Official Journal of
ARRL
The national association for AMATEUR RADIO

QST

devoted entirely to
AMATEUR RADIO

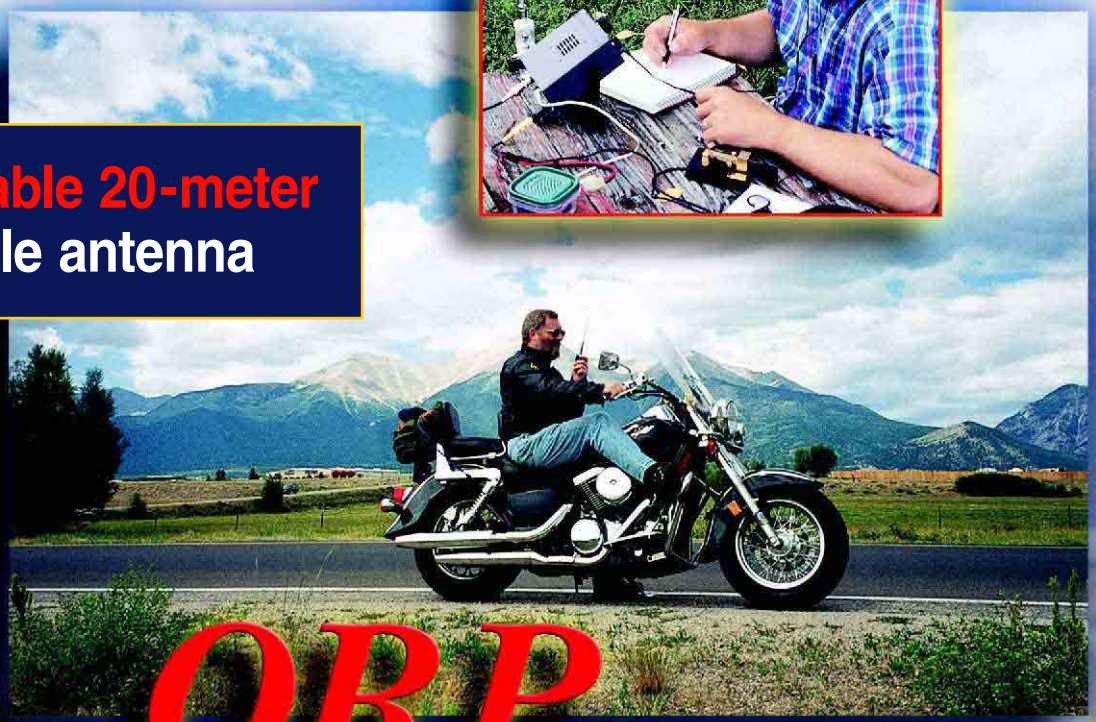
February 2002

QST reviews

- ICOM IC-756PROII HF transceiver
- Yaesu FTV-1000 6-meter transverter

A mobile tracking system you can build

A portable 20-meter dipole antenna



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"A versatile HF/6-meter receiver that offers a good measure of performance in a compact package. All mode capability for the ham and utility listeners and synchronous AM for the SWLs should make the IC-R75 a popular choice for a wide variety of radio enthusiasts." – QST, 1/00

FREE DSP! A $166 VALUE!*

The IC-R75 covers a wide frequency range, 0.03 - 60.0 MHz, allowing you to listen in to a world of information. With innovative features like twin passband tuning, synchronous AM detection, DSP capabilities, remote PC control and more - shortwave listening is easier than ever. All this comes in a compact, lightweight package that can be conveniently used in your ham shack, den or car.*

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-Editorial section, 2001 WRTH

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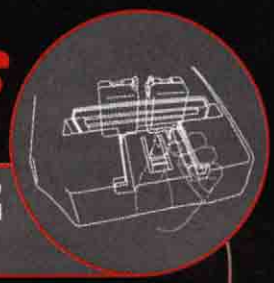

The "floating contact pins" system enables you to move the contact pins from left to right and top to bottom to charge almost any shape of battery pack.

- Analyzes and conditions battery packs
- Supports 3.6V-14.4V in Lithium Ion and 1.2V-14.4V in NiCD and NiMH
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- Discharge current: 300 mA

Sample LCD read out during charging. Shows current voltage, time, and charging capacity

Sample LCD read out during discharging, showing current voltage, time, and discharging capacity.

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X500HA (UHF-Conn.)
X500HNA (Type-N Conn.)
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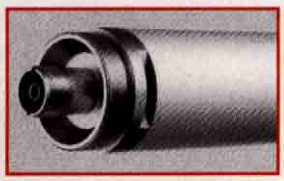

COAX CONNECTION AT BASE END

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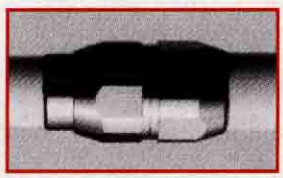

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The X50NA is an excellent choice where ruggedness is required in a medium–gain, dual-band, base/repeater application.

Features

- Wide frequency bandwidth
- Heavy duty fiberglass radome
- Stainless steel mounting hardware and radials
- Type–N Cable connection
- Compact size for easy mounting/ installation

Specifications:

Freq.: 2m: 144–148MHz
70cm: 440-450MHz
Power: 200 watts
Wind Rating: 135 MPH (no ice)
Height: 5.6 feet

X500HNA

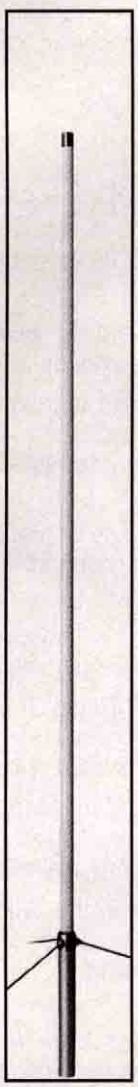
Diamond Antenna's best base station repeater antenna. Designed for strength and performance, the X500HNA is pretuned to achieve maximum gain in both the 2m and 70cm amateur bands.

Features

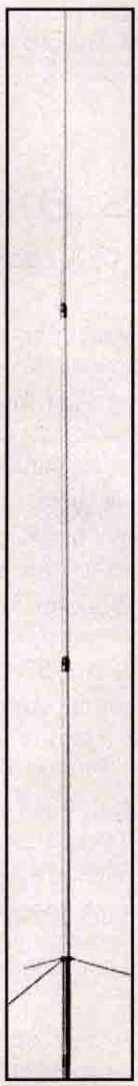
- Heavy duty fiberglass radome
- Overlapping outer shells for added strength
- Stainless steel mounting hardware and radials
- Strong–waterproof joint couplings
- Type–N Cable connection
- Wide band performance

Specifications:

Freq.: 2m: 144–148MHz
70cm: 440-450MHz
Power: 200 watts
Wind Rating: 90 MPH (no ice)
Height: 17.8 feet



X50NA



X500HNA

DIAMOND Mono-Band Base/Repeater Antennas

MODEL	BAND (MHz)	WATTS	CONN.	HT. FT.	RATED WIND MPH (No. Ice)
CP22E [1]	144	200	UHF	9.0	90
DPGH62 [1,6]	50	200	UHF	21.0	78
F22A	144	200	UHF	10.5	112
F23A	144	200	UHF	15.0	90
F718A [2]	440	250	N	15.0	90

DIAMOND Dual-Band Base/Repeater Antennas

MODEL	BAND (MHz)	WATTS	CONN.	HT. FT.	RATED WIND MPH (No. Ice)
X50A	144/440	200	UHF	5.6	135
X50NA	144/440	200	N	5.6	135
X200A	144/440	200	UHF	8.3	112
X510NA [3]	144/440	200	N	17.2	90
X510MA	144/440	200	UHF	17.2	90
X500HNA	144/440	200	N	17.8	90+
X700HNA	144/440	200	N	24.0	90
X2200A	144/222	150	UHF	11.5	112
U200	440/1240	100	N	5.9	135

DIAMOND Tri-Band Base/Repeater Antennas

MODEL	BAND (MHz)	WATTS	CONN.	HT. FT.	RATED WIND MPH (No. Ice)
U5000A	144/440/1240	100	N	5.9	135
V2000A [4,6]	52/144/440	150	UHF	8.3	110
X3200A [5]	146/222/440	100/200	UHF	10.5	112
X6000A	144/440/1240	100/60	N	10.5	112

1 Heavy duty aluminum construction.
2 F-718A: 440-450MHz., F718L: 420-430MHz.
3 X510NJ: 144-147/430-440MHz.
4 1/4λ rated in dBi. Most requirement: 1.4"-2.4".
5 2m: 146-148; 100 watts
6 52-54MHz. only; DPGH62 adjustable from 50-54MHz.

BAND: 144=144-148MHz., 222=222-225MHz., 420=420-430MHz.,430=430-440MHz., 440=440 450MHz., 1240=1240-1300MHz.

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News and Features

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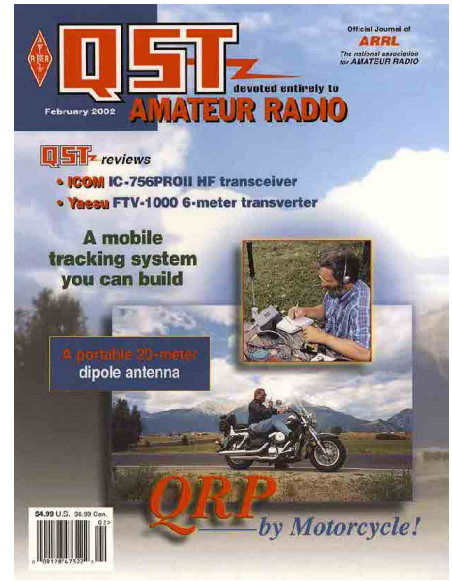
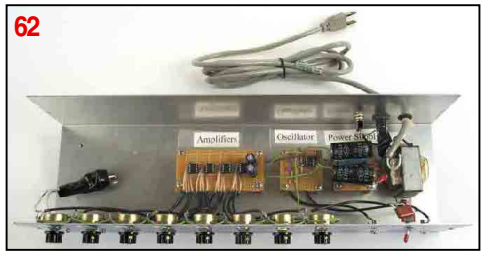
QST Workbench





Our Cover:

There's no better time than mid-winter to dream of the warm weather to come. The cover photos provide a taste of a ham's cross-country bike trip, while other articles cover a fishing adventure, an expedition to a remote Maryland island and an easy-to-build, 20-meter antenna that's ideal for the great outdoors.

Operating

Departments

US & Possessions: Membership in the ARRL, including a one year subscription to *QST*, is available to individuals at $39. Age 65 and over, with proof of age, $34. Licensed radio amateurs age 21 and under and the eldest licensee in the household may qualify for the rate of $20. Life Membership, including a subscription to *QST* is available at $975.* Age 65 and over, $850.* Membership and *QST* cannot be separated. Fifty percent of dues is allocated to *QST*, the balance for membership. Subscription rate for libraries and institutions is $39 per year. Single copies $5.

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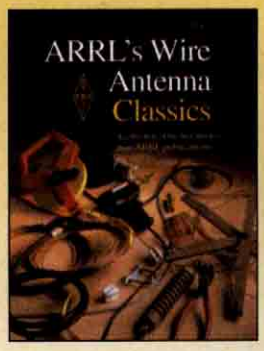
The ARRL Antenna Classics series!



The Original!
ARRL's Wire Antenna Classics

So many wire antenna designs have proven to be first class performers! Here's an entire book devoted to wire antennas, from the simple to the complex. Includes articles on dipoles, loops, rhombics, wire beams and receive antennas—and some time-proven classics! An ideal book for Field Day planners or the next wire antenna project at your home station.
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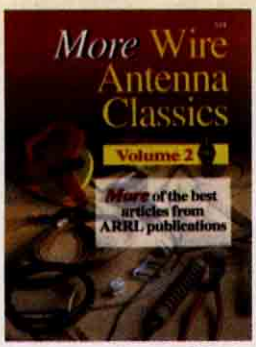

Enjoy even MORE wire antennas!
More Wire Antenna Classics

This book is filled with innovative designs from the pages of *QST* and other ARRL publications. Experience the satisfaction and enjoy the benefits of building your own wire antennas. Inside, you'll find more than just creative ideas. These versatile antennas work! If you have the original ARRL's Wire Antenna Classics—you'll want MORE! ARRL Order No. 7709—**$14** plus shipping*

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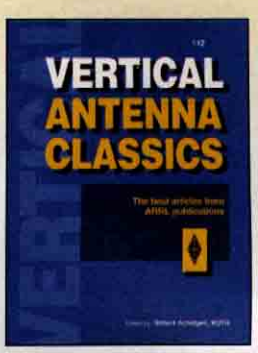

ARRL's Yagi Antenna Classics

Yagis, Quads, Loops, and other Beam Antennas

A wealth of ideas from some of the leaders in antenna design and experimentation of the last 70 years. Covers monobanders; multibanders; HF, VHF and UHF beams from 80 meters to 2304 MHz; computer modeling; towers, masts and guys. Some of the very best articles from *QST*, *QEX*, *NCJ* and other ARRL publications.
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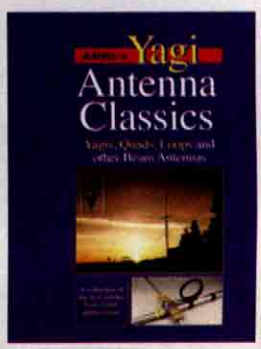
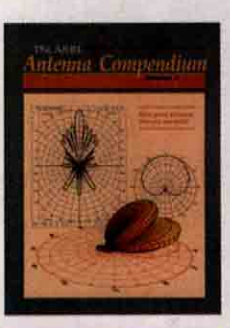


ARRL Antenna Compendiums

More *antennas* — *ideas* and *practical projects*



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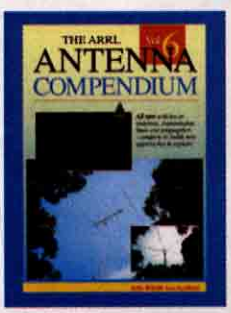

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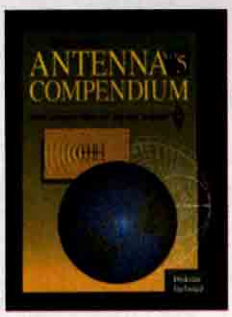

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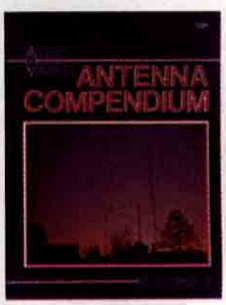

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"IT SEEMS TO US..."

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It is surprising to some that the ARRL is classified as an exempt organization under Section 501(c)(3) of the Internal Revenue Code. This determination dates back to the 1930s and is based on our educational and scientific mission. Voluntary contributions to the ARRL for which there is no tangible benefit are tax-deductible to the extent they would be for any charity. In return we can only devote an insubstantial part of our activities to influencing legislation and cannot participate, directly or indirectly, in any candidate's political campaign, either for or against. The corporate assets of the ARRL must be used for its exempt purposes; there are no stockholders to collect dividends. In short, we share the same characteristics as thousands of religious, charitable, scientific, and educational organizations throughout the United States.

One thing that has distinguished the ARRL from most such organizations is that we have not relied on voluntary contributions to fund the bulk of our activities. The three financial pillars that have supported the ARRL through its first 88 years of existence are membership dues, advertising revenues, and the sale of publications. Historically these have been good revenue sources and the profits thus generated have been sufficient to cover our essential work for the protection, promotion, and advancement of Amateur Radio. While the ARRL has been the beneficiary of a number of generous gifts and bequests over the years, fund drives generally have had a specific project as their objective—for example, helping to build and launch an amateur satellite, the representation of Amateur Radio at a particular international conference, or the renovation and preservation of the Maxim Memorial Station, W1AW. When asked, members have always responded generously—but we didn't ask very often because we were able to pay the day-to-day bills from dues and the sale of books and advertising. This is in sharp contrast to most exempt organizations, which could not exist but for the benevolence of their contributors.

The realization that we could not continue to follow this funding strategy hit home in 1996 when a major new competitor for radio spectrum surfaced at the same time that our funding from traditional sources was reaching a low ebb. Several companies were preparing to spend hundreds of millions of dollars on constellations of low-Earth-orbit satellites to provide commercial messaging services. Some of them thought the 2-meter and 70-cm bands would be dandy places for their "little LEO" systems. (They predicted that by this year, 2002, they would have between 51 and 56 million customers. The reality turned out to be somewhat different, of course—the commercial little LEOs are either already out of business or well on their way—but that's a story for another time.) Mounting an effective defense against the little LEOs and other looming spectrum challenges required an increased commitment to the staffing of our Technical Relations Office (see July 2001 *QST*, p 59)—but where was the money going to come from?

That was the start of what has become an annual drive on behalf of the Fund for the Defense of Amateur Radio Frequencies. In its first five years members contributed more than $1.6 million to the Fund. Without this support the ARRL could not have done its necessary work on behalf of Amateur Radio during those years without dangerously depleting its limited reserves. During the same time the ARRL has been the beneficiary of several bequests and gifts that have made it possible to launch initiatives such as the Certification and Continuing Education Program and the ARRL Amateur Radio Education Project.

To build on this promising beginning, in January 2001 the ARRL Board authorized the creation of a Development Department. After a national search we hired Mary Hobart as Chief Development Officer. Mary's first task when she joined the staff in October was the Defense Fund drive. She got off to a great start, raising more than $100,000 over the previous year's total. Now comes the patient effort that will be required to develop a planned giving program and other funding in support of the Education Project, a W1AW endowment, and other initiatives that are essential to a healthy future for Amateur Radio but are above and beyond what our traditional revenue sources can support.

Even as we seek to broaden its financial base, the Board and staff remain firmly committed to preserving the character of the ARRL as a membership organization. We know that our members are our most important asset. We know that tens of thousands of members spend countless hours of their time as volunteers on behalf of Amateur Radio and the ARRL. We know that not every member is in a position to offer financial support above and beyond the membership dues. But we also know the strength of our members' devotion to Amateur Radio because we are members ourselves. We know we will all do what we can, so that the enrichment that Amateur Radio has brought to our lives will touch future generations.—*David Sumner, K1ZZ*

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It Doesn't take a DIRECT HIT!

Dangerous static charges measuring 1000s of volts can be developed from local thunderstorms, high wind driven snow or sand; so potent, they can actually puncture the dielectric of coaxial cable. Solid-state transceivers and other equipment in your hamshack are very vulnerable to these high-voltage charges so you should take every precaution to protect your equipment and shack from possible serious damage... and, ALPHA DELTA has the answer!

Special Arc-Plugs are used in ALPHA DELTA's Coax Switches, Surge Protectors and DELTA-C Center Insulator which "bleed off" slow rising static electricity charges from the feed line, routing them harmlessly to ground. This is far more effective than DC grounded baluns or chokes. But, even as effective as these devices are, you still need to pay attention to proper grounding procedures as outlined in the ARRL Handbook and other technical publications.

ALPHA DELTA Lightning/EMP Surge Protectors

UL LISTED – Certified protection for your equipment from lightning and static charges much more effectively than low-cost air-gap types.

The heart of this protector is an Arc-Plug™, two electrodes hermetically sealed in a gas filled ceramic cylinder. Acting like a voltage dependent switch, the Arc-Plug™ can repeatedly carry large currents for brief periods of time. If an excessive voltage appears on the feedline line, due to lightning or static charges, the Arc-Plug™ is energized forming a momentary arc and discharge to ground which protects your valuable equipment from damage.

After repeated zaps, the Arc-Plug™ may need replacing as indicated by an increased VSWR or reduced receive signal strength. A top mounted "O" ring sealed knurled knob allows easy access and replacement of the Arc-Plug™ without tools.

If you are running control voltages through the coax, the impedance compensated thru-line cavity design allows it to pass thru, instead of having to "wire around" as with some other *DC-blocked* designs.

Wide Frequency Range: DC thru 3 GHz, much wider than narrow band DC blocked or stub designs.

Low Insertion Loss: 0.1dB @ 1 GHz, 0.2dB @ 2 GHz, and only 0.5dB @ 3GHz, typical.

4 Models:

ATT-3G50* has Type-N females connectors, rated up to 3.0 GHz and 200 Watts $59.95

ATT-3G50U* has UHF female connectors, rated up to 500MHz and 200 Watts $49.95

**2000 Watt (HP) version available at No Extra Cost*

Antenna Insulator Kit with Protection

Highest quality Center and End Insulators, ideal for all types of wire antennas using either coax or balanced feed line, and up to full legal power. Made from an extremely rugged UV and RF resistant material that is virtually unbreakable. Stainless steel hardware used in the center insulator, and all internal connections are hard soldered. A built-in replaceable Arc-Plug™ provides surge protection.

DELTA-C Antenna hardware kit $29.95

DELTA-CIN End-insulator, only ..... each $1.95

Lightning Surge Protected Coaxial Switches

DELTA Features:

- High Quality custom design featuring a rugged Cast Aluminum Housing.
- Constant impedance micro-strip cavities that provide very low-loss and high isolation through the UHF frequencies.
- Rated for Full Legal power.
- A solid positive detent roller bearing switch snaps positively into each position.
- An Alpha Delta Arc-Plug™ Cartridge provides continuous surge protection. If needed, it is easily replaced from the front without disassembly.
- Automatic grounding of the unused antennas to reduce antenna interaction, noise and the effects of lightning.

4 Models:

DELTA-2 2-position, with SO-239 connectors and rated for operation up to 500MHz $49.95

DELTA-2/N 2-position, with N-type connectors, rated for operation up to 1.3GHz $64.95

DELTA-4 4-position, with SO-239 connectors, rated for operation up to 500MHz $79.95

DELTA-4/N 4-position, with N-type connectors, rated for operation up to 1.3GHz $89.95

Lightning Surge Protected Console Coax Switches

- The switch mechanism and features are the same as in the DELTA-4 models above.
- Built into a heavy 3/16 inch thick cast aluminum console weighing a hefty 2-3/4 lbs.
- The attractive, no nonsense design sits conveniently right on the operating desk and stays put.

2 Models:

DELTA-4C CONSOLE with SO-239 connectors, rated for up to 500MHz $139.95

DELTA-4CN CONSOLE with type-N connectors, rated for up to 1.3GHz $149.95

ALPHA DELTA Limited Space Sloper Antennas

- Proven 1/4 -wave sloper DX Performance
- Alpha Delta "ISO-RES" inductors replace lossy traps and capacitors • Full Power operation
- Factory assembled using insulated #12 copper wire, stainless hardware and 50 ft. of nylon rope.
- Direct 50Ω coaxial feed, no tuner required. See our web site for sloper installation requirements.

DX-A A top performing 1/4-wave Twin Sloper 160, 80 and 40 meter DX antenna. Combines the DX firepower of the 1/4-wave sloper with the wide bandwidth of a 1/2-wave dipole. Installs like an Inverted-V. The length of the legs are only 67 ft. and 55 ft. long **$59.95**

DX-B A single wire high performance 1/4-wave DX Sloper with for 160, 80, 40 and 30 meters. Limited space. installation requires only 60 ft. of space for amazing DX performance with the feed-end at 35 ft. and the low end only 8 ft. above ground..... **$69.95**

Shortened Multibanders

- Alpha Delta "ISO-RES" inductors replace lossy traps and capacitors • Full Power operation
- Direct 50Ω coaxial feed, no tuner required except for extended frequency coverage.
- Factory assembled with insulated #12 copper wire, stainless hardware and 50 ft. of nylon rope.
- Uses a DELTA-C Static Protected center insulator and DELTA-CIN end insulators.
- Install Horizontally of as an Inverted-V.

5 Models:

DX-CC Covers 80-40-20-15-10M, 82 ft. long $119.95

DX-DD Covers 80-40 M,82 ft. long $89.95

DX-EE Covers 40-20-15-10M plus 30-17-12M using a wide range antenna tuner, 40 ft. long $99.95

DX-LB 160-80-40M, 100 ft. long. Typical bandwidth for 2:1 VSWR: 160M-20kHz, 80M-40kHz, 40M-300kHz. Full coverage using a wide range antenna tuner $119.95

DX-LB PLUS 160-80-40-20-15-10M..... $149.95

Full-Size Monoband Dipoles

50Ω coax feed, full power • Horizontal or inverted V • Factory assembled with #12 insulated copper wire, DELTA-C static protected center insulator, DELTA-CIN end insulators and 50 ft nylon support rope.

3 Models:

DX-80 75/80 meters, 134 ft. long..... $49.95

DX-40 40 meters, 67 ft. long $39.95

DX-20 20 meters, 34 ft. long $39.95

Available thru Alpha Delta Dealers or Direct (Add $8 S/H in U.S. – exports quoted)

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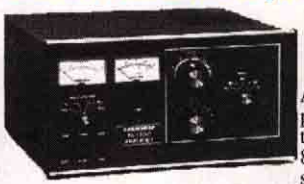

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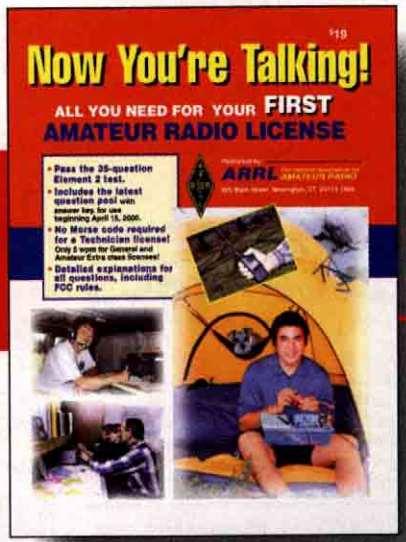

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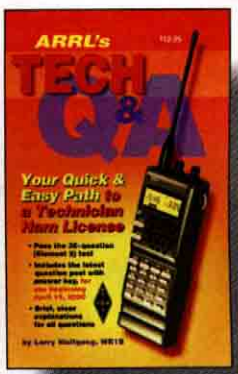

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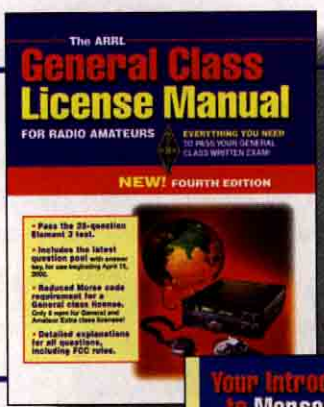

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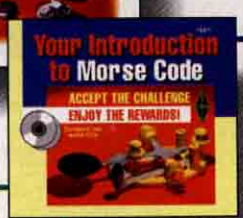

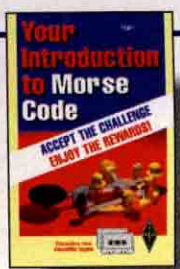

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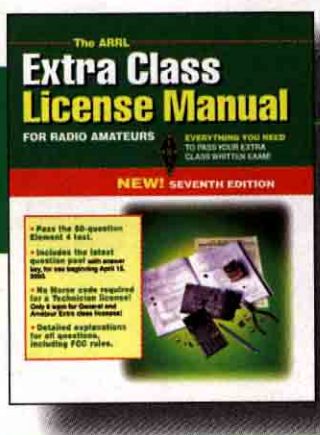

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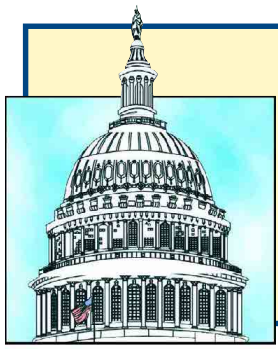

DC Currents

By Steve Mansfield, N1MZA
Manager, Legislative and Public Affairs

Just as radio waves aren't constrained by artificial boundaries, neither is ARRL's government relations effort. "DC Currents" covers behind-the-scenes activity you need to know about in Congress, at the FCC and other regulatory agencies, as well as at worldwide bodies such as the International Telecommunication Union.

Senate "NetGuard" Hearing asks ARRL for Written Testimony

What if another crisis, terrorist attack or natural disaster took out the nation's communication infrastructure? Not long after the September 11 terrorist attacks on the World Trade Center and the Pentagon, US Senator Ron Wyden (D-OR) wondered aloud about how the nation's information technology (IT) companies might organize to restore service quickly and effectively. (Senator Wyden's ideas were noted in the December 2001 "DC Currents.")

In a widely reported statement, the Senator proposed a cadre of volunteers in information technology companies. These volunteers would form a National Emergency Technology Guard (NET Guard) equipped to fix potential disruptions. They would be "called up" as needed like a form of National Guard.

Senator Wyden, chairman of the Senate Commerce Subcommittee on Science, Technology and Space, said on the Senate floor:

> I intend to use the Subcommittee that I chair to initiate a dialogue among Congressional, corporate, military and non-profit leaders to begin a new effort to mobilize information technology in times of crisis. As we seek to prevent future disasters, I believe the technology professionals of this nation, like most Americans, want to use their skills, their equipment, and their talents to this call and do their part. I propose we give leading information technology professionals a chance to use their ingenuity and creativity to insure greater safety and stability for our communities and our citizens in the coming days.

Hearing Industry Dominated

As we went to press, the hearing was over. But no legislation had yet been introduced.

The initial witness list was dominated by a handful of government and industry heavyweights. The list included Joe Allbaugh, FEMA; John Marburger, of the US Office of Science and Technology Policy; Craig McCaw, founder of Teledesic; Will Pelgrin, of the New York State Governor's Office for Technology; Roger Cochetti, of VeriSign; Julie Coppernoll, of Intel; Timothy Graham, of Winstar; Stephen J. Rohleder, of Accenture, and Sarah Roche, of Upoc.

ARRL Contacted Early

ARRL was among the non-profit groups contacted, early in the process. Our first attempted meeting with Senator Wyden's office took on a surrealistic quality, however. As we arrived at the Hart Senate Office Building in Washington to meet with Senator Wyden's staff, the way was blocked by police cars, fire trucks and hazmat trucks staffed by serious looking people in biohazard suits. It turned out they were responding to the first of the Capitol Hill anthrax incidents, at Majority Leader Daschle's office just down the hall from the Senator Wyden's. This resulted in immediate postponement of our meeting.

Some days afterward, ARRL and the Senator's staff finally were able to get together elsewhere to discuss Amateur Radio's contribution to emergency communication. The Senator's staff urged us to submit written testimony, as so many were already in line for the witness table. There was some concern about how even those already on the list were going to get their chance for oral testimony.

So ARRL jumped at the chance. Our written testimony focussed first on the capabilities and track record of Amateur Radio in providing emergency communication. We noted that Amateur Radio "already performs as a technology national guard, albeit not in the context proposed by Senator Wyden."

ARRL Reports Amateur Radio Track Record and Capability

We told the Subcommittee about a track record of emergency communication dating back to 1913, and forward through the years. We lauded the more than 100 Amateur Radio volunteers providing emergency communication at the Pentagon for about a week after September 11, and another 500 working for more than two weeks helping out at Red Cross and Salvation Army communications sites around the World Trade Center. We noted that many amateurs have been identified as employed in the Internet infrastructure and are willing to participate in restoration should the need arise.

"Whenever natural catastrophes or acts of terrorism occur in our country, Amateur Radio is available as a tested and organized nationwide network of trained radio experts," ARRL offered. "These volunteers provide radio communication under longstanding written agreements with major government and private disaster relief organizations."

ARRL told the subcommittee that, under the provisions of these agreements, amateurs often step forward to help when telephone services, data networks, radio and television broadcasters, police, fire and ambulance two-way radios, or other vital components of local, state or national telecommunications systems are disrupted.

ARRL went head-on at the concern sometimes expressed by unknowledgeable politicos that the "amateur" in Amateur Radio implies we're not up to the task.

"It is important to note that the word 'amateur' is more aligned with the Latin root *amo* (as 'to love')," we said, "than it is with the contemporary vernacular implying 'lack of skill.'"

ARRL said that Amateur Radio operators bring a deep love of science and technology to electronic communication. Driven by that love, they offer a high level of emergency communication services supported within an infrastructure of frequency allocations that allow them to surmount physical and electromagnetic conditions encountered in emergency communication. Formal groups like RACES, ARES, Skywarn, as well as local, informal groups, can be mustered after a disaster. ARRL noted that the radio amateur's "extra expertise" such as knowledge of circuitry, can facilitate field repairs, and makeshift antennas can be erected on scenes of devastation where a standard antenna might not function.

National "Party Line" During Emergencies

ARRL called Amateur Radio the National "Party Line" during times of emergency, so that networks can extend to all borders of the country and beyond borders in cases of hurricanes in the islands or other international crises. That "open" quality also makes these frequencies particularly useful for coordination at a national level during large-scale disruptions or disasters.

ARRL offered to provide the committee additional information as needed.

FCC Puts Off Consideration of Ultra-Wideband Rules

The FCC in mid-December postponed consideration of a revision to its Part 15 rules to provide for new ultra-wideband (UWB) devices. At the eleventh hour, the Commission deleted an agenda item for its December 12 open meeting that could have led to issuance of a *First Report and Order* in the UWB proceeding, ET Docket 98-153.

"The FCC's action followed a flurry of last-minute *ex parte* filings in support of early action by UWB proponents—mostly manufacturers—and by those urging instead the issuance of a *Further Notice of Proposed Rule Making*—incumbent users of the spectrum," said ARRL Technical Relations Manager Paul Rinaldo, W4RI. Amateur Radio is among those in the latter category. As ARRL Executive Vice President David Sumner, K1ZZ, put it, "We were one of a large chorus that included the Department of Defense."

The ARRL is part of an industry coalition that's been calling on the FCC "as a matter of fairness" to issue a *Further Notice of Proposed Rule Making* that includes proposed UWB rules and specifies emission limits before it takes final action to authorize UWB equipment under Part 15. Rinaldo and ARRL General Counsel Chris Imlay, W3KD, are participants in the coalition, which has met with FCC commissioners, members of Congress and cabinet secretaries.

"These meetings served to deliver the message that incumbent users are not opposed to UWB but simply wish to have a chance to study the effects of UWB on existing and planned uses of the spectrum," Rinaldo said. "Without knowledge of UWB emission limits, it is not possible either to measure the interference in field testing or to calculate the effects by computer simulation."

The FCC has kept any proposed UWB rules under wraps while it coordinates them with the Interdepartment Radio Advisory Committee—or IRAC—the group that considers federal government use of the spectrum. Proposed rules for different UWB applications could include ground-penetrating radar (GPR) systems to locate objects in the ground, through-the-wall radar—typically for construction and disaster relief—and yet-to-be defined communications uses. "GPR is expected to use frequencies below 1 GHz, while other applications are believed to have wide emissions centered at around 3 GHz," Rinaldo explained, adding that, in any case, the energy would be spread over a number of amateur bands. The issue is expected to resurface on the FCC's agenda early this year.

Lawmakers Trying to Create New Radio HERO

California Representative Jane Harman (D-CA-36th) has introduced legislation entitled the "Homeland Emergency Response Operations Act" or the "HERO Act" (HR 3397). The bill is intended to free up some of the upper ranges of the UHF television broadcast spectrum for use by agencies responding to emergencies. Frequencies in question include 764-776 MHz and 794-806 MHz. Those frequencies represent channels 63, 64, 68 and 69.

Joining Representative Harman in introducing the bill were six other Representatives including Rep Cass Ballenger (R-NC-10th), Rep Rodney P. Frelinghuysen (R-NJ-11th), Rep Benjamin A. Gilman (R-NY-20th), Rep Mike McIntyre (D-NC-7th), Rep James P. Moran (D-VA-8th) and Rep Curt Weldon (R-PA-7th), making it a bipartisan measure.

The HERO Act responds to a mandate that was in the 1997 Balanced Budget Act. That mandate was intended to get broadcasters to vacate several specified channels to allow the FCC to reallocate them. It was primarily for public safety use with improved interoperability, as well as for use by potential commercial broadband and land mobile services during the period of transition from analog to digital TV services. While the FCC already has issued rules for public safety use of the specified frequencies, broadcasters have not shown as much momentum toward vacating them as some lawmakers would like. Under the law, broadcasters can stay in that range until the end of 2006, the date mandated for the conversion from analog to digital. The FCC could extend the deadline if there were not sufficient households equipped with digital receivers in a given market. But, the HERO Act makes the year 2007 the *absolute* cutoff date.

Media Hits

- "During times of crisis, like now, the skills of the ever-increasing ranks of radio operators are even more vital," says an article in the *Los Angeles Times*, featuring the involvement of Amateur Radio operators in emergency communication. In addition to extolling the ability of Amateur Radio to make friends around the world, the article quotes ARRL President Jim Haynie, W5JBP and Media Relations Manager Jennifer Hagy, N1TDY.
- Jim Scanlan, W4AAF, of the Rancho Bernardo Emergency Radio Service (RBERS) got the chance to tell the Amateur Radio emergency communication story to the *San Diego Union Tribune.* Scanlan explained to the reporter just how the Rancho Bernardo community, a suburb of San Diego, is served by Amateur Radio programs during emergencies and detailed the efforts of the approximately 30 member RBERS, whose names and call signs appear on the RBERS Web page at **www.rbernardo.com/safesec/rbers.htm**.
- Merrie Suydam, AB6LR, keeps pretty busy, according to the copy of the *Azusa* (CA) *Herald* that Merrie sent us. An article in the *Herald* that pays tribute to some of activities of the 15 member Azusa Amateur Radio Communications Emergency Services (AACES) group. The article focuses on the very busy AB6LR who, in addition to intense involvement with Amateur Radio, is also into bicycling, needlepoint, crocheting and knitting, classical music, opera, reading, photography and travel.
- Ron Moorefield, W8ILC, lets us know that the *Huber Heights Courier Times* published nice pictures of scouts and members of the Huber Heights Amateur Radio Club communicating with other scouts around the world during the Jamboree-on-the-Air. Hams pictured included Jim Ebner, N8JE and Gary Walker, N8OI. The photographer who took the pictures is Rob Taylor, KC8LNO, a member of the club.
- Shoppers at the Golden Triangle Mall in Denton, Texas, got a little extra attention Fridays and Saturdays during the holiday shopping season according to an article in the *Denton Record Chronicle*. The article reports that local hams from the Denton County Amateur Radio Association keep an eye on the parking lot to deter theft, vandalism and other forms of mischief. The group has also helped identify shoplifters, helped out stranded motorists and performed a variety of other Good Samaritan acts. George Lindley, WA5HKW, was interviewed for the article.

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- 7.4V 1550mAh lithium-ion battery (std.) for high output[2] and extended operation
- 16-key pad plus multi-scroll key for easy operation
- Built-in charging circuitry for battery recharge while the unit operates from a DC supply
- Tough construction: meets MIL-STD 810 C/D/E standards for resistance to vibration, shock, humidity and light rain
- Large frequency display for single-band use
- Automatic simplex checker
- Wireless remote control function
- Battery indicator • Internal VOX • MCP software

[1] Note that certain frequencies are unavailable. [2] 5W output

"Specifications subject to change without notice."

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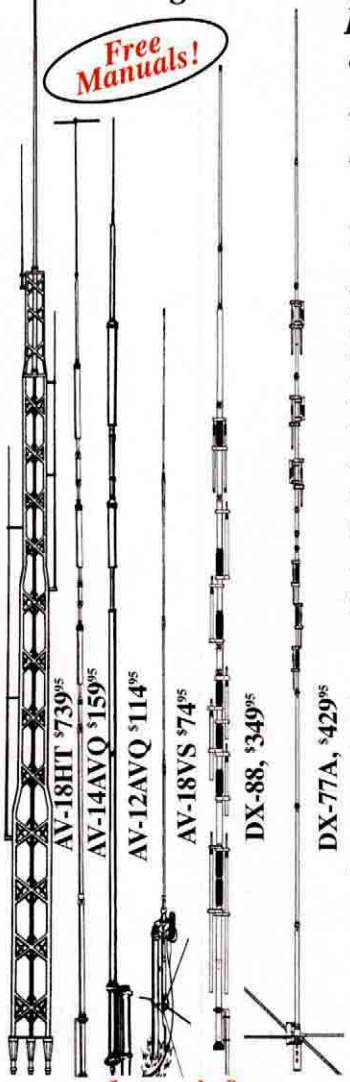
hy-gain HF VERTICALS...

Self-supporting -- no guys required . . . Remarkable DX performance -- low angle radiation, omnidirectional . . . Handles 1500 Watts . . . Low SWR . . . Automatic band switching . . . Aircraft quality aluminum tubing . . . Stainless steel hardware . . . Recessed SO-239 connector . . . Two year limited Warranty . . .

Free Manuals!



hy-gain[R] Classics

All hy-gain multi-band vertical antennas are entirely self supporting -- no guys required.

They offer remarkable DX performance with their extremely low angle of radiation and omnidirectional pattern.

All handle 1500 Watts PEP SSB, have low SWR, automatic bandswitching (except AV-18VS) and include a 12-inch heavy duty mast support bracket (except AV-18HT).

Heavy duty, slotted, tapered swaged, aircraft quality aluminum tubing with full circumference compression clamps is used for radiators. Includes all stainless steel hardware. Recessed SO-239 prevents moisture damage. Hy-gain verticals go up easily with just hand tools and their cost is surprisingly low. Two year limited warranty.

AV-18HT, $739.95. (10, 12, 15, 20, 40, 80 Meters, 160 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. With the addition of a base loading coil (LC-160Q, $99.95), it also provides exceptional 160 Meter performance.

The 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 and lowering.

AV-14AVQ, $159.95. (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, $79.95.

AV-12AVQ, $114.95. (10, 15, 20 Meters). 13 ft., 9 lbs. The 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, $79.95.

AV-18VS, $74.95. (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, $79.95.

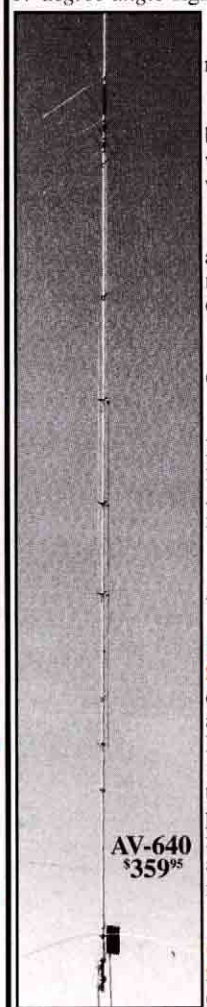
DX-88, $349.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs. All bands are *easily* tuned with the DX-88's *exclusive* adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, $179.95. Ground Radial System, GRK-88, $81.95. Roof Radial System, RRK-88, $89.95.

DX-77A, $429.95. (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	$739.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	------
AV-14AVQ	**$159.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$114.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$74.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$349.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$429.95**	**10 - 80 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

hy-gain[R] 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.

Sleek and low-profile

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

Full legal limit

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*[R] insulated wire. Aircraft quality aluminum tubing, stainless steel hardware.

hy-gain[R] warranty

Two year limited warranty. All replacement parts in stock.

AV-640, $359.95. (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, $269.95. (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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UP FRONT IN QST

PAUL GODOLPHIN, G4XTA

"Do you know the way to . . . QST?" ARRL member Paul Godolphin, G4XTA, of Cumbria County, England, found this highway sign near his home. Where does it lead? "I never found out exactly what QST was, as I followed the signs for a few miles until they ran out, and never found anything. Anyhow," he adds, "I never need directing to the magazine—it arrives in my mailbox!"

ROBERT GILLESPIE, WB5KJE

He knows which way the wind blows. Robert Gillespie, WB5KJE, of Hugo, Oklahoma, is well prepared for any weather emergency. In case he needs to gain access to an emergency scene, his call sign appears on his special "Firefighters" license plate. Up top is an anemometer connected to a Davis weather center inside the vehicle. The antenna is a Comet UHV-6 mounted on a dual-axis Diamond lip mount. Inside is a Yaesu FT-100D, ICOM IC-2800, Kantronics KPC-3, Compaq 600 MHz laptop computer and an R-3-26 TV/scanner. If all that weren't enough, "I also use a cell phone with modem to keep up with changing weather condition using the Internet," Robert says.

The flag "got out" better than an antenna would have. Members of Western Carolina ARS set up this emergency communications display in Asheville, North Carolina to help support the Red Cross Disaster Relief Fund in the wake of the September 11 attacks. The club expected to raise about $500, but the final total after only four hours was $2085. Their effort was reported in the Asheville *Citizen-Times*. "Amateur Radio helped make a difference that day," writes WCARS' Robert Dockery, WD4CNZ.

ROBERT DOCKERY, WD4CNZ

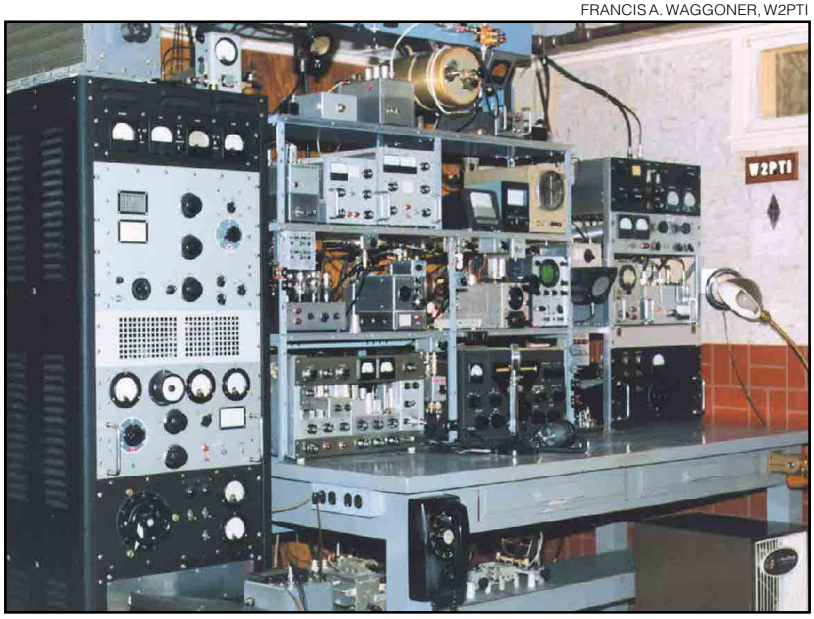
ED GUSTAT, W1FBI

Is he mobile or is he maritime mobile? Well, that depends… Ed Gustat's 1967 Amphicar can change its driver's status right in the middle of a QSO! In case you're wondering, W1FBI's eye-catching vehicle sports a 43-hp engine capable of reaching 75 mph on land and 10 knots on water. It's outfitted with both 2-meter and 40-meter (QRP) gear, with mag mount antennas.

PAUL HERTZBERG, K2DUX

You can find Hammies, whatever they are, on this corner in Brooklyn, New York.

FRANCIS A. WAGGONER, W2PTI



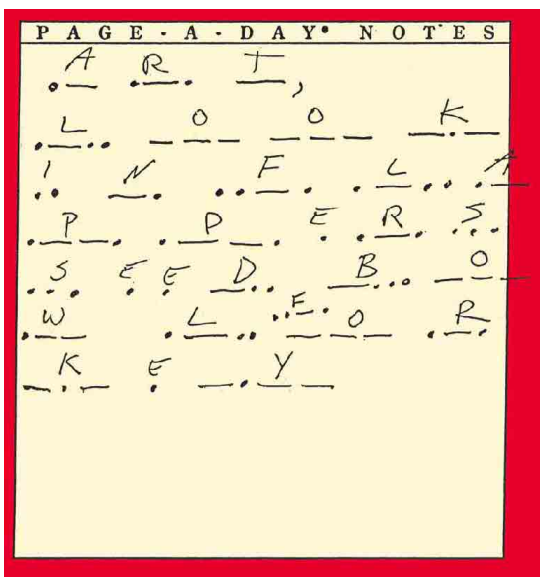
"Thought you might want to see some homebrew," writes Francis A. Waggoner, W2PTI, of Watertown, New York. For those who haven't been able to figure it out from the photo, you're looking at: 4-1000 amp, 4CX1000 amp, 0-4000 V dc power supply, SSB exciter for 10-15-20-40-80, 160-m transverter, 160-m amp (two 4X250s), 2-m converter by W2AZL, 2-m transverter, 2-m amp (also two 4X250s), 70-cm transverter, 70-cm amp (4X250), 0-2000 V dc power supply, and a 75-A4 receiver. The latter, Francis admits, isn't homebrew. In fact, you can see the first of these famous Collins receivers (serial no. 000001) at ARRL Headquarters.

BRAD BUCHAR, KA3EPR

Brad Buchar, KA3EPR, of New Freedom, Pennsylvania, obtained this license plate by chance. Traffic-handlers will recognize ARL58 as the ARRL Numbered Radiogram for "Have a wonderful time. Let me know when you return." As it happens, Brad is, you guessed it, 58 years of age.

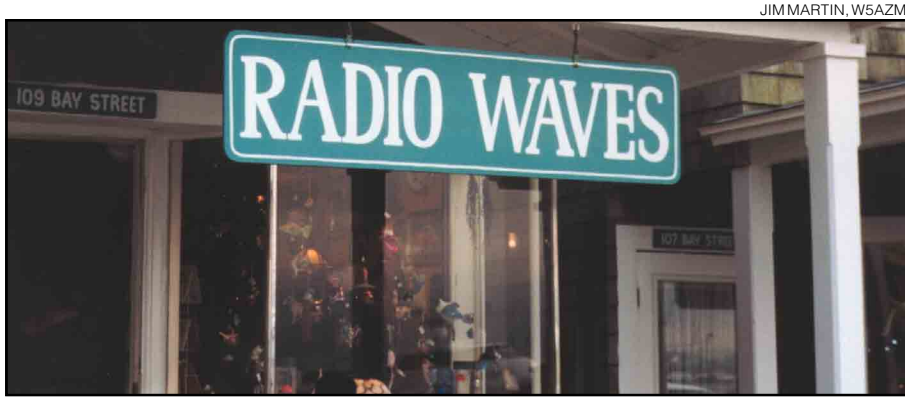
The spotlight is on Sam Powell, N8SAZ, of Wilmington, Ohio, who couldn't resist being photographed with this sign. "Found my shopping area in Oldham County, Kentucky," he writes.

SAM POWELL, N8SAZ



Flapper foils code key plan. Art Lee, WF6P, of Santa Cruz, California, explains: My wife Donna, AB6XJ, and daughter-in-law Cybele, KC6ZQS, wanted to leave the house while I was away, and I had left my key with Cybele. They hit on a novel idea for keeping the key out of sight—hiding it in the food tray of our African Gray parrot named Flapper, whose cage was on the back patio. Donna pinned this note to the front door, and it worked fine—up to a point. When I looked in the cage, I couldn't find the key. After my wife and daughter-in-law arrived home, we searched everywhere, in and around Flapper's cage. We finally found it, partially hidden beneath the edges of the newspaper tray liner. Like a child hiding his broccoli, Flapper had rid his food dish of the offending shiny metal object—certainly not fit to eat.

JIM MARTIN, W5AZM



Having trouble getting out? This store in Westerly, Rhode Island, could help.

~ Recycling is Alive and Well at W7UPF ~

Auctions that feature ham gear can be addictive for some of us and I got hooked when a Technical Materials Corporation TU-2 antenna tuner came up for bid—a military type built to handle high power, to be mounted in an exposed environment, and remotely controlled. The tuner may have been of 1960s vintage but as you can see in Figure 1, it looked as though it could be put to ham use. However, it did not come with its associated MCU-2 control unit.

The lure of locating my "auction" tuner outside at the feed point for my antenna and controlled from inside the ham shack was the incentive I needed to carefully look at the manual and see just what it would take to build a controller. After reading the manual and looking long and hard at the controller circuit, I decided the key parts could be found in my junk boxes, but some sort of enclosure to house the parts and watt/SWR meter would be needed. In my ham shack was a somewhat-decrepit swapmeet-acquired antenna tuner. "Gutting" it in order to use the housing and meter seemed the right way to go.

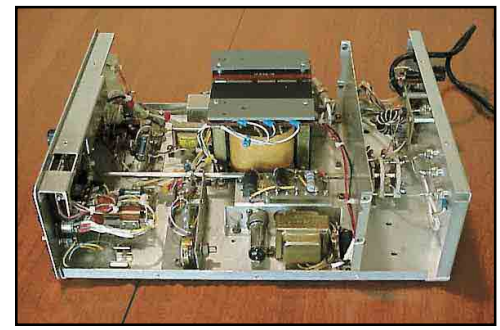


Figure 2—Constructed control unit for TU-2 tuner.

The control unit was constructed as shown in Figure 2, and it's doing a great job out at the antenna feed point…controlled from the comfort of the ham shack. Now I had parts left after dismantling the old manual tuner to get the enclosure and meter. These initiated still another tuner recycle challenge.

Unlike the military tuner, this latest recycling effort was a full-blown bits and pieces project. See Figure 3. An old 19-inch rack panel was used as a base for the variable condenser and the rotary inductor. Note the motors used to drive the condenser and inductor…they were "new surplus" 40 rpm, reversible direction motors, rated at 19.1 volts dc input and 130 mA.

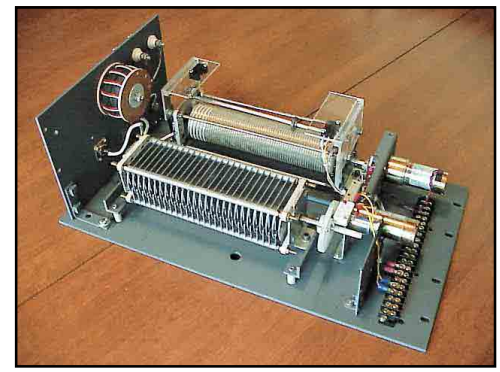


Figure 3—Second tuner from "bits and pieces."

All of the metal brackets used to support the motors and the rear panel were scrap items salvaged from long-ago discarded equipment and given a reprieve in past "clean up the shack" exercises. Figure 4 displays the rear of the tuner and shows through-panel insulators for a balanced feed line as well as coax connectors and a ground post.

It seemed important to have a reference point for pre-setting the variable condenser. So a plastic gear from the "gutted" tuner was mounted on the condenser shaft and it makes contact with a "sense" switch sending a signal back to a control box LED when the condenser reaches half capacitance. Luck is often needed in a project and the plastic gear just happened to have the right teeth and gear ratio to mate with the motor and produce close to an acceptable condenser tune speed.

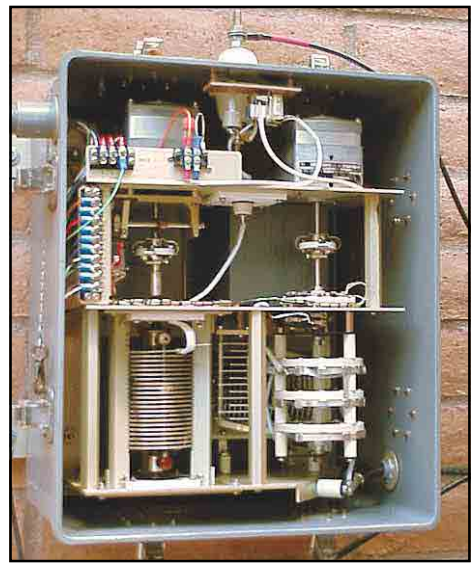


Figure 1—TMC TU-2 antenna tuner with front cover removed.

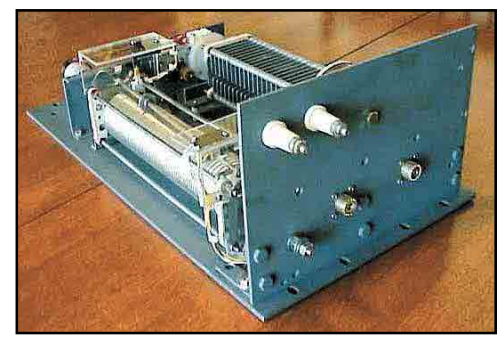


Figure 4—Rear panel of the second tuner.

Who needs two tuners? That is a fair question. I can only say this latest tuner is mounted outdoors in a recycled waterproof equipment case next to my auction-acquired sophisticated military tuner where it serves as a standby but ready to go full duty at any time. Maybe it can be dedicated to work with another antenna if space can be found on my urban lot. In any case, the project was a challenge and may serve as an answer to those who ask, "What are you ever going to do with all of that junk box stuff?"—*Donald W. Richards, W7UPF, Tucson, Arizona*

Simultaneous Reception

VHF/VHF | UHF/UHF | VHF/UHF

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Rugged, reliable, and versatile, the FT-7100M provides the highest cost-performance available among Dual Band FM Mobiles. See your Yaesu Dealer today for a test drive!

FEATURES

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- Smart Search™ Automatic Memory Loading System
- 50 CTCSS Encode/Decode Tones
- 104 DCS Encode/Decode Codes
- CTCSS and DCS Search
- ARTS™ (Auto-Range Transponder System)
- Automatic Repeater Shift (ARS)
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VX-5RS
(Silver version)

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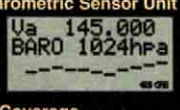

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  TX : 50-54 MHz 144-148 MHz
  430-450 MHz
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- AM/Shortwave Receive
- AM Aircraft Receive
- High-Capacity Lithium-Ion Battery: 7.2 V @ 1100 mAh
- CTCSS and DCS Built In
- Dot Matrix LCD
- Dual Watch
- Spectra-Scope™ Graphical Display
- 220 Memories plus "Home" Channels
- Ten Pairs of "Band Limit" Memories
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- Convenient Icon Display Mode
- Smart Search™ Automatic Memory Loading
- Automatic Repeater Shift
- Auto-Range Transponder System (ARTS™)
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- Busy Channel Lock Out (BCLO)
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POOR IMAGE

♦Having acquired my amateur radio license as a high school senior in 1992 and gradually upgrading to Advanced class since that time, I am always excited about trying a new mode. I don't have a whole lot of money, and most of my gear is used, but I love to get on 10 meters and do some DXing. I also love to learn about the newer modes, such as PSK 31. Recently, one of the modes I became interested in learning a little more about was Slow Scan Television. I didn't know a whole lot about SSTV, but I figured with my laptop computer and shortwave radio, I had enough to at least get started in receiving some images on my laptop.

I checked around on some of the amateur radio related Web pages, and finally settled on a good SSTV program. After downloading the program to my computer and hooking up everything, I tuned around to 14.230 on the 20 meter band and gradually began receiving some SSTV images. I was shocked and embarrassed at some of the images that I have seen amateurs sending to each other. I have come across everything from half-naked women, off-color jokes and political commentary, and other things that are generally in bad taste as far as ham radio goes.

It would seem to me that this puts ham radio in a bad light, and goes against some of the regulations of the amateur service. Isn't there enough of this kind of stuff already on the Internet without hams using SSTV to send it around the world for anyone who has a slow-scan TV program to view? I would urge all operators who use SSTV to exercise good judgment before sending this kind of material over the air. A lot of this stuff has nothing to do with amateur radio, and quite frankly is just childish. Let's all remember that our amateur radio spectrum is precious and could be taken away from us if it isn't being used for the purposes that it was set up to be used for in the first place. Remember before you key a microphone or send an image over the radio that anyone in the world could be watching or listening. Let's all put our best foot forward to show others that amateur radio is a great service, and do our part to keep the garbage off the air.—*Michael Brown, KU4UV, Lexington, Kentucky*

LET'S GO BACK TO THE FUN

♦Modern technology is great but there must still be a place for some of us who love ham radio for the original purpose of building and operating homebrew equipment for the fun of it and for meeting like-minded people of all backgrounds. Ham radio began as a hobby. Let's go back to some of the fun instead of having one computer driven machine talking to another. We have lost a lot of the person to person pleasure that was the mainstay of ham radio. We do have the ability to act in times of emergency as was demonstrated on September 11. I was a bomber pilot in WW2 and one of my wireless ops was a ham. Once in a while, I had him fly the aircraft while I operated the radio. This is what it was all about.—*Randy West, VE2ALD, Pointe-Claire, Quebec*

TIME TO UPSIZE

♦First, I must say this: I do applaud manufacturers such as ICOM, Kenwood and Yaesu for making their equipment more compact, more "ready to go anywhere." However, good things don't always come in small packages.

I became more mindful of this, not only as a member of the League, but of Handi-Hams as well, when I attended their winter ham radio workshop in Malibu, California, and listening to a presentation by Gordon West, WB6NOA. The smaller rigs, while nice, are sometimes harder to operate—not only for those of us who are "physically challenged," but for those of us who have big hands. Some of us have very mild coordination problems; others have more severe problems. Some options that could be considered:

- Large dials and/or buttons.
- Voice control (we already have packet connections and places for expansion modules in some rigs)

While I'm crazy about my new "toy," my FT-2600M, which is just right for me, I urge the manufacturers to not only consider upsizing their rigs but possibly providing the "options" mentioned above. If this is done, you will, I think, see more hams in the future if their equipment is easy to operate.—*Mike Gruteke, K3BRJ, Derby Line, Vermont*

ZZ IS TOPS

♦Way back in 1933, when I was a kid, I obtained by ham license and was assigned the call of W7DET. I loved it, and it served me well for several decades. However, it had a few drawbacks—the D-E-T all rhymed on phone, for one thing.

In 1973 I decided to go for an Extra class license and was assigned the call of W7ZZ. I didn't realize at the time that the call was to change my whole ham radio operating enjoyment. Somehow the letters ZZ—Zulu-Zulu; Zed-Zed; Zanzibar-Zanzibar had a rhythm and ring to it.

As of now, I have worked some 35 (and counting) stations, worldwide, who have the same "ZZ" suffix. With all due respect to the thousands of hams around the world enjoying their beloved call signs, who among them has amassed so many similar suffixes?—*Bill Vandermay, W7ZZ, Portland, Oregon*

TERMINALLY SHY?

♦Several recent letters to the editor suggest that many hams are socially challenged, particularly when dealing with new hams like myself. I have been ignored in person at club meetings, church gatherings, hamfests, Field Day exercises and open houses by many knowledgeable (meaning older) hams.

Yet my experience on the air (HF CW and phone exclusively) has been excellent. I note "nice guy" in the log on many QSOs, domestic and foreign, and have never been ignored, rejected or otherwise mistreated on the air. I suspect some (many, most?) hams may be terminally shy and unable to relate person to person, and are much more comfortable on the air. Or maybe operating HF CW and phone brings out the best in people. That's certainly been my experience. PS: The new *Operating Manual* is terrific!—*John Rippey, W3ULS, Montross, Virginia*

EXCELLENT WORK

♦Among my many reasons for joining ARRL was the excellent work being done in Washington on behalf of the membership as well as those operators who for some strange reason known only to themselves have chosen not to join. Many times when a person joins an organization that is active on the political front you get no feedback, often times due to the fact that they are doing self-serving activities they don't want you to know about. ARRL on the other hand is very straightforward and reports weekly to its members as well as monthly in *QST* and even asks for input and feedback. This alone is worth the price of membership to keep our hobby effective and fun. Keep

up the good work!—*William D. Huff, KG4PXJ, Brunswick, Georgia*

WHAT IT'S ALL ABOUT

♦A few months ago the ERG (Emergency Radio Group) repeater system, N6AMG/R, experienced a major crash at its hub site on Mt Diablo, just east of San Francisco. Originally designed and built by Joel Paladino, N6AMG (SK), the ERG system covers over half of the state of California with an interlinked system of repeaters. It forms a critical component of the amateur emergency communications system, and has been used several times in emergencies, including the Loma Prieta earthquake.

The system failure was due to several 12 V dc supplies operating in parallel to power the hub site. One failed, overloading the others, which in turn caused other failures. I offered to try to "scrounge up," in true ham fashion, a power supply capable of 50 A at 12 V. I sent several e-mails to three or four manufacturers, asking if they had a surplus, maybe physically damaged but operational, supply. Several days later I received a telephone call from Mr Tom Steinke, president of LaMarche Manufacturing. Much to my surprise, Tom said he was K9WYG, and that his computer records showed that they did indeed have a 50 A/12 V supply in the warehouse. . . brand new. To my surprise, he offered to donate it free of charge.

A few days later I received a call from LaMarche. The caller said the computerized inventory was out of date, and that the power supply had in fact been sold a few days before I had talked with Tom. My heart dropped to the floor, until the caller said, "Don't worry—Tom has ordered manufacturing to build one from scratch, and to ship it to you free of charge."

Hams have always tried to help out one another, but when it comes to building a power supply like this (with a price tag of around $2000!), it's just too much to comprehend. Everyone who uses the ERG system will be forever thankful for the generosity of Tom Steinke, K9WYG, and his company for the donation. This is what "real Amateur Radio" is all about—helping each other!—*Allen B. Ferrera, WA6MXI, Santa Rosa, California*

DO WE NEED CW?

♦The Op-Ed column ("Strategic Thinking Needed Like Never Before," Dec 2001 *QST*) makes some very good points. However, the portion of the piece which reads "...remember, the government no longer needs a giant pool of CW operators for its next war" contradicts the very theme of the article.

When an enemy has destroyed communications satellites, crippled or destroyed land line links, and are successfully jamming other forms of command and control communication, someone just might want to put out a call for a couple of CW operators who can work through atmospheric noise, jamming and other nuisances to get a message through. Remember—when you run out of matches in a crisis, it's sometimes nice to know someone who knows how to start a fire by rubbing two sticks together.—*George Hicks, K6RAS, Grass Valley, California*

♦By the time my Op Ed article, "Strategic Thinking Needed Like Never Before," appeared in December *QST*, the whole subject had been repeatedly overtaken by events. The President announced that he would encourage the redevelopment of a Civil Defense organization. Washington was awash with talk about forming a national service organization, perhaps an extension of Americorps, for use in fighting terrorism.

We must presume that such rapidly constituted entities would lack totally in communications capabilities and would have to rely on cell phones, which, remember, depend in turn on the hardline system. Yet I am also reading an article in the *New York Times* from November 23 ("Attacks at Hubs Could Disrupt Phone Lines") about the vulnerability of the public telephone system.

I also see that the FCC has created a "Homeland Security Policy Council," some kind of "executive council responsible for coordinating the agency's response to potential terrorist attacks on the nation's telecommunications infrastructure."

These are critical times for the future of Amateur Radio. The ARRL should immediately create its own "Homeland Security Emergency Communications Council."—*Jim Nash, K4HMS*, **nashcom1@flash.net**

IT'S WHAT'S INSIDE THAT COUNTS

♦One of the biggest problems the police have with stolen property is identifying it when it has been recovered. Serial numbers are very often removed by the thieves, and in some cases serial numbers are not unique anyway. Use of SSN on your valuables is a good idea. It will not deter the thief, but engraved on the *inside* of your rig it will serve as positive identification should the item be recovered. Thieves don't normally examine the insides of their loot so it will probably be intact. If you are fortunate enough to get a call, even years later, that a radio like yours has been recovered minus the serial number (which is most often the case) it's a simple matter to identify it as yours or not.—*Dave Lott, VE3BHZ, Det/Sgt Retired, Cambridge, Ontario* QST

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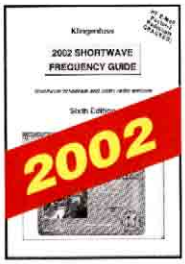

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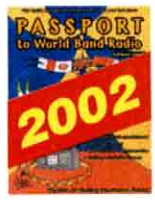

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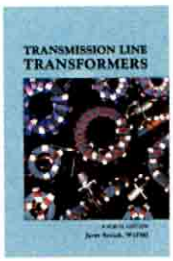

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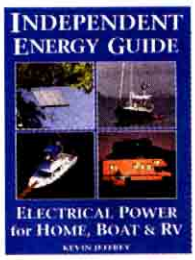

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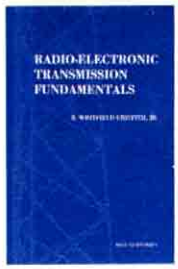

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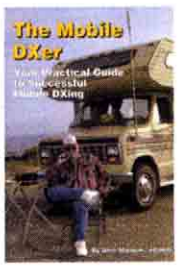

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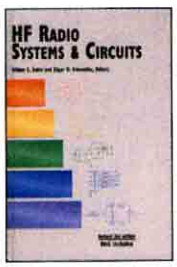

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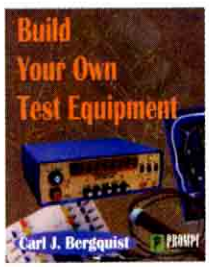

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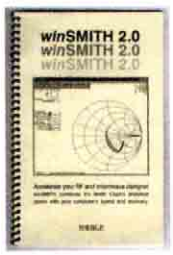

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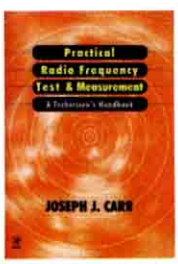

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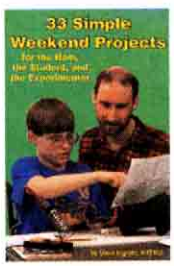

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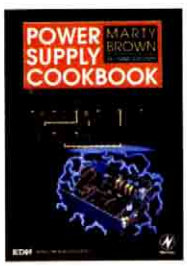

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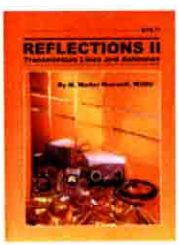

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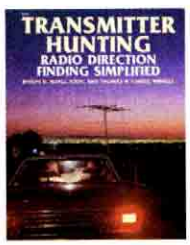

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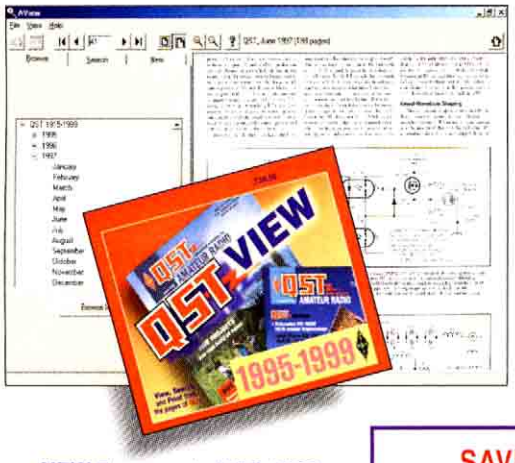

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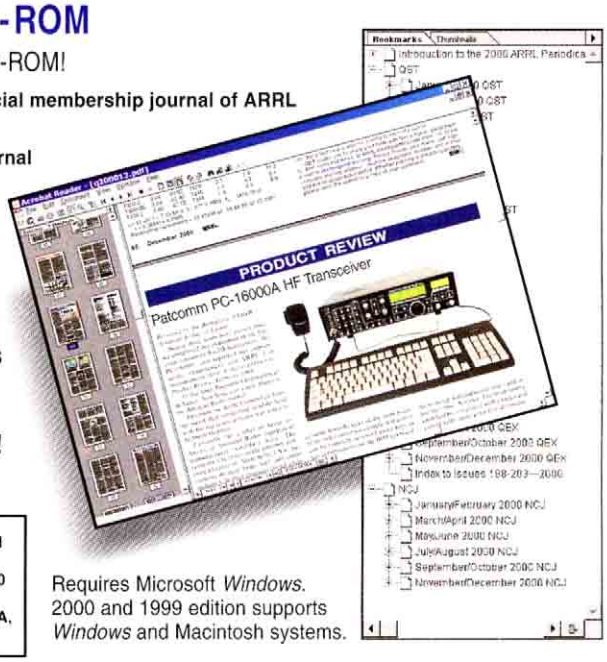

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By Jim Carter, WB6HAG

Build an APRS Encoder Tracker

Could your club or public-service group benefit from an affordable, real-time tracking system that can monitor the location of dozens of fixed or mobile items (people, assets, vehicles, locations, etc) on a high-resolution computer map? Of course! Using the ever-improving automatic position reporting system (APRS), you can now assemble an economical mobile tracking system using off-the-shelf and readily available parts.

The state of the Amateur art is often amazing, and the present-day sophistication and usefulness of the automatic position reporting system, APRS, developed by packet radio guru Bob Bruninga, WB4APR, is a shining example. Using *APRS* software, a simple encoder and *Streets on a Disk*, a professional-grade computer mapping program, you can create a sophisticated mobile tracking and status system that encodes real-time GPS data for transmission by an FM transmitter. This article describes how to construct this system using an FM transceiver or an inexpensive MFJ data radio operating at 144.390 MHz, the 2-meter APRS operating frequency in the US and Canada.

The system permits listeners (workers or volunteers at emergency response centers or other served agencies, for example) to track the location and status of multiple fixed and mobile vehicles (or other assets) using the detailed *Streets on a Disk* mapping program. Using this new system, a simple encoder (microphone- or fixed-mounted) changes the color of a vehicle's icon as displayed on the map to visually alert those monitoring of any changes in status.

During the Southern California 1993 firestorms, I recognized the need for accurate information regarding the location of volunteer amateur operators. I discovered that standard APRS software identifies a volunteer's general location *when* that volunteer has a GPS receiver connected to a TNC and interfaced to an FM transceiver—but the maps that accompanied the DOS version of APRS at that earlier date (*APRS-DOS*) didn't provide the street-level accuracy I required. To remedy this, I found a mapping program (*Streets on a Disk,* which I'll simply refer to as *Streets)* that solved this problem. I contacted Bob Bruninga, WB4APR, the author of *APRS-DOS,* and asked for help in interfacing his program with the new software.

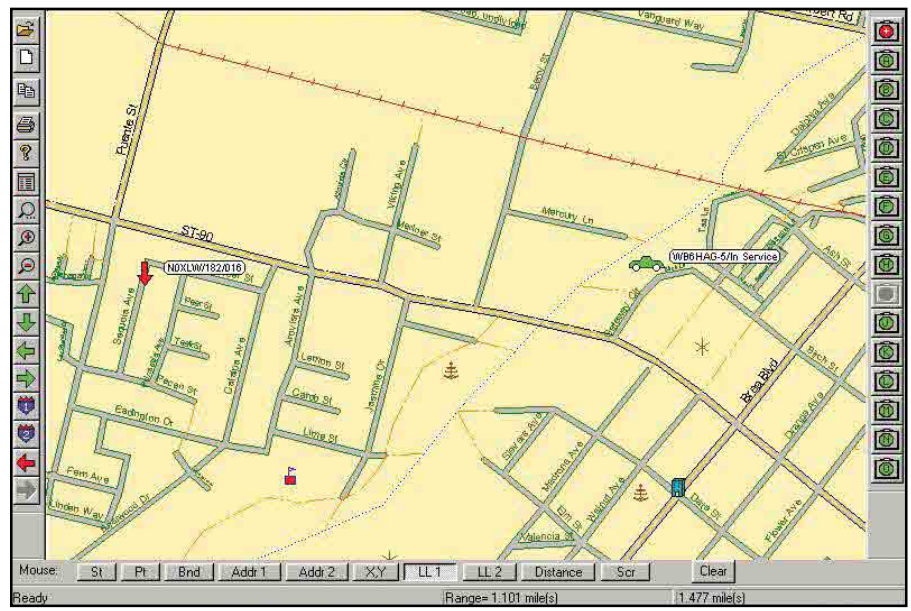

Figure 1—This *Streets on a Disk* map displays two methods of indicating a mobile station's location: with a red arrow (to indicate direction) or with a vehicle icon, in this case, a car. Call signs accompany each indication, and speed and course information accompany arrows, while status information accompanies vehicle icons.

Bob modified *APRS-DOS* to interface with *Streets.* Scott Klynas, of Klynas Engineering (**www.klynas.com**), designed *Streets* to accept latitude and longitude data and other information from an external interface and integrate that information into its mapping system. Thus, the software displays moving vehicle icons with station call signs and other pertinent information defined by the user and *APRS-DOS*. (You can download a demo copy of *Streets* from **www.klynas.com/**

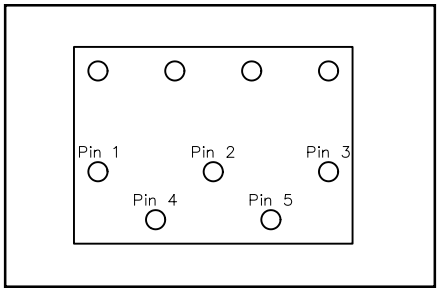

Figure 2—Pin locations of the previously installed DIN connector on the MFJ data radio PCBA.

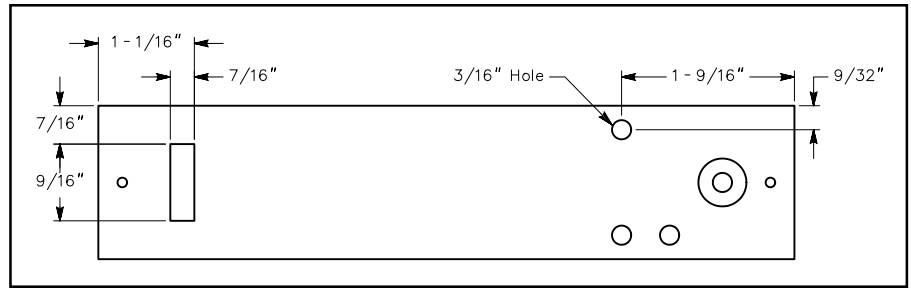

Figure 3—Dimensions for mounting the thumbwheel switch and LED to the front panel of the MFJ data radio.

free.html.)

WB4APR further enhanced his *APRS*-to-*Streets* interface by removing the DOS maps and adding advanced features. (This updated version, *APRS-STS*, is available as a shareware from **ftp://tapr.org/aprssig/dosstuff/APRSdos/aprs-sts.zip**.) *APRS-STS* takes advantage of the status messages generated by inexpensive encoders available from APRS Engineering (Mic-E and MIM modules) and Byonics (TinyTrak), as well as the encoders built into Kenwood TM-D700 and TH-D7 transceivers. *APRS-STS* overlays the encoder status messages onto *Streets* maps.

Thanks to these new capabilities, the vehicle icons displayed on the maps now change color according to decoded status messages. For example, when a vehicle's status is "in-service," the vehicle icon is green; when the status changes to "returning," the icon turns white. Much like the sophisticated systems used by law-enforcement agencies, this feature allows receiving stations to quickly assess a vehicle's operating status. *Streets* shows the eight possible status messages as text, color or both, and displays the "emergency" status in a uniform manner for all vehicle types. That is, instead of displaying a vehicle symbol (car, truck, jeep, etc), a red rectangle with the station's identification and the word "Emergency!" is shown.

To accommodate a greater variety of indicators, *Streets'* icon table was expanded from 64 to 320 fields. Using *Streets* with an optional *GPS.STA* file translates the standard APRS symbol codes from *APRS-STS* and displays them on *Streets* maps (*GPS.STA* is available free with complete instructions from **ftp://www.klynas.com/APRSSTS.ZIP**). APRS symbols include red arrows and vehicle icons that change color according to received status messages. The arrows identify a moving vehicle's direction and speed. (*APRS-STS* translates GPS course and speed information and uses a red arrow to display that information on the *Streets* map.) The red arrow is user-configurable and may be disabled to display the correct APRS vehicle icon.

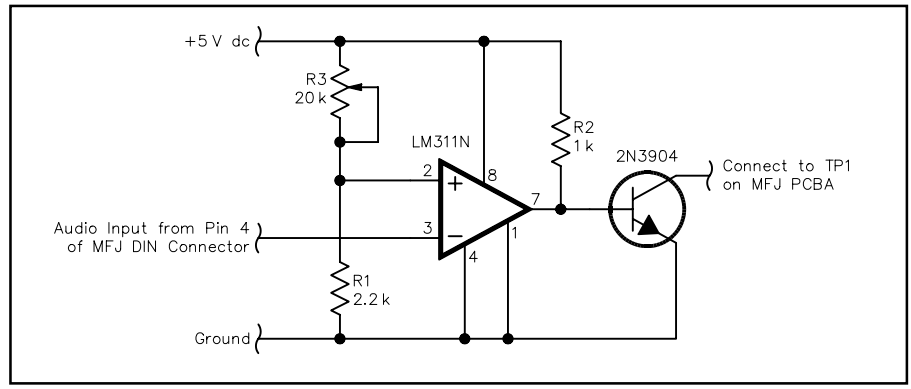

Figure 4—Squelch circuit for the MFJ data radio.

Parts List

Byonics
TinyTrak I with Mic-E Option

Digi-Key
2—1/2-inch male/female threaded hexagonal standoffs, part no. 8401-ND
20-kΩ potentiometer, part no. K4A24-ND
End caps, part nos. CH194-ND and CH195-ND
LM311N-ND IC
Thumbwheel switch, part no. CH185-ND

Garmin
GPS30 magnetic mounting kit (optional)
GPS35-HVS GPS receiver

MFJ
8621-X2 data radio

RadioShack
0.1-µF capacitor, part no. 272-0109 (optional)
1-kΩ, 1/4-W resistor
1N4148 diodes
2.2-kΩ, 1/4-W resistor
2N3904 transistor
8-pin IC socket (optional)
DIP shunt shorting jumpers, part no. 276-1512
Vector board, part no. 276-0148

APRS-STS also translates APRS vehicle symbols to a car or van icon whenever it decodes an encoder status message. This information is transferred to the *Streets* maps and is displayed as various car or van colors with a reference to the status message. Users can disable this option, which causes *Streets* to display the correct vehicle type (rather than a car or van) with its corresponding status color.

Generating the correct status information requires an encoder that's compatible with the Mic-E standard. The APRS Engineering Mic-E/MIM encoder is compatible, but if you use a Byonics TinyTrak encoder you must order the Mic-E option (an additional $5 at press time). The encoders built into Kenwood TM-D700 and TH-D7 transceivers work great, but you may find that the steps required to select status messages to be a bit complex in the field (you have to wade through several menus to make the switch). With a Mic-E/MIM or TinyTrak, you simply flip or rotate a switch to change status messages.

Building the Tracker

Adding a GPS receiver to Kenwood TH-D7 or TM-D700 transceivers and using their built-in Mic-E encoder circuitry is the simplest way of assembling a mobile tracker. Using the transceiver's somewhat cumbersome menu structures

to change status information may be more complex than using a Mic-E/MIM or TinyTrak. So, this article describes how to assemble the simpler system using the encoder with an MFJ 8621-X2 data radio or another 2-meter FM transceiver.

If you choose to use the MFJ VHF Data Radio, Model No. 8621-X2, tuned to 144.390 MHz, you'll need a GPS receiver, an analog-to-BCD converter (a simple BCD thumbwheel switch), a squelch circuit and a Mic-E-compatible encoder assembly. Using your own VHF FM transceiver, you need the same devices minus the squelch circuit.

MFJ 8621-X2 Modifications

Before you tear into your MFJ 8621-X2 data radio to fit the encoder and associated parts, be aware that any modifications—including these—technically void the factory warranty. That said, I used the Byonics TinyTrak encoder for this modification (the APRS Engineering Mic-E/MIM encoder works, too), along with a Garmin GPS35 TracPak 12-channel receiver.

Getting Started

Remove the printed circuit board assembly (PCBA) from the MFJ chassis.

Remove the five-pin DIN data connector and dc power receptacle from the PCBA.

Prepare four insulated #26 wires of different colors, one cut to six inches and the others cut to four inches in length.

In the location where the DIN connector was previously installed, solder separate wires to pin numbers one and three, and two wires (one 6-inch and one 4-inch) to pin number four on the PCBA (see Figure 1 for the pin locations). Identify which colored wire is connected to each pin number. I chose white for pin one (AFSK In), yellow for pin three (PTT), and two blue wires for pin four.

Strip the unconnected end of each wire and twist them all together with the exception of the six-inch wire on pin four. The ends will be soldered later to the squelch circuit and the TinyTrak.

Prepare the following: four #26 wires (two red and two black) cut to six inches in length, and an #18 red and black power-lead pigtail, 12 inches in length.

Connect the red wires to the positive side of the dc power circuit and the black wires to the negative side. Be careful not to short any adjacent circuits while soldering these wires in place and do not install a power connector on the other end of the power cable pigtail until you have reinstalled the PCBA into its metal chassis.

MFJ Metal Chassis Modifications

The MFJ front panel requires a square hole for mounting the BCD thumbwheel switch and a round hole for mounting a yellow LED that indicates when the GPS receiver is locked onto the satellites.

The size of the square hole depends on the size of the BCD thumbwheel switch you use. I used the 10-position BCD cherry thumbwheel switch from Digi-Key (part no. CH185-ND) and its associated end caps (part nos. CH194-ND and CH195-ND). Using this switch assembly requires cutting the square hole at the location with the dimensions shown in Figure 2. Make sure your switch hardware is positioned so it will not interfere with the MFJ PCBA.

Drill a $^{3}/_{16}$-inch hole for the yellow LED at the location shown in Figure 2. Drill the MFJ front cover plate first and use it as a drilling template for the aluminum chassis.

The large hole on the back of the MFJ chassis must be enlarged to 3/4 inch to permit an electrical clamp to be screwed into the chassis. This clamp is used to protect and secure the GPS receiver wires that will be installed later. You may choose another fastener, if desired.

Squelch Circuit Assembly

The MFJ data radio needs a squelch circuit for the encoder to function properly. I found the circuit shown in Figure 4 at various Web sites and made some modifications. It can be built on a vector board from Radio Shack.

This circuit is simple to construct and fits nicely inside the MFJ data radio housing. Its required 5-V dc power is provided by the TinyTrak PCBA, as described in the next section. You can replace potentiometer R3 with a fixed resistor once you determine the value required to set the squelch level, as described in the Testing section below.

Connect the blue wire at pin four of the MFJ DIN connector to pin three of the LM311 IC to provide audio input to the squelch circuit.

Connect the collector of the 2N3904 transistor to TP1, located on the MFJ PCBA near the data DIN connector.

TinyTrak Assembly

Assemble the TinyTrak PCBA according to the instructions provided with the following exceptions: Do *not* install LEDs D3 and D4 and resistors R12 and R13 (see Figure 5). I installed the green LED for D1 and the yellow LED for D2, but attached a six-inch wire pigtail to the yellow LED leads and connected the other end of the pigtail to the TinyTrak PCBA at location D2. Later you will mount this LED into the $^{3}/_{16}$-inch hole drilled into the MFJ radio's front panel and secure it with silicone adhesive. This LED shows when the GPS receiver is locked and providing accurate data.

Only one 1N4148 diode is provided in the kit. You need to purchase or scrounge two more from Radio Shack or elsewhere. When installing D5, install it on end into the PCBA with the band facing toward you and bend its opposite lead into a loop or hook near the body of the diode. Duplicate this process with the remaining two diodes and place their respective ends into mountings holes located near pins 12 and 13 of the IC. The TinyTrak PCBA has a silk-screened "number 1" next to the hole for IC pin 12 and a "number 2" next to the hole for IC pin 13. Once completed, you will have

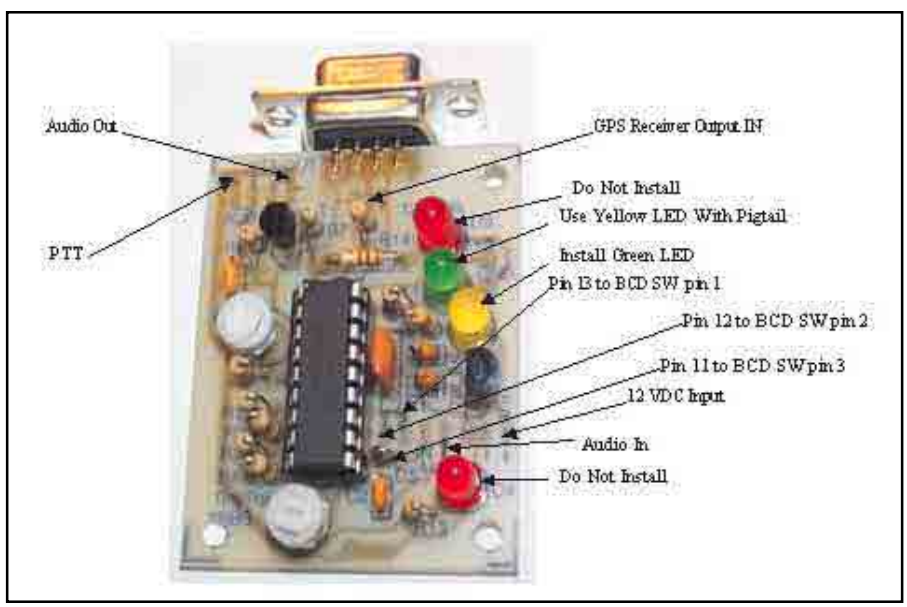

Figure 5—Modified TinyTrak circuit-board assembly.

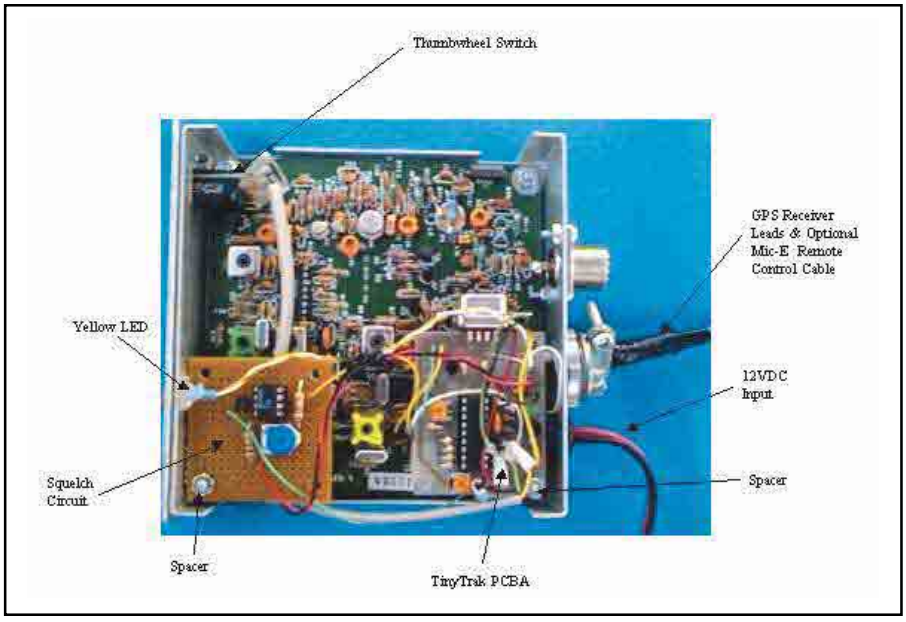

Figure 6—Modified MFJ data radio.

