunk with ZD8D's radio. However, Chris Burger, ZS6EZ, sent down his own DXpedition radio by courier, and it arrived in time to make the trip to Marion. QSL ZD8D via Chris Burger, ZS6EZ, P.O. Box 4485, Pretoria 0001, South Africa. Chris has also obtained the logs for the previous Marion Island operations of **ZS8MI** and **ZS8IR**.

The Northern California DX Foundation has funded the printing of ZS8MI QSL cards, so ZS8D, ZS8MI, and ZS8IR can now all be confirmed via ZS6EZ. Chris says for a direct response he prefers two International Reply Coupons (IRCs). A single IRC is not enough for postage outside of Africa. He also says that the suppliers of South African stamps don't keep up with the regular increases in postage, and many SASEs don't have enough postage. A self-addressed envelope and two IRCs is the recommended package for a direct reply. QSL requests without sufficient postage for a direct reply will be answered via the QSL bureau system.

Peter McKay, G3WQU, is operating from Bethlehem in the West Bank of the new DXCC entity of Palestine as **E4/G3WQU** for the next two years. Peter operates on CW only on 80–10 meters. QSL via the RSGB (British) bureau to G3WQU or direct to Peter at UNIFIL, P.O. Box 75, Nahariyya 22100, Israel. His e-mail address is <mckay@un.org>.

David, **E41/OK1DTP**, is also active until the end of the year from the West Bank, mostly on weekends. QSL to Jiri Lunak, OK1TD, U Sporky 185, 470 01 Ceska Lipa, Czech Republic.

Dal, T94DO. QSL via Mario Lovric, DJ2MX.

The WAZ Program

Single Band WAZ

10 Meter SSB

495 ..... JA4HXZ

10 Meter CW

153 ..... JF2UPM

15 Meter SSB

518 ..... JA1FYS
519 ..... DS5RNM
520 ..... DS4BBL
521 ..... JH1UBK

15 Meter CW

275 ..... JF2UPM
276 ..... K5MC

17 Meter CW

24 ..... JA8IYI

20 Meter SSB

1034 ..... 9A7C
1035 ..... JA7AER
1036 ..... VE3HIR
1037 ..... JA9FO
1038 ..... DS1BHE
1039 ..... W6YJ
1040 ..... JH2IEE
1041 ..... LU5DV

20 Meter CW

493 ..... K6RO
494 ..... JA1ITX
495 ..... PY7OJ
496 ..... W6YJ

40 Meter SSB

88 ..... CE3CDV

RTTY

110 ..... W6KUT
111 ..... IK8CNT
112 ..... IV3IIM

160 Meter WAZ

50 ..... 40 zones endorsement OK1DOT
132 ..... 38 zones endorsement SP3CB

All Band WAZ

SSB

4450 ..... WØCK
4451 ..... KQ4DO
4452 ..... DS4BHW
4453 ..... IK2QET
4454 ..... BD4DW
4455 ..... W5HGO
4456 ..... DL1DCY
4457 ..... SV1AER
4458 ..... PY8AJD
4459 ..... DK8UI
4460 ..... DS4BBL
4461 ..... I7JFQ
4462 ..... K9SH
4463 ..... JH2IJC
4464 ..... OZ1LHV
4465 ..... EA3DW
4466 ..... EA4AQQ
4467 ..... IK1PFE
4468 ..... KT4BW
4469 ..... JH1VES
4470 ..... JJ6WZS
4471 ..... IK1RGL
4472 ..... I2VGW
4473 ..... DL1EHY
4474 ..... DL1ARD

CW/Phone

7824 ..... K5NZ
7825 ..... K6ETM (all CW)
7826 ..... WB6MWY
7827 ..... K2YJL
7828 ..... HL4CUY
7829 ..... JAØBYJ
7830 ..... VE3UZ
7831 ..... OE4WBW
7832 ..... UA1CGS
7833 ..... DL1HN
7834 ..... S53ZZ
7835 ..... KP3RU
7836 ..... JA1KXT
7837 ..... KP3W
7838 ..... W8DMC
7839 ..... DK6YY
7840 ..... YU1BEF
7841 ..... N2UTO

All CW

124 ..... W8EB
125 ..... OZ7QB
126 ..... DL3NEO
127 ..... DL3CX
128 ..... IK1YDB
129 ..... (open)
130 ..... I1NVU
131 ..... HB9CVO
132 ..... SM1TDE
133 ..... EA2CIN
134 ..... K8MFO

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

5 Band WAZ

As of March 31, 1999, 485 stations have attained the 200 Zone level.

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

N6AW
KM2P
W2YC

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

N4WW, 199 (26)
AA4KT, 199 (26)
W4LI, 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 on 40)
K1ST, 199 (26)
ABØP, 199 (23)
KL7Y, 199 (34)
NN7X, 199 (34)
OE6MKG, 199 (31)
HA8IB, 199 (2 on 15)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
W6SR, 199 (37)
W3UR, 199 (23)
KC7V, 199 (34)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
N4CH, 199 (18 on 10)
OE1ZL, 199 (1)
W6DN, 199 (17)
W3NO, 199 (26)
K4UTE, 199 (18)
K5RT, 199 (23)
UA3AGW, 198 (1, 12)
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)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K4ZW, 198 (18, 23)
OH2VZ, 198 (1, 31)
RAØFA, 198 (2 on10,15)

The following have qualified for the basic 5 Band WAZ Award:
None

Endorsements:

N6AW, 200 zones
KM2P, 200 zones
W2YC, 200 zones
W9XY, 195 zones
W4UW, 190 zones
AE1Q, 180 zones

1083 Stations have attained the 150 Zone level as of March 31, 1999

****PLEASE NOTE: Due to supplier increases, effective September 1, 1998 cost of the 5 Band WAZ Plaque is now $80 ($100 if airmail shipping is requested).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ 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.

Diane, K2DO, and George, N2GA, will operate from Provodenciales Island as **VP5GA** in the CQ WPX CW Contest May 29–30. Outside the contest, May 24 to June 1, they will operate **VP5/** home calls. QSL home calls.

Scottish amateurs may celebrate the new Scottish Parliament by using the prefix **2S** instead of the usual GM until July 31. QSL via the corresponding GM callsign.

Walt Brenner, DJØFX, who operated as **FOØPT** from Tahiti last year, reports three recurring problems with QSLing. First, with the low exchange rate between the U.S. and Germany, one U.S. dollar is not enough to pay for surface postage, much less airmail back to the U.S. Walt says is costs 3 DM, or about $US2, for an airmail letter from Germany to the U.S. However, one IRC is sufficient. It is obviously less

