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MAY 2005

CQ

1945 Our 60th Anniversary 2005

Introducing: The NEW CQ DX Marathon p. 16

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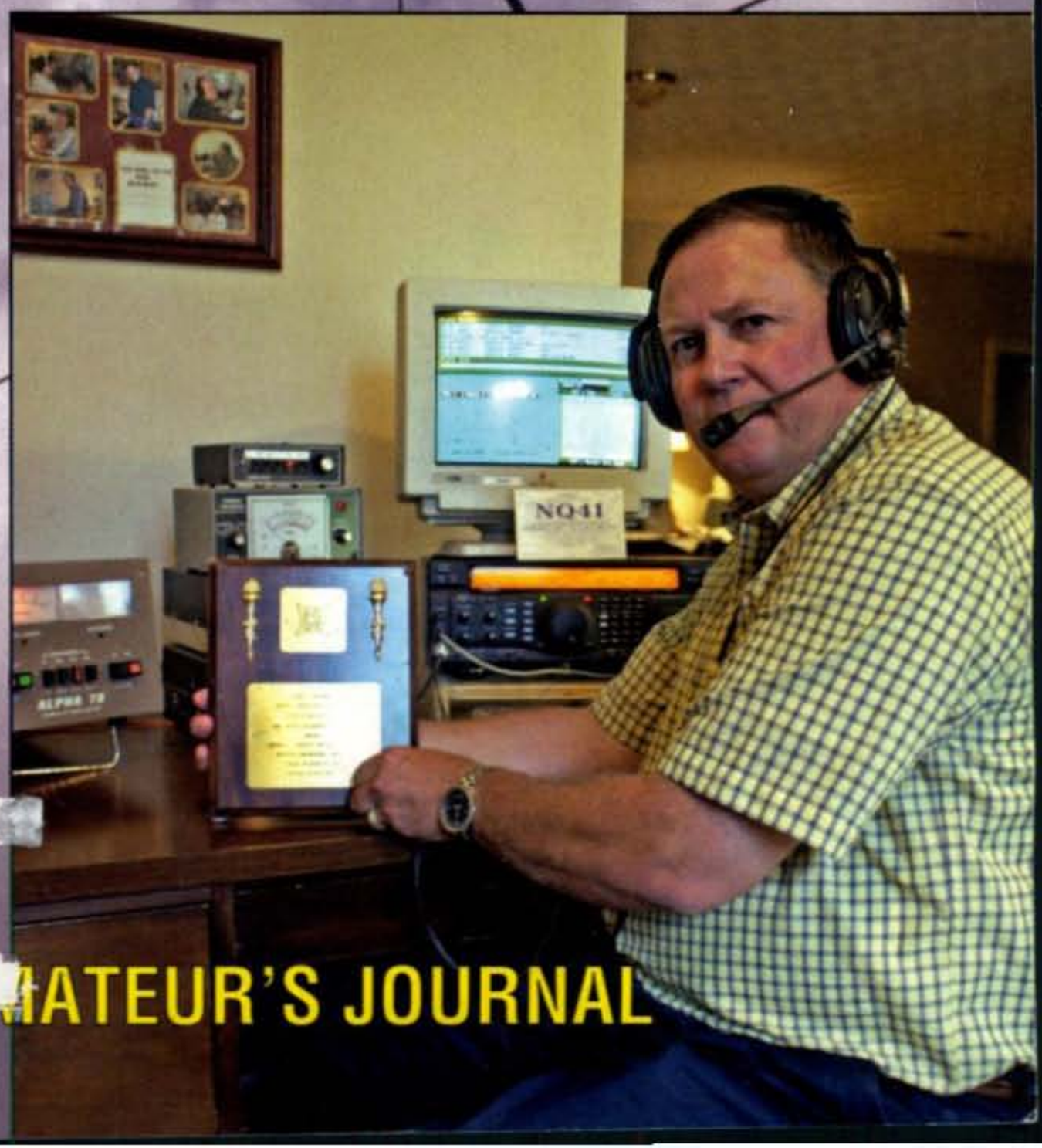
On the Cover: Rick Dougherty, Jr., NQ4I, of Griffin, Georgia, displays one of the many CQ contesting plaques he's won over the years. His multi-multi superstation consists of 11 complete stations and eight towers. Details on page 72.



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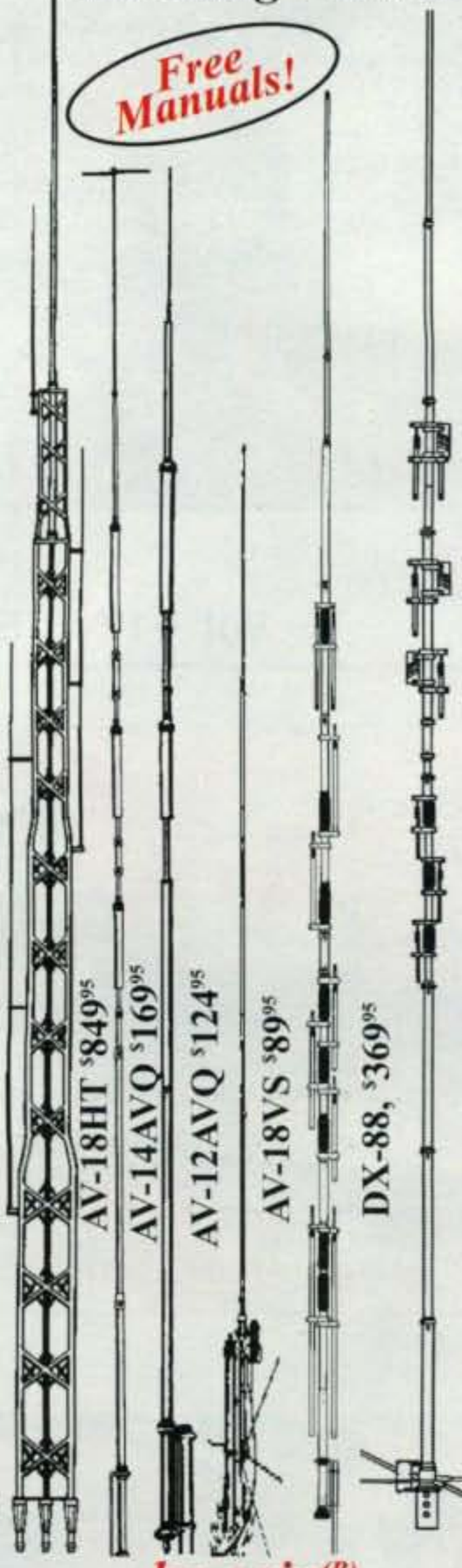

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AV-18HT, $849.95. (10,12,15,20,40,80 M, 160, 17 Meters optional). 53 ft., 114 lbs.

Standing 53 feet tall, the famous *Hy-Gain HyTower* is the world's best performing vertical! The AV-18HT features automatic band selection achieved through a unique stub-decoupling system which effectively isolates various sections of the antenna so that an electrical 1/4 wavelength (or odd multiple of a 1/4 wavelength) exists on all bands. Approximately 250 kHz bandwidth at 2:1 VSWR on 80 Meters. The addition of a base loading coil (**LC-160Q, $109.95**), provides exceptional 160 Meter performance. **MK-17, $89.95**. Add-on 17 Meter kit. 24 foot tower is all rugged, hot-dip galvanized steel and all hardware is iridited for corrosion resistance. Special tilt-over hinged base for easy raising & lowering.

AV-14AVQ, $169.95. (10,15,20,40 Meters). 18 ft., 9 lbs. **The** Hy-Gain AV-14AVQ uses the same trap design as the famous Hy-Gain Thunderbird beams. Three separate air dielectric Hy-Q traps with oversize coils give superb stability and 1/4 wave resonance on all bands. Roof mount with Hy-Gain AV-14RMQ kit, $89.95.

AV-12AVQ, $124.95. (10, 15, 20 Meters). 13 ft., 9 lbs. **AV-12AVQ** also uses Thunderbird beam design air dielectric traps for extremely Hy-Q performance. This is the way to go for inexpensive tri-band performance in limited space. Roof mount with AV-14RMQ kit, $89.95.

AV-18VS, $89.95. (10,12,15,17,20,30,40,80 Meters). 18 ft., 4 lbs. **High** quality construction and low cost make the AV-18VS an exceptional value. Easily tuned to any band by adjusting feed point at the base loading coil. Roof mount with Hy-Gain AV-14RMQ kit, $89.95.

DX-88, $369.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs.

All bands are *easily* tuned with the DX-88's *exclusive* adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, $189.95. Ground Radial System, GRK-88, $99.95. Roof Radial System, RRK-88, $99.95.

DX-77A, $449.95. (10, 12, 15, 17, 20, 30, 40 Meters). 29 ft., 25 lbs.

***No** ground radials required!* Off-center-fed Windom has 55% greater bandwidth than competitive verticals. Heavy-duty tiltable base. Each band independently tunable.

Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
AV-18HT	$849.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	------
AV-14AVQ	**$169.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$134.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$89.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$369.95	10 - 80 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$449.95**	**10 - 40 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

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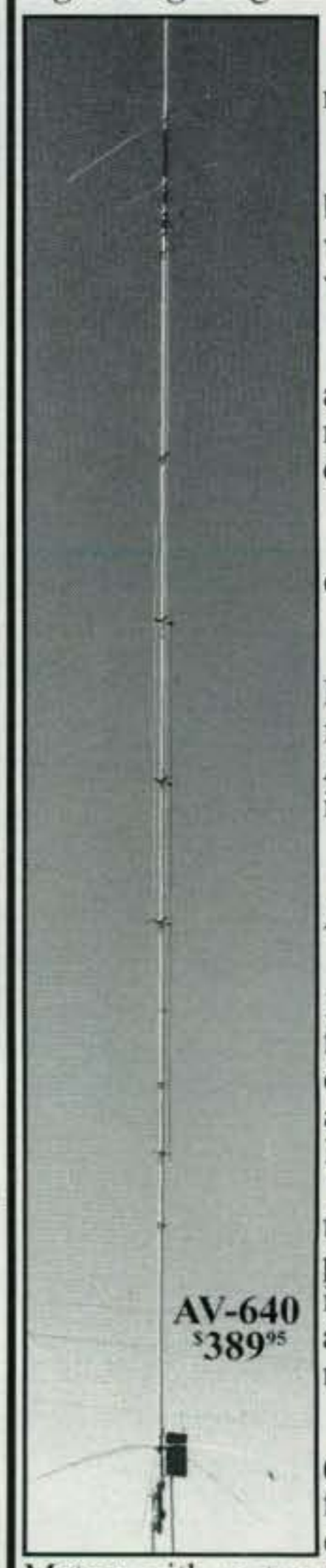
PATRIOT

Hy-Gain's new PATRIOT HF verticals are the best built, best performing and best priced multiband verticals available today. For exciting DX make full use of your sunspot cycle with the PATRIOT's *low 17 degree angle* signal.



No ground or radials needed

Effective counterpoise replaces radials and ground.

Automatic bandswitching

Single coax cable feed. Each band is individually tunable. Extra wide VSWR bandwidth. End fed with broadband matching unit.

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Low 2.5 sq. ft. wind surface area. Small area required for mounting. Mounts easily on decks, roofs and patios.

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Handles 1500 Watts key down continuous for two minutes.

Built-to-last

High wind survival of 80 mph. Broadband matching unit made from all *Teflon®* insulated wire. Aircraft quality aluminum tubing, stainless steel hardware.

hy-gain® warranty

Two year limited warranty. All replacement parts in stock.

AV-640, $389.95. (6,10,12, 15,17,20,30,40 Meters). 25.5 ft., 17.5 lbs. The AV-640 uses quarter wave stubs on 6, 10, 12 and 17 meters and efficient end loading coil and capacity hats on 15, 20, 30 and 40 meters -- no traps. Resonators are placed in parallel not in series. End loading of the lower HF bands allows efficient operation with a manageable antenna height.

AV-620, $289.95. (6,10,12,15,17,20 Meters). 22.5 ft., 10.5 lbs. The AV-620 covers all bands 6 through 20 Meters with no traps, no coils, no radials yielding an uncompromised signal across all bands.

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ham radio news

Martin New FCC Chairman

Kevin Martin is the new Chairman of the Federal Communications Commission. Martin was elevated to the chairmanship in mid-March by President Bush, succeeding Michael Powell, who left the Commission. Since Martin was already serving as a Commissioner, he did not need Senate confirmation. Martin and Powell clashed over several major issues considered by the FCC in recent years, most notably over media ownership rules and local telephone network sharing rules.

Martin did vote with the rest of the Commission last year to approve new rules for Broadband over Power Lines, saying there is "no question that this technology has terrific potential." However, he acknowledged that "Amateur radio operators still have concerns that they will experience interference from BPL systems," and said he takes those concerns "very seriously," adding, "I am confident that the Commission will continue to monitor these concerns and will take steps, where needed, to address interference problems going forward."

Kaul, Prasad, Sevick, Given Dayton Honors

Alan Kaul, W6RCL, has been named the Dayton Hamvention® Radio Amateur of the Year. Kaul, a west coast producer for the NBC Nightly News, was honored for his "dedication to the ongoing education of radio amateurs" and for "publicizing Amateur Radio to the non-licensed world..." according to a Hamvention announcement. Kaul has been deeply involved in producing several ham radio videos over the past 20 years.

Dayton's 2005 Special Achievement Award goes to Bharathi Prasad, VU2RBI. Prasad was the leader of the December 2004 DXpedition to the generally off-limits Anadaman and Nicobar Islands that shifted smoothly into an emergency communications network after the December 26th earthquake and tsunami, providing the only communications off the islands for weeks. (See Bharathi's story in last month's issue of *CQ*.)

Dr. Jerry Sevick, W2FMI, was honored with the Hamvention®'s 2005 Technical Excellence Award. Sevick is an expert in transmission-line transformers and has authored many articles for *CQ* and *Communications Quarterly*, as well as two CQ books, *Understanding, Building and Using Baluns and Ununs* and *The Short Vertical Antenna and Ground Radial*. The awards are scheduled to be presented at the Dayton Hamvention® in May.

ARRL Calls FCC Efforts on BPL "Woefully Inadequate"

ARRL Chief Executive Officer Dave Sumner used the opportunity of a congratulatory note to new FCC Chairman Kevin Martin to remind him of the concerns he expressed during a meeting about BPL last summer, and the League's contention that "the Commission's record of addressing BPL interference has proved to be woefully inadequate." In particular, according to the *ARRL Letter*, the ARRL says the FCC has not taken action to stop BPL interference in New York State and the League recently filed a new interference complaint regarding a BPL system in Texas.

The ARRL has also filed a petition with the FCC, calling for it to reverse its ruling on BPL (see this issue's "Washington Readout" on page 60). However, CEO Sumner told an interviewer for a BPL newsletter that he expects the League will have to take the FCC to court over the matter.

FCC May Have Restructuring Proposal Out by Mid-Year

The ARRL reports that the FCC is hoping to release by mid-year a Notice of Proposed Rule Making, or NPRM, on possible amateur licensing changes. In the wake of the International Telecommunications Union's decision last year to remove the international requirement for hams to know Morse code before gaining access to HF, 18 petitions were filed with the FCC seeking various changes in licensing rules and exam requirements, including at least two proposing a new entry-level license. The League says the FCC is planning to deal with all 18 petitions in a single rule-making proposal. It may take another year after the proposal is issued before new rules are adopted and put into place.

FCC Issues 28 More Retest Letters

The FCC has ordered 28 more hams to retake their Technician exams as part of an ongoing audit of exams given between 1999 and 2001 by a W5YI/VEC team in Yucaipa, California. As with the approximately 75 hams previously ordered to be retested, these amateurs were given approximately a month to appear for an exam before any non-W5YI VEC team. It is estimated that some 200 retests will be ordered before the inquiry is complete. The FCC still has not said exactly what irregularities it has found in these test sessions.

R.L. Drake Out of Radio Business

A legendary name in amateur radio equipment is now completely out of the radio business. R.L. Drake Co., whose R8 shortwave receiver line had been its only radio product for the past 14 years, announced in March that it had ended production of the unit and that all active dealers had sold out their remaining stock. Mike Brubaker, WA8NOP, Drake's V.P. of Sales and Marketing, wrote in a letter to the amateur radio industry that the company's focus today is on cable television and "the migration taking place as digital television transmission is introduced across the nation..." However, he pointed out that many Drake employees are still hams and shortwave enthusiasts and that they plan to keep their "hand in the business" by providing other manufacturers with "depot repair services and engineering design services on a low-key basis." In addition, Brubaker said Drake will continue to provide warranty coverage and service support for the R8 series "for many years to come."

Rebates Ending for ARRL EmComm Courses

Over the past three years, ARRL members signing up for the League's Amateur Radio Emergency Communications Course have had their $45 tuitions reimbursed from the proceeds of a grant from the Corporation for National and Community Service (CNCS). That grant is running out and the last reimbursable course will be offered this June. The courses will continue to be offered but there will be no tuition reimbursement ($45 for ARRL members, $75 for non-members), according to the *ARRL Letter*. For more information, see this month's "Public Service" column on page 54 or visit the ARRL's Continuing Education webpage at <http://www.arrl.org/cce>.

Additional and updated news is available on the Ham Radio News page of the CQ website at <http://www.cq-amateur-radio.com>. For breaking news stories, plus info on additional items of interest, sign up for CQ's free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.

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. . . the first choice of hams around the world!

HAM-IV

HAM-IV
$559.95

The most popular rotator in the world! For medium communications arrays up to 15 square feet wind load area. *New* 5-second brake delay! *New* Test/Calibrate function. *New* low temperature grease permits normal operation down to -30 degrees F. *New* alloy ring gear gives extra strength up to 100,000 PSI for maximum readability. *New* indicator potentiometer. *New* ferrite beads reduce RF susceptibility. *New* Cinch plug plus 8-pin plug at control box. Dual 98 ball bearing race for load bearing strength and electric locking steel wedge brake prevents wind induced antenna movement. North or South center of rotation scale on meter, low voltage control, max mast size of 2 1/16 inches.

HAM IV and HAM V Rotator Specifications	
WindLoad capacity (inside tower)	15 square feet
Wind Load (w/mast adapter)	**7.5 square feet**
Turning Power (in lbs.)	800
Brake Power (in lbs.)	**5000**
Brake Construction	Electric Wedge
Bearing Assembly	**dual race/96 ball bearings**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight (lbs.)	26
Effective Moment (in tower)	**2800 ft/lbs.**

TAILTWISTER SERIES II

T-2X
$649.95

T-2XD
$1029.95
with DCU-1

For large medium antenna arrays up to 20 sq. ft. wind load. Available with *DCU-1 Pathfinder* digital control (T2XD) or standard analog control box (T2X) with *new* 5-second brake delay and *new* Test/ Calibrate function. Low temperature grease, alloy ring gear, indicator potentiometer, ferrite beads on potentiometer wires, *new* weatherproof AMP connectors plus 8-pin plug at control box, triple bearing race with 138 ball bearings for large load bearing strength, electric locking steel wedge brake, North or South center of rotation scale on meter, low voltage control, 2 1/16 inch max. mast.

TAILTWISTER Rotator Specifications	
Wind load capacity (inside tower)	20 square feet
Wind Load (w/ mast adapter)	**10 square feet**
Turning Power (in lbs.)	1000
Brake Power (in lbs.)	**9000**
Brake Construction	Electric Wedge
Bearing Assembly	**Triple race/138 ball brngs**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight (lbs.)	31
Effective Moment (in tower)	**3400 ft/lbs.**

CD-45II

CD-45II
$389.95

For antenna arrays up to 8.5 sq. feet mounted inside tower or 5 sq. ft. with mast adapter. Low temperature grease good to -30 F degrees. *New* Test/Calibrate function. Bell rotator design gives total weather protection, dual 58 ball bearing race gives proven support. Die-cast ring gear, stamped steel gear drive, heavy duty, trouble free gear train, North center scale, lighted directional indicator, 8-pin plug/socket on control unit, snap-action control switches, low voltage control, safe operation, takes maximum mast size to 2 1/16 inches. MSLD light duty lower mast support included.

CD-45II Rotator Specifications	
Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	**5.0 square feet**
Turning Power (in lbs.)	600
Brake Power (in lbs.)	**800**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/48 ball brings**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight (lbs.)	22
Effective Moment (in tower)	**1200 ft/lbs.**

HAM-V

HAM-V
$949.95
with DCU-1

For medium antenna arrays up to 15 square feet wind load area. Similar to the HAM IV, but includes *DCU-1 Pathfinder* digital control unit with gas plasma display. Provides automatic operation of brake and rotor, compatible with many logging/contest programs, 6 presets for beam headings, 1 degree accuracy, auto 8-second brake delay, 360 degree choice for center location, *more!*

ROTATOR OPTIONS

MSHD, $99.95. Heavy duty mast support for T2X, HAM-IV and HAM-V.
MSLD, $39.95. Light duty mast support for CD-45II and AR-40.
TSP-1, $34.95. Lower spacer plate for HAM-IV and HAM-V.

AR-40

AR-40
$289.95

For compact antenna arrays and large FM/TV up to 3.0 square feet wind load area. Dual 12 ball bearing race. Automatic position sensor never needs resetting. Fully automatic control -- just dial and touch for any desired location. Solid state, low voltage control, safe and silent operation. 2 1/16 inch maximum mast size. MSLD light duty lower mast support included.

AR-40 Rotator Specifications	
Wind load capacity (inside tower)	3.0 square feet
Wind Load (w/ mast adapter)	**1.5 square feet**
Turning Power (in lbs.)	350
Brake Power (in lbs.)	**450**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/12 ball bearings**
Mounting Hardware	Clamp plate/steel bolts
Control Cable Conductors	**5**
Shipping Weight (lbs.)	14
Effective Moment (in tower)	**300 ft/lbs.**

HDR-300A

HDR-300A
$1379.95

For ***king-sized*** antenna arrays up to 25 sq.ft. wind load area. Control cable connector, *new* hardened stainless steel output shaft, *new* North or South centered calibration, *new* ferrite beads on potentiometer wires reduce RF susceptibility, *new* longer output shaft keyway adds reliability. Heavy-duty self-centering steel clamp and hardware. Display accurate to 1°. Machined steel output.

HDR-300A Rotator Specifications	
Wind load capacity (inside tower)	25 square feet
Wind Load (w/ mast adapter)	**not applicable**
Turning Power (in lbs.)	5000
Brake Power (in lbs.)	**7500**
Brake Construction	solenoid operated locking
Bearing Assembly	**bronze sleeve w/rollers**
Mounting Hardware	stainless steel bolts
Control Cable Conductors	**7**
Shipping Weight (lbs.)	61
Effective Moment (in tower)	**5000 ft/lbs.**

Digital Automatic Controller

DCU-1
$649.95

Automatically controls T2X, HAM-IV, V rotators. 6 presets for favorite headings, 1 degree accuracy, 8-sec. brake delay, choice for center of rotation, crisp *plasma* display. Computer controlled with many logging/contest programs.

AR-35 Rotator/Controller

AR-35
$69.95

For UHF, VHF, 6-Meter, TV/FM antennas. Includes automatic controller, rotator, mounting clamps, mounting hardware. 110 VAC. One Year Warranty.

RBD-5
$29.95

NEW! Automatic Rotator Brake Delay

Provides automatic 5-second brake delay -- insures your rotator is fully stopped before brake is engaged. Prevents accidentally engaging brake while rotator is moving. Use with HAM II, III, IV, V, T2Xs. Easy-to-install. Includes pre-assembled PCB, hardware.

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CQ editorial — BY RICH MOSESON,* W2VU

DXing and World Peace

Writing this column is always an interesting endeavor. Some months, the topic jumps out in front of me waving its arms, and the editorial practically writes itself. Other times, the topic plays hide-and-seek and I have to search the bottom of the junk box (where all the best stuff hides) to find it. And then there are months when the topic throws hints at me from seemingly unrelated events, and what I have to do is be open to seeing the common thread and how to tie it into ham radio. This is one of those months ... we'll start with two seemingly unrelated snapshots in time:

Snapshot #1: Mid-March. I was in my hotel room in Charlotte, North Carolina, getting ready for the ham-fest there (no woodworking show this year) and watching TV as I shaved and dressed. I was watching a fascinating "CNN Reports" program on Saudi Arabia, which focused primarily on people there who were working to counter the influence of the radicals who are trying to recruit people to be terrorists. One of the people featured was a Saudi TV producer who came to New York to tape at "Ground Zero" and try to show people that America and Americans were more than the mostly-negative images from Iraq shown every night on the news there. Along the way, the program accomplished the same goal in reverse—showing Americans that Saudi Arabia and the Saudi people were more than the royal family and religious radicals (the images we generally see on TV). We saw regular people, with regular families, going to work at regular jobs and talking about trying to bring about positive changes in their society.

Snapshot #2: Back home. I was listening to a CD I'd recorded from some of my record albums (anybody remember records?). This particular CD was of Harry Chapin, a rock balladeer of the 1970s, best known for such songs as "Taxi," "Cat's Cradle," and "WOLD." One of his lesser-known songs (but one of my favorites) is a six-plus minute story-song called "What Made America Famous?" To try to make a very long story short, it's about a fictional American small town in the 70s, and all the prejudice and distrust between different groups there, in this case, the "hippie" narrator and the fire department "stocked with short-haired volunteers." The climax of the song comes when the narrator's house catches fire, most of the volunteers "saw what was burning and said, 'Take it slow, let 'em sweat a little...' " but one fireman goes on alone and rescues the residents who are hanging from a ledge. "We spent the rest of that night in the home of this man who we'd never known before," Chapin sang. "It's funny when you get that close, it's kind of hard to hate."

The DXing Advantage

Bringing together those two snapshots made me think of ... DXing. One of the great benefits of ham radio, and especially of DXing, is that it gives each of us the opportunity to meet and interact with regular, everyday people in other countries around the world—even in countries whose governments don't get along with ours.

It is part of human nature—whether genetic or learned through generations—to be more trusting of your own "tribe" than of others, and to look upon other groups as being both different and the same—different from us (the good guys), but all of "them" (the bad guys) are the same ... and a threat. Someone who is part of your extended family, after all, presumably is less likely to try to kill you than is a stranger. You're safer with your own tribe, or so the theory goes.

But we hams have an advantage. Along with the national, ethnic and religious "tribes" to which we each belong, those of us with those funny groups of letters and numbers after our names belong to yet another tribe, one without borders, the "tribe" of amateur radio. Through on-air contacts (if you can get past the "5-9, 7-3" contacts, which often takes only a little effort), and if we're lucky, in-person meetings with people we already "know" from the radio, we hams have always had the ability to get past the prejudice, past the politics, and past the propaganda, and to know first-hand that at least *some* of "those" people are not the monolithic ogres they're often made out to be, but rather everyday people just like us, with families, jobs, and of course, a love for ham radio. And nobody who loves ham radio can be *all* bad, can they? "It's funny when you get that close, it's kind of hard to hate."

Both the FCC and the International Telecommunications Union recognize the unique ability of amateur radio to bridge national and political boundaries, and have written the enhancement of international goodwill into law as one of the reasons ham radio exists. The key to this aspect of our "mission statement" is what we know as DXing—seeking out contact with other hams in faraway places.

The Jewel in the Crown

To us here at *CQ*, DXing is the jewel in the crown of amateur radio. It is what sets us apart from other technical pursuits, and it is the lure of talking to remote places that draws more new people into ham radio than anything else. This is why we believe it is critically important to the future of amateur radio for DXing to remain a strong and vital centerpiece of who we are and what we do.

Many of us have noticed a drop-off in general DXing activity (outside of contests and DXpeditions) and we've embarked on a three-part program to try to re-energize DXing. Part one was introduced last month—the CQ DX Field Award, the first new major operating award in recent memory (see last month's issue or our website for details). This month we introduce part two, and the centerpiece of our program—the return of the CQ DX Marathon. As we explain in the article on page 16, the Marathon is a year-long DXing competition, so the activity isn't concentrated into one or two weekends like a traditional contest—and it starts over again at the beginning of each new year, so there's no possibility of "working them all" for more than a few months before you have to start all over again.

It is our hope that these programs, along the third piece of the pie that we'll be announcing next month—a program designed to bring new people into the fun of DXing—help provide the jump-start needed to make sure that DX and DXing continue to be ham radio's central appeal and continue providing us with our unique ability to be personal diplomats for the human race. If only everyone had the opportunity we have to make personal contact with people from other cultures in a non-threatening setting such as ham radio provides, the world would be a much better place. Because, as Harry Chapin put it, "...when you get that close, it's kind of hard to hate."

73, Rich, W2VU

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

Conquer the Elements!

Ideal for the most demanding field use, the exciting new YAESU VX-6R features wide receiver frequency coverage, JIS7 submersibility weatherproofing, the Emergency Automatic Identification (EAI) system for rescue operations, and ultra-simple keypad access to the features you need now!

- Compact size, utilizing a rugged case with weatherproofing O-rings, rated to JIS7 submersion specifications (immersion to 3 feet for up to 30 minutes).
- High-capacity (1400 mAh) FNB-80LI Lithium-Ion Battery Pack provides a typical 5-Watt operating time of 7 hours.*
  *(144 MHz, duty cycle of 6 minutes TX, 6 minutes RX, 48 minutes standby)
- One-touch Direct Memory Recall (DMR) access to most important memory channels (similar to channel access on a car stereo).
- Large concentric control knobs for easy adjustments while wearing gloves.
- Wide frequency coverage: 504 kHz – 998.99 MHz (cellular blocked and non-restorable).
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announcements

LIMARC 40th Anniversary Award – The Long Island (NY) Mobile ARC is celebrating its 40th anniversary in 2005 with this award. To earn a certificate work 40 LIMARC members on all amateur frequencies below 54 MHz on any mode as follows: three "contact credits" for contacts with club stations W2VL or WV2LI; two credits for contacts with club officers as listed on the club's web page (www.limarc.org) and verified by the Certificate Administrator; one credit for contacts with club members as listed on the club's web page and verified by the Certificate Administrator. Each callsign may be worked only once. DX portable operations by these stations count as separate callsigns. All contacts must have been made between 0000Z January 1, 2005 and 2359Z December 31, 2005. To receive an award certificate mail contact logs (no QSLs required) to Harry Gross, KC2FYJ, Secretary LIMARC, P.O. Box 392, Levittown, NY 11756. Enclose $3.00 (US) or 4 IRCs to cover certificate and mailing costs. Award applications must be received by March 31, 2006. Additional information: <www.limarc.org>; e-mail: <kc2fyj@limarc.org>.

• The following special event stations are scheduled for May:

N2UL, from CQ Memorial Day, Nutley, New Jersey; Robert D. Grant United Labor ARA; 0400–2300Z May 30 on 28.420, 14.260, 7.260, 449.975 MHz. For certificate send QSL to RDGULARA, c/o WA2VJA, 112 Prospect St., Nutley, NJ 07110-0716.

W2EF, from Grover Cleveland birthplace, Caldwell, New Jersey; West Essex ARC; 1400–1900Z May 7 on 7.250, 14.250, 21.330, 28.350 MHz. For certificate send 9×12 SASE with 49 cents postage to West Essex ARC, P.O. Box 54, Essex Fells, NJ 07021 (http://www.wearc.org>.

W5CRC, from commemoration of the last battle of the Civil War, Brownsville, Texas; Charro ARC; 1400–2200Z May 7 on 28.330 and 21.330 MHz. For certificate send QSL and SASE to Charro ARC, 107 West Park Dr., Brownsville, TX 78520 (http://www.qsl.net/w5crc/).

W6APD, from National Police Week, Anaheim, California; Anaheim Police ARC; 0000Z May 14 to 2400Z May 22 on 28.450, 21.350, 18.150, 14.250 MHz. For QSL send QSL to Mark McMullin, KM6HB, P.O. Box 27271, Santa Ana, CA 92799 (http://www.qsl.net/w6apd/).

W7A, from 25th anniversary of eruption of Mt. St. Helens, Chehalis, Washington; Chehalis Valley ARS; 1700–2400Z May 18 on 28.360, 21.360, 14.260, 7.260 MHz. Send QSL to Steve Pack, WB7VAS, 136 Newaukum Village Dr., Chehalis, WA 98532 (www.cvars.org).

W8YAF, from Memorial Day celebration at Yankee Air Force Mudeum, Willow Run Airport, Belleville, Michigan; 1200–2000Z May 30 on 7.270 MHz. For QSL send QSL and SASE to Frank Nagy, N8BIB, 24315 Waltz Rd., New Boston, MI 48164-9167.

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

May 7, **Owego Hamfest**, Marvin Park (Tioga County Fairgrounds), Owego, New York. Contact Robert Mess, WS2U, 607-777-6039 (days), e-mail: <rmess@binghamton.edu>. (Talk-in 146.760)

May 7, **Wexaukee ARC Swapmeet**, Cadillac Junior High School, Cadillac, Michigan. Contact Brian Polk, 231-743-6860, e-mail: <bandb@netonecom.net>. (talk-in 146.98; exams, must preregister starting at 8:30 AM, exams 10 AM)

May 7, **Key City ARC Hamfest**, Abilene Civic Center, Abilene, Texas. Contact Peg Richard, KA4UPA, 325-672-8889, e-mail: <ka4upa@arrl.net>. (Talk-in 146.160/760, PL146,2; exams)

May 14, **Mountain City Swapfest '05**, National Guard Armory, Mountain City, Tennessee. Contact Danny Herman, 423-727-0732, e-mail: <k4dht@preferred.com>. (Talk-in 146.610, 146.760, 103.5 tone, 146.520; exams 1 PM)

May 14, **EMCOMMWEST & Reno Spring Hamswap**, Reno Holiday Inn, Reno, Nevada. For more information go to: <http://www.emcommwest.org>.

May 21, **East Greenbush (W2EGB) ARA Hamfest**, Phillips Road Firehouse, East Greenbush, New York. Contact via e-mail: <KB2HWL@nvcap.rr.com>. (Talk-in 146.520; exams 9 AM)

May 21, **East Carolina Antique RC Swapfest**, Kiwanis Club, Winterville, North Carolina. Contact Herman Schnur, K4CTG, 252-752-2264, e-mail: <<hschnur@cox.net>.

May 20–22, **Dayton Hamvention®**, Hara Arena, Dayton, Ohio. For information go to: <www.hamvention.org>.

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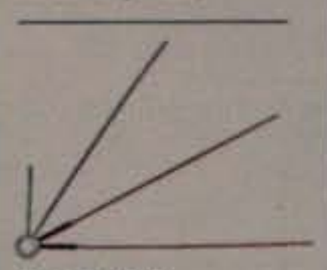

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Among the thousands of Americans and others serving in Iraq at any one time are at least a sprinkling of hams. Some of them are finding time to get Iraqi licenses and get on the air as a welcome break from the dangers they face daily. A report from the field...

DXing on Deployment
American Hams in Iraq

BY BRUCE MCPHERSON,* AB3AC/YI9AC

"I've got orders for where?" For most of the Americans now stationed in Iraq and Afghanistan, life is busy with military or logistics operations, leaving little free time to engage in hobbies. However, for a small group of American soldiers, Marines, airmen, sailors, civilians, and contractors in Iraq, ham radio provides a welcome reprieve from the daily routine. These hams have overcome a variety of circumstances to build some ingenious stations and have managed to work an impressive amount of DX from "the other side of the pile-up." In most cases, these hams have not met in person, but have recently begun to correspond with one another to share their experiences.

Under the Saddam Hussein regime, ham radio in Iraq was severely restricted and there were few stations sanctioned and operating. With Operation Iraqi Freedom, American, British, Australian, Polish, and other coalition forces started to establish a presence here. With the thousands of troops coming into theater, there were bound to be a few hams excited at the prospect of being on the other side of DX and getting as close as most of us will ever be to a real DXpedition. After the fall of the regime, amateur radio licensing was performed by a ministry in the Coalition Provisional Authority (CPA). Some of the first Americans working for the CPA were hams and got some of the first new callsigns. After the transfer of authority to the Iraqis in 2003, amateur licensing fell to the Iraq National Communications and Media Commission (NCMC).

*LTC Bruce McPherson, 353 Civil Affairs Brigade, APO AE 09342
e-mail: <Bmcpherson73@comcast.net>

The author at his station in Iraq. Hams among the foreign military and civilian contractors are putting YI into many stations' logbooks around the world and hope that Iraq's new government will encourage amateur radio among its citizens.
(All photos courtesy of the author)

More hams came in with each new rotation of military forces and contractors. Some appended a YI prefix to their American callsigns, although this is not officially sanctioned. Others applied for and received Iraqi callsigns, in most cases consisting of the YI9 prefix ahead of their U.S. suffix. Other coalition partners also received YI9 callsigns.

Most people are assigned for about a year in the country, and many hams have already come and gone since 2003. This article will highlight a few of the hams who are currently serving in Iraq or who recently went home. There are many others, but the following are representative of who we are and what operating ham radio here is like.

Bruce McPherson, YI9AC

I originally went to Iraq in June 2004, doing tower site surveys for Motorola, my civilian employer. When I arrived home in July, I opened the mail and found deployment orders to return to

Iraq, this time with my Army Reserve unit. Here we go again! I arrived once more in Baghdad in September 2004. I'm assigned as the signal officer for a U.S. Army Reserve Civil Affairs Command whose mission is rebuilding civilian government and infrastructure. In this position I manage a communications team, which includes HF radio nets.

The unit employs the Harris AN/PRC-150 military HF radio, which operates from 2–60 MHz and employs single-channel mode as well as Automatic Link Establishment (ALE) in both plain and cipher mode. My original intention was to use these radios to work on the ham bands as part of my new part-time amateur station. However, after operating these radios for a few minutes it became apparent that the PRC-150 requires a full sequence of steps to change frequencies and that it would be too cumbersome to quickly tune and change bands as we are accustomed to on commercial ham gear.

Thus, I convinced my XYL to send my Kenwood TS-450S and all required accessories. She didn't know what all that stuff in the basement was, let alone how to unhook it, so in desperation she called on my nephew, Andrew Kelly, K3ASK, to figure out what was important and ship it out to me. The big Astron power supply was too heavy, so it stayed home and I ordered a new MFJ switching power supply, tuner, and 20-meter dipole. I couldn't wait for all the pieces to arrive for the big day to get on the air!

After mentioning my intentions to my radio officer, Ferdinand (Fred) Villarosa, I learned to my surprise that Fred was also a ham, KG4WCR, and the two of us proceeded to get our Iraqi licenses together. We figured two hams are better than one! After getting the information from the ARRL website, we filled out the forms and submitted them, along with a scanned copy of our FCC licenses, to the CMC. After what seemed like an eternity, we received our new callsigns, YI9AC and YI9WCR, respectively. Even though Fred is a Technician at home, he was granted full HF privileges here. An instant upgrade!

Being Signal Corps officers made it easy to convince the commander to allow all kinds of antennas to be erected on our building, so we didn't arouse any suspicion as we strung more wires, cables, and insulators around our compound. No restrictive covenants here! If only it were this easy at home. The antenna array consists of separate 20-meter and 40-meter dipoles. The first station was pretty successful, so a second, smaller station was set up in the officers' barracks with a Yaesu FT-817 and G5RV antenna. Now we could at least talk to one another!

I got lots of help from the folks back home in the form of equipment, information, and advice. Regular e-mails were exchanged with Bill Morrison, W9GMO; Bruce Carpenter, W3YVV; Ed Picha, N9EP; and my nephew Andrew, K3ASK, who is also serving as my stateside QSL manager.

I like to work PSK-31 on 20 meters from my desk. I prefer this mode, because 20-meter propagation is best during the day and I can be typing messages on the computer while everyone thinks I'm sending e-mail! I recently received my MARS license as AEM3RAD and plan to be active in the local Army MARS net.

My first QSO came as I was tuning around on 20-meter phone. I heard a station with an extremely strong signal calling CQ. It was YI9BON, Bob Kenney, from a neighboring camp only about two miles away. So much for DX!

Bob Kenney, YI9BON

Bob's home call is WA5BON. He is a civilian contractor for Kellogg, Brown, and Root, installing heating and air-conditioning systems. We had a lengthy rag chew, exchanging information about other known American hams in Iraq. Bob related how he carried his kilowatt amplifier with him as carry-on baggage all the way from Texas (8000 miles) so that the tubes would not break. I'm sure he got some stares from the other passengers with his valuable piece of "top secret" equipment!

Bob lives in a modular trailer-type building, with his rig and amplifier by his side to help heat the trailer. He has a 40-meter dipole strung on some old utility poles between the trailers. Bob has worked DX on 20 and 40 meters, phone and CW. He also is licensed as MARS station AEM3AD, and is currently constructing a MARS station at Camp Victory to be used by soldiers and hams stationed there.

Bob and I soon met in person and set out to contact other hams in Iraq. A search through QRZ.com revealed that there were several American hams who had been using the YI/xxx identifier, but only a few who had received the official government-issued reciprocal license.

Wally Veal, YI9WRV

The first of these we encountered was Wally Veal, YI9WRV (N4ZNH). Wally was based in Taji, north of Baghdad, working as a civilian for the Army-Air Force Exchange Service (AAFES). AAFES operates the exchange system, the stores used by soldiers and civilians, commonly referred to as the "PX."

As Wally tells his story…

Once the decision was made to join the many service members who were currently deployed in Iraq, thoughts and worries began to run rampant in my mind of what I had gotten myself into. Unlike the active-

Korey Chandler, YI9VCQ/KA5VCQ (left), is an Army sergeant stationed in Taji, about 25 miles northwest of Baghdad. He is pictured here with Wally Veal, YI9WRV/N4ZNH, a civilian employee of the Department of Defense, who recently returned home.

duty guard and reserve troops who are deployed into such areas, I had *volunteered* for this assignment. As many have said over the last several years, it was the opportunity for me to do my part in contributing to the efforts after 9/11. Working as a Department of Defense civilian for the Army and Air Force Exchange Service, our motto is "We Go Where You Go," and I was on my way.

After all the preliminary preparations and the initial anxiety began to settle, I started thinking about amateur radio and the possibilities of setting up a station during the deployment. I can still remember the thrill when I was able to enter that one and only YI contact into the logbook in the early '90s. A quick check on the internet and sure enough, the possibility was there. I contacted Fred Matos, YI3DX, who was working with the Coalition Provisional Authority, and after a few e-mails and phone calls the application process was completed and YI9WRV was a reality.

OK, I got my ticket. Now what do I do? Unsure of exactly where I would be located and what conditions I would be faced with, I decided to pack up the station and have it ready to ship if the opportunity materialized. The rig would be a Kenwood TS-570, but what about the antenna? The simplest and easiest option would be the trusty ole dipole, and I just happened to have several that were used for a Field Day operation many years ago. They seemed to be in good shape and could easily be reconfigured, so in the box they went!

I arrived in Iraq on January 8, 2004 and was stationed in the Baghdad area. "Home" was right in the middle of what is commonly called "tent city." Not too many options there for getting a station on the air. It wasn't until the early part of February, when I was assigned to Taji about 25 miles NW of Baghdad, that the opportunity to set up a station began to materialize. I was amazed when it took only 15 days for the box to arrive from the states via the US Postal Service. It took a few more days to get the station up and running with an old section of galvanized water pipe for an antenna mast and power from the trusty generator that powered up everything within sight. The wire antennas were configured as inverted-Vees and surprisingly, the SWR was almost flat on 10, 20, and 40 meters. The tuner in the TS-570 was able to handle 12, 15, and 17 with no problems at all. Pretty soon that first contact was in the log—on 20 meters with DL2RMC on February 27, 2004 with 59 reports both ways. A couple more CQs and the pile-up was under way—49 contacts with 14 countries on the first day and I was on cloud nine. Over the next 10 months the logbook filled up fairly quickly. With a 7-day-a-week work schedule, I was only able to operate two or three days a week, for only a few hours at a time. But 10 months and 4516 log entries later, I ended up having worked 132 countries and 37 states on 10 through 40 meters. The most interesting accomplishment in my mind would have to be working stateside on 40 meters split with 100 watts.

Korey Chandler, YI9VCQ/KA5VCQ, has made over 1,000 contacts from his station in Taji, Iraq—mostly CW, but he's also active on voice and digital modes.

A special thanks to W3HNK, who volunteered his time and resources to handle the QSL cards and hopefully I was able to give a few fellow hams the same thrill I got when I was able to log that YI prefix.

Wally has since returned to the states, but he was very active in the area and introduced us to some other hams in the country, including Korey Chandler, YI9VCQ.

Korey Chandler, YI9VCQ

Korey, YI9VCQ (KA5VCQ), is an Army sergeant also stationed in Taji. Korey arrived in Iraq in mid-December of 2004 just as Wally was leaving. Upon his arrival, Korey cleared his station installation with the chain-of-command and then put up a Zepp antenna constructed during his pre-deployment time in Kuwait. As Korey relates...

My mind was filled with excitement as I hooked up the radio and tuned up on 40 meters for my first DX pile-up. I heard a 60-dB station on SSB and was even more surprised to hear him identify as YI9WRV (Wally). Wow! Another ham in Iraq! I answered his CQ and found out that he was located only a mile or so from me. My first contact as DX amounted to a few blocks away. An eyeball QSO was arranged and I met Wally a few days later. It's too bad that he was about to complete his service to AAFES and head back to the U.S.

By the end of December I had worked 224 stations on both CW and SSB. As of February 13, 2005 I have 1086 contacts in my log. There are 292 SSB, 696 CW, and 98 PSK-31 QSOs. As you can tell, I prefer CW, but I have put more time into digital modes since the arrival of my new RIGblaster interface. RTTY is my next adventure.

My living compound is quite spacious, and I constructed a full-size 160-meter Windom antenna one weekend. Later that night I talked to a friend of mine in Kuwait, 9K2MU (Murtada). He suggested that we try a 160-meter CW contact. We completed the contact, and I realized that I'd never had a QSO on the low band before and I've been licensed almost 20 years!

I recently competed in the CQ WW 160 meter CW Contest and had a blast! My goal for the contest was to make enough points to qualify for a certificate. My total for the contest equaled 15,174 points. I hope I placed decently for the Asian continent and made a good showing for Iraq.

Numerous hams back in the states have offered their services and help. QSL requests to my home call became numerous. My request for a QSL manager on a ham radio internet site was answered almost immediately by Bryan McDorbert, N3ST. Bryan does an excellent job, and I appreciate his help immensely.

My personal goals while deployed are to compete in as many contests as possible and to earn the eQSL DX award. I also would like to reach the 4000 QSO mark before going home.

David Howard, YI9QWO

Another ham we found was located in the Tikrit area. David Howard, YI9QWO (K5QWO), is former military and is currently a civilian security contractor. He is a paramedic and works training Iraqi police officers in emergency medical skills. At his ham staition David operates a Yaesu FT-847, two MFJ-945e tuners, a Yaesu FC-20 tuner, an Alinco DM-330MVE power supply, and a RIGblaster Pro. His antenna farm contains a Codan mobile HF antenna

David Howard, YI9QWO/K5QWO, is a civilian security contractor in Tikrit. He says his supervisors all understand that ham radio is another means of communication that works when the phones and the internet don't.

mounted on his living quarters and horizontal dipoles mounted 2.5 meters above ground, as well as a Cushcraft R-8 vertical and a 1.2-wavelength 160-meter dipole.

David's most memorable QSOs were working the CQWW contest while taking mortars, rockets, and some small arms fire very close to his "QTH," and wondering if there were any extra multipliers he could get credit for! His favorite QSO was with his "Elmer," Coy Day, N5OK, ARRL West Gulf Division Director, who lives about 3 miles from David's home QTH in Oklahoma.

David says he has faced few real challenges, and the local managers he works for are very accepting of his hobby, since they all are prior military and understand that we can use amateur communications in an emergency to get messages passed to and from the USA. They all had used MARS when they were in the military, and they know that ham radio is another form of communication when the internet is down and the phones won't work. Even so, he does catch some flack when he is stringing up a new wire antenna for testing.

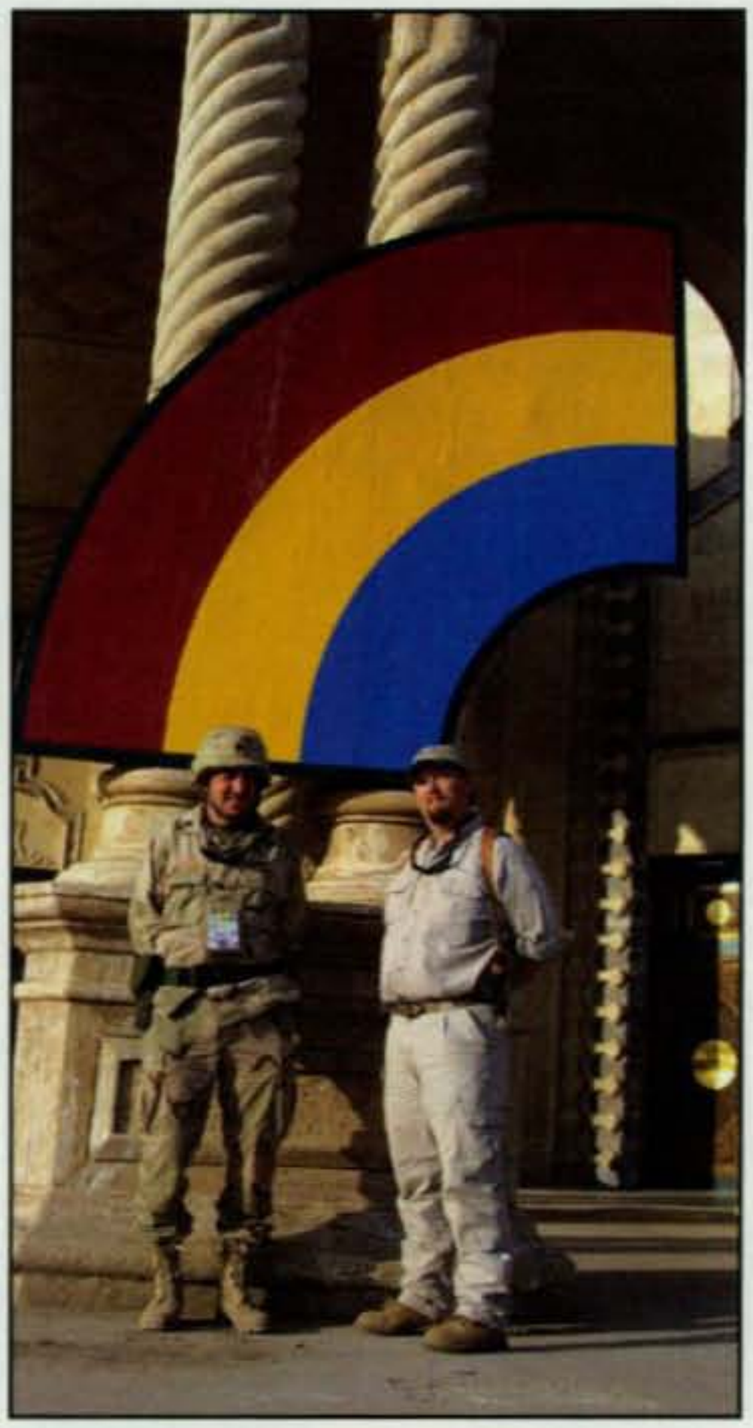
David says, "My experience with pile-ups back in the states was with 6 meters, and that was tough, but these HF pile-ups are murder. I'm working around 40–80 QSOs per hour on SSB (I'm a lot slower on CW). My voice cracks, and sometimes I can't even pick out callsigns in the pile-ups and I repeat callsigns backwards at times." But, he adds, "Life is good when you're the DX!" David has logged over 3500 QSOs so far, good for DXCC on 10, 15, 20, and 40 meters.

The HAMmurabi Net

Since travel between bases in Iraq is so difficult, requiring armed convoys for even the shortest trip, most of the hams in Iraq have never met in person. Therefore, we arranged for a weekly net on 20 meters every Sunday night. The working name for the group is the HAMmurabi Net. As you may recall from history, Hammurabi was an ancient Babylonian king. Babylon was the capital of Mesopotamia, the land between the Tigris and Euphrates Rivers, in what is now Iraq. Hammurabi was known for developing the "Code of Hammurabi," one of the first sets of laws known to man. He is a prominent figure in Iraqi history. From our perspective, anyone whose name starts with Ham and is a master of the code is a natural choice for a namesake! The Hammurabi Net also maintains a website at <http:// home.comcast.net/~bmcpherson73/ham.html>. You can check there for the current net frequency (it's been shifting around from time to time). I have also set up an Echolink node on a 2-meter link. The node ID is 238028.

A Welcome Break

Life in Iraq is by no means all fun and games. There is a serious mission here, and there are hidden threats and constant danger. However, for a few hours each day we can try to forget all of that and enjoy the fun and fellowship of ham radio.



Author Bruce McPherson, YI9AC/AB3AC (in uniform), with civilian security contractor David Howard, YI9QWO/K5QWO, at 42nd Division Headquarters in Iraq.

There are several other American hams in Iraq, as well as our coalition partners, and those represented in this article are just a sample. There doubtless will be many others who pass through before we finally achieve a stable environment here. We are enjoying our brief stay in Iraq and will remember the experiences we had and the friends we made. Our sincere hope is that we have made a significant demonstration of the role of amateur radio in fostering international good will and that amateur radio will be encouraged and promoted in the new Iraq. ■

"Things Are Looking Up..."

Editor's Note: Here at home, the reports we hear on the evening news each night from Iraq tend to be mostly negative. It appears that all is not as bad as it may seem, though, as related in this e-mail from author YI9AC: "Things are looking up in Iraq," Bruce wrote in mid-March. "I attended a local provincial meeting where local leaders were speaking up in a public forum for the first time in a long time. Though I don't speak Arabic, they told me they were grateful for the Americans coming, and are elated to be free to live their lives without fear." – *W2VU*

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Is your DX alarm clock ringing yet? Here's a concept that dates back nearly 70 years, yet seems to be just what's needed today to get hams who have "worked 'em all" back on the air, along with newcomers to DXing who can start out on an equal level with all those old-timers. The New CQ DX Marathon is this month's component of our "Waking Up DXing" program.

Announcing:

The NEW CQ DX Marathon

BY BOB LOCHER, W9KNI, & RICH MOSESON,* W2VU

CQ magazine is proud to announce the renewal of the CQ DX Marathon, last run in 1948, which will now become an annual event. Basically, it's a year-long DX hunt, with participants competing to see who can work the greatest number of countries ("entities") and CQ zones over the course of a full year. While not a contest in the usual sense of a 48-hour sprint, it is very much a competition, and the competition starts fresh each year, so there's no carry-over to create long-term advantages or disadvantages. The format also largely eliminates geographical advantage within a country. Plus, there are two divisions within the Marathon to allow nearly any HF station a chance to realistically compete.

A Bit of History

The original DX Marathon was run in 1939, sponsored by *Radio* magazine. The developing conflicts leading to World War II halted this event after only one year. In 1948, *CQ* magazine, *Radio*'s successor in the ham radio arena, revived the Marathon, which resulted in a spirited chase. However, the event was abandoned the following year in favor of a new contest—the now classic CQ World-Wide DX Contests. The workload for managing those contests meant that something had to give, and it turned out to be the DX Marathon (see "Contesting History" by Jan Perkins, N6AW, *CQ Contest* magazine, October 1998, pp. 36–37). But times change. Now *CQ* sponsors many contests, and the work of managing these events has been largely taken over by volunteers.

Serious DXers are very concerned about an obvious decline in DX operating on the HF bands, and it is anticipated that the DX Marathon, along with two other operating achievement programs that *CQ* is introducing this year (see the "CQ DX Field Award" announcement last month and watch for a third program next month), will help restore the missing excitement.

Philosophy

The CQ DX Marathon is intended to be a vehicle for all DXers to have a significant and competitive new operating activity. A major intent of the rule design is to limit to the extent possible the geographic benefit of a particular location within a country or zone so that any well-operated station has a realistic chance to win. This is why, for example, band countries (meaning credit for a country the first time it's worked on each band) do not add to a score. As an example, a station on the American east coast might have considerable luck working countries on 160 meters and on 6 meters that stations in other parts of the States are unable to work at any time of year. If band countries are counted, it would be possible to win the USA only from the east coast. But with band countries and band zones *not* counting, we believe the winners can come from any part of the country. The scoring is very simple—you get one point for each country and each CQ zone worked, period. The more you operate, and the more intelligently you operate, the better your chances of working more zones and countries.

Operating Classes

There are two operating classes in which a station may compete, "Formula" and "Unlimited." The Formula Class is open only to stations using 10 watts output or less (QRP), or to stations whose power output is 100 watts or less and whose antennas are limited to basic dipoles or verticals (see Rules for more details). The rules prohibit the use of any assistance in arranging/making a contact (except for spotting networks, such as the DX Cluster®, which is permitted for both classes). The intent of the Formula Class is to offer QRP stations and stations not normally considered to be competitive an opportunity to fully participate and to have a very real chance of winning. The Unlimited Class is for those stations normally considered competitive in contests and other competitions —no limits on antennas or power used (up to your license's legal limit).

All entries must be single-op only; no multi-op or club entries will be accepted, nor may stations help each other arrange or make contacts. Use of DX Clusters is OK, but having your buddy ask a DX station to listen for you, or relaying information that one of you can't hear, is not OK, nor are contacts made through "list" operations.

Even though there is no provision for

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club entries, we strongly encourage clubs to organize their own *internal* competitions within the structure of the CQ DX Marathon.

The DX Marathon Committee expects operators to abide by the spirit of these rules, rather than trying to figure ways to secure a rule-bending advantage. The CQ DX Marathon relies to a very considerable extent on the ethics of the operators. While every effort will be made to verify contacts using outside information, as in any contest or operating program, the integrity of the final results reflects the integrity of the participants.

Logs and Results

At this writing, the only way to submit your logs will be via a special downloadable matrix that will be made available on the CQ website at <http://www.cq-amateur-radio.com>. We are currently in discussions with the ARRL regarding the ability of Logbook of the World to support non-ARRL awards. If arrangements can be made and are in place before the end of 2005 for LoTW to support the CQ DX Marathon, we will accept entries made via LoTW. Watch for announcements in *CQ* and/or on our website. In any event, all submissions for the Marathon must be made electronically.

Claimed scores will be posted on the CQ website as soon as possible after they are submitted. A report on final scores will be published annually in *CQ*. Interim results may be published in *CQ* from time to time as well.

Certificates and Plaques

The top-scoring station in each CQ zone and country will receive a certificate suitable for framing. In zones/countries with sufficient activity, certificates may also be issued to other high scorers. We also anticipate awarding plaques to the very highest scorers in each category, and possibly to the DX station(s) whose callsigns appear in the greatest number of submitted logs. Plaque sponsorships are solicited. The number of plaques issued will be determined in part by the number of sponsors who sign up. (These plaques generally cost $50 to $60 each.)

In addition, we plan to make downloadable Certificates of Participation available to anyone who has submitted a log. You would download and print these certificates yourself, so the quality would be determined primarily by the quality of the printer and paper you use.

Future Rules Changes

One of the benefits of starting from scratch each year will be that fine-tuning the rules will be easy. So if it appears at the end of the first year that, for instance, a mobile category is required, or that some tweaks are needed in the rules for each entry class, we can make whatever changes are required without putting any stations at a disadvantage for the prior year. Everybody starts each year at zero, so you'll have to do it all again when 2007 rolls around ... and that's the whole idea!

Next month we'll conclude our "Waking Up DXing" series of new operating events with a program designed to introduce newer hams to the joys of DXing and award-chasing.

Good Hunting!

Now, here are the rules for the New CQ DX Marathon:

Rules, 2006 CQ DX Marathon

1. Activity period: The CQ DX Marathon is a year-long activity, beginning at 0000 UTC January 1 and ending at

2359 UTC December 31. Each year's event is separate.

2. Frequencies: Any authorized amateur frequency may be used, with the exception of the 60-, 30-, 17-, and 12-meter bands. Contacts through repeaters or satellites are not allowed for credit. All contacts must be made entirely over amateur radio frequencies; i.e., Echolink-type contacts do not count.

3. Categories: All awards are for single operator only. There are two entry classes, "Formula" and "Unlimited."

a. Formula: All contacts must be made with a maximum output power of 10 watts, regardless of band or mode. Or, the operator may run a maximum of 100 watts output to a simple antenna, such as a vertical or dipole. (See the appendix for further rules on antennas used in this class.) All contacts must be made without assistance of any sort, including but not limited to lists, passes, or use of higher power or prohibited antennas to initially secure the contact. Use of spotting nets such as a DX Cluster® is allowed. An operator in Formula Class must select a choice of QRP or 100 watts and limited antennas at the beginning of the year's DX Marathon, and may not switch between entry modes during the year.

b. Unlimited: Any antenna may be used, along with any power level for which the operator is licensed. As in the Formula class, all contacts must be made without assistance of any sort, including but not limited to lists and passes. Use of spotting nets such as a DX Cluster® is allowed.

4. Scoring: Each country worked is worth one point. Each CQ zone worked is worth one point. The total score is the sum of zones and countries worked, on any mode and any authorized band. There are no multipliers of any kind. Each country and zone count only once. If in the course of the year you work 238 countries and 37 zones, your score is 275. If you work all 40 zones and 150 countries, your score is 190. The CQ DX Countries List and the CQ Zone List constitute the official lists. In the case of ties, the operator whose last scoring contact was earlier chronologically will be judged the winner. Decisions of the Marathon Manager are final.

5. Submissions: Submissions must be made electronically, using the downloadable entry matrix form to be made available on the CQ website, <http://www.cq-amateur-radio.com>. This matrix requires logging of all scoring contacts, showing date, time, frequency, mode, callsign, country, and zone. All scores must be received by January 31 following the close of each DX Marathon.

6. Verification: QSLs are not required. The operator is expected to claim contacts only from stations the operator has every reason to believe are legitimate, and only to claim contacts in which an accurate two-way exchange was clearly accomplished (see Appendix for further explanation). Scores will be adjusted by the DX Marathon committee for claimed contacts with pirates or any station not considered legitimate. Submissions may be penalized or voided in cases of fraud or poor sportsmanship.

7. Clubs: Clubs are strongly encouraged to use the framework of this contest for intramural and regional competitions.

8. Claimed Scores: Competitors will be encouraged to post claimed scores to the DX Marathon Web page on the *CQ* magazine site. These claims will be updated regularly, and may be published periodically in *CQ* magazine.

9. Results: The final listing of scores will be posted each year on the CQ website. In addition, *CQ* magazine will publish an annual summary of the winning scores and details.

10. Awards:

a. Certificates: Certificates will be issued to the winners from each CQ zone and each CQ country. Where there is sufficient activity, additional certificates will be issued for other high scorers. In addition, downloadable certificates of participation will be made available to each participant. Other awards may be offered at the discretion of the DX Marathon committee.

b. Plaques: The CQ DX Marathon Committee anticipates that plaques will be given to major winners. Sponsors are solicited.

c. Special recognition: The CQ DX Marathon Committee is also examining the possibility of special prizes for DX stations that appear in the greatest number of submitted logs.

11. In all cases, the rulings of the CQ DX Marathon Committee and the CQ DX Marathon Manager are final.

Appendix:

a. Formula Class antennas: Antennas used in this category for operators choosing the 100-watt option must be either simple verticals or wire antennas lacking significant gain. No arrays are allowed, whether vertical or horizontal, nor are long wires exceeding 100 feet in length, except on 80 and 160 meters. Vertical antennas used must not be more than 33 feet higher than the station floor at their base, while dipoles or other wire antennas must not be more than 60 feet above ground. Yagis, quads, or tower-mounted antennas (except wire antennas meeting the height limits above) may not be used in this category.

b. Operators selecting the 10-watt option are limited to antennas on a single tower whose height does not exceed 65 feet above ground elevation within 330 feet or 100 meters of the tower base. Wire antennas may also be used but must meet the criteria of the 100-watt option, and may be tower-supported at only one point.

c. Contacts: The DX Marathon Committee believes that each contact for a claimed country or zone must be a solid contact. The station claiming a contact with another station is expected to have had his or her callsign fully and accurately received and transmitted by the other station, and to have copied his/her own call being correctly sent by the other station. For example, K2MGA may not claim credit for a QSO with a DX station who had his call as K3MGA, even though in many cases the DX station would QSL the contact with the correction made (after receiving a card from K2MGA, realizing the error and correcting his/her log). For a contact to count, both stations must correctly copy all of both callsigns. ■

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With our announcement this month of the revival of the "CQ DX Marathon," we thought it would be particularly appropriate to take you back to the earliest days of CQ's DX program, as recalled by John Attaway, K4IIF, who was CQ's DX Editor from 1967 to 1981.