Sources

APRS software and Mic-E Encoder: APRS Engineering LLC, 115 Old Farm Ct, Glen Burnie, MD 21060; **www.toad.net/~wclement/bruninga/mic-lite.html**; **ftp://tapr.org/aprssig/dosstuff/APRSdos/aprs-sts.zip**

TinyTrak: Byonics, Byon Garrabrant, 8378 Granite Mountain Ln, Las Vegas, NV 89129; **www.byonics.com**

Digi-Key Corp, 701 Brooks Ave S, Thief River Falls, MN 56701-0677; tel 800-344-4539, fax 218-681-3380; **www.digi-key.com**

Garmin, 1200 E 151st St, Olathe, KS 66062; tel 913-397-8200, fax 913-397-8282; **www.garmin.com**

Streets on a Disk: Klynas Engineering, PO Box 1818, Santa Maria, CA 93456-1818; tel 805-938-9988, fax 805-938-0988; **www.klynas.com**

MFJ 8621-X2 data radio: MFJ Enterprises, PO Box 494, Mississippi State, MS 39762; tel 800-647-1800, fax 662-323-6551; **www.mfjenterprises.com**

APRS-STS: Jim Carter, WB6HAG, 2029 W Hall Ave, Santa Ana, CA 92704; **ftp://www.klynas.com/APRSSTS.ZIP**

three diodes standing on end near IC pins 11, 12 and 13.

Connect a five-inch length of red #26 wire from the output of the Q2 5-V regulator and a five-inch length of black #26 wire to the ground pad near the Q2 regulator, then twist these wires together. This pigtail will power the squelch circuit. Connect the other ends of the pigtail to the squelch circuit PCBA power input, red wire to 5 V dc and the black wire to ground.

Attach the free ends of the red and black wires from the MFJ PCBA power connection to the 12-V dc input holes on the TinyTrak PCBA.

At this time, program the TinyTrak with your call sign and vehicle token type according to the encoder's instructions.

Sub-Assemblies

Install the MFJ PCB assembly back into its chassis.

Insert the main MFJ PCBA power lead pigtail through the small hole where the power connector was previously located. I used a strain relief purchased from Radio Shack to secure the pigtail in the hole and soldered a two-pin connector to the wire ends.

Solder the antenna bus wire to the SO-239 center connector.

Do not install the two #4-40 nuts on the screws located on the right side of the MFJ PCBA. Instead, use a hexagonal $^1/_2$-inch male/female threaded standoff (Digi-Key part no. 8401-ND) and mount one nut on each screw end. These are used for mounting the squelch circuit and TinyTrak PCBA (see Figure 6). When mounting it (later), make sure you place a piece of insulating material (double-sided tape, cardboard, etc.) between the TinyTrak PCBA and the top of the MFJ's metal coil enclosure that sits below the TinyTrak assembly. Otherwise, you will short its circuitry.

I used a Garmin GPS GPS35-HVS receiver for this project because the receiver is actually embedded into the antenna housing—it's essentially a "plug and play" assembly. I inserted the GPS receiver/antenna cable through the wire clamp mounted on the backside of the MFJ chassis and soldered the black and red power leads to the MJF PCBA 12-V dc connection point mentioned previously. The white lead from this cable is connected to the GPS input on the TinyTrak PCBA. The remaining GPS cable leads are not used.

The remaining wires connected at the MFJ data DIN connector will now be attached to the TinyTrak PCBA. The wire located at pin one (white) is soldered to the "audio out" point, DIN pin three (yellow) is soldered to the PTT point, and pin four (blue) is soldered to the "audio in" point. Mount the TinyTrak PCBA on the standoff nearest the back MFJ housing by using the #4-40 nut that once held the MFJ PCBA in place at that location. The TinyTrak PCBA will rest on an MFJ coil enclosure. Make sure you placed insulating material between the two.

Pre-wire the thumbwheel switch using three #26 wires of different colors (red, green and yellow). Cut them to 12 inches in length and twist them together. Cut a black #26 wire to four inches and solder one end to the switch terminal "C" pad. Solder the red wire to pad two, green to pad four, and yellow to pad eight of the thumbwheel PCBA pads. Pass all the wires through the front of the MFJ panel at the precut switch opening. Solder the black wire coming from terminal "C" to the MFJ's PCBA ground plane. Install the thumbwheel switch into the front side of the MFJ panel opening. Solder the opposite ends of the remaining switch wires to the diodes at Pins 11 (red), 12 (green) and 13 (yellow) on the TinyTrak PCBA. You might want to place shrink tubing onto each wire lead before soldering the wires to the diodes. This will help to eliminate any potential shorts.

The yellow LED, mounted on the six-inch pigtail on the TinyTrak PCBA, is mounted into the MFJ front-panel hole and secured with silicone adhesive.

Use a short piece of wire to connect the squelch circuit input to TP1 on the MFJ PCBA assembly. I used DIP shunt shorting jumpers from Radio Shack (part no. 276-1512) and connected the wire from the squelch circuit input connection to one side and connector TP1 to the other side, located near the DIN connector area. This eliminates any soldering in that area

since the shunt slides nicely over TP1.

Connect pin four of the MFJ DIN connector (blue wire) to pin three of IC, LM311, located on the squelch assembly board. The second wire (blue), located on pin four of the DIN connector, is connected to the TinyTrak audio input pad, and the MFJ DIN connector pin one (white wire) is connected to the TinyTrak audio output pad. This completes the assembly process.

Mount the squelch assembly onto the front standoff in the MFJ housing by using the #4-40 nut that once held the MFJ PCBA in place. Do not install the cover until testing is complete. It's advisable to add an insulator to the top inside cover above the area where the TinyTrak PCBA is located (I used plastic tape). This eliminates any possible shorting between the TinyTrak resistor leads and the top cover.

Testing

Double-check your wiring before applying power, then set the thumbwheel switch to position 0. Attach an antenna to the antenna connector on the MFJ data radio, place the GPS antenna in a location that can "see" the sky as clearly as possible and apply 12 V dc to the MFJ radio's power lead.

Depress the power switch on the MFJ radio. The MFJ power LED will glow and the green LED located on the TinyTrak will flash several times to indicate the firmware is working properly. The yellow LED (mounted on the MFJ front panel) will blink once every second until a GPS signal is locked, then it will glow steadily.

If you used a fixed resistor at R3, you simply have to adjust R9 until the green LED goes off when there is no signal.

If you didn't use a fixed resistor to replace potentiometer R3, adjust R3 until the green LED lights on the TinyTrak PCBA. Next, adjust R9 on the TinyTrak until the green LED goes out. Then, slowly turn R3 in the opposite direction until the green LED comes on again. Use another VHF receiver to monitor 144.390 MHz and adjust R3 so the green light just goes out when no APRS signals is heard on the other receiver. When adjusted correctly, the green LED turns on when a signal is received.

The MFJ data radio should now be transmitting at the prescribed time you programmed into the TinyTrak. If the TinyTrak remains keyed after the transmitter is unkeyed, install 0.1-µF capacitors across the base and emitter of the 2N2222 transistor to ground.

Adjust R6 on the TinyTrak PCBA for proper modulation by using a deviation meter or by listening to your VHF receiver on the other VHF receiver used earlier. If the modulation level is set too high you will hear the tones change pitch, which indicates that the transmitter is clipping the audio. As a result, other stations will not be able to decode your packets.

Once everything is working properly, select a thumbwheel switch setting to indicate your mobile status. The status positions are as follows:

0 = off duty or out of service
1 = en-route
2 = in service
3 = returning
4 = committed
5 = special
6 = priority
7 = emergency
8 = not used
9 = not used

The MFJ radio will now transmit your status based upon the setting of the thumbwheel switch and cause the color of your vehicle icon to change on the *Streets* map to represent your vehicle status.

Install the top cover of the MFJ radio, making sure no circuit assemblies short out to the top cover. Installing insulating material to the underside of the cover prevents this from occurring.

Conclusion

If you experience any problems with *APRS-STS*, *Streets on a Disk*, or TinyTrak products, please contact the respective developers for assistance.

I hope you find this system helpful in your daily activities or during emergency operations at EOC, RACES or ARES events. If you have questions regarding this system, please email me at the address below.

Jim Carter, WB6HAG, is the Product Compliance and Regulatory Manager for Yamaha Corporation of America, where he is responsible for FCC, UL and environmental compliance matters, He received his amateur license in 1963 and holds an Amateur Extra class license, as well as the General Radiotelephone license. An ARRL member, he's active in the Orange County RACES. You can contact the author at 2029 W Hall Ave, Santa Ana, CA 92704; **jecarter@ix.netcom.com**.

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Next New Products

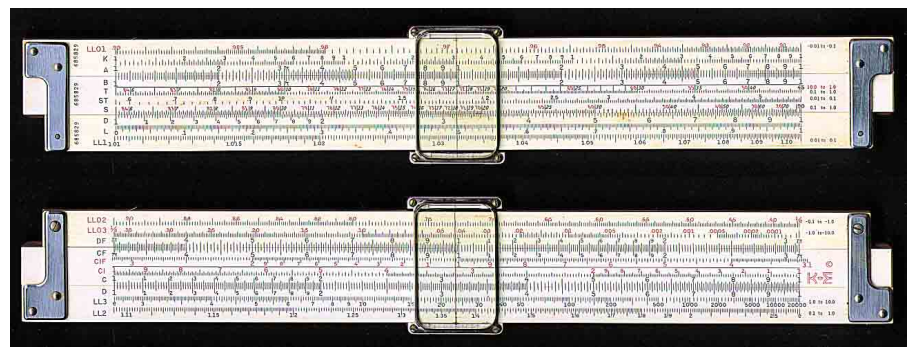
By Brian Wood, W0DZ

The Return of the Slide Rule Dial

Transceivers have long abandoned the elegant convenience of analog slide rule dials. But if you own a Yaesu FT-1000 transceiver, the slide rule dial can live again on your PC. Readers familiar with *Visual BASIC* can also adapt this clever software for other computer-compatible radios.

There's a line in a classic *Star Trek* episode that goes "Here you stand—the perfect symbol of our technical society—mechanized, electronicized, and not very human." The line was spoken by Karidian, once known as the evil "Kodos the Executioner," about Captain Kirk. It could just as easily have been about modern amateur radios. In the "good old days," when Amateur Radio was younger, radios had an ambience (heat, light and smell) that doesn't exist today in our "microprocessorized" versions. (Of course, they also had drift and accuracy problems, contact arcing due to the high voltages, and a lack of features we accept as essential today, but I digress.) I eagerly anticipated the digital revolution that was coming as much as anyone, but I now look back and see that something was lost in the transition—the *information* that was available in the display. This article looks back fondly at the old rigs and offers a modern technological solution for at least some of that missing ambience in the form of a *Visual Basic* program that gives the Yaesu FT-1000 (and potentially other modern radios with RS-232 interfaces) a "slide rule" dial.

"What's a slide rule?" you might ask! If you hit grade school after about 1973, you might never have experienced one. Nestled in history between the abacus and the handheld calculator, they were flat, plastic sticks that slid against each other, with numbers printed on them, and they had a clear, plastic, movable dial with a thin line down the center. They allowed engineers and scientists to make calculations. If you saw the movie *Apollo 13*, you saw NASA engineers using them as



TODD N. TOLHURST, WA1M

Figure 1—Technological antiques: the venerable slide rules.

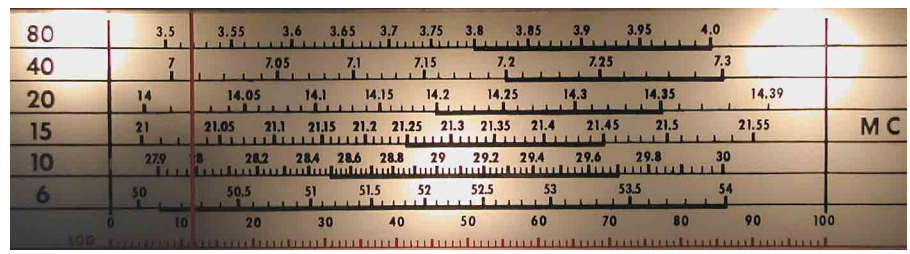


Figure 2—The slide rule dial made famous on the National NC-270.

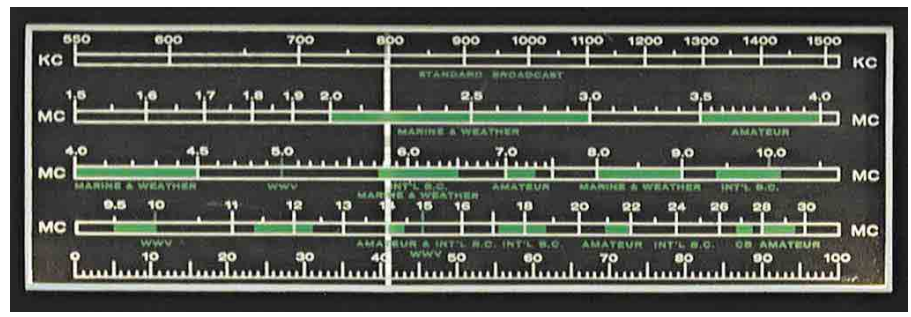


Figure 3—The Heathkit GR-64 dial provided information on location of the ham, marine and weather, standard broadcast and international broadcast bands, and WWV.

men traveled to the moon. How crude, you say! But they worked, they were accurate to about 2 decimal places, and they didn't require batteries. See Figure 1.

Actual vs Displayed Frequency

The frequency tuning mechanism in older radios consisted of a variable capacitor or inductor that was part of the LC circuits in a VFO. When you turned the tuning knob, you weren't putting pulses into a microprocessor that was computing the frequency, outputting data to other circuitry and updating a digital display. You were actually directly varying an oscillator's frequency. The capacitance of a variable capacitor as it is tuned across its range, while predictable, is not linear and also varies slightly from batch to batch, so it was difficult to make a display that accurately represented the rig's frequency. Lots of creative solutions arose, and one of them was the slide rule dial.

The slide rule dial consisted of a vertical "dial pointer" that moved across a long, translucent background that had frequencies printed on it and light bulbs behind. A dial cord was strung around the main tuning capacitor and connected by pulleys to the dial pointer. Great effort was expended to make the frequencies printed on the dial face match the actual frequencies that were being generated or received. Since production variations had to be accounted for, methods of calibrating the dial had to be made available to the user. Thus was born the "100-Kc crystal calibrator," a circuit that injected carriers every 100 kHz across the bands when it was turned on. A tweak to the position of the dial pointer was available to allow the dial to be adjusted at a 100 kHz mark near the operating frequency. Figure 2 shows a National NC-270 dial that was built in this way.

You are Here

Although the slide rule dial was born of necessity, one of its byproducts was the ability to mark the bands with information. As you can see from the NC-270's dial, the locations of phone bands prior to 1968 was visible as thicker lines. The venerable Heathkit GR-64 shortwave receiver (Figure 3) provided information on location of the ham, marine and weather, standard broadcast and international broadcast bands, and WWV. Of course incentive licensing changed the location of the accessible phone bands for some hams, and other rules changes have affected the starting points of the phone bands themselves.

Once radios went "digital", that is, started displaying operating frequency as

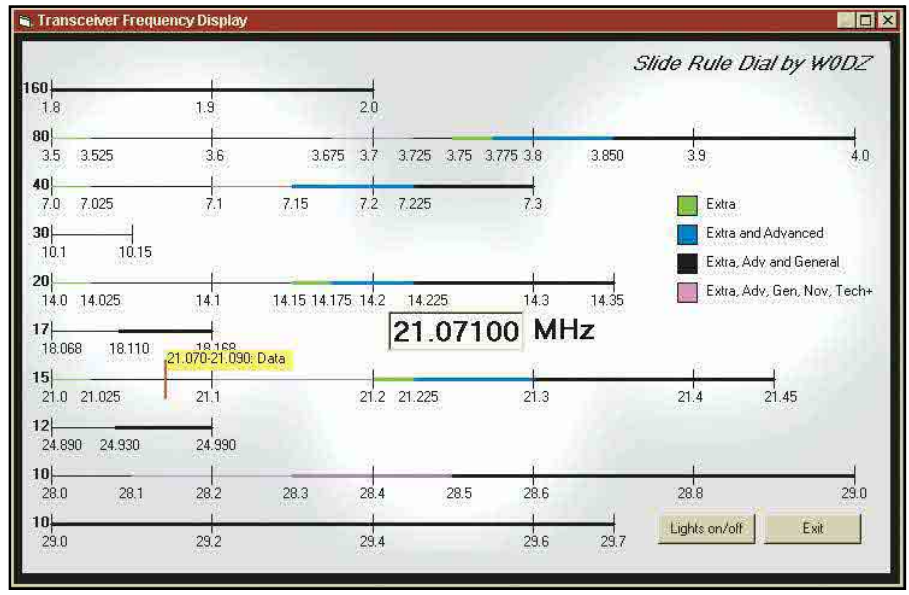


Figure 4—Here's my *Visual BASIC* implementation of a modern "slide rule dial."

```
Private Sub Timer1_Timer()
Dim x() As Byte
Dim Freq As Double
Dim Counter As Integer

    ' Send "Get current operating data" command to FT-1000
    MSComm1.Output = Chr$(0) + Chr$(0) + Chr$(0) + Chr$(2) + Chr$(16)

    ' Wait for buffer full
    ' Note: this is highly dependent on processor speed and ought to be changed,
    ' but it's an easy way to avoid hang-ups.
    Counter = 0
    Do
        Counter = Counter + 1
    Loop Until MSComm1.InBufferCount >= 16 Or Counter > 20000

    ' If no data were read, skip the rest of the routine!
    If Counter >= 20000 Then
        GoTo Skip
    End If

    ' Read data from rig
    x = MSComm1.Input

    ' Calc new freq
    Freq = x(1) * 256 + x(2)
    Freq = Freq * 256 + x(3)
    Freq = Freq * 256 + x(4)
    Freq = Freq / 16
    Freq = Freq / 10 ^ 5
    Text1.Text = Freq

    ' Rest of code to position red dial indicator, pop up voluntary band plan,
    ' and position memory markers goes here.

Skip:
End Sub
```

Figure 5—Code snippet showing how to extract the frequency, band and mode data from the FT-1000 and show the frequency in the text box in the center of the display. The RS-232 interface uses the mscomm32.ocx control, called "MSComm1."

digits, either with Nixie tubes, seven-segment displays or alphanumeric displays, this wealth of information—your *place* in the spectrum—was lost. Today, even the most expensive rig does not show you the edges of the ham bands or sub-bands, or the locations of international broadcast bands. It behooves you to keep a chart handy so you don't inadvertently stumble into the wrong section of a band. The 30, 17 and 12-meter bands are the worst. I can never remember exactly where they are!

Why is this? How did we manage to add so many cool features to our radios, but lose one of the most important? I think you don't have to look too far to see that technology for technology's sake is rampant today. Electronics has matured to the point that we can now make almost anything we want, and we do—without paying attention to the human beings who have to operate them. It's time to restore some of the "humanity" to our technological marvels and make things that do our bidding, not that make us think like a machine. Paradoxically, technology itself can provide the answer.

Technology to the Rescue!

There are several good control programs for PCs and Macs that are available for modern ham rigs. All of them, though, mimic the look of the radio and let you work the controls from the computer. I don't know about you, but I *like* operating my rig—pushing buttons, turning knobs, flipping switches. That's more fun than clicking a mouse. What I want from my computer is to put it to work giving me the information that's missing from my radio. I just want a new display!

With that in mind, I thought it would be fun to write a *Visual BASIC* program that could recreate the ambience of an old radio with a slide rule dial, but that could take advantage of today's technology. The screen shot shown in Figure 4 is the result. The ham bands from 160 through 10 meters are shown, and the various sub-bands for each class of license are also shown. Even the voluntary band plans are shown; as you pass through the relevant section of a band, a popup text box explains the details (one example of which is shown in the screen shot). As with the NC-270, the phone bands have a thicker line marking their location, but they're color coded to show the incentive licensing sub-bands. Unlike the radios of old, modern radios don't have a logarithmic effect; the displayed frequency changes at a constant rate as you move the dial. I even threw in a "backlit" display—a background image (jpeg), created using Adobe *Photoshop*, which mimics three light bulbs behind the display. There's a button at the bottom to turn the "bulbs" on and off (and these bulbs will never burn out!). Since the band edges are likely to change again in the future, the program is written to allow reasonable modifications, although they aren't necessarily trivial.

The program's dial pointer is a red, vertical line that moves across the operating band. On old radios, when you changed bands the pointer stayed put, so you ended up on whatever frequency the pointer happened to be pointing to—sort of a "mechanical memory." With electronic memories, this is not true today, so the dial pointer does not need to run the full height of the display. As you change bands, a marker is deposited at the last location of the pointer and the pointer moves to the memorized location on the new band. Since the program was written for a rig that has two memories for each band (called the "front" and "rear" memories), two markers, one blue and one green, can be deposited on each band. When you return to a band, the relevant marker is replaced with the moving red dial pointer.

Program Details

I wrote this program to work with a Yaesu FT-1000MP, but it could be adapted to virtually any modern rig. As shown in the code snippet in Figure 5, it doesn't take much code to output a command to the rig that asks, "What band, mode and frequency are you on?" and then get the reply. Note that this code is placed inside a timer event that is set to occur every 100 ms, so that the display can keep up with the user.

The FT-1000MP returns binary data that must be converted into a useful number, but once you have the band, mode and frequency from any rig, the rest of the program would remain essentially the same.

By the way, I discovered while writing this program that the FT-1000MP manual, at least mine, dating back to 1999, is wrong—the frequency is returned as a pure binary number in several bytes, not binary-coded-decimal as the manual shows. It took some experimenting to figure out what was really coming back from the rig! I also discovered that there's no way to read the front/rear band information, which means the program must start without any markers on the screen; you have to go through the bands once to "teach" the *Visual BASIC* program where the memories are. For the same reason, you also have to stick to a strict discipline of using a different mode for the front and rear memory so the program can tell that you've pushed the button!

Visual BASIC programs are hard to print because of the large number of graphical properties that are attached to each object, so it is impractical to print the program in this article. However, I'll be happy to provide the source code and/or the executable free by e-mail (**w0dz@arrl.net**). If you don't have e-mail, send a floppy disk and an SASE to the address shown below.

As a final note, I'd like to implore ham radio manufacturers to think more about the displays they put in the next generation of radios. Many new radios have larger displays with spectral information, but they still don't show you band edges or other information. Let's see some more information content in the displays!

You can contact the author at 710 Grove Ct, Loveland, CO 80537; **w0dz@arrl.net**. QST

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Previous • Next New Products

By Rich Wadsworth, KF6QKI

A Portable Twin-Lead 20-Meter Dipole

With its relatively low loss and no need for a tuner, this resonant portable dipole for 14.060 MHz is perfect for portable QRP.

My first attempt at a portable dipole was using 20 AWG speaker wire, with the leads simply pulled apart for the length required for a 1/2 wavelength top and the rest used for the feed line. The simplicity of no connections, no tuner and minimal bulk was compelling. And it worked (I made contacts)!

Jim Duffey's antenna presentation at the 1999 PacifiCon QRP Symposium made me rethink that. The loss in the feed line can be substantial, especially at the higher frequencies, if the choice in feed line is not made rationally. Since a dipole's standard height is a half wavelength, I calculated those losses for 33 feet of coaxial feed line at 14 MHz. RG-174 will lose about 1.5 dB in 33 feet, RG-58 about 0.5 dB, RG-8X about 0.4 dB. RG-8 is too bulky for portable use, but has about 0.25 dB loss. For comparison, *The ARRL Antenna Book* shows No. 18 AWG zip cord (similar to my speaker wire) to have about 3.8 dB loss per 100 feet at 14 MHz, or around 1.3 dB for that 33 feet length. Note that mini-coax or zip cord has about 1 dB more loss than RG-58. Are you willing to give up that much of your QRP power and your hearing ability? I decided to limit antenna losses in my system to a half dB, which means I draw the line at RG-58 or equivalent loss.

TV Twin Lead

It is generally accepted that 300 ohm ribbon line has much less loss than RG-58. Some authors have stated that TV twin lead has similar loss as RG-58, which is acceptable to me. A coil of twin-lead is less bulky and lighter than the same length of RG-58. These qualities led me to experiment with it. One problem is that its 300 ohm impedance normally requires a tuner or 4:1 balun at the rig end.

But, since I want approximately a half wavelength of feed line anyway, I decided to experiment with the concept of making it an exact electrical half wavelength long. Any feed line will reflect the impedance of its load at points along the feed line that are multiples of a half wavelength. Since a dipole pitched as a flat-top or inverted V has an impedance of 50 to 70 ohms, a feed line that is an electrical half wave long will also measure 50 to 70 ohms at the transceiver end, eliminating the need for a tuner or 4:1 balun.

To determine the electrical length of a wire, you must adjust for the velocity factor (VF), the ratio of the speed of the signal in the wire compared to the speed of light in free space. For twin lead, it is 0.82. This means the signal will travel at 0.82 times the speed of light, so it will only go 82% as far in one cycle as one

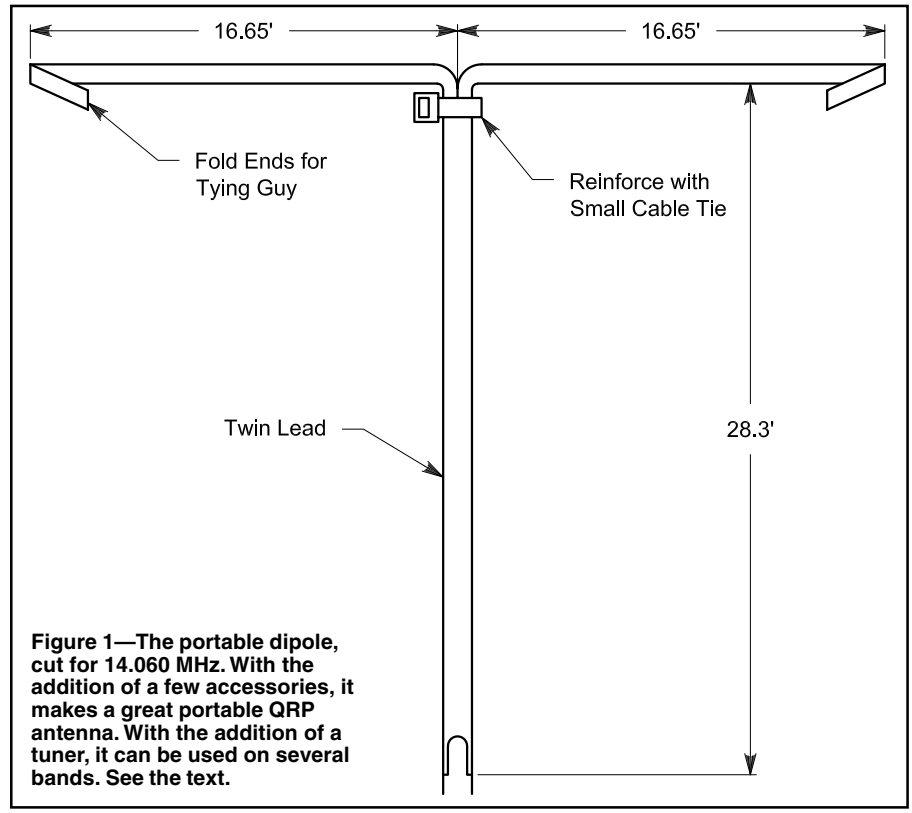


Figure 1—The portable dipole, cut for 14.060 MHz. With the addition of a few accessories, it makes a great portable QRP antenna. With the addition of a tuner, it can be used on several bands. See the text.

would normally compute using the formula 984/f(MHz). I put a 50 ohm dummy load on one end of a 49 ft length of twin lead and used an MFJ 259B antenna analyzer to measure the resonant frequency, which was 8.10 MHz. The 2:1 SWR bandwidth measured 7.76 to 8.47 MHz, or about 4.4% from 8.10 MHz.

The theoretical 1/2 wavelength would be 492/8.1 MHz, or 60.7 feet, so the VF is 49/60.7=0.81, close to the 0.82 that is published. A 1/2 wave for 14.06 MHz would therefore be 492×0.81/14.06 or 28.3 feet. I cut a piece that length, soldered a 51 ohm resistor between the leads at one end, and hoisted that end up in the air. I then measured the SWR with the 259B set for 14.060 MHz and found it to be 1:1. I used the above-measured 2:1 bandwidth variation of 4.4% to calculate that the feed line could vary in length between 27.1 and 29.5 feet for a 2:1 maximum SWR.

Now comes the fun part. With another length of twin lead, I cut the web between the wires, creating 17 ft legs, and left 28.3 feet of feed line. I hung it 30 feet high, tested, and trimmed the legs until the 259B measured 1:1 SWR. The leg length ended up at 16.75 feet. (Note: The VF determined above only applies to the feed line portion of the antenna.) There is no soldering and no special connections at the antenna feed point. I left the ends of the legs an inch longer to have something to tie to for hanging. I reinforced the antenna end of the uncut twin lead with a nylon pull tie, with another pull tie looped through it to tie a string to it for using as an inverted V. To connect the feed line to the transceiver, I used a binding post-BNC adaptor that is available from Ocean State.[1] My original intention of leaving the feed line free of a permanent connector was to allow connection to an Emtech ZM-2 balanced antenna binding post connectors. Since then I have permanently attached a short stub of RG-58 with a BNC, because I plan to either use it with my single band 20 meter Wilderness Radio SST, or with an Elecraft K1 or K2 with built-in tuner. I did this by connecting the shield to one side of the twin lead and the center conductor to the other side—no balun was used between the coax and twin lead.

After a year or so of use and further field testing, including different heights and V angles, I further trimmed the legs to a length of 16.65 feet. I found that the lowest SWR was usually obtained with the V as close to 90 degrees as I could determine visually.

[1]Ocean State Electronics, 6 Industrial Dr, Westerly RI 02891, tel 800-866-6626 or 401-596-3080; fax 401-596-3590; e-mail: ose@oselectronics.com.

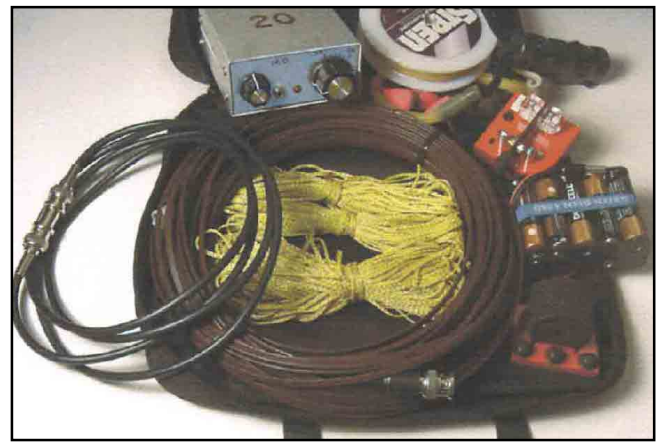


Figure 2—The author's portable station, including twin-lead dipole, 20-meter Wilderness Radio SST transceiver and support line. It all fits in the 8″×10 1/2″×2″ Compaq notebook computer case.

Also, I found that the resonant frequency (or at least the frequency at which SWR was at a minimum) is lower if the antenna is closer to the ground, and vice-versa. For example, with the top of the V at 22 feet, the lowest SWR was measured at around 13.9 MHz, and with the top of the V at 31 feet, SWR was lowest at around 14.1 MHz. In both cases, SWR at 14.060 did not exceed 1.3:1.

I used Radio Shack 22 AWG twin lead that is available in 50 ft rolls. To have no solder connections, you need at least 45 feet. When I cut the twin lead to make the legs, I just cut the "web" down the middle and didn't try to cut it out from between the wires. It helps make the whole thing roll up into a coil, and the legs don't tangle when it's unrolled, since they're a little stiff. It turned out that the entire antenna is lighter than a 25 ft roll of RG-58. This antenna can be scaled up or down for other frequencies also. An even lower loss version can be made with 20 AWG 300 ohm "window" line, though the VF of that line is different and should be measured before construction.

How High?

Wait, you say—"After all that talk about having it a half wave up, you only have it up 28 feet." A 6 or 12 ft RG-58 jumper, available with BNC connectors from RadioShack, can be used to get it higher if the right branch is available. Since impedance at the feed point is 50 to 70 ohms, 50 ohm coax can be used to extend the feed line. I have used it in the field a few times as an inverted V, at various heights and leg angles, and used an SWR meter to double-check its consistency in different situations. SWR never exceeded 1.5:1, so I feel safe leaving the tuner home. For backpacking, I leave the SWR meter home, too!

And there's a bonus: Since it has a balanced feed line, it *can* be used with little loss as a multi-band antenna, with a tuner, from 10 to 40 meters. I quote John Heyes, G3BDQ, from *Practical Wire Antennas*, page 18: "Even when the top of the doublet antenna is a quarter-wavelength long, the antenna will still be an effective radiator." Heyes used an antenna with a 30 ft top length about 25 ft off the ground on 40 meters and received consistently good reports from all Europe and even the USA (from England). It will not perform as well at 40 meters as at 20 meters, however, though 10 through 20 meters should be excellent.

Testing, Testing

To test this theory, I recently worked some of Washington State's Salmon Run contesters and worked many Washington hams and an Ohio and a Texas station on 15 and 20 meters, with the antenna up 22 feet on a tripod-mounted SD20 fishing pole, using 10 W from an Elecraft K2 from central California. The K2 tuner was used to tune the antenna on 15 meters. Signal reports were from 549 to 599. Unfortunately, this was a daytime experiment and 40 meters was limited to local traffic.

At the 2001 Freeze Your Buns Off QRP contest, it was hung at 30 feet and compared to a 66 ft doublet up 50 feet on 10, 15 and 20 meters, using a K2 S-meter. There was little if any difference. At the 2001 Flight of the Bumblebees QRP contest I compared it, at 20 meters, to a resonant wire groundplane antenna with each antenna top at 20 feet and found it to consistently outperform the groundplane. I have concluded through these informal experiments that a resonant inverted V, when raised at a height close to or exceeding a half wavelength, produces the most "bang for your buck" and that extra length or height beyond that yields diminishing returns.

A ham since 1998, Rich Wadsworth, KF6QKI, is a civil engineer in private practice as a consultant. Since earning his license, he reports, that he has become obsessed with kits and homebrewing. You can reach Rich at 320 Eureka Canyon Rd, Watsonville, CA 95076; richwads@compuserve.com.

By Doug Smith, KF6DX

Digital Voice: An Update and Forecast

Having read the background information in my article last month,[1] you may be asking, "That's fine, but what are hams doing with digital voice now? What can we expect in the future?" Well, I am back to tell you what I have learned about that since writing the last article.

Things are definitely warming up on the digital voice front. Hams have fielded working systems and interest is growing. There is still a lot of work to be done, but the use of digital voice technology in Amateur Radio is rapidly expanding.

Amateur Digital Voice Systems

G4GUO and Friends

As reported last time, Tucson Amateur Packet Radio (TAPR) is producing a digital voice coder/decoder ("vocoder"). Charles Brain, G4GUO, and Andy Talbot, G4JNT, began work on that design in 1998.[2] They sorted through the coding algorithms available and decided on an advanced multi-band excitation (AMBE) vocoder from Digital Voice Systems, Inc (DVSI). AMBE vocoders are available in chip form and the algorithm, coded for several popular DSP platforms, is available for licensing from the manufacturer.[3] As explained previously, AMBE vocoders attain good voice quality at low bit rates by using advanced parametric speech-coding methods.

Charles and Andy chose a Microchip 17C44JW PIC microcontroller for their design to do the data handling and control. The circuit also has a Motorola MC14LC5480P μ-law coder. μ-law extends the dynamic range of the system (see previous article). Using the forward error-correction (FEC) facility of the AMBE chip, Charles and Andy operated the system using 2400 bits/s for voice; an additional 1200 bits/s were necessary for the FEC, producing a final bit rate of 3600 bits/s.

3600 bits/s is a fast rate for HF and a 36-tone PSK modem was used for initial testing. The system requires no feedback from the listener. It can therefore be operated with one talker and many listeners. It is capable of full-duplex operation.

By March 1999, Charles and Andy had made their first digital voice contact on the 40-m band over a 70-km path. They report that when signal-to-noise ratio (SNR) was 25 dB or better, it sounded like a telephone conversation—no background noise whatever, except for the "comfort noise" inserted by the vocoder itself. Lower SNRs produced degradation in some proportion.

At the time of this writing, the TAPR kit is in its beta test phase and does not include a modem. Modems are readily available, though, for VHF-and-above work that will sustain data rates up to 9600 bits/s. The vocoder may be programmed to operate at various slower rates for experimentation. Contact TAPR for more information.[4]

Work continues at G4GUO on high-speed HF modems having sophisticated error-correction schemes. We can expect

[1]Notes appear on page 41.

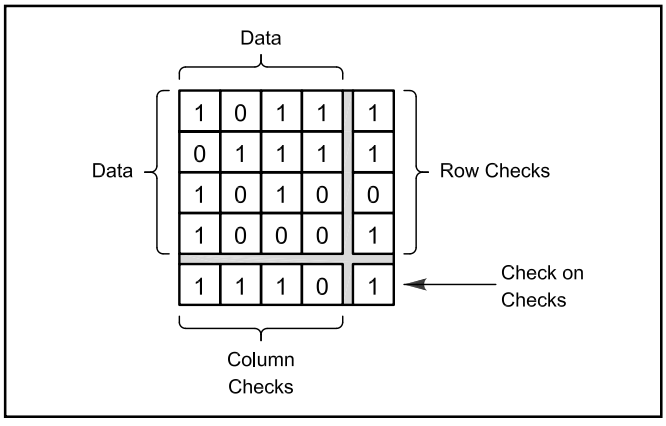


Figure 1—An example of iterated coding.

Figure 2—505RC remote-control setup.

Charles' work to benefit data communications as well as digital phone. We are finding that many digital voice schemes tolerate up to about 1% data loss without seriously affecting performance.

The KF6DX Remote Control

Also in 1998, I designed a remote-control system for the Kachina 505DSP transceiver called 505RC that employed digital voice techniques. I arranged the system for operation over either telephone lines or dedicated data radios.

I chose a continuously variable slope-delta (CVSD) vocoder, the MX-COM MX609. CVSD was discussed in the previous article and also in *QEX*.[5] It is a waveform vocoder that aims at exact reproduction of the input signal; AMBE is a parametric vocoder that focuses on reproducing the correct time spectrum of its input. AMBE operates well at bit rates of less than one-quarter those of CVSD, but CVSD is very simple and inexpensive. The MX609 does not require any programming by a microprocessor and the chip needs only 5 V dc, audio and serial data in and out, and a crystal to run. CVSD also does not require synchronism between talker and listener other than reasonable clock accuracy.

I wanted to be able to send command and control data along with the voice data over the control link, as well as some telemetry and feedback to and from the transceiver. I arranged to time-multiplex the command, control and telemetry data with the voice data, producing a single serial bit stream. I added synchronization bits to allow the demultiplexer to sort out the parts of the data stream. I used an error-correction scheme called *iterated coding*.[6]

Iterated coding is a fairly simple block code that can detect and correct a single bit error in the encoded block. Checksum bits are computed for all rows and columns in the block, modulo-2. See Figure 1. A check bit is also computed for the row and column containing the other check bits—a sort of check on the checks. For a block of M bits, it requires $2M^{1/2}+1$ additional bits to be sent. An input block of 49 bits, for example, results in a coded block of 64 bits.

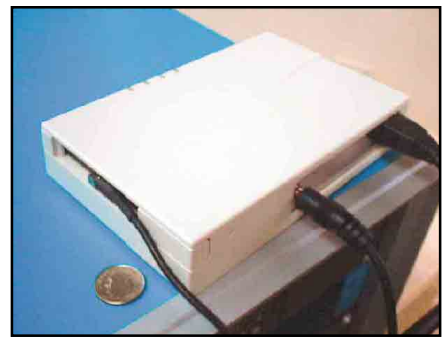


Figure 3—Lucent EC/S high-speed data radio.

The serial bit streams in and out of the control unit are passed to the data radios at standard EIA-232 rates up to 38.4 kbits/s. At that highest rate, about 26.4 kbits/s are used for digital voice and 12.0 kbps for telecommand data and coding overhead. The audio quality of CVSD at 26.4 kbits/s is reasonably good, attaining a mean opinion score (MOS) of almost four out of a possible five. I made the audio bandwidth proportional to the data rate; it is about 2.7 kHz at the highest rate. In addition, the system supports three discrete serial command/control channels, also at EIA-232 standard rates. It uses one channel to control the transceiver (using software running on a PC) and the other two may be used to control an antenna rotor control and a RTTY modem, for example. Five ancillary open-collector outputs are also provided. Those are good for turning power on and off to a solid-state amplifier or for operating a digital antenna switch. Figure 2 shows one of the remote-control units. A complete system requires two units: one at the control point and one at the transceiver site.

I used data radios originally intended for Part-15 use on the 900-MHz industrial, scientific and medical (ISM) band. I finished with a pair of 2.4-GHz ISM radios from Lucent (model EC/S) having serial input and output (see Figure 3). They produce about 35 mW of transmit power and are capable of passing 11 Mbits/s of data in half-duplex—overkill! But they are reasonably inexpensive and they work well over a 5-km path with 24-dB-gain, grid-dish antennas when forced to 1 Mbit/s pseudo-full-duplex. Full-duplex operation is simulated by switching the radios rapidly between transmit and receive. The switching times of the Lucent radios are on the order of a microsecond. It is neat to operate remotely—my system works well enough that it is hard to tell that the radio isn't in front of you.

The WK6F Remote

Ken Beals is WK6F and he, too, chose CVSD for his remote-control system.[7] He began work on his design while at Cal State, Chico in 1994, but the results were not published until 1999. The vocoder chip chosen is the Motorola MC3418. He uses 10-GHz Gunnplexer transceivers for the control link and separate channels for control and voice data. A 4-5 MHz subcarrier is modulated with the digitized voice data and the control channel supports up to 115 kbits/s. Both channels are full-duplex.

Ken did a beautiful job (see Figure 4) and he predicts the system would work well over a 40-mile line-of-sight path with decent antennas. I was unaware of his work until I jumped on the *QEX* bandwagon. Check out his article (see Note 7).

APCO 25

APCO 25 is a standard that provides digital voice and messaging to the public-service community. The system incorporates AMBE vocoders at VHF and above. Both APCO and ARRL understand there may be a need for interoperability using those rigs during emergencies and at least one group of amateurs, the Motorola Amateur Radio Club of North Texas (MARC), has been using the technology in the Fort Worth, Texas area since August 2001. They have installed a Motorola Quantar repeater at their facility that is compatible with the APCO 25 standard.

Harold Reasoner, K5SXK, reports that the Fort Worth chapter of the Texas VHF-FM Society gained access to APCO 25 mobiles and hand-helds for testing purposes through its relationship with MARC. The Quantar repeater operates in both digital voice and traditional analog voice modes. When asked to rate the

Figure 4—WK6F's remote-control units.

Figure 5—Motorola APCO 25 mobile and hand-held transceivers.

voice quality of the APCO 25 system on a scale from zero to five, Harold said: "It's near a five when you're in range. When traditional analog modes are getting noisy, the APCO 25 radios remain virtually noise-free." Testing by users shows that the coverage area is consistently greater when operating in digital mode than in analog mode, although quality tends to fall off rapidly at the extremes of the coverage area.

The APCO 25 mobile rigs cover portions of the two-meter amateur band, plus public-service frequencies in the range 148-174 MHz. They put out 75-80 W on 2 meters (see Figure 5). Occupied bandwidth as configured in digital voice mode is virtually the same as that of a normal, 5-kHz-deviation analog signal. The equipment can also operate on 12.5-kHz channels. Motorola programmed the frequencies and certain digital group codes into the units. The group codes allow selective reception of messages intended only for a particular group. According to Harold, Motorola has recently announced a voice-over-IP (VoIP) option for APCO 25 systems operating in the 800-MHz, 821-MHz and the newly allocated 700-MHz public-safety bands. The implication is that the units can be tied into IP networks or through the Internet.

Although APCO 25 radios are more costly than regular amateur rigs, the standard may catch on with more hams as they and public-safety officials work together to meet increasing demands.

Alinco's Digital Voice System

Several months ago, Alinco announced a digital voice option for some of their VHF and UHF transceivers.[8] Their DJ-596 dual-band hand-held (see Figure 6) and DR-135, -235 and -435 mobiles may be fitted with digital voice units. Models EJ-40U and EJ-43U use—you guessed it—CVSD and Gaussian minimum-shift keying (GMSK) modems employing the V.32 modulation standard. CVSD audio is transmitted at 14 kbits/s.

Alinco spokesman Jeff Reinhardt, AA6JR, describes the system as "purely experimental" and "a transitional step." That may mean Alinco has something even greater in mind for the future.

Other Systems from Japan

Others in Japan are right there with digital voice technology, too. Last year at Ham Fair 2001, three organizations displayed prototype digital transceivers (see Figure 7). Both ICOM and Kenwood demonstrated 23-cm (1.2 GHz) digital transceivers. The ICOM unit is designed to operate at 8 kbits/s in digital voice mode and at 128 kbits/s in data mode. It also includes a regular, analog FM phone mode. For digital voice, the rig uses a G723.1 vocoder (code-book-excited linear-prediction coding, or CELP) and it even sports a 10Base-T network interface. Both digital modes utilize a GMSK modem. Digital voice sensitivity is listed as only 6 dB worse than in analog FM mode. How that sensitivity was determined is not known. Maximum transmit power is 10 W.

Kenwood also showed a prototype 23-cm digital transceiver, operating digital voice using AMBE at 2.4 kbits/s and a GMSK modem. Specifications and other details were not available at the time of this writing.

Also shown were 23-cm and 3-cm (10-GHz) digital terminal equipment, including a digipeater. It looks as if those units are intended for use for high-speed networking applications, perhaps using TCP/IP. Further details were not available. For an English translation of a short *CQ Ham Radio* article on that part of the show, visit **www.arrl.org/tis/info/digivoice.html**.

Digital Audio Broadcasting and IBOC

In mid-2001, the International Telecommunication Union (ITU), an arm of the United Nations, approved certain systems as standards for digital audio broadcasting.[9] One of these systems allows the simultaneous transmission of both a standard AM signal and a digital audio signal. Such in-band, on-channel (IBOC) systems are thus compatible with existing analog AM receivers and also supply an enhanced digital audio signal.

The appearance of digital audio on international broadcasting channels will soon give rise to a new crop of digital short-wave receivers. Only a few stations are experimenting with those systems now; but it is expected that soon, many more will join in. Some hams believe we can learn something from the technology, too.

Michael Schulhof, K1OKI, reports that one of the early developers of technology for digital audio broadcasting is Thales Corporation (formerly Thomson CSF), a French company. "Their approach to HF digital audio and their participation in developing the ITU standards have been vigorous from the beginning," Michael said.

According to Schulhof, the Thales system has already been tested in an occupied bandwidth of 3 kHz, which makes it a likely candidate for Amateur Radio trials. A subset of MPEG-4 AAC (advanced audio coding, a form of parametric vocoder) is used. Like other digital audio broadcasting systems, it uses orthogonal frequency-division multiplexing (OFDM) modulation. OFDM is another multiple-sub-carrier method that is getting attention among digital TV designers. The Thales scheme includes error correction and can handle either monaural or stereo sound in its preferred embodiment.

Amateur Radio transatlantic trials are in the planning stages at the time of this writing. Schulhof, the former Chairman and CEO of Sony Corporation of America, also points out that the Thales system satisfies a requirement for fast signal acquisition as the receiver is tuned. He added, "Hams will eventually be seeing it show up in manufacturers' specifications."

Michael Schulhof holds a PhD in physics from Brandeis University and was instrumental in introducing to the public many of the digital services we now take for granted. He has been continuously involved in Amateur Radio since 1958. He currently runs a private investment firm in New York.

Voice Quality Evaluation

In its recent report to the ARRL Technology Task Force, the ARRL Digital Voice Working Group (DVWG) recommended some standards for voice-quality evaluation of digital voice systems.[10] Those standards are based on the subjective judgments of listeners. The term subjective means that questions are asked of the listeners and voice quality is rated based on their answers.

The ITU is working with KPN Research of The Netherlands and British Telecom to refine a standard for the objective measurement of voice quality.[11] The term objective means that physical measurements are taken of the original and decoded signals and a complex numeric analysis is used to determine voice quality. Researchers are designing their algorithms carefully so that the results correspond closely to the kind of subjective evaluation proposed by the DVWG.

When evaluations must be made continually over short time frames, say every five minutes, objective measurement wins over subjective by a long way. It is quicker

to make some physical measurements than to ask a bunch of listeners how something sounds. Objective measurements are inherently repeatable and can be done by those having the necessary test equipment and computing power. Objectivity is difficult to achieve, though, when you are considering what someone hears or does not hear. Much work remains to be done; but I am confident that as far as human-hearing traits can be identified, they can also be formulated.

What Else Does the Future Hold?

It is not easy to predict the future; but within the realm of digital voice, we see some very interesting possibilities on the horizon. Consider the following ideas as examples and not as an exhaustive list.

Much work in the coming years will focus on improving the quality and robustness of digital voice communications. HF is an especially difficult medium to tame and Amateur Radio experimenters will continue to work on high-speed data transmission and digital voice through it, alongside digital broadcasters. That is a reassuring prospect, since we may find the results valuable the next time someone asks, "What have you done with the spectrum lately?" That same thought applies equally well to the rest of our allocations.

Unlike broadcasters, though, amateurs can consider the possibility of transmitting digital voice at a slow rate, then speeding it back up at the receiver. That opens the door to narrower bandwidths that allow greater distances to be covered. It would not surprise me to see Earth-Moon-Earth (EME) voice contacts become commonplace that way—as long as you are willing to wait! Additionally, transmissions may be sent many times to achieve a large measure of FEC, accomplishing the same thing (long time integration). I wonder what that will do to voice contests and distance records.

Hams and other users may be willing to accept less than perfect voice quality in return for other capabilities and services. The embedding of coded identifiers in digital voice transmissions suggests some very exciting possibilities. For example, those codes could be used to identify source and destination addresses for messages, extending store-and-forward capabilities to users. In fact, TCP/IP and other packet schemes may be attractive for digital voice on certain bands. Equipment is out there now for wireless networking systems. We could be using it to occupy the 33-cm, 13-cm and 5-cm bands and to exploit our privileges there before commercial interests overrun them.

Embedded codes could also provide feedback about propagation conditions. For example, a spread-spectrum user could arrange to reduce his transmit power to the minimum based on feedback from the listener, in accordance with the new FCC rules regarding that mode. During a CQ call, those same types of codes might indicate the caller's areas of interest or that the call is directed at a particular country or group.

Through multiplexing techniques that are currently widespread in cellular telephone systems, more than one QSO could be supported simultaneously through digital repeaters or "digipeaters." The same thing applies to satellite operation. Code-division multiple-access (CDMA) and time-division multiple-access (TDMA) are proven technologies that may go well with digital voice over Amateur Radio.

A movement is afoot to tie Amateur Radio networks together with the global Internet. That is already providing unparalleled robustness and redundancy to critical communications systems. We can bolster our public-service value and enhance our enjoyment by continuing to expand and enhance such cross-connections. Would it not be neat to operate through your repeater in San Diego and work a handheld station in New Zealand? Or anywhere your embedded codes indicate you want?

Finally, detection and correction of multipath distortion on digital links is an area ripe for experimentation. Amateur Radio is already in the thick of it.[12] Who says we're not on top of the technology, eh?

Figure 6—Alinco DJ-596 transceiver.

Figure 7—Prototype digital radios shown recently in Japan.

Acknowledgment

Many thanks to Michael Schulhof, K1OKI and Harold Reasoner, K5SXK for their contributions to this article. Belated thanks to Allan Kaplan, W1AEL and the DVWG for reviewing drafts of my articles.

Notes

[1]D. Smith, KF6DX, "Digital Voice: The Next New Mode?" *QST*, Jan 2002.

[2]C. Brain, G4GUO, and A. Talbot, G4JNT, "Practical HF Digital Voice," *QEX*, May/Jun 2000.

[3]Digital Voice Systems, Inc, 234 Littleton Rd, Westford, MA 01886, tel 978-392-0002, **www.dvsinc.com**.

[4]Tuscon Amateur Packet Radio, 8987-309 Tanque Verde Rd, Tucson, AZ 85749-9399, 940-383-0000, **www.tapr.org**.

[5]D. Smith, "Signals, Samples and Stuff, Part 4," *QEX*, Sep/Oct 1998.

[6]H. P. Westman, ed., *Reference Data for Radio Engineers*, 6th ed., Howard W. Sams & Co, Indianapolis, IN, 1975.

[7]K. Beals, WK6F, "A 10-GHz Remote-Control System for HF Transceivers," *QEX*, Mar/Apr 1999.

[8]See **www.alinco.com** for more information.

[9]"Empirically Speaking," *QEX*, Jul/Aug 2001.

[10]For more information, visit **www.arrl.org/announce/board.html** and look for "Committee Reports."

[11]P. Denisowski, "How Does It Sound?" *IEEE Spectrum*, Feb 2001.

[12]See articles by N2MJI and KF6DX in *20th Digital Communications Conference*, 2001, ARRL/TAPR.

Doug Smith, KF6DX, is Chair of the ARRL Digital Voice Working Group. Since 1998, he has edited QEX: Forum for Communications Experimenters for ARRL. He is the author of the DSP chapter in the current edition of the ARRL Handbook for Radio Amateurs (ARRL, ISBN 0-87259-189-1, ARRL order number 1891) and of Digital Signal Processing Technology: Essentials of the Communications Revolution (ARRL, ISBN 0-87259-819-5, ARRL order number 8195). Doug may be contacted via e-mail at **kf6dx@arrl.org**.

By Murray Green, K3BEQ

An Island Sprouts Its First Amateur Inhabitants

An expedition to a Maryland island bears unexpected fruit!

In his book *Robinson Crusoe,* Daniel Defoe writes about the adventures of a man shipwrecked and marooned on a lonely tropical island. Crusoe, the unexpected visitor, encounters and befriends a native inhabitant he later named "Friday."

Fast forward to 2001. There is another island, closer to my home, believed to have received its first settlers in the 1600 or 1700s, whose inhabitants conversely befriend visitors and also embrace Amateur Radio.

Closer to Home

The island is secluded. Forget about RadioShack stores to shop around in. In fact, there is no police force simply because there is no crime. A few hours' drive from Washington, DC, and a 40-60 minute ferry ride, lies Smith Island, a marshy 8 by 4 mile archipelago about 10 miles off the Maryland mainland in the Chesapeake Bay. Three communities (Tylerton, Ewell and Rhodes Point) are home to about 350 inhabitants—watermen, their families, store/innkeepers…or mainlanders seeking Shangri-la. A very friendly lot.

Upon arriving on the island, and depending upon the time and type of day, you are met with a deafening quiet, or perhaps the wind and sounds of the watermen's boats as they strain at their moorings. Despite its isolation, the island is no stranger to Amateur Radio. Over the years a number of Islands On The Air (IOTA) operations have taken place there. However, outside of a microwave telephone system to the mainland, the usual ship-to-shore VHF radios, and maybe Citizens Band radio, there were no Amateur Radio operators residing on the island. That was about to change.

It Was the Best of Times

In December of 2000, a group of Maryland and Washington, DC, amateurs decided to visit the island and "do a little hamming." Arrangements were made with a bed and breakfast innkeeper for transportation and accommodations at the community of Ewell. As a courtesy, the innkeeper provided his own boat transportation so the group did not have to use the services of a commercial ferry that connects to the island from Crisfield or Point Lookout, Maryland. The island is a tourist attraction during the late spring and throughout the summer months, so the amateurs, arriving on a Saturday, had the inn to themselves. Despite wintry winds they were comfortably situated, until it was time to put up the antennas. Only several feet above sea level (and eroding more each year), the island is extremely flat. There is nothing to stop the wind. Even so, the hams managed. Nothing elaborate, mind you—essentially a G5RV dipole and a loop for 6 meters.

Ham Radio, Good Food, Friendly People

Now, you have to recognize that while this particular group of amateurs loves their hobby, they equally enjoy good food and people. The islanders took an immediate liking to them. Having set up their station at the inn, the amateurs began their operation. From time to time some of the islanders dropped in to watch and listen as the group worked stations needing Smith Island as a new IOTA (NA 140) or US Island (MD00035). For the permanent residents this became an education in Amateur Radio, planting seeds of curiosity that promised to bloom later.

One of the visitors who came through the unlocked doors (virtually no one locks

DCMARC

A happy group of visitors. Left to right: Herbert; Skip, K3FOR; Karl, AA3XC; Walter, AA3SG; Grady, WB3JUV; Kenny, AA3NN; Keith, KB3EGL.

their doors) was the island's only pastor. Every Sunday he travels to each of the three community churches by boat and golf cart to lead services. For an interesting related story on Smith Island's only pastor, see the May 2001 issue of *Smithsonian* magazine, page 32, titled "Preacher on the Go," by T. Edward Nickens.

DCMARC

Smith Island, Maryland's only inhabited offshore island.

An Unexpected Turn Of Events

On Saturday evening, the innkeeper approached the amateurs with news that the weather had turned foul and it appeared that they may not be able to leave the island Sunday because of very high winds and 4-6 foot waves. He was understandably reluctant to venture out in his boat. With this in mind, and although it was evening, he served up an extra-special "breakfast" for everyone. The group continued to operate throughout the night.

Sunday morning arrived and with it a possible break in the weather. Still reluctant to take out his boat, the innkeeper suggested that the group ride the commercial ferry back to the mainland that afternoon. Packing up their gear the amateurs boarded the ferry. However, Mother Nature's fickle mood changed, and the weather once again closed in. The ferry began an hour-long roller coaster ride across Chesapeake Bay, its passengers consisting of the amateurs, some Smith Islanders and other visitors returning to their mainland homes.

A Surprise Conversation

Sometime during the ride back, one of the passengers, an islander by the name of William Clayton from the community of Tylerton, struck up a conversation with the amateurs. He stated that a number of years back, he had studied for the Amateur Radio license, taken the test and failed. Seems he was studying from an outdated guide. Hearing about his misfortune, the group said they would send him the most current study material, maintain contact with him and, when he was ready, they would return to the island with Volunteer Examiners and administer the test. Strange bedfellows these: amateurs from a large, sophisticated, heavily populated metropolitan area, and a quiet waterman who grew up without the benefit of modern conveniences, talking about modern-day Amateur Radio. It is written that we amateurs come from all walks of life.

Return to the Island

On Memorial Day weekend 2001, a group returned to the island with three Volunteer Examiners, sponsored by the District of Columbia Metropolitan Area Repeater Club (DCMARC). Not only was William Clayton there for his examination, but also his son Matthew, who resides on the mainland in the town of Princess Anne, his interest in Amateur Radio piqued by his father. I am pleased to report that both father and son successfully passed their Technician Class license exams, and shortly thereafter received the call signs KB3GRC and KB3GRD, respectively. Smith Island, Maryland's only inhabited offshore island in the Chesapeake Bay, now had its first full-time resident Amateur Radio operator.[1]

Since the group was already on the island, the remainder of the weekend was spent enjoying their favorite pastimes: radio, good food and conversation. The islanders served some of the largest and most delectable crabs the amateurs had ever tasted. There was no doubt in their minds that the crabs were carefully hand

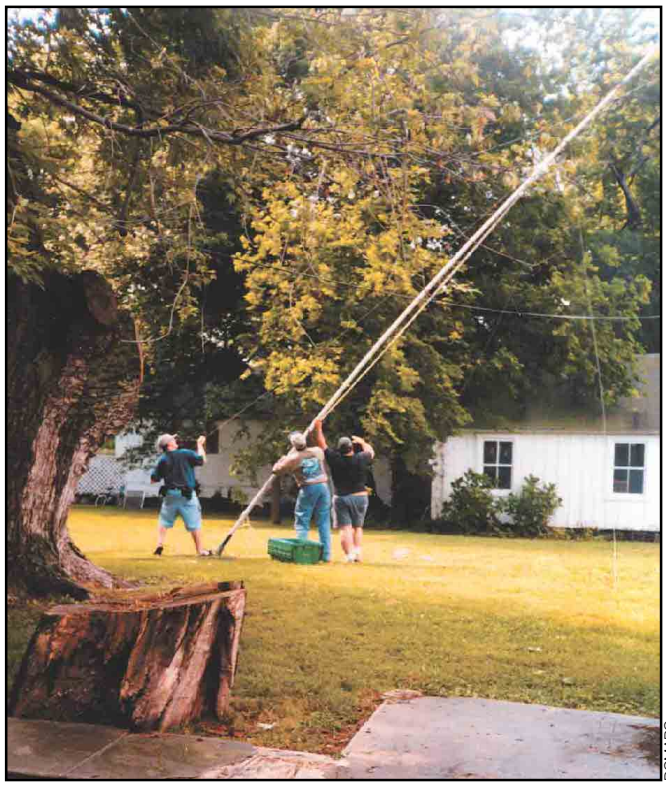
[1]If there was a resident of Smith Island licensed in the Amateur Radio Service prior to William Clayton, he/she is unknown to the author, the visiting amateurs and the islanders they came in contact with.

DCMARC

The Ewell Tide Inn was home to the amateurs during all three visits to the island.

DCMARC

An antenna party behind the Ewell Tide Inn.

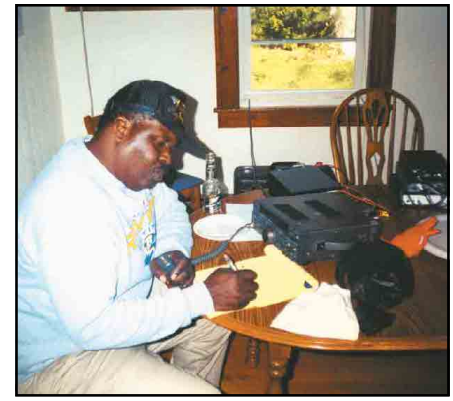


The antenna mast goes up in preparation for the start of the Smith Island operation.

DCMARC

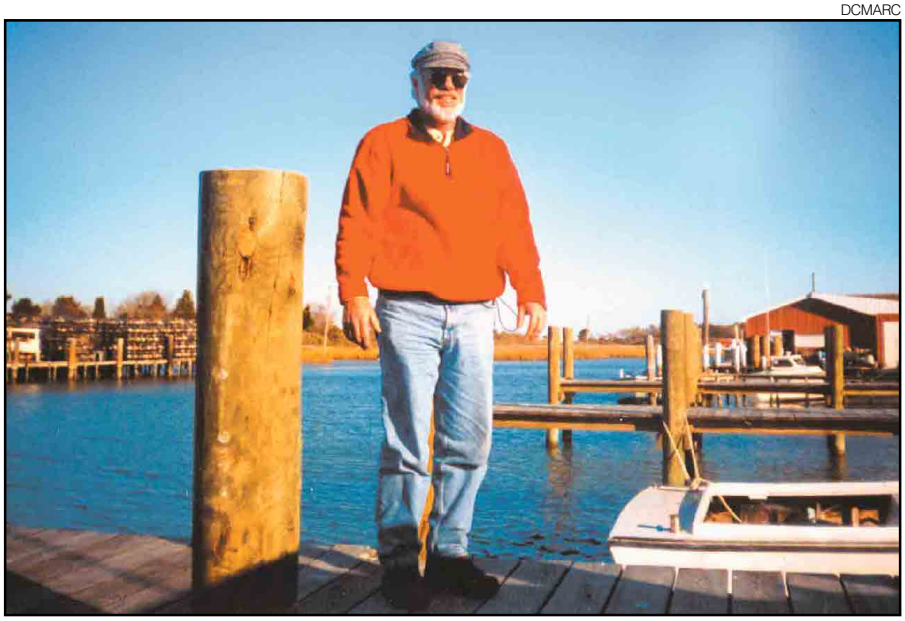
Keith, KB3EGL, giving out a new IOTA.

DCMARC



Roger, KA3FTJ, manages the Smith Island pileup.

DCMARC



Steve Eades, the second new amateur resident on Smith Island, passed his Technician exam in November 2001, and now holds the call sign KB3HHU.

selected especially for them. In addition to the ham station setup at the inn, a temporary station was established at the local grocery store using a military tape antenna. This provided more visibility for Amateur Radio (and I suspect gave the amateurs better access to even more food!).

It was an education for the islanders, and some expressed interest in obtaining their Amateur Radio licenses, so a third trip was made in November 2001—and this visit produced a second islander ham.

When the sun comes up, it is a new day with new expectations. You never know what will be coming your way even from a small, isolated, quiet island, somewhere in time.

Epilogue

I struggled to find the right words to express how we felt about what these visiting amateurs did for the Smith Islanders and son Matthew Clayton. The effort they made to provide the necessary study guides; the time to stay in touch with them; the arrangements they made for the required number of Volunteer Examiners and the return trip to the island to administer the examination. Although I do not know all of them, I would venture to say that a simple "thank you" is all that they would want. The pleasure was theirs: Kenneth Courtney, AA3NN; Walter Jackson, AA3SG; Jeffrey Norman, AA3WP; Karl Pearson Sr, AA3XC; Ryan Johnson, K3FOR; Robert Lee, K3RE; William Gilliam Sr, KB3FEA; William Gilliam Jr, KB3FEB; Roger Johnson Sr, KA3FTJ; Roger Johnson Jr, KB3GFU; Keith Poptanich, KB3EGL; Sharon Armstrong, KB3EUI and Grady Ball, WB3JUV. Each one of you is indicative of the professionalism and helping hands of the Amateur Radio community. And that's what it's all about.

Smith Island

To learn more about Smith Island, its inhabitants, places to stay, where to eat, how to get there and ferry schedules, go to the following Web pages:
www.intercom.net/npo/smithisland/ and
www.smithisland.com.

You can contact the author at 5730 Lockwood Rd, Cheverly, MD 20785; **k3beq@arrl.net**.

By Dr Charles Vogan, KD5KA

A Virginia Ham Goes West

Lookin' for adventure and racin' with the wind, a new ham who's been riding motorcycles for 30 years headed cross-country last summer with a small arsenal of radio gear, his wife, son, daughter-in-law and two friends. They returned wiser about the creative use of "high-speed CW" and the ruggedness of mil spec H-T cases.

In July 2000 my wife and I took a motorcycle trip out to Oregon from Virginia, and on the way back we came through Colorado. We didn't have much time to see the sights as we drove back along I-70 through the mountains, but I realized that there was a lot more to see there. So I started planning another Colorado trip for the summer of 2001.

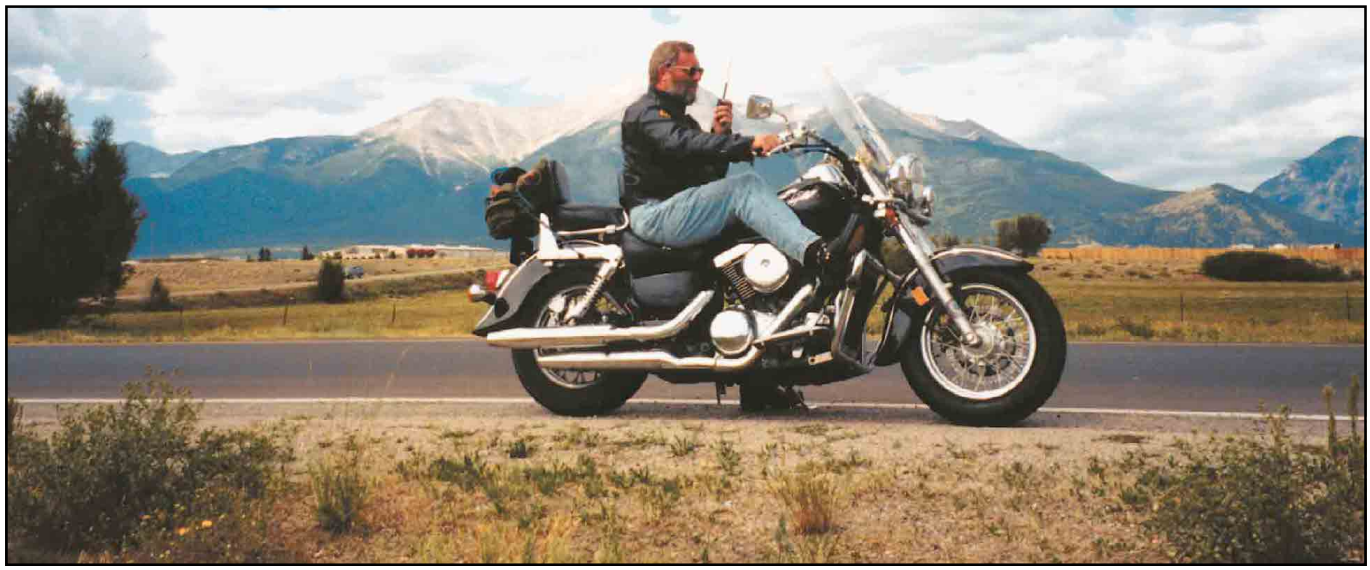
I had just gotten my ticket in June 2000, and hardly knew how to use my VX-5 radio—so I didn't use it much at all on the first trip. But I've been learning as much as possible about the hobby over the last year, and this year I was determined to turn the trip into a radio vacation.

I'd been preparing for months. One of the first things I did was order and assemble a K1 CW QRP kit from Elecraft. After working out a few bugs during assembly (Elecraft was very gracious in helping me), I was ready. To finish the setup, on a trip to a local ham supply store I saw a demonstration of the Super Antennas MP-1. (I came home and announced subtly to my family that "I just saw my birthday present!" They took the hint.) The two would work perfectly together as a portable, battery-powered CW station. I completed the rig with a Kent single-paddle key, rugged enough to handle a trip like this.

At the same time I was helping a friend, Elwood Shrader, KB4DJN (a ham for 18 years), get some kind of antenna going in his new house. He suffers from covenant restrictions, and it's been ridiculous what we've had to go through to get something radiating from his attic without coupling to all the metallic objects in sight and setting off his fire alarm. So he ended up borrowing my MP-1 antenna for a week just so we could do trial-run communications between our homes. By the time he got his own MP-1, we were ready to leave on the trip. This meant I had no idea how my K1/MP-1 system would work once I got on the road. Nor did we know whether his setup would work long-distance.

The Group

Aside from me, our group included my wife Elma, KG4LRG, my son Jeremy, KG4IEK, his wife Lynn, a good friend Gary Bothof, KG4OFU, a new ham in time for this trip and his wife Gert. We had three bikes and one car (Lynn was pregnant and didn't want to do the whole trip on a bouncy two-wheeler!). Between us we started out with 10 radios and two



The author on his "wannabe Harley," a 1500 Kawasaki Vulcan.

telephones: two Yaesu VX-150s, a Yaesu VX-5, a RadioShack HTX-242 in the car, four RS FRS radios, a Yaesu VX-1 and the K1. If there was someone out there to communicate with, we could do it!

Our kind of trip isn't a relaxing one. For three days out we rode more than 500 miles a day, some of which was through what turned out to be Kansas' hottest heat wave of the year. In Colorado we averaged 120 miles a day through the mountains. And on the way back we again traveled more than 500 miles a day. Each night we would find a camp site and set up tents; in the morning we would tear it all down, pack it up, and hit the road again. This kind of vacation isn't for the faint of heart! We were always on the go. But the glorious mountain views were worth all the trouble—the *only* way to see the Rockies is on a motorcycle!

The headsets I got for the 2-meter H-Ts were abysmal failures. Our problem was that we needed a mike that wouldn't pick up a lot of ambient noise—just our voices. We tried several versions before the trip. One was an earbud that had the microphone and earphone built into one—all you had to do was talk, and the vibrations from your head would be picked up in the earpiece. Another set uses the vibrations from your throat—the mike is strapped against the side of your windpipe.

We tried both kinds of mikes, but we just couldn't hear each other well enough to make out the words. All I heard from Jeremy was *Amph frummp engrump a trmgh inbph?* It was loud enough, but nothing made sense. So we gave up on them. We went back to the old-fashioned way—just key up the H-T and yell into the thing. Amazingly, the ladies in the car heard us clearly enough on their mobile, and I could hear them clearly if I held the H-T up to my ear at almost full volume. Picture me doing this primitive communication while holding on to the handlebars with one hand, rolling down the highway at 75 mph! (PS: Anybody know where I can get a military helicopter mike set? That's about how much noise I have to contend with on the bike!)

Ham Radio Keeps Us Together

The 2 meter radios worked great (we stayed on 146.550). Keeping four vehicles together and making sure everyone knows what's going on isn't easy unless there's communication between them. I was generally leading the group, and the radios proved invaluable, for example, for keeping us together during rush hours in big cities (which we seemed to be good at hitting!).

"Where are you?"

"I don't know—where are you?"

The author operates his 7-W CW station: Elecraft K1 QRP transceiver, Super Antennas MP-1 HF portable antenna and Kent single-paddle key.

"Weren't you in front of Jeremy?"

"Yes!"

"Well, Jeremy's sitting here with me right now."

"I didn't see you anywhere!"

"Well, you have to turn around and come back."

"OK ..."

The car was always third in line, and if someone had to move information around the group, they would contact Lynn first and she would get the news to the rest of us. Since Lynn doesn't have her license, I would call back to her with something like this: "OK, Lynn, we need to take this next exit—head east. If you can hear me, flash the lights." And then I would see the headlights flash on and off, and I knew the message was getting through.

Jeremy and I also had some fun with CW—on the bikes. He's got his General ticket, but CW isn't his favorite mode, so we had to make it simple. I would pull up beside him and, using my horn, beep out a message: *dah dah dit, di dah, di di dit*.[1] Or he would beep at me that it was *di di di dit, dah dah dah, dah* today.[2] You aren't limited to radio waves to enjoy Morse code!

Gary put his H-T through the ultimate road test. Everyone knows that, on a Harley, every bolt comes unscrewed from the vibrations. Without knowing the rubber ducky on his VX-150 was almost off, he handed it back to Gert while they were riding and she grabbed it by the antenna. Off it came. The radio hit the road at 70 mph, bounced on all four corners (it has the abrasions left to prove it!), and rolled over into the median strip. We had all pulled off when we didn't see him behind us. Soon Lynn heard on the radio: "We just dropped our radio, but we found it—we'll be right there!" Amazing—the silly thing still worked! Hats off to Yaesu for building an incredible case.

HF Success!

The schedule for HF was based on the fact that my new K1 has only two bands built in: 20 and 40 meters. So I set up an alternating schedule that I would use from night to night. I found out that there are "watering holes" (officially known as CW QRP calling frequencies) where people can get in touch with each other, and then move to another frequency to make room for others wanting to use it. So on July 16, the first night out, I would use 14.060, on July 17, 7.040, July 18, back to 14.060, and so on.

Every night I faithfully set up the radio and gear, and at 0300 UTC called back home on the assigned frequency. The first five nights turned up nothing. I was beginning to get discouraged, not knowing whether my K1 and the MP-1 antenna were even working. Then on Saturday night, July 21, outside of Durango, I heard him—WD4RXU was calling me. I got on the phone right away and called him back.

"Steve! I heard you! I heard you!"

Steve Hensley was my Elmer, the one who got me started in this hobby last year. He's been a ham for more than 20 years. And he's shown a lot of patience with me.

"Yeah, but there's too much QRN here on this frequency," he said. "Let's move down to 7.035.25 and try it again."

"OK."

[1]GAS
[2]HOT

The three bikes and all the travelers at rest at the author's parents' home in New Brighton, Pennsylvania, at the end of their cross-country adventure. From the left: Gert and Gary (KG4OFU) Bothof; Chuck (KD5KA) and Elma (KG4LRG) Vogan; and Jeremy (KG4IEK) and Lynn Vogan.

So we moved down the dial and finished our contact there. The conditions weren't great, but we heard each other. I was floating on air. My little portable setup worked!

To top things off, the next night 20 meters was scheduled, and he came roaring through with a 599 signal. And he said I was hitting Virginia with just as strong a signal. The K1 was doing a great job, though I was only running 7 watts (and a short vertical antenna) to his 100 watts and multiband beam.

Right outside of Omaha, while we were tooling along on the interstate, I was surprised to hear (or so I thought) CW. Am I taking this hobby too seriously, that I would hear Morse code in the middle of Nebraska out of thin air? Then a little red sports car pulled alongside me, and on his license plate was the call sign N0XAS. He saw my vanity license plate and was beeping CQ on his horn! Does this count for a QSL card? Thanks, Dale, for the contact! Hams, I was learning, can get in touch with each other anywhere, any time and in many ways.

The only problem we had with the bikes was right outside of Pittsburgh. We were running through a construction zone, and when I looked back, there was nobody behind me! In a panic I stopped and called for someone to tell me what was going on. After a couple of minutes Jeremy came back on the radio and told me that Gary's trailer hitch had broken and they were jerry-rigging a solution to put it back together so they could get to the next exit. Then after a few minutes a car came along, pulled up to me, and informed me that the biker I was waiting on had trailer problems. I know, I told him—they just told me that on the radio. He looked at me with a blank expression—"Oh"—and then drove on. Isn't modern technology wonderful?

Between us we had 10 radios, 2 telephones, 3 motorcycles and a car.

The Capstone

I learned that ham radio, especially the HF bands, is a lot like fishing. You aren't guaranteed to catch a contact every time you get on the air. We were out a total of 12 nights, and I touched base with friends back home on only three of those nights. Everything depends on conditions. On one night I was transmitting from the middle of a bowl of mountains, and the signal got through! Other nights I tried it from elevations that I thought surely would make it back home, yet I heard nothing—and they didn't hear me either. To me, that adds to the challenge of learning more about weather, terrain, equipment, time of day, solar activity and other factors to increase the success rate.

I continued to set up my HF rig faithfully and stick to the schedule, but night after night I never heard anybody I recognized. I may have to explain something here. Anybody who has traveled long distances on a motorcycle knows that after 10 to 12 hours on the bike, traveling up to 500 miles a day, you don't feel like doing anything but dropping into your tent at the end of the day—it wears you out completely. When dark comes, who feels like sitting around doing nothing when that air mattress looks so inviting? So I stuck to trying to get select friends back home, instead of sending out CQs and risking long QSOs that would keep me up late.

The last night was in New Brighton, Pennsylvania, just north of Pittsburgh, at my parents' place. This time I too was in the Eastern Time Zone, so I had to wait until 11 PM until my scheduled transmission. I fired up the K1 and started sending out signals to both Steve and Elwood.

Elwood has been my personal CW tutor, and it was a real disappointment to me that we hadn't made any contacts on this trip. We certainly did prepare enough for it over the last few months! So when I didn't get any responses back on 40 meters, I was pretty discouraged. The last chance, the last night, and still nothing.

Suddenly a strong signal came ringing through: KD5KA DE KB4DJN KN

Finally, there was Elwood! I tried to hit him back, but I heard no response. But I had what I was after. I picked up the phone and called him. I found he heard me clearly, and then my signal dropped back into the noise and he lost me. Then he sent his signal out to me. What that told me was that his MP-1 antenna *was* working—I was picking him up easily in Pittsburgh! I took it for a contact—he heard me, and I heard him. And for me, it was the capstone to the trip—I had finally raised both Steve and Elwood on the K1.

One of the things I've enjoyed doing over the years is combining hobbies (and I have many!). Turning this bike trip out west into a radio vacation was a great experience. Keep your sets tuned next year—you just may hear this Virginia ham as he heads out West again!

Dr Charles Vogan, KD5KA, has been a ham since June 2000. When the bug hit, he took and passed all the exams in a month and a half to get his Extra Class license. He favors QRP CW. The pastor of a small church in Weyers Cave, Virginia, Chuck is a man of many hobbies. Aside from Amateur Radio and motorcycling, he enjoys woodworking, astronomy, reading, painting and writing books (25 to date). He's managed to get three sons, his wife and a friend started in Amateur Radio. His call sign comes from his days growing up outside Pittsburgh, listening to KDKA before going to school. A licensed Volunteer Examiner, Chuck has also completed the first two levels of the ARRL Emergency Communications Course. You can reach him at **cvogan@shentel.net**

All photos by the author. QST

By Parke Slater, N4KFT

Making the Media Work for You

Special-event station K4L hits a "grand slam" for history—and ham radio.

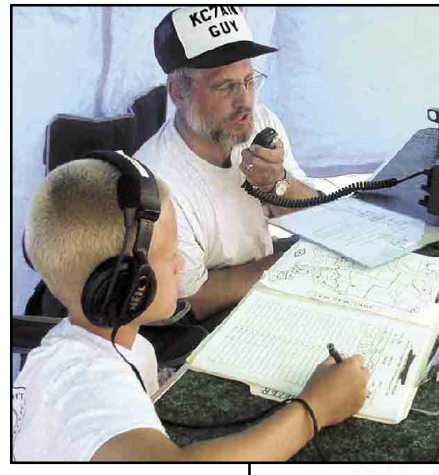
What started off as an innocent desire to perform a public service to preserve a piece of history developed into a concept that garnered unprecedented media coverage in our area and put Amateur Radio in front of hundreds of thousands of Virginians. The same approach can work for you in bringing the media to beg for a story that includes Amateur Radio as a critical component.

At an impromptu breakfast meeting, Tony Day, KC4AUF, and his wife Becky, KS4RX, were presented with a proposal. I showed them a newspaper article about a Chesapeake Bay lighthouse and said, "Let's go do something good for them."

One month later, six hams met and planned a "mini-DXpedition" to a remote island on Virginia's Chesapeake Bay. What was unusual was that the primary mission was *not* to participate in the Amateur Radio Lighthouse Society's International Lighthouse/Lightship Weekend. The six members of the Richmond Amateur Telecommunications Society had but a simple desire to help Mathews County, Virginia (population 8000) raise public awareness about the little-known New Point Comfort Lighthouse, a structure that saw action in both the War of 1812 and Civil War. Ham radio and the special event call sign K4L were simply the vehicles to do it.

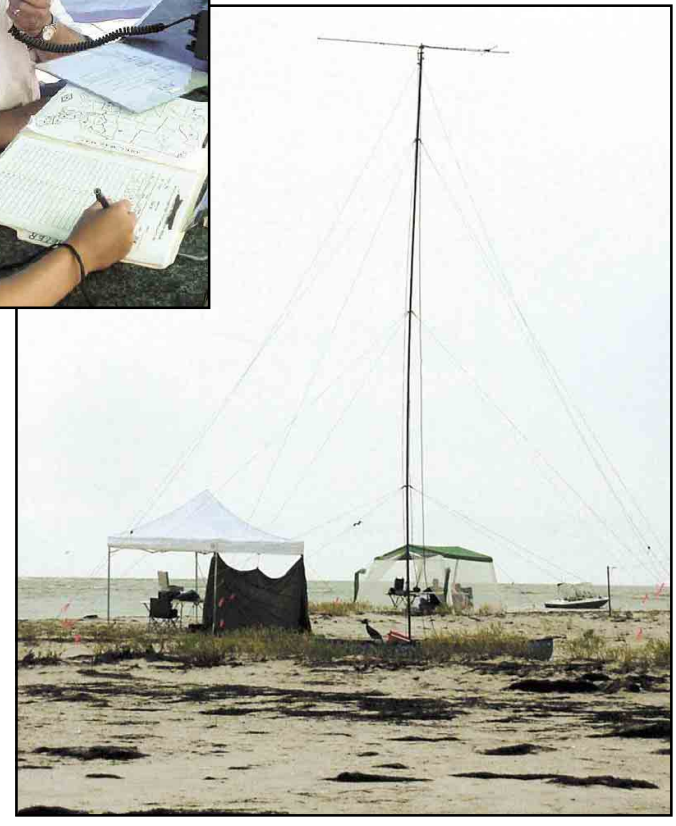
The New Point Light, while half a century older than its well-known cousin, the Cape Hatteras (NC) Lighthouse, is tucked far away from population centers that enabled the raising of $10 million that was used to move the latter structure inland. Sitting at the end of a peninsula in a county that has but one stoplight (on a swing bridge), the lighthouse was understandably out of the limelight.

The 197-year-old New Point Light, rich in maritime history, had fallen victim to time, vandals and the sea. In April 2001, the *Gloucester-Mathews Gazette-Journal* ran an article describing the un-



Twelve-year-old General class licensee Andrew Slater, K4PUF (left), logs while Guy Carlsen, K4CNF, works the pileup.

The K4L team from left to right: Guy Carlsen, K4CNF; Andrew Slater, K4PUF; Tony Day, KC4AUF; Stan Sitnik, KG4JMY; Chris Waters, K4ADU, and Parke Slater, N4KFT.



The two stations (40, 80 and 2 meters) and one of the towers used by the K4L team on New Point Island.

certain future of the structure. In turn, the hams contacted the Mathews County Historical Society, to whom the county had ceded responsibility for the development of a master plan to save the lighthouse.

The Historical Society jumped at the opportunity to have help in their endeavor and requested permission from the county for the team of hams to occupy a 1.5 acre island adjacent to the lighthouse. Both parcels had been torn from land during a 1933 hurricane.

The team's largest obstacle to the mission remained transportation to the island, but because of the nature of the project, they were able to convince the Virginia Department of Game and Inland Fisheries and the US Coast Guard to assist. In addition, the Coast Guard agreed to bring out the media for a visit during high tide on Saturday.

"Transportation for the press was a must," said assistant team leader Guy Carlsen, K4CNF. "Without it, they [press] wouldn't have been there." No doubt the fact that a boat was needed to get to the island had its own allure. The team also employed the talents of its youngest member, 12-year-old General class licensee Andrew Slater, K4PUF, to design a Web page. A "media link" was prominently placed on the page to explain the press transportation plans (see **www.qsl.net/k4l**).

While this could have been called little more than a special event station lasting just over two days, the K4L team treated it with the import of an extensive South Pacific DXpedition. "We were serious in the manner in which we treated K4L," said team member Stan Sitnik, KG4JMY. "Planning paid off where we lacked experience." The degree of detail and planning necessary gave the team much respect for full-blown DXpeditions such as Kingman Reef's KH5K and the recent YK9A DXpedition to Syria.

Richmond Times-Dispatch **photographer Alexa Edlund-Welch photographs Andrew Slater, K4PUF (left), and Tony Day, KC4AUF, for the Sunday edition's story.**

Organizing the Media Blitz

The team's first splash came in a Tidewater, Virginia regional newspaper as a "freebie." The county-sanctioned plans had been mentioned in a governmental board of supervisors' meeting and were picked up by the media six weeks before the event. Similarly, the Mathews County Historical Society informed the local paper of the team's intentions, prompting a second article.

The team developed a press release for distribution. We knew it had to be attention grabbing, to the point and kept to one page, since the story had to compete with every other. With a vow that our primary emphasis would be to let the general population know of the lighthouse's peril, K4L team went to work.

The news release headline read "Richmond area Amateur Radio operators will travel to Mathews County to help a lighthouse in peril." Immediately underneath, two photos—one, a sepia-colored early-1900s picture showing the structure on a sandy beach, and the other showing the lighthouse surrounded by the waters of the Chesapeake Bay. "There is no question that the side-by-side comparison of 'then and now' photos was dramatic," said team leader Tony Day. "I think it gave perspective and added realism, demonstrating the hardships the light had endured." Below the pictures was a brief history of the light that highlighted its importance in our national heritage, followed by a synopsis of what the team intended to accomplish.

Both in the release and during telephone conversations with the media outlets, New Point Comfort Lighthouse was compared to the Cape Hatteras Lighthouse. East coast residents could easily make the connection, which made it easy for the reporters to understand what K4L was trying to accomplish. There is no

The New Point Lighthouse as seen from the north end of New Point Island. This photograph was used for the team's QSL card.

You Can Do It, Too

Planning an event? There are a number of things that can be done to increase the odds you will pique media interest and gain exposure for Amateur Radio.

• **Find an arena where ham radio is not the end-all, but the vehicle that gets you there.** While there occasionally will be a riveting story where ham radio saves a life or plays a pivotal role in something as dramatic as the Iraqi invasion of Kuwait, those events and stories are the exception. Amateur Radio can get mileage by being incidental to the main thrust of a project.

• **Find a public service that ham radio can perform.** It is much easier to get coverage for public concerns of an everyday variety that may be historical or environmental in nature.

• **Think big.** Treat your event like you want it to be perceived. Make sure your Web page is concise, attention grabbing and easy to navigate. Be professional in your dealings with the media. Use printed not handwritten literature and envelopes. Take it on the chin if you are turned down. Develop a logo, banner and perhaps shirts for those hams involved.

• **Pick your media targets and personalize your releases.** Identify those outlets you want to include and put yourself in their shoes. Style your information so that they can relate to it. Create a log that includes the names of the outlets, the method of contact, the names of those you speak with and their response.

• **Keep your media release to one page**. Just like a resume, you want your information to be concise and only include pertinent information that will get you the attention you are seeking. Details can be furnished later.

• **The more unique angles you have, the more the media is likely to be interested.** Is there an element of danger or risk to what you are doing? Perhaps a different mode of travel or location? Accentuate any anomaly. Use photographs to show contrast.