QSL INFORMATION

3D2OM to WA5Y
4S7IJG to DK8ZD
5U7DG to K4SE
6Y5/W4SO to WA4WTG
8P9P to WJ5DX
9G1XA to K1ER
9K2ZZ to W8CNL
AH1A to K1ER
C21ZM to G3ZEM
EJ7M to EI6HB
EZ5A to W5BWA
EZ5AA to W5BWA
FM5JV to F5LNV
HC5C to WJ5DX
J73CCM to SMØCCM
JT1Y to IØSNY
KG4JO to WI2T
OX3GH to WA2TTI
PYØFM to JA1VOK
RHØE to N8OO
S79AG to SMØAGD
S79OY to KF8OY
S79XB to LA7XB
S92A to NJ2D
S92AT to NJ2D
S92YN to HB9CYN
S92YV to HB9CYV
SNØYEN to SP6YEN
SN6Y to SP6YEN
SPØYEN to SP6YEN
ST2/PAØGAM to PA5NT
SVØJF to NJ2D
T2ØJC to N6FF
T32CW to NI6T
T32MP to KØMP
T32PL to WØNF
T32PS to KØMP
T48RAC to VE3ESE
T5EC to DLØMAR
T88HY to JA1HYF
T88SY to JA5IU
T88T to N5OK
T88TM to JA5AUC
T9/YO2LDE to N1NJ
TJ1US to NW8F
TJ2US to NW8F
TZ6VV to AAØGL
UAØMF to W3HNK
UA3SDK/O to RU3SD
UEØFFF to N6FF
UH8EA to N8OO
UH8EAA to N8OO
UM1N to N6FF
UM8NAP to N6FF
UM8NU to N6FF
UM93NU to N6FF
UN7EG to DL8KAC
US1I to N5FG
US1IDX/US1I to N5FG
V2/KJ4VH to N4GN
V2/NF6H to N6RT
V26KW to K3TEJ
V26O to N5NJ
V29QQ to G6QQ
V31EN to WA5Y
V31GI to PA3GIO
V31JP to KA9WON
V31KX to NJ2D
V31KX/VOA to NJ2D
V31PU to N7UE
V31RL to NG7S
V31TP to WCØW
V32FI to WCØW
V51KG to SM7DZZ
V63CP to JH1BLP
V63DC to NG7S
V63OH to N5OK
V63RL to NG7S
V63RL/P to NG7S
V63SC to JM1LBO
V73RL/P to NG7S
VI3GP to VK3ER
VK2GUZ to NI6T
VK9GA to PA5NT
VK9WY to VK4FW
VK9XRS to ND3A
VP2EJU to W5SJ
VP2EZA to ND3A
VP2M/KJ4VH to N4GN
VP2MDH to N4GN
VP2MDY to NW8F
VP2MFH to NW8F
VP2V to K1DW
VP5/KM9D to OM2SA
VP5GA to N2GA
VP5J to KK9A
VP8BZL to WA4JQS
VP8CEO to N6FF
VP8CSA to DL1SDN
VP9/N1KS to JA1FUI
VP9/US1IDX to N5FG
VP9/US5I to N5FG
VS6/KJ4VH to N4GN
VU3VLH to OK1MM
W4O to W4QO
W96O to W4QO
WH7Q to ND3A
XE1/JH1VRQ to NX1L
XE2GBD to N6EK
XF3/XE2GBD to N6EK
XF4MX to XE1MX
XX7IK to CT1CSN
YBØAZ to W7TSQ
YBØCY to W8CNL
YBØECT to K5ZE
YB3AQE to PA5NT
YJØAOY to KF8OY
YVØ/W6JKV to W8CNL
YV5/DL2GG to DJ7AO
Z3ØM to NN6C
Z31GB to NN6C
Z31GX to DJØLZ
Z31XX to NN6C
Z32AF to NN6C
Z32XA to NN6C
Z32XX to NN6C
Z35ØGBC to NN6C
Z37FCA to NN6C
Z37GBC to NO6X
ZA/PAØGAM to PA5NT
ZAØB.25 to HB9BGN
ZD7SM to W1ZT
ZE1CY to W8CNL
ZF2AB to WA3EOP
ZF2MO to OM2SA
ZF2PF to WCØW
ZF2SO to K2ZD
ZF2VV to NX1L
ZK1AAG to NA7DB
ZK1AW to NA7DB
4F1EJD to Emmanuel J. Diesta, #20 Sumulong St., Parang, Marikina City 1809, Philippines
4F1KBW to Benjamin C. Delfin, Lot 15 Block 2, Masagana Homes Subdivision, Santa Rita, Guiguinto, Bulacan, Philippines
6Y5TM to DeLeon A. Miller, 148 Mansfield Heights, Ocho Rios, Jamaica
9K2TO to Mosad A. Mohsen, P.O. Box 915, Farwaniya 81020, Kuwait
9K2UB to Mohammad Almutairi, P.O. Box 7158, Fahaheel 64002, Kuwait
BG4VBW to Yang Zhong Bo, No. 288 Qingnian Road, Xuzhou, Jiangsu 221003, China
DU1KBW to Benjamin C. Delfin, 364 2nd St., 10th Ave., Grace Park, Caloocan City 1400, Philippines
DX1E to Eastern Amateur Radio Telecommunication Hobbyist, Inc., Olympia Bldg., #618 J. P. Rizal St., Concepcion, Marikina City 1800, Philippines
E31AA to Jacky Calvo, P.O. Box 593, Pukekohe 1800, New Zealand
ET3KV to Karl-Heinz Vollkopf, P.O. Box 7633, Addis Ababa, Ethiopia
HI3LFE to Lorenzo Fernandez E., P.O. Box 1464, Santiago, Dominican Republic
HI3K to Julio Henriquez, P.O. Box 122, Santiago, Dominican Republic
J69AZ to Ernest, P.O. Box 3056, Le Clery, St. Lucia
JT1BG to Bator Sambu, P.O. Box 158, Ulaanbaatar 13, Mongolia, Via Japan
JT1CC to Oyuna Sambu, P.O. Box 158, Ulaanbaatar 13, Mongolia, Via Japan
JT1CT to Jargal Sambu, P.O. Box 158, Ulaanbaatar 13, Mongolia, Via Japan
JT1DA to B. Enkhbayar, P.O. Box 736, Ulan Bator 13, Mongolia, Via Japan
JT1M to Sambu Family Club, P.O. Box 158, Ulaanbaatar 13, Mongolia, Via Japan
SV8CKM to Fotis Plessas, G. Doriza 3, GR-281 00 Argostoli, Greece
SV8JE to Chris Plessas, G. Doriza 3, GR-281 00 Argostoli, Greece
VU3DFM to Deshmukh Mohd. Arif, 27 Tenaments Municipal Building, 4th Floor, R. No. 25, P. T. Udyan, Sewree (W), Bombay 400 015, 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>).

expensive for stateside DXers to supply an IRC than $US2. (Walt also recommends QSLing via the bureau system; it's slower, but much less expensive.)

A second problem Walt notes is with the date format. The standard in Europe is day-month-year, as opposed to the stateside system of month-day-year. The recommended international standard is year-month-day. Especially with the coming of the year 2001 soon, unless the date is unambiguous, the QSLer may be at a loss as to the year, much less the month and date. There are several ways to make the date obvious. The simplest way is to write out the name of the month (or use Roman numerals): 12APR1999 or 12IV1999.

A final problem that Walt mentioned is the use of the small U.S. return envelopes. These are not large enough for many European QSL cards, including most of his. He requests sending a return address label rather than the small envelope. He would rather supply the envelope himself than copy 2000 addresses from the inadequate small envelopes. European airmail envelopes and nesting airmail return envelopes are available from William Plum, 12 Glenn Road, Flemington, NJ 08822; or James Mackey, P.O. Box 270569, West Hartford, CT 06127.

Remember that keeping DXpeditioners happy and not significantly out-of-pocket for QSLing means more DXpeditions. Walt has traveled extensively in the Pacific and elsewhere and plans future trips to Niue and Tokelau.

The new officers for the Western Washington DX Club for 1999 are President, Dick Swanson, K7BTW; Vice President, Ralph Javins, N7KGA; Secretary, Mike Schone, WA7BAY; Treasurer, Marina Zuettel, N7LSL. The trustees are John Gohndrone, N7TT; Roger Huntley, W7VV; Joe Gregory, W7QN; Dave Wallace, KK7KJ; David Jones, KK7GW; and Adam Kerner, K7ST.

The following officers of the Northern Ohio DX Association will continue during 1999: President, Ted Mirgliotta, KB8NW; Vice-President, Dwaine Modock, K8ME; Secretary, Ron Borkey, K8VJG; and Treasurer, Mary Michaelis, N8DMM.

The newly elected officers of the Great Lakes DX/Contest Club for 1999 are as follows: President, Bob Williams, W9NIP; Vice President, Ron St. Laurent, ND5S; Secretary, Dorothy VanConant, W8DVC; and Treasurer, Mark Mowery, AA8TC.

DX news is provided by "The Daily DX," a daily electronic DX newsletter. Subscriptions to The Daily DX are $28 for 6 months (25 weeks), or $49 for 12 months (50 weeks). Send check or money order to "The Daily DX," 3025 Hobbs Road, Glenwood, Maryland 21738-9728 U.S.