The CQ DX Program
Some Early History

BY JOHN A. ATTAWAY, SR.,* K4IIF

This story begins in the years prior to World War II and continues into the immediate postwar years. It will be most interesting to those in Tom Brokaw's "Greatest Generation" who fought and sacrificed in the years 1941–1945, but we hope that it will be of interest to all *CQ* readers.

The DX Program began at a magazine simply called *Radio*, the parent of today's *CQ* magazine. In 1934 *Radio* invited Herb Becker, W6QD, to occasionally contribute some items of overseas news, and in the October 1935 issue Herb's comments evolved into the first amateur radio column devoted entirely to DX.

Some Early News Items

Among Herb's early DX notes was an award earned by Byron Goodman, W6CAL, in June 1935 for having the first station to complete a 10-meter QSO over 2000 miles by working W4AJY. Byron won the 10-meter contest that year before moving to Connecticut and becoming W1JPE, later W1DX. W2BJ worked all Burroughs, an award I don't believe has been given in many years.

In July 1937, Larry LeCashman, W2IOP, was living within what he described as "one subway station from Times Square." His shack was on the third floor of a 20-story apartment house wired with DC power. He had worked 33 zones from that QTH using a Q antenna. In November 1937, W6TT had an AM phone QSO (no SSB in those days) with HS1BJ. In January 1938, HS1BJ gave W8LEC his 38th zone (*CQ*'s Worked All Zones program also began in the pages of *Radio*—ed.), and on June 24, 1939, HS1BJ announced to the DX world that the government had changed the name of his country from Siam to Thailand.

CQ's first DX Editor, Herb Becker, W6QD (left), greets one of his successors (and this article's author), John Attaway, K4IIF, in this 1988 Los Angeles photo. (Photo courtesay K4IIF)

AC4YN was very active in June 1940 and was worked by a group of W6s, including W6QD. Unfortunately, the fun was over in 1940 when the FCC issued an order banning amateur radio contacts with foreign stations. As a result, the October worldwide DX contest was cancelled and the title of Herb, W6QD's column was changed from "DX" to "X-DX." In October 1941, just two months before the attack on Pearl Harbor, "X-DX" was discontinued due to the lack of overseas news. It was resumed again after the war when *Radio* was purchased and moved to New York, finally evolving into *CQ* magazine.

The Postwar Period

In April 1946, Larry, W2IOP, became Managing Editor of *CQ* magazine, and Herb, W6QD, resumed writing the DX news column. At that time, much of the best DX was made available by GIs serving overseas. For example, in February 1947, W6GRL was passing out China contacts as XU6GRL.

In June 1947, the WAZ Honor Roll was resumed, with W2BXA in the No. 1 position, followed by W6VFR as No. 2. Herb's DX news column in *CQ* became must reading for DXers worldwide. He was ably assisted by the very first CQ DX Advisory Committee composed of Guy Dennis, W6DI; Andy Elsner, W6ENV; George Sinclair, W6GAL; and Ed Hayes, W6SH. This committee not only labored in the DX area but also inaugurated the first CQ World-Wide DX Contest in 1948, an event which quickly became one of the major operating events in amateur radio.

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The Changing of the Guard

After six pre-war years writing the "DX" and "X-DX" columns for *Radio*, and six post-war years as DX Editor for *CQ*, Herb Becker found that he could no longer do justice to the column and also maintain his business. Business had to come first, so a search committee was formed to select a new DX Editor. The unanimous choice for *CQ*'s second DX Editor was Dick Spenceley, KV4AA, known worldwide in DX circles as King Victor Four, Able Able. Dick was one of the world's most active DXers and held many records. He had served as a Radioman for the Navy, NBB, until his discharge in 1928. His first amateur call-sign was NP4TC in 1926, then K4AAN from 1927 to 1941. He returned to the air in January 1947 from the U.S. Virgin Islands as KV4AA, a call he held until his death 20 years ago.

Thus ended the W6QD's long tenure as DX Editor, but he continued as a member of the CQ DX Committee and handled matters related to WAZ and the CQ World-Wide DX Contest, while KV4AA devoted his time to writing the DX column and answering the massive correspondence related to the CQ DX Program, including Honor Roll additions and changes.

Do You Remember?

To stir up your memories, see how many of these calls you can recognize from the all-band category in the 1951 CQ World-Wide DX Contest:

CW: W9KFC 199,000; W8JIN 195,000; W4ESK 174,000; W2WZ 145,888; W8ZY 141,000; W8MVQ 122,958; VQ2AB 119,000; ON4QF 117,000; KV4AA 111,000; W8DFY 105,000; W6AM 103,000; and W7DL 101,000.

Phone: MD2AM 209,802; W4ESK 134,700; LU8CW 74,000; W6RRG 70,064; W6AM 58,200; W8JIN 57,105; and KH6MG 45,950.

Many readers will recognize W6AM as Don Wallace, considered by many to be the greatest ham operator of all time.

Beyond the Beginning

CQ has had many DX Editors over the years, including myself, but there has always been a DX column and a focus on DXing as the core of amateur radio. That unbroken line continues today with N4AA as DX Editor and a variety of DX-focused awards and operating activities, including the new CQ DX Field Award announced last month and the revival of the CQ DX Marathon announced elsewhere in this issue. ■

How many QSOs can one ham make in one year? A few years ago, Z35M decided to find out. We're bringing you his story this month because of how closely Vlado's philosophy matches up with the philosophy behind the CQ DX Marathon, which we're introducing elsewhere in this issue.

A Personal QSO Marathon: 43,300 QSOs in One Year!

BY VLADIMIR KOVACESKI,* ZA/Z35M

In 2001 I decided to run my personal QSO Marathon with the aim of seeing how many QSOs could be made in one year using only my home station and personal callsign, Z35M. The final result after 12 months of operation was 43,300 QSOs! This, as far as I could determine, is the European one-year QSO record (single operator, one year, one callsign) and third best in the world. The better known results are those of VP6BR (a DXpedition from Pitcairn Island), operated by OH2BR in 2000, with 56,059 QSOs; and KV4AA (SK), who made 48,100 QSOs in 1978 from the U.S. Virgin Islands.

I want to emphasize that this operation was not a DXpedition, and that the Republic of Macedonia, Z3, is not listed among the 100 most wanted DXCC entities. At the same time, it is the best result ever achieved from any mainland location. At that time I was 35 years old, had a full-time job and family obligations, and managed to fulfill other social and personal activities.

Out of 365 days in the year I was active on 350 and spent around 1000 hours on the air. My average daily rate was 118.6 QSOs, and approximately three in ten contacts were with DX stations outside Europe. The best results were achieved during the second half of the Marathon, when, for six months (July–December 2001), a total of 25,080 QSOs was made, or 136.3 QSOs per day on average. In the last three months (October–December 2001), a total of 17,200 QSOs, or 186.9 per day, was made. The last ten days of the Marathon ended with total of 2,740 QSOs, or 274 QSOs per day. All QSOs were made on the HF bands, operating CW and SSB.

This QSO record was set using modest equipment: My transceivers were an ICOM IC-745 and a Yaesu FT-101E; power 100–400 W; 2-el. quad (14/ 21/ 28 MHz) at 10m; 3-el. Yagi (14/ 21/28 MHz) at 14m (2m above the roof), GAP multiband vertical 2m above the ground used for 7/ 3.5/ 24 MHz, and a dipole at 10m for 3.5 MHz. Nearly all QSOs were logged on paper logs (prepared by myself from ordinary A4 format notebooks, 1443 pages).

The author with his children, Mihaela, age 9, and Gorjan, age 3.

More than 40,000 hams around the world got the opportunity to add this QSL card to their collection in 2001, the year the author conducted a personal QSO marathon and set what appears to be a European record for number of ham radio contacts in a year.

Seeking a New Challenge

A few years earlier, in an ordinary chat with a fellow ham from Z3-land, we discussed the challenges facing our hobby. We

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website: <http://www.qsl.net/z35m>

came to the conclusion that everything we had done in amateur radio had already been achieved by someone else. In my 20-year-long ham career I have managed to achieve DXCC (311 confirmed), 5-Band DXCC, WPX Honor Roll, and 5-Band WAZ (basic), and have joined extremely high-speed telegraphy clubs (HSC, VHSC, SHSC, EHSC) etc. However, there was nothing really special and unique.

Back in 1993, when the Republic of Macedonia got its Z3 prefix, we experienced pile-ups all year long. My QSO total that year was 17,900 (using my former callsign, Z32KV). I thought I would never repeat that result (obviously, I was wrong). But in 2000, when I got my new callsign, Z35M, and put up the 2-el. quad for 14, 21, and 28 MHz, I managed to finish that year with 19,480 QSOs. The next year I made the record with 43,300 QSOs.

To set the record, I didn't make any special preparations. The same antennas and equipment were used as before. I didn't have antennas for 160, 30, or 17 meters. No computer, and virtually all logging was done on paper logs (I started to use a logging program in November 2001). The DX cluster was not used (remember, no computer), nor did I use any propagation predictions or check the current parameters. In fact, I don't even do that now. I operate when I have free time, choosing the best band at that time.

A Matter of Style

Why search for DX when you can become DX? It's not necessary to be in a rare location to be DX! Every station is DX on the other side of the world! So stay at home, stay comfortable, and at the same time have tons of stations calling you (even from semi-rare DXCC countries).

Your operating style, along with the combination of a relatively strong signal and an interesting callsign, especially if you are in a semi-rare country (although solid results can be achieved even if you live in a country with a large ham population), can capture the attention of a lot of stations who will want to call you.

If you are going after numbers, do not make long contacts and leave many stations waiting for you. Many of them will QSY because you are not very rare. The majority of my contacts were made with a DXpedition style (only exchange callsign and the signal report, periodically giving other details). The QSO can last only few seconds, but the good feeling and memories may last much

longer. A long QSO does not guarantee good feelings and a long memory. Remember your feelings when you work a rare one—the QSO lasts only a few seconds, but you still remember that QSO.

Some Tips for Raising Your Numbers

Be on the air more! Some preparations are necessary, but they are required in order for us to be active on the air. Presently, we lose too much of our time making endless preparations and missing the opportunity to be on the air more. The ratio of "preparations vs. on the air activity" must be in favor of the latter.

Do not "lose" time checking the cluster and propagation data! Turn on your radio, quickly check the bands, choose the band that seems to have possibilities for making contacts, find a free channel, and start to call CQ. Even those bands that, at first glance, may look dead can become very productive after a short time of CQing. I'm not against using the DX Cluster and other helpful tools, but my intention is to show that we can also live without them. Our hobby is older than the DX Cluster.

Skip the contests. You can often make more QSOs outside of a contest than in the contest! That's especially true for modest stations that are not competitive in overcrowded bands. Sometimes I decided to give up low-rate operation in small contests and QSY to a different band or mode. I continued my operation outside the contest and ended up with a higher QSO rate. If you can operate during weekdays, do it. Off the weekend, you can operate with very high rates when nothing else interesting is on the bands and you are the only attraction. I discovered a new ham radio rule during this QSO Marathon: "Nobody needs you, but everybody likes to work you." More than 100,000 QSOs were logged with my personal callsigns from Z3-land before the QSO Marathon, but the stations were willing to call me again and again.

I never called CQ DX! Of the total of 43,300 QSOs, 12,542 (or 28.9%) were with DX stations (stations outside Europe). Nearly every third QSO was with DX station! Such a high percentage of DX stations worked is similar to working in the major DX contests. It's much easier to be called by DX than to enter in the pile-up of other DX stations. Of course, most of the very rare DX stations and DXpeditions will never come and call you on your channel, and you must to go and call them. The goal of the QSO Marathon was to make as many QSOs as possible, regardless of whether they were DX or local. If you are looking to complete your DXCC total (especially if you are looking for very rare stations), this operating strategy is not a good choice. My most productive band was 14 MHz, especially on SSB.

Transmit! Instead of the golden rule of ham radio, "Listen, Listen, and Listen," I used the opposite philosophy: "Transmit, Transmit, and Transmit." This doesn't mean not to ask "Is this frequency is in use?" and to carefully listen between CQ calls to pick up stations that are calling. But when the rest of the world is listening, very good results can be achieved if you transmit.

A Few Cautions

My approach during the QSO Marathon was extreme and cannot be applied in general to all situations. The operating strategy was set to serve my specific goal. If you do not have the same goal, do not try this. Some of the correspondents were not very pleased with short contacts and complained. In the worst case, some frustrated operators started to make intentional QRM to disturb my operation.

Such a large number of QSOs later creates an enormous number of QSL cards. My all-time QSL collection counts 50,000 received cards (a pile of about 13 meters, or nearly 40 feet!), which results in problems for storage, sorting, and answering. In my case, dealing with the QSL cards required more time than making all those QSOs! The managers of the Macedonian QSL Bureau (Zlatko, Z33AA, and George, Z33A) informed me that 40% of all incoming cards in the national bureau are for me!

I announced my QSO Marathon one and half months before the *end* of the year. In the last few weeks I started to search the internet to find any existing Year QSO Records. This was not an easy task. I also sent a series of e-mails to some stations which at that time (or in the near past) were very active (e.g., 9K2ZZ, VP6BR, JX7DFA) and to various DX bulletins to find out whether any record of this kind exists. After all the responses, I am sure that my result is European One-Year QSO Record.

Could I have done even better? I think yes. I decided to run QSO Marathon in the middle of April 2001, after I saw that my QSO total for the first few months of the year was more than 10,000. I was curious to see if it would be possible to make 30,000 QSOs in a single year. Yes, 30,000 QSOs was my initial goal. Honestly, I didn't expect such a result.

"If the QSO is the backbone of our hobby, then let's do it —be active and make QSOs." —Z35M

Finding the Time

How did I manage to find enough free time to run the QSO Marathon? I previously mentioned that around 1000 working hours were necessary to make this possible. Is this too much? Yes and no. That works out to an average of two to three hours per day. According to one serious study, people in my country in 2001 spent an average of five hours per day watching TV programs. In order to find free time for the QSO Marathon, I decided to watch TV only two hours per day and to spend the other three hours on the radio. Smart solution!

Some days when the propagation was poor it was very difficult to make even 50 QSOs after a few hours of calling CQ. Good days (outside of contests) ended with 500 QSOs. The key strategy approach was to call CQ and make short QSOs. During good propagation and high activity, it took just one hour to make the needed 118 daily QSOs to maintain the average.

It's very important to maximize on-the-air time. I know many operators who spend more than three hours per day in their radio rooms, but they are not on the air. Rather, they are watching DX clusters, preparing different ham-related programs, tuning the bands looking for rare DX, scanning "magic bands" where propagation is the exception—hi— etc. I noticed that we are talking more about ham radio than practicing it. We are shifting our attention to activities other than the classic activity of making QSOs. All those radios, antennas, and other equipment are for making radio contacts. If the QSO is the backbone of our hobby, then let's do it—be active and make QSOs.

Z35M European Year QSO Record 2001

Month	QSOs	DX QSOs	% DX
January	1680	493	29.3
February	2730	1321	48.3
March	3150	996	31.6
April	4215	649	15.3
May	3910	1053	26.9
June	2535	549	21.6
July	2795	601	21.5
August	2685	952	35.4
September	2400	1034	43.0
October	5900	1859	31.5
November	5510	1697	30.7
December	5790	1338	23.1
Total	**43,300**	**12,542**	**28.9**

Fig. 1– Breakdown of QSOs made by month, including the number and percentage of DX stations worked each month.

Reactions of the Ham and Non Ham Community

The reaction to the results I achieved generally was very positive both in the ham and non-ham communities. Some of the ham magazines and DX bulletins in different countries pub-

lished the results in association with positive comments. I'm aware that some of my fellow hams think that my effort was crazy and that it is pointless to make such a number of QSOs without caring about DXCC totals, ignoring long conversations on the bands, etc.

The non-ham community in my country doesn't know much about amateur radio despite a 60-year-long tradition (the Radio Society of the Republic of Macedonia, RSM, was founded in 1946), but feel that this hobby is something special. After a short article in one of the national newspapers, Macedonian national TV, MKTV, came to do a short interview with me, taking images of my station setup, antennas, a short demonstration of making a QSO, etc. On the micro-local level, I feel changes in the treatment of my hobby in the eyes of my neighbors (TVI victims, hi!), my family members, and friends. After this result, my 2-el. quad in their eyes is not only a "spider web for catching birds," but a useful tool to communicate worldwide and to set records. Some of my closest friends and family members visit me, together with their kids, and ask for QSO demonstrations. Before that, they refused to talk about this "crazy hobby." Here in the Balkans, where the standard of living is not as high as in the western world, to be a ham means "to lose valuable time of daily survival for unnecessary activities."

I'm still very active on the air. In the last five years a total of 140,000 QSOs was made using my personal callsigns from Macedonia, Z3, and from Albania, ZA, where I temporarily live and work. (This works out to an average of 28,000 QSOs per year, five years in a row, since 2000).

My all-time total (as of 31 December 2004) is 169,271 QSOs using my personal callsigns from Macedonia (YU5KV, 4N5KV, Z32KV, Z350KV, Z3100M, and Z35M), and 61,500 QSOs from Albania using ZA/Z35M (June 2002 – December 2004).

Since 1984 I have made an additional 25,000 QSOs as a guest operator at various other stations, including ZA1MH, ZA1B, ZA1A, ZA1AJ, ZA1UT, YU5FCA, Z37FCA, Z30SVP, Z30A RZ4FWA, YUØHN, YU6GAH, and LZ1RDF. My overall total for 21 years is approximately 260,000 QSOs.

Again?

Can I repeat this kind of effort? Yes, but not in the near future. My callsign, Z35M, is in too many logbooks. Maybe in a few more years . . . semi-rare country, interesting callsign, sunspot maximum, modest equipment, plenty of free time, and I can go for 60,000, even 100,000 in a single year. This is not an easy task, but it is not impossible. Just one request: Please do not tell my wife about these plans!

It's not easy for the rest of the family to have a ham living with them. Imagine having one of the most active operators under the same roof. I would like to thank my wife Dijana (non ham), my daughter Mihaela (9), and son Gorjan (3), who was not born at time of the QSO Marathon, for their tolerance then and now. I dedicate this QSO Marathon to them. ■

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Results of the 2004 CQ WW RTTY DX Contest

BY GLENN VINSON,* W6OTC, AND JOE WITTMER,† K9SZ

The 18th Annual CQ WW RTTY DX Contest was held September 25–26, 2004, with solar Cycle 23 continuing its slow decline. Although solar flux was only 90, geomagnetic noise was generally low, with an *A*-index of 6 and a *K*-index of 2, and participation continued to soar. Almost 1250 logs—by far the largest participation in *any* RTTY contest in history—were submitted. While the greatest number of contacts were made on 20 and 15 meters, scores continued to increase on 80 and 40 meters. Also, for those able to take advantage of north-south paths, 10 meters continued to provide significant contacts and multipliers, particularly for multi-band entrants. New world records were set for Single Op 7 MHz and Single Op 14 MHz, and new regional records were set for Single Op Assisted, Multi-2, Single Op 3.5 MHz, and Single Op 21 MHz. In general, scores on 20, 40, and 80 meters increased, while those on 15 (with a few exceptions) and 10 meters declined.

As in prior years, interest in this contest continues to grow as new participants from the CW and SSB CQ WW DX contests add RTTY to their repertoire and overall RTTY contesting skills continue to improve.

K1TTT (ops: K1TTT, K1MK, N1XS, WØBR, W1TO, WM1K), world second-place Multi-Single Low Power. Left to right in the photo: K1MK closing down 40 meters, N1XS on 20 meters, and W1TO waiting for 15 to open.

Single Operator

Single Operator, High Power (SOH). Single operator results returned to Earth this year after two years of extraordinary scores. Even so, P3F (op: 5B4AGN) made 3,316,924 points (2499 QSOs, 454 mults), moving up from fourth place from the previous year with a score achieved only by multi-multi stations as recently as 1997. In second place was LY2IJ, scoring 3,038,992 points (2211 QSOs, 557 mults). Here the two-point European QSOs were a big disadvantage compared to P3F's location on Cyprus in Asia. Advancing from fifth place in 2003, RK4FF moved to third place this time with 2,743,048 points (2311 QSOs, 511 mults). In the U.S. competition, Charlie, KI5XP, won an exceedingly tight battle with Don, AA5AU, scoring 2,160,564 points versus Don's 2,152,918 points—a difference of only 7646 points. AB5K was very close behind with 2,064,270 points.

Single Operator, Assisted (SOA). Unlike the scores in SOH and SOL, scores in SOA increased around the world this year, suggesting that packet or other spotting assistance may be relatively more valuable as the solar flux declines. Rick, KI1G, the perennial U.S. leader in SOA, was first in the world, setting new North American and USA records with a score of 3,763,700 points (2499 QSOs, 617 mults). Very close behind was Brazilian powerhouse Wanderley, ZX2B (op: PY2MNL), who set a new South American record with 3,665,803 points (2,246 QSOs, 551 mults). Notice the large number of mults for Rick and Wanderley compared to the top SOH and SOL winners. World third was EO3Q, making 1,990,378 points (1729 QSOs, 481 mults).

Single Operator, Low Power (SOL). Like top scores in SOH, those in SOL were somewhat lower than in 2003. The winner in SOL was CN8KD, with a score of 2,224,250 points. World second was LZ9W (op: LZ2HM), achieving a score of 1,807,877 points. A45WD (op: YO9HP) won world third from Oman with a score of 1,483,758 points.

Single Operator, Single Band 28 MHz (28). Single band, 10-meter scores reflected not only the reality of lower solar flux, but also a declining interest in entering single band on 10 meters. Several multi-op stations achieved significantly better 10-meter results than any of the single band entrants. The single band winner, HC1JQ, illustrated the problem, winning with a score of only 34,000 points, approximately one eighth of his world third-place score in 2003.

Single Operator, Single Band 21 MHz (21). In contrast to 10 meters, two new regional records were set on 15 meters. The world winner, with a new Asian record, was ZC4LI, scoring 591,528 points. Three-time winner Nikola, 9A5W, slipped to second place with score of 551,592 points, about 130,000 points lower than his 2003 world record. However, LPØH (op: LU7HN) set a new South American SO21 record with a score of 489,955 points. Nikolay, UXØFF, operating this year as EO6F, dropped back to world fourth with a score of 423,980 points.

Single Operator, Single Band 14 MHz (14). Twenty-meter scores increased in 2004 compared to 2003. The winner, setting a new world record, was VE2RYY, moving up from fifth place with a score of 590,772 points. This score exceeded S50U's prior record, set in 2002, by only 1300 points. Three-time winner 9A2DQ was second, scoring 544,452 points. World third was MIØLLL with 508,604 points. This was the first year that the top three entrants all scored more than 500,000 points.

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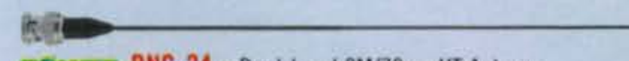

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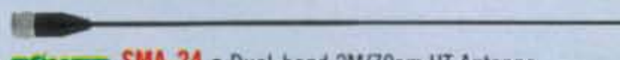

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COMET SBB-7/SBB-7NMO • Dual-band 146/446MHz w/fold-over
• Gain & Wave: 146MHz 4.5dBi 6/8 wave • 446MHz 7.2dBi 5/8 wave x 3 • Length: 58" • Conn: SBB-7 PL-259/SBB-7NMO NMO • Max Pwr: 70W

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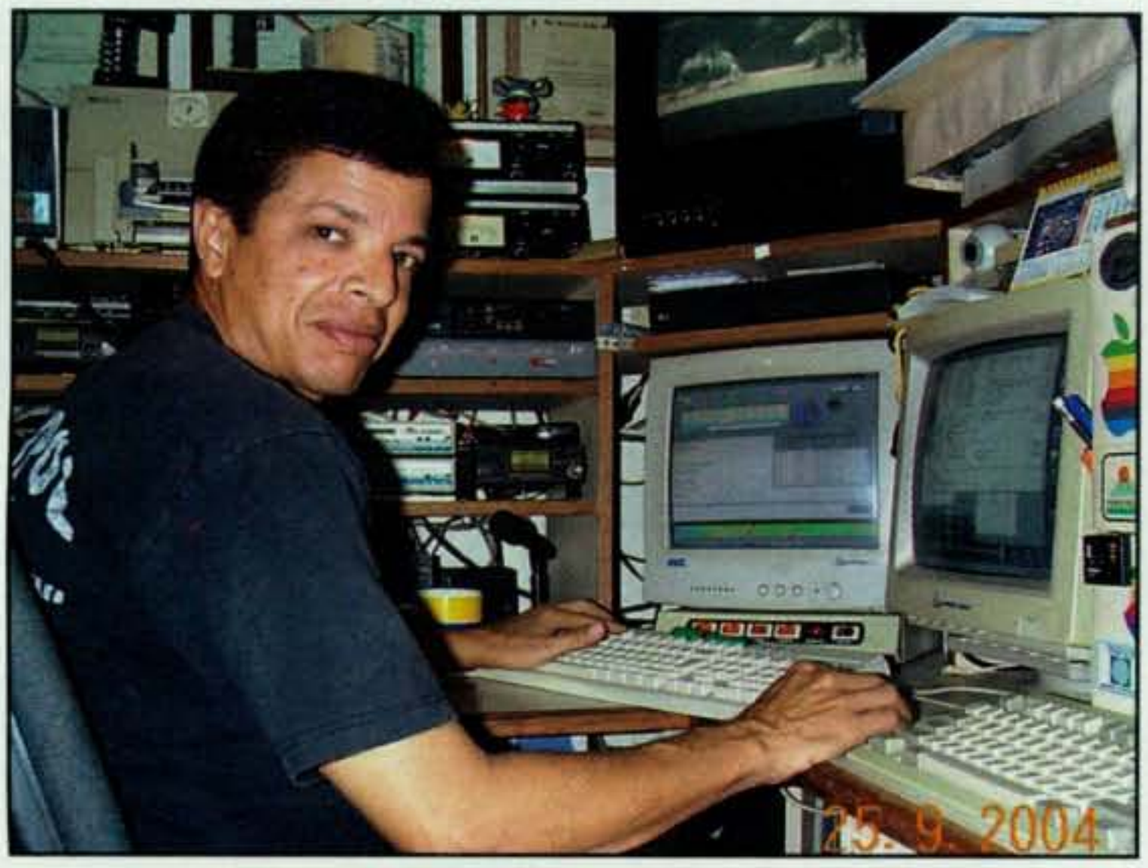

YV6BTF, winner Single Op Low Power, South America.

PJ4/W9ILY hard at work on 15 meters.

Single Operator, Single Band 7 MHz (7). Continuing with the trend began in 2003, scores on 40 meters generally increased. S50A's 2003 world record of 334,558 points was exceeded by IY4W (op: IK4MHB), who scored 392,000 points—a new world and European record. We will be surprised if this new record is not challenged again next year. In world second place was HA1WD/5 with 303,335 points. Europe again completed its dominance on 40 meters with OL1RY coming in world third with 287,826 points.

Single Operator, Single Band 3.5 MHz (3.5). The 80-meter top five scorers all repeated in the same relative positions as in 2003. Incredibly, on 80 meters the 1997 world record of GIØKOW, at 137,862 points, remained intact, although all of the top scores increased over 2003. This year S54E won again with 137,340 points, only 523 points short of a new world record. NB1B won world second again, and also again set new USA and North American 3.5 MHz records, with 122,213 points. Very close behind, 9A7R repeated as world third with 119,213 points. Any of these three stations can win the 2005 contest and set a new world record.

Multi-Operator

Multi-Operator Two Transmitter (M2). For the fourth year running the M2 class has produced the largest score in CQ WW RTTY, and HC8N repeated as the winner. This year's crew (ops: W6OTC, K6AW, N6ZZ) made 8,792,022 points (4228 QSOs, 699 mults). Moving into world second this time was the contesting team at KM4M (ops: K4JA, AJ3M, K4GMH, K7SV, K9JY, W1ZT, W3BP), who scored 5,402,160 points, just short of KI1G's 2002 North American record. KH7X (ops: KH7U, AH7R, AH6OZ, KH6ND) placed third and established the Oceania record with 4,822,532 points.

Multi-Operator Multi-Transmitter (MOM). MOM did not have a dominant entrant this year, and scores generally were down from those of 2003. The winner this time was Z37M (ops: Z31GX, Z31MM, Z32ID, Z32PT, Z32XA, Z33F, Z33GOK, Z33ZOD, Z36W), with 3,872,168 points. World second was RKØAXX (ops: RAØAM, RAØAHC, RAØALM, RUØAM, RWØAR, RVØAR, RVØAU, RVØAX, RXØAE, RUØAKA, RUØAKB, RZØAF), scoring 3,252,480 points. KA4RRU (ops: KA4RRU, W4DAV, W4DC, N4DXS, KD6AKC, K3UI, WB4ZNH, WA4TK, K5OF, WC4J, K4RG, Lianna, Tessa) moved up from world fourth to world third with 2,876,936 points.

Multi-Operator Single Transmitter, High Power (MOH). The unique rules of the RTTY Multi-Operator, Single Transmitter class produce a large number of entries every year, many more than the other multi-operator classes. Allowing, in limited circumstances, the intermittent use of two transmitters, this class remains popular with groups who do not have the larger stations that are required to support MOM or M2 operations. This year in MOH the winner was UU7J (ops: UUØJM, UU4JMG, UR5FEL, UR5FEO, UR5FUS, UR5MAF, UT5UGR, UT5UGW, UT8NA, UT9FJ) with 3,708,163 points. World second place was RL3A (ops: RX3DCX, RV3BA, UA3ASZ) with a score of 3,055,032 points. Very close behind in world third place

The PJ4 shack.

was RY9C (ops: RW9CF, UA9CGA, RA9DK, RU9CK, RV9COX) with 2,975,362 points. As we mention annually, the 1999 KH7R Oceania (2.6 mm points) and 1996 TY1RY Africa (2.7 mm points) MOH records continue to survive without serious challenge.

Multi-Operator Single Transmitter, Low Power (MOL). While the second largest multi-op category is MOL, no new records were set in 2004. World record holder HG1S (ops: HA1TJ, HA1DAI, HA1DAC, HA3UU, HA1AR, HA1AV, HA1SN, HA1AH, HA1SD, HA1DAE) came in first in the world this time with 3,362,333 points. The 2003 winner, K1TTT (ops: K1TTT, K1MK, N1XS, WØBR, W1TO, WM1K), was bumped to world second, scoring 2,459,041 points. World third, for the third year in a row, was KP2D (ops: KP2N, KP2VI, NP2M, NP2W, NP2MN, NP2DJ, NP2DZ), achieving a score of 1,869,600 points.

Summary

This RTTY contest is the "granddaddy" of the big RTTY contests, with more entries, more contacts, more mults, and more action than any other RTTY contest. To check all-time CQ WW RTTY records, look at <www.rttycontesting.com>, maintained by Don, AA5AU. For a listing of the operators of the multi stations, see the expanded 2004 CQ WW RTTY results at <www.cq-amateur-radio.com>. For comments by participants, see the QRM which follows.

We continue to progress with the electronic submission of logs, with approximately 99.6% of all logs (and 100% of competitive logs) submitted via e-mail to <rtty@cqww.com>. Indeed, only five paper logs were submitted. However, because the participation in this contest continues to grow so rapidly, some newer participants continue to have problems with recording the required exchanges (for

example, including state/province and zone information) and in submitting logs in proper Cabrillo format. The major problem this year was inattention to including all required log information when generating a Cabrillo format log from popular programs such as MMTTY. If the submitted log does not include all of the critical exchange data (including zones, states, provinces) from the raw log, the log-checkers can do little to salvage the log. Accordingly, *please carefully follow the instructions in your logging software (or your Cabrillo-conversion program) to be sure that all of the required fields have been included in your final log before submitting it to the robot.* Also remember to *read carefully any error message from the robot. The required language in the headers is precise—not simply anything you or your logging program decides to put there.* Those errors were the most prevalent in the 300 logs that required some editing by Joe, K9SZ, and Trey, N5KO. In addition, Paulo, I2UIY, converted non-Cabrillo logs to Cabrillo format prior to their being submitted into the master log-checking process. As in 2003, we received a large number of check logs, which were very helpful for log-checking. Thanks to all who submitted these logs.

The 2005 CQ WW RTTY Contest

The 19th Annual CQ WW RTTY Contest will be run on September 24–25, 2005. *Please note that Cabrillo-format logs are highly encouraged for all entrants, with e-logs required from all potentially high-scoring entrants in any category.* Also, *any computer-generated log with more than 100 contacts must be submitted via e-mail or on a 3.5-inch diskette via snail mail.* For those who submit diskettes, please remember to send the diskettes in a protective envelope. E-mail is clearly the most reliable and easiest mode for log submissions, but we welcome all logs, including (subject to the restrictions described above) paper logs, no matter how they are sent. Finally, *the deadline for log submissions is October 31, 2005.* The full text of the 2005 rules will be published in the July issue of *CQ* and on the *CQ* website at <www.cq-amateur-radio.com>. Please read the rules carefully prior to the contest, and please note that all logs submitted via e-mail go to **<rtty@cqww.com>**.

QRM

And this is with the SFI below 100! Wow, has RTTY technology come a long way fast. MMTTY was printing things that I could barely tell were there . . . **KI1G.** Almost never break 100 QSOs/hour on RTTY and did it 3 hours in a row, all thanks to the extra QSOs from the second radio. RTTY contests are ideal for practicing and improving SO2R technique. You get to do all the practice of operating and switching, while the computer does the job of copying . . . **K5ZD**. Great participation from SE Asia. "SE Asia Big Gun" award goes to Hun Champ, E21EIC, who bashed my S-meter on every band . . . **9M2/G4ZFE.** It was a tough one, but I did have fun. It's cool to see three W5 call area stations with over 2 million points each at the top of the scores for USA . . . **AA5AU.** Conditions were a mixed bag. Little could be wrung out of 10 meters and 80 was hardly bubbling . . . **P3F.** Wow! What a surprise. Conditions much better than expected. Wish I were younger. At 75 could only last 30 hours. But what a wonderful 30 hours . . . **NO2T.** Had a goal of making 800 QSOs. Was having so much fun I couldn't stop. Made 1600+! . . . **K5ZD.** Thank you for the nice contest! I used my new radio FT1000 MkV Field + Writelog 10.48 for first time in the contest . . . **LZ2HM.** First multi-op hosted by KH6YY. Thanks, Alex for the new Oceania M2 record! . . . **KH7X (KH6ND).** Surprisingly, I surpassed the old U.S. 80 meter SO record entry by the time I went to sleep Saturday AM. Best treat of the contest: working JA's on 80 . . . **NB1B.** Great contest end with two unexpected multipliers coming into the log. Special thanks to VK2KM and 9M2/G4ZFE for their very welcome calls . . . **IY4W (IK4MHB).** Although 15 meters is becoming worse and worse, nice activity from all over the world . . . **9A5W.** Bad conditions. One contact with Europe; one QSO with Asia. I will be back next year . . . **HC1JQ.**

(Continued on page 108)

Important On-Line Resources

To prepare for the 2005 contest, please refer to the following on-line resources:

Contest rules: <www.cq-amateur-radio.com>
Contest records: <www.rttycontesting.com>
Cabrillo specifications: <www.kkn.net/~trey/cabrillo/spec.html>
Cabrillo template for this contest: <www.kkn.net/~trey/cabrillo/cqww-rtty.txt>
Log Submissions: <rtty@cqww.com>

Hams living on small lots where towers are not an option might be interested in K4PRL's creative approach to putting up several inverted-L wire antennas and feeding them with a single piece of coax.

Multiple Inverted "Ls" With A Common Feedpoint

BY W. L. STEED,* K4PRL

Want an antenna solution for all amateur HF bands that re-quires only one coaxial feedline? The following describes such an antenna assembly, consisting of three pairs of inverted "Ls" that cover all amateur HF bands, including the new 60-meter band. All the feedpoints of the inverted-Ls are paralleled into a single 50-ohm coaxial feedline and exhibit VSWRs well within the higher efficiency range of most antenna tuners. The entire assembly need not be duplicated, but can be scaled to cover only those bands of interest. While this article describes a specific assembly of inverted-Ls, the underlying message is that the feedpoints of an inverted-Ls that are resonant on different amateur HF bands can be paralleled into a common 50-ohm feedline while essentially preserving the VSWR of each inverted-L.

Each inverted-L operates at about one-quarter wavelength and/or odd multiples thereof. Odd multiples of one quarter wavelength are used at the higher frequencies so that sufficient wire length can be allocated to permit a significant length of each element to be made horizontal. Since the downhaul wire from the horizontal member to the feedpoint is part of the antenna, its length will determine the odd multiple of one-quarter wavelength to be selected. The odd multiple wavelengths used in this article are based on a downhaul wire length of only 14 feet.

Fig. 1 shows the general configuration of one pair of wire elements, A and B. My entire setup has two more similar pairs. Element A is like most inverted-Ls and is strung between supports such as a tree and a building. Element B is suspended beneath and insulated from element A. The far end of element B is designed to be about 2 feet below element A in order to minimize interaction between the elements. A 3/16-inch diameter braided polyester rope is used between the insulator at the far end of element B and the one at the far end of element A, connected so as to maintain the 2-foot separation of the elements. Rope rather than wire is used between these insulators to forgo wire acting as an unwanted parasitic element.

The 3-foot vertical section at the far end of each element provides some wire for pruning, as you tune each element.

**6812 Lynbrook Drive, Springfield, VA 22150*

Photo A– Wide view of K4PRL's multiband inverted-L antenna array. The PVC separators "float" on the wires and are not connected to the base section. (Photos by the author)

The 5-ounce fishing sinker weights at the end of the tuning sections help to hold both the elements and ropes taut and to keep the tuning sections hanging vertical.

Element length is the sum total of the lengths of the vertical downhaul section, the horizontal section, and the tuning section of each element. The length of the tuning section is

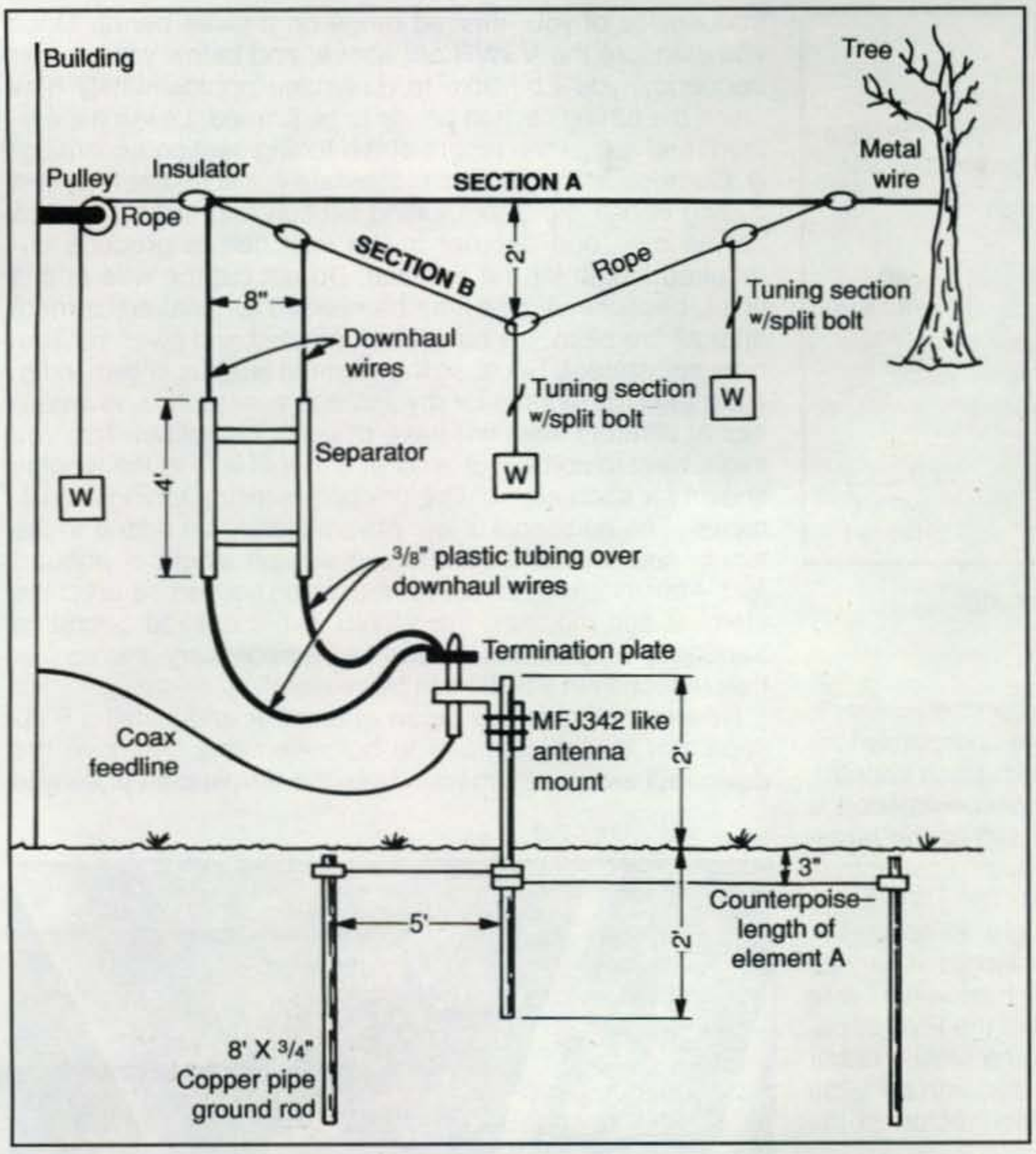

Fig. 1– The general configuration of one pair of wire elements, A and B.

to be pruned for minimum VSWR. The two antenna elements are separated by about 8 inches at the top of the downhauls. This separation is maintained by a 4-foot long ladder-like unit made of 3/4-inch PVC components that is positioned at the bottom end of the downhaul wires. These wires run through the PVC separator to the termination plate on the center conductor of the coaxial antenna mount such as the MFJ-342. The triangular termination plate is made of aluminum and is about 3" × 3" × 3" and at least 20 gauge. A 3/8-inch hole should be drilled in the center of the plate so that it can be secured to the antenna mount with a 3/8-inch bolt. Two holes should be drilled on each of three sides of the plate about 1/2 inch from the edges. The size of the holes should accommodate the lugs that are soldered to the ends of the six downhaul wires.

The antenna mount with the termina atop is supported about 2 feet above ground by a 3/4-inch copper pipe that in my case is driven into the ground only about 2 feet because of fear of hitting a sewer pipe. To provide a deep ground for this shallow copper pipe it is bonded to a 3/4-inch, 8-foot long copper pipe driven vertically into the ground 5 feet from the shallow pipe. The bonding is via a 5-foot long No. 6 copper wire using electricians' pipe clamps. A buried counterpoise made of No. 6 copper wire is run about 3 inches below ground surface beneath each pair of elements. See fig. 1 for details; in the figure, I have included two 8-foot ground rods.

The downhaul separators are made of 3/4-inch PVC water pipe, using "Ts" and straight sections in a configuration as shown in fig. 1. The distance between the centers of the 48-inch long barrels through which the downhauls are threaded is 8 inches.

Each counterpoise is connected to the copper pipe that supports the coaxial termination by use of electricians' grounding clamps. The clamps are secured to the pipes about 3 inches below the surface of the ground. Electricians' clamps are also used at the *far* end of each counterpoise to secure it to an 8-

Element		
Pair 1		
Length (feet)	127	26
Frequency (MHz)	1.85	10.125–29.4
Fraction of Wavelength	1/4	1/4–3/4
VSWR	1.8/1	1.7/1–1.4/1
Pair 2		
Length (feet)	62	40
Frequency (MHz)	3.9–28.4	18.15
Fraction of Wavelength	1/4–7/4	3/4
VSWR	1.7/1–2.6/1	2.2/1
Pair 3		
Length (feet)	51	35
Frequency (MHz)	5.32–14.2–24.93	7.2–21.3
Fraction of Wavelength	1/4–3/4–5/4	1/4–3/4
VSWR	3.7/1–2.2/1–2.3/1	2/1–2.8/1

Fig. 2– Characteristics of elements.

foot ground rod. A counterpoise for each pair of elements is a must if the antenna current path is to have acceptable loss and in-shack RF fields are to be minimized. Each counterpoise should be about as long as the longest element it is beneath. The downhaul wires are connected to the terminating plate via dip-loops to allow for non-destructive movement of the antenna assembly in the wind. The PVC separators float in the dip-loops, their weight keeping the downhauls separated and straight. A 3-foot length of 3/4-inch plastic tubing is put on the lower end of each downhaul wire from the termination block into the bottom of the PVC separators so that the separators can float on the plastic rather than the wire. The coaxial feedline is provided with a PL259 connector which mates directly with the connector on the MFJ-342 or similar antenna mount.

The three-pulley/counterweight system is used to allow non-destructive movement of the antenna pairs in the wind and facilitate lowering of the elements for tuning or general maintenance.

In my installation, the three pairs of elements are displaced from one another by about 15 degrees in the horizontal plane. The horizontal displacement between pairs of elements is thought not to be critical but should be greater than 10 degrees and less than 45 degrees.

Fig. 2 shows the characteristics of each element in each pair for my antenna assembly. The element length, center frequency and the fraction of a wavelength on which the element operates, and the associated VSWR are shown. Notice that the 51-foot element of pair 3 can be operated on three different frequencies of 5.32, 14.2, and 24.93 MHz, and the 35-foot element can operate on 7.2 and 21.3 MHz for a total of five bands, all with only two wire elements and with reasonable VSWRs.

Construction and Testing

The recommended construction ap-proach is to erect the longest element A of a pair first. Install the buried counterpoise beneath the element and terminate the downhaul wire on the termination plate. Connect a coaxial cable between the MFJ-342-like antenna mount and the VSWR measurement instrument. With the element fully erected, attach an SWR analyzer or a transmitter at very low power with an SWR meter in line, and measure the VSWR on and around your desired operating frequency (or the bottom, center, and top frequencies of your desired range on a given band). Once you measure the VSWR on, above, and below your center frequency, you'll be able to determine approximately how much the tuning section needs to be pruned. Lower the element and adjust the length of the tuning section accordingly. Electricians' split bolts can facilitate this adjustment by first cutting in half the 3-foot tuning section and sliding the two halves over one another in the split bolt to produce the required length for the first trial. Do not cut the wire at this point, because all of it may be needed for final adjustment after all the elements have been erected and given preliminary adjustment. Because the element lengths shown in fig. 2 are the final lengths for my antenna assembly, and antennas at different sites will have different characteristics, you might want to add about another 3 feet of wire to the lengths shown for each element before commencing tuning adjustments. The additional 3 feet of wire should be added to the tuning sections for a total tuning section length of about 6 feet. After initial adjustment to the tuning section, re-erect the element and measure the VSWR at the desired operating frequency. Repeat this procedure as necessary until no further reduction in VSWR can be realized.

Now erect element B below element A and install a PVC separator that is common to both elements. Remove the downhaul wire for element A from the termination plate and

Photo B– Close-up of base section showing antenna wires coming through each of the PVC separators and meeting in the middle, where they're connected to a single piece of coaxial feedline going back to the shack.

The Secret to Maximizing the Performance of Your Transceiver

Are You Still Using Your Built-in Tuner?

Many HF transceivers now include a built-in antenna tuner. So, if your radio has a built-in tuner, why do you need an external tuner? The answer is very simple: performance. **Your built-in tuner is a compromise between size, cost and performance.**

Your Built-in Tuner – Slow, No Memories, Limited Range

Many built-in tuners still use motor-driven variable capacitors, tune slowly, have limited or no memories, and most important, are limited to an SWR range of only about 3:1. Even a well designed and well installed antenna can have an SWR greater than 3 under normal operating conditions; in this case, your built-in tuner may simply stop when it can't find a match, leaving you high and dry.

LDG Automatic Antenna Tuners – The Secret to Getting the Most Out of Your Radio

LDG's automatic switched-L tuners are very fast and have a tuning range of 10:1. That's over three times the tuning range of most internal tuners! More tuning range gives you more forward power when your SWR is high. And with thousands of memories and frequency sensing, the re-tune time is less than a tenth of a second. It even tunes with SSB. **So you get more power out of your radio!**

LDG's tuners can be integrated with most transceivers so that the TUNE button automatically keys the transmitter, tunes, and returns to your operating mode and power in just a fraction of a second! This makes them just as easy to use at a built-in tuner, but with vastly greater performance. **That's the Secret to Getting the Most Out of Your Radio!**

The First Two-Year Warranty in the Auto Tuner Industry!

LDG Electronics believes we make the best automatic antenna tuners in the industry. But, we also know that you hear that from many manufacturers. As a consumer you don't know who to believe and who is just shouting false claims.

At LDG Electronics We Want to Set the Industry Standard!

Every product we sell now comes with a 2 year warranty. So now when we say that our products are thoroughly tested, we have high levels of quality control, and we over-engineer our products to make them last longer—you will know that we mean it.

Are You Still Trying to Decide if You Need an Auto Tuner?

So if you are still one of those Hams who haven't already taken the plunge and added a high-performance auto tuner to your shack, now is the time. Visit our Web site **(www.ldgelectronics.com)** and check out the most well built auto tuners in the industry including the new, top-of the-line AT-200Pro.

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NEW!
The 200 Watt AT-200Pro with 16,000 "3-D Memories"

Our first auto tuner specifically designed for today's newest high-powered transceivers.

The AT-200Pro features LDG's new "3-D memory system" allowing up to eight antenna settings to be stored for each frequency. Rugged and easy-to-read LED bargraphs show power and SWR, and a Function key on the front panel allows you to access data like mode and status.

List price $249

NEW!
The TW-1 "Talking" SWR/Wattmeter

"The Forward Power is 112 Watts"

The TW-1 Talking Wattmeter provides an aural spoken indication of power and SWR using a digitally recorded voice. It is ideal for the vision-impaired, for those of us in the "bi-focal set", or just for those times when you need to be looking somewhere else. At the press of a button, the TW-1 speaks the forward power, reverse power or SWR. Three languages are selectable: English, Spanish and German. It includes its own internal speaker; no external audio hookups are needed.

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Tune your high power station quickly when you QSY or change bands. 200 memories provide instant recall. Easy installation and use make this the choice for any Amateur Radio Operator with an amplifier.

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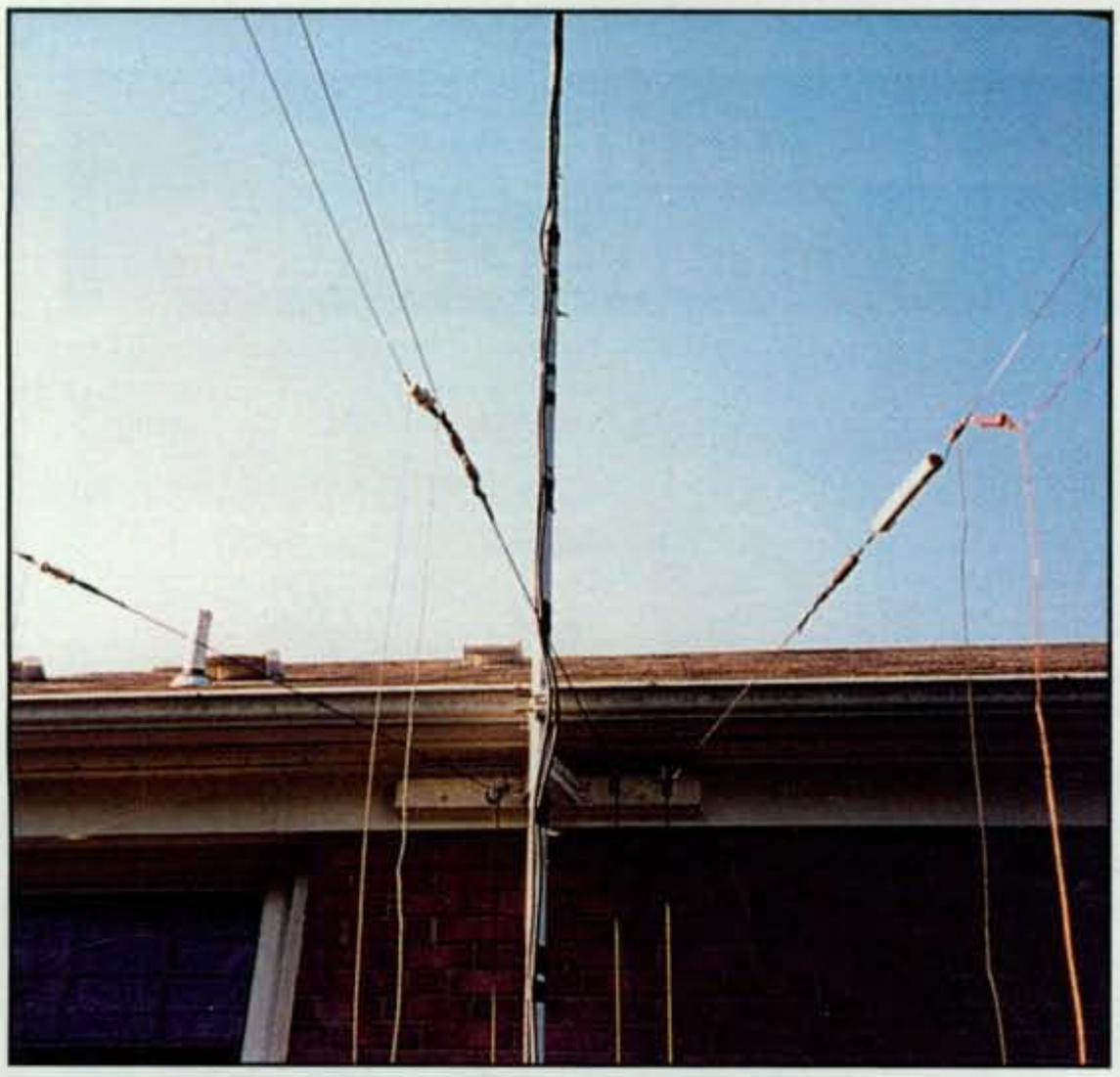

Photo C– Close-up of the connection points between the horizontal portions of the antennas and the 14-foot "downhaul" lines. Your measurements may vary, depending on how high you can mount the antennas, but the goal is to maximize the horizontal length over the vertical drop.

put a 3-foot length of 3/4-inch plastic tubing over the lower end of the downhaul. Put a like piece of the plastic tubing over the lower end of the downhaul for element B. Slide each of the downhaul wires, with the plastic tubing in place, through separate tubes of the PVC separator. Solder a lug on the ends of each downhaul wire and attach the lugs to separate holes in the termination plate. There must be sufficient downhaul wire length to permit the forming of dip-loops between the lower end of the PVC separator and the termination plate. The lower end of the plastic tubing should be against the termination plate, and the other end should be up in the PVC separator such that the separator floats in the dip-loop about a foot above the ground surface.

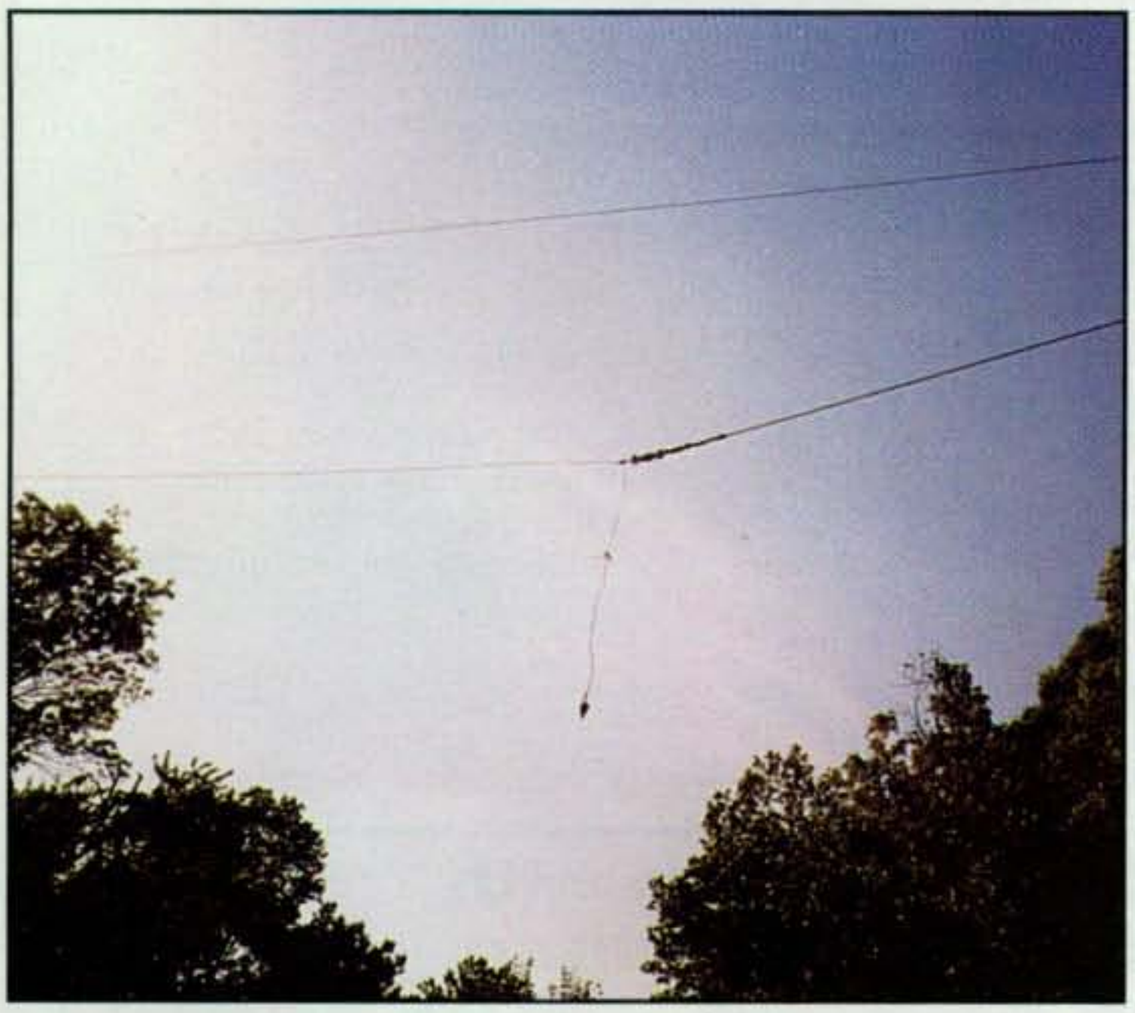

Photo D– Tuning stub of a B element, held in place by a fishing weight. Note the longer A element above.

With both A and B elements erected, check your VSWR on and around your desired operating frequency for element B to determine how much pruning is needed. Lower element B and make the appropriate adjustment to that tuning section. Re-erect element B and measure the VSWR again. Repeat this procedure until the VSWR cannot be reduced further. Now re-test element A and adjust its tuning section for minimum VSWR, since the addition of element B may have affected the resonant frequency of element A. Any increase in VSWR of an element due to the tuning of the other element can likely be corrected by retuning the adversely affected element.

Additional Element Pairs

Erect the other two pair of elements with a separation of 10 to 45 degrees in the horizontal plane between each pair of elements. Install a buried counterpoise beneath each pair of elements. Terminate the downhaul wires of each element on the termination plate. A PVC separator should be installed on each pair of downhauls. Make VSWR measurements and tuning adjustments as for the first pair of elements.

After all elements are erected and tested in sequence, repeat the tests to determine if the VSWR for any band has increased. Where such changes occur, re-adjust the tuning section for that band. Since there is only one tuning section for each element and some elements operate on more than one band, compromises have to be made so that all bands have acceptable but not necessarily minimum VSWRs.

Final Words

Should the far antenna support be marginally close, some relief can be had by making the tuning section longer than 3 to 6 feet with commensurate reduction in the length of the horizontal section.

The length of the line supporting the far end of each element A should be at least as long as the height above ground of the far support point so as to provide means to lower the element for tuning and maintenance. The far support lines should be metal if you have squirrels. A metal support line will have little impact on antenna operation in that the tuning will have been done with the metal line in place.

The radiation patterns of this antenna assembly have not been measured, but four years of on-the-air operation on all but the 30- and 60-meter bands have shown that it performs well both close-in and for DX.

No attempt has been made to reduce the VSWR of 3.7:1 at 5.32 MHz (60 meters). This VSWR is residual after adjustments have been made for the other bands and can probably be reduced at some sacrifice to the other bands that use the 51-foot element.

Plan your installation well, especially where you will put the downhaul terminations with respect to the pulley system. Start each run of wire at the termination plate and plan the locations of insulator support points out to the end of each element, keeping in mind that another element is to be suspended beneath each element A. Plan where to put grounds. Do not put up an inverted-L without a counterpoise. Keep in mind that antennas have to be able to move in the wind and survive in icy conditions or they will break.

I have explained one way to parallel inverted-L antennas. Each location is different, and you can probably do better by customizing your installation for your location. Have fun! ■

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SS-10	7	10	1⅛ x 6 x 9	3.2
SS-12	10	12	1⅛ x 6 x 9	3.4
SS-18	15	18	1⅛ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅝	4.2
SS-30	25	30	3¾ x 7 x 9⅝	5.0

MODEL SS-25M

DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2⅞ x 7 x 9⅝	4.2
SS-30M*	25	30	3¾ x 7 x 9⅝	5.0

MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3½ x 19 x 9⅝	6.5
SRM-30	25	30	3½ x 19 x 9⅝	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3½ x 19 x 9⅝	6.5
SRM-30M	25	30	3½ x 19 x 9⅝	7.0

MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3½ x 19 x 9⅝	10.5
SRM-30-2	25	30	3½ x 19 x 9⅝	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9⅝	10.5
SRM-30M-2	25	30	3½ x 19 x 9⅝	11.0

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

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

CIRCLE 134 ON READER SERVICE CARD

NEW SWITCHING MODELS

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

*ICS – Intermittent Communication Service

beginner's corner

BY WAYNE YOSHIDA,* KH6WZ

Contests: Your Chances of Winning Increase if You Enter

A friend said something funny on the radio the other day while we talked about the lottery and the upcoming radio club raffle. He said, "Your chances of winning increase if you enter." Well, of course this is true, but there are a lot of people who seem to be unaware of this concept of winning games and getting prizes.

The timing of this discussion was incredibly ironic, because later that same evening, I opened my mail and got a pleasant surprise (see photo A). It's a certificate for winning first place in the ARRL Orange Section in the 2004 ARRL June VHF QSO Party. This is the contest I mentioned last year in the "Beginner's Corner" for September 2004 called "Beyond Channel Clicking." I participated in the contest with a very modest station and operated stationery mobile for just a few hours in a local park that happens to be on slightly elevated terrain, a good advantage for any radio operation. I participated in that VHF contest for two reasons: first to test my then newly rebuilt 10-GHz rig, Morpheus, and second just to get out and have some fun.

It has always been my practice to follow up any contest activity by preparing all the paperwork and turning in an entry, no matter how well or how poorly I thought I did in the contest. This establishes a personal benchmark for future comparisons. Even if I am not operating seriously, it is important to me to see what I did before and to strive to do something to improve my radio system or operating performance. Besides, after all that work, I may as well finish the job, and make my participation "official."

