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Amateur Radio

COMMUNICATIONS & TECHNOLOGY

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CQ

NOVEMBER 2004

1945 Our 60th Year 2004

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On the Cover: Hurricane Frances over Florida, and hams at the National Hurricane Center. Details on page 80.

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AMATEUR'S JOURNAL

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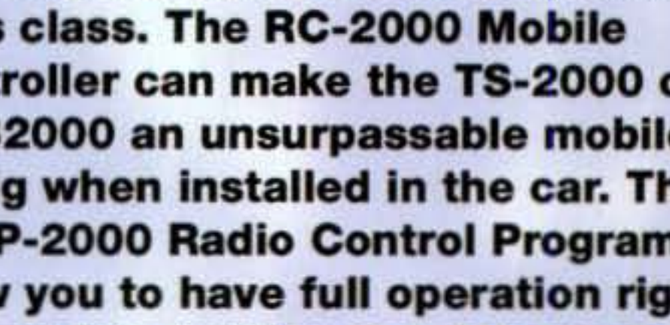

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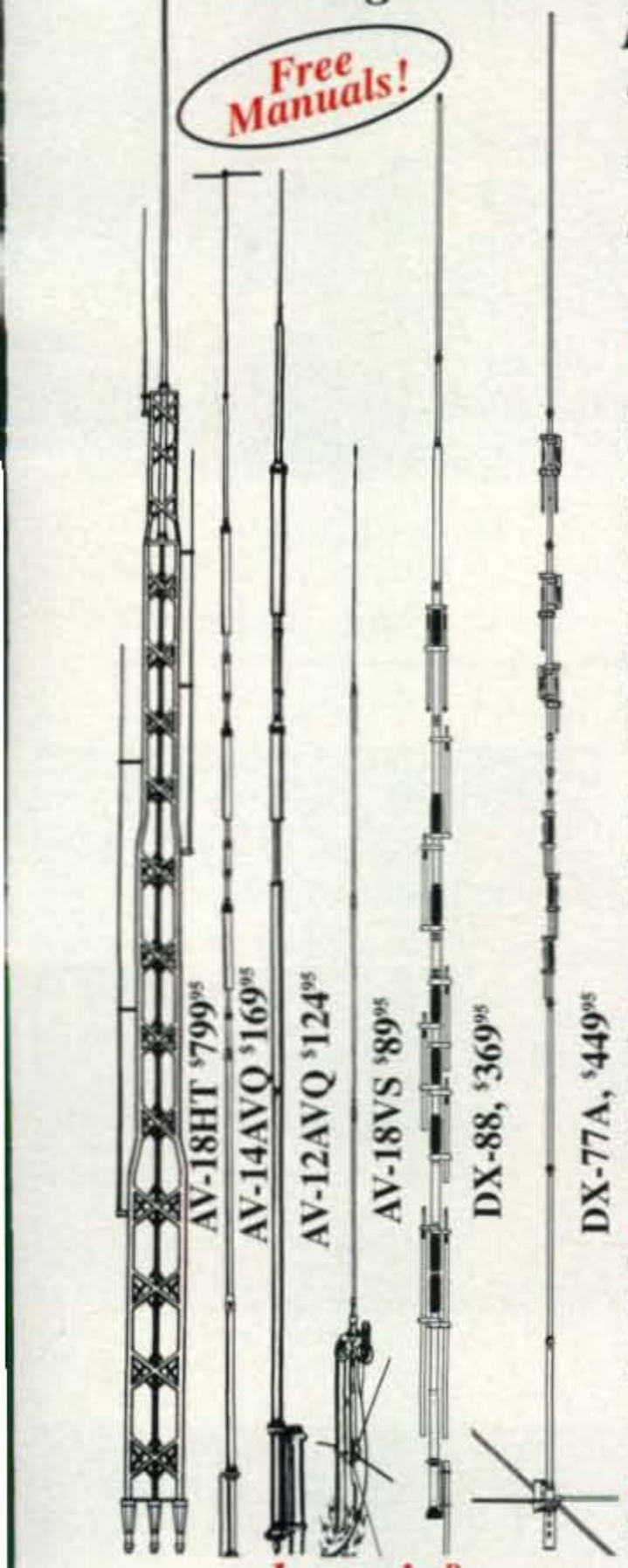

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Standing 53 feet tall, the famous *Hy-Gain HyTower* is the world's best performing vertical! The AV-18HT features automatic band selection achieved through a unique stub-decoupling system which effectively isolates various sections of the antenna so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

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AV-12AVQ, $124.95. (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, $89.95.

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DX-88, $369.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs. All bands are *easily* tuned with the DX-88's *exclusive* adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, $189.95. Ground Radial System, GRK-88, $99.95. Roof Radial System, RRK-88, $99.95.

DX-77A, $449.95. (10, 12, 15, 17, 20, 30, 40 Meters). 29 ft., 25 lbs. *No ground radials required!* Off-center-fed Windom has 55% greater bandwidth than competitive verticals. Heavy-duty tiltable base. Each band independently tunable.

Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
AV-18HT	$799.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	------
AV-14AVQ	**$169.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$134.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$89.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$369.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$449.95**	**10 - 80 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

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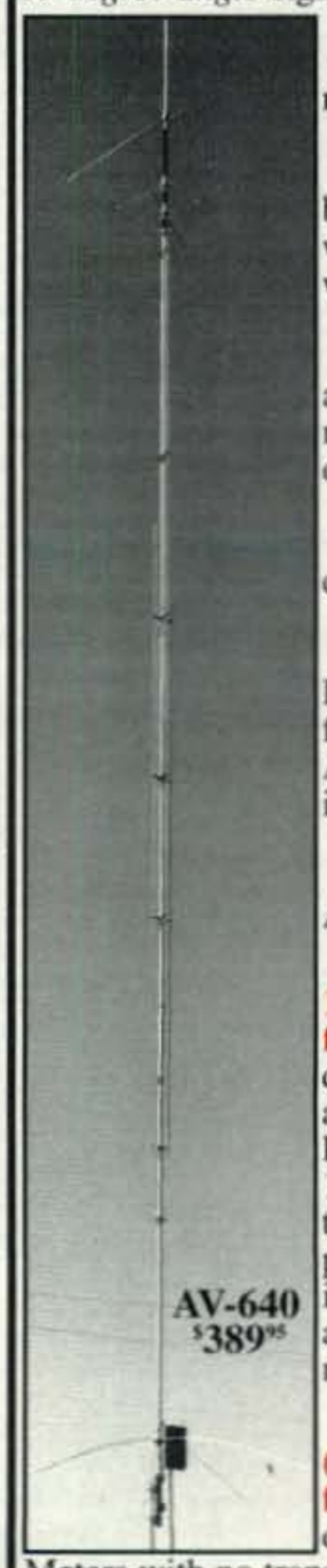

No ground or radials needed

Effective counterpoise replaces radials and ground.