• **Go for the weekday, if possible**. For the same reason that you enjoy ham radio more on the weekends, you are less apt to be able to get a reporter to cover your event then. Everyone likes a weekend off. News crews are relatively scarce. If it is possible to schedule your event during the week, then do so. Television reporters can often conduct interviews during the week and augment their report with file footage. The farther out your event is from the TV studio, the less likely the assignment editor will be willing to send them. With limited resources, they do not want to miss "the big one" in town while the crew is in Angola interviewing hams.

• **Schedule a press conference.** If access is restricted, arrange a time to meet and transport the press. Special accommodations to enable them to cover the event may entice coverage.

• **Timing is everything.** If news is otherwise dead, you may be in luck. By the same token, the absence of another Washington, DC scandal may dictate whether the story is a "lead" or a mere footnote. Send out your press information no more than three weeks in advance. Promises made two months ahead of time can fail because of interim events and changes.

• **Blitz the outlets**. Send your releases via fax, email *and* the postal service. The odds are that three different people will receive each of the three releases you send. All you need to do is catch the eye of one person. Be sure you include several means by which the media can contact you and do not be afraid to follow up with a telephone call when you have not heard back. The worst they can do is say, "No."

• **Do not lie to the press.** While you do want to portray your event in a manner they can understand, be sure not to embellish or mislead. Not only can doing so come back and bite you; it will also be remembered for years to come when you or another ham tries to gain coverage for a future event.

• **How unique is your station?** Is there something nonstandard about your operation, station or operators? Accentuate it. Is there a very young or well-known op? Place them at the station when the press arrives. How conducive is the layout of your operation to photography? Will the background and sun enhance the photogenic potential?

• **Spreading coverage evenly.** While everyone would like to be mentioned, photographed or filmed by the press, it isn't likely to happen. Writing a release that quotes all or most of those involved will help keep your ops happy, whether it is actually used or not. Make someone's day, and insist that the most seasoned hams take a back seat while junior operators have their shot with the press. Not only might such tactics give newer hams greater appreciation for you, but the press at times seems more enamored with those who do not fit a stereotypical mold, much as they would with an interview with the famous.

Finally, keep your eyes set on the overall objective. While most hams see Amateur Radio as being newsworthy in-and-of-itself, most media outlets would probably disagree.

You may have attended a symphony concert. The purpose? To hear music. Think of news the same way. Music is what the reporter is after, but he cannot help seeing the instruments while listening. Let's make Amateur Radio the bow that plays the violin and "talk up ham radio."

doubt that the press's "discovery" that Virginia has its own "Cape Hatteras Light," was a story in itself.

The release ended with an invitation to make reservations on the Coast Guard boat by contacting a team member. Ease of contact being critical, the team provided a name, email address and telephone number with voice mail. "The last thing we wanted was prospective press not covering the event because they could not contact us," said team member Chris Waters, K4ADU.

By Every Means Possible

How did the team get the press release into the hands of the media? By every means possible. "We sent them two weeks before the event by the postal service, email and fax," said Guy Carlsen, the K4L Assistant Team Leader. "It was a shotgun approach, and when we did not hear back, we called them by telephone."

The K4L team targeted six television stations, including the three major network affiliates in the metro Richmond area, and three in the Hampton Roads community. In addition, one local paper in each of the two localities was solicited, as were one regional and one statewide newspaper.

This resulted in one immediate story in one of the local papers and a call from NBC affiliate WWBT 12. Team Leader Tony Day, KC4AUF, the group's most experienced ham, was interviewed in the studio. The reporter later traveled to the Chesapeake Bay to film the lighthouse and interview historical society representatives for the story that would later air during the event.

The local paper story that ran prompted another club to release information that they had plans to activate another tidewater lighthouse. That story in a regional paper also resulted in another mention of K4L.

In the follow-up telephone calls to the media K4L was largely turned down, with the exception of one local paper and the *Richmond Times-Dispatch*, Virginia's

premier newspaper. Sending both a reporter and photographer, the latter paper was the sole media outlet taken to the island by the Coast Guard. "We were actually wondering if they would show up," said Guy Carlsen, noting the chronic series of thunderstorms that had plagued the weekend. "But media coverage was central to our effort, so the weather became secondary for us."

The weather may actually have played into our favor, demonstrating the tenacity and commitment we had for the lighthouse project. The message that was sent did not become apparent until the next day.

Success!

The story landed on the front page of the Sunday edition of the statewide newspaper with a 5×7 photograph and a title banner, "Mayday for A Lighthouse." The following article entitled, "Yes, Virginia, There Is A Lighthouse: Hams help get the word out," detailed the team's hardships and featured a photograph of Andrew Slater, K4PUF, and Tony Day, KC4AUF, operating one of the HF stations. On the preceding night, WWBT 12 had aired their two-minute taped segment over the central Virginia airwaves.

The following week, two local papers requested story information and photographs for their publications, resulting in articles as well. In addition, one magazine to which a press release was sent called, wanting information on the lighthouse for a book. K4L could not have bought greater coverage for the lighthouse project and Amateur Radio!

Photos by the author.

Parke Slater, 43, has been a licensed ham since 1999, having been encouraged to get his ticket by his then 10-year-old son, Andrew, whom he was helping study for his own test. The elder Slater is a police officer in Henrico County, Virginia, and is a board director for the Richmond Amateur Telecommunications Society. Both Slaters are Skywarn storm spotters and Parke's daughter, Amanda, age 10, is KG4NBF. You can reach Parke Slater at 1243 Grapevine Rd, Sandston, VA 23150; **n4kft@arrl.net**.

NEW BOOKS

KENTUCKY FARMER INVENTS WIRELESS TELEPHONE! BUT WAS IT RADIO? FACTS AND FOLKLORE ABOUT NATHAN STUBBLEFIELD

By Bob Lochte

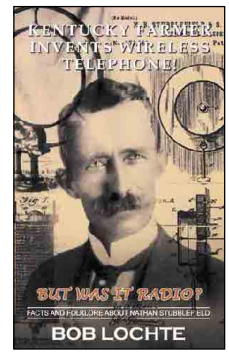
Published by All About Wireless, PO Box 1194, Murray, KY 42071; **www.nathanstubblefield.com**. *First edition, 2001, softcover, 5½ × 8½ inches with black and white photographs and drawings. ISBN 0-9712511-9-3. $16.95.*

Reviewed by Gil McElroy, VE3PKD

◊ The United States has its own homegrown Marconis, inventors who staked an early technological claim on ways of communication that dispensed with the annoying need for connecting wires. Amos Dolbear, Mahlon Loomis, and even Alexander Graham Bell all developed competing systems of wireless communication in the late 19th century that ran the gamut from the use of induction to light.

And then there is the case of Murray, Kentucky's favorite son, Nathan B. Stubblefield, an eccentric farmer and self-taught inventor who died in 1928. Legend has grown up around Stubblefield as the result of a series of inventions, experiments and media coverage he received in his lifetime, as well as some outrageously self-serving claims made by others after his death.

Author Bob Lochte, a professor at Murray State University, has tackled head-on the messy tangle of truth and fiction that surrounds Stubblefield, and attempted to sort out just what's what. The first part of *Kentucky Farmer...* is a relatively brief factual account of Stubblefield's life and achievements. Ambitious beyond his rural farming background and self-educated about things electrical, Stubblefield made his debut in the fledgling telecommunications realm by supplying telephone services—of a sort—to his neighbors in Murray in the 1880s. His "Vibrating Telephone" was little more than a slightly sophisticated variation on the child's toy of tin cans connected to one another by a taut string. But at a time when Bell's telephone system hadn't yet spread to more rural parts of the country, Stubblefield sold enough of his contraptions to make a living from them for a time.



But the cause of all the controversy that exists to this day has to do with Stubblefield's invention of what amounted to a wireless telephone system that operated via earth conduction using rods inserted into the ground, a device he publicly demonstrated in Washington, Philadelphia and (unsuccessfully) New York City in 1902. Stubblefield received much media coverage over the system, but Lochte reminds us that others had trod this path before; both William Preece and A. Frederick Collins, for instance, had previously invented (and patented) similar systems. At a time when a number of other early wireless pioneers (Lee De Forest preeminent among them) willingly engaged in shady stock promotions, Stubblefield, to his great credit, recoiled from the dubious dealings of a promoter with whom he had become involved. Abandoning his efforts to commercially market his earth conduction system of wireless telephony, and after failing to interest the world in an induction coil wireless system, he ended his life a secretive and desperately poor hermit living just outside of Murray.

It is here that the second part of Lochte's story begins: the construction of the mythology of Stubblefield as a misunderstood and neglected wireless genius, a process that began during his lifetime but which took off in earnest after his death from malnutrition in March of 1928. Journalists, the civic leaders of Murray, and even Kentucky politicians relied heavily on gross exaggerations of a few facts and out and out untruths in their efforts to package and market Stubblefield. Enormous misunderstandings arose, for instance, over the fact that, since Stubblefield's earth conduction system employed telephony rather than telegraphy, it must therefore have amounted to the invention of radio. Accordingly, the community of Murray began to heavily identify itself as the "birthplace of radio." Lochte's account of the entire business makes for a fascinating case study in how legends and myths emerge from embellished truths and simple lies.

Bob Lochte has been studying Stubblefield and his legend since 1990. His research even led him and television engineer Larry Albert to build a working replica of Stubblefield's earth conduction telephone system and successfully demonstrate it. If anyone should get the Stubblefield story right, it should be he. And he doesn't disappoint. The thoroughness of his scholarship is evident throughout his book (though the text would have benefited from the use of footnotes), and the inclusion of Stubblefield's patents in the appendices, as well as reprints of some of the period articles (including one from *Scientific American*) that helped get the whole Stubblefield myth started, are particularly useful for those who want to see exactly what the fuss has been all about and how it got started. At a time when Nathan Stubblefield's minor (but notable) achievements in early wireless communication have become so overblown as to rank him up there with Nikola Tesla in the eyes of many contemporary conspiracy theorists, Bob Lochte's *Kentucky Farmer Invents Wireless Telephone!* proves to be a much-needed and welcome setting straight of the historical record.

By Jennifer Hagy, N1TDY

Announcing the Eleventh Annual Philip J. McGan Memorial Silver Antenna Award

Throughout the year ARRL Public Information Coordinators, Public Information Officers and other PR volunteers strive to keep Amateur Radio visible in their communities by publicizing special events, writing press releases, and maintaining good relations with local media among many other valuable activities. Their efforts benefit us all. If you know someone who has achieved public relations success on behalf of Amateur Radio, nominating him or her for the McGan award is the perfect way to say thank you.

The award's namesake, journalist Philip J. McGan, WA2MBQ (SK), served as the first chairman of the ARRL's Public Relations Committee, which helped reinvigorate the League's commitment to public relations.

Unfortunately, Phil never got to see how well his efforts paid off. In honor of Phil, his friends in the New Hampshire Amateur Radio Association joined with the ARRL Board of Directors to pay a lasting tribute to the important contributions he made on behalf of Amateur Radio.

The 2002 McGan award will go to that ham who has demonstrated success in Amateur Radio public relations and best exemplifies the volunteer spirit of Phil McGan. A committee of volunteers knowledgeable about Amateur Radio public relations will pick the winner, subject to approval by the ARRL Board of Directors.

CALL FOR 2002 NOMINATIONS

(1) The award is given only to an individual (not a group), who must be a full ARRL member in good standing at the time of nomination. The nominee must not be compensated for any public relations work involving Amateur Radio (including payment for articles) and may not be a current officer, director, vice director or paid staff member, or a member of the current selection committee.

(2) The winner of the Philip J. McGan Memorial Silver Antenna Award will demonstrate volunteer public relations success on behalf of Amateur Radio at the local, state or national level, and will live up to the high standard of achievement exemplified by Philip J. McGan.

(3) Anyone may make a nomination. Nominations must be on an official entry form, available from ARRL Headquarters. The nomination will include a written summary whenever possible.

(4) Deadline: Nominations must be received at ARRL HQ in Newington by 5 PM May 24, 2002. Nominations arriving after the deadline or without an entry form cannot be considered.

(5) Eligible nominations will be screened by a committee of Amateur Radio operators knowledgeable about public relations, which will forward its recommendation to the Volunteer Resources Committee of the ARRL Board of Directors. The Board will make a final determination at its July meeting and the winner will be notified shortly thereafter.

(6) To obtain an entry form, call ARRL HQ at 860-594-0328 or e-mail jhagy@arrl.org. Ask for an official Philip J. McGan Memorial Silver Antenna Award entry form.

(7) Return the completed entry form and supporting materials to: Philip J. McGan Memorial Silver Antenna Award, c/o Jennifer Hagy, N1TDY, ARRL, 225 Main St, Newington, CT 06111. QST

Last year's winner Bill Morine, N2COP (center), is presented with the McGan Award at the Virginia State Convention by Roanoke Division Director Dennis Bodson, W4PWF (left) and ARRL President Jim Haynie, W5JBP.

Public Relations vs Public Service

In the past, there has been some confusion about the difference between "public relations" and "public service." Public Relations activities for which the McGan Award is given include efforts specifically directed at bringing Amateur Radio to the public's attention (and most often the media's) in a positive light. This may include traditional methods, like news releases; or non-traditional methods, such as hosting a radio show or being an active public speaker. Some candidates have been nominated for their public service activities, such as emergency communications, net leadership and other activities that, while helping maintain a positive impression of Amateur Radio among the public, don't fit the definition of "public relations." So, if you're considering nominating someone in your area for the 2002 award, please ask yourself if your candidate's work fits the *public relations* criteria.

Amateur Radio at the 2001 New York Marathon

Despite the events of September 11, New York City was determined to have its annual Marathon go off without a hitch. With unprecedented levels of security, and the able assistance of nearly 500 Amateur Radio operators, it did just that.

RACE DAY STARTS AT 4 AM

By Ronnie M. Hirsh, W2RMH

The alarm rings. It is dark outside, as you'd expect it to be at 4 o'clock in the morning. It is Marathon day in New York City, Sunday, November 4, 2001. It has been 53 days since thousands of people were killed here, in Pennsylvania and at the Pentagon. Reports of anthrax permeate the local news channel. Anxiety is high. Despite all this, the race will go on. Race Director Allan Steinfeld, W2TN, had these words of reassurance before the race: "In the wake of the terrible events of September 11, the New York City Marathon will highlight the diversity, energy and resilience of New York City as never before. New York Road Runners is dedicating the 2001 New York City Marathon to the victims of the tragic events of September 11, and to the courageous rescuers who have worked tirelessly to save lives and to rebuild our great city and nation." Steinfeld also serves as president and CEO of the New York Road Runners Club, which organizes the New York Marathon.

Along with nearly 500 other Amateur Radio operators, I have volunteered to be a communicator. This was to be my 16th year as a Marathon volunteer. Many of us have been here year in and year out. Rain or shine, we are doing what we love—talking on radios and helping out. Many hams are assigned along the course as communicators; others are assigned as shadows to follow officials wherever they go. My assignment this day is to shadow Mayor Rudolph Giuliani.

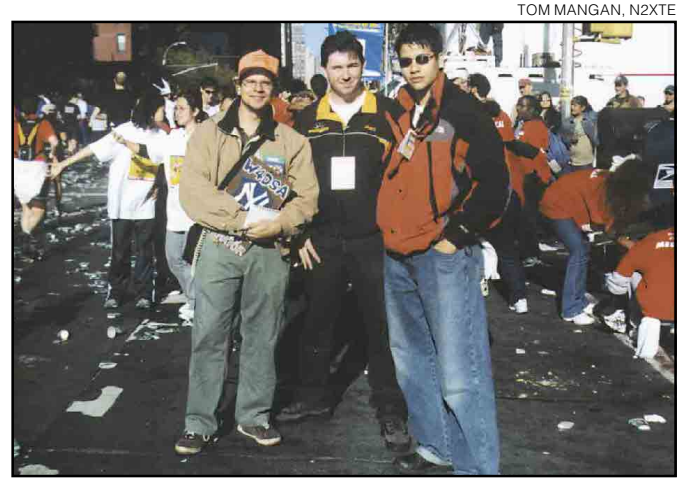
The night before the race, as I gave my equipment a final once-over, I realized that I was feeling somewhat apprehensive. Would the terrorists strike again? Is biological warfare a possibility? Was I over-reacting? In my work as a psychotherapist, I have spent the last seven weeks working with first responders to the World Trade Center disaster as well

Mayor Guiliani (center, rear) did the Marathon route in style. WILLIAM BENNETT, KB2ZDZ

JENNA PRESCOTT

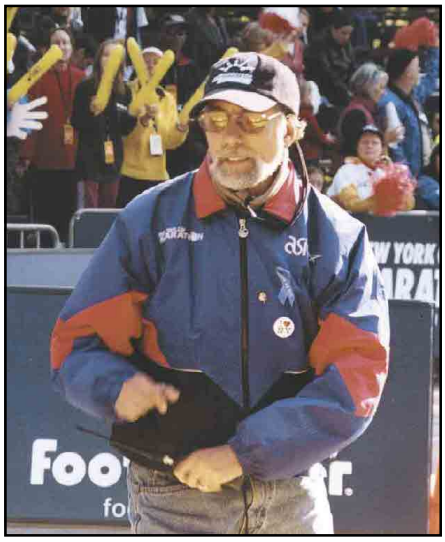
Robert (KB2PSM) and Phyllis (KC2DKD) Robinson served as a logistics team, helping to ensure that the hams stationed between mileposts 3 and 25 had eveything they needed.

TOM MANGAN, N2XTE



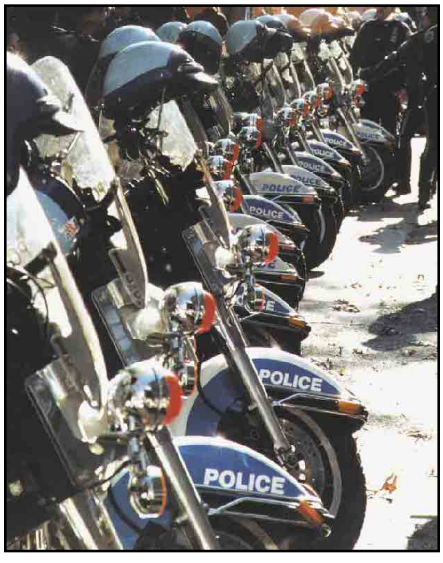
The group at Mile 17: From the left, Daniel Abranko, WA2DSA; Patrick Rice, KC2BEG, and Jonathan Lee, KC2COD, all from the Bronx High School of Science Radio Club.

WILLIAM BENNETT, KB2ZDZ



Marathon director Allan Steinfeld, W2TN, watches the race action.

WILLIAM BENNETT, KB2ZDZ



The police presence was apparent at 66th Street and Central Park West.

as with many who were traumatized by the event. I have listened as people expressed their fears, worries and concerns. I have heard many stories of pain, loss and sadness. I have also heard many stories of heroism and bravery.

This year's Marathon would be different. On Saturday, the day before the big race, I spoke with Allan, W2TN. I asked him what was different this year. "What's different this year has nothing to do with the race," he said. "It has to do with the world. It has changed since 9/11. Most of the runners are still coming. The police are very alert and very prepared. Security for the runners will be tighter than ever before. They will need to show photo identification to pick up their numbers. Also, all the bridges will be closed to traffic. New York City will be a 'no fly' zone with the exception of NYPD and one WNBC chopper. Mayor Giuliani wants the world to know that this great city is on its feet again."

"What is different? Life as normal," said New Jersey State Trooper and first-time runner Timothy Mahoney, who would finish at 3:57:38. "I followed the suggestions of the Mayor and the President." The desire to return to normalcy is powerful. "I never considered sitting out the race. Never thought of staying home," said Jimmy Phibbs of Dublin, Ireland (3:41:17), who dedicated his race to the New York City Police Department, in general, and, in particular, to his friend, NYPD officer Paul Gaglio, who also completed the Marathon.

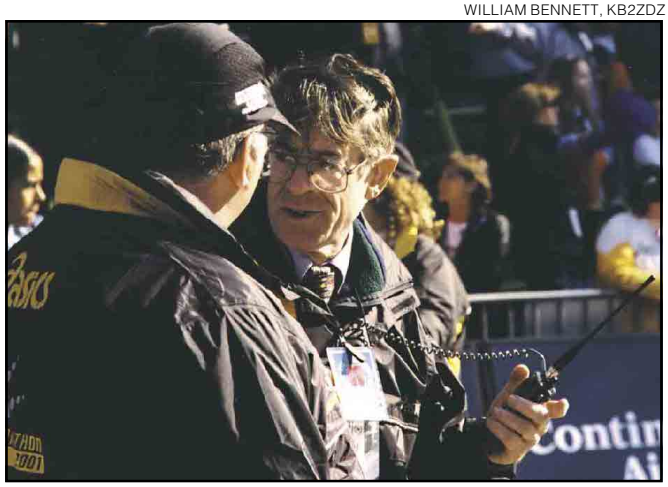
How were my fellow hams reacting to the terrorist threat? I spoke with a number of them the day before the race in order to gauge their feeling about working this high profile event. Ralph Haller, N4RH, and his wife Karen have been coming to New York to volunteer for the Marathon for about eight years. Ralph, the former chief of the FCC Private Radio Bureau, reported having no concerns about safety but he did note the much higher level of security. Karen, on the other hand, expressed anxiety about anthrax and worried that there could be a possibility of chemical terrorism with a crowd this large.

Martin Finkelstein, N2PCW, a New York City police officer, works in the elite Highway Unit. A former president of the NYC Repeater Association, Martin told me: "Without the ham radio operators on the course, there would be no Marathon because they would need so many paid personnel. I don't think it could be properly coordinated. Ham radio operators are coordinated due to their training, love of the hobby and sense of public service volunteerism."

Communications Director Steve Mendelsohn, W2ML, has been working with the Marathon for 26 years. Steve said he personally made no special efforts to do anything different this year. His view is, "I don't want them to change me." Steve did increase the number of operators on the course this year from 425 to 491, however. When reflecting on the effects of September 11, he said, "What 9/11 did in my view is sensitize the public to how important Amateur Radio is."

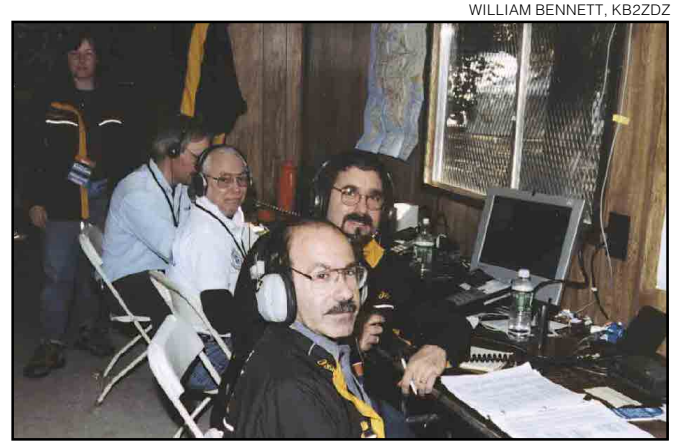
The race would begin at Fort Wadsworth on Staten Island. In order to enter the waiting area, runners and staff needed to show identification. As evidence of the tightened security, Steve and Allan were walking around the perimeter when they came to a checkpoint. They were stopped by a police officer and asked for their credentials. Race Director Steinfeld shrugged his shoulders since he had no picture credentials with him and looked to Mendelsohn for help. Steve

WILLIAM BENNETT, KB2ZDZ



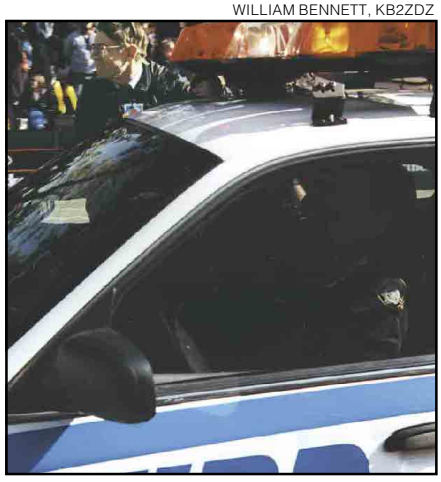
Communications Director Mendelsohn consults with Assistant Communications Director Rick Ramhap, N2GQR.

WILLIAM BENNETT, KB2ZDZ



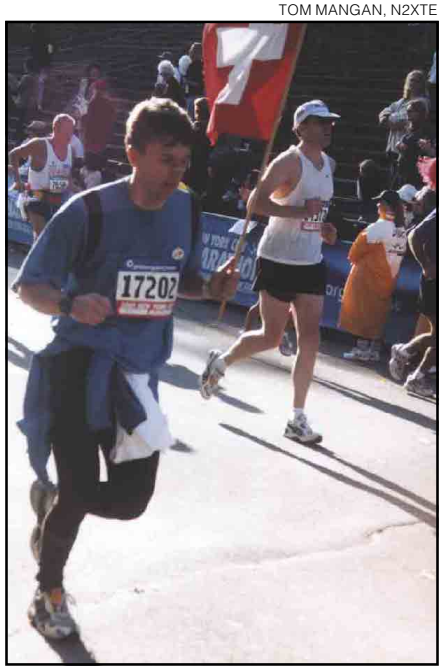
From the left: Alan Crosswell, N2YGK; Joe Brown, KB2NBN; David Spector, W2DHM, and Mitch Stern, W1SJ.

WILLIAM BENNETT, KB2ZDZ



W2ML checks on the progress of the runners from his mobile vantage point.

TOM MANGAN, N2XTE



Runners pass the specially erected stands.

showed his ARES ID card and the officer said, "You're OK." Pointing to W2TN, he asked Steve, "Can you vouch for that one?" Even the race director needs to wear credentials!

The willingness to provide a public service, even in times of personal risk, is nothing new for the radio amateur. Many times amateurs have placed themselves in harm's way in order to provide needed and critical communications. As testimony to the ultimate sacrifice, a monument stands in front of ARRL Headquarters. It commemorates amateurs who sacrificed their lives while performing Amateur Radio emergency communications and public service duties.

Amateur Radio operators are quick to offer their help and expertise as communicators. This was demonstrated as never before in New York on and after September 11. Joe Tomasone, AB2M, created a Web site so hams wishing to assist in the World Trade Center disaster could register. He reports: "During its operation, 570 amateurs registered along with their time, their equipment and their expertise to serve their fellow man. Representing over 35 states and two Canadian provinces, these dedicated volunteers represent the very essence of the Amateur Radio Service." At the New York Marathon, I found this to be the prevailing spirit among hams, whether they were new to Amateur Radio or had many years of experience.

One of the newer hams, Kaye Morgeneier, KB3FQU, earned her ticket just over a year ago. She finds this work exciting and fulfilling. Kaye had wanted to be a ham since she was young but was unable to find the time until recently. She believes that our work greatly enhances the safety of the runners and spectators. "It's not the happy and carefree event it was last year when we were all so innocent," she added wistfully.

Another recent addition to the Marathon radio staff is Deborah Kerr, KC2GPV. After the events of 9/11 she gave service to the Red Cross. She feels strongly about public service: "Any way I can help out, I will." She added: "We're supposed to be a united nation, helping each other. For me the Marathon is another example of that spirit."

It seems to me that my fellow Ama-

"Where is that Ham Radio Guy?"

I hear the Emergency Medical Technician ask that very question as she looks around for him. The ham is one of hundreds who are volunteering at this year's Marathon, even on such a beautiful sunny day as this one.

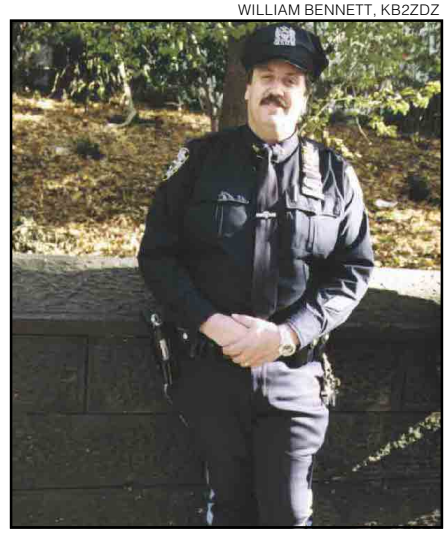
I spend a large part of the day with total strangers who are helpful, kind and generous to me. They share stories with me, some that depress me and some that make me laugh out loud. For instance, Steve Kaufman, N2RIY, told me about the time he watched a runner who thought the Ben Gay on the tongue depressor was glucose and put it in his mouth as he imitates the face the runner made. Joe Bruno, WB2VVS, always likes to see the runner in the rhino costume. Apparently, there is one every year. Another ham tells me how he stopped doing the NYC Marathon and ham radio for several years. He came back because he knew they needed the help. He stays because, he tells me, "ham radio becomes part of you."

And they tell me it's only a hobby...—*Jenna Prescott*

RONNIE M. HIRSH, W2RMH

Deborah Kerr, KC2GPV, is dedicated. "Any way I can help out, I will," she commented.

WILLIAM BENNETT, KB2ZDZ



Kenny Laydon, W2KOP, received permission to take his usual turn driving the police car used by communications director W2ML. Since 9/11, Ken's been assigned to Ground Zero.

JENNA PRESCOTT

Steve Kaufman, N2RIY, whose day job is police officer, has been volunteering at the New York Marathon for about 10 years.

WILLIAM BENNETT, KB2ZDZ

Richard Otake, KB2SPA (left), and Russ Greenman, WB2LXC, look well prepared.

teur Radio operators are well prepared. They have the right equipment and healthy mental attitudes to perform their function at the New York Marathon. Their spirit and dedication fill me with pride.

It's time to leave my home. It is now 4:30 AM. I'm in a cab heading to the bus that will take me to Fort Wadsworth. I'm still thinking that today could be a difficult one. The uncertainty of what may occur intrudes on my thoughts. But, as I am listening to the early morning traffic on the Marathon net, I smile with satisfaction as I realize I am part of a wonderful team and no matter what happens, we can handle it.

HAMS AGAIN PROVIDE SUPERB COMMUNICATIONS TO THE NY MARATHON

By William Bennett, KB2ZDZ

It was NYC Marathon Day again and we were there. There was a slight chill in the air, great for the runners. Sunny with a few clouds with blue sky, but no jets flying overhead or noisy helicopters. The slow-moving blimp was also noticeably absent and the A train was rumored to have been stopped from running. Large orange NYC Department of Sanitation trucks filled with sand were parked in the middle of the side streets where they intersected the race route to restrict access to only approved vehicles. All this was in the interest of security, we were told.

Not absent were millions of energetic fans lining the course from Staten Island to the finish line into the Family Reunion area shouting their enthusiasm for the runners and waving banners representing every American ethnic background and almost all the nations of the world.

Also present with equal enthusiasm were large numbers of volunteer Amateur Radio operators providing vital communications throughout the course and beyond. Many wore orange hats and special jackets issued to them for serving in the Marathon. Most were from the tri-state area of New York, New Jersey and Pennsylvania, but others came from more distant areas. There was good representation of the first year volunteers as well as those who have been volunteering for decades.

In the middle of the Queensboro Bridge with five other hams stood George Gluck, WA2WKV, who has been assigned this post for the last 25 years. Kenny Leydon, W2KOP, has been driving Communications Director Steve Mendelsohn, W2ML, for the last five years through the course in a police car just ahead of the lead runners. An active member of the Larkfield ARC on Long Island, Ken has been assigned to Ground Zero since 9/11/01. Russ Greenman, WB2LXC, comes from the Albany, New York, area and was given his first Marathon assignment at the West 86 St medical tent. Hams came from Long Island, Westchester, upstate New York, New Jersey, Pennsylvania, Massachusetts and many other states. They came for the fun and excitement, to maintain their radio skills and to learn new ones—all in the interest of maintaining preparedness for future emergencies.

Hams were assigned at each mile location throughout the course and at the Family Reunion area. Many were shadows for the numerous race managers who made the smooth running of the whole event possible. Many hams who served at the Marathon had also assisted in the aftermath of the World Trade Center tragedy, the crash of Flight 800, the Pine Barrens fires on Long Island and other emergencies. Every ham we met was on an emotional high as a result of taking part in the Marathon communications.

What about next year? It's a safe bet there will be no shortage of volunteers!

Acknowledgments

The authors and photographers wish to thank Tom Beecher, Kodak professional film representative, for his technical support and Kodak's contribution toward the photographs that accompany this article. Thanks, too, to the members of the Huntington (Long Island) Camera Club for their photographic coverage of the ham radio contribution to the 2001 New York Marathon. QST

By Ray Abraczinskas, W8HVG

A Ham Radio Fishing DXpedition in the Wilds of Quebec

Hamming and fishing—a group of Michigan hams enjoyed the best of both during a memorable trek to VE2.

Canadian fishing is hard to beat, especially in Quebec where abundant lakes and rivers offer many species of fish with adequate catch limits making the travel there worthwhile. That's why I've been going to the same area in Quebec for over 40 years, ever since my dad first took me there in the late 1950s.

In early September 2001, my son David, N8PMK, my brother-in-law Tom Oleksy, K8LZH, and I went on another fishing trip to the wilds of Quebec. This time, though, plans included taking along a QRP HF station to operate from the bush in case of an emergency, and for fun.

Normally, the outfitter makes a check-flight every two or three days to pick up the fish and see how we are doing during our weeklong stay in the bush. The idea of having a radio for communications somehow made sense, but could we get it all packed into the plane with a 100-pound weight allowance per person? We'd have to plan very carefully because all our personal gear, fishing equipment and food for the week usually weighed in at slightly over the limit.

The Journey North

We fish in a wilderness area 100 miles northeast of Senneterre, Quebec, about 400 miles north of Montreal. Our outfitter is Pavillion du Lac Berthelot Outfitters owned by Gary and Diane Koch who have a main lodge and 14 fly-in outpost camps. Their lodge is at the end of a 68-mile road out of Senneterre. They provide excellent services in a huge area of excellent fishing (and hunting).

The 900-mile drive from Grand Rapids, Michigan takes about 22 hours. We drove across the scenic Mackinac Bridge in northern Michigan, crossed into Canada at Sault Ste Marie, Ontario and headed east on Route 17 through Sudbury toward North Bay.

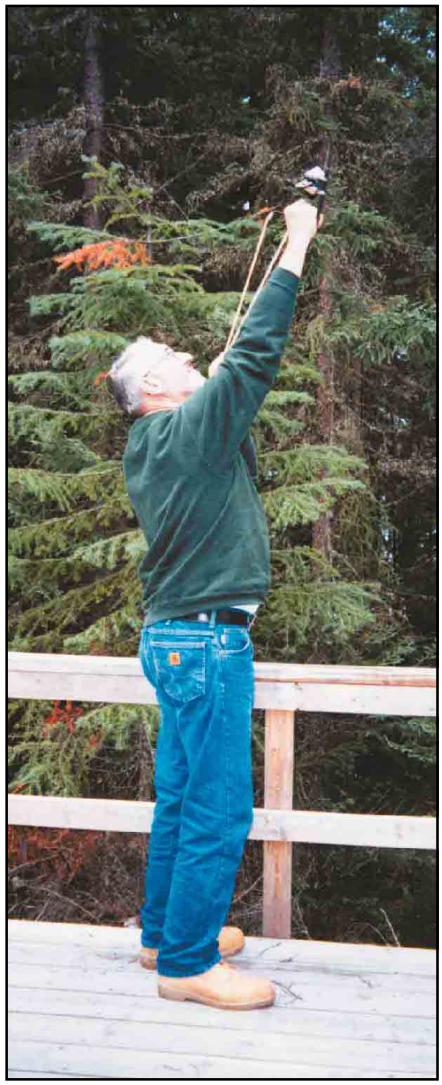
Then we headed north up Route 11 to New Liskeard, Ontario, and turned east toward Quebec. The road to Rouyn and Val-d'Or, Quebec passes through some very beautiful farming country. We worked many hams on 2 meters along the way and occasionally we stopped and had an eyeball QSO or two. In Quebec, speaking French helps!

We arrived in Senneterre mid-morning and gassed up for the final 68-mile drive to the outfitter. The road was in excellent condition and it only took 2½ hours to drive to the lodge.

We were greeted by Diane and Gary and we discussed our plan to haul in our

Left to right: Tom Oleksy, K8LZH, David Abraczinskas, N8PMK and Ray Abraczinskas, W8HVG, at Barry Lake, Quebec.

The road ends at Berthelot Lake Lodge 68 miles northeast of Senneterre, Quebec—a place for great fishing and hunting. I've been fishing there for over 40 years.



Tom Oleksy, K8LZH, threading the treetops with a slingshot and 10# fishing line. It was hard getting the weight back down through the limbs.

radio equipment for emergency communications, even though it put us slightly over the weight limit. They graciously agreed, so we paid our expenses, unpacked our car with 360 pounds of gear and got ready to load the plane for the 35-minute flight to Barry Lake, one of many excellent fishing outpost camps available.

Airborne

The flight was smooth and we landed right in front of our cabin on Barry Lake. The weather was mild as we approached the dock where two couples from West Virginia were waiting to be flown out. They helped unload all our gear on the dock and commented, "Where are the other six people?" We sheepishly laughed while helping load their sparse gear for the flight out.

We quickly hauled our equipment up the 100-foot boardwalk to the cabin and began to unpack. The cabin was nestled on a hillside in a clearing of 50-foot fir trees. It was built 3 years ago and had most of the comforts of home. The kitchen had a gas refrigerator, cook stove and lights. There was a dining area, sleeping area with eight bunks and a deck. A small wood stove set in the corner. Running water was available (if you *ran* to the lake and hauled it!). The outhouse was behind the cabin a short walk up the hill.

Setting Up

After unpacking and assembling our fishing gear, our first priority was to put up the 250-foot loop antenna and check out the station. The excitement of hamming and fishing started to build, but then things changed.

Tom stretched out the loop antenna wire around the clearing and hooked up the 300-Ω TV flatline to the center insulator with small wire nuts. Then, using the slingshot, he started to shoot lines up into the tops of the highest fir trees near where the corners of the loop would be. The fir trees in Quebec can have some extremely thick tops and the fishing sinker didn't seem to want to come back down through the limbs. After many attempts and repositioning in the dense foilage, we finally got the first line up, over and back down to connect to the pull-up line. The first support line only took us an hour. Only three or four more lines to go!

Each time, Tom became more efficient and the loop started to go up easier and easier as we threaded it through the thick tree growth.

Up the hill behind the cabin, we had to remove four sapling trees with the ax. We added the results to the firewood pile. Then, jokingly, Tom threatened to move the outhouse and I hollered, "Enough! It's time to go fishing!"

Our ham station was packed in a 5-gallon plastic bucket, weighing all of 26 pounds. The Yaesu FT-817 transceiver and the MFJ antenna tuner were wrapped in bubble pack. We used a 12-V, 18-Ah gel-cell battery that provided adequate power. We had two notebook-sized military surplus solar panels rated at 1.6 A to charge the battery.

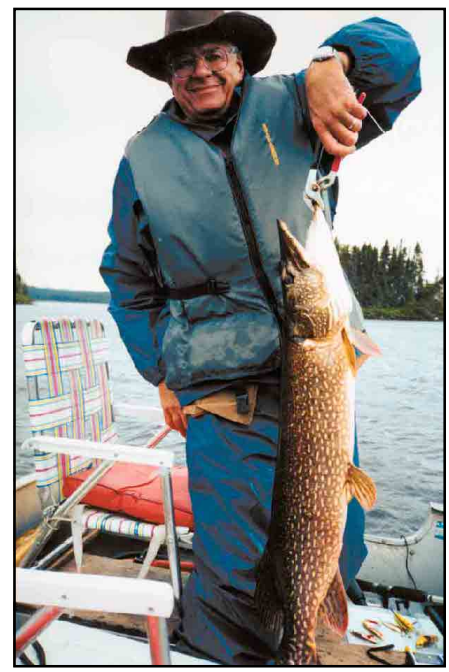
Setting up the "shack" in the cabin was easy. We used a plastic storage box on a chair as the table and pulled up another chair for the operator. Keep it simple!

After powering up the equipment and tuning the antenna, it was obvious that a ground was needed because tuning on some of the bands was a little squirrelly. We found a long metal spike and rigged a ground wire under the porch. Tuning became easy and stable. Success at last!

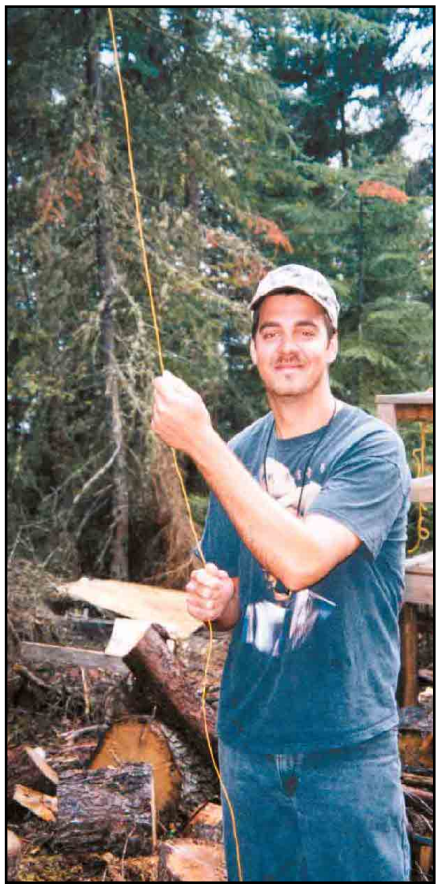
It took over three hours to clear the trees, erect the antenna, and set up the station! Now it was time to go fishing. We anxiously loaded our gear into the boat and set out across the lake. The depthfinder indicated some good drop-offs right in front of our cabin. We trolled some of our favorite spots and caught five walleyes and a northern pike for supper. There is no better fish to eat than fresh-caught walleye. It was soon 7 PM, time to clean fish and prepare our first fish supper. After supper, it was time to check out the ham bands.

Tom tuned the radio on 75 meters and suddenly we hear Ed, WA8ZXZ, in our

Tom, K8LZH, checking out our station setup. After installing a ground wire to the tuner, everything tuned up nicely. We were ready to work the world!



Ray, W8HVG, about to release a 45-inch, 25-pound pike.



David, N8PMK, pulling the 250-foot loop antenna into the thick fir trees.

Ray, W8HVG, and Bill Gauthier, VE2HG, share a laugh in Bill's shack in Val-d'Or, Quebec. After talking for many years, they finally had an eyeball.

hometown, Grand Rapids, with a signal 20 dB over 9. What a morale booster! But, alas, the noise level was S8 because of some neighboring storms. No one on the frequency could hear our 5-W QRP signal on 75.

We checked out 40 and 20 with similar results and decided to record all the antenna tuner settings for later use. The loop antenna tuned nicely on all bands. We hit the sack at 10 PM. It was a long two days getting there and 6 AM came early.

Reveille

While the bacon and eggs were frying, Tom tuned 40 meters and discovered a QSO occurring between a ham at a fishing camp on Lake Winnebago in Ontario and a ham near Cincinnati who had the fisherman's wife on the phone patch. This went on for hours every day at 8 AM and 8 PM. It was fun hearing how other hams were fishing and hamming in the northwoods. They even had a generator! We contacted them every day and compared our daily fishing experiences. The rest of the week, we awoke early, fished hard all day, ate fish for supper and hammed until bedtime. We worked stations in England, Rio de Janeiro, Ontario, up and down the East Coast and throughout the Midwest. It was very reassuring to be able to relay messages home via Tim, WB8UHZ, in Saginaw, and Chuck, N8CM, in Holt, that the fishing was good and everything was okay. Ham radio provided us reassurance in case anything went wrong.

The fishing was excellent! We caught our limit of walleyes and threw many smaller ones back. The pike were hitting too and we put several larger ones back. The largest one caught was 45 inches long and weighed 25 pounds.

Friday evening came incredibly fast. Our last walleye supper for the week was as great as the previous six. We listened on 40 meters at 8 PM and there was the same group in Ontario talking to Cincinnati (and his wife). He would be flying out tomorrow also.

It was time to dismantle the ham station and start packing our gear for the trip back to the main lodge. Weather permitting, the plane would pick us up between 9 and 11 AM.

Departure

The pilot picked us up on time and we were back at the lodge by 11 AM. The temperature was 83 degrees—a gorgeous summer day!

We packed the fish and gear and started taking showers. While Tom and Dave showered, I talked to Gary about our ham radio and fishing experiences. I showed him Tom's FT-817 and the solar panels. He was impressed. I suggested that he consider promoting and advertising to hams who are fisherman to bring their portable ham equipment along, just so it doesn't exceed the fly-in weight limits. He agreed.

In Senneterre, we were able to key up the Val-d'Or repeater and talk to Bill, VE2HG. I've talked to Bill every year for many years, but have never met him. I was quite pleased when he asked us to stop by for a cup of coffee. Bill guided us right to his house a short distance from the town center.

We liked Bill immediately! He poured us a giant cup of coffee and invited us into his shack, which was built in the back of his garage. He showed us his gear, and told jokes and stories. Being a retired miner, Bill had many stories. It was one of the best ham visits I ever had!

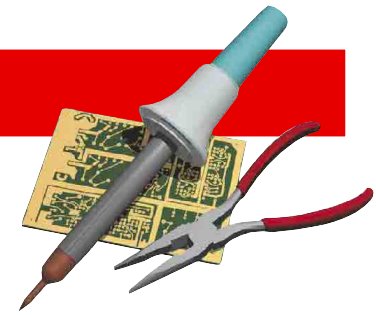
We left Bill's QTH around 7 PM heading west toward the Quebec-Ontario border near Notre-Dame-du-Nord. We continued to talk to Bill on the repeater. Several other familar hams joined in telling more stories.

As we approached New Liskeard, Ontario we saw what appeared to be a large brush fire ahead on the hillside. A quick call on the New Liskeard repeater and we were in contact with a ham who called the Ontario Provincial Police to check it out. What a hobby!

We crossed back into the US at Sault Ste Marie and headed for the Mackinac Bridge. We arrived in Charlevoix at 6 AM and unloaded Tom, who treated us to a nice breakfast before Dave and I left for Grand Rapids. It was Sunday, 11 AM as we rolled into the driveway and unloaded the van. Another great fishing trip was over for another year. However, this one held many fond memories about Amateur Radio, which we thought about as we drifted into peaceful sleep.

Ray Abraczinskas, W8HVG is an electronics engineer recently retired from Smiths Aerospace in Grand Rapids, Michigan. You can contact Ray at 4295 Kentridge SE, Grand Rapids, MI 49508; **abra@i2k.com**.

QST



The Doctor is IN

Q Anthony Manser, AF7J, of Centerville, Utah, writes: I would like to know how to evaluate my antenna system for RF radiation in the QTH, etc (health concerns).

I'm using two R7 verticals in phase at 60 ft spacing. Height above ground is 10 ft at the base where the radials are. The verticals are positioned at each end of my QTH, so I'm right in the middle of the system and approximately 10 ft below the bases.

Also, is my maximum field at the center of the verticals, like a simple vertical dipole antenna?

A This is one evaluation that is really not well covered by "the book." You can use the RF-safety calculator at the University of Texas to estimate the worst-case exposure from your station. Fed in phase like that, the two verticals would have a gain of as much as about 5 dBi. If you run this through the calculator, assuming 28 MHz (your worst-case HF frequency) and assume 100 W of continuous power, this gives you a required separation distance of 7.8 feet for controlled exposure (you and your household, if they are aware of RF energy) and 17.4 feet for your neighbors.

If you and your family are 7.8 feet below the antenna, your evaluation using the simple methods was sufficient.

I ran EZNEC (**www.eznec.com**) to calculate the near field under your antenna, at a height 10 feet below the antenna whose bottom was 20 feet in the air, starting below one antenna and going toward the other. The exposure level does go up and down along the line extending to below one antenna to below the other, but the minimum exposure is below either antenna and the maximum exposure is toward the area midway between the two antennas.

For more information, including links to the University of Texas site, see **www.arrl.org/rfsafety/**.

Q Craig Stadler, KG4EOM, writes: My new Ford F150 is producing so much static in my Yaesu FT-100 it makes it unusable. I used it in a Dodge diesel with no problems. Is there any way to stop the problem?

A Unfortunately, there are a number of different problems that can create what most hams call "ignition noise." There are a number of reasons for this: modern vehicles need to meet all sorts of regulatory objectives with respect to pollution, fuel economy and vehicle safety. One way that manufacturers have met those guidelines is to make improvements to the ignition systems of vehicles. They have done things such as increasing the voltage to the spark plugs and decreasing the rise time of the ignition pulses. You guessed it—both of those "improvements" increase ignition noise. In today's vehicles, the old coil-distributor are gone, with the vehicle's electronic control module (ECM) sending signals to high-voltage modules at each plug. The backyard mechanic of yore would scarcely recognize some of today's vehicles.

And, of course, the problem could extend past "ignition noise." Some fuel injectors, also controlled by the ECM, can make the same pop-pop sound at low speeds, changing to a whine at higher speeds, that is characteristic of ignition noise. Today's alternators often have to deliver much higher current than older models, increasing their noise-generating potential.

Ed Hare, W1RFI, recently visited the EMC laboratories at Chrysler, General Motors and Ford in Detroit. At one of the Labs, he was shown a test fixture that contained the vehicle wiring and electronics, all laid out on a large table. In that vehicle, there were over 30 electronic modules, and the EMC engineer giving him the tour told him that some vehicles have over 60 such modules—some of them containing several ICs. There is simply no way that such a vehicle can be as quiet as Ed's 1978 GMC pickup (nicknamed the Deathmobile by *QST* QRP columnist Rich Arland, K7SZ).

Add to the mix some of the traditional noise sources, such as the numerous electric motors in today's vehicles, and you have an interference potential that is much higher that even a few years ago.

You didn't mention what the noise sounds like. One "classic" problem in today's vehicles comes from the in-tank fuel pump used in many cars today. Ford has recognized this problem and has published a Technical Service Bulletin to describe how to install a filter in the tank.

ARRL has created or identified a number of Web pages that may help you. Start with *RFI—Automotive*: **www.arrl.org/tis/info/rficar.html**. This is where you'll find the automotive RFI "home page."

Other pages that may help are:

Automotive Electric Motor and Fuel Pump Noise: **www.arrl.org/tis/info/fuel.html**. How to diagnose and cure noise from fuel pumps and other electric motors. This includes a reprint of the information in the Ford TSB on the subject.

Automotive Interference Problems: What the Manufacturers Say—**www.arrl.org/tis/info/carproblems.html**. This page gives the RFI policy statements of vehicle manufacturers.

Lab Notes—Mobile Installations and Electromagnetic Compatibility—**www.arrl.org/tis/info/pdf/39574.pdf**. Some general guidelines on various automotive RFI problems.

Off-site Web links:

NOISE and How to KILL It—**www.primenet.com/~nx7u/mobile/noise.html**. More information on Ford fuel pump noise solutions.

Engine Noises—**www.arrl.org/tis/**. This section is devoted to helping you diagnose engine and ambient noises.

HF Mobile's Home On the Web—**www.mindspring.com/~nx7u/mobile/noise.htm**. General information on automotive noise.

Ford Explorer Radio Frequency Interference—**www.4x4central.com/tips.htm#rfi**. Still more information on Ford fuel pump noise solutions.

Radio Interference to/from two-way radio receivers.—**dodgeram.com/technical/tsb96/08_30_96.HTM**. Models: Dodge 1995-1997 BR Ram Truck.

Radio Telephone / Mobile Radio Installation Guidelines—**service.gm.com/techlineinfo/radio.html**. GMNA Engineering Centers General Motors Corporation installation guidelines.

Q Tony, W4FOA, writes: I have tried to find a review of the Dentron MT3000A and the Dentron AT3K antenna tuners, but no luck. Could you please point me in the right direction?

A There are several ways to find if/when a Product Review was done. Go to the TIS (Technical Information Service) Web page **www.arrl.org/tis/** and familiarize yourself with what's available.

First, there is the *QST* Product Review Downloads (for ARRL Members): This contains the Product Reviews for viewing and download from 1980 to the most current (even before it hits your mailbox).

Next is the *QST* Product Review List (open to all): This contains a list only, showing the product and issue date going back to 1970.

Before then there was the Recent Equipment column—not yet listed at all. However, you can still find out whether *QST* has reviewed a product by using the ARRL Periodicals Index Search (ARRL Members). In the case of the Dentron MT3000A and the Dentron AT3K, using the model number may not be a good idea because we can never be sure if and where the hyphens (-) or slashes (/) might have been used. But searching on the word Dentron reveals that we did five articles on Dentron in *QST* and one in *QEX*—none of which were reviews of the models you mention, unfortunately.

Q Bill Gier, KB0VYG, of Omaha, Nebraska, writes: I have been trying to figure out why I can't seem to make my 2-meter H-T work with any antenna other than the rubber ducky that came with it. The rubber ducky is fine, but when I hook a BNC adapter to receive a PL-259 from a 5/8 wave mag mount mobile antenna, or my 5 el Yagi on the roof of my house, I get no reception and weak reports from a fellow ham who lives just a few miles away. I know he can hear me because I listen to him responding to my transmission on another 2-meter rig. I do know when I use the H-T on simplex (hardly ever visit the local repeater) when mobile at 5 W, my friend and I can usually maintain contact around the city. I wanted to use my H-T through my 5/8-wave 2-meter mag-mount antenna for better coverage.

A The only possible reason I can think of for this would be that you have some sort of problem with the adapter you are using. When I test radios in the ARRL Lab, I do not use the rubber duck antennas. We use cables with BNC connectors attached (or SMA connectors, if that is what the H-T has).

I will say that the mag mount *must* be used with something large and metal though—if you are using it indoors rather than mounting in on the car, try placing it on top of a stove or other large metal object. Of course, the Yagi should work fine as is.

Q Michael J. Linden, N9BDF, writes: Conventional wisdom says that when you build a dipole, you cut each leg to the exact same length. Then, when in place, you tune it by trimming (or adding wire) the same length (always) from each side until you get the dipole to resonate where you want it to in the band.

Is there ever a case where it would be advantageous to trim each side individually to decrease the minimum SWR? In my case, I'm working with a unique situation. My dipole is in the attic of my house and, although the antenna clearly shows a point of resonance, I'm having problems getting the minimum SWR below 2:1 (even with a feedpoint balun). It has occurred to me that this may be a result of interaction with metallic objects at the base of the attic (conduit, cable TV coax, etc) or on the roof (six or so aluminum roof vents). Is it possible that one leg of the dipole is interacting with something in the attic such that the length of this leg should be adjusted with respect to the other leg? I guess my assumption (which could certainly be wrong) is that the electrical length of one leg of the dipole may need to be adjusted due to "coupling" with something while the other leg's electrical length is fine because it is not interacting with anything nearby. Is this possible?

I should mention that the antenna is a multiband trap dipole that covers 10/15/20/40. I'm having the SWR problem (minimum is 2:1) on 10/15/20 m, while 40 m seems okay.

I've asked Santa to bring me a copy of *The ARRL Antenna Book* for Christmas, but in the meantime, I'd appreciate any input you have on this matter.

A The feed-point impedance of a center fed dipole varies with height above ground, so the 2:1 SWR might not be related to assymetry in the antenna system.

Here is the *EZNEC*-predicted feed-point impedance of an 80-meter antenna at different heights above ground:

Height	*Feed-point-impedance (ohms)*	*SWR*
10'	4.8–*j*33.4	15.0:1
20'	12.7–*j*14.9	4.3:1
30'	25.7–*j*0.0	1.95:1
40'	41.6+*j*9.8	1.3:1
50'	58.2+*j*12.9	1.3:1
60'	73.2+*j*10.0	1.5:1
90'	93.7–*j*19.0	2.0:1
120'	78.0–*j*40.8	2.2:1

The antenna was adjusted to be resonant at a height of 30 feet above ground, but at that height, the SWR is 2:1, because the feed-point impedance is about 25 ohms. As the antenna is lowered or raised, its feed-point impedance changes with height above ground. Although the SWR could be improved a bit by adjusting the length of the antenna, if the resistive part of that feed-point impedance is not 50 ohms, the SWR will never get to 1:1.

In practice, a 2:1 SWR on your feed line is really not all that bad on HF. If the feed line were 100 feet of RG-213, the loss if the line were matched (ie, 1:1 SWR) would be 0.36 dB. If the SWR were 2:1, the additional loss caused by the mismatch would result in a total of 0.42 dB of feed line loss. This loss is insignificant. The only problem you might encounter is that some transmitters' SWR protection circuitry may reduce power if the SWR exceeds 1.5:1 or so. In that case, you could use an antenna tuner to ensure that the transmitter operates into a 50-ohm load.

The feed-point impedance shown above is for the antenna fed exactly in the center. If the feed point is moved closer to one end, the feed-point impedance will go up. For example, if the antenna shown above at 30 feet above the ground is fed at a point 25% from one end, the *feed-point imp*edance increases to 50 ohms resistive. However, this off-center feed comes with a price—the feed line is not seeing a balanced load, so there can be problems with common-mode currents on the feed line. The most common manifestation of this is going to be problems with RF in the shack. It might be possible to tame this with a common-mode choke or balun at the transmitter end of the feed line. For more on this subject, see Zack Lau, "Making Off-Center Dipoles Work," *QEX*, Apr/May 2001.

If I were to speculate about the cause of your 2:1 SWR, I would guess that the antenna height is relatively low, causing the feed-point impedance to be less than 50 ohms. Coupling into nearby objects can also lower the feed-point impedance, so perhaps the best approach is to consider the use of an antenna tuner.

Do you have a question or a problem? Ask the Doctor! Send your questions (no telephone calls, please) to: "The Doctor," ARRL, 225 Main St, Newington, CT 06111; doctor@arrl.org; www.arrl.org/tis/. Add your comments: "The Doctor is Online" at www.arrl.org/members-only/qst/doctor/. QST

By William Rynone, PhD, PE

A CW Generator and Audio Distribution System for Students

Up to eight students can copy CW at the same time with this distribution amplifier, and it even includes its own CW oscillator!

The Anne Arundel (Maryland) Amateur Radio Club president, Bob Rose, AA3RR, dedicated a significant portion of one of our meetings to a discussion of how we might encourage more young people to join the ham community. It seems that Bob had attended a meeting of another club where a junior group was "in full swing." He was quite impressed and wanted to see if we could achieve similar results.

Of course, one of the challenges involved in developing potential new amateurs is providing educational assistance. Arranging classes is easy, even when they take place on Saturdays (Saturday classes are welcomed in the Northeast during the cold winter months!). Teaching theory in a classroom setting is straightforward, too. CW instruction in a group setting, however, is another matter. This can be a challenge to both students and teachers.

Bob determined that the best approach was to teach the receiving portion of the code lesson to all the students simultaneously. To minimize interference and to enhance concentration, the students would have to wear headphones. With these objectives in mind, he requested that volunteers design and build a combination code practice oscillator and distribution amplifier.

Meeting the Requirements

Bob specified that the system should provide headphone outputs to eight students. Each student would have the ability to adjust the audio level for his set of headphones. The club had already purchased eight identical sets of headphones at a Dollar Store, but we wanted to preserve the flexibility for each student to use his personal headphones as well.

We considered trying a basic audio power amplifier, but the students might be using low-impedance headphones. In this instance, we'd have to be careful to use coupling capacitors with high capacitance ratings (think "large"). On the other hand, the output terminals of dual power supply op-amps are almost at ground (with no applied signal). Thus, no output coupling capacitors would be required. The choice seemed obvious.

Finally, we wanted to keep the CW oscillator design as simple, yet stable, as possible. It would also be convenient if the project could include an input from an external audio source. That would give the instructor the flexibility to either generate the practice himself, with a key or keyer of his choice, or use a tape player or similar device.

Building the Distribution Amplifier

The schematic diagram is shown in Figure 1. You'll notice right away that this project is based on the Fairchild KA334 dual op-amp IC. While this op-amp is not common, it is an excellent choice for its current handling and the fact that you can couple almost any low-impedance load directly to its output without bulky transformers or coupling capacitors. If you have difficulty finding the KA334, try obtaining them as samples directly from Fairchild. The best way to do this is on the Web at **www.fairchildsemi.com/samples/index.jsp**. Create an "end user account," then request samples of the KA334. You'll only need five to complete this project.

The power supply was designed with simplicity and cost in mind. A single transformer, a bridge rectifier (U1), a DIP socket and two filter capacitors are the only parts used. The transformer is a very common 6.3-V center-tapped filament model. The bridge rectifier used in this project is a four-pin DIP unit. This was selected for its small size. Since we're using a socket, the rectifier is easily replaced should an inadvertent short "cook" the bridge.

To avoid the cost, weight and volume of a CW oscillator that employs a resonant L-C network, the circuit chosen was a Wein Bridge oscillator running at approximately 625 Hz with one section of a KA334 (U2). This type of oscillator only requires resistors and capacitors in the frequency-determining feedback network. A CW key plugged into the $^1/_8$-inch jack at J1 can key the oscillator. Alternatively, you can patch the audio output of a tape player into jack J10 and feed its signal into the amplifier network. SPDT switch (S2) allows you to select either the CW key or tape player option.

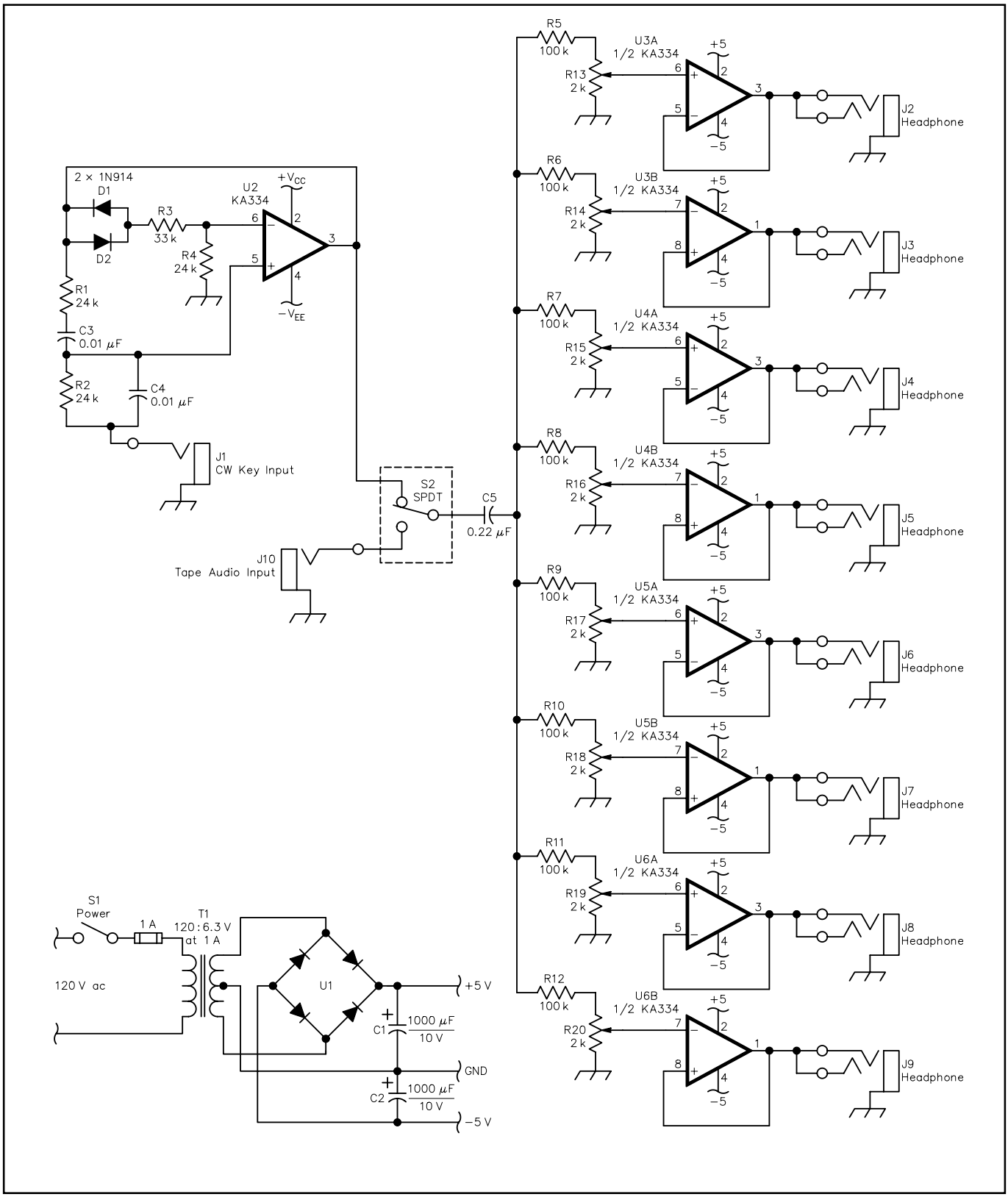
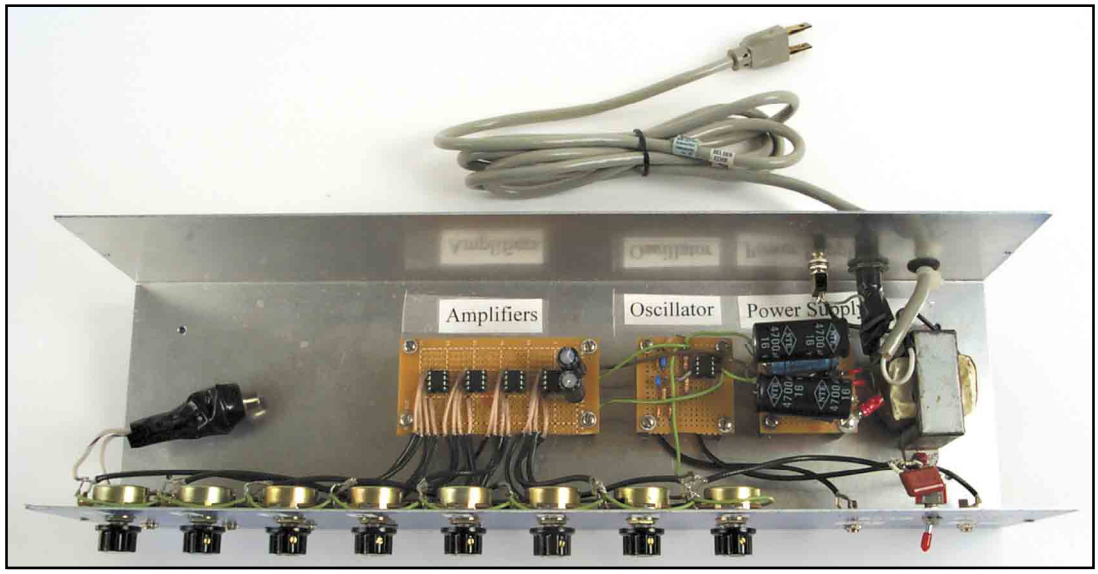


Figure 1—Schematic diagram of the distribution amplifier. RadioShack part numbers shown in parentheses unless otherwise noted.

C1, C2—Electrolytic capacitors, 1000 µF at 10 V (272-1047).
C3, C4—0.01 µF ceramic disk capacitors.
C5—0.22 µF ceramic disk capacitor.
D1, D2—1N914 diodes.
J1—1/8-inch 2-conductor jack (274-251).
J2-J10—1/8-inch 3-conductor jacks (274-246).
R1, R2, R4—24 kΩ 1/4-W resistors.
R3—33 kΩ 1/4-W resistors.
R5-R12—100 kΩ 1/4–W resistors.
R13-R20—2 kΩ potentiometers, audio taper.
S1—SPST toggle switch (275-651).
S2—SPDT toggle switch (275-603).
T1—Transformer, 120 V primary, 6.3 V center-tapped secondary at 1.2 A. Available from Mouser Electronics, part no. 553-F14X. Tel 800-346-6873; www.mouser.com.
U1—Bridge rectifier, 1 A at 200 V (276-1161).
U2-U6—Dual op-amps, Fairchild KA334 (see text).
Misc—Perfboard, knobs, enclosure.



Interior view of the distribution amplifier.

The distribution amplifier consists of four KA334s, U3-U6, each plugged-into eight-pin DIP sockets. The op-amp inputs are derived from the wipers of potentiometers (the audio level controls). The signal from the oscillator or tape player is simultaneously fed into one end of eight 100 kΩ 1/4-W resistors, and then fed into each of the eight potentiometers before being applied to their respective op-amps. The output of each op-amp is directed to one of eight headphone jacks (J2-J9) that are mounted on the front control panel.

The power supply, oscillator and the amplifier parts were mounted on separate perf boards, but could be combined into a single unit. The perf boards are then mounted on standoffs on the bottom of a Bud box which functions as a chassis.

Depending on the approach you use, and how handy you are with tools, this can be a single-evening project. The result will be most appreciated by your CW students!

Acknowledgments

Oscar Ramsey, NV3G, displayed his parts layout and wiring skills, and Norm Chipps donated parts and supplied ideas from his extensive practical knowledge. Dick Wilkinson used his beautiful Nikon camera to its best and also provided labels. Professors (Ret) Ralph Santoro and Steve Burns made valuable technical contributions.

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NEW PRODUCTS

MIDLAND'S F-10 FRS MINI RADIO

◊ Midland's new F-10 FRS miniature hand-held features the usual 14 channels, but does so in a tiny, virtually miniature package. In fact, the manufacturer claims the F-10 is the world's smallest FRS hand-held with a two-mile maximum range.

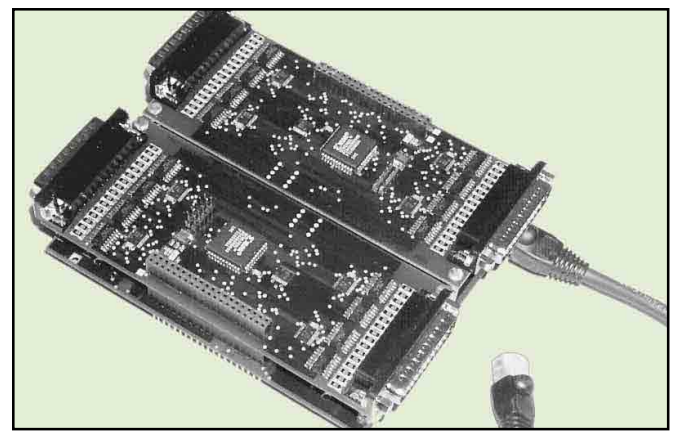
The little Family Radio Service transceiver features innovative VOX-based T/R switching. You simply talk into the radio and it transmits—without requiring the use of a headset.

Other features include a paging function, channel scan, low battery indicator, a bright daylight-visible LCD, squelch and an accessory speaker/mike jack. The radio operates on three AAA batteries.

Price: $24.95 each, or $49.95 per pair. For more information, contact Midland at 1670 N Topping Ave, Kansas City, MO 64120, or on the Web at **www.midlandradio.com**.

ETHERNET OPTO INPUT MODULE FROM J-WORKS

◊ J-Works, a developer of PC- and USB-based monitor, control and test instrumentation, is now shipping its Model JNT-36XX Opto Input Module. This device (and other models in its family) communicates with PCs via Ethernet and Internet connections to provide opto-isolated inputs that can be read in

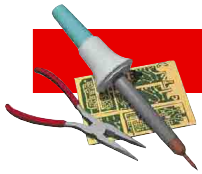


an open systems environment from any number of remote sites. The device is designed to replace internal, PC-based plug-in cards commonly used for data acquisition and control systems.

Other features include an embedded HTML control panel, synchronous or asynchronous operation, an input range of 0 to 30 V and up to 256 inputs per module.

Prices start at $375. For more information, contact J-Works at 12328 Gladstone Ave, Unit 1, Sylmar, CA 91342; tel 818-361-0787, fax 818-270-2413, **sales@j-works.com**, **www.j-works.com**.

Previous • Next New Products



By H. Ward Silver, NOAX

Test Your Knowledge!

Filtering and Tuning

Filtering and tuning are common operations in amateur equipment and stations. Here's some practice in figuring out the essentials of these important functions. Look in *The ARRL Handbook for Radio Amateurs* for formulas and constants.

1. In order to improve a QRP rig's performance on 30 meters, a parallel-LC circuit is to be added to the receiver input. The circuit's attenuation is a minimum at 10.12 MHz and rises to 3 dB at 10.25 and 9.98 MHz. What is the Q of this circuit?

2. The 8th harmonic of a signal at F requires 14 dB of attenuation. Two filters with a cutoff frequency of F are available—one has a rolloff of 4 dB per octave, the other 10 dB per decade. Which will provide the necessary attenuation, assuming attenuation at F is 3 dB.

3. The new low-band receiving antenna requires a tunable preamp with a frequency range of 1.8 to 4 MHz. An inductor of 100 µH has been selected for the tuned circuit. What are the minimum and maximum values for the tuning capacitor?

4. Getting ready for Sweepstakes has you thinking about a narrower SSB filter for your transceiver. How much does your existing 2.4-kHz-wide crystal filter with a shape factor of 1:3 at the 3 dB and 30 dB points attenuate a signal 3 kHz away? If solving your interference problems requires another 10 dB of filter attenuation for the same strong signal, which is required—a 2.1 kHz or a 1.8 kHz filter? Both have the same shape factor.

5. A 100 pF variable capacitor is used as the main tuning capacitor for an oscillator that covers the 20-meter band. The desired average tuning rate of the main tuning knob is 10 kHz per turn. If a 0.25 µH inductor is chosen for the tuning inductor, what gearing ratio must be used to achieve the desired tuning rate?

6. Here's a common Field Day issue—it is desired to reject the 2nd harmonic of a 40-meter signal that is interfering with the 20-meter station. The harmonic is S9 and it needs to be reduced to S5 to keep the peace in category 2A. A piece of RG-58/U is available—can it make a satisfactory quarter-wave 7 MHz stub?

Total Your Score!
Give yourself one point for each correct answer.

4-6	Top of the class
1-3	Try again!

22916 107th Ave SW
Vashon, WA 98070

Answers

1. For this circuit, Q equals the frequency of peak response (10.12 MHz) divided by the 3 dB bandwidth (10.25 – 9.98 MHz = 270 kHz), or 37.5.
2. The eighth harmonic of a signal is 3 octaves (F×8 = F×2×2×2) above the fundamental. Three octaves equal 0.8 decade. Starting with the 3 dB of attenuation at F, the 4 dB per octave filter provides 15 dB (3+3×4) while the 10 dB per decade filter will only provide 12 dB (3 + 10log(0.8)).
3. To resonate at 1.8 MHz, the capacitor value required is 1 / ($4\pi^2$ × 100 µH × $1.8\ MHz^2$) = 79 pF. At 4 MHz, the value is 15.4 pF. A 100 pF variable capacitor with a minimum capacitance of 15 pF or less will do.
4. The existing filter has an attenuation of 3 dB at 1.2 kHz from the center frequency ($^1/_2$ total bandwidth) and 30 dB at 3.6 kHz (3 × 1.2 kHz). This is a slope of 27 dB / (3.6–1.2) = 11.3 dB/kHz, starting at 1.2 kHz from the filter's center frequency. Attenuation at 3 kHz from the center frequency is 3 + (3–1.2) × 11.3 = 23.3 dB. To find attenuation from the other two filters, calculate the slope of each:
2.1 kHz filter : (30–3) dB / (3.15–1.05) kHz = 12.9 dB/kHz
1.8 kHz filter : (30–3) dB / (2.7–0.9) kHz = 15 dB/kHz
At 3 kHz from the filter's center frequency:
2.1 kHz filter : 3 + (3–1.05) × 12.9 = 26.9 dB
1.8 kHz filter : 3 + (3–0.9) × 15 = 34.5 dB
The narrower filter is required.
5. Assume the capacitor has a 180-degree min-to-max rotation range with capacitance varying linearly. With a 0.25 µH inductor, resonance at the band edges requires 517 pF and 493 pF, respectively—a range of 24 pF or 0.24 of the capacitor's total range. 0.24 × 180 = 43.2 degrees. (A fixed-value capacitor of 470 pF should be added in parallel with the variable unit.) The 20-meter band is 350 kHz wide, requiring 35 turns of the tuning knob at 10 kHz/turn. 35 turns of 360 degrees each must result in 43.2 degrees of capacitor shaft rotation for a total reduction of (35×360)/43.2 = 292:1.
6. First, how much attenuation is required? S9–S5 is 4 S-units, or 24 dB, assuming 6 dB/S-unit (this is only a rule of thumb and not a standard). Second, how long must the stub be? A quarter-wave shorted stub will act as an open circuit at the fundamental, but a short at the second harmonic. The velocity factor of RG-58/U is 66%—so a quarter-wave stub at 7 MHz is 7.07 meters (23.1 feet). The rejection is achieved by cancellation of the interfering signal and an out-of-phase signal reflected from the end of the stub. Using the 10 MHz loss factor of 1.1 dB/100 ft and multiplying by 2 for the round trip the energy must make, the stub will have a loss of 1.1 × 0.23 × 2 = 0.5 dB or 11.2%. Ignoring all other loss factors (such as connectors), 88.8% of the interfering signal will be eliminated, for a total rejection of 9.6 dB—only $1^1/_2$ S-units. A stub made from RG-8/U would have a loss of 0.18 dB and give a rejection of 13.9 dB, still not sufficient.

STRAYS

NEW ARRL EXTRA CLASS CERTIFICATE

◊ The Awards Branch of the Membership Services Department is offering a newly designed Extra Class License Certificate acknowledging the achievements of newly licensed Amateur Extra Class amateurs as well as those who qualified for this license class long ago. The attractive 8½×11 certificate is suitable for framing. ARRL members send $7.50 ($10 for non-members) to the Awards Branch, ARRL, 225 Main St, Newington, CT 06111. Be sure to include your name and address as well as the year you first received your Amateur Extra Class license. To learn more about ARRL awards and to see an image of the Amateur Extra certificate, point your Web browser to **www.arrl.org/awards**.

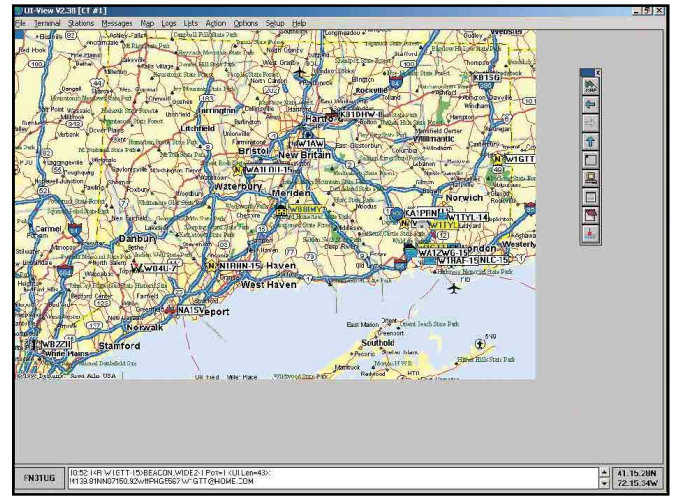
Next Strays

UI-View

It isn't often that you come across a piece of Amateur Radio software that is so easy and enjoyable to use. The user friendliness of *DigiPan* was largely responsible for igniting the PSK31 explosion. *UI-View* for *Windows* by Roger Barker, G4IDE, may do the same for APRS.

For those not familiar with the term, APRS is the Automatic Position Reporting System developed by Bob Bruninga, WB4APR. In its most basic form, APRS involves tracking radios that transmit data beacons. The beaconing stations use standard AX.25 packet, often at 1200 baud, to relay their latitude and longitude coordinates (many have Global Positioning System [GPS] receivers that provide accurate coordinates as their station positions change). At the receiving end, the APRS software decodes the beacon data and displays the positions as icons on a computer-generated map. As the stations move and beacon their new positions, the icons move.

During the last few years, APRS has become much more sophisticated than mere beacon tracking. APRS weather stations allow you to sample conditions at their locations. This is especially handy when severe weather strikes. "Information Kiosk" stations can be queried for various kinds of helpful data. Messages can be exchanged (some are routed through the Internet). There are APRS satellite relays such as the new PCSat…and the list goes on.



Introducing *UI-View*

What sets *UI-View* apart from other APRS applications is its versatility and ease of use. Like any complex piece of software, you should read the Help files before you begin hiking up the learning curve with *UI-View*. Even so, I found *UI-View* to be intuitive and easy to grasp.

You can start by downloading and installing the free version of *UI-View* that you'll find at **www.packetradio.org.uk/**. This version contains some basic maps, but nothing detailed—unless you happen to live in the UK. I discovered that the key to really getting the most out of *UI-View* is having a good set of local and regional map images—the kind that show details right down to street level if necessary. Many *UI-View* users capture and import maps from DeLorme's *Street Atlas* software (available for less than $30 at most retailers). You cannot zoom into map images with *UI-View*, so you need to import maps that provide the detail you need for the area you want to see. For example, there is a lot of APRS activity in Connecticut. If I used a map of New England only, the small area of the image set aside for Connecticut would quickly fill with APRS icons to the point where I couldn't separate one from the other. So, what I needed was a map of Connecticut by itself. Some users might even need maps of their hometowns for even greater "resolution." *UI-View* allows you to instantly switch from one map to another.

In Business

With the proper maps captured and loaded, I was ready to enjoy APRS with *UI-View*. You need a packet radio terminal node controller (TNC) to act as the radio "modem," and *UI-View* is set up to work with just about any TNC made. Rather than invest in a TNC, however, I opted to download the *AGWPE* software from **www.elcom.gr/sv2agw/index.html**. Created by George Rossopoulos, SV2AGW, *AGWPE* puts your computer sound card to work as a packet TNC—no external hardware required!

I installed and configured *AGWPE*, a task made easier by the fact that *UI-View* is also designed to recognize it. I tuned my FM transceiver to 144.39 MHz and within a few minutes the Connecticut map filled with APRS icons.

I clicked on a weather (WX) icon and *UI-View* obligingly opened a little window complete with the latest conditions at the station, along with a graphic showing wind direction. I clicked on the MESSAGES menu and saw a list of brief messages going back and forth among various stations. Other dropdown menus provided station lists, headings from my station and much more. After about 15 minutes I switched to the USA map and saw icons that had popped through Internet APRS gateways—such as a Weather Service special event operation in Oklahoma. When I wasn't paying attention to the monitor, I could listen to *UI-View* "announce" each new station over my computer speakers with a smooth British accent (presumably Roger's). This was fun!

Try *UI-View*

If you'd like to explore APRS, *UI-View* is one of the best software packages for the beginner as well as the advanced user. If you don't have a TNC to use with *UI-View*, try the *AGWPE* sound card software. And don't worry about owning a GPS receiver. This isn't necessary unless you intend to operate mobile.

The freeware version is bound to whet your appetite. After you've tried it, step up to the registered version, known as *UI-View32*, which offers more useful features. You can't go wrong for the $15 investment. *UI-View* will run on most PCs, even on 486DX2/66 systems running *Windows 95*. QST

Steve Ford, WB8IMY ♦ *QST* Editor

A COMPRESSION CAPACITOR FOR QRP TRANSMITTERS

◊ My favorite QRP transmitter generates enough power from a single IC to work plenty of 10-meter DX.[1] It, like many QRP circuits, uses a variable crystal oscillator (VXO). This allows operation over most of the 20-kHz region near the bottom end of the band, where the majority of the CW activity occurs.

Most VXO circuits specify a small air-dielectric variable capacitor. Unfortunately, these capacitors are becoming harder to find. When I recently rebuilt my QRP transmitter, I substituted a homebrew compression capacitor. The tuning range and resolution were significantly improved.

Construction is easy; there are no critical dimensions. (See Figures 1 through 3.) The PC-board pattern can be heavily scored with a sharp knife, and the unwanted copper foil can be peeled off after first heating it with a hot soldering iron. All parts except the PC-board material were purchased at my local ACE hardware store. (Choose the small screws and nuts to suit the tee nut available to you; then size the holes in the parts accordingly. Other fasteners such as anchor nuts or threaded inserts may be used in place of the tee nut if they are available to you.—*Ed.*)

[1]L. Smith, N7KSB, "An Experimental 1/2-W CW Transmitter," *QST*, Nov 1994, p 84.

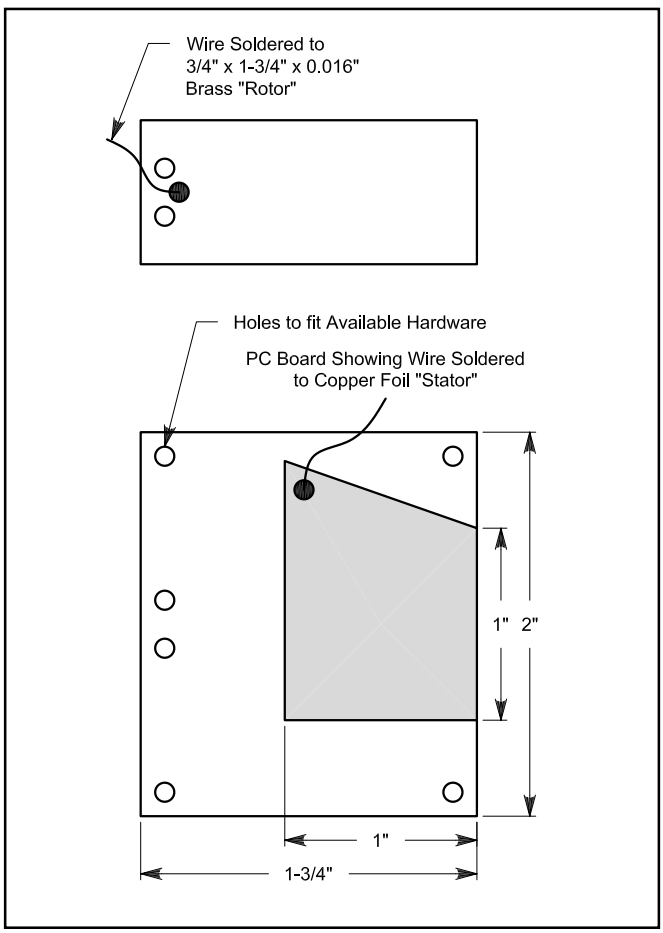


Figure 1—Cutting patterns for the circuit board and brass strip that form N7KSB's 4 to 75-pF homebrew compression capacitor.

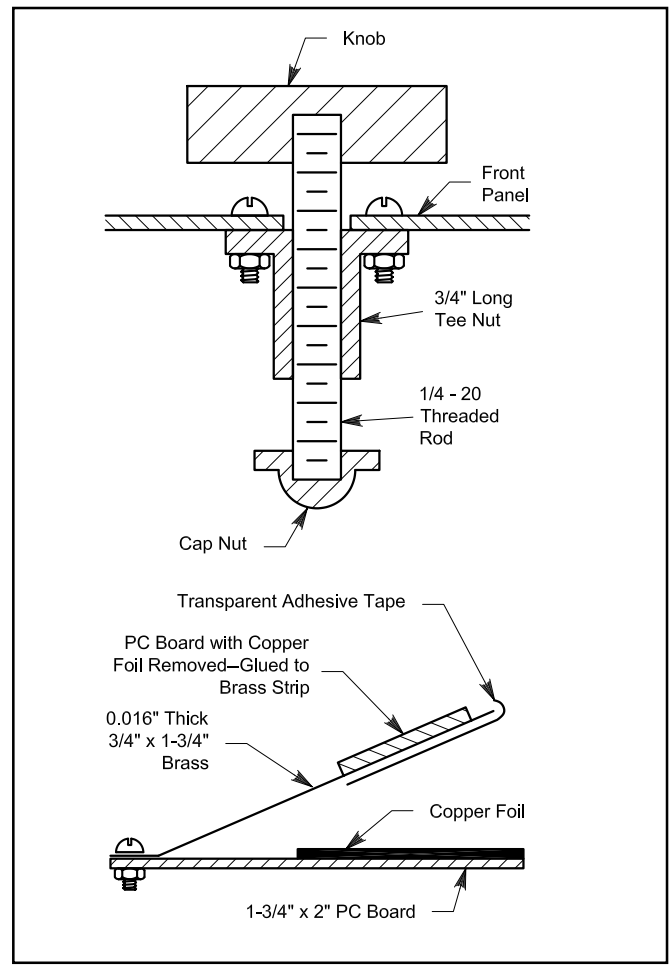


Figure 2—Mechanical details of the assembled compression capacitor. The spacers that hold the PC-board assembly approximately 1¼ inches from the front panel are not shown here. They are present in Figure 3.

Figure 3—A photo of the prototype 2-pF (1×3-inch brass strip) compression capacitor.