Preparing the paperwork for a contest is not difficult, but it does require discipline, and in the end it is always nice to see your name (or at least your callsign) in a magazine or on a website. I suppose this could be just like your 15 minutes of fame, ham radio style. Also, when the bands are dead or you decide to take a break, take a minute or two and snap some photos of your contest activities. In just about all contest results write-ups the text is sprinkled with images of contesters and their stations.

A Ham Station is Still a Ham Station

A contest station can be as simple or as complicated as your budget or your spouse or your real estate will allow, and in many cases all of these factors will drive what your contest station looks like. As you can see in photo B, most of my portable VHF contest station gear for the "lower bands" looks just like any other ham station. The rig is an ordinary off-the-shelf HF/VHF/UHF all-mode transceiver that can operate from 12 VDC. The only exception may be the 10-GHz system, described in the "Beginner's Corner" for January 2004.

*16428 Camino Canada Lane, Huntington Beach, CA 92649
e-mail: <kh6wz@cq-amateur-radio.com>

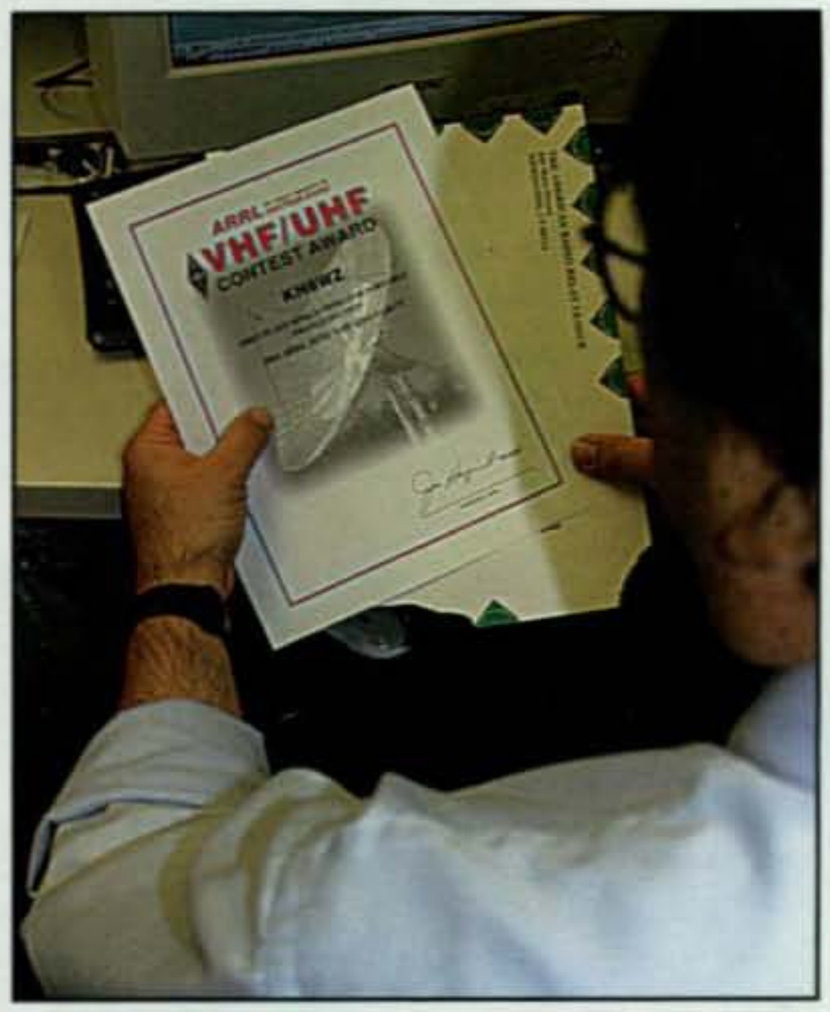


Photo A– A pleasant surprise from ARRL Headquarters was in my mailbox. Remember, you will never win a contest if you do not enter!

Even the 220-MHz and the dual-band (144- and 440-MHz) mobile FM transceivers and their mobile antennas, ordinarily used for repeater operation during my long commute to and from the office, were used in the contest on simplex frequencies. Additional antennas included a small 2m/70cm beam, actually a part of my RACES (Radio Amateur Civil Emergency Service) response kit, and a newly acquired, used 6-meter loop antenna mounted on my bike and ski rack, less than two feet above the vehicle roof.

A Necessary Evil

In all bureaucratic systems there are lots of forms and papers and procedures to follow. Entering a radio contest is no exception. Each contest has its own set of rules and forms and paperwork requirements, but after becoming familiar with these basic concepts, contest paperwork will become a simple chore anyone can do.

As you make contacts during a contest, your log will include the contest exchange of information, or just "exchange." The exchange is usually signal report and location or some other specific piece of information. Because I did not expect to make a huge score, I used the old-fashioned "pen and paper" method to keep my log. When logging in this old-fashioned way, it may be best to use black or dark-blue ball-point pen rather than pencil, because the ink will be easier to see and will make better photocopies for your records after the contest is over. If you are operating outdoors, or in a high-humidity area, pencil may smear, and some rolling-ball pens will, too. If you make a mis-

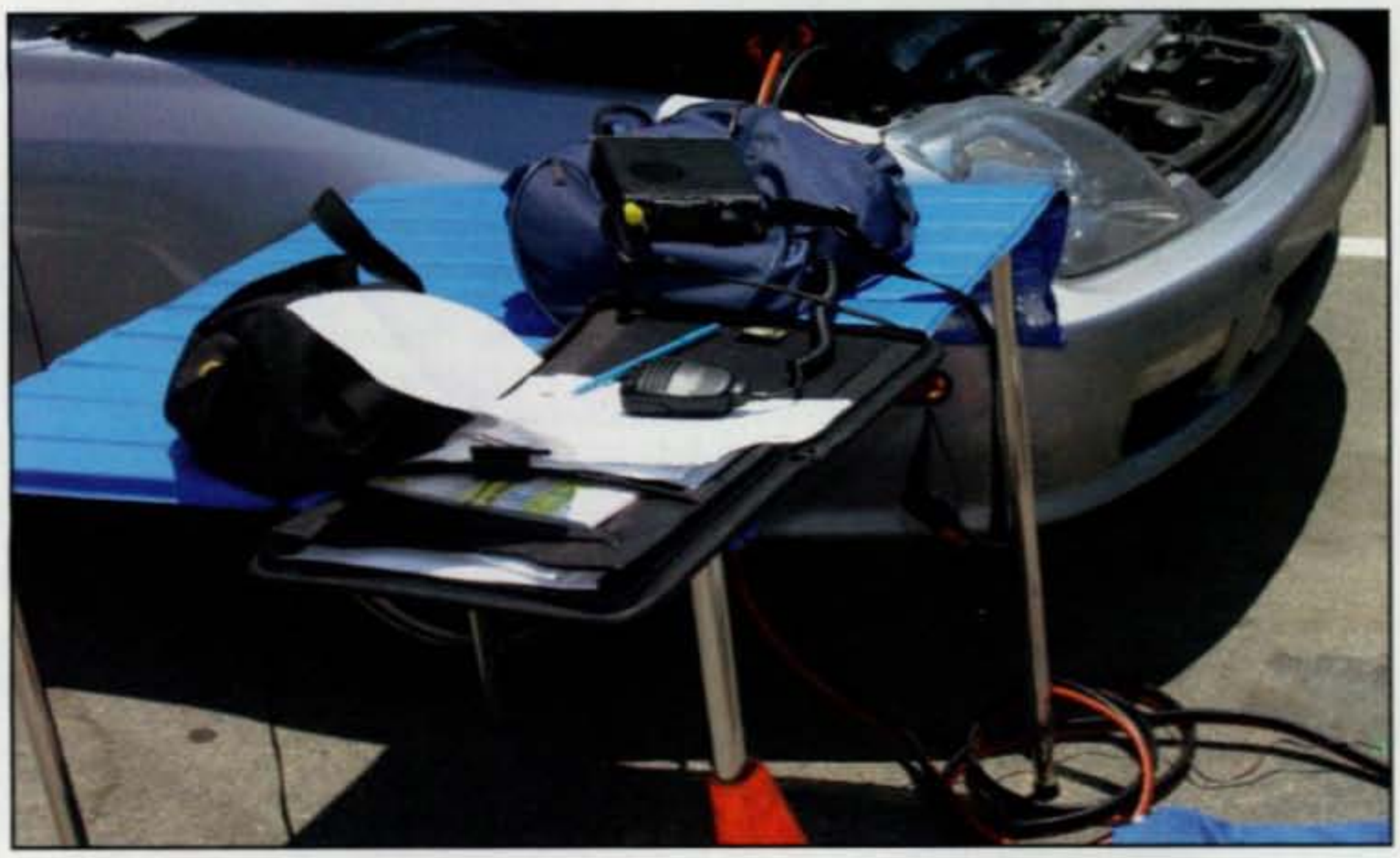


Photo B– A ham station is a ham station is a ham station, including portable contesting stations such as the one shown here. This is my portable VHF station set up in a local park. You can also see the old-fashioned pen and paper log. As the number of contacts increases, it becomes a good idea to use a computer to keep track of all the contacts—and most important, to help find multipliers and to prevent "dupes."

take, just cross out the entry with a simple line.

Computers and Contesting: Decreasing the Evil Chores

I can remember radio contesting before the days of personal computers. We had maps and lots of forms and used lots of pencils, scratching out duplicate contacts. Then, after the contest, we had to decipher the strange handwriting that happens at 2 AM. As the number of contacts grew, record-keeping became more complicated. I think that the use of computer logging and duping has opened up the path to increasingly higher and higher scores, especially when it comes time to remove (or prevent) duplicate contacts (dupes) and preparing paperwork.

Many contest programs are available, and some are even free. A good example of a very useful contest program is CT, by K1EA. This was my very first exposure to computer logging during contesting, and it was (and still is) amazing. Although a DOS program, it does just about everything needed to efficiently log contacts, verify multipliers, search for calls previously worked, and display needed multipliers. It can even control certain radios, and can interface with external CW and voice keyers to send various messages needed for the contest exchange.When the contest is over, the program can prepare the summary sheet and entry forms to make an official entry, in both paper and paperless formats. There are many other radio contesting programs available; use your favorite search engine or talk to other hams to find more.

Accidental Planning

When the contest was over, I contacted a few other hams in the area to see how they did, including a neighbor and fellow microwave radio club member, Larry Frakes, KG6EG. Larry and I discussed which contest category to enter; we would either compete against one another or simply be participants in the same contest.

As we compared notes on how we did in the contest, I decided that I could send in my entry in the "single operator, portable" category, since I was a portable station and operated from the same location for the entire contest. This turned out to my advantage, since there were very few entries in my category. When the results were published several weeks later, I discovered that I had won in my category for my location!

A very good reason to submit your score if you participate in a radio contest is that the contest organizers usually use logs to cross-check contacts made during the contest as a double-check on activity. Even if a contest entry and log are received after the deadline, these "check logs" can become a valuable part of the contest database of callsigns and operating bands and modes.

There is another very good reason to submit your score. As you gain experience in contesting, and as your callsign begins to appear regularly in the contest results articles, fellow contest participants will begin to recognize your call and maybe even your voice or CW operating style. This can be a great advantage when trying to bust through a pile-up on a crowded and busy frequency. This is very similar to the phenomenon of buying and selling: People tend to work with others they know, rather than with complete strangers they do not know. Putting this concept into a radio contesting perspective, it would be like the station calling CQ listening to the crowd and being able to pick your callsign out of the jumble of dozens or hundreds of other stations calling in.

Last, but not least, submitting your contest entry just could bring you a pleasant surprise in your mailbox!

73, Wayne, KH6WZ

References

Rosen, Rick, K1DS, "Results, 2004 ARRL June VHF QSO Party," *QST*, December 2004, page 100.

What You've Told Us...

Our February survey asked about your DXing activities and accomplishments as well as your views on the general state of DXing today. Nearly two-thirds of you who replied (64%) consider yourselves to be DXers, and nearly the same number (58%) have contacted more than 150 different countries via ham radio (37% over 250; 21% 151–250). Another 15% have worked between 51 and 150 countries, 18% have worked 1–50, and 6% have worked no countries besides their own. Virtually all of you are optimistic though, since 92% of you have invested in QSL cards to send out!

While most of you enjoy DXing, getting the "wallpaper" to recognize your accomplishments doesn't seem quite as important. Just under half of you (48%) hold the ARRL's DXCC award, and 17% are on the DXCC Honor Roll; 36% have the Worked All Continents award, while 27% have earned the CQ Worked All Zones award and 6% have 5-Band WAZ. In addition, 13% of you have the CQ DX award, 4% are on the CQ DX Honor Roll, but 41% of you have none of these DX-oriented operating awards.

Only 15% of you report using the ARRL's online "Logbook of the World" system and 14% use eQSL.cc for online confirmations, while 4% use some other electronic/online system, but 70% use none.

Nearly half of you—43%—use packet or internet spotting networks, such as the DX Cluster, but 55% don't. Your impression of the value of these networks is generally positive, with 39% saying they've improved DXing, 19% saying they've hurt it, 6% have seen no major change one way or the other, and 34% have no opinion.

As for the current state of DXing, the biggest group of you (34%) feels current DXing levels are about the same as they've been in the past, while 30% feel there's less activity now, 21% don't know and 16% feel there's more DXing going on now than in the past.

This month's free subscription winner is Sam Moore, K7SAM, of Flaxville, Montana.

Reader Survey May 2005

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

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

This month we'd like to know how you feel about license courses and test opportunities in your area.

Please answer by circling the appropriate numbers on the reply card.

1. What sort of area do you live in?
   - Urban 1
   - Suburban 2
   - Rural 3

2. Are Technician Class licensing courses offered at least once a year in your area?
   - Yes 4
   - No 5
   - Don't know 6

3. Are license upgrade courses offered in your area?
   - Yes, at least once a year 7
   - Yes, but not regularly 8
   - No 9
   - Don't know 10

4. Are amateur radio license exams offered regularly in your area? (Circle only one)
   - Yes, monthly or more frequently 11
   - Yes, at least four times per year 12
   - Yes, at least once per year 13
   - No 14
   - Don't know 15

5. About how far do you consider it reasonable to travel to reach a licensing course or test session in your area?
   - Less than 10 miles 16
   - 10–25 miles 17
   - 25–50 miles 18
   - More than 50 miles 19
   - Don't know 20

6. Are there regularly scheduled courses and/or test sessions offered within the range you selected for Question 5?
   - Yes, both courses and tests 21
   - Yes, test only 22
   - Yes, course only 23
   - Neither 24
   - Don't know 25

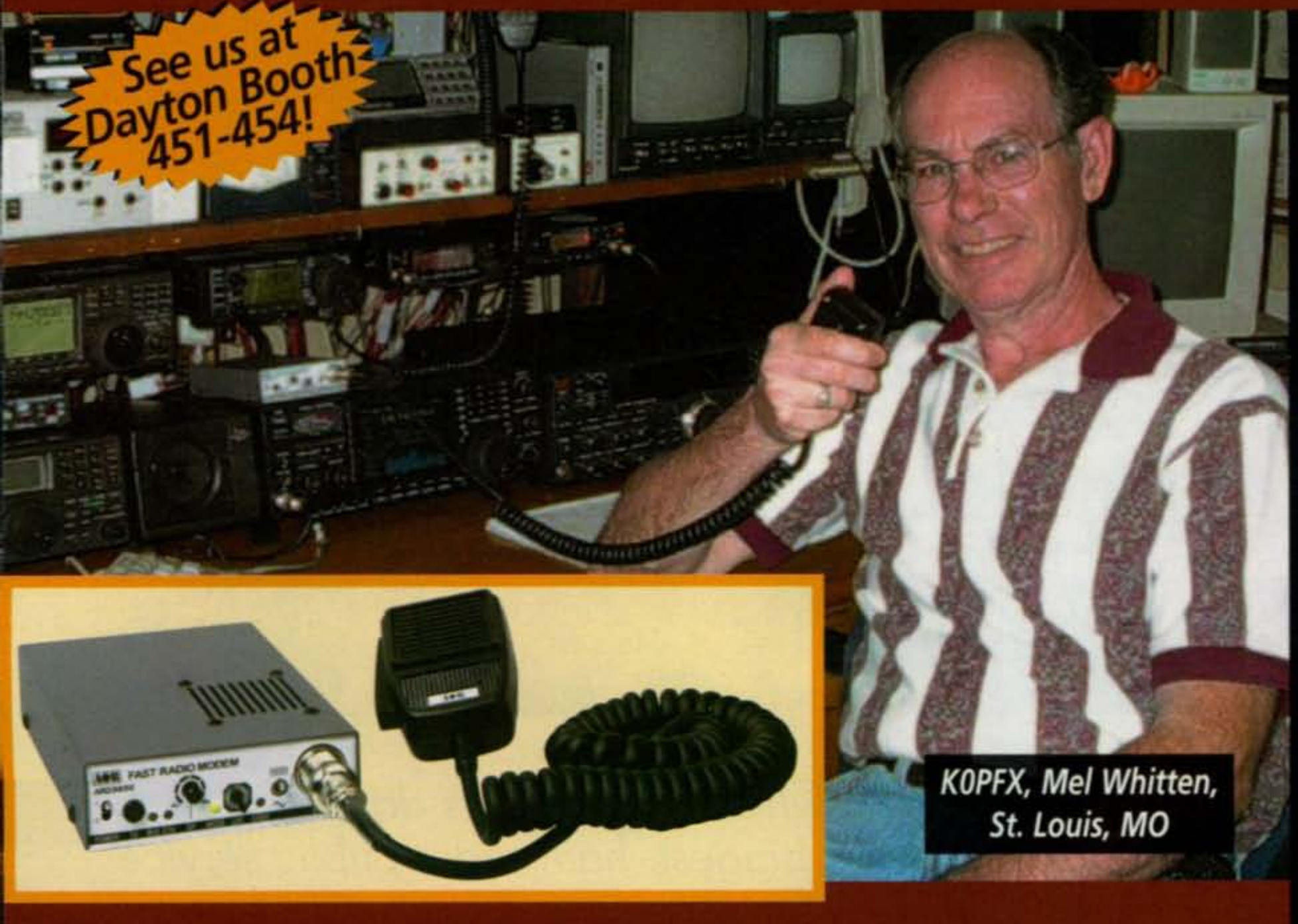
7. Generally speaking, how satisfied or dissatisfied are you with the availability of licensing courses in your area?
   - Very satisfied 26
   - Somewhat satisfied 27
   - Neither satisfied nor dissatisfied 28
   - Somewhat dissatisfied 29
   - Very dissatisfied 30

8. Generally speaking, how satisfied or dissatisfied are you with the availability of license exam sessions in your area?
   - Very satisfied 31
   - Somewhat satisfied 32
   - Neither satisfied nor dissatisfied 33
   - Somewhat dissatisfied 34
   - Very dissatisfied 35

Thank you very much for your replies. We'll be back with more questions next month.

"Thanks AOR! The ARD9800 put the *FUN* back into Amateur Radio!"

See us at Dayton Booth 451-454!



K0PFX, Mel Whitten, St. Louis, MO

The AOR ARD9800 could be the biggest revolution in HF radio since SSB!

The audio quality is something you have to hear to believe. Amazing doesn't seem strong enough to describe it.

"The performance is unlike anything I've heard in ham radio – it really sounds like a local telephone call."
– QST Review, February 2004

"On a solid link, this audio is just as rich and full-bodied as anything coming out of an AM or FM transmitter, with absolutely no noise."
– CQ Review, June 2004

With an **ARD9800**, any ham can convert an existing analog transceiver to work digital voice & image in one easy step!
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Try it for yourself!

You'll be amazed at what a breakthrough in communications technology this is. And you'll find yourself having a lot of fun working ham radio digital mode.

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"Special Purchase Discounts Available for Ham Radio Clubs!"

(Photo by Ryan Jairam, AB2MH)

What is 47 miles long, has 60,000 wheels, and sports dozens of antennas? One of the longest, if not biggest, ham radio public service events in the country.

Leading the Pack

Ham Radio and New York City's Five Boro Bike Tour

BY ALAN DOVE,* N3IMU

On New York's Staten Island a man was searching for his young son. The two had gone for a bicycle ride together, and somehow they had become separated. Ordinarily, locating a boy on a bicycle would probably not be too difficult. This, however, was the day of the annual Five Boro Bike Tour, the largest organized bicycle ride in America, which takes place in the largest city in America. With more than 30,000 cyclists traversing a 47-mile route that sprawls across New York City, finding one particular rider looked like a daunting task.

Fortunately, there were plenty of amateur radio operators on the job. In a few minutes, every ham on the route had received a description of the boy and his bicycle, and a city-wide search was under way. Hams weren't the only ones helping in the search, of course, but our communication network was by far the most effective. Although the police could contact their individual precincts by radio, the route stretched through dozens of precincts across the five counties, or boroughs, that make up the city. The event organizers were well-equipped with Nextel phones, but by afternoon some of their staffers were experiencing bad reception or weak batteries. Only the amateurs had instant and reliable communication across the entire event.

*155 Carroll Place, First Floor, Staten Island, NY 10301-1505

The Joy of a Savvy Organizer

Public-service-oriented hams in New York City have helped support the Five Boro Bike Tour for several years, and the scale of the operation still amazes us. The early morning line-up, with all of the participants packed close together, fills an entire street at the southern tip of Manhattan for more than

A highway entrance ramp causes a massive two-wheeled traffic jam during the Five Boro Bike Tour in New York City. (Photo by Dara Weinerman, KB2RTH)

a mile. When the starting horn sounds, the first riders start pedaling, and the mass of cyclists gradually stretches along the route like a giant Slinky toy. The tail end of the ride does not cross the starting line until two hours later, by which time the group covers more than 20 miles of roads across at least three counties. They spread out even farther as the day wears on, with hard-core athletes zipping across the Verrazano Narrows Bridge towards Staten Island while the slowest stragglers are still grinding their way through the streets of the Bronx, Queens, and Brooklyn.

The Tour, held each spring, has as many participants as the New York Marathon, but the route is nearly twice as long. The riders are vulnerable to all of the medical problems that affect a foot race, from blisters to fatigue to heart failure, but the bicycles add another layer of complexity. Along with first-aid stations, toilets, food, and water, Tour organizers also have to worry about bicycle mechanics and spare parts. With so many logistical demands, the folks who run this event take communication very seriously.

These days, Nextel phones are a common accessory for event organizers as well as disaster response workers, but few groups understand the strengths and limitations of this system. Some hams have commented that if people ever learn how to change the batteries in their phones, amateur radio will be out of a job. I am happy to report that this is false.

For the 2004 Five Boro Bike Tour I was assigned to be the "radio shadow" for Steve Taylor, the event's lead organizer, so I got to see the inner workings of the Tour up close[1] (see notes at end of article). Shortly after the starting horn sounded, we hopped into Steve's car and set out on a complicated all-day road trip. An assistant with a map and a Nextel phone plotted routes through the city's back streets (since most major roadways were now clogged with cyclists), Steve drove with another Nextel phone in his hand, and I monitored two ham radio nets simultaneously with "ear bud" style headphones, so I could hear all of the conversations around me. I had squelch tails echoing in my head for days afterward.

I quickly learned that Steve and his staff are not like the communications-naive event organizers we often encounter. This savvy crew packed multiple sets of spare batteries for their phones and not only knew how to change them, but actually had a schedule for doing so. Their phone system was segregated into logical talk groups, so discussions about the water supply at Rest Stop One, for example, were kept completely separate from a distress call about a man with chest pains at Mile 30. In other words, they worked a lot like experienced public-service hams, but with commercial gear.

If the "ham radio is doomed" crowd was right, I should have had a very boring day. Instead, it rapidly became clear that hams are an integral part of a good communication system, not just a redundant backup.

"Steve's shadow from net" crackled in my left ear. "Steve's shadow here."

"Tell Steve that some riders on the East Side are cutting directly to the bridge and bypassing the Bronx, and the bridge is still open to car traffic. Find out what he wants done about it."

"Will do. N3IMU."

"N2NOV, net control."

A moment later I relayed Steve's instructions back to the net. By the time we arrived at the bridge turnoff a few minutes later, volunteers on the scene had followed the instructions precisely, and the errant riders were corralled on one side of the street, waiting for car

All sorts of bicycles—and bicyclists—participate in the Tour. (KB2RTH photo)

The author outfitted for "radio shadow" duty on a rainy day. (AB2MH photo)

The staff at a reunion tent in Brooklyn takes messages for some of the 30,000 cyclists in the event. Hams relayed the messages to other rest stops. (AB2MH photo)

traffic to be diverted. The police close off the streets for the ride at predetermined times, so it is vitally important to keep riders from taking shortcuts and getting ahead of the closures; 30,000 bicyclists riding together alongside ordinary New York City car traffic is a recipe for disaster.

Throughout the day ham radio and mobile phones continued to work well together. Often it was easiest for one organizer to page another through the phone system. However, sometimes problems arose that did not fit into one of the predefined talk groups, sometimes a volunteer couldn't hear the phone ring, and sometimes, despite the precautions, phone batteries died. The hams, operating on several VHF and UHF frequencies with multiple backup systems, kept busy.

Packet Radio and Other Disasters

This is not to say that everything on the amateur radio side worked perfectly. In fact, one neat ham technology provided a tremendous learning experience, which is a diplomatic way of saying that it crashed.

Besides the old standby of FM repeaters, our group[2] is expanding its use of other modes for events and emergencies. We have several "black box" APRS trackers that we can attach to vehicles, and after our members responded to a few very large-scale disasters, most notably the 9/11 attacks and the 2003 blackout, we saw a need for a citywide packet radio network that portable stations could use for e-mail. Unfortunately, the VHF packet network that spanned much of the nation in the early 1990s essentially has vanished, so we are now faced with building a new local system from scratch.

The Tour provided the first major test of the system's basic elements, including a packet BBS, a node, and several portable stations at far-flung locations around the city. The idea was to send packet e-mail between the rest stops, so riders who got separated from their friends could have a note posted at all of the rest stops to find them. If the system worked, we could incorporate it into our plans for sending forms, lists, reports, and formal traffic during disasters.

All of the operators involved in the packet experiment are excellent hams with extensive public-service and disaster-response training, and a few of them work with computers professionally. Nonetheless, Murphy caught up to them.

The problems started early. One operator set up his station and sent a test e-mail to the BBS, but then his laptop died unrecoverably before the starting horn had even sounded. Others managed to keep their packet stations working all day, but the BBS frequently stopped responding for no apparent reason. All of the packet stations needed to use the digipeater at least occasionally, making it a critical choke point in the system and lowering the throughput even when the BBS was working. Our packet operation was clearly not ready for prime time.

We were glad that we had stress-tested the system at an event before trying to use it in a real disaster, and we were very glad that we had a backup plan. When the packet system failed, the operators at the rest stops ran a separate net to discuss the problems and later used the same frequency to pass traffic by voice. The information still got through. We learned a lot about what our packet system needs in order to work and identified glitches that would never have surfaced in a controlled simulation.

The Slowest 5 Percent

Midway through the day Steve and I stood at a rest stop in Brooklyn eating some delicious barbecue, when I com-

MFJ tiny Travel Tuner

Tiny 4½x2¼x3 inch tuner handles full 150 Watts! Covers 80-10 Meters, has tuner bypass switch, tunes nearly anything!

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MFJ-902H, same as MFJ-902 *Tiny Travel Tuner* but has *4:1 balun* for balanced lines and 5-way binding posts for balanced lines and random wire. 5¾Wx2¼Hx 2¾D inches.

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MFJ-904, same as MFJ-902 *Tiny Travel Tuner* but has *Cross-Needle SWR/Wattmeter.* Read SWR, forward and re-flected power all at a glance in 300/60 and 30/6 Watt ranges. 7¼Hx2¼Hx2¾D in.

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Half-size 52 foot *G5RV Jr*
40-10 Meters, 1500 Watts.

1500 Watt Lightning Surge Protector

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Talking Around

While most ham radio traffic at the Five Boro Bike Tour went through repeaters, we also tested an FM simplex "talkaround" technique that we have now incorporated into our standard communications plan. Any ham with any modern FM rig can use talkaround, which is especially useful in the fringes and dead spots of a repeater's coverage area. Just program a repeater's output frequency and CTCSS tone into your HT as you would to use the repeater, but set the radio for simplex. By transmitting on the output frequency, you can be heard by anyone within simplex range on that frequency without using the repeater (you are "talking around" the repeater). Of course, this only works when the repeater is quiet.

At the Bike Tour some of the stations near the Staten Island Ferry discovered that they could not hit the repeater they had planned to use, so they used talkaround. As long as at least one other ham in the group could hear them, they could get traffic through by relay. Since they were still on the repeater output frequency, other stations could listen for simplex traffic and repeater traffic simultaneously, without needing two receivers.

The method is also useful when a repeater fails. In fact, our group started discussing talkaround in the wake of the August 2003 northeast blackout, when we discovered that several of our regular repeaters lacked reliable backup power. By calling on simplex on the repeater output, stations can still find one another on their usual frequencies, even without the repeater.

Talkaround is also handy for traffic that is slightly sensitive, or only of interest to one or two other hams in the immediate vicinity. Rather than tying up the net control station and the repeater and announcing their traffic to every scanner listener within 50 miles, two hams near one another at an event can quickly pop over to the talkaround frequency for a side conversation. This can be handy when dealing with minor technical problems. No matter how talkaround is used, though, everyone needs to be sure to observe proper net discipline on the repeater, and talkaround side conversations should be kept to an absolute minimum.

mented on how well-supported (and well-catered) this event was. Besides feeding a ride-through lunch to a population equivalent to a small city, the Tour also provides bottled water, snacks, sports drinks, sodas, ice, first aid, mechanics, and, for riders who cannot finish the course, transportation to the finish line in "sag buses." There is actually a whole convoy at the trailing end of the ride, including the buses, trucks to haul disabled bicycles, and a posse of bike marshals to keep an eye on the riders at the very back of the pack.

Later Steve observed that "95 percent of the work of running an event like this

30,000 bicycles riding along a 47-mile course in New York City guarantees at least a few breakdowns—enough to keep a posse of bicycle mechanics busy all day long. (AB2MH photo)

is done for the slowest 5 percent of the riders." This was not meant as an insult to those riders. Indeed, for many of the slowest participants the Tour is the challenge of a lifetime, and completing it is far sweeter for them than it is for the athletes on racing bikes at the front of the pack. The Tour is not a race, so there is no penalty for finishing last. Those at the back of the pack, though, are much closer to their personal limits than the leaders or even the average cyclists, so their margin for error is smaller. This year two riders suffered fatal heart attacks, despite nearly instantaneous responses by paramedics and EMTs posted along the route.

Later, as I thought about Steve's comment, I realized that it applies to nearly every activity that public-service hams support. Even more than the other support staff for an event or disaster response, we are there for the "slowest" 5 percent, the ones who, for whatever reason, are closest to their personal limits for survival. Whether at a short walkathon or an ultramarathon, the tail end of the group will be most dependent on a robust communications system. Whether an area is hit by a fire or a hurricane, those without large networks of friends and relatives or large balances in the bank will be most dependent on public disaster shelters and volunteer radio operators.

It is not always obvious who the slowest 5 percent will be. The father searching for his lost son, for example, got good—but embarrassing—news a short time later. Phil, KC2JXB, had found the son alive and well in Manhattan. It seems the boy had finished the ride and taken the ferry back to the starting point and was just waiting for his old man to catch up.

Notes

1. There were many amateur radio operators working this event, and it would be impossible to describe all of their contributions in one article. The team included AB2MH, K2VLA, KA2ABV, KA2WCB, KB2RTH, KB2WUS, KC2HZH, KC2JXB, KC2KFW, KC2MAC, KE2UN, KF2EO, N2BGR, N2GAB, N2NOV, N2UMC, N2YP, N2ZWT, N2ZYF, N3IMU, N2UIH, and W2BH.

2. Ham radio communication for the Five Boro Bike Tour was provided by members of the New York City Amateur Radio Emergency Communications Service (http://www.nyc-arecs.org). NYC-ARECS, an independent organization formed in 2003, is not affiliated with the American Radio Relay League's Amateur Radio Emergency Service (ARES). ■

From the concrete canyons of New York City, we move to the majestic peaks of the Appalachians, as hams in a very different setting provide communications for a bicycling challenge of a different sort — a 100-mile ride to the highest point east of the Mississippi.

The 29th Assault on Mt. Mitchell

Never a Humdrum Event

BY ELSIE L. FINKELSTEIN,* KA2CLX

It was May 22, 2004, and once again as it had been for over 20 years, Church Street in downtown Spartanburg, South Carolina appeared a palette of color. Some 1600 bicyclists made final preparations as they waited for the 6:30 AM stroke of the clock to begin their trek to the summit of Mt. Mitchell, the highest peak east of the Mississippi (6684 feet above sea level). The less hardy of the group would complete their journey at Marion, North Carolina, a distance of 72 miles, while 1000 would attempt the additional arduous miles to the top. This annual event, "The Assault on Mt. Mitchell," sponsored by the Freewheelers Bicycle Club, is not a race against time. For the cyclists it is a test of endurance, both physical and mental. For the ham radio operators who provide communications along the 102-mile route, it is a test of radio skills as well as endurance.

For the first time in four years I was not there to watch the beginning of the race. I was home preparing to drive to Marion to assist net control. In prior years I had provided communication for the director of the event, John Bryan. Being with John meant spending most of the time at the top of Mt. Mitchell. This time I decided I could not bear the thought of the weather at the top. I like John and we had fun, but for the three years I rode with him, the weather had been nasty. The first year was sunny on arrival and then deteriorated to six inches of hail on the windshield. The second year it snowed and sleeted. Last year was the worst—light rain, sustained winds of 35 miles per hour with gusts up to 50, and wind chill at freezing. It was too much for me. I shook and chattered like a rattletrap and left the top before noon.

I realized that I would be doing no good to John or the rest of the group if those conditions existed this year. I moved to South Carolina from upstate New York some 20 years ago and don't remember ever having weather as mean as it was last year at the top. Wouldn't you know? This year the weather was sunny and warm. I just couldn't take that chance, though.

Each year John had tried to have a bicycle repair truck and Sag Wagons to transport riders who couldn't make the full trip, but we did not know about them in time to find radio operators. This year we knew in advance, and special arrangements were made to have a radio operator in each of two Sag Wagons and one in the repair truck. Two operators—Carl Beck, N3EKW, and Randy Clair, KI4CQO—were new to the event, and the third was our Handi-Ham (physically challenged amateur radio operator) Chris Gross, KF4ZLD,[1] who was assigned to a water stop last year.

The three broke new ground, working with stunning professionalism while dashing up and down the mountain with their drivers, picking up bikes and cyclists who decided to quit the ride for whatever reason, as well as moving water and supplies from one water stop to another. From the log, it was plain to see that these positions were necessary to meet the safety and physical needs of the riders. In prior years it became necessary to have the water-stop stations flag down the trucks and give them messages, if and when the trucks came by.

The net control station for the "assault" on Mt. Mitchell is located in Marion, North Carolina, the end of the line for those riders who aren't up to climbing the mountain and the "base" for those who are—72 miles from the start in Spartanburg, SC. Pictured here, standing, are ham cyclist Joe Domaleski, KI4ASK, who had just finished the complete trek, and Mike Bonner, KI4AWC, assistant to race director John Bryan. Seated are net controls Craig Hall, KV4EE, center, and Art Patterson, KE4EAN, on the right. (Photo courtesy KI4ASK)

*114 Lori Circle, Spartanburg, SC 29303
e-mail: <ka2clx@bellsouth.net>

I had planned to get to Marion by 10 AM. While preparing to depart, I listened to net control. "Report rider down, Peachtree Road 9 miles from Start. Dispatch EMS." A few seconds later, "EMS on the way." That was the kind of situation for which we were prepared. The report came in from one of the "Motos," amateur operators riding motorcycles, who were among the volunteers. Although some of the Motos were from our club, they were with a group of Motos from several clubs who volunteer for public service events. They rode with the pack to keep the cyclists on course and, along with several law enforcement agencies, to help keep the roads clear. We later learned that the rider who fell may have had broken bones. It is not unusual for cyclists to have accidents at the initial stages of the ride. The group hadn't completely thinned out yet and the cyclists in the rear were shoving through the group. As they did, riders on the outside were forced onto the gravel shoulders of the country roads—alright for autos, but hazardous for two-wheel vehicles, including the Motos.

Twenty-five minutes later another rider was down. Fortunately for her, the Moto had a well-stocked first-aid kit in his pouch and was able to patch her up. She was picked up by a Sag Wagon and brought to Marion, where she could later get a bus back to Spartanburg.

Since Marion was the hub for the visitors as well as for the buses and trucks that would be needed to take all of the riders and bikes back to Spartanburg, net control was most effective stationed there. I should mention that the food concession was also located there.

Being in a matriarchal position in the club, I decided to be in Marion by 10 AM to help out net control. In order to do that I would have to leave my home by 8:30 AM. At about 8 AM I heard a figurative fire bell. "John has left some papers he needs at the auditorium. He needs to have someone get them and bring them to Marion."

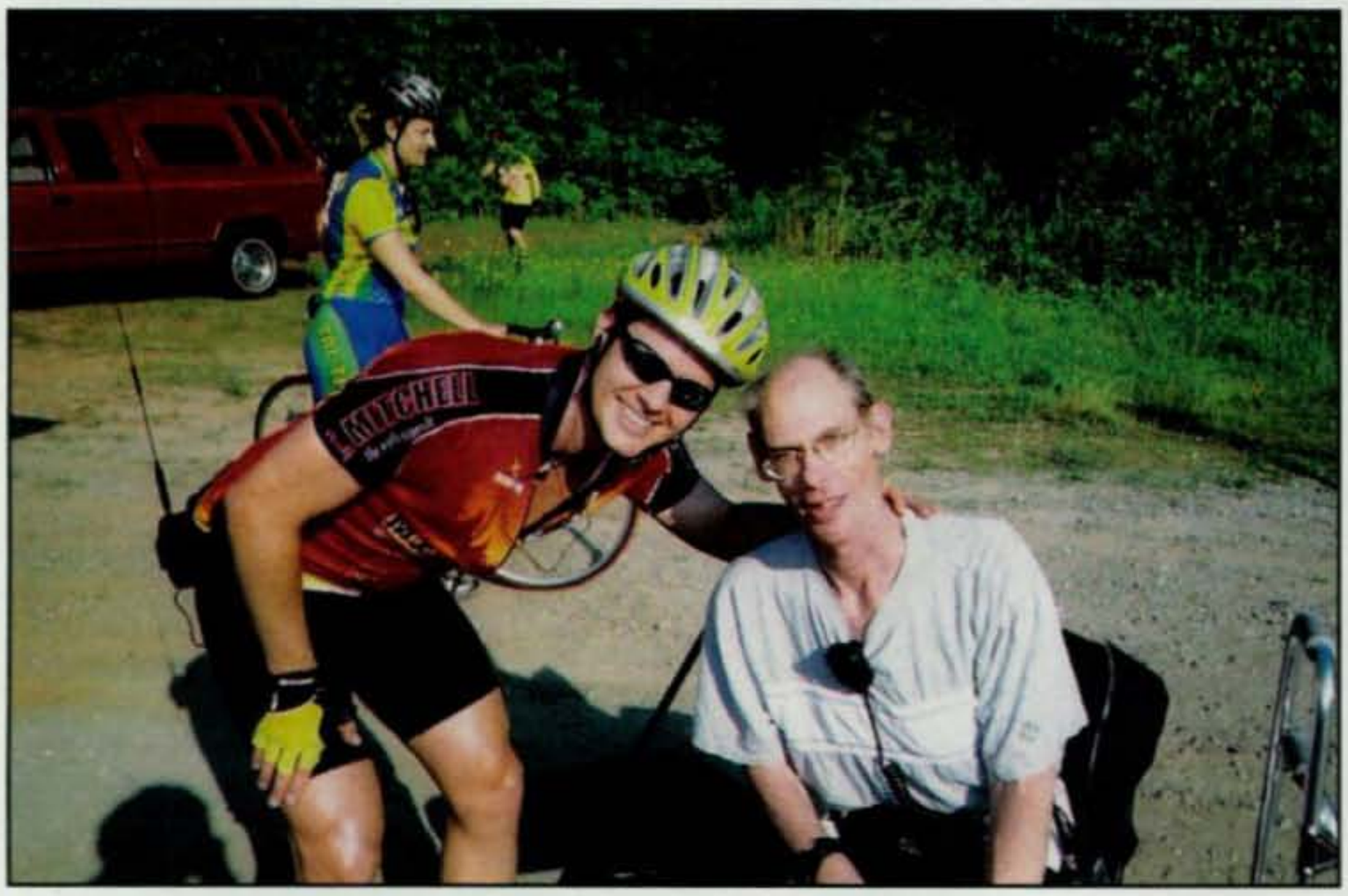
I was the only one left in Spartanburg who was also going to Marion. "That shouldn't take long, and I could still be in Marion by 10:30," I thought. I volunteered. Well, between finding someone to get the doors unlocked, rifling through boxes to get the proper papers, checking back via 2 meters, and learning that I needed more papers, and what not, I finally *started out* for Marion at 10:30 AM.

Most of the details of this story have been gleaned from the meticulous logs kept by the net control operators at Marion, Craig Hall, KV4EE, and Art Patterson, KE4EAN. Were it not for the log, I could not tell this story. While at home dashing around getting ready to leave, and in the car, I heard only snippets while "reading the mail" and nothing while wasting my time at the auditorium. Oh, and when I got to Marion carrying two large cartons of notebooks and records, John looked through them and told me they did not contain the papers he needed. Hey, my only task was to provide communications with my radio. Shuffling papers was not in my job description. Let that be a lesson to all.

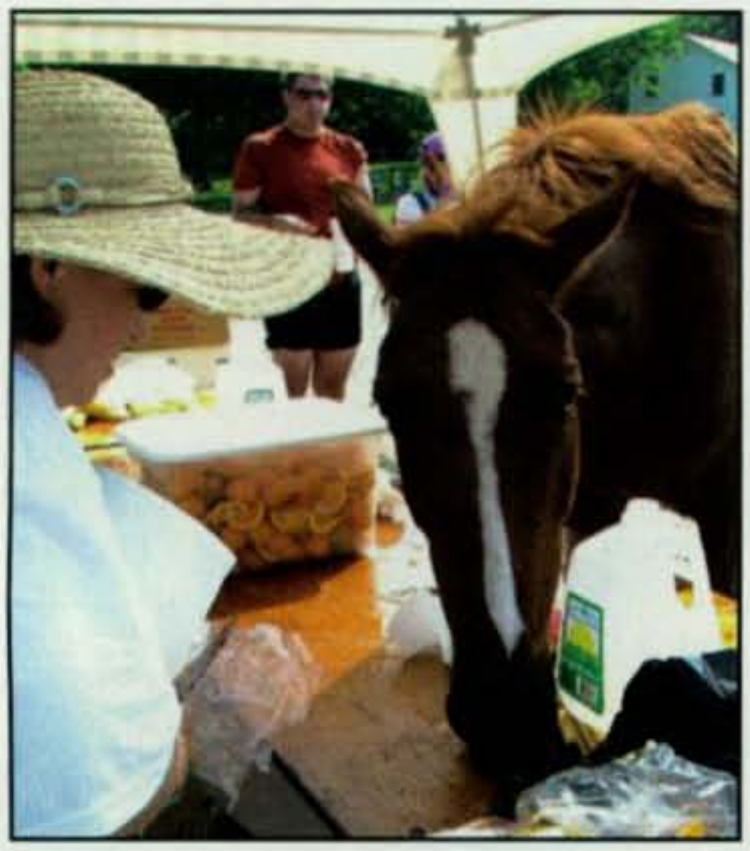
On the Course

The Sags had picked up four riders and their bikes before 9 AM. Then came the rush to help get food and water to the various stops that had somehow been missed or had run out of water. It was a very warm day for such a strenuous ride and the riders needed to keep hydrated.

There was one other unusual communicator in our midst who kept us apprised of events on the journey to the



Joe Domaleski, KI4ASK, with Chris Gross, KF4ZLD, who staffed one of the "Sag Wagons" and an unknown cyclist in the rear. Gross became a Silent Key last summer. (Photo courtesy KI4ASK)



Water station volunteer Susan Fierova watches as a friendly but hungry horse helps itself to some treats intended for the riders! Student volunteers from the local track team escorted the horse home and then ran back to the water station. (Photo courtesy Joe Fierova)

top. The night before the event, as we were holding our usual Friday night net and ragchew, firming up some of the arrangements for the "assault," we heard this unfamiliar check-in, "KI4ASK, Joe." When recognized, we discovered that Joe Domaleski, KI4ASK, was scheduled to cycle in the assault and planned to have his handi-talkie available. He offered to provide his eyes and ears to assist in keeping track of the ride from a participant's view. We knew that some of the riders had carried radios in the past, but this was the first time one had offered to be a part of the communications effort. Joe kept us aware of his location throughout his ride. You should have seen his face when he met us at Marion, having completed his ride to the summit: "I made it." That's what the assault is about—just making it to the top. The first rider came across the finish line at about 11:45 AM. Joe crossed the line at 3:20 PM and was proud of it.

From the time the first rider crossed the finish line until 6 PM the biggest concern was keeping track of the buses and trucks responsible for taking the nearly 1000 riders and their bikes back down the mountain to Marion and Spartanburg. Some may wonder why the riders don't simply get on their bikes and ride down. Well, that would cause a rather large traffic jam. The roads are narrow and to have some riding down while others are still riding up . . . just picture the bedlam. As a weather person might say, "conditions would be favorable" for a number of accidents.

As always, there was some comic relief. This occurred while I was about to leave the auditorium for Marion. As I listened to the chatter, Mike Thompson, KE4KMA, came on saying, "We've got a horse at Water Stop #2. He's enjoying the bananas and oatmeal cookies." A smile crossed my face. I could just picture this devilish creature with head held high and a twinkle in his eye trotting alongside the cyclists. Mike later told me he supposed the horse had seen this particular group of cyclists as his "pack" and decided to jump the fence and trot along with them. While the horse was busy picking banana peels from the trash pails, Mike got a strong rope, which he carried with him in his truck, and collared the horse. The horse appeared friendly and mild mannered, but Mike was worried it might be injured by some of the cars coming along the road. When a trooper drove by Mike asked if the trooper knew where the horse belonged. The trooper pointed down the road about two miles. Luckily, the young people who were handing out the food were part of a local track team. With the trooper leading the way, the youngsters led the horse home and raced back to the water stop to continue their volunteer work of providing for the cyclists.

I'll not bore you with the minute details of the log. Suffice it to say, there was plenty of communication among the ten water stops, the Sags, the head Moto, and net control, not to mention John and the top, about 32 operators in all. We started at 6 AM. Like dominoes, one by one the water stops closed down as the last riders cleared each location. At 6:29 PM the last cyclist completed the ride to the top. After clearing the course the Motos closed down. With the last bus and truck sent on their way to Spartanburg, where Fritz Nitsch, W4NTO, and Art, KE4EAN, were helping the Boy Scouts line up the bikes and bags for pickup by the cyclists before midnight, net control could finally close down. Picking up his equipment, Craig, KV4EE, could start home to his family. It had been a job well done by everyone. I had been everywhere . . . and been needed nowhere. ■

Note

1. Chris Gross, KF4ZLD, became a Silent Key on July 6, 2004. This story is dedicated to his memory.

For More Information

For further information about the roles played by amateur radio and the Motos, the following might be helpful:

Johnson, Howard D., W4CCP, "26th Assault on Mt.Mitchell," *Wing World;* Part 1, March 2002, pp. 69–73; Part 2, April 2002, pp. 48–56.

Finkelstein,Elsie L., KA2CLX. "The 2002 Bicycle Assault on Mt. Mitchell," *QST,* March 2003, pp. 77–79.

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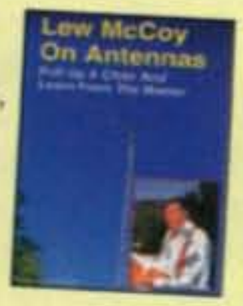
by Lew McCoy, W1ICP



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BY BOB JOSUWEIT,* WA3PZO

Hamming It Up for the Troops

In a small town in western Pennsylvania a daughter knelt at the grave of her father, a surgeon in the Union Army. Nearby a woman knelt at the grave of her son, a private who died on the last day of the battle of Gettysburg. Both were honoring their fallen soldiers, their heroes. On May 5, 1868, just four years later, Gen. John A. Logan, then commander-in-chief of the Grand Army of the Republic, issued an order naming May 30, 1868 as a day "for the purpose of strewing with flowers or otherwise decorating the graves of comrades who died in defense of their country." He signed the order "with the hope that it will be kept up from year to year." This month we step back from the calamity of major disasters to say thanks by "hamming it up" for the troops.

Moment to Remember

On May 21 amateur radio operators from New York will provide critical communication, as needed, to hook up national cemeteries some 41 miles apart. A bugler at the Woodlawn National Cemetery in Elmira, NY will play taps. A second bugler will follow by playing a taps echo. This will be followed by a third, fourth, fifth. . . . The echo will continue toward a second national cemetery located at the Bath, NY VA Center, traveling at a rate of 60 miles per hour. This will require a minimum of 410 buglers playing taps between the two national cemeteries, and the assistance of amateur radio operators along the route to coordinate the staging of players and support staff. According to Denis Uminski, N2HP, ARES®, MARS, and Civil Air Patrol members will be involved in this event. Each group will have a net control operator at the main tactical operation center. Several other operation centers will be staged along the route. Amateurs will provide mobile communications along the hilly route, and the Civil Air Patrol will provide slow-scan TV pictures from an aircraft. The Echotaps website is <http://www.echotaps.org/>.

*c/o CQ magazine
e-mail: <wa3pzo@cq-amateur-radio.com>

Kids have an opportunity to learn geography and talk to hams in Kentucky thanks to Emery McClendon, KB9IBW. (Photo courtesy of KB9IBW)

Armed Forces Day

The Army, Air Force, Navy, Marine Corps, and Coast Guard are co-sponsoring the annual military/amateur radio communications tests in celebration of the 55th anniversary of Armed Forces Day (AFD). Although the actual Armed Forces Day will be celebrated on Saturday, May 21, 2005, the Armed Forces Day Military/Amateur Crossband Communications Test will be conducted one week earlier on May 14 so that it will not conflict with the Dayton Hamvention® (May 20–22), which is on the same weekend as the actual Armed Forces Day.

The annual celebration features traditional military to amateur cross-band communications SSB voice test and the Secretary of Defense message-receiving test. These tests give amateur radio operators and shortwave listeners an opportunity to demonstrate their individual technical skills and receive recognition from the Secretary of Defense and/or the appropriate military radio station for their proven expertise.

QSL cards will be provided to those making contact with the military stations. Special commemorative certificates will be awarded to anyone who receives and copies the digital Armed Forces Day message from the Secretary of Defense. A complete list of frequencies can be found on the CQ website <www.cq-amateur-radio.com>. Look under Q&A and Public Service.

Ham It Up for the Troops

On May 28 ham radio operators and amateur radio clubs are invited to "Ham It Up for the Troops" during the second annual Amateur Radio Military Appreciation Day (ARMAD). According to ARMAD founder Emery McClendon, KB9IBW, the event will be a time to thank active-duty, veteran, and retired military people for their service and sacrifices to the nation. McClendon is a former Air Force sergeant.

McClendon says this is a joint effort of hams around the country to set up stations at public locations such as shopping centers, parks, VA hospitals, and sporting events to express verbal positive support for members of the military, veterans, reserve members, National Guard personnel, and military support groups. He says, "Many of us have

Local reporter Kevin Kilbane and his family have a chance to talk to a ham in Kuwait. (Photo courtesy of KB9IBW)

friends, relatives, and neighbors who are active duty, and past members of the Armed Forces. ARMAD gives us the chance to support one another, and to express our thanks and appreciation to those who sacrifice and serve in the Armed Forces."

McClendon is encouraging amateur radio clubs and operators to set up on or near military bases, veterans' facilities, and local public places so that the positive message of support can be expressed and heard worldwide. In early March amateur radio stations were scheduled to be set up in ten states. He said operators in several foreign countries—including Australia, Greece, Kuwait, and England—also are slated to participate, and members of the Iraq Amateur Radio Club are expected to join in as well.

"We expect many others, including ships and military hospitals, as we approach the event date," he said. "Last year we had more than 25 different groups in the U.S. and about 15 foreign countries participating in ARMAD." McClendon said he expects participation to triple for the 2005 event. "We've had great response just by word of mouth. With publicity, we will grow and reach many more troops and communities."

Teaching Youth

The event will give youth a chance to learn about the sacrifices present and past generations have made to keep us free and America strong. McClendon says it is important that we remind future generations of what price veterans paid for our country.

This event will give children an opportunity to develop communication skills and knowledge of geography, and will allow them to meet new friends worldwide. ARMAD has participated in several large public events, including the Rally for America in Fort Wayne, Indiana.

McClendon said he received several heartwarming comments during last year's event at Fort Wayne Memorial Stadium. Local government officials read proclamations of support for the military during a small ceremony. "After hearing these local officials speak over the radio," McClendon said, "some of our military members remarked that they were pleased and felt privileged that government officials would take time away from families for such a cause. "Many kind words were exchanged from all over the world to American and coalition troops. One man from Kuwait joined us on the air to say thanks to America for freeing his country from Saddam Hussein. His statements moved the crowd in the stadium."

For the latest information on Amateur Radio Military Appreciation Day go to: <http://www.freewebs.com/kb9ibw>.

Training

Next month tuition reimbursement will end for the ARRL Emergency Communications courses. According to the ARRL some 8000 radio amateurs will

have taken advantage of the tuition subsidies and received training in amateur radio emergency communication. The ARRL says there are no further grant-sponsored reimbursements for Amateur Radio Emergency Communications courses on the horizon.

One course that should be on everyone's checklist is the Department of Homeland Security's on-line National Incident Management System Introductory course. This independent study course explains the purpose, principles, key components, and benefits of NIMS. The NIMS Integration Center encourages all emergency personnel with a direct role in emergency preparedness, incident management, or response to take the NIMS course by October 1, 2005. It is offered free of charge through the Emergency Management Institute at <http://training.fema.gov/EMIWeb/IS/crslist.asp>. The course is called "National Incident Management System, An Introduction – IS 700" and is recommended for emergency management response personnel. The NIMS introductory course very likely will be required in FY'06 for state, territorial, tribal, and local personnel who have emergency assignments at any level of government. Full NIMS compliance is required by September 30, 2006.

A Review

With tuition reimbursement coming to an end, amateur radio operators may be looking for a compact training manual that will help get them started in emergency communications. In addition, the advanced user may want to learn more about alternate power sources. *The ARRL Emergency Communications Handbook* will provide a good resource.

The book covers amateur radio's relationship with served agencies, nets, and operating guidelines. It helps you be better prepared when you are activated at a moment's notice. Do you have the right equipment in your go kit? Are you prepared to take care of yourself when in the field? Remember that several hams were injured during last year's hurricanes in Florida.

There's a discussion of hazardous materials and what to expect in a large-scale disaster. Message handling and other communications methods are covered. Overall the book is a good reference source but should only be considered a part of your emergency communications library. It provides a foundation, but does not replace the in-person meetings with members of your local emergency communications group, participating in drills, and reading about the response to other disasters around the world.

India's Minister of Communications & Information Technology Shri Dayanidhi Maran shows off a QSL card to be sent in thanks for amateur radio communications during the tsunami disaster. (Photo courtesy Government of India Press Bureau)

Training On The Air

In the office many of us participate in conference calls which include viewing a common online presentation. This concept has been moved to the amateur radio ranks. The North Carolina ARES® recently presented a special information net on the geohazards of the Carolinas. This presentation was prepared by Bob Conder, K4RLC, and is offered as part of an ongoing ARES training program in North Carolina. The presentation and script are available for download in several formats. The audio for the presentation was carried over the Tar Heel Emergency Net 3923 kHz, the Piedmont Coastal Repeater Network (PCRN), and the Coastal Linking Network (Eastern NC), as well as IRLP and Echolink.

Indiana State Senator Dennis Kruse,R, chats with Emery, KB9IBW, and Fred, KC9EZP. They were able to make a contact with the Cherry Pointe Naval Station in North Carolina. (Photo courtesy of KB9IBW)

Tsunami Hams Honored

The government of India recently recognized the yeoman services rendered by various organizations in the tsunami-affected areas. Minister of Communications & Information Technology Shri Dayanidhi Maran voiced his appreciation of the exemplary work of the National Institute of Amateur Radio (NIAR), Hyderabad in the tsunami-affected areas, particularly on the islands of Andaman & Nicobar. Shri Maran unveiled a QSL card that was to be sent as a "thanksgiving letter to all

Amateur Radio Aids Rescue

Hiking in the rugged mountains of Chugach State Park near Anchorage, Alaska, two hikers went from having a fun day in the mountains to being rescued from a fall. One of the hikers, Jesse Jones, KL1RK, slipped and fell more than 200 feet down a steep ravine, losing his snow shoes in the process. Jones was trapped between a low overhang on one side and a swiftly moving winter stream on the other. Jim Wiley, KL7CC, told *CQ* that Jones's precarious position was made worse by the fact that his descent could have continued into the water at any moment, and since snow depth exceeded 10 feet, the loss of his snow shoes meant he could not walk out. Since the outside air temperature at that time was near –10°F, falling into the water would likely have meant immediate hypothermia followed by death shortly thereafter.

Mayday from the Mountain!

Jones had his 2-meter handheld transceiver with him. Given his precarious position, the only repeater he could reach was some 40 miles away. The WL7CVG repeater is on top of a 4400-foot mountain. Shortly after 4 PM a weak Mayday was heard on the repeater. Wiley, a control operator on the repeater, called 911 and was placed in contact with the local fire department rescue coordinator. Jim was able to pass on Jesse's messages to the rescue coordinator, including coordinates from a GPS unit that Jesse was carrying. The rescue coordinator's office called out the local mountain rescue group and the Alaska State Troopers, who immediately left for the scene with a search team and snow machines.

Wiley said the rescue team met with Jesse's climbing partner, who had been able to hike out to a place where he could assist the rescue team. Jesse was able to keep in touch via 2 meters to tell the rescuers his condition, including the fact that he was uninjured, but very cold. His extremities were becoming numb after being forced to remain in one position in the sub-zero conditions. Complicating the issue was the fact that Jesse's hands were so cold he was having trouble operating the PTT button. On top of all of this, his signal was very marginal, sometimes fading out altogether.

Two Hours and Counting

It took about two hours for the rescue teams to reach Jones. The rescue team knew they would need additional help getting Jones out of his location. An Air National Guard helicopter dropped additional rescuers to a nearby location. By 10 PM they were able to bring Jones out of the canyon and transport him to a hospital for observation. He was released just before midnight, cold and a bit hungry, but otherwise almost as good as new.

Just last fall, the Alaska Mountain Rescue Group and the American Red Cross of Alaska received a large grant for communications equipment from the Anchorage Amateur Radio Club. Little did any of the club members know that this same equipment would have a part in the rescue of one of their own.

the 36,000 ham operators worldwide who were in contact and were associated with the relief services after the tsunami disaster." The card has information about Indian resources and technical skills and institutions such as NIAR, which provided support during natural disasters.

The National Institute of Amateur Radio was created in 1983. Over the past 20 years members have assisted in many disasters, including the Orissa Super Cyclone in 1999 and the Gujarat Earthquake 2001. NIAR has augmented its infrastructure with a state-of-the-art communications system and has set up ten new centers to help with disaster management in coordination with the Ministry of Home Affairs and the associated state units. These centers will also train a large number of interested persons to become licensed ham radio operators.

In addition, NIAR Andamans DXpedition team leader Bharathi Prasad, VU2RBI, is being honored this month with the Dayton Hamvention®'s 2005 Special Achievement Award.

With Thanks...

Field Day is coming up next month. As we stated in the January issue, just participating in Field Day is not enough. Make plans now to learn about another form of communications, how to tune the Field Day radios, or how to pass a message for bonus points.

This month we want to thank Emery McClendon, KB9IBW, and Jim Wiley, KL7CC, for supplying information. Do you have a story to tell of how your group provided public service? Drop us a note. Also check out the Q&A section of the CQ web page. We'll provide additional info on the Armed Forces Day frequencies as well as links to other sites mentioned in this article. Until next time . . .

73, Bob, WA3PZO

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A1712, 12/17m Kit	$54
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440-470-5W/420-450-11	$139/95
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GP15, 6m/2m/70cm Vertical	$159
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EXP14/QK710	$519/159
LJ103BA/105CA/155CA	$145/259/379
LJ203BA/204BA/205BA	$289/479/679
TH3MK4/TH3JRS	$399/319
TH5MK2/TH2MK3	$849/319
TH11DX/TH7DX	$995/749
VB64DX/VB66DX	$139/249

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4-40'/50'/60'	$539/769/1089
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X200A, 2m/70cm Vertical	$129
X500HNA/X700HNA	$229/369
X510MA/510NA	$189/189
X50A/V2000A	$99/149
CR627B/SG2000HD	$99/79
SG7500NMO/SG7900A	$75/112

MORE DIAMOND ANTENNAS IN STOCK.

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269, Antenna Analyzer	$299
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949E, Antenna Tuner	$139
969, Antenna Tuner	$169
986, Antenna Tuner	$289
989C, Antenna Tuner	$309
1798, 80--2m Vertical	$249
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1/2"x12"EE / EJ Turnbuckle	$21/22
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Challenger DX	$289
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Eagle Guy Kit	$29
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Voyager DX	$409
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Voyager Guy Kit	$45

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9112	12m	9120	20m	9175	75m

All handle 600W, 7' approximate length, 2:1 typical VSWR .$24.95

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Yaesu G-800SA / G-800DXA	$329/409
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Yaesu G-2800SDX	$1089
Yaesu G-550 / G-5500	$299/599

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R81/82/84	$.29/ft./.45/ft./.89/ft.

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HPTG2100I	$.59/ft
PLP2738 Big Grip (2100)	$6.00
HPTG4000I	$.89/ft
PLP2739 Big Grip (4000)	$8.50
HPTG6700I	$1.29/ft
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HPTG11200	$1.89/ft
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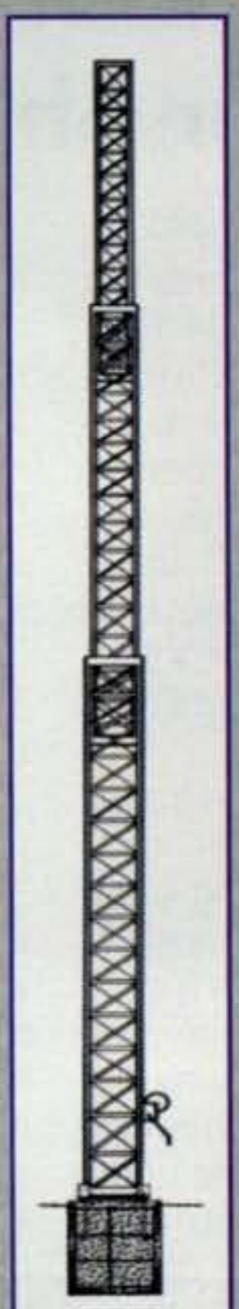
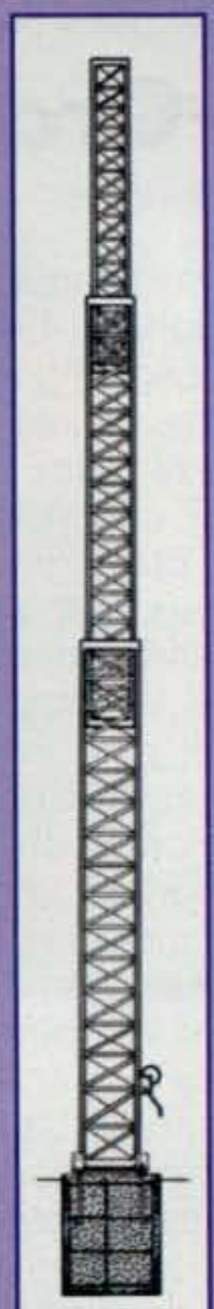


TX SERIES HEAVY DUTY CRANK-UP TOWERS					
TOWER MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	LIST PRICE	SALE PRICE
TX-438	38'	21'6"	355	$1,523	$1,379
TX-455	55'	22'	670	$2,107	$1,899
TX-472	72'	22'8"	1040	$3,462	$3,139
TX-472MDP	72'	22'8"	1210	$5,571	$5,049
TX-489MDPL	89'	23'4"	1800	$9,034	$8,239



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• Heavy duty, handles 44.7 square feet of antenna load at 50 MPH, 35 square feet at 70 MPH.