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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

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

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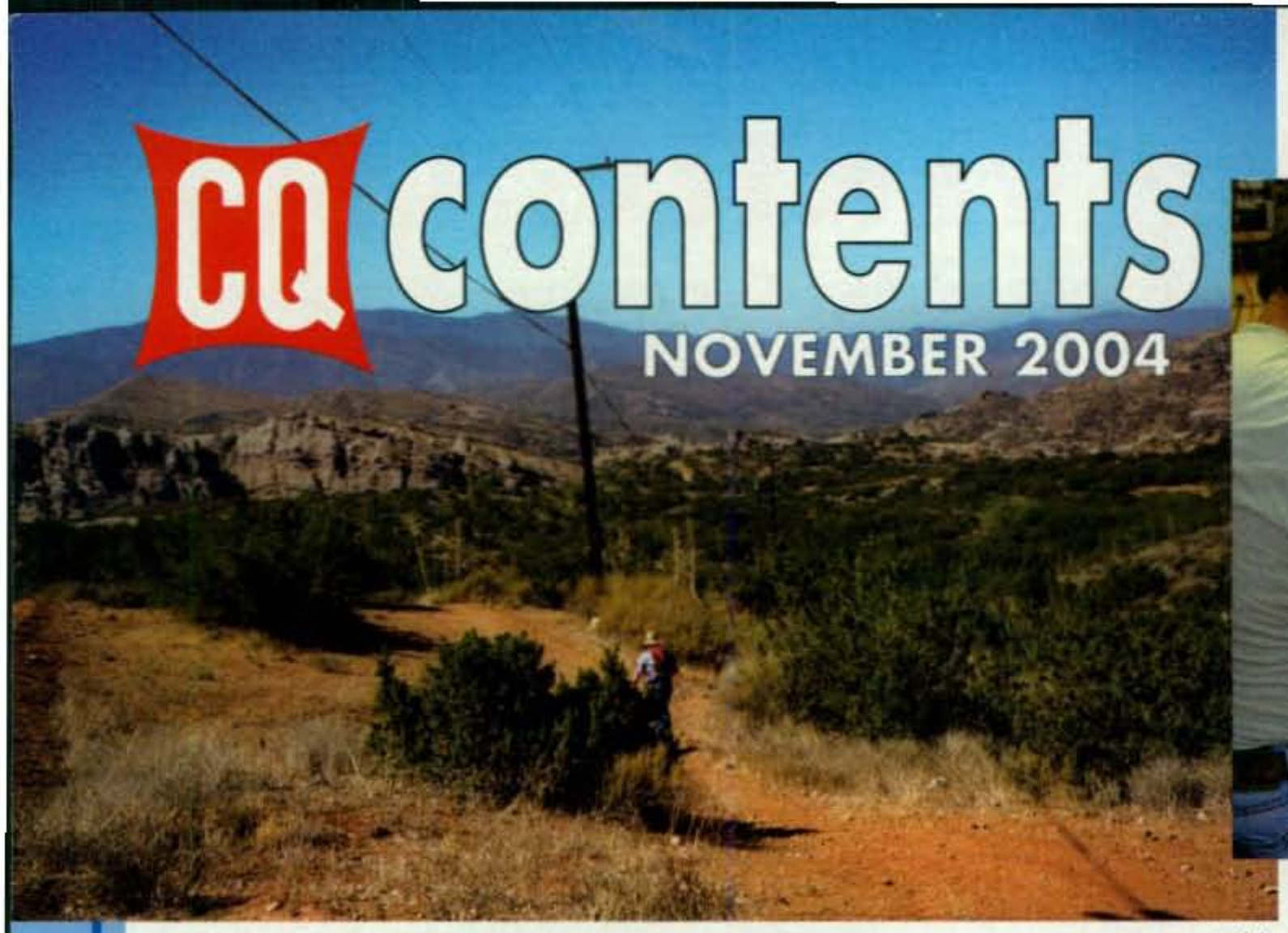

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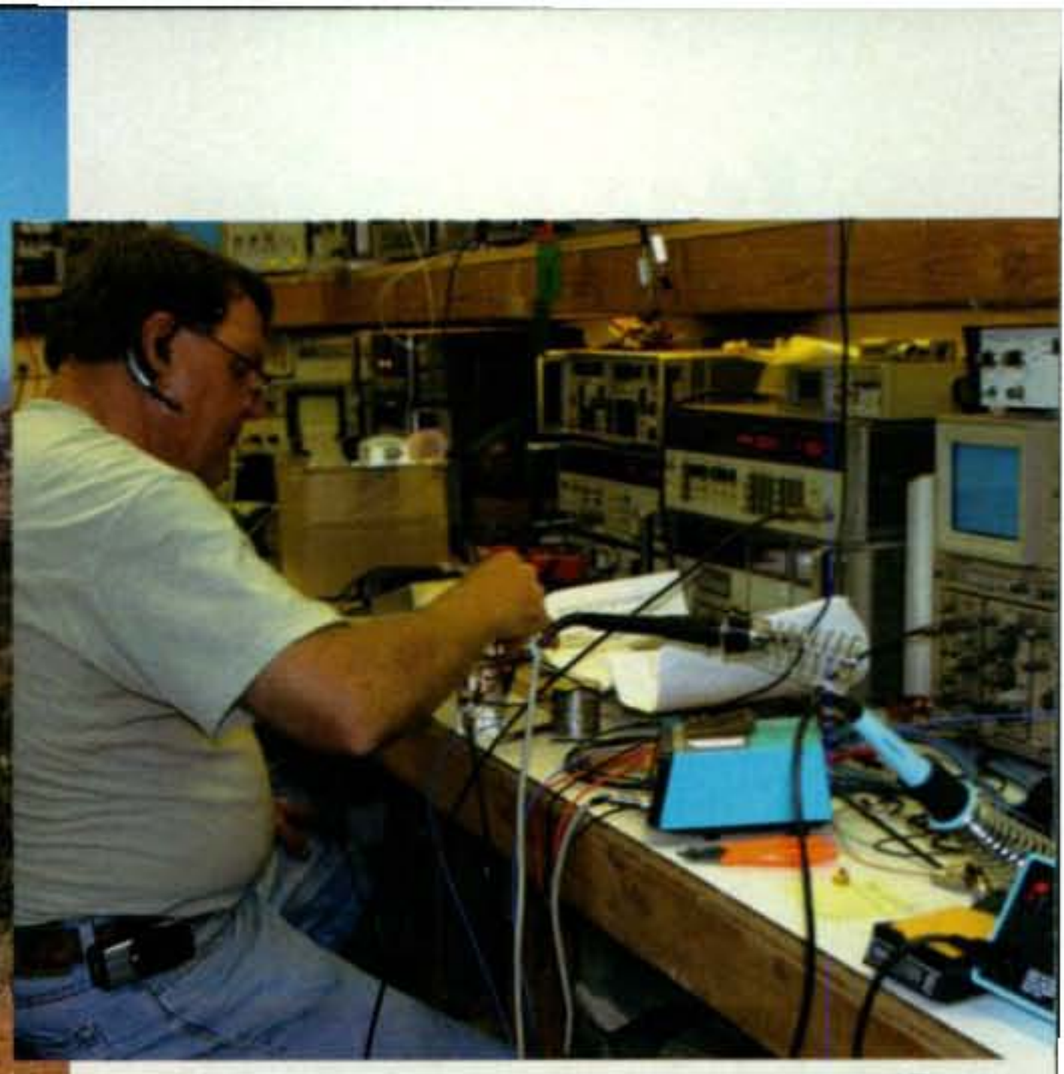

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departments

the next best thing to a Ten-Tec Transceiver is a Ten-Tec Accessory

High Power Tuner – Superior matching capability with an L-network tuner assures correct match every time. 2000 watts CW or SSB PEP power rating. ***$485.***

Titan III – NEW! Two 4CX800A tubes, massive power supply, solid overdrive protection. Peak reading wattmeter and QSK standard. Titan III loafs at 1500 watts with 65 watts of drive. ***$3,565.***

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Studio One – Manufactured with a unique mic element for Ten-Tec by Heil sound, STUDIO ONE is fast becoming the new standard for high quality SSB transmission. ***$129.95.***
Cord and stand sold separately.