DX Conventions

The Pacific Northwest DX Convention will be held July 30 to August 1 at the Monarch

CQ DX Awards Program

SSB

2269.....KE4SCY

CW

987.....KEØA 988.....EA2CIN

SSB Endorsements

320.....N7RO/330
320.....KZ2P/330
320.....EA4DO/330
320.....XE1VIC/329
320.....WØYDB/329
320.....W9OKL/327
320.....CT1EEB/327
320.....K4JDJ/323
320.....W3AZD/322
320.....EA8TE/321
310.....W2FKF/317
310.....W6MFC/317
310.....NØMI/313
300.....EA5GMB/304
275.....K2EEK/292
250.....EA2BP/262
250.....KE4SCY/258

CW Endorsements

320.....K4CEB/329
320.....N7RO/329
275.....EA2CIN/278

Total number of active countries is 330. 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.

Hotel in Portland, Oregon. The sponsor this year is the Willamette Valley DX Club, which has a web page: <qsl.net/wvDXc>. In addition to the usual DX programs, the convention will offer QSL card checking for DXCC, pick-up of W7 bureau cards, and more. To register, contact the club at it web site or via convention chairman Al Rovner, K7AR, at <K7AR@qsl.net>. This is one of the best of the regional DX conventions and is always a good time.

The eighth annual New Orleans International DX Convention will be August 27-28 at the Royal Sonesta Hotel in the historic French Quarter in New Orleans. Save the dates. More information soon.

QSL News

QSL **VK9NX** via operator Kevin Mulcahy, VK2CE, P.O. Box 300, Merrimbula 2548 Australia.

Eric, **VK4XN**, reports that he is no longer on the air, but continues to receive QSL cards. Any VK4XN operation is a pirate; please don't QSL.

You can QSL **HSØZCY** via RB Boone, WB4FNH, 3809 13th Avenue West, Bradenton, FL 34205.

QSL **YBØAZ** via manager W7TSQ, direct or via the W7 bureau. Wisnu is on the air near 14195 kHz daily.

QSL both **CE3/NE4Z** and **XR3Z** via manager Paul Womble, AJ4Y, P.O. Box 1207, Highland City, FL 33846-1207.

QSL **PT2VE** direct, *not* via PY2YW.

QSL the January 1999 operation of **VK9CA** from Cocos-Keeling direct to Miyamori, Hilton Residence 2-52604, P.O. Box 4084kby, Jakarta 12040, Indonesia, or via the Japanese JARL bureau to JA1CMD.

On the right, Frank Smith, AHØW, who has operated from Market Reef OJØ.

Not Managers

Joe W3HNK reports that he is *not* manager for JD1AMA.

Similarly, Frank, WA1ECA, reports he is not manager for ZA5G. Further, he can no longer accept cards for 5X1F and 5X1C. 5X1F is a Silent Key, and Frank has logs for August 22, 1995 *only*. Frank has not received any logs from 5X1C since 1995, and is thus unable to confirm any contacts.

Jose, CT1EEB, reports that he is receiving cards for **YT1BB**, but is *not* manager for this or any Yugoslavian station.

Likewise, Paul, K9PG, is *not* the manager for **KH7R**; QSL direct.

Bob, W3BYV, says he is no longer manager for **TG5ITS** and **KBØQMY/TI5**. He continues to handle cards for PZ5JR, PZ5DX, and P29ND.

73, Chod, VP2ML

BY FREDERICK O. MAIA, W5YI

WASHINGTON READOUT

REGULATORY NEWS IN THE WORLD OF AMATEUR RADIO

FCC Chairman to "Restructure" the Agency; Republicans Want It "Overhauled"

Commission Chairman William Kennard announced plans to reorganize the FCC to reflect an era of competitive telecommunications markets. "This agency will look very different in five years," he said.

Since communications technologies are converging, Kennard said he will also examine the structure of the FCC, which has been divided into bureaus serving wireline phone, wireless, cable, broadcast, and international services.

The FCC Chairman said he wants to work with lawmakers, and at Congressional hearings held March 17, Kennard gave lawmakers a five-year plan, subject to revisions, for reorganizing the FCC internally along functional rather than technological lines, as well as putting greater emphasis on competition, deregulation, enforcement, and consumer protection. Kennard also said he wants to speed up FCC decisions.

The overwhelming sense from the members of the House Commerce Subcommittee on Telecommunications is that the FCC is an elderly regulatory agency that needs either to be restructured or completely overhauled to do its duty in the modern information age.

The FCC expects to have its reorganization plan ready for public comment in May or June and finalized in the fall. Some of the plan could be implemented on its own, but some of the parts require congressional action.

Republicans Want To Revamp the FCC

Republicans in the GOP-controlled Congress have long criticized the FCC for acting too regulatory, particularly in its implementation of a 1996 law freeing cable, local, and long-distance companies to get into each other's business.

In a February 28 speech, new House Speaker Dennis Hastert (R-Ill.) said that although he has a busy national agenda, telecommunications policy and ongoing FCC implementation of the Telecommunications Act of 1996 would be a priority. "I am confident that we can restructure the FCC and help to drag the overly bureaucratic FCC kicking and screaming into the 21st century," Hastert said.

Rep. Billy Tauzin (R-La.), chairman of the House Commerce Committee's telecommunications panel, which has jurisdiction over the FCC, is leading the overhaul effort. "We have, in effect, a horse and buggy agency trying to bridle supersonic technology," Tauzin said. He believes reorganization is not enough. "The FCC should change to an entirely new agency ... not just one that behaves better." He wants to "radically reshape" the Commission.

"We need to redesign [the FCC's] mandate to clearly state what it should do and what it shouldn't do," Tauzin said. "We haven't had a comprehensive review of the FCC since the 1970s, when there was one telephone company, three networks, and not even Bill Gates had heard of a laptop with Internet access." Rep. Tauzin, along with other lawmakers, plans to have a bill drafted by June detailing some changes in the FCC's mission, powers, and structure.

Rep. Tauzin believes that: (1) Congress should get rid of FCC rules that lawmakers see as unnecessary; (2) some FCC functions should be given over to the private sector; and (3) some of the bureaus should be combined to prevent overlapping of duties.

Republicans and some Democrats in the GOP-controlled Congress have accused the FCC of being too regulatory, particularly in its implementation of a 1996 law that freed cable TV and local and long-distance telephone companies to get into each other's businesses.

Rep. John Dingell of Michigan, the Commerce Committee's senior Democrat and a frequent FCC critic, blasted the agency's implementation of the law. "It has thumbed its nose at Congress." But another key Democrat, Rep. Edward Markey of Massachusetts, gave the agency high marks for implementing the 1996 law and said radically restructuring the FCC "would be counterproductive." Tauzin, meanwhile, renewed his push to try to limit the FCC's authority to review mergers.

"Radical restructuring" of the FCC does not seem to have as much support in the U.S. Senate, where counterparts prefer a more modest proposal. "We have to change [the FCC] slowly," said Sen. Conrad Burns (R-Mont.), chairman of the Communications Subcommittee. "It's an evolutionary thing."

Tauzin Opposes Microradio

Tauzin is particularly outraged by the FCC's plan to allow thousands of new low-powered FM radio stations. The Commission proposed in February to create hundreds " . . . or even thousands . . . " of new FM radio stations broadcasting at 1000 watts down to as little as 1 watt. Commercial stations typically broadcast at 5000 watts or more, requiring expensive outlays for equipment and massive antenna towers.

Tauzin believes the Commission plan for microradio broadcast stations would reduce the audience and advertising revenue of current stations and possibly create severe interference. In a letter to FCC chairman William Kennard, Tauzin called the microradio initiative "ill-advised." He charged that the FCC " . . . is an agency out of control that demands congressional action to straighten it out."

But FCC Chairman Kennard believes "There is enough room for the voices of churches, schools, and neighborhood groups as well as established radio companies."

Tauzin also wants to repeal a provision of the 1996 Telecommunications Act that subsidizes Internet connections for schools and libraries. The education rate, or e-rate, discount is funded from fees added to long-distance telephone calls. The program came under fire last year from some Republicans who labeled it the "Al Gore tax."