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• MDPL models include motor drive

• Options include coax arms, raising fixtures, masts, motor drives, and more!

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HDX SERIES HEAVY DUTY CRANK-UP TOWERS					
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HDX-538	38'	21'6"	600	$1,807	$1,649
HDX-555	55'	22'	870	$3,162	$2,889
HDX-572MDPL	72'	22'8"	1600	$8,281	$7,549
HDX-589MDPL	89'	23'8"	2440	$10,841	$9,899
HDX-689MDPL	89'	23'8"	3450	$20,943	$19,129
HDX-5106MDPL	106'	24'8"	3700	$22,791	$20,799

MA SERIES CRANK-UP MASTS

• Handles up to 22 square feet of antenna load. (See chart below)

• MDP models include motor drive.

• All models supllied with anchor bolts, load-actuated hand winch, and house bracket.

• Options include coax arms, raising fixtures, motor drives, self-supporting and rotator bases, remote control panel, and more!

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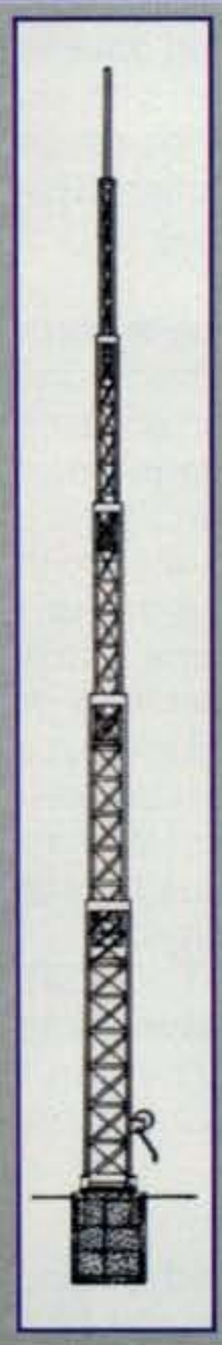
MA SERIES CRANK-UP MASTS							
MAST MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	50 MPH (sq. ft.)	70 MPH (sq. ft.)	LIST PRICE	SALE PRICE
MA-40	40'	21'6"	242	16.5	6.8	$1,209	$1,099
MA-550	55'	22'1"	435	22	9	$1,875	$1,699
MA-550MDP	55'	22'1"	620	22	9	$3,584	$3,249
MA-770	71'	22'10"	645	15.5	5.5	$3,091	$2,799
MA-770MDP	71'	22'10"	830	15.5	5.5	$4,890	$4,449
MA-850MDP	85'	23'6"	1128	15.3	6.3	$6,591	$5,999



TMM SERIES COMPACT CRANK-UP TOWERS

• Handles 20 square feet of antenna load at 50 MPH, 8 square feet at 70 MPH.

• Compact design is great for areas with tower restrictions, or where a less intrusive installation is desirable.

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• Options include coax arms, raising fixtures, motor drives, thrust bearing, remote control panel, and more!

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TMM SERIES COMPACT CRANK-UP TOWERS					
TOWER MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	LIST PRICE	SALE PRICE
TMM-433SS	33'	11'4"	315	$1,626	$1,479
TMM-433HD	33'	11'4"	400	$1,970	$1,789
TMM-541SS	41'	12'	430	$2,135	$1,939

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BY FREDERICK O. MAIA,* W5YI

ARRL: FCC's Broadband over Power Lines (BPL) Order Should Be Canceled

The American Radio Relay League wants the FCC to cancel its October 14, 2004 BPL order. In a strongly worded 70-page Petition for Reconsideration the League maintains that the new Part 15 guidelines on how utility companies should roll out BPL across HF and VHF spectrum represent "a classic case of prejudgment" and a "bad method" of internet access. Acceptable methods that do not cause interference are "cable modem, satellite, DSL, Wi-Fi, Wi-Max, and fiber-optic cable," the ARRL noted.

Broadband over Power Lines (BPL) is the transmission of high-speed communications services, including internet access, over the existing electric power infrastructure. The wires that carry electricity possess the capacity to also serve as a conduit for data signals.

By bundling radio-frequency (RF) energy on the same line with the electric current that is already carried, data can be transmitted without the need for a separate line. Since the electric current, which is used to provide power to the end users, and RF energy signals carrying the data operate at different frequencies (with electric current traveling at lower frequencies and data at higher levels), the two don't interfere with one another. Technological advances in the past several years have enabled electric companies to place devices along existing wires and poles to provide broadband services.

Known as Access BPL, the systems require a connection from the internet backbone at a power substation, repeaters (in some cases) and couplers along the medium-voltage power lines that transmit the data signals, and then a final converter that transfers the signal from the medium-voltage to the low-voltage lines that go into homes. Once inside the home, the signal can be accessed with a BPL modem at any electrical outlet.

Last fall the FCC approved the set of rules with the objective of limiting BPL interference to other radio frequency devices such as amateur radio. However, the ARRL continues to protest rollouts of BPL, arguing the technology causes significant interference to ham radios. The ARRL contends that a by-product of BPL is severe interference to sensitive HF receivers, since the unshielded power lines act as radiating antennas.

FCC Prejudgment?

Citing information it received stating that FCC Chairman Powell had promised beforehand to adopt the proposed rules, in the Petition for Reconsideration the ARRL charges, "It is readily apparent that the Commission long ago made up its mind that it was going to permit BPL without substantial regulation no matter what the effect of this flawed application of old technology is on licensed radio services."

The League accused the Commission of only being concerned with achieving what Powell said was a "strategic goal of this Commission" to "promote the availability of broadband to all Americans irrespective of platform." The ARRL re-emphasized that BPL "has, time and again, been demonstrated to be incompatible with existing, licensed uses of the limited and unique High-Frequency (HF) spectrum."

The League said Powell's assertion that FCC testing of BPL systems showed that the new rules would "protect existing governmental uses, amateur radio operators, and other licensees from interference" was pure "nonsense." Furthermore, information received by the ARRL under the Freedom of Information Act showed that there was "...very little [FCC] testing," and even then the results were only selectively released. According to the ARRL, "The FCC field test result wording seems to point to an already 'predetermined outcome.'"

In short, says the League, the FCC "deliberately covered up the bad [interference] news about BPL" that it long had in its possession. "The Commission wanted nothing to contradict its enthusiasm about BPL..." and saw to it that the "fundamental incompatibility between BPL and incumbent radio services in the HF spectrum was suppressed, ignored, or discredited...."

"What little testing has been done by the Commission and released (late) to the public is not at all supportive of the conclusion that BPL has 'little interference potential,' or that the interference potential can be easily mitigated or eliminated, by notching or otherwise."

In short, the ARRL charges the Commission with deliberately authorizing "a spectrum pollution source" that has proven to be incompatible with existing licensed HF uses and with "sweeping all interference complaints under the rug." The League believes that this "suppression of evidence" requires that the Commission take "a fresh look at BPL [with an accompanying] fair evaluation of its incompatibility with licensed radio services (including public safety), and the need to either prohibit BPL outright or substantially revise the ineffective and purely cosmetic rules adopted...."

Cheerleading or Rule Breaking?

The ARRL was particularly annoyed with Powell's role as a "cheerleader" for BPL and argued that he should have been precluded from voting on the issue. The League pointed out that he attended a BPL provider's demonstration during the consideration phase of the proceeding in violation of the

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e-mail: <w5yi@cq-amateur-radio.com>

FCC's own ex parte rules but "refused an invitation to witness a demonstration by radio amateurs of the interference potential of BPL...." The details of the allegedly illegal presentation were included as Exhibit A of the petition. "The Chairman tainted this proceeding by participating in that illegal ex parte presentation," the ARRL stated. "The decision should be vacated and reconsidered after further input...."

The ARRL noted that the Commission imposed certain obligations on BPL providers relative to interference mitigation or resolution with respect to government and public safety facilities. "It failed, however, to apply those same obligations to interference incidents involving Amateur Radio stations. Amateur stations are referred to as a mere hobby service, and therefore treated as though interference to that one service is not of any consequence."

The League reminded the FCC that "Congress has repeatedly acknowledged that Amateur Radio is far more than just a 'hobby'...." Public Law 103-408 approved in 1994 commends radio amateurs for their contributions to technology and emergency communications in times of disaster. "It urges the Commission to continue and enhance the development of the Amateur Radio Service ... and holds that reasonable accommodation should be made for the effective operation of Amateur Radio from residences, private vehicles, and public areas," and that "regulation at all levels of government should facilitate and encourage amateur radio operation as a public benefit."

The League said that there can be no doubt that BPL has a very substantial interference potential. "The mitigation techniques available and relied upon by the Commission are neither effective nor, in most cases, even applicable to BPL interference to Amateur Radio stations." Furthermore, BPL operators are not required to meet any objective interference resolution benchmarks or timeliness relative to interference complaints filed by licensees in the Amateur Service.

Although the ARRL previously submitted extensive technical exhibits showing substantial interference from BPL in its formal comments, it says those studies were ignored. "The Commission concluded prematurely in the NPRM [and also in the final Order] that any interference to licensed services would be 'minimal' but offered absolutely no evidence that could allow the FCC to reach that conclusion." The ARRL submitted another 58 pages of interference data along with its Petition for Reconsideration.

"The Commission's conclusions regarding interference potential of BPL are both logically inconsistent and consist entirely of summary, bare, terse conclusions without any specific analysis at all of the extensive engineering studies submitted by ARRL and others in this proceeding."

"Chilling" Effect

The ARRL noted that amateur radio operators are warned in the Order not to submit "frivolous" complaints of interference from BPL. "If the Commission uses its resources to investigate an interference complaint found to be frivolous, it will 'impose appropriate sanctions' for abuse of its administrative process." This warning is clearly intended to "chill" interference complaints from licensed radio amateurs," the ARRL said, "who will be reluctant to complain of interference out of concern for sanctions from the Commission." The League also said that it is unclear

what constitutes a "frivolous" interference complaint.

The adopted procedure for interference resolution, says the League, is first to require the radio amateur to contact the BPL provider and "beg for resolution." If that does not resolve the interference, then the complainant can contact the Commission for intervention. "No intervention is promised or assured," the ARRL said. The FCC's Enforcement Bureau and the Office of Engineering and Technology will then "review the complaint" and "take appropriate action." What action, and when it will be taken, is not stated. "In ARRL's experience, this takes many, many months, if indeed any response is forthcoming."

The ARRL's experience to date has confirmed that "the Commission cannot be relied on to address the interference cases that require its intervention." There have been many instances to date of complete inaction in *handling* BPL complaints filed concerning test sites. "If the Commission has even visited these sites, it has not contacted the complaining radio amateurs in the area, nor communicated with them."

At press time there had been no response from the FCC to the ARRL's Petition for Reconsideration.

73, Fred, W5YI

Washington Think-Tank Ponders Future of BPL

Says 2005 Could be Breakthrough Year for Broadband over Power Lines

In a white paper report, an independent Washington, DC research group called the New Millennium Research Council (NMRC) said that BPL technology may be "primed for real growth in 2005 and beyond." It said BPL could be the "third wire" (after cable modems and DSL) into the home "if technical and economic challenges are overcome."

Entitled "Powering the Broadband Market in 2005 and Beyond," the NMRC white paper asks: "Is 2005 the year of BPL? Today, electric utilities across the country are deploying the necessary technology to provide broadband and other advanced communications services, such as Voice over Internet Protocol (VoIP), via the power lines that connect to virtually every home and business. Many industry watchers and representatives now believe BPL can dramatically change the landscape of the broadband market, offering new forms of competition and delivering high quality service to remote areas."

The NMRC has compiled a comprehensive picture of the BPL industry to provide a basis for discussion among industry experts and other interested observers. We suggest you read the full text of the NMRC report, which is available online at: <http://www.newmillenniumresearch.org/archive/bpl_report022405.pdf>.

According to the group's February press conference and subsequent press release, the New Millennium Research Council is composed of a network of policy, legal, academic, and research experts who develop workable, real-world solutions to the issues and challenges confronting telecommunications policymakers without taking sides. We have reviewed NMRC's blue-ribbon panel of scholars and experts and it is indeed very impressive. It includes MBAs from technology companies; university electrical engineering, finance, and law professors; several technology research directors; public interest and consumer law attorneys; FCC legal advisors; PhD economists; several state public service commissioners; communications engineers; a former FCC General Counsel, and even an ex-FCC Commissioner now in private practice.

The following are some BPL assertions and statements made by the NMRC:

• There are a number of experts who suggest that this could be the time the technology begins its emergence as a viable competitor in the broadband market.

• During the past two years, the commercial and media perspectives on BPL in the United States have evolved from categorizing the technology as "almost ready" to "really here." ...It's estimated that more than 250,000 U.S. households already can choose BPL service.

• Now that millions of Americans are abandoning their traditional phone lines for wireless cell phones and cable for satellite TV, it may mean that the electricity coming into your home will be the last wire.

• While BPL has the potential to serve 13 million U.S. households in the next three to five years, interference problems and a reluctance from many electric companies to offer new services may slow its development.

• A range of questions still remain: What is the future of this technology? Is it a viable entrant into the broadband sphere? Can BPL generate profits and return on investment? Does the existing ubiquitous power-line infrastructure provide a suitable platform for ensuring broadband access to all Americans? Have interference and other technical issues been addressed? Is 2005 the year of BPL? There are a number of signs that suggest this could be the time the technology begins its emergence as a viable competitor in the broadband market.

• A handful of BPL trials in Europe and elsewhere have been shut down because of interference problems. While the FCC has set down rules about interference, those rules have not yet been challenged in the real world. Interference is "the real wild card."

• The FCC cited tests done by its own engineers, the National Telecommunications and Information Administration (NTIA), and others that indicated such interference was only detected within close proximity of approximately 150 meters from the power lines. The FCC concluded that the importance of promoting greater broadband deployment and competition outweighed the limited potential of interference from BPL.

• Some BPL companies have the capacity to "notch" out frequencies used by amateur radio, eliminating much of the interference problem. This technique involves altering BPL transmissions to reduce the emissions in a certain frequency band. In its order, the FCC specified that "notching" was a suitable remedy should interference occur. If a shortwave radio user indicates that a BPL system's operations are interfering with a licensed amateur radio transmission, the FCC will require the BPL provider to "notch" or reduce its emissions in that frequency by between 10 and 20 decibels. The FCC believes such reductions in "noise" will mitigate any interference problems for amateur radio. If the notching is unsuccessful, the FCC can then require the BPL provider to resolve the interference using other methods, or, in extreme cases, to cease operations in that specific area.

• While the interference question should not be overlooked, most experts outside of the amateur radio community believe the FCC has established a set of rules that will mitigate the problem. Continuing technological advances may hopefully further erode these concerns.

• States play an important role in governing BPL. Most regulation of the electric industry occurs at the state level. It remains unclear how a communications service offered over an electric network will be regulated by each of the 50 states. As states decide issues related to BPL, they may be at odds with federal mandates.

• Consumers in the various BPL deployments across the nation on average are paying $30 per month for BPL services. This price is in line with average costs for DSL and cable modem services.

• BPL experts expect that next-generation technology will allow up to 100 Mbps transmissions over the medium-voltage wires, which translates to between 10 and 30 Mbps available to the end user.

• Fiber is seen as the "coming technology," offering extremely high-speed services greater than all other broadband forms, including BPL, as well as the capacity for bundled voice, video, and data services. But deploying fiber to the home requires the building of an almost entirely new network which would cost billions.

60 Great Things About Ham Radio

In celebration of *CQ*'s 60th anniversary in 2005, we've come up with 60 great things about ham radio which we'll bring you each month, five at a time. We're sure you'll have more great things that we haven't thought of, so when we're all done, we'd love to compare our list with yours.—*W2VU*

This month, we'll focus on some of the practical benefits ham radio offers that often aren't included in the "Why You Should Be a Ham" brochures:

21. A good way to get driving directions when visiting someplace new — If you're on the road and not sure where you're going, then getting on the local repeater can be as good as or better than your fancy little GPS doohickey. GPS doohickeys still occasionally tell you to drive through a field, and more than once, I've had a local ham say, "I'm right near you and heading in that direction. Meet me at the next exit and I'll lead you there." You get where you're going and make a new friend at the same time.

22. A good way to find the best places to eat when visiting someplace new — If there's one things most hams love to do more than talk, it's eat. So you can pretty much depend on getting good advice about places to eat from local hams. I can honestly say I've never been steered wrong, have often discovered some delightful out-of-the-way places, and occasionally even found myself with company for lunch or dinner (or invited to someone's house).

23. A good way to keep in touch with faraway friends and relatives — This works best if both of you are hams. You can set up skeds (schedules, for the uninitiated) and meet on the air. I remember a former boss of mine used to meet every Saturday afternoon on the air with a group of old friends who were literally scattered all over the world. Even an unlimited long-distance plan won't let you do that.

24. A good way to practice a foreign language — Most public school "world language" courses focus on reading and writing the language of your choice, rather than teaching you to actually speak the language and carry on more than a very basic conversation. Ham radio can put you in contact with native speakers of all major languages, and I can't imagine much of anyone who wouldn't enjoy having you speak to them in *their* language instead of yours (even if you need a *lot* of practice).

25. A good way to keep tabs on elderly/infirm people — As our population ages, ham radio is becoming a more important tool in checking up on older people living alone, or those with chronic illnesses or mobility impairments. We've heard many stories of hams going or sending someone to check on a "regular" on their net or repeater who doesn't show up when expected, finding that the person is ill or injured, and getting them help that might have taken hours or days to call, if it wasn't for the radio. Plus, of course, there are plenty of hams who have used their radios to call for help themselves when sick or hurt.

We'll be back next month with another installment...

BPL Investigations

BY IRWIN MATH,* WA2NDM

The amateur community certainly is well aware of the various discussions and concerns regarding interference caused by the transmission of broadband digital signals over existing power lines (better known as Broadband over Power Lines, or BPL). As a result, we thought it would be appropriate to suggest an experiment that the average amateur might wish to perform to see the effects of these types of transmissions at his or her station. The experiment consists of the construction of a small, low-power transmitter that will couple a digital signal directly onto the AC power line (via an RF carrier) in a manner similar to what one might encounter in a real-world BPL installation. Unlike a true BPL signal, however, there is no data encoding, frequency hopping, or any other sophisticated modulation method employed. To keep things simple, only a single-frequency RF carrier is employed and only a simple digital-like signal is used. *Also keep in mind that this experiment is just intended for very short-interval tests. It is expressly not designed to attempt to create interference with existing signals or for continuous transmissions, but simply to educate.*

Fig. 1 is the schematic of the transmitter. A low-cost, stock crystal clock oscillator such as an ECS-100A series (available from Mouser Electronics, DigiKey, and many other distributors) is coupled to a low-power RF amplifier made from a high-current CMOS NAND gate. The oscillator signal is then turned on and off (CW modulated) with a 1-kHz somewhat non-symmetrical digital signal pro-

*c/o CQ magazine

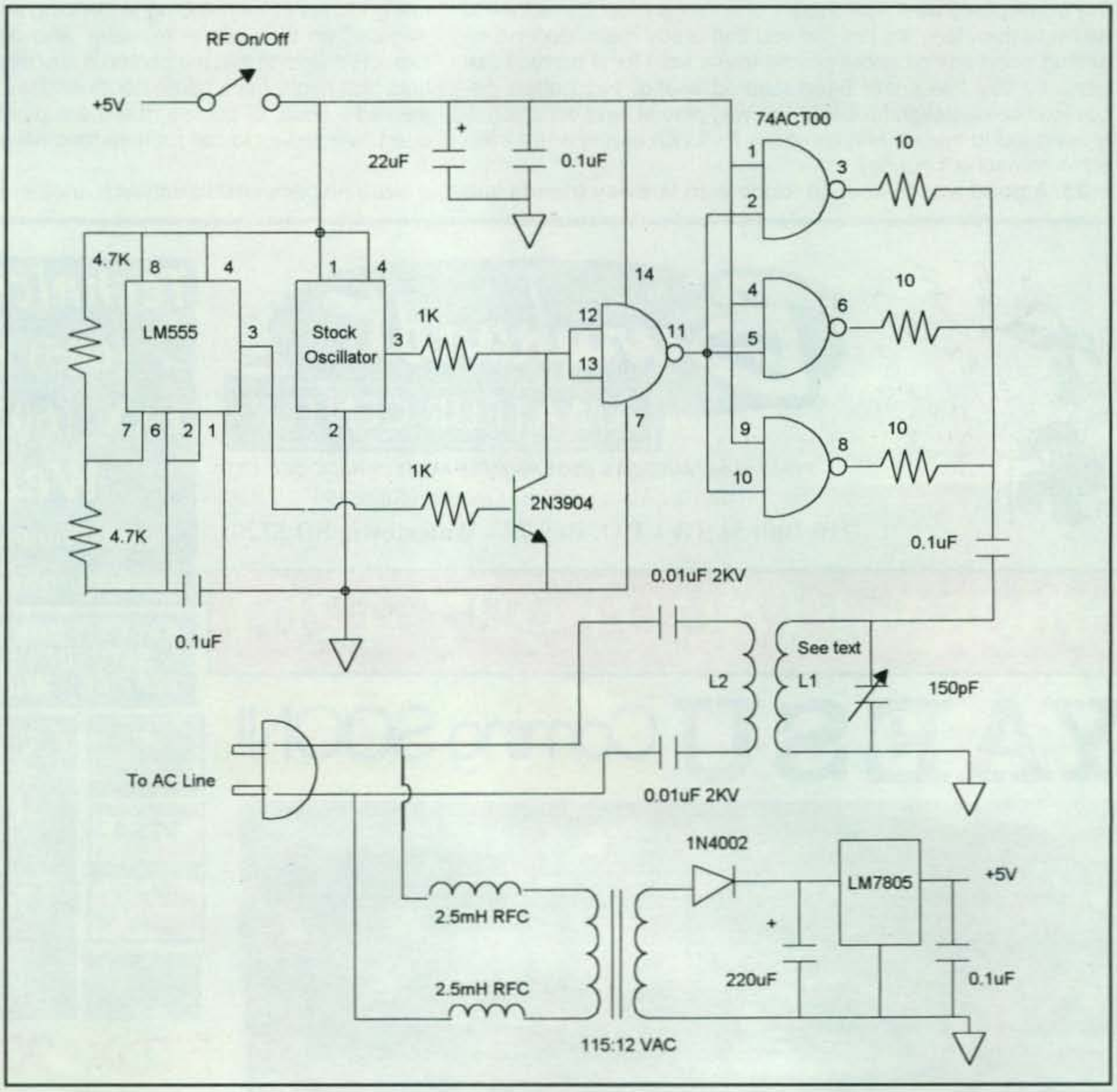

Fig. 1– A simple "transmitter" for BPL investigations.

Frequency Range	Details of L1	Details of L2
2.5 to 6 MHz	23 turns #20	5 turns #20
6 to 12 MHz	10 turns #20	2 turns #20
12 to 20 MHz	5 turns #20	1 turn #20
20 to 40 MHz	2 turns #20	1 turn #20

Table I– The tuned circuit consists of a coil and capacitor that should resonate at the chosen frequency. Shown here are typical starting points with a 150-pF variable capacitor.

duced by a common 555 to simulate possible BPL modulation. A modulating frequency of 1 kHz was chosen, by the way, so that one would be able to easily hear the signal on almost any type of receiver that might be used for monitoring. Although the result may not sound exactly like a typical BPL signal, it is probably close enough to demonstrate what might happen at a particular location as well as to show how such a signal might propagate.

Since BPL signals can operate over a wide range of frequencies from 2 to 80 MHz, the actual choice of the final test frequency is left to the experimenter, although it is probably a good idea to keep within an amateur band to avoid interfering with other services. The 74ACT00 will switch well in excess of 30 MHz, so it is easy to operate anywhere in the HF amateur spectrum that one might desire simply by choosing the desired oscillator and re-adjusting the tuned circuit values. The transmitter is coupled to the AC line by two ceramic capacitors, and the operating power is derived from a simple half-wave rectifier driven by a low-voltage transformer. Two RF chokes are also provided to prevent the RF signal from being shorted by the transformer.

Construction is not particularly critical, and most common bread-boarding techniques should suffice. If the final circuit is enclosed in a metal box, then the possibility of RF being received directly from the transmitter (not from the power line) will be minimized. The tuned circuit consists of a coil and capacitor that should resonate at the chosen frequency. Typical starting points with a 150-pF variable capacitor are given in Table I.

The coils are wound on a $1^1/4$-inch diameter plastic form, such as a small, common plastic pill container or scrap of PVC tubing. L1 is close wound first, and then L2 is wound over the grounded end of L1. Depending on the characteristics of your local power line, you may have to pad the variable capacitor or adjust the number of turns on L1 to tune to the exact frequency you have chosen. The value of the RF chokes is not critical, however, and anything above a couple of microHenries or so should be fine. Follow the schematic carefully and please do not try to skimp on the 2-KV AC line-coupling capacitors. These are for your own protection and safety.

Above all, do not forget that one side of each coupling capacitor, the primary of the power transformer, and the isolating RF choke coils all are connected directly to the AC line. As a result, be sure to properly insulate these portions of the circuit so that they do not accidentally come in contact with you, the enclosure (if it is metal), or other components in the circuit!

Once you have selected your test frequency, connect an oscilloscope across the tuned circuit and adjust the variable capacitor for maximum RF voltage across the "tank" coil. As we mentioned, you can experiment with the number of turns on L1 and/or L2 as well as the value of the variable capacitor to provide a better match to the AC line if desired. Now turn on your station receiver and tune to the frequency of the oscillator. You probably will hear the 1-kHz tone simulating the BPL signal. If you have a small, portable shortwave receiver that can tune to the RF carrier, it would be interesting to see how far away from the power line you can move and still hear the interfering signal. In areas where the power lines are on above-ground poles, you may be able to track the signal over significant distances. Remember that the power produced from this transmitter is only a few hundred milliwatts at best. Commercial BPL equipment no doubt uses higher power levels and much more efficient coupling to the AC line.

Now before all of the technically proficient engineers who read this column write to complain, correct, or "nit-pick" the details of this experiment, please remember that it has not been designed to produce accurate BPL signals. It is really only intended as a very simple way for the average amateur to gain some sort of a rough understanding of what might happen should BPL become commonplace in his or her location. If you have a better or simpler way to demonstrate this, please let me know and I will certainly be happy to pass it on to the readers. 73, Irwin, WA2NDM

world of ideas

Keys 2005: The Glamour! Part I

BY DAVE INGRAM,* K4TWJ

Your requests (indeed demands!) for more views and discussions of amateur radio's all-time favorite accessory and pursuit—keys and CW—have been pouring in, and the time for yet another "Keys Special" has arrived. As the popularity of keys continues to soar, new designs from both individuals and companies are capturing the interest of amateurs near and far. That makes good sense to us, as almost every key, bug, and paddle made is a work of art, and operating CW with said items is a thrill of the best kind. In light of those thoughts and thanks to supporters such as W1YBR, WB9LPU, RA1AOM, N1FN, and KB4LJV, we have views and details of some fantastic little gems to share with you this time.

With your sharing photos and descriptions of your favorite Morse manipulators, more columns highlighting keys will grace future issues of *CQ* as well. This is especially good if you have developed a new key you would like to show the amateur radio community but cannot yet afford a large promotional campaign. Send full details of your key(s) directly to me (the more I know about it, the better I can describe it to others), and I will strive to get plenty of well-deserved recognition headed your way. Who knows? Your key may even make it into my new *Keys III* book, which is coming together right now and will be sold worldwide. Now let's talk keys and CW!

New in 2005

Nothing brings out the sheer joy of operating CW like a new key, and some real beauties are making their presence known this year. Of particular interest is the new "Cliff Dweller" hand key designed and produced by Dave Nicholson, W1YBR (photos 1 and 2). The key's unusual design results from a double-stacked arm, or lever, supported by a ball bearing and axle assembly mounted to copper tubes shaped like U-bolts. The large base and the arm's positive action produce a "click-clack" report like a classic telegraph sounder, and the key's combination of brass, copper, and rosewood make it a most impressive showpiece for home or office. The key is well-balanced and has a solid big key feel. It is also supplied with two tension springs so an owner can set it according to personal feel and then fine-tune it with lever-mounted set screws. More details (and keys!) are available directly from Dave Nicholson, W1YBR, 625 Townhouse Rd., Center Ossipee, NH 03814; e-mail: <cliffdwellerproducts@ttlc.net>.

Next up are three terrific new gems from an increasingly popular name in custom keys (and one you have seen in a couple of our previous keys columns): the magnetically operated paddle, key, and bug made by Richard Meiss, WB9LPU. In several ways Richard reminds us of Horace G. Martin, the inventor of the Vibroplex bug. Richard develops one design after another, selling some as he goes and also using each new brainchild on the air for enhanced CW enjoyment. His enthusiasm for CW is also reflected in his choice of gear—an Elecraft K1 and KX1 and a Ten-Tec Argonaut V. Ah . . . Richard's keys are really special.

One of the newer items from WB9LPU is the KXer iambic paddle shown in photo 3. The paddle has self-aligning upper and lower bearings for each lever, a pair of rare earth magnets for tensioning,

Photo 1– Making its grand debut in this year's keys special column is the all-new Cliff Dweller key designed and produced by Dave Nicholson, W1YBR. It sports a highly polished brass and copper mechanism complete with a ball bearing and axle assembly at its pivot point, a double-decker arm, and a 4.5- by 6-inch rosewood base and knob. Awesome! (Photo courtesy of W1YBR)

Photo 2– A reverse-angle view of the W1YBR Cliff Dweller key gives more insight to its unusual design. The key is supplied with two leaf-type springs for varying tension, and fitted with a pewter nameplate showing its serial number and the cliff-dwelling caveman log. (Photo courtesy of W1YBR)

*4100 S. Oates Street #906, Dothan, AL 36301
e-mail: <k4twj@cq-amateur-radio.com>

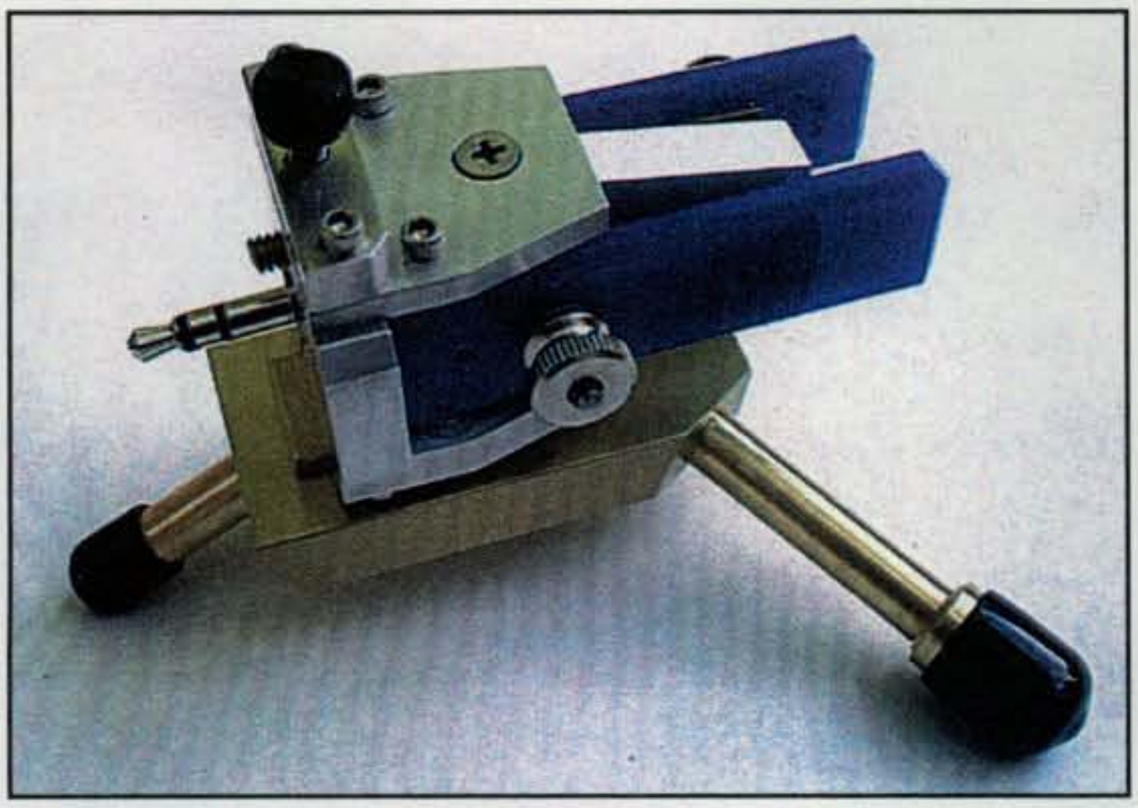

Photo 3– This new magnetically tensioned, dual-lever paddle is made by Richard Meiss, WB9LPU, and is called the KXer. It measures 1.5"H × 1.5"W × 2.5"D and mounts to and plugs directly into a little Elecraft KX1 transceiver (after quick removal from its brass base assembly). As an alternative, the paddle can be used stand-alone style as shown with a mini-stereo extension cable connecting it to any transceiver. Wow! (Photo courtesy of WB9LPU)

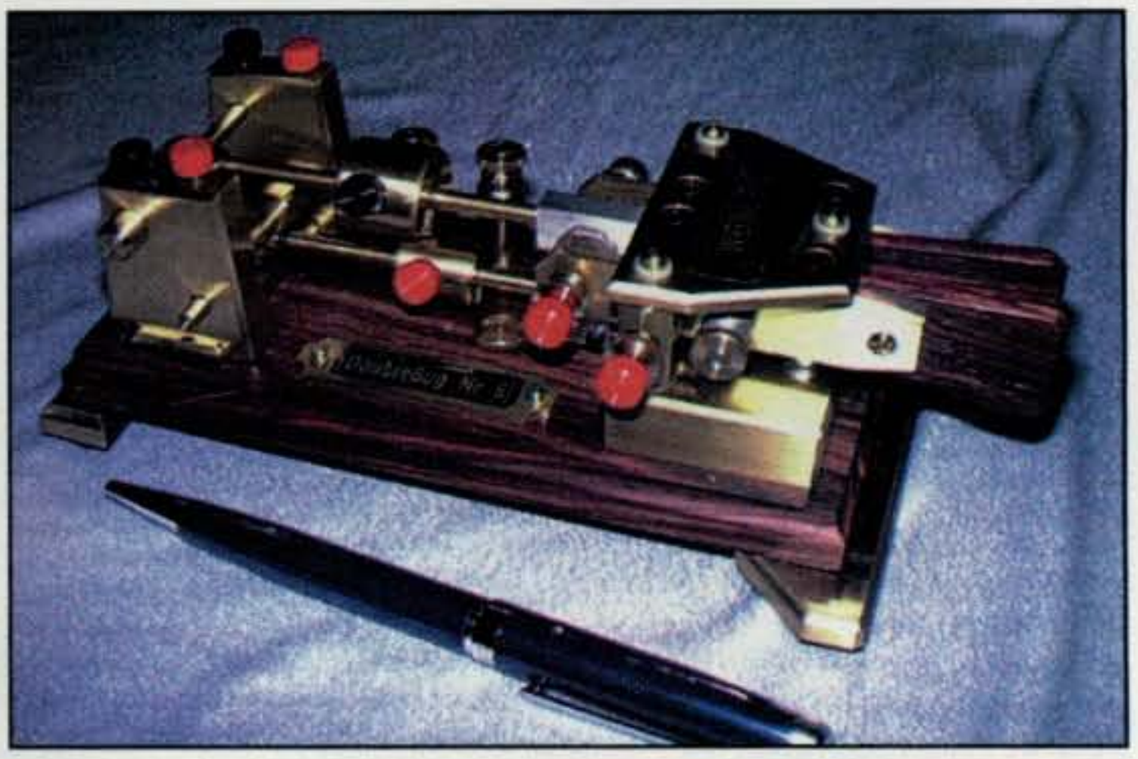

Photo 5– Take a close look at this fully automatic Double Bug also made by WB9LPU. It has dual pendulums operated by rare-earth magnets, reed switches for contacts, and a full complement of adjustments for each lever. This super bug also works on the principle of releasing rather than applying movement/pressure to the pendulums, which then vibrate or oscillate according to the magnet's pull.

and independent travel adjustments for each lever. The combination produces a light, yet positive feel that works great for sending CW. This versatile paddle can be used stand-alone style on its brass base as shown by just adding a 1/4-inch stereo earphone extension cable between the front plug and the rig's key socket. During non-use, the little black-tipped extension legs unscrew from the base rear and insert/store in the base front. As an alternative, removing a bottom set screw and the brass base lets the paddle mount and plug directly into a KX1 transceiver. I often use a KXer when traveling and love it. The little critter works as smooth as silk!

After producing a few tiny Micro Bugs, Richard has also developed a fully automatic Double Bug, and the one I heard in operation sounded great. The Double Bug (photo 5) sports dual magnetically operated pendulums with spring-tension levers and reed switches for contacts. Although a personal opinion, I would say this magnetically based and fully automatic bug has truly earned WB9LPU a place in telegraphic history. Like to order a special WB9LPU item? Contact Richard at 2626 Parkwood Drive, Speedway, IN 46224, or e-mail him at <wb9lpu@earthlink.net>.

Our CW friend in Russia, Valery Pavlon, RA1AOM, also has a new hand key we are sure you will enjoy studying (photo 6). The new key is made similar to the famous Swedish Key with an extended-length arm and inverted leaf contacts at the rear for an excellent feel. Val makes the keys for friends—mainly as a love for CW—in wood, Jasper stone, or chrome

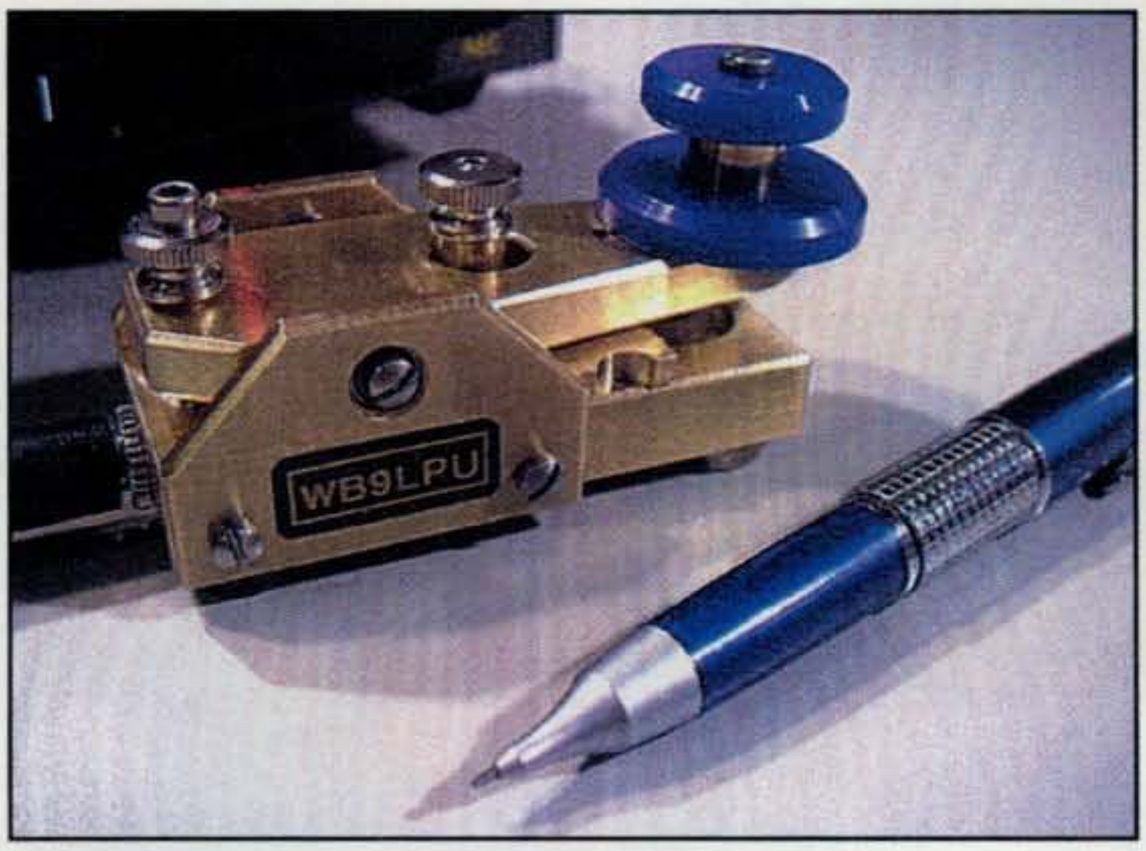

Photo 4– Check out this miniature hand key made by Richard, WB9LPU. It has a brass frame with ball bearings at the pivot point and a shiny blue skirted knob and is tensioned by magnets for a pleasantly light and elegant feel. It's a gem! (Photo courtesy of WB9LPU)

Photo 6– Valery Pavlov, RA1AOM, makes a limited number of these Swedish-style keys for amateur radio friends around the world, and everyone is crazy about them. The key sports an exceptionally long and well-balanced arm with a leaf-spring contact at the rear and is available with an exotic wood, Jasper stone, or chrome-plated base. (Photo courtesy of RA1AOM)

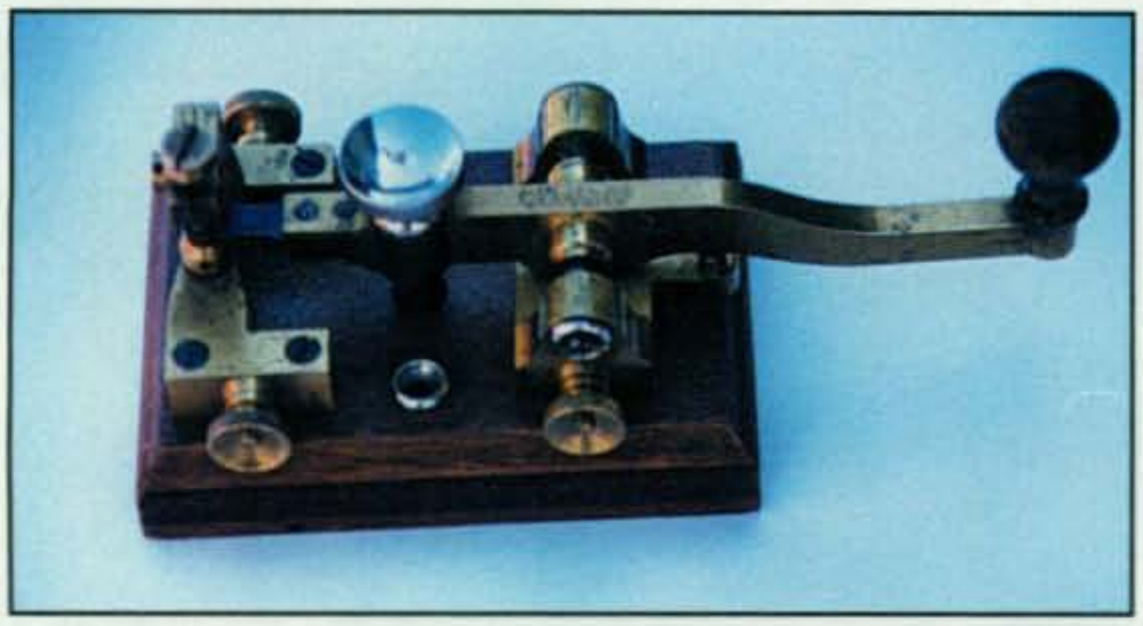

Photo 7– An original version of the ever-famous Swedish key, well-used and still going strong. This golden oldie may look simple and plain, but its feel during use puts it in a class all its own. It's a classic! Brand-new, in-box Swedish Keys, incidentally, are presently available from Morse Express at <www.morseX.com>.

Photo 8– Ham Radio Center of St. Louis, Missouri produced this attractive Ham Key during the 1960s, and it is still popular today. The key sports a rear-pivoting arm fitted with a shiny red, navy-type knob and supported by a red plastic frame. Cool! (Key owned and photographed by James Butler, KB4LJV)

Photo 9– This matching twin-lever paddle was also produced by Ham Radio Center, and it too sports a bright-red plastic frame plus red fingerpieces. A single right-side adjustment sets tension, adjustments on each side set gap, and a ground contact/stop post is mounted between the levers. (Photo courtesy of WB4LJV)

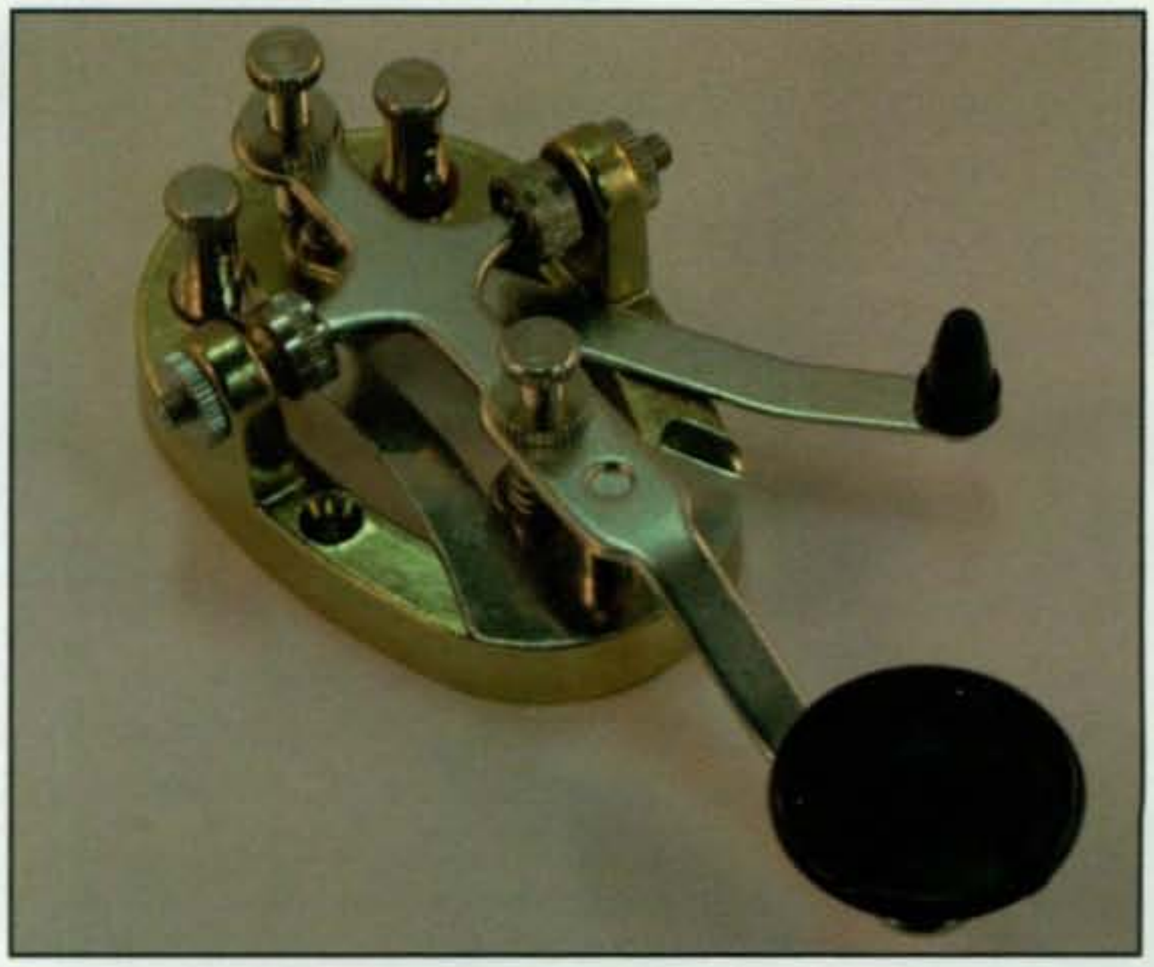

Photo 10– Another golden oldie many of our readers may affectionately remember from their Novice days is this sweet little Ameco "code key." It sports a five-ball-bearing race at its pivot point, a brass-plated mechanism, and a cool-going "Abandon Ship" sideswitch. The hot news here is these Ameco keys are now available from <www.morseX.com>. (Photo via N1FN)

base versions. You can contact him at P.O. Box 98, St. Petersburg 197022, Russia, or via <www.qsl.net/DL4FO>.

Golden Oldies

We always strive to include a few memorable Morse manipulators from the past in this annual keys series, and the focus this year is on hand keys. First is the original and legendary Swedish Key (photo 7), which has undergone several mild-mannered changes over the years yet continues as an all-time favorite CW instrument. The key's smooth and almost magical feel results from an extra-long and remarkably well-balanced arm that is still a reference for comparing new keys. If you would like a new-in-box Swedish Key, incidentally, check with Marshall Emm, N1FN of Morse Express at <www.morseX.com>. Marshall also tells us that Ameco hand

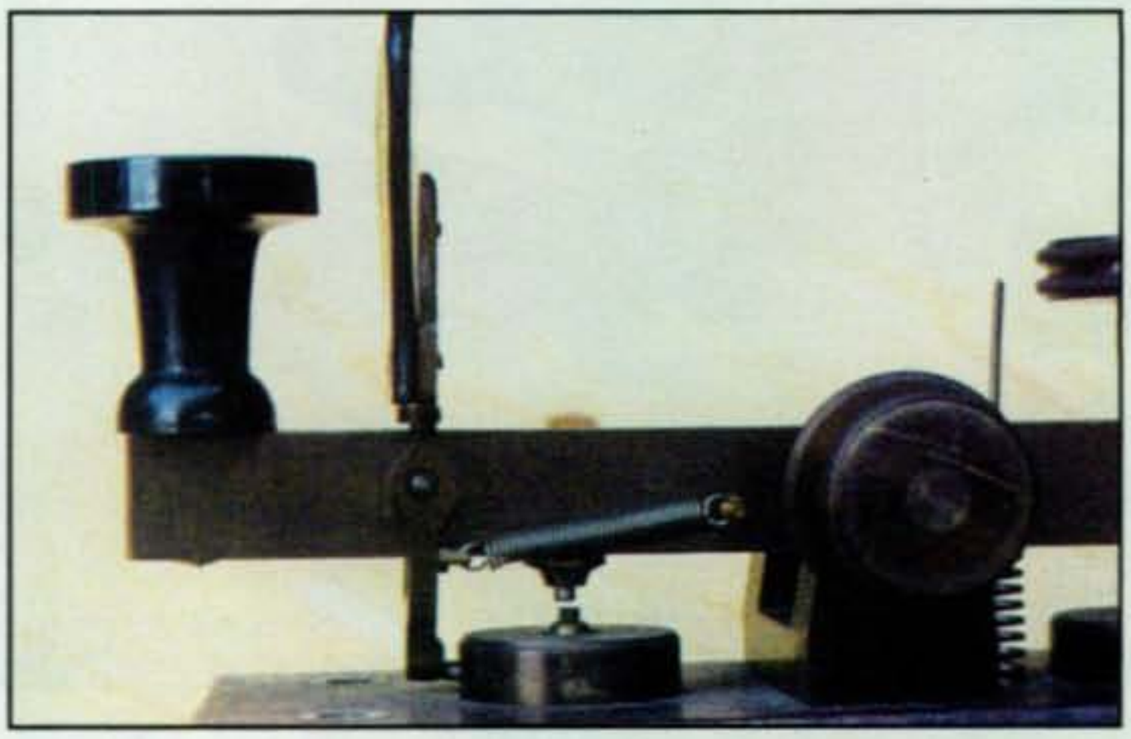

Photo 11– Notice the unusual spring-loaded circuit-closing lever on this European-made telegraph key. Unattended, it stands vertically and shorts the arm to the lower/base contact. (Photo courtesy of DL1BFE and his book Fazsination Morsetasten*)*

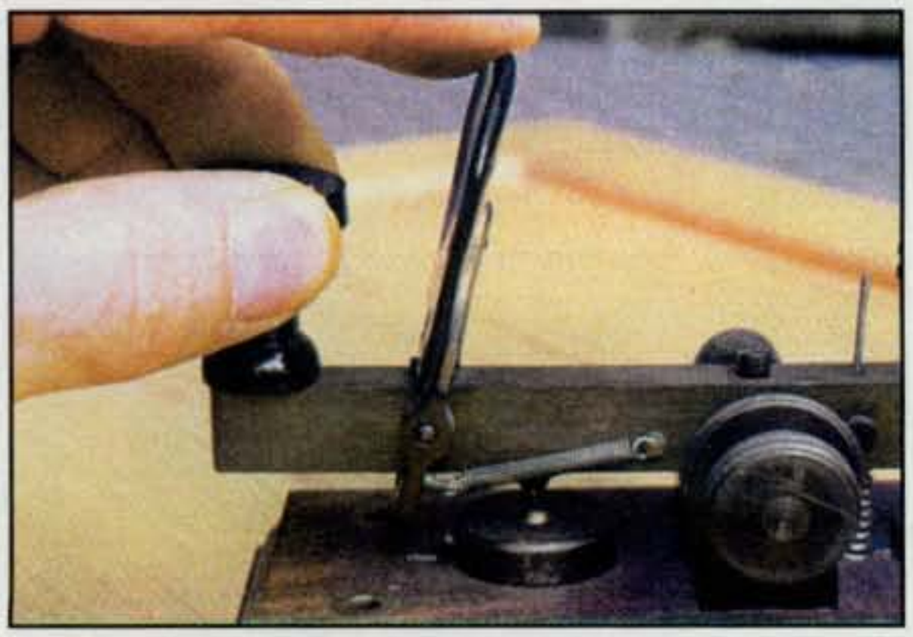

Photo 12– When transmitting messages, the telegraph-key operator moves the circuit-closing lever forward and holds it there so it disconnects from the key's base contact. (Photo courtesy of DL1BFE and his book Fazsination Morsetasten*)*

keys—those little gems many budget-conscious amateurs started out using during the 1950s and '60s—are back in production and available from Morse Express. They may not exhibit all the glitz and glamour of modern keys, but they are low in cost and oh so memorable!

Another popular hand key from the same time period was produced by Ham Radio Center of St. Louis, Missouri (photo 8). The key's rear pivoting arm was unusual compared to "regular" (J-38-type) keys, but it handled well and looked great with its red plastic knob and frame. Its big brother, the twin-lever paddle shown in photo 9, was another flashy red-base item that many folks still find irresistible. Our thanks to James Butler, KB4LVJ, for sharing views of his Ham Radio Center keys.

While the only available photograph was not sharp enough for printing here in *CQ,* we also recently learned of a neat semi-automatic key called the Ingram Master Key. The gem was made by H. C. Ingram in Perth, Australia during eras past and obviously was the handiwork of an undiscovered relative "down under." Might any of our readers have more information on the Ingram key?

The Abandon Ship Switch

We have seen them, those handy, flat circuit-closing levers on keys and bugs, and we also have heard them referred to as shorting bars, key-down levers, and tune-up switches. While recently discussing his newly acquired line of Ameco products and keys, however, Marshall, N1FN, offered the best explanation we have heard to date: It is an abandon-ship switch (photo 10). Say what?

When a new marine radio operator acquired a job as a ship's communications officer, usually his first question was how long should he remain at his post if the ship began to sink. The captain typically responded by raising one of the operator's trouser legs, whipping out a large black pen, and marking a spot midway between his ankle and knee. "If we begin taking on water," the captain said, "stay at your post transmitting an S.O.S. followed by our ship's name and location. When the water reaches the pen's mark, close the key's shorting lever to transmit a continuous beacon signal, pray for a quick rescue, and abandon ship!" Enough said!

Each time we introduce some lighthearted thoughts in a column, someone invariably takes issue and demands a more formal description (picky, picky!). Hopefully the following notes will quell such complaints.

Circuit-closing levers on keys were first used during the era of landline telegraphy (mid to late 1800s). Telegraphers in offices along a line were required to keep their levers closed so their sounders would pull in and receive messages, or they opened the lever and manipulated the key to send messages. Occasionally, some telegraphers forgot to keep the lever closed, so a couple of key makers installed a spring-loaded pawl and wafer which an operator had to move and hold with a finger while transmitting messages. With the help of Gregor Ulsamer, DL1BFE, and photos from his book *Faszination Morsetasten* (written in German, photos viewable in English), this lever's operation is shown in photos 11 and 12. If you would like a copy of Gregor's book, incidentally, contact him at Logumer Strasse 66, D-26723, Emden, Germany or via e-mail at <dl1bfe@emsnet.de>.

Wrap-up

That overflows available space for this time gang, but watch for more special views of keys, bugs, and paddles coming up next month in Part II. Meanwhile, enjoy some good on-the-air time on CW. Thirty meters in particular is good at night, especially if you are running low power. 73, Dave, K4TWJ

mobiling

BY JEFF REINHARDT,* AA6JR

A Variety of Mobile Installations

It's great to tune the bands and hear so many mobile operators on the air. I may be biased, but I seem to observe that more and more hams are enjoying taking their rigs on the road despite the many considerations that are necessary to achieve a safe and effective installation.

I'll attribute some of the growth in mobiling to the availability of powerful, reliable, and compact HF transceivers. About a decade ago, Kenwood rocked the mobile world with its TS-50. Alinco followed with the DX-70T HF+6 meters, and then ICOM and Yaesu came around with products, each one improving the breed in its own way. The ICOM IC-706 captured the imagination with its VHF and UHF capabilities, allowing the consolidation of HF and popular repeater bands into a single unit and greatly simplifying the space challenge most newer model cars present. There has also been a gradual reduction in the cost of getting a mobile HF rig on the air. By shopping around you can easily find a new 100-watt rig for under $800, with used rigs priced even lower.

A Giant Leap Forward

Newcomers to ham radio may wonder what mobiling was like "back in the day" of tube-powered transceivers. While I never did it myself, I'm told it was quite a challenge, often requiring the placement of a motorized generator in the trunk of the vehicle to create the high voltages required for those rigs. Anyone want to share stories (and maybe photos) of what mobiling was like in the '40s, '50s or '60s? We've come a long way, and while not quite "plug & play," you can get a good, space-efficient mobile operation going in a vehicle in about an afternoon. The job will go more quickly if you have an experienced mobile operator assisting with your installation project.

Also aiding the boom in mobile operations is the availability of a variety of antenna systems, and that includes tuning options from rigs with internal tuners, match boxes between the rig and antenna, and some antennas that have their own tuning mechanisms. You can be effective on the air with a single-band "stick" antenna costing around $20, or you can spend hundreds of dollars on any number of multi-band antennas.

As mentioned before in this column, another reason we're finding more mobiles on the air is the antenna prohibitions now found in many communities. The mobile option allows hams to enjoy the hobby free from restrictions.

There's another element I enjoy in mobiling: It's the ability to operate from wonderfully scenic and sometimes exotic locations. Breathtaking mountain vistas and the serenity of wide-open spaces have been my companions. It's great to drive to a place free from RFI and electrical noise and "set up shop" in a location away from distractions and conducive to the enjoyment of radio.

Multi-band capabilities in the author's Mercury Grand Marquis: Alinco DX-70TH control head attached to ashtray/cupholder for 6-meter +HF operations; and Kenwood TM-741A control head with 2m/222/440MHz modules just below the broadcast receiver. Microphones hang from the cell-phone holder, and all equipment is clear of airbag-deployment zones. The main transceiver units are mounted in the trunk and fed by fused wires connected directly to the car's battery.

Showtime

Someone finally "called my cards" and wrote, "OK, so what do you run in your car?"

Fair enough question! I've gone through stages in my mobiling, and I now find myself hanging onto a car that's past its prime largely because the mobile radios work well in the car and I have a lot of hours invested in making everything work.

For the past several years I have owned a Mercury Grand Marquis (sister car to the Ford Crown Vic) with the ability to transmit and receive on every ham band from 80 meters through 440 MHz. The VHF/UHF transceiver is a Kenwood tri-band that covers 2 meters, 222 MHz, and 440 MHz. The control head is mounted on the dash, with the main unit mounted in the trunk. The HF and 6-meter

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Alinco DR-135 2-meter transceiver mounted in the trunk for APRS operations. Not pictured is the GPS receiver, with the "stealth" antenna invisibly mounted beneath the fabric of the rear window shelf. Out of view, other transceiver units are securely mounted out of harm's way, against the rear seat support panel. Attention was given to air circulation for cooling.

transceiver is an Alinco DX-70TH, with its control head mounted below the dash tray/cupholder and the main unit mounted in the trunk.

In addition, I have a discrete 2-meter rig mounted in the trunk for APRS operations. Much of this nifty installation was done with the help of the late Wally Foster, N6CDJ, and Frank Sain, KA6BPA, and Rob Hanson, W6RH.

There are four antenna systems on the car. The easiest to explain is the 6-meter whip mounted on the trunk lid. On either side of the trunk are multiband antennas for 2 meters and 440 and 222 MHz. The HF radio feeds an Alinco automatic tuner mounted in the trunk well. RF is then fed through the trunk floor to a custom-made antenna mount with a quick-disconnect feature. The Alinco tuner allows the use of just about anything as an antenna. I typically use an Outbacker Perth. It just seems to work well, but I have used some "stick" antennas and even a 108-inch CB whip antenna. When engaging in stationary operations, I can also clip a long wire onto the antenna connector, and with 40 feet or more of wire in the air I can work 160 through 10 meters!

A few years ago I was lamenting the notion of missing Field Day with my club because of the need to take one of my offspring to a college orientation. Therefore, I decided to try Field Day as a mobile operation and it worked very well. We set up computer logging in the car and scored very well despite limited operating time. It's really quite amazing what you can do with a little advance planning.

With all those rigs located in the rear of the car, I was tempted to place a sep-

John Deegan, K9XT, operating his Yaesu HF transceiver aboard the sailboat Shearwater. *(See text for details.)*

arate battery in the trunk, but I decided to first try some heavy feeders run from the front of the vehicle. We installed flexible #8 cables attached directly to the battery (through fuses as close to the battery as possible). The cables were run down the right side of the car in a protected channel. The cables are adequate for my needs and I have never had a problem, even on those rare occasions when two radios were transmitting at the same time.

The only ongoing complaint I have is one familiar to many Ford owners—specifically, that the car is electrically noisy. I have spent some time, effort, and money on noise suppression, and it's better but not perfect. The only way I can be sure of noise-free operation is to operate the HF transceiver with the engine off.

Finishing off my installation are speakers located near the top of the "B" pillar on the left side of the car, making it easier for me to hear the transceivers. A standard mobile speaker does the job for the Kenwood tri-band, while a Clearspeech-powered unit is used to further reduce noise and interference from the HF transceiver.

The ultimate measure I apply to any installation is "Does it work?" Add to that "Does it keep working?" The answer to both in my case is yes, which is fortunate, because I really don't like doing maintenance or having to do the same job over and over. My installation has passed the test of time for better than six years with very little in the way of repairs needed. What's really fun is just being able to pick up the mic and enjoy a chat on just about any popular band.

We Got Mail...

Last time we mentioned the portable antenna systems offered by Buddipole.