Bob Schetgen, KU7G ♦ Senior Assistant Technical Editor

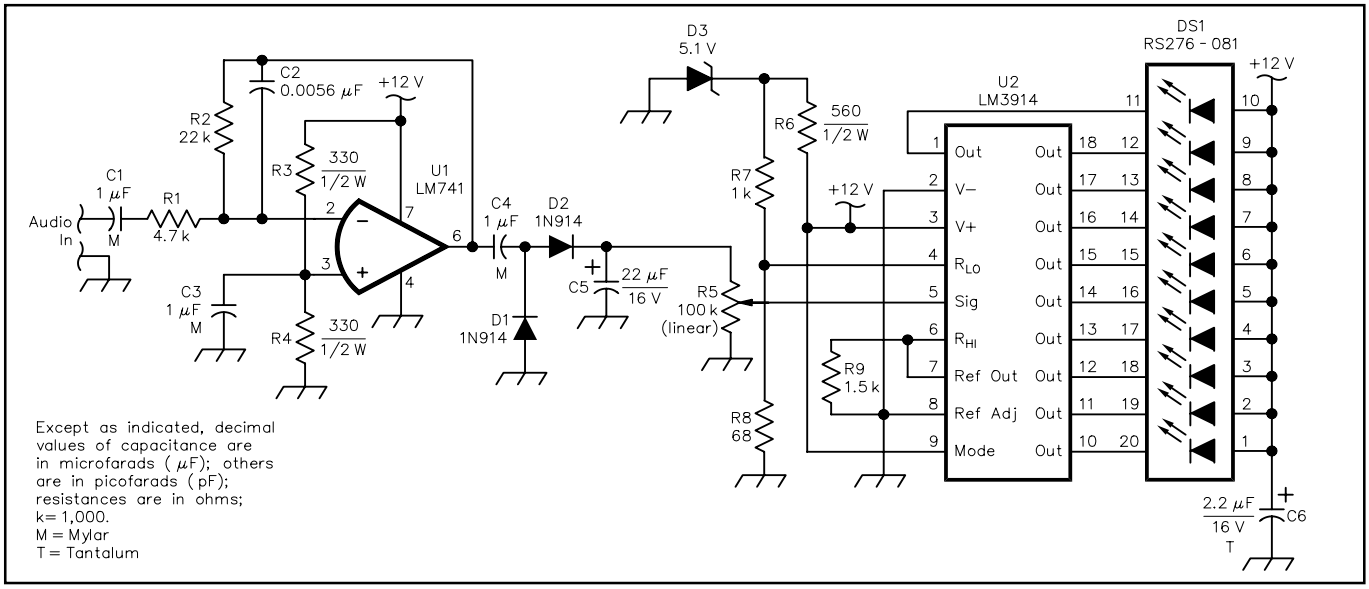


Figure 4—K6FM's circuit uses an LED bargraph and driver as a VU-meter.

I built two compression capacitors. The prototype was a 2-pF device using a 1×3×0.016-inch brass strip. It gave a 19-kHz range (versus a 12.5-kHz range for a conventional air-dielectric variable capacitor) for seven turns. A smaller, 4 to 75-pF, compression capacitor using a $^3/_4$×1$^3/_4$×0.016-inch brass strip gave a 14.5-kHz tuning range for two turns. When limited to a single turn, the smaller capacitor had an 11.5-kHz tuning range.—*Lew Smith, N7KSB, 4176 N Soldier Trail, Tucson AZ 85749*

AN LED VU-METER

◊ Audio level indicators, like the old needle-pointer VU-meters in broadcast stations, are interesting to watch and useful around the station. The common 10-element LED bargraph makes a handy display. An LM3914 IC display driver will light all 10 LED segments with as little as 1.2 V of dc input.

Surprisingly, the audio voltage to drive 8-Ω speakers to comfortable loudness averages only 0.5 to 0.7 V. It was necessary to add a '741 op amp to get a meaningful presentation range. I connected it as a first-order low-pass filter with a gain of four at 500 Hz and a cutoff frequency of 1250 Hz. This reduces display jitter and provides enough control voltage. The time constant from a 100-kΩ potentiometer across a C5 of 22 µF steadies the display change but other values of C5 may be tried.

The average band noise in the receiver audio at first lit the bottom few LEDs all the time. By biasing pin 4 of the LM3914 with +0.3 V dc from a voltage divider across a 5.1-V Zener diode (see Figure 4) increases the display to a more useful range. In one application, I connected the input of the LED indicator in parallel with the speaker. The receiver volume control is then set for the desired speaker loudness and the pot adjusted to light eight or nine bargraph segments for the average talker.—*Jan K. Moller, K6FM, PO Box 2272, Grants Pass, OR 97528-0295;* **jankuno@internetcds.com**

MORE ON DETERMINING TRANSISTOR AND DIODE LEADS WITH AN OHMMETER[2]

◊ This was a very good article. There is one additional comment that I would like to make for persons who may be using multimeters *without* a diode-check function.

When using the OHMS function of a multimeter, quite often

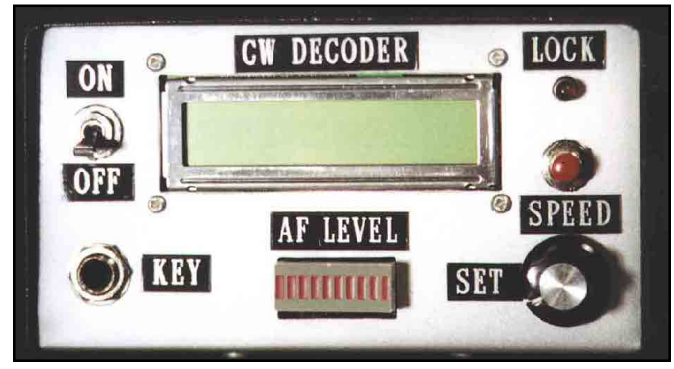


Figure 5—K6FM's VU-meter is mounted in the box with a CW decoder from an earlier *QST* article (F. Morgantini, IK3OIL, "A PIC16F84-Based CW Decoder," *QST*, Aug 1999 pp 37-39). The driver-gain control is to the right of the display; it's labeled SET. The VU-meter makes it easy to set the audio level for the CW decoder.

the normal polarity (red is positive and black is negative) test leads will be reversed. That is, the red lead will have a negative potential and the black lead will have a positive potential. You can determine the polarity of your leads with a known-good diode (with the anode and cathode leads marked) or by using the VOLTAGE function of another multimeter.

If you test transistors without knowing the polarity of the OHMS test leads of your multimeter, you may erroneously classify a PNP as NPN and NPN as PNP.—*Frank O. Long, N3ZOC, 108 Ridgely Rd, Glen Burnie MD 21061-4516;* **n3zoc@arrl.net**

MORE ON "GOO REMOVERS"

◊ This is in response to KI4RK's hint in the January 2001, column about "goo removers." Other removers work; some are totally biodegradable and probably in your kitchen. Try these removers before spending money on the expensive, toxic stuff: peanut butter, margarine, butter, vegetable oil, WD-40 and car wax.—*Wayne Yoshida, KH6WZ, 16428 Camino Canada Ln, Huntington Beach, CA 92649-5206;* **wyoshid1@irf.com**

RADIOSHACK HTX202 AND HTX404 RECHARGEABLE-BATTERY REPLACEMENT

◊ Thousands of HTX202 and HTX404 H-Ts have been sold by RadioShack since they were introduced in the 1990s. The

[2]By Bert Kelley, AA4FB, *QST*, Sep 2001, p 64.

rechargeable batteries cost around $50 new. The 7.2 V battery can be replaced with two RadioShack #23-193 3.6-V, 700-mAh telephone batteries for $20.

The old battery case comes apart easily. Two screws in the top correspond with two screws in the bottom, and the case splits in the middle. Identify the screws as you remove them from the top and bottom so that they can be replaced accurately. Unsolder the four wires of the old battery, two from the positive and negative connections at the top and two from those at the bottom.

Now remove the plugs from the telephone batteries, keeping the black and red wires as long as possible. Solder the batteries in series, with the black lead from one battery soldered to the red of the other battery, and tape the connection. This leaves a black lead from one battery and a red from the other supplying 7.2 V. A slight modification to the inside of the case lets both new batteries lie in like the original pack. Solder the red lead to the positive case terminal and the black lead to the negative terminal. (The terminals at the case bottom were never used.)

Some HTX202s experience "ER-2" problems even before any attempts to replace their batteries. I have a solution and I've notified the Tandy engineers of it: While the battery is apart, cut a piece of insulated #22 AWG wire 12 3/4 inches long. Solder one end of it to the negative battery terminal (where the black wire was soldered) and coil it along the inside of the battery case next to the new battery. This wire does several things: (1) It acts as a counterpoise and serves as the second half of the "rubber duck" antenna. (2) It lowers the SWR so the radio performs better, and (3) it helps keep RF out of the PLL circuit to help prevent ER-2 problems.—*David P. McDaniel, AB5UE, 412 Cedar Pl, Boerne, TX 78006*

ABOUT HINTS AND KINKS

◊ There has been some discussion of hints from the January column on Internet reflectors and that's a good thing. Hints and Kinks is a forum where hams can share their ideas, and discussion of those ideas is beneficial. We readers should not simply accept any hint as the best solution to a problem. After all, hints are only suggestions from other hams about ways that they have solved problems. There may be better solutions, or a given solution may not work for a particular situation. That's the reason for the note at the end of each Hints and Kinks column. As readers, each of us should evaluate any hint we want to use and decide whether it applies to our situation.

While I do try to screen out harmful hints, I'm not an expert. Hints and Kinks is a forum for communication, and I'm a facilitator, not a judge. That's why many topics appear more than once. The column is a two-way street, and it's important for your thoughts about hints to reach me. Some hints need further discussion and sometimes all of us need to see it. If you have an improvement on a hint, we all want to hear it. So send them in—we can all learn.—*KU7G*

ADD SAFETY AND COMFORT FOR TOWER CLIMBING?

[Several experienced tower workers have told me that the use of rubber hose on tower rungs is a very bad idea. They envision the caulk bond between the hose and tower rung failing and leaving the rung and hose to act as a large roller bearing under the climber's foot. Here's a response from one such reader.—*KU7G*]

◊ Having worked on commercial towers for around 30 years, I am appalled at the hint suggesting a rubber hose on a tower rung for "comfort and safety." This is one of the worst things I could imagine. The hose *will* slip, despite RTV or whatever. One of the most dangerous facets of tower climbing is unexpected movement, which is sure to occur with this "idea." If comfort is a concern, obtain the proper climbing boots or stay off the iron.—*Michael J. Castellano, KM1R, 631 Great Hill Rd, Guilford, CT 06437-3628;* **km1r@snet.net**

MORE ON AN ANTENNA THRUST BACKUP

◊ An astute fellow on the Tower Talk reflector (**towertalk@contesting.com**) observes that the location of the hole for the bolt or shear pin is near the worst possible point on the mast. He is correct. Wind force on the antennas is resisted at the point of the bearing, and there the bending stress will be greatest. The hole for the bolt is near by and it does weaken the mast. If the mast loads and wind are such that the mast is stressed near failure, it will fail sooner because of the hole. (The basics of bending in antenna masts are presented on pages 22-20 and 22-21 of *The ARRL Antenna Book*, 19th edition.)

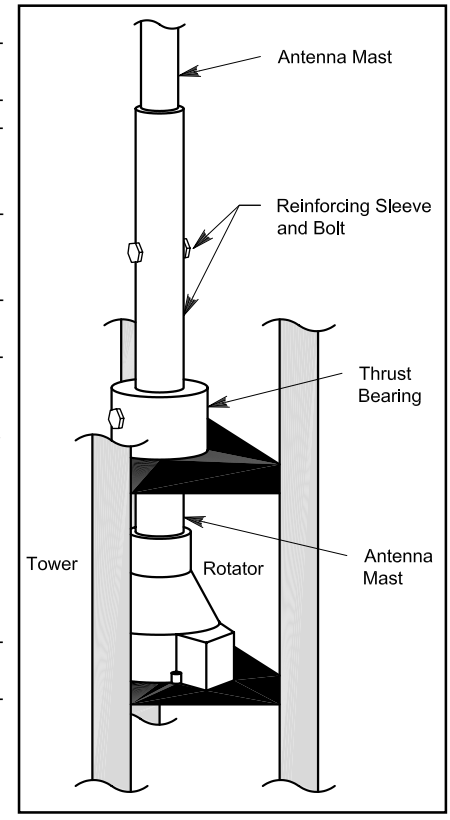


Figure 6—A sleeve arrangement permits moving the bolt away from the mast's area of greatest bending stress. This leaves the mast stronger than the washer hint presented by WA0KKC in the January column.

If the array wind load (area) perpendicular to the boom is substantially less than it is in line with the boom, we can reduce the likelihood of failure by orienting the bolt axis perpendicular to the antenna boom(s). That way, the hole is positioned on the mast centerline with respect to the direction of greatest bending load—but maybe there's another way.

The bolt and washer could be replaced by a bolt and sleeve (see Figure 6). The sleeve prevents the mast from slipping as well as the washer did, but it allows the bolt (and hole) to be placed farther up the mast, well away from the area of maximum moment (bending stress). If the sleeve fits closely around the mast, it may also serve to strengthen it slightly by making it more difficult for the mast to fold at the bearing.

Those who want to study the stresses on masts and towers more closely should read "Tower and Antenna Wind Loading as a Function of Height," by Frank Travanty, W9JCC (*QEX*, Jul/Aug 2001, pp 23-33). In that article, Frank uses an *Excel* spreadsheet and some basic structural engineering to examine the stresses on a mast and free-standing tower. —*KU7G*

Hints and Kinks items have not been tested by *QST* or the ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

QST invites you to share your hints with fellow hams. Send them to "Attn: Hints and Kinks" at ARRL Headquarters (see page 10), or via e-mail to **h&k@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing an item, please send the author(s) a copy of your comments.

ICOM IC-756PROII HF/6-Meter Transceiver

By Rick Lindquist, N1RL
ARRL Senior News Editor

With the IC-756PROII, ICOM likely has come the closest of any manufacturer in providing the sort of performance demanding operators expect in a radio that relies largely on digital signal processing (DSP) for its ultimate selectivity.

To review very quickly for those of you who are tuning in late, the IC-756PROII covers the HF bands and 6 meters, plus it offers general coverage receive that begins down in the nether regions of the spectrum (30 kHz) and extends up to the VHF range (60 MHz). It transmits and receives SSB, CW, AM and FM, and it can even decode RTTY and directly display the text.

Of course, we liked the original PRO very much, so we had to wonder if those Roman numerals really added much. Personally, I tend to stay away from those Roman numeral movie sequels, but that doesn't necessarily apply to ham radio gear.

"The best just got better," ICOM's ads proclaim. With our focus on performance, the degree to which that claim is true about the IC-756PROII is our chief task at hand. While it may not be readily apparent from the Lab numbers alone, the PROII *does* represent a level of improvement over its predecessor. It hears and sounds better, and it does so without some of the annoying idiosyncrasies of the original PRO.

So Soon?

Indeed, it seems like just yesterday that we'd reviewed the IC-756PRO. Well, aging is a funny thing, I guess; your sense of time gets all compressed. It was June 2000 when the PRO "Product Review" appeared in *QST*. While that's a technological eternity, it's not, after all, very long in the greater scheme of things.

With the PROII coming out a year or so later, the more cynical might wonder if there was something *wrong* with the original PRO that ICOM needed to fix, hence the PROII. Or did technology just leapfrog ahead, and ICOM now is taking advantage with this updated model? Manufacturers might balk, but, cynics aside, these are valid questions that prospective buyers of transceivers in this price class have a right and a responsibility to ask.

True Story

You probably knew you were going to get a story at some point, so here it is. The first piece of new ham gear I ever bought was a 2-meter all-mode transceiver. At the time (this goes back about 20 years), I was very much into working Mode A on the early OSCAR and RS satellites, and the modified Tecraft (remember that little outfit?), crystal-controlled, tube-type transmitter I'd modified for CW satellite use just wasn't cutting it anymore (imagine that).

So, I scanned the catalogs, asked around and finally settled on a Kenwood TR-9000. Over vigorous spously protest, I plunked down about $450 for that little gem—a good chunk of cash in the early 1980s—and that unit continued to serve me well for the next 15 years, when I finally parted with it. But it always just galled the *heck* out of me that, within six or eight months after I'd bought the TR-9000, Kenwood came out with the TR-9130, which had a vastly more readable fluorescent display (the 9000's red LEDs were wicked hard, if not altogether impossible, to read in sunlight), plus more memories, among other things I'd wished the TR-9000 had when I'd bought mine.

Bottom Line

With subtle but significant improvements, ICOM has nudged this latest incarnation of the '756—the IC-756PROII—even closer to Nirvana.

There were other new niceties, too, and the price was about the same.

Arrgh! If only I'd waited!

We can't speak for them, of course, but a few owners of the original PRO might well be saying the same thing to themselves right about now. ICOM says the PROII includes "improvements and features that you requested most." The changes are more than mere software upgrades and, no, you can't upgrade your PRO to a PROII.

As we've said in the past, ICOM is perhaps the only ham radio equipment manufacturer to routinely build on its past successes. Witness the three iterations of the extremely popular IC-706, which is now up to its MkIIG model and still going strong. Each model is better and more feature-filled than its predecessor. This is an admirable trend. Let's see how it worked out in the case of the latest IC-756 model.

A 3G Radio

Taking a cue from the wireless telecommunications industry, we'd have to call the PROII a "third-generation"—or "3G"—radio. The original IC-756 was a very capable, yet more conventional, transceiver that showed up in 1996 (see *QST* "Product Review," May 1997).

Like most other transceivers in its price class, it continued the trend to rely on conventional crystal or mechanical filters to enhance selectivity in the intermediate-frequency stages. But, as we pointed out in our review of the original PRO, the die had been cast with the debut of the

Joe Bottiglieri, AA1GW ♦ Assistant Technical Editor

Kenwood TS-870, which relied on then-state-of-the-art DSP.

Coming up with a flawless DSP design has become a search for the Holy Grail of sorts among manufacturers—although some seem to favor designs that meld conventional and DSP IF filtering systems, as Yaesu's MARK-V FT-1000MP does. Not only do DSP-based filters eliminate the need and expense of optional crystal or mechanical filters, but they also enhance flexibility. With the PROII's DSP, you don't just have a couple or three hard-and-fast choices for narrow filters, you've got more than 50 (by ICOM's count). Then there are the notch filters and digital noise reduction to sweeten the pot. We should point out, however, in the interests of accuracy that the PRO and the PROII use *crystal* filters in the signal path, not *ceramic*, as we'd incorrectly stated in our earlier PRO review. We're not quite to the point that we're ready to do away with crystal filters altogether.

We appear to be inching forward to that fabled day in the future when we'll "upgrade" our totally software-defined radios via the Internet.

Changes at the Cellular Level

ICOM says it went back to the drawing board to effect considerable changes from the original PRO to the new PROII at what we might call the cellular level. All of these changes seem to be aimed at reducing distortion in various places along the signal path. To wit (according to ICOM):

- The front-end bandpass filters have been completely redesigned to improve the second and third-order intercept numbers (more on what this means in a bit).
- PIN diodes have been improved to further reduce front-end distortion.
- The first mixer has been reworked for improved sensitivity and intermodulation distortion characteristics.
- "Preamp 1" now is a push-pull design, which reduces second-order IMD.
- The third mixer was redesigned for lower distortion using fast analog switches. (ICOM says that, because the DSP does the narrow-band filtering after the mixer, the third mixer becomes more critical in DSP receiver designs.)

A *More* Delightful Display

Everyone loved the display on the original PRO, and they adored the one on the PROII just as ardently. While ICOM touts the PROII's display as being "higher quality," putting a PRO and a PROII side-by-side revealed distinctions without much of a difference. For all intents and purposes, these were identical twins—clear and crisp and easily readable at wide angles from either side. To the naked eye, we noticed only that the large font used to read out the frequency was composed of vertical lines in the PROII rather than the tiny dots in the original PRO's display.

The *real big* difference is that you can do more with the display on the PROII. There's a greater choice of display backgrounds, and, as with the earlier model, there is a choice of seven fonts for the frequency readout and other on-screen legends.

The PROII now provides eight possible display backgrounds, labeled A through H. In summary, there's a black background with white, yellow, light blue or green legends, a white background with dark blue legends, a dark blue background with white legends, a seascape with white legends or a cityscape (is it Tokyo, and, if so, can we get one with Godzilla?) with white legends.

Performance: Are We There Yet?

Creature comforts in a transceiver cer-

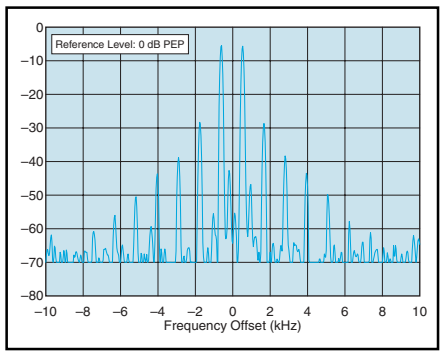


Figure 1—Worst-case spectral display of the IC-756PROII transmitter during two-tone intermodulation distortion (IMD) testing on HF. The worst-case third-order product is approximately 30 dB below PEP output, and the worst-case fifth-order is approximately 40 dB down. The transmitter was being operated at 100 W output at 28.35 MHz.

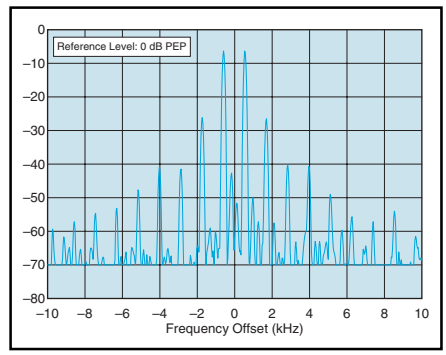


Figure 2—Spectral display of the IC-756PROII transmitter during two-tone intermodulation distortion (IMD) testing on 6 meters. The third-order product is approximately 28 dB below PEP output, and the fifth-order is approximately 42 dB down. The transmitter was being operated at 100 W output at 50.2 MHz.

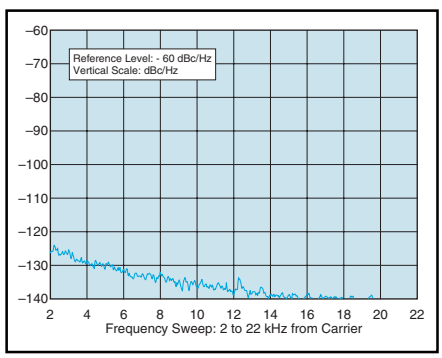


Figure 4—Worst-case tested HF spectral display of the IC-756PROII transmitter output during composite-noise testing at 14 MHz. Power output is 100 W. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

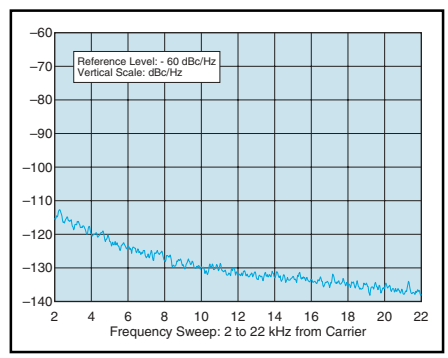


Figure 5—Spectral display of the IC-756PROII transmitter output during composite-noise testing at 50.2 MHz. Power output is 100 W. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

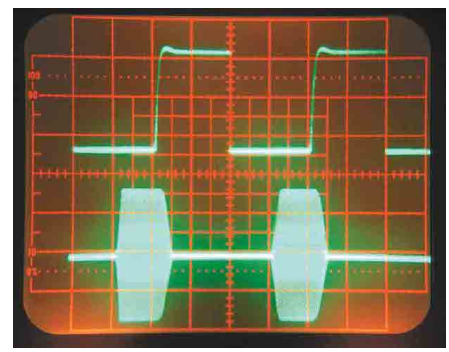


Figure 3—CW keying waveform for the IC-756PROII showing the first two dits in full-break-in (QSK) mode. The equivalent keying speed is 60 WPM. The upper trace is the actual key closure; the lower trace is the RF envelope. Horizontal divisions are 10 ms. The transceiver was being operated at 100 W output at 14.2 MHz. Note that both dits are somewhat shortened. Only the first dit is shortened in semi-break-in mode.

Table 1
ICOM IC-756PROII, serial number 01164

Manufacturer's Claimed Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 0.03-60 MHz; transmit, 1.8-2, 3.5-4, 7-7.3,10.1-10.15, 14-14.35,18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7, 50-54 MHz.	Receive, as specified[1]; transmit, as specified.
Power requirement: Receive, 3.5 A; transmit, 23 A (maximum).	Receive, 3.2 A; transmit, 21 A. Tested at 13.8 V.
Modes of operation: SSB, CW, AM, FM, FSK, AFSK.	As specified.

Receiver

SSB/CW sensitivity, bandwidth not specified, 10 dB S/N: 1.8-30 MHz (preamp 1 on), <0.16 µV; 50-54 MHz (preamp 2 on), <0.13 µV.

AM sensitivity, 10 dB S/N: 0.5-1.8 MHz, <13 µV; 1.8-30 MHz (preamp 1 on), <2 µV; 50-54 MHz, <1 µV.

FM sensitivity, 12 dB SINAD: 28-30 MHz (preamp 1 on), <0.5 µV; 50-54 MHz (preamp 2 on), <0.32 µV.

Blocking dynamic range: Not specified.

Two-tone, third-order IMD dynamic range: Not specified.

Third-order intercept: Not specified.

Second-order intercept: Not specified.

FM adjacent channel rejection: Not specified.

Receiver Dynamic Testing

Noise Floor (MDS), 500 Hz filter:

	Preamp off	*Preamp one*	*Preamp two*
1.0 MHz	–121 dBm	N/A	N/A
3.5 MHz	–132 dBm	–140 dBm	–143 dBm
14 MHz	–131 dBm	–139 dBm	–141 dBm
50 MHz	–125 dBm	–136 dBm	–139 dBm

10 dB (S+N)/N, 1-kHz tone, 30% modulation:

	Preamp off	*Preamp one*	*Preamp two*
1.0 MHz	5.0 µV	N/A	N/A
3.8 MHz	1.6 µV	0.7 µV	0.46 µV
50 MHz	3.6 µV	1.2 µV	0.65 µV

For 12 dB SINAD:

	Preamp off	*Preamp one*	*Preamp two*
29 MHz	0.72 µV	0.33 µV	0.21 µV
52 MHz	1.2 µV	0.43 µV	0.28 µV

Blocking dynamic range, 500-Hz filter:

Spacing	*20 kHz Preamp off/one/two*	*5 kHz Preamp off/one/two*
3.5 MHz	119/118/113 dB	102/100/95 dB
14 MHz	118/116/111 dB	100/97/94 dB
50 MHz	116/117/115 dB	99/99/96 dB

Two-tone, third-order IMD dynamic range, 500-Hz filter:

Spacing	*20 kHz Preamp off/one/two*	*5 kHz Preamp off/one/two*
3.5 MHz	98/97/92 dB	77/77/73 dB
14 MHz	97/95/91 dB	76/75/72 dB
50 MHz	94/94/90 dB	74/74/73 dB

Spacing	20 kHz *Preamp off/one/two*	5 kHz *Preamp off/one/two*
3.5 MHz	+17.1/+8.2/–4.3 dBm	–18.9/–27.8/–35.8 dBm
14 MHz	+20.2/+10.2/–4.1 dBm	–18.8/–28.8/–35.5 dBm
50 MHz	+14.4/+6.1/–4.2 dBm	–15.6/–25.5/–31.2 dBm

Preamp off/one/two, +75/+71/+59 dBm.

20 kHz channel spacing, both preamps on: 29 MHz, 77 dB; 52 MHz, 77 dB.

tainly are welcome, but for most amateurs, it's all about performance, and ICOM says it's upped the ante in the PROII. Among other things, ICOM claims that its newest all-DSP-filter radio offers improved third-order intercept (this has to do with dynamic range and a receiver's ability to let you hear weak signals in the presence of strong ones), as well as better sensitivity without having to hit the PREAMP button, selectable IF filter "shape" and enhanced DSP noise reduction.

ICOM says it's completely redesigned the noise blanker, and the PROII offers an adjustable noise blanker level (not just an on/off button), improved band scope noise floor and better audio fidelity.

When the first radios with digital filters came onto the market, one of my colleagues opined that we were still years away from the day that any software-defined filters would be capable of replacing crystal or mechanical filters. At that point, DSP "boxes"—outboard accessories that offered DSP filters at baseband audio—still were popular. Although earlier iterations of this technology—inboard and outboard—may have fallen short of the benchmark set by conventional IF filters, many users were willing to sacrifice some performance for the flexible user-friendly DSP filters.

DSP designs are getting better, though, and the days of the tradeoff and the compromise may well be in the past. With more than one "DSP" transceiver (including the original PRO) now on the market, it's easier to make comparisons to quantify the state of the art in this regard.

Learning to Love the Numbers

Deciding what radio to buy—helping you to do that as an informed consumer is what "Product Review" is all about—is a little bit like falling in love. A lot of

Receiver	Receiver Dynamic Testing
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing, both preamps on: 29 MHz, 77 dB*; 52 MHz, 77 dB*. 10 MHz channel spacing: 52 MHz, 92 dB.
S-meter sensitivity: Not specified.	S9 signal at 14.2 MHz: preamp off, 53 μV; preamp one, 19 μV; preamp two, 7.9 μV; 50 MHz, preamp off, 73 μV; preamp one, 26 μV; preamp two, 13 μV.
Squelch sensitivity: SSB, CW, RTTY, <5.6 μV; FM, <1 μV.	At threshold, preamp on: SSB, 3.8 μV; FM, 29 MHz, 0.31 μV; 52 MHz, 0.25 μV.
Receiver audio output: 2 W into 8 Ω at 10% THD.	2.2 W at 10% THD into 8 Ω.
IF/audio response: Not specified.	Range at –6 dB points, (bandwidth):[2] CW-N (500-Hz filter): 466-982 Hz (516 Hz); CW-W: 348-1679 Hz (1331 Hz); USB-W: 235-2725 Hz (2490 Hz); LSB-W: 232-2716 Hz (2484 Hz); AM: 94-2786 Hz (2692 Hz).
Spurious and image rejection: HF & 50 MHz, (except IF rejection on 50 MHz): 70 dB.	First IF rejection, 14 MHz, 94 dB; 50 MHz, 83 dB; image rejection, 14 MHz, 110 dB; 50 MHz, 110 dB.

Transmitter	Transmitter Dynamic Testing
Power output: HF & 50 MHz: SSB, CW, FM, 100 W (high), 5 W (low); AM, 40 W (high), 5 W (low).	HF: CW, SSB, FM, typically 115 W high, <1 W low; AM, typically 39 W high, <1 W low; 50 MHz: CW, SSB, FM, typically 108 W high, <1 W low; AM, typically 38 W high, <1 W low.
Spurious-signal and harmonic suppression: ≥50 dB on HF, ≥60 dB on 50 MHz.	HF, 57 dB; 50 MHz, 62 dB. Meets FCC requirements for spectral purity.
SSB carrier suppression: ≥40 dB.	As specified. >65 dB.
Undesired sideband suppression: ≥55 dB.	As specified. >65 dB.
Third-order intermodulation distortion (IMD) products: Not specified.	See Figures 1 and 2.
CW keyer speed range: Not specified.	6 to 48 WPM.
CW keying characteristics: Not specified.	See Figure 3.
Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.	S9 signal, 23 ms.
Receive-transmit turn-around time (tx delay): Not specified.	SSB, 20 ms; FM, 11 ms. Unit is suitable for use on AMTOR.
Composite transmitted noise: Not specified.	See Figures 4 and 5.

Size (HWD): 4.4×13.4×11.2 inches; weight, 21.1 pounds.

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.

Third-order intercept points were determined using S5 reference.

*Measurement was noise-limited at the value indicated.
[1]Sensitivity degrades below 150 kHz and above 58 MHz.
[2]All measurements were taken at the "sharp" filter setting. SSB measured in the 2.4 kHz filter setting. CW bandwidth varies with the PBT and Pitch control settings.

subjective factors can attract an adoring amateur public to a given transceiver—fancy or innovative display, nice knobs, a quality "look and feel," even the color and texture of the cabinet (remember those two-tone green Heathkit boxes?). Starting with its dazzling TFT display, the PROII has its share of these.

OK, she's sweet as honey, but is her daddy rich? The subjective stuff is just one side of the coin. It's the objective numbers that result from rigorous and standardized testing in the ARRL Lab than can separate wheat from chaff in terms of manufacturer's representations and stark reality. Quite frankly, the margin of measurable improvement from the PRO to the PROII is rather narrow.

We've included some numbers for competitors' radios in the same price class. If you're curious about the specific transceivers and can't guess, you can look these up in past reviews; we would rather not inject the issue of brand names in this particular discussion, however, so we'll stick to the numbers themselves.

Let's cut to the chase. Please turn to Table 1 and follow along in your books as we learn several words and concepts you might not be familiar with.

SSB/CW Sensitivity

ICOM says it's beefed up the transceiver's sensitivity, so you won't need to be hitting that PREAMP button when the weak one comes along. The problem with adding stages of amplification is, of course, that you risk adding distortion, so more is not always better when it comes to "preamps." ICOM seems to be reasoning that the primary RF-amplification circuitry ought to be sufficient for most situations.

On our original PRO, we measured the SSB/CW sensitivity or noise floor (what the Lab calls "minimum discernible sig-

nal" or MDS) on 14 MHz, preamp off, at –128 dBm. Indeed, our PROII came in a bit better, at –131 dBm, and a second unit we checked tested at –132 dBm.

Recent comparable offerings from competitors came it at –127 dBm and –129 dBm in the MDS department at 14 MHz, preamp off.

Dynamic Range

The most demanding DXers and contesters tend to gravitate toward transceivers that offer superior dynamic range, rather than sensitivity, however. Something known as "two-tone, third-order IMD dynamic range" is an objective measure of the receiver's ability to let you discern (copy) a weak signal in the midst of stronger—even much stronger—signals. On a practical level, the difference here can be finding and working that rare one with the puny signal or going without because you couldn't "pull him out."

Now, eyes forward and repeat after me: "If you can't hear 'em, you can't work 'em!"

As regular readers of this column are aware, this past summer we began testing and publishing two-tone, third-order IMD dynamic range numbers at spacings of both 20 kHz—our standard for many years—and at 5 kHz. The latter measurement is closer to real-world QRM. It's also well inside the typical 15-kHz front-end "roofing filter."

At the 20-kHz spacing, our original PRO came in at 95 dB on 14 MHz, preamp off. We weren't publishing a 5-kHz number when we reviewed the original PRO, so we measured the one ICOM donated to W1AW. It came in at 80 dB on 14 MHz, preamp off.

By comparison, our PROII measured at 97 dB and 76 dB respectively. We checked another unit provided by ICOM and we measured 100 dB at the 20-kHz spacing.

The competition, you ask? The most recent comparable unit with DSP filtering tested at both spacings came in at 94 dB and 69 dB, respectively. Another competitor's current transceiver offering in the same price class that uses crystal/mechanical filters and DSP topped 100 dB at 20-kHz spacing and 76 dB at 5-kHz spacing.

Third-Order Intercept

The bottom line statistic for many manufacturers and prospective buyers is something called "third-order intercept" or IP_3. ICOM claims an IP_3 improvement for the PROII over its predecessor. This number is calculated on the basis of the MDS (or some higher signal level) and the two-tone, third-order IMD dynamic range figures we just discussed. The more the third-order intercept is in the positive range, the better.

Sticking with 14-MHz, preamp off, numbers, our PRO's IP_3 worked out to be +15.4 dBm. Our PROII came in at +20.2 dBm, while a second unit tested at +17 dBm and a third, provided by ICOM, tested at +21 dBm (we also measured 100 dB dynamic range on this unit).

IF/Audio Response

The characteristics of the IF "strip" and the audio amplifier stages by and large determine how a receiver sounds, assuming that whatever you're using to listen with—speaker or headphones—are up to the task of handling the delivered audio. Good "communications-quality" audio for amateur SSB work typically has a bandwidth in the vicinity of 2.4 kHz or so. Depending on what happens inside the radio, the resulting audio within such a passband can range from rich and full to overly bright, tinny or muddy. Digital filters of the sort the PROII employs allow the user to customize response, within design limits, among the various extremes.

Since ICOM claims "improved audio fidelity" as one of the PROII's selling points, we were a bit perplexed to discover that SSB audio with the 2.4 kHz filter engaged in the default "sharp" filter position sounded identical to our ears as that from the earlier PRO (we'll say more about the "sharp" vs "soft" filters in just a bit). The audio sounded clean; it just was not perceptibly better.

This was borne out by our Lab numbers (see Table 1), which show the USB "wide" response curve or range, measured at the –6-dB points, starting at 235 Hz on the "bass" end and ending at 2725 Hz on the "treble" side—a total audio bandwidth of 2490 Hz—pretty close to what it should be according to the filter setting. For all intents and purposes, this was identical to the audio response curve we'd measured with our original PRO, and it left us pondering ICOM's definition of "improved audio fidelity."

Widening the SSB filter to a full 3.0 kHz yielded "richer" audio, as expected—with the low end now rolling off at around 100 Hz and the high end at around 3010 Hz, or 2910 Hz of audio bandwidth. These are the kinds of things that flexible DSP filters let you do.

The good news here for ICOM is that while the PROII's "default" audio is no better or worse than the original PRO's, it does appear to top that of two competing transceivers we reviewed in recent months. We'd measured the "SSB-wide" audio passband for one DSP-based transceiver at a rather constricted 1911 Hz (the low end rolled off at around 450 Hz on that unit), and at a somewhat better 2157 Hz on another transceiver that employs conventional filtering (the low-end response was slightly better, and there was more high end). These measurements also were made at the 2.4-kHz filter settings on the respective radios.

Going by our Lab numbers, the PROII's audio response curve for classic AM mode does not appear to be nearly as good as the original PRO's, but this number is a bit deceptive. Keep in mind that our measurement was at the rather narrow 3.0 kHz bandwidth, and PROII's measured AM bandwidth of 2692 Hz is much more in line with what one should expect from a 3.0-kHz filter than the broader 3363 Hz we'd measured on the original PRO. The narrower passband in the PROII comes largely at the expense of high-end response, which will mean slightly muddier-sounding AM audio in the narrow filter position. The PRO and PROII offer AM filters at 6.0 and 9.0 kHz too.

The PRO and the PROII both measured a substantial 2.2 W at 10% total harmonic distortion into an 8-Ω load.

Killing Me Softly

A significant change in the DSP filtering is that you can select (via the menu) whether you want "sharp" or "soft" filter skirts for SSB or CW. These choices will impact the audio response curve. The PROII offers a graphical representation of the filter curves. In the sharp position, the filter curves are flat at the top and break at nearly right angles at the top of the slope. In the soft position, the filter curves are rounded at the top, something like a sine wave—sort of the kinder, gentler version of DSP.

On SSB, the difference is a bit more noticeable to the ear, and we were able to quantify this in the Lab in terms of how it affects audio response. In the USB mode with a 2.4-kHz filter enabled, the soft filter rolled off the audio at both the high and low ends—yielding a passband that started at 283 Hz and didn't roll off until 2456 Hz at the top—a total of 2173 Hz. That's more than 300 Hz narrower than the sharp mode—mostly as a result of high-end rolloff. As a result, it seems like there's less distortion and less background noise with the soft filter engaged, and, in general, the soft filter setting sounded better in the presence of atmospheric noise.

On CW, the soft filter exhibits much less ringing, especially at narrower bandwidths—although overall there's not much discernible difference on CW between the sharp and soft settings. The graphical representation of the filter curve indicates that the filter's skirts broaden in the soft mode in CW. In terms of measurable filter bandwidth, with a 500-Hz

filter setting in the sharp mode, it's 516 Hz—pretty close! With the same filter in the soft mode, it's 541 Hz.

For those who use or listen in the AM mode, the sharp filter sounded a bit better than the soft filter. This would make sense, since the soft filter would similarly constrict the audio passband, and AM listeners typically like as much as they can get.

A Different Breed

Because some of the odd things we'd noticed in the original PRO only manifest themselves when the band we were using was really busy, we put the PROII though its paces in one SSB contest and two CW contests. A couple of things became clear: (1) the PROII comes through in a competitive environment and (2) it's a breed apart from the more conventional (ie, non-DSP) transceiver and you'll need to work with it a bit to learn how to achieve optimum results.

We alluded to the fact that ICOM has punched up the receiver's sensitivity. In fact, outside of FM use, I can't recall needing to turn on the preamp. Nine times out of ten, it did just fine without.

Arguably, the two most valuable features are the twin passband tuning and the manual notch control. The twin PBT is an obvious choice, since it lets you adjust your bandpass on the fly (high and low) as well as shift it to avoid interference (and displays the results on the screen). As for the notch, I've found on conventional transceivers that an IF notch (as opposed to most DSP-based notching system) can be a valuable asset to manually "shape" the IF filtering to help cut noise and pull out especially faint signals. This seemed to work even more superbly with the manual notch on the PROII.

The noise reduction often can accomplish the same thing, but a lot of operators don't care for the digital artifacts that some NR systems can impart.

ICOM Hears Us

We'd observed on the original PRO some distortion on stronger signals, with signals being further degraded with the preamps switched in. CW signals sounded "flutey" or a little rough. Loud CW and some SSB signals sometimes sounded as though they were on the verge of overloading the receiver or being clipped. Speculation was that this might have resulted from the inability of the analog-to-digital converter to track the input signal in a linear fashion, possibly as a result of AGC delays. Additionally, the original PRO would introduce pops on the "make" of each CW element. Keeping gain down or using noise reduction helped.

We're not exactly sure what ICOM did, but these idiosyncrasies are barely noticeable in the PROII. It's a much more delightful receiver to listen to. As with the PRO, the thing that seems to help most is simply engaging the 6-dB attenuator. By and large, the PROII is plenty "hot" already, and reducing the gain a bit can make all the difference.

In the original PRO, several operators noticed that, at some wider filter settings and with a band filled with signals, the radio generated a low-level rumble. The more signals in the bandpass, the more rumble. With no signals, the rumble disappeared. This was especially noticeable on CW and when using headphones that have good low-frequency response. ICOM said it got very few complaints about this but addressed it anyway by making some changes in the audio amplifier stages. They apparently worked, because the rumble was not detectable on the PROII—even during a contest.

We'd griped that when you're running the built-in digital voice recorder, you could not bring up the band scope at the same time—something you may want to be doing during a contest. The DVR in the PROII now can be controlled remotely—as we'd suggested in our earlier review—while the band scope or other menu is up on the display.

You also can control the memory keyer the same way.

Incremental Improvements

- The better-looking, brighter, easier-to-read analog meter is an unheralded improvement. The PRO meter has a jaundiced cast to it. The PROII meter has white markings and brighter backlighting. (The PROII also provides more steps for backlight dimming.)
- It's now possible to store digital and voice mode filter settings independently.
- It's no longer possible to inadvertently engage the speech processor in digital data modes, assuming you select the data mode. The *Instruction Manual* is not real detailed in this regard, but you'll know you're there when you see the "-D" appear after the mode in the display. You press and hold the AM/FM or SSB mode button to get into the data mode. A quick press returns you to speech mode.
- You can activate 1/4 tuning (fine tuning) in the digital mode.
- There are two menu modes for clearing the RIT. You can set the RIT either to clear at a single button press or to clear only when the button is pressed and held, lest it be cleared accidentally.
- The noise reduction is a big help. It works very well and even helps on noisy FM signals. ICOM says that it's improved the NR function to reduce noise without degrading the signal.
- We of the failing-eyesight generation applaud ICOM for also improving the labeling on the PROII's keypad. The larger, bolder red digits are much easier to read than the boxed, small teal-colored ones on the original PRO.
- ICOM has changed the color of the function buttons that line the lefthand side of the display. The new ones are black, not gray, and now have little red arrows pointing toward the screen function displays they're associated with.
- ICOM improved the sensitivity of the PROII's band scope. It's now about 5 dB (nearly two ICOM S units) hotter, which means that signals that might not have showed up on the PRO band scope are visible on the newer model's screen.

What More Could We Ask For?

ICOM has been so accommodating in updating and enhancing the PRO that we're reluctant to suggest they might have left anything out, for fear that we be considered ingrates. But I think most users will concur that the cooling fan—as was the case with the PRO—is still *waaaay* too loud. It makes so much noise that you can hear it while using headphones.

In addition, the SSB monitor is a bit muddy-sounding, and some kind of "tune" button would be nice too.

But the big thing ICOM didn't do is include 2 meters on the PROII. Frankly, I've never understood the logic of including both 6 and 2 meters on the IC-746—one of my personal favorite ICOM radios that's soon to get the "PRO" treatment—and *not* including it on the higher-priced, better-featured unit. With 2-meter capability, the PROII would be approaching Nirvana—at least in ham radio terms.

We'd concluded our review of the original IC-756PRO by suggesting that all but the most particular operator would enjoy owning one. Given the subtle but significant improvements ICOM's managed to make in the PROII, we'd have to amend that statement to say that ICOM, with the IC-756PROII, has minimized the need for further improvements—and satisfied just about everyone but the crystal-filters-are-forever and heavy-metal AM crowds.

So, just when *are* they coming out with *Halloween X,* anyway?

Manufacturer: ICOM America, 2380 116th Ave NE, Bellevue, WA 98004; 425-454-8155, fax 425-454-1509; **amateur@icomamerica.com**; **www.icomamerica.com**. Manufacturer's suggested list price: $3599.99. Typical current street price: $2980. Manufacturer's suggested list prices for selected optional accessories: UT-102 voice synthesizer unit: $74; CT-17 CT-V level converter (for computer control): $169.

Yaesu FTV-1000 6-Meter Transverter

Reviewed by Dave Patton, NT1N

Over the years I've developed a deep love for 6 meters, "The Magic Band."

My first experience on 6 was way back in my high school days when Frank Miller, K9HMB, let me give it a try from his station. I didn't have another opportunity to operate on the band until about 10 years later, when I borrowed a Kenwood TS-690 (an HF/6-meter rig) to take along on a small DXpedition to Saipan. While our operations were mainly focused on HF, we did manage to work a handful of JAs on 6. I was hooked.

In the mid-'90s I purchased a brand new JRC JST-245 HF/6-meter transceiver. Around that same time, several of the other radio manufacturers were also beginning to include 6-meter coverage as standard fare in a few of their mid-level HF transceivers (the Yaesu FT-920, the Kenwood TS-570S, the Alinco DX-70T and the ICOM IC-736 are some examples). More recently, 6-meter, 2-meter and 70-cm capabilities have been finding their way into relatively affordable transceivers. The tremendous popularity of this new breed of multiband/multimode radios has been partially responsible for a dramatic increase in the level of activity on 6. The tremendous 6-meter propagation that we've enjoyed lately certainly hasn't hurt either!

A Blast from the Past

Yaesu's original version of the FT-1000MP hit the market just before this "added bands" phenomenon really got rolling. During the recent reworking of the 'MP into the new MARK-V FT-1000MP version, Yaesu chose to take a more classic approach to adding 6-meter band coverage: they designed an optional external transverter, the FTV-1000. This unit is built specifically to pair up with the MARK-V FT-1000MP transceiver. The *Operating Manual* provides no information for connecting the transverter to any alternative transceivers—Yaesu or otherwise. (Yaesu recently released an optional cabling kit for connecting the FTV-1000 to the original version of the FT-1000MP. An FP-29 power supply would be required.)

Adding the FTV-1000 transverter will allow you get to take full advantage of the excellent receiver characteristics, flexible DSP and all of the other advanced features available in the MARK-V on the 6-meter band. The maximum RF output power of the transverter is 200 W in Class-AB or 50 W in Class-A mode.

There's no shortage of serious ham operators plying both the HF *and* 6-meter bands from the New England region. I was very anxious to see how an FTV-1000-equipped MARK-V FT-1000MP would hold up on 6 when the band was hopping.

Hooking Up

The FTV-1000 transverter package comes complete with all of the cabling necessary to lash it up to a MARK-V. DC power for both units is supplied by the FP-29 13.8-V/30-V switching power supply that comes with the MARK-V. The FP-29 is connected to the DC POWER IN jack on the back panel of the FTV-1000, and then a second cable—connected to the DC POWER OUT jack—provides power to the transceiver.

The radio and the transverter communicate via a BAND DATA cable. Low level RF drive (50 mV_{rms}) and ALC are handled through phono plug terminated cables. A coax jumper is used to carry the received signals—converted from 6 meters to 10 meters in the transverter—from the FTV-1000's TRANSCEIVER connector into the MARK-V's ANT A connector.

Setting up the system is very easy. The manual includes "Interconnections" diagrams for connecting the transverter to the transceiver alone or for integrating it into a high-power station that includes both the MARK-V and the VL-1000 HF/6-meter amplifier.

Bottom Line

The FTV-1000 transverter can transform a MARK-V FT-1000MP into a very capable HF/6-meter transceiver.

A Quick Tour of the Front Panel

The front panel of the transverter supports seven rocker switches. These control a 12-dB attenuator, IPO (intercept point optimization), preamp level (one or two), amplifier class (AB or A), band segment (50-52 MHz or 52-54 MHz), antenna selection and power.

An LED display window is located in the center of the panel. Eight LEDs positioned around its perimeter show the state of the various settings. In addition to these, there's a five-LED relative power output meter, warning lights for high SWR and excessive temperature, and fan and ALC indicators. The fan is temperature controlled.

Are You Ready to Rumble?

Once you've got everything hooked up and a 6-meter antenna connected to the transverter, to operate on 6, you set the MARK-V to the 10-meter band, disable the radio's front-end RF preamplifier (the associated "IPO" LED should show green), switch the ATT knob to the 0 position and select antenna "A."

The FTV-1000 transverts 6-meter signals to and from frequencies between 28 and 30 MHz. A menu setting (item #3-3) allows you to program the MARK-V to display the 6-meter frequencies directly, if so desired. While this is a nice feature, it takes a minute or so to set it up, and you've got to go back into the menu and disable it for typical HF operation. Since it doesn't affect actual operation, I often

Table 2
Yaesu FTV-1000, serial number 10040047

Manufacturer's Claimed Specifications	Measured in the ARRL Lab
Frequency coverage: Receive and transmit, 50-54 MHz.	Receive, 35-54 MHz; transmit, as specified.
Power requirement: Receive, 0.5 A, 13.8 V dc; transmit, 14.5 A, 30 V dc and 0.5 A, 13.8 V dc (200 W output).	As specified.
Receiver	**Receiver Dynamic Testing**
SSB/CW sensitivity: n/a.	Noise floor (MDS), 500-Hz filter:[1] *Preamp off* / *Preamp one* / *Preamp two* 50 MHz: –127 dBm / –136 dBm / –141 dBm
AM sensitivity, 10 dB S/N: n/a.	10 dB (S+N)/N, 1-kHz tone, 30% modulation:[1] *Preamp off* / *Preamp one* / *Preamp two* 53 MHz: 1.95 µV / 1.02 µV / 0.56 µV
FM sensitivity, 12 dB SINAD: 1.8-30 MHz, <0.5 µV.	For 12 dB SINAD:[1] *Preamp off* / *Preamp one* / *Preamp two* 52 MHz: 0.69 µV / 0.35 µV / 0.19 µV
Blocking dynamic range: Not specified.	Blocking dynamic range, 500-Hz filter:[1] *Preamp off* / *Preamp one* / *Preamp two* 50 MHz: 125 dB / 123 dB / 118 dB
Two-tone, third-order IMD dynamic range: Not specified.	Two-tone, third-order IMD dynamic range, 500-Hz filter:[1] *Preamp off* / *Preamp one* / *Preamp two* 50 MHz: 85 dB / 84 dB / 81 dB
Third-order intercept: Not specified.	*Preamp off* / *Preamp one* / *Preamp two* 50 MHz: +6.2 dBm / –6.1 dBm / –15.7 dBm
FM adjacent channel rejection: Not specified.	20 kHz channel spacing, both preamps on: 52 MHz, 80 dB.
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing, both preamps on: 52 MHz, 62 dB.
IF and image rejection: n/a.	First IF rejection, 79 dB; image rejection, 142 dB.
Transmitter	**Transmitter Dynamic Testing**
Power output: 200 W.	CW, SSB, FM, typically 180 W high, < 1 W low.
Spurious-signal and harmonic suppression: 60 dB.	64 dB. Meets FCC requirements for spectral purity.
SSB carrier suppression: n/a	>75 dB.
Undesired sideband suppression: n/a	>80 dB.
Third-order intermodulation distortion (IMD) products: n/a.	See Figures 6 and 7.
Composite transmitted noise: Not specified.	See Figure 8.
Size (HWD): 5.4×9.6×13 inches; weight, 16.5 pounds.	

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.
Third-order intercept points were determined using S5 reference.
[1]Tested with MARK-V FT-1000MP.

didn't bother to take the time to enable it. It would be nice if the radio could sense when the transverter was turned on, and toggle this menu setting automatically.

The FTV-1000 has two antenna jacks that can be used in a couple of different ways. The ANTENNA switch on the front panel of the transverter can be set to NOR or ALT ("normal" or "alternative"). The most obvious arrangement is to connect 6-meter antennas to both jacks and then use the switch to select the desired antenna. The MARK-V also has two antenna jacks. When the transverter is connected, it might seem that the antenna A connector is tied up for transverter use only, making it unavailable for use with a second HF antenna—but that's not necessarily the case.

When the transverter is switched off, the connection defaults to the to the antenna that's connected to the NOR ANT jack on the back of the transverter. If you want to continue to use both antenna connectors on the MARK-V for HF applications, you can attach your second HF antenna to the transverter's NOR ANT jack and leave the front panel ANTENNA switch in the ALT position. When you turn the transverter on, the 6-meter antenna (connected to the ALT ANT jack) will be automatically selected. Power it off, and the HF antenna will be selected.

In the CW mode, the 6-meter RF output power is controlled by the RF PWR control on the MARK-V. For 200 W operation, you set the control to the point where all five LEDs on the output power meter on the transverter are lit. For 200 W SSB operation, you speak into the microphone and adjust the RF PWR control until all five LEDs are lit on voice

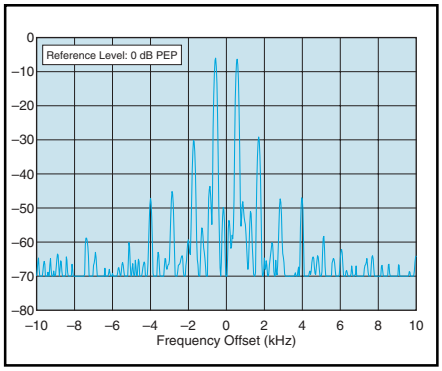
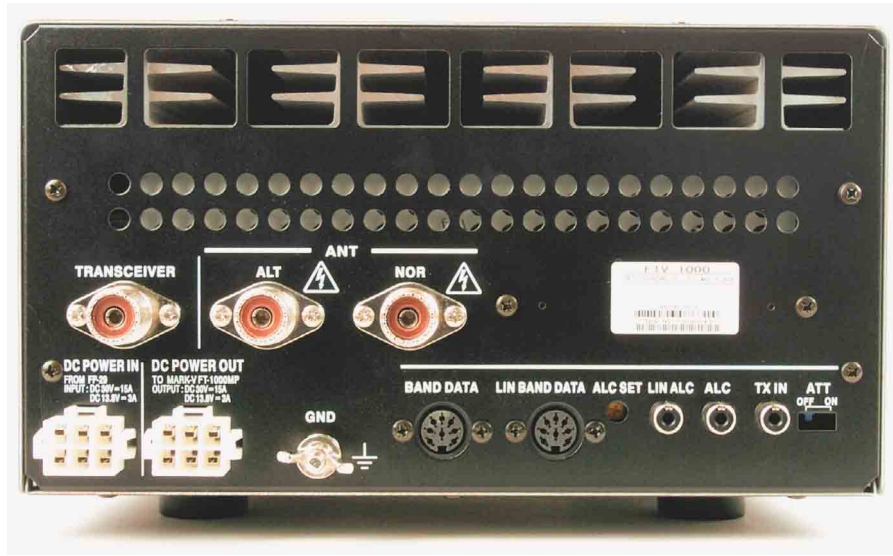


Figure 6—Spectral display of the FTV-1000 transverter's transmitter during two-tone intermodulation distortion (IMD) testing in Class-AB mode. The worst-case third-order product is approximately 30 dB below PEP output, and the worst-case fifth-order is approximately 46 dB down. The transmitter was being operated at 200 W output at 50.2 MHz.



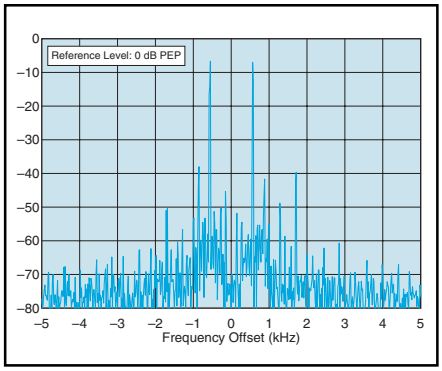


Figure 7—Spectral display of the FTV-1000 transverter's transmitter during two-tone intermodulation distortion (IMD) testing in Class-A mode. The third-order product is approximately 40 dB below PEP output, and the fifth-order is approximately 61 dB down. The transmitter was being operated at 50 W output at 50.2 MHz.

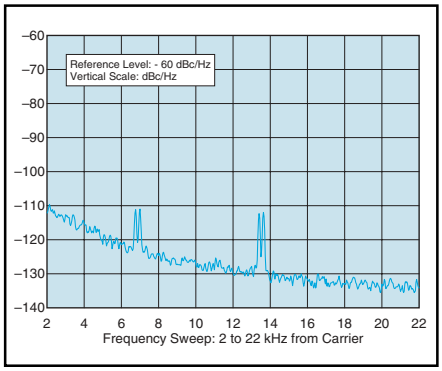


Figure 8—Worst-case spectral display of the FTV-1000 transverter's transmitter output during composite-noise testing in Class-AB mode. Power output is 200 W. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

peaks. Maximum output power in the AM mode is specified as 50 W. It's important to note that the transverter does not contain a built-in automatic antenna tuner. The FTV-1000 is designed to operate into loads that present an SWR no greater than 2.5:1.

If you want to put out a particularly clean SSB signal, you can switch the transverter into the Class-A mode (it's not necessary to select the Class-A setting on the MARK-V, as the low-level RF signal from the transceiver's transverter jack is already Class A). I have a homebrew 8877 amplifier that operates on very low levels of drive power, and I was really looking forward to trying it out in Class A. Unfortunately, the amp went up in flames a few days before I had the chance to hook it up to the FTV-1000. I do think the ability to operate in Class-A mode is a great feature for those of us who use low drive amplifiers.

Some Informal Comparisons

So how did it work? The thing works great! I set up a coax switch so that I could quickly swap my 7-element Yagi between my JST-245 and the MARK-V/FTV-1000. I aimed my antenna towards the W1RA beacon on Cape Cod.

After switching back and forth a few times, I convinced myself that there was something wrong with my '245! Listening on the MARK-V/FTV-1000, the beacon really seemed to jump up out of the noise. The S meter indication was approximately S7. When I switched the antenna over to the '245, the S meter only read about S2. (This was with the maximum amount of preamplification switched in on both radios.)

The following day I hauled the '245 into the ARRL Lab and had them check its sensitivity. With its preamp on, it measured –136 dBm. The MARK-V/FTV-1000 with both preamps selected measured –141 dBm (see Table 2).

My '245 wasn't broken—the MARK-V/FTV-1000 combination is just considerably more sensitive. The preamps don't just raise the noise floor either. On the JST I hear lots of little blips and pops from the synthesizer when I tune the band. This isn't the case with the MARK-V/FTV-1000.

I was especially enamored with the 200-W MARK-V/FTV-1000 combination after using it to blast through some tremendous 6-meter pileups with relative ease, including E30NA's, and many Europeans'. The extra 3-dB advantage that it gained me over the typical 100-W radios I was up against in the pileups seemed to make a noticeable difference.

Top Shelf

If you already own a Yaesu MARK-V FT-1000MP and want a terrific radio for 6 meters, you simply cannot go wrong with the FTV-1000. Add Yaesu's VL-1000 solid state amp, and you'll end up with a nicely integrated "plug and play" kW station for 6 meters and the HF bands.

If your main interest is 6 meters, and you don't already own a MARK-V, this combination is obviously a pricey way to go. If money is no object, though, it's certainly one of the nicer choices available.

Manufacturer: Yaesu USA, 17210 Edwards Rd, Cerritos, CA 90703; 562-404-2700; fax 562-404-1210; **www.yaesu.com**. Manufacturer's suggested list price: $1100. Typical current street price: $900.

TECHNICAL CORRESPONDENCE

MATCHING ELECTRICALLY SMALL ANTENNAS

By Grant Bingeman, KM5KG, 1908 Paris Ave, Plano, TX 75025;
DrBingo@compuserve.com

◊ As more Amateur Radio and SWL antennas are forced indoors by home-owner association restrictions, we are faced with an increasing problem operating on the lower frequencies where a physically large antenna is normally required for good performance. For one thing, the limited space available for indoor antennas means that we have to become more concerned with matching-network losses associated with *small aperture* antennas. It is also a fact that electrically small indoor antennas are not as efficient as typical outdoor antennas because of their high currents, hence increased copper losses. Indoor antennas are also subject to the scattering effects (radiation-pattern disturbances) of nearby metal objects such as wiring, HVAC ducts, gas appliance chimneys, copper water pipes, iron gas pipes and foil-sheathed insulation panels. In addition, the efficiency of typical antenna tuners is atrocious when connected to an electrically small antenna, which typically has a low radiation resistance and high-reactance input.

So a typical indoor antenna suffers from a *double-whammy*: (1) a lack of antenna height, increased copper losses, pattern scattering, etc and (2) increased matching-network losses. To be very specific, when operating into an electrically small antenna it is common to put 100 W into your 50-Ω matchbox input, yet deliver only 10 W to the antenna. On the other hand, many hams will claim that a particular small *magic* antenna has allowed them to consistently work DX. Well, any QRP operator using an attic antenna can say the same. In fact, just to prove a point, I have achieved QSOs operating QRP SSB into a dummy load. It is even easier to do this with Morse code. My point is that before you start believing the magic claims of an antenna manufacturer, you should ask for the real-world measurement procedures and electromagnetic field-intensity data to support their claims. Think twice before mailing your check to the land of enchantment. Besides, you can usually build an excellent indoor antenna yourself with a few dollars worth of parts, which in my opinion is the fundamental philosophy of Amateur Radio anyway.

Remember that what you think of as ground in a ham shack is not really ground for RF, especially when your transceiver is located on the second or third floor of a residence. Have you ever felt an RF tingle on the case of your transceiver or microphone? That's a bad sign. Many apartment or hotel dwellers do not live on the ground floor or have a basement, where a good RF ground may be possible. When RF ground is not certain, a good balun at the input to the antenna is particularly important. It is hard to find a balun that operates well at the lower frequencies, however, so do your homework before you buy. Be sure to ask for the RF-voltage and current ratings of baluns you are considering, not just a power rating at 50 Ω. The current and voltage stresses at the input to an electrically small antenna can be astronomical. Yes, balun losses can also be an important consideration when attached to electrically small antennas (whammy number three).

T-Network Impedance-Matching Example

Let us look at a particular matcher problem when the antenna input impedance is 1.0 $-j1000$ Ω at 3.5 MHz. Those physically small impedance matchers made for the Amateur Radio market typically have coil and capacitor *Q*s that are quite low, hence lossy. Most of the losses in a T-network used to match an electrically small antenna occur in the large inductance that must be used to tune out the antenna reactance because of the relatively high RF current in that inductance.

Referring to Figure 1, the loss resistance in the output coil is 10.2 Ω, so instead of matching 50 Ω to 1.0 Ω after tuning out the antenna reactance, we are really matching 50 Ω to 11.2 Ω (R_{loss} + R_{ant}). Ninety percent of the input power to this antenna is wasted as heat in the tuning coil required to series-resonate (tune out) the antenna reactance. Losses in the T-network input coil and shunt capacitor are small, such that the overall network losses total 91%.

Notice that I had to trick the program into thinking that it wanted to match 560 Ω to 1.0 Ω in order to obtain an input impedance of 50 Ω in this very lossy situation.[1] The solution is easier to iterate when the phase shift of the network is a lagging or leading by 90°, like a quarter-wave transmission-line

[1]You may download a free demo of the latest version of the *RF Network Designer* program used to generate the figures in this article from **www.qsl.net/km5kg**. The detailed help text built into this program explains how L, T, π and other networks are designed in the professional arena of high-power broadcasting. Several of my articles are available at this site and from **www.contelec.com**.

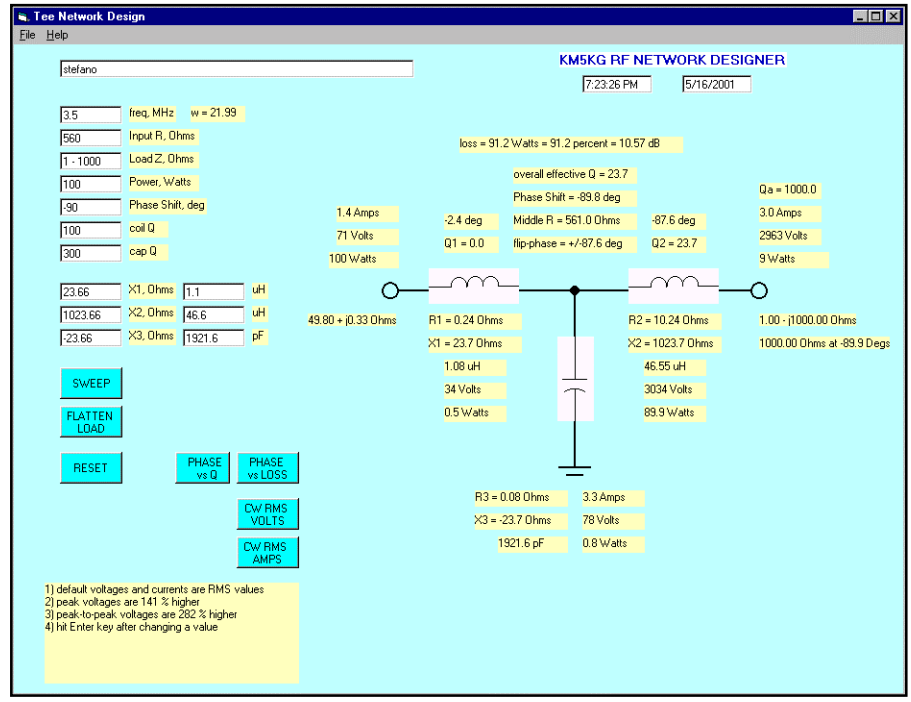


Figure 1—The T-Network Design page from KM5KG's *RF Network Designer* software.

transformer. Perhaps it would be better to run the program once to determine the actual loss resistance in the output coil, then run it again using a load resistance of $R_{loss} + R_{ant}$ and a load reactance of zero. There is less trickery this way for those who prefer the analytical approach, as opposed to an intuitive, iterative approach.

It is helpful to consider the impedance-matching process as two steps. First the antenna reactance must be tuned out (resonated), leaving a purely resistive load. This load resistance is then transformed to 50 Ω by a conventional T, π or L network. Sometimes an RF transformer is used, but that is beyond the scope of this article. An RF transformer does not really behave as many expect unless the primary and secondary impedances are much larger than the load impedance and the coefficient of coupling between primary and secondary windings is high. Fortunately, a transformer can be modeled as a lossy T or π network, but an ideal transformer is hard to make, so what seems a good idea at the start turns out to be just another lossy impedance matcher.

In order to reduce T-network losses it appears that the best approach is to increase the Q of the output coil. I would recommend a solenoidal coil wound with $^3/_8$-inch-OD copper tubing. Maximum Q occurs when the coil shape has a length about equal to its diameter. If the coil is suspended in free space but close to the antenna input, the desired 45 µH at 3.5 MHz can be obtained with 15 turns spaced 0.5 inches between tubing walls on a 12-inch-ID form. This is shown in Figure 2. A coil Q of 300 to 800 is then possible, but its realization depends on how solidly electrical connections are made, the wire or tubing diameter, the plating material, proximity of the coil to lossy objects, etc. Electrically small antennas can have high input currents and voltages and thus so can the coil used to tune these antennas. Thus, it is often important to enclose these coils (preferably with a low-loss material) if they are going to be subject to accidental human contact. At any rate, if we change the coil Q of Figure 1 to 800, the network losses total only 57%, a big improvement over the 91% loss in the previous example.

Incidentally, much higher inductor Q can be obtained from an air-core toroidal coil with a pair of contra-wound windings. However, such air-core toroidal coils can be quite large. Common toroidal coil losses with a *single winding* on a ferrite doughnut are very dependent on the dielectric loss of the particular ferrite material used. You may not be able to obtain as high a Q as you can get with a solenoidal air-core coil, but in the interest of saving space, it would be worth

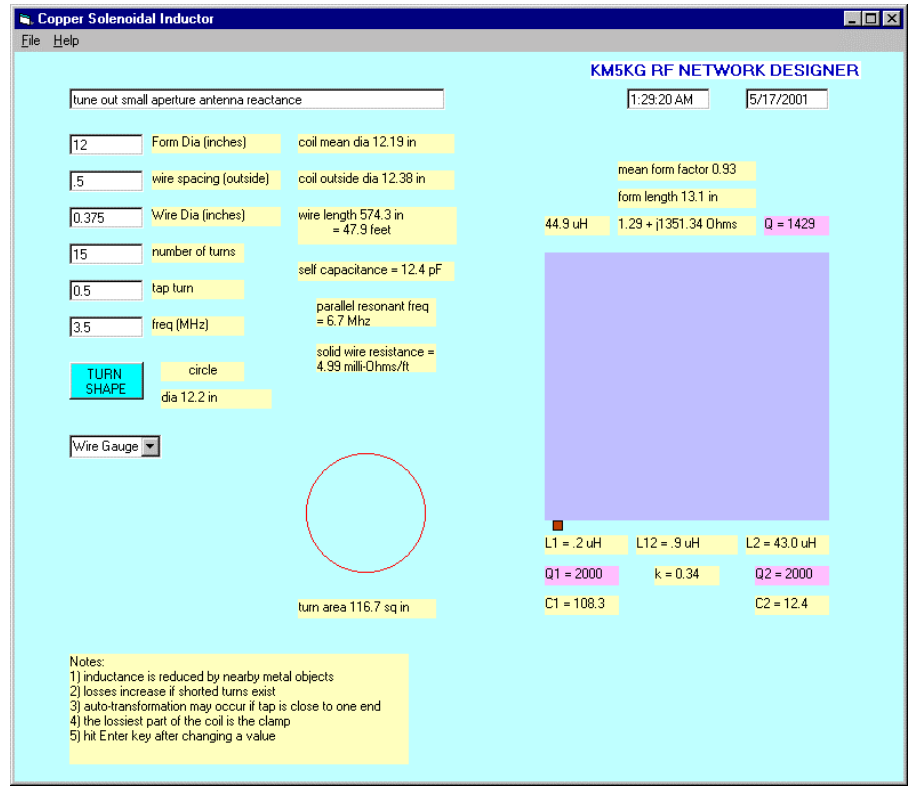


Figure 2—The Copper Solenoid Inductor page from KM5KG's *RF Network Designer* software.

investigating. The field around a toroidal coil is less sensitive to nearby objects than that of an open solenoidal coil, which is certainly an advantage. You can also experiment with contra-wound toroidal coils to see if you can obtain a significant increase in Q compared to their smaller single-winding brethren. You would most likely need a fan on a typically small ferrite coil, and even then it may simply burn up unless you use a large and expensive ferrite coil form. Consult Fair-Rite.[2] It is perhaps an unavoidable fact of life that electrically small antennas have high input currents and voltages, and can stress many matchers, ferrite or iron-powder devices beyond their ratings.

A π network matchbox tunes out antenna reactance with a shunt element, rather than the series element demonstrated in the earlier T-network example. This means that the resistance of the antenna is also transformed by the antenna-reactance tuning, which adds a second parameter to the analysis complexity. It also tends to make tuning less intuitive, which means that an operator can get into trouble more easily. Some people can think in shunt/admittance terms as easily as they can think in series/impedance terms, but I'm not one of them.

[2]Fair-Rite Products Corp., PO Box J, 1 Commercial Row, Wallkill, NY 12589; tel 888-FAIRRITE (324-7748), 845-895-2055, fax 888-FERRITE (337-7483) or 845-895-2629; **ferrites@fair-rite.com**; **www.fair-rite.com**.

Pre-tuning with a Shunt Element

Assume that the shunt output element of the π network is a variable capacitor with a Q of 300. If we adjust that shunt capacitor for about 500 pF, the antenna impedance of 1.0 $-j1000$ Ω is pulled down to a value of about 0.3 $-j83$ Ω per Figure 3. The rest of the π network may be able to match this value to 50 Ω, but when 97% of the input power is already lost in this shunt capacitor, why continue? Nearly all of the remaining input power will be lost in the other components, so you might as well be operating into a dummy load. Chances are that the network components will run so hot that they will burn up anyway from I^2R heating, unless they just arc to death first. Yes, you can choose an expensive vacuum variable capacitor with a much higher Q, but the shunt current will simply increase. For example, if we change the capacitor Q from 300 to 800 in the previous example, the losses in that capacitor would still total 93%. Thus, I would recommend trying a T-network approach instead. The reason for this will become more apparent in the next paragraph.

If the output shunt element is a coil instead of a capacitor, a 4.0-µH value with a Q of 100 will transform the antenna impedance to a manageable

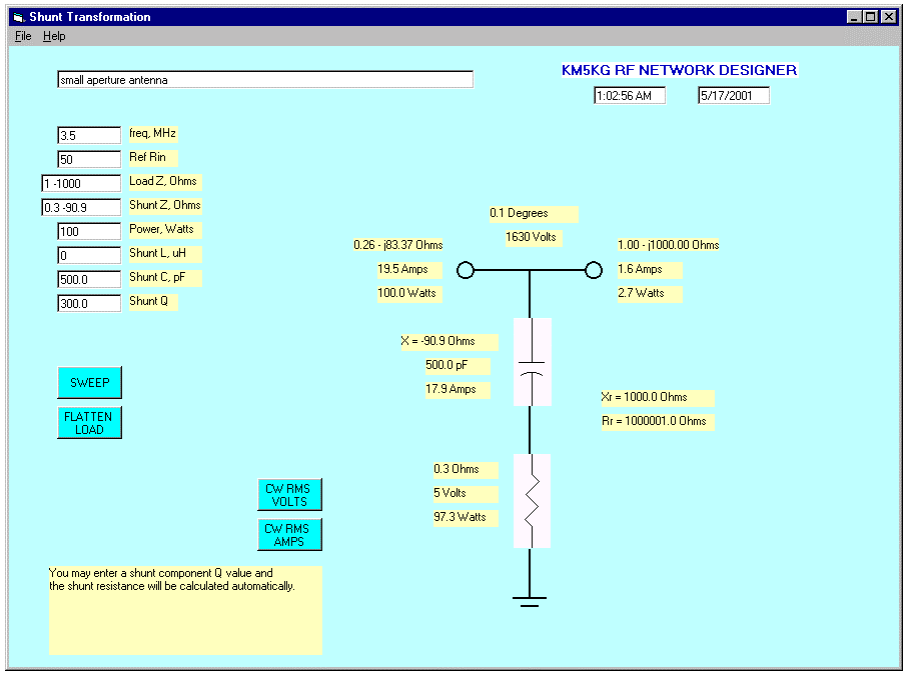


Figure 3—The Shunt Transformation page from KM5KG's *RF Network Designer* software.

1.1 + *j*96.4 Ω. However, the losses in this coil will be 99% of the input power! Do you think this coil might run hot? If the coil *Q* is changed to 800, then the antenna impedance is transformed to 0.1 + *j*96.4 Ω, and the losses are still very significant (at 93%) because of the higher *circulating* current. Ultimately, as we increase the shunt inductance, we can attain parallel resonance such that the antenna reactance is transformed to zero and losses may be reduced. However, the parallel-resonant resistance would be very high, requiring a lot of reactance in the rest of the matching network components. Again, this forces us back to the T-network configuration, if we want any power delivered to the antenna.

Did you notice that we have not talked about transmission-line losses? That is because I have assumed that the impedance matching network is located directly at the input to the antenna, which is sometimes the case in apartments, hotel rooms and at a few professional ham installations. However, if your antenna is located in the attic and your matchbox is far enough from the antenna to require a significant length of coax between the antenna and matchbox, coax losses can be appreciable. This is so because of the very high SWR possible with electrically short antennas. In fact, you can easily exceed the current or voltage ratings of the transmission line and quite literally burn it up. So in this case you really need to mount a matching circuit as close to the antenna as practical, so that your transmission line will be operating into the 50 Ω input of the matchbox. In other words, you want to arrange your equipment sequence as transceiver, coax, matchbox, antenna (TCMA). Whenever antenna SWR is high at your operating frequency, you never want to arrange your equipment in the conventional TMCA sequence.

In conclusion, remember that the low input resistances and high input reactances typical of many electrically small antennas can produce very high currents and voltages. This is especially so if you have managed to deliver a reasonable amount of power to the antenna. This assumes that you have built an efficient impedance-matching network and have a very good balun. On the other hand, keep in mind that an ordinary antenna matchbox may act as a dummy load in this situation. If it can't take the heat, it may need an expensive repair. When in doubt, consult the manufacturer of your matching network. In addition, take care to evaluate extra stresses in your transmission line if it shows a high SWR for the frequency and antenna you have chosen.

ON "SELECTIVITY AND HEARING"

By Lew Tijsma, PA0LH, retired electronic and acoustical engineer of the Philips Company

◊ The interesting articles of Larry, W4QEJ, and the comments of Harvey, K5LIM, and Tony, K1KP, need some amplification.[3, 4] A very important thing has not been mentioned. That is the human hearing mechanism. The reception and analysis of sound is a very complicated process that is still not completely understood.

When we listen to a pure tone (CW signal) and this signal passes the IF amplifier, all the signals within the passband will arrive into the ear. Stronger interfering signals lower the readability of the wanted signal. Nevertheless, we must not forget that the part of the brain that converts the signals from the auditory nerves to the impression of sound can sharpen the passband (in the brain) on the frequency of the wanted signal, as narrowly as we unconsciously want!

When we listen to a weak CW signal, all the other tones reach the ear, but we listen and write down only the desired text, while neglecting the other signals. When the QRM increases in volume, it becomes more difficult to copy a desired signal until the signal disappears in the "woods" of unwanted noise.

When we decrease the RF or AF gain, the whole level decreases, but at some level the ear detects the desired signal again. Thus, this masking effect is very difficult to understand. A 2-kHz tone with a sound-pressure level of 45 dB can be heard when narrow-bandwidth noise centered on 1200 Hz has a level of 75 dB. When this noise reaches a level of 80 dB, the pure tone will be masked. Now, if we decrease both the pure tone and the narrow-band noise by 20 dB, we detect the pure tone again. If the frequency of this pure tone is below that of the narrow-band noise, this effect is less. The physicist Zwicker and many more people have investigated this hearing phenomenon.

[3]L. Scheff, W4QEJ, "How to Maximize Your Receiver's Effective Selectivity," Part 1, *QST*, Feb 2001, pp 42-48; Part 2, *QST*, Mar 2001, pp 44-47. L. Scheff, W4QEJ, "The Proof of the Pudding is in the Eating!" (Technical Correspondence), *QST*, Aug 2001, p 79.

[4]T. Brock-Fisher, K1KP, "They're *not really* Brick-Wall Filters" (Technical Correspondence), *QST*, Aug 2001, pp 78-79. H. Tetmeyer, K5LJM, "Comments on 'How to Maximize Your Receiver's Effective Selectivity'" (Technical Correspondence), *QST*, Aug 2001, pp 77-78.

Technical Correspondence items have not been tested by *QST* or the ARRL unless otherwise stated. Although we can't guarantee that a given idea will work for your situation, we make every effort to screen out harmful information.

Letters for this column may be sent to Technical Correspondence, ARRL, 225 Main St, Newington, CT 06111, or via e-mail to **tc@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing a work, please send the author(s) a copy of your comments. The publishers of *QST* assume no responsibility for statements made herein by correspondents. QST

"Hollingsworth Era" of Amateur Enforcement Enters Fourth Year

FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth, K4ZDH, has praised the overall level of Amateur Radio compliance with FCC rules as "outstanding." Hollingsworth's assessment came as the current era of Amateur Radio enforcement under his guidance and direction entered its fourth year.

"The vast majority of operators are proud of the service and want to contribute to it and want to pass on the great legacy that it has become," Hollingsworth said in a statement prepared to mark the occasion. "May it last a thousand years!"

An amateur for 41 years, Hollingsworth also declared his pride in the Amateur Service. "I saw the energy and compassion and excellent operating of amateurs at the Pentagon and World Trade Center after September 11," he said. "I've seen and heard it at the National Hurricane Center in Miami—home of W4EHW—and in countless meetings with individual amateurs and at amateur events all over the United States."

Hollingsworth said US hams "have a lot to be proud of," and he urged them to "participate in Amateur Radio with enthusiasm, celebrate it, enjoy it and share it, because you have made it an incredible national resource and the *only truly fail-safe communication* service on the planet Earth."

In his statement, Hollingsworth again reminded amateurs to be acutely aware of the image they present to anyone who might be listening. "I hear far too many operators who don't realize what a bad reflection they are on American amateur operators," he said. This has been an oft-repeated refrain during Hollingsworth's convention and hamfest visits, where he's encouraged amateurs to serve as on-air ambassadors and urged them to avoid questionable on-air practices, language and antics.

Now nationally recognized and respected within the amateur community, Hollingsworth was relatively unknown outside the FCC bureaucracy when he volunteered to take on the challenge of amateur enforcement in 1998. For several years prior, the FCC had all but abandoned amateur enforcement. Hollingsworth notes that it was not until another plea went out from the ARRL to the FCC in the summer of 1998 that the FCC responded. The agency transferred Amateur Service enforcement from the Wireless Telecommunications Bureau to what was then called the Compliance and Information Bureau.

Statement of Riley Hollingsworth on Enforcement Anniversary

In the summer of 1998, the ARRL wrote yet another letter to the FCC imploring it to beef up amateur enforcement. It was October when the letter arrived in the Compliance and Information Bureau. By November, amateur enforcement had been transferred *carte blanche* from the Wireless Bureau, which retained its licensing and policy functions. Amateur enforcement thus began in this renewed context in November 1998.

In this three-year period, the Commission established an Enforcement Bureau and enhanced its enforcement presence across the board in the various areas it regulates—from broadcast to tower lighting, unsolicited faxes and long-distance carrier slamming to pirate radio cases. Enforcement in the Amateur Service was folded into the Enforcement Bureau and continued as well in a vigorous and determined way.

Now moving into the fourth year of diligent amateur enforcement, I have strong feelings about the Amateur Radio Service and its diverse participants. I personally believe that it has the brightest potential in 25 years, and there are several reasons why. The overwhelming majority of amateur operators care about Amateur Radio, want it to thrive and want to share their joy and enthusiasm for it. They want to be proud of it and proud to demonstrate it to a niece, neighbor or news reporter. That's why we have had a 99.9% support level for the enforcement program.

Amateur Radio remains at the leading edge of technological experimentation, especially in the digital arena. The satellites, Amateur Radio participation in the space program, the array of new equipment and the convergence of Amateur Radio and computers—perhaps best exemplified by the popularity of PSK31—all point toward great things ahead for Amateur Radio.

It is the task of you, as individual amateurs, to educate the public and the media about the wonderful benefits of Amateur Radio. You need to do a better job of that. You also need a greater realization that you are, indeed, heard throughout the world and you need to be more aware of how you sound to the rest of the world. I hear far too many operators who don't realize what a bad reflection they are on American amateur operators. Additionally, you, as well as any other serious national activity, business or service, need to continue to support a vigorous national voice in Washington.

But I can honestly say, from this three-year perspective, that the overall level of rule compliance in the Amateur Radio Service is, simply put, outstanding! The vast majority of operators are proud of the service and want to contribute to it and want to pass on the great legacy that it has become. Your enthusiasm is contagious.

I am proud of the Amateur Service. I saw the energy and compassion and excellent operating of amateurs at the Pentagon and World Trade Center after September 11. I've seen and heard it at the National Hurricane Center in Miami and in countless meetings with individual amateurs and at amateur events all over the United States. Amateur Radio operators in America have a lot to be proud of.

Participate in your service with enthusiasm, celebrate it, enjoy it and share it, because you have made it an incredible national resource and the only truly fail-safe communication service on the planet Earth.

I am proud of all of you. My personal and professional goal for Amateur Radio is the same: *May it last a thousand years!*

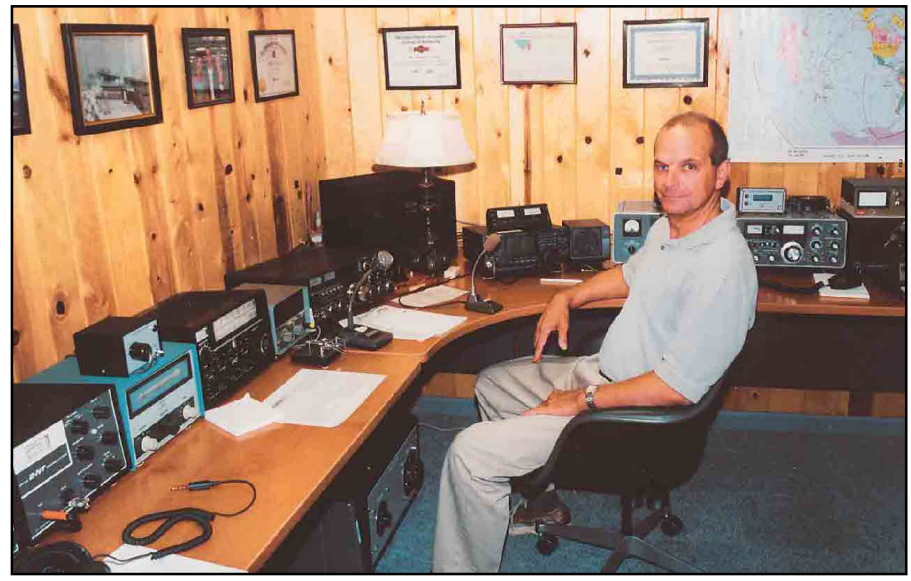
Rick Lindquist, N1RL ♦ Senior News Editor

"Amateur enforcement thus began in this renewed context in November 1998," Hollingsworth recalled. The FCC subsequently created the Enforcement Bureau to handle agency-wide enforcement activities.

ARRL President Jim Haynie, W5JBP, lauded Hollingsworth as "a great gift" to the amateur community and expressed appreciation on behalf of the League for what he's been able to accomplish during his tenure. "Over the past three years, Mr Hollingsworth has breathed new validity and vitality into the enforcement of Amateur Radio," Haynie said. "His strong support for the amateur community as a whole and the ARRL's initiatives, has been unwavering."

Haynie said that Hollingsworth—guided by his passions for Amateur Radio and for the law—"has given hams across the nation reason to pause, think, promote and yes, even laugh about ourselves."

RICK LINDQUIST, N1RL



"I am proud of the Amateur Service." Riley Hollingsworth, K4ZDH, at home in his well-equipped basement ham shack. Hollingsworth's station includes several "vintage" operating positions.

New York Ham Wins Antenna Lawsuit

In one of the most favorable PRB-1 court rulings in years, a New York amateur has won a three-year battle to erect a tower on his property. The US District Court for the Northern District of New York on December 3 ordered the Saratoga Springs Planning Board to grant Randall J. Palmer, N2NVH, a special use permit for a 44-foot antenna support structure. PRB-1 is the limited federal pre-emption that requires localities to reasonably accommodate Amateur Radio communication.

In a 20-page decision, US District Judge Norman A. Mordue found that "the planning board did not attempt to negotiate a satisfactory compromise" with Palmer. As a result, Mordue, said, the town failed to reasonably accommodate Palmer's amateur communication needs pursuant to PRB-1. The judge found that "the planning board engaged Palmer in a strictly one-sided negotiation consisting of inflexible demands and the construction of hoop after hoop for Palmer to jump through."

Mordue found that the record "clearly proves" the planning board made no attempt to negotiate a satisfactory compromise. On the other hand, the judge asserted, Palmer complied with many of the planning board's numerous requests and even made concessions on his own initiative. Mordue said that since the town already understood its obligations under PRB-1, he was directing the planning board to immediately grant Palmer's application.

ARRL Volunteer Counsel Albert J. Millus, WB2EQR, represented Palmer through much of the battle.

Saratoga Springs limits all antennas to 20 feet in height and allows exceptions only upon issuance of a special use permit. Palmer applied for one in 1999 to erect a modest antenna system of less than 50 feet in height, but the town continued to deny his permit application.

After the last rejection earlier this year, Palmer went forward with his lawsuit, filed following the town's initial denial, and a bench trial was held October 30. Mordue's decision relied on an analysis of prior antenna cases, including the landmark *Pentel v Mendota Heights* case—issued by the Eighth Circuit in 1994.

ARRL Hudson Division Director Frank Fallon, N2FF, said he hoped the decision in the Palmer case—coupled with the goodwill generated by amateur response to the September 11 World Trade Center attacks—would prompt the New York Assembly to act favorably on a pending PRB-1 bill in that state.

Comments Due February 12 in "Band Threat" Proceeding

Comments are due February 12, 2002, in the FCC *Notice of Proposed Rule Making and Order* in ET Docket 01-278. Reply comments are due on March 12, 2002. The proceeding deals in part with a potential band threat to the popular 70-cm band from a Part 15 RF identification device proposed for deployment by SAVI Technology (see the Threats to our Amateur Bands page on *ARRLWeb*, **www.arrl.org/news/bandthreat/**, for details). The ARRL has argued that the FCC lacks authority under the Communications Act of 1934 to permit unlicensed devices with substantial interference potential and that such devices must be licensed.

The ARRL also is looking into the interference potential posed to 20 meters by a proposal to increase the maximum emission levels permitted by Part 15 devices operating at 13.56 MHz, as well as the maximum level of out-of-band emissions for such devices.

Commenters are advised to read paragraphs 20-27 of the *NPRM&O* (available on *ARRLWeb*, **www.arrl.org/news/stories/2001/10/19/1/290a11.html**.

Interested parties may file comments using the FCC's Electronic Comment Filing System, **www.fcc.gov/e-file/ecfs.html** (search using "01-278"). Commenters should include full name, US Postal Service mailing address, and applicable docket or rule making number—in this case ET 01-278.

It's also possible to e-mail comments via the ECFS. To obtain e-mail filing instructions, commenters should send an e-mail to **ecfs@fcc.gov** and include the words "get form ***<your e-mail address>***" in the body of the message. A sample form and directions will be sent by reply e-mail.