In a speech, Kennard disagreed. He said, "I'm happy to report that this month marked the end of the first year of e-rate funding. And after only 12 months, we've

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(telephone 817-461-6443
e-mail <fmaia@cwixmail.com>)

given out $1.6 billion to over 80,000 schools. We have wired over one half of all the classrooms in the nation."

FCC Agrees It Needs Restructuring

Kennard agrees and said, "The FCC needs change, but it doesn't need chaos. And I hope Congress does not use FCC reform as a back door to rewrite the 1996 Telecommunications Act," which he called " . . . fundamentally sound." Kennard also reiterated his pledge not to regulate the Internet.

FCC Chairman Kennard presented his report entitled "A New Federal Communications Commission for the 21st Century," which committed the FCC to focusing on three core functions: consumer protection, including universal service; enforcement; and spectrum management.

Kennard noted, "In . . . a world where old industry boundaries are no longer and competition is king, we need a new FCC. . . . The traditional boundaries delineating the FCC's current operating bureaus will cease to be relevant. Simply, in five years time, the FCC will be dramatically transformed."

Further, Kennard said, "Change is inevitable; it is necessary. We must re-organize the FCC in such a way that respects the integrity of our staff and protects the interests of the American people."

The FCC believes the re-invention of the Commission is well underway. In a public notice, Kennard said that since becoming Chairman in November 1997, he has emphasized the importance of strengthening agency enforcement as essential to protect consumers.

As a result, the Commission has investigated and shut down and fined hundreds of companies that engaged in "slamming" (unauthorized switching of long-distance telephone service); shut down 261 unlicensed "pirate" broadcast radio operations, including five that were interfering with air traffic control or were otherwise endangering human life; and established a "fast-track" complaint process for resolution of complaints that are important to maintaining fair rules of competition.

Since December 1997 the Commission has stressed the importance of removing unnecessary burdensome regulations. The Commission's efforts to streamline regulations include simplifying the equipment authorization process; implementing electronic filing of applications and comments in rulemakings; and proposing several streamlining initiatives in over two dozen areas, as part of the 1998 Biennial Regulatory Review " . . . including the restructuring of the Amateur Service.

73, Fred, W5YI

BY GEORGE JACOBS, W3ASK

PROPAGATION

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Solar Roller Coaster!

The unexplained wide swings in daily sunspot counts continue. The Royal Observatory of Belgium reports a mean sunspot number of 66 for February 1999. The daily sunspot level reached a record high to date for Cycle 23 on February 15 with a count of 144, which is in the Extremely High range. On the other hand, a low of 12 was recorded on February 5, which is in the Low range. Such wide day-to-day variations in sunspot levels are most unusual.

The highest daily sunspot count on record is 335. This took place during Cycle 19 on both December 24 and 25, 1957 as a special gift from Santa Claus! Cycle 19 reached a record-breaking smoothed sunspot count of 201 during February and March 1958. In contrast, the count falls to zero on a good number of days during all periods of low solar activity.

February's mean value results in a 12-month running smoothed sunspot number of 68 centered on August 1998. This is an increase of 3 numbers from the previous month's smoothed level. A smoothed sunspot count of 117 is expected during June 1999. If the cycle continues on its present course, it is very likely to reach a peak during early 2000 with a count on the order of 125 to 140.

The Dominion Radio Astrophysical Observatory at Penticton, British Columbia reports for February 1999 a mean value of 139 for the 10.7 cm solar flux level. This results in a smoothed value of 125 centered on August 1998. A level on the order of 149 is forecast for June 1999.

Salting the Ionosphere

While there are no scientific grounds to explain it, symbolically "salting" the ionosphere appears to have contributed to the favorable results observed during the past eight CQ World-Wide DX Contest periods. This was especially so during last year's contest, after our visit to the Royal Observatory of Belgium, the home of sunspot number archives.

As this column is being read, I am carrying my mythical bags of salt throughout Italy, from Venice to Rome, via the Tuscany hill towns and Florence. Somewhere along this route I am certain to find a location where physical or natural conditions are conducive to symbolically "salting the ionosphere" and appealing to Mother Nature to provide especially good propagation conditions during this year's annual CQ World-Wide DX Contest periods.

11307 Clara Street, Silver Spring, MD 20902
e-mail: <g.jacobs@ieee.org>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for June 1999

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 5, 11-13	A	A	B	C
High Normal: 6, 8-10, 15-16	A	B	C	C-D
Low Normal: 1-3, 7, 14, 17-18 21-22, 24-25, 28-30	B	C-B	C-D	D-E
Below Normal: 4, 20, 23, 26-27	C	C-D	D-E	E
Disturbed: 19	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 and 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 good (C-B) on June 1st through the 3rd, fair to poor (C-D) on the 4th, excellent (A) on the 5th, good (B) on the 6th, etc.

Great Circle Maps

In my almost 60 years in the field of radio communications, both as an amateur and a professional, and as a navigator, I have made extensive use of Azimuthal Equidistant maps, more commonly referred to as Great Circle maps. A Great Circle map centered on a specific point accurately displays azimuth or true bearing and the shortest distance to any other point in the world as a straight line. Fig. 1 is a typical Great Circle map centered on my QTH, Silver Spring, Maryland. Note the azimuthal bearing to South Africa on 100 degrees. In amateur radio, Great Circle maps are indispensable in determining correct antenna beam directions to any world location. They are invaluable in the conceptual design of shortwave broadcasting and communication stations, and in their effective coverage.

I am often asked for a source of personalized Great Circle maps centered on specific QTHs. Until about ten years ago these maps were available centered only on the world's largest cities. If you didn't live in any of these cities, you either did without, or used the map for the nearest available city, which could lead to considerable errors in azimuth and distance determinations.

Then along came Bill Johnson, K5ZI. Working as a scientist in New Mexico, Bill developed a computer program for drawing Great Circle maps for any location. I have been using maps developed by K5ZI for almost ten years for the stations of my professional clients and in amateur radio. The map shown in fig. 1 centered on my QTH was produced by Bill.

Bill's recent retirement has now given him the time to upgrade his computer program and to make personalized Great Circle maps available at reasonable cost to radio amateurs anywhere in the world. You can get in touch with Bill directly at the following address for more information and pricing for Great Circle maps and for several other computer-produced ham-heading and distance determination products that he has developed for HF and satellite communications: Bill Johnson, K5ZI, P.O. Box 640, Organ, NM 88052.

Summertime Propagation Conditions

June marks the changeover from equinoctial to summertime propagation conditions on the HF bands. Solar absorption is expected to be at seasonally high levels, resulting in generally weaker signals during the hours of daylight when compared to reception during the winter and spring months. Thunderstorm activity, and the associated level of static, increases considerably during June and the summer months, and higher static levels should be noticeable on all HF bands, particularly the 40, 80, and 160 meter bands.

Maximum usable frequencies during the daytime hours are considerably *lower* during June and the summer months than during the other seasons, and considerably *higher* during the hours of darkness. This changeover should have its greatest impact on the 20 meter band, which during other seasons is a near-optimum daytime DX band, but during the summer months becomes the optimum DX band during the hours of darkness.

Sporadic-*E* propagation peaks during June and the summer months, increasing

the number of short-skip openings possible on the HF bands, and often making possible openings up to 1300 miles and sometimes beyond on the 6 and 2 meter bands.

This month's propagation charts contain DX predictions for the period June 15 through August 15. Short-Skip Charts for June for openings between 50 and 2300 miles and from Hawaii and Alaska appeared in last month's column.

June Forecast

While fewer east-west openings are expected, 10 and 12 meters should continue to provide excellent daytime propagation, particularly on north-south paths to Central and South America, Africa, Asia, and the Pacific areas. Conditions should peak during the afternoon hours. Short-skip openings, primarily as a result of sporadic-*E* ionization, should be possible between approximately 500 and 1300 miles. While sporadic-*E* openings occur most often during the hours of daylight, some may occur at night as well. Some *F2*-layer openings for distances beyond 1300 miles should also be possible, mainly during the afternoon hours.