On the Cover

Well, if you think the antennas on the 155-foot tower behind Rick Dougherty, NQ4I, are impressive (and we certainly do!), you ought to see the *other seven towers* on his 13-acre antenna farm in Griffin, Georgia! Rick, who flies private jets all over the world for a living in between contests, loves hosting multi-multi (multi-operator, multi-transmitter) teams at his QTH on contest weekends. He's also participated in contest DXpeditions (generally placing in the top three) from a variety of locations around the Caribbean.

On the tower in the photo, Rick has three 5-element 20-meter Yagis on 50-foot booms, at 55, 105 and 155 feet, for his 20-meter "run" station, as well as a single 5-element Yagi on a 36-foot boom at 85 feet for his 15-meter multiplier station. Overall, Rick has 11 complete stations set up in his contest shack, one for 160 meters and two each (one "run," one "mult") for each of the bands between 80 and 10 meters, except for the WARC bands, where contest activity is generally discouraged. The antennas are split up among a total of eight towers, two at 155 feet, one at 185 feet, another at 125 feet, and four "little" ones at 60 feet.

Rick says he started contesting in the Novice Roundup in 1961 and has never looked back. He started building his multi-multi station about 15 years ago and says it's a continual building process. About three years ago, Rick and his family moved to a new QTH about a mile away from the old one—and he says it took him a year and a half to get all the equipment, antennas, and towers moved, reinstalled, and put back on the air!

On a typical contest weekend, says Rick, he'll have 15 to 16 guest ops at his station, often including several first-time multi-multi ops. Why does he do all this? "What can be more fun," says Rick, "than to get the guys together, play in the contest, have good food, talk, tell stories, and play on the radio?" What, indeed?

(Cover photo by Larry Mulvehill, WB2ZPI)

As a classy follow-up, Budd, W3FF, dropped us a note:

Currently I am playing radio from my mountain bike. The new Hi-Capacity C cell NiMH batteries are outstanding. I have packs of them which provide 4500 MAH each at 12+ volts, and when they are hooked in parallel they can do a super job.

Fifteen and 17 meters have been excellent for bike mobiling lately. The day before the recent CQ WW DX SSB Test, in a 24-hour period I snagged all the continents, including Antarctica, while riding in my neighborhood running 50 watts, an FT-857, and a Buddistick on the handlebars of the bike.

Do you ever work 60 meters? Biking on 60 is very effective. I have worked the East Coast from Redding, CA on that band with a little bit larger coil.

CQ readers may recall Dave Ingram, K4TWJ, having featured Budd's bicycle mobile. It's a great experiment and serves as proof that you don't need an elaborate installation to enjoy mobile operations!

Craig Vagell, WR2G, dropped us a note describing his interesting mobile installation. It keeps the rig's controls away from the air bag deployment zone. Craig wrote:

This system of mounting the remote control head, radio, and external speaker has proved to be very functional for mobile operation. Mounting the remote-control head on the sun visor allows flexibility and safety in viewing the remote display. Operating the radio while in motion is never recommended. However, this mounting configuration is safer than conventional dashboard mounts. Since the remote-head display is directly in front and just above of the driver's eyes, there is less distraction than looking through the rear- or side-view mirrors. After initial contact is made, engage the frequency lock on the transceiver. Continue operating with the visor up with the remote head out of view, allowing complete and normal visibility through the windshield. This mounting technique also offers some security from theft, since the remote head is not readily visible through the windows. With the visor turned toward the window, it is also convenient to operate standing next to the car. Anyone operating mobile knows how difficult ambient road noise can make it to hear signals from the speaker. The audio output from an external speaker mounted next to the driver's seat makes it easier to hear, since it is next to the driver's left ear. Of course, the trunk-mounted radio is powered directly from the 12-volt battery. The antenna is trunk mounted with separate ground wires connected to the car frame and fed by a 2-foot coax feed line.

And from Hawaii, Ernie Murphy, NH7L, shares the following:

Enjoyed your *CQ* article on the usefulness of operating portable mobile. You've operated here in Hawaii, so you have some idea

A sunset at sea . . . one of the "fringe benefits" of marine mobile operations.

of the limitations and advantages that come with the location.

Parked portable mobile is the only way I can operate on the HF bands. I live in an antenna-restricted Honolulu high-rise, and I have to park all day, five days a week, in an unguarded lot. Vehicle thefts, break-ins, and burglaries are out of control here, and there's no way I'd keep an expensive radio in my pickup truck.

I have, however, permanently replaced the truck's starter battery with two AGM deep-cycle batteries, each of 80 amp hours. Was going to put in an isolator or relay to preserve enough juice to always start the truck, but for my truck model that would have been expensive. (The batteries themselves were expensive enough at around $180 each. One has to live in the cab behind the seats, so it had to be an expensive nongassing AGM or gel-cell. AGMs don't play well with wet-cell batteries, so the one in front got replaced, too.) I use an ICOM 706 at 100 watts, never for more than a couple of hours (of which most time is spent receiving, which takes few amps), so I don't much worry about getting stuck with an unstartable vehicle. The only gear that's kept in the truck, hidden behind the seats, is a big mag mount, a bundle of Iron Horse mobile sticks, and a Rigrunner power panel, total replacement cost about $200. The 706, kept at home when not in use, is mounted on a plastic cutting board that can fit between the two seats or onto a floor-mounted vehicle desk. The sticks are pre-tuned with an antenna analyzer, so no tuner is connected to the rig. Half-inch grounding braids are connected to seat bolts and hidden under seats when not in use.

The truck is quiet enough electrically such that I could operate while driving, but I don't. Traffic here on Oahu is congested and homicidal, and I get my best HF results when parked within a few feet of the ocean. With my tiny antennas and what amounts to the world's biggest and best ground plane, I've had a couple over-the-pole QSOs with Italy and Spain in the few months I've been on the air. Other hams here who operate the way I do contact southern Africa on occasion, and I imagine I will, too, one of these days. There's a narrow all-saltwater path between here and South Africa that may have something to do with that.

I learned about installing and operating mobile portable from other hams here who have been doing it for years for the same reasons I do it. The experience is inspiring enough for me to put together a travel HF station I can operate out of rental cars when on the mainland.

Thanks, Ernie. I'll try to share the contents of my "on the go" travel package for mobile ops in a future column. However, Ernie also makes an important point. The security of your installation is important. Don't let your guard down for a minute; it takes very little time for a thief to spoil the fun, particularly in travel and resort areas.

Marine Mobile

We'll close this session with photos from an area in which I don't have a lot of experience—operating marine mobile. I was invited, along with a group of ham friends, to spend a wonderful day on the sailboat *Shearwater* off the coast of Camarillo, California. The ship's captain, Dr. Randal Orton, granted permission for us to operate marine mobile. We expressed some of our thanks by presenting him with amateur radio license manuals, hoping that the good captain explores the blue waters of the Pacific with ham radio as a companion.

Please keep those e-mails coming. It's a delight to learn how many great installations there are out there!

73, Jeff, AA6JR

Xtend Your Performance Envelope!

Alinco HTs take ham radio fun to new Xtremes.

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Alinco HTs pack a lot of engineering into small packages so you can enjoy your hobby in many different places. Whether you're cycling with friends, chasing storms as a volunteer or keeping the family in touch at a large outdoor festival, Alinco HTs are ready for action.

DJ-C7T 2m+440 "Pocket" HT

This new generation "credit card" size HT delivers VHF and UHF performance in a very small package with GREAT audio! Amazing internal speaker, 200 memories, VFO, Memory & Scan modes, CTCSS encode + decode, AM airband and wideband FM broadcast RX, 300mw output, SMA antenna port, lithium ion battery, cloning feature, split function and more. ***Fits easily in pocket or purse, so it's an Xcellent choice for the entire "hamily"!***

DJ-V5TH 2m/440 Full power HT

Enjoy a full 5 watts output from a small HT! Great 2m/440 TX & RX, xtended RX range from 76~999 MHz, includes wide band FM; alpha display, 4 scan modes, 200 memories, CTCSS & DCS encode+ decode, split-band ops, auto-dialer, SMA antenna port 13.8 VDC direct input - all in a compact size. ***Xtra rugged.***

DJ-S40TD 440 MHz HT

This pocket HT features 500mw output using AA cells, and up to 1 watt using an optional NiMH battery. 100 memories, CTCSS encode + decode, SMA antenna port, great audio, theft alarm and more.

DJ-596T Mark II Dual-Band HT

VHF and UHF performance in a great looking package. Easy to operate with a large, backlit alphanumeric display, full-size control pad, powerful Ni-MH battery, 6 ~ 16 VDC auxiliary power input, up to 5 watts output. 100 memories, CTCSS and DCS encode+decode, WFM+NFM, plus super-accurate frequency stability that meets the toughest standards of demanding users! Also, be sure to check out the optional digital voice communications board and the many accessories tailored to your operating needs.

DJ-196T (2M) DJ-296T (222 MHz) DJ-496T (440MHz) HT

These monoband HTs all feature a large alphanumeric display with a full size backlit keypad, 40 memories, CTCSS and DCS encode+decode, autodial, 13.8 VDC input and more. High power battery is standard.

www.ALINCO.com

what's new

BY KARL T. THURBER, JR.,* W8FX

Timepieces, Keying Products, Antenna Controller, Contest Software, and more

This month we'll focus on some noteworthy radio ham shack accessories, antenna accessories, software, books, radio resources, and other items of timely interest.

Accessories for the Shack

TechNote Time Watch Company Expands its Timepiece Product Line. TechNote Time's slogan "Never Fumble for a Formula Again" is catching on with electrical and electronics professionals, students, and hobbyists, according to the company's Anne Dorsey. In fact, the firm, based in Ocala, Florida, has seen sales so brisk that it has added Ohm's Law desk and wall clocks to its existing line of Ohm's Law wristwatches (photo A).

According to Anne, TechNote Time reports that the electrical and electronics communities (including amateur radio operators) have received their products well. She's proud that their customer base now includes various apprenticeship and training centers, technical training institutes, and major corporations. As Anne puts it, hams are a very diverse, technically inclined group, and for many the attraction to the hobby is to build their own equipment. She adds, "Our Ohm's Law clocks are an especially appealing product for radio hams because they can refer to its formulas while at their workbench working on their projects."

The company's products can be invaluable when it comes to efficiency and saving time. Reportedly, customers like the idea of always having those hard-to-remember Ohm's Law formulas with them at all times—with the added benefit of having a great conversation piece at hand.

TechNote Time now carries 12 different products for both AC and DC applications. A colorful resistor band color chart encompasses its Ohm's Law and power formulas, resulting in a very unique and eye-catching product line.

For more information regarding both the firm's products and the company itself, contact TechNote Time Watch Company, 5330 SE 28th Lane, Ocala, FL 34471 (phone 352-694-2744; e-mail: <info@technotetime.com>; on the web: <http://www.technotetime.com>).

Photo A– One of the TechNote Time Watch Company's Ohm's Law Wristwatches is the Model 0776 Ohm's Law Watch with DC formulas. Reportedly, sales have been so brisk that the firm recently added Ohm's Law desk clocks and wall clocks to its line of Ohm's Law wristwatches. See the column for details. (Photo courtesy TechNote Time Watch Company)

New Keying Products from Morse Express. Do you remember Island Memory? Recalls Morse Express proprietor Marshall Emm, N1FN/VK5FN, it was a very successful little project to add four message memories to early electronic keyers that did not have message memories. Well, it's back, he reports, as the Jackson Harbor Press (JHP) Island Memory II (photo B), with even more capability and simpler installation. The unit sits between your transmitter and your keyer—or bug or straight key—and records what you send for immediate playback. And yes, if you have a distinctive "fist" with bug or key, the Island Memory II kit is said to faithfully reproduce it. The complete board kit with manual is $22.95, and Morse Express even has a hardware pack and enclosure available for it.

The Island Memory II kit adds message memory capability to any keyer, straight key, cootie key, or bug. If it sends code, it can be used to program messages so they can be sent repetitively at the touch of a button. The new unit even has a piezo speaker so you can check your work, or use it as a code practice oscillator. Building and connection are simple, using readily available components or the hardware pack available as an option. (Marshall adds that if you'd rather not build the kit,

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e-mail: <w8fx@cq-amateur-radio.com>

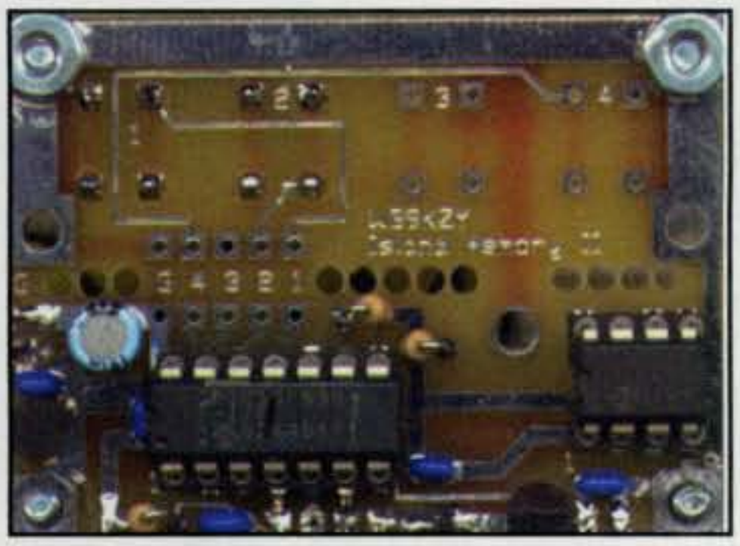

Photo B– The Jackson Harbor Press Island Memory II from Morse Express sits between your transmitter and your keyer—or bug or straight key—and records what you send for immediate playback. If you have a distinctive "fist" with your bug or key, the new Island Memory II is said to faithfully reproduce it. (Photo courtesy Morse Express)

you'll find similar features in the fully assembled GHD Autobug, which includes an electronic keyer; see his website for details.)

Some of the many Island Memory II features include eight separate, non-volatile, 90-character message memories in two banks of four; four playback speeds; piezo transducer output for "code practice oscillator" and variable sidetone pitch; straight-key memory; ability to work with bug, keyer, or key; capture of the unique timing of an operator's fist; four momentary switches built in; no wiring needed; selectable looping (beacon mode) for each memory; low power consumption; and sleep mode. The kit includes circuit board, components shown, and manual.

Another interesting (and inexpensive) product is the JHP Keyall Pos/Neg Keying Adapter Kit (photo C), known popularly as the Keyall. It's an accessory for a keyer, hand key, or bug that allows operation with nearly any transmitter. The circuit effectively is a solid-state relay that will key solid-state (12-volt), cathode-keyed tube rigs (high positive keying voltage) or grid-block tube rigs (high negative keying voltage). The Keyall will even key transmitters that require a keying output that is isolated from ground; the Keyall's output can be made fully optically isolated from the keyer input. The unit also may be used as a conventional solid-state relay. The Keyall kit, Model JH-KA, is $12.00, and it includes complete documentation. You'll find the complete details of both products we mentioned at <http://www.MorseX.com/jhp>.

For more information, contact Morse Express, 10691 E. Bethany Dr., Suite 800, Aurora, CO 80014 (1-800-238-8205; e-mail: <info@MorseX.com>; on the web: <http://www.MorseX.com>).

Antennas and Antenna Accessories

New from W4RT Electronics. At the last Huntsville (AL) Hamfest we had a very nice chat with some of the fine staff of W4RT Electronics, which is well-known for quality products—both products of its own manufacture and others that the firm resells. Be sure to check out their well-appointed website at <http://www.w4rt.com> (see fig. 1), which for the most part features antenna-related items.

Recently W4RT Electronics announced the new Antenna BOSS II, which interfaces directly with the ICOM IC-706 series of radios for automatic tuning of motorized antennas from Hi-Q Antennas (with Blackhawk motors), High Sierra Antennas, and Tarheel Antennas, and others that draw less than about 750 mA while running. Tuning is activated by pressing the IC-706 Tune button. The BOSS II also can be interfaced with many other radios from ICOM, Yaesu, and Kenwood, providing coverage capability from 6–160 meters. Interfacing with non-ICOM radios requires the use of an appropriate One-Touch Tune module (available from LDG Electronics or W4RT) and appropriate cabling.

Bear in mind that the BOSS II is an intelligent antenna controller, not an antenna tuner in the classic sense. When activated, the BOSS II measures the frequency of the transmitted carrier, measures the SWR, and then adjusts the antenna-coil position to minimize system SWR. The unit can't adjust the match between the radio and the antenna other than by moving the antenna coil.

For those motorized antennas that use drive motors that draw several amps while running, W4RT Electronics will offer the BOSS Mate as an accessory to the Antenna BOSS II; it should be available by the time this column appears in print. The BOSS Mate, with the BOSS II, will allow interfacing with such motorized antennas.

For more information, contact W4RT Electronics, 3077-K Leeman Ferry Road, Huntsville, AL 35801; (fax 256-880-3866; e-mail: <info@w4rt.com>; on the web: <http://www.w4rt.com>).

Software and Computers

Win-Test Contest Logging Software. Herve Biraud, F5HRY, let *CQ* know that a new contest logging software package, Win-Test, is now available. He helpfully pointed us to some details that suggest it would definitely be of interest to many of our contest-oriented readers and subscribers.

Win-Test (see fig. 2) is a W32 contest logging software package developed in the C++ computer language by Olivier Le Cam, F5MZN, father of Editest (a DOS-based French contest logging program) and DXnet (an open-source DX Cluster system). With assistance from several others, Olivier created a new and now fully operational contesting tool, based on the well-known CT syntax by K1EA, used by many serious contesters.

Designed by contesters, Win-Test is said to be not only another contest logging software package, but a no-compromise package that is "a real tool to win." Easy to use, fast, and powerful, its many features include support of numerous international, national, and VHF+ contests; easy navigation in the log; CW generation in the background; resizable and floating windows; an integrated voice keyer; real-time greyline display; graphical bandmaps; numerous supported transceivers; interfacing of the HamCAP propagation prediction software; Cabrillo and ADIF files generation; multi-screen windowing capability; and more.

For availability, pricing, features, and minimum requirements, check out the informative Win-Test website at <http://www.win-test.com>. You also

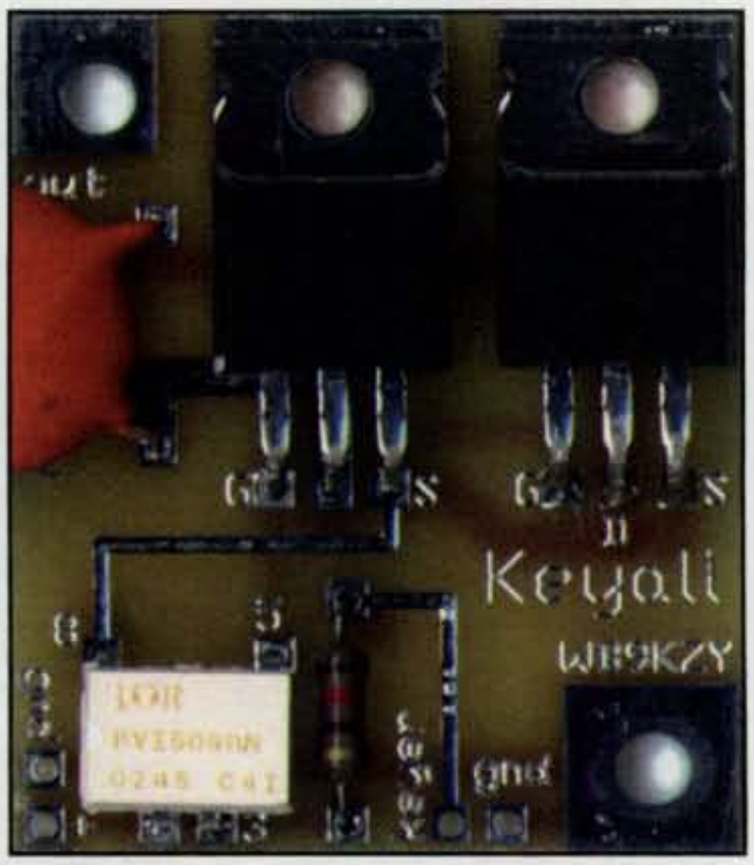

Photo C– The JHP Keyall Pos/Neg Keying Adapter Kit from Morse Express is a handy accessory for a keyer, hand key, or bug. It will allow operation with nearly any transmitter. Details are in this month's column. (Photo courtesy Morse Express)

Fig. 1– W4RT Electronics offers a very comprehensive website that profiles not only the firm's own offerings, but selected products from other manufacturers that the firm resells. Check out the site's features at <http://www.w4rt.com>. (Graphic from the W4RT website)

can download a free trial version of the software at the website before purchasing it.

Copernic Desktop Search. In several columns we have noted various Copernic® programs, especially the Copernic search tools. These very capable computer programs help you find what you're looking for on the web by simultaneously using several user-selected search engines.

Now Copernic has entered the emerging, highly competitive so-called "desktop search derby" with the launch of what it claims to be revolutionary free software called Copernic Desktop Search™ (fig. 3), or simply "CDS." Billed as "The Search Engine for Your PC," CDS brings the power of a search engine right to your PC and allows you to instantly search files, e-mails, and e-mail attachments stored anywhere on your hard disk. Reportedly, the days when searching for files on a PC was harder than searching the web are over!

CDS has a streamlined and intuitive user interface that lets you perform sub-second searches of PDFs, Microsoft® Word and Excel® files, PowerPoint® files, MP3s, pictures, videos, contacts, your browser history, and even your bookmarks. An important aspect, the freely available CDS is very fast, in that you can search your entire hard drive in less than a second; it's fresh, in that new and updated files and new e-mails are indexed the instant they arrive on your hard drive; it's ultra-light, in that it uses CPU, memory, and disk space efficiently to ensure continued high levels of system performance; and it's rock solid, with its fault-tolerant technology which ensures your PC is searchable at all times. Perhaps above all, it's easy to use, such that you need to simply type words into the search bar to find all relevant documents in an instant.

Contact Copernic, 360 Franquet St., Suite 60, Sainte-Foy, Quebec, Canada G1P 4N3 (418-527-0528; e-mail: <sales@copernic.com>; on the web: <http://www.copernic.com>).

From the Bookshelf

Leo Laporte's *2005 Mac Gadget Guide* from Que® Books. Several months ago we profiled Leo Laporte's *2005 Gadget Guide*, a fascinating book all about "cool gadgets" of all shapes and sizes for IBM-PC computers. As we noted, these include gadgets you attach to your computer; gadgets you carry around on a belt clip; gadgets that ride along with you in your car; and gadgets you talk into, or type on, or shoot pictures with.

According to the author, Macintosh® owners love their gadgets almost as much as they love their Macs. Unfortunately, Mac users must suffer through life in a PC world. As a result, Mac owners have come to rely on themselves for figuring out how to get these devices to play nicely with their systems. Laporte's *2005 Mac Gadget Guide* is designed to solve the problem of living in a PC world. The book contains information on darn near every Mac-compatible gadget category: what to buy, what to avoid, and how to get gadgets to work best with your Mac.

In 13 sections plus glossary and index, the $24.99, 290-page book tackles setting up and using MP3 players, wireless gadgets, digital cameras, digital video cameras, PocketPCs, PDAs, and other gadgets and gizmos specifically on a Mac. The book is written in the personable, humorous, and engaging style of the author. Full-color photos, manufacturer contact information, and street price are provided for every gadget covered.

Check your local bookstore, or for more information, contact Pearson Education, 200 Old Tappan Road, Tappan, NJ 07675 (phone 1-800-922-0579; on the web: <http://www.quepublishing.com>).

***Special Edition Using Microsoft® Windows® XP Home,* Third Edition.** Also from Que Books is the third edition of this "old standby," billed as "the only Windows XP book you need." The book series is considered by many to be the most comprehensive user-friendly XP compendiums available. This newest edition covers all of the updates to Windows® XP since it was released, including both Service Packs 1 and 2, so it's indeed up to date.

With the massive, 1141-page book you can learn from the undisputed Windows® heavyweight authors Robert Cowart and Brian Knittel. Thankfully, the $44.99 book/CD combo's authors don't try to overwhelm you with their technical expertise, and they don't just tell you how to use the Windows® features and point you elsewhere for networking or hardware advice. Instead, they help you choose, install, and configure hardware and software that work in concert with Windows®.

Also included with the new book is the "Windows® XP CD-Extra" video. With it, the authors themselves provide more

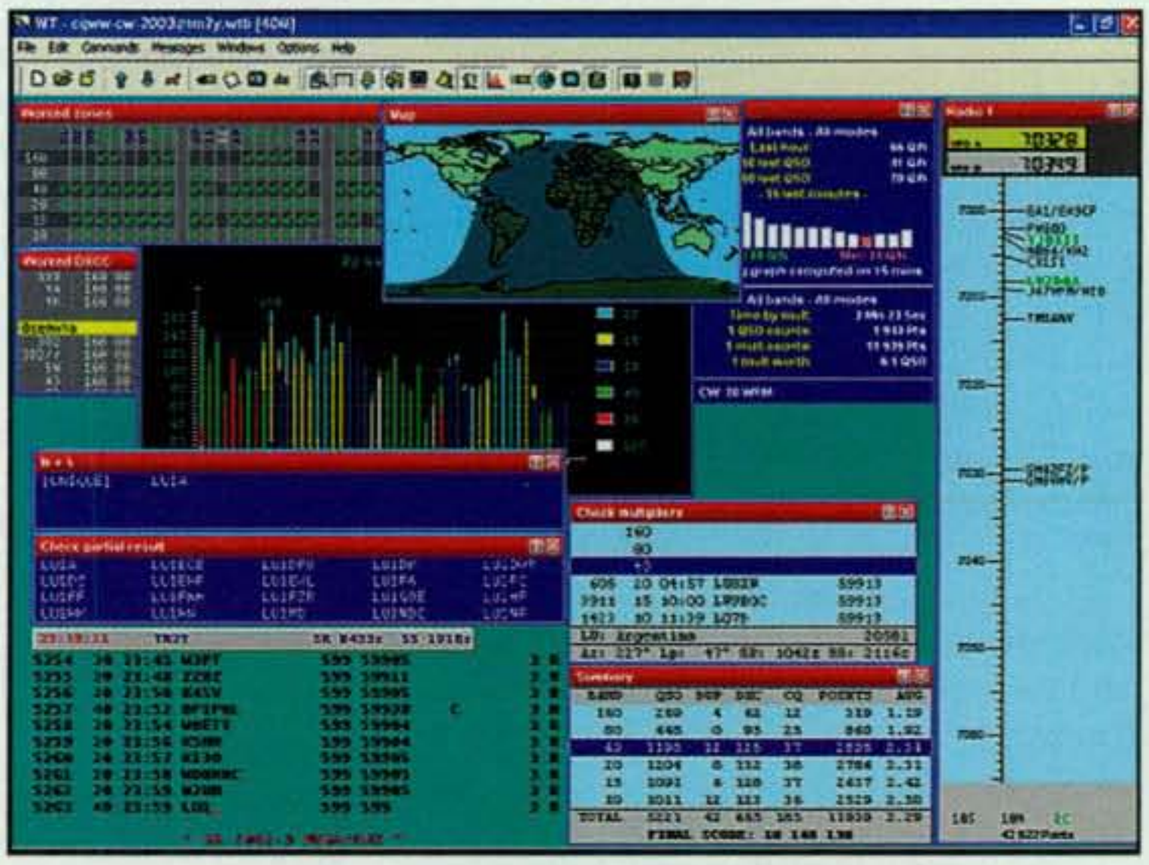

Fig. 2– Designed by contesters, Win-Test is said to be not only another contest logging software package, but a no-compromise one that's "a real tool to win." Easy to use, fast, and powerful, its many features include support of numerous contests. (Graphic from the Win-Test website)

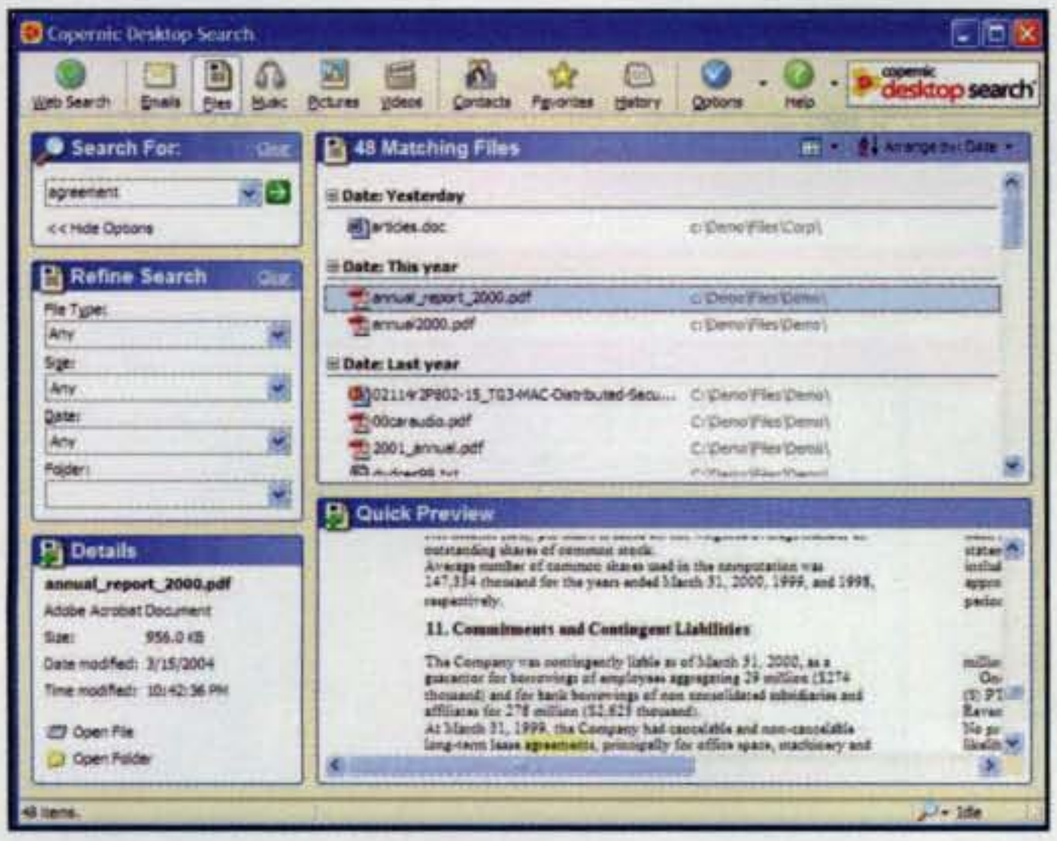

Fig. 3– Copernic Desktop Search (CDS) is billed as "The Search Engine for Your PC." CDS brings the power of a search engine to your PC and allows you to instantly search files, e-mails, and e-mail attachments stored anywhere on your hard disk. (Graphic courtesy Copernic)

than 45 minutes of video lessons to help you get "up to speed" on Windows® XP fast and easily.

For more information, visit your local bookstore, or contact Pearson Education, 200 Old Tappan Road, Tappan, NJ 07675 (phone 1-800-922-0579; on the web: <http://www.quepublishing.com>).

Radio Resources

eHam.net. What is eHam.net (fig. 4)? It is a very popular community website designed and operated by, and run for, active amateur radio operators. The staff invites you to bookmark the site, explore the system, and join their group of dedicated volunteers and enthusiastic members in continuing to build the world's largest community of amateur radio enthusiasts.

Fig. 4– The popular eHam.net is a community site designed and operated by, and run for, active amateur radio operators. It also may be helpful to you in making purchase decisions on products announced in your "What's New" column. Reviews such as those on eHam.net are by and large not in-depth analyses of products. Rather, they tend to be "ham on the street" opinions that reflect the writers' individual product experiences. (Graphic from the eHam.net website)

The eHam.net vision statement shows that its objective is to build the largest and most complete amateur radio community site on the internet—a "portal" that hams think of as the first place to go for information, to exchange ideas, and be part of what's happening with ham radio on the 'net. The website is intended to provide recognition for, and enjoyment to, the people who use, contribute to, and build the site.

The site includes Articles, Calendar, Callbook, Chat, Classifieds, DX Packet Spots, Forums, Friends Remembered, Ham Exams, Ham Links, News, Profiles, Propagation, Shack Showcase, Speak Out, Spotlight, QSL Managers, Strays, Survey Question, Product Reviews, and many other interests and areas.

We're especially interested in the Product Reviews area, which may be of real value to you, especially after reading a product announcement in your "What's New" column (remember, in this column we run product announcements, not reviews). On eHam.net you'll find and can read reviews of products and services submitted by website members—first-person, potentially valuable reviews from real people with real opinions—about products you're considering buying. You also can create a review of any ham product you own and submit it to the site.

The last time we checked, there were well over 32,000 reviews on more than 4200 different amateur radio products and services. To browse the reviews or to write your own, just follow the links in the tables in the Product Reviews area. Check out this interesting website at <http://www.eham.net>.

Special Note: Remember that the product reviews you'll find on eHam.net (and those posted elsewhere on the internet) are mostly written by "average hams" who may bring their own biases to the reviews. There usually are no qualification or fact-checking requirements for what reviewers write, and there's no major editing process for the reviews.

With that in mind, you may, of course, productively use eHam.net and other posted reviews to follow-up on product announcements in this column (please read the "What's New" column disclaimer at the end of each month's column), and you may also want to check out *CQ*'s own published reviews when you find a product of interest. While we can only publish a limited number of reviews, our reviewers are generally known quantities, and *CQ* tries to make sure the facts are right before publishing reviews.

At the bottom line, the final purchase decision for the products we mention in this column is a personal one that only you can make. Just be sure to get all the information you can about the products, whether from *CQ, QST,* other pubs, eHam.net, friends and associates, or other sources—and then evaluate this information carefully. As it is often said, "trust, but verify."

Wrap-Up

That's all for this time, gang. Next time, more "What's New." See you then.

Overheard: Why jump the gun? I've found that if I just keep quiet, someone else likely will ask the stupid question that I was just about to ask. 73, Karl, W8FX

Note: *Listings in "What's New" are not product reviews and do not constitute a product endorsement by CQ or the column editor. Information in this column is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of this column is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.*

how it works

BY DAVE INGRAM,* K4TWJ

IF Filters and Receiver Selectivity

Our study of receiver designs that began in the January issue with an overview of double- and triple-conversion receivers and continued in March with analyzing RF stages continues this month with a closer look at IF stages and bandpass filters. In particular, we will consider what makes up crystal and mechanical filters, what determines their bandwidths, and why filters vary in overall quality of performance. We also will briefly discuss IF-level DSP filtering and where filters are located electrically in a receiver's or transceiver's circuitry. We are sure you will find this information beneficial both now and for many years hence. Let's begin with a mini review of some general information related to both IFs and filters.

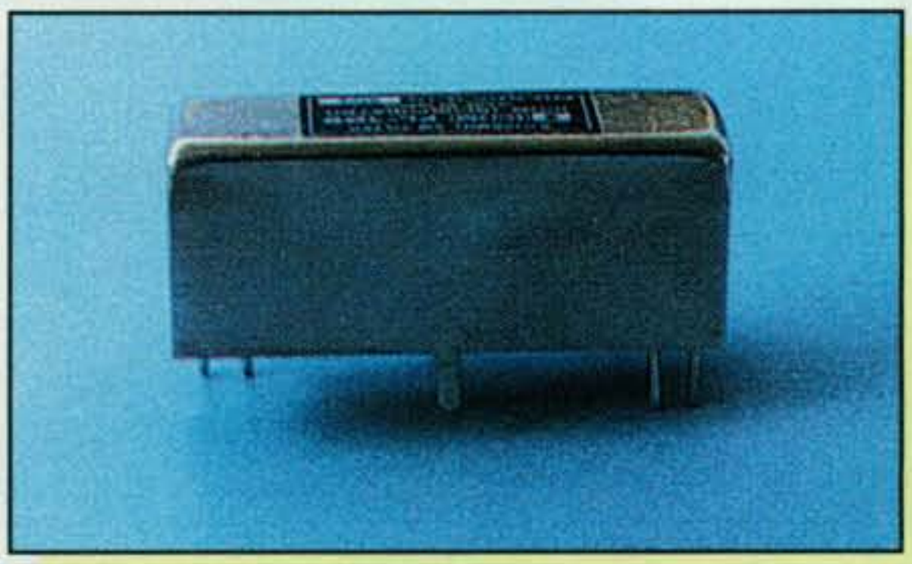

Photo A– A typical plug-in, optional crystal filter for an HF transceiver. These items are produced in various sizes, bandwidths, and IFs to mate with specific models of receivers or transceivers.

IFs and Filters

IF, or intermediate frequency, stages are so named because they are located both frequency-wise and electrically between a receiver's or transceiver's RF and audio stages. Their main purpose is to enhance or improve receiver selectivity so one signal can be separated from several other near-frequency signals. Most modern receivers use two or more IF stages, and crystal or mechanical filters are included in at least one of those stages.

Prior to the development of crystal filters, receivers relied solely on an IF stage's tuned input and output circuits for selectivity. Typical bandwidth of those dear little receivers measured 5 to 7 kHz for average-strength signals, with strong signals pushing that bandwidth up to 65 or 70 kHz. Can you visualize that? Receivers tuned to 14.200 MHz could pick up interference from strong signals on any frequency from 14.165 to 14.235 MHz. They were akin to a no-tune scanner; you just set one on a frequency and heard all the action at once. Crystal filters noticeably improve that situation by narrowing both average- and strong-signal bandwidths. As a result, modern receivers can copy an average-strength signal amidst several stronger signals on nearby frequencies with surprisingly good results. Now let's take a slightly more technical look at the previously mentioned "specs."

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Filter Facts and Figures

When discussing IF stages and filters, we often hear references to types of filters, their bandwidths, strong-signal and/or adjacent frequency rejection, and center frequency of operation. This mix of technical specs and jargon can seem rather confusing to newer amateurs, so let's clear the air with some plain-language explanations of general facts and figures.

Basically, there are three types of IF filters used today in receivers and transceivers: *crystal lattice filters* (most common), *mechanical filters* (more elaborate and expensive), and *DSP filter systems* (the latest and greatest technical innovation). IF filters are also categorized according to their bandwidth, which in turn depends on the desired mode of operation—SSB, CW, or AM. SSB filters are produced in bandwidths such as 2.3 or 2.4 kHz for general all-around use/work and the most natural-sounding audio. They are also produced in more

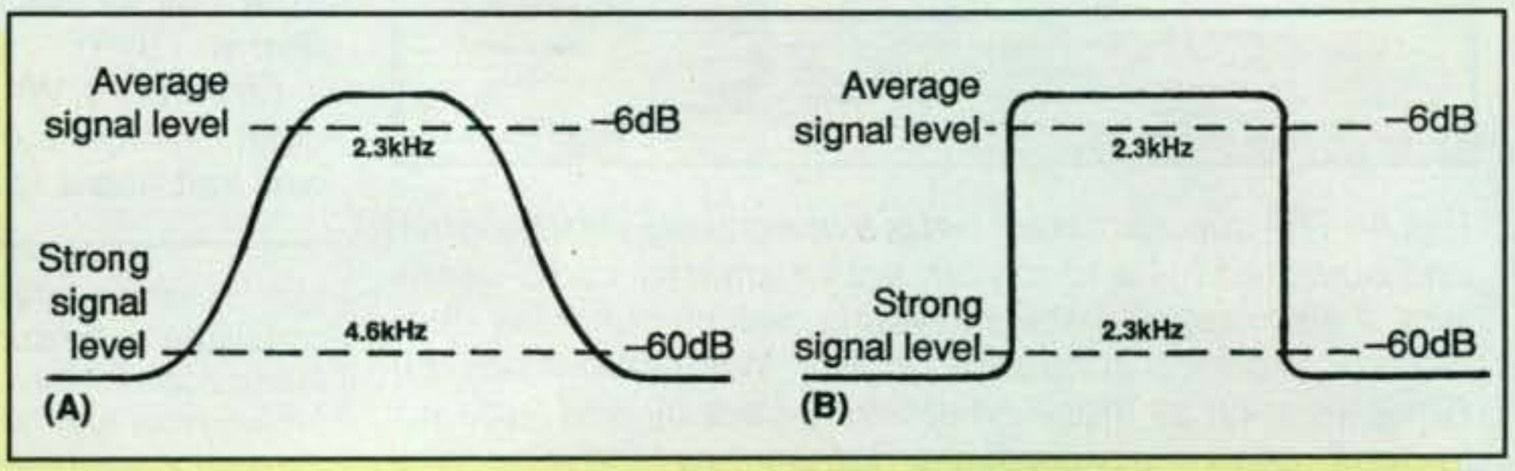

Fig. 1– (A) A hypothetical passband response curve for a good, general-purpose SSB filter with an average signal width of 2.3 kHz, a strong signal width of 4.6 kHz, and a shaping factor of 2:1. (B) Passband response curve of a theoretically perfect SSB filter with both average strength and strong signal widths of 2.3 kHz and a shaping factor of 1:1.

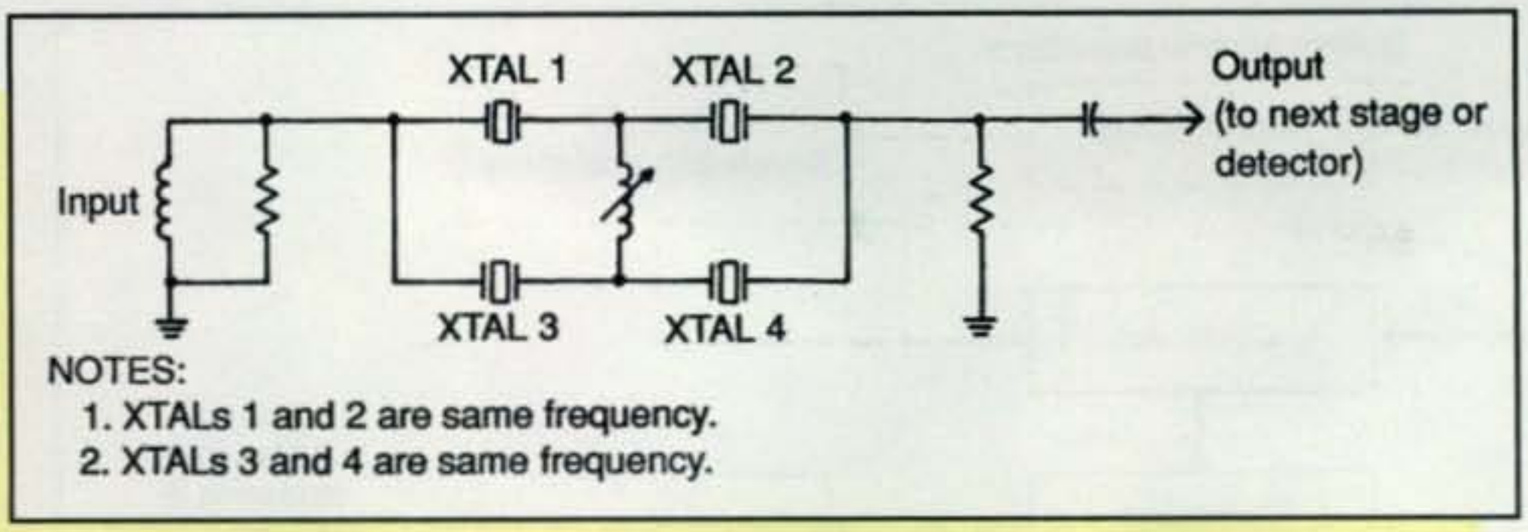

Fig. 2– Circuit diagram of a basic, generic four-pole crystal lattice filter. All four crystals are resonant at the IF's approximate center frequency and offset slightly to produce the desired bandwidth. Increasing the number of crystals, or poles, improves the filter's shaping factor or strong signal rejection.

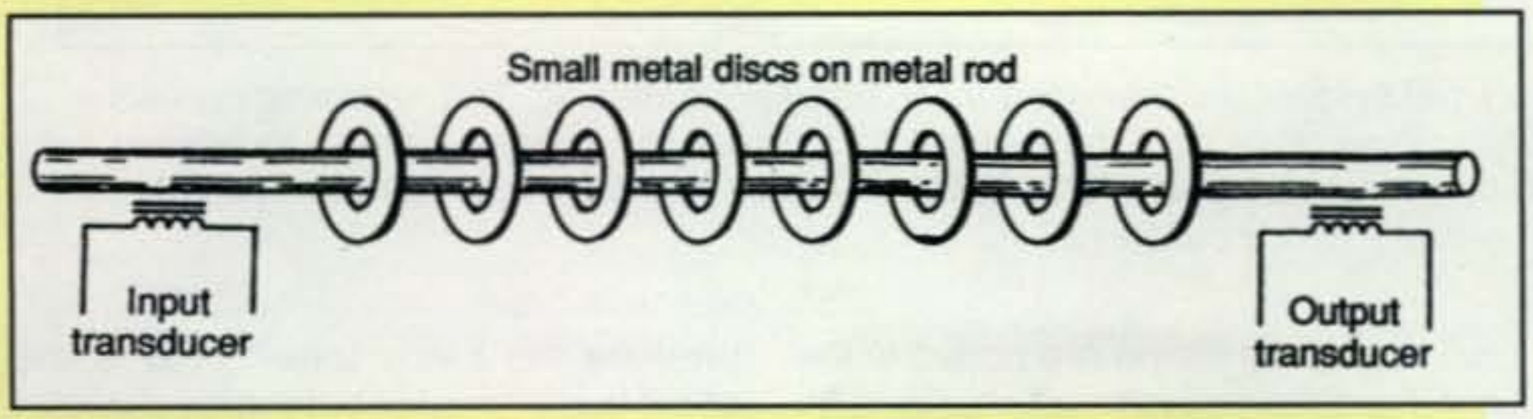

Fig. 3– Outline of a Collins-type mechanical filter. An input transducer converts signals into mechanical variations that cause the center rod to vibrate. Small metal disks along the rod resonate it at the IF, and each disk is offset slightly to produce the desired bandwidth. Signals passing through the rod are converted from mechanical vibrations to analog signals at the output transducer and passed to subsequent stages.

narrow widths of 2.1 or 1.8 kHz; they sound more restricted but work well for combating interference or cutting through DX pile-ups. SSB filters also work well for general CW use. However, narrower filters of 500 Hz or .5 kHz and ultra-narrow filters of 250 Hz or .25 kHz are available as options for most receivers and transceivers. A 500-Hz filter is the most common choice here, as it works great, and unlike a super-sharp 250-Hz filter, it does not require an extremely steady hand for tuning in signals.

An SSB filter is also useful for copying AM signals, although its narrow bandwidth limits audio fidelity. When full-bodied audio is a prime concern (as an example, for serious SWLing or listening to entertainment/music directly from international shortwave broadcast stations), an optional 6-kHz filter is desirable for most radios.

The previous figures relate to a filter's width for average-strength signals. However, stronger adjacent-frequency signals can "blast through" some filters and appear to noticeably increase their bandwidth. A filter's ability to pass an average-level/desired signal while rejecting strong adjacent-frequency/undesired signals is related to its skirt-shaping factor, which is also described mathematically as its –6 dB to –60 dB ratio. For clarification, their parameters are illustrated in fig. 1. The figure is slightly tricky to read because it seems to be upside down; the average signal width (–6 dB) is near the top, and the strong signal width (–60 dB) is near the bottom. If those widths are 2.3 and 4.6 kHz, respectively, the filter's skirts will be twice as wide at the bottom as at the top (a 2:1 shaping factor—not the ultimate best, but quite acceptable for general communications work). If the widths are 2.3 and 3.5 kHz (a 1.5:1 shaping factor), the filters' skirts will be narrower at the bottom and the adjacent frequency/strong signal rejection will be noticeably better. Finally, we should point out that while a shaping factor of 1:1 may seem ideal, it is not actually feasible in real life because of capacitance, inductance, and electromechanical component limitations within a filter. As we will discuss later, IF-level DSP filter systems come close to obtaining a 1:1 ratio because they clock data through a microprocessor rather than using conventional tuned circuits for achieving selectivity. Now let's take a closer look at filters.

Types of Filters

As previously discussed, an IF filter may be crystal lattice, mechanical based. or DSP in nature. Depending on internal composition and/or circuitry, the filter may also exhibit a wide or narrow bandwidth at its –6 dB points with somewhat flared skirts at its –60 dB points.

Crystals function like sharply tuned circuits, boosting signals at their resonant frequency while rejecting signals removed from that frequency. Looking at the circuit diagram of a basic crystal filter (fig. 2), the frequencies of crystals three and four are separated from crystals one and two by the desired bandwidth, and the IF stage's center frequency is midway between the crystals' frequencies. As an example and as-

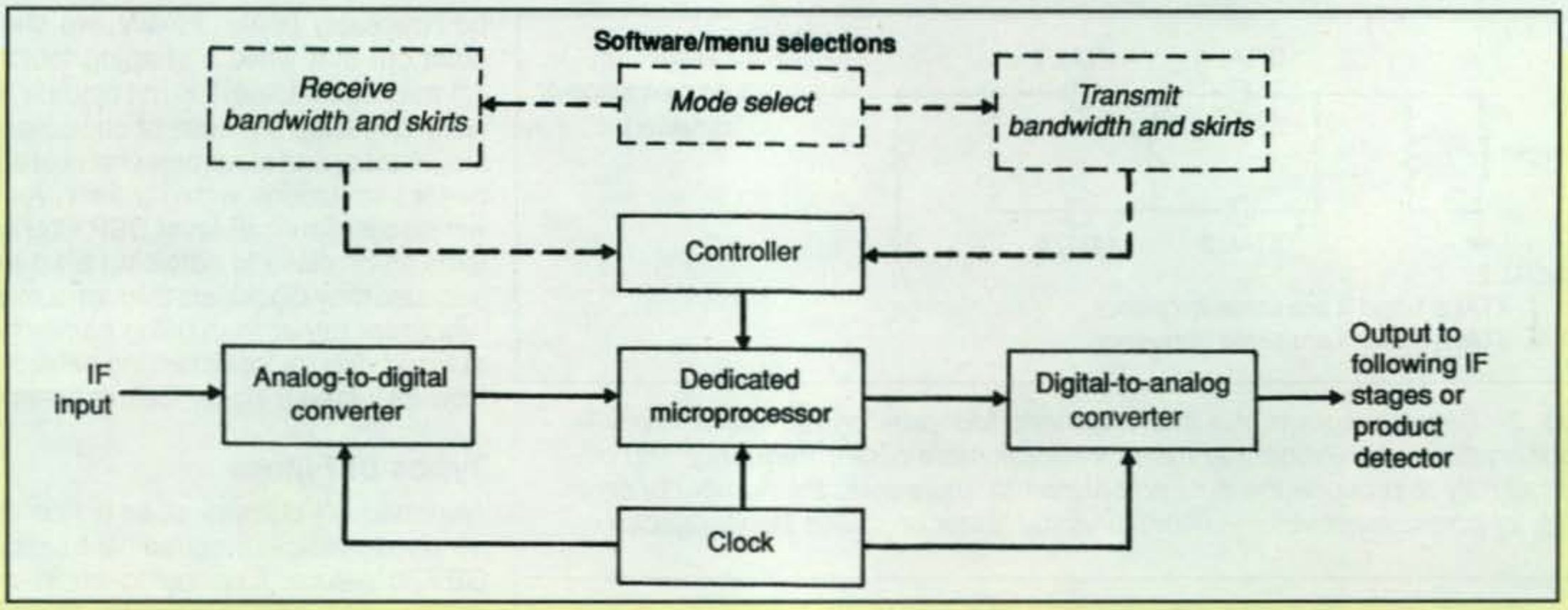

Fig. 4– Simplified block diagram of a DSP system like that used for IF bandwidth filtering. The response curve's width and skirts can be set by specifying how close data must be to clock frequency to pass through the microprocessor. That parameter can also be menu-changed and switched between transmit and receive to produce a custom IF.

suming a hypothetical IF center frequency of precisely 8.00 MHz, crystals one and two would be 7.998.8 MHz and crystals three and four would be 8.001.2 MHz for an SSB bandwidth of 2.4 kHz. Since this is only a four-pole or four-crystal filter, its skirt-shaping factor probably will be around 2:1 (2.4 kHz at –6 dB; 4.8 kHz at –60 dB). Incidentally, if more series-connected crystals (called *poles* in filters) are added to the filter, the shaping factor will improve. An eight-pole filter, for example, may exhibit a shaping factor of 1.65:1.

Do you remember experimenting with tuning forks in school? Do you recall how striking one tuning fork on a table and then moving it near another tuning fork of the same length (frequency) also caused the second fork to vibrate and produce the same tone? That is the same basic concept behind mechanical filters. As shown in fig. 3, a mechanical filter consists of an input transducer (similar to a coil on a medal rod, like an electromagnet), a number of small, rod-mounted metal disks (like tiny tuning forks), and an output transducer. Incoming signals cause the transducer to vibrate the rod, but disks on the rod are cut to an exact size/frequency and only allow the rod to vibrate at that frequency. The vibrations are then converted back to an electrical signal by the output transducer (a single signal, corresponding to the disks' resonant frequency) and passed to subsequent receiver stages. Each disk in the filter is called a *pole*, just like each crystal in a crystal filter is called a *pole*. Likewise, each disk is cut to an ever-so-slightly different frequency (in the case of an eight-pole filter, each disk would resonate at 300-Hz intervals between 7.998.8 and 8.001.2 MHz).

IF-level DSP is the new kid on the block, so to speak, and typically is used in conjunction with crystal filters to yield top-line selectivity with software-defined bandwidths and skirt-shaping factors. As shown in fig. 4, DSP converts signals to digital data, which is then clocked through a high-speed and multi-function microprocessor and then converted back to an analog signal. The clock speed, or frequency, is comparable to that of the IF. Specifying how close data must be to the clock frequency determines the DSP system's bandwidth, shaping factor, and even roll-off angles at –6 dB points. In addition, the settings can be changed (such

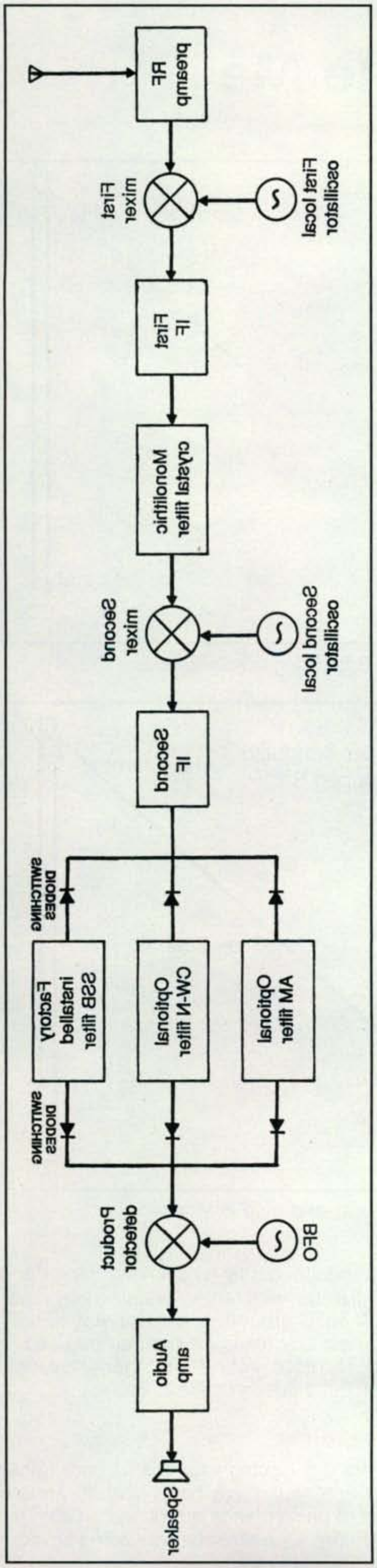

Fig. 5– Streamlined block diagram of a modern double-conversion receiver showing electrical position of circuits and crystal filters. The upper crystal filter is factory-installed and used for transmitting on both SSB and CW, while owner-installed filter(s) in "optional" slot(s) are used for receiving SSB and/or CW. ←

as from wide to narrow) between transmit and receive. The concept (explained here briefly and in simple terms) is quite different from crystal and mechanical filters, but it works like a champ.

A Brief Circuit Study

As illustrated in fig. 5, most modern receivers and transceivers include a factory-installed monolithic crystal filter between the first and second IF stages and a factory-installed SSB crystal filter between the second (and possibly third) IF stages. The filters are then followed by the product detector, one or more stages of audio amplification, and the speaker. This factory-installed SSB filter is usually a high-quality and medium-bandwidth item used during both transmit and receive operation/functions. An empty filter slot is usually included for owner installation of a narrow SSB or CW filter. The optional filter is most often employed only during receive, with the factory-installed SSB filter being switched back in line during transmit. The filters are switched by forward and reversed biasing diodes, which are located right at the filters' positions on a PC board to minimize strong-signal "blow by" associated with long wire runs to a front-panel switch. The types of optional filters and guidance on their installation are usually included in a radio's owner's manual.

Conclusion

We have only scratched the surface of a most extensive subject, but we have also again overflowed available column space and must sign off for another month. We trust, however, that this basic and somewhat technical overview has helped you to understand the why, how, and general operational concepts of IF filters used in both receivers and transceivers. While studying communications-type electronics is a good form of self-improvement, bear in mind that we all should enjoy some good on-the-air QSOs every day. Go for it, and here's hoping we meet on 30-meter CW one weeknight or 20-meter sideband one Saturday or Sunday afternoon.

73, Dave, K4TWJ

antennas

BY KENT BRITAIN,* WA5VJB

Antennas That Trouble Me

Quite a variety of antennas that trouble me a bit have been showing up. As a result, this time we'll go back to some antenna basics.

In fig. 1 we have the simple long-wire antenna. The long wire has been serving the radio community for over a hundred years and still works well. For me it goes back to the days when I tied my 3-watt Ten-Tec Argonaut to the top strand of a barbed-wire fence; it worked out all over Navarro County, Texas and all over the world. Of course, the more modern rigs would like an antenna tuner between the rig and the long wire. However, if you have an old 6146 tube rig with a pi-output tune-and-load circuit, your rig will be quite happy loading into this antenna.

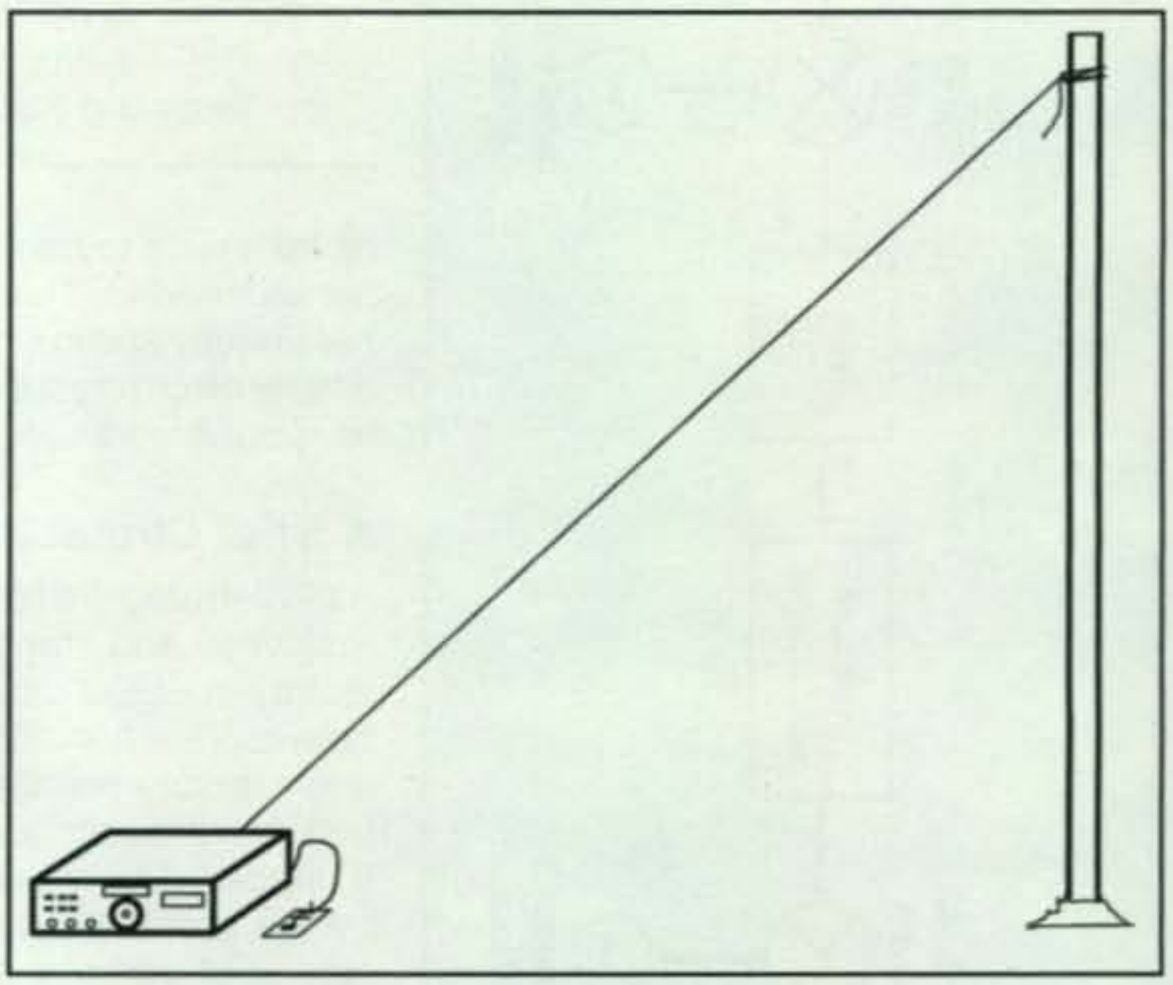

Fig. 1– Basic long-wire antenna.

Antenna basics hold for the long wire: You want it as high in the air as practical and as long as practical. Yes, bigger *is* better. In fig. 1 we show the long-wire feed at the rig end. How about feeding it at the other end? Let's take a look at fig. 2. It's easy enough to just connect the coax braid of, say, a 2-meter antenna and use it as a 75-meter long wire. However, if we can induce the current at the far end of the coax, we can now feed that braid as a long-wire antenna, but from the far end. Now don't any of you go out and build this antenna. It's not going to work very well, but we're getting there.