706 Desk Mic – Our standard communications desk mic comes ready to plug into any 4-pin-equipped Ten-Tec transceiver. Quality audio with plenty of punch. ***$99.95.***

307 Speaker Series – External front-firing communications speakers, available in light grey (307G), black (307B), or charcoal grey (307C), are a terrific addition to any receiver or transceiver. Cabinet and large 4-inch speaker designed specifically for amateur radio use. ***$98.***

963 Power Supply – Hash-free switching design. 13.8 Vdc at 25 amps continuous, 30 amps peak. Small, lightweight (4 lbs!) and 90-264 VAC, 50/60 Hz input make 963 usable from just about anywhere. ***$169.***

937 Power Supply – 13.8 Vdc at 11 amps for powering HF or VHF transceivers of up to 50 watts output. 115 VAC input. ***$89.***

302 Series Tuning Knobs – Armchair tuning and direct frequency entry for your Jupiter (302J), RX-350 or Orion (302R). Function buttons allow control of some radio features. ***$139.***

310 Fan Kit – NEW! Hole-free allen screw attachment to transceiver heat sink. 13.8 Vdc powered. Use with Orion, Jupiter, Pegasus, all Omnis, Corsairs, Tritons, Paragons. ***$39.95.***

308A Fan Kit – Slide-on attachment to the Argonaut V transceiver. ***$15.***

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ham radio news

Hurricanes Test Hams' Limits

Hams across the eastern United States and throughout the Caribbean were put to the test this past summer by a string of hurricanes that caused massive damage to homes, businesses, and critical infrastructure. In the U.S., Hurricane Charley ripped across central Florida from west to east, then turned north and slammed into the Carolinas. Hurricane Frances hit south Florida from the east and then crawled up the eastern Appalachians, bringing flooding inland. And that was just a warmup for Ivan, which came ashore near Mobile, Alabama and moved north, dropping 17 inches of rain in North Carolina and causing major flooding as far north as New Jersey and Pennsylvania. Hams throughout the east—and beyond—answered the call as power lines and telephone lines came down. *CQ* Public Service Editor Bob Josuweit, WA3PZO, begins his hurricane season coverage in this issue (page 11) and will continue it next month and, if necessary, in January.

In a related story, the FCC told the ARRL it was okay for American hams to pass emergency-related third-party traffic to and from the Cayman Islands. The U.S. and the Cayman Islands do not have a third-party agreement, but rule changes enacted at last year's World Radiocommunication Conference removed the restriction on international third-party traffic unless one country or the other specifically bans it. The FCC has not yet adopted new rules to reflect those changes, but the *ARRL Letter* reported that officials said there would be no enforcement action taken against U.S. hams who exchange "appropriate emergency-related traffic" with the Caymans.

ARRL Gets Community Education Grant

The ARRL has received a federal grant of nearly $90,000 to start a Community Education Project to help explain the value of amateur radio to communities around the country. According to the *ARRL Letter,* the program will work through local civic associations, religious organizations, the news media, schools, and other community groups, as well as the nationwide Citizen Corps. ARRL Chief Development Officer Mary Hobart, K1MMH, explains that "a clear understanding of what certified Amateur Radio operators can accomplish to enhance safety and security has not trickled down to the general community." The one-year grant will fund pilot programs in a dozen communities. The League also got a renewal for a third and final year of its federal grant to help offset costs of taking the ARRL's Amateur Radio Emergency Communications Course.

SERA Makes Repeater Tone Control Mandatory

The Southeast Repeater Association (SERA) has adopted a new policy requiring the use of either CTCSS (Continuous Tone-Coded Squelch System) or DCS (Digitally Coded Squelch) on both transmit and receive, on all of the repeaters it coordinates. According to the *ARRL Letter,* the group is imposing the requirement immediately on all new repeaters and giving existing repeaters until July 1, 2006 to comply. SERA coordinates amateur repeaters in all or part of eight southeastern states. The new rules were adopted—over the objection of some—in order to reduce interference between users of different repeaters operating on the same frequencies.

Worked All Continents from Space

Astronaut Mike Fincke, KE5AIT, has become the first ham aboard the International Space Station to contact hams on all seven continents, after working KC4AAC in Antarctica on September 11. According to the AMSAT News Service, the only other ham astronauts who have worked all continents from space were Dave Leestma and Kathy Sullivan, both of whom operated from the space shuttle on mission STS-45.

Fincke also put the space station's dual-band transceiver into crossband repeater mode for a week in September, in addition to getting on the air himself to make non-scheduled contacts. After a school contact in Japan on September 17, he was scheduled to put the radio back into packet mode.

Ham Satellites Will Need to Include "Debris Mitigation" Plans

New FCC rules will require all satellite builders, including amateurs, to incorporate plans to minimize the generation of orbital debris, either from the launch process or from in-orbit accidents or collisions with other objects in space. AMSAT-NA had not commented formally on the new rules as of press time, but the *ARRL Letter* reported that AMSAT had previously expressed concern that some of the requirements might be beyond the ability of small-satellite builders to comply with.

FCC Adopts Limited Nationwide Review Process for Antenna Structures

The FCC has established uniform nationwide procedures for streamlining the review process of communication towers in areas under the jurisdiction of the National Historic Preservation Act (NHPA). While this covers only a limited area, it includes the very specific statement that the FCC views "the construction of communications facilities by and for its licensees to constitute a federal undertaking..." in terms of the NHPA. It is too soon to tell if this is the first step in establishing nationwide standards and procedures for all towers and antennas, including amateurs', that might supersede state and local regulations.

Mystery Signal on 40 Meters

Hams and the FCC are trying to track down the source of a mysterious signal that's popped up recently on or near 7238 kHz. The *ARRL Letter* reports that the signal resembles a steady carrier, but that closer study reveals that it is actually a series of closely spaced signals. It is uncertain whether the signals originate from one transmitter. The FCC's HF Direction Finding Facility has narrowed down the source of the signal(s) to an area north of Prescott, Arizona and west of Interstate 17, but has not yet determined its nature or its specific source. Hams all over the western U.S. and Canada have reported hearing the signal.

FCC Continues Trucker Crackdown

The FCC is continuing its crackdown on truckers illegally operating on the low end of the 10-meter ham band. In the past month, a half dozen letters were sent out by the Enforcement Bureau to truck owners, citing transmissions monitored in various locations and warning the owners that they could be fined if the illegal transmissions continue.

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

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

HAM-IV

HAM-IV
$559.95

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

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

TAILTWISTER SERIES II

T-2X
$649.95

T-2XD
$1029.95
with DCU-1

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

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

CD-45II

CD-45II
$389.95

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

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

HAM-V

HAM-V
$949.95
with DCU-1

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

ROTATOR OPTIONS

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

AR-40

AR-40
$289.95

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

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

HDR-300A

HDR-300A
$1379.95

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

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

Digital Automatic Controller

DCU-1
$649.95

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

AR-35 Rotator/Controller

AR-35
$69.95

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

RBD-5
$29.95

NEW! Automatic Rotator Brake Delay

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

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zero bias — a CQ editorial

BY RICH MOSESON,* W2VU

Regulation by Bandwidth

Warning! Last month's editorial had me reflecting on hamfest conversations and a day at the beach. Well, vacation's over and it's time to go back to school. This month's topic—changing the way we organize our frequency bands—is pretty complicated, but very important. It's an issue that will affect every ham who's active on the air. So, while you might not find this month's "ZB" particularly entertaining, I hope you will find it educational . . . which means that, yes, actual thinking will be required. You've been warned.

The ARRL's recent proposal to ask the FCC to shift from regulating subbands by mode to regulating them by maximum signal bandwidth has resulted in quite a bit of discussion, much of it negative—something to be expected when people perceive that their status quo is being threatened. But despite the negatives, and there are some, the League's proposal is an idea whose time has come.