FCC News

FCC STILL SINGING THE POSTAL BLUES

E-mail it or fax it, but if you've got something to send to the FCC, don't put it in the mail if you expect the FCC to receive it promptly. Since October 19, the FCC has been urging everyone to avoid using the mails to conduct business with the agency and to use electronic means to file applications or comments.

In the aftermath of anthrax incidents involving the mails, the FCC began diverting mail destined for its Gettysburg, Pennsylvania, office and for its Washington, DC, headquarters to special-handling facilities. The action effectively halted processing of Amateur Radio vanity call sign applications in mid-October. As of press time in mid-December, the FCC had not processed vanity applications received after October 14, and the Wireless Telecommunications Bureau at Gettysburg had put on hold any vanity applications—paper or electronic—received after that date. Vanity fees paid by credit card for electronic filings were being charged to holders' accounts, however.

The FCC suspended Amateur Radio vanity call sign processing altogether because hard copy and electronic vanity applications now are supposed to receive equal processing priority. The Commission was not expected to resume vanity processing until the mail situation was untangled.

ARRL VEC Manager Bart Jahnke, W9JJ, noted that the mailroom situation also could affect some Amateur Radio renewals filed on paper. He said amateurs who filed timely renewal applications may continue to operate beyond a license's expiration date, if the mail delays cause the license to lapse before the renewal is granted.

"For persons filing for renewal near the end of their two-year grace period, their applications will be accepted for processing if they arrive at FCC before the grace period expires," he added.

The FCC has been acting on amateur renewals and administrative updates filed on-line via the Wireless Telecommunications Bureau's Universal Licensing System, **www.wireless.fcc.gov/uls/**. As of December 3, all applicants must include an FCC Registration Number (FRN) when filing.

The Gettysburg office is where the Wireless Telecommunications Bureau processes Amateur Radio applications and issues licenses. It's also where Special Counsel for Amateur Radio Enforcement Riley Hollingsworth has his office. Citing heightened security measures, the FCC announced November 14 that it had moved the Gettysburg office's mailroom offsite, to the rear entrance of 35 York St, Gettysburg, PA 17325. The FCC neglected to announce, however, that mail received at Gettysburg starting October 15 had not yet been opened, pending arrangements to handle it without the possibility of endangering personnel.

As of early December FCC staff members in Gettysburg were opening mail already a couple of weeks old. Staffers said, however, that some pre-October 15 Gettysburg mail was diverted to FCC Headquarters for decontamination with other federal mail and had not yet been returned.

Mail sent to FCC Headquarters was being diverted to a warehouse facility in Capitol Heights, Maryland, since late October. The FCC has indicated that it continues to track the date of receipt for each piece of mail.

An FCC spokesperson in Washington has assured that no mail has been destroyed and that the Commission probably would permit additional time to include any comments filed on paper in a proceeding that might be caught in the special-handling and decontamination process. The FCC staff member invited those who had filed paper comments in a proceeding to file their comments again electronically, using the FCC's Electronic Comment Filing System (ECFS), **www.fcc.gov/e-file/ecfs.html**.

The FCC said the US Postal Service will continue to accept and will divert all mail addressed to 1270 Fairfield Road, Gettysburg—the office's physical location—to the off-site mailroom. The Gettysburg office now only accepts hand and courier deliveries at the rear entrance of 35 York Street, Gettysburg.

Amateur Enforcement

♦ **FCC lets deliberate interference *Warning Notice* stand:** FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth will let stand a *Warning Notice* sent to a Pennsylvania licensee following accusations of deliberate interference. The complaint—

HAM-SAILOR COMPLETES THE BIG ROUND TRIP

David Clark, KB6TAM—the oldest person to sail solo around the world—arrived back in Fort Lauderdale, Florida, December 7 to a huge welcome. He'd been on the high seas for two years.

"They made a big deal out of it," said Chuck Baer, W4ROA, an ARRL Assistant Southeastern Division Director who followed Clark's journey and was on hand for the Florida homecoming. "The *Guinness Book of World Records* people were there to declare it official." He said Clark, 77, was in high spirits and glad to be back on solid ground.

Although Clark technically had completed his circumnavigation when he arrived back in the Bahamas in November, he had said he would not

David Clark, KB6TAM, aboard *Mickey*, on the home stretch into Fort Lauderdale.

which arose in part from split-frequency contest operation—alleged that K3NM failed to shift frequency after being notified that the station's signal was interfering with an ongoing contact. The FCC *Warning Notice* and its routine publication by ARRL and other media ruffled some feathers within the contesting community. Some worried that "both sides of the story" were not being told; others complained about the public airing of unproved allegations.

John King, K5PGW, of Louisiana complained to the FCC after the September 9 incident, which occurred while K3NM was operating split mode on 40-meter SSB during the Worked All Europe Contest. Following up, Hollingsworth sent a *Warning Notice* September 12 to K3NM licensee Joseph Brue Jr.

King—an attorney—asserted that he was operating mobile and in QSO with Roy Ezell, K9ROY, in Kentucky when K3NM came on frequency without asking if it were in use and began calling "CQ contest." King told the FCC that he and K9ROY attempted to alert the K3NM operator—Matt Vanni, LU9AY/W1—but were unable to do so, because K3NM was listening on 7.083 MHz, outside the US phone band. King said that Ezell twice telephoned Brue, letting him know his station was interfering and asking him to move. King maintained that the interference continued, even after the second telephone call.

Vanni subsequently told the FCC that he could not hear K5PGW or K9ROY, even after the telephone calls, so he continued operating as he had been. Vanni told the FCC that K3NM's two-element beam at 112 feet was on the opposite heading from the complainant's location. He also said that he always monitors his transmitting frequency when working split on 40 SSB. Brue also wrote the FCC, confirming Vanni's version of events to the FCC and adding that Vanni had asked several times if the frequency—7.210 MHz—was in use before transmitting. Brue also verified receiving the two phone calls from the complainants.

Hollingsworth said in an October 30 letter to Brue that he was standing behind his *Warning Notice* and that it would remain in the licensee's file. Hollingsworth agreed that Brue and Vanni could not be expected to protect communications they couldn't hear, given their antenna system. But, he continued, given the two telephone calls, "it was not good Amateur practice to merely ignore the protests of the complainant and continue operating the station without a good faith attempt at compromise or corrective action."

♦ **FCC chastises feuding 75-meter occupants:** The FCC's Enforcement Bureau has stepped in to halt feuding over the use of some 75-meter frequencies. The dispute had pitted the Alabama Traffic Net, the Alabama SKYWARN Net and the Country Cousins Net against an informal group of amateurs. All wanted to operate between 3.965 and 3.970 MHz. In the end, the FCC declined to take any enforcement action in the situation, but Special Counsel for Amateur Radio Enforcement Riley Hollingsworth took all sides to task for bringing their charges and countercharges to the FCC in the first place.

"This dispute appears to be largely a 'who's-on-first' dispute, involving issues of proper operating procedures, and not appropriate for enforcement action," Hollingsworth told the parties involved.

In a two-page response sent to Jeremy Jackson, K9CNI, Henry Willmon, WA4GQS, Sal Viglione, W4SAL, and Alabama ARRL Section Manager Bill Cleveland, KR4TZ, Hollingsworth recounted allegations of deliberate and retaliatory interference, verbal harassment, frequency hogging, obscenity and profanity and even a charge that one individual was selling illegal linear amplifiers.

Hollingsworth pointed out that nets—regardless of their longevity, membership numbers or public service benefit—are not specifically regulated by FCC rules and have no greater rights to any frequency than any other licensee. On the other hand, Hollingsworth said, the informal group needs to consider whether it's good amateur practice to deliberately start communications on a frequency widely known to be used by a long-established net.

Hollingsworth warned that anyone violating the rules was risking FCC enforcement action and possible fines. "We cannot, however, mandate courtesy, good and fair operating practices or even common sense," he added. He said the informal group had told him it would find another frequency to meet on 75 meters.

consider his journey complete until he'd returned to the port from which he'd departed two years earlier. Originally intending to arrive back in Florida in time for his 77th birthday last May 17, Clark decided instead to sit out much of the Atlantic hurricane season in Trinidad.

In Fort Lauderdale, Clark was reunited with his wife, Lynda, and other family members whom he had not seen since he left the US. Baer said a crowd of around 300 people—including news media—was on hand, and Clark's arrival was heralded by a plume of water from a Fort Lauderdale fireboat. A local high school band and a Navy ROTC color guard added to the pomp and circumstance.

Clark almost lost his life a year ago when his original sailboat, the *Mollie Milar*, sank off the coast of South Africa. Clark bought another sailboat—a smaller one that he named *Mickey* after his canine sailing companion lost in the rescue effort—and he resumed his quest in April 2001. Baer presented Clark with a plaque honoring Mickey.

Clark used Amateur Radio through-out his two-year odyssey to keep in touch with his family. Having the radio aboard also may have saved his life. When his boat began sinking off South Africa, Clark put out a distress call on ham radio that was relayed to maritime authorities. The crew of a commercial vessel plucked him out of the water.

An earlier attempt by Clark to circle the globe nine years ago fell short when his vessel was dismasted and sank in the Indian Ocean.

Clark in part supported his adventure with corporate sponsorship, but he funded much of the trip through Social Security earnings and occasional clarinet gigs. Hams along the way also provided financial assistance and as well as solid communication links.

ARISS SUCCESS STORY CONTINUES

The Amateur Radio on the International Space Station (ARISS) program now has continued its success story through three crew changes. As the only ham aboard the Expedition 3 crew, which began its stay in August, Commander Frank Culbertson, KD5OPQ, logged nearly two dozen ARISS school and educational contacts before returning to Earth in December in time to join his family for the holidays.

The all-ham Expedition 4 crew of Commander Yuri Onufrienko, RK3DUO, and flight engineers Dan Bursch, KD5PNU, and Carl Walz, KC5TIE, blasted into space December 5 aboard the shuttle *Endeavour*. The shuttle also carried new ham radio antennas that will

NASA

Students at the Iruma Children's Center in Japan spoke with the ISS on November 23, marking the first ARISS contact with that country.

At the South Carolina State Museum, student Stephen Clifton of Heathwood Hall Episcopal School asks his question of ISS crew chief Frank Culbertson while Matthew Shelton of Lexington Middle School and Samantha Niemeyer of Lexington Intermediate School await their turns.

permit setting up two complete amateur stations aboard the space station. The new antennas were not expected to be installed until the Expedition 6 crew comes aboard later this year, however. A new packet TNC sent up to the ISS late last summer also remains to be installed.

Although he became licensed only shortly before heading to the ISS, Culbertson—operating as NA1SS—quickly acquired a snappy operating rhythm that served him well during his periodic ham radio chats with earthbound students. And he never seemed to tire of hearing the same questions rephrased from school to school.

Among the highlights of his ARISS legacy was a morale-boosting on-air visit November 7 with students at New York City's Public School 234, whose students were in temporary quarters following the September 11 terrorist attack on the World Trade Center. PS 234's normal campus is only two blocks from "Ground Zero." The nearly 700 students and faculty had to be evacuated on September 11.

"It's sad that you've had to move from school to school, but we're proud that you're continuing to work and take your education seriously," Culbertson told the students in Francine Cornelius's computer class.

Culbertson also completed the first ARISS contact with students in Japan. On November 23, Culbertson worked JK1ZAM, the Amateur Radio club station at the Iruma Children's Center in Iruma City, Japan. The Iruma contact was conducted in English.

The Japanese students were eager to know about how the aurora and a recent Leonid meteor shower appeared from space. Culbertson said the crew could see the auroras "very clearly" at both poles and that he was able to photograph the phenomena from space. "It looks like you're about to fly through a curtain of light," he said. The Leonid meteor shower, he added, was "very spectacular" with hundreds of meteors visible per hour that appeared to be "falling vertically below us" as they entered Earth's atmosphere.

Despite the long work days aboard the ISS, Culbertson never lost his sense of humor during his school contacts. During a November 30 QSO with youngsters visiting the South Carolina State Museum in Columbia, one fifth grader wanted to know whether Culbertson had ever seen life in space.

"Just the guys I live with up here," Culbertson quipped. "I haven't seen any other kind of life outside the space station." His remark drew laughter from the earthbound audience.

"Who knows whether there is or not," he continued in a more serious vein. "If there is, it's a pretty big deal and would be very important. If there's not, then it makes our place in the universe even more important and gives us more responsibility to take care of what we have."

The ARISS program is a joint effort of ARRL, NASA and AMSAT. More information is available on the ARISS Web site, **ariss.gsfc.nasa.gov**.

ARRL HONORS ITS OWN FOR LONG SERVICE

Each year, ARRL takes time to recognize employees who have attained at least 10 years' service as Headquarters staff members. Eight people were honored in October. Executive Vice President David Sumner, K1ZZ, took top honors, marking his 30th year of service to the League. Not far behind were three 25-year honorees: *QST* Managing Editor Joel Kleinman, N1BKE, ARRL Building Manager Greg Kwasowski, KB1GJF, and Assistant Mailroom Supervisor Berta Hould. Recognized for 10 years' service were *QST* Editor Steve Ford, WB8IMY, Legislative and Public Affairs Manager Steve Mansfield, N1MZA, Lab Test Engineer Mike Tracy, KC1SX, and Marketing Coordinator Bob Inderbitzen, NQ1R.

ARRL

Back row (L-R): Steve Ford, WB8IMY, Bob Inderbitzen, NQ1R, Mike Tracy, KC1SX; front row: Steve Mansfield, N1MZA, David Sumner, K1ZZ, Berta Hould, and Joel Kleinman, N1BKE. (Not pictured: Greg Kwasowski, KB1GJF.)

THREE SECTION MANAGERS APPOINTED TO FILL VACANCIES

ARRL Field and Educational Services Manager Rosalie White, K1STO, has named three new ARRL section managers to fill vacancies in the field organization. New section managers were appointed in the Alaska, Georgia and San Diego sections.

In Alaska, David Stevens, KL7EB, of Anchorage, was tapped to succeed L. Kent Petty, KL5T. In November Petty had withstood a challenge from Stevens for the SM slot, 154 to 104, but then decided to step aside. An ARRL Life Member and an Extra class licensee, Stevens previously served as SM from July 1998 until December 1999.

In Georgia, Susan Swiderski, AF4FO, of Norcross, was named to replace Sandy Donahue, W4RU, the SM since 1997, who was elected last fall as Southeastern Division Vice Director. An Extra class licensee, Swiderski has served as an Affiliated Club Coordinator.

In the San Diego Section, Kent Tiburski, K6FQ, of San Diego was appointed to the post formerly held by Tuck Miller, NZ6T, who was elected last fall as ARRL Southwestern Division Vice Director. Miller had served as SM since April 1998. Tiburski has served as an Assistant Section Manager, District Emergency Coordinator and Technical Coordinator.

Terms of office for the appointees began January 1, 2002.

In Brief

• **Vote on *QST* Cover Plaque Award:** The winner of the *QST* Cover Plaque Award for November was Paul Shuch, N6TX, for his article "A Moonbounce Odyssey." Congratulations, Paul! The winner of the *QST* Cover Plaque award—given to the author of the best article in each issue—is determined by a vote of ARRL members. Voting takes place each month on the Cover Plaque Poll Web page, **www.arrl.org/members-only/qstvote.html**. As soon as your copy arrives, cast a ballot for your favorite article.

• **FCC only accepting newer Form 159:** The FCC says that, effective for all payments received by the Commission on or after December 3, 2001, the FCC Form 159 dated February 2000 will be the *only acceptable form*. The February 2000 version requires that applicants provide an FCC Registration Number (FRN) for both applicant and payer (likely to be the same for Amateur Radio transactions). Applications or filings accompanied by the obsolete FCC Form 159 (dated July 1997) will be returned. A copy of the acceptable Form 159 is available on the FCC Web site, **www.fcc.gov/fees**. At the left side of the page, click on "Form 159." This allows either printing a copy of Form 159 or completing the form on-line and printing it. Anyone doing business with the FCC on or after December 3, 2001, must provide an FCC Registration Number. Applicants who have not obtained an FRN may do so via the FCC Web site, **www.fcc.gov/**. Click on the "Commission Registration System" link on the left side of the page. For more information on obtaining an FRN, contact the CORES Help Desk, 877-480-3201.—*FCC*

• **G3AQC spans the Atlantic on 73 kHz!** Low-frequency experimenter Lawrence "Laurie" Mayhead, G3AQC, has added another LF accomplishment to his list—transatlantic reception of his 73 kHz signal. Word of the LF exploit came just three weeks before the centennial of the historic transatlantic transmission of December 12, 1901, when Guglielmo Marconi, in Newfoundland, received the letter "S" transmitted from England. On the night of November 21-22, John Andrews, W1TAG, in Holden, Massachusetts, received Mayhead's signal on 72.401 kHz. Mayhead was using dual-frequency CW—or DFCW—featuring elements that are two minutes long, and Andrews detected his signal using *ARGO* DSP software. Andrews said he'd devoted "quite a number of evenings" to trying to hear G3AQC. "Luck being with us, conditions were absolutely amazing," he said. The distance between G3AQC and W1TAG was estimated at 3275 miles (5270 km). A year ago, Mayhead and Larry Kayser, VA3LK, in Ontario, completed a transatlantic Amateur Radio contact on 136 kHz.

• ***Amateur Radio Trader* calls it quits:** *Amateur Radio Trader* magazine has ceased publication. Its last edition was the second November issue. "This was a difficult but necessary decision, due to the combined effects of the Internet on our print edition (the primary source of our Web content), and the economic climate," said the magazine's editor Barbara Patterson, KF4MVV, in a statement on the *Amateur Radio Trader* Web site, which also was to be discontinued. "*ART* is no longer a viable product for us. We are redirecting the company's resources into other areas." Patterson told ARRL that subscribers would be reimbursed for any outstanding issues. She said TAP Publishing Company, which owns the twice-monthly listing of classified ads, had decided to put its energies into other areas. Patterson apologized for any inconvenience.

SECTION MANAGER ELECTION NOTICE

To all ARRL members in the Illinois, Indiana, Maine, Northern Florida, Oregon, Santa Clara Valley, Vermont and Wisconsin sections. You are hereby solicited for nominating petitions pursuant to an election for Section Manager (SM). Incumbents are listed on page 12 of this issue.

To be valid, a petition must contain the signatures of five or more full ARRL members residing in the section concerned. Photocopied signatures are *not* acceptable. No petition is valid without at least five signatures, and it is advisable to have a few more than five signatures on each petition. Petition forms (FSD-129) are available on request from ARRL Headquarters but are not required. We suggest the following format:

(Place and Date)

Field & Educational Services Manager
ARRL
225 Main St
Newington, CT 06111

We, the undersigned full members of the _____ ARRL section of the _____ division, hereby nominate _____ as candidate for Section Manager for this section for the next two-year term of office.

(Signature___ Call Sign___ City___ ZIP___)

Any candidate for the office of Section Manager must be a resident of the section, a licensed amateur of Technician class or higher and a full member of the League for a continuous term of at least two years immediately preceding receipt of a petition for nomination. Petitions must be received at Headquarters by 4 PM Eastern Time on March 8, 2002. Whenever more than one member is nominated in a single section, ballots will be mailed from Headquarters on or before April 1, 2002, to full members of record as of March 8, 2002 which is the closing date for nominations. Returns will be counted May 21, 2002. Section Managers elected as a result of the above procedure will take office July 1, 2002.

If only one valid petition is received from a section, that nominee shall be declared elected without opposition for a two-year term beginning July 1, 2002. If *no* petitions are received from a section by the specified closing date, such section will be resolicited in the July 2002 *QST*. A Section Manager elected through the resolicitation will serve a term of 18 months. Vacancies in any Section Manager's office between elections are filled by the Field & Educational Services Manager. You are urged to take the initiative and file a nomination petition immediately. —*Rosalie White, K1STO, Field & Educational Services Manager* QST

Xtreme! In More Ways Than One

By Bill Niemuth, KB9ENO, EC, Outagamie County ARES

As Wisconsin ARES/RACES organizations, we are fortunately not exposed to some of the disasters and tragedies that affect other parts of the US. We have our share of severe weather (thunderstorms, occasional tornadoes and blizzards), and sometimes hazardous materials issues, but overall the state is tranquil. We don't normally need to operate in the elements for long periods.

This was not the case on Saturday, July 21, 2001. Outagamie County ARES began working with the Mid-America Adventure Racing in February, 2001, after agreeing to coordinate the communications for its 2001 Xtreme Race held in the Nicolet National Forest. Without knowing a great deal about the event, we anticipated it would be a communications challenge.

Course Challenges

The 2001 Xtreme Race consisted of a 55-mile course in rugged northeastern Wisconsin. This is an area known for off-roading, hiking and waterfalls. The Race was to begin with participants floating several miles down the Pestigo River, then hiking 13 miles through the woods on a marked trail. They would then need to test their navigation skills for over eight miles, which included some of the most difficult terrain in Wisconsin. There were to be rappel, traverse and ascent challenges. They would need to find four orienteering points with the help of only a compass and topographical map. After running this gauntlet, they would ride mountain bikes for nearly 30 miles, mostly uphill. When the bike competition finished, they would get in rafts and run the difficult rapids of the Pestigo River until the finish. We were told by Race Director Mike Polzin that the course would take a minimum 10 hours to complete. The worst case may be 18 hours!

Our ARES group has always looked for communications challenges to sharpen our skills. We are blessed with good support from the community, emergency management and have always been treated with respect. This event was no different; we were welcomed with open-arms. Because of the requirement for staffing, we contacted our surrounding counties' ARES groups and requested volunteers. Winnebago, Waupaca and Calumet County ARES groups all responded with willing volunteers. Winnebago County brought their Remote Operations Center (ROC), which was used for Race Command. We appreciated the help of these groups and could not have done it without them. The event also strengthened relationships for future mutual assistance for emergencies and disasters because it is easier to work with someone the second time.

Race Preparations

Preparations for the Race began early Friday, July 20, 2001, when we had to drive the 100+ miles to the site. Operators began arriving at Wildman's Whitewater Ranch (base camp) about 11:30 AM. The weather had been extremely hot and humid, and we were aware of the chance for severe weather. We began to set up operations and the first task was to find a spot for the ROC. We tried one location, but opted for another because of the shade. We previously secured permission to use the K9ARF, 145.470 MHz, Crivitz repeater for the event, but wanted backup communications, so we transported two repeaters from Outagamie County. The 145.150 MHz repeater (Red Cross) was the designated backup, although we did not need it because of the stellar performance of the 145.470 MHz repeater. The other system was designated as the "chat" frequency. The 443.650 MHz (Fox Valley VHF Association) was installed and used. We thank all of the organizations for the use of their systems.

KB9ENO

The Winnebago County ARES Remote Operations Center was used for Race Command.

Once we completed setup, it was nearly dinnertime. As we stood in line for the spaghetti dinner, thunder began. Rain began shortly after we finished eating and the big rains came just as we were about to start our pre-race meeting. As we discussed the final details for the Race, the ground became a river as about three inches of rain fell. Fortunately, there was not much wind, but plenty of lightning instead. The radio equipment survived. As we settled in for the night, the rain stopped. By midnight, the sky was clear and the only reminder of the storm was a flicker of lightning in the southeast sky.

An Early Start

Around 1:15 AM our folks began to stir. Race participants assembled at 1:30 AM and they were led to the river. The start was an interesting sight as 185 people, clad with headlamps and colored safety lights jumped into the river. At 2 AM the Xtreme Race was on! We also dispatched a number of teams at that time. Checkpoint (CP) 1, CP 2, and Orienteering Points (OP) 2 and 3 were dispatched. CP 2, and OP 2 and 3 required a trek to access them.

Because operators could not be close to their cars, HTs with additional battery power and cross-band capability were required. We coordinated the frequencies ahead of time, but still had some conflict issues. These were grueling assignments, because of the mid-90 degree temperatures and high humidity, our operators and Race volunteers ran out of water and were getting close to having heat problems. At OP 3, Steve Lamers, N9SGG, and Steve Pelletier, KB9OAL,

reported temperatures of 110 degrees on the summit. Needless to say, these were difficult spots.

A Long, Hot Day

As the Race moved along, it was apparent the heat was taking its toll on the racers. Because of the rain the previous night, length of the race and ATV traffic along the mountain bike route, the race was shortened by a few miles. This news reinvigorated the racers and allowed for a number of additional teams to finish. It also provided us with a bit shorter day.

The last piece of traffic was passed on the net about 7:15 PM. There were no injuries, none of the racers got too lost, we provided a terrific public service, and learned a great deal about remote communications and deployment of the ROC. The most valuable aspect of this event in my eyes was the opportunity to participate in this type of communication event with neighboring counties in a non-emergency or disaster situation. We better understand each other's capabilities and will know how to work together when a serious emergency/disaster strikes.

The following is a list of ARES operators, assignment and county ARES affiliation:

Mark Heimmermann, KF9CS—Command Post—AEC Outagamie
Dan Lenz, KB9IME—Command Post—EC Winnebago
Carol Lenz, KB9WPH—Command Post—Winnebago
Brian Long, KB9LRD—CP 3—Outagamie
Greg Ramlow, KB9SZP—CP 1 & CP 3—AEC Winnebago
Stephen Williams, KB9RLF—CP 1 & Command Post—Outagamie
Stan Piekarczyk, KE6IFC—CP 2 and Command Post—Outagamie
Dominique Piekarczyk, KF6HCG—CP 2 and Command Post—Outagamie
Jeff Schmeichel, KB9BYP—OP 2—AEC Outagamie
Steve Bresee, KB9MBC—OP 2—Outagamie
Steve Pelletier, KB9OAL—OP 3—AEC Outagamie
Steve Lamers, N9SGG—OP 3—Outagamie
Rick Kosiorek, W9RIC—CP 4—Calumet
Judy Kosiorek, N9JLQ—CP 4—Calumet
Dave Wahl, KB9WAF—CP 5—Outagamie
Dan Williams, KB9VLG—Command Post & CP 5—EC Waupaca
Bill Niemuth, KB9ENO—Race Director Shadow—EC Outagamie
Aaron Heise, KB9QWC—Sag Vehicle
Communications—AEC Waupaca

Special thanks to Dan Lenz and Dan Williams for transporting the ROC; and Stan and Dominique Piekarczyk, Jeff Schmeichel, Steve Bresee, Steve Lamers and Steve Pelletier for hiking and enduring the elements beyond the call-of-duty. We are already looking forward to next year's race!

HAMS SUPPORT RELIEF EFFORTS IN NEW YORK CITY AIRLINE CRASH

Amateur Radio operators responded to support Salvation Army and American Red Cross relief operations after American Airlines Flight 587 went down November 12 in a residential area of the Borough of Queens, near JFK International Airport.

Queens District Emergency Coordinator Mark Phillips, KC2ENI, said that the Amateur Radio Emergency Service had been planning on up to three days of Amateur Radio support on behalf of the Salvation Army, at the request of the Salvation Army Team Emergency Response Network—SATERN. Conventional communications systems returned to service by the first evening, and ARES and the Red Cross support operations were able to stand down.

A Salvation Army emergency disaster canteen stationed in Queens began offering aid within moments after the crash. Salvation Army personnel, two additional canteens and a mobile kitchen from the World Trade Center site also were sent to the scene. With all bridges and tunnels initially closed in New York after the crash, the Salvation Army arrived with a police escort.

K2EL

Plane crash site investigators take a coffee break at one of the canteen sites.

The American Red Cross Emergency Communications Service in Queens also activated immediately after the crash. ARC ECS President George Sau, WB2ZTH, reported that members rallied at the Queens Chapter of the American Red Cross. From that staging area, the amateurs were dispatched with Red Cross disaster action teams to the crash site in Rockaway, Queens.

SATERN Amateur Radio Liaison Officer Jeff Schneller, N2HPO, said telephone cables had been destroyed by the crash, cell phone communication "was spotty at best, the Nextels were not working most of the time, and power was cut off to the entire area." He was initially able to keep in contact with the Bronx canteen mobile unit via a Nextel radio. "I abruptly lost contact with him when he pulled into the crash site," Scheller said. "It took about two hours before contact could be reestablished and a formal request for SATERN was made by the Incident Commander." Schneller said.

SATERN supplied several radio opera-

K2EL

Police, firefighters and federal investigators probe for evidence in the shattered Queens neighborhood where American Airlines Flight 587 went down November 12.

tors and a net control station at a remote site. The Rockaway Emergency Coastal Weather Alert—whose primary function is weather emergencies and has both ARES and SATERN members—set up at its operations base to support the activation. Schneller contacted the ARES DEC and SATERN members and notified the Electchester VHF and Broadcast Employees Amateur Radio Society of the intended operation. Both groups who volunteered had their repeaters during the World Trade Center disaster and did so again November 12—although Schneller said a lot of the operation was handled on simplex.

Schneller said the SATERN responders were able to put their "field packs"—used recently for the World Trade Center disaster—into use for the plane crash support operation. "We ended the SATERN operation at about 10:30 PM when power in the area was restored and cell phones were working," he said.

Sau said his ARC Emergency Communications Service was immediately able to provide emergency communication via the WB2QBP UHF repeater as well as on simplex. As a result, Red Cross support personnel at the crash site, the temporary disaster Family Information Center at the JFK Ramada Inn, the established Red Cross shelter at Public School 114 in the Rockaway, and the Queens Red Cross chapter operations base were able to remain in contact.

"We supported the Red Cross by providing and maintaining emergency field logistic communications," Sau said. "Many of our volunteers responded to the callout." Most of the victims on the plane were bound for the Dominican Republic. Sau said some group members were able to use their fluency in Spanish to support the disaster action team translators at the Family Information Center.

Sau said the ARC ECS stood down at around 8 PM on November 12, although several group members—among them Joe Berrios, WB2BWU, and Armando Virola, KA2JEM, remained at the ARC Logistics Unit-Family Information Center to assist in bridging the language barrier.

Schneller expressed his appreciation to ARES New York City-Long Island Section Emergency Coordinator Tom Carrubba, KA2D, and to NYC ARES, as well as to the Electchester VHF Radio Club and the Broadcast Engineers Amateur Radio Society "who have supported us in the past and once again relinquished their repeaters for our exclusive use" and to Rockaway Emergency Coastal Weather Alert.

Schneller also thanked ARRL for its support and noted that he'd again been contacted by hams from outside the Greater New York City area who had volunteered following September 11 and offered to turn out to help following the plane crash as well.

Field Organization Reports

Public Service Honor Roll
November 2001

This listing is to recognize amateurs whose public service performance during the month indicated qualifies for 70 or more total points in the following 8 categories (as reported to their Section Managers). Please note the maximum points for each category:
1) Checking into a public service net, using any mode, 1 point each; maximum 60.
2) Performing as Net Control Station (NCS) for a public service net, using any mode, 3 points each; maximum 24. 3) Performing assigned liaison between public service nets, 3 points each; maximum 24.
4) Delivering a formal message to a third party, 1 point each; no limit.
5) Originating a formal message from a third party, 1 point each; no limit.
6) Serving as an ARRL field appointee or Section Manager, 10 points each appointment; maximum 30.
7) Participating in a communications network for a public service event, 10 points each event; no limit.
8) Providing and maintaining an automated digital system that handles ARRL radiogram-formatted messages; 30 points. Stations that qualify for PSHR 12 consecutive months, or 18 out of a 24-month period, will be awarded a certificate from HQ on written notification of qualifying months to the Public Service Branch at HQ.

353 K9JPS
310 N8IO
290 WA5OUV
276 N9VE
263 W7TVA
249 N1SN
248 KK3F
228 N8OD
219 KA2ZNZ
218 KB1DSB
217 N2LTC
216 KK5GY
211 WA9VND
201 KA4FZI
200 KB2VRO
198 N5IKN
196 N7CEU
195 AC4XK
192 K2UL
191 W5ZX KB2RTZ
190 K4RBR
186 AG4DL
181 WA2MWT
180 W0WWR
178 W5RDM
177 N5NAV
176 KA5KLU
175 AC4CS
173 WB2GTG K4FQU
172 N2CCN NN7H
171 W4EAT
170 WB5NKC W6IVV
168 K9FHI K0IBS KA2GJV K6YR
167 W6DOB
WN0Y
164 W4ZJY WB4GM
163 K4RLD
162 W3HK
160 N2RPI
159 N9KNJ
157 K4SCL NR2F
156 K2BCL
155 N5OUJ KC2EOT
154 N2JBA N2OPJ
152 K4YVX
N2GJ
151 WA5I W4UAN
150 N7YSS W3YVQ WA4DOX WA2YL
149 N3ZKP W6QZ
148 N0SU
147 KE4JHJ N2AKZ
145 KC5OZT
144 K4IWW W2JHO N9BDL KC4ZHF
143 WB2ZCM
142 WB2UVB W8YS
141 W2MTA
140 W0LAW WA4QXT W1PEX N8BV AF4NS
139 W4DGH KC2DAA W5GKH N3WAV
138 N2YJZ W3BBQ W7ZIW
137 W5CDX NC4ML KB2KLH
136 KC7ZZB
135 WB5NKD
134 AC7DD W2AKT NB4K N3EFW
133 KM5YL
132 NN2H
131 K5IQZ AF4QZ N4VVX KA1GWE W9CBE N3YSI
130 KK1A KA4UIV WD9FLJ W3IPX KF6OIF KG4EZQ WX4H
129 KD4CQJ
WB4BHH N4TAB N2WDS WD8DHC W7QM
128 WA0TFC KX0N KB5TCH W7GB
127 AD4XV W9YCV WD4MIS KF4KSN
125 K9LGU
124 KC7SRL KB0DTI W1ALE WI2G K1FP
123 K5DPG KD4GR K7GXZ KD4EFM WD4GDB
122 N2BVM
121 WB2QIX WA4EIC K4BEH
120 K0PIZ W4NTI N3RB K8PJ AA2SV
119 K9GBR N9TVT KB2ETO KM5VA W7GHT
118 N7DRP KC7SGM K4MTX KA2DBD WA2GUP W7LG K4WKT KF5A
N9MN
117 KB0RUU AB4XK
116 KA4LRM KI4YV AA3GV N5SIG
115 KB5WY KG2D K7MQF WB2LEZ KG4FXG
114 KG4HDT N3WKE KE4UOF KJ5SI
113 WD0GUF K2PB W2LC KC8CON
112 AG9G W2MTO AF2K K2DN
111 W4WXA WB4BIK
110 KV4AN K1JPG
109 N3WK AC5Z WW8D KF4WIJ
108 KB2KOJ
107 K4BG AB2IZ N3SW WD9F
106 WB4UHC WA1JVV N8DD KA2CQX
105 W1QU
W3NNL KA4HHE
104 WD9HII W1JTH KG4CHW
103 W5PY W3UAQ KC6NBI K8KV
102 W0OYH K2YS WA7UVX
101 WA2YOW
100 K5MC WA9JWL KE4GYR W5AYX WA2CUW
99 W2GUT AE4MR KT4TD
98 WA1QAA K2DBK KD4HGU
97 KE4WBI KF4OPT
96 W1JX
95 W4CC KC2HUV KE4PAP W4VLL WB2IJH
93 AA4YW WB4ZNB KC2ANN
92 W3CB
91 KA2ZKM
90 W8IVF KC6SKK
89 KC4PZA
KE2SX K2VX
88 KF4NJP N2RTF
87 KE3FL KG9B KA2BCE
86 WA4GLS W4MWC W2CC W7DPW
85 KE0K KA2IWK KB3CEZ
84 W0FCL WB9OFG W2PII WA4CSQ
83 KC3Y N2AVY
82 WB9GIU N8NMA KA7TTY
81 AA4BN W6JPH
80 W7VSE
78 W4QAT K1STV
75 W7EP KT4PM KU6Z
73 WJ2F WB4PAM KE4DNO
72 KJ2N K3TX K6IUI
71 KC8KYP W8IM

K8QIP qualified for 75 PSHR points during October, 2001, but was not previously recognized in this column.

Section Traffic Manager Reports
November 2001

The following ARRL Section Traffic Managers reported: AK, AR, AZ, AL, CO, CT, ENY, EPA, EWA, GA, IA, ID, IL, IN, KS, LA, MDC, ME, MN, NC, NNJ, NTX, MO, MS, NFL, NH, NLI, OK, OR, ORG, SBAR, SC, SDG, SFL, SNJ, STX, TN, VA, VT, WCF, WNY, WPA, WI, WV, WWA, WY.

Section Emergency Coordinator Reports
November 2001

The following ARRL Section Emergency Coordinators reported: AZ, CT, ENY, EWA, IN, KS, KY, LA, MI, MO, NFL, NLI, SD, SFL, STX, SV, TN, WCF, WMA, WNY.

Brass Pounders League
November 2001

The BPL is open to all amateurs in the US, Canada and US possessions who report to their SMs a total of 500 points or a sum of 100 or more origination and delivery points for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL radiogram format.

Call	*Orig*	*Rcvd*	*Sent*	*Dlvd*	*Total*
KK3F	35	1966	1901	65	3967
N2LTC	0	1103	1105	49	2257
KF5A	1	602	620	0	1222
WX4H	0	648	610	0	1258
WB5ZED	32	472	383	14	901
W0WWR	0	187	668	12	867
W1PEX	0	84	741	26	851
WB2GTG	45	242	359	10	656
K9JPS	1	293	32	291	625
W4EAT	0	320	298	3	621
KA2ZNZ	42	257	269	39	607
N8IO	126	234	208	16	584
W6DOB	0	139	389	29	557
K2BCL	14	263	236	42	555
WB2IJH	0	250	251	1	502

BPL for 100 or more originations plus deliveries: K9GU 196, N9VE 191, W9IHW 187, W7TVA 183, N5IKN 149, K5KXL 127, W3HK 122, NU0D 116, KB1DSB 100.

North Korea Now on the Air

P5 on the air! I thought that would get your attention. Yes, it is true Ed Giorgadze, 4L4FN, has been QRV from Pyongyang, North Korea since early November 2000. Signals here on the East Coast of the US have not been strong and the pileups have been unruly and ferocious. Please read carefully what is going on in North Korea and take heed so that soon we may see more activity from this once rarest of the rarest DXCC Entities. Good things come to those who wait!

Ed Giorgadze, 4L4FN, has been in Pyongyang working for the United Nations World Food Program for almost three years. He is expected to be there until at least June or July 2002. In early November he was given oral permission to operate as P5/4L4FN. He has a 20 meter dipole and an IC-706MKIIG. Ed has been QRV only on 10 and 20 meters SSB. Bob, W9KNE, graciously sent a Butternut HF vertical and Bencher paddle, which he should be using by the time you read this. To keep up with the latest news on North Korea and Ed's activities, check out the Web page set up by his QSL manager Bruce, KK5DO, at **www.amsatnet.com/p5.html**.

Important Background

As we all know North Korea was the most wanted DXCC Entity, until November 16 when Ducie Island was added to the DXCC list. Who would ever have thought that P5 would be number 2? Remember when North Korea was added to the DXCC list? How about the demands to remove it because no one could operate from this rare location? After the first and second operations still more cries to "take P5 off the DXCC list." Activating North Korea has been a work in progress, taking one step at a time.

The current P5/4L4FN operation is part of that work in progress. DXers around the globe need to have the patience, understanding and foresight that this is only the beginning. Several issues are going on both in the public and behind the scenes. Hopefully nothing that has been done will jeopardize this operation. Trying to send e-mails to the WFP and Ed could be very dangerous to the operation.

The policemen and hecklers with all their comments being made on Ed's frequency, do nothing to help the situation. In fact it could actually damage future operations. Everyone must realize that the North Korean authorities recognize what is going on with P5/4L4FN and are monitoring everything. Our display of Amateur Radio to those in charge of the future in North Korea is at stake.

Many are wondering about the license to operate from the second rarest QTH on the planet. DXers are asking, "How come only an oral permission?" DXers who ask this question are absolutely thinking correctly; however, keep those comments and questions off Ed's frequency. This can be damaging.

Let's not worry about a license right away; as we all know there is no Amateur Radio Service in North Korea. Ed has been in Pyongyang working for WFP for almost three years now and he knows how the system works. I cannot tell you every detail but can tell you that up until recently communications (phone calls, satellite, radio, e-mail, etc) have been very tight in and out of North Korea.

That is until recent openings of several Western embassies in Pyongyang. Until then other organizations have not been able to use certain modes of telecommunications to their full extent. However, now the door has been opened, if only so slightly.

Authorization for these new modes of communications has been given orally, including Ed's operations. A more formalized written authorization is expected, perhaps by the time you read this.

Until November 16, 2001 North Korea was the most wanted DXCC Entity.

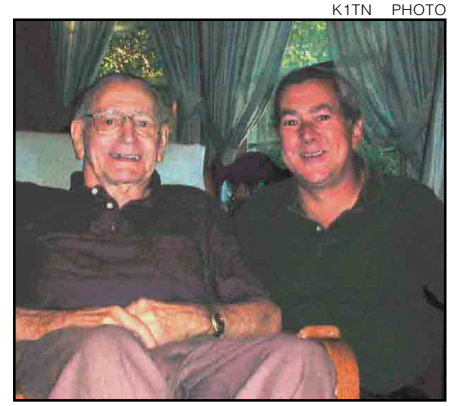
Here is Ed, P5/4L4FN, at his shack in his home in Pyongyang, North Korea. He is expected to be there until at least June or July.

Bernie McClenny, W3UR ♦ 3025 Hobbs Rd, Glenwood, MD 21738-9728 ♦ w3ur@arrl.org

SM0JHF

Look for more activity from the Cape Verde Islands during major contests in the near future. Here is the CQ WW SSB team at D44TC. (L-R) Matteo, IK2SGC; Xara, CT1EKF/D44TD; Vittorio, I4YSS; Fabio, I4UFH/D44TB; Alberto, IV3TAN/D44TC; Gabriele, IK4UPB/D44TA; Franco, I4LCK, and Santos, CT1DVV/CT8T.

K1TN PHOTO



Danny Weil, ex-VP2VB (left) and Jim Cain, K1TN, met in San Antonio in early October. Danny, 84 and a member of the CQ DX Hall of Fame, operated from a number of rare islands in the mid-1950s and early 1960s as he sailed the boat Yasme. Danny, from England and now a US citizen, "wanted to see the world" and set out single-handedly. When he arrived in the US Virgin Islands he was taught Morse code by KV4AA, then obtained a British license on Tortola, and the rest is DX history. K1TN (cainjim@mindspring.com) continues research for an upcoming history of The Yasme Foundation.

As we all know Amateur Radio is a great means of spreading International Goodwill. As DXers each of us has the responsibility in helping to spread the word as ambassadors.

Ducie Island

As most of you know, the Ducie Island DXpedition that was to have taken place in late November 2001 was aborted just 80 nautical miles from the newest DXCC Entity. The team made the decision to cancel based on forecasted wave predictions. The expected wave heights at Ducie were expected to be 3 meters or higher, which would have made landing extremely hazardous. They also had several other problems including bad diesel fuel in their boat's engine and rough seas the entire trip. During the entire journey from French Polynesia to Ducie the operators never saw clear skies. The *Temarama* was located at 25'13"S, 126'19"W at 2347 when they did an about-face. It's your editor's gut feeling that the team made the correct decision. Safety first!

That being said we now have a new number one most wanted country. Who would ever have thought that P5 would be number 2! A related article appears elsewhere in this month's column.

Afghanistan

As of the writing of this column, Peter, ON6TT (5X1T), has secured a valid license to operate from this war-torn nation. The call sign, YA5T, can be used by Mats, SM7PKK, Marc, ON4WW, Robert, S53R and Peter from anywhere in the country. So far Peter has been the only one in the country mostly working to get the telecommunications networks set-up for the UN's World Food Program (WFP). He has been working with very simple and modest equipment on SSB on the HF bands. Once things settle down a little in the country we can expect to see more activity, with more operators and more equipment. QSL via KU9C. Remember, a DXer is patient!

Jawboning

Folks, every once in a while I have the "displeasurable" duty as a DX editor to bring up difficult subjects. Currently there are a few that need to be addressed. If someone doesn't step up to the microphone and say something, these bad operating practices will only continue to get worse and eventually become the norm.

PacketCluster

Most serious DXers have packet or access to telnet clusters or DX Summit. These excellent DX tools are a great source of information. The first PacketClusters came out of New England in the mid-1980s thanks to Dick Newell, AK1A. At first it was a few in major cities throughout the US and then growing into a worldwide DX spotting system. Most of the major DX nodes feed into this global network, allowing DXers all around the world a quick notification of what DX stations are currently QRV.

As I said this is a great tool. However, tools need to be used properly or they can cause real damage. Since the first PacketClusters there have been several other hybrids, different but still passing on the same DX spots with each other.

One major problem on the clusters has been the pirating of someone's call as the spotter of the DX. What will happen is some lowlife will trick the cluster by putting in someone else's call sign instead of his call as the spotter. This can be done several different ways. I am not going to tell everyone publicly how this can be done. Most of the sysops know about the feature and so do non-sysops.

So here is what is happening. WZ5SP (spot pirate) will spot BS7H on 14195. The spot comes out saying that WB3JRU made the spot, not WZ5SP, when actually the BS7H is not even on the air. This is a bogus spot. This is only the tip of the iceberg as there are other malicious things that are going on with the clusters. Recently some lowlife got on the cluster spotting a DX station on hundreds of different frequencies all at the same time. Of course they used one person's call sign, damaging their reputation!

It's time now for the sysops and software developers to eliminate this feature and to come up with security methods to prevent these activities from continuing. If not, the spotting terrorists' acts will only get worse, damaging DXing and Amateur Radio all the more.

Watch Your Language!

Another issue that is becoming more and more prevalent is the type of language DXers are using on the clusters via both the DX spots and the announce feature. Comments like "dismal signal on this band too!" and "pathetic signal unworkable" are

just a few that I would even consider to print here. The language and hostility are uncalled for and do nothing to promote Amateur Radio or DXing for that matter. I am all for freedom of the press and freedom of speech, but think about what you say and how it can be perceived by future Amateur Radio and DX operators!

PIARA Announces Ducie Island DXpedition 2002

By Tom Christian, VP6TC
President PIARA

After weather conditions near Ducie Island did not permit landing in November, the Pitcairn Island Amateur Radio Association (PIARA) announces that all planning is now complete for their second attempt to activate Ducie Island. Ducie Island became a new entity on the ARRL DXCC List, as of November 16, 2001, and has not yet been activated as such.

The group will depart from Mangareva on March 12 in the ship Braveheart, which is more adequate for the task. They will use a VP6 callsign to be announced at the beginning of the operation, and plans to be operational as soon as possible after arriving upon the island. Those who wish to keep up with the progress of the DXpedition as they move to the island may check 21.260 MHz for Maritime Mobile operation.

Operating plans for the group are intended to provide contacts with as many different Amateur Radio operators as possible during their stay on the island. The band plan is as follows: 21.020 MHz (CW) and 21.295 MHz (SSB) will be QRV 24 hours each day. This is to allow more individuals to find and work the group, depending upon propagation to their area. 28.495 MHz, and 14.195 MHz will be the prime SSB frequencies, and 14.020 MHz will be the prime CW frequency other than 15 meters.

It is planned that there will be some operation on all bands, 160 through 6 meters, and RTTY in addition to SSB and CW operations. It is expected that Low Band and WARC operations are more likely to take place in the last days of the operation, as concentration from the beginning will be to allow as many operators as possible to work this new DXCC Entity.

Antennas on 10 and 15 meters will be a 2 element HB9CV, with a 4 Square for 20 meters, and wire and vertical antennas for the other bands. There will be a 6-meter beacon on 50.110 MHz.

Operators will be: VP6TC, VP6DB, VP6AZ, VP6MW, VP6BK/JA1BK, JA3USA, JF1IST, K9AJ and K5VT. Randy, an SWL will be going to provide additional logistical support. QSL manager is Garth Hamilton, VE3HO for all HF operations only. QSL manager for 6-meter operation is JA1BK.

This is the part of the team that went from Mangareva to Pitcairn Island to pick up the VP6s before heading on to Ducie Island. Back (l to r): K5VT, K9AJ, JA1BK, FO3BM; Front (l to r): JF1IST, JA1SLS. A second attempt is planed for mid-March.

While stations who dupe the operation will not be blacklisted, it is recommended that once you hear your call coming back that you not work the station again on that band and mode so that others will have an opportunity. Log checks will be available at **www.big.or.jp/~ham/dx.html**.

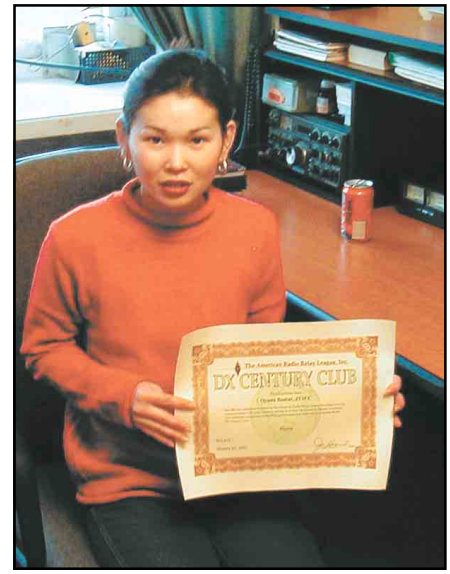
The Yaesu Division of Vertex Standard and FTI are providing support for this operation. An ARRL Colvin Grant has been made to PIARA for to help with the Ducie operation. At present, no other foundation or club support has been received; any donations will be gratefully accepted.

QSLs should be sent to the manager with an SASE or through the Bureau. However, please do not send a second request through the bureau after QSLing direct. Good luck in working the DXpedition. We hope to hear all of you from Ducie in March.

DX NEWS FROM AROUND THE GLOBE

3W—VIETNAM

Japanese operators Shu, JA6IEF, and Yuki, JI6KVR, will be joining Hau, 3W6LI, on an IOTA DXpedition to Cham Island (AS-NEW). The team's official Web site has been set up at **www3.ocn.ne.jp/~iota/newpage25.htm**. They will be active with two stations on CW and SSB from April 17 to 22, 2002. QSL via EA5KB.



Oyuna, JT1CC, daughter of JT1BG, proudly displays her DXCC certificate.

7Q—MALAWI

Missionaries Trudie, 7Q7TV, and Richard, 7Q7RV, are newly licensed Amateur Radio operators in Malawi. Currently they have antennas for 20, 30 and 40 meters and are QRV on SSB, but will soon be active on CW. They also plan to operate on other bands. QSL via ZS6DX.

9L—SIERRA LEONE

Polish operator Zbyszek (Zbig) Belchacz, SP7BTB, a UN Assistance Mission in Sierra Leone (UNAMSIL), was recently issued the call 9L1BTB. He will be QRV from Freetown for about 10 months using a Barrett radio running 120 watts and a multi-band dipole. So far he has been active on 10, 15 and 20 meters SSB. He expects to be on all bands from 10 to 80 meters. Look for him on 20 meters SSB (14268±) most days around 2000Z. QSL via SP7BTB.

WRAP UP

That's all for this month's column. Thanks to 9V1YC, JA1BK, K4ZW, K5NX, K7BV, KK5DO, ON6TT, VP6TC and especially P5/4L4FN for the news. Have a photo, story, DX news or DX newsletter you want to send in? Please direct any input to Bernie McClenny, W3UR, 3025 Hobbs Rd, Glenwood, MD 21738. Until next month, see you in the pileups!
—Bernie, W3UR

A Day in the Life of 6 Meters

By all accounts, US and Canadian 6-meter operators experienced the best-ever conditions for worldwide propagation this past November 2001. This was the happy result of a solar flux that generally remained above 200 and the huge number of eager 6-meter operators throughout the world. Countless stations worked new countries and marked other operating milestones, such as qualifying for DXCC, WAS or WAC.

It is not possible to mention all the incredible contacts or provide a detailed day-to-day account of this exciting month. Instead, the following composite summary of a day in the life of 6 meters, as experienced from the US, provides a general overview of what was both typical and exceptional during November. Six-meter DX activity generally followed a predictable daily cycle, because the most intense portion of the F_2 layer generally forms around noon at mid-path. Thus, propagation is generally best to the east in the mornings and to the west in the afternoons. Six-meter openings rarely last longer than three or four hours to any particular region.

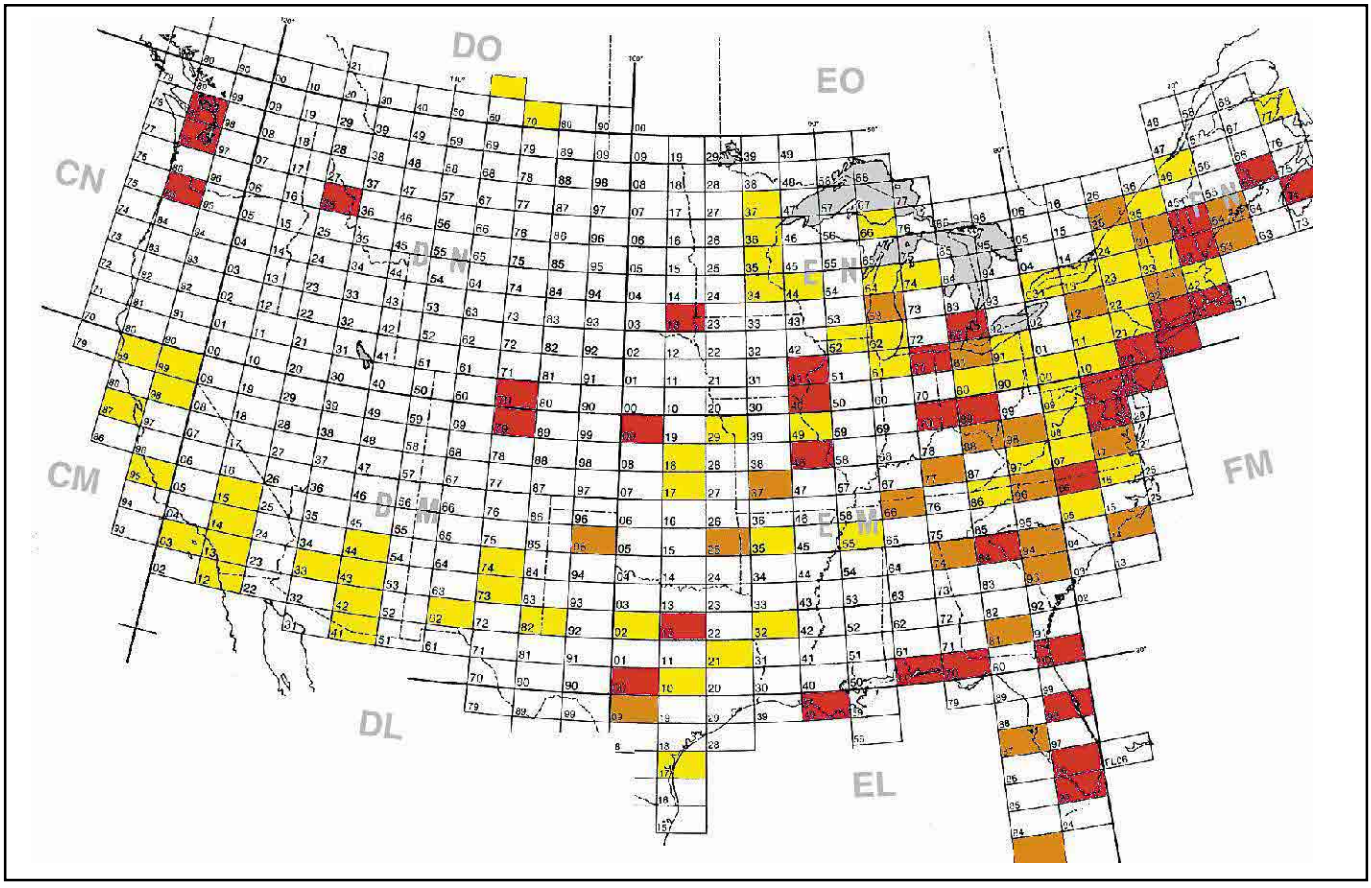
In general, the most exciting days for propagation to Europe and across the Pacific took place over November 14 to 19. A great solar proton event and subsequent severe geomagnetic storm depressed conditions considerably on November 5 to 7. It took several days for conditions to rebound, but by November 11, eastern Europeans were again booming into the East Coast.

Mornings to Europe, Africa and Asia

Each 6-meter day began about sunrise on the East Coast. Experienced operators checked for 48.250 and 49.750 MHz European video signals, European beacons, and other indicators that the MUF was rising toward 50 MHz. By 1130 or so, VO1, VE1 and VE9 stations usually reported the first transatlantic contacts of the day. Within an hour, stations along much the East Coast from Newfoundland to Florida were hearing Europe and Africa, although openings were often quite localized.

Typical daily contacts from the East Coast to western Europe, including EH, CT, GM, GI, GW, GD, G, GU, GJ, PA, ON and F, were in full swing by 1230, but sometimes later. Signal strengths often built quite quickly to 59 levels, making SSB contacts relatively easy, even for modest stations. By 1330 on more than half the days, East Coast stations worked into central Europe as well, including LA, SM, OZ, DL, SP, OK, OM, OE, HB, I, S5, 9A, I and IS0. Stations west of the Appalachians in the W4,

This Month
Feb 8-11 Six Club 6-meter Sprint



Six-meter operators in nearly every part of the country made European contacts during November. Color indicates the easterly extent of contacts reported from each grid: yellow (western Europe, including TF, GM, GI, GW, GD, G, GU, GJ, ON, PA, F, EH, C3 and CT); orange (central Europe, including LA, SM, OZ, DL, SP, OK, OM, OE, HB, I, S5, 9A); red (eastern Europe and adjacent Asia, including OH, ES, YL, LY, UR, YO, YU, Z3, LZ, SV, 5B, OD, JY).

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8 and 9 call areas often made contacts in western Europe about this time.

Some of the western and central Europeans were rare just because they appeared only on select days or stayed on the air for short time periods, even though they were generally loud into the US. These included OX3SA, TF3FK, OY9JD (Nov 15), JX7DFA (Nov 16-18), OH0JFP, HV0A (Nov 16), C31HK (Nov 17) and T77GO. Several of them worked well into the Midwest and Southwest.

Propagation extended into Eastern Europe and the Middle East, most notably on November 11 and 13-19. The favored East Coast commonly worked OH, ES, YL, LY, UR, YO, LZ and YU, along with ER, Z3, SV, 5B, OD, 4X and JY. Among the most active and sought after stations were ES1CW, ES2QN, YL3AG, YL2JN, LY2BAW, LY3MR, UR7QR, UT3BW, UT5JAJ, UY5HF, UX0FF, YO1IS, ER1OO, Z36W, SV1DH, 5B4AGM, 5B4FL, OD5/OK2MU and JY9NX. Several of these countries were worked for the first time from the US. See Table 1 for a preliminary list of October and November US firsts.

When conditions were favorable, propagation extended into the Southwest and Midwest after 1500. WA5RT, in Louisiana, made it as far as S5, 9A, OE, SP, SV and LZ, for example. W5UWB, W5UN, W3XO/5, W6JKV/5 and others in Texas logged Europeans as far eastward as DL, OK, OM, S5, 9A and SP on several days, most notably during the midmonth peak. N0LL, in Kansas, managed to nab EH, CT, GM, ON, PA and DL, among others. K0FF, in Missouri, added OY9, JX, LA, OH, OH0, YU and LZ to his log.

W7XU/0 in South Dakota also worked the usual Western Europeans, as well as DL, 9A, SM, OH and ES. Colorado stations K0GU and N0VSB worked GM, GI, GW, G, PA, ON, F, DL, I, 9A, SM and OH, most notably on November 13, 14 and 15. VE5UF worked GI0OTC, MM0AMW and GW4VEQ on November 14 after 1640, while VE5LY also logged GW4VEQ.

The first occasion for the West Coast to work Europe was November 4, when N6CA and others in southern California and Arizona were delighted to hear CT, GW, GD, G and EI after 1700. KB6NAN in the Bay area logged CT1EEB. XE2EED worked four G stations at about the same time. W7CI nabbed G0JHC on November 12. Widely scattered stations on the West Coast found Europeans again on November 14 after 1645. K6QXY worked GW4VEQ and G3FPQ; from Arizona W7RV also logged GW and G; Washington stations K7NQ and K7KV found EH7KW. On the 19th, VE7SL worked YU1DG, but also heard OK, S5, 9A, SP, LZ and SV!

Table 1
US 6-Meter Firsts in October and November, 2001

Country	*QSO Date*	*DX Call*	*US Call (State)*
Eritrea	Oct 21	E30NA	W1GF (ME)
Lithuania	Oct 21	LY2BAW	N1RZ (NH)
Ghana	Oct 29	9G5AN	W1JJM (RI)
Moldova	Oct 30	ER1OO	W4SO (FL)
Latvia	Nov 13	YL2JN	K1TOL (ME)
Aland Islands	Nov 15	OH0JFP	AA6TT/1 (VT)
East Malaysia	Nov 15	9M6JU	N7EPD (WA)
Vatican	Nov 16	HV0A	N4RFN (FL)
Jan Mayen	Nov 18	JX7DFA	K4RX (FL)
Vietnam	Nov 18	XV3AA	K6QXY (CA)

Several stations in Colorado, Washington and Montana worked Finland on November 13 after 1945, which was late in the day for Europe. K0GU logged three OH calls. K7CW, W7FI, W7YOZ and KB7WW all worked OH calls as well for their first ever Europeans. W7KNT in western Montana logged OH7PI, OH5NQ, OH7RJ, OH6RK, OH1XT, OH7KM, OH5LK and most astonishingly, ES1CW.

Africans appeared on fewer days than might have been expected, given the general conditions. November 2 may have been the best day for Africa, as 5R8FU, 9G5AN, D44TD, FR1GZ, Z22JE worked the W1-4 and 8-9 call areas. N6RA and KB6NAN logged Z22JE. On the fourth, N6CA and at least four others in southern California worked FR1GZ over an impressively long path of over 18,000 km. Several of these stations reappeared for short times into W1-4 and 8 call areas on succeeding days, and K5UR found D44CA on November 11. FR1GZ worked K5AM in New Mexico, AA7A in Arizona, N6CA, N6KK, N6XQ and WA6PEV on November 17. ZS6PJS worked VE3, 10 stations in the W9 call area, plus K0FF, WA0KBZ and K0AZ on November 19. Finally, K5AM reported 9J2BO around 1630 on November 21.

Caribbean and South America

Mornings after 1300 were also prime times for long-path propagation from eastern North America to Australia, Japan and adjacent regions, but few such openings were reported in November and none from the US. KP4 worked JA via this long-way around on November 2 around 1400, and TG9AJR and possibly other stations in Central America worked a handful of JAs on November 11 and 18.

South American and Caribbean stations were also likely to work the US and Europe simultaneously in the mornings, adding to the variety of possible contacts. US and Europeans worked more than two dozen DXCC entities in this region, including 9Z4BM, FG5FR, FM1DQ, FY5KE, HC2FG, HK4SAN, HK0GU, HR1BY, OA4DJW, P43JB, P49MR, PJ2BR, YN9HAU, YS1RR, ZF1RC, along with several HP, KP4, PY, TI, YV stations.

Among many nearly routine contacts between South American and Europe were some unusually long ones. HC2FG worked 5B4FL and JY4NE on November 7, and OA4DJW and 5B4FL connected on the 27th. In addition, VP8DBL worked widely throughout the W1-5 and 8-0 call areas on November 1 between 1245 and 1515.

Contributing much of the excitement during the month were a number of expeditions, mostly planned around Thanksgiving-week vacations or as part of HF-contest operations. Among those stations making contacts into much of the US, Canada, Europe and elsewhere in mid-November were 6Y5/K2KW, FG/N4CD, HC8N, KP2/N1DJB, PJ2/W0CG, TI2/N0KE and VP5/K5CM.

Connie Marshall, VP5/K5CM, made 1400 6-meter contacts with 44 DXCC entities November 8-18, while running an IC-706 and a five-element Yagi. Connie worked throughout the US and as far eastward as LY, UR and 4X. Jon Jones, N0JK, who was one of 10 operators at HC8N November 18-27, reported that the expedition logged more than 3000 6-meter contacts, including more than 1700 in North America and more than 250 in Europe. HC8N ran just 50 W to a seven-element Yagi, but the signal boomed into the East Coast with 59-plus signals on several mornings.

Midday across the Continent and on to Alaska

Coast-to-coast contacts were likely after 1700, just as the Europeans were fading in the East and Midwest. When propagation was favorable (such as on November 18), East Coast stations heard W6, W7 and VE7 stations off the back of their Yagis prior to 1600, while Europeans were still coming in. Notable openings of this sort took place on November 4, 12, 14, 17 and 18.

Transcontinental contacts generally

began with the longest paths, typically W6, W7 and VE7 to VO1 and VE1, and then gradually shortened as the MUF rose. Signals were generally exceedingly strong. The East Coast rarely made contacts closer than Montana, Colorado and Arizona. Stations in the Midwest reported TF, OX and VE8 beacons and stations on early afternoons as well, sometimes with astonishingly loud signals.

As early as 1900, often about the time transcontinental propagation was fading, 6 meters frequently opened further west, from the Midwest and East Coast to Alaska. Such openings took place on November 3, 9-14 and 17. Alaskans worked just about every part of the lower 48 states. Many operators were surprised by the loud signals and the number of Alaskans on the band. As many as 10 Alaskans boomed into the East Coast on November 10 after 1900. W2GFF, N4GFO and others in Florida worked as many as four Alaskans on November 12. Texans got their opportunity to work Alaska on November 14 and worked VY1VY as a bonus.

Propagation across the Pacific was also possible, but there were surprisingly few afternoon openings. N7DB and other W7s caught ZK1NCP on November 1. K7CW worked T88BV on the 16th. The most widespread openings took place on November 17 and 18, when several KH6 stations, KH2JU, V73AT and V73UX ran stations all the way to the East Coast. N7EPD found FK8CA on the 17th, and AH8A worked widely throughout the VE1, 3, W1-3 and 8-9 call areas on November 20 after 1900.

Afternoons and Evenings across the Pacific to East Asia

As the Alaskans faded out about 2100 or so, the West Coast prepared to work Japan and East Asia. Stations west of the Rocky Mountains worked the bulk of the Japanese on November 1, 3-7, 9, 11-15 and 17-20, often with incredibly loud signals. It was not unusual for stations in the Pacific Northwest to report working more than 100 Japanese on SSB. XE2EED logged more than 80 Japanese on November 5. Even those further east made incredible runs. VA6SZ logged 85 and W7XU/0 worked 67 JAs on November 9. Japanese also worked New Mexico, Texas (W5UWB), Missouri (K0FF), Iowa (ND0S), Minnesota, Wisconsin, Illinois and Michigan. Ohio station WB8XX logged two JA stations on November 15, probably the easternmost station to make it. The runs on November 17 were incredible. K0GU worked 186 JAs in 77 minutes from Colorado, and N0LL logged 45 in all JA call areas—his best Japanese opening since 1989.

Table 2
Long 144 MHz Meteor-Scatter Contacts

Distance (km)	*Stations (grids)*
2309	N0KQY (DM98)—AA2UK (FM29)
2251	N0VSB (DM79)—K4QI (FM06)
2242	N5LJL (EM26)—K1WHS (FN43)
2220	N6YM (CM88)—W7XU/0
2218	AJ6T (CM87)—W7XU/0
2207	KD4ESV (EL87)—W7XU/0

Japan was not the only country in Asia that US stations worked. The first opportunity came on the afternoon of November 4-5. N6KK and others in the Bay area nabbed 9M6US (East Malaysia) and K0GU found DU1EV at 0014 among a band full of JAs. Most of the Asian contacts outside of Japan occurred during the heady days of November 14-18. On November 15, 9M6JU worked N7EPD (a US first), KB7WW and NN7J. DU7/N7ET completed with N7EPD and others in the Pacific Northwest.

The best afternoon was November 17. VR2XMT worked K6QXY and 30 other alert stations in the W6, 7 and 0 call areas as far east as Colorado. 4F2KWT (Philippines) had an astonishing afternoon working K0JKM in Colorado, followed by stations in CA, UT, NV, ID, MT, WY, AZ and VE7. He went on to work KL7Y and WL7M, topping off his morning with PY2XB, PY5IB and PY5CC.

The opening looked just as good from the US side. In addition to logging pages full of JA calls, K6QXY found 9M6US, XV3AA (Vietnam—a US first), DU1EV, VR2XMT, DU1/GM4COK and 4F2KWT. W7GJ in Montana worked the 9M, DU and VR stations along with YJ8UU (Vanuatu) in the western Pacific. Montana neighbor W7KNT also logged DU, 9M and VR, but managed to find VK and ZL among the crowd. N7EPD also worked DU, 9M6 and VK among his long list of Pacific-area stations. K0GU squeezed out 9M6 and VR during his incredible Japanese run, while N0VSB nabbed 9M6 and DU.

Activity was slower across the Pacific on November 18 (it was Monday), but W3XO/5 worked DU1/GM4COK during a JA run, and N7EPD picked out HL1LTC (Korea). W2GFF, in Florida, nabbed VK4CXQ after working NH6JC.

QRP Operating

During marginal openings, stations with large antennas and high power definitely have an advantage, but the openings during November were often so intense that modest stations could achieve spectacular results, even on SSB. Many western Europeans worked US stations with 10 W and simple antennas, such as indoor loops and dipoles, long wires and ground planes. US operators also discovered they could work real DX with equally modest and makeshift 6-meter stations.

Phil Goetz, N6ZZ, ran 8 W from a Ten-Tec transverter and a five-element Yagi from his home in New Mexico, yet worked six Europeans (EH, GW, ON, JX), including GW4VEQ on SSB, many JAs, DU, V7, and more than half-a-dozen Caribbean countries. N7CNH logged JAs while running 10 W to his attic loop antenna. K7BG in Montana pushed 2 W from an old IC-502 into a 40-meter Yagi and worked KH6, V7, VP5, JA and VO1. W2AGN nabbed G, GW and GD from New Jersey running 2.5 W from an FT-817 into a four-element Yagi. Signals were so strong during the November 17 opening to Japan that N7EPD worked two JAs while standing in his living room using only his FT-817 and the built-in six-inch antenna.

Outside the US

There were excellent activities in the rest of the world as well, of course, but much of the groundwork had been laid in October. Europeans found conditions to Asia during the mornings of the month's first half quite excellent. They fought it out in the pileups to work 9V1UV (Singapore), DU1EV and others in the Philippines, XU7ABW (Kampuchea), XW0X (Laos), XV3AA (Vietnam) and YB0QZ and other Indonesians. The most exciting day for BG7OH (China) was perhaps November 12, when he worked as far westward as ON, PA, G, GW, EI and GM. Among other Asian calls that commonly made it into European logs were VU2ZAP (India), UK9AA, UN6P and UN5PR (all Kazakhstan).

ON THE BANDS

Although the extraordinary worldwide conditions on 6 meters dominated on-the-air activities during November, other propagation events kept the VHF faithful busy. The Leonids put on an unusual display approaching storm conditions during the morning of November 18, and a great aurora on November 6 added to the variety. Many more than 100 VHF operators sent in reports—too many to acknowledge in print individually. Nevertheless, the outpouring of e-mail is gratifying and provided the basis for the activities

summaries. Dates and times throughout the column are in UTC, unless otherwise noted.

Leonids Storm

Several meteor experts had predicted the Leonids could produce 800 to 4000 meteors per hour during the early morning hours of November 18 for observers in Western Europe and North America. VHF operators on both sides of the Atlantic were well prepared for something unusual, and for the most part, they were not disappointed. The Leonids did put on an unusual display—probably the best since the 1966 Leonids storm. It was common to see several meteors per minute from the eastern part of the US over a stretch of two hours or so between 0900 and 1100, the apparent peak of the storm.

Meteor-scatter radio propagation was similarly intense. On 50 MHz, propagation over distances of 1000 to 2000 km was nearly continuous for several hours, reminiscent of sporadic E. Even so, several 6-meter operators noted that signal strength was not great and many SSB stations had a watery or hollow sound. No one reported double-hop contacts or anything else out of the ordinary.

Signals on 144 MHz were more typical of meteor-scatter propagation, with long silences punctuated with sudden rises in signal strength. Residuals typically lasted several seconds to as long as 20 or 30 seconds each, providing plenty of time to complete two or three contacts per meteor. The Leonids were so intense at times that short-lived bursts sometimes overlapped, creating almost continuous propagation for several minutes at a stretch.

Peak times were difficult to identify from incomplete radio reports. East Coast operators noted the most intense meteor activity from 0830 until about 1230. There may have been a lull of an hour or two and then resurgence after 1400 until 1700 or even later for those in the West. These subjective impressions were reasonably close to the widely reported forecast peaks.

Aside from the sheer number of 2-meter contacts, there were actually few surprises or unusual reports. Active stations typically made 30 to 50 SSB contacts, although some like KG4BMH (EM76), N0VSB (DM79) and W7XU/0 (EN31) logged more than 80 each. No unusual distances were spanned. All of the longest contacts were within the normally expected maximum of 2300 km or so (see Table 2).

Several stations ran schedules over longer distances without success. N6RPM (DM04) had three schedules over 3000-km paths, but heard nothing. K6PF (DM13) failed on all seven of his schedules longer than 2100 km.

Several 2-meter operators reported contacts in the 500 to 800-km range, generally too short for typical meteor scatter. These signals were generally weak, but continuous, with a curious hollow or watery sound. Some reports mentioned that meteor bursts punctuated the underlying propagation. Several of those mentioning these contacts thought they were via slightly enhanced tropospheric propagation or perhaps a kind of backscatter. The distances and the hollow sound suggest these contacts may have actually been via D-layer scattering enhanced by the meteor bombardment.

Relatively fewer 222-MHz contacts were made. W7XU/0 concentrated on this band and completed 10 contacts. Others reporting two to six 222-MHz contacts each included WD5AGO (EM26), W8PAT (EN81), K1WHS (FN43), K5LLL (EM10), K1TEO (FN31), N0LL (EM09) and K7ICW (DN26). Not a single 432 contact was claimed, although W7XU/0, K1WHS and others ran several 432-MHz schedules.

A few operators tried other sorts of experiments. Greg Stahlman, KJ6KO, ran a series of comparative listening trials to determine if beam heading made any difference to signal strength using a single 17-element 2-meter Yagi. He concluded that signal strength on loud stations did not vary much when he turned the Yagi by as much as 45°.

Several who attempted contacts using WSJT were generally disappointed, as the results were no better than those running on SSB. Shelby Ennis, W8WN, who has been using this digital mode as much as anyone in the US, thought it was more suited to weak signals and short pings than to the nearly continuous propagation the Leonids provided.

Dave Olean, K1WHS, invited K7KX, WB2ONA and K0ZK to a Leonids party at his southern Maine home to take advantage of the expected meteor storm. They saw plenty of meteors—up to 200 per hour around 0900—and made more than 50 contacts on 144 MHz, a handful on 222 MHz and came up empty on 432. Dave noted that 2 meters was crowded:

"We staked out 144.215 and had no trouble attracting stations there. 144.200 was a madhouse and we stayed off it. It was very gratifying to see the Northeast ops spreading out and working plenty of stuff. It seemed that was activity on 144.190, 144.195, 144.205, etc. That was great. I talked to someone on the West Coast and he was lamenting the 144.200 syndrome there. No one moved off the calling frequency. That is too bad."

Aurora

The severe geomagnetic storm that erupted early on November 6 had been widely expected, but the late hour probably caught many off guard. The K index suddenly shot up to 8 at 0300, held there at 0600, and was still 6 as late as 1500. Observers over much of the country, as far south as Florida and Texas, reported a dramatic red visual display.

Auroral conditions on 50 and 144 MHz also extended well into the South, but reports were scanty. The log of Chet Pierson, K3TV (FN20), suggests what was possible. He made two dozen 2-meter contacts, the longest to N5GN (EM20) at about 2100 km. This is impressive for both the distance and the southerly extent of the aurora. NE0P (EM04) made a contact with K5TR (EM00), just about as far south in Texas. Aurora contacts were still being made on both the east and west coasts the next morning as late as 1500.

NOTES FROM ALL OVER

New North American 47-GHz Distance

Bernhard Keiser, W4SW, announced that he and W4IY completed a 174-km contact on 47 GHz during the afternoon of November 14. This exceeds the existing North American distance record of 135 km set by W0EOM/6 and KF6KVG in 1999. Initial contacts were made at 10 and 24 GHz to check propagation and align the antennas.

W4IY (FN10ff) set up at Shippensburg, Pennsylvania, while W4SW (FM08us) went to Hogback Mountain along the Skyline Drive. The rigs were nearly identical, consisting of keyed 12-GHz oscillators followed by a pair of doublers, which produced 20 to 30 mW at 47 GHz. Receivers were mixers using 12-GHz local oscillators. The antennas were 25-cm dishes—just about 10 inches in diameter.

World 75-GHz Record

JA1ELV/2 and JA1KVN/1 have set a new 75-GHz distance standard of 151 km on the afternoon of November 16, according to a announcement sent to Peter Day (G3PHO), editor of the RSGB *Microwave Newsletter*. The pair exchanged 45/43 SSB signal reports between the slopes of Mt Fuji and Mt Tsukuba in central Honshu Island.

JA1ELV ran 3 mW to a 50-cm dish and JA1KVN generated just 1 mW into an 80-cm antenna. No further details of the equipment were available. The distance is just 6 km longer than that achieved by W0EOM and KF6KVG earlier in the year. QST

VHF/UHF CENTURY CLUB AWARDS

Compiled by Beverly Fernandez, N1NAV
Senior VUCC Technician

The ARRL VUCC numbered certificates are awarded to amateurs who submit written confirmations for contacts with the minimum number of Maidenhead grid locators (indicated in *italics*) for each band listing. The numbers preceding call signs indicate total grid locators claimed. The numbers after call signs indicate claimed endorsements. The totals shown are for credits given from October 13, 2001 to December 7, 2001.

The VUCC application form, field sheet and complete list of VUF Awards Managers can be found on *ARRLWeb* at **www.arrl.org/awards/vucc**. Please send an SASE if you cannot download the forms online. If you have questions relating to VUCC, send an e-mail to **vucc@arrl.org**.

50 MHz
100

1167	W1TE
1168	W7JHS
1169	G6BFP
1170	N2VHZ
1171	W5AFD
1172	WB4KTF
1173	W6IT
1174	HB9DDZ
1175	W6WE
1176	N9MSG
1177	AE5B
1178	KA0ABA
1179	K7JE
1180	KC4KK
1181	W8GBH
1182	KJ7TH
1183	KF0LA
1184	N3VOP
WA1ECF	475
W2YE	300
W3EP	725
KE4JOA	200
KM4H	325
N4LXB	200
W5AL	600
KB6NAN	525
KF6GYM	300
KE7SW	400
WX7M	325
K1WVX	375
N8KOL	425

144 MHz
100

595	WA1ECF
596	K0AZ
N8KOL	150

222 MHz
50

N8KOL	75

432 MHz
50

N8KOL	175

1296
25

136	N8KOL

3.4 GHz
5

5	NQ2O

10 GHz
5

114	K2AXX
115	KB2VGH
116	WO2P
WA1ECF	15
K2AXX	10

Satellite
100

110	N5ZNL
111	K6CVC
112	K0RZ
XE2AT	425
WA1ECF	300
KE4AZN	250
K5OE	575
N7SFI	750
W5ADC	225
W6ZQ	275

QST

IARU Region 2 Meets in Guatemala

The International Amateur Radio Union, Region 2, held its 14th General Assembly in Guatemala City, October 1-5, 2001, with 21 IARU member-societies from throughout the Americas represented in person or by proxy. On the evening before the opening of the conference an Extraordinary General Assembly was held for the purpose of approving a new Constitution, Bylaws and Standard Operating Procedures for IARU Region 2. The proceedings of the week-long conference were governed by the new documents (see **www.iaru-r2.org/constitution_e.htm**).

Elected as President of Region 2 for a three-year term was past President Pedro Seidemann, YV5BPG. Outgoing President Tom Atkins, VE3CDM, declined to seek re-election after two terms as President and a total of 18 years as an officer of Region 2. Elected as Vice President was Dario Jurado, HP1DJ, who previously served as a member of the Executive Committee. Dario replaces Reinaldo Leandro, YV5AMH, who declined to seek re-election after one term. ARRL International Affairs Vice President Rod Stafford, W6ROD, was elected Secretary. Rod previously served as a member of the Executive Committee. Noel Donawa, 9Y4NED, was re-elected Treasurer and Ron Szama, LU2AH, was re-elected to the Executive Committee. Newly elected to the Executive Committee were Tim Ellam, VE6SH, Pedro Rodriguez, CO2RP, Marco Tulio Gudiel, TG9AGD, and Gustavo de Faria Franco, PT2ADM.

IARU President Larry Price, W4RA, addressed the Region 2 Conference in Guatemala City.

Preparing for Upcoming Telecommunications Conferences

In other actions, the conference:

- Approved a three-year budget that provides for additional contact by members of the Executive Committee with the member-societies of the Region, preparation within the Region for the 2003 World Radiocommunication Conference, and representation of Amateur Radio at Americas Telecom 2003 in Buenos Aires.
- Endorsed the objective of a worldwide allocation of at least 300 kHz for the amateur service at 7 MHz, with the maintaining of a 300-kHz allocation for Region 2 amateurs as "an essential and non-negotiable requirement." The conference emphasized that other objectives being sought by international broadcasters "should not be permitted to detract from reaching the above goals."
- Supported the revision of Article S25 of the international radio regulations as proposed by the IARU Administrative Council, including the incorporation by reference of Recommendation ITU-R M.1544. This would permit operator qualifications in the amateur service to be updated in the appropriate ITU-R Study Group rather than in a World Radiocommunication Conference. A proposal to amend Article S19 to permit greater flexibility in the formation of Amateur Radio call signs also was endorsed.
- Instructed the Region 2 Executive Committee to develop and implement a program to promote greater collaboration between member-societies of Region 2, and to develop a long range or strategic plan for the Region.
- Encouraged member-societies to urge individual radio amateurs to intensify their efforts to bring more persons to join Amateur Radio, with special attention to young people. A number of activities that have proven to be successful were offered for consideration.
- Encouraged the publicizing of international frequency allocations with the objective of educating the users of CB equipment about the need for the responsible use of the radio spectrum.
- Asked the IARU Administrative Council to study other ways to reduce interference from the users of CB radio equipment, particularly in the 10 and 12 meter bands.
- Urged Region 2 member-societies to support a coordinated approach to secondary allocations to the amateur service in the low-frequency bands 135.7-137.8 kHz and 160-190 kHz.
- Requested the Region 2 Executive Committee to study the possibility of an amateur allocation near 5 MHz, similar to the domestic allocation recently requested by the ARRL in the United States.
- Expressed concern about unauthorized operation in the amateur VHF and UHF bands and encouraged member-societies to take appropriate action, particularly against continuing commercial interference to amateur satellite uplinks in the two-meter band.
- Noted with pride the many recent developments in Amateur Radio digital communications and urged member-societies to acquaint their members and their national administrations with these developments and to stimulate further development in their countries.
- Recognized outgoing President Tom Atkins, VE3CDM, for his devoted 18 years of service to the IARU with the presentation of a commemorative plaque.

The conference voted to hold its 15th General Assembly in 2004 in Trinidad & Tobago.

The Amateur Radio Club of Guatemala (CRAG) hosted the meeting and provided special event station TG0IARU whose operators made hundreds of contacts during the weeklong operation.

ARRL President Jim Haynie, W5JBP, headed the ARRL delegation. He was assisted by First Vice President Joel Harrison, W5ZN, and staff members David Sumner, K1ZZ, Paul Rinaldo, W4RI, and Jon Siverling, WB3ERA.

IARU ADMINISTRATIVE COUNCIL REVIEWS THE STATUS OF WRC-2003

In addition to the Administrative Council's resolution to call for the end of the Morse testing requirement in the international *Radio Regulations* (see December 2001 *QST*, p 73), the body also reviewed the status of IARU preparations for WRC-2003, to be held in Venezuela. Meeting immediately after the conclusion of IARU Region 2's 14th General Assembly, the Council also affirmed IARU objectives with regard to agenda items of concern, which include other possible revisions to Article S25 beyond the Morse issue; the harmonization of amateur and broadcasting allocations near 7 MHz; the adequacy of HF broadcasting allocations below 10 MHz; changes to terms and definitions in Article S1, as a result of amend-

Dave Patton, NT1N ♦ Special Assistant to the Executive Vice President

ments to Article S25; and review of provisions concerning the formation of amateur call signs in Article S19.

Other agenda items of concern to amateurs include additional allocations for Little LEO satellites; study of a possible allocation to the earth exploration-satellite service for synthetic aperture radars (SARs) near 435 MHz; and possible identification of globally harmonized frequency bands for use by agencies and organizations dealing with public protection—such as police—and disaster relief.

The IARU Council also selected the theme of the next World Amateur Radio Day, April 18, 2002, as "Amateur Radio: Continuing Innovation in Communication Technology."

In other business, the IARU Administrative Council:

• Identified ITU meetings at which IARU representation will be required for the coming year and reviewed the recommendations of the President and International Secretariat regarding representatives to attend these meetings.

• Reviewed, updated and approved the present and anticipated future requirements for radio spectrum allocations to the amateur and amateur-satellite services.

• Agreed to continue monitoring ongoing discussions of reform of the ITU structure, with regard to any changes affecting Amateur Radio.

• Noted the growing popularity of the IARU HF World Championship and urged headquarters stations of member-societies to participate. The Council also urged the members of the regional executive committees to take part on an individual basis.

• Received with thanks a report from the International Secretariat on new technologies being introduced in the Amateur Service and expressed appreciation for the contributions of the individuals responsible for these exciting developments.

In addition, reports of IARU international coordinators and advisers were received. Retiring Beacon Project Coordinator Bob Fabry, N6EK, was thanked for his work. Attending the Administrative Council meeting were IARU President Larry Price, W4RA; Vice President David Wardlaw, VK3ADW; Secretary David Sumner, K1ZZ; regional representatives Ole Garpestad, LA2RR, Tom Atkins, VE3CDM, Rod Stafford, W6ROD, Ron Szama, LU2AH, Fred Johnson, ZL2AMJ and Y. S. Park, HL1IFM; and recording secretary Paul Rinaldo, W4RI.

AMATEUR RADIO OPERATORS AND THE UNITED NATIONS

As this column is written, amateur station YA5T is active from Afghanistan. As authorized by the UN-recognized pre-Taliban government, YA5T has been operational in the spare time of its operators—UN workers who are communications experts as well as amateurs.

Often the first into a stricken area, the UN telecoms workers risk active war situations to install, repair, and provide communications equipment for the UN. Pero Simundza, 9A4SP, was killed by a mob in West Timor in 2000. Pero was working for the UN's High Commission for Refugees during the East Timor conflict. Noted DXpeditioner Peter Casier, ON6TT, may be the most well-known among this select group. Working for the UN's Fast Information Technology and Telecoms Emergency and Support Team (Fittest) as Worldwide Coordinator, has been a full-time adventure for Peter and his colleagues. At a point in his life when he was bored and dissatisfied, he applied for a telecoms job with the UN and since then has worked and "played" around the world. Peter wrote:

> In 1994, my first trip was to Angola—and it was an eye-opener. My vision of Africa was of a hot and humid savannah, with loads of wildlife and villages made of clay huts. Quiet nights with stars overhead. Instead of all that romantic stuff, I got a flat in the middle of Luanda, with plenty of noise from hundreds of television sets and radios, each one tuned to shout over the other and machine guns firing in the city the whole night. But the job was exactly as I expected it to be. Telecommunications full time. Loads of freedom to plan my job as I wanted and lots of unexpected improvisation. One day I was driving off to a town in the middle of the bush, another day I was flown into a shelled and deserted town and given a few hours to install a complete radio station from scratch. And to train people in Portuguese how to operate a radio. No, I do not speak Portuguese! Talk about challenges. I remember one night climbing a tree in the pitch dark to hang a dipole and thinking how much I truly enjoyed this work.

Peter Casier, 5X1T/ON6TT (right), and an assistant getting a satellite link going in the fields of Africa.

In Africa the Telecoms group supervises 67 bases (Peter was home-stationed in Uganda for more than three years) and in the few slower times they upgrade equipment and develop new systems. Most of the time though is spent dealing with emergencies caused by flooding, drought, civil war, or myriad other causes. Peter writes:

> As telecommunications is one of the backbones of our operations, and the lifeline of our staff in the field, we are always out there as one of the first from the UN to come in and set things up. We install repeaters, base and mobile HF radio stations, satellite ground stations, generators, solar power systems, computers, email, you name it. Our unit had quite a number of hams passing through, each of them contributing much to the development of our infrastructure, and each of them doing it with a creativity and independence only hams have. And as my employer appreciates the experience hams can bring to relief organizations, they allowed me to take three months off and co-lead the expedition to VK0IR, Heard Island in 1997.

Other amateurs working for the WFP Telecoms are Robert Kasca, S53R, who heads the Eurasia Team from Pakistan, and Mats Persson, SM7PKK, who heads the African Team. Ed, 4L4FN, is presently working for the WFP in North Korea, and is active as P5/4L4FN in his spare time. There are many hams in other UN agencies, including Thor, TF1MM/4W6MM working for the Field Services/peacekeeping mission in E. Timor, along with OH2BF and CT1EEB. 5B4ADA works for the UN in Cyprus. In New York, Alain Moerenhout, ON5HE is the UN telecommunications officer. The UN's High Commissioner for Refugees has Mark Demeuleneere, ON4WW and Piero Calvi-Parisetti, IK2BHX/9U5X.

Peter sums up his life as "very intense."