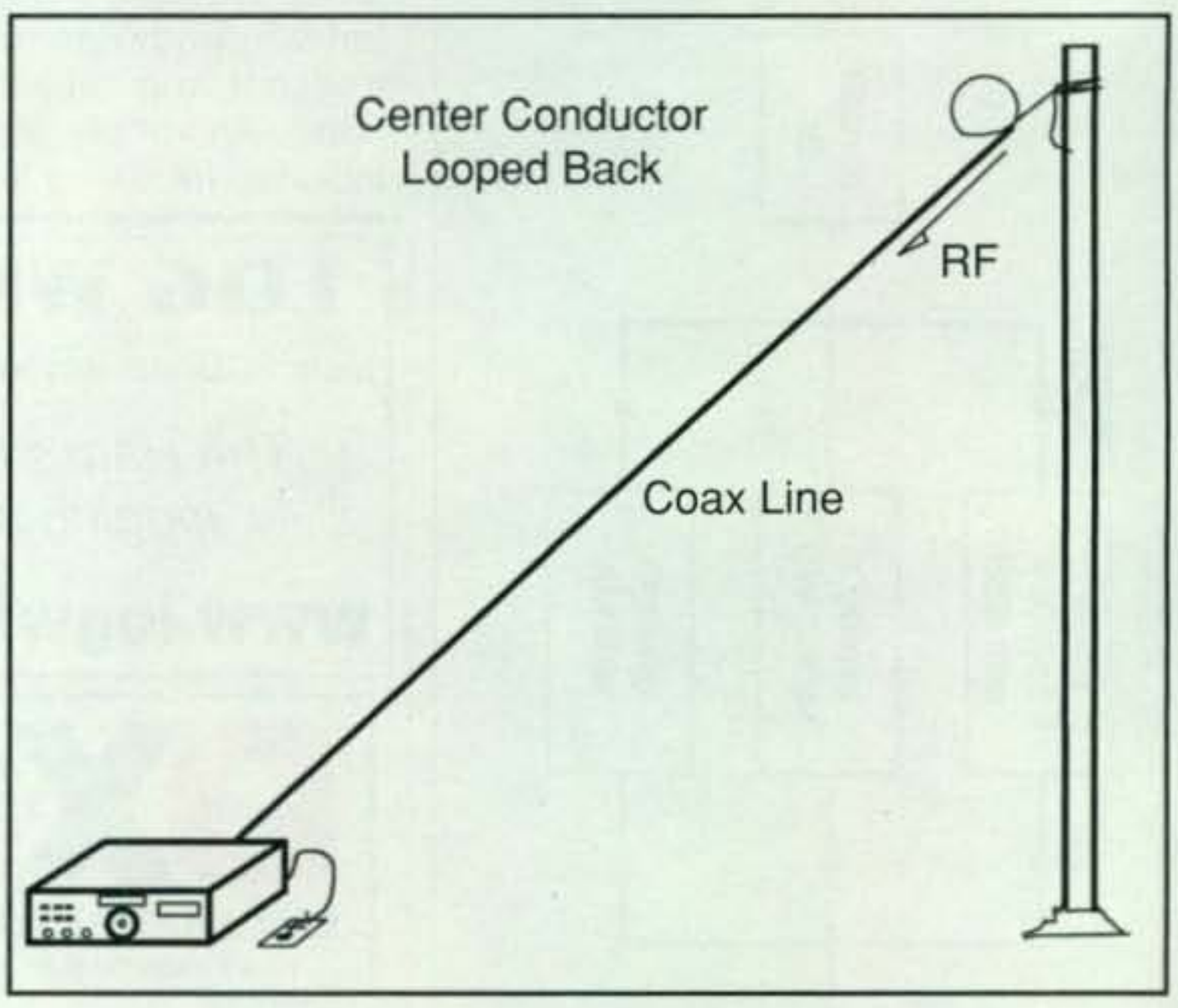

Fig. 2– Far-end-feed long wire.

A signal going down coax generates equal and opposite currents in the center conductor and the shield (see fig. 3). Without a balun or choke, these equal and opposite currents just run around the end of the shield and continue on the outside of the coax. Thus, to get an amp of RF current on the shield, we need to get an amp of RF current to go down the center conductor. By running the coax to a ground at the far end, we get maximum RF current on the outside of the coax (see fig. 4).

I don't recommend this as a practical antenna. For one thing, you would also need to ground the shield near the rig, or get some high-voltage RF burns on your lips when you get too close to the mic. Also, loss in the coax means you won't have as much signal as when you just connect the outside braid of the coax near the rig. Again, you'll need to run a Heathkit DX-40 or use an antenna tuner. It is, though, a fully functional antenna and similar to trailing wire antennas used by submarines. A solid ground, a quarter-wavelength wire, or almost any mass of wire can be used in the far end. The solid ground or quarter-wave whip works best, but it doesn't have to be.

Dubious Claims

Okay, where am I going with this? Some rather interesting antennas have been floating around with claims of performance not based on electromagnetic theory. One antenna was being hawked

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e-mail: <wa5vjb@cq-amateur-radio.com>

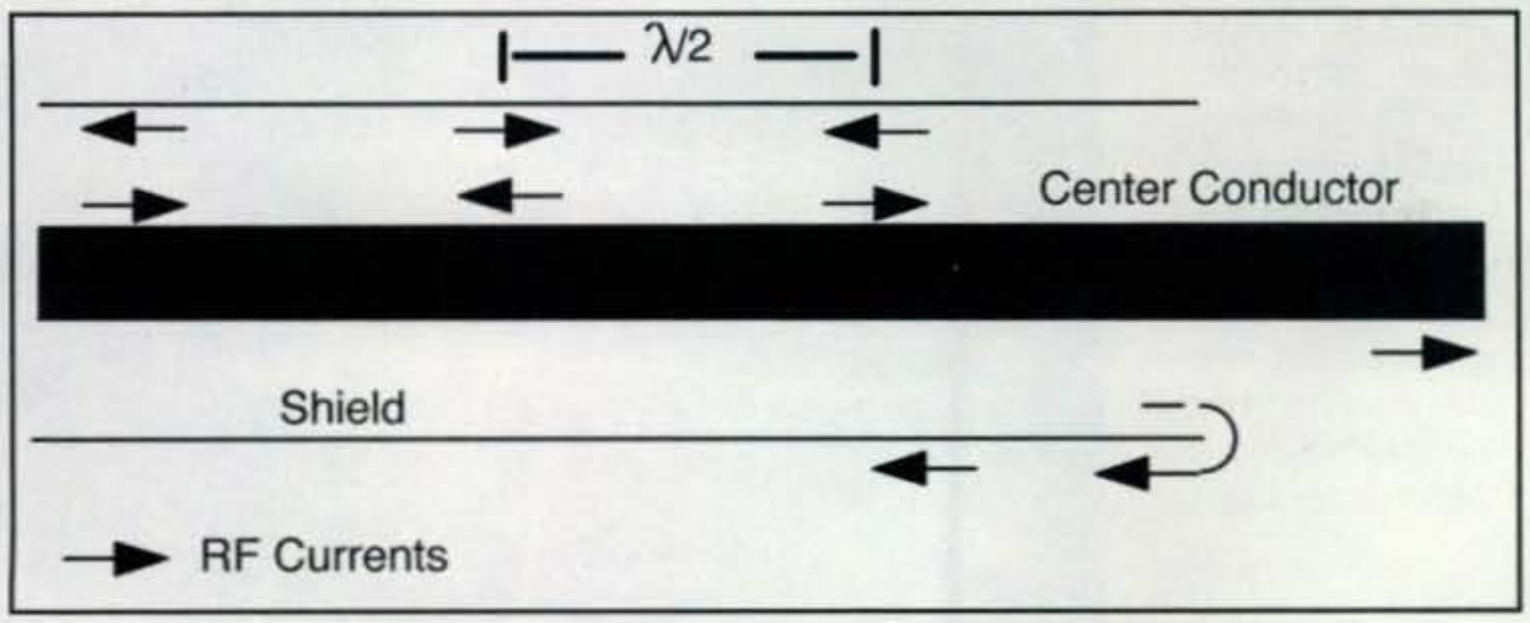

Fig. 3– Equal and opposite RF currents in coax.

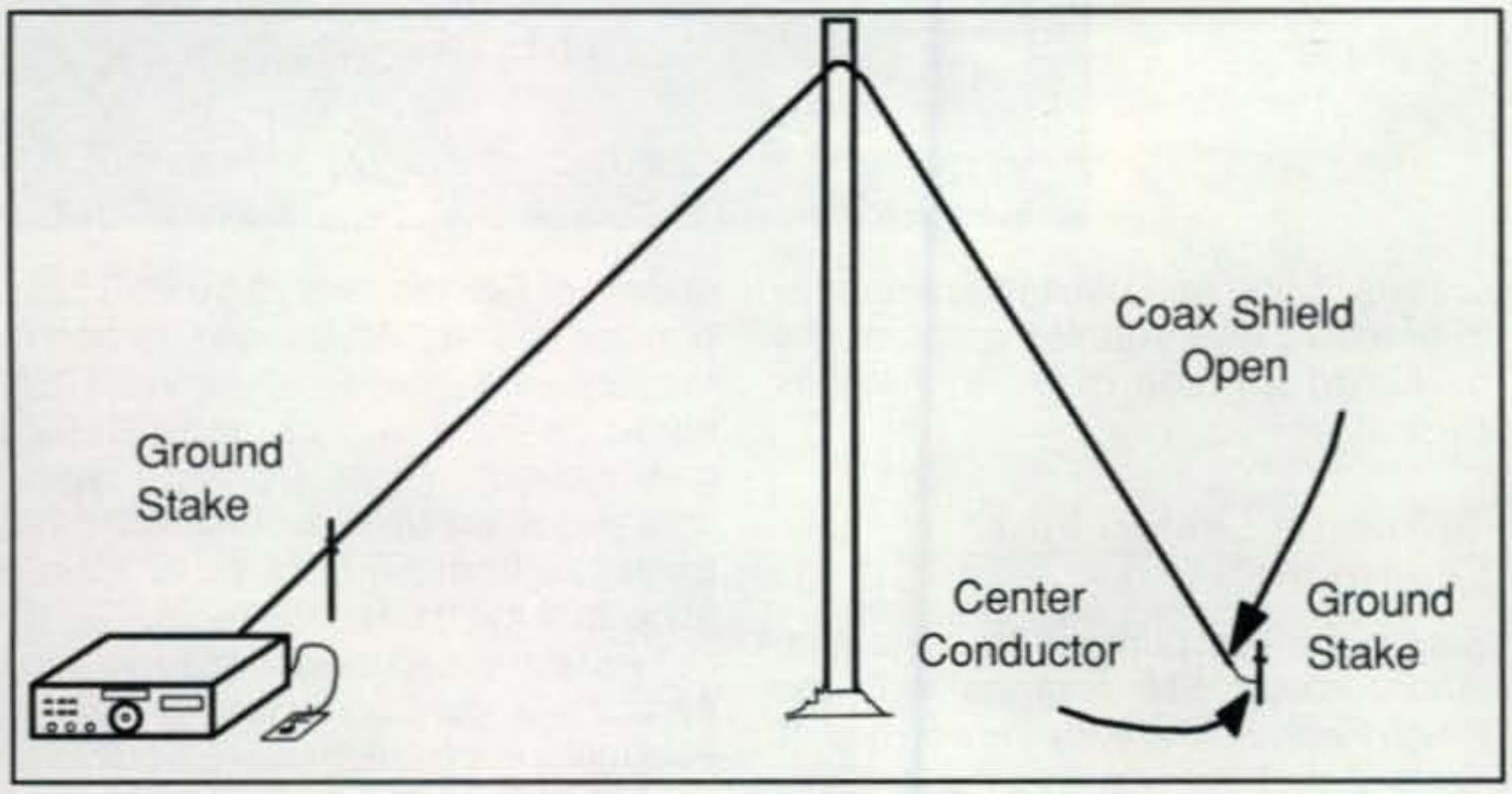

Fig. 4– Current-feed long-wire antenna.

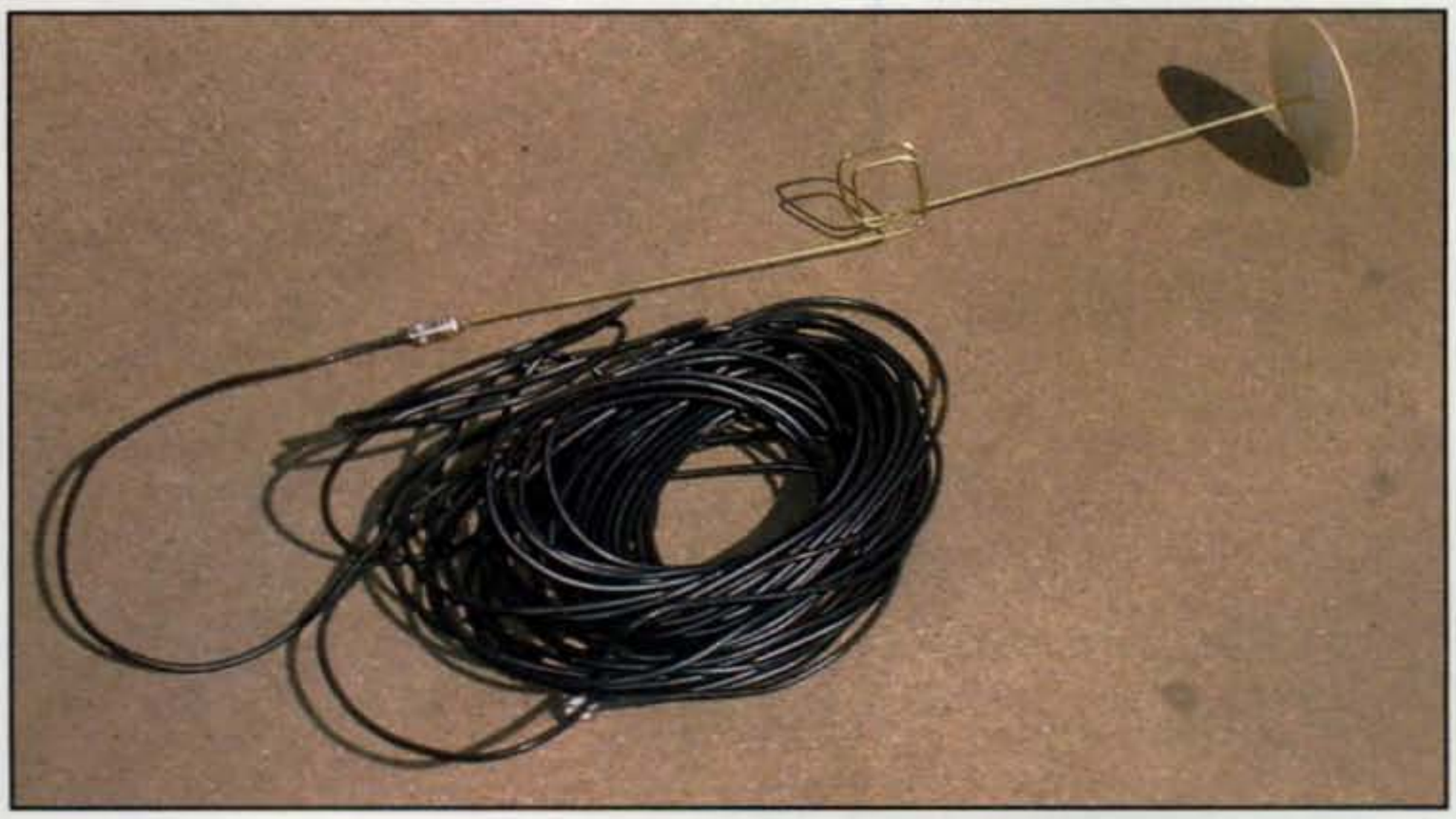

Photo A– Can you point out the antenna? See text for the answer and explanation.

at a Dayton fleamarket spot with demonstrations of how well it got into a local repeater (big deal, I could have done that with my belt buckle or key ring!). This twisty thing was just connected to the center conductor of the coax—no balun, no ground. "Oh yeah, it doesn't need a ground; it finds its own ground." Most of these "magic antennas" also don't use a ground. In reality, the coax is the antenna. The bandwidth and radiation efficiency are based on the length of the coax, not the twisty thing at the end. Buyer beware!

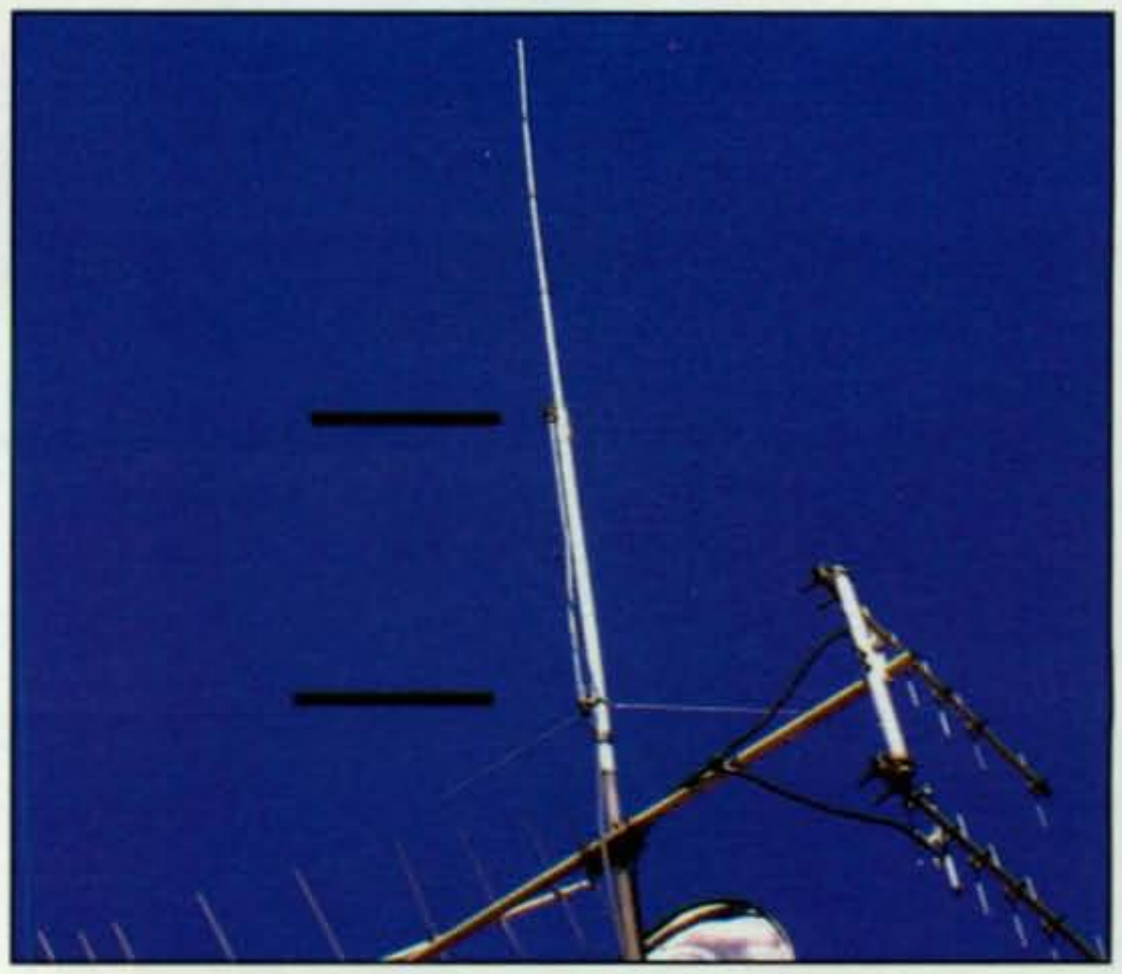

Photo B– A half-wave add-on to the Ringo Ranger with decoupled coax turned out to be a good fix for problems that plagued the original versions of this venerable 2-meter base antenna.

Thus, if you had pointed to the coax in photo A, give yourself a pat on the back and a grade of "A" in Antenna Basics.

Turning a Lemon Into Lemonade

Back in the '70s, perhaps the most common 2-meter FM antenna was the Ringo Ranger. The early version had all kinds of problems, such as poor SWR when mounted on certain length poles and RF on the rigs, all caused by poor isolation of RF on the coax. Nearly half of the RF was running back down the outside of the coax. A popular add-on kit was a half wavelength of coax and a set of decoupling stubs, or ground radials. This created a second antenna below and in phase with the Ranger. The coax was decoupled, and the antenna had a couple of dB more gain—a good fix.

Extraordinary Claims Require Extraordinary Proof

Several years ago, something called a "Contrawound Toroidal Helix Antenna" was being heavily promoted. Only once have I heard of it being tested on a proper antenna range. A few years ago, General Dynamics tested a CTHA on its HF antenna range as part of a contract. All they could report was a gain of less than –30 dBd. The noise floor was 30 dB below the level produced by a dipole, and the CTHA was less than that.

I recently set up the 2.4-GHz antenna range for a local WiFi group. It was amazing how many of the commercial "6 dBi" antennas measured in at –2 dBi.

For nearly 30 years the Central States VHF Society has had an antenna contest as part of its annual conference activities. For the last 20 years I have handled the 902 MHz+ and up part of the antenna range, while WBØTEM made the 50, 144, 222, and 432 MHz gain measurements. During a typical conference we will measure 100 to 125 antennas from 50 MHz to 47 GHz (I hope to add 80 GHz this year).

If you have a super-duper, room-temperature, super-conducting, E- and H-field multiplying antenna, we would love to test it. Drop me an e-mail (wa5vjb @cq-amateur-radio.com) and we will see about testing it this July.

Cheap Yagis on Other Frequencies

About a dozen readers have asked about moving Cheap Yagis to other frequencies, such as the 2-meter Cheap Yagi to 155 MHz, or the 445-MHz version to 470 or 420 MHz. These antennas can be scaled to nearby frequencies. Just multiply the element lengths and spacing by the ratio of old freq./new freq. As an example, you could move the 445-MHz version to 470 MHz by multiplying all dimensions by 445/470, or about .95. Thus, a 12-inch-long director becomes 12 × .95, or 11.4 inches. You can get away with this for about ±10% change in frequency. Beyond that range you need to scale the element diameters and even the thickness of the wood boom as well.

Next Time

I will see if I can't finish up those 75-ohm ATV versions of the Cheap Yagis and then we'll go over antenna-range basics and measuring antenna gain. Now go out in the garage, build something, and get it in the air!

73, Kent, WA5VJB

BY JOE LYNCH,* N6CL

They're Not Your Father's VHF+ Ham Bands—Part II: Now

This month I conclude the two-part series on the then and now of VHF+ operating. As I wrote last month, much has changed over my history of being a ham radio operator. When I was first licensed, AM and CW were the only modes of operation on the VHF+ ham bands. Now, 44 years later, the VHF+ ham bands have many different specialty niches. Gone is AM, except for the rare 6-meter operator who wants to see if his multi-mode radio will really work in that mode. CW continues to be used on 6 and 2 meters, as well as for occasional contacts on the higher frequencies, but only by DXers, those weak-signal operators who attempt to work as far as possible.

As editor of this column, and for the past three years as editor of *CQ VHF* magazine as well, I have seen the growing interest in the VHF+ ham bands. No longer are we just interested in FM, space, weak-signal, and ATV (amateur television) communications. We are now interested in using the VHF+ ham bands for all of the following applications:

Weak signal: Weak signal continues to be of prime interest on the VHF+ ham bands. Among the quite popular weak-signal activities are EME (Earth-Moon-Earth), meteor scatter, and various types of propagation-related contacts, such as sporadic-*E*, tropospheric (including ducting), transequatorial, aurora, and *F2*. With regard to EME and meteor-scatter communications, digital software development, in particular WSJT, is being used in more sophisticated EME and meteor-scatter communications. Increasingly, digital is displacing SSB on meteor scatter and CW on EME as the primary mode of communication.

Space: Communications via satellites continues to be very popular—including LEO (low Earth orbiting) satellites, as well as the more recently launched AO-51, the to-be-launched Phase 3E and Eagle, and a satellite proposed to orbit Mars, Phase 6.

Communicating with persons in space via ARISS (Amateur Radio aboard the International Space Station) continues to increase. This has proven to be of educational value, as well as experimental value. As ham radio activity continues to increase in the coming years onboard the ISS, the possibilities for experiments will also increase.

FM: FM communication continues to be the backbone for most who first enter our hobby via the VHF+ ham bands. Of particular importance in these days of increased homeland security threats is emergency communications. Also, changes in technology will cause the developers and users of repeaters to re-evaluate the changing dynamics of repeater use. For example, controlling HF radios such as Kenwood's Sky Command unit and the TS-2000 could become an increased activity via FM and possibly repeater use.

The internet has also opened the VHF+ ham bands via IRLP (the Internet Radio Linking Project) and Echolink. Now hams using Echolink do not even have to have a radio in order to talk over a repeater; they just need a computer. For those who live in facilities that prohibit amateur radio station installations, ham radio contacts are available via Echolink (IRLP requires end users to be on the radio).

Digital: Digital communications has seriously evolved over the past 40-plus years. While being a method of passing messages from one point to another, it has also become a backbone for emergency communications. Digital communications continues to see evolution in how we perceive packet communications, in particular with the more recent addition of HSMM (high-speed multimedia) connections on our microwave ham bands. In addition, use of the GPS (global positioning system) satellite network has become increasingly popular in APRS (Automatic Position Reporting System).

ATV: Amateur television has been around for a long time. It also is a tool for emergency communications, with ham radio operators equipped with ATV sending pictures back to fixed stations and weather maps being transmitted over ATV for the use of storm spotters and others involved in communications during severe weather. Along with digital developments in commercial television broadcasts, digital ATV development is following, especially in Europe.

Balloons: Ballooning continues to increase in popularity. Balloons equipped with ATV and digital devices, as well as voice repeaters and GPS receivers, appear frequently in the skies.

R/C: Speaking of the skies, model airplane radio control, as well as model car radio control, continues to be popular. Equipping these models with ATV and GPS will add even more creativity to this aspect of the hobby.

Contests: Ham radio contesting has been around for a very long time, and the VHF bands are becoming ever more popular in this activity. There are weak-signal contests, as well as the ever-popular Field Day.

VHF Plus Calendar

May 1	Last Quarter Moon. Moderate EME conditions
May 7	West Coast Space Symposium. Microwave Spring Sprint
May 7–8	2 GHz and Up World Wide Club Contest
May 8	New Moon. Moderate EME conditions
May 9	The *e-Arietids* meteor shower predicted peak
May 14	Moon Apogee
May 14–15	50 MHz Spring Sprint. Second weekend of the European Worldwide EME Contest 2005
May 15	Good EME conditions
May 16	First Quarter Moon. May *Arietids* meteor shower predicted peak
May 20	The *o-Cetids* meteor shower predicted peak
May 20–22	Dayton HamVention®
May 22	Moderate EME conditions
May 23	Full Moon
May 26	Moon Perigee
May 29	Moderate EME conditions
May 30	Last Quarter Moon

—EME conditions courtesy W5LUU.

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In particular, Field Day has undergone several changes in order to keep pace with the changes in communications on the VHF+ ham bands. For example, when Field Day first started, no one could possibly have imagined gaining bonus points for contacts via satellites. Also, while the introduction of WSJT has proven to be controversial, a growing number of contesters are using digital modes for competing in the various EME contests during the year.

There you have it, a brief look at the "now" of the VHF+ ham bands. As you can see, this niche area of the hobby is evolving into several more sub-niches as technological advances create more possibilities. Whatever your particular interest in the hobby, you will find an opportunity to pursue it via the VHF+ ham bands.

Space Shuttle Re-launch Expected This Month

According to NASA, STS-114 is the Space Shuttle's Return to Flight Mission, and it is scheduled for launch between May 15 and June 3, 2005. Designated Logistics Flight 1, or LF-1, the STS-114 flight will use the completely overhauled *Discovery* orbiter. During its orbit it will dock at the International Space Station, where it will offload badly needed supplies. Also, the astronauts will conduct three space walks, or EVAs, the first one demonstrating newly developed repair techniques for the orbiter and its heat tiles.

The STS-114 crew includes Commander Eileen Collins, KD5EDS; Pilot James Kelly, KC5ZSW; and Mission Specialists Charles Camarda, KC5ZSY, Wendy Lawrence, KC5KII, Stephen Robinson, Soichi Noguchi, KD5TVP, and Andrew Thomas, KD5CHF/VK5MIR. Pilot Kelly previously piloted the *Discovery* orbiter in March 2001 during the STS-102 flight. Also on board that flight was Mission Specialist Thomas.

While six of the crew are ham radio licensees, it is not anticipated that amateur radio will be a part of the activities of the mission while in orbit. Even so, do not rule out the possibility of amateur radio contact with any of these operators while the orbiter is docked at the ISS. Their specifically designed patch commemorates the loss of the crew of STS-107 by way of seven stars, one of which is a Star of David, in honor of Israeli Payload Specialist Ilan Ramon. For more information on the STS-114 flight, see <http://spaceflight.nasa.gov/shuttle>.

BPL and BOB

Developing technology continues to redefine for us concepts and understanding of what it means for us humans to be connected with one another. In particular, we are becoming increasingly comfortable with, and even demanding, reliable ubiquitous computing connections, meaning that wherever we go, we want the internet seamlessly available to us.

A recent development in broadband communications may have long-term and widely diverse implications with regard to ubiquitous computing. According to Norio Wada, President and CEO of the Nippon Telegraph and Telephone Corporation (NTT), which is headquartered in Chiyoda-ku, Tokyo, the firm's researchers are pursuing research and development of an innovative Human Area Networking (HAN) technology called RedTacton (see <http://www.redtaction.com> and <http://www.ntt.co.jp/news/news05e/0502/050218.html>), which safely turns the surface of the human body into a data transmission path at speeds of up to 10 Mbps between any two points on the body.

It seems that this breakthrough technology could give a whole new meaning to the concept of skin effect. Furthermore, a fan of catchy nomenclatures may want to label this technology broadband over body, or BOB.

According to the NTT press release:

> Human society is entering an era of ubiquitous computing, when networks are seamlessly interconnected and information is always accessible at our fingertips. The practical implementation of ubiquitous services requires three levels of connectivity: Wide Area Networks (WAN), typically via the internet, to remotely connect all types of severs and terminals; Local Area Networks (LAN), typically via Ethernet or WiFi connectivity among all the information and communication appliances in offices and homes; and Human Area Networks (HAN) for connectivity to personal information, media, and communication appliances within the much smaller sphere of ordinary daily activities— the last one meter. NTT's RedTacton is a break-through technology that, for the first time, enables reliable high-speed HAN. In the past, Bluetooth, infrared communications (IrDA), radio frequency ID systems (RFID), and other technologies have been proposed to solve the "last meter" connectivity problem. However, they each have various fundamental technical limitations that constrain their usage, such as the precipitous fall-off in transmission speed in multi-user environments producing network congestion.

Again from NTT's press release:

> Using a RedTacton electro-optic sensor, two-way communication is supported between any two points on the body at a throughput of up to 10 Mbps. Communication is not just confined to the surface of the body, but can travel through the user's clothing to a RedTacton device in a pocket or through shoes to communicate with a RedTacton device embedded in the floor. Unlike wireless technologies, the transmission speed does not deteriorate even in the presence of large crowds of people all communicating at the same time in meeting rooms, auditoriums, or stores. Because the body surface is the transmission path, increasing the number of connected users directly increases the available number of individual communication channels.

According to NTT, an application of this technology is the ability to transfer data from a device one is wearing to a nearby device. For example, someone standing on a RedTacton device that is built into the floor could transfer data from a handheld camera, cell phone, or a PDA to a network or another nearby computer.

As a ham radio operator, amateur radio applications could include using a RedTacton device that would enable the operator to "communicate" with his or her transceiver via that RedTaction device carried or worn by the user. It could make armchair copy available from practically anywhere in the ham shack, or even the house, for that matter. Furthermore, imagine yourself driving around town, or possibly even walking around a shopping center, while wearing a RedTacton device that would allow you to be connected to your ham radio station back home via a WiMax connection. No more problems of trying to copy the other station while driving through areas of town known to be saturated with power-line QRN, or even BPL QRM, for that matter!

Speaking of BPL technology, what about that technology? Will this breakthrough HAN technology to the last meter of connectivity have an effect on the development of BPL technology? To the extent that reliable high-speed (10 Mbps) connectivity will be available to the last meter, any linkage between WAN and HAN that degrades that high-speed connectivity will be perceived as a problem for ubiquitous computing, rather than a solution. While NTT states that RedTacton will have throughput speeds up to 10 Mbps, even under high usage (or multiple users), the proponents of BPL technology are only guaranteeing connectivity speeds in the 2–5 Mbps range, and that being under ideal conditions. In practicality, under load their speeds drop to well below 1 Mbps.

By contrast, WiMax promises to offer sustained speeds well above 1 Mbps, even under loaded conditions, and that being out to five or more miles from the WAN connection, which eliminates the necessity of having hard-wired (meaning power line) connections into one's home or business. In a community where WiMax would be the predominant link between WAN and HAN, it is quite possible to envision a WiMax modem equipped with a RedTacton device being the only presence of one's ubiquitous computing connection, whether in one's home or business, or even in one's car. It seems to your columnist that as advances in connectivity continue to be made, BPL technology becomes more and more antiquated—even before it ever gets out of the box!

Sporadic-*E* and Thunderstorms Feedback

The following is from Jim Stewart, WA4MVI:

> I just read, with much interest, your column in

the February edition of *CQ* and wanted to comment about the section on sporadic-*E* and thunderstorms. I feel strongly that there is a connection. After a five-year study, I wrote several articles for *QST* and had two books published, featuring original studies and conclusions.

Now retired, I worked for the FAA and also was a certified weatherman, for 30 years, having access to the national Weather Service and FAA computers. I also was a ham and very active on the 6- and 2-meter bands, and investigated the correlation between sporadic-*E* and severe thunderstorms.

Massive thunderstorms, now called by several names, such as a "megastorm" or a "super storm," often had a sporadic-*E* cloud apparently over them, or close by. The unusual ones that grew very high, sometimes to 70,000 feet, featured heavy lightning, turbulence, and what we now call "micro bursts"; the ones occasionally two times as tall as a normal storm were often observed to be a mid-path point. Sometimes these storms can be found near one end of the circuit with a shorter propagation path. These were not the usual summer storms, but ones that showed more vertical growth than usual.

"I ran this study for five years, diligently for two, during the late 1970s, pulling and studying weather charts after they were discarded. These are no longer printed but can be found on the internet. Not many people had ready access to them then.

I published my findings in *QST* and in two books that I wrote, which were published and successful, but are now out of print. *VHF Radio Propagation* and *VHF Propagation Handbook* were published and contained my original results.

I used these discoveries to hunt for DX and achieved WAS and WAC on both 6 and 2 meters, receiving one of the first WAS on 2 meters in the late 1970s. I also worked a lot of meteor scatter and EME and am still active. I have WAS and WAC on 70 cm, but most of that was EME.

I hope that the researchers doing the new study will build on my older one, adding some new details about this phenomenon.

On the Air

Following is the activity report of Julio Medina, NP3CW, in Puerto Rico FK68 in February and early March 2005: 02/10, ZP6CW, GG14; 02/12, ZD8I, II22, PY2DJC, PY1NB, GG87, PY2CDS, GG86; 02/13, CX4CR; 02/14, ZP6CW, LU1DMA/B, and ZD8VHF/B; 02/18, ZP6CW; 02/19, ZP6CW; 02/21, ZP6CW; 02/22, PY2PR, GG66, and ZP6CW; 03/01, K4RX, EM70; 03/02, AC4TO, EM70, K4RX, EM70, N4NN, EM90, K4RX, EM70, and W4SO, EL96.

Central States VHF Society Reverse VUCC Award Program

This program is to recognize the contribution of rover station operators to the world of grid hunting. Rovers are those operating while mobile in motion or temporarily parked to give out grids to fixed stations.

Fixed station operators have long appreciated the efforts to which rovers go to activate rare grids—both in contests and outside of contests. While the fixed-station operator is collecting grids usable for earning the ARRL's VUCC award, the rover or portable station, until now, has been unable to put his work towards a similar award.

The award is called the Reverse VUCC Award, VUCC/r. It is not an easy award to earn. Those who can meet its stringent rules will have earned a cherished honor. For instance, imagine a fixed station collecting grids on 10 GHz. If one rover is the station who activates the appropriate number of grids for him, each operator made identical contacts. However, who worked harder? The answer is the rover. It is that effort which the CSVHFS wants to recognize and honor.

The award is very similar to the ARRL's VUCC, but rather than contact a set number of grids on a frequency band, the goal is to make contacts *from* a set number of grids per band. The number of grids coincides with the ARRL award. Certificates, as well as endorsement stickers, will be awarded . QSL cards are required and will be verified by the program administrator. Awards with a unique serial number will be

presented. There is no fee, but return postage for the QSL cards must be included.

The award came about due to the efforts of Bill Wageman, K5MAT, who is the program administrator. Rules and contact information are available on the CSVHFS website, <http://www.csvhfs.org>. Rovers and portables, take a look at the rules, initiate cards from all those QSOs from your past, and submit entries for this significant award.

Rules: Contacts made on January 1, 1983 or later qualify. The rules that govern the ARRL VUCC program are also applicable to VUCC/r, with the following exceptions and qualifications:

1. All contacts must be made operating while away from the home station location.

2. The applicant must work and confirm contacts made while activating different grids. Which grid or grids the rover contacts is not relevant except for contacts above 1.3 GHz per Rule 3. Confirmation can be QSL cards, QSO listings, or log extracts.

2(a). Required information: QSL cards, QSO listings, and log extracts must include both calls, both grids, mode, date, time, and band/frequency. The QSLing station's fixed info, such as callsign and grid, need not be on every line of a QSO listing or log extract but must be indicated somewhere on the page. Required information may be in any order on a QSO listing or log extract. Cards, listings, and extracts should also have the name of the licensee (person or club); mailing address; operating location information if different from mailing address (address, GPS coordinates, 6-digit grid, or latitude/longitude); and have a written signature (minimum of first name) of the licensee, trustee, operator, QSL Manager, or appropriate person confirming the specifics of the listed contacts. If a QSL card does not natively indicate the grid in which the rover was operating, it should be added in pencil.

2(b). QSL cards, QSO listings, or log extracts may be submitted indicating contacts beyond the number required for an award or endorsement level. The program administrator will maintain record of these additional QSOs. Subsequent submissions should refer to QSOs on file when applying for an endorsement.

3. At frequencies below 1.3 GHz (and satellite) any number of stations in any number of grids may be worked. Above that frequency target stations worked must all be within the 300-meter circle that is specified by VUCC rules. The location of the target stations must be indicated on their cards by at least the four-digit grid, or preferably their latitude/longitude or some other indication that they were inside the same circle. The rover, of course, is required to move around.

4. Endorsements above the basic award may be submitted just as in VUCC.

5. The only report form needed is a readable alphabetized list of the grids from which operation was done with the calls of the station worked. The applicant's call and name must be clearly stated.

6. All cards and forms, along with appropriate self-addressed packaging with sufficient postage for the return of the cards plus a business-size envelope (if folding the certificate is okay) or 9 ×12 or larger SASE should be sent to: Bill Wageman, K5MAT, CSVHFS VUCC/r Award, 7309 Avenida La Costa, NE, Albuquerque, NM 87109-3900. If you have questions, contact the program administrator at <vucc-r@comcast.net>.

Current Contests

European Worldwide EME Contest 2005: Sponsored by DUBUS and REF, the EU WW EME Contest is intended to encourage worldwide activity on moonbounce. Multipliers are DXCC countries plus all W/VK/VE states. This gives an equal chance for stations from North America, Europe, and Oceania. The rules reward random QSOs, but do not penalize skeds on 2.3 GHz or above. Winners (those in first place) receive free subscriptions to *DUBUS* magazine.

The contest dates and bands are as follows: Second weekend—144 MHz, 2.3 GHz, and 3.4 GHz, 14–15 May, 0000–2400 UTC; and third weekend—432 MHz and 5.7 GHz, 11–12 June, 0000–2400 UTC. Sections and awards include the following: QRP 144 MHz <100 kW EIRP, 432 MHz <400 kW EIRP, 1296 MHz <600 kW EIRP, and ≥ 2300 MHz no separate QRP/QRO categories. The QRO category on 144, 432, and 1296 MHz, stations with EIRP equal to or greater than stated above. The PRO category includes non-amateur equipment or antenna; PRO stations will have scores listed separately. There are no separate multi-operator classes. Multi-operator and QRO stations will be highlighted in the general classifications. All QRP/QRO band winners and QRP/QRO multiband winners will receive a year's free subscription to *DUBUS* magazine. In each band/section, certificates will be sent to the top ten entries and to the highest scoring station in the Southern Hemisphere.

For a valid QSO, both stations must transmit and receive both callsigns + TMO/RST + R. During a QSO, on any band, liaison by any other means (e.g., DXcluster, internet, telephone) is forbidden. There is no restriction on modes, but entrants must not cause inter-mode QRM.

Contest entries *must* be sent no later than 28 days after the end of the third weekend (i.e., in the mail or e-mail by 10 July 2005). Mailing address: Patrick Magnin, F6HYE, Marcorens, F-74140 Ballaison, France. You may also e-mail your contest entry in ASCII format to: <f6hye@ref-union.org>. All e-mail entries will be acknowledged within one week of their receipt. For additional rules and general questions contact: <info@dubus.de>. Complete rules can be found at: <http://www.marsport.demon.co.uk/EMEcont2005.pdf>.

Spring Sprints: These short-duration (usually four hours) VHF+ contests are held on various dates (for each band) during the months of April and May. This year's May dates and times are as follows: Microwave, May 7, 6 AM to 1 PM local time; and 50 MHz, May 14–15, 2300 UTC Saturday until 0300 UTC Sunday. Logs and summary sheets should be e-mailed or snail mailed to the below addresses. Logs should be submitted within 30 days of the end of each contest. Contact information: Jeff Baker, WU4O, 2012 Hinds Creek Road, Heiskell, Tennessee 37754. E-mail: <springsprints@etdxa.org>. Sponsored by the East Tennessee Valley DX Association, further information on these contests can be found at <http://www.etdxa.org>. Click on the VHF/UHF link to get to the contest information.

2 GHz and Up World Wide Club Contest: The following is unofficial and was developed from assumptions based on last year's contest. Sponsored by the San Bernardino Microwave Society, this contest should run from 6 AM on May 7 to 12 midnight on May 8 (36 hours). The object is for worldwide club groups of amateurs to work as many amateur stations in as many different locations in the world as possible on bands from 2 GHz through Light. Rules are available at: <http://www.ham-radio.com/sbms/club_contest/2GHzUp.pdf>.

Conventions and Conferences

Southeastern VHF Society: The society's 9th annual conference will be hosted in Charlotte, North Carolina, April 29–30 at the Hilton Charlotte Executive Park, 5624 Westpark Drive, Charlotte, NC 28217 (phone 704-527-8000, fax 704-529-5963). Group rate is $75 per night. Call the hotel direct and be sure to mention the Southeastern VHF Society Conference to get the discount rate. For more information about the hotel see <http://www.hilton.com/en/hi/hotels/index.jhtml?ctyhocn=CLTEPHF>. Check the society's website at <http://www.svhfs.org/registration_05.htm> for the conference registration forms.

West Coast Space Symposium: The 2005 West Coast Space Symposium will be presented by Project OSCAR and The College of San Mateo on May 7 in San Mateo, California. Topics include: Satellite Basics, Software Defined Radio, Digital Modes on Amateur Satellites, Satellite Tracking, Dish Feed Designs, 10 GHz and Above, Amateur Radio on the ISS, Orbital Debris Mitigation, Satellite Launch Options, and Youth and Amateur

Satellites. For additional information go to<http://www.ProjectOSCAR.net>.

Dayton Hamvention®: The Dayton Hamvention® will again be held at the Hara Arena in Dayton, Ohio, May 20–22. For more information, go to <http://www.hamvention.org>. Your editor is scheduled to be one of the speakers for the VHF forums.

The following about the Dayton VHF banquet is from Tom Whitted, WA8WZG:

Tom, WA8WZG, Tony, WA8RJF, and the Weak Signal Group that meets Monday nights at 0200 UTC on 3.843 MHz would like to invite everyone who is coming to the Dayton Hamvention® to our 12th annual banquet. We have reserved a room that will seat 125 on Friday night May 20, at the Holiday Inn North, Waggoner Ford Rd. exit off I-75. There will be a cash bar starting at 6:15 PM, as well as plenty of room to mix and mingle with VHFers from all over the country and the world. The cost of a ticket to attend this function is $35 per person. Spouses are welcome to join us and are eligible for the prize drawings. You may order your tickets by sending $35 plus an SASE to: Tony Emanuele, WA8RJF, 7156 Kory Court, Concord, Ohio 44077-2221. Please include the names and calls of all ticket purchasers as well as e-mail address.

Calls for Papers

Calls for papers are issued in advance of forthcoming conferences either for presenters to be speakers, or for papers to be published in the conferences' *Proceedings*, or both. For more information, questions about format, media, hardcopy, e-mail, etc., contact the person listed with the announcement. To date this year the following organizations or conference organizers have announced calls for papers for their forthcoming conferences:

The 39th annual **Central States VHF Society Conference** will be held July 28–31 at the Sheraton Hotel, Colorado Springs. The deadline for submitting final papers will be around May 15. Submit your papers and your desire to make a presentation as soon as possible to Technical Program Chair Joe Lynch, N6CL, at <n6cl@sbcglobal.net>.

TAPR/ARRL Digital Communications Conference: Technical papers are solicited for presentation at the 24th annual ARRL and TAPR Digital Communications Conference to be held September 23–25 in Santa Ana, California, and for publication in the conference *Proceedings*. Presentation at the conference is *not* required for publication. Submission of papers is due by August 9th and should be submitted to: Maty Weinberg, ARRL, 225 Main St., Newington, CT 06111, or via e-mail to <maty@arrl.org>.

Microwave UpDate: The following is from Chip Angle, N6CA:

The 2005 Microwave UpDate will be held this year in the Los Angeles area on October 27–31. As the Technical Program Chairman this year, I would like to invite interested authors to present a paper(s) for the 2005 conference.

Microwave Update is the premiere microwave amateur radio conference on the planet. Many people around the world collect the *Proceedings* from this conference, since it represents the current state of the art in microwave amateur radio. This is a great opportunity to get your ideas and papers published! You don't have to give a talk to get your paper included in the *Proceedings*.

Electronic submissions in Word, WordPerfect, or text format accepted by e-mail or CD. The usual drawing formats also accepted with your paper(s). Cutoff date for inclusion in the *Proceedings* is September 5th. If you are interested in writing and/or presenting a paper for the 2005 conference, please send me an e-mail at <n6ca@ham-radio.com> or write to: Chip Angle, N6CA, P.O. Box 35, Lomita, CA 90717-0035. Please contact me as soon as possible with an abstract or even a general idea. This will help the conference team with its planning activities. For more information about the Microwave UpDate 2005 see <http://www.microwaveupdate.org>.

Meteor Showers

May minor showers include the following, with their possible radio peaks: *e-Arietids*, May 9, 0700 UTC; May *Arietids*, May 16, 0800 UTC; and *o-Cetids*, May 20, 0700 UTC. This information courtesy the International Meteor Organization and its website at <http://www.imo.net>.

Lyell Louttit, VK2BE SK

The following is from Doug McArthur, VK3UM: "It is with deep sadness that I report that Lyell Louttit, VK2BE, became a Silent Key the week of February 21, 2005 following hospitalization and surgery. It is believed he was 84. Many have worked him off the Moon on 70 cm and he also had the odd QSO on 23 cm. He was a most active VHF and UHF operator in the Sydney area and always had a very big signal. Many will also remember him on HF from his activities from VS6.

And Finally . . .

There was lots and lots of VHF+ related material to cover this month. Again, I have run out of column space. If you are at Dayton this month, I hope to see you there—particularly at the VHF forum or the VHF banquet. Until next time…

73, de Joe, N6CL

BY CARL SMITH,* N4AA

DXpeditions to Kerguelen, Crozet, and Glorioso

Well, as many of you know by now, in spite of all the effort put forth by the Peter I DXpedition team, it didn't happen. Due to a series of contract defaults, the team leaders finally decided they could not wait any longer and chose to postpone the trip for another year. I know we all were looking forward to working them, many for an all-time new one. However, they ran out of time, and the personal safety of the team had to be considered foremost in the final decision, as well it should be. They have said they will make every effort to do it next year in the January/ February time frame.

DXpeditions of Note

Kerguelen: As I write this column, the Micro-Lite Team is enroute to the island. They left from Durban, South Africa and were to spend nine or ten days aboard the ship before reaching Kerguelen around March 19th. Once there, they will spend about two weeks passing out QSOs for this most needed country. It was ranked #12 worldwide on *The DX Magazine*'s Most Wanted survey for 2004. In the U.S. it ranked #8.

Crozet: Although FT5WJ has been active from Crozet, he has not been able to spend much time on the air, and his signal has not been all that readable—at least in the U.S. Hopefully, our French friends will be able to mount a DXpedition to this most wanted one in the foreseeable future, as they have done with Europa and plan to do with the upcoming DXpedition to Glorioso.

Glorioso: Here is another one of those which ranks pretty high on the list—#14 worldwide for 2004. The French team that brought us Europa will be making the trip to Glorioso in mid-May for a few weeks. These three French islands should drop down on the list for 2005 if everything goes well for them.

As we fall deeper into the solar minimum, there seem to be fewer DXpeditions to those really rare ones. However, there are lots of operations from Africa and other areas to keep our interest up while the sun makes its cycle back to those good numbers/propagation. Of course, there are always the contests to generate DX activity, too.

A New Book from G3SXW

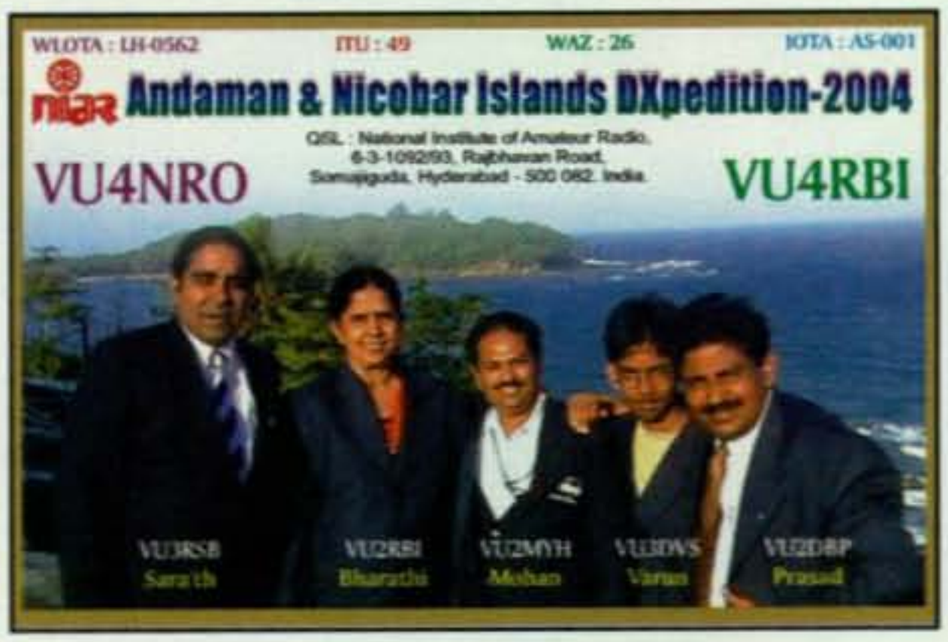
Speaking of contests, Roger Western, G3SXW, has a new book available. It is called *Contesting in Africa,* and it relates the the multi-multi efforts of the VooDoo Contest Group. My good friend

The DX Dinner at the Charlotte Hamfest in March found Wayne Mills, N7NG, from the ARRL (in the center) explaining "something" to the group at his table. The group included Rich Moseson, W2VU, Editor of CQ magazine, and a fine group of DXers from Tennessee, with a few from North Carolina as well. (Photo courtesy of Carl, N4AA)

"Uncle DX" reviewed the book recently and had this to say:

Most books I've read have some redeeming value, no matter what the subject. The exceptions are few. Books covering the competitive part of ham radio, be it DXing or contesting, are of interest to our ham radio family all over the planet. Those who have not been fortunate enough to know hams on the cutting edge of communications, and who may wonder what makes us happy, smiling blokes, need to become more informed. There is no better way than to sign up for a ham radio contesting course with Roger Weston, G3SXW, and his new book, *Contesting in Africa.*

Roger's previous book, *Up Two,* which is about DXing



The VU4RBI/VU4NRO QSL card for the December 2004 DXpedition. These cards started coming out in mid-March. (Courtesy of Franz, DJ9ZB)

*P.O. Box DX, Leicester, NC 28748-0249
e-mail: <n4aa@cq-amateur-radio.com>

The WPX Program

CW

3149 .....4W3CW 3150 .....RA1AOB

SSB

2926 .....AA3TH 2929 .....RA1AOB
2927 .....OK2BEN 2930 .....K4EBK
2928 .....SV1EOS

Mixed

1953 .....RA1AOB

CW: 500 KG6DFM, 600 RA1AOB, 650 DL5DBH. 950 W2OO.
SSB: 600 RA1AOB. 700 AA3TH. 1250 W2OO.
MIXED: 1500 RA1AOB. 1550 W2OO. 2900 ON4CAS.

10/15/20/40/80/160 Meters: RA1AOB
15 Meters: PP6CW

Asia, Africa, No. America, So. America, Europe, Oceania: RA1AOB

Award of Excellence: S53MJ, DL2KQ
160 Meter Bar: S53MJ, DL2KQ

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, 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, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT.

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. *Note: WPX will not accept prefixes/calls which have been confirmed by computer-generated electronic means.*

Please Note: As of February 2004, the price of the 160 meter bar for the Award of Excellence is now $6.50.

around the world, addresses DXing at a high level, and I reviewed it in *The DX Magazine* some time ago. Just as *Up Two* is a must read for DXers, is a must read for contesters.

Contesting in Africa is entertaining, and a gutsy, real-life played-out drama and cook book for contesting. Being chief operator of a mult-op station myself, albeit from the safe comforts of my stateside shack, as well as a Potomac Valley Radio Club member (along with my XYL, Auntie DX!) for many years, I can safely say that what Roger says about contesting is very true. Roger and the other members of the VooDoo Contest Group have experienced many challenges on their trips to Africa, and their experiences are related in this book on both a serious level and with Roger's well-known sense of humor. When planning a large contest operation, especially in a foreign environment, there is a delicate balance between the drive to win and the enjoyment of the operation.

Many of you may recognize these two DXers: Gary Dixon, K4MQG (left), and Wayne Carroll, W4MPY (The QSL Man), at the Carolina DX Association booth at the Charlotte Hamfest. (Photo courtesy of N4AA)

CQ DX Awards Program

CW

1065.....KD2GC

SSB Endorsements

320 .....VE3GHZ/334 320 .....KD2GC/320
320 .....AB4IQ/330 275 .....KU4BP/286

CW Endorsements

320 .....KA7T/332 150 .....KD2GC/156
250 .....F5JIW/254

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 335 active countries. Please make all checks payable to the award manager.

Oyunaa, JT1CC, is the daughter of Baatar, JT1BG. She is shown here at the 2004 Olympics in Athens, which she covered for Mongolian television. She had been on the air from JT1BG, but she now has her own QTH. (Photo courtesy of Ken, K4ZW)

The achievement of this balance is one of the reasons why the VooDoo Contest Group is a formidable opponent.

The contest of choice for the group is the CQ WW DX CW, and Roger presents a candid look at data accuracy, with well-researched opinions and suggestions. He offerscontesting tips that can be extremely helpful.

Contesting from Africa was written by one of the best CW operators in the world. The book is a lesson in contesting and good leadership, while at the same time being an entertaining look at the VooDoo Contest Group and their travels.

Contesting in Africa is published by Idiom Press and is available on-line for $19.95 plus shipping from <www. idiompress.com>, or from CQ Communications (see the ad elsewhere in this issue) and many distributors.

CQ's New Operating Awards

Just to keep things interesting for DXers, *CQ* has come up with a new series of operating awards for us. The first, announced at the Charlotte Hamfest DX Dinner in March, is the CQ DX Field Award (see the April issue and the CQ website for complete rules). The award is based on the Maidenhead Grid System. With 324 grid fields covering the entire world, it should be interesting to see how this works out. The basic award is for 50 or more grid fields, with endorsements for levels above that.

There will be two more DX awards offered by *CQ*, including the CQ DX Marathon announced elsewhere in this issue.

The WAZ Program

15 Meter CW

324 ..... UA1ACG

20 Meter CW

548 ..... UA3TCJ 549 ..... KØGM

40 Meter CW

242 ..... VE3XN 243 ..... KØGM

80 Meter CW

64 ..... JA2EPW 65 ..... K5MC

6 Meters

69 ..... W4UDH (25 zones)

160 Meters

204 ..... VN4MM (30 zones)

All Band WAZ

SSB

4954 ..... DL2VNL

Mixed

8346 ..... N2SU 8348 ..... IZ2EJU
8347 ..... HL4CEL

All CW

452 ..... N2SU 453 ..... GØHIO

RTTY

155 ..... DK6CQ

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

5 Band WAZ

As of March 1, 2005, 670 stations have attained the 200 zone level and 1434 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:

None

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

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
VE7AHA, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
IK1AOD, 199 (1)
DF3CB, 199 (1)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W6SR, 199 (37)
W3NO, 199 (26)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
HB9BGV, 199 (31)
N3UN, 199 (18)
OH2VZ, 199 (31)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
PY5EG, 199 (23)
SP5DVP, 199 (31 on 40)
W8AEF, 199 (40)
K8RR, 199 (26)
UU5JR, 199 (4)
W8GF, 199 (22)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N4PQX, 199 (26)
JA5IU, 199 (2)
N6HR/7, 199 (37)
CT3DL, 199 (26)
NØIJ, 199 (21)
VE3XN, 199 (26)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
KG9N, 198 (18, 22)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K5PC, 198 (18, 23)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
N4XR, 198 (22, 27)
RU3DX, 198 (1, 6)
OE2LCM, 198 (1, 31)
W7SX, 198 (18, 23)
HA1RW, 198 (1, 31)
WK3N, 198 (23, 24)
HA9RT, 198 (1, 31)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)

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

JS3CTQ (170 zones)
UA1ACG (184 zones)
UAØYAY (170 zones)
HL4GHT (170 zones)
UA3TCJ (189 zones)
W1FJ (193 zones)
KG1V (164 zones)
F5LND (162 zones)

Endorsements:

UT7UW (193 zones)
JS3CTQ (170 zones)
UA1ACG (184 zones)
UAØYAY (170 zones)
K8VFV (170 zones)
HL4GHT (170 zones)
VE3XN (199 zones)
NØIJ (199 zones)
UA3TCJ (189 zones)
K5MC (200 zones)
W1FJ (193 zones)
KG1V (164 zones)
K2EP (190 zones)
F5LND (162 zones)

****Please note: Cost of the 5 Band WAZ Plaque is $80 ($100 if airmail shipping is requested).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

DXCC Yearbook

I'm afraid I "jumped the gun" last month when I said the *DXCC Yearbook* was history. It was not clear to me at that point, but I have since been corrected by the ARRL's DXCC personnel. There

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 335 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is $1.00 each plus SASE. Please make checks payable to the awards manager, Billy F. Williams. All updates should be mailed to P.O. Box 9673, Jacksonville, FL 32208.

CW

K2TQC 334	W2FXA 334	G4BWP 333	K5RT 332	K7LAY 331	N6AW 329	9A2AA 325	F5OIU 320	YU7FW 306
K2FL 334	N4JF 334	K4CEB 333	YU1AB 332	W2UE 330	K9OW 328	N4OT 325	KA3S 320	LU3DSI 302
K9BWQ 334	K4MQG 334	K4IQJ 333	NØFW 332	I4LCK 330	K8PV 327	K1FK 324	F6HMJ 319	N1KC 302
K9MM 334	EA2IA 334	WØHZ 333	N4AH 332	VE7CNE 330	W4QB 327	YV5ANT 324	OZ5UR 319	VE7KDU 300
W7OM 334	PA5PQ 334	N5FG 333	HB9DDZ 332	4N7ZZ 330	DL8CM 327	9A2AJ 323	PY4WS 319	WG7A 295
K2JLA 334	K3UA 334	N7RO 333	N4CH 332	W6DN 330	K4JLD 327	W6SR 323	G3KMQ 317	KE3A 295
N7FU 334	DL3DXX 334	K4CN 333	K6LEB 331	YU1TR 330	W6OUL 327	N5ZM 323	YT1AT 317	K4IE 291
K2OWE 334	K2ENT 334	W4MPY 333	VE3XN 331	W4UW 330	SM5HV/HK7 327	KE5PO 322	K8JJC 315	WA4DOU 286
N4MM 334	OK1MP 334	PY2YP 333	W1WAI 331	G3KMQ 329	IT9TQH 326	HA5DA 321	CT1YH 313	G3DPX 284
F3TH 334	NC9T 334	W8XD 333	K2JF 331	KZ4V 329	I2EOW 326	IKØTUG 321	N1HN 313	EA3BHK 282
F3AT 334	WB5MTV 333	KA7T 332	K3JGJ 331	N5HB 329	W7IIT 326	VE7DX 320	W6YQ 313	YC2OK 282
DJ2PJ 334	W7CNL 333	WØJLC 332	WA8DXA 331	W9IL 329	K6CU 326	IKØADY 320	W3II 312	DJ1YH 281
WA4IUM 334	YU1HA 333	K8LJG 332	K9IW 331	K1HDO 329	W4LI 325	WG5G/QRPp 320	UA9SG 309	XE1MD 278
W4OEL 334	IT9QDS 333	YU1AB 332	WB4UBD 331	K7JS 329	K5UO 325	N7WO 320	EA3ALV 306	I3ZSX 276

SSB

K6YRA 335	K5TVC 335	K9BWQ 334	4N7ZZ 333	W8KS 331	KF8UN 328	PY2DBU 325	K6RO 316	K4IE 300
K2TQC 335	N5FG 335	W4NKI 334	KE5PO 333	YV5IVB 331	WØULU 328	IKØIOL 325	N8SHZ 316	WØROB 296
W6EUF 335	DJ9ZB 335	WB4UBD 334	VE1YX 333	KX5V 331	K1EY 328	YT1AT 325	WZ3E 314	WA1ECF 295
K2JLA 335	PY4OY 335	W4UNP 334	I4LCK 333	K3JGJ 331	KZ4V 328	K7HG 324	IZ6CST 314	KW1DX 295
K4MQG 335	VE3XN 335	W8AXI 334	W2JZK 333	N5ORT 331	XE1D 328	K4JDJ 323	W7GAX 312	K7ZM 292
IK1GPG 335	4Z4DX 335	VE2GHZ 334	K8LJG 333	PT2TF 331	KD8IW 328	W6WI 323	CT1YH 311	OA4EI 292
K5OVC 335	N7RO 335	OE2EGL 334	VE4ACY 333	CT1AHU 331	KE3A 328	EA3CYM 323	YV5NWG 311	K7ZM 292
NØFW 335	IØZV 335	WA4IUM 334	KØKG 333	EA3JL 331	W9IL 328	K6CF 322	LU3HBO 310	K1RB 292
K9MM 335	EA2IA 335	K5RT 334	W4WX 333	K9IW 331	K3LC 328	LU7HJM 322	WA5MLT 310	KØOZ 291
W6BCQ 335	IN3DEI 335	W2FXA 334	VE2WY 333	K1HDO 331	K4DXA 328	K5NP 322	XE2NLD 310	W9ACE 291
XE1AE 335	EA4DO 335	W6SHY 334	WB3DNA 333	W6DN 330	LU5DV 328	WA4ZZ 322	RW9SG 307	I3ZSX 290
W7OM 335	PA5PQ 335	W5RUK 334	K9PP 333	YV1CLM 330	I1EEW 327	WN9NBT 322	W9IL 306	N2LM 286
KZ2P 335	K9OW 335	K4CN 334	W2CC 333	AB4IQ 330	SV1ADG 327	WW1N 322	XE1MDX 305	KKØDX 285
IK8CNT 335	W6DPD 335	EA3KB 334	DL3DXX 333	AE5DX 330	DL8CM 327	W6OUL 322	EA5OL 305	VE7HAM 285
VK4LC 335	XE1VIC 335	N4CH 334	EA3BMT 333	KB2MY 330	F9RM 327	XE1CI 321	WB2AQC 305	N8LIQ 284
OE7SEL 335	K2ENT 335	K3UA 334	EA3EQT 333	K3PT 330	XE1MD 327	CT1ESO 321	VE7SMP 305	WØIKD 283
VE3MR 335	OK1MP 335	K4JLD 334	YV1KZ 333	ZL1BOQ 330	IØSGF 327	EA8TE 321	KK4TR 305	K7SAM 283
VE3MRS 335	IZ6GPZ 335	N5ZM 334	YV1AJ 332	KW7J 330	IT9TGO 327	KD5ZD 321	K3BYV 303	KBØRNC 282
K4MZU 335	K1UO 335	PY2YP 334	KSØZ 332	WS9V 329	IT9TQH 327	KØFP 320	YC2OK 303	IK8TMI 281
OZ5EV 335	I8KCI 335	AA4S 334	LU4DXU 332	K2JF 329	DK5WQ 327	EA7TV 320	JR4NUN 303	F5JSK 281
N7BK 335	I8LEL 335	CT3DL 334	VE4ROY 332	ZL1AGO 329	KE5K 327	SV1RK 320	VE7KDU 302	KA5OER 280
K7LAY 335	DU9RG 335	NC9T 334	W7FP 332	W9OKL 329	CP2DL 327	N1KC 320	W5GZI 302	F5INJ 279
ZL3NS 335	DU1KT 335	W9SS 334	K9HQM 332	I2EOW 329	NI5D 327	W5GZI 320	W4PGC 302	W5GT 276
N4MM 335	N4JF 335	VE7WJ 334	W2FKF 332	VE7DX 329	K7TCL 326	SV3AQR 320	YV2FEQ 301	4Z5FL/M 275
OZ3SK 335	CT1EEB 335	VE2PJ 334	CT1EEN 332	W2FGY 329	W9HRQ 326	KD2GC 320	AC6WO 301	
K7JS 335	WDØBNC 334	W3AZD 334	DL9OH 331	CT1CFH 329	DL6KG 326	KE4SCY 319	4X6DK 301	
XE1L 335	K2FL 334	YZ7AA 334	N2VW 331	EA1JG 329	HB9DDZ 326	CE1YI 318	SV2CWY 300	
YU1AB 335	WØYDB 334	CT3BM 334	YV1JV 331	KE4VU 328	WR5Y 325	W5OXA 317	4X6DK 300	
OE3WWB 335	W4UW 334	N6AW 334	WA4WTG 331	K5UO 328	KC4MJ 325	YV4VN 317	N5WYR 300	

RTTY

K2ENT 333	K3UA 328	EA5FKI 320	W2JGR 316	OK1MP 312	KE5PO 297	W4EEU 297	I2EOW 291	YC2OK 280
WB4UBD 330	NI4H 325	N5FG 318	G4BWP 312	PA5PQ 311				

QSL Information

A25/DL7CM via DL7CM
A25/DM2AYO via DM2AYO
A25CM via DL7CM
A35RK via W7TSQ
A43XA via A47RS
AB4XQ/TG via NI4Y
AH6NF/KH5 via AH6NF
AL5A/NH2 via JHØMGJ
C21HC via DL9HCU
C56C via G3SWH
C6AMM via K1CN
C6AWW via K1CN
C6AXX via W9IXX
CE6TBN/7 via CE6TBN
CN/F5VHH via F5VHH
CN2R via W7EJ
CN8KD via EA5XX
CO2WL via EA3ESZ
CO2WL/P via EA3ESZ
CO3CJ/P via IZ8EBI
CO3JN via IZ8EBI
CO3JN/P via IZ8EBI
CO3LF via IZ8EBI
CO3LF/P via IZ8EBI
CO3VK via IZ8EBI
CO3VK/P via IZ8EBI
CQ3A via OH2PM
CT9C via OK5DX
CT9M via CS3MAD
CU7/DL5AXX via DL5AXX
CY9SS via VY2SS
D2AA via LA9IAA
DH8WR/HC2 via DH8WR
DXØK via 4F2KWT
EA8/DL8KWS via DL8KWS
EA8ZS via EA8ZS
EF8BDX via EC8ADU
EM6ØJ via UU5JYA
EP4HR via I2MQP
EP4HR via UA4WHX
EX8A via W3HNK
EY8/F5NHJ via F5NHJ
F5KAR/P via F6GUF
F6ACC via F3MB
FG/F6FXS via F6FXS
FS/K9EL via K9EL
FS/KT8X via KT8X
FT1WK via F6APU
FT5WJ via F5BU
HA7TM/PT7 via HA7TM
HBØ/IK1WEG via IK1WEG
HBØ/IZ1DSH via IZ1DSH
HFØPOL via SP3WVL
HF1IARU via SP1DPA
HF2IARU via SP2PI
HF2PZK via SP2PMK
HF3IARU via SP3SLD
HF4IARU via SP4YFG
HF5ØTPN via SP9PTG
HF6IARU via SP6BOW
HF7IARU via SP7LFT
HH4/K2AC via JA7AGO
HI3A via AD4Z
HK1AR via K7ZD
HZ1EX via SMØBYD
II3CC via IV3HWY
II8ANT via IZ8EDJ
IQ1IV via IK1YLO
IQ7TA via IQ7TA
IU7ANT via I7YKN
IU8GMM via IQ8PD
IY9MAR via IT9MRM

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," 106 Dogwood Dr., Paris, TN 38242; phone 731-641-4354; e-mail: <golist@golist.net>.)

will be a yearbook; it just won't have as many of the listings as in prior years.