First and foremost, I want to say that *CQ* strongly supports the concept of regulating subbands by bandwidth rather than mode (and has for years), especially since new modes like digital voice or MFSK 16 are kind of hybrids (more on that in a minute). Second, we applaud the ARRL for taking on this issue and especially for publicly posting and drawing attention to its draft proposal *before* submitting it to the FCC. This way, the folks in Newington can get as much input as possible from as many people who may be affected as possible, before the FCC comment process begins. This is good, because the ARRL's draft, while an excellent starting point, needs some work to assure that no one group of amateurs benefits or is penalized unfairly by any changes.

Why Bandwidth Regulation?

Some of the new modes in use by hams today, and certainly more of those that will come on the scene in the future, don't fit neatly into the traditional "mode" definitions. For example, is a digital voice signal "phone" or "data"? Are photos sent by MFSK 16 "image" or "data"? In both cases, the answer determines where it's legal to operate the modes, and in both cases, as our web guru, KØFO, says, the answers are "clear as mud."

When I was reviewing the AOR ARD-9800 digital voice modem (see June 2004 issue), I learned that some hams using the 9800 were operating digital voice on 30 meters, a CW/data-only band. Their argument, which is not without merit, is that what they are transmitting on the air—a digital bitstream—is data, not phone. It only becomes a voice signal, they argue, after it is received and processed. Limiting bandwidth on 30 meters to no more than 500 Hz, as the ARRL proposes, would solve that problem—the digital voice signal has a bandwidth of roughly 3 kHz and would clearly be prohibited.

On the other hand, an MFSK 16 signal is about 315 Hz wide, so it would clearly be permitted in a 500-Hz maximum bandwidth band segment, regardless of whether the "message" was text or a photo file. Simple, no? Well, no, not really. Nothing ever is . . .

The ARRL's Proposal

The central part of the ARRL's draft proposal is to replace specific emission modes with maximum signal bandwidths. Band segments currently used primarily for CW communications would have a 200 Hz maximum bandwidth, while those segments commonly used for digital modes would have a 500 Hz maximum. There would also be some band segments where signals as wide as 3 kHz would be permitted. These would be taken mostly from the current Novice/Tech Plus bands that the League has already asked the FCC to "refarm," plus the top 50 kHz of the current 20-meter CW/data band. This would be to accommodate "wideband" HF digital modes such as Pactor-III, which occupies 2.4 kHz of spectrum space. (Curiously, though, there is no proposal for any 3-kHz data segments on 10 meters, where the CW/data subband alone is wider than most of the other HF ham bands in their entirety.)

The League proposes a footnote prohibiting phone emissions in these "wideband digital" segments—but that takes us right back to the digital voice question—is it phone or is it data? This footnote reintroduces exactly the type of confusion the proposal is trying to eliminate. A better approach is needed. Likewise, there is no prohibition proposed on using wideband digital modes on the traditional analog phone bands.

Separating Incompatible Modes

One thing that was clear to me when playing with digital voice was that it is not compatible with analog voice—in either direction. A strong DV signal a few hundred Hz away will make a traditional SSB QSO impossible, while a strong SSB station adjacent to a DV QSO will introduce enough "noise" that the signal won't decode properly. Similarly, Pactor-III and other wideband digital modes will not be compatible with analog SSB. One particular problem with Pactor-III (which is important because it's the mode used by WinLink 2000, recently adopted by the ARRL as its primary HF digital mode for emergency communications) is that it has a network of automatic and semi-automatic relay stations. Currently, these are restricted to small pieces of the HF bands. Semiautomatic stations (which may transmit only in response to a query from a station under manual control) are permitted elsewhere on the HF bands, but they are limited to 500 Hz bandwidth. The League's draft would prohibit automatically controlled stations on HF (a problem for what's left of the HF packet network) but would permit semi-automatic stations throughout the "wideband digital" and phone bands. The biggest

(Continued on page 111)

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announcements

The following Special Event stations are scheduled for November:

N2UL, from CQ Veteran's Day, Nutley, New Jersey; Robert D. Grant United Labor ARA; 1300–2200Z November 11 on 14.260, 28.460, 449.975 MHz. For certificate send QSL and SASE to RDGULARA, c/o WA2VJA, 112 Prospect St., Nutley, NJ 07110-0716.

W3UDX, for Veteran's Day, Butler, Pennsylvania; Butler County ARA; 1200–1700Z November 6, 25 kHz up ±10 kHz in the General bands, 80–10 meters. QSL via BCARA, P.O. Box 1787, Butler, PA 16003.

W5C, from Historic Arkansas Museum for the dedication of the William Jefferson Clinton Presidential Library, Dover, Arkansas; 1500Z November 13 to 0400Z November 14, and 1300–2200Z November 14; on 14.260, 7.250, 21.360, 14.040, 7.040, and PSK31. For certificate send QSL and 9×12 SASE to Dennis Schaefer, W5RZ, 181 Schaefer Dr., Dover, AR 72837.

W6OI (10-10 club station), from celebration of four decades of 10-10 International, on the air in all ten call areas; 0000Z November 27 to 2400Z November 28 on 28.340– 28.400 MHz. Free certificate for working all call areas. QSL cards for each area. Send logs for certificate and SASE for cards to Jack Moore, K5CC, 371 Ridge Creek Lane, Bulverde, TX 78163.

N8F, from Remembering the Edmund Fitzgerald, Whitefish Point, Michigan; 1700Z November 4 to 1700Z November 7 on 3.860, 7.260, 14.260, 21.360 MHz. For certificate send QSL and SASE to Richard Barker, W8VS, 264 N. East St., Brighton, MI 48116.

KØAIR & KØGRL, from commemoration of Veteran's Day and General Curtis E. LeMay's birthday, Bellevue, Nebraska; Strategic Air Command Memorial ARC; 1200–2400Z November 11 on or near 3.947, 7.247, 14.247, 21.347, and 28.347 MHz (whichever band seems to be open best to most locations), and 51.47 and 146.46 simplex. For QSL, send QSL and SASE to the contact person listed on the SACMARC website, <http://www.sacmarc.org>.

ON60CLM, commemorating the 60th anniversary of the liberation of Belgium, Knokke-Heist, Belgium; Belgian Air Force ARA, Belgian Maritime ARS, International Police Assn. RC; November 5–9, on SSB 3.685, 7.045, 14.145, 18.150, 21.245, 28.545, 144.250; CW 3.515, 7.012, 10.118, 14.020, 18.087, 21.020, 24.897, 28.020, 144.020; FM 145.475. For more information, go to: <http://www.on4clm.be>.

The following hamfests, etc., are slated for November:

Nov. 5–6, **Great Lakes Shore Swap and ARRL State Convention**, Holiday Inn of Holland, Holland, Michigan. Contact Chuck Rich, W8GCW, 616-396-2294; e-mail: <w8gcw@arrl.net>; for tickets call 616-394-9821, or go to: <www.hollandarc.org>. (Talk-in 147.060 MHz, 94.8 Hz; exams)

Nov. 13, **Montgomery Hamfest & Computer Show**, Garrett Coliseum, South Alabama Fairgrounds, Montgomery, Alabama. Contact Phil, K4OZN, 334-272-7980 (after 5 PM CST), e-mail: <k4ozn@charter.net>; web: <http://www.w4ap.org>. (Talk-in 146.24/84, call W4AP; exams 8 AM))

Nov. 13–14, **Fort Wayne Hamfest & Computer Expo**, Allen County War Memorial Coliseum, Fort Wayne, Indiana. Call 260-484-1314 (leave message); <http://www.fortwaynehamfest.com>. (Talk-in 146.88[–]; exams Saturday)

Nov. 14, **Davenport RAC Hamfest/Computer Show**, Iowa National Guard Hangar, Mt. Joy Airport, north of Davenport, Iowa. Contact Phil McMillan, K9ZK, 309-441-6884, e-mail: <philhenry@arcsupport.com>. (Talk-in 146.88/28, 146.04/.64)

Nov. 21, **Central Illinois/St. Louis Area ATV Club Banquet**, Ariston Restaurant, Litchfield, Illinois. Contact Scott Millick, K9SM, 217-324-2412, e-mail: <smillick@wamusa.com>.