> One day I am living in the fast lane, traveling in the middle of the desert, and the next day flying in a cargo plane to a snowy place and hopping a ride on a snowscooter, and a couple weeks after that I'll be driving through the lush jungles of Rwanda. Two weeks later and I am in north Myanmar followed shortly thereafter with a trip to New York in order to give a presentation to the big shots, ha.

For more information about the UN World Food Programme's communications programs, go to **www.wfp.org/index.asp?section=5**.

Learning the Code

One of the most written about radio subjects is Learning the Code. The earliest magazines and books I own, from as early as 1910, have articles of instruction and many different methods to learn. Since the early days hams have spent many hours reading and practicing.

Code predates radio. Young prospective Telegraphers in the mid to late 1800s would get jobs delivering messages. They would sit quietly in the telegraph office between deliveries, copying the messages for practice. As soon as they could qualify, they could move up to the position of Telegrapher.

Learning usually meant practicing together with a friend or in a small group. Each would take turns sending and receiving using a hand key and buzzer or sounder. Radio schools started teaching code so students could get commercial licenses. Early on it was discovered that some sort of automatic means for generating code characters was needed.

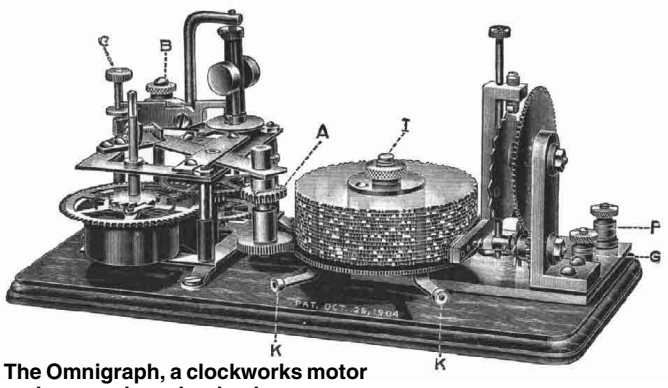
Enter the Omnigraph

My Omnigraph was patented on October 25, 1904. It consists of a variable speed spring-wound clockworks motor driving a gear train, turning a horizontal wheel. The wheel is made up of several pre-coded aluminum platters—stacked one on top of the other. A small pin follows the wheel edge and operated a set of keying contacts. The contacts in turn key a sounding device for the student. These were used for many years.

Other Devices

Later paper tape machines were invented, like the Instructograph. These were cheaper than Omnigraphs and came with long paper tapes, which were run through a set of contacts. The early ones came with a spring-wound motor. Eventually they added electric motors. There were more expensive and elaborate devices used by the military for training. Many of them worked just like the Instructograph. Phonograph records were also used.

Today a prospective code student has many methods to learn, such as audio tape, CD-ROMs and computer programs. Take a look at some of the early code practice devices. I'll



The Omnigraph, a clockworks motor and pre-made code wheels...

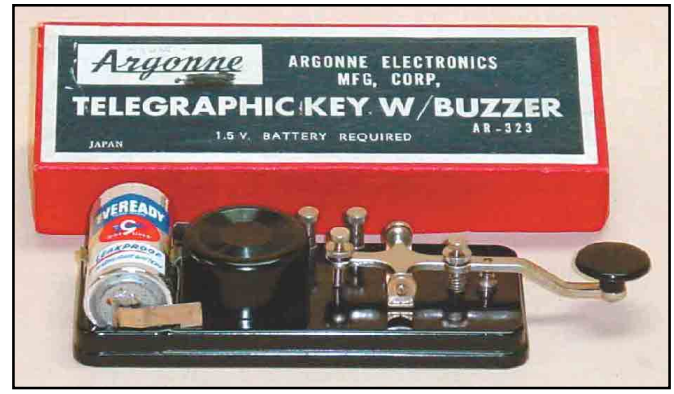
...and the Omnigraph wheel. Note the code letters in edge of the aluminum wheel.

The popular Telegraph Apparatus oscillator with built-in practice key.

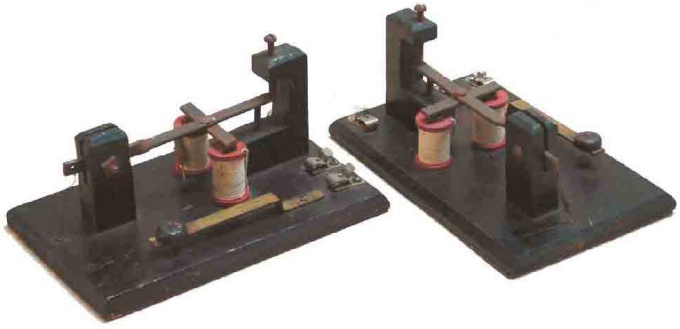
The Instructograph with practice tape in place.

John Dilks, K2TQN ♦ 125 Warf Road, Egg Harbor Township, NJ 08234-8501 ♦ k2tqn@arrl.org

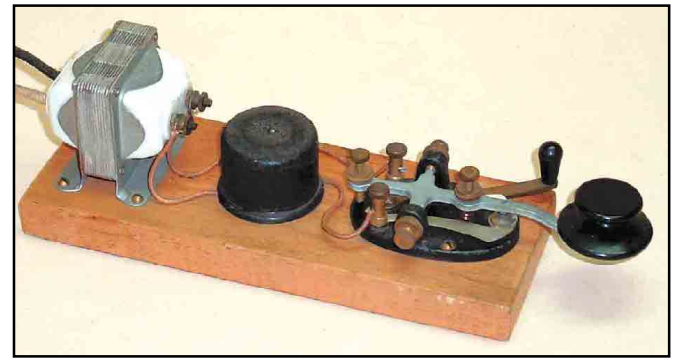
This 1918 practice set was made for training operators during WW-I. It had a light and a buzzer and could be connected to others via external wiring and using a battery like that shown. Hams bought these from surplus companies after the war. Note the extension on the key to bring the knob down to regular height.



This early "Made in Japan" key is typical of those sold from the early 1950s through the late 1980s. Many hams owned one of these.



A homemade pair of telegraph practice keys and sounders.



This late 1940s key is typical of those from the 1930s through the late 1970s. The doorbell transformer supplies voltage to the buzzer, which is keyed by the surplus WW-II key.

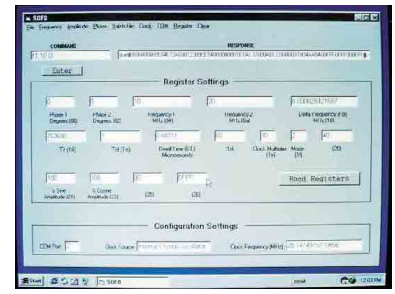
A popular 1950s code oscillator. Thousands of these were sold to hams.

keep it short this month so we can get in more photos. These photos should bring back some fond memories for the old-timers and enjoyment for the computer generation.

Please visit my Web page, **www.eht.com/oldradio/arrl/index.html**.—*K2TQN*

NEW PRODUCTS

SOF8 SIGNAL GENERATOR CONTROL SOFTWARE FROM NOVATECH



◊ Designed for *Windows*-based PCs, Novatech's *SOF8* control software works with the company's precision signal generators (up to 100 MHz) to enable programmable features (amplitude, phase, FSK, BPSK, chirp, frequency sweeps) via USB or an RS-232 serial port.

SOF8, written in *Visual Basic* (including source code), features intuitive drop-down menus, sequencing/batch capabilities, automated testing functions and the ability to parse and display the hex-code replies sent by the signal generator in response to *SOF8* commands.

Price: $95. For more information, contact Novatech Instruments, PO Box 55997, Seattle, WA 98155-0997; tel 206-301-8986, fax 206-363-4367, **www.novatech-instr.com**.

Previous • Next New Products

YL NEWS

Indiana YL Brings Ham Radio to her Eighth Grade Classroom

Sometimes the best ideas come from unexpected sources. That's what happened to Vicki Rudicel, KB9OME, of Grant County, Indiana.

Vicki is very active in Amateur Radio. She's president of the Grant County Amateur Radio Club in northeast Indiana and an ARRL Assistant Director, Central Division. One of the club members, Phil Adrianson, WD9FVM, is good friends with a ham radio operator in Puerto Rico and often patched him in from HF to their local 2-meter repeater. William Schwarz, KP4EEB, of San Juan, became somewhat of a regular on the air, and last summer Willie and his wife Teresita visited his friend Phil and met many of the Grant County ARC members, including Vicki and her family. The 80-year-old Puerto Rican was very impressed by Vicki's 13-year-old daughter Amanda, W9JOY (her middle name is Joy).

BETH RUDICEL

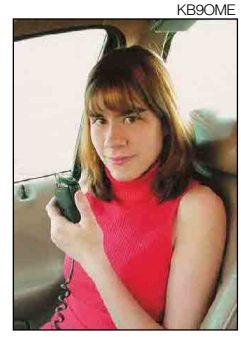
Vicki Rudicel, KB9OME, president of the Grant County Amateur Radio Club.

A few months later while in her eighth grade Spanish class, Amanda had an idea. Why not have her class speak to Willie from school using Amateur Radio?

It seemed like a good opportunity to showcase Amateur Radio, and Vicki contacted Phil, WD9FVM, and Joy's Spanish teacher, Mrs Glenda Rogers, at the Jones Middle School to start the ball rolling. Mrs Rogers thought it would be a wonderful experience to have the students actually talk to a person who speaks Spanish and lives thousands of miles away in Puerto Rico. On Friday, October 5, Vicki brought an HT to school and Phil patched in Willie, KP4EEB, on the 2-meter repeater. The local paper sent a reporter and photographer to Amanda's class and they talked to Willie in English and Spanish! "We talked about a lot of things," Amanda said. "It was a lot of fun and my classmates seemed to enjoy it very much. It was a lot better than taking a test, and great practice for us."

Vicki, KB9OME, said the experience brought the Spanish language and Amateur Radio communications alive to the students, and their teacher has noticed an increased interest among them to learn the language. "This was a wonderful opportunity to share the magic of Amateur Radio with young people," Vicki said. "We hope to do it again next year, when the students should be able to *hablar Español* even better."

KB9OME



Amanda Rudicel, W9JOY, whose eighth grade class enjoyed a "live" Spanish lesson with Willie, KP4EEB.

The 33 Award

The Young Ladies Radio League has announced a new certificate to be offered only during 2002—the "33 Award." It is in honor of YLRL founder Ethel Smith, K4LMB (SK). A certificate will be awarded to any licensed Amateur Radio operator who works 33 different YLs on any authorized frequency, including UHF, VHF or HF.

Contacts can begin on or after February 13, 2002, which was Ethel's birthday. Net or repeater contacts will not count.

A log showing the frequency, date and time of each QSO, and the call sign and first name of the YL worked should be mailed to YLRL Vice President Jeanie Parker, WA6UVF, 28400 Vista Del Valle, Hemet, CA 92544. Please enclose $1 with your log for postage and handling, which must be postmarked by December 31, 2002.

In May 1939, *QST* ran an ad for a new book, *Two Hundred Meters and Down*, with a black lace border around it. The ad read, "Dear YL:-" and went on to say that no one knew how many YLs were operating. Ethel Smith, then W7FWB, later K4LMB, responded with a letter to the editor that was published in the July 1939 *QST*. She asked YLs to write her and suggested that they might "band themselves together into a YLorganization." Twelve YLs wrote Ethel, and by September, a constitution had been drafted and YLRL was born.

The original members were Ethel, W7FWB/K4LMB; Lenore, W9CHD/W6NAZ; Anita, W8TAY; Lida, W1GQT; Enid, W9NBX; Loretta, W9UA/W0UA; Ethel, VE2HI; Jean, W9NLW; Carol, W6WSV; Jean, W5HYF; Marjorie, W7GXI; Genevieve, W6RGX, and Mary, W8SMM.

Where does "33" come from? It means "love sealed with friendship and mutual respect between a YL and another YL." Clara, W2RUF, signed "33" even before the YLRL days, and it was adopted by YLRL in 1940. QST

Diane P. Ortiz, K2DO ♦ PO Box 296, Bellport, NY 11713 ♦ k2do@arrl.org

NEW PRODUCTS

THE IXTH 24P20 P-CHANNEL POWER MOSFET

◊ Power semiconductor specialist IXYS announces its new P-channel Enhancement Mode Avalanche Rated Power MOSFET, the IXTH 24P20. The device has a continuous drain current rating of 24 A, a Vds rating of 200 V and an "on state" resistance of 0.15 ohms. The MOSFET is packaged in a rugged TO-247 housing and has a power rating of 300 W at 25° C. Other features include fast turn-on and turn-off times, a low-inductance package and suitability for driving heavy loads from rail to rail.

Price: $8.70 in quantities of 1000. For more information, contact IXYS at 3540 Bassett St, Santa Clara, CA 95054, tel 408-982-0700, fax 408-496-0670, **www.ixys.net**.

Previous • Next New Products QST

PSK31: HF Fun and Excitement!

Like it or not, the digital revolution is upon us. QRPers tend to shy away from modes other than CW, which is a pity. While CW is "comfortable" for many QRPers due to the success rate with this mode, phone operation and the new digital modes should not be overlooked as a source of fun and excitement on the HF bands. This month we are going to explore the hottest new mode to hit the ham radio scene since the introduction of packet radio *and* the Internet, combined!

During the past year, PSK31 has emerged as the new cutting edge digital mode in the radio hobby. Not surprisingly, PSK31 has also garnered a massive following in the QRP fraternity. Thanks to Dave Benson, K1SWL, of Small Wonder Labs, and George Heron, N2APB, and the New Jersey QRP Club, QRPers have ready access to some unique and inexpensive QRP digital transceivers. The extremely narrow bandwidth of the transmission medium (around 30 Hz) coupled with free software and ease of getting into this newest digital mode makes PSK31 attractive to everyone. Over the last couple of years, *QST* has featured articles that covered operating PSK31 and building PSK31-related projects.[1,2,3,4]

An Ideal Marriage

QRPers are traditionally slow to adopt new modes, but in the case of PSK31, acceptance has been overwhelming and immediate. PSK31 is made for low power applications. It's an ideal marriage of cutting edge technology and traditional ham radio, with real-time keyboard-to-keyboard contacts. PSK31 is a "friendly mode" offering the intimacy of personal contacts, much like CW, but without the frustrating loss of speech intelligence that happens with phone operation. Its narrow bandwidth is less susceptible to interference, which results in almost error-free digital communications. All the digital QRPer really needs to start enjoying PSK31 is a stable transceiver, a computer with a sound card and a piece of freeware called *DigiPan*.[5] The software is extremely easy to use and provides a panoramic waterfall display of the PSK portion of the band, allowing the precise tuning and decoding of PSK signals via the shack computer. The computer sound card does the job of transmitting and receiving the PSK tones.

At Pacificon 2000, the New Jersey QRP Club unveiled their latest club project: the PSK-80 Warbler, an 80 meter digital transceiver kit. Subsequently, an article that focused on the PSK-80 appeared in *QST*.[6] This article, along with in-depth discussions on several Internet reflectors, created a surge of 80 meter digital operation. During Atlanticon 2001, I became infected with the digital QRP bug, and purchased a PSK-80 transceiver from the NJ-QRP-Club. Construction took several hours over two evenings.

Where else can you buy a rig for under $50 and get on the air with one of the hottest modes to rock ham radio in the last 30 years?

The PSK-80 Warbler (Figure 1) is a direct conversion receiver coupled to a QRP transmitter. The front end of the receiver section has a crystal filter ahead of the first mixer, which provides some extra front end bandwidth limiting. The kit is based around the prolific 3.579 MHz television color burst crystals. The PSK "watering hole" on 80 meters has defaulted to 3581 kHz, a perfect match for these crystals. The T/R functions are controlled by the RS-232 port on the computer via a serial cable to the PSK-80 transceiver. Two stereo audio cables connect transmit and receive audio between the computer's sound card and the rig. Once you customize the *DigiPan* software for your station and call sign, the software on the computer handles almost everything. All that is left for the operator to do is to type on the keyboard.

The *DigiPan* panoramic waterfall display looks like something right out of

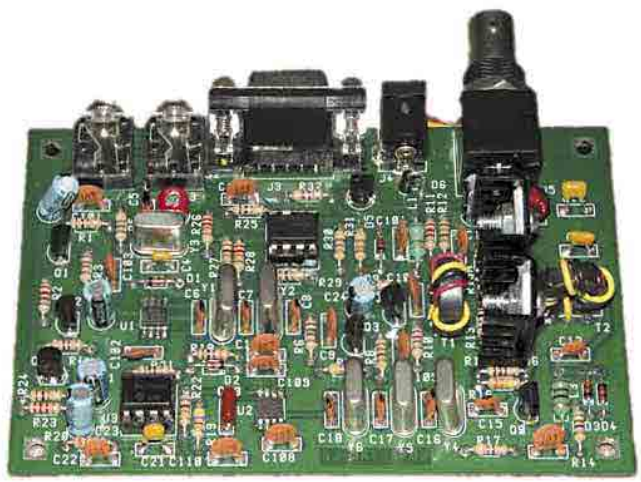


Figure 1—My 80 meter Warbler prior to putting it in the case. The small size and good performance of this rig make it a deal at only $45 from Small Wonder Labs.

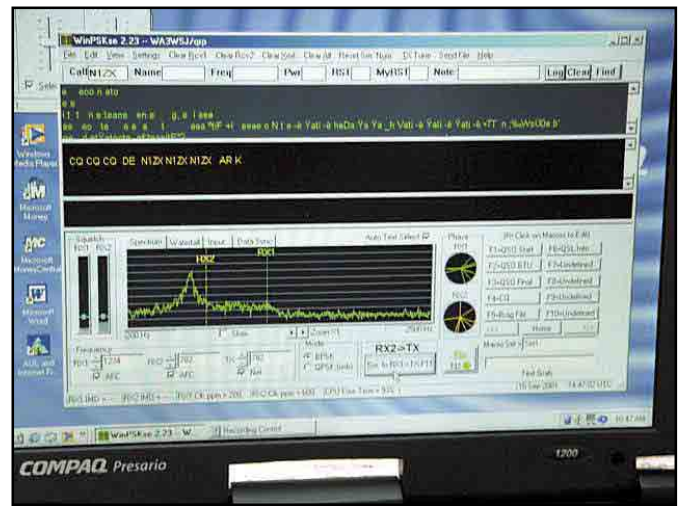


Figure 2—The screen of Ed's laptop. Notice the layout of *WinPSKse* and the panoramic frequency display. Available on the Internet, this program can decode two PSK31 signals simultaneously.

Rich Arland, K7SZ ♦ 25 Amherst Ave, Wilkes Barre, PA 18702 ♦ k7sz@arrl.org

a Tom Clancy novel. After the initial customization of the software, the operator selects a band, in this case 80 meters. The range of frequencies is represented by a bar the width of the computer screen, just above the waterfall display. The lowest frequency will appear at the extreme left and the highest frequency at the extreme right. The "waterfall" portion of this display represents PSK signals in the passband of the receiver (Figure 2). When the receiver hears a signal, a vertical track appears, starting at the top of the waterfall moving downward as a function of time. A good PSK signal will look like a small set of railroad tracks.

To start deciphering this transmission, the operator positions the cursor on the computer screen over the PSK signal and clicks the mouse. The received text will start to appear in the area above the waterfall display. The extremely narrow bandwidth of the PSK signals requires a very stable receiver. The PSK-80, since it is crystal controlled, certainly fits that description. I have successfully used my Elecraft K2 to receive PSK signals, indicating that the K2 is also stable enough for the task.

To transmit PSK signals, simply hit the macro key and start typing or use one of the preassigned macro keys to send "CQ." Your outgoing text appears in a box just below the received text. The size of both of these boxes and the waterfall display are fully adjustable via the software.

Other Software

DigiPan is not the only game in town; several other PSK31 software packages are available on the Internet. Ed Breneiser, WA3WSJ, demonstrated portable PSK31 at the Eastern Pennsylvania QRP Club's fall meeting in French Creek State Park, near Reading (Figure 3). Ed used his Elecraft K2 and a laptop computer running *WinPSKse* software for the demonstration. The interesting thing about *WinPSKse* is that it accommodates both a waterfall display and a spectral display of the receiver passband, *and* allows the decoding of two channels of PSK data simultaneously. This software is free for the downloading at **www.psk31.com**. This is a terrific site for the budding PSK31 aficionado as well as the seasoned digital user. Additionally, Buck Rogers, K4ABT, has a site dedicated to digital ham radio. Point your browser to **www.packetradio.com**. Buck is no stranger to the digital realm. His Packet Radio Notebook was featured for years in *CQ Magazine*. Both sites have downloads available for PSK31 software as well as FAQs (Frequently Asked Questions) and a great deal of other information about the digital modes.

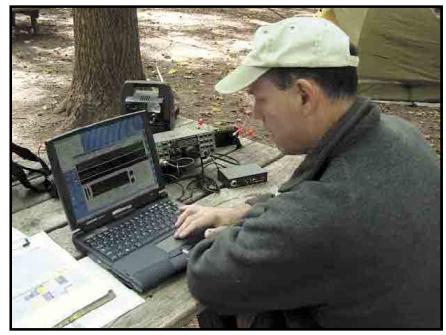


Figure 3—Ed Breneiser, WA3WSJ, is using his laptop running *WinPSKse* software and his Elecraft K2 transceiver to enjoy some PSK31 operating from a camp site in French Creek State Park, near Reading, Pennsylvania. The ability to use this station from almost any location has a direct application in emergency communications applications.

Have I piqued your interest in PSK31? I certainly hope so. Where else can you buy a rig for under $50 and get on the air with one of the hottest modes to rock ham radio in the last 30 years? If you want to get your own 80 meter Warbler I've got some good news and some bad news. First, the bad news: the New Jersey QRP Club no longer kits this rig. The good news is that Dave Benson, K1SWL, of Small Wonder Labs (**www.smallwonderlabs.com**) now offers the commercial kit version for the same price of only $45 plus shipping.

PSK31 is a "friendly mode" offering the intimacy of personal contacts, much like CW, but without the frustrating loss of speech intelligence that happens with phone operation.

Why do I like PSK31? It's a fascinating digital mode, a lot like CW, that allows me to communicate with other digital QRPers, in real-time, directly from my keyboard. There's also a lot of DX to be worked. Additionally, PSK31 offers a unique opportunity to expand the ranks of QRPers. Thanks to the recent relaxation of the CW requirements and licensing restructuring at the FCC there are thousands of new HF operators. These folks have been descending upon the "low bands," exploring new modes, in search of new thrills and challenges. What better way to get these folks into the QRP side of the hobby than by getting them started with low power and PSK31?

Food for Thought

With the events of September 11, 2001 still freshly burned into our collective memory, we all need to seriously reevaluate our emergency communications preparedness. Do your capabilities begin and end with a 2 meter H-T and a spare set of batteries? If so, you might want to seriously consider expanding your emergency communications capabilities. While tactical communications via VHF FM is one of our mainstay modes, we may also be tasked with providing long-haul, point-to-point communications to move emergency traffic into and out of a disaster site. This dictates the use of HF.

Packet radio was heralded as the digital savior of ham radio for just such situations back in the 1980s. Unfortunately, HF packet suffers from several limitations, one being the need for a good signal-to-noise ratio at the receiving end. Degrade the circuit path with noise or fading, and HF packet doesn't work well.

PSK31, on the other hand, has the ability to provide almost error-free communications under the varying band conditions found on HF, using extremely small amounts of radiated RF power. PSK31 has been advertised as the replacement for RTTY, the longstanding HF data communications mode. PSK31 takes less bandwidth, allowing more stations to operate in close proximity. It's much less susceptible to noise and fading than RTTY, making it a good choice for HF long-haul data communications. In addition, PSK31 dovetails nicely with QRP, making the use of low power HF transceivers an outstanding choice for long-haul disaster communications.

PSK31 is a great marriage of traditional ham radio and cutting edge technology ideally suited for ragchewing, traffic handling, DXing and emergency communications. If you haven't tried this mode, don't wait. For further reading I recommend *The HF Digital Handbook* by Steve Ford, WB8IMY, available from the ARRL (**www.arrl.org/catalog/**). "Warble on," loyal readers!

Notes

[1]Steve Ford, WB8IMY, "PSK31 2000," *QST,* May 2000, pp 42-45.

[2]Don Urbytes, W8LGV, "A PSK31 Tuning Aid," *QST,* Dec 1999, pp 35-37.

[3]Steve Ford, WB8IMY, "PSK31—Has RTTY's Replacement Arrived?" *QST*, May 1999, pp 41-44.

[4]Howard "Skip" Teller, KH6TY, and Dave Benson, NN1G, "A Panoramic Transceiving System for PSK31," *QST*, Jun 2000, pp 31-36.

[5]*DigiPan* freeware is downloadable from **members.home.com/hteller/digipan/**.

[6]Dave Benson, K1SWL, and George Heron, N2APB, "The Warbler—A Simple PSK31 Transceiver for 80 Meters," *QST,* Mar 2001, pp 37-41.

COMING CONVENTIONS

VERMONT STATE CONVENTION

February 23, Milton

The Vermont State Convention, sponsored by the Radio Amateurs of Northern Vermont, will be held at Milton High School, Rte 7, 5 miles N of I-89, Exit 17. Doors are open 8 AM to 2 PM. Features include flea market, vendors (please call for setup information), dealers, book sales, demonstrations, forums (ARRL, QRP, Contesting, Satellites, Antennas), VE sessions (9 AM and 1 PM), commercial radio exams, refreshments. Talk-in on 145.15, bulletins on 146.67. Admission is $3, under 18 free. Tables are free while they last. Contact Mitch Stern, W1SJ, 802-879-6589; **w1sj@arrl.net**; **www.ranv.org**.

LOUISIANA STATE CONVENTION

March 8-10, Rayne

The Louisiana State Convention, sponsored by the Acadiana ARA, will be held at the Rayne Civic Center, 300 Frog Festival Dr, just S of I-10 at Exit 87; go S on LA 35, go to first traffic light and turn right onto Oak St, go to the second street and take a right onto Gossen Memorial, follow the street to the end. Doors are open Saturday 8 AM to 3 PM, Sunday 8 AM to noon. New this year on Friday, Mar 8 will be a Fais Do Do (Cajun Dance) and Bar-B-Q (1 PM). Features include flea market, commercial dealers, forums (ARRL, AMSAT, MARS), VE sessions (Sunday, 9 AM). Talk-in on 146.82. Admission is $3 in advance, $4 at the door; under 17 free when accompanied by a registered adult. Tables are $20 (6-ft, with electricity; bring your own extension cords). Contact Al Oubre, K5DPG, 3011 Sugar Mill Rd, New Iberia, LA 70563; 337-367-3901; **k5dpg@arrl.net**; **www.w5ddl.org**.

January 20
New York City/Long Island Section, North Babylon*

February 1-2
Mississippi State, Jackson*

February 2-3
Southeastern Division, Miami, FL*

February 8-10
Northern Florida Section, Orlando*

February 9-10
Tennessee State, Memphis*

February 10
Virginia State, Richmond*

March 15-16
Oklahoma Section, Claremore

March 16-17
West Texas Section, Midland

March 22-23
Nebraska State, Norfolk

April 6-7
Maryland State, Timonium
Washington State, Yakima

***See January *QST* for details.**

Attention Hamfest and Convention Sponsors:

ARRL HQ maintains a date register of scheduled events that may assist you in picking a suitable date for your event. You're encouraged to register your event with HQ as far in advance as your planning permits. Hamfest and convention approval procedures for ARRL sanction are separate and distinct from the date register. Registering dates with ARRL HQ doesn't constitute League sanction, nor does it guarantee there will not be a conflict with another established event in the same area.

We at ARRL HQ are not able to approve dates for sanctioned hamfests and conventions. For hamfests, this must be done by your division director. For conventions, approval must be made by your director and by the executive committee. Application forms can be obtained by writing to or calling the ARRL convention program manager, tel 860-594-0262.

Note: Sponsors of large gatherings should check with League HQ for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL HQ for up to two years in advance. QST

HAMFEST CALENDAR

(Abbreviations: *Spr* = Sponsor, *TI* = Talk-in frequency, *Adm* = Admission.)

Arizona (Phoenix)—Feb 4. Jerry Basso, W9JIF, 623-214-8136.

†**Arizona (Scottsdale)—Mar 9,** 6 AM. *Spr:* Scottsdale ARC. Scottsdale Community College, 9000 E Chaparral Rd; take 101 N, exit Chaparral Rd. VE sessions, self-contained RV parking, refreshments. *TI:* 147.18. *Adm:* $2 (parking). Tables: $10. Ed Nickerson, WU7S, 902 N 73rd Pl, Scottsdale, AZ 85257; 480-949-5162; **bnickers@qwest.net**.

†**Arkansas (Harrison)—Mar 9,** 8 AM to 2 PM. *Spr:* North Arkansas ARS. Boone County Fairgrounds, US 62/65 Business; from the intersection of US 62/65 Business and US 412 go N on 62/65 B for ¾ mile, Fairgrounds on right. Forums,VE sessions, Special Event station, talk-in station. *TI:* 147.0. *Adm:* $5. Tables: $15 (for first table, includes 1 admission); $10 (for each additional table). Bill Rose, N5VKF, 1007 N Maple, Harrison, AR 72601; 870-741-7074; **billrose@cox-internet.com**; **www.qsl.net/naars/hamfest/index.html**.

British Columbia (New Westminster)—Mar 10. Bob Kungl, VE7KW, 604-524-9177.

†**California (Monterey/Seaside)—Feb 16,** 7 AM to 3 PM. *Spr:* Naval Postgraduate School ARC. General Stilwell Community Center (old Fort Ord), 4260 Gigling Rd; take CSU Monterey Bay Exit from Hwy 1, go right at first traffic light, go left at next stop sign, Center on right. This year's theme is "To Serve Your Country," flea market, numerous dealers, seminars, demonstrations, VE sessions, guest speakers, free parking. *TI:* 146.97 (94.8 Hz). *Adm:* Donations accepted. Tables: first $20, each additional $15. Brian Broggie, W6FVI, Box 7368, Carmel, CA 93921-7368; 831-626-1501; **w6fvi@arrl.net**; **www.k6ly.org/radiofest**.

†**California (Redding)—Mar 2;** set up 9-10 AM; public 10 AM to 3 PM. *Spr:* Shasta Cascade ARS. Downtown Mall; use Butte entrance, off Pine or California Sts. Swapmeet, vendors, radios, antennas, power supplies, computers, ARRL information table, refreshments. *TI:* 146.64. *Adm:* Free. Tables: $10 (limited; reserve early). Jim Bremer, KE6OUA, Box 493549, Redding, CA 96049-3549; 530-222-8001; **ke6oua@arrl.net**.

†**Colorado (Brighton)—Feb 17,** 9 AM to 1 PM. *Spr:* Aurora Repeater Assn. Adams County Fairgrounds, 9755 Henderson Rd; I-76 E to US 85 N, turn left on E 124th Ave, follow to Fairgrounds. VE sessions (10 AM). *TI:* 147.15. *Adm:* $4. Tables: advance $10, door $15. Wayne Heinen, N0POH, Box 473411, Aurora, CO 80047-3411; 303-699-6335; **n0poh@arrl.net**; **www.qsl.net/n0ara**.

†**Florida (New Port Richey)—Mar 2;** set up Friday after 4 PM; public Saturday 9 AM. *Spr:* Gulf Coast ARC. Ridgewood High School, 7650 Orchid Lake Dr, next to Marchman Technical Education Center; take Ridge Rd off US 19, go S on Lemon Rd; or take Little Rd W to Lemon Rd and turn S (left). Amateur Radio and Computer Show, tailgating ($6), vendors, VE sessions (11 AM). *TI:* 146.67. *Adm:* $6. Tables: $6. Rick Brown, AG4JN, Box 595, New Port Richey, FL 34656-0595; 727-934-8741; **ag4jn@arrl.net**; **www.gulfcoastarc.org/**.

†**Florida (Port Charlotte)—Mar 9;** set up Friday noon to 8 PM; public Saturday 7 AM to 5 PM. *Sprs:* Englewood ARS and Peace River Repeater Assn. Charlotte County Fairgrounds, 2333 El Jobean Rd; opposite Ranger Stadium, SR 776, 2.5 miles W of US 41. Swap tables, tailgating ($15 per space, includes 1 admission; additional spaces $10 each), VE sessions, overnight self-contained RV parking ($10, no hookups), free parking, refreshments. *TI:* 147.255. *Adm:* advance $4, door $5. Tables: $20. Vic Emmelkamp, KF4VHX, 1181 Manor Rd, Englewood, FL 34223; 941-473-5560; **vkamp1@glnet.com**; **www.fcrosby.com/hamfest**.

†**Florida (Zephyrhills)—Feb 24,** 8 AM to 1 PM. *Spr:* Zephyrhills Area ARC. Zephyrhills Lions Den, 5827 Dean Diary Rd; N of SR 54, between I-75 and US Rte 301. "Phinneyfest," tailgating, VE sessions, refreshments. *TI:* 147.135. *Adm:* $5. Tables: $5. Ron Russell, N8VFE, 38545 Goodland Dr, Zephyrhills, FL 33540; 813-782-1602; fax 813-783-8336; **ron301@aol.com**.

†**Georgia (Dalton)—Feb 23,** 7 AM to 2:30 PM. *Spr:* Dalton ARC. N GA Fairgrounds, Legion Dr; Exit I-75, No 336 to N Bypass, go 5 lights and turn right onto Glenwood Ave, go 2 lights and turn left onto Legion Dr. *TI:* 145.23. *Adm:* $5. Tables: $5. Marvin Cooper, N2MC, 144 Danny Cir, Calhoun, GA 30701; 706-629-1480; **n2mc@pointlink.net**.

†**Illinois (Sterling)—Mar 17;** set up Saturday 6-9 PM, Sunday 6 AM; public 7:30 AM to 3 PM. *Spr:* Sterling-Rock Falls ARS. Challand Middle School Gym, 1700 6th Ave; LeFevre Rd E to 6th Ave. Large indoor flea market, vendors, radio and electronics items, computers, antennas, VE sessions, accommodations for self-contained campers, free parking, re-

†ARRL Hamfest

Gail Iannone ♦ Convention Program Manager

freshments. *TI:* 146.85 (114.8 Hz). *Adm:* advance $4 (by Mar 1; send SASE), door $5. Tables: $7 (with or without electricity; bring your own drop cords). Lloyd Sherman, KB9APW, c/o SRFARS, Box 521, Sterling, IL 61081-0521; 815-336-2434; **lsherman@essex1.com**; **www.sterlinghamfest.com**.

Indiana (La Porte)—Feb 23. Neil Straub, WZ9N, 219-324-7525.

†Kentucky (Cave City)—Mar 2, 7:30 AM to 2 PM. *Spr:* Mammoth Cave ARC. Cave City Convention Center, Convention Dr; I-65, Exit 53. Dealers, tailgating, ARRL forum, VE sessions (9 AM), 3.960 MHz Meeting, free coffee. *TI:* 146.94. *Adm:* $6. Tables: $7. Jim Erskine, KD4GNN, Box 187, Canmer, KY 42722; 270-528-3956; **mail@chirotoons.com**; **www.scrtc.com/mcarc**.

Louisiana (Rayne)—Mar 8-10, Louisiana State Convention. See "Coming Conventions."

†Massachusetts (Amherst)—Mar 10; set up 7 AM; public 9 AM to 1 PM. *Spr:* Mount Tom Amateur Repeater Assn. Amherst Regional Middle School, 170 Chestnut St; from Mass Pike Exit 4, take Rte 91 N to Exit 19 (Rte 9), take Rte 9 N to Amherst Center, left on Main St, pass 2 lights, right on Chestnut St. Flea market, vendors, tailgating ($5), VE sessions (10 AM; pre-registration recommended; Dave Cote, WA1DC, **waldc@pipeline.com**), commercial license testing, handicapped accessible, refreshments. *TI:* 146.94, 145.13 (71.9 Hz). *Adm:* $5, under 12 free. Tables: $15 (8-ft). Bob Meneguzzo, K1YO, 3 Dairy Ln, Southwick, MA 01077; 877-481-8131 or 413-569-0320; **k1yo@arrl.net**; **www.mtara.org/hamfest/flea.html**.

†Massachusetts (Marlborough)—Feb 16; set up 8 AM; public 10 AM. *Spr:* Algonquin ARC. Marlborough Middle School, 25 Union St; on Rte 85, behind Marlborough Police Headquarters. Flea market, dealers, VE sessions (9-11 AM; walk-ins accepted). *TI:* 146.61. *Adm:* $3. Tables: advance $12 (before Feb 7), $15 (Feb 7 and after); includes 1 admission. Ann Weldon, KA1PON, 14A Emmett St, Marlborough, MA 01752; 508-481-4988 (before 9 PM); **ka1pon@amsat.org**.

†Michigan (Traverse City)—Feb 9, 8 AM to noon. *Spr:* Cherryland ARC. Immaculate Conception Middle School Gym, 720 2nd St; from US 31 turn W on Randolph St, first street on left is Vine, turn left and go 1 block to school. Swap-n-Shop, VE sessions (pre-register or register at the Swap). *TI:* 146.86. *Adm:* $5. Tables: $8. Joe Novak, W8TVT, 201 S Spruce St, Traverse City, MI 49684; 231-947-8555; **jnovak@traverse.net**.

†New Jersey (Parsippany)—Mar 2; sellers 6:30 AM, buyers 8 AM. *Spr:* Splitrock ARA. Parsippany PAL Building, Smith Field, Rte 46 and Baldwin Rd; I-80, Exit 45 Eastbound or Exit 47 Westbound. Tailgating ($15 per space, weather permitting; includes 1 admission), vendors, VE sessions (registration 8:30 AM, exams 9 AM sharp), plenty of parking, refreshments. *TI:* 146.985 (131.8 Hz), 146.52. *Adm:* $6, nonham spouses and children free. Tables: $18 (includes 1 admission). Maria Turner, KB2VKP, Box 610, Rockaway, NJ 07866; 888-511-7272; **hamfest@splitrockara.org**; **www.splitrockara.org**.

New Mexico (Albuquerque)—Jan 26. Tom Ellis, K5TEE, 505-291-8122.

†New York (Hicksville)—Feb 24; set up 8 AM; public 9 AM to 1 PM. *Spr:* Long Island Mobile ARC. Levittown Hall, 201 Levittown Pkwy; located E of Wantagh Pkwy (Exit W2 E), ½ mile S of Old Country Rd. Hamfair and Electronics Show, flea market, vendors, parts and equipment, computers, accessories, antennas, VHF tune-up clinic, ARRL info, VE sessions (10 AM prompt, all classes, $10), refreshments. *TI:* 146.85 (136.5 Hz). *Adm:* $6, under 12 free. Tables: $25 (advanced registration only, must be paid by Feb 20; includes 1 admission). Rich Rosner, N2STU, Box 392, Levittown, NY 11756-0392; 631-563-1859; **hamfest@limarc.org**; **www.limarc.org**.

†New York (Horseheads)—Feb 23; set up 7 AM; public 8 AM to 3 PM. *Spr:* ARA of the Southern Tier. NYS National Guard Armory, Colonial Dr; from NY Rte 17 W, take Exit 51A, turn right at light, proceed straight for 0.1 miles, Armory on left. Huge indoor flea market, dealer displays of new and used equipment, vendors, VE sessions (9 AM, walk-ins; John, 607-565-4020), refreshments. *TI:* 146.7, 147.36. *Adm:* advance $5, door $6; under 11 free. Tables: $12 (8-ft). Randy Viele, N2SYT, Box 44, Elmira, NY 14902-0044; 607-625-5893 (days) or 607-738-6857 (eves); **n2syt@arast.org** or **winterfest@arast.org**; **www.arast.org**.

†New York (Williamsville)—Feb 24. *Spr:* Lancaster ARC. Main Transit Fire Hall, 6777 Main St (Rte 5); 1/8 mile from Transit Rd (Rte 78); I-90, Exit 49 (Depew/Lockport Exit). Greater Buffalo Winter Hamfest and Computer Show. *TI:* 147.255. *Adm:* $6. Tables: $10. Luke Calianno, N2GDU, 1105 Ransom Rd, Lancaster, NY 14086; 716-634-4667; **luke@towncountryflorist.com**; **gbhamfest.hamgate.net**.

†North Carolina (Charlotte)—Mar 9-10; Saturday 8:30 AM to 5 PM, Sunday 8:30 AM to 2 PM. *Spr:* Mecklenburg ARS. Charlotte Merchandise Mart, Independence and Freedom Halls, 2500 E Independence Blvd; I-77 to Exit 11, Brookshire Freeway E to Independence Blvd at Exit 2B. Hamfest/Computer Fair, indoor flea market (**fleamarket@w4bfb.org**), dealers (**dealers@w4bfb.org**), commercial exhibitor booths, major equipment manufacturers, forums, VE sessions (Saturday, 2 PM; walk-ins accepted), discount parking. *TI:* 145.29. *Adm:* advance $6, door $8. Tables: $22. Tom Hunt, KA3VVJ, 16007 Wynfield Creek Parkway, Huntersville, NC 28078; 704-948-7373 (hamfest info line); **hamfest@w4bfb.org**; **www.w4bfb.org**.

†North Carolina (Elkin)—Feb 24, 8 AM to 3 PM. *Sprs:* Briarpatch and Foothills ARCs. Elkin National Guard Armory. VE sessions (walk-ins only). *Adm:* $5. Craig Patton, KG4FLA, 250 Rippey Hollow Ln, Galax, VA 24333; **kg4fla@hotmail.com**; or Pat Hill, AE4HK, 540-236-6747.

†North Dakota (Bismarck)—Feb 23, 7 AM to 4:30 PM. *Spr:* Central Dakota ARC. St Mary's Elementary School, 807 E Thayer Ave; located between Medcenter One Health Systems and St Alexius Hospitals; I-94, S to State St, turn off State St to 7th St S (one way), turn left onto Thayer Ave. Swap tables, seminar, VE sessions, refreshments. *TI:* 146.94. *Adm:* advance $5, door $6. Tables: $5. Kurt Carufel, KB0KDG, 941 N 33rd St, Bismarck, ND 58501; 701-222-0938; **carufel@home.com**.

†Ohio (Cuyahoga Falls)—Feb 24; set up Saturday 3-5 PM; public Sunday 8 AM to 2 PM. *Spr:* Cuyahoga Falls ARC. Emidio and Sons Party Center, 48 E Bath Rd, at corner of State Rd; State Rte 8 N to Graham Rd Exit, travel 1.2 miles W on Graham Rd, turn right onto E Bath Rd and go W for 1 mile. Hamfest and Electronics/Computer Show, vendors, free parking. *TI:* 147.27. *Adm:* advance $4, door $5. Tables: advance first table $15, additional $12; door first table $18, additional $15 (includes 1 admission). Ted Sarah, W8TTS, 239 Bermont Ave, Munroe Falls, OH 44262; 330-688-2013; **w8tts@arrl.net**; **www.cfarc.org**.

Oklahoma (Ada)—Feb 9. Charles Etier, KC5TGA, 580-436-4425.

†Oklahoma (Elk City)—Mar 2. *Spr:* West Central Oklahoma ARC. Community Civic Center, E Highway, Rte 66; 1 mile W of Rte 66 and Hwy 34; I-40, Exit 41. VE sessions. *TI:* 146.76. *Adm:* advance $5, door $8. Tables: $5. Earl Bottom, N5NEB, Rte 1, Box 62A, Hammon, OK 73650; 580-821-0633; **n5neb@logixonline.net**.

Oregon (Rickreall/Salem)—Feb 16. Larry Quiring, KC7NOS, 503-585-8897.

†Pennsylvania (Greensburg)—Mar 3, 8 AM to 2 PM. *Spr:* Foothills ARC. Fire Department, McLaughlin Dr; Rte 66 N of Greensburg, turn right onto Old Salem Rd, turn right onto McLaughlin Dr. Refreshments. *TI:* 147.18 (131.8 Hz). *Adm:* Free. Tables: $10 (8-ft table space). Tim Bartlow, K3TB, 213 S Washington Ave, Greensburg, PA 15601; 724-834-6517; **k3tb@yahoo.com**; **www.geocities.com/foothills007**.

†Texas (Smithville)—Feb 16, 8 AM. *Spr:* Bastrop County ARC. Riverbend Park, Hwy 71; 45 miles E of Austin. Tailgating (covered space $5, not covered $3), plenty of parking, RV hookups. *TI:* 145.35, 443.75. *Adm:* Free. Tables: $10 (inside), $5 (outside). Juan Vinton, KB5YAE, 504 Pea Jay CV, Bastrop, TX 78602; 512-303-4743; **kb5yae@qsl.net**; **www.qsl.net/kb5yae/**.

Vermont (Milton)—Feb 23, Vermont State Convention. See "Coming Conventions."

†Virginia (Annandale)—Mar 3, 8 AM to 2 PM. *Spr:* Vienna Wireless Society. Northern Virginia Community College, 8333 Little River Turnpike; I-495 (Capital Beltway) to Exit 52, then westbound on Rte 236 (Little River Turnpike), NVCC campus is 1 mile on left. Ham Radio, electronics, and computer parts; vendors (Terry Hines, N4ZH, 703-560-1824); seminars; guest speakers (FCC's Riley Hollingsworth; RFI expert Mike Martin); VE sessions (Saturday, Mar 2, 9 AM at the same site); free parking; refreshments. *TI:* 146.91, 146.685. *Adm:* $6. Tables: $20 (includes 1 admission). Jim Parsons, W4JTP, 10011 Moxleys Ford Ln, Bristow, VA 20136; 703-392-0150; **w4jtp@aol.com** or **winterfest@att.net**; **winterfest.home.att.net**.

†Washington (Puyallup)—Mar 9; set up Friday 2-7:30 PM, Saturday 5:30-8:30 AM; public 9 AM to 3 PM. *Spr:* Mike and Key ARC. Western Washington Fairgrounds Pavilion Exhibition Hall; 14th Ave SW Exit from SR 512, NE corner of Fairgrounds. Electronics Show and Flea Market, commercial booths, vendors, computers, parts, consignment store, club info, VE sessions (206-824-9039; **k7yh@worldnet.att.net**), free parking, overnight SC/RV camping available, refreshments. *TI:* 146.82 (103.5 Hz), 146.58. *Adm:* $6, under 16 free with adult. Tables: $22, seller registration $5, helper registration $7. Michael Dinkelman, N7WA, 22222 148th Ave SE, Kent, WA 98042; 425-867-4797 (days) or 253-631-3756 (eves); **mwdink@eskimo.com**; **www.mikeandkey.com**.

Wisconsin (Waukesha)—Mar 3. Gary Pierce, N9LGE, **sewfars@hotmail.com**.

Attention: The deadline for receipt of items for this column is the **1st of the second month preceding publication date**. For example, your information must arrive at HQ by **February 1** to be listed in the **April** issue. Hamfest information is accurate as of our deadline; contact sponsor for possible late changes. For those who send in items for Hamfest Calendar and Coming Conventions: Postal regulations prohibit mention in *QST* of prizes or any kind of games of chance such as raffles or bingo.

SILENT KEYS

It is with deep regret that we record the passing of these amateurs:

N1KFG, Ian McLeish, Taylor, AL
NX2G, Edwin J. Hegstedt, Lakewood, NY
W2QCV, Dana Pratt, Atco, NJ
W2VUJ, Herman Berkeley, Utica, NY
*W2ZU, John J. Jeffrey, Delmar, NY
KB3ALY, Robert F. Sherwin, Erie, PA
WA3FIX, Daniel L. Sullivan, New Oxford, PA
N3KND, Robert C. Spangler, Mount Pleasant Mills, PA
K3LPT, Walter A. Purdy, Moscow, PA
K3PSO, Edward S. Smith, Mansfield, PA
KE3RF, Donald E. Clark, Punxsutawney, PA
W3TPW, Elbert H. Van Houten, Long Island City, NY
KA3ZRO, Frank H. Rigney, Bensalem, PA
*W4BDC, Carlie A. Manion, Shepherdsville, KY
W4BSS, John I. Nance, Charlotte, NC
KB4CKZ, Arthur Cherry, Bowling Green, VA
WA4CRH, Ernest L. Allen, Madison, TN
K4DEZ, Richard G. Keller, Fort Thomas, KY
KA4DIP, Herman McConnell, Toccoa, GA
WG4G, Charlie A. Curle, Ooltewah, TN
*W4IGO, Robert C. Cannon, Sterling, VA
KD4LL, J. O. Black, Montgomery, AL
WD4LYX, Searcy E. Englebert, Mobile, AL
K4MMB, T. V. Cranmer, Frankfort, KY
KD4NXU, Wesley H. Morrison, Hiseville, KY
W4PD, Vincent A. Padula, Fort Lauderdale, FL
NU4R, Robert N. Porterfield, Chilhowie, VA
WD4R, Lewis E. Batts, Pleasureville, KY
W4SAM, Ronald C. Rolen, Charlotte, NC
W4STV, Thomas A. Lee, Gallatin, TN
KD4TGS, Donna S. Rice, Cullman, AL
K4VGI, John T. Laney, Columbus, GA
W4WDM, Doug Moore, Sunset Beach, NC
N4WQL, David L. Foster, Flatwoods, KY
KQ4XH, Gene W. Killen, Tazewell, VA
K5HCI, Toy G. Jackson, Greenville, MS
KC5HHV, Lonnie T. Waltman, Lake, MS
WA5INV, Alma L. Aylesworth, Lucedale, MS
W5OFG, John Mc Cawley, Chickasha, OK
W5UAX, Earnest G. Basinger, Norman, OK
K5UTH, Scott M. Aylesworth, Lucedale, MS
KH6AFS, Sam Kumukahi, Hilo, HI
N6AFT, Vernon L. Reinke, Fortuna, CA
W6BQD, Howard B. Mouatt, St Paul, MN
N6DYL, D. W. McIntire, Kerman, CA
N6FZJ, Donald D. Gestner, Westwood, CA
KD6JCA, Gary N. Scherer, Lemoore, CA
N6PKK, John J. Flaherty, Lompoc, CA
KI6RR, Ellis F. King, Stockton, CA
K6RTS, Daniel M. Corkins, Stockton, CA
K6STR, Joseph H. Bentson, Oakhurst, CA
W7ASW, Roger C. Raymond, Massapequa Park, NY
W7CIQ, George G. Gomez, Seattle, WA
*KL7IZZ, Harley Steward, Anchorage, AK
KC7PTA, Gerald W. Kalb, Auburn, WA
N8BN, Arthur J. Stokes, Hudson, OH
*W8CFT, Thomas W. MacClure, Boulder City, NV
KC8MN, Granvil Bolen, Zanesville, OH
WA8NRR, Joseph Ellwood, Byesville, OH
WA8OTQ, Johney C. Breeding, Johnson City, TN
W9HI, G. A. Stewart, White Pine, MI
W9KNF, George W. Thompson, Billings, MT
KA9LQM, Michael G. Anderson, Evansville, IN
W9UGW, James A. Quinn, Evergreen Park, IL
*W0AP, John McKinney, Dannebrog, NE
KA0DFE, Weldon L. Fogle, Saint Louis, MO
K0DKJ, David E. Henderson, Inver Grove Heights, MN
K0FAZ, Frank W. Naylor, Kansas City, KS
*WB0HUD, Selden Dambrosky, Denver, CO
W0LPF, Wilbur R. Emerson, Beatrice, NE
WB0TBP, La Verne R. Clark, Spearfish, SD
KA0TTH, Kent T. Douglass, Windsor, CO
K0UOP, James W. Woody, Sumner, MO
*W0VJ, William T. Vance, Parkville, MO

*Life Member, ARRL

**Charter Life Member, ARRL

‡Call sign has been re-issued through the vanity call sign program.

Note: Silent Key reports must confirm the death by one of the following means: a letter or note from a family member, a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address and call sign. Allow several months for the listing to appear in this column.

Many hams remember a Silent Key with a memorial contribution to the ARRL Foundation. If you wish to make a contribution in a friend or relative's memory, you can designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund, or the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation Inc, 225 Main St, Newington, CT 06111. QST

Kathy Capodicasa, N1GZO ♦ Silent Key Administrator

NEW PRODUCTS

ALINCO'S DJ-596 DUAL-BAND HANDHELD SUPPORTS DIGITAL VOICE COMMUNICATION

◊ Able to put out up to 5 W on 2 meters and 70 cm, the new Alinco DJ-596 works in traditional wide and narrow FM modes and, with the addition of the EJ-43U digital board, also supports digital voice communication (between compatible radios).

A partial feature list includes 100 memory channels, full coverage of the 2-m and 70-cm US ham bands, extended receive capabilities, CTCSS and DCS encode/decode, three scan modes and the ability to work and save in memory any number of "odd split" transmit/receive offsets. A nickel metal hydride (NiMH) battery is standard, and the unit will accept and operate on a wide range of input voltages from 6 to16 V dc. A theft alarm and experimental "mosquito repelling sound" are among the rig's unique features.

The digital module uses the open ITU-TV.32 protocol and produces unencrypted GMSK direct-frequency modulation (which can be received by any compatible receiver).

Price: $302 (MSRP). For more information, see your favorite Amateur Radio products dealer or point your Web browser to **www.alinco.com/usa/**.

PSK31 KIT RADIOS FOR 30 AND 40 METERS FROM SMALL WONDER LABS

◊ Based on the popular PSK-20 3-W, 20-meter data transceiver, Small Wonder Labs is now shipping 30 and 40-meter versions of the crystal-controlled PSK31 kit radio, the PSK-30 and PSK-40, respectively. Frequency coverage of the entire line is 14.0695 to 14.073 MHz (PSK-20), 10.1385 to 10.131 MHz (PSK-30), and 7.070 to 7.074 MHz (PSK-40)—the PSK31 "sweet spots" for each band.

The kits, designed by Dave Benson, K1SWL, are easy to assemble and require winding only four toroids. No special test equipment is needed, and all connections are made to the circuit board (no complicated wiring harnesses). All require 12-15 V dc power and a 75-MHz Pentium-class PC (or newer running *Windows* 95 (or later) and a 16-bit sound card (used by *DigiPan* to encode/decode PSK31 audio tones). *DigiPan* is available for download at **members-http-1.rwc1.sfba.home.net/hteller/digipan/**.

Price: $100 each. A special enclosure, panels and additional hardware cost $30. For more information on Small Wonder's entire lineup, point your Web browser to **smallwonderlabs.com/**.

FLEXIBLE, MINIATURE TRIAXIAL VIDEO CABLE FROM NEMAL

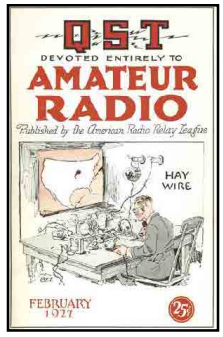
◊ Despite its small, 6-mm diameter, Nemal's new flexible, miniature triaxial video cable has low loss characteristics and a high degree of shielding effectiveness. Available in a wide variety of colors, the 75-ohm Model 1839 video cable is suitable for analog or digital applications and is available in 1000-foot rolls or custom-terminated assemblies. The outer jacket resists oil and abrasions, and the cable features a reasonable loss figure of 1.6 dB per 100 feet at 10 MHz. Nemal also makes a complete line of compatible connectors.

For prices and additional information, contact Nemal Electronics at 12240 NE 14th Ave, North Miami, FL 33161; tel 305-899-0900, fax 305-895-8178, **info@nemal.com**, **www.nemal.com**.

Previous New Products QST

75, 50 AND 25 YEARS AGO

February 1927



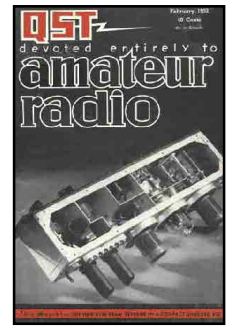
◊ The cover art by Clyde Darr, 8ZZ, shows a "Hay Wire" ham station. The editorial points out that the federal government favorably notices Amateur Radio.

In Part 3 of "How Our Tube Circuits Work," Bob Kruse explains the Colpitts circuit. The Old Man again shares his thoughts, this time complaining about "Rotten Reasons." John Clayton tells about "A D.C.-A.C. Crystal-Controlled Transmitter." Alpha Learned, 1AAU, describes "A Compact Receiver." "A New Radio Circuit," by Robert Marriott, explains the new Loftin-White circuit for interstage transmitter coupling. "On Top of the World—nc5GHO" tells about the small outpost of civilization at Ponds Inlet, near the North Pole, where Constable M. Tidbury of the RCMP has gone to great effort to put a battery-powered ham station on the air. G. H. Browning and R. S. Briggs describe "An Airplane Transmitter."

February 1952

◊ The cover photo shows a rig with extensive shielding and TVI-reduction circuitry. The editorial reports that the FCC has released proposed rules for the new Radio Amateur Civil Emergency Service.

George Grammer, W1DF, tells about "Painless Shielding for the Plug-in Coil Transmitter-Exciter." "A Radio-Control System for Models," by Harry Lawson, W2TTZ, describes his proportional-control R/C system. Keith Williams, W6DTY, tells how he cured his interference problems, in "TVI Went That-away, or I'm Back in the Hamshack Again." Laurence LePage, W3QCV, describes "A Battery-Operated 2-Meter Portable Station." Fred Gemmill, W2VLQ, tells about "Simplified Adjustment of the T and Gamma Matches."



"W2ZXM/mm—'Captain Stay-Put'" tells how Captain Henrik Kurt Carlsen saved his ship, the *Flying Enterprise*, using a battery-powered ham station to communicate with approaching rescuers. By Goodman, W1DX, discusses "How to Wire a Transmitter." Yardley Beers, W2AWH, considers the influence of the antenna, in "The Wavelength Factor." George Gabert, W9JM, describes "A Mobile Installation for 10 and 11 Meters," which uses military surplus equipment.

February 1977

◊ The cover montage shows how "Headquarters expands to meet Amateur Radio Service needs." The editorial asks readers to write and offer opinions of how bad the amateur TVI/RFI problem *really* is.

"TVI Sleuths at Work," by Ed Harrington, DJ0MW/W1JEL, tells "how interference is handled in the land where radio was born." Tony Mula, K6QIC, adds an amplifier, "Codzila 1," to his Tuna-Tin 2, raising his input from 350 mW to 3.5 watts! "Inexpensive Traps for Wire Antennas," by J. R. Mathison, WB9OQM, helps the budget-minded ham build a multi-band antenna. Doug DeMaw, W1FB, presents Part 2 of "Understanding Linear ICs." Paul Argo, Jay Hill, Robert Rose, K6GKU, and Michael Gannis examine 300 years of sunspot cycles, in "Radio Propagation and Solar Activity." Joe Lynch, WA6PDE, discusses various predictions about the next sunspot cycle, in "Cycle 21—Four Divergent Views." J. R. Sheller, WA8ZDF, developed a "TR-4C Outboard Receiver Modification." Jon Harder, W1GVN, describes "A Control System for Your Station: Simple and Economical." R.S.N. Rau, VU2CX, modernizes a WW II surplus frequency meter, in "Solid-State BC-221 Frequency Meter." If you need a little more oomph in your 440-MHz signal, you can "Build This Solid-State PA for 440 MHz," says Rick Olsen, WA7CNP. Wayne Overbeck, K6YNB, tells about his "Moonbounce Boondoggle." Charles Harris, WB2CHO, describes DX contesting from the other side, in "Portable Victor Papa Nine," and also co-authors, with James Kearman, WA1WVK, Part 2 of "Getting to Know OSCAR—from the Ground Up." Assistant General Manager David Sumner, K1ZZ, tells how "The U.S. WARC Position Begins to Take Shape." Communications Manager George Hart, W1NJM, commemorates 40 years of HQ station W1AW, in "Happy Birthday, W1AW!" Rosalie Cain, WA1STO, tells how ham clubs can raise their meeting attendance, in "Next Month Is Auction Night."

QST

Al Brogdon, W1AB ♦ Contributing Editor

W1AW Schedule

PACIFIC	MTN	CENT	EAST	MON	TUE	WED	THU	FRI
6 AM	7 AM	8 AM	9 AM		FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
7 AM-1 PM	8 AM-2 PM	9 AM-3 PM	10 AM-4 PM	VISITING OPERATOR TIME 12 PM - 1 PM CLOSED FOR LUNCH)				
1 PM	2 PM	3 PM	4 PM	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
2 PM	3 PM	4 PM	5 PM	CODE BULLETIN				
3 PM	4 PM	5 PM	6 PM	TELEPRINTER BULLETIN				
4 PM	5 PM	6 PM	7 PM	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
5 PM	6 PM	7 PM	8 PM	CODE BULLETIN				
6 PM	7 PM	8 PM	9 PM	TELEPRINTER BULLETIN				
6:45 PM	7:45 PM	8:45 PM	9:45 PM	VOICE BULLETIN				
7 PM	8 PM	9 PM	10 PM	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
8 PM	9 PM	10 PM	11 PM	CODE BULLETIN				

W1AW's schedule is at the same local time throughout the year. The schedule according to your local time will change if your local time does not have seasonal adjustments that are made at the same time as North American time changes between standard time and daylight time. From the first Sunday in April to the last Sunday in October, UTC = Eastern Time + 4 hours. For the rest of the year, UTC = Eastern Time + 5 hours.

♦ **Morse code transmissions:**
Frequencies are 1.818, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675 and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 10, 13 and 15 wpm.
Fast Code = practice sent at 35, 30, 25, 20, 15, 13 and 10 wpm.
Code practice text is from the pages of *QST*. The source is given at the beginning of each practice session and alternate speeds within each session. For example, "Text is from July 1992 *QST*, pages 9 and 81," indicates that the plain text is from the article on page 9 and mixed number/letter groups are from page 81.

Code bulletins are sent at 18 wpm.

W1AW qualifying runs are sent on the same frequencies as the Morse code transmissions. West Coast qualifying runs are transmitted on approximately 3.590 MHz by K6YR. See "Contest Corral" in this issue. At the beginning of each code practice session, the schedule for the next qualifying run is presented. Underline one minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any) and complete mailing address. Send a 9×12-inch SASE for a certificate, or a business-size SASE for an endorsement.

♦ **Teleprinter transmissions:**
Frequencies are 3.625, 7.095, 14.095, 18.1025, 21.095, 28.095 and 147.555 MHz. Bulletins are sent at 45.45-baud Baudot and 100-baud AMTOR, FEC Mode B. 110-baud ASCII will be sent only as time allows.
On Tuesdays and Fridays at 6:30 PM Eastern Time, Keplerian elements for many amateur satellites are sent on the regular teleprinter frequencies.

♦ **Voice transmissions:**
Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59 and 147.555 MHz.

♦ **Miscellanea:**
On Fridays, UTC, a DX bulletin replaces the regular bulletins.
W1AW is open to visitors from 10 AM until noon and from 1 PM until 3:45 PM on Monday through Friday. FCC licensed amateurs may operate the station during that time. Be sure to bring your current FCC amateur license or a photocopy.
In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.
Headquarters and W1AW are closed on New Year's Day, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving and the following Friday, and Christmas Day.

CONTEST CORRAL

Feedback

In the **2001 Field Day** the **Smoky Mountain ARC W4OLB** (5A TN) call sign was reported incorrectly.

In the **2001 ARRL International DX Phone** contest, the entry of **W1FJ** was omitted from the Multioperator Unlimited category. Their score of 6,478,680, 4153 Qs and 520 multipliers places them in 10th place among W/VE entries.

In the **2001 June VHF QSO Party** results, **WA8RJF** was reported incorrectly as High Power when they were actually Low Power. This contest was the first time that the new VHF/UHF contest log processing software was used. While the majority of logs processed resulted in no errors, we did find an error with the final score from several logs. This problem has been corrected for future results and we apologize for the errors. The score corrections include: **WA2HFI**, MN, 31,376 points, 208 Qs, 106 mults; **K8RS**, EPA, 8,272 points, 160 Qs, 44, mults; **K0MHC**, MN, 30,393 points, 179 Qs, 99 mults; **KB3AFT**, 2,727, 82Qs, 27 mults; and **N0SPP**, IA, 2,242 points, 56 Qs and 38 mults. **N7ROJ** submitted his log as a Single Operator but was in fact a Rover. The summary of **N6ZE** did not include the ARRL Section for his Rover operation. He was in the Alaska section in the Pacific Division.

W1AW Qualifying Runs are 7 PM EST Friday, February 1 and 4 PM EST Tuesday, February 19. The K6YR West Coast Qualifying Run will be at 9 PM PST Wednesday, February 13. Check the W1AW Schedule for details.

Abbreviations: SO—Single-Op; M2—Multiop-2 Transmitters; MO—Multi-Op; MS—Multi-Op, Single Transmitter; MM—Multi-Op, Multiple Transmitters; AB—All Band; SB—Single Band; SPC—State/Province/DXCC Entity; HP—High Power; LP—Low Power; Entity—DXCC Entity.

There is no contest activity on the 30, 17 and 12-meter bands.

Jan 19

070 Club PSKfest—sponsored by the Penn-Ohio DX Society (PODXS), from 0000-2400Z Jan 19. Frequencies are 80-10 meters, use common digital frequencies, PSK-to-PSK only, no repeaters. Categories are SOAB-QRP (<5 W), SOAB-Med Power (<50 W), SOAB-QRP (<100 W), and SOSB-QRP. Exchange RST, serial number and SPC. Scoring is QSOs×SPC (count once only). For more information, see **members.aol.com/n3dqu/070_pskfest.htm**. Logs must be e-mailed (preferred) or postmarked by Feb 19 to **spdomingue@aol.com** or by mail to Steve Dominguez, N6YIH/7, 070 Club PSKfest, 5657 Elkhorn Ave, Boise, ID 83705-2817.

Feb 1-3

Vermont QSO Party—CW/Phone, sponsored by the Central Vermont Amateur Radio Club, 0000Z Feb 2 to 2400Z Feb 3. Frequencies: 160-10 meters and VHF/UHF; CW—40 kHz up from band edge (20 kHz Novice/Tech bands), Phone—lowest 25 kHz of the General privileges and entire Novice/Tech 10-meter band, VHF—SSB-50.200 and 144.200 MHz, FM-146.49 and 146.69 MHz. SOAB, MO, Club, and Rover categories, no time limit. Exchange RST and SPC, Vermont stations send RST and county abbr. QSO Points: CW or digital-2 pts, phone—1 pt, work each station once per mode. Score is QSO points×total counties in VT/NH/ME+SPC+ Vermont club stations, multipliers count only once. For more information and list of club stations, **www.ranv.org/vtqso.html**. Logs must be postmarked by Mar 1 to Bob DeForge, K1HKI, QSO Party Coordinator, Vermont QSO Party, Central Vermont Amateur Radio Club, 1607 East St, Brookfield, VT 05036.

New Hampshire QSO Party—CW/Phone, sponsored by the ARRL of New Hampshire, 0000Z Feb 2 to 2400Z Feb 3. Frequencies: CW-1.810, 3.535, 7.035, 14.035, 21.035, 28.035 MHz, phone-1.875, 3.935, 3.950, 7.235, 14,280, 21.380, 28.390 MHz—no repeaters. SOAB and MOAB-QRP (<5 W), -LP (<150 W), -HP. Operate max 24 hours with off times of at least 15 minutes marked in log. Exchange RST and SPC (DX stations send RST and serial number), NH stations send RST and county. QSO Points: CW or digital—2 pts, phone—1 pt, work stations once per band and mode. Multipliers: NH stations—SPC (only 1 Entity multiplier), non-NH stations—NH counties. For more information, **www.nhradio.org/nh-qso**. Logs must be emailed or postmarked by Mar 31 to **arrl@nhradio.org** or to NH-ARRL, POB 119 Goffstown, NH 03045-0119.

Minnesota QSO Party—CW/Phone, co-sponsored by several groups, 1400-2359Z Feb 2. Frequencies: 1.810, 3.550 (3.695), 7.050 (7.110), 14.050, 21.050 (21.150), 28.050 (28.150), 50.050 MHz; SSB—1.870, 3.890, 7.230, 14.290, 21.390, 28.420, 50.150 MHz. Categories: SO-QRP (<5 W), -LP (<150 W), -QRO, MS, Mobile/Portable, SO-VHF, SO-8 hours max. Exchange serial number and MN county or SPC. QSO Points: SSB—1 pt, CW—2 pts. Score is QSO points × MN counties (87 max, count each only once), MN stations multiply by MN counties plus States and Provinces. For more information-**www.radist.net/mnqsorules.htm**. Logs must be emailed or postmarked by Mar 15 to Sean Warner, K0XQ, 3385 178th Ave NW, Andover, MN 55304.

Ten-Ten International Winter Phone QSO Party, sponsored by Ten-Ten International, 0000Z Feb 2 until 2400Z Feb 3, 10 meters only. Exchange call/name/state and 10-10 number (if a member). QSO Points: nonmembers—1 pt, members—2 pts. Score is total points. Send logs by Feb 18 to Gateway Chapter c/o Don Ward, W0RTV, 4514 Ferrer Dr, St Louis, MO 63129-3741.

North American Sprint—Phone, sponsored by the *National Contest Journal*, 0000Z-0400Z Feb 3. (CW is Feb 10.) Frequencies—3.850, 7.225, 14.275 MHz, work stations once per band. North American stations work everyone; others work NA stations only. Exchange other station's call, your call, serial number, name, SPC. QSY rule: Stations calling CQ, QRZ, etc, may only work one station in response to that call; they must then move at least 1 kHz before working another station or 5 kHz before soliciting another call. Once you are required to QSY, you may not make a new QSO on the previous frequency until you have made a contact at least 1 or 5 kHz (as required) away. (see **www.contesting.com/articles/198** for beginner's guide) Score is QSOs×SPC (count each only once). For more information, **www.ncjweb.com**. Logs must be emailed or postmarked within 30 days to **ssbsprint@ncjweb.com** or to Jim Stevens, K4MA, 6609 Vardon Ct, Fuquay-Varina, NC 27526.

XE International RTTY Contest, sponsored by FMRE, 1800Z Feb 2-2400Z Feb 3. Use RTTY frequencies on all HF bands, SOAB category only. Exchange RST and serial number or XE state/district. QSO Points: within own country—2 pts, DX—3 pts, XE stations—4 pts. Score is QSO points×XE states+DX entities from each band. For more information-**www.fmre.org.mx**. Logs must be emailed or postmarked by Mar 4 to **xe1j@ucol.mx** or Jose Levy, XE1J, Dirección de Concursos FMRE, Clavel 333, Colima, Col 28030, MEXICO.

FYBO (Freeze Your B____ Off) Winter QRP Field Day—CW, sponsored by the AZ ScQRPions 1400Z Feb 2-0200Z Feb 3. Use QRP calling frequencies on HF bands, work stations once per band. Categories are SO, MO, and Novice/Tech—indicate home or field. Exchange RST, SPC, name, power, and temperature in deg F at operating position. Score is total QSOs×SPC (counted only once)×Temperature multiplier ×4(if field location)×2 (if alternative pwr)×2 (if QRP). Temp. mult-65+ ×1, 50-64 ×2, 40-49 ×3, 30-39 ×4, 20-29 ×5, <20 ×6. For more information, **www.extremezone.com/~nk7m**. Logs must be postmarked by Mar 3 to Joe Gervais, AB7TT, PO Box 5010, Peoria, AZ 85385.

Feb 2-4

Delaware QSO Party—CW/Phone, sponsored by the First State ARC (FSARC), 1700Z Feb 2 to 0500Z Feb 3 and 1300Z Feb 3 to 0100Z Feb 4. Frequencies: CW-1.825 3.550 7.050 14.050 21.050 28.050 MHz; Phone-1.860 3.960 7.260 14.260 21.360 28.360 MHz, Novice & Technician: 25 kHz above the subband edge. One class for all entries, no time limit. Exchange RST and SPC, Delaware stations send RST and county. QSO Points: CW/RTTY/digital—2 points, phone—1 pt, work each station once per band and mode (CW/RTTY/digital are separate modes). Score is total of QSO Points (no multiplier). For more information, **www.fsarc.org**. Logs must be emailed or postmarked by Mar 11 to **QSOparty@fsarc.org** or Contest Chairman-FSARC, Inc, PO Box 1050, Newark, DE 19715.

Feb 9-10

North American Sprint, CW 0000Z-0400Z, Feb 10 (see Feb 3). Frequencies—3.540, 7.040, 14.040 MHz. Logs to **cwsprint@ncjweb.com** or Boring ARC, 15125 Bartell Rd, Boring, OR 97009.

Utah QSO Party/Olympics QSO Party—CW/Phone, sponsored by the Utah DX Club, 0000Z Feb 9 until 0000Z Feb 11. Frequencies—all HF bands, CW—1.805 MHz and 40 kHz from band edge (CW QSOs in CW subband, except 160 meters), phone—1.850 3.850 7.230 14.250 21.300 28.450 MHz, 6 and 2 meters. Categories are SOAB, MSAB and mobile, 24-hr time limit for SO. Exchange RST, serial number and UT county or SPC. Work stations once per band/mode, work mobile stations again as they change counties. Mobile on county line counts for 1 QSO but multiple counties. QSO Points: phone-1 pt, CW-2 pts. Score: QSO points × UT counties (max 29) or States + VE sections. For more information, **www.vcr.com/uqp**. Logs must be sent via email to **uqp@vcr.com**.

RSGB 1.8 MHz Contest—CW, sponsored by RSGB 2100Z Feb 9-0100Z Feb 10 (see Feb 23-24 for RSGB information).

Asia-Pacific Sprint—CW, sponsored by the AP Sprint Contest Committee, 1100-1300Z Feb 9. Frequencies: 20 and 40 meters, NA stations work Asia-Pacific countries only. SO category only, 150 W max power. Exchange RST and serial number. Score is total QSOs × WPX prefixes (counted once). For more information, **jsfc.org/apsprint/aprule.txt**. Logs must be emailed (no paper logs) within 7 days following the contest to **apsprint@kkn.net**.

FISTS CW Winter Sprint—CW, sponsored by FISTS International CW Club, 1700Z until 2100Z Feb 9. Frequencies: 80-10 meters, work US/VE stations, once per band. Categories—SOAB-QRP (<5 W), SOAB-QRO and Club. Exchange name, RST, state/province/DXCC country; members send FISTS number, nonmembers send power output. QSO Points: FISTS members—5 pts, nonmembers-2 pts. Score is QSO points × SPC (count each only once). For more information, **www.FISTS.org**. Send *paper logs only* within 30 days to Alan M. Tanner, W8FAX, 1525 Trebein Rd, Fairborn, OH 45324.

Classic Exchange—CW/Phone, 2000Z Feb 9 to

H. Ward Silver, N0AX ♦ 22916 107th Ave SW, Vashon, WA 98070 ♦ n0ax@arrl.org

0500Z Feb 10. Frequencies: CW: 3.545 (3.695), 7.045 (7.120), 14.045, 21.135, 28.180 MHz; Phone: 3.880, 7.290, 14.280, 21.380, 28.320 MHz. Exchange name, RST, SPC and radio model. Work stations on each band and mode or with different radios. Score is QSOs×total of different rcvrs, xmtrs, or xcvrs+SPC from each band and mode×total age of all equipment used for 3 QSOs or more (count xcvr age × 2 and homebrew equipment counts as 25 years old, min) Send logs to Allan Stephens, N5AIT, 106 Bobolink Dr, Richmond, KY 40475 or **al.stephens@.eku.edu**.

QRP ARCI Winter Fireside SSB Sprint, sponsored by the QRP ARCI, 2000-2400Z Feb 10. Frequencies—3865, 7285, 14285, 21385, 28385 kHz. (See Dec *QST*, p 98, for QRP ARCI information.)

Feb 8-11

Winter 6-Meter Contest—CW/Phone, sponsored by the Six Club, 2300Z Feb 8-0300Z Feb 11. Exchange RST and grid square. QSO Points: 1 pt in same country, DX (incl. KL7 and KH6)—2 pts. Score is QSO points×grid squares. For more information—**6mt.com/contest.htm**. Logs must be emailed or postmarked by Mar 15 to **ka0nno@arkansas.net** or Sixclub, PO Box 307, Hatfield, AR 71945.

Feb 11-16

School Club Roundup; see Jan *QST*, p 115.

Feb 16-17

ARRL International DX Contest, CW. See Dec 2001 *QST*, p 113.

YL International QSO Party—CW, sponsored by YL International SSB System, 0000Z Feb 16 through 2400Z Feb 17, two 6-hr off times required. Frequencies—160 through 10-meters, no repeaters. Categories: CW, SSB, or mixed mode, SOAB, YL/OM Team, DX/US Team. Exchange: Call sign, RST, State, County, YLISSB member number [if applicable]. QSO Points—YLISSB members on own continent—2 pts, on other cont.—6 pts; DX members—3 pts, non-members—2 pts. QSO party points may *not* be made on the YL net frequency of 14.332 MHz. Score is QSO Points×SPC+Teams. For more information, **www.qsl.net/yl-issb/**. Logs must be emailed or postmarked by Apr 30 to **2hamsrus@home.com** or to N4KNF/N4ZGH, 2160 Ivy St, Port Charlotte, FL 33952.

Feb 23-25

CQ WW 160-meter SSB Contest (see Jan *QST*, p 107).

REF French Contest, phone (see Jan *QST*, p 107).

UBA Contest, CW (see Jan *QST*, p 107).

CQC Winter QSO Party—CW/Phone, sponsored by the Colorado QRP Club, 2200Z Feb 24 to 0359Z Feb 25. Frequencies: CW-1825, 3560, 3710, 7040, 7110, 14060, 21060, 21110, 28060, 28110 kHz, SSB-1910, 3985, 7285, 14285, 21385, 28385 kHz. Categories are SOAB, SOSB, SO-Homebrew, no time limit. Exchange RST, SPC, name, CQC member number or power output (5W max). QSO Points: CW—CQC member—6 pts, non-member-4 pts, phone—members—3 pts, non-members—2 pts, work each station once per band and mode. Score is total of QSO Points × SPC (count once per band) X names (one name from each letter of the alphabet) + 1000 pts for QSO with W0CQC. For more information, **www.mtechnologies.com/cqc/**. Logs must be emailed or postmarked within 30 days to **contest@cqc.org** (ASCII text only) or Colorado QRP Club, Box 371883, Denver, CO 80237-1883.

North Carolina QSO Party—CW/Phone, sponsored by the Forsyth Amateur Radio Club, 1700Z Feb 24-0300Z Feb 25. Categories—SO, Mobile, Club, no time limit, all stations 100 W max output. NC stations work everyone; others work NC stations only. Frequencies: CW—3.540, 3.740, 7.040, 7.140, 14.040, 21.040, 21.140, 28.040, 28.140 MHz; phone—3.860, 7.260, 14.260, 21.360, 28.360 MHz and any VHF/UHF—CW/SSB only; no FM, repeater or crossband/mode QSOs. Work stations once per band and mode; mobiles may be worked again as they change counties. Exchange RST and NC county or SPC. QSO Points: phone—2 pts, CW—3 pts, NC mobile—3 pts (either mode). Score: NC stations-QSO points×NC counties+SPC (only 1 DX multiplier); others-QSO points×NC counties (max 100). Add to score—50 bonus points for working Cherokee or Dare counties (150 for working both) and 50 points for working W4NC or K4EG (150 points for both). Mobiles add 100 bonus points for each NC county activated. For more information, **www.w4nc.org/ncqsoparty.html**. Logs must be emailed or postmarked by April 1 to **n4vhk@summitschool.com** or NC QSO Party, c/o N4VHK, 934 Franklin St, Winston-Salem, NC 27101. QST

SPECIAL EVENTS

Pasco, WA: Pasco Washington Olympic Torch Committee, W7P. 1200Z **Jan 24** to 1200Z **Jan 26**. Commemorating Day 51 of the Olympic Torch Relay. 21.040 14.040 7.040 3.540. Certificate. WA7CS, 4102 Meadowsweet St, Pasco, WA 99301.

Boise, ID: Voice of Idaho, W7BOI. 1600Z **Jan 25** to 2400Z **Jan 26**. Olympic Torch Relay through Boise, ID. 28.380 14.239 7.225. QSL. Richard Dees, 22765 W Sandalwood Dr, Meridian, ID 83642.

Dade City, FL: East Pasco Amateur Radio Society, K4EX. 1300Z to 2200Z **Jan 26**. Commemorating the Kumquat from the Kumquat Capital. 28.450 21.340 14.250 7.245. Certificate. EPARS Special Event, PO Box 942, Dade City, FL 33526.

San Diego, CA: Challenger Middle School ARC, KI6YG. 1500Z to 2400Z **Jan 28**. Commemorating the 16th Anniversary of the Challenger Tragedy. 146.52 28.350 21.350 14.250. QSL. Frank Forrester, KI6YG, Challenger Middle School, 10810 Parkdale Ave, San Diego, CA 92126.

Tawas City, MI: ICARE, Iosco County Amateur Radio Enthusiasts, W8P. 1200Z **Feb 1** to 0200Z **Feb 3**. Celebrating the 52nd Year of the Perchville USA Festival on Tawas Bay. 28.350 14.250 7.250 3.950. QSL. ICARE, c/o KB8ZYY, PO Box 271, Oscoda, MI 48750.

Punxsutawney, PA: Punxsutawney Area Amateur Radio Club, K3HWJ. 1400Z to 2100Z **Feb 2**. Commemorating Groundhog Day 2002. 14.240 7.240 7.125. Certificate. Sherman Hollopeter, W3QOS, Box 20 216 E Main St, Big Run, PA 15715.

Saranac Lake, NY: Tri-Lakes Amateur Radio Club, W2C. 1500Z **Feb 2** to 2000Z **Feb 10**. Celebrating the 105th Annual Winter Carnival. 14.257 14.045 7.250 7.045. QSL. Tri-Lakes Amateur Radio Club, Box 95, Saranac Lake, NY 12983. See **home.adelphia.net/~tlarc/news.html** and ad in this issue.

Houghton, MI: Husky Amateur Radio Club W8YY, W8C. 0300Z **Feb 6** to 0300Z **Feb 10**. Celebrating Winter Carnival 2002. 28.365 21.365 14.265 7.265. Certificate. Husky Amateur Radio Club, W8YY EE Dept MTU, 1400 Townsend Dr, Houghton, MI 49931.

Orlando, FL: Orlando Amateur Radio Club, K4H. 1300Z **Feb 7** to 1700Z **Feb 10**. Celebrating 55 years of Orlando HamCation. 28.405 21.275 14.320 7.275. Certificate. Quentin Jones, KU4WD, 1802 Colleen Dr, Orlando, FL 32809.

Washington, PA: Washington Amateur Communications, W3C. 1600Z **Feb 7** to 2000Z **Feb 10**. 2002 Washington County Sportsmen's Show. 28.460 21.375 14.270 7.270. QSL. Ed Oelschlager, N3ZNI, Washington Amateur Communications, 1696 E Maiden St, Washington, PA 15301.

Grantsville, UT: West Desert ARC (W7EO), W7U. 0000Z **Feb 8** to 0000Z **Feb 24**. 2002 Winter Olympic Games. 28.400 21.300 14.250 3.768. QSL. W7EO, PO Box 98, Grantsville, UT 84029.

Myrtle Beach, SC: Grand Strand ARC, W4GS. 1130Z to 1900Z **Feb 9**. Celebrating the 6th Annual Myrtle Beach Marathon. 28.365 21.265 14.265. Certificate. Glen Bowden, 703 Connie Ct, Myrtle Beach, SC 29588-6003.

Chicago, IL: Metro Amateur Radio Club (MAC), K9Y. 1800-0002Z **Feb 9-10** to 1800-2400Z **Feb 10**. The Activation of Chicago Harbor Lighthouse (USA 171). 21.370 21.030 14.270 14.030. QSL. Michael Dinelli, N9BPR, 9423 Kolmar Ave, Skokie, IL 60076-1321. See **www.qsl.net/mac** for times and more information.

Ft Myers, FL: Ft Myers Amateur Radio Club, Inc, W4LX. 1500Z **Feb 11** to 2100Z **Feb 15**. The Edison Festival of Lights and Thomas Edison's Birthday. 28.430 21.330 14.230 7.230. Certificate and QSL. FMARC, PO Box 61183, Ft Myers, FL 33906.

Marquette, MI: Hiawatha Amateur Radio Association, K8LOD. 2000Z **Feb 15** to 2000Z **Feb 17**. Celebrating the 13th running of the UP 200 Sled Dog Championship. 21.300 14.225 7.225 3.850. Certificate. Rich Schwenke, N8GBA, 21 Smith Ln, Marquette, MI 49855.

Alexandria, VA: Mount Vernon Amateur Radio Club, K4US. 1600Z **Feb 16** to 2100Z **Feb 17**. Commemorating George Washington's Birthday. 18.080 14.240 10.110 7.240. Certificate. Mount Vernon ARC, PO Box 7234, Alexandria, VA 22307.

Rapid City, SD: QCWA Dakota Chapter 102, W0DAK. 1500Z **Feb 23** to 0300Z **Feb 24**. Commemorating the 25th anniversary of Chapter 102. 21.375 14.275 7.240 3.889. Certificate. Frank Shaw, W0DAK, 118 E Van Buren, Rapid City, SD 57701.

Round Rock, TX: Cen-Tex Contest Group, WA5DTK. 0001Z **Feb 23** to 2359Z **Mar 6**. Commemorating the siege days at the Alamo. 28.465 21.265 14.265 7.265. QSL. Barry Brewer, WA5DTK, 603 Broken Bow Dr, Round Rock, TX 78681-7401. For more information, e-mail **jbrewer@constant.com**.

Certificates and QSL cards: To obtain a certificate from any of the special-event stations offering them, send your QSO information along with a 9×12 inch self-addressed, stamped envelope to the address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, you must be an Amateur Radio club, and use the ARRL Special Events Listing Form. Copies of this form are available via Internet (**info@arrl.org**), or for an SASE (send to Special Requests, ARRL, 225 Main St, Newington, CT 06111, and write "Special Events Form" in the lower left-hand corner). You can also submit your special event information on-line at **www.arrl.org/contests/spevform.html**. Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; that is, a special event listing for **Apr** *QST* would have to be received by **Feb 1**. Submissions may be mailed (Attn: Maty Weinberg), faxed (860-594-0259) or e-mailed (**events@arrl.org**) to ARRL HQ. QST

Maty Weinberg, KB1EIB ♦ Special Events

By Dan Henderson, N1ND
Contest Branch Manager

2001 ARRL August UHF Contest Results

Because of its small size, the ARRL August UHF Contest features competition and awards on the division level rather than the section level. Outstanding efforts were found in almost every division. The division with the smallest participation rate managed an overall contest category victory. In fact, participants from four different divisions each won one of the overall contest categories. A total of 149 entries were received representing all 15 ARRL divisions and Canada. This represents a 12.4% drop in participation from the year 2000 for this contest.

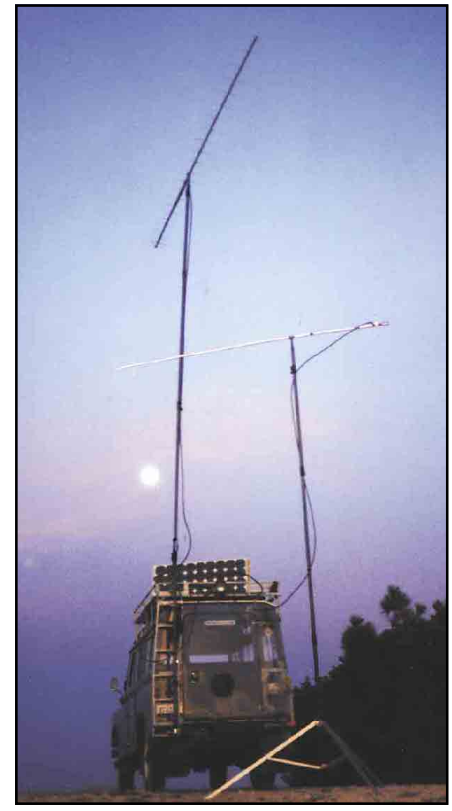
The overall Single Operator Low Power winner was Bob, K2DRH (Hudson division), who took top honors and set a new category scoring record with 84,252 points. Finishing second was Russell, KB8U (Great Lakes division), with a score of 51,798, which also broke the old category mark. The winner of the Single Operator High Power category was Joel, W5ZN (Delta division), who posted a score of 160,602 to beat back the 145,215 point challenge of Jeff, K1TEO (New England division).

Roving in the August UHF contest is a special challenge, especially since the workhorse 6 and 2 meter bands are not included in the event. Gene, N0DQS (Midwest division) was the only rover in 2001 to break the 100k barrier, and easily held off category runner-up Lloyd, NE8I (Great Lakes division), by a score of 100,800 to 45,000. The final overall winner was the perennial category favorite W2SZ (New England division) multioperator team, working from their FN32 QTH in the WMA section. Their score of 614,394 bested the efforts of the WW8M (Great Lakes division) crew in the MI section.

Several close division races highlighted this year's contest. Leonard, N3NGE, and Roger, K2SMN, went head to head in the Atlantic Division Single Operator High Power category. While Roger managed more QSOs and multipliers, Leonard was able to parlay QSOs on the higher-point 3456 and 5760 MHz bands into a victory by a score of 38,472 to 34,800. As with all VHF/UHF contests, the more bands on which you are active, especially in the microwave spectrum, the better your chances of scoring.

The antenna farm of Russ, N3EMF, in White Plains, New York.