Upcoming Events

Don't forget these upcoming events: the Dayton Hamvention®, May 20–22, and the CQ WW WPX CW Contest, May 28–29. In our wonderful world of ham radio, there is something for everyone!

In Closing . . .

The low bands have been particularly good this year, and that should continue for another year, or even two. Ten, 12, and 15 meters continue to show spurts of activity if you are there at the right time. Thankfully, working at home has helped me catch a number of "goodies" on 12 meters so far this year. Signals are not very strong, but they are quite workable even with 100 watts.

Until next time, remember: Enjoy the chase, but above all . . . have fun !

73, Carl, N4AA

awards

BY TED MELINOSKY,* K1BV

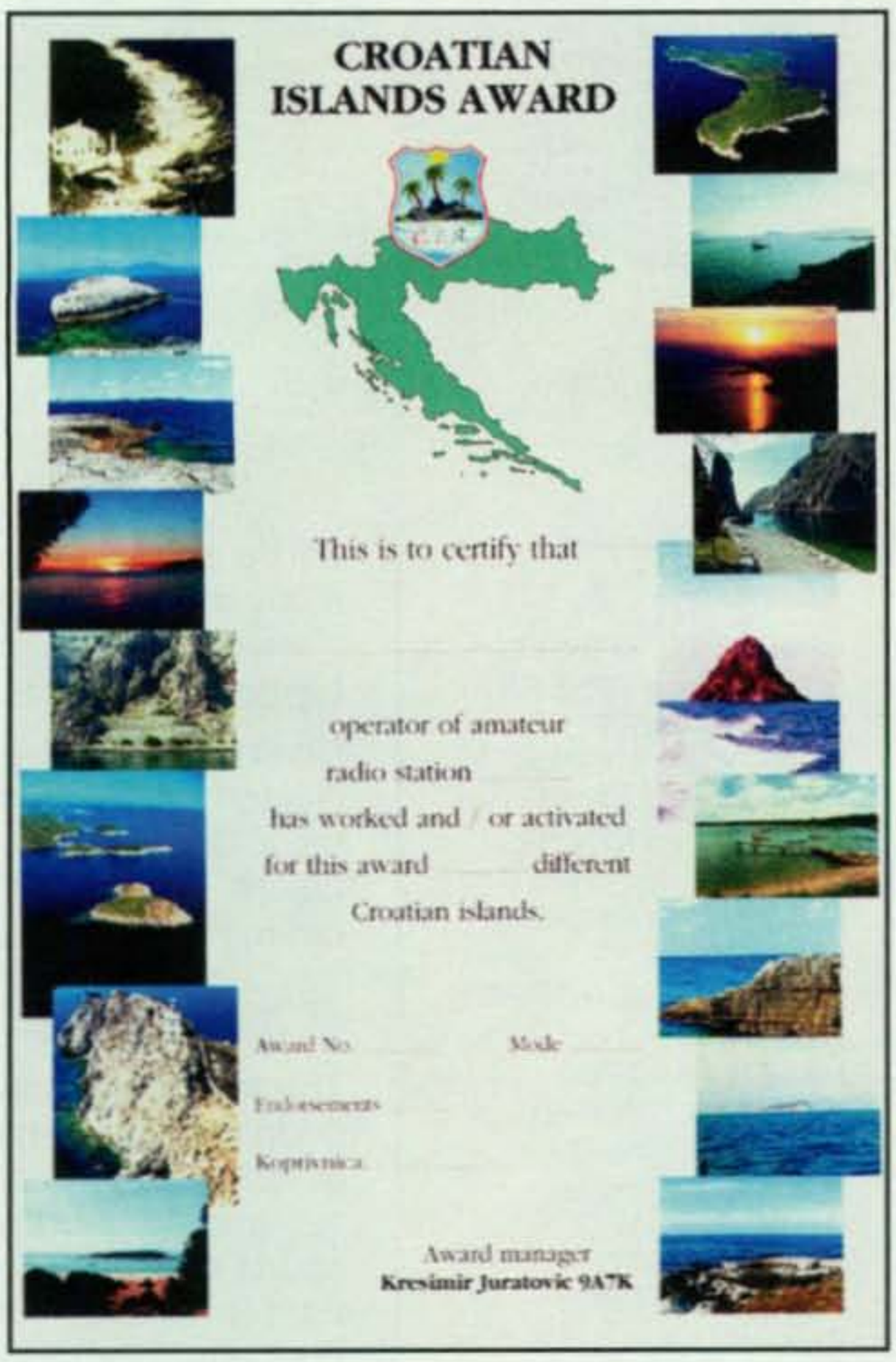
Croatia, the Rhine, and Marco Polo

The CQ/60 Anniversary operating activity is now officially over. I hope that many participants were able to make sufficient contacts with /60 stations to qualify for a certificate. A record of 60 continuous years of publishing a magazine of any kind is a rare event these days, and the staff of *CQ* deserves a hearty congratulations for creating an interesting product to serve the diverse community of interests found in amateur radio.

During the last two weeks of February I enjoyed contacting about 600 stations just by getting on the low end of 15 meters CW and calling CQ with /60. It was just like a great, long "run" during a contest, and I think I was able to improve my contesting skills as well.

DX Awards

Croatian Islands Award (CIA). Look at a map of Croatia and you will see a long coastline along the Adriatic Sea leading into the Mediterranean. There are *many* islands along this picturesque coastline, and thumbnail pictures of 17 of them form the border of the handsome, colorful Croatian Islands Award certificate. Some of these islands have year-long residents, while others are uninhabited. Summer is always a good time to swing the antenna toward southern Europe and listen for 9A/portable calls. You never know; it could be a new island.



The Croatian Islands Award is sponsored by the Croatian IOTA Hunters Group.

Sponsored by the Croatian IOTA (Islands On The Air) Hunters Group (CIHG), this award is issued for confirmed contacts on or after July 5, 1992 with hams operating from Croatian islands with year-round residents. A total of 60 Croatian islands and lighthouses count for the award. Each island and lighthouse is allocated a permanent CIA reference number (e.g., island Vis is CIA-56). A list of all Croatian islands and lighthouses valid for the award is obtainable from the award manager on request. The list is free of charge. However, return postage of $US2 or 2 Euros is required.

USA-CA Special Honor Roll

Jeffrey Napier, AF3X
USA-CA All Counties #1109
January 25, 2005

University of Tennessee Amateur Radio Club, AA4UT
USA-CA All Counties #1110
January 25, 2005

Henry Warren, K5OH
USA-CA All Counties #1111
January 29, 2005

James Martin, Jr., K4YFH
USA-CA All Counties #1112
January 29, 2005

Robert C. Moore, G3SPU
USA-CA All Counties #1113
February 17, 2005

USA-CA Honor Roll

500

KI7WO.....3333
W1WFZ....3334
SM7CQY ..3335
K5OH.....3336
K4YFH.....3337
DJ8BD.....3338
HK3JJH....3339
AA9ZZ.....3340

1000

KI7WO.....1682
K5OH.....1683
K4YFH.....1684
HK3JJH....1685

1500

KI7WO.....1404
K5OH.....1405
K4YFH.....1406
PA3ARM...1407
HK3JJH....1408

2000

KI7WO.....1301
K5OH.....1302
K4YFH.....1303
HK3JJH....1304

2500

K5OH.....1223
K4YFH.....1224
HK3JJH....1225

3000

K5OH.....1133
K4YFH.....1134
HK3JJH....1135

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. 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 June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>

It is expected that many contacts will be made by expeditions who activate the islands or lighthouses. To be recognized and validated, activators must comply with the following:

a. During one day, a maximum of three CIA references can be activated.

b. A photo with all operators, antennas, or equipment used must be submitted.

c. A minimum of 101 contacts must be made from each CIA island or lighthouse, proven by log copy or e-mail list.

The award is available in six levels (the level designation is followed by the number of CIAs needed and the fee):

1. Basic—10 CIAs, $US6 or 5 Euros for hams outside Croatia. Fee for Croatian hams is 25 kuna.

2. Silver endorsement—20 CIAs, $US2 or 2 Euros for those outside Croatia, and 10 kuna for Croatians.

3. Gold endorsement—30 CIAs, $US2 or 2 Euros for those outside Croatia, and 10 kuna for Croatians.

4. Medal—40 CIAs, $US17 or 15 Euros, or equivalent in local currency kuna.

5. CIA Trophy—50 CIAs, $US30 or 25 Euros, or equivalent in local currency kuna.

6. Honour Roll—60 CIAs, free of

Robert Craft, Sr., W6FAH
USA-CA All Counties #1108, January 20, 2005

County hunting has been interesting, intriguing, and educational. I can equate my persistence for accomplishment similar to completing DXCC or WAS.

My interest in amateur radio dates back to 1955, at which time I obtained my Novice Class license. As I advanced up the ladder to Extra Class, I became ever more involved. Along the way I did not design any interesting or special electronic circuits, but I constructed many projects. And, by the way, some are still in service today. During my military career I taught electronics to other young members of the Air Force. Then later, after I was discharged, I taught electronics at a local junior college. All the while I remained active in amateur radio.

In part, I can attribute my successful career in hospital administration to amateur radio. I retired from the hospital environment in the summer of 2001 as Director of Environmental Services and Maintenance. Directing the maintenance of a large medical facility requires an enormous amount of self-control and commitment, much like amateur radio. This learned characteristic provided me the opportunity to confront service and maintenance problems on a daily basis, from gathering data, to reviewing information, to making decisions based on facts. After all, within the hospital appropriate maintenance and service can affect the outcome of patient care.

I started working counties and collecting confirmations in earnest in 2001, the year I retired. It was great fun to be able to work all those stations during the day. I had already worked DXCC (SSB and CW), Worked All States (SSB and CW), and obtained top of the DXCC Honor Roll. County hunting was the next item to be conquered.

So far, county hunting, in my opinion, has been my most personally rewarding activity in amateur radio. Meeting the other people involved in this activity is very energizing. They all have the same goal in mind, with interesting stories to exchange, and they share great hospitality any time folks

get together at a convention or a casual gathering. Furthermore, they all encourage the continuation of county hunting. This encouragement is very important. For example, when I just missed working a new county that a mobile station had just traveled through, often I was told, "Don't worry about missing the county. It will still be there. . . . Or, when a mobile station called me first during his run in a county that I needed, the excitement was beyond belief! As I reflect back to many such instances, the experienced county hunters often reminded me, "That is the thrill of county hunting."

Now that I have worked all 3077 counties of the United States, I would like to travel. Maybe I can convince my XYL to travel with me, and together we can explore new counties. I am working on that! Look for me operating from my mobile station giving out counties.

—W6FAH

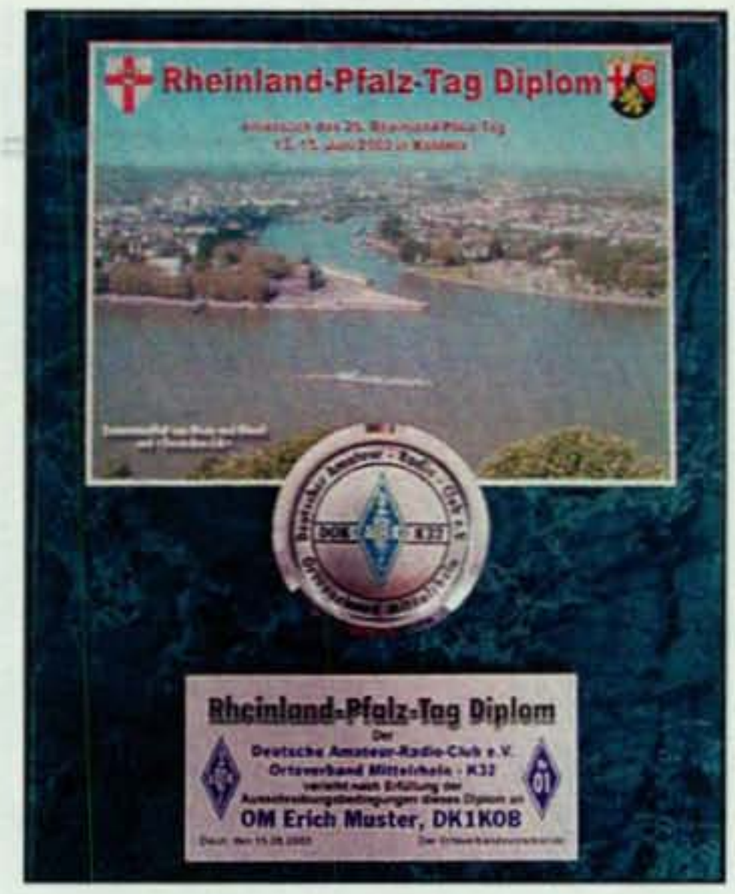
charge for all hams who possess the basic award, endorsements, medal, and CIA trophy.

The certificate may be endorsed for all CW, Phone, RTTY, and Mixed. All bands okay. The award is available for both 50 MHz and 144 MHz contacts as well, but only in the Mixed category. No use of repeaters, packet, or satellites is allowed.

All contacts must be made from one single DXCC entity. If applicants used a special event callsign, proof of a valid permit for the callsign must be submitted. SWL okay. Cards must be in your possession. The award manager has the right to check any cards on request. The award is available after receipt of a properly filled in application form. Data requested in the application form are the following: callsign, CIA reference, island or lighthouse name, date, time, frequency, mode, and signal report.

Apply to: CIA Award Manager, Kresimir Juratovic, 9A7K, P.O. Box 88, HR – 48001 Koprivnica, Croatia. Internet: <http://www.qsl.net/9a7k>.

Rheinland-Pfalz Diploma. The beautiful Rhine River is featured on the Rheinland-Pfalz Award. This award is typical of many German awards which require contacts with club members, although the terminology is slightly different. German clubs are organized into DOKs, and almost 100 percent of the time you will find the DOK number shown on their QSL cards. This makes it very easy to check to see if you have sufficient confirmed contacts to earn an award. If you are a "DX" station, only 20 points and 10-plus DOKs are needed to qualify for the award.



Make contact with stations in the Rheinland-Pfalz district of Germany to earn this award.

Geographical Areas	Prefixes (score only one per area)	Country
Italy (any province)	I (IK, IZ)	Italy
Venice region	IV3	Italy
Greece (any province)	SV	Greece
Eubea island	SV4	Greece
Israel 4X	(4Z)	Israel
Syria	YK	Syria
Iraq	YI	Iraq
Iran	EP	Iran
Turkey	TA	Turkey
Armenia	EK	Armenia
Azerbaijan	4J	Azerbaijan
Georgia	4L	Georgia
Turkmenistan (any province)	UH	Turkmenistan
Uzbekhistan (any province)	UI	Uzbekistan
Samarkand province	UI...I	Uzbekistan
Tadjikistan (any province)	UJ, EY	Tadjikistan
Kirghiz (any province)	UM	Kirghiz
Kazakhistan (any province)	UL	Kazakhistan
Alma Ata Province	UL7G...UL7Q	Kazakhistan
Mongolia	JT	Mongolia
R.P. China (any province)	BY	China
Guang Dong Region	BY7I...P, XX9, VR2, VS6	China
Taiwan	BV, BW	Taiwan
Japan	JA	Japan
Korea	HL	South Korea
Malacca	9M2, 9V1	Malaysia, Singapore
Bengala	XZ, S21	Burma, Bangladesh
Siam	XU, HS	Kampuchea, Thailand
Tibet and Himalaya	9N, A51	Nepal, Bhutan
India (any province)	VU	India
Region of Gujarat*	VU *	India
Sri Lanka	4S7	Sri Lanka
Sumatra Island	YB4, 5, 6	Indonesia
Borneo Island	YB7, V8, VS5, 9M6, 9M8	Indonesia, Brunei, Sabah, Sarawak
Java Island	YBØ, 1, 2, 3	Indonesia
Oman	A4	Oman
Persian Gulf	A6, A7, A9, 9K, HZ	E.A.U., Qatar, Bahrain, Kuwait, Arabia
Ethiopia	ET	Ethiopia
Djibouti	J28	Djibouti
Somalia	T5, 6O	Somalia
Masai table-land	5H3, 5Z4	Tanzania, Kenya
Zanzibar Island	5H1, 5H3/A	Tanzania
Madagascar	5R8	Madagascar

**Check your VU QSLs. Towns located in the Indian Region of Gujarat have a postal code starting with 33 . . . to 39.*
 # Only one prefix per area must be scored (e.g., it is incorrect to add 9M2 or 9V1, etc.).

Table I– List of countries, valid area prefixes, and point values for the Marco Polo International DX Award.

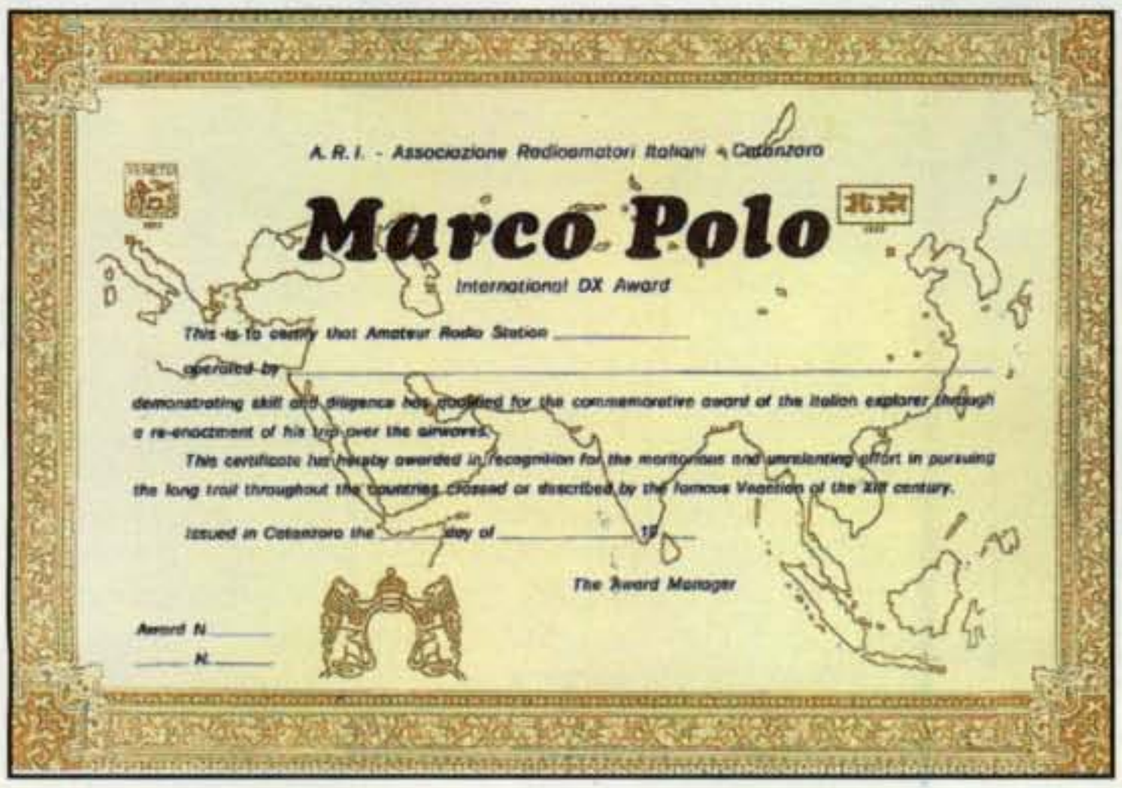
Contact stations in the Rheinland-Pfalz district after January 1, 1970. These are any DOKs which begin with the letter "K" plus Z11, Z22, Z23, Z74, Z77, Z82, and special DOK RP and RP50. SWL okay. Each such station counts for one point and may be worked once per band, any mode.

HF (DLs may only use the 80- and 40-meter bands): DLs need 40 points and 20 or more DOKs. Other Europeans need 30 points and 15 or more DOKs. All others need 20 points and 10 or more DOKs.

VHF: Stations in Rheinland-Pfalz need 50 points and 20 or more DOKs. All other stations need 30 points and 15 or more DOKs.

Send GCR (General Certification Rule, which indicates the sponsor will accept an application with the signatures of two other licensed amateurs who certify that they have viewed the cards) list and fee of 5 Euros or 10 IRCs to: Thomas Kramer, DL4PY, Lindenstrasse 7, D-56812 Cochem, Germany.

Marco Polo International DX Award. This award is sponsored by the ARI Chapter, Radio Club of Catanzaro, Italy and contains a number of changes all effective March 1, 2005, although contacts going back to January 1, 1978



The Marco Polo International DX Award is sponsored by the ARI Chapter, Radio Club of Catanzaro, Italy.

Contact stations in the Russian oblasts situated in CQ zone 18 to earn the Worked 18 Zone Award.

may still be used. The award is challenging because of the many "rare" countries traversed by Marco Polo.

The award is available to any amateur/SWL who is a member of the IARU section of his or her own country and who contacts various areas mentioned or crossed in the explorers famous book *Il Milione* ("The Million"). SWL okay. All modes except cross band are valid. Only one QSO for each country. If two countries are shown in the same geographical area (such as 9N and A51), only one can be used to count for that area. Contacts since January 1, 1978 count.

At least 35 geographical areas are required (see Table I). A certified list of contacts is acceptable, but it must be signed by a recipient of DXCC, WAZ, or another prestigious international DX award. The cards are not required, but if you cannot get the signatures as mentioned, then a photocopy of the front and back of the cards is acceptable.

Fee is 15 Euros or $US18 (please provide a mailing label). The award manager reserves the right to ask for cards or photocopies. Apply to: Award Manager, Louis Foggia, I8FXT, Contrada Guglielmina, I-88050 Soveria Simeri CZ, Italy. Internet: <http://www.aricz.it/diplomi.htm>.The application form can be found on the web at: <http://www.aricz.it/i8qli/APPLICATIONFORMENGLISH.rtf>.

Russia's W-18-Z Award. From the far away frigid Siberian Zone 18 comes the Worked 18 Zone Award sponsored by the Kuzbass DX Group. I'm sure that the Siberian summer is quite pleasant, but the impressionist-style painting of the snow-covered hut in rural Kemerovskaja Oblast that graces the certificate reminds me of a scene from the movie *Doctor Zhivago*.

Contact stations in the Russian oblasts situated in CQ zone 18: R9H (Current oblast = TO, ex-oblast = 158), R9O (NS, ex-145), R9U (KE, ex-130), R9Y (AL, ex-99), R9Z (GA, ex-100), RØA (KK, ex-103), RØB (TM, ex-105), RØH (EW, ex-106), RØO (BU, ex-85), RØS (IR, ex-124), RØU (CT, ex-166), RØW (HA, ex-104), R8T (UO, ex-174), R8V (AB, ex-175).

The award is available in three classes as follows:

1st class—18 different stations in zone 18, among them at least one station in each of the above-listed oblasts.

2nd class—18 different stations from at least 7 different oblasts located in zone 18.

3rd class—10 different stations in zone 18.

QSLs of SWLs located in zone 18 are equally valid for award purposes (SWL okay). Log extract accepted. No restrictions for date, mode, and bands. Award fee is $US1 or equivalent for Russian amateurs; $US2 or 4 IRCs for CIS amateurs; and $US10, 10 IRCs, or 10 Euros for the rest of world. Application and fee should be sent (registered letter recommended) to: O. A. Maljavskij, Box 1, Topki, Kemerovskaja obl., 652300 Russia. Internet: <http://home.concepts.nl/~kruistum/russian_awards.htm>; e-mail: <ua9uax@kuzbass.net>.

Should your club or group need publicity for a new or existing awards program, please send me the details via letter or e-mail. Publicity is the key to success for any awards program.

73, Ted, K1BV

contesting

BY JOHN DORR,* K1AR

Learning Old Tricks

May's Contest Tip

If you're a packet-node user, this one's for you. Most of us are painfully aware of the nearly instantaneous pile-ups that take place after a rare multiplier is spotted. Sometimes this happens late in the contest for common stations as well. Unless you're operating from a huge station, trying to work these stations can be an exercise in futility. In the future, try waiting ten minutes before calling the station to let the pile-up thin out a bit. You may lose one or two multipliers that way, but you will benefit by ultimately working more of these types of stations. Plus there will be the added QSOs that come from working other guys rather than waiting around in a pile-up you can't break!

Calendar of Events

Apr. 23–24	DX Colombia Int'l Contest
Apr. 23–24	SP DX RTTY Contest
Apr. 23–24	Helvetia Contest
Apr. 23–24	Florida QSO Party
Apr. 23–24	Nebraska QSO Party
May 7–8	MARAC CW County Hunter's Contest
May 7–8	Nevada QSO Party
May 7–8	Oregon QSO Party
May 7–8	Indiana QSO Party
May 7–8	ARI Int'l DX Contest
May 7–8	New England QSO Party
May 14–15	CQ-M Int'l DX Contest
May 14–15	VOLTA WW RTTY Contest
May 14–15	Mid-Atlantic QSO Party
May 21–22	EU PSK DX Contest
May 21–22	His Majesty of Spain CW Contest
May 28–29	**CQ WW WPX CW Contest**
June 4–5	IARU Region 1 CW Field Day
June 4–5	RSGB National Field Day
June 18	Kid's Day Contest
June 25–26	ARRL Field Day

Recently, after doing some quick math, I realized that I've been playing the contesting game for over 35 years. While there are many of you out there who can top that, I think it does provide for a legitimate claim of being "long in the tooth" in this business of radio contesting. If you've made it this far into the conversation, you're probably asking, "So what?" As it turns out, I've rediscovered a humbling fact: There is always something to be learned, no matter where you are on the experience curve.

A Few Examples

On the surface, contest operating really isn't that complicated. You get on the air, find a station to work, and exchange some information. The ones who do that the most times with the most places win. It's the subtlety behind the basics that provides the basis for differentiation and improvements in a score. Let me give you a few examples that I have either learned or become mindful of over this past contest season:

• **Calling stations off frequency on CW.** Ah, those nasty DX pile-ups. I'll bet you "love" them as much as I do. That being said, have you recently noticed an improved ability to break CW pile-ups simply by calling a station a little "high" or "low" off the station's transmitting frequency? It's the old adage "calling them where they are not." In my case, I've had to learn this at home out of necessity because of my feeble wire antennas, but the technique works equally well from any station.

• **Using alternative/unconventional antennas to receive.** I've been amazed at what I can hear by using non-standard antennas as an alternative for difficult receiving situations—for example, switching to the 80-meter 4-square to try to dig out a weak one on 160 when the Beverages aren't working. There are many other combinations, usually limited by your station's filtering systems and flexibility in antenna switching. A sidebar to this technique is to consider Beverage use for the high bands. You might be surprised how they can help under certain conditions.

• **Waiting for spotted station pile-ups to die down.** This one is addressed in the tip of the month at the beginning of this column, but it's worth a second look. When something exciting/needed gets spotted on packet, your natural inclination is to run off and work it—hence the birth of the hideous packet pile-up. I'm learning that there is merit, especially with a smaller station, to letting the pile-up work itself out a bit and calling some of these stations five or ten minutes after they've been spotted. Yes, you may miss a few multipliers, but that loss will be made up by working other guys faster. It's a balancing act that seems to be paying dividends more and more these days.

• **Changing those antennas.** A corollary to the antenna tip above is a reminder that antenna height and stacking combinations need to be considered when trying to contact certain parts of the world. For example, never assume that pointing all of your antennas toward Europe (if you're fortunate enough to have this option in the first place) is the best strategy. There will be times when a low, single Yagi outperforms a high four-stack and vice versa. I remember a time years ago when I was operating at W2PV on 10 meters. I was being crushed in a pile-up on a station in Africa by guys running low tribanders, while we were using our mammoth 10-over-10 stacked Big Bertha array. Those fellows had an antenna angle that I didn't have, and they prevailed.

In contesting we are always learning. It's one of the attractions to the sport. Regardless of our level of experience, if we don't constantly strive to learn from the experiences of others, access to the winner's circle (however you choose to define that) will pass right by us. Just as with everything else in life,

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

there is always someone smarter and better. Make sure you know who they are and learn from their experiences!

W7RM Remembered

It is with great sadness this month that I report on the loss of another contesting legend and dear friend, Rush Drake, W7RM. As contesters, we have been blessed with so many individuals whom we look up to and respect as true leaders of our sport. Rush was indeed a giant among men.

As a young buck, I initially cut my contesting teeth by slugging it out from my home QTH, only to rapidly move on to operating from some of the great multi-multi stations—W1ZM, W2PV, W3AU, and others. In those days, technology was rudimentary compared to today's revolution, but the thrill of the battle was still there. As a 15- or 20-meter operator I often enjoyed the great runs into Europe, only to listen to the monster stations of the west bring it home in the evening hours with endless JAs. Operators such as K7JA running hundreds of Asians (mostly in Japanese) from W7RM are memories that are indelibly etched in my brain.

Sadly, the days of W7RM are now only a memory as well. However, I cherish the relationship I had with Rush, whether it was the hallway chats he and I had at Dayton, or the time I had the honor of sharing the head table at the Hamvention® Contest Dinner when Rush accepted W6RR's CQ Contest Hall of Fame award.

I never had the opportunity to operate from W7RM. I now wish I had done it at least once. Unfortunately, it's the latest addition to the "should have," "could have" list we all maintain. However, there are others who enjoyed direct personal experiences I can't hold a candle to, so I'd like to share a few comments I've read in recent days:

I am sure many tributes will follow, but as one who knew Rush very well during his

Contesting in Africa

By Roger Western, G3SXW

There are many great amateur radio books on the market, and every once in a while you come across a real winner. Well, I've found it—*Contesting in Africa,* by Roger Western, G3SXW, and the VooDoo Contest Group, recently published by Idiompress. With the ink barely dry on the pages, Roger will captivate your imagination and dreams by retelling the team's experiences in Africa. And it's not all about ham radio!

Establishing a winning multi-multi station on the African continent is one of our hobby's greatest logistical challenges. Roger says it best when he exclaims, "Moving 1.5 tons of equipment on a lorry accompanied by only two of us could no longer be passed off as normal tourism." Indeed, tourism is not the goal of the VooDoo Contest Group. Rather, high-performance contesting is the game, and *Contesting in Africa* is a collection of stories told by some of contesting's finest players who were there and did it!

If you want to discover what it takes to win from the exotic lands of Africa, learn a thing or two about contest operating, or just be entertained by 190 pages of great reading, I strongly suggest you purchase a copy. *Contesting in Africa* is available on-line for $19.95 plus shipping from <www.idiompress.com>, or from CQ Communications (see the ad elsewhere in this issue) and many distributors. *—K1AR*

The QSL card of Rush, W7RM (SK), prominently displays the amazing W7RM antenna farm. No wonder he was a beacon from the northwest. (Tnx K7GDN)

Nothing made Rush happier than running his multi-multi operations. Here he is serving up chow for the team during the 2000 CQ WW CW Contest. It's just one of my fond memories from W7RM. (Tnx NØAX)

glory years at Foul Weather Bluff, I must say that it was an honor to have grown up in contesting at the helm of his station and at his side on many a tower. He put together a potent antenna farm at one of the premier locations in North America and reshaped contesting in the USA for many years. Big Yagis up high and four-vertical arrays on Puget Sound—what an effort! The first-place finishes his station made in DX contests were among the last ever recorded from the West Coast, and may turn out to be the last ever. *—Chip, K7JA*

Although I never visited Rush's Foul Weather Bluff QTH, I will always remember the twinkle in Rush's eyes when he described it at one of the DX convention meetings.*—Pete, WØETT*

I will never forget the day when the late Don Reiboff and I visited Rush on Foul Weather Bluff. I think it was the day after we had been entertained by Chip and Danny at KRAB. The station design was reminiscent of the W3MSK/W3AU (SK) station. Of course, W3ESK, Rush, and Ed shared a lot of ideas. I particularly remember the huge helical resonators that he had built to reduce inter-station interference. And, oh those antennas!— *Dallas, W3PP*

Rush was always so loud here in the northern latitudes! I remember when he came on the empty band as a local station! *—Harry, OH6YF*

I want to share one final story about W7RM. One of my more memorable encounters with Rush occurred when some of us were at K1EA's 50th birthday party at KC1XX's house. It turned out that Ken and Rush shared a common birthdate (or close to it). We took a break from Ken's party and called Rush on the telephone to wish him "Happy 82nd." K1GQ, K1EA, K1DG, N2AA, and others chimed in as we passed my cell phone through the crowd of well-wishers. I'm certain Rush was thrilled, but not as much as we were. Rush may never have known how much he meant to all of us.

Rush would likely be embarrassed by all the attention he's received after his passing. This month's column is a good example. That being said, there is no one more deserving. Thank you, Rush! RIP, OM.

Final Comments

It's been another great month, but at the same time a sad one with the passing of W7RM. I often find it to be overstated, but we are indeed losing our great ones with increasing frequency. However, let's not be too hard on ourselves. The current generation of contest leaders is also doing amazing things—both in terms of innovation and operating excellence. To these individuals, we owe our thanks.

That's all for this month. Until next time, good luck in the contest!

73, John, K1AR

Dayton Contesting and Antenna Technology Forums

Two of the Dayton Hamvention® forum programs of interest to contesters, the Antenna Technology Forum, chaired by Tim Duffy, K3LR, and the Contesting Forum, chaired by Doug Grant, K1DG, will be moving to a new location this year. The facilities at the Hara Arena site are no longer able to accommodate these two programs, which have grown to be the highest attended of the 40-plus Hamvention® forums. Therefore, this year they will be held in the Van Cleve Ballroom at the Crowne Plaza hotel in downtown Dayton on Saturday, May 21, from 12 noon to 4:30 PM. The annual Contest Dinner will be held in the same room at 6:30 PM that evening.

2004 CQ WW WPX CW Contest Addition

NG7Z's Multi-Single log was inadvertently left out of the results published in the March issue: 2,111,374 points, 1399 QSOs, 617 prefixes; #1 USA 7th Call Area.

On the Bands

BY TOMAS HOOD,* NW7US

propagation

A Quick Look at Current Cycle 23 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, February 2005: 29
Twelve-month smoothed, August 2004: 39

10.7 cm Flux
Observed Monthly, February 2005: 97
Twelve-month smoothed, August 2004: 105

***Ap* Index**
Observed Monthly, February 2005: 11
Twelve-month smoothed, August 2004: 14

It is spring, and as we move closer to summer, DX signals on the higher bands become weaker and openings sparser, especially now that solar Cycle 23 is near its end. Long-distance *F*-layer propagation via 10 meters through 15 meters will continue to suffer due to the lower maximum usable frequencies (MUF) caused by an only moderately active sun. Optimum frequencies for DX propagation are lower during most of the daylight hours, but higher during the late afternoon, early evening, and nighttime hours than were observed during the winter months. However, during May, occasional sporadic-*E* propagation may be possible on the highest HF bands and even on 6 meters. Seasonal static is increasing during May, but perhaps not enough yet to overly degrade the lowest HF bands.

The following is an overall picture of the high-frequency amateur band openings expected during May 2005. For specific times of DX openings, refer to the DX Propagation Charts that appeared in last month's column. This month's column contains Short-Skip Propagation Charts valid for May and June, as well as charts centered on Alaska and Hawaii. The Short-Skip Charts contain propagation forecasts for openings varying in distance between 50 and 2300 miles. For day-to-day propagation conditions expected during the month, see the "Last-Minute Forecast."

10 and 12 Meters: Except for an occasional daytime opening to some southern or tropical areas, not many DX openings are forecast for these bands during May. The afternoon hours are the best time to check for DX openings. Frequent short-skip openings between distances of approximately 750 and 1400 miles, however, should be possible.

15 Meters: A seasonal decrease in DX openings is normal for May. Some fairly good openings still are possible toward the south during the late afternoon and evening. Numerous short-skip openings, between about 600 and 2300 miles, should be possible almost daily.

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for May 2005

Propagation Index.....	Expected Signal Quality (4)	(3)	(2)	(1)
Above Normal: 5-7, 9-10, 12, 14-20, 24-26	A	A	B	C
High Normal: 3-4, 11, 13, 21-23, 30-31	A	B	C	C-D
Low Normal: 2, 8, 29	B	C-B	C-D	D-E
Below Normal: 27	C	C-D	D-E	E
Disturbed: 1, 28	C-D	D	E	E

Where expected signal quality is:
A—Excellent opening, exceptionally strong, steady signals greater than S9.
B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing on the following pages.
2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 3 will be poor (D) on May 1st, fair to good (C-B) on the 2nd, good (B) on the 3rd and 4th, etc.

17 and 20 Meters: These should be the best bands for DX during May. Opening shortly after sunrise, good DX conditions are expected to one area or another through the evening hours. These bands may also remain open to southern and tropical areas through much of the nighttime hours. DX conditions should peak during the late afternoon and early evening, with openings possible to almost all areas of the world. Very frequent short-skip openings are also forecast for distances between about 350 and 2300 miles. Quite often, especially during the late afternoon, optimum conditions may exist for both the short and long skip, and stations a few hundred miles away will be heard at the same time as DX stations several thousand miles away, causing considerable QRM.

30 Meters: This band will often play a major role in DX propagation, with somewhat better nighttime propagation than 40, and solid daytime propagation into many areas of the world. Exotic DX can be found here on CW and digital modes. Check this band often during the course of the day.

40 Meters: Fewer DX openings are expected because of the shorter hours of darkness and the higher level of static. Fairly good openings should still be possible, however, to several areas of the world from shortly before sunset, through the hours of darkness, until shortly after sunrise. Good daytime short-skip openings can be expected over distances of between approximately 150 and 750 miles, with nighttime openings extending up to the one-hop limit of 2300 miles.

60 and 80 Meters: Fewer hours of darkness and higher static levels are also expected to reduce DX openings on these bands, but a few fairly good ones should still be possible. Check during the hours of

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings. An ** indicates possible 10 meter openings.

2. The *propagation index* is the number that appears in ( ) after the time of each predicted opening. In the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. 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.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 AM; 13 is 1 PM, etc. On the Short-Skip Chart appropriate *daylight* time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EDT, on a circuit between New York and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii Chart are in HST. To convert to daylight time in other USA time zones add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone; and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 PM in Los Angeles; 18 or 6 PM in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *daylight* time in other areas of the USA subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone; and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 PM in New York City.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave 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.

5. 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.

CQ Short-Skip Propagation Chart
May & June 2005
Local Daylight Savings Time
At Path Mid-Point
(24-Hour Time System)

Band (Meters)	*Distance From Transmitter (Miles)*			
	50-250	*250-750*	*750-1300*	*1300-2300*
10	Nil	08-09 (0-1) 09-13 (0-2) 13-17 (0-1) 17-21 (0-2) 21-23 (0-1)	08-09 (1) 09-13 (2) 13-17 (1-2) 17-21 (2) 21-23 (1) 23-07 (0-1)	08-09 (1-0) 09-21 (2-0) 21-23 (1-0) 23-07 (1-0)
15	Nil	07-09 (0-1) 09-13 (0-2) 13-17 (0-1) 17-21 (0-2) 21-00 (0-1)	07-09 (1-2) 09-13 (2-3) 13-17 (1-2) 17-19 (2-3) 19-21 (2) 21-00 (1) 00-07 (0-1)	07-09 (2-0) 09-13 (3-1) 13-17 (2-1) 17-19 (3-1) 19-21 (2-0) 21-07 (1-0)
20	Nil	07-09 (0-2) 09-12 (0-3) 12-17 (0-4) 17-19 (0-3) 19-23 (0-2) 23-07 (0-1)	07-08 (2) 08-09 (2-3) 09-12 (3-4) 12-17 (4) 17-19 (3-4) 19-20 (2-4) 20-21 (2-3) 21-23 (2) 23-07 (1)	07-08 (2) 08-09 (3-2) 09-15 (4-2) 15-17 (4-3) 17-20 (4) 20-21 (3) 21-23 (2) 23-07 (1)
40	08-10 (0-2) 10-16 (1-4) 16-18 (2-4)	08-10 (2-4) 10-15 (4-2) 15-16 (4-3)	08-09 (4-3) 09-10 (4-2) 10-15 (2-1) 18-20 (1-3) 20-22 (0-2) 22-08 (0-1)	08-09 (3-1) 09-10 (2-1) 10-16 (1-0) 16-19 (4) 19-20 (3-4) 20-22 (2-3) 22-08 (1-2)	15-16 (3-1) 16-19 (4-2) 19-20 (4) 20-22 (3-4) 22-01 (2-4) 01-03 (2-3) 03-08 (2)	16-19 (2-1) 19-20 (4-3) 20-01 (4) 01-03 (3) 03-06 (2) 06-08 (2-1)
80	08-10 (4) 10-18 (4-3) 18-20 (4) 20-22 (3-4) 22-00 (2-4) 00-06 (2-3) 06-08 (3-4)	08-10 (4-1) 10-16 (3-0) 16-18 (3-1) 18-20 (4-2) 20-00 (4) 00-06 (3-4) 06-08 (4-3)	08-09 (1) 09-10 (1-0) 10-16 (0) 16-18 (1-0) 18-20 (2-1) 20-22 (4-3) 22-02 (4) 02-06 (4-3) 06-08 (3-2)	08-09 (1-0) 09-18 (0) 18-20 (1-0) 20-22 (3-2) 22-02 (4-3) 02-06 (3-2) 06-08 (2-1)
160	06-09 (4-1) 09-10 (2-0) 10-19 (1-0) 19-21 (3-1) 21-23 (4-2) 23-06 (4-3)	06-09 (1) 09-19 (0) 19-21 (1-0) 21-23 (2-1) 23-01 (3-2) 01-04 (3) 04-06 (3-2)	08-09 (1-0) 09-21 (0) 21-23 (1) 23-01 (2-1) 01-04 (3-2) 04-07 (2) 07-08 (1)	08-21 (0) 21-01 (1) 01-04 (2) 04-06 (2-1) 06-07 (1) 07-08 (0-1)

ALASKA
May & June 2005
Openings Given in GMT

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Eastern USA	Nil	20-02 (1)	22-00 (1) 00-02 (2) 02-04 (3) 04-05 (2) 05-06 (1) 10-12 (1)	Nil
Eastern USA			12-14 (2) 14-16 (1)	
Central USA	Nil	21-04 (1)	22-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 12-13 (1) 13-15 (2) 15-16 (1)	08-12 (1)
Western USA	Nil	20-23 (1) 01-03 (1) 03-05 (2) 05-06 (1)	00-02 (2) 02-04 (3) 04-07 (4) 07-08 (3) 08-09 (2) 09-15 (1) 15-18 (2) 18-00 (1)	07-09 (1) 09-14 (2) 14-15 (1) 11-13 (1)*

HAWAII
May & June 2005
Openings Given in Hawaiian Standard Time

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Eastern USA	Nil	12-15 (1) 15-17 (2) 17-19 (1)	13-15 (1) 15-17 (2) 17-19 (3) 20-04 (2) 04-08 (1)	19-20 (1) 20-23 (2) 23-02 (1) 21-23 (1)*
Central USA	Nil	12-15 (1) 15-18 (2) 18-20 (1)	15-16 (2) 16-17 (3) 17-19 (4) 19-20 (3) 20-22 (2) 22-04 (1) 04-05 (2) 05-07 (3) 07-09 (2) 09-15 (1)	19-20 (1) 20-21 (2) 21-01 (3) 01-02 (2) 02-04 (1) 20-21 (1)* 21-00 (2)* 00-03 (1)*
Western USA	13-17 (1)	09-12 (1) 12-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	06-08 (4) 08-16 (3) 16-19 (4) 19-20 (3) 20-22 (2) 22-05 (1) 05-06 (2)	18-19 (1) 19-20 (2) 20-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1) 19-20 (1)* 20-22 (2)* 22-02 (3)* 02-04 (2)* 04-05 (1)*

**Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.*
For 12 meter openings interpolate between 10 and 15 meter openings.
For 17 meter openings interpolate between 15 and 20 meter openings.
For 30 meter openings interpolate between 40 and 20 meter openings.

Propagation charts prepared by George Jacobs, W3ASK.

darkness. Excellent short-skip openings are forecast for the daylight hours over distances ranging between 50 and 250 miles. During the hours of darkness, the short-skip range should increase up to approximately 2300 miles.

160 Meters: Propagation conditions on this band have passed their seasonal peak and should decline until the early fall. Openings up to a distance of 1000 miles or so should be possible this month during the hours of darkness. An occasional opening well beyond this range may also be possible when static levels are exceptionally low.

VHF Conditions

May should see an increase in sporadic-*E*, with some continued trans-equatorial propagation. Solar activity is not expected to be high enough to support *F*-layer DX on 6 meters.

Sporadic-*E* ionization is expected to increase moderately during May, so look for short-skip openings, likely to occur over distances of approximately 1000 to 1400 miles. Although sporadic-*E* openings can take place at just about any time, the best time to check is between 10 AM and 2 PM and again between 6 and 10 PM local daylight time.

During periods of intense and widespread sporadic-*E* ionization, two-hop openings considerably beyond 1400 miles should be possible on 6 meters. Short-skip openings between about 1200 and 1400 miles may also be possible on 2 meters.

A seasonal decline in trans-equatorial (TE) propagation is expected during May. An occasional opening may still be possible on 6 meters toward South America from the southern tier states and the Caribbean area. The best time to check for 6-meter TE openings is between 9 and 11 PM local daylight time. These openings will be north-south paths that cross the geomagnetic equator at an approximate right angle.

Auroral activity is generally lower than in March and April due to the change in the orientation and position of the Earth and magnetosphere in relation to the solar wind. This year very little aurora can be expected during May. Watch for *Kp* values above 6, which occur on days of Below Normal and Disturbed HF conditions. Refer to the Last-Minute Forecast for those days in May that are expected to be in these categories. Point your antenna north when this condition exists. You will find that CW is the modulation and mode of choice, as the signals you will hear on aurora will be raspy and very distorted.

Current Solar Cycle Progress

Sunspots have been observed telescopically for more than 300 years and daily records have been available since the mid-18th century. Today sunspots are observed telescopically each day by a worldwide network of more than 30 solar observatories. While the telescope at each participating observatory is calibrated against a standard, results can vary among observations. Measurements strongly depend on observer interpretation and experience and on the stability of the Earth's atmosphere above the observing site.

To compensate for differences the Royal Observatory of Belgium computes the daily international number as a weighted average of measurements made from the network of cooperating observatories. The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for February 2005 is 29.1, continuing the downward trend. The lowest daily sunspot value during February, recorded on February 28, was 7. The highest daily sunspot count was 56 on February 12.

Each solar cycle is based on the monthly smoothed sunspot number, which is calculated by creating a 12-month running average of the monthly mean sunspot number. The 12-month running smoothed sunspot number centered on August is 39.3, down from July's 40.2. A smoothed sunspot count of 19, give or take about 12 points, is expected for May by the SIDC.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 97.3 for February 2005, down from January's 102.4. The 12-month smoothed 10.7-cm flux centered on August 2004 is 105. The predicted smoothed 10.7-cm solar flux for May 2005 is about 82, give or take about 16 points.

The observed monthly mean planetary *A*-index (*Ap*) for February 2005 is 11, down nicely from January's 22. The 12-month smoothed *Ap*-index centered on August 2004 is 13.8, the same as for July. Expect the overall geomagnetic activity to be quiet to active during most days in May, with some isolated periods of storm-level activity. Refer to the Last-Minute Forecast for the outlook on what days this might occur.

Please come and participate in my online propagation discussion forum at <http://hfradio.org/forums/>. You can get live, up-to-the-minute solar weather and terrestrial data by visiting my Space Weather and Radio Propagation center at <http://prop.hfradio.org>, so come take a look. These resources may also be viewed on a cellphone or other wireless device that has WAP/WML features by browsing to <http://wap.hfradio.org>.

Drop me an e-mail or send me a letter if you have questions or topics you would like to see me explore in this column. I'd also love to hear any feedback you might have on what I have written. Until next month . . .

73, de Tomas, NW7US/AAAØWA

(Continued from page 31)

Number groups after callsigns denote the following: QSOs, Points, Zones, Countries, US/VE, Final Score. Certificate winners are listed in boldface.

2004 CQ WW RTTY DX CONTEST

SINGLE OPERATOR ASSISTED

KI1G	2499	6100	116	309	192	3,763,700
ZX2B	2246	6653	103	278	170	3,665,803
EO3Q	1729	4138	102	278	101	1,990,378
HA8IE	1513	3743	108	301	121	1,983,790
II1DCI	1580	3990	101	253	141	1,975,050
KU1CW	1650	3639	106	243	164	1,866,807
I2UIY	1490	3783	89	212	149	1,702,350
DK3GI	1246	3165	111	265	126	1,588,830
W3FV	1435	3727	75	224	122	1,569,067
UAØAGI	1408	3863	90	238	51	1,464,077
DKØEE	1227	3096	98	257	111	1,442,736
UW8M	1480	3424	91	258	72	1,441,504
NO2T	1228	2945	76	209	132	1,228,065
WK6I	1212	2536	96	191	161	1,136,128
EA5RM	1148	2724	89	223	100	1,122,288
RX9SR	1195	3392	71	204	31	1,037,952
DL6JZ	1043	2452	87	224	85	970,992
RZ3AZ	1130	2489	86	246	54	960,754
W9MU	987	2463	78	203	101	940,866
AD4EB	1026	2329	77	196	122	919,955
N5JR	1033	2438	60	168	113	831,358
VK4UC	851	2512	76	148	95	801,328
RW4WZ	934	2064	90	245	40	774,000
WT8C	827	1911	75	188	122	735,735
USØKW	923	2105	69	204	52	684,125
RF4R	723	1634	95	267	36	650,332
K3SV	724	1767	63	204	100	648,489
W4ZE/3	720	1855	71	175	80	604,730
CT3IA	665	1984	60	165	75	595,200
SV8CS	683	1658	76	186	57	528,902
HA5BSW	672	1591	82	196	52	525,030
SM7BHM	678	1591	66	190	57	497,983
K3KO	677	1892	59	158	44	493,812
DL7VEE	533	1274	85	221	67	475,202
N2BJ	655	1466	72	150	100	472,052
K7RL	694	1488	57	111	122	431,520
PH7J	643	1551	59	154	51	409,464
ABØRX	692	1376	63	117	117	408,672
MM5DWW	615	1426	59	152	49	370,760
N2FF	550	1269	53	149	90	370,548
G3UHU	564	1284	61	170	44	353,100
DJ5JK	400	1042	80	185	70	349,070
J49XB	590	1351	58	162	37	347,207
UA4HJ	631	1354	60	177	14	339,854
DL4RCK	485	1171	58	162	65	333,735
N9QQK	532	1207	59	139	74	328,304
JA1XRH	488	1215	80	144	43	324,405
PI4COM	686	1801	31	94	44	304,369
IT9JOF	454	1174	55	133	70	302,892
W7ZR	578	1156	61	109	91	301,716
JA1WSK	485	1316	55	127	47	301,364
PC1A	716	1781	31	82	48	286,741
SP3GXH	530	1191	60	165	1	269,166
W3WKR	424	940	59	136	84	262,260
KØBX	431	1137	55	131	44	261,510
G4WFQ	418	1000	59	144	49	252,000
NE3H	429	1095	45	130	51	247,470
UY5ZZ	643	1469	37	101	30	246,792
E21EIC	393	1045	77	137	15	239,305
ABØTA	394	834	66	130	83	232,686
F5PHW	396	928	59	138	42	221,792
UT7QF	566	1503	32	77	38	220,941
I2SVA	349	870	56	130	59	213,150
JA1XUY	370	924	74	118	30	205,128
JG1GGU	337	888	70	114	39	198,024
GM2Z	511	1092	37	108	25	185,640
K3UW	295	673	55	115	69	160,847
7L4IDU	299	719	78	101	40	157,461
DL4NN	291	702	59	120	34	149,526
DL3ARK	240	584	55	117	35	120,888
DHØGHU	257	618	45	96	52	119,274
IK3ORD	264	614	50	123	19	117,888
N6VH	284	511	50	70	86	105,266
JR1BAS	241	624	51	97	14	101,088
OK2ZJ	235	529	40	102	18	84,640
DL6FCB	179	469	47	81	39	78,323
KF9YR	257	612	28	63	27	72,216
DF2LH	188	449	39	85	36	71,840
W2YR	244	613	25	64	25	69,882
SP3KFH	318	708	23	73	0	67,968
SP3HUU	175	426	42	86	20	63,048
F6IFY	166	381	43	104	6	58,293
WØDET	207	408	39	52	48	56,712
JA3PYC	138	376	53	82	10	54,520
W3BW	148	358	34	73	34	50,478
K5WW	187	321	34	51	69	49,434
AA9RR	130	348	33	83	18	46,632
JA1BWA	138	343	50	64	17	44,933
RU3AT	120	313	51	76	16	44,759
JA1IST	132	366	40	60	19	43,554
AD1C	119	275	39	69	30	37,950
JA1ALE	136	320	45	61	7	36,160
DL2YCA	146	302	24	75	6	31,710
JEØIUR	93	256	36	51	11	25,088
KC5YKX	77	200	45	65	11	24,200
K1TC	111	258	21	47	21	22,962
LU7DR	80	224	28	43	25	21,504
N4XMX	76	217	32	59	5	20,832
OH4RH	95	240	31	40	12	19,920
YO3III	93	208	26	55	7	18,304
N6KJ	93	179	31	33	38	18,258
W1DY	71	206	34	51	0	17,510
K6JJ	102	158	26	24	55	16,590
KØPC	79	161	23	36	27	13,846
ON4CAS	59	163	21	24	27	11,736
N7JB	68	136	27	29	22	10,608
SV1DPI	54	157	17	19	29	10,205
KB3EAX	52	150	17	47	2	9,900
JJ1BDX/3	51	131	30	38	3	9,301
DL9SEV	69	150	17	33	0	7,500
KI4FDF	34	87	14	27	5	4,002
JS3CTQ	32	73	18	21	2	2,993

SINGLE OPERATOR ALL BAND HIGH POWER

P3F	2499	7306	93	267	94	3,316,924
LY2IJ	2211	5456	115	319	123	3,038,992
RK4FF	2311	5368	108	308	95	2,743,048
RD3A	1801	4272	113	305	109	2,251,344
JH4UYB	1746	4815	110	246	100	2,195,640
KI5XP	1907	4046	105	245	184	2,160,564
AA5AU	1973	4093	99	239	188	2,152,918
AB5K	2082	4355	89	218	167	2,064,270
YL7A	1543	3647	106	303	116	1,914,675
K5ZD/1	1595	4048	89	246	136	1,906,608
EA1AKS	1589	3959	92	234	143	1,856,771
7S2E	1706	4114	87	243	118	1,843,072
9J2KC	1623	4859	73	195	88	1,729,804
WA2ETU	1559	3827	86	223	140	1,718,323
LTØH	1330	3909	87	209	141	1,708,233
F6IRF	1469	3619	89	246	126	1,668,359
AI9T	1453	3354	84	217	141	1,482,468
K5AM	1585	3114	84	176	190	1,401,300
9M2/G4ZFE	1511	4193	79	214	37	1,383,690
GM5A	1471	3448	80	211	101	1,351,616
WØYR/4	1328	3357	74	205	122	1,346,157
SM4RGD	1338	3260	82	237	89	1,330,080
I1COB	1197	2986	70	193	114	1,125,722
RV6YZ/6	1142	2674	88	230	88	1,085,644
K3WW	1130	2786	70	194	119	1,067,038
OK2BXW	1080	2632	77	228	96	1,055,432
YU7AM	1098	2597	78	226	90	1,023,218
LU8EKC	970	2828	73	172	116	1,020,908
JM1XCW	1011	2740	86	179	93	980,920
DJ3NG	1094	2572	71	220	89	977,360
ZL2AMI	865	2554	88	150	135	952,642
CQ3A	1124	3364	50	153	61	888,096
SM5FUG	1024	2389	78	206	85	881,541
AB8NI	1054	2417	63	180	120	877,371
HA3LI	1063	2494	72	200	72	857,936
EA3RH	1040	2440	72	184	91	846,680
H2E	963	2779	70	203	28	836,479
K5CM	1045	2345	70	157	122	818,405
YEØANA	980	2905	73	180	27	813,400
W2YE	939	2273	65	181	110	809,188
VR2BG	1011	2525	96	167	40	765,075
KØFX	952	1954	81	171	138	762,060
AY8A	746	2164	72	161	110	742,252
LT1D	788	2290	65	148	105	728,220
OH7UE	1030	2318	65	190	45	695,400
UN6G	913	2468	65	186	24	678,700
W4UK	946	1857	68	151	143	672,234
SM5D	813	1880	77	210	60	652,360
VE6YR	857	2102	60	122	119	632,702
IN3JJI	829	2007	65	172	77	630,198
RU6MM	855	1940	77	205	42	628,560
G1W	774	1888	64	162	106	626,816
EI4DW	793	1937	68	164	90	623,714
YL2CI	834	1858	78	216	34	609,424
UN8GV	859	2374	63	184	7	602,996
UA3LEO	745	1727	75	204	62	588,907
WM7A	875	1628	63	150	139	573,056
K6HGF	941	1591	73	128	155	566,396
W9NGA	737	1688	68	147	97	526,656
RX9TX	745	2011	68	177	15	522,860
UA9MA	726	1982	67	161	34	519,284
LA7CL	743	1730	64	173	57	508,620
W6IHG	637	1468	70	172	98	499,120
AK6DV	795	1574	68	112	125	480,070
JA1BNW	637	1704	76	163	42	478,824
RV6BC/P	814	1816	53	161	36	454,000
JA2FSM	572	1502	82	138	69	434,078
KØJJ	768	1376	68	113	132	430,688
HB9CAL	555	1414	71	171	62	429,856
YL2NN	615	1418	64	188	42	416,892
JR3NZC	571	1554	68	138	56	407,148
KL7DX	720	1761	49	83	90	390,942
DU9/NØNM	557	1626	75	121	44	390,240
DJ1TU	542	1273	67	187	50	386,992
W9WI	554	1311	58	142	88	377,568
OK2SG	508	1203	70	191	52	376,539
DF3IS	577	1342	55	147	52	340,868
N7BF	608	1112	66	109	120	328,040
JR3UIC	444	1202	83	159	29	325,742
K6YUI	497	1032	69	126	106	310,632
K6RIM	506	1093	62	117	96	300,575
DK7ZT	484	1099	59	158	49	292,334
WW7OR	511	1522	62	128	0	289,180
EA2ASB	569	1270	55	130	39	284,480
OM4A	501	1207	49	122	48	264,333
DJ3IW	317	805	72	183	65	257,600
W7KB	597	953	55	82	128	252,545
UAØAZ	415	1145	55	129	30	245,030
JN1BMX	399	1053	61	116	45	233,766
YB2EMK	439	1297	51	109	18	230,866
HL2WP	482	1334	45	97	30	229,448
WØHW	449	987	52	110	65	224,049
W7TVF	407	812	65	105	99	218,428
JA7IC	358	973	63	111	49	216,979
JA2BQX	380	985	62	122	26	206,850
DK4IO	396	910	53	130	40	202,930
HB9AVK	341	846	52	113	69	197,964
K6XX	391	889	52	101	67	195,580
K6TA	387	810	65	83	90	192,780
OH9RI	329	822	54	128	51	191,526
OK2BZ	360	836	49	133	42	187,264
WA6BOB	492	823	53	62	104	180,237
ES1AJ	340	803	52	128	42	178,266
DL3BQA	333	817	50	125	43	178,106
SP5GMM	316	776	61	131	31	173,048
9V1UV	421	1063	43	92	22	166,891
WN1OTV	330	758	39	116	62	164,486
DL5YM	379	851	44	119	29	163,392
RK3BA	380	826	48	134	15	162,722
W8CAR	342	834	47	102	44	160,962
W4BCG	382	666	49	93	94	157,176
WB2JEP	333	747	44	110	55	156,123
JA7MJ	275	757	65	103	35	153,671
OH7KNM	333	781	50	126	17	150,733
IK8URC	429	950	30	96	31	149,150
JA5JWQ	293	794	58	99	30	148,478
EA3AGZ	351	819	42	97	29	137,592
KY7M	298	624	52	88	71	131,664
5U7B	329	979	34	100	0	131,186
W1AJT/VE3	244	565	52	111	59	125,430
K4DJ	244	615	54	103	40	121,155
K7CS	256	563	49	101	57	116,541
LX7I	228	571	44	100	53	112,487
F5CQ	246	630	41	82	55	112,140
UA3TCJ	334	844	32	71	29	111,408
RA3FD	297	627	42	127	7	110,352
K5SF	295	511	53	86	75	109,354
SQ5RK	234	594	43	82	54	106,326
W6OQI	306	568	48	69	70	106,216
DL3JPN	236	590	47	98	30	103,250
W8WEJ	269	522	44	75	78	102,834
W2LE	226	570	37	102	38	100,890
DL6CNG	239	572	45	102	29	100,672
IK2SND	286	653	36	90	28	100,562
W7DPW	244	474	53	68	72	91,482
TA7EB	256	759	24	90	5	90,321
AB5C	215	500	43	83	54	90,000
UV5U	252	600	40	83	19	85,200
OK2PZ	233	532	44	113	0	83,524
W5KI	212	473	46	81	48	82,775
KL7IWC	234	594	32	60	46	81,972
KH6FI	194	568	44	42	55	80,088
N3NZ	248	551	31	70	40	77,691
DL6UNF	261	552	28	90	17	74,520
LU1BJW	193	563	33	60	39	74,316
W3FQE	212	539	27	73	30	70,070
NA5Q	193	374	47	72	66	69,190
JS1OYN	196	475	45	71	23	66,025
NF6V	229	426	42	46	65	65,178
TF3AO	244	517	21	74	19	58,938
WØML	161	477	35	83	0	56,286
DJ4PI	159	414	41	72	21	55,476
KI6CK	207	386	35	44	58	52,882
JE1LFX	189	415	45	57	23	51,875
TF4M	286	627	19	63	0	51,414
K7VI	153	394	40	56	32	50,432
K8RT	157	341	33	72	35	47,740
VE9NC	148	401	24	67	24	46,115
KFØOH	163	326	31	58	51	45,640
RA3CO	143	342	44	74	3	41,382
K1JN	149	342	25	54	30	37,278
RZ3TZA	154	360	34	65	0	35,640
OK1FED	121	295	33	67	20	35,400
WG7X	141	257	33	40	52	32,125
N4CW/1	116	286	28	59	20	30,602
EA7EYQ	123	275	27	84	0	30,525
K4SV	136	372	19	47	15	30,132
JF2FIU	114	297	34	51	13	29,106
YO7BGA	143	315	26	65	1	28,980
KØFG	117	258	29	52	26	27,606
AB4EJ	123	253	21	44	30	24,035
SM1TDE	74	203	45	62	6	22,939
W6JOX	114	219	22	38	41	22,119
PA1T	105	251	20	43	25	22,088
DJ5MW	89	239	24	39	28	21,749
YL2LY	90	213	29	50	6	18,105
DL7UFN	77	209	30	33	13	15,884
PA1M	89	209	20	36	11	14,003
DL5NDX	80	198	15	33	22	13,860
WBØDUL	120	145	20	17	50	12,615
EU7SA	46	131	32	40	1	9,563
KØAD	63	113	18	25	30	8,249
UA4LL	66	133	17	41	1	7,847
RZ3DX	45	96	16	29	0	4,320
W6KNB	39	84	11	11	14	3,024
WØTY	34	76	13	13	5	2,356
JR1VAY	19	52	14	16	4	1,768
WA6OGD	23	34	9	8	15	1,088
SP2BBD	11	23	5	9	0	322