Nov. 27, **Evansville, Indiana Hamfest**, Vanderburgh County 4-H Fairgrounds Auditorium, Evansville, Indiana. Contact Neil Rapp, WB9VPG, 812-333-4116; e-mail: <wb9vpg@w9ear.org>. (Talk-in 145.15, 146.925, 443.925 with 107.2 CTCSS)

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Here Comes Another One!

Hams and the Hurricanes of 2004—Part I

BY BOB JOSUWEIT,* WA3PZO

Thirty days hath September, April, June, and November... Do you remember the rest of the saying to figure out the number of days in a month? The 31 days of August seemed like a nightmare in the tropics as one hurricane after another battered the eastern United States and the Caribbean. Alex, Bonnie, Charley, Earl, Frances, Gaston, and Ivan gathered their fury and aimed at points west. This month we'll take a look at an overview of the worldwide amateur radio response when normal communications failed. Next month we'll continue our coverage with specifics of Hurricane Ivan (which, as this was written, had not yet made landfall in the United States) —and possibly Jeanne—and look at some of the after-action reports that are coming in.

APRS unit packed to be shipped to the Salvation Army in Tampa. The kit's contents: the Kenwood TM-D700 main body on the right; in the center, the microphone on top and Garmin GPS 18PC GPS receiver below; on the left, power/interface cables and the D700 control head and mount. (Photo by Thomas Webb, WA9AFM)

HF Operations

WX4NHC, the Amateur Radio Station at the National Hurricane Center in Miami, will activate operations Tuesday morning, August 3rd at 10 AM EDT (1400Z).

Hurricane season started off with the first of what would prove to be many bulletins from WX4NHC. Volunteers at the National Hurricane Center began monitoring the Hurricane Watch Net on 14.325 MHz for surface reports in and near the path of Hurricane Alex, which had 75-mph winds off the North Carolina coast. Reports were also taken on-line and via Echolink and IRLP nodes. The surface reports are very important, since they give Hurricane Specialists at NHC a better idea of what is actually happening on the ground level during a storm. Max Mayfield, Director of the National Hurricane Center, said, "Despite sophisticated technology that has made hurricane forecasting more accurate, ham radio operators remain a critical component, sometimes providing more reliable information than satellites and hurricane-hunter aircraft to forecasters whose job it is to track the storms and warn people out of harm's way." Assistant Amateur Radio Coordinator Julio Ripoll, WD4R, said several of the surface reports received at WX4NHC were cited in the various hurricane advisories.

A North Carolina ham radio operator turned out to be a primary source of weather data for the Hurricane Watch Net during Alex. According to reports received, the station was on emergency power and using a wire antenna that was coming down in the winds.

Voice Over IP (Internet Linking)

As Tropical Storm Bonnie and Hurricane Charley made landfall on the Florida coastline, volunteer amateur radio operators working for Deep East Texas Skywarn were gearing up for duty. For the last two years, Deep East Texas Skywarn has operated and maintained an Echolink server, WX_TALK, that allows amateur radio operators in storm-affected areas to communicate directly with liaisons to the National Hurricane Center in Florida. The system recently was combined with IRLP (Internet Repeater Linking Project) Node #9210, maintained by Danny Musten, KD4RAA, in Raleigh, North Carolina, to become VoIP.net, an even more robust and reliable communications system.

Apart from providing the communications equipment, stations from around the world took turns at serving as the Net Control Station. During the overnight hours on the east coast, Tony Langdon, VK3JKD, in Australia, served as Net Control. This allowed operators in the United States to get some much needed rest.

The combined net allowed the National Hurricane Center to get information from local ham radio operators who did not have HF capability or did not have emergency power available. Thanks to the help of several other Echolink and IRLP node owners, they were able to establish listen-only systems on which casual listeners could tune in without interfering with those stations in the affected area.

Charley

As Hurricane Charley bore down on the Florida coast, amateur radio operators working with the National Hurricane Center and local National Weather Service offices were busy gathering weather reports from hams and others in the

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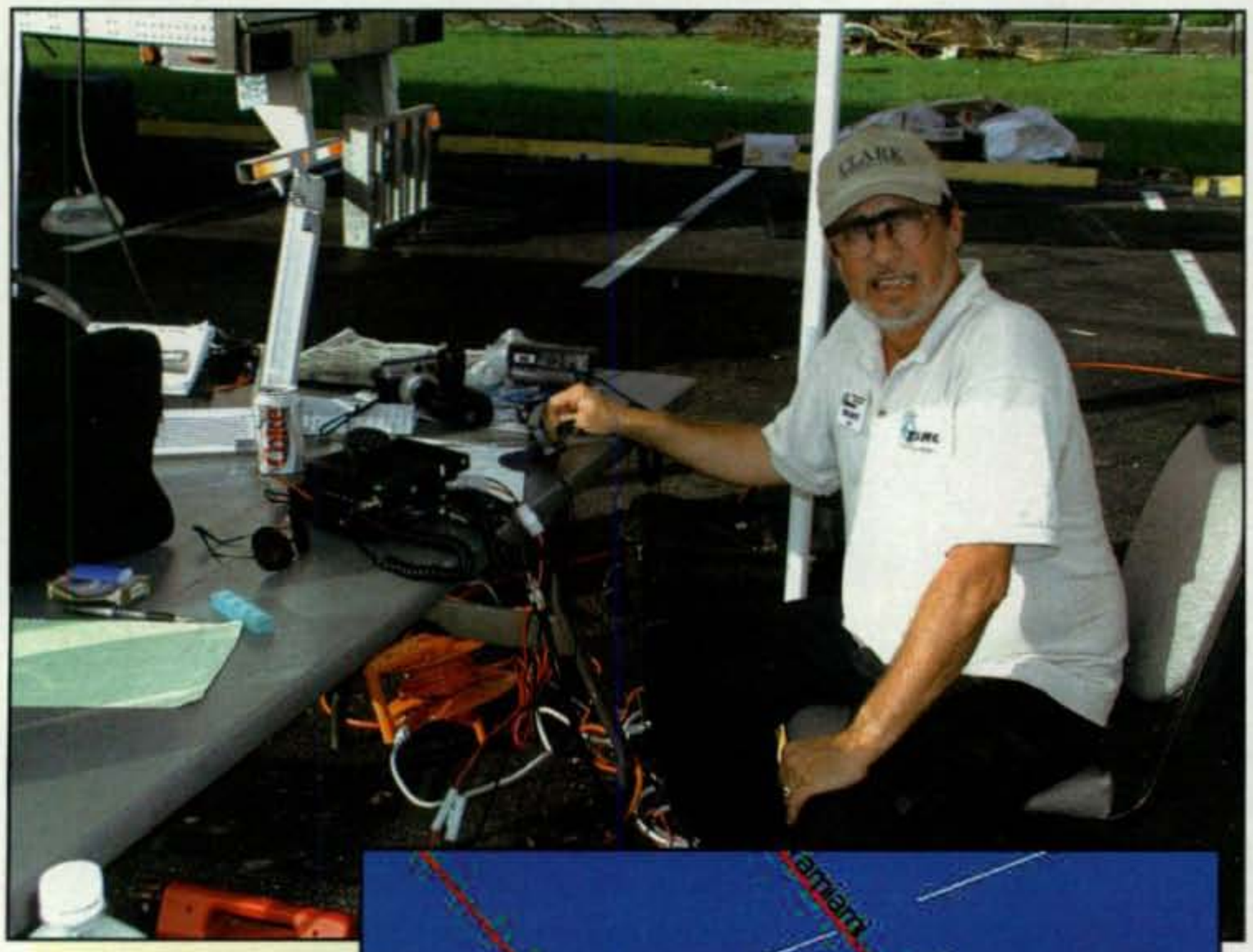