The Central division witnessed a good contest between Steve, N9GH, and Rob, N9LAG, in the Single Op Low Power category, with Steve hanging on by a mere 297 points to win the division. Almost as close a finish was the New England division contest in the same category between Tony, W1PM, and Bob, K2HZN. Seven more QSOs and 3 additional multipliers spelled out a 1962 point cushion of victory for Tony. In the Pacific division, Larry, W6OMF, lost the QSO battle to Norman, KC6ZWT, by 3 but won the multiplier battle by 4 to take a 1002 point win—3186 to 2184. Finally in the Southwestern division, John, KE6GFF, using only 432 MHz, was able to fend off a three-band effort by Jerry, K6DYD (operating as WB6DTA), to win the Single Op Low Power category by 972 points—3564 to 2592. Congratulations to all of the participants in each category.



"Red skies at night, Sailor's delight. Red skies in the morning..." Not sure if the old adage held true, but with the sunrise to his back and antennas poised for action, John, KE6GFF, was able to capture this magnificent view of the setting moon and the early morning skies in the Los Angeles area.

As you plan station improvements and development, don't forget to check the ARRL Technical Information Service Web pages devoted to this challenging and exciting part of the hobby. A visit to **www.arrl.org/tis/info/microwave.html** will take you down the road to a wide range of UHF and microwave resources. Whether you are looking for a simple, inexpensive way to experiment in this part of the spectrum, or whether you are looking for specific information to broaden your scope of knowledge, the TIS resources page is the place to start.

Top Ten

Single Operator Low Power

K2DRH	84,252
KB8U	51,798
K0MHC	32,508
WA8RJF	17,400
W1PM	14,364
W7YOZ	13,857
K2MLB	12,600
K2HZN	12,402
N9GH	11,088
N9LAG	10,791

Single Operator High Power

W5ZN	160,602
K1TEO	145,215
KM0T	138,312
N2BJ	112,395
K8TQK	67,626
K1GX	54,834
K2YAZ	52,416
W0GHZ	40,803
N3NGE	38,472
K2SMN	34,800

Multioperator

W2SZ	614,394
WW8M	235,605
WA3UGP	37,800
NU7Z	35,649
N1KAT	8,514
W4EUH	1,785

Rover

N0DQS	100,800
NE8I	45,000
N1JEZ	36,252
W7GHZ	27,864
N2JMH	20,592
N7CFO	18,009
K1DS	13,230
AA7VT	13,122
N2UZQ	10,350
N6DN	8,148

Scores

Each line score lists call sign, score, stations worked, multipliers, entry category (A = Single Operator Low Power, B = Single Operator High Power, M = Multioperator, R = Rover), ARRL/RAC section, and bands (C = 222 MHz, D = 432 MHz, 9 = 902 MHz, E = 1296 MHz, F = 2304 MHz, G = 3456 MHz, H = 5760 MHz, I = 10 GHz. J = 24 GHz, K = 47 GHz, L = 75 GHz, M = 119 GHz, N = 142 GHz, O = 241 GHz, P = 300+ GHz).

Atlantic

N3RN	9,828	62	39	A	EPA	**CD9E**F
W3KM	2,700	29	18	A	EPA	CDE**F**
K3IXD	1,512	34	12	A	MDC	CDE
NT2W	60	5	4	A	NNY	D
N3NGE	38,472	117	56	B	EPA	CD9**EFGH**
K2SMN	34,800	150	58	B	SNJ	**CD9E**F
W2SJ	10,791	58	33	B	SNJ	CD9EFG
NQ2O	8,643	53	43	B	WNY	CD9EF
AA3GM	270	10	9	B	WPA	CD
WA2FGK (K2LNS,op)						
	150	5	5	B	EPA	9E
WA3UGP (+K3YWY, N3LJK)						
	37,800	135	60	M	EPA	CD9EFGHIJ
N2JMH (+ VE3IEY)						
	20,592	91	44	R	WNY	CD9EFGHI
K1DS	13,230	79	30	R	EPA	CD9EFGHL

Central

N9GH	11,088	68	44	A	IL	CD**E**
N9LAG	10,791	98	33	A	IL	**CDE**
K9YR	5,940	66	30	A	IL	CD
NV8V	2,376	36	22	A	IL	D
KB9PJL	1,302	31	14	A	WI	D
K9RQ	819	21	13	A	IN	D
K9IJ	357	17	7	A	IL	CD
KG9PF	108	9	4	A	IL	CD
N2BJ	112,395	217	127	B	IL	**CD9EF**
ND9Z	3,075	32	25	B	WI	CDE
N0AKC	510	16	10	B	WI	CD9
N8KWX	1,512	24	14	R	IL	CDIP
NE9O	1,404	26	18	R	IN	CD
KG9PF/R	180	12	5	R	IL	CD

Dakota

K0MHC	32,508	116	63	A	MN	**CD9EFG**
K0SHF	7,500	69	25	A	MN	CD9EF
W0AUS	5,451	50	23	A	MN	CDE**F**
WB0LJC	3,408	40	16	A	MN	CD9EF
WA2VOI	2,835	39	15	A	MN	CD9EF
W0PHD	1,995	27	19	A	MN	DE
W0GHZ	40,803	124	67	B	MN	**CD9EFG**
W0ZQ	21,000	92	50	B	MN	CD9EF
W0OHU	11,562	69	41	B	MN	**DE**
N0UK	627	14	11	B	MN	C9E
KB0THN	4,158	58	21	R	MN	DE
KB0N	2,754	50	17	R	MN	CDE
W0AMT	432	18	8	R	MN	D

Delta

W5ZN	160,602	166	142	B	AR	**CD9EFGHIJ**

Great Lakes

KB8U	51,798	131	89	A	MI	**CD9EF**
WA8RJF	17,400	75	50	A	OH	CD9EF**GH**
N8XA	9,720	57	40	A	OH	CD9E**I**
N8PVT	8,040	58	40	A	MI	CDE
KC8LGL	1,458	27	18	A	OH	D
K8TQK	67,626	153	102	B	OH	**CD9EFG**
K2YAZ	52,416	115	96	B	MI	CD9EF**GHI**
K8MD	24,180	94	65	B	MI	CD9E
WW8M (WA8VPD,NE8I,WA8HGX,WB8TGY,K9UIF, W9ZIH,ops)						
	235,605	289	139	M	MI	CD9EFGHIJK
NE8I	45,000	162	50	R	MI	CD9EFGHIJK
WB8TGY	3,840	34	16	R	MI	CDEFGI

Hudson

K2DRH	84,252	182	118	A	ENY	**CD9E**
K2MLB	12,600	91	35	A	NNJ	CDE
WB2SIH	4,140	61	20	A	ENY	CDE
W3HHN	3,132	50	18	A	ENY	CD9E
K2RI	528	22	8	A	ENY	CD
W2BEJ	108	9	4	A	ENY	CD
K2OVS	96	8	4	A	NLI	D
AB2IW	72	8	3	A	ENY	D
WA2NXK	63	7	3	A	NNJ	D
WB2IDV	42	7	2	A	NNJ	D
WB2AMU	36	4	3	A	NLI	D
N3EMF	22,908	107	46	B	ENY	**CD9EFGHI**
N2UZQ (+N2TJQ)						
	10,350	75	25	R	ENY	CD9EFHIJ
N2GKM	4,260	60	20	R	ENY	CDE

Midwest

N0JK	144	8	6	A	KS	**C**
KM0T	138,312	184	136	B	IA	**CD9EFG**
K0AZ	4,860	54	30	B	MO	D
W0RT	126	7	6	B	KS	D
N0DQS	100,800	265	80	R	IA	CD9EFG

New England

W1PM	14,364	90	42	A	EMA	**CD9E**
K2HZN	12,402	83	39	A	NH	CD9E
W1BQ	8,352	68	29	A	ME	CD9E**F**
AC1J	1,344	29	14	A	NH	CDE
W1GHZ	810	15	9	A	EMA	**DI**
KB1DFB	693	21	11	A	CT	D
W1XM (KB1CGZ,op)						
	360	12	8	A	EMA	CDE
W1VT	240	8	4	A	CT	DI
N1HL	96	8	4	A	ME	D
K1OYB	36	4	3	A	ME	CD
K1TEO	145,215	277	105	B	CT	**CD9EFGI**
K1GX	54,834	146	74	B	CT	CD9EFG**HI**
AF1T	6,708	50	26	B	NH	CD9EI
W2SZ (WA1ZMS, WA2AAU, WA8USA, +loggers)						
	614,394	568	174	M	WMA	CD9EFGHIJP
N1KAT (+K1ZE, N1DGF)						
	8,514	70	33	M	ME	CD9E
N1JEZ	36,252	135	53	R	VT	CD9EFI
KE3HT	288	7	8	R	WMA	CD9EF

Northwestern

W7YOZ	13,857	59	31	A	WWA	CD**EFHI**
N7DB	180	15	4	A	OR	**CD**
K7HSJ	120	8	4	A	OR	CDE
KK7AT	33	11	1	A	ID	D
KE7SW	16,872	84	37	B	WWA	**CD9EFGH**
N7EPD	12,480	82	32	B	WWA	**CD9EF**
W7DSA	294	14	7	B	OR	CD
NU7Z (+K7ND)						
	35,649	108	51	M	WWA	CD9EFGHIJ
W7GHZ	27,864	146	36	R	EWA	CD9EF
N7CFO	18,009	127	29	R	WWA	CD9EF
AA7VT	13,122	100	18	R	WWA	CD9EFGHI

Pacific

W6OMF	3,186	49	18	A	EB	**CDE**
KC6ZWT	2,184	52	14	A	SV	**CD**
KF6GYM	1,254	33	11	A	EB	CDE
KE6QR	108	9	4	A	EB	D
W6ABW	42	7	2	A	NV	CD
WB6NTL	11,124	85	36	B	SV	**CDE**

Roanoke

K4ZOO	1,539	25	19	A	VA	**CDE**
WF4R	294	14	7	A	VA	**D**
W4FAL	255	17	5	A	NC	D
WN3C	150	10	5	A	VA	D
K4FJW	99	11	3	A	VA	CD
K4QI	26,100	121	60	B	NC	**CDE**
W4RX (W3IY, op)						
	21,714	103	47	B	VA	CD9EF**GHI**
W3IY	7,728	48	28	B	VA	CD9EF**HI**
W4DEX	4,131	31	27	B	NC	CD9EFGI
W4SW	576	8	6	R	VA	FHI

Rocky Mountain

W6OAL	6,900	57	25	B	CO	**CD9EI**
KB5ZSK	117	11	3	B	NM	CDE
N0IO (+K5RHR)						
	6,222	67	17	R	CO	CD9EI

Southeastern

K0VXM	693	19	7	A	SFL	**CD9FI**
W4AZR	300	7	5	A	SFL	CD9**FI**
KU4WW	264	11	8	A	AL	**CD**
W4OZK	144	7	6	A	AL	**DE**
WP4LNY	12	4	1	A	PR	D
W4ZRZ	5,376	47	32	B	AL	**CDE**
W4EUH	1,785	35	17	M	GA	CD
K4SZ	3,960	39	24	R	GA	CD9EF

Southwestern

KE6GFF	3,564	99	12	A	LAX	**D**
WB6DTA (K6DYD,op)						
	2,592	43	18	A	ORG	**CDE**
K6JEY	504	16	7	A	LAX	**DEI**
N6ZE	264	10	8	A	SB	CDE
W9EC	234	10	6	A	SB	CDE
W6IST	180	10	6	A	LAX	CD
KE6RCI	81	9	3	A	SB	D
N7IR	72	6	4	A	AZ	D
K6TSK	17,328	130	38	B	ORG	**CDE**
N6DN (+W6KK)						
	8,148	90	28	R	ORG	CDE
KC6UIX (+W6AT)						
	1,260	27	14	R	ORG	CDE
KQ6EE	870	27	10	R	LAX	CDE
AD6AF	264	11	8	R	LAX	D
KE6GFI	105	7	5	R	ORG	D

West Gulf

KM5OL	702	26	9	A	NTX	**CD**
KI5DR	90	6	5	A	STX	D
WO7GI	60	5	4	A	OK	CD
WH6LR	18	3	2	A	OK	D

Canada

VE4KQ	5,712	46	34	A	MB	**CD9E**
VE3OIL	2,394	28	21	A	ON	**CD9EF**
VE3SMA	2,394	29	21	A	ON	CDEF
VE3KZ	648	18	12	A	ON	D
VE3BFM	4,998	42	34	B	ON	**CD9E**

Checklogs: AA9KH, K9KL, KC7WUE, KD5GAQ, KE6TDP, KU4IU, WA3ZKR

STRAYS

QST congratulates . . .

75 Year Members

Edmond Lar Rieu, W6BEM, Sacramento, CA
Charles Scholten, W9BZU, Manitowoc, WI

70 Year Members

Laurence Stein, Jr, W1BIY, Hingham, MA
Frederic Albert, Jr, W1QP, Ft Myers, FL
Samuel Johnson, Jr, W6BS, Escondido, CA
Stanton Allison, W0IB, St Paul, MN

60 Year Members

Julius Hoffer, W1DL, Framingham, MA
Edward Mazuronis, W1HNF, Kensington, CT
Joseph Duffin, W2ORA, Moorestown, NJ
William Leavitt, W3AZ, Accokeek, MD
W. P. Sides, W4AUP, Montgomery, AL
James Miller, W4JR, Rockford, IL
Gene Sykes, W4OO, West Palm Beach, FL
Bertram Green, KN4OU, Lake Worth, FL
John Matthews, W4OWJ, Palm City, FL
Richard Stevens, AK4T, Columbus, GA
J. A. Fulmer, W4YF, Ponte Vedra Beach, FL
Ulis Tucker, W4YRK, Auburndale, FL
Robert Blair, K5AY, Richardson, TX
Richard Blanchard, Jr, W6AG, Escondido, CA
Oswald Villard, Jr, W6QYT, Palo Alto, CA
Fred Linn, W9NZF, West Bend, WI
Carroll DeGroff, W9OLY, South Bend, IN
Wilbur Goll, W0DEL, Shawnee, KS
Delton Patterson, W0JCY, Wichita, KS
Robert Hempy, W0KOW, South St Paul, MN
Francis Saltus, N0OO, Crestview, FL
Alexander Muggli, W0ZTL, Glen Ullin, ND

50 Year Members

Robert Enemark, W1EC, Duxbury, MA
Chester Lech, W2DPR, Hicksville, NY
Frederick Holler, Jr, W2EKB, Cherry Hill, NJ
Henry Wemple, W2EQO, Spring Hill, FL
Richard Sobus, W2LR, West Melbourne, FL
Thomas Bright, W2OHI, Citrus Springs, FL
Wilbur Fulton, W2SE, West End, NC
Cornelius Auletto, W2VPY, Huntington, NY
Ernest Farkas, K3CBW, Frederick, MD
F. Allan Herridge, G3IDG, Hampshire, England
Roger Colvin, W3PWH, Elizabethtown, PA
Jerome Layfield, W4GIO, Fortson, GA
H. Wm Bardenwerper, MD, K4JWP, Louisville, KY
Sam Hunt, K4LE, Naples, FL
Edgar Bigbie, W4MMQ, Richmond Hill, GA
Grady Fonville, W4ONM, Greensboro, NC
Roger Crabill, W4PNK, Winter Haven, FL
Richardson Phelps, Jr, N4RP, Delray Beach, FL
Alfred Leonard, W4RXG, Winston Salem, NC
Hugh Pulliam, W4SEM, Ft. Myers, FL
Charles Williams, W4UV, Jacksonville, FL
James Campbell, W4YFN, Huntsville, AL
William Felder, W6DCP, Corcoran, CA
John Lewis, W6HIA, Auburn, CA
Jerry Fuller, W6JRY, Forest Ranch, CA
Frank Binkley, W6SRT, Claremont, CA
Kenneth Zadwick, NE6Y, Vallejo, CA
Donald Rose, W7JPH, Seattle, WA
Jack Norman, W7LDZ, Mt Vernon, WA
Charles Ziegler, W8RV, Columbus, OH
Eugene Ballard, W9SFU, Brownsburg, IN
James McCoy, W0LQV, Overland Park, KS
Rex Miller, W0VGX, Satanta, KS

Previous Strays

SECTION NEWS

The ARRL Field Organization Forum

ATLANTIC DIVISION

DELAWARE: SM, Randall Carlson, WB0JJX—Where did everybody go! I was driving around town last weekend on some errands. So I turned on the radio in the car and tuned to several of the local repeaters—dead quite. 2 meters, 440, 222, didn't matter—dead quite. Even after announcing my call sign—dead quiet. I quickly realized there is nothing sadder than a ham with no one to talk to. Imagine the new ham in the same situation. No wonder folks give up the hobby. I also realized that I am just as bad about this as everyone else. We all have major pressure in our lives that pull us in all different directions for very valid reasons. I certainly spend less time on the air than I did just a couple years ago. I am sure as you read this you all are coming up with a whole bunch of reasons as well. I can write about what we should do, and what we would be nice to do, but it's going to be the individual who must decide how much time he can devote to the hobby. In the end, the only person's habits we can really change is our own. For my part, I am going to make my New Year's Resolution to spend more time on the local repeaters. I hope you will join me in doing the same. Traffic (Nov) DTN: QNI 190 QTC 14 in 22 sess, DEPN: QNI 37 QTC 2 in 4 sess. K3JL 27.

EASTERN PENNSYLVANIA: SM, Eric D. Olena, WB3FPL — SEC: Michael O. Miguelez, N3IRN. ACC: Steve Maslin, N3ORH. BM: Fredric Serota, K3BHX. OOC: Alan Maslin, N3EA. PIC: Robert Josuweit, WA3PZO. STM: Paul Craig, N3YSI. SGL: Allen Breiner, W3ZRQ. TC: Lawrence Thomas, AA3PX. ASMs: Robert Josuweit, WA3PZO, Pietro DeVolpi, K3PD. Dave Heller, K3TX, George Law, N3KYZ, Harry Thomas, W3KOD. DXCC Card Checker E. Pa.: Glenn Kurzenknabe, K3SWZ. The first WCAU-TV 10 Family TechFest is now history. We spent December 1st and 2nd talking to quite a few people at the Pennsylvania Convention Center in Philadelphia. The number of people that were active Hams was a small percentage of the crowd. The number of people that we talked to I will not try to estimate. The best way to put it is that the four of us on Saturday and the six of us on Sunday did not have a whole lot of inactive time. The rewarding aspect of the entire time that we were there was talking to so many people who knew very little about Amateur Radio but were genuinely interested in what the hobby had to offer. Without a doubt all of this would not have gone very well at all, if it had not been for the outstanding Ham volunteers who helped to man the tables. Alfred T. Tribble, W3STW, is a very special person who kept many people glued to his end of the table where he explained his satellite display and then went on to point them towards getting started properly in Amateur Radio. Al's experience as a volunteer at the Franklin Institute was a great asset, but his way with people was magic. James Biddle, W3DCL, was terrific also. While the rest of us were helping people Jim would be cruising the back of the crowd at our table answering questions and talking to everyone. Dennis Silage, K3DS, was kept busy explaining this 10 GHz display and other general questions. Bob, WA3PZO, Kay, WT3P, and myself made up the remainder of the crew. The most important member of the crew not already mentioned was Paul Sokoloff, WA3GFZ. Without Paul, Amateur Radio may not have even had the chance to be on public display. Paul alerted us to the opportunity at the initial planning stage and even though he was extremely busy helping WCAU with everything he still found time to make sure we had what we needed. My most sincere thank you to the entire crew, The Family TechFest may well be an annual event. Volunteers will be most welcome. Tfc: K2BCL 555, N3YSI 388, W3IPX 292, N3EFW 266, W3HK 259, W3NNL 149, W3UAQ 101, N3SW 75, KB3CEZ 67, W3TWV 32, KB3BBR 28, K3TX 21, N3AO 21, W3ZQN 18, KB3DCT 14, KA3LVP 12, KB3CVO 8, W3JKX 6, K3ARR 4, KB3DDL 4, W3BNR 4, N3KYZ 2, N3IRN 2, N3HR 1. Net Reports: EPA 195, EPAPTN 190, PTTN 112, PFN 20, CATN 17, MARCTN 13, D3ARES 13, SEPPTN 10, LCARES 7, MCOES 2, and D4ARES 1.

MARYLAND/DC: SM, Tom Abernethy, W3TOM, 301-292-6263, w3tom@arrl.org— MDC Section Web page: *http://www.qsl.net/w3tom/*. With the nets submitted by STM N3EGF. - Net/Net Mgr/QND/QTC/QNI: MSN/KC3Y/30/43/339, MEPN/N3WKE/no report/, MDD/WJ3K/59/164/607, MDD Top Brass K3JL 182, AA3GV 141, AA3SB 137, BTN/AA3LN/no report. Tfc: KK3F 3967, AA3GV 167, W3YVQ 100, KC3Y 48, N3KGM 38, N3WK 34, N3WKE 31, N3DE 22, KJ3E 21, N3OR 15, WA1QAA 14, W3CB 10, N3ZKP 10, WA3GYW 6, KE3FL 4. PSHR: KK3F 248, W3YVQ 150, N3ZKP 149, AA3GV 116, N3WKE 114, N3WK 109, WA1QAA 98, W3CB 92, KE3FL 87, KC3Y 83.

NORTHERN NEW YORK: SM, Thomas A. Dick, KF2GC—*http://www.northnet.org/nnyham.* e-mail: *kf2gc@arrl.org*—ASMs: KD2AJ, WZ2T, WB2KLD, N2ZMS, WA2RLW. BM: KA2JXI. OOC: N2MX. PIC: N2SZK. SEC: WN2F. STM: N2ZGN. TC: N2JKG. February means Winter Carnival in Saranac Lake, NY and this year is no exception as we look forward to the 105th edition of the now world famous Saranac Lake Winter Carnival – this year's theme. The north country relies on help from all of our surrounding communities and what we can accomplish if we work together. And I feel this is true in Amateur Radio as well. All our affiliated clubs can make this section even greater in the year ahead by helping each other to be even better. Info on Breakfast Mtgs at Clarkson Tech. Stay tuned… The TLARC of NNY will again this year be heading up the special event station. Winter Carnival "Unity in the Mountains" chairperson is Warrene McCarthy, KB2YYV. Special event chairman is Chuck Brumley, KB2E. Special event station will be at the Union Depot our local train station. Watch QST for special event mention and our ad. We will have amateurs helping out from all around the north country again this year. Also, nice job on your new location in the EOC at the American Red Cross & American Management Complex. See new web page of TLARC *http://home.adelphia.net/~tlarc/index.html.*

SOUTHERN NEW JERSEY: SM, Jean Priestley, KA2YKN (@K2AA) e-mail ka2ykn@voicenet.com—ASM: W2BE, K2WB, W2OB, N2OO, N2YAJ, N2XYZ. SEC: KC2GID. STM: K2UL. ACC: KB2ADL. SGL: W2CAM. OOC: K2PSC. TC: W2EKB. TS: W2PAU, WB2MNF, AA2BN, KD4HZW, WB3IJB, WA2NBL, N2QNX, N2XFM. As we give thought as to what to do in 2002, think about holding an entry level class into ham radio. Just a few dedicated hams, a straight key and NOW YOUR TALKING and you can look through a window "with" and open a door "for" new radio operators. I recently sat in on a class and I was impressed. Progress is still being made with the Battleship New Jersey. She is a work in progress. You missed volunteering in 2001? Do it in 2002. Nov: Net QNI rpts: NJM 96 WA2OPY, NJN(E) 190 AG2R, NJN(L) 150, AG2R, NJPN 206 W2CC, NJSN 177 K2PB, (above joint with NNJ) JSARS 334 K2ATQ, SJTN 65 KB2RTZ, SJVN 243 WB2UVB. Tfc: K2UL 207, WA2CUW 76, AA2SV 56, K2UL-4 49, KB2RTZ 42, WB2UVB 40, N2VQA 31, WJ2F 21, W2AZ 14, N2WFN 12, KA2CQX 9, N2ZMI 3, KB2VYZ 2, KB2VSR KB2YBM KC2ETU 1. PSHR K2UL 192, KB2RTZ 191, AA2SV 120, WA2CUW 100, WB2UVB 142, KA2CQX 106, WJ2F 73, N2VQA 61, N2HQL 60, KA2YKN 56, N2WFN 40, KB2YJD 32, W2MC 14. NOTE: NJM will now meet on FRI, Sat, Sun only. SJTN 8 PM on Mon, Wed, Fri and Sun on 147.15.

WESTERN NEW YORK: SM, Scott Bauer, W2LC— Chenango Valley ARA reports a successful Jamboree on the Air JOTA, with 52 scouts making QSOs, including Troop 99 and Venture Crew 73, with Fred K2FRD, Kevin, KB2EZR, and Jim, WA2IAX, helping with the operation. Medieval period cooking, chess, tree identification, fire building, obstacle course, jousting, archery and problem solving contests. Sounds like a lot of fun. Drumlins ARC and Rochester ARA teamed up for the American Diabetes Assoc. Finger Lakes Foliage 130 mile bike ride along Cayuga and Seneca lakes. Keith, N2BEL, and Bob, W2GIV, used boy scouts to help set-up and the Auburn repeater W2QYT to provide communications. Mark, KC2GMG, and Greg, KC2GXV, and others reported progress of the cyclists. Drumlins, WA2AAZ, and RARA, K2JD, demonstrated Amateur Radio to the riders and the public. Robbie, KC2DQN, age 14, rode along with the bike repair crew. A nice area for a long bike ride. The South Towns Amateur Radio Society, WB2ELW, with operators Keith, KC2DGC, Gerry, KA2MGE, Scott, KB2KOL, John, K2CF, Bruce KC2GJX, Bob, WA2YSJ, and Terry, K2OO, posted a score of 609,168 in the CQ World Wide SSB DX contest. An operating event is a great way to build club moral and camaraderie. A good way to learn HF propagation and work a few rare countries too. A weekend where hams around the world share good will and friendship with each other. Congrats guys! Heard and worked them in the 160 m test too. How about those Leonid meteors! I counted up to 30 per minute. Meteor scatter QSOs were easily made to as far away as Colorado! Net Summaries (Nov 2001): Net Manager (Sessions) QNI QSP. Sessions in () if less than 31. BRVSN N2OYQ 167 1; CNYTN WA2PUU 316 94; ESS WI2G 400 103; NYPHONE N2LTC 247 534; NYPON N2YJZ 382 218; NYS/E WB2QIX 355 211; NYS/L W2YGW 268 182; NYS/M KA2GJV 160 60; NYSCN W2MTA (4) 141; NYSPTEN WB3CUF 323 51; OCTEN/E KA2ZNZ 1378 305; OCTEN/L KA2ZNZ 562 244; OMEN N2UC (1) 131; STAR N2NCB 310 26; TIGARDS W2MTA (4) 231; VHFTHIN N2JRS (1) 130; WDN/E N2JRS 475 123; WDN/L W2GUT 431 61; WDN/M KA2IWK (7) 92 31. Traffic (Nov 2001), * for PSHR, # for BPL: N2LTC#* 2257, KA2ZNZ#* 607, WB2IJH#* 502, NN2H* 350, KA2GJV* 344, W2MTA* 329, KB2KOJ* 206, WI2G* 202, WB2QIX* 149, KC2EOT* 128, N2CCN* 107, KA2DBD* 101, W2LC* 93, AF2K* 69, W2GUT* 57, KB2ETO* 43, WA2GUP* 43, W2PII* 42, KA2IWK* 39, N2WDS* 29, K2DN* 12, KA2BCE* 11, KG2HA* 1. Digital, Rx/Tx: KA2GJV 8/0, N2LTC 803/486.

WESTERN PENNSYLVANIA: SM, John Rodgers, N3MSE—ASM: N3MYZ. SEC: N3SRJ. ASM-ARES: WB3KGT. ASM-Packet: KE3ED. OOC: W3ZPI. PIC: W3CG. STM: N3WAV. TC: WR4W. DEC: N3YEA. DEC-SO: KD3OH. DEC-N1: (vacant). DEC-N2: KA3UVC. DEC-S1: KA3HUK. DEC-S2: (vacant). DEC-Rapid Response: N3HJY. DEC-OES: K3TB. While checking my calendar for upcoming events, I quickly realized that spring is just around the corner. We have several hamfests scheduled in the Western Pa. Section during the next few weeks, and it is a sure sign that spring is upon us. For a schedule of hamfests visit the ARRL Web site at http://www/arrl.org. Please take part in the School Club Roundup that will take place this month on the air. This is an excellent chance for clubs in the section to participate with individual operators and other schools and show the many facets of Amateur Radio. I can assure you that it is very rewarding to work with the young people and share their enthusiasm for this event. Complete information is available online or by contacting me directly for assistance. I would be interested in hearing from individuals that would like to volunteer for the field service appointments that we have open in the section. We can always use individuals that are willing to share their talents to make the Amateur Radio service a better hobby. Please contact me if you would like to have more information. If you would like to have anyone from the section staff to speak at your club event, please contact me as I am currently working on the calendar for this year's trips. This month's web site belongs to the Steel City ARC and is located at http://www.w3kwh.com. 73 de John Rodgers, N3MSE, WPA-SM, n3mse@arrl.org.

CENTRAL DIVISION

ILLINOIS: SM, Bruce Boston, KD9UL—SEC: W9QBH. ACC: N9KP. STM: K9CNP. PIC: N9EWA. OOC: KB9FBI. DEC-Central: N9FNP. DEC-S/W: KB9AIL. The DuPage ARC elected new club officers for the coming term. President is John, N9HRT, Vice President is Bob, WB9HNS, Secretary is Brian WB9UGX, and Sargeant at Arms is Maureen, KB9WVJ. The club thanks past President, Randy, N9NWA, for his multiple terms as president. Central DEC N9FNP held a meeting at the Lincoln NWS office in November. The group discussed the response and outcome of the Monticello tornado. Another meeting took place in Decatur where traffic handling was discussed. The Peoria Area ARC officers for the next term will be: Pres. KB9NW, VP KB9TLF, Sec K9DRF, Trea N9QZ. Lake County RACES reports it has received a grant of $500. The grant was awarded to the group by the Allstate Foundation. They plan to use the gift to update some communications equipment. It was also announced that W9ND recently received on On-The-Spot recognition award from Lake County for his outstanding efforts in supporting the county's new radio system and for the excellent support he provides to Lake County RACES. New officers for the Schaumburg ARC are Pres W9ZJX, VP N9TOI, Sec KB9UGF, Trea KA9ZKR. The SARC devoted over 500 hours to public service work during 2001, with the final event being the Hanover Park Pumpkin Patrol on Halloween evening. November traffic: K9CNP 90, WB9TVD 34, WD9F 34, W9HLX 21, KA9IMX 19, W9FIF 13, KD9YV 8, WA9RUM 6. ISN report for 11/01: QNI-208, QTC-67, Sessions-29. Ninth region C4 report, traffic 201, sessions 59, time 345, average 3.40, rate .582, percent rep 95% by ILN K9CNP, WD9F, NS9F. 9RN cycles 1 & 2 checkins-569, Sessions-60, traffic-187, average-3.1, total time-693 min., rate-3.7, IL. traffic 85% represented by NN9M, W9HLX, N9PLM, KD9YV, N9GZ, KA9IMX, WB9RJQ, KA9PZQ, WN9E, N9JJN, N9KJ. W9VEY Memorial Net report de K9AXS 6 with 185 check-ins.

INDIANA: SM, Peggy Coulter, W9JUJ—SEC: K9ZBM. ASEC: WA9ZCE. STM: WA9JWL. OOC: AA9WD. SGL: K9JZZ. PIC: KB9LEI. TC: W9MWY. BM: KA9QWC. ACC: N9RG. Sympathy extended to the families and friends of Silent Keys: 11/10 William Benny Kern, K9BEH, Bedford; 11/23 Alva L. Perry, W9IMA, New Castle; 11/24 Carlos M. Watson, KC9XR, Terre Haute; 11/24 Robert J. Bontempo, Jr.,W9GHA, Ft. Wayne; 12/1 John W. Lantz, K9OUP, Richmond; and 12/6 Dave Kadinger, WB9WOK, Crawfordsville. They will be missed. The Ft Wayne Hamfest (IN ARRL State Convention) is memories. The IRCC IN Amateur of the Year for 2001 was awarded to David Littlejohn, N9FMD, for his involvements in groups ARES, Skywarn, American Red Cross, Salvation Army and Civil Air Patrol. Earlier this year he was honored by the Wabash Valley ARA with the coveted Brentlinger award. Other nominees named were Chuck Crist W9IH, David Doiron WA1MKE, Bill McCleary KG9QJ, Rod Perry W9ROD, Jay Sisson KA9OKT, Deb Vierling N9TML and Gale Wuollett AA9WU. The IRCC also gave awards at the forum to the ham with the longest ham license of 51 ½ years to W9JUJ and to the newest ham of 3 days to Tony Hobart not having a call yet. Does anyone recall when ICN was started also who started it. I should recall but I don't. Tippecanoe ARA provided communications for the Lafayette Christmas Parade. Those participating were KF9UP, N9LF, K9MAB, K9WX, KB9SSS, KC9AFE, WB9BRX, W9TN, N9IP, KB9KUQ, N9MNZ and KB9YZT. Seventeen students in grade 5 at Kolling Elementary School at St John were able to talk to the International Space Station Expedition with a direct link with W9WY acting net control. The contact lasted about 10 minutes. Word of thought, I receive quite a few QTC via e-mail. Do you realize that is taking tfc from our tfc nets. I hope everyone had a Merry Christmas and that the New Year will be great for each and everyone. NM's ITN/WA9JWL, QIN/K9PUI/KJ9J, ICN/K8LEN, VHF/WA9JWL.

Net	*Freq*	*Time/Daily/UTC*	*QNI*	*QTC*	*QTR*	*Sess*
ITN	3910	1330/2130/2300	2503	202	1624	84
QIN	3656	1430/0000	124	36	580	43
ICN	3705	2315	19	19	310	22
Hoosier VHF nets (7 nets)			400	9	545	29

D9RN Total QTC 187 in 60 sessions IN represented 100 % by K9GBR, WB9QPA, WA9JWL, N9KNJ, KE9AK, KB9NPU, K9QDR and W9FU. 9RN Total QTC 201 in 59 sessions IN represented by K9PUI, KO9D, WB9OFG, N9HZ, WB9UYU and W9FC. Tfc: W9FC 283, K9PUI 108, WA9JWL 106, N9KNJ 70, KB9NPU 56, KO9D 45, W9JUJ 42, K9GBR 37, WD9HII 35, W9UEM 27, KA9EIV 20, W9EHY 20, WB9OFG 19, K9RPZ 18, WB9QPA 16, K8LEN 14, K9CUN 9, AB9AA 6, K9ZBM 6, WB9NCE 4.

WISCONSIN: SM, Don Michalski, W9IXG—BWN 3985 0500-0715 W9RCW. BEN 3985 1200 KE9VU. WSBN 3985 1715-1800 K9FHI. WNN 3723 1800 KB9ROB. WSSN 3645 1830 N9BDL. WIN-E 3662 1900 WB9ICH. WIN-L 3662 2200 W9UW. Virgina Hewitt, N9CSG, became a SK Nov. 4th. She was a Charter Member of the Fox Cities Amateur Radio Club as well as being very active in the YL Net and NTS for years. John Wolozyn, W9ORS, 84, is a SK. John was a member of FLARC. Congratulations to the following Amateurs of the Year: Tom Macon, K9BTQ, of WARAC. WARAC had 3 stations set up for JOTA where 61 scouts signed in at the Potawatomi Council site. The Milwaukee Sullivan Weather Forecast Office (WFO MKX) has asked the Sullivan Committee to design and implement a winter version of the summer program. It defines the dangers of winter weather, followed by detailed descriptions of how to make proper winter measurements, and what qualifies as data that should be relayed to the Sullivan WFO. Details are at: *http://skywarn.wwoc.org/sullivan/.* W9RH, Milwaukee Radio Amateurs' Club commemorates its 85th anniversary, 000 UTC to 2400UTC on March 16, 2002! The 3rd annual EC conference was held on December 1 in Plover. 66 DECs, ECs, AECs attended the meeting. The need for increased ARES training was the general theme. Our thanks to everyone who participated and exchanged important ideas. 73, Don *www.w9ixg.eboard.com.* Tfc: K9JPS 625, W9IHW 442, K9GU 419, N9VE 410, N9TVT 329, K9LGU 122, W9CBE 111, N9BDL 92, AG9G 72, K9FHI 70, W9YCV 55, N9KHD 54, KG9B 51, KE9VU

Continued on page 120.

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DAKOTA DIVISION

MINNESOTA: SM, Randy Wendel, KMØD—Many thanks to Gordy, KXØN, of St. Paul Park who is back active on-air and able to assist in representing the Twin Cities on the ARRL Section Phone Net. Gordy has been able to assist taking incoming NTS traffic for metro area, helping take the load off Jerrys' KBØOHI shoulders. It's nice to have a few stations in the metro with HF to help. Thanks to Bob, KØWPK, Geb, WØGRW, John W3FAF, and Jim, WØHPD, who continue their active vigil on the CW nets representing the metro area. Bob Fehr, KØWPK, is NM for CW Section Net Session 1 at 6:30 PM. Bill Baeten, KØPIZ, resigns as NM for ARRL Section Net CW Session 2 with his pending move to Bloomington. Bill has been an outstanding help between both phone and CW nets over the years. It will be an honor to have Bill as my neighbor! Bill has also been busy as a VE for a number of years. We are seeking a replacement NM for Session 2. Congrats to Northern Lakes ARC and Southwest Metro AR Transmitting Society for 25 yrs as ARRL affiliated clubs. 73 de KMØD. MINNESOTA ARRL SECTION NETS ARE AS FOLLOWS:

Net	*Freq*	*Time*	*QNI/QTC/Sess*	*Mgr*
MSPN/E	3860	5:30 P	836/55/30	KBØOHI
MSPN/N	3860	12 P	410/100/30	WAØTFC
MSSN	3710	6 P	N/A	vacant
MSN/1	3605	6:30 P	286/80/30	KØWPK
MSN/2	3605	9:50 P	129/18/29	KØPIZ
PAW	3925	9A-5P	2954/110/87	KAØIZA

The following stations submitted station activity reports and Public Service Honor Roll reports. SAR: KBØOHI, WAØTFC, WØLAW, KØPIZ, W3FAF, KBØOHI, KXØN, KØWPK, WØHPD, KAØIZA, KCØHAW, KØPSH, KBØAIJ, WØGRW, KN9U, WAØYSL, WDØGUF.

NORTH DAKOTA: SM, Kent Olson, KAØLDG —I hope the winter has been good for all. It's pretty easy to think of warmer times during February (maybe the ground hog will help us out this year). Check out League Web site regarding 70cm band threats. Consider sending in your concerns. The more responses the FCC receives, the better. Don't let private industry take away our spectrum. Let your Congressmen know the same thing by supporting the Amateur Radio Spectrum Act. Congratulations to the Jamestown ARC who have been affiliated with the ARRL for 55 years. Grand Forks club (Forx ARC) helped out with the NWS special event station earning the Patriot and Pacific Mariner endorsements. Tower battle continues with the hams in Fargo. They hope to have the matter resolved by spring so concrete can be poured for those wishing to erect a tower. Section's Web site at: http://home.earthlink.net/~qtipf16/. Bismarck hamfest to be held on February 23rd. Fargo hamfest to be held on March 9th. HF NM KEØXT reports Goose River Net, 3/35/0; WX Net 46/882/8; Data Net 28/681/12.

SOUTH DAKOTA: SM, R. L. Cory, WØYMB—Field Day scores have been released. Lark Club at Watertown had 2838 points to finish 116th place out of 324 clubs in Class 3A. This was a 27 percent increase over last year. In Class 1A with one transmitter-battery operated- Mobridge Club had 638 points to finish 44th with 59 clubs. Brookings had 524 points to finish 47th out of 59 clubs. In Class 1A gen power, Pennington Co had 994 points – 86th with 134 clubs. In Class 2A Prairie Dog ARC had 1746 points 255th place and Huron 1146 points for 334th place with 367 clubs. In class 4A, Sioux Empire club at Sioux Falls had 3582 points for 60th place with 150 clubs and Hot Springs had 2342 points for 85th place with 150 clubs. On November 3, the Lark Club at Watertown was presented a 50-year certificate by ARRL Director Jay Bellows. KØQB in recognition of their 50 year affiliation with the ARRL. Wal-Mart Safety Day organizers at Watertown have sent a thank you to the Lark Club for their participation. We are glad to hear KØERM back on the air after surviving a very serious illness.

DELTA DIVISION

ARKANSAS: SM, Bob Ideker, WB5VUH—As with any new year, we have new opportunities. Perhaps its been a while since you've been to a club meeting, or if you are already going (thanks), how about volunteering to do something special to help the club and your fellow members. What you say? Well, how about volunteering for a committee or organizing an event somewhere in your city's main area for a one-day ham operator-driven display and operation of some of your gear. RECRUIT, recruit, recruit. Let's all work to regain the interest of some of our members of the past to attend club events. Pick someone up and take them with you to your meetings and events. They'll appreciate it, and you'll be glad they cared enough to go. March and April will be full of hamfests in Arkansas. Make sure you plan to attend the Russellville, Harrison, Fort Smith, & Little Rock gatherings. More information can be found on our section Web site, www.all-arkansas-hams.org. Speaking of the Web site, items of interest are being added all of the time and its recommended you look at it weekly if not more often. Hopefully, you're finding some information that you've always wanted to have in the shack when either showing someone your setup or you've needed when doing something on your own. Your suggestions are always welcome toward improving the site. Nov. traffic net includes 3,232 checked into our 4 nets - outstanding! Individual traffic counts include: K5BOC 73, K7ZQR 49, W5RXU 19, WB5HIL 18, W9YCE 12, KA5MGL 8, AD5AM 7, AD5BV 3, WA5KQU 2. Thanks for all of the work done by our nets.

LOUISIANA: SM, Mickey Cox, K5MC — Good luck to KM5IX and N5ULA as they begin their EC duties for Ascension Parish and East Baton Rouge Parish, respectively. The national Flag Run in honor of the September 11th victims made its way across north LA in late October. The following amateurs have earned Public Service Commendation certificates for providing communications for the event: KM5YL, KD5ITA, AC5VQ, K5ER, KC5LFB, KB5ZVK, K5DLH, KD5LKB, KB5PKW, KB5LE, KD5ETE, KB5WFE, and KB5WPV. K5ER and KC5LFB were also recognized by the Northeast LA Chapter of the American Red Cross for their work in public awareness programs. AC5VN and KD5IBY have completed levels II and III, respectively, of the ARRL emergency communications course. LA is well represented these days on

RN5/cycle 4 by WA5CAV, WA5LQZ, KM5YL, W5NK, K5KV, W5CDX, K5MC, and W4DLZ. We also continue to be very well represented on the daytime cycles by K5IQZ, K5DPG, W5CDX, KG5GE, KC5QAY, W5PY, and KB5SDU. Our section is now perhaps the strongest one in the Fifth Region of NTS in terms of the number of different stations that perform liaison duties. To all ARES members and traffic handlers in LA, thanks very much for your public service efforts! Tfc: W5CDX 170, K5IQZ 126, K5MC 61, KM5YL 61, K5DPG 19, W5PY 17. PSHR: W5CDX 137, KM5YL 133, K5IQZ 131, K5DPG 123, W5PY 103, K5MC 100. Net Reports: sessions/QNI/QTC. LTN: 30/371/79. LCW: 30/198/53.

MISSISSIPPI: SM, Malcolm Keown, W5XX—Section Web Page: www.arrlmiss.org. Web Master: K5IBM at k5ibm@arrl.net. ASM: N5EZX, W5EPW. ACC: N5JGK. SGL: AB5WF. STM: KJ5YY. TC: N5XXX. Tornados raced across Mississippi over the Thanksgiving weekend and during the week after. Skywarn and local emergency nets were up all over the state. DEC AB5WF reports that W5JWX at the Jackson NWS was up for a good part of three days. Those manning the station were AB5WF, AC5SU, W5PES, KD5KHI, KC5OSM, and N5XXX. DEC KD5CKP reports the NW MS ARES provided weather spotting and communications assistance to the local EMA and the Memphis NWS. Those assisting were AB5WR, KA5JNK, KB5QVX, KC5WMX, KD4SLW, KD5CKP, KD5IWH, KD5ONH, KM5WX, N5EOE, N5PYQ, N5UOV, W4FP, W5LJD, WB4KQO, and KB5KID. Net Manager KC5YCH reports that the Attala County ARES was activated with storm information reports being filed by WB5HPZ and KD5MLU. Forrest County EC N5MZ reports that the Hattiesburg ARES Net was in session during the tornado outbreak. The NE MS Red Cross asked the Tupelo ARC for assistance with communications after a tornado passed through the Sledge community causing extensive damage. This mission was coordinated by KE4LWT and KD5PLG. Also assisting were WJ5K, KD5CKP, N5EOE, KD5QAM, KD5CJR, KD5IWH, and KC5WMX. Congratulations to KC5YCH for completing the ARRL Level 3 Emergency Communications Course and AC5SU the Level 1 Course. Eleven Mississippi Clubs sent in their scores for Field Day 2001 and are listed in the December *QST*. Two Clubs made the top 15 in their respective categories. Congratulations to the SW MS ARC (WB5ASP) coming in at # 15 in 1A Battery and the MDXA (K5MDX) #13 in 2A. W5OXA, W5UE, K5NY, and KK5EW operated as C6AKO from Treasure Cay in the Bahamas during the CQ WW SSB making over 4500 QSOs during the contest. WB5OCD, our DEC for East Central Mississippi and EC for Lauderdale and Clarke Counties, will be moving to Wisconsin for part of the upcoming years and must now relinquish his duties. Jim has been a prime mover in organizing emergency communications in his area. Thanks for your efforts, Jim! KD5GWM will be taking over as EC. Congratulations to W5UE, who was honored as MDXA Ham of the Year, and W5FI, who was awarded DXer of the Year. Don't forget to put the ARRL State Convention and Capital City hamfest on your agenda for February 1-2 at the Trademart in Jackson. Contact AB5WF for more details at ab5wf@arrl.net. Regret to report the passing of KD5BQZ of Sumrall. OO Report: KK5OI, K5XQ. PIO Report: W5KWB. TS Report: AC5GX. DEC/EC Reports: NN5AF, KD5CKP, K5DMC, N5MZ, N5NQ, WB5OCD, KC5TYL, AB5WF. Net Reports: sessions/QNI/QTC: MSPN 30/3711/47, MTN 30/94/50, MSN 30/1264/14, PBRA 30/839/4, Jackson Co ARES/RACES 30/377/9, MSSN 22/73/0, WCMS ARES 12/122/12, MAEN 7/90/0, Bluff City Em Net 4/84/0, JARCEN 4/84/0, NW MS Skywarn 4/41/0, MBHN 4/32/0, MLEN 4/72/0, Lo Co Net 4/55/0, LARC & Jones Co ARES 4/78/0, MCARA 4/51/0, Attala Co ARES 4/28/0, CMSN 1/22/0. PSHR: WB5ZED 214, K5VV 125, W5XX 82, KJ5YY 77. Traffic: WB5ZED 901 (BPL), K5VV 53, KJ5YY 24, W5LEW 7, W5XX 3.

TENNESSEE: SM, O.D. Keaton, WA4GLS—ACC: WA4GLS. ASM: WB4DYJ. SEC: WD4JJ. STM: WA4HKU. TC: KB4LJV. Thanks to the RACK members who had a very busy October. First: Jeff, N4EWK, Warren, W4FN, Natanya, KG4KVR, Jim, KG4KVP, Ed, KG4ELT, Tom, KD4MEU, Tommy & Dick, WI8X, for their great work with the Boy Scouts. Second: Dick, WI8X, Warren, W4FN, Allison, KG4KVO & Mike, N4KNX, supported the Walk for Diabetes. Third: Dick, WI8X, Jim, KG4KVP, Jerry, AF1P, Merle, KD4FBT & Mike, N4KNX, helped the Twi-light run for the Pumpkins. The following Anderson Co ARES members along with the Red Cross conducted a simulated emergency response exercise with the following ARES members participating: Betty, N4LZL, Chip, KC4YYD, Mike, KG4CRT, Scott, WB4EFS, Marion, KD4VER, Doug, N1CWR, Chet, W4GEK, Dale, WD9HQC, Cheri Petitt, Noble, KC4WKG, Bill, KE4KOW & Howard, KF4ATA. CARC had a good turnout for the MS Bike Ride Roundup that included Clark Tate, Charles Goodner, Wally Bell, Greg Boots, Gail Boots, Tom Wolfe, Garland Eubanks, Peyton Carter, Dan Clark, Charlie Curle, Joe Anderson, Roy Bowman, David Lankford, Harold Camp, Charles Chauncy, John Harris & Charlie Wheato. DRN-5 rpt. Sess 60, Msg 605, TN rep 67% by W4OGG, KE4GYR & WA4LGH. Net sess/QTC/NM/QNI: TMPN 29/21/K4QQ/2604; TEMPN 22/46/KR4TT/799; TEPN 26/40/WA4HKU/2837; TCWN 27/69/N4PU/237; TSCWN 23/28/N4PU/136. Tfc: KE4GYR 40, N4PU 34, WA4HKU 14, WA4GLS 14, K4QQ 11, WB4DYJ 10.

GREAT LAKES DIVISION

KENTUCKY: SM. John D. Meyers, NB4K—This month found the most Silent Keys reported so far for 2001; K4UKI, N4NXU, WD4R, K4MMB, K4DEZ, W4BDC, N4WQL and KF4LBL. I would like to thank Joe Pollock, K4ULW, for his time spent in the Technical Coordinators chair and the work he does in Amateur Radio. Joe vacated the TC position the first part of January and has been replaced by Martin (Marty) Sauer, KD4IXQ, from Maysville. Marty is available by e-mailing to meast@atcc.net or telephone 606-564-6120. As some of you may know there have been some changes made in the Kentucky Traffic Nets. Hopefully for the better as the National Traffic System is under change here in the Commonwealth. There is always a need for net controls as this is a dedicated position. If your are interested in becoming a net control for the KTN contact Mike Wagoner, KB4VKS, his e-mail is kb4vks@arrl.net. Hamfest time will be here soon and as I have it right now the first one is Cave City on March 2nd and then April 6th in E Town and May 4th in Louisa. See you there.

Net	*QNI*	*QTC*	*Sess*
KTN	2195	92	60
KYN	343	51	30
TSTMN	491	39	30
1 ARES	3	6	3
7DARN	6	2	25
K4MSU	46	1	4
NKEN	42	1	4

Tfc: K4AVW 61, NB4K 24, WD8JAW 20, WB4ZDM 17, KE4JFS 6, K4TXJ 5. PSHR: NB4K 134, KE4JFS 74.

MICHIGAN: SM, Dick Mondro, W8FQT (w8fqt@arrl.org)—ASM: Roger Edwards, WB8WJV (wb8wjv@arrl.net). ASM: John Freeman, N8ZE (n8ze@arrl.net). ASM: Lyle Willette, AB8CB (ab8cb@arrl.net). ASM: Deborah Kirkbride, KA8YKK (ka8ykk@arrl.net). SEC: Ray DeVlieg, kb8vni@arrl.net. STM: James Wades, WB8SIW (wb8siw@arrl.net). ACC: Sandra Mondro, KG8HM (kg8hm@arrl.net). OOC: Donald Sefcik, N8NJE (n8nje@arrl.net). PIC/SNE: David Colangelo, KB8RJI (kb8rji@arrl.net). SGL: Ed Hude, WA8QJE (wa8qje@arrl.net). TC: Dave Smith, W8YZ (w8yz@arrl.net). Youth Activities: Steve Lendzion, N8GQ (n8gq@arrl.net). BM: Thomas Durfee, Jr., WI8W (*wi8w@arrl.net*). Congratulations go out this month to the newly elected officers of the Central Michigan Amateur Radio Club. President Mike Rhew, KC8DBP; VP Ken Faiver, W8HNI; Directors Bruce Rainey,KC8ODP; Wayne Atkinson,KC8QEK; Gregg Mulder, WB8LZG; Candice Coburn,KC8QZF; Tyler Whitney,KC8NSB. Congratulations to the new officers of the Firebird Amateur Radio Club. President Wallace Renn, WB8M; VP Denny Simmons, N8XLS; Secretary Darrel Baxter, WD8ANZ; Treas. Verle Winningham; Officer At Large Jack Walters, WA8UXN. Spring and our severe weather season are not very far off and this would be a good time to make plans for your clubs Skywarn Spotter Training Sessions. Please contact your NWS Office to make arrangements early. In addition to Skywarn Spotter Training, let's give some thought to net control operator training for the nets. Please let me know when your club or ARES Group has scheduled a training session and I can help to get the word out to those that may wish to attend. Congratulations to Gerry, K8GA of Dearborn, for earning a BPL Medallion. Thanks Gerry for keeping the NTS Traffic moving. 73, Dick. Traffic reports for November 2001: K8GA 452, KB8ZYY 352, AA8PI 313, W8RTN 213, N8FPN 176, K8AE 126, K8LJG 119, W8RNQ 101, WX8Y 78, WR8F 55, N8JGS 54, WI8K 48, VE3EUI 46, K8ZJU 42, AA8SN 41, KA8DDQ 35, K8UPE 31, K8FE 23, W8YIQ 22, WA8DHB 20, K8AMR 18, K8AI 13, N8JAT 11, NX8S 8, K8YB 8,WB8WJV 7; KI8GR 5, W8WOJ 4, W8NGO 3, KA8LAR 3. Deadline 5th of the month.

Please support the following SECTION NETS:

Net	*QNI*	*QTC*	*Sess*	*Net Mngr*	*Freq.*	*Time*	*Day*
MITN	403	231	30	N8FPN	3.952	7 PM	Daily
GLETN	621	102	30	WB8ICN	3.932	8:30 PM	Daily
MI-ARPSC	67	2	4	W8FQT	3.932	5 PM	Sunday (Alt. 7.232).

OHIO: SM: Joe Phillips, K8QOE, Fairfield, (to contact me, see page 12 and check out the Section Page at www.maser.org). ASM-NE: Bob Winston, W2THU, Cleveland; ASM-NW: Ron Griffin, N8AEH, Findlay; ASM-Central: Mary Carpenter, N8OAM, Westerville; ASM-SW: John Haungs, W8STX, Cincinnati; ASM-SE: Connie Hamilton, N8IO, Marietta; SEC: Larry Rain, WD8IHP, Mansfield. STM: Jack Wagoner, WB8FSV, Hilliard. ACC: Brenda Krukowski, KB8IUP, Toledo. TC: Tom Holmes, N8ZM, Tipp City. PIC: Scott Yonally, N8SY, Mansfield. OOC: Richard Kuns, KC8TW, Fairfield. SGL: Jeff Ferriell, K8ZDA, Columbus...As we move to the nicer weather, there will be more opportunities to see ARRL officials at club meetings, hamfests, and ARES events. Have a question about League programs, services, appointments? Ask the ham who wears the badge - ARRL badge, that is. These League leaders have access to the information you need. But be patient. No one in this very diverse hobby keeps all the answers in their head. It takes time to seek the correct answers...Recently in reading Ohio Newsletters I found 6-meters, the Magic Band, is getting more popular, even for DXers...Getting to be SKYWARN time in Ohio. Check with your local WARN officials about March training schedules and membership... Congratulations to the Ashland Area Amateur Radio Club for becoming a Special Service Club. Now all other Ohio clubs, please look up your status as SSC and see if it is time to renew. Every two years clubs needs to renew their status. Is it time to send in your club info to ARRL to keep your records up to date. Any questions, contact the ACC at kb8iup@arrl.net. Newsletters editors, it is time to plan for your 2002 entry in the 11th annual Ohio ham radio newsletter contest. Contact the PIC at n8sy@arrl.net for rules and details...As well as the Ohio Section Web Page listed above, please visit the Great Lakes Division web page (www.mrrace.com) for complete information on ARRL services...OHIO SECT CONGRATS TO: (A) The Mansfield IARC and MASER for hosting a hamfest banquet February 9th the evening before its hamfest; (B) Dennis Fox, KB8ROA, Cincinnati, for seven excellent years as net control of the Tri-State Amateur Traffic Net (TATN), who just announced retirement; (C) The new officers of the Woodchuck Amateur Radio Club; Pres: Jason Jodon KB8QQS; Sec: Edward Jodon Jr. N8VUA and Treas: Jeffrey Brown N3OYQ; (D) Jay Milner, KA8LFI, Cambridge, who was named Ham of the Year for the Cambridge ARA, and (E) Michigan SM, Dick Mondro, W8FQT, for being a good sport in the OSU football bet last November...OHIO FEBRUARY HAMFESTS: (3) NOARS at Lorain (10) IARC & MASER at Mansfield and (24) Cuyahoga Falls ARC at Cuyahoga Falls...de K8QOE. Now for the Nov traffic reports.

Net	*QNI*	*QTC*	*QTR*	*Sess*	*Time*	*Freq*	*NM*
BN (E)	113	63	241	30	1845	3.577	WD8KFN
BN (L)	149	94	277	30	2200	3.577	NY8V
OSN	137	56	471	30	1810	3.708	WB8KQJ
OSSBN	2041	776	3069	91	1030, 1615, 1845	3.9725	N8IO

Tfc: N8IO 584, N8IXF 470, N8OD 317, WD8KFN 265, N8BV 202, KD8HB 193, WB8KBM 193, N7CEU 168, W8QIW 168, W8STX 152, K8PJ 123, N8DD 94, WA8EYQ 92, N8TNV 80, KA8FCC 76, N8IBR 73, KC8DWM 71, WB8SIQ 68, KA8CAV 65, W8BZY 62, KA8VWE 61, N8CW 59, N8GP 57, W8RPS 56, KC8HJL 49, NS8C 48, KB9K 47, WA8SSI 46, AS8KS 39, WB8HZZ 38, KI8IM 38, W8RG 36, N8GOB NY8V 26, K3RC 21, KI8O 21, KC8PDY 16, KB8ESY 14, WB8PMG 14, K8QIP 13, KC8KYP 12, N8YWX 12, N8WLE 10, N8RRB 10, KB8SIA 9, WB8IOW 3, K8WC 1. (Oct) W8BZY 6.

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LMR 400 "ULTRA-FLEX" STRD BC CNTR FOIL + BRAID 3.1dB @ 450 MHz TPE JKT	.89/FT	.87/FT	.85/FT
LMR 600 (OD.590") SOLID CCA CNTR FOIL + BRAID 1.72dB @ 450 MHz WP/UV JKT	1.27/FT	1.25/FT	1.23/FT
LDF4-50A Andrew 1/2" Heliax® 1.51 db/1530 watts @450 MHz 450 MHz	2.38/FT	2.33/FT	2.25/FT

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RG8/U STRD BC FOAM 95% BRAID UV RESISTANT JKT 0.9dB/1350WATTS @ 30MHz	.34/FT	.32/FT	.30/FT
RG8 MINI(X)95% BRAID UV RESISTANT JACKET 2.0dB/875 WATTS @ 30MHz	.18/FT	.16/FT	.14/FT
RG58A/U STRD CENTER 95% TC BRD UV RESISTANT JKT 2.6dB/350 WATTS @ 30MHz	.19/FT	.17/FT	.15/FT
RG223/U SOLID SC 2 95% BRD NC/DB/UV JKT 2.0 dB/600 WATTS @ 30 MHz	.69/FT	.62/FT	.56/FT
RG214/U STRD SC 2 95% BRD NC/DB/UV JKT 0.925 dB/2500WATTS @ 30MHz	.25FT/UP	1.75/FT.	
RG142/U SOLID SCCS 2-95% SILVER BRAIDS *Teflon®* JKT 8.2dB/1100WATTS @ 400MHz	.25FT/UP	1.75/FT.	

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1216 8/COND (2/12 6/16) BLK UV RES JKT. Recommended up to 500ft.	.80/FT	.76/FT	.72/FT
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HUDSON DIVISION

EASTERN NEW YORK: SM: Pete Cecere, N2YJZ— STM: Jim Peterson, K2CSS. SEC: Ken Akasofu, KL7JCQ. ACC: Shirley Dahlgren, N2SKP. SGL: Herb Sweet, K2GBH. PIC: John Farina, WA2QCY. BM: Ed Rubin, N2JBA. OOC: Hal Post, AK2E. TC: Rudy Dehn W2JVF. ASM: Tom Raffaelli, WB2NHC. ASM: Bob Chamberlain, N2KBC. ASM: Andrew Schmidt, N2FTR. ASM: Richard Sandell, WK6R. ASM: Phil Bradway, KB2HQ. We are a month into 2002, and we will hopefully have many new hams joining the hobby. Those who had an Elmer help them, then should consider Elmering now. Elmers have always been part of the backbone of the hobby and are still needed. Contact me if you think starting an Elmer support group would be a good idea. 73 de Pete, N2YJZ, *n2yjz@arrl.org.* November - PSHR: N2JBA 154, W2JHO 144, WB2ZCM 143, KC2DAA 139, N2YJZ 138, W2AKT 134, K2YS 102, KC2HUV 95, N2RTF 88. Station Traffic: N2YJZ 210, K2YS 89, KC2DAA 78, N2JBA 75, N2TWN 54, W2AKT 37, WA2ZCM 31, W2JHO 25 WA2WMJ 24, N2RTF 22, KC2HUV 19, K2AVV 5 KL7JCQ 1, KC2BUW 1. Net Reports: QNI/QTC+QSP, AES 27/2 CDN 170/102, CGESN 36/6, ESS 400/206, HVN 664/262, SDN 360/189, NYPHONE 247/1079, NYPON 382/439, NYS/M 160/140, NYSPTEN 335/104, CHN 146/54.

NEW YORK CITY / LONG ISLAND: SM, George Tranos, N2GA— ASM: KA2D, N1XL, K2YEW, W2FX, KB2SCS. SEC: KA2D. ACC: N2MUN. PIC: K2DO. TC: K2LJH. BM: W2IW. OOC: N1XL. STM: WA2YOW. SGL: N2GA. The NLI Web site has moved - its new address is www.hudson.arrl.org/nli - please make a note of it. You should read this prior to HRU 2002, the ARRL NYC/LI Section Convention. Ham Radio University 2002 is Sunday, January 20, 2002 in North Babylon. Talk-in is on 146.685. A full program of education seminars is planned. 21 different forums are planned on all aspects of Amateur Radio. New this year are forums on "Debunking antenna myths", "Emergency antennas and power", "The Art of QSLing", "Skywarn / Severe weather" and "Disaster Communications". The focus will be "hands on" with many demonstrations. Clubs and organizations will set up information tables. There will be forums geared to the non-ham as well as seasoned veterans. More information is on the NLI Web or contact Phil, N2MUN, at n2mun@arrl.net or 631-226-0698. If you can't make it, listen for our special event station - W2V - on 15 & 20 meters SSB. Look for me QRV from the Turks & Caicos Island as VP5/N2GA on Feb. 12 thru 18 and as VP5GA in the ARRL DX CW Contest. NLI CW Traffic Net meets Monday thru Friday at 7:30 PM Local Time on 3630 kHz. The monthly NLI Section e-happenings newsletter is being e-mailed to all ARRL members in the section who have subscribed to Division / Section bulletins. If you have not received this newsletter, go to the ARRL Web site (www.arrl.org) and update your profile. Check the box that indicates you want Division / Section bulletins. Previous newsletters are available on the NLI site. Please e-mail me with your club's information and I will get it in the newsletter! Volunteer Exam sessions, club listings, upcoming events and more are available on the NLI Web site - www.hudson.arrl/nli. Tfc: WB2GTG 656, N2AKZ 330, KB2KLH 118, N2AYV 80, WA2YOW 77, AB2IZ 45, KA2YDW 42, KA2UEC 42, KE2SX 22, N2TEE 5, WA2VZK 2.

NORTHERN NEW JERSEY: SM, Bill Hudzik, W2UDT—ASM: K2WJ. STM: WB2FTX. ACC: N3RB. SEC: K2SO. OOC: K2ZD. SGL: K1VX. Web page:www.arrlhudson.org/nnj. Please send your club info and any events to our Web master, N2WZB, to keep the NNJ Web page updated. Mark would like to include more links to other NNJ clubs. I will also be using the page to update NNJ members on news items important to us. It is also a place to see what ARRL section level appointments are available there are opportunities for everyone. All affiliated clubs should have received a mailing from me indicating my desire to visit them sometime during the year. In that respect, I was happy to attend the Roseland ARC meeting in November and talk to the members of this active group. Congrats to the new officers of the County Line ARA: Pres. K2AF, VP. N2KGW, Sec. KC2INX and Treas. KB2YWZ. The 2002 officers for the 10-70 Repeater Assn are: Pres. N2ZNF, VP. KA2ANF, Sec. KC2CJW and Treas. W2NLX. Many NNJ ARES members have received Public Service certificates for their participation in ARES nets following the September 11 attacks. Thanks to DEC KB2UQW for taking on this chore. Bruce did a fine job! Additional certificates of appreciation were presented at the December SEC meeting held by K2SO. Emergency Communication activities will continue to play an important part in the state. By taking part in public service events and section nets we can improve our communication skills. 73, Bill Hudzik, W2UDT. Net sess/QNI/QTC/QSP: NJM 30/96/28/26; NJPN 34/206/55/43; NJSN 30/177/11/11; NJN/E 30/190/129/73; NJN/L 30/150/86/67; CJTN 29/176/58/34. NJVN/E 30/506/83/78; NJVN/L 30/460/38/37. Tfc: W2MTO 130, N2GJ 70, K2VX 62, KB2VRO 57, WA2MWT 51, N2OPJ 50, N2RPI 39, KJ2N 30, KC2ANN 25, K2PB 22, N2BVM 17, N3RB 17, W2CC 16, K2DBK 8.

MIDWEST DIVISION

IOWA: SM, Jim Lasley, N0JL—ASM: N0LDD. SEC: NA0R. ACC: N0IJP @ KE0BX. BM: K0IIR @ W0CXX. SGL: K0KD. STM: KB0RUU. CVARC had a 90% success rate for their exam session in November. That's pretty good. I hope the other 10% come back for more! Sorry to note we have lost two active Section Managers in the last round of elections. They were elected Vice Directors! GRARC has a Tech class going that ends the end of Feb. Can you think of a better way to provide fodder for an exam team? KA9FAJ is now the holder of a QLF award by the Iowa Radiosport Society. Welcome to a noble group! (I earned one at Hamboree a couple years ago.) Sorry, CVARC, but FMARC beat you on FD in 2A. They managed to also get it listed in IL! I think that has been straightened out though. Have you notice that the new Extra class question pool is out? There are more than 20% more questions. It takes effect July 1, 2002. DARC does exams on odd numbered months. I hear from OARC that W0DIA has a new radio so fancy it will continue to make contacts while he goes for more coffee! Officers at CIRAS are N0MXK, WB0RMT (VP & Tr.), N0JGB. I'm told the meteor showers in November were wonderful. Newsletters were received from CVARC, GRARC, FMARC, OARC, DMRAA, SCARES, DARC, CIRAS. Traffic: KB0RUU 213, W0SS 173, WB0B 46, N0JL 24. 73 de N0JL.

KANSAS: SM Orlan Cook, W0OYH— ASM/ACC/OCC: Robert Summers, K0BXF. SEC: Joseph Plankinton, WD0DMV. STM: Ron Cowan, KB0DTI. PIC: Scott Slocum, KC0DYA. TC: Rick Carver, WA0KS. Many times an emergency agency may approach an ARES Group and ask them to completely dedicate their group to their cause. This is not a description of an ARES Group but there is a way you can dedicate part of your group. An ARES Group

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EC can appoint an AEC and under him/her build an "ARES Group Team." The team can also do specialized things that the Group cannot do. The AEC is a buffer between the agency and the EC separating two authorities. Build the group and Team together. We don't want the tail wagging the dog. Let's write this one down now: ARRL Convention August 18 at Salina. Wilbur Goll, W0DEL is celebrating his 60 year in ham radio and Jim McCoy, W0LVQ his 50th. The JoCoRA Club is planning a special club meeting. 73! Oct. Kansas Nets: sessions/QNI/QTC: KSBN31/1170/101; KPN 24/371/57; KMWN 31/712/525; KWN 31/938/621. CSTN 27/1991/98; QKS 62/294/95; QKS-SS 12/30/10; SEC 62/647/34 QNS KB0AMY, KC0AUH, N0BTH, KC0CFL, KC0CIG, WD0DDG, AA0IQ, N0LKK, KB0WEQ, KB0ZWK, WD0DMV, Joseph SEC. TEN Ks 89% 62/QNI/200 AA0FO, W0FCL, K0PY, W00WWR, NB0Z, WB0ZNY, W0SS/Mgr. TRN60/578/381 Ks 98% with KB0AMY, W0FE, N0KJ AA0OM W0WWR. Ks tfc: W0WWR 867, N0ZIZ 68, KB0ODT 50, KC0JCQ 24, N0RZ 17, W0FCL 16, W0OYH 10, NB0Z 10, KC0GL 9. 73, Orlan.

MISSOURI: SM, Dale Bagley, K0KY—ASM: John Seals, WR0R. ASM: Bill Coby, KB0MWG. ASM: Larry Ballew, AB0HP. ACC: Keith Haye, WE0G. BM: Brian Smith, KI0MB. OOC: Mike Musick, N0QBF. STM: Charles Boyd, KE0K. SEC: Patrick Boyle, K0JPB. I had the pleasure of attending the Boeing Employees Amateur Radio Society meeting at the Boeing Facility in St. Louis. I was met at the entrance by a security guard. I explained my purpose for wishing to enter. The guard said, much to my relief, that he was expecting me. BEARS President Gary Meissner, W0GOM, and the other members of the club were excellent hosts. Jim Kinser, N0AJ, the Chairman of the MO QSO party, Eric Zust, W0TT, BEARS Contest Manager, Dave Propper, K2DP Club Trustee and Gary, W0GOM, met to discuss the rules for the 2002 Missouri QSO Party. When the finalized rules are available and the date verified, there will be a statewide effort to promote the operating event. The MO QSO Party has not been held for several years, we are fortunate that the BEARS have accepted the challenge of sponsoring the event. This year the Simulated Emergency Tests involved not only conducting the test, but reporting on the SET to both the SM and SEC via the MO Traffic System. At a meeting of ARES members, ECs, DECs and the SEC at SEMA 2001 Communications Conference, Dean Bickford, K0PHI volunteered to help Patrick Boyle, K0JPB, with planning for the 2001 SET. Their efforts have resulted in increased SET activity in the Section. There have been a large number of formal numbered messages describing the SET efforts delivered to both the SM and SEC. The extra effort of all those in the ARES program is very much appreciated. It is with much sadness I report that the PHD ARA, once the most active Amateur Radio club in the Kansas City Area has voted to go out of existence. They plan to donate $2500.00 to ARRL Scholarship fund and merge with the Ray-Clay ARC beginning in January 2002. The combined Clubs should be a powerful force for Amateur Radio. I hope everyone will take a moment and consider how much that PHD ARA has accomplished since its founding. They have sponsored the ARRL National Convention, provided thousands of dollars in scholarships to young people, they had their own VEC program and so much more. PHD ARA is a club with a great history, and it is sad to see it go. But I suppose it's fitting that it ended the same year as its driving force, Chuck Miller, WA0KUH, became a SK. Net Sess/QNI/QTC/NM: WAARCI 4/114/0/KB0VZP; Sullivan ARC 4/50/2/KB0ROX; MTN 30/559/93/K0DAT; N0ATH Rptr 4/83/4/KB0OFC; Jackson Co ARES 4/54/2/K0UAA; MON 50/115/35/K9ZTV; 10TH Region 60/182/W0SS. Tfc: KE0K 64, PSHR: KE0K PSHR 85.

NEBRASKA: SM, Bill McCollum, KE0XQ—ASM: W0KVM, N0MT, WY0F, WB0ULH & WB0YWO. Nebraska lost one of it's well known hams on Saturday, November 24th. John (Mac) McKinney, W0AP, suffered an apparent heart attack at his home in Dannebrog. He was 83. Mac was an FCC employee from 1945 until 1975. He last served as chief of the monitoring station in Grand Island. Mac was an ARRL Life Member, 3900 Club board, Assistant Midwest Division Director and Net Manager of the Nebraska CW Net. He is remembered for his stories of wartime radio espionage and monitoring activities. Five daughters survive Mac. I also regret to inform you that Ray Clifton (W0HTA) and Marilyn Gooding (N0XNB) have also become Silent Keys. We extend our sympathies to their families. Net Reports: MIDNE ARES: QNI 361, QTC 3 & 29 sessions. NPPARC: QNI 21, QTC 2 & 3 sessions. NE Storm Net: QNI 943, QTC 17 & 30 sessions. NCHN: QNI 214, QTC 5 & 29 sessions. NE 40 Meter Net: QNI 306, QTC 8 & 24 sessions. I want to take this opportunity to wish all of you a prosperous 2002 - 73, Bill KE0XQ. Tfc: K0PTK 98, KE0XQ 28, WY0F 6, W0UJI 2, W0DED 2, W0EXK 2, WA0ZCN 2, W0RWA 2.

NEW ENGLAND DIVISION

CONNECTICUT: SM, Betsey Doane, K1EIC—ASMs KZ1Z, NK1J, N1API, K1STM. BM: KD1YV. OOC: W1GC. PIC: W1FXQ. SEC: KB1CTC. SGL: W1UTQ. STM: K1HEJ. TC: W1FAI. Congrats to Dan, K3UFG, on getting the Ham Op of the Year Award at the NARL Christmas party—well deserved, Dan! Emergency communications is on the mind of an increasing number of ops these days. Your SM is taking the time to update her training and hopes to complete the three levels of the Ecomm course within the next few months. Indeed, there is always something to learn! The Naugatuck Valley is starting a formal ARES group. SEC Mike, KB1CTC, attended a meeting of ops interested in becoming leaders. Howie, W1HO, has been appointed DEC of the Valley Region. Jon, N1BDF, was appointed EC of Shelton, George, N1YAE, EC of Seymour. Barb, K1EIR, will be an assistant EC for Valley Red Cross and Bob, N1RKZ, an assistant EC for Griffin Hospital. This steering committee is enthused about recruiting and training and plans to meet each month. For further information, contact Howie, W1HO, w1ho@arrl.net. Our focus during this next year should be on training and the proper reporting of ARES activities by ECs and DECs to the SEC each month. This is nothing new-training and reporting have always been strongly advocated in this Section. But this is my focus for the year 2002 for the CT ARRL Field Organization. Experienced and inexperienced alike must continue to keep skills updated. I urge you to watch for on-air and in-the-field opportunities to participate in ecomm training. Become active and get involved! If you are not sure how to be involved or who your leaders are in your area, contact SEC Mike, KB1CTC, kb1ctc@arrl.org. Another aspect of ARES training is the proper sending of formal written traffic. Try checking into one of our traffic nets; NTS ops, consider participating in ARES nets and get to know your local ARES leaders. Ct Phone Net 3.965 1800 M-SA, 1000 Su.; CN 3.640 1900 daily;

MIRAGE . . . 160 Watts on 2 Meters!

Turn your mobile, base or handheld into 160 Watt powerhouses and talk further, longer, clearer . . . All modes: FM, SSB, CW . . . Superb GaAsFET preamp . . . Overdrive, high SWR, Over-temperature protection . . . Remote controllable . . .

MIRAGE RUGGED!

B-5016-G
$299
Suggested Retail

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

Ideal for 20 to 60 Watt 2 Meter mobile or base. *Power Curve* chart shows typical output power.

Hear weak signals -- low noise GaAsFET preamp gives you excellent 0.6 dB noise figure. Select 15 or 20 dB gain.

B-5016-G has legendary ruggedness. *We know of one that has been in constant use since 1979!*

Heavy-duty heatsink spans entire length of cabinet -- prevents overheating. Power transistors protected by MIRAGE's *Therm-O-Guard*™.

Fully protected from high SWR and excessive input power. Has warning LED.

Has smooth adjustable Transmit/Receive switching with remote external keying.

Draws 17-22 Amps at 13.8 VDC. 12x3x5½ in.

RC-1B, $45. Remote Control. On/Off, preamp On/Off, selects SSB/FM. With 18 foot cable.

Power Curve -- typical B-5016-G output power

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

More 160 Watt, 2 Meter Amplifiers . . .

B-2516-G, $299. For 10 to 35 Watt mobile or base stations. 160 Watts out for 25 Watts in.

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

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

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

100 Watts for 2 Meter HTs

B-310-G
$199
Suggested Retail
MIRAGE RUGGED!

Power Curve -- typical B-310-G output power

Watts Out	25	50	75	95	100	100	100	100
Watts In	¼	½	1	2	4	6	7	8

- *100 Watts out with all handhelds up to 8 Watts*
- *All modes: FM, SSB, CW*
- *Great for ICOM IC-706*
- *15 dB low noise GaAsFET preamp*
- *Reverse polarity protection*
- *SWR Protection*
- *FREE mobile bracket*
- *Auto T/R Switch*
- *FREE handheld BNC to B-310-G patch cable*
- *Ultra-compact 4¼x1¾x7¼ inches, 2½ pounds*
- *One year MIRAGE warranty*

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

35 Watts for 2 Meter HTs

B-34-G
$89.95
Suggested Retail

Power Curve -- typical B-34-G output power

Watts Out	18	30	33	35	35	35	35+
Watts In	1	2	3	4	5	6	8

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

MIRAGE RUGGED!

35 Watts, FM only . . . $69.95

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

MIRAGE Dual Band 144/440 MHz Amp

BD-35
$159.95
Suggested Retail

Power Curve -- typical BD-35 output power

Watts Out 2 Meters	30	40	45	45	45	45	45+
Watts Out 440 MHz	16	26	32	35	35	35	35+
Watts In	1	2	3	4	5	6	7

- *45 Watts on 2 Meters/35 Watts on 440 MHz*
- *Auto Band Selection*
- *Auto T/R Switch*
- *Full Duplex Operation*
- *5x1¾x5 inches*
- *FREE mobile bracket*
- *"On Air" LEDs*
- *Single Connector for dual band radios and antennas*
- *Reverse polarity protection*
- *Works with all FM handhelds to 7 Watts*
- *One year MIRAGE warranty*

Add this Mirage dual band amp and boost your handheld to a powerful mobile or base -- 45 Watts on 2 Meters or 35 Watts on 440 MHz! Mirage's exclusive *FullDuplexAmp*™ lets you talk on one band and listen on the other band at the same time -- just like a telephone conversation. *(Requires compatible HT).*

6 Meter Amplifier

FCC Type Accepted

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

70 cm Amplifiers (420-450 MHz)

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

Amateur TV Amps

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

Remote Control Head for Amps

RC-1, $45, remote controls most MIRAGE amps. Check with Mirage for compatibility. Power On/Off, preamp On/Off, switch for SSB/FM. 18 foot cable (longer available). Tiny 1¾x3¾x2½ inches.

Repeater Amps

11 models -- continuous duty all mode FM/SSB/CW repeater amps for 6, 2, 1¼ Meters, 70 cm, 450 MHz, ATV.

Low noise GaAsFET preamps

KP-1

KP-2

High gain ultra low noise GaAsFET preamps for receiving weak signals. Selectable gain prevents receiver intermod. 15 to 22 dB gain. Less than 0.8 dB noise figure. Automatic RF switching up to 100 Watts.

Choose *In-Shack* model or *Mast Mount* (includes remote control) model to reduce loss. Rugged die-cast enclosure.

Frequency (MHz)	In Shack $139	Mast Mount $195
28-30	KP-1/10M	KP-2/10M
50-54	KP-1/6M	KP-2/6M
144-148	KP-1/2M	KP-2/2M
220-225	KP-1/220	KP-2/220
430-450	KP-1/440	KP-2/440

1¼ Meter Amps (223-225 MHz)

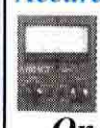
Choose from 10 models -- 20 to 220 Watts out for 2 to 50 Watts in, $129 to $655.

Commercial Amps ($199 to $395)

FCC Type Accepted

Commercial Amps for 150-174, 450-470 MHz and VHF marine bands, 70-130 Watts out.

Accurate SWR/Wattmeters



Read SWR directly and Forward/Reverse, Peak/Average power. Remote coupler. 1.8-30, 50-200, 420-450, 1260-1300 MHz band models.

One Year Mirage Warranty

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WESCONN 147.18 2030 daily; ECTN 2100 146.73/R daily; BEARS of Manchester Net 145.11/R 2115 daily. Net sess/QNI/QTC: WESCON 30/268/77; ECTN 30/241/230; NVTN 28/190/46; CPN 30/222/79; CN 30/103/57. Tfc: WA4QXT 302, KB1CTC 276, K1UQE 231, KA1GWE 105.

EASTERN MASSACHUSETTS: SM, Phil Temples, K9HI—ASMs: WA1ECF, N1GTB, WA1IDA, N1UGA, AA1MO. ACC: N1DHW. BM: N1IST. OOC: K1LJN. PIC: N1PBA. SEC: W1MPN. SGL: K3HI. STM: NZ1D. TC: N1UEC. e-mail list: ema-arrl@qth.net, web: http://www.qsl.net/ema-arrl. SGL K3HI reports MA Senate Bill 1217, the controversial mobile "hands-free" legislation is still stuck in committee. Over a dozen Sturdy Memorial Hospital ARC members participated in the recent N. Attleboro Santa Parade. SMH ARC fielded its own float in the parade! Members handed out PR material along the route. Don't forget the weekly EMA Public Safety Net Tuesdays at 2100 ET on the 145.23 Boston repeater (88.5 PL). Harvard Wireless Club has a new crop of enthusiastic undergrads this year. HWC revised their by-laws, and re-affiliated with ARRL. MIT RC recently hosted a visit by Harvard Wireless Club members. MIT invited the HWC ops to work with them in the upcoming ARRL VHF contest. Natick Emergency Radio Net members received kudos for their help in the recent Eliot Church Road Race. Minuteman RA members toured the American Medical Response facilities. MMRA also conducted a one-day Tech class. The Council of Eastern MA Radio Clubs held an organizational meeting at the Salvation Army Hq in Boston. 14 EMA clubs were represented. Billerica ARS enjoyed great success at its recent one-day Tech class: 16 of 18 participants passed! Congrats to W1LUS for conducting the class. N1IWF spoke on anti-terrorism techniques at the Mystic Valley ARG. MVARG invited other clubs in EMA to the special presentation. W1IS and family members W1MGA, K1SRG and K1LTG operated while on vacation in Iceland. W1RY recently showed off his restored 1941 Coast Guard 5-watt, 4-tube transmitter at an Acton-Boxboro ARC meeting. Northeastern Univ. RC has gotten more active of late: it is now a member of CEMARC. Patriot DX Assoc. members sorted cards for the W1 QSL bureau. Twelve-year old Katie Condo, KB1HIM of Hull was featured in a recent ARRL Letter story. Katie, who was recently licensed, suffers from cerebral palsy. She is QRV on 2m and currently SWLing on the HF bands. Cape Ann ARA will soon inherit a retired Gloucester PD ambulance to replace their existing emergency communications van, a 1964 International "bread delivery" truck! CAARA has also acquired a new 5 kW generator. Capeway RC members are swapping Christmas gifts. This SM donated bright orange hats inscribed with, "EMERGENCY COMMUNICATIONS" to Handi-HAM campers at Courage North in Minnesota. The campers participated in a simulated public service event, scripted from actual BAA Marathon communications.

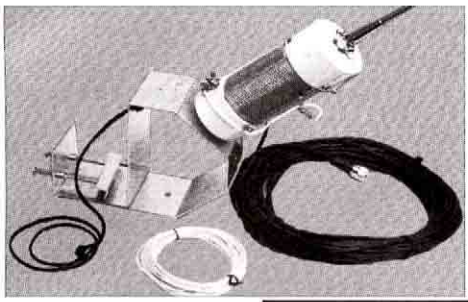
MAINE: SM, Bill Woodhead, N1KAT—ASMs: WA1YNZ, KA1TKS. STM: N1JBD. BM: W1JTH. SGL: W1AO. ACC: KA1RFD. OOC: N1RY. PIC: KD1OW. SEC: N1KGS. Asst. Dirs: KA1TKS, K1NIT. Web Site: N1WFO. The Oxford Hills Chamber of Commerce Christmas Parade was larger than ever, and to help keep everything running smoothly, the following area Hams were on hand: KB1CUY, KE1LB, N1WFO, KB1GCX, AA1UT, KA1VZL, N1VVJ, N1WJO, N1ZNJ, N1TOF, and N1GZB. Tnx to all. A well done goes out to KA1RFD and N1RY for a very successful educational program. The number of newly licensed Amateurs in our state is rising substantially, due to the hard work and long hours they have put in. Also would like to say "Great job!" to all who are involved with the elmer and Scout Net that runs Tues. 7 PM on the KQ1L linked repeater system. This type of net is useful not just for beginners, but cal also help the more seasoned operators, as well. The results of Field Day were in this month's *QST*, and it was nice to see a good showing of Maine stations that participated in a variety of categories. For me, Field Day is at the top of the "To Do" list, and speaking of which, it is only 4 months away. (Is 4 months enough time to be cloned, so I can be at several sites that weekend?) But before that, we will enjoy seeing everyone at the Maine State Convention in Lewiston on Mar. 29-30. 73, Bill, N1KAT. Tfc: W1KX 110, W1QU 59, W1JX 49, AF1L 38, N1JBD 38, W1JTH 33, KA2ZKM 33, KA1RFD 26.

NEW HAMPSHIRE: SM, Al Shuman, N1FIK (n1fik@arrl.org) (www.nhradio.org)—Thanks to W1SJ's class in October, NH, has 25 new hams. Here is your chance to ELMER a new licensee. We need to welcome them or loose them. The New Hampshire QSO Party is now sponsored by the ARRL of NH. Revised rules for 2002. Time 0000 Z Feb 2 to 2400 Z. For more info and software, go to www.nhradio.org/nh-qso. Operate a total of 24 hours of 48-hour contest. HF plus VHF/UHF. Classes: Single and Multi Transmitter QRP (less/5 W), LP (150 W or less). HP (more than 150 W), New Hampshire stations send RST and county, others send RST/state/province. DX stations send RST/serial number. Stations may be worked once per band per mode. One point per phone QSO two points per Digital QSO. Multipliers: NH stations - 49 States, 10 NH Counties, 13 Canadian Providences, 1 DX country. Non-NH stations – number NH (10) Counties worked. All participants recognized with award. Easy contest for newcomers. Send logs to NH-ARRL POB 119 Goffstown, NH 03045 posted NLT 3/31/02 or e-mail to arrl@nhradio.org. Need a strong NH turn out. 73-Al N1FIK. Net NM/sess/QNI/QTC: GSFM N1RCQ/30/175/30; GSPN WB1GXM/30/197/65; VTNH WA1JVV/30/145/132. Tfc: W1PEX 851, N1NH 148, WA1JVV 102, W1ALE 35, AA1XC 29, WB1GXM 22, K1STV 11, N1CPX 5.

RHODE ISLAND: SM, Armand Lambert, K1FLD—ASM: W1YRC. In the aftermath of the WTC disaster, your ASM has been pleased to visit our state's clubs and present special recognition certificates to those who served in NYC. By the time this report is read, we should have presented over two dozen commendations at four different club meetings. In the best spirit of Amateur Radio, you RI hams have given all amateurs proud to be licensed and I congratulate you. The BVARC hosted a large audience to a very detailed and informative A/V presentation by Dick, W1HQV, who is a FEMA Manager and just returned from his NYC assignment. He provided unforgettable images to the crowd which was made up of members from several area clubs. BVARC had invited all to attend this special meeting and about 80 attended. More consolidated efforts like this should be undertaken in the future where clubs share their resources for the common good. Leaders of four clubs have agreed to meet early in 2002 to brainstorm and develop ideas to serve this goal. Your SM, K1FLD, is continuing his medical battles and is maintaining his duties with some help from yours truly. Enjoy the band openings now. The next sunspot cycle. #24 won't start its climb until 2004 or 5. 73, Bob W1YRC, ASM.

MFJ Apartment Antenna

Covers 40 thru 2 Meters . . . Mounts outdoor to windows, balconies, railings . . . works great indoors mounted to desks, tables, bookshelves



MFJ-1622 **$99.95** *New!*

New MFJ-1622 Apartment Antenna lets you operate 40 thru 10 Meters on HF and 6 and 2 Meters on VHF with a single antenna!

Its universal mount/clamp lets you easily attach it to window frames, balconies and railings. It also works great indoors mounted to a bookshelf, desk, or table. It's not a 5 element yagi, but you'll work your share of exciting DX!

Highly efficient air wound "bug catcher" loading coil and telescoping 5½ foot radiator lets you really get out! Radiator collapses to 2½ feet for easy storage and carrying.

It includes coax RF choke balun, coax feed line, counterpoise wire and safety rope. Handles 200 Watts PEP.

Operating frequency is adjusted by moving the "wander lead" on coil and adjusting counterpoise for best SWR.

MFJ Ground-Coupled Portable Antenna Base

Provides effective RF ground and stable mount for vertical antennas . . . Antennas radiate well with low SWR

MFJ-1904 **$99.95** *New!*

MFJ *Ground-Coupled Portable Antenna Base*™ provides an *effective* RF ground 160 through 2 Meters and a stable mount for vertical antennas.

Capacitive coupling to ground is a *time-proven* principle. It needs no tuning and antenna radiates well and gives good SWR on all bands. Performance is similar to mobile stations when using a mobile antenna but is far better with longer antennas.

The base can support a lightweight multiband vertical antenna -- like the all band Hy-Gain 18AVS and the bandswitching MFJ-1795 -- and provide a semi or permanent installation.

You can easily set up and take down vertical antennas for stealth operation and hide the base by covering it with dirt.

The MFJ-1904 is a 2x2 foot *stainless steel* square with reinforcing bends that greatly strengthens it. Folded and tapered six-inch *stainless steel* legs firmly anchor the MFJ-1904 into the ground.