SINGLE OPERATOR ALL BAND LOW POWER

CN8KD	1810	5425	68	198	144	2,224,250
LZ9W	1468	3623	105	276	118	1,807,877
A45WD	1337	3834	95	258	34	1,483,758
W1ECT	1309	3387	72	213	116	1,358,187
UP6P	1238	3465	86	224	44	1,226,610
EU1MM	1183	2734	82	235	77	1,077,196
OK2ZC	1027	2456	87	251	98	1,070,816
LZ9R	1206	2748	83	237	68	1,066,224
4Z5CP	1250	3528	76	189	33	1,051,344
YV6BTF	902	2646	76	175	143	1,042,524
VU2WAP	1125	3169	69	202	49	1,014,080
UW5U	1160	2632	81	225	79	1,013,320
YO3APJ	999	2424	90	233	91	1,003,536
9A3ZI	1112	2637	76	209	90	988,875
WA1Z	1086	2431	72	193	137	977,262
UT2IO	1086	2455	89	247	54	957,450
GØMTN	1082	2498	73	209	95	941,746
OK2PMS	1053	2436	78	220	88	940,296
K9MUG/4	1028	2419	74	187	120	921,639
VE3XD	917	2371	73	186	115	886,754
VE9DX	904	2261	66	191	128	870,485
YV5AAX	803	2387	59	140	139	806,806
UA4FCO	1042	2286	73	232	44	797,814
F5NOD	815	2015	79	211	89	763,685
L44DX	773	2260	68	142	117	739,020
WA1EHK	807	1955	78	191	105	731,170
RK1AM	1004	2211	70	203	55	725,208
HI3TEJ	883	2226	49	141	130	712,320
YU1RH	890	2052	74	194	70	693,576
OK2RU	763	1806	77	214	80	670,026
VE3DZ	736	1886	70	174	105	658,214
KF8HR	864	1937	66	153	113	643,084
W8UL	813	1867	64	168	104	627,312
UA3SAQ	879	1943	70	210	40	621,760
RA3RHA	846	1895	68	192	49	585,555
SN8A	817	1810	73	210	37	579,200
YL2TW	733	1643	77	205	48	542,190
SY9Y	983	2159	52	165	32	537,591
N6OJ	871	1660	66	122	134	534,520
UT2UZ	614	1472	84	216	60	529,920
SP9H	709	1632	72	193	58	527,136
HB9BJJ	634	1512	68	191	76	506,520
RV3QX	713	1616	70	200	41	502,576
HL2FDW	755	1962	83	147	22	494,424
MØGTO/P	712	1736	53	149	82	493,024
EU1AZ	777	1715	59	182	44	488,775
4X6UU	636	1829	63	188	16	488,343
OK2SFP	732	1654	59	171	64	486,276
W8AH	696	1500	72	141	111	486,000
KI6DY	759	1498	60	138	126	485,352
UA9OG	683	1854	70	158	33	483,894
VA7ST	736	1711	54	99	127	479,080
OK2WH	654	1519	68	186	57	472,409
SP7AWG	687	1577	63	179	55	468,369
DL4CF	619	1430	76	183	67	466,180
W3MEL	764	1688	42	123	109	462,512
RW3LB	668	1533	65	191	44	459,900
SP8ONZ	594	1442	70	180	68	458,556
RA3ALJ	734	1638	67	182	29	455,364
F5TNI	591	1422	68	172	80	455,040
PA1CC	588	1416	67	170	72	437,544
JI1RXQ	587	1592	78	148	45	431,432
SP6GCU	633	1441	65	184	48	427,977
NA4K	624	1417	58	138	101	420,849
YB5BO	612	1811	58	138	30	409,286
W1BYH	617	1247	62	144	121	407,769
DC3HB	624	1378	57	178	56	400,998
JA1OVD	683	1789	59	115	47	395,369
RZ6LG	525	1216	67	189	53	375,744
KU5S	579	1345	65	127	82	368,530
WA1LWS	549	1175	60	153	96	363,075
LV7H	519	1526	47	99	91	361,662
EA7AJR	644	1459	48	130	62	350,160
SQ2AF	534	1254	68	175	36	349,866
UT5UML	523	1218	73	177	31	342,258
DL1ARJ	564	1258	63	170	39	342,176
KB1JZU	529	1176	53	143	93	339,864
4Z4TL	544	1572	50	139	24	334,836
KO4NX	572	1193	56	122	102	334,040
UR5FS	567	1335	58	148	44	333,750
GUØSUP	448	1120	64	165	66	330,400
UA9AX	470	1298	67	174	11	327,096
WB2RHM	514	1193	59	133	82	326,882
DM3HZN	544	1242	60	159	43	325,404
DL4JYT	560	1221	63	170	27	317,460
VE3ESH	511	1169	53	112	105	315,630
OM7RC	457	1112	64	158	52	304,688
K4SB	480	1124	55	139	76	303,480
K7RE	572	1145	49	107	106	299,990
EI4CF	457	1088	56	163	56	299,200
WD4GBW	499	1343	47	123	51	296,803
IZØEHL	480	1120	61	153	51	296,800
WD5K	520	1224	52	124	66	296,208
W6FFH	555	1056	59	104	116	294,624
NP4BM	415	1036	58	124	100	292,152
LY2BUU	539	1229	54	154	25	286,357
JA3EOP	404	1128	72	139	41	284,256
EY8MM	424	1199	57	140	37	280,566
N6WS	445	1117	61	121	67	278,133
TF3KX	475	1091	48	140	64	274,932
HG4I	414	1084	55	120	75	271,000
EA4BT	499	1170	44	122	63	267,930
UA3WHF	506	1113	58	163	19	267,120
YU8/OK1CRM	462	1078	59	136	52	266,266
WØAW	676	1642	33	88	41	266,004
DL8NBE	452	1018	56	155	42	257,554
TM6OSE	434	1053	61	142	41	256,932
VK2KM	371	1088	65	117	48	250,240
VE2FK	395	1026	43	127	73	249,318
VE3HG	388	1001	49	129	70	248,248
UAØSMF	675	1727	38	105	0	246,961
KA2D	397	1060	57	124	50	244,860
N6PC	535	913	54	87	125	242,858
VE7FO	454	989	55	76	106	234,393
PA3EBP	489	1074	48	138	31	233,058
UA4FEN	482	1035	52	171	2	232,875
OZØF	521	1132	44	137	23	230,928
UA6JD	494	1102	50	134	24	229,216
DK3WN	422	967	54	147	36	229,179
JA1BHK	400	1032	62	120	39	228,072
KO1H	413	890	52	119	81	224,280
RD4WA	478	1049	49	149	12	220,290
RA9XF	517	1456	34	117	0	219,856
PT7AZ	389	1133	46	107	41	219,802
RX9DJ	432	1169	43	129	12	215,096
IK7AFM	476	1092	42	110	44	214,032
N1HRA	440	914	42	101	91	213,876
EA3EYD	388	924	55	123	51	211,596
OK1FHI	374	873	61	141	40	211,266
KE5OG	474	880	53	90	97	211,200
CT1ELC	356	960	42	88	88	209,280
VE3IAY	354	884	44	113	77	206,856
IK2RPJ	397	944	47	123	49	206,736
YL3FP	438	964	52	149	12	205,332
N1LDY	389	919	47	124	52	204,937
SP9FT	410	938	49	132	37	204,484
SM5UFB	450	1012	39	120	43	204,424
DL1BBO	355	877	55	117	57	200,833
RA3BB	434	1014	49	114	35	200,772
DL6UHD	394	891	54	145	24	198,693
EA6LP	413	985	47	110	42	196,015
RA9AU	477	1373	34	108	0	194,966
N7DB	432	817	56	84	98	194,446
K3ZV	370	864	42	113	69	193,536
PR7ZZ	316	899	46	97	65	186,992
VA6MM	382	947	40	77	79	185,612
RX9FG	399	1144	42	117	3	185,328
N5IJE	431	756	54	84	107	185,220
AC6JT	494	790	49	65	115	180,910
HB9AWS	338	811	46	118	52	175,176
NC2N	356	701	49	110	90	174,549
VE3SHL	326	786	46	105	71	174,492
UT5EPP	480	1009	32	128	11	172,539
OG80AA	442	1012	41	110	19	172,040
OM5MX	361	808	49	126	37	171,296
RW4FE	299	705	65	162	13	169,200
RX9JM	360	964	48	116	11	168,700
JH7XGN	316	876	53	98	41	168,192
ISØHQJ	383	881	44	105	37	163,866
VK4AN	275	788	66	98	43	163,116
LZ2UZ	432	919	35	128	13	161,744
K9WX	383	700	46	95	88	160,300
MØCFV	343	822	42	105	48	160,290
RU3WR	403	863	45	139	0	158,792
RA6XE	427	916	40	117	16	158,468
BX4AF	439	1132	37	101	0	156,216
OK2BMC	332	747	54	133	18	153,135
JA2CXF	286	756	65	110	27	152,712
W8LU	299	760	51	111	37	151,240
RA3NZ	369	833	48	118	14	149,940
JM1NKT	301	779	63	97	31	148,789
RX3RZ	376	843	40	133	3	148,368
OK2PAD	343	776	43	128	18	146,664
PA5O	295	771	46	90	53	145,719
VA3PC	265	671	46	102	69	145,607
SP8FHJ	307	692	54	140	14	143,936
W4TIJ	325	653	48	102	69	143,007
KØRFD	336	641	50	87	86	142,943
DK7FP	305	742	41	89	60	140,980
EW1CQ	271	680	54	121	31	140,080
UA9FFV	376	1059	35	97	0	139,788
VA3XRZ	302	710	36	83	77	139,160
KD7GTI	339	686	46	76	78	137,200
ABØCT	241	616	60	121	40	136,136
AD4AX	354	673	43	91	68	135,946
RA6AAW	297	648	49	137	23	135,432
M5AEX	324	749	39	95	43	132,573
NT2A	271	719	42	109	28	128,701
G3LHJ	326	780	35	75	55	128,700
UA3DCW	346	814	42	104	12	128,612
EA9IB	335	1004	30	84	14	128,512
UN8PO	304	884	37	91	17	128,180
4K6DI	237	673	50	126	13	127,197
HB9TOC	261	631	46	110	43	125,569
W3OFD	277	600	45	104	58	124,200
W6ZL	284	630	56	77	64	124,110
VA3PL	249	669	43	109	33	123,765
RW3DG	317	699	41	116	20	123,723
PA3BFH	270	650	48	104	38	123,500
OK1AZK	296	705	40	103	31	122,670
ES4RD	346	784	44	98	14	122,304
JA2KCY	256	658	59	95	31	121,730
WA4PGM	281	668	38	86	57	120,908
IK8SCR	283	700	40	90	42	120,400
M1SMH	269	653	38	104	42	120,152
JH7QXJ	276	735	49	89	24	119,070
WD9GMK	324	607	44	93	59	118,972

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USA: Sponsored by Joseph Young, W6RLL. Winner: **Don Hill, AA5AU**
Oceania: Sponsored by Sid Caesar, NH7C. Winner: **R. G. Stewart, ZL2AMI**
Asia: Sponsored by Bruce Lee, KD6WW. Winner: **Masaki Okano, JH4UYB**
Europe: Sponsored by Larry Lindblom, WØETC. Winner: **Arunas Vaglys, LY2IJ**

Single Operator Low Power

World: Sponsored by Don Hill, AA5AU. Winner: **Mohamed Kharbouche, CN8KD**
N. A.: Sponsored by Joseph Young, W6RLL. Winner: **Michael McAmis, W1ECT**
USA: Sponsored by Larry Lindblom, WØETC. Winner: **Bob Raymond, WA1Z**
S.A.: Sponsored by Trey Garlough, N5KO. Winner: **Jose V. Pinto A., YV6BTF**
Canada: Sponsored by Scott Nichols, VE1OP. Winner: **Don Cassel, VE3XD**
Europe: George Johnson, W1ZT. Winner: **Andrey Sachkov, L29W (Op: LZ2HM)**

Single Operator Assisted

World: Sponsored by Bryan Preas, AC6JT. Winner: **Rick Davenport, KI1G**
S.A.: Sponsored by Joe Wittmer, K9SZ. Winner: **Wanderley Ferreira Gomes, ZX2B (Op: PY2MNL)**

Single Operator 21 MHz

World: Sponsored by Charles Anderson, KK5OQ. Winner: **Steve Hodgson, ZC4LI**

Single Operator 14 MHz

World: Sponsored by Doug Faunt, N6TQS. Winner: **Noel Poulin, VE2RYY**

Single Operator 7 MHz

World: Sponsored by *CQ* Magazine. Winner: **Roberto Paganelli, IY4W (IK4MHB)**
N.A.: Sponsored by Frank McGonigal, W6DSQ. Winner: **Glenn R. Wyant, VA3DX**

Single Operator 3.5 MHz

World: Sponsored by Neal Campbell, K3NC. Winner: **Tone Crv, S54E**
N.A.: Sponsored by Wayne King, N2WK. Winner: **Dennis Egan, NB1B**

Multi-Op Single Transmitter, High Power

World: Sponsored by David Robbins. Winner: **UU7J (Ops: UUØJM, UU4JMG, UR5FEL, UR5FEO, UR5FUS, UR5MAF, UT5UGR, UT5UGW, UT8NA, UT9FJ)**
USA: Sponsored by John Lockhart, WØDC. Winner: **N9TK (Ops: N9TK, WB9Z)**

Multi-Op Single Transmitter, Low Power

World: Sponsored by Ron Hall, KP2N. Winner: **HG1S (Ops: HA1TJ, HA1DAI, HA1DAC, HA3UU, HA1AR, HA1AV, HA1SN, HA1AH, HA1SD, HA1DAE)**
N.A.: Sponsored by Glenn Vinson, W6OTC. Winner: **K1TTT (Ops: K1MK, K1TTT, N1XS, WØBR, W1TO, WM1K)**

Multi-Op Two Transmitter

World: Sponsored by CQ Magazine. Winner: **HC8N (Ops**: **W6OTC, K6AW, N6ZZ)**
N.A.: Sponsored by Neal Campbell, K3NC. Winner: **KM4M (Ops: K4JA, AJ3M, K4GMH, K7SV, K9JY, W1ZT, W3BP)**
Oceania: Sponsored by Steve Merchant, K6AW. Winner: **KH7X (Ops: KH7U, AH7R, AH6OZ, KH6ND)**

Multi-Op Multi-Transmitter

World: Sponsored by KA4RRU—Woodbridge Wireless. Winner: **Z37M (Ops: Z31GX, Z31MM, Z32ID, Z32PT, Z32XA, Z33F, Z33GOK, Z33ZOD, Z36W)**

FR1HZ	**245**	**730**	**52**	**92**	**16**	**116,800**
WB3LGC	256	567	43	96	65	115,668
9A2DI	229	583	49	112	37	115,434
SV1XV	**226**	**547**	**54**	**124**	**31**	**114,323**
UAØFAI	299	757	44	86	21	114,307
7N2UQC	296	761	44	89	17	114,150
UR4CU	414	856	26	105	2	113,848
KJ7NO	297	518	50	73	96	113,442
UAØLKD	327	740	59	81	13	113,220
IKØXBX	246	577	51	115	30	113,092
AH6HH	**246**	**723**	**41**	**46**	**69**	**112,788**
LA5TFA	**342**	**751**	**43**	**102**	**5**	**112,650**
VE3RZ	252	592	43	88	59	112,480
N2KX	244	584	44	101	47	112,128
VK3DBQ	**252**	**723**	**48**	**85**	**22**	**112,065**
SM7BJW	258	669	37	79	50	111,054
OH9GIT	326	707	34	103	19	110,292
DL9NDV	252	606	44	100	38	110,292
OM4W	356	764	36	102	6	110,016
LY2FN	271	625	49	102	25	110,000
UA1OAM	363	772	32	110	0	109,624
UR5SEH	286	630	43	119	11	108,990
SP9CV	248	616	44	94	38	108,416
F6FTB	227	590	48	91	44	107,970
RN1AO	290	652	45	93	27	107,580
SP7TEX	304	666	37	106	18	107,226
W7VXS	334	597	37	60	82	106,863
SP3DSC	304	660	42	118	0	105,600
DL8ZAJ	249	586	45	101	34	105,480
YU7NW	248	667	34	66	57	104,719
UA9CR	247	678	43	104	7	104,412
UK/JI2MED	**304**	**835**	**38**	**86**	**8**	**103,540**
VE9IQ	250	626	34	69	62	103,290
DK3WJ	240	571	44	102	32	101,638
NI5F	228	505	55	93	49	101,061
YU1LM	256	593	41	102	27	100,810
HB9DWL	256	635	46	87	25	100,330
KØCIE	312	528	43	65	82	100,320
SM5YMT	277	611	44	113	6	99,593
K6OWL	285	541	50	57	76	99,003
G7TMU	290	655	34	94	23	98,905
SP3HC	233	548	42	105	28	95,900
CT2IUA	238	563	36	86	48	95,710
VE4YU	233	587	39	69	54	95,094
JA3HBF	**209**	**555**	**54**	**104**	**10**	**93,240**
W7TMT	248	543	45	63	62	92,310
DG1RKP	252	595	40	91	24	92,225
HB9HQX	291	627	33	112	2	92,169
KSØM	219	501	44	94	44	91,182
N4NX	211	459	57	92	49	90,882
ON6OM	**257**	**592**	**35**	**89**	**28**	**89,984**
SP4CJA	309	674	35	98	0	89,642
UAØFDX	251	614	53	76	16	89,030
IIØMOM	185	492	50	89	41	88,560
UA9WIK	242	680	29	100	1	88,400
ZL3JT	**232**	**665**	**48**	**84**	**8**	**87,780**
OZ6TL	237	537	39	102	20	86,457
KD6LU	272	475	49	58	74	85,975
KA5EYH	296	491	39	52	81	84,452
EA2BNU	190	481	45	79	46	81,770
DU7/ G4DUM	**223**	**657**	**40**	**79**	**2**	**79,497**
SP4KEV	274	575	32	105	0	78,775
UX5UO	204	461	48	110	12	78,370
IK3ASM	189	457	49	107	15	78,147
SM6WET	205	506	41	79	33	77,724
JA5ATN	**200**	**549**	**44**	**83**	**14**	**77,409**
DL2IAN	190	487	41	76	39	75,972
JH3CUL	196	470	61	85	14	75,200
DL6RBH	203	500	41	76	33	75,000
KH6GMP	224	653	23	23	68	74,442
VE7UQ	212	503	36	45	66	73,941
9A4PG	257	554	29	84	19	73,128
RK6MY	246	521	31	104	5	72,940
UA9OV	225	627	29	86	1	72,732
JH1EEB	190	537	38	65	31	71,958
YL2KF	237	512	36	100	4	71,680
N1EO	228	420	33	66	69	70,560
PAØLSK	250	538	29	91	10	69,940
RX4HX	200	450	36	110	4	67,500
DJ9ER	188	459	34	90	21	66,555
VE6RRD	226	502	24	48	60	66,264
F5RD	203	466	39	83	19	65,706
RA9UN	232	579	35	78	0	65,427
RN4AAK	216	474	37	90	10	64,938
GW4MVA	**198**	**462**	**36**	**82**	**22**	**64,680**
PAØWRS	159	417	42	73	40	64,635
SP2MKZ	180	441	40	90	15	63,945
K7VIT	215	395	45	50	66	63,595
RA3FH	205	478	37	96	0	63,574
DU1UGZ	205	609	36	56	12	63,336
JA8EIU	**214**	**501**	**45**	**76**	**3**	**62,124**
VE3UKR	191	469	31	70	29	60,970
N4LF	191	393	31	70	54	60,915
SM2M	165	381	39	94	26	60,579
IK2WYI	176	437	35	69	33	59,869
RA9KM	180	502	32	76	11	59,738
XE2AUB	**175**	**414**	**41**	**43**	**59**	**59,202**
PY2BRZ	184	505	37	80	0	59,085
K4JAF	149	418	40	89	12	58,938
IKØMIB	157	400	44	78	25	58,800
K9EMG	144	400	42	90	11	57,200
LW5DR	142	393	46	70	27	56,199
IK2WFN	180	438	35	66	27	56,064
WA2LUY	180	439	29	67	29	54,875
SV1EML	160	371	38	85	24	54,537
UA6AGK	151	366	35	103	11	54,534
UA4CC	165	392	42	84	13	54,488
SP9IHP	138	373	36	70	40	54,458
AE4Y	190	343	41	59	57	53,851
DL1KUR	155	418	33	56	39	53,504
DK3WI	194	427	34	81	9	52,948
RW6AH	207	454	30	84	2	52,664
DL5ARM	222	450	23	88	5	52,200
DS5DNO	200	490	42	59	5	51,940
3Z8Z	139	357	50	81	14	51,765
N5UWY/9	198	346	35	60	54	51,554
NØOBM	208	331	35	51	68	50,974
IZ4DZD	166	402	43	69	14	50,652
OH7JJT	168	385	35	85	11	50,435
K6BIR	185	339	39	45	63	49,833
YC3MM	188	559	24	65	0	49,751
HL2/JH1FXF	200	464	40	58	9	49,648
N9SV	195	384	30	58	41	49,536
JA9LX	**157**	**416**	**44**	**64**	**11**	**49,504**
W2QQ	166	305	38	66	58	49,410
UA6XIS	166	368	34	91	9	49,312
VK2IMM	151	427	43	61	11	49,105
IK2YSJ	183	397	34	89	0	48,831
SP6BBE	216	453	21	77	9	48,471
JA5ENO	140	398	33	68	19	47,760
G4B	195	420	28	73	10	46,620
SQ9AOR	156	404	28	55	31	46,056
JA2OVP	130	357	42	63	23	45,696
WB8IMY/1	158	319	35	64	44	45,617
HB9DBK	154	364	36	71	18	45,500
RU6YY	175	363	34	91	0	45,375
VE7HBS	194	400	28	24	60	44,800
UA1OMS	154	363	36	80	7	44,649
SP6EIY	133	339	46	74	11	44,409
KØRY	159	348	34	61	32	44,196
F6CZV	165	371	25	68	24	43,407
IKØWRB	146	335	35	80	11	42,210
KC8GCR	159	331	30	57	39	41,706
N8PUG	182	295	33	48	60	41,595
OH2LZI	173	398	26	69	9	41,392
KC5LK	123	362	38	76	0	41,268
WB9BSH	153	299	35	57	46	41,262
ES1RF	137	318	33	78	18	41,022
EA5ETP	155	357	25	71	18	40,698
K7JJ	164	281	35	45	64	40,464
YI9GT	**159**	**461**	**18**	**68**	**1**	**40,107**
DL9ST	135	331	34	65	22	40,051
DL1EFD	142	307	35	74	21	39,910
KØCF	146	278	36	53	54	39,754
N3JIX	121	301	33	70	28	39,431
RU9AZ/9	151	410	28	68	0	39,360
VA7CAB	159	343	25	35	52	38,416
N1WI	153	284	38	50	47	38,340
WA4OSD	165	299	29	50	48	37,973
DL6UAM	184	370	20	77	4	37,370
JH1ECF	151	418	22	61	6	37,202
AA8EN	148	274	33	49	51	36,442
EA5ME	126	323	30	50	32	36,176
ON7CFZ	143	341	24	52	28	35,464
AA5VU	134	262	37	52	46	35,370
N9LYE	173	260	31	41	61	34,580
KC4SAW	135	293	26	57	34	34,281
K4AQ	190	261	28	33	70	34,191
I2ORX	133	334	26	54	22	34,068
SQ6FHP	179	356	21	74	0	33,820
TA1EE	**220**	**471**	**19**	**51**	**1**	**33,441**
SP3BGD	106	312	31	30	45	33,072
IQ2SG	139	312	26	63	17	33,072
GW3YVC	148	327	23	62	15	32,700
DG5GTI	135	298	25	76	8	32,482
OK2SWD	168	371	21	55	11	32,277
AAØCY/3	129	295	24	59	26	32,155
SMØEPO	142	318	25	65	10	31,800
AB8ND	124	274	30	59	27	31,784
OE1KTS	**145**	**364**	**20**	**46**	**20**	**31,384**
OZ5AGJ	177	376	23	58	2	31,208
YO5BYV	164	348	20	59	9	30,624
N9LF	142	247	31	47	44	30,134
NØIBT	145	246	34	40	47	29,766
N7ON	144	217	35	36	65	29,512
YO3FOM	102	280	37	51	16	29,120
IZ7EUB	96	259	36	58	18	29,008
VR2XLN	**108**	**290**	**35**	**63**	**2**	**29,000**
WBØBLV	165	277	23	42	39	28,808
OM3TLE	147	323	22	66	1	28,747
JF1QJD	118	271	45	49	12	28,726
JA4XHF/3	98	271	35	62	8	28,455
I1/K7GQ	126	286	27	65	7	28,314
JF2IGP	121	324	30	45	12	28,188
UT4HZ	117	261	31	72	4	27,927
SP6DNZ	108	278	30	57	13	27,800
DL8HCO	120	282	27	60	11	27,636
K8GVK	98	284	30	62	5	27,548
W7AFR	134	237	30	37	48	27,255
OE3GAS	126	301	25	51	14	27,090
SP6NVK	125	280	28	58	9	26,600
JA1IZ	94	271	31	45	20	26,016
DL1YFF	120	267	33	61	2	25,632
SM4RLD	132	280	22	60	9	25,480
WN3C	88	243	27	65	10	24,786
K8RJW	111	263	23	49	22	24,722
AE9F	106	275	33	40	16	24,475
JO3AGQ	109	285	30	41	14	24,225
VE7WU	85	215	38	43	31	24,080
SP6BSL	98	255	29	48	17	23,970
RV4LS	93	238	31	69	0	23,800
K1XS	97	230	28	50	24	23,460
ON4CIN	110	248	22	56	16	23,312
K5NZ	115	199	31	42	44	23,283
KV4CN	93	199	32	48	34	22,686
IK5WQO	95	208	27	76	5	22,464
KE6QR	125	220	22	40	39	22,220
W4ROT	97	198	33	46	31	21,780
K6MI	97	191	39	42	33	21,774
AD6G	113	211	26	40	37	21,733
4Z5PM	99	285	20	50	4	21,090
SP3JIA	100	260	28	42	11	21,060
M3DXL	98	226	22	56	15	21,018
SM6AOU	82	205	34	67	1	20,910
SP3DOF	115	278	24	50	1	20,850
OE3CJB	121	262	19	58	0	20,174
VE2FFE	87	223	20	46	24	20,070
AE4EC	99	210	25	42	28	19,950
JA1XPU	98	223	35	39	13	19,401
DL3BBY	95	210	23	56	11	18,900
OK2BWK	102	248	21	35	20	18,848
SM6CRM	103	240	22	56	0	18,720
W3BUI	100	182	26	37	37	18,200
SQ9ANS	87	199	24	53	12	17,711
NØICV	99	175	20	35	45	17,500
7N4XCA	95	196	38	44	7	17,444
LY3BY	100	214	20	55	6	17,334
EA5EM	159	327	12	40	0	17,004
7L3IUE	83	215	27	38	8	15,695
K2MK	72	213	20	52	0	15,336
IK3CST	97	216	21	43	7	15,336
PA3HGF	82	183	23	48	10	14,823
N5VYS	119	182	19	21	41	14,742
JA8UON	74	201	23	43	5	14,271
WYØV	67	182	27	41	7	13,650
ISØBRQ	87	197	18	38	13	13,593
DL1JB	81	183	21	44	6	12,993
UA3ZU	93	198	15	49	0	12,672
KE1F	77	149	21	32	31	12,516
K7KAR	99	135	20	18	54	12,420
DS5KJR	95	208	28	30	1	12,272
K5PSB	66	193	18	45	0	12,159
UA9DD	69	187	19	44	0	11,781
DL5JWL	87	188	15	40	5	11,280
WA4FXX	60	162	26	36	7	11,178
DK2PC	66	159	17	38	12	10,653
IK2NCF	65	153	20	36	13	10,557
WB4YDY	56	166	25	37	0	10,292
PY2IQ	72	176	19	37	0	9,856
IK3WUB	62	160	19	30	12	9,760
VA7IRL	69	137	18	16	33	9,179
RX3AA	59	135	16	40	6	8,370
N9CI	71	121	19	26	22	8,107
K9QH	71	116	14	21	31	7,656
PAØFAW	60	134	13	35	7	7,370
OE1TKW	50	112	20	43	2	7,280
IZ5DKJ	42	115	24	31	8	7,245
NEØP	51	113	20	25	15	6,780
EA5TS	52	120	19	34	3	6,720
W2NRA	50	115	18	29	11	6,670
G3VCP	58	129	15	29	7	6,579
EA4AWM	59	121	13	39	1	6,413
RW4LQ	41	104	23	38	0	6,344
WA4GLH	51	81	24	20	29	5,913
DJ9RR	51	118	16	28	4	5,664
SM6AHU	45	102	16	25	8	4,998
OZ9AG	40	100	13	21	11	4,500
RUØLL	38	107	14	27	1	4,494
ON7BS	42	98	12	27	6	4,410
SP9UOJ	59	119	8	28	1	4,403
W6ZZZ	52	73	13	10	33	4,088
KØXU	48	76	14	16	23	4,028
EA4BNQ	37	88	13	26	6	3,960
SP9SOU	31	76	19	30	1	3,800
WN1X	39	76	11	17	18	3,496
N2ALE/5	45	59	13	11	32	3,304
G4EMT	32	79	12	19	10	3,239
CT1EGW	30	70	14	28	0	2,940
NC6P	32	65	15	16	13	2,860
W4GTM	25	73	14	22	0	2,628
F5CWU	29	75	10	15	10	2,625
SP8QED	28	67	15	18	6	2,613
JR3NDM	27	65	16	20	1	2,405
WØPSS	33	50	14	12	18	2,200
KA9WKA	23	56	15	19	5	2,184
N9YLE	35	46	14	10	23	2,162
AD7BN	25	63	13	12	6	1,953
UAØCW	21	58	13	20	0	1,914
VE3FAL	25	59	10	10	9	1,711
JA1GSO	19	54	11	12	0	1,242
Z36A	16	35	13	16	2	1,085
WØBR	18	33	8	10	8	858
WA6NOL	12	26	9	9	4	572
RW4NN	11	29	8	11	0	551
UA4FX	8	17	3	8	0	187
DF1GW	6	10	2	6	0	80

SINGLE OPERATOR 80 METERS

S54E	**574**	**1260**	**18**	**63**	**28**	**137,340**
NB1B	**518**	**1027**	**18**	**52**	**49**	**122,213**
9A7R	**566**	**1229**	**15**	**58**	**24**	**119,213**
HA8BE	**429**	**884**	**14**	**55**	**10**	**69,836**
OK1VSL	**460**	**926**	**12**	**54**	**9**	**69,450**
OH7CX	**386**	**819**	**17**	**60**	**7**	**68,796**
W4PK	**323**	**618**	**14**	**41**	**44**	**61,182**
LX8M	**401**	**821**	**9**	**50**	**6**	**53,365**
SP6IHE	**343**	**684**	**14**	**52**	**10**	**51,984**
G3LDI	**324**	**663**	**11**	**52**	**12**	**49,725**
SQ9UM	377	739	10	52	3	48,035
OK2KCE	389	766	9	46	7	47,492
SP1DTG	346	688	8	47	5	41,280
OK1TNM	384	754	6	44	0	37,700
OM1AVK	**293**	**591**	**7**	**42**	**3**	**30,732**
UR5WCQ	**270**	**542**	**9**	**44**	**1**	**29,268**
WB4YDL	**177**	**239**	**12**	**21**	**44**	**18,403**
RZ3AIR	**188**	**353**	**8**	**40**	**1**	**17,297**
IK1RQT	**149**	**309**	**8**	**39**	**3**	**15,450**
SP9UOP	157	316	6	38	0	13,904
LA2IJ	**151**	**304**	**8**	**36**	**1**	**13,680**

TOP SCORES

Single Op High Power

P3F (Op: 5B4AGN)	3,316,924	RD3A (Op: RD3AF)	2,251,344
LY2IJ	3,038,992	JH4UYB	2,195,640
RK4FF	2,743,048		

Single Op Low Power

CN8KD	2,224,250	W1ECT	1,358,187
LZ9W (Op: LZ2HM)	1,807,877	UP6P (Op: UN6P)	1,226,610
A45WD (Op: YO9HP)	1,483,758		

Single Op Assisted

KI1G	3,763,700	HA8IE	1,983,790
ZX2B (Op: PY2MNL)	3,665,803	II1DCI (Op: IK1GPG)	1,975,050
EO3Q	1,990,378		

Multi-Op Single Transmitter High Power

UU7J	3,708,163	LN8W	2,635,167
RL3A	3,055,032	IT9LGV	2,063,053
RY9C	2,975,362		

Multi-Op Single Transmitter Low Power

HG1S	3,362,333	UZ4E	1,573,539
K1TTT	2,459,041	HBØ/DJ5BX	1,521,195
KP2D	1,869,600		

Multi-Op Two Transmitter

HC8N	8,792,022	PI4CC	3,726,276
KM4M	5,402,160	DAØBCC	2,823,648
KH7X	4,822,532		

Multi-Op Multi-Transmitter

Z37M	3,872,168	JE1ZWT	2,499,376
RKØAXX	3,252,480	OM3RJB	553,539
KA4RRU	2,876,936		

Single Op 3.5 MHz

S54E	137,340	HA8BE	69,836
NB1B	122,213	OK1VSL	69,450
9A7R	119,219		

7.0 MHz

IY4W (Op: IK4MHB)	392,000	OH2BP	203,190
HA1WD/5	303,335	OL9R (Op: OK1WMV)	199,780
OL1RY (Op: OK1DF)	287,826		

14 MHz

VE2RYY	590,772	OM2VL	489,924
9A2DQ	544,452	LY3BH	474,204
MIØLLL	508,604		

21 MHz

ZC4LI	591,528	EO6F (Op: UXØFF)	423,980
9A5W	551,592	IV3SKB	333,904
LPØH (LU7HN)	489,955		

28 MHz

HC1JQ	34,000	UR5FGW	8,505
PR7FN	16,640	4Z8EE	8,140
JA6WJL	9,072		

UR5SKB	131	253	6	30	0	9,108
VK6HD	49	143	13	25	8	6,578
JA2ZJW	94	168	16	17	6	6,552
SQ2BXI	59	117	6	27	3	4,212
SV1FJN	63	124	5	27	1	4,092
WA3AAN	56	69	6	6	24	2,484
JE2OTM	59	80	9	8	2	1,520
EC1CTV	28	57	5	15	1	1,197

SINGLE OPERATOR 40 METERS

IY4W	**1029**	**2450**	**30**	**84**	**46**	**392,000**
HA1WD/5	**842**	**1957**	**32**	**81**	**42**	**303,335**
OL1RY	**863**	**1958**	**28**	**77**	**42**	**287,826**
OH2BP	**701**	**1563**	**27**	**76**	**27**	**203,190**
OL9R	579	1427	26	69	45	199,780
A61AR	**572**	**1619**	**28**	**77**	**18**	**199,137**
VA3DX	**535**	**1347**	**23**	**66**	**48**	**184,539**
CT3EN	**458**	**1367**	**22**	**65**	**42**	**176,343**
ON4QX	**595**	**1324**	**21**	**66**	**27**	**150,936**
ZX7A	**414**	**1227**	**22**	**63**	**38**	**150,921**
T94DO	**565**	**1236**	**20**	**64**	**26**	**135,960**
DL3LE	**415**	**913**	**20**	**62**	**26**	**98,604**
WØGJ	**383**	**727**	**27**	**61**	**47**	**98,145**
DF3GY	352	831	21	66	30	97,227
LU1NDC	**291**	**838**	**23**	**51**	**34**	**90,504**
LR4E	284	824	22	55	29	87,344
GØDEZ	**397**	**854**	**18**	**57**	**19**	**80,276**
UW2F	**395**	**835**	**17**	**59**	**12**	**73,480**
SP5DXJ	**368**	**787**	**20**	**61**	**9**	**70,830**
RK5BZ	**328**	**674**	**23**	**63**	**6**	**62,808**
US0MM	286	617	21	59	13	57,381
SV1CER	**296**	**633**	**16**	**49**	**10**	**47,475**
OH5VG	298	633	15	54	5	46,842
UT2II	271	593	16	53	9	46,254
OK1FAV	277	576	17	54	9	46,080
DK3RA	295	581	18	54	6	45,318
UA3RF	251	526	20	56	6	43,132
WD4DDU	**204**	**445**	**17**	**46**	**31**	**41,830**
UU4J	263	563	14	52	8	41,662
UT8EL	297	604	13	52	2	40,468
VK6DXI	**151**	**432**	**21**	**48**	**16**	**36,720**
DJ2YE	204	414	15	47	8	28,980
US0HZ	235	490	11	46	0	27,930
KØHW	**248**	**336**	**17**	**21**	**43**	**27,216**
IK1SPR	**146**	**331**	**18**	**49**	**13**	**26,480**
EA4WC	**156**	**341**	**15**	**50**	**10**	**25,916**
ON4MGY	151	328	15	49	13	25,256
UX6F	199	407	12	45	4	24,827
OK1AXB	166	361	16	45	6	24,187
OK2SPD	179	362	10	43	3	20,272
HB9DWU	**117**	**265**	**16**	**45**	**11**	**19,080**
RU3VD	147	312	12	47	2	19,032
JH1APZ	**113**	**306**	**19**	**34**	**9**	**18,972**
SM3JUR	**151**	**313**	**11**	**41**	**8**	**16,276**
RWØLZ	**156**	**340**	**18**	**25**	**2**	**15,300**
PR7AR	83	239	12	28	14	12,906
HAØGK	92	203	12	40	4	11,368
DF8XC	90	188	11	38	4	9,964
OM7PY	97	206	11	34	3	9,888
UX3MR	95	206	11	31	5	9,682
K2PS	66	146	14	26	20	8,760
IK3SSJ	61	132	10	30	2	5,544
W6FRH	55	108	15	17	18	5,400
EA4DEI	55	115	8	25	4	4,255
ON4TO	50	108	8	24	0	3,456
VE3RCN	38	79	7	8	15	2,370
DL3EBX	35	71	6	22	0	1,988
ES4MF	38	78	5	20	0	1,950

Looking Ahead in CQ

Here's a look at articles we're working on for upcoming issues of *CQ:*

- Our third new "Waking Up DXing" program
- More reader feedback on Long-Delayed Echoes
- Research Opportunities for Hams, by W4MB
- Rules, 2005 CQ WW VHF Contest

Do you have a ham radio story to tell? See our writers' guidelines on the CQ website at <http://www.cq-amateur-radio.com/guide.html>.

YB2DGR	10	27	6	7	0	351
HC1JP	4	12	1	1	0	24

SINGLE OPERATOR 20 METERS

VE2RYY	**1184**	**3246**	**38**	**97**	**47**	**590,772**
9A2DQ	**1243**	**3076**	**34**	**92**	**51**	**544,452**
MIØLLL	**1198**	**2957**	**35**	**88**	**49**	**508,604**
OM2VL	1034	2634	35	100	51	489,924
LY3BH	**1077**	**2757**	**33**	**89**	**50**	**474,204**
LX5A	**1094**	**2806**	**32**	**88**	**48**	**471,408**
VA7XX	**1004**	**2675**	**29**	**85**	**49**	**436,025**
UA9CLB	**977**	**2781**	**30**	**83**	**42**	**431,055**
EU1DX	**1002**	**2490**	**31**	**92**	**49**	**428,280**
S51DX	**955**	**2408**	**33**	**85**	**50**	**404,544**
LV5V	**762**	**2236**	**33**	**80**	**46**	**355,524**
WBETC	**888**	**2040**	**34**	**82**	**49**	**336,600**
VK1AA/4	**678**	**2006**	**35**	**89**	**42**	**332,996**
UZ7U	**846**	**2053**	**31**	**82**	**47**	**328,480**
NL7G	**777**	**2109**	**29**	**76**	**46**	**318,459**
OK1VWK	**745**	**1947**	**32**	**83**	**48**	**317,361**
IT9STX	**875**	**2109**	**23**	**62**	**49**	**282,606**
CX4AAJ	**592**	**1745**	**28**	**71**	**47**	**254,770**
OH7MN	**724**	**1688**	**29**	**80**	**41**	**253,200**
CX7BY	553	1635	29	72	48	243,615
W6WRT	**732**	**1548**	**31**	**75**	**48**	**238,392**
YO6BHN	**609**	**1454**	**32**	**82**	**43**	**228,278**
UXØIK	671	1554	30	85	29	223,776
W7WW	**684**	**1370**	**26**	**67**	**50**	**195,910**
UT7FP	647	1451	22	68	39	187,179
K4WW	**534**	**1331**	**26**	**72**	**38**	**181,016**
UN7GCE	**518**	**1448**	**27**	**74**	**24**	**181,000**
S51U	485	1183	27	75	39	166,803
RA6DB	**552**	**1268**	**30**	**74**	**27**	**166,108**
PY2NY	**446**	**1315**	**26**	**49**	**46**	**159,115**
SV1CIB	**521**	**1153**	**26**	**74**	**28**	**147,584**
US4LPY	512	1149	26	75	25	144,774
4L1DA	**483**	**1285**	**21**	**65**	**19**	**134,925**
MWØCRI	**531**	**1183**	**23**	**63**	**28**	**134,862**
F6FJE	**431**	**1040**	**26**	**62**	**41**	**134,160**
SU8HI	**551**	**1653**	**15**	**57**	**9**	**133,893**
K9JS	**438**	**1008**	**25**	**67**	**40**	**133,056**
IKØBAL	**413**	**972**	**26**	**69**	**38**	**129,276**
EA1BD	**443**	**1063**	**22**	**56**	**42**	**127,560**
UX2HR	527	1162	24	73	12	126,658
EA5FIV	362	874	31	70	37	120,612
LZ2JA	**456**	**1009**	**27**	**68**	**24**	**120,071**
UN7JX	352	965	25	69	17	107,115
4N1JA	**418**	**933**	**25**	**63**	**16**	**97,032**
ON4CHT	**313**	**765**	**26**	**65**	**34**	**95,625**
UAØQBR	**310**	**789**	**25**	**70**	**19**	**89,946**
JA8RAT	**287**	**781**	**26**	**69**	**18**	**88,253**
PT2BW	252	728	23	51	42	84,448
RA3SI	391	854	21	64	12	82,838
RUØAT	300	840	20	51	27	82,320
ON4APU	298	700	24	60	33	81,900
DH8WR	**288**	**681**	**22**	**60**	**31**	**76,953**
IT9BLB	353	804	19	58	18	76,380
UR8QR	309	706	25	69	12	74,836
WA1FCN	292	603	22	61	36	71,757
TF3RB	**347**	**787**	**17**	**58**	**24**	**71,617**
UT2AU	320	725	23	66	6	68,875
RU4SS	324	712	23	71	0	66,928
DJ2XC	252	596	22	57	25	61,984
IT9LGW	296	645	14	48	22	54,180
JH3SIF	**198**	**538**	**27**	**56**	**17**	**53,000**
RD3AY	245	540	22	59	16	52,380
RW3AI	267	579	18	56	15	51,531
I4DOO	215	501	21	56	18	47,595
JH2NWP	**172**	**486**	**25**	**55**	**17**	**47,142**
F5DEM	210	485	18	48	31	47,045
CT4DX	**245**	**531**	**17**	**56**	**13**	**45,666**
7Z1SJ	**208**	**603**	**14**	**48**	**2**	**38,592**
RV3LQ	214	465	19	55	6	37,200
RK2FXG	**190**	**431**	**19**	**52**	**13**	**36,204**
ER3GS	**201**	**452**	**16**	**49**	**9**	**33,448**
FO5PS	**148**	**425**	**19**	**23**	**29**	**30,175**
HS0EHF	**154**	**412**	**18**	**51**	**2**	**29,252**
CT1AOZ	115	276	18	55	23	26,496
TA1DX	**197**	**426**	**12**	**46**	**0**	**24,708**
OH3LQK	147	321	14	41	10	20,865
RAØAM	116	314	13	22	30	20,410
VE7KET	**103**	**297**	**17**	**44**	**6**	**19,899**
N3ND	**115**	**249**	**16**	**39**	**20**	**18,675**
UT5JAB	131	301	14	45	2	18,361
URØIDX	100	241	19	47	6	17,352
YO4CVV	119	266	13	48	1	16,492
W1LZ	94	258	13	41	9	16,254
N5PA	90	214	17	39	18	15,836
RX9LW	110	289	15	36	0	14,739
YB1TYG	**111**	**331**	**10**	**34**	**0**	**14,564**
SP5XOV	107	244	15	42	0	13,908
HA1AG	80	193	19	32	18	13,317
HA1AG	80	193	19	32	18	13,317
IK2AHB	90	221	14	29	17	13,260
UT5KO	129	290	12	29	2	12,470
DL9NEI	72	212	7	6	31	9,328
OZ4SK	82	186	14	27	8	9,114
SV9/G3URA	82	183	11	29	0	7,320
RA6YDX	69	149	13	34	0	7,003
DH2PL	69	152	9	27	7	6,536
SM4XIH	44	119	8	18	17	5,117
UR5WDQ	53	117	10	29	1	4,680
OZ9GA	61	135	9	18	6	4,455
ZL1BT	34	93	13	25	0	3,534
K4YL	35	58	8	8	12	1,624
OZ1DGQ	32	67	7	16	0	1,541
DL2DBS	25	55	7	14	2	1,265
AI9X	24	40	6	9	10	1,000
EW7EW	20	46	7	9	0	736
DJ6AR	12	35	6	6	5	595
KP4JRS	13	27	5	4	9	486

SINGLE OPERATOR 15 METERS

ZC4LI	**1429**	**4024**	**28**	**81**	**38**	**591,528**
9A5W	**1100**	**2934**	**35**	**102**	**51**	**551,592**
LPØH	**1066**	**3161**	**27**	**79**	**49**	**489,955**
EO6F	**982**	**2494**	**34**	**93**	**43**	**423,980**
IV3SKB	**751**	**2036**	**31**	**85**	**48**	**333,904**
JA6WFM/ HI8	**862**	**2456**	**20**	**56**	**50**	**309,456**
PJ4/W9ILY	**775**	**2309**	**22**	**60**	**51**	**307,097**
K4EA	**711**	**1897**	**31**	**85**	**28**	**273,168**
SP4TXI	**593**	**1579**	**32**	**91**	**42**	**260,535**
UV8M	**699**	**1679**	**29**	**85**	**34**	**248,492**
F5MOO	**617**	**1624**	**31**	**79**	**42**	**246,848**
S53S	**612**	**1651**	**31**	**72**	**41**	**237,744**
YBØAJR	**635**	**1885**	**30**	**79**	**13**	**229,970**
DL1LH	**536**	**1435**	**31**	**78**	**44**	**219,555**
YO3JF	**547**	**1376**	**28**	**76**	**35**	**191,264**
EA4DEC	**617**	**1521**	**24**	**63**	**38**	**190,125**
AB8K	**569**	**1488**	**26**	**76**	**25**	**188,976**
UA4LCQ/9	**505**	**1424**	**28**	**83**	**10**	**172,304**
ON4ADZ	**422**	**1136**	**27**	**66**	**42**	**153,360**
EA8RCT	**464**	**1391**	**18**	**54**	**37**	**151,619**
JE1GMM	**402**	**1113**	**28**	**74**	**32**	**149,142**
SS7UYX	406	1086	26	60	43	140,094
PY2SRB	**377**	**1100**	**23**	**57**	**45**	**137,500**
EO1I	398	1002	29	73	29	131,262
OK2CLW	**348**	**945**	**30**	**70**	**34**	**126,630**
RA9SC	486	1363	21	63	2	117,218
JR1NHD	362	998	26	64	23	112,774
OK1TRM	326	903	25	52	39	104,748
YC2ECG	**403**	**1192**	**23**	**61**	**0**	**100,128**
DH5HV	265	717	29	59	39	91,059
JR3RIY	**315**	**881**	**25**	**60**	**18**	**90,743**
RU2FL	**256**	**686**	**27**	**70**	**29**	**86,436**
4L1BR	**392**	**1108**	**15**	**51**	**10**	**84,208**
F6KZC	270	708	23	54	33	77,880
HAØHV	243	665	26	62	28	77,140
DL1DTL	238	628	27	65	29	75,988
YO2RR	262	699	24	58	26	75,492
K7WM	**273**	**682**	**24**	**46**	**34**	**62,608**
ES4MM	**217**	**555**	**27**	**59**	**26**	**62,160**
OH3TY	**192**	**508**	**27**	**63**	**26**	**58,928**
DJ6TK	206	538	23	54	26	55,414
JL3SBE	211	593	24	50	14	52,184
JM1GHT	191	546	23	55	14	50,232
RN9XA	196	560	22	50	11	46,480
DL2FAG	163	427	21	47	22	38,430
SS7NRO	191	472	22	58	0	37,760
SP5GDY	151	401	24	49	16	35,689
S51J	170	445	20	38	19	34,265
4X6UO	**219**	**654**	**9**	**37**	**6**	**34,008**
OK2PBM	140	401	21	37	17	30,075
DK2GZ	146	388	20	34	23	29,876
YC2WBF	139	409	21	43	6	28,630
IK2UCK	145	348	23	52	0	26,100
JA3MIB	120	334	20	38	15	24,382
UWØF	114	308	22	40	13	23,100
MØCOP	**118**	**317**	**15**	**27**	**25**	**21,239**
W6IWO	**131**	**275**	**17**	**33**	**26**	**20,900**
JH9BWC	**109**	**309**	**18**	**32**	**13**	**19,467**
IØQM	100	261	18	31	19	17,748
JH2BTM	79	227	21	33	18	16,344
KP4KE	87	237	18	28	16	14,694
DL1EJD	70	190	19	27	16	11,780
RV3APM	72	178	17	32	4	9,434
JQ1AHZ/2	57	152	15	25	8	7,296
DF7JC	55	140	15	22	8	6,300
EA7CWA	41	95	10	19	2	2,945
RA4LK	19	48	11	16	2	1,392
PY4PW	13	32	5	7	0	384
K4RV	10	30	5	5	0	300

SINGLE OPERATOR 10 METERS

HC1JQ	**170**	**500**	**14**	**17**	**37**	**34,000**
PR7FN	91	256	16	32	17	16,640
JA6WJL	70	168	22	30	2	9,072
UR5FGW	80	189	16	29	0	8,505
4Z8EE	77	220	12	25	0	8,140
UA6ADC	40	105	19	25	0	4,620
SQ6ELV	20	53	10	13	0	1,219
OK2EQ	18	40	8	14	0	880
YBØWWW	11	31	6	9	0	465
SQ9IET	12	35	5	6	0	385
JE2SOY	4	10	3	4	0	70

MULTI-OP SINGLE-TRANSMITTER HIGH

UU7J	**2553**	**6109**	**127**	**359**	**121**	**3,708,163**
RL3A	**2321**	**5436**	**123**	**329**	**110**	**3,055,032**
RY9C	**2149**	**6023**	**117**	**323**	**54**	**2,975,362**
LN8W	**1941**	**4731**	**108**	**312**	**137**	**2,635,167**
IT9LGV	**1836**	**4307**	**93**	**269**	**117**	**2,063,053**
VE3NE	**1581**	**4164**	**86**	**227**	**153**	**1,940,424**
N9TK	**1590**	**3752**	**101**	**249**	**162**	**1,921,024**
J42T	**1788**	**4133**	**77**	**225**	**115**	**1,723,461**
OL3A	**1298**	**3252**	**93**	**243**	**123**	**1,492,568**
OK1KSL	1166	2827	91	245	111	1,263,669
KJ7TH	**1485**	**2871**	**87**	**157**	**167**	**1,179,981**
WØLSD	**1288**	**2599**	**88**	**196**	**158**	**1,148,758**
YL1A	**1144**	**2622**	**80**	**228**	**77**	**1,009,470**
RZ9SWR	**1185**	**3323**	**63**	**186**	**23**	**903,856**
VE7CF	**1032**	**2487**	**69**	**117**	**139**	**808,275**
W2YC	**624**	**1286**	**70**	**179**	**121**	**475,820**
RK3RWA	**356**	**785**	**44**	**128**	**5**	**138,945**
TF3W	**419**	**915**	**23**	**73**	**22**	**107,970**
F8KFN/P	**186**	**387**	**23**	**78**	**0**	**39,087**
N5KO/6	6	18	5	6	0	198

MULTI-OP SINGLE-TRANSMITTER LOW

HG1S	**2161**	**5503**	**121**	**337**	**153**	**3,362,333**
K1TTT	**1788**	**4399**	**108**	**282**	**169**	**2,459,041**
KP2D	**1552**	**3895**	**87**	**215**	**178**	**1,869,600**
UZ4E	**1495**	**3489**	**100**	**265**	**86**	**1,573,539**
HBØ/ DJ5BX	**1475**	**3497**	**86**	**243**	**106**	**1,521,195**
UD1P	**1467**	**4141**	**81**	**241**	**35**	**1,478,337**
ES6Q	**1314**	**3157**	**93**	**267**	**88**	**1,418,816**
LR7F	**1016**	**2978**	**75**	**159**	**107**	**1,015,498**
9A7T	**915**	**2205**	**96**	**249**	**86**	**950,355**
RZ3DZF	**1039**	**2338**	**85**	**243**	**39**	**858,046**
W6YX	**923**	**1957**	**93**	**182**	**147**	**825,854**
UTØH	**1000**	**2305**	**81**	**222**	**45**	**802,140**
OZ2MO	**960**	**2179**	**70**	**212**	**60**	**745,218**
SK3GA	**923**	**2070**	**61**	**180**	**57**	**616,860**
N4DSL	**823**	**1776**	**48**	**134**	**123**	**541,680**
LUØEGS	**591**	**1722**	**62**	**142**	**70**	**471,828**
W1GZ	**651**	**1391**	**57**	**151**	**111**	**443,729**
CT9R	**492**	**1467**	**61**	**131**	**91**	**415,161**
RK9AZZ	**652**	**1815**	**50**	**154**	**0**	**378,260**
WC4DC	586	1028	61	120	114	303,260
SP9ZHR	**404**	**948**	**59**	**161**	**42**	**248,376**
HF8OLD	408	898	49	147	14	186,580
F8KGH	**301**	**665**	**44**	**119**	**6**	**112,385**
JF2SKV	**248**	**607**	**52**	**81**	**21**	**93,478**
OL9S	**169**	**370**	**32**	**83**	**0**	**42,550**
RV3UN	161	346	22	76	0	33,908
UR4PWC	129	299	31	65	6	30,498
DSØIC	**138**	**327**	**22**	**45**	**0**	**21,909**
OK1KDO	85	217	28	41	21	19,530
W3DSX	72	145	20	33	28	11,745
K9OSH	59	74	12	10	34	4,144
LA1K	47	95	6	20	0	247

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HC8N	**4228**	**12578**	**131**	**334**	**234**	**8,792,022**
KM4M	**3401**	**8235**	**122**	**331**	**203**	**5,402,160**
KH7X	**2841**	**8431**	**127**	**234**	**211**	**4,822,532**
PI4CC	**2569**	**6348**	**115**	**324**	**148**	**3,726,276**
DAØBCC	**2156**	**5268**	**106**	**283**	**147**	**2,823,648**
DAØINN	1594	3903	86	228	121	1,697,805
OH2ET	**1585**	**3568**	**82**	**247**	**78**	**1,452,176**
AA5NT	**1067**	**2173**	**80**	**182**	**137**	**867,027**
SY3Y	**687**	**1513**	**32**	**107**	**49**	**284,444**
OL7R	7	18	7	6	2	270

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Z37M	**2961**	**7066**	**110**	**295**	**143**	**3,872,168**
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KA4RRU	**2302**	**5308**	**103**	**253**	**176**	**2,876,936**
JE1ZWT	**1941**	**5164**	**110**	**258**	**116**	**2,499,376**
OM3RJB	**772**	**1839**	**66**	**168**	**67**	**553,539**
OH2K	**598**	**1484**	**60**	**153**	**67**	**430,360**
B1Z	**518**	**1171**	**58**	**96**	**0**	**180,334**

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our readers say

Newsstand Sales

Editor, *CQ*:

Regarding your reply to WA7LKF in *CQ* October 2004 about trouble finding *CQ* on newsstands:

(Here) in Switzerland ... it's not only *CQ* which has disappeared from our newsstands, but a lot of other DIY (do-it-yourself) magazines as well (*Popular Mechanics, Popular Electronics,* etc.). Interest in homebrewing of technical devices has declined; what's moving in now is "build your own home" (We're still waiting for Home Depot to cross the seas...).

Two years ago my wife bought a newsstand; it was her 60th birthday present actually. I managed to secure two slots in her magazine window 'cause I was curious to test the market. (Of course, I had and still have to pay by taking over more low-level duties like vacuuming, dishwashing, recycling bottles, etc., all things which take away many, many precious minutes from hamming!) One is allocated to the German magazine *Funk Amateur* the other to *CQ*. ... Sad to say, in past 27 months we've sold about four copies of *Funk Amateur* and none of *CQ*. According to my boss (wife in the days before Kiosk), her customers are much more interested in knowing why the princess of 3A is so unhappy (tabloid story) than how to organize a DXpedition to 3A (*CQ* story)...

Peter Stoller, HB9AAP

Glued to the Radio

The following was sent to Irwin Math, WA2NDM, editor of "Math's Notes."

Dear Irwin:

Loved your January 2005 column. When I was 12 I lived in an apartment in Montreal. My neighbour Tommy was my age and we strung a wire telegraph line around the building. We did the same roof/ground antics that you went through. Tommy's dad had been in the US Air Force, and he bought him a Knight Kit Star Roamer. . . . I was hooked. My dad got me an HQ100AC receiver and I was glued to the radio. I built several transmitters with crystals salvaged from old Canadian/ British MK19 sets (mule pack). Thanks to Tommy, I made electrical engineering a career. My love of distant places, etc., also was the impetus for my foreign travels and assignments. Just finished building an Elecraft K2.

Jeremy Clark, VE3PKC

Protect the Farallones

Editor, *CQ:*

I note with alarm that a ham has spurred Rep. Pombo to introduce legislation that would open the Farallones Islands (located off the California coast near San Francisco) to DXpeditions ("Ham Radio News," April *CQ*). While I am an enthusiastic supporter of DXpeditions, the Farallones are a uniquely sensitive wildlife habitat, and opening them to visits by hams or anyone else without a pressing need to be there is reckless and environmentally irresponsible. Ham radio is built on a foundation of public service, and thus selfishly endangering the environmental health of such a critical wilderness area is not merely irresponsible, it runs counter to the very principles that underpin all our activities.

Moreover, I note that Rep. Pombo is using this issue as a stalking horse in his larger effort to eviscerate wilderness protections nationwide. It thus pains me to see the ARRL and ham community at large become unwitting pawns in such a nasty bit of politicking.

There is no shortage of other islands that hams can visit without harm to the environment. Let us thus stay off the Farallones, and refrain from helping those who would wish to destroy their protection.

Paul Saffo, KF6STF

Picture Worth a Thousand Words

The following letter was addressed to Digital Editor Don Rotolo, N2IRZ:

Hi Don,

Thanks so much for the nice mention in your February 2005 *CQ* "Digital Connection" column sidebar on Interference, AGC, and IF shift. Even better was your "picture is worth a thousand words" demonstration of how IF shift makes such a huge difference on PSK-31. That ought to make a lot of believers out of the PSK-31 crowd!

Of course, your entire "Digital Connection"column was right up to your usual high standards and I enjoyed it very much. Keep up the good work!

Bill Gerth, W4RK
Emergency Coordinator
Williamson Co. Amateur Radio Emergency Service

Oops...

In the March issue, a footnote in "Zero Bias" referred readers to a website for more information on IRLP, the Internet Repeater Linking Program. It was wrong. The correct address is <http://www. irlp.net>. *(Tnx K2GVC)*

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