Base Station APRS. Fr. Jim Gerhart, WA3DIT, operates from the Salvation Army base station using one of ten APRS units supplied by the Oklahoma City Auto Patch Association. The APRS stations used the calls W5MEL-1 to W5MEL-10. The second photo shows a screen shot of W5MEL-1. (Photo via WA3DIT)

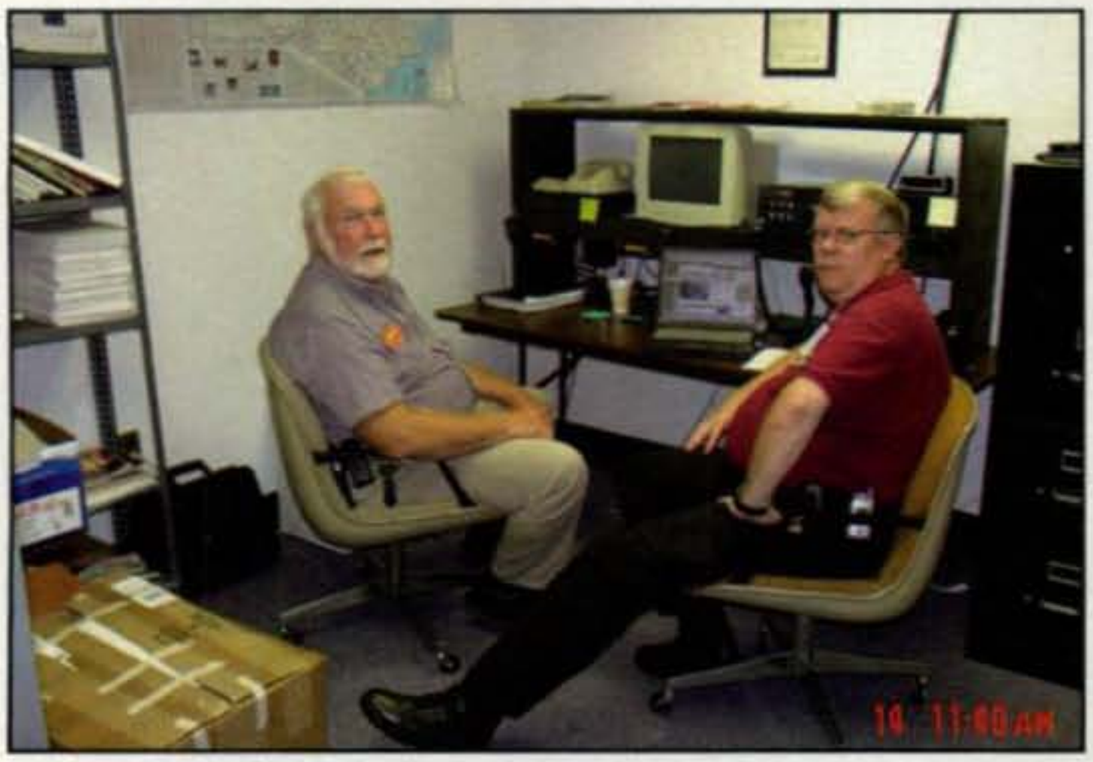
Amateurs at the National Hurricane Center, WX4NHC, gathered weather reports from radio operators in the hurricane-affected areas. (Photo courtesy Julio Ripoll, WD4R)

storm's path to issue weather information to local emergency management agencies as well as the general public. Dennis Decker of the Melbourne National Weather Service Office thanked the hams for providing local information on weather conditions. "You helped us verify the severity of the winds around the eye wall, and pass that info to the public as the storm crossed the area."

The high winds ripped down power and telephone lines throughout the affected area. Telephone poles and cellular telephone towers were snapped in two like toothpicks. Broadcast-radio and television-station towers were damaged or destroyed. Many areas had no means of communications except for ham radio. At the Arcadia Emergency Operations Center, President Bush was told that amateur radio was the only means of communications for the first 48 hours. Hams were able to help reestablish a local trunking system. Before the storm hit, amateur radio operators staffed local and state Emergency Operations Centers, shelters, staging areas, and other key locations.

Ham radio operators provided communications at special-needs shelters, food-distribution points, Red Cross shelters and distribution points, Salvation Army canteens, Federal Emergency Management Agency offices, and local radio stations. In Punta Gorda, Florida, the local radio station's roof had blown off. Once the station was able to get back on the air, ham radio operators kept the station in contact with emergency management officials so the station could pass on important information to one of the hardest hit areas. A week after the storm, only the ham radio operator and the announcer's cell phone kept the public informed. They kept hurricane survivors and volunteers up to the moment with vital data, such as who had generators, where medical assistance could be obtained, and where ice and food were available.

The Charlotte Regional Medical Center was closed because of hurricane damage. In order to meet the needs of the community, a portable hospital was set up by a Disaster Medical Assistance Team. Team Member Peter Allen, K9DPK, of Jupiter, Florida, said they were handling over 120 emergency-room patients a day. Many of the patients needed to be transported to hospitals for further care. Initially, the DMAT group had satellite-phone communications with their Operational Support Center and Joint Management Team, but had no contact with county



Pitt County, North Carolina amateur radio operators Byron Highland, K4BMH (left), and Doug Ferris, K4ROK, staff EOC as Charley heads up the east coast. (Photo courtesy Byron M. Highland, III)

Wind from the Ocean

For over a month, amateur radio operators provided nearly continuous emergency communications for areas hit by tropical storms (TS) and hurricanes (H). Here is a list of the named storms as of our deadline in mid-September:

Name	Dates	Max. Wind (mph)
H Alex	31 July – 6 August	120
TS Bonnie	3–12 August	65
H Charley	9–14 August	145
H Danielle	13-21 August	105
TS Earl	13–15 August	45
H Frances	24 August – 6 September	135
TS Gaston	27 August	70
TS Hermine	29–31 August	40
H Ivan	2 September – ? September	160

911 centers to coordinate patient transport. Communication links were established using amateur radio. At the peak of operations, transportation was being coordinated for patients at a rate of 10 per hour. Even as routine communication systems were restored, amateur radio continued to provide an important link. The volume of message traffic was simply overwhelming.

Salvation Army

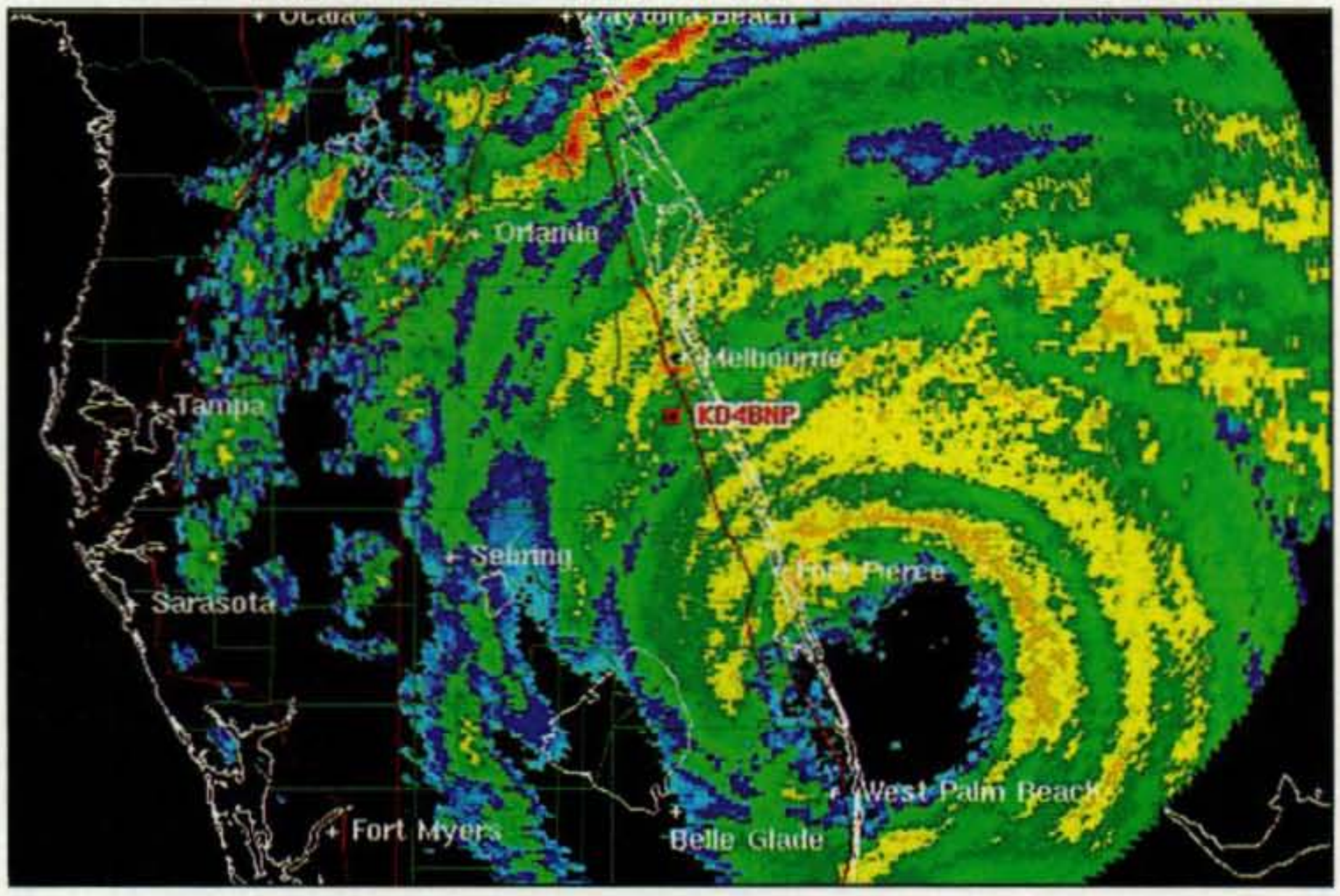
With so much devastation and destruction, it's almost hard to know where to begin to describe the work that ham radio operators did around the state.

Tampa Amateur Radio Club member Biff Craine, K4LAW, received a call from the Chicago office of the Salvation Army with what initially appeared to be a simple request. They requested help with communications between their canteens and their base of operations, which was located in the parking lot of the Charlotte County Convention Center (or what remained of it). The base also needed to have the opportunity to contact its Tampa warehouse.

Early into the relief operations, the Tampa club received ten Kenwood D-700 dual banders from the Oklahoma Division of the Salvation Army. They were called upon to deploy these units with the canteens and have a working unit at Base Camp and the Tampa warehouse. The Oklahoma City Autopatch Association (OCAPA) had just received the radios and quickly worked to build the necessary power cords, antennas, and mounts so they could be shipped overnight to Tampa. After some minor adjustments to the APRS information being transmitted, the units worked and worked well. With most street signs and buildings destroyed or severely damaged, anyone, including the Salvation Army management group, could see via the internet where all the canteens were located, along with the Base of Operations and the Tampa Warehouse. The locations shown were accurate within 40 feet!

Fr. Jim Gerhart, WA3DIT, said, "The powers-that-be at the Salvation Army were very pleased. It was very rewarding to have the Major in charge of the Base Camp look over to the hams at least twice a day and say, 'I don't know what we'd do without you guys.' When we informed the Major that we were going to be relieved by members of the Sarasota Emergency Group, we had to assure him that they were hams like us and would fall into their system. Larry, KS4NB, gave him his cell-phone number—just in case."

"OCAPA has had a long-lasting team effort with the Salvation Army," said Mark Hamblin, AE5MH. "We got a $6000 grant from OK Emergency Management. That was the foundation for the kits. We spent more than what we got. Let's see . . . 10 kits @ $800 hmm!" Hamblin said they were able to get the grant because they had used APRS at the Oklahoma City Marathon and replayed the event to emergency management personnel at a Salvation Army disaster conference.



APRS Station KB4BNP stays on the air as Hurricane Frances approaches. (Photo from <http://www.findu.com>)

Hams Make Sacrifices To Help Others

As hurricane after hurricane battered Florida and other areas, amateur radio operators sacrificed time with their families and spent time away from their jobs and homes to help others. Here is just a sampling of hams extending a helping hand:

"Within 48 hours I will leave my home and go to the Humane Society," wrote ARRL South Florida Section Manager Sherri Brower, W4STB, as Hurricane Frances approached the east coast of Florida. "The OM (husband David Brower, W4DKB) and I are in charge of ESF17 communications for the county as of 2 PM today (9/1). At least the shelter is sturdy." Emergency Support Function 17 provides rescue, protective care, feeding, and identification of animals that are separated from their owners. Seven days later, W4STB reported, "I'm alive and well and still living in the Humane Society, where we went to assist during the storm." Her home had no power, phone, or water.

Phil Royce, KE4PWE, of the Palm Beach Amateur Radio Council said he was "tired as heck and still going." He added that Melissa Shires, KE4WBQ, "is working her butt off here running messages and traffic" to the National Weather Service and to shelter managers." Phil concluded, "We are fine, but the townhouse stinks from water intrusion in the living room. God knows what we will find when we get back."

Trying to keep a bit of humor Phil asked, "Anyone got a battery to put in me?"

Southeastern Massachusetts Amateur Radio Assn. members Rick Cabral, W1RJC, at the Echolink PC, and Rob Macedo, KD1CY, share net control and logging duties for the Voice Over IP Weather Net. The arrangement permitted some tasks to be handled by hams outside the storm-affected areas. (Photo courtesy KD1CY)

"We proved that it was not only feasible but could be an extremely valuable tool," said Gerhart. "I think that it is safe to say that the Salvation Army will be expanding its use of APRS in the future. I also know that there were many hams who are now adding the purchase of a Kenwood D-700 to their wish lists."

Operating in Adverse Conditions

Don deWinn, W4NXJ, and John Weatherley, AB4ET, provided communications from the Emergency Operations Center in the Sheriff's Office building at the Port Charlotte Airport. Following Hurricane Charley, they thought they were going to have to move due to mold in the building. The situation was stabilized with the use of portable air-condition units and high-volume blowers placed in the halls and rooms to keep the air moving. The EOC was a large metal-skinned building and lost a significant proportion of its roof.

"We have been running the RACES/ARES EOC Communications net for the past two days by ourselves," said Weatherley. "We have been sleeping here on the floor in our communications room and running the station. The floor is cold and hard, as we both can verify. We plan to find replacements and head back home by the weekend."

Weatherly continued, "When we first arrived, the EOC operators just operated the radio and that was a busy task. A group from Monroe County had an assignment called *staging*. That important job was to staff all of the areas requiring amateur radio operators and keep them staffed. They pulled out last Monday morning and (we were) assigned to carry out that task in addition to running the EOC communications. We stayed very busy from 8 AM until about 2 PM. Traffic picked up again at about 4:30 PM as the dinner hour approached, and the Red Cross shelters called asking for information on their dinner delivery, ice and water supply, etc."

Ham Radio Is Important

Gary Johansan, WD4NKA, in Deltona, Florida, said his family was evacuated to Orlando. He said cell phones were useless in large areas of Volusia County until well after Frances left the Florida peninsula. "Ham Radio may be a lot of things," Johanson said, "but one thing the twin storms have proven to us on the peninsula is this: Ham radio is absolutely relevant." Johanson said amateur radio's response and recovery activities also have demonstrated ham radio's value to emergency management officials, medical personnel, and shelter staffers.

The stories here barely touch on all of the events where amateur radio played a vital role in emergency communications, the countless hours of hams serving in the public interest while being away from their homes, which were damaged or destroyed.

Our thanks to everyone who supplied us with information in between storms. Next month we'll continue to look at the response to Hurricane Ivan and possibly at some lessons learned. As one ham commented, "All of the previous hurricanes were just practice for what could come with Ivan." ■

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What changes in direction will new leadership bring to the group that writes the questions for our amateur license exams? New Question Pool Committee Chairman Jim Wiley, KL7CC, talked with CQ about his goals for the future.

CQ Interviews:

Jim Wiley, KL7CC

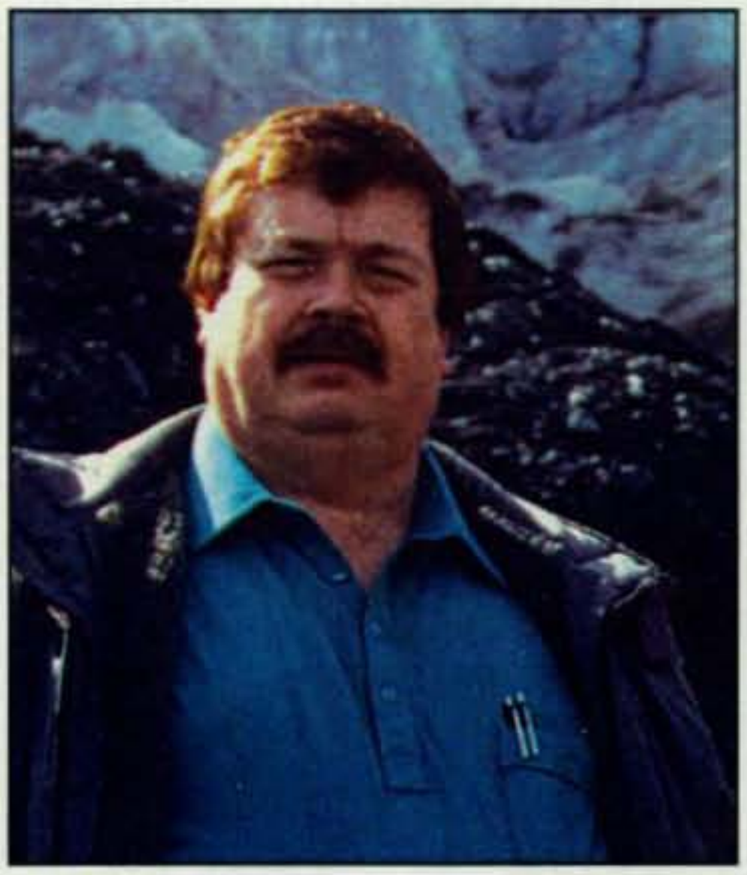
New Chairman, NCVEC Question Pool Committee

BY DANIEL MOSESON*

A new entry-level license with questions aimed at eighth-graders ... tests focused on "rules of the road" ... and greater participation by hams in the process of writing questions for amateur license exams. These are among the highlights of what the new chairman of the National Conference of Volunteer Examiner Coordinators' (NCVEC's) Question Pool Committee (QPC) hopes to accomplish in the next few years.

In an interview with *CQ*, Jim Wiley, KL7CC, Chairman of the Anchorage Amateur Radio Club VEC, Vice Chairman of the NCVEC, and the new chairman of the Question Pool Committee, talked about the changes in the QPC's membership and its role in the future of licensing and ham radio in general. He said that while he nominated the previous chairman—Scotty Neustadter, W4WW—to serve another term in the position, other members felt that a change was necessary. He also expressed his personal feeling that "the chairmanship ought to change every three or four years." Fred Maia, W5YI, was also replaced as a QPC member by the current chairman of the W5YI-VEC, Larry Pollock, NB5X. ARRL-VEC Manager Bart Jahnke, W9JJ, retains his seat on the panel that writes and regularly updates the question pools for the FCC amateur radio license exams.

Wiley told *CQ* he did not think the changes in the QPC membership were significantly influenced by a recent report by Greater Los Angeles Amateur Radio Group VEC Chairman R.C. Smith, W6RZA. In that report to the 2004 NVCEC annual meeting last summer, Smith tracked changes in amateur licensing patterns over the past five years. He said the numbers showed that restructuring in 2000 from seven license classes to three, along with a drop in code speed requirements from 13 and 20 words per minute to a single 5 wpm exam, produced an ongoing increase in the growth rate of the Amateur Radio Service. He said there was an additional uptick after the terrorist attacks of September 11, 2001, a trend which continued until the latest Technician Class question pool was introduced in July 2003.



Jim Wiley, KL7CC, is the new Chairman of the National Conference of Volunteer Examiner Coordinators' Question Pool Committee. (Photo courtesy KL7CC)

The introduction of the new and much larger question pool coincided with an abrupt turnaround in licensing trends, Smith reported, going from an average growth of 19.5 hams per day to an average decline of 8.2 hams per day. That trend continued through at least July 1, 2004, Smith reported, adding that, "(i)f the decline persists at its present rate, all gain achieved by restructuring will be wiped out in the next 3.5 years." Upgrades continued to increase, Smith's report noted, concluding that "(t)he average technical competence of the amateur community has improved at the expense of a declining entry level population. The decline gives rise to serious concerns for future growth."

"Somehow, the questions are perceived to be too difficult," Smith later told *CQ*, adding, "Whether they *are* more difficult or not doesn't matter, the perception does," and the result is that fewer people are taking the test.

"The Language is Too Hard"

Wiley said he agrees "somewhat" with that conclusion, but feels the problem is more in how the questions are phrased. "I think the language is too hard, not the questions," he explained. "I think it's too high a reading level, too high a math level." Wiley said he believes it's possible to test for the same knowledge with questions that are easier to understand, especially for young people.

**Editorial Intern, c/o CQ magazine*

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He also believes that "there is an overwhelming feeling in the amateur radio community that a new entry-level license is needed," and said the QPC is already working on a question pool for it. "On the new entry level license," he told *CQ*, "we want to make sure that a typical 12 to 14-year-old (6th to 8th grade) can read and understand the questions."

Dumbing Down?

Some people claim that making the exam questions less complex will "dumb down" amateur radio. Wiley responded to this charge with a story e-mailed to him by ARRL Laboratory