The 15 and 17 meter bands will likely be the optimum DX bands during the daytime hours of June. They are expected to open shortly after sunrise, peak during the afternoon hours, and remain open for DX through the early evening hours. During this span openings should be possible to most areas of the world. Conditions will favor paths towards Central and South America and Africa during most of the daylight hours, with signals peaking towards Europe during the late afternoon, and towards Asia and the Pacific area during the late afternoon and early evening. Don't be surprised if on some days these bands remain open for DX to as late as midnight! Short-skip openings ranging between 500 and 2300 miles should be possible throughout the daytime hours and well into the evening.

The 20 meter band should open to some area of the world or another for the entire 24-hour period on most days of the month. Signals should peak in all directions just after local sunrise. Intense solar absorption, however, will reduce DX openings considerably from about mid-morning through the early afternoon hours, although fairly good openings still should be possible towards the Caribbean area, Central America, and the northern tier countries of South America. By late afternoon, though, signals should begin to increase considerably, peaking towards the east and the south during the early evening hours. During the hours of darkness, propagation should be possible to almost all areas of the world, with signals peaking towards Asia and the Pacific after midnight. Exceptionally high signal levels may often be noted during nighttime openings on this band. Short-skip during the day should extend from 250 to 2300 miles, and during the hours of darkness from 500 to 2300 miles. During the late afternoon and evening hours conditions may often peak for both short skip and long skip, resulting in an exceptionally high level of interference.

The 30 and 40 meter bands should continue to provide good DX conditions during the hours of darkness despite the higher static levels mentioned earlier. These bands may not sound as good as they did during the spring months, with some of the long inter-hemispheric openings gone, but the DX will be there, and signals often will be exceptionally strong. Look for openings towards Europe and Africa as early as sunset. Signals should peak towards the east and the south before midnight, and towards the south and the west after midnight. The best bet for DX towards Asia and the Pacific area would be an hour or so before daybreak. Short-skip should be possible out to about 750 miles during the daylight hours. During the hours of darkness, short-skip should extend out to the 2300 mile limit.

Look for some DX openings on 80 meters, following the same east-south-west pattern as on 40 meters, during the hours of darkness. Signals should peak from an easterly direction before midnight and

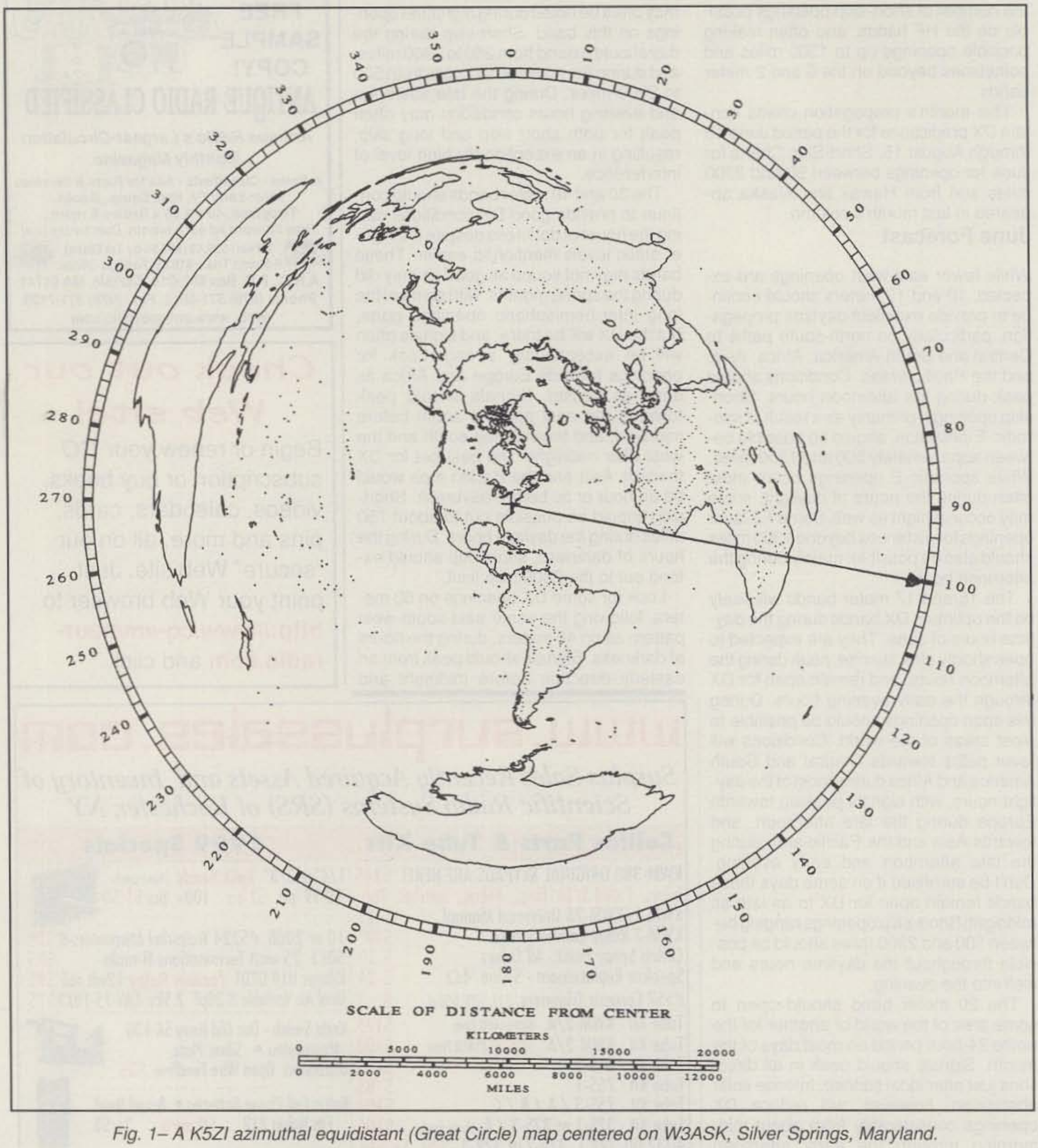

Fig. 1– A K5ZI azimuthal equidistant (Great Circle) map centered on W3ASK, Silver Springs, Maryland.

from the west before sunrise. Expect considerably higher noise levels and weaker signals on this band compared to 40 meter openings. Daytime short-skip openings will be limited to approximately 250 miles due to intense solar absorption, but at night openings should extend out to beyond 1800 miles.

Not much DX is expected on 160 meters until the fall, when static levels should subside and solar absorption decrease. An occasional opening, however, towards the Caribbean, Central America, and the northern tier countries of South America may be possible during the nighttime hours. At best, however, openings will be weak and noisy. Fairly frequent nighttime short-skip openings should be possible over a range of approximately 1000 miles. It is very unlikely that any daytime skip openings will be possible on this band due to very intense solar absorption.

Expect plenty for *short-skip* openings on the shortwave bands this month. For distances less than 250 miles, try 40 and 80 meters during the day and 80 and 160 meters at night. For openings between 250 and 750 miles, 30 and 40 meters should be best during the day, with 20 meters a close second. Try 80 meters at night, with 40 meters a second choice. Twenty meters should be best for daytime openings between 750 and 1300 miles,

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 80 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

June 15 to August 15, 1999
Time Zone: EDT
EASTERN USA TO:

To:	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Central Europe & North Africa	16-18 (1)	08-09 (1) 09-12 (2) 12-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	09-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-03 (3) 03-05 (2) 05-07 (3) 07-09 (2)	20-21 (1) 21-22 (2) 22-23 (3) 23-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 21-22 (1)* 22-23 (2)* 23-00 (3)* 00-01 (2)* 01-02 (1)*
Northern Europe & European CIS	15-17 (1)	11-15 (1) 15-18 (2) 18-19 (1)	09-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-01 (3) 01-03 (2) 03-06 (1) 06-09 (2)	21-22 (1) 22-23 (2) 23-00 (3) 00-01 (2) 01-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	16-18 (1)	11-13 (1) 13-17 (2) 17-18 (3) 18-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	12-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-01 (3) 01-03 (2) 03-06 (1) 06-08 (2) 08-09 (1)	20-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Western Africa	11-13 (1) 15-17 (1) 17-19 (2) 19-21 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-23 (4) 23-03 (3) 03-04 (2) 04-05 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-03 (4) 03-04 (3) 04-05 (2) 05-07 (1)	20-22 (1) 22-00 (2) 00-02 (1) 22-00 (1)*
Eastern & Central Africa	17-19 (1)	09-12 (1) 12-14 (2) 14-17 (3) 17-19 (4) 19-22 (3) 22-23 (2) 23-00 (1)	14-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-02 (3) 02-03 (2) 03-05 (1)	21-00 (1)
Southern Africa	10-13 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-13 (4) 13-14 (3) 14-15 (2) 15-16 (1) 01-03 (1)	23-01 (1) 01-03 (3) 03-05 (2) 05-08 (1) 14-15 (1) 15-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	21-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*
Central & South Asia	Nil	09-10 (1) 10-12 (2) 12-13 (1) 17-19 (1) 19-22 (2) 22-23 (1)	17-20 (1) 20-23 (2) 23-03 (1) 03-06 (2) 06-08 (1)	19-21 (1) 04-06 (1)
Southeast Asia	Nil	10-14 (1) 14-16 (2) 16-19 (1) 19-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-19 (1) 19-21 (2) 21-23 (1) 23-02 (2) 02-03 (1)	04-06 (1)
Far East	Nil	09-10 (1) 10-12 (2) 12-18 (1) 18-20 (2) 20-22 (1)	06-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 18-21 (1) 21-23 (2) 23-02 (3) 02-04 (2) 04-06 (1)	04-06 (1)
South Pacific & New Zealand	16-18 (1) 18-20 (2) 20-22 (1)	09-11 (1) 14-16 (1) 16-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-01 (1)	18-20 (1) 20-23 (2) 23-01 (3) 01-04 (4) 04-05 (3) 05-06 (2) 06-09 (3) 09-10 (2) 10-12 (1)	01-03 (1) 03-05 (2) 05-06 (3) 06-07 (2) 07-08 (1) 04-06 (1)*
Australasia	18-19 (1) 19-21 (2) 21-22 (1)	10-12 (1) 17-18 (1) 18-20 (2) 20-22 (3) 22-23 (2) 23-00 (1)	21-23 (1) 23-01 (2) 01-03 (3) 03-05 (4) 05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1) 16-18 (1)	03-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Caribbean, Central America & Northern Countries of South America	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	08-09 (2) 09-12 (4) 12-14 (3) 14-21 (4) 21-01 (3) 01-03 (2) 03-08 (1)	06-07 (3) 07-10 (4) 10-11 (3) 11-15 (2) 15-17 (3) 17-03 (4) 03-05 (3) 05-06 (2)	19-20 (1) 20-21 (2) 21-23 (3) 23-03 (4) 03-04 (3) 04-05 (2) 05-06 (1) 22-23 (1)* 23-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-21 (2) 21-22 (1)	07-08 (1) 08-11 (2) 11-15 (1) 15-16 (2) 16-17 (3) 17-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	10-16 (1) 16-18 (2) 18-19 (3) 19-02 (4) 02-04 (3) 04-07 (2) 07-09 (3) 09-10 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-04 (2) 04-05 (1) 22-03 (1)*
McMurdo Sound, Antarctica	15-17 (1)	16-18 (1) 18-21 (2) 21-22 (1)	17-19 (1) 19-22 (2) 22-03 (3) 03-05 (2) 05-06 (1) 07-09 (1)	02-05 (1)

Time Zones: CDT & MDT
(24-Hour Time)
CENTRAL USA TO:

To:	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Southern Europe & North Africa	Nil	11-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-20 (1) 23-01 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-18 (3) 18-22 (4) 22-02 (3) 02-03 (2) 03-05 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-00 (1)*

Northern & Central Europe & European CIS	Nil	10-15 (1) 15-17 (2) 17-18 (1)	02-06 (1) 06-09 (2) 09-15 (1) 15-18 (2) 18-19 (3) 19-21 (4) 21-00 (3) 00-02 (2)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Eastern Mediter-ranean & Middle East	15-17 (1)	11-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-02 (1) 07-09 (1)	21-23 (1)
Western Africa	10-12 (1) 15-16 (1) 16-18 (2) 18-20 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-21 (4) 21-00 (3) 00-02 (2) 02-03 (1)	14-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-02 (3) 02-04 (2) 04-06 (1)	20-00 (1) 22-00 (1)*
Eastern & Central Africa	16-18 (1)	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	15-17 (1) 17-18 (2) 18-19 (3) 19-22 (4) 22-00 (3) 00-02 (2) 02-04 (1)	21-23 (1)
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (4) 12-13 (3) 13-14 (2) 14-15 (1) 00-02 (1)	23-00 (1) 00-02 (3) 02-04 (2) 04-06 (1) 12-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	21-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Central & South Asia	Nil	09-11 (1) 11-12 (2) 12-13 (1) 15-18 (1) 18-21 (2) 21-23 (1)	17-19 (1) 19-22 (2) 22-02 (1) 02-06 (2) 06-08 (3) 08-09 (2) 09-10 (1)	19-21 (1) 05-07 (1)
Southeast Asia	Nil	10-11 (1) 11-14 (2) 14-19 (1) 19-22 (2) 22-00 (1)	07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-23 (1) 23-00 (2) 00-01 (3) 01-02 (2) 02-03 (1)	03-05 (1)
Far East	Nil	09-11 (1) 13-15 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 20-22 (1) 22-00 (2) 00-03 (3) 03-04 (2) 04-05 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)*
South Pacific & New Zealand	14-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-01 (1)	17-19 (1) 19-23 (2) 23-02 (4) 02-05 (3) 05-07 (2) 07-09 (4) 09-10 (3) 10-11 (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)*
Australasia	16-17 (1) 17-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	14-15 (1) 15-17 (2) 17-19 (1) 19-20 (2) 20-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	22-00 (1) 00-01 (2) 01-04 (4) 04-05 (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	10-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-23 (3) 23-01 (2) 01-08 (1)	03-05 (2) 05-07 (3) 07-09 (4) 09-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-03 (3)	19-20 (1) 20-21 (3) 21-23 (4) 23-00 (3) 00-03 (2) 03-05 (3) 05-06 (1) 20-22 (1)* 22-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay,	09-13 (1) 13-15 (2) 15-16 (3)	07-08 (1) 08-10 (2) 10-14 (1)	10-15 (1) 15-17 (2) 17-18 (3)	20-21 (1) 21-22 (2) 22-02 (3)
Brazil, Chile, Argentina & Uruguay	16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	14-15 (2) 15-16 (3) 16-22 (4) 22-00 (3) 00-01 (2) 01-02 (1)	18-01 (4) 01-03 (3) 03-07 (2) 07-09 (3) 09-10 (2)	02-03 (2) 03-05 (1) 20-03 (1)*
McMurdo Sound Antarctica	15-18 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	17-19 (1) 19-22 (2) 22-02 (3) 02-04 (2) 04-07 (1) 07-09 (2) 09-10 (1)	02-06 (1)

Time Zones PDT (24-Hour Time) WESTERN USA TO:

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80* Meters*
Western & Southern Europe & North Africa	Nil	08-09 (1) 09-11 (2) 11-15 (1) 15-17 (2) 17-18 (1) 21-23 (1)	23-01 (3) 01-06 (1) 06-08 (2) 08-14 (1) 14-16 (2) 16-21 (3) 21-23 (2)	20-23 (1)
Central Northern Europe & CIS	Nil	07-09 (1) 13-14 (1) 14-16 (2) 16-17 (1)	13-15 (1) 15-19 (2) 19-00 (3) 00-01 (2) 01-06 (1) 06-08 (2) 08-10 (1)	20-22 (1)
Eastern Mediter-ranean & Middle East	Nil	07-09 (1) 11-15 (1) 15-17 (2) 17-18 (1) 22-00 (1)	13-16 (1) 16-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 06-08 (1)	20-21 (1)
Western & Central Africa	09-14 (1) 14-16 (2) 16-18 (1)	07-11 (1) 11-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	13-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-00 (3) 00-04 (2) 04-08 (1)	20-22 (1)
Eastern Africa	Nil	09-14 (1) 14-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 00-02 (1)	15-17 (1) 17-19 (2) 19-22 (3) 22-00 (2) 00-02 (1)	Nil
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-14 (2) 14-15 (1)	14-15 (1) 15-17 (2) 17-18 (1) 22-23 (1) 23-00 (2) 00-02 (3) 02-03 (2) 03-06 (1) 06-08 (2) 08-10 (1)	20-23 (1)
Central & South Asia	Nil	08-10 (1) 10-12 (2) 12-14 (1) 17-19 (1) 19-22 (2) 22-23 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1)	05-07 (1) 19-20 (1)
Southeast Asia	11-15 (1)	08-09 (1) 09-11 (3) 11-13 (2) 13-16 (1) 20-22 (1) 22-00 (2) 00-02 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	03-07 (1)
Far East	14-16 (1)	09-10 (1) 10-12 (2) 12-15 (1) 15-17 (2) 17-19 (3) 19-21 (2) 21-23 (1)	19-21 (1) 21-23 (2) 23-01 (3) 01-04 (4) 04-06 (3) 06-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	01-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 03-05 (1)*
South Pacific & New Zealand	12-14 (1) 14-16 (2) 16-18 (3) 18-20 (4) 20-21 (2) 21-22 (1)	11-13 (1) 13-15 (2) 15-18 (3) 18-21 (4) 21-22 (3) 22-23 (2) 23-01 (1)	17-19 (1) 19-21 (2) 21-03 (4) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-13 (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)*

Australasia	14-17 (1)	07-09 (1)	20-22 (1)	22-00 (1)
	17-19 (2)	13-17 (1)	22-00 (2)	00-01 (2)
	19-21 (3)	17-19 (2)	00-05 (4)	01-05 (3)
	21-22 (2)	19-22 (3)	05-07 (3)	05-06 (2)
	22-23 (1)	22-00 (4)	07-09 (4)	06-08 (1)
		00-01 (3)	09-10 (2)	01-04 (1)*
		01-02 (2)	10-13 (1)	
		02-03 (1)	13-15 (2)	
			15-17 (1)	
Caribbean,	09-11 (1)	08-09 (2)	08-11 (3)	19-21 (1)
Central	11-12 (2)	09-10 (3)	11-15 (2)	21-22 (2)
America &	12-14 (3)	10-12 (4)	15-17 (3)	22-00 (3)
Northern	14-16 (4)	12-14 (3)	17-01 (4)	00-03 (2)
Countries	16-17 (3)	14-19 (4)	01-04 (3)	03-04 (3)
of South	17-18 (2)	19-21 (3)	04-05 (2)	04-05 (2)
America	18-19 (1)	21-00 (2)	05-06 (3)	05-06 (1)
		00-08 (1)	06-08 (4)	21-23 (1)*
				23-03 (2)*
				03-04 (1)*
Peru,	09-12 (1)	06-07 (1)	09-15 (1)	20-21 (1)
Bolivia,	12-15 (2)	07-09 (2)	15-17 (2)	21-00 (2)
Paraguay,	15-16 (3)	09-13 (1)	17-18 (3)	00-02 (1)
Brazil,	16-18 (4)	13-15 (2)	18-01 (4)	02-03 (3)
Chile,	18-19 (3)	15-16 (3)	01-03 (3)	03-04 (2)
Argentina	19-20 (2)	16-23 (4)	03-06 (2)	04-05 (1)
& Uruguay	20-21 (1)	23-00 (3)	06-08 (3)	02-04 (1)*
		00-01 (2)	08-09 (2)	
		01-02 (1)		
McMurdo	17-19 (1)	14-16 (1)	16-18 (1)	00-23 (1)
Sound,		16-17 (2)	18-19 (2)	23-01 (2)
Antarctica		17-19 (3)	19-02 (3)	01-04 (1)
		19-21 (2)	02-04 (2)	04-06 (2)
		21-22 (1)	04-06 (1)	06-07 (1)
			06-08 (2)	
			08-10 (1)	

*Best times to check for 80 meter openings. Openings on 160 meters are likely to occur during times when 80 meter openings are shown with a propagation index of (2) or higher. Openings on 6 meters may be possible at times. 10 meter openings are shown with a propagation index greater than (3). For 12 meter openings, interpolate between 10 and 15 meters. For 17 meter openings interpolate between 15 and 20 meters. For 30 meter openings interpolate between 40 and 20 meter openings.

with 30 and 40 meters best at night, backed up by 80 meters. Between distances of 1300 and 2300 miles use 20 meters during the day, with 17 and 15 meters as a second choice. Thirty and 40 meters are expected to be best for this distance range at night. Frequent short-skip openings, resulting from an expected seasonal increase in sporadic-*E* ionization, should also be possible on 10, 12, 15, and 17 meters over distances ranging between approximately 450 and 1300 miles. As its name implies, sporadic-*E* ionization can occur at any time. However, it is usually most prevalent between 10 AM and 2 PM and again between 6 and 10 PM local daylight time.

VHF Ionospheric Openings

The big VHF news during June will very likely be sporadic-*E* propagation on 6 meters. Fairly frequent openings are expected over a range between approximately 900 and 1300 miles. During intense and widespread sporadic-*E* ionization two-hop openings well beyond 1300 miles may be possible. An occasional sporadic-*E* opening on 2 meters is also possible during June, particularly when ionization is very intense, and over distances between approximately 1100 and 1300 miles. While June is not usually a good month for *F2*-layer propagation on 6 meters, an occasional DX opening may be possible. The best time to check for 6 meter DX openings is during the afternoon hours on days when conditions are expected to be High Normal or better. Occasional openings should be possible towards Latin America, southern Africa, the South Pacific, and Australasia.

Not much meteor-type ionization is expected during June, but some may occur during the *Herculids* and *Scorpiids* showers on June 3 and 5. While these are minor meteor showers, it may be worthwhile to check the VHF bands for unusual short-skip openings on these days.

There is also a greater tendency for VHF ionospheric openings on days that are expected to be Below Normal or Disturbed. Check the Last-Minute Forecast at the beginning if this column to find those days during June that are most likely to be in these categories.

A seasonal decline is expected for trans-equatorial (TE) propagation on 6 meters during June, but an occasional opening may still be possible between southern tier states and deep Latin America. The best time to check for TE openings is between 8 and 11 PM local daylight time.

Check *CQ*'s sister monthly magazine *CQ VHF Ham Radio Above 50 MHz*. It is devoted entirely to the latest news and information on VHF communications.

73, George, W3ASK

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ATTENTION SB-200 & SB-220 OWNERS: Restore and up-grade your tired old amplifier with our parts and kits. Power supply boards, soft keys, soft starts, new fans & motors, many more items. Write for details—**Please specify the model**. Harbach Electronics—WA4DRU, 2318 S. Country Club Rd., Melbourne, FL 32901-5809 (http://www.harbach.com).

ALUMINUM CHASSIS-CABINET KITS, UHF and VHF Antenna Parts. K3IWK, 5120 Harmony Grove Road, Dover, PA 17315-3016.

QSLs FOR DX STATIONS: Our new "International Division" was established to handle QSL needs of DX hams. We understand the problems of packaging, shipping, and dealing with the customs problems. You can trust us to deliver a quality QSL, usually much cheaper than you can find locally. Write, call, or FAX for free samples and ordering information. "The QSL Man—W4MPY," 682 Mount Pleasant Road, Monetta, SC 29105 USA. Phone or FAX 803-685-7117.

WANTED: Older model bugs, unusual bugs, and miniature hand keys. State price, condition. Dave Ingram, K4TWJ, 4941 Scenic View Drive, Birmingham, AL 35210.

TRYLON SELF-SUPPORTING TOWERS: Steel towers available up to 96 ft. Terrific value and reliability. The popular T-500 72-footer will take 45 square feet of antennas at 70 mph and is only $1825.00. <www.championradio.com> or 888-833-3104 for more info.

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IMRA-International Mission Radio Assn. helps missioners—equipment loaned; weekday net, 14.280 MHz, 1:00–3:00 PM Eastern. Sr. Noreen Perelli, KE2LT, 2755 Woodhull Ave., Bronx, NY 10469.

FREE GUIDE "THE TEN MOST COMMON TOWER BUILDING MISTAKES": Written by well-known tower expert Steve Morris, K7LXC, this guide will help you avoid dangerous mistakes. TOWER TECH, Box 572, Woodinville, WA 98072; e-mail <UpTheTower@aol.com> or call 800-TOWERS8 or on the web: <www.championradio.com>.

FOR SALE: **Transmission Line Transformers** (Baluns and Ununs). Due to QTH downsizing, I have to dispose of the many transformers used in my study of these broadband and highly efficient matching transformers. A suggested price is $20, covering labor, packaging, and shipping. Oldest transformers will be shipped first. They will include a short personal note on the particular experiment. Please, no special requests.Most transformers are uncased. Jerry Sevick, W2FMI, 32 Granville Way, Basking Ridge, NJ 07920 (908-766-6122). **Note:** These are one of a kind, for experimental use only.

THE 59(9) DX REPORT: Weekly DX and Contest bulletin. SASE for sample. P.O. Box 73, Spring Brook, NY 14140.

TELEGRAPH COLLECTOR'S PRICE GUIDE: 250 pictures/prices. $12 postpaid. ARTIFAX BOOKS, Box 88, Maynard, MA 01754.

ASTRON Power Supply, brand new w/warranty, RS20M $99, RS35M $145, RS50M $209, RS70M $249. Call for other models, AVT 626-286-0118 <www.aventrade.com>.

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TRIBANDER COMPARISON REPORT: Find out the real lowdown on HF antenna performance. K7LXC and NØAX test the KT34XA, TH7, TH11, C-3, Skyhawk, and more. Over 60 pages. $15 plus $3.00 s/h. <www.championradio.com> or 888-833-3104.

WANTED: ICOM sales brochures for IC-970, 275, 375, and 575 transceivers. Randy Ballard, N5WV, 903-687-3002.

B&B WITH A HAM! Enjoy hamming from Hawaii. Join those who have chased DX from beautiful upcountry Maui! (Non-smokers only, thanks.) "SEA Q MAUI," call 808-572-7914; <kh6sq@seaqmaui.com> <http://www.seaqmaui.com>.

PHASED ARRAY NETWORKS by COMTEK SYSTEMS deliver gain and front to back. Call 704-542-4808; fax 704-542-9652. COMTEK SYSTEMS, P.O. Box 470565, Charlotte, NC 28247.

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OVER 2500 DIFFERENT DX AWARDS from 122 DXCC countries listed. K1BV DX Awards Directory. Put your QSLs to work for you! $21 postpaid. Ted Melinosky, 65 Glebe Road, Spofford, NH 03462-4411. <http://top.monad.net/~k1bv>.

Advertiser's Index

(continued on page 99)

ARIZONA STATE CONVENTION AND HAMFEST: Largest FREE ADMISSION hamfest in the Southwest. July 23, 24, and 25, 1999. I-17 exit 337 (Ft. Tuthill), Flagstaff, AZ. Our 48th consecutive year. Manufacturers, Dealers, Exhibits, Seminars, VE Testing, Huge Swap, Camping, and more. Gordon West, WB6NOA, will present two of his famous seminars. Contact Amateur Radio Council of Arizona, POB 42003-312, Phoenix, AZ 85080-2003; or e-mail: <arcathill@aol.com>; web site: <http://www.hamsrus.com>. Enjoy cool weather and the pines.

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TESLA. WIZARD by Marc Seifer. Citadel Press. Definitive biography. "METICULOUSLY RESEARCHED," Booklist. **www.netsense.net/tesla**

SX88 Hallicrafters receiver wanted. Jim, W6OU, 714-528-5652.

RAINBOW AMATEUR RADIO Association, the gay/lesbian club. Active HF nets, newsletter, uncensored listserv, web page: <www.rara.org>. Privacy respected. E-mail: <rara@en.com> or Dept. A, P.O. Box 191, Chesterland, OH 44026-0191.

VISIT THE "K8CX HAM GALLERY" at <http://paradox2010.com/ham/>, the largest Ham site on the Internet!

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LOG BOOK AND QSL CARD PRINTING PROGRAM for Win 95, Win98, and NT. Featuring multiple logbooks, sort and search capabilities, online help, easy Navigation and automatic printing of QSL cards. Download free from **<www.n3jl.com>** or send your callsign and ten dollars for CD-ROM to: Joe Lynn, P.O. Box 2980, Montgomery Village, MD 20886-2980.

Join the LAMBDA AMATEUR RADIO CLUB (LARC) since 1975, the only open and visible public-service oriented ham club for gay and lesbian hams. Monthly newsletter, HF skeds, internet listserv and IRC, hamfest meetings, chapters, DXpeditions. Write LARC, P.O. Box 56069, Philadelphia, PA 19130-6069 or e-mail <lambda-arc@geocities.com>; <http://www.geocities.com/WestHollywood/1686>.

INTERESTED IN VIEWING the Earth from space? Subscribe to Weather Satellite Report. Since 1992 the international quarterly of Earth and atmospheric imagery. Woodhouse Communication, telephone 616-226-8873; fax 616-226-9073; e-mail <www.view2earth.com>.

RF TRANSISTORS AND TUBES: MRF454, MRF455, MRF422, SD1446, 2SC2879, 2SC2312, 2SC2166, 2SC1969, 2SC2904, 2SB754, SAV17, TA7222AP. 3-500ZG, 3CX3000A7, 4CX250B, 572B, 6146W. WESTGATE 800-213-4563.

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FOR SALE: A-Tronix CW Keyboard $80, ICOM IC-211 2 meter all-mode excellent $275, B&W 51SB-B SSB generator for B&W 5100B $90, B&W 5100B AM trans. with SSB generator $350. Bill Smitherman, KD4AF, 336-699-8699.

KK7TV COMMUNICATIONS: *See our display ad.*

WANTED: ICOM IC-970. Must be in mint condition, non-smoker. Also looking for ICOM UX-R96 and UX-97 plug-in modules for the ICOM IC-970. Randy Ballard, N5WV, 903-687-3002.

RADIOAMADORES BRASILEIROS! Equipamentos Yaesu, ICOM, Kenwood e Acessórios, compre no Brasil. (019) 875-6174.

OFFERS: Apache, DX100, SX96, R4B/T4XB, SPR4, more. List $1.00 and SASE. Joseph Bedlovies, P.O. Box 139, Stratford, CT 06615.

WANTED: (1) Vibroplex Deluxe Semiautomatic keyer in WW II battleship gray. (2) J-36 military keys by Vibroplex, Bunnell, Lionel, etc. (3) Coast Guard, Navy RM, or MM Radio Officer's speed key in carrying case—for private collection by senior Coast Guard officer. Also other straight keys/bugs/keyers with naval history and incomplete/broken bugs for restoration parts. wb4rhb@arrl.net

KENWOOD TS-830S $550. Yaesu FT901DM $500. K1BW 413-538-7861.

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MODEL	CONT. AMP	ICS	SIZE (Inches)	WT.(LBS)
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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
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Mode: ..... AM (118 - 135.9 Rx only), FM
Power: ..... 2 Meter: 50W/20W/10W/5W
440 MHz: 35W/20W/10W/5W
Power Supply Requirement: ... 13.8 V DC
Memory Channels: ..... 232 Total
Including 12 Scan Edges, 10 Log, 10 Repeater, and 2 Call
Size & Weight (approximate):
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10.2 oz /290 g
Main Unit: ..... 5.5(W) x 1.6(H) x 6.6(D) in.
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2 lb, 9 oz /1.15 kg

FEATURES

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