Built-in antenna mount with SO-239 coax connector and two U-bolts lets you mount most standard and homebrew vertical antennas.

Standard 3/8-inch x 24 mobile mount is built-in for MFJ Mobile Whips, bug catchers, *Hustlers* and screwdriver antennas.

Two handles make carrying and removing the base fast and easy. You can also attach radials for improved performance.

33 Feet Telescoping fiberglass Mast . . .

Collapses to 3.8 feet, weighs 3.3 lbs.

Super strong fiberglass mast has huge 1¾ inch bottom section. Flexes to resist breaking. Resists UV. Put up *full size* inverted Vee dipole/vertical antenna in minutes and get *full size performance!*

MFJ-1910 **$79.95**

MFJ Vertical

for Antenna Restricted Areas

40, 20, 15, 10 Meters, Automatic Band Switching

Perfect for permanent or portable operation in antenna restricted areas. Hide behind trees, fences, buildings, *in* bushes -- only 7 to 10 feet tall (adjustable).

MFJ-1795 **$149.95** *New!*

Low angle of radiation for DXing, omni-directional, handles 1500 watts PEP, low SWR.

Highly efficient end-loading. Entire length radiates.

Ground mounts with suitable ground such as MFJ-1904 *Ground-Coupled Antenna Base*, radials or ground rods. Or roof mount with radials.

HF mini-Bugcatcher

Highly efficient 40 - 6 Meter base-loaded 5½ foot Bugcatcher mobile antenna . . . Use light duty mounts

Become an *"HF Mobileer"* almost instantly with this *new* MFJ high-efficiency *mini-bugcatcher* mobile antenna! Have tons of fun rag-chewing and DXing on the HF bands. Turn boring drives into fun-filled ham adventures.

MFJ-1624 **$79.95** *New!*

Attach a simple mount to your vehicle (*mounts*: trunk lip, MFJ-347, $39.95; mirror or luggage, MFJ-342, $9.95; tri-magnet, MFJ-338T, $19.95) . . . **Screw** in your MFJ *mini-bugcatcher* . . . **Throw** your rig into your car, plug into cigarette lighter and turn power down to 20 Watts (to avoid overloading your cigarette lighter; MFJ-1624 handles 300 Watts PEP). **Operate!**

Bugcatcher design uses large highly-efficient *air-wound* inductor -- far out performs other compact HF antennas. *Exclusive* built-in inductive matching network keeps SWR low. 5½ foot whip collapses to 2½ feet for easy storage and low garages. Base loaded for minimum wind load and light duty mounts. Change band by moving *wander lead*. 3/8x24 in. mount.

MFJ Portable Antenna

MFJ-1621 **$89.95**

Operate from apartments, homes, hotels, campsites, beaches or any antenna restricted area. Work all bands 40, 30, 20, 17, 15, 12 and 10 Meters.

DXCC, WAZ, WAC, WAS have been won with the MFJ-1621! Compact 6x3x6 inch cabinet has 4½ foot telescoping whip, built-in antenna tuner, field strength meter and 50 feet coax. Handles 200 Watts.

MFJ Super High-Q Loop

MFJ's *tiny* 36 inch diameter *high-efficiency* loop antenna performs like a *full-size* dipole! Operate 10 thru 30 MHz *continuously* -- including WARC bands!

MFJ-1786 **$379.95**

Ideal for limited space -- apartments, small lots, motor homes, attics or mobile homes.

Mounts vertically or horizontally. Low angle radiation gives you excellent DX.

Super easy-to-use! Remote control auto-tunes to desired band, then beeps. No control cable needed. Handles 150 watts.

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VERMONT: SM, Bob DeVarney, WE1U—February can only mean one thing: It's Milton Hamfest time! Attendance has been off at most local hamfests, and for most clubs, that's one of the only ways they can keep their budget in the black. Several hamfests have been canceled due to poor attendance. Please make an effort to come out and support the Milton Hamfest, and attend the VT ARRL State Convention on Saturday, February 23, 2002. I hope to see you there. 73 de WE1U. Nets and traffic compiled by STM Karl, KB1DSB. Net sess/QNI/QTC/NM: VT YL Net 4/44/0/KA1LDS. Green Mtn Net 26/636/19/N1HXC. VTNH 30/145/132/WA1JVV. VT Phone Emergency Net 4/29/2/WA1DLA. VT Phone Traffic Net 30/240/74/KB1DSB. Central VT Traffic Net 29/230/71/KB1DSB. Tfc: KB1DSB 278, KB1EYP 82, AA1PR 72, W1KMH 22, W1FRP 13.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, W1UD, *w1ud@arrl.org*— ASM: N1MAP. ASM (digital) KD1SM. STM: NZ1D. SEC: K1VSG. OOC: WT1W. It is with deep regret that I announce the passing of Al, W1MDF, of Fitchburg. He was a friend of mine for over 40 years and an active operator at the age of 90. He will be missed by all who knew him. All the clubs in the area had their annual Christmas party. Our bands have been extremely active this past month. A contest or special event each weekend. So multi-faceted that everyone had a chance to operate in their favorite mode. I've noted a number of new call signs on the Sunday morning emergency net. It's great to have additional stations become active in emergency work. I have a number of openings on the 1RN/4 CW traffic net. If anyone is interested handling traffic, contact me using e-mail. The Western Mass Phone Net has been idle for a number of years. If anyone wants to activate it, please let me know. Drive carefully! It's winter, and accidents do happen more frequently during the winter season. 73, Bill.

NORTHWESTERN DIVISION

ALASKA: SM, David Stevens, KL7EB—I want to thank Kent Petty, KL5T, for serving as Section Manager. He did push PRB-1 known as Senate Bill 78. With the help and push of Dan Squires, KD7WN, of Juneau, and many letters from Alaska's hams, the bill passed senate, house, and governor office without one no vote. Linda Mullen AD4BL, is the new Section Emergency Coordinator. Her phone number is 907 488-7046, e-mail ad4bl@mosquitonet.com The Yukon Quest needs support even if it is just a phone patch or two. The Iditarod Dog Sled race starts Sat March 3, 2002. Let's get involved and SHOW CASE Amateur Radio. Sniper net 3920 1800 AST, Bush Net 7093 2000 AST, Motley Group 3933 2100 AST, and Alaska Pacific Net M-F 14.292 0830.

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP—On Nov 30, 2001, the Spokane ARES/RACES joined 96 other special event stations across the country in the 3rd annual NWS Skywarn Commemoration Day. Several antennas were set up Field-Day style at the Spokane NWS amateur station. Winds and icing caused some antenna problems at one point, and the NWS building lost commercial power due to arcing power lines, but a generator kept the station operating uninterrupted. A good number of hams participated in the 24 hour event racking up hundreds of contacts. Happy Birthday to Reggie Hoskins, W7ROL, of Four Lakes, who turned 100 years of age in December. Reggie was first licensed in 1919 and is still active on the air. In Memoriam: Dale Blair, KA7IWP, of Spokane, and Mel Hixson, WK7P, of Grand Coulee, became Silent Keys. Both were active hams and will be missed. Tfc: K7GXZ 112, W7GB 71, KA7EKL 67, K7BFL 57, KK7T 15, PSHR: W7GB 128, K7GXZ 123.

IDAHO: SM, John Cline, K7BDS — OOC: W7ZU. SEC: AA7VR. STM: W7GHT. In every section there are those few people who do most of the work. They carry on the ARRL tradition while the rest of us enjoy the benefits. To all of you who continually manage your ARRL programs and nets, I want to make sure that you know and understand that your work is appreciated. I would ask each Idaho ham to select just one ARRL net or program manager and send them a message thanking them for their work on behalf of all Idaho hams. Have you ever sent an ARRL message? Let's make February "SEND A MESSAGE OF THANKS MONTH" in Idaho. For more information, please check out the Web page at idahohamradio.com. Tfc: W7GHT 254, KB7GZU 90, WB7VYH 68, W6ZOH 19. PSHR: W7GHT 119, WB7VYH 68. Nets: FARM 30/3129/16/W7WJH; NWTN 30/1387/58/ KC7RNT; IDACD 22/464/10/WB7VYH; IMN 30/469/ 192/W6ZOH.

MONTANA: SM, Darrell Thomas, N7KOR—After a couple rather active months, Amateur Radio activity in the Montana Section dropped very low in November. I received no reports of any activity to list in this column. I urge all Amateurs in the Montana Section to please submit anything to me you feel you would like to see in the Section News. Any information should be submitted by the 7th day of the month. Net/QNI/QTC/NM MSN 151/1 W7OW, MTN 2210/43 KD7HWV, IMN 469/192 W6ZOH.

OREGON: SM, Bill Sawders, K7ZM—ASM: KK7CW. SEC: WB7NML. STM: W7IZ. SGL: N7QQU. OOC: NB7J. STC: N7LA. ACC: K7SQ. My Assistant Section Manager Marshall Johnson, Sr, KK7CW is doing an outstanding job representing the ARRL, as are ALL of the present Section appointees. I thank everyone for your support. On behalf of the Officers and Directors of the American Radio Relay League, I am proud to announce the winner and recipient of the ARRL 2000 Technical Innovation Award. Robert.S.Larkin, W7PUA of Corvallis, Oregon. The ARRL is proud to honor Mr. Larkin for his dedication to promoting the technical advancements of Amateur Radio. In addition to an engraved plaque, Robert received a check for $500. Amateur Radio continues to grow because of people like Robert Larkin. Remember this date: Saturday, February 16th. That's the day for this year's 22nd annual Salem Hamfair-computer/electronics swapmeet. This is Oregon's biggest and best hamfair. Take Hwy 22 west from Salem, to the Route 99 turn off and go south 1/2 mile to the Polk County Fairgrounds. Doors open at 9AM. I experienced a complete "computer crash" in November, and lost everything I had stored. It seems the fan failed and a complete hardware meltdown occurred. I just wanted to relay this to you, so you know how important it is to keep a backup copy of every thing you want protected. See you at the hamfair, and keep in touch.

WESTERN WASHINGTON: SM, Harry Lewis, W7JWJ—It's a good month when someone has nothing to report, or at least it is for the Official Observers of Western Washington. The last few months have been in that category with just a few reports sent to stations that failed to identify properly. If you do hear illegal

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You can determine velocity factor, coax loss in dB, length of coax and *distance to short or open in feet (it's like a built-in TDR).*

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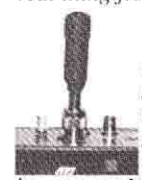

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operation on the amateur bands, the procedure established via understanding with the League and the FCC is to report through channels, namely through the OOs to Headquarters and then to the Commission. Via the SEC, the Clark Co. ARES/RACES group participated in the Vancouver Veterans' Day parade. 10 operators helped with communications and 5 members walked with and drove the float that honored all veterans. World tensions dictate emergency communicators be ready for anything - at a moment's notice. If we have a large-scale event that has a major impact on the telephone infrastructure, there will be a need for copious quantities of TRAINED responders. Does your group have enough active members that meet that criteria? Does your training program include incident Command System? Do your members have HAZMAT and Weapons of Mass Destruction awareness training? These are topics that should be in all training programs. Everyone needs to be involved in recruiting and training. Are you ready to respond if the event is in your jurisdiction? Is your group ready to support a jurisdiction that needs help? 73 & good year from N7NVP, SEC. Imagine this scenario. We are in the middle of a 100 year flood when a wild wind storm topples your tower onto your automobile. All antennas and the mobile rig are lost. The accompanying lightning vaporizes your computer and takes out all of the surge protectors in your base station. The electromagnetic pulse lets the smoke out of your back up equipment that is on charge. Your telephone lines are down, power is out and your cell phone is under water someplace. How will you communicate? Do you have that spare handheld safely stored in a ziplock bag? Is it secure so it won't float away? 73 & have a good year W7JWJ, SM.

PACIFIC DIVISION

EAST BAY: SM: Andy Oppel, N6AJO—ASMs: NJ6T, KE6QJV. SEC: KE6NVU. DECs: KE6QJV/Alameda County, KO6JR/Contra Costa County, WA7IND/Napa County, K6HEW/Solano County, N6UOW/Training, W6CPO/Technical Services, KQ6TM/Section Plans and Administration. OOC: KD6FFN. STM: W6DOB. ACC: NJ6T. EB Web Page: http://www.pdarrl.org/ebsec/. Webmaster is KB6MP. EBARC congratulates W6EDI on upgrade to Extra and to new officers for 2002: KA6BQF/Pres, KB6WC/1VP, KG6ATH/2VP, AA6XZ/3VP, NU6W/Treas, WB6VEX/Secty. NALCO welcomes WA6CCF as their new EC. ROVARC elected 2002 officers: WB6NOV/Pres, WA6KCP/VP, KC6SSF/Secty, W6KNO/Treas, AA6YE/Trustee. HRC congratulates KE6HBM for upgrading to Extra. Our thanks to VVRC for the hospitality at their Holiday Dinner. Nov tfc: W6DOB 557, WB6UZX 43, AK6DV 28, KE6QR 11. PSHR: W6DOB. BPL: W6DOB. Tfc nets: NCN1/3630/7PM; NCN2-SLOW SESSION/3705/9PM; NCN-VHF/145.21/7:30PM; RN6/3655/7:45 PM & 9:30 PM; PAN/3651/7052/8:30PM. Your check-ins are always welcome.

NEVADA: SM, Jan Welsh, NK7N—ACC: Melissa-KK7AA, corrected e- mail kk7aa@arrl.net. ASM: Dick, W6OLD, presented RARA club Merit award, and here in Las Vegas area, I presented LVRAC the club Merit award. Both groups are inclusive, diversified, represent what Amateur Radio stands for, and have the welcome mat out for new members. Congratulations to both! NW7O, Jim Frye, checks WAS, VUCC and DXCC nw7o@arrl.net ph 702-456-5396. Congratulations from DEC N7TOD-Matt Parker and Washoe County Emer Cg.Mgmt. to all participating in SKYWARN recognition day. Especially to KD7OAT! This time of year many of you are attending club festivities and going to your homes to visit family and friends. We have many reasons to be thankful. All of the reports of Amateur Radio assistance that have been flying around the country regarding the September 11th event said the same thing. Without your help, it would have been much harder to handle some of the things that needed to be done. Using your skills to assist others in their hour of need is what Amateur Radio is all about. Keep up the good work—you are needed! 73 Jan, nk7n@arrl.org.

PACIFIC: SM, Ron Phillips, AH6HN— It is with deep regret that I report the passing of Sam Kumukahi, KH6AFS. Sam was one of the founding members of the Big Island Amateur Radio Club, and a very active member. He will be missed by all hams in Hawaii. Members of EARC, Honolulu ARC, Honolulu DX Club, Chapter #193 Honolulu Chapter of QCWA, the OHANA Radio club, the Pacific Radio Amateur Transmitting Society and KARC were in attendance for a fine presentation by Mike Burger, AH7R, on antennas for small locations. Mike presented how a person living in a condo/high rise apartment, condos with a lanai, tiny backyards, hotel room balconies and so forth can really succeed using some of Mike's designed antenna and his resourceful methods of mounting them on his lanai. Mike also brought antennas, coils, hardware, tuners, etc., and mixed those hardware's with his "mental Magic" and ingenuity. GREAT JOB, Mike. Joe Speroni, AH0A, reports that with the support of the Kauai Amateur Radio Club, 15 students from Kauai Island School today had the opportunity to talk with Frank Culbertson operating NA1SS from the International Space Station. The contact started on schedule, November 15 at 20:05:45 UTC and was enjoyed by all. This was an extraordinary chance for the students and the school feels fortunate to have been selected by ARISS. Seven of the students raised their hands that they would be interested in getting an Amateur Radio license. Good work, Joe and to all those who helped. Planning has been started for the Hawaii Amateur Convention for 2002. More details later. Many thanks to all those who contributed to this report. Mahalo and 73, Ron, AH6HN.

SACRAMENTO VALLEY: SM, Jerry Boyd, K6BZ—A reminder that EMCOMM 2002 (third year of this offering) is scheduled in April near Redding. Contact *K6SOJ@arrl.net* for more info. Due to a promotion with his employer, State OES, Bill Pennington, WA6SLA, has had to resign as SEC-South. K6SOJ now wears the SEC hat for the entire Section. Thanks to Bill for his excellent work over the past 18 months. Congratulations to Tehama County ARES (KF6KDD is EC) on an excellent county-wide disaster drill held recently. Thanks to W6TEE for his work in maintaining the Section Website. El Dorado County ARC Newsletter had an excellent article in the Nov 01 edition re dealing with terrorist incidents. That club also reports that a Past President, KB6JPZ, is now a SK. Nice to hear lots of Sacramento Valley Section stations on during recent Sweepstakes weekends and during the 10 meter contest. Some great scores too! Increasing SKYWARN activity in the Section. With a very early and hard-hitting winter, this may turn out to be a record snow and rainfall season. All the more important to support SKYWARN reporting and nets. Also, as we found out recently with a major closure of I-5 due to WX, there are traveling hams not familiar with local repeaters who may need assistance. Please keep that second receiver on 146.52 simplex to be of help in such cases. Until next month, 73 de K6BZ.

SAN FRANCISCO: SM, Len Gwinn, WA6KLK—ASM: KH6GJV. SEC: KE6EAQ. Elections for 2002 officers and directors for many of the clubs in the Section have taken place. Congratulations to those elected and best wishes for a productive 2002. The REDXA group continues to have record turnouts for their meetings. The most recent had Al Burnham, K6RIM, giving a presentation on his recent trip to China. Several REDXA members were elected to the NCDXF Board: Len Geraldi, K6ANP, President; Al Burnham, K6RIM, Vice President; Bruce Butler W6OSP and Check Ternes N6OJ, Directors. The Valley of the Moon club members recently assisted with the Vintage Festival parade. They are planning a new licensing class and hope to involve members of the local Boys and Girls club. They hosted Pacific Division Director Jim Maxwell, W6CF, to a recent meeting, inviting members of the Napa club to join them. The San Francisco ARC used Oct 31st as a way to practice their ARES emergency communications skills. Calling the event the Halloween Pumpkin Patrol, the ARES group used two repeaters to cover the city with several local news organizations reporting on the activity. Other events the SFARC members supported recently were the Bridge-2-Bridge and a race in Marin County. Lake County ARC recently announced that one of their members, Dick Vander Jagt, KQ6YH, was appointed as ARES DEC for Lake County. Dick has completed ARRL's EMCOMM Level I and II courses. The Section has experienced several heavy rain storms. Section members are encouraged to keep their "Go-Packs" ready and to polish their skills by participating with their local ARES, RACES or ACS group.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN—ASM: Mike Siegel, KI6PR. ASM: John Lee, K6YK. ACC: Charles McConnell, W6DPD. OOC: Victor Magana, N1VM. SEC: Kent LeBarts, K6IN. STM: Fred Silveira, K6RAU. Once a year, I take time in the Section News to thank all of the appointees who have given of their time and talents to serve the San Joaquin Valley Section. Their names appear above and to all of them, Thank you. Thanks to our local radio clubs throughout the San Joaquin Valley communities who serve the communications needs of walk-a-thons, parades, and much more. Thanks to the members of the ARES units in each county for emergency communications and thanks to the Skywarn volunteers for assisting the National Weather Service with on the ground reports of WX to Hanford NWS that makes earlier warning assessment of severe weather possible. My personal thanks to all in the Section for the honor of your continued support as your Section Manager. Please, join your local radio club and perhaps ARES and/or Skywarn. Your volunteerism is what helps to fulfill our mandate in FCC Part 97 to serve the emergency communications needs of our communities through amateur radio. To all those QRP operators in the Section, finally DXCC is available. For details see the ARRL Web page. Don't forget to start planning for the DX Convention. The convention is to take place April 26-28, 2002, at the Holiday Inn in Visalia. The International DX Convention is held in SJV Section every year and 2002 will be the fifty third year it has been held. More information at http://www.qsl.net/visalia2002/ I hope to see you all the Convention.

SANTA CLARA VALLEY: SM, Glenn Thomas, WB6W—SEC: KQ6FM. PIC: K6ALZ. BM: WB6MRQ. TC: WA6PWW. OOC: KB6FPW. SCV Homepage is http://www.pdarrl.org/scvsec - Info on license exam sessions is also available on the SCV homepage... The HFpack group had their one year anniversary net. These folks delight in working HF pedestrian mobile. Calls heard include Bonnie KQ6XA, W3FF, N6TZV, WB6MLC, N6PBV, AB7FT and W6MMA. They meet at several times/freqs. See their Web site at http://www.hfPack.com for details...Planning is moving along for Radiofest 2002 in Monterey, sponsored by the Naval Postgraduate School ARC. It will be held on Feb16. Info at http://www.k6ly.org/radiofest or contact Brian Broggie, W6FVI w6fvi@arrl.net. The Lockheed Martin ARC held a meeting where the future of the club was discussed. They have a weekly net every Wednesday night at 8 PM on WA6GFY/R, linked on 145.62 (100 Hz for aux link), 224.28(-, 100 Hz), 443.775 (+, 100Hz) and 1283.7 (-, no pl). The South County ARES elected new officers at their November meeting. President (and San Mateo county ARES DEC) is Pete Liljequist, KD6BXY, VP Dave W6IBC, Treasurer Albert KF6KPX, Secretary James KF6OZV and Member-at-large William K6TYO. They have a wonderful ARES/RACES group in San Mateo Co and also one of the better newsletters. http://www.K6MPN.org. Santa Cruz County ARC: www.k6bj.org. The Palo Alto Amateur Radio Association meets on first Friday at 7:30 PM in Menlo Park Recreation Center. West Valley ARA: www.wvara.org. 73 de Glenn WB6W.

ROANOKE DIVISION

NORTH CAROLINA: SM, John Covington, W4CC - SEC: KE4JHJ. STM: N0SU. BM: KD4YTU. TC: K4ITL. PIC: KN4AQ. OOC: W4ZRA. SGL: AB4W. ACC: vacant. http://www.ncarrl.org. This month I would like to recognize an individual who has contributed greatly to Amateur Radio in North Carolina. Wayne Williams, K4MOB, of Colfax is stepping down as editor of the South Eastern Repeater Association (SERA) Repeater Journal. Wayne has been editor since the late 1970s and has put together a superb publication which covers not just repeaters but has become a de facto regional ham radio magazine for our part of the country. It is hard to imagine that our repeaters would work as well as they do without the coordination efforts of SERA, and SERA would undoubtedly not have the presence it does without the Repeater Journal. Wayne, thanks so much for all you have done. SERA has its roots in North Carolina, so it is fitting that the new editor is also the ARRL NC Public Information Coordinator, Gary Pearce, KN4AQ. Gary has done an outstanding job as PIC and as editor of other publications, and I am sure he will do well. I encourage all of you to support both ARRL and SERA (as well as your local club), even if you are not a frequent repeater user. We depend on repeaters for much of our public service communications. On another note, Gary and I had an outstanding visit with members of the Azalea Coast Amateur Radio Club and Wilmington VHF Society on December 4th. PIO Bill Morine, N2COP, was recognized as the winner of the ARRL Philip J. McGan Memorial Silver Antenna Award for his public relations efforts. Great job, Bill! Hamfests: Elkin February 24, Charlotte March 9-10. Traffic: W4EAT 621 (BPL), K4IWW 256, K4RLD 252, NC4ML 209, AB4E 141, AA4YW 117, KB5WY 115, KI4YV 114, KE4JHJ 109, AD4XV 72, W3HL 41, KE4AHC 38, N0SU 38, W4CC 31, KG4HDT 25, WA4SRD 24, K4WKT 21, N4TAB 16, N4NTO 10, WD4LSS 8, KE4YMA 8, KB8VCZ 7, WA2EDN 6, NT4K 6, WD4MRD 4.

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Everything you need is included -- software, audio cables and power plug.

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Works with all transceivers with 8-pin round or modular microphone plugs.

Operate PSK-31, packet, APRS, AMTOR, RTTY, SSTV, CW, high speed CW Meteor Scatter and many others. Also use as Contest Voice Keyer and CW Contest Memory Keyer.

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Choose digital or normal transceiver or computer operation with the push of a switch.

Selecting the ON digital mode, all connections are made between your rig and computer for instant digital operation.

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Rugged Construction -- All aluminum cabinet and surface-mount construction gives you years of trouble-free service.

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MFJ-1275/MFJ-1275M includes audio cables, power plug and a CD with a collection of the most popular amateur radio software to operate PSK-31, RTTY, SSTV, PACKET, AMTOR, CW, HSCW Meteor Scatter, Contest Voice Keying and other modes. Uses 12 VDC or 110 VAC with optional adapter (**MFJ-1312B, $14.95**).

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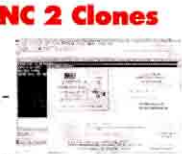

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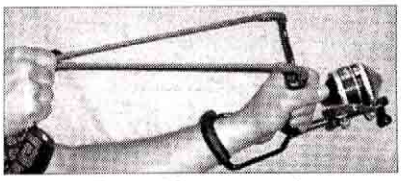

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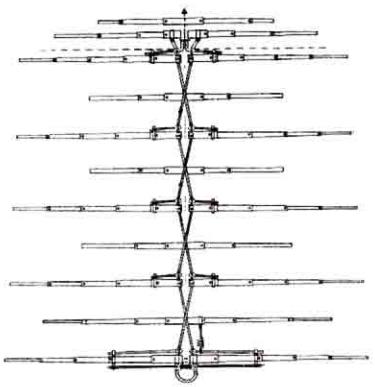

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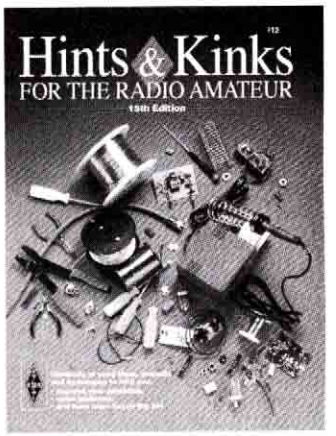

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"What did you say?" ***Can you hear but . . . just can't always understand everything people are saying?***

As we get older, high frequency hearing loss reduces our ability to understand speech. Here's why . . .

Research shows that nearly *half* the speech intelligibility is contained in 1000 to 4000 Hz range, but contains a miniscule 4% of total speech energy.

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By boosting high and cutting low frequencies and adjusting the balanced control, speech that you can barely understand become highly understandable!

Even if you *don't* have high frequency hearing loss, you'll dramatically improve your ability to understand speech. You'll get an edge in contesting and DXing and enjoy ragchewing more.

Here's what *QST* for April, 2001 said . . . *"I expected a subtle effect at best, but I was astonished . . . The result was remarkably clean, understandable speech without hissing, ringing or other strange effects . . . made a dramatic improvement . . ."*

Immuned to RFI. Has phone jack, on/off speaker switch, 2 inputs, bypass switch. 10Wx2½Hx6D". Needs 12 VDC.

MFJ-1316, $19.95. For 110 VAC operation. Provides 12 VDC/1.5 Amps.

MFJ-72, $58.80. *All-in-one MFJ-616 Accessory Pack.* Includes MFJ-392 headphones, two MFJ-281 speakers and MFJ-1316 power supply. ***Save $7!***

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MFJ Contest Voice Keyer

Transformer-coupled -- No RFI, hum or feedback . . . 75 seconds total, 5-messages . . . Records received audio . . .

MFJ-434
$179.95

Let this *new* microprocessor controlled MFJ *Contest Voice Keyer*™ call CQ, send your call and do contest exchanges for you in your own natural voice!

Store frequently used phrases like "CQ Contest this is AA5MT", "You're 59" . . . "Qth is Mississippi" . . . Contest by pressing a few buttons and save your voice.

Record and play back five natural sounding messages in a total of 75 seconds. Uses *eeprom* -- no battery backup needed.

You can repeat messages continuously and vary the repeat delay from 3 to 500 seconds. Makes a great voice beacon and calling CQ is *so* easy.

You can also record and play back off-the-air signals -- great help if you didn't get it right the first time! No more "*Please repeat*".

A playing message can be halted by the *Stop Button*, your microphone's PTT/VOX, remote control or computer.

Has jack for remote or computer control (using CT, NA or other program). Lets you select, play and cancel messages.

Your mic's audio characteristics do not change when your MFJ-434 is installed.

All audio lines are RF filtered to eliminate RFI, audio feedback and distortion. An audio isolation transformer totally eliminates hum and distortion caused by ground loops.

It's easy to use -- just plug in your 8 pin mic and plug the MFJ-434 cable into your transceiver. Internal jumpers let you set it to your rig. Use your mic or its built-in mic for recording.

Built-in speaker-amplifier. Speaker/phone jack. Use 9 Volt battery, 9-15 VDC or 110 VAC with optional MFJ-1312B, $14.95. 6½Wx2½Hx6½D in.

MFJ-73, $29.95. MFJ-434 Remote Control with cable.

60 dB Null *wipes out* noise and interference

MFJ-1026
$179.95

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

Eliminate all types of noise -- severe power line noise from arcing transformers and insulators, fluorescent lamps, light dimmers, touch controlled lamps, computers, TV birdies, lightning crashes from distant thunderstorms, electric drills, motors, industrial processes . . .

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

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

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

Use the MFJ-1026 as an *adjustable phasing network.* You can combine two antennas to give you various directional patterns. Null out a strong interfering signal or peak a weak signal at a push of a button.

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

RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312B, $14.95. 6½x1½x6¼ in.

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

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SOUTH CAROLINA: SM, Patricia M. Hensley, N4ROS — The foundation of the ARRL administrative network is comprised of the many clubs-formal and informal-to which individual amateurs belong and support. These collections of amateurs many times may extol different philosophies, but they all have the same goal: communications-a desire to exchange ideas, feelings, and information with others. This may occur face-to-face at the monthly meeting; across town on the local repeater; or even around the world. Regardless at what distance "the communication" occurs, the result is usually a better understanding of a problem; an increased awareness of another viewpoint; or an acquisition of new information. Therefore, the function of the President's Council is to better facilitate communication among SC amateurs. As of this report, there have been four meetings of the President's Council at respective hamfests. These meetings have provided a forum for exchange of ideas and suggestions. I encourage clubs who have not participated in the Council meetings to attend the Greenwood and Charleston hamfests. Help us to communicate with all SC amateurs. Tfc: AF4QZ 208, KA4UIV 93, KA4LRM 84, K3LM 27, K4JIF 26, N4VVX 21, K4BG 20, WD4BUH 17, K8DZH 2. PSHR: AF4QZ/N4VVX 131, KA4UIV 130, KA4LRM 116, K4BG 107. SEC: 294.

VIRGINIA: SM, Carl Clements, W4CAC—SEC: N4NW. STM: N1SN. PIC: W4PW. ACC: W4IM. OOC: W4NEZ. TC: W4RAH. Web page; www.arrlva.org. I would like to mention another of the ARRL programs this month. That is the Affiliated Club program. Last year, three clubs in the Section were recognized for their longevity as affiliated clubs. Congratulations to the Richmond Amateur Radio Club for their 75 years of affiliation, the Shenandoah Valley Amateur Radio Club for 50 years of affiliation, and to the Portsmouth Amateur Radio Club for 25 years of affiliation with the ARRL. Welcome aboard to the Virginia Appalachian Wireless Association, as they became an affiliated club last August. If your club is not affiliated and would like to be, or you would like information on becoming a Special Service Club, please get in touch with John Humphrey, W4IM (w4im@arrl.net). John is the ACC for the Section and will be more than glad to help you. If a link to your club's web page has yet to be put on the Section Web page at www.arrlva.org, just let Pat Wilson, W4PW (w4pw@arrl.net) know. Pat is our PIC and is looking for more information for the Web pages. Tom Gregory, N4NW (n4nw@arrl.net), is the SEC and is still looking for volunteers to help with the ARES program in the Section. Several amateurs in the section have responded to Ed Ray's plea for more OOs, especially in the western part of the state. If you are interested in the OO program, come to the forum at the Frostfest for the OO program. Ed (W4NEZ), the OOC, will be there and looks forward to meeting all the OOs and any interested in the program. Speaking of Frostfest, it will held on February 10th this year. I look forward to seeing everyone there. Remember, you are the ARRL! 73 de Carl, W4CAC. Tfc: W3BBQ 472, N1SN 216, K4YVX 206, WA4DOX 184, K0IBS 177, WD4MIS 125, N4ABM 108, K4MTX 93, AA4AT 61, KV4AN 59, KE4PAP 56, WB4ZNB 52, W4VLL 43, KG4OTL 36, WB4UHC 24, KU4MF 19, KU4TM 18, W4MWC 18, W4JLS 16, K3SS 11, KB4CAU 10, W4CAC 9, W4YE 8, N4FNT 2, KU4JM 1.

WEST VIRGINIA: SM, Hal Turley, KC8FS— SEC: W8XF. STM: KC8CON. SGL: K8BS. OOC: N8OYY. TC: W8DL. PIC: N8TMW. ACC: KC8KVF. I'm happy to announce the appointments of Dennis, W8YS, as Assistant SM representing Northern W.Va. and Nick KB8NDS as ASM representing Eastern W.Va. Tnx Dennis and Nick for your help. W.Va. ARRL Affiliated clubs reporting election results with officers/trustees for 2002 include: Monongalia Wireless Assoc.- President Mike K8LG, V.P. Jack N8NQW, Sec./Treas. Norene N8TJM; Plateau ARA- President Juddie KC8CON, V.P. Jeremy N8JTL, Sec./Treas. Clark AA8SH, Trustees Steve NM8T, Arnold N8BJY, Richard KB8SMC; Tri-State ARA- President Bill AB8BY, V.P. Dwight WB8JPJ, Sec. Mike KB8QEK, Treas. Don KB8TSC; Kanawha ARC- President Olie WD8V, V.P. Jim N8TMW, Sec. Ann KA8ZGY, Treas. Bob N9DMK. Congratulations es GL to all! Check out new WV Section Web site at www.qsl.net/wvarrl. Hope to see a good crowd at the Charleston Hamfest on March 16th. 73 de Hal. Tfc (Nov.) WD8DHC 218, W8YS 117, N8NMA 81, WW8D 61, KC8CON 60, N8FXH 6. PSHR: W8YS 142, WD8DHC 129, KC8CON 113, WW8D 109, W8IVF 90, N8NMA 82. WVMDN 670/56/449 WW8D; WVN E 142/59/309 N8NMA; WVN L 120/49/253 N8NMA; WVFN 1064/228/902 KC8CON; BDARC (2mtr) 269/0/568, EPTN (2mtr) 19/2/47.

ROCKY MOUNTAIN DIVISION

COLORADO: SM, Jeff Ryan, N0WPA— ASM: Tim Armagost, WB0TUB. ASM: Jerry VerDuft, AD0A. SEC: Mike Morgan, N5LPZ. STM: Mike Stansberry, K0TER. ACC: Ron Deutsch, NK0P. PIC: Erik Dyce, W0ERX. OOC: Karen Schultz, KA0CDN & Glenn Schultz, W0IJR. SGL: Mark Baker, KG0PA. TC: Bob Armstrong, AE0B. BM: Jerry Cassidy, N0MYY. The 2001 National Weather Service / ARRL Skywarn recognition day is becoming one of my favorite annual events. A cross between a special event station and a contest, this year there were 96 NWS stations on the air. I stopped at the Pueblo NWS forecast office for several hours on December 1st and operated a PSK-31 station set up by Mike, K0TER, our Section Traffic Manager and member of Pikes Peak (D14) ARES who were hosting the event along with the Pueblo Ham Club and ARES D16. I have operated RTTY before and the procedures were pretty much identical. I had a great time! Thanks to Wes, K0HBZ, Mike, K0TER and others for the invite, and for letting me get on the air and make some contacts. In an effort to host an ARRL Rocky Mountain Division convention in Colorado, probably in 2003, there will be a kick-off meeting in Denver on January 12th. I've sent invitations to the president of each ARRL affiliated club as listed on the ARRL's affiliated club database. If you haven't updated your info in a long time, you may no longer be affiliated. Please check your data on the ARRL Web (do a search for 'affiliated'). If you believe I've overlooked your club and wish to participate in this meeting let me know. My contact information is on page 12 of *QST*. I've appointed a new cabinet member, Assistant Section Manager Jerry VerDuft, AD0A to chair this effort. Welcome Jerry, and thanks for volunteering. 73, de N0WPA. NTS Traffic: AD0A 166, K0TER 119, W0ZZS 84. CAWN: W0WPD 911, K4ARM 760, W0LVI 436, AA0ZR 366, KI0ND 356, W0GGP 337, AB0PG 305, W0NCD 257, WB0VET 244, WD0CKP 227, N0NMP 224, N0FCR 63.

NEW MEXICO: SM, Joe T. Knight, W5PDY—ASM: K5BIS, N5ART & KM5FT. SEC: K6YEJ. STM: N7IOM. NMs: WA5UNO & W5UWY. TC: W8GY. ACC: N5ART. Efforts to get the New Mexico PRB-1 Legislation on the agenda for this session are moving forward with AC5ZO leading the way. The Bill is entitled "Emergency Commu-

MFJ *Pocket size* Morse Code Reader™

Hold near your receiver -- it instantly displays CW in English!

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$79.95

Is your CW rusty?

Relax and place this tiny pocket size MFJ Morse Code Reader near your receiver's speaker . . .

Then watch CW turn into solid text messages as they scroll across an easy-to-read LCD display.

No cables to hook-up, no computer, no interface, nothing else needed!

Use it as a backup in case you mis-copy a few characters - - it makes working high speed CW a breeze - - even if you're rusty.

Practice by copying along with the MFJ-461. It'll help you learn the code and increase your speed as you instantly see if you're right or wrong.

Eavesdrop on interesting Morse code QSOs from hams all over the world. It's a universal language that's understood the world over.

Automatic Speed Tracking

MFJ *AutoTrak*™ automatically locks on, tracks and displays CW speed up to 99 Words-Per-Minute.

Simply place your MFJ-461 close to your receiver speaker until the lock LED flashes in time with the CW.

Four Display Modes

1. Bottom line scrolls and fills with text, then that entire line is displayed on top line until bottom line refills -- makes reading text extra easy! Automatically displays speed in WPM.

2. Same as **1**, without speed display -- gives you maximum text display.

3. Top line scrolls, bottom line displays speed in Words-Per-Minute.

4. Both top and bottom lines scroll. **Two-line** LCD display has 32 large 1/4 inch high-contrast characters.

MFJ Instant Replay

The last 140 characters can be instantly replayed. This lets you re-read or check your copy if you're copying along side the MFJ-461.

High Performance Modem

Consistently get solid copy from MFJ's high performance *PLL* (*phase-lock loop*) modem. Digs out weak signals. Even tracks slightly drifting signals.

Of course, nothing can clean up and copy a sloppy fist, especially weak signals with lots of QRM/QRN.

Computer Interface

The MFJ-461's serial port lets you display CW text full screen on a bright computer monitor -- just use your computer serial port and terminal program.

More Features

When it's too noisy for its microphone pickup, you can connect the MFJ-461 to your receiver with a cable.

Battery saving feature puts MFJ-461 to sleep during periods of inactivity. It wakes up and decodes when it hears CW.

Uses 9 Volt battery (not included).

True Pocket Size

Fits in your shirt pocket with room to spare - smaller than a pack of cigarettes. Tiny 2¼x3¼x1 in. 5½ ounces.

No Instruction Manual needed!

Super easy-to-use! Just turn it on -- it starts copying instantly!

Accessories

MFJ-26B, $4.95. Soft leather protective pouch. Clear plastic overlay for display, push button opening, strong, pocket/belt clip secures MFJ-461.

MFJ-5161, $14.95. MFJ-461 to computer serial port cable (DB-9).

MFJ-5162, $5.95. Receiver cable connects MFJ-461 to your radio's external speaker 3.5 mm jack.

MFJ *Pocket* Morse Tutor

MFJ-418
$79.95

Learn Morse code anywhere with this tiny *MFJ Pocket-sized Morse Code Tutor*™! Practice copying letters, numbers, prosigns, punctuations or any combination or words or QSOs. Follows ARRL/VEC format. Start at zero code speed and end up as a high speed *CW Pro!* LCD, built-in speaker.

MFJ Code Oscillator

MFJ-557
$29.95

MFJ-557 Deluxe Code Practice Oscillator has a Morse key and oscillator unit mounted together on a heavy steel base -- stays put on your table! Portable. 9-Volt battery or 110 VAC with MFJ-1312, $14.95. Earphone jack, tone and volume controls, speaker. Adjustable key. Sturdy. 8½x2¼x3¼ in.

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Built-in Iambic Paddle. Thumbwheel speed control. Adjustable weight. Adjustable sidetone with speaker. Iambic modes A or B. Fully automatic or semi-auto "bug" mode. Reversable paddle. Tune mode. RF-proof. Battery Saver. Tiny 2¼x3¼x1 in.

MFJ *miniature* Travel Iambic Paddle

MFJ-561, $19.95. 1¾Wx1¾Dx¾H in. *Formed* phosphorous bronze spring paddle, stainless steel base. 4 ft. cord, 3.5 mm plug.

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nications Response Act" and is an attempt to get Governor Johnson to put the bill on the agenda for this session. Since this session of the legislators is only intended for appropriations, it is necessary for the Governor to specifically request any items that he deems appropriate to be added, otherwise we will have to await next year's session. We are hoping for the best! If you did not contact the Governor or your representatives, please do make contact and support our effort for the next session in 2003! We need to make our voices heard. Hams around the state have been responding to FEMA's national has-mat program in order to work better with other emergency responders. In light of recent events, this aid could be invaluable. Keep up the good work! Very sorry to report the passing of K5KKO, of El Paso. He is an ole timer who will certainly be missed. Many good newsletters from around the state, and thanks to all who make this information available! Congratulations to all the new club officers and let's all show our appreciation to those taking on the challenge! 73, W5PDY.

UTAH: SM, Mel Parkes, AC7CP—I was very saddened at the news of a very good friend becoming a Silent Key. Collene Jameson, N7XLP, passed away on 26 Nov and was very well known to many hams in the Davis County Area and throughout Utah. Our thoughts and prayers go to Allen, KE7BG, her husband and family. Congratulations to Jessica Dowding, this 6 year old YL passed her Technician License on 8 December, I'm sure she is one of the youngest hams in the State of Utah. The Olympics are finally here, I would like to thank all those who have spent many hours training and getting ready to support this monumental event. The combined Utah QSOParty/Olympics QSO Party, 9-11 Feb will be the dates, look for the specific details in the Feb *QST*. If you have questions contact Jon Utley, K7CO, uqp@vcr.com. Ray Friend will be operating a special event station using the call sign, WA7ITZ/w19og for the Winter 19th Olympic Games. The VHF annual swap meet will be held on 02 Mar at the Utah State Fair Park at 0800 local. Join us for great deal on new and used gear. You will also be able to pre-register for the Utah hamfest there. 73 de Mel, AC7CP.

WYOMING: SM, Bob Williams, N7LKH— University ARC, N7UW, in Laramie, blew away the competition for the Wyoming Field Day Cup, with 5048 points, placing 17th overall in the 2A Battery class. Next was Campbell Co. ARC, W7CW, with 3814 points, then Sweetwater ARC, WY7U, with 2158 points. Other clubs turning in scores were: Carbon Co. ARS, KC7OZU, 2094 points; Shy-Wy RC, KC7SNO/N7JYY, 1012 points; Star Valley ARC, KD7LVE, 784 points; and Sheridan RAL, W7GUX, 324 points. A group of hams in Southern Wyoming, including KJ7AZ, N7ZEF, KK7CN, KD7TA, N7ERH, K0DJ, and WA7LFT, along with others, have added three new APRS digipeaters since June, at Elk Mt. (Laramie/Rawlins area), Oyster Ridge (Diamondville/Kemmerer area), and Limestone Peak (South Pass area). They have also completely rebuilt the site at Wamsutter, which is now totally solar-powered. They are still trying to get activity going along the I-25 and I-90 corridors, but are in business along the I-80 corridor, in time for the upcoming Olympics in Salt Lake. The APRS frequency is 144.390, nationwide. For more information, contact Bob, K0DJ, K0DJ@arrl.net. Tfc: NN7H 263. PSHR: NN7H 172.

SOUTHEASTERN DIVISION

ALABAMA: SM, Bill Cleveland, KR4TZ – ASMs: W4XI, WB4GM, KB4KOY. SEC: W4NTI. STM: AC4CS. BM: KA4ZXL. OOC: WB4GM. SGL: KU4PY. ACC: KV4CX. TC: W4OZK. PIC: KA4MGE. Thank you for allowing me to serve the Alabama Section for another term. I have big plans this term, and look forward to working with you to reach our new goals. The following appointees ended their term in the Alabama Section: Chris Sells (AC4CS) served as Section Traffic Manager, Gene McGlaughn (WB4GM) served as Official Observer Coordinator, and Ricky Barnes (KA4MGE) served as Public Information Coordinator. They served the Alabama Section well during their tenure, and I hope you will join me in thanking them for volunteering their time and effort into providing the service you expect from the ARRL at the State Level. I am proud to announce the following people are renewing their term on the section cabinet: Dan Jeswald (W4NTI) will continue serving as Section Emergency Coordinator, Rik Doll (KU4PY) will continue serving as State Government Liaison, and Gregory Sarratt (W4OZK) will continue serving as Technical Coordinator. Thank them for continuing to volunteer their time to serve the ham community of the Alabama Section. The ARRL is starting a new service on January 1, 2002. This new service allows me to keep you up-to-date on all that is happening with the ARRL on a national and state level. Basically, it's a Section News Web page, that is meant to supplement our current section web page, and you'll be able to try it out by going to http://www.arrl.org/sections and selecting Alabama. God bless & 73, Bill Cleveland, KR4TZ. Tfc: W4ZJY 195, AC4CS 83, W4CKS 75, WB4GM 65, WB4BHH 27, KD4CQJ 26, W4DGH 21, W4NTI 13, W4QAT 11.

GEORGIA: SM: Susan Swiderski, AF4FO—ASM/South Ga: Marshall Thigpen, W4IS. ASM/Legal: Jim Altman, W4UCK. Asst SM/IT: Mike Boatright, KO4WX. SEC: vacant. STM: Jim Hanna, AF4NS. SGL: Charles Griffin, WB4UVW. BM: Eddie Kosobucki, K4JNL. ACC: Mary Whatley Ahls, W4NZJ. OOC: Mike Swiderski, K4HBI. TC: Fred Runkle, K4KAZ. PIC: Matt Cook, KG4CAA. Web site www.qsl.net/arrl-ga. This is my last Section News column. In light of my election as Vice Director of the Southeastern Division, I have retired as SM. ARRL HQ has appointed Susan Swiderski, AF4FO, to fill out my term which ends Oct 31, 2003. Susan has been the outstanding ACC in Georgia. She has appointed Mary Whatley Ahls, W4NZJ, as ACC. As of this writing, the SEC job in vacant due to the resignation of Lowry, Rouse, KM4Z. QCWA elected officers for the next year. Pres: K4HBI, V Pres: W3CDE, Sec/Tres: NK4U. I regret to report the passing of John T. Laney Jr, K4VGI, father of K4BAI, in Columbus. I have known the family for decades and this is very tragic news. Two clubs announced amateurs of the year. Lanierland ARC tapped team Parrish, Peggy, K4PEG, and Ken, KN4UO. Atlanta ARC named John Talipsky Jr, KA4VQH. The SE DX club has a new President. K4PI stepped down and VP. W4TE has stepped up. ARC of Augusta has new officers. Pres: Henry Arostegui, KN4AV. V Pres: KG4LEY. Sec: W4SJR, Tres: KF4ITM. Ken Sargent, W2DWW, Warner Robbins, is a SK. We regret his passing. It has been a honor and a pleasure to serve as your Section Manager the past 4 plus years. I am not going anywhere, I have been kicked upstairs, in true Peter Principle fashion, to serve as your Vice Director of the division which includes Ga, Al, Fl, Pr and the Virgin Islands. I will attend semi-annual board meetings and observe how the ARRL policy is manufactured. I sit behind W4RH at board meetings and keep silent (a very difficult task) as the meeting progresses. I will still travel to as many Ga hamfests as possible but expand a bit to include the rest of the division. Please give your support to Susan as you have supported me as SM. 73, Sandy. Tfc Nov. W4WXA 151, AF4NS 121, K1FP 76, K4WKT 58, K4BEH 57, KA4HHE 56, KG4FXG 46, WB4BIK 40, KE4R 32, K4JNL 6.

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—Northern Florida District Assistant Section Managers: Capital: Jim, K4VRT; East Central: Rick, K1CE; East Panhandle: Nils, WA4NDA; Florida Crown, Billy, N4UF; Suwanee, Joe, W2DWR; West Panhandle, Steve, KO4TT. Staff Appointments: ACC: Steve, WA4B. BM: David, N4GMU. OOC: Cindy, KD4NLF. PIC: Mike,KF4HFC. SEC: Nils, WA4NDA. SGL: John, KC4N. STM: Mort, WX4H. TC: Steve, KO4TT. Packet: David, N4GMU. The Hurricane Season came and went without our having to activate the Sections' Emergency Communication Net. This is good, as we did not experience any damages, injuries, and other problems relating to disasters. However, we did experience several fires, and considerable damages to property. These were handled on a local basis. Since the FCC changed the requirement for Morse code, there are hams out there which are available to be part of the local emergency operations. The Amateur Radio clubs are missing a great opportunity, as well as Emergency Coordinators recruiting them to assist during disasters. Most Clubs are affiliated with the ARRL and some as Special Event Clubs, but seem to forget they volunteered their members to support the ARRL programs. The first objective concerns the support of the emergency communications systems. Yet, there are some refusing to do so. At clubs meeting, it is often said they do not want any part of the Amateur Radio emergency communication system. What has happened to the spirit, when in the past amateur radio was know for its concern for the welfare of the public and for each other? The Northern Florida Section developed an Organization System, which has been tried, and proven to be effective and reliable. The State of Florida has made it as part of the States' Emergency Operations Plan. Those desiring to use the System are welcomed and invited to do so. The monthly traffic reports are down, and understandably due to cell phones. It seems everybody has one or two phones. We must not forget how to prepare NTS traffic reports. Most of the local nets will accept traffic and list it on the Section and Region Nets. It is a very good way to learn the ins and outs of traffic handling.. Instead of sending e-mail, try sending message through the traffic system. 73 de Rudy. Tfc: WX4H 1258, KE4DNO 225, AG4DL 180, NR2F 177, KF4WIJ 149, WD4GDB 112, K1JPG 110, N9MN 92, AF4PU 92, K8KV 57, KG4EZQ 45, K4JTD 39, W4KIX 28, WD4IIO 20, KB4DCR 18, WX4H 18, WA1VOP 16, KC4FL 16, W8IM 14, AB4PG 12, KJ4HS 11, WA4EYU 5, WB9GIU 4, WD4ILF 3.

PUERTO RICO: SM, Víctor Madera, KP4PQ — Celebrando los días finales de la Fiesta Navideña. Creo que podemos que salimos de la época de huracanes de forma victoriosa. Solo sentimos lluvias fuertes e inundaciones. Aunque no hubo necesidad de trabajar en emergencias este año me preocupa mucho la dejadez que hubo de parte de las agencias de servicio civil en cuanto al uso de los servicios de ARES. Trabajamos junto a la Cruz Roja para suplementar sus comunicaciones con el servicio de ARES. Esperamos tener un programa funcionando y listo para la próxima temporada. Los interesados en participar en la red de HF en las zonas deben comunicarse con el SM. Su dirección parece en la página 12 del QST. Comienza la segunda ronda de exámenes del ARRL/VEC en toda la isla. Visite http://prarl.org/exámenes para detalles. La FRA celebró su Fiesta Navideña en Mayagüez. La misma fue muy concurrida. El PRARL celebró su Décima Cuarta Asamblea Anual 2002 en el Albergue Olímpico de Salinas, PR. Nuestras felicitaciones a la nueva Junta de Directores. Exhortamos a todos los clubes a preparar programas de orientación y educación para sus socios en el 2002—"El Año de la Educación". Los interesados en el programa para certificarse en Comunicaciones de Emergencia y ARES, comuníquense con el Section Manager vía email a *kp4pq@arrl.org*.

SOUTHERN FLORIDA: SM, Phyllisan West, KA4FZI—SEC: W4SS. STM: WA2YL. ACC: WA4AW. PIC: W4STB. OOC: K4GP. BM: KC4ZHF. SGL: KC4N. DEC/ASM: N4LEM, K9SHT, AA4BN, KD4GR. Web Page: http://www.sflarrl.org. Coming Attractions 2002: Best of luck to Lee County on their Jan. 11-12 hamfest and Dade County for the Miami Hamboree on Feb. 2-3. AROUND THE SECTION: Brevard County provided communications for the Sharing Center's fishing tournament and also for the Nov. 10 Boy Scout Food Drive. Nov. 25 found them helping out at the Space Coast Runners Marathon. Broward County's will work at the Winterfest Boat Parade featuring 100 boats. Collier County has been upgrading equipment at the EOC including antenna and tower replacement/additions and repeater renovation. The packet stack is being restored and ATV worked on. With brushfire season coming they should be ready for any emergency. Indian River ARES/RACES members had a radiological training course since radiation detection devices will be placed in the two COMM vehicles. K4MVO was contacted to be interviewed and answer phoned-in questions on radio station WXXU about ham radio and amateur public service. Great going, Stephanie! Martin County's Treasure Coast Weather Net participated in the NWS Special Event Dec. 1 by being on the air for 24 hours. Osceola has moved forward with an Internet link through the repeater so ARES/RACES activities can be checked around the world via radio! Palm Beach EC, N4QPM, reports a new possible opening for ARES/RACES to expand their EOC assistance by providing information on I-95 and FL Turnpike traffic movement during evacuations. Fifty-one members participated in the Food For Families drive Nov 10 and 17. The Wellington group will have a Dec 8 weekend campout and survival training with members of the Miami DCAT. St. Lucie County has a new EC, Pete Bordonali, AA4PN. Our thanks to outgoing EC, Dana Elliott, AF4CN, for all the years he served before moving out of the county. November Traffic by STM WA2YL: WA9VND 450, KA4FZI 232, K4FQU 200, KD4GR 167, WA2YL 139, KD4HGU 104, KE4UOF 92, KC4ZHF 88, K4VMC (club) 73, KE4WBI 51, W6VIF 48, AA4BN 47, KG4MLD 45, WA4EIC 43, WB4PAM 42, KG4ILJ 37, KT4XK 34, KG4MLC 27, KG4CHW 25, WA4CSQ 23, KF4OMB 14, WA4GUK 7, AF4NR 7, KF4UTH 4. 73, Phyllisan West, KA4FZI, Section Manager, Southern Florida.

VIRGIN ISLANDS: SM, John Ellis, NP2B, St. Croix—ASM: Ron KP2N, St. Thomas. ASM: Mal, NP2L, St. John. Sect. Internet Mgr, SIM: Jeanette, NP2C. St. Croix. SEC: Duane, NP2CY, St. Tho-

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MFJ uses super heavy duty components -- roller inductor, variable capacitors, antenna switch and balun -- to build the world's most popular high power antenna tuner.

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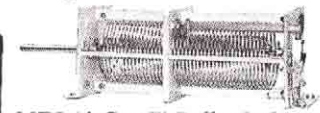

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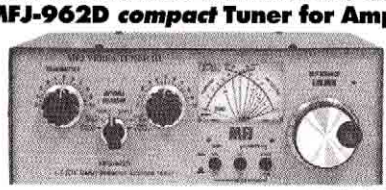
Two knob tuning (differential capacitor and *AirCore*™ roller inductor) makes tuning foolproof and easier than ever. Gives minimum SWR at only one setting. Handles 3 KW PEP SSB amplifier input power (1.5 KW output). Gear-driven turns counter, lighted peak/average Cross-Needle SWR/Wattmeter, antenna switch, balun. 10³/₄Wx4¹/₂Hx15 in.

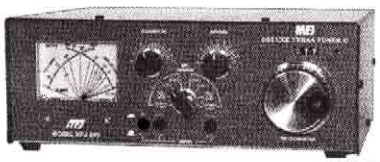
MFJ-962D *compact* Tuner for Amps



MFJ-962D **$269.95**

A few more dollars steps you up to a KW tuner for an amp later. Handles 1.5 KW PEP SSB amplifier input power (800W output). Ideal for Ameritron's AL-811H! *AirCore*™ roller inductor, gear-driven turns counter, pk/avg lighted Cross-Needle SWR/Wattmeter, antenna switch, balun, Lexan front, 1.8-30MHz. 10³/₄x4¹/₂x10⁷/₈ in.

MFJ-969 300W *Roller Inductor* Tuner



MFJ-969 **$199.95**

Superb *AirCore*™ Roller Inductor tuning. Covers *6 Meters* thru 160 Meters! 300 Watts PEP SSB. *Active* true peak reading lighted Cross-Needle SWR Wattmeter, *QRM-Free PreTune*™, antenna switch, dummy load, 4:1 balun, Lexan front panel. 3¹/₂Hx10¹/₂Wx9¹/₂D inches.

MFJ-949E *deluxe* 300 Watt Tuner

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More *hams use MFJ-949s than any other antenna tuner in the world!* Handles 300 Watts. Full 1.8 to 30 MHz coverage, 48 position *Precision48*™ inductor, 1000 Volt tuning capacitors, *full size* peak/average lighted Cross-Needle SWR/Wattmeter, 8 position antenna switch, dummy load, *QRM-Free PreTune*™, scratch proof Lexan front panel. 3¹/₂Hx10⁵/₈Wx7D inches. **MFJ-948, $129.95.** Economy version of MFJ-949E, less dummy load, Lexan front panel.

MFJ-941E *super value* Tuner

MFJ-941E **$129.95**

The *most for your money!* Handles 300 Watts PEP, covers 1.8-30 MHz, *lighted* Cross-Needle SWR/Wattmeter, 8 position antenna switch, 4:1 balun, 1000 volt capacitors, Lexan front panel. Sleek 10¹/₂Wx2¹/₂Hx7D in.

MFJ-945E HF+6 Meter *mobile* Tuner

MFJ-945E **$119.95**

Extends your mobile antenna bandwidth so you don't have to stop, go outside and adjust your antenna. Tiny 8x2x6 in. *Lighted* Cross-Needle SWR/Wattmeter. Lamp and bypass switches. Covers 1.8-30 MHz *and* 6 Meters. 300 Watts PEP. **MFJ-20, $4.95,** mobile mount.

MFJ-971 *portable/QRP* Tuner

MFJ-971 **$99.95**

Tunes coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle Meter. SWR, 30/300 or 6 Watt QRP ranges. Matches popular MFJ transceivers. Tiny 6x6¹/₂x2¹/₂ inches.

MFJ-901B *smallest* Versa Tuner

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MFJ's smallest (5x2x6 in.) and most affordable wide range 200 Watt PEP Versa tuner. Covers 1.8 to 30 MHz. Great for matching solid state rigs to linear amps.

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Operate all bands anywhere with MFJ's reversible L-network. Turns random wire into powerful transmitting antenna. 1.8-30 MHz. 200 Watts PEP. Tiny 2x3x4 in.

MFJ-906/903 *6 Meter* Tuners

MFJ-906 **$79.95**

MFJ-906 has lighted Cross-Needle SWR/wattmeter, bypass switch. Handles 100 W FM, 200W SSB. **MFJ-903, $49.95.** Like MFJ-906, less SWR/Wattmeter, bypass switch.

MFJ-921/924 *VHF/UHF* Tuners

MFJ-921 or MFJ-924 **$69.95**

MFJ-921 covers 2 Meters/220 MHz. **MFJ-924** covers 440 MHz. SWR/Wattmeter. 8x2¹/₂x3 inches. Simple 2-knob tuning for mobile or base.

MFJ-922 144/440 MHz Tuner

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Ultra tiny 4x2¹/₂x1¹/₂ inch tuner covers VHF 136-175 MHz and UHF 420-460 MHz. SWR/Wattmeter reads 60/150 Watts.

MFJ-931 *artificial* RF Ground

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Creates artificial RF ground. Also electrically places a far away RF ground directly at your rig by tuning out reactance of connecting wire. Eliminates RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding. **MFJ-934, $169.95**, Artificial ground/300 Watt Tuner/Cross-Needle SWR/Wattmeter.

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mas. PIC: Lou, KV4JC, St. Croix. ACC: Debbie, NP2DJ, St. Thomas. NM: Bob VP2VI/W0DX, Tortola. Hurricane season was very good to us in the V.I. this year, a couple of scares but nothing of any significance. The V.I. was well represented in the ARRL SS, had the unexpected pleasure of hosting NNJ ARRL section manger Bill, W2UDT, who, along with Bruce, W4OV, and myself operated NP2B in the phone SS and did pretty well. We currently have some QSL delivery problems on St. Croix which are being ironed out as new QSL manager Bernie, NP2W, gets everything organized. Lou, KV4JC, sporting a new computer that he finally got to work! Al, formerly KP2CF, is now NP2V. St. Thomas Club meets every Tuesday at Hook Line and Sinker in Frenchtown for lunch, close to the downtown Area. Stop by if you are on a cruise ship or just visiting the island. Repeaters 146.63 St. John, 146.81 St. Thomas and 147.25 St. Croix. Section Web site www.viaccess.net/~jellis. 73 de John, NP2B.

WEST CENTRAL FLORIDA: SM, Dave Armbrust, AE4MR, ae4mr@arrl.org http://www.wcfarrl.org—ASM: NA4AR. ASM-Web: N4PK. ASM-Legal: K4LAW. SEC: KD4E. TC: KT4WX. BM: KE4WU. STM: AB4XK. OOC: W4ABC. SGL: KC4N. ACC: AC4MK. PIC: WX1JAD. The December Tampa Bay Hamfest was a huge success. A special thanks is given to special guests ARRL President Jim Haynie, W5JBP, and Ed Hare, W1RFI. Please welcome John Townsley, AE4GB, as the new EC for Pasco and Darrell Davis, KT4WX, as the new EC for Hardee County. Florida Gulf Beaches Marathon on Jan. 20 will require over 100 Amateur Radio operators. There will be 19 Aid Stations and we anticipate the operation of an Operations Net, a Logistics Net and a Medical Net before and during the event. Please lend a hand if you can. Contact your EC if you can participate. Hamfests: Sarasota Jan 19-20, DeSoto Jan 26. SEC KD4E reports little change in ARES membership total of 445. In November, there were 37 ARES Nets. 3 public service events, 23 drills and 0 emergency for a total of 26 ops. The total man hours reported is 690.3 hours. ECs reporting: KBØEVM, KN4YT, KT4WX, K4ZVO, AC4MK, AE4GB, AI4ET, K4FB and WD4AHZ. STM AB4XK reports November's net report is available on the section's Web page. November PSHR: K4RBR 190, K4SCL 157, W4AUN 151, KF4KSN 127, KD4EFM 123, AB4XK 117, WB2LEZ 115, KT4TD 99, AE4MR 99, KF4OPT 97, KT4PM 75. SAR: K4SCL 360, AB4XK 265, KD4EFM 56, KT4PM 40, K4RBR 39, KF4OPT 31, W4AUN 29, KT4TD 26, WB2LEZ 19, KF4KSN 18, AE4MR 14. 73, Dave, AE4MR.

SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford Hauser, KD6XH—Art Goddard, W6XD, our new ARRL division director plans to be at the Scottsdale hamfest on March 9. The Scottsdale amateur radio club will hold its "Spring Hamfest" on 9 March 2002 at the Scottsdale community college. Stop by the ARRL booth (normally my truck) and talk with me on your suggestions to improve amateur radio within the state. I also need many more volunteers to help with the many duties involved within the state (i.e. Technical support, EC's, etc). We have seen an increase in the need for amateur radio emergency communications planning since last fall. Are you prepared? Has your message handling capability improved? If not, then join the many state emergency nets and help out your community and our state in preparation for emergencies. It is not if an emergency will occur, but only when. There have been a few complaints about the language used on several repeaters throughout the state. Remember that we are suppose to be responsible people and talking over a repeater is the same as talking HF. The FCC rulebook defines the prohibited language that is not recommended. Being courteous towards others and this will help promote the virture of Amateur Radio. Remember that we represent an elite group of people throughout the world who share a common interest/hobby. We should be good examples to the rest of the world. I am trying to put together a folder on how others (individuals and/or clubs) have fought the CC & R's throughout the state. It does not matter if you won or lost, I am trying to obtain information. I have been asked by several people for this type of information so they can fight antenna restrictions in their area. We need to band together and see if we can change this restriction on antennas. If you have been successful or not, please call me and provide any documentation you used. I will make this documentation available to others. Don't forget to checkout our state web site at www.qsl.net/arrlaz/. This site has all the latest state information and links to the many clubs here in Arizona, throughout the country, and has the latest listing or all the ARRL volunteer's for this section, club listings, and links to other activities. If your club or organization has changed officer's or address, I need to know so I can keep up with my "Club Listing" up-to-date. There will be a hamfest on March 09, 2002 at the Scottsdale Community College, on April 13,2002 at Devry, then on May 04, 2002 in Sierra Vista. My present plan calls for me to be at these events. 73, Clifford Hauser KD6XH. ATEN 1130 QNI; 47 QTC; 30 sess. Tfc: W7EP 76, K7POF 41.

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF— Please check-out our section Web site to see if your club is listed correctly. All Los Angeles clubs should be listed and up dated when changes are made www.qsl.net/arrlsw/lax. We provide this list to new potential Amateurs who are looking for a local club to join. Please e-mail the changes to me at w6bf@arrl.org. As an engineer, one learns to solve and calculate complex equations. Most of the time the calculations are very precise but based upon a series of assumptions. This is often worthwhile because it provides insight into the problem. One question often heard on the ham bands was: what is the maximum speed you can expect to achieve with Morse code. My answer is 108 words per minute. (My assumptions are.) The human brain can function at about 45 bits/second and there are 25 bits/word. (There are five bits per character and five characters per word.) To verify that this answer is in the right "ball-park," I spent about two hours a day practicing for two years and concluded that I could send for a short duration about 108 words per minute. Then K1ZZ introduced me a few years ago to one of the, "listed World champions" from Arizona. He told me that he practiced every day for two hours at over 120 words per minute while doing his walking exercise. He also said that he could copy more than a dozen random Amateur call signs and repeat them at over 100 words per minute. This is not quite the same as mixed letters and numbers in random groups with a zero error rate. My guess is that very few experts can copy at more than 75 words per minute for an extended period of time. W6FZZ, Samuel F. B. Morse III, once told me that he thought that he held the record for copying code on the old fashioned mill at 55 words per minute for a period of eight hours. I heard that, "The Guinness Book of Records" still shows 75.2

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wpm for McElroy. This was an official FCC five-minute test using plain text. Great CW to you, too. Some day your microphone or your voice may quit and you will need CW. Many stories tell of rescued code senders tapping out SOS messages with stones or blinker lights. I hope that you never need this capability. Vy 73 de W6BF, Phineas.

ORANGE: SM, Joe Brown, W6UBQ, 909-687-8394— ASM Riv. Co. Brett, N6BLN, 760-436-6291. ASM Org. Co. Richard, WA6NOL, 714-835-3295. ASM SB Co. Jeff, W6JJR, 909-886-3453. TASMA Officers for 2002, re-elected. Chairman-Bob, NO6B, Vice Chair- Pat, KC6ACL. Jim, K6IYK, Treasurer. Agenda items covered at the Annual Meeting were tech standards, operating reports, Bylaws changes and discussion of bandplan changes. We wish to thank Bob, Pat, Ted, Jim and the TASMA staff for all the hard work on behalf of Amateur Radio. The new officers for San Gorgonio Pass ARC: Pres, Martie KF6YND; VP Ron WB6MSS; Trea Charlene KQ6HG; Dir Steve, KD6JDM. From the Lee Deforest ARC Rpter courtesies. 1. Listen before transmitting. 2 Wait for Courtesy beep before keying up. 3. Give time for other stations wishing to use the repeater. 4. If you are having a long conversation, consider simplex. 5. During an emergency, listen, and respond only if invited to do so. Costa Mesa RACES, Gordon, WB6NOA, invites all Amateurs to learn Morse Code on the air. 144.330 MHz simplex will be used. This is intended for students who have wanted to take an actual code class, but lacked transportation. Modulated CW will be used, so no special equipment is required. For further info, call Gordon 714-549-5000. The Statewide Medical and Health Disaster Exercise was a good test for Radio Amateur's public service capabilities. Riverside Co. and San Bernardino Co. Races/ ARES Groups manned the Hospitals. Orange Co RACES participated by provided SSTV. Hospital Disaster Support Communications System had 26 members and supported 15 Hospitals. The Circle City Communicator has the perfect holiday gift. (MEMBERSHIP IN THE ARRL). What a great IDEA! STM NTS Report. QTC: KC6SKK 197, K6IUI 87, W6JPH 73, W6QZ 69.PSHR W6QZ 149, KC6SKK 90, W6JPH 81, K6IUI 72.SCN/V NET MGR W6JPH Reports: 21 Sessions, QNI 138, QTC 101. AVG Net Time 20 Minutes.

SAN DIEGO: SM, Tuck Miller, NZ6T, 619-434-4211— Thanks to all who have given me so much support the last 4 years as your San Diego Section Manager. By now, most should be aware that as of Jan 1 (at noon) I was no longer your Section Manager, and taking my place is Kent Tiburski K6FQ. I have known Kent for about 2 years now. In that time, have found him to be quite enthusiastic about all facets of ham radio, especially that of public service. I would urge you to drop him an e-mail at k6fq@arrl.org and welcome him aboard. As I write this, traffic is winding down on a wild land fire that occurred in the Portrero area of the county. Starting in the early afternoon of Dec 8, ARES volunteers were called out to support activities for our local Red Cross unit. We were the ONLY communications link from the area due to terrain. For some oddball reason, their cell phones would not fill the bill. I wonder why? For all of you who contributed your valuable time and equipment, we thank you. I would like to take just a few minutes and welcome aboard our new Division Director Art Goddard, W6XD. Art had served as Vice Director for many years, and will contribute immensely to the Board of the ARRL. For the DXers in the crowd, Art also enjoys going on DXpeditions, with his most recent to T88, Palau. I was able to work them on 20 and 15. Drop Art and e-mail at w6xd@arrl.org. I am sure he would appreciate your support. I would like to thank Ned Stearns, AA7A. Ned was my opponent during the recent election for Vice Director. When many candidates feel it is necessary to sling mud at each other, Ned was a true gentleman. An avid DXer and contester, it shows. Ned, you're a true gent, and we thank you. As your new Vice Director, I will continue to work my best for you, the members of the Southwestern Division. At any time you need to contact either Art, Kent or myself, please feel free to do so. For further info on any of us, go to page 10 of QST for Art and me, and to page 12 for Kent. Complete mailing addresses, as well as phone numbers are listed for your convenience. This is my last column for the Section News pages of *QST*, but don't tune out, as Kent will continue on. I know George will always be here. One last thing, if the clubs in the SDG section could send a comp copy of your newsletter to Kent, I am sure he would appreciate it. Please keep me on your list as well. Tfc: N6TEP 34, KD6YJB 60, KC6NXZ 57, K6DAY 30, WA6IIK 24, K6CD 37. Try to check into the traffic net soon. Remember, Helping Others.....Always Worthwhile!! 73, Tuck, NZ6T.

SANTA BARBARA: SM, Robert Griffin, K6YR (k6yr@arrl.org or k6yr@arrl.net)—SEC: Jack Hunter, KD6HHG (kd6hhg@arrl.net). STM: Ed Shaw, KF6SHU (kf6shu@arrl.net). SGL: Paul Lonnquist, NS6V (paul@dock.net). ACC: Michael Atmore, KE6DKU (ke6dku@aol.com). OOC: Howard Coleman, N6VDV (N6VDV@arrl.net). PIC: Jeff Reinhardt, AA6JR (jreinh@ix.netcom.com). TC: Warren Glenn, KM6RZ (wglennrz@ix.netcom.com). ASMs: Ventura, Don Milbury, W6YN (w6yn@arrl.net); Santa Barbara, Marvin Johnston, KE6HTS (ke6hts@sbarc.org). San Luis Obisipo, Bill Palmerston, K6BWJ, (bpalmers@fix.net) & for Internet, Jack Bankson, AD6AD (ad6ad@arrl.net); & DECs: Santa Barb-Dave Lamb, WA6BRW (wa6brw@arrl.net); SLO-Bill Peirce, KE6FKS (ke6fks@arrl.net) & Ven-Dave Gilmore, AA6VH (aa6vh@arrl.net). To Art Goddard, W6XD, and Tuck Miller, NZ6T, our new division director and vice director, respectively, congratulations on your recent election. The Santa Barbara Section Field Organization is with you! Congrats to SBARC for great year under Lou, N6ZKJ. FREE instant Section news updates? Join the SB Reflector! E-mail majordomo@qth.net the message subscribe arrlsb. SB Sec Web: www.qsl.net/arrlsb/.SCN slow speed NTS Net, M-F, at 1915 local on 3598 kHz & SCN/SB at 2100 local on 147.000+ (131.8), 224.90-(131.8) & 449.300-(131.8). That's 30. Rob, K6YR.

WEST GULF DIVISION

NORTH TEXAS: SM, Larry Melby, KA5TXL—It's February, 2002, and the Holiday Season is behind us. The spring storm season is coming, and I urge everyone to attend a local Skywarn school. Even if you have been for 10 or 15 of them, you will learn something new every year. As I write this column in early December, there are not any hamfests on the calendar for 2002. So, if your club is considering sponsoring a hamfest, let the League know several months in advance so that it can be included in *QST* and put on the Web site. On another note, it is time for every ham in the North Texas Section to dust off their computer keyboards or the keyboards on your 1912 Underwood and send

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CAROLINA WINDOM 160 Special, 160 - 10m, 132' long.	**All bands 160 - 10**	$125
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50 MHz						
0503G	1-5	10-50	6	15/0.7	LPA	208
0508G	1	170	28	15/0.7	Standard	367
0510G	10	170	25	15/0.7	Standard	319
0550G	5-10	375	59	15/0.7	HPA	524
0552G	20-25	375	54	15/0.7	HPA	486
144 MHz						
1403G	1-5	10-50	6	15/0.7	LPA	163
1405G	1-2	100	14	15/0.7	Standard	295
1410G	5-10	160-200	28	15/0.7	Standard	328
1412G	25-45	160-200	22	15/0.7	Standard	286
1450G	5-10	350+	56	15/0.7	HPA	572
1452G	10-25	350+	52	15/0.7	HPA	525
220 MHz						
2203G	1-5	8-35	5	14/0.8	LPA	168
2210G	5-10	130	20	14/0.8	Standard	346
2212G	25-45	130	16	14/0.8	Standard	316
2250G	5-10	225	40	14/0.8	HPA	579
2252G	10-25	225	36	14/0.8	HPA	537
2254	75	225	32		HPA	494
440MHz						
4405G	1-5	15-50	9	12/1.2	LPA	309
4410G	10	100	19	12/1.2	Standard	367
4412G	15-30	100	19	12/1.2	Standard	355
4448G	1-5	75-100	25	12/1.2	HPA	429
4450G	5-10	185	35	12/1.2	HPA	585
4452G	25	185	30	12/1.2	HPA	547

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a letter to your member of Congress asking for their support of HR 817 and to our two Senators to support SB 549. These two companion bills are titled the Amateur Radio Spectrum Protection Act of 2001. We are now half-way thru the 107th session of Congress. If it doesn't pass this time around, then we have to start from scratch with the 108th Congress in 2003. It distresses me that we do not have one member of the North Texas Congressional Delegation as a co-sponsor to this bill. Also, both Texas Senators have not signed on as a co-sponsor either. After you have sent them an e-mail, send them a real letter along with a QSL card asking for their support. For more information on this, check page 15 of the Oct 2001 issue of *QST* or go to the League's Web site *www.arrl.org/govrelations/arspa.html*. 73 de KA5TXL. Tfc: KC5OZT 235, W5RDM 120, W5AYX 115, KB5TCH 61, WA5I 57, AC5Z 43, N8QVT 1.

OKLAHOMA: SM: Charlie Calhoun, K5TTT—ASMs: N6CL, W6CL. SEC: KA7GLA. ACC: KB5BOB. PIC: N7XYO. OOC: WB9VMY. SGL: W5NZS. STM: K5KXL Be sure to attend the Greencountry Hamfest this year. The location has changed from years past. It will be held at the new Claremore Expo Center just west of Claremore on Highway 20. They always have a good selection of forums to attend and dealers to buy from. I would like to congratulate Tim Diehl, KB5ZVC, and the Tulsa Amateur Radio Club for their assistance in getting the Collinsville Police and Fire Departments back on the air after a recent fire that destroyed City Hall. Tim and the group were able to provide equipment, loaned from the club and much needed expertise to get them communicating again, both with each other and the 911 dispatch system. Charlie Kays, AB5EF, club trustee, and PIC Mark Conklin, N7XYO, provided assistance in getting some media coverage both locally and on the ARRL Web site. The Oklahoma DX Association will be sponsoring the first, in a long time, Oklahoma QSO Party the weekend of March 23-24. Check the OKDXA Web site for the latest details and rules. I would like to encourage everyone to participate. Get out there and hand out one of our rare counties. Congratulations to Jerry Chouinard, K5YAA, on being named OKDXA ham of the year! That's about it for this month. Look for you on the bands. 73, Charlie. Tfc: KF5A 1222, WB5NKC 331, KK5GY 216, WB5NKD 209, KM5VA 135, WA5IMO 122, KI5LQ 106.

SOUTH TEXAS: SM, Ray Taylor, N5NAV—ASMs: KS5V, N5WSW, W5GKH, K5DG, N5LYG, WA5UZB, KK5CA, K5EJL, W5ZX, WA5TUM, KB5AWM, WA5JYK, K5PFE, K5PNV, W5JAM. STM: W5GKH. SEC: W5ZX. ACC: N5WSW. TC: KJ5YN. BM: W5KLV. OOC: W5JAM. SGL: K5PNV. PIC: KD5HOP. November was a rough month for South Texas. On the 15th about 9 AM, we had a line of tornadoes pass from North San Antonio, to Boerne, Buda, South Austin, and Del Valle by 4 PM. We had 11 deaths plus injuries. Later that night and into the 16th, a line of tornadoes passed through Three Rivers, Beeville, and Goliad. I-35 was closed near Buda after trucks and cars were thrown from the roadway like leaves from a tree. Several hours were spent getting the roadway cleared. This all lasted until the 19th with heavy flooding, from Austin to Corpus Christi. The Baptist Men's Kitchens and the Red Cross were kept very busy. We activated 7285 and 3873 HF and 2 meters for the local areas until everyone got cell phones. While we were trying to get a shelter set up for 600 by the Red Cross near Corpus and coordinate with the Baptist Men's Kitchens on 3873, we had a group of contesters come on frequency, but they finally moved. Then another group came on and refused to move. I have nothing against contests, but they do come right on nets in progress and have for years. To break in on an emergency net is beyond my comprehension. This really impressed the Baptist Men's Kitchen group and the Red Cross in the negative. On the 28th, while we were getting ready for the Skywarn Recognition Day, we had another storm with some damaging winds and heavy rain. We had a great turn out for Skywarn Recognition Day. There were 195 contacts made from the weather station here in New Braunfels. I don't have the call signs of all the operators that gave of their time to help make this a success. I do want to thank W5WD for heading up the event. While I'm writing this we had 2 tornadoes in Brazoria. One did lots of damage. I hope we come out of this one without injuries. I want to welcome all the new hams to the wonderful World of Ham Radio. This will be one of your most rewarding times in your life. Have a great month. God Bless America. Tfc: KA5KLU 452, AC5XK 173, W5GKH 139, W5KLV 139, N5SIG 118, W5TUK 122, W5ZX 117, N5OUJ 72, KD5GM 36, N5NAV 23.

WEST TEXAS: SM, Lee Kitchens, N5YBW— Many thanks to Kent West, KC5ENO, for the copy of the Key City ARC newsletter. It includes 5 pages packed with local, national, and international ham news. I will be meeting with this club in January. We had a great meeting with the Plainview ARC. They have a great secret, which the rest of us OM's need to discover. Half of those attending were YL's and XYL's. There is great activity in the far western part of the section. Enjoyed meeting with all the clubs in El Paso. Thanks to Larry Springsteen, WB8LBZ, for being my host. The repeater club has a great facility, which includes their own screen room. They look after many, many, repeaters including their one-watt solar powered wide area coverage machine. The HF group facility has a radio room that is set up like a broadcast station. The next day was the SKYWARN event. El Paso was well represented on 20M with 88 contacts with other SKYWARN groups around the country including one VE3 station. This was a fun event that gives contesters great experience in working pile ups without the pressure to get in and get out. Everyone took time to report on the weather. Let's all do this next year. They used a Hustler vertical mounted on a trailer with great results. Emergency preparedness is still, and will continue to be, something we all need to understand and train for. Please take every opportunity to attend and participate in any and all classes and practice events available.

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VX-150 Designed to perform under the most difficult operating conditions. (left) Compact yet incredibly rugged, this 2M HT provides exceptional receiver performance along with clean, clear transmit audio. Built to withstand the rigors of outdoor use, the 16-key 150 is constructed of a die-cast aluminum housing to MIL-STD standards, with a large, high-output speaker delivering commercial-grade audio. And, the Omni-Glow™ illuminated keypad makes nighttime operation easy. It also pipes out a full 5 Watts. 4.3"h x 2.3"w x 1"d, 11.5 oz..... **$129.99**

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FT-1500M A masterpiece of RF and mechanical engineering. This 144MHz FM mobile is the quietest and most efficient radio transceiver ever built. 50-tone CTCSS encode/decode, direct keypad frequency entry, alphanumeric memory, 50 Watts of output power, and 6-pin mini-DIN data port are just the start. 5"w x 1.4"h x 4.9"d, 2.2 lbs.... **$139.99**

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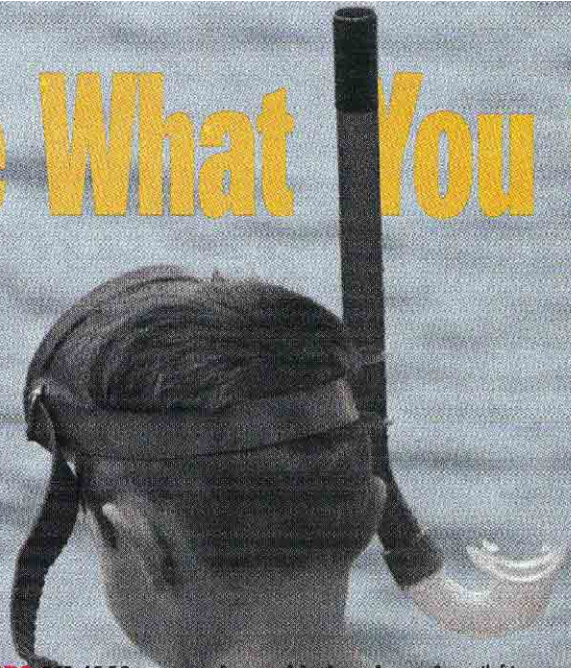

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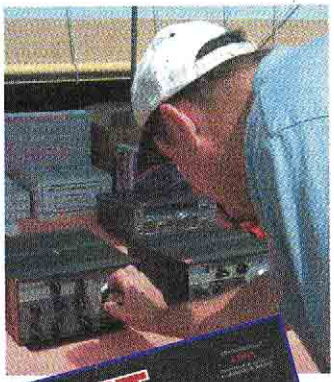

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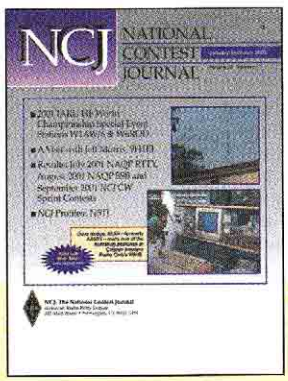

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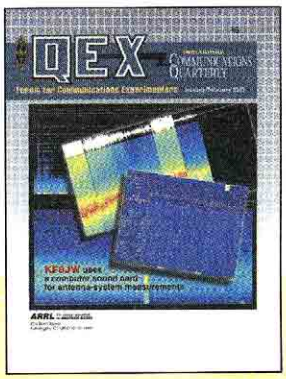

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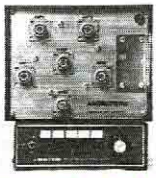

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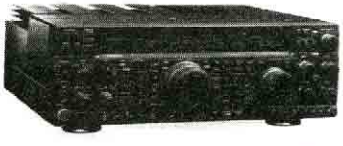

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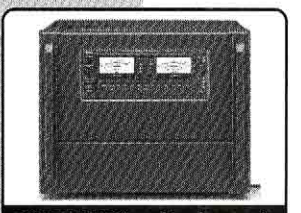
ICOM IC-PW1(Control head mounted)

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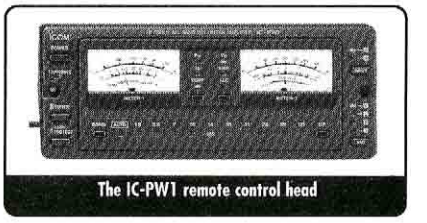
The IC-PW1 remote control head

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Wind Load (with mast adapter)	10 sq. ft.	7.5 sq. ft.	5.0 sq. ft.	1.5 sq. ft.
Turning Power (in pounds)	1000	800	600	350
Brake Power (in pounds)	9000	5000	800	450
Brake Construction	Electric wedge	Electric wedge	Disc brake	Disc brake
Bearing Assembly/How many	Tripl race/138	Dual Race/96	Dual race/48	Dual race/12
Mounting Hardware	Clamp plate	Clamp plate	Clamp plate	Clamp plate
Control Cable Conductors	8	8	8	5
Shipping Weight (pounds)	28	24	22	14
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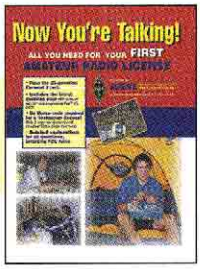

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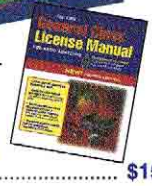

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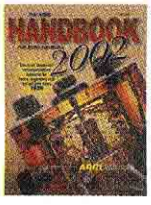

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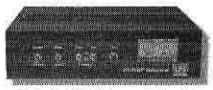

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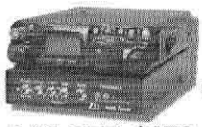

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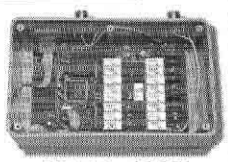

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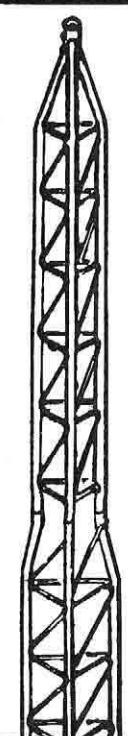

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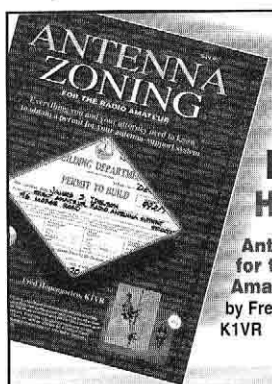

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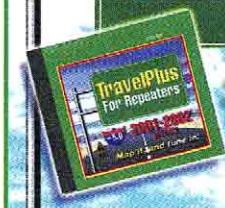

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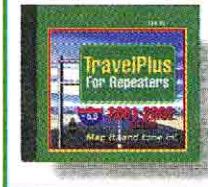

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Hustler Resonators in stock–call

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Yaesu G-1000DXA	$499
Yaesu G-2800SDX	$1089
Yaesu G-550/G-5500	$299/599

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R81/82	$.25/.39
R83/R84	$.52/.85/ft

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HPTG4000I	$.89/ft
PLP2739 Big Grip (4000)	$8.50
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Solid state 1 kW autotuning amplifier.

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Heavy duty antenna rotator handles 34 sq. ft. of antenna load, and features 450° rotation, preset and variable speed.

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I. Interlocked Digital Bandwidth Tracking System (IDBT)

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III. 200 Watts of Transmitter Power Output

IV. Class-A SSB Operation

V. Multi-Function Shuttle Jog Tuning/ Control Ring

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VSPC (Variable Side Pressure Control)

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* The FT-1000/-1000D/-990/-840 do not support the illumination of the TX LED during transmission.

Ultra-High-Fidelity Desktop Microphone

MD-200A8X

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Specifications

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Power Output:	200 Watts PEP
Spurious Emissions:	At least 60 dB down
Power Source:	DC 30 V and 13.8 V (supplied by FP-29 Power Supply of MARK-V)
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200 W 50 MHz Transverter

FTV-1000

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The Kenwood TS-2000 system offers Amateurs the versatility of operation that has never been achieved. This Multi-band/Multi-mode transceiver offers several different operation methods that provide Amateurs with both high performance not available on competitive models as well as 4 distinct methods to operate. The TS-2000 is available with a full functioning front panel or as a "high tech" self enclosed TS-B2000 model. Both units can also utilize the 1.2 GHz UT-20 module for the widest range of transmit capabilities. Both units can be operated with the ARCP-2000 Radio Control Software or the unique, easy to use RC-2000/TM-D700A remote controller. Older TM-D700A displays can be modified to operate the TS-2000 series also. If that wasn't enough, Kenwood offers the capability to use the popular TH-D7AG handheld to operate HF and 6M via SkyCommand II.* The TS-2000 also is the World's First HF radio that has PC Flash-ROM capability, which means in the future your TS-2000 is self-upgradeable, no new versions or models to buy. It's easy to see the TS-2000 all adds up to the transceiver with features designed for the future, available today.

TH-D7AG
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01ARD-2166 #121301 *Skycommand II is pending FCC rule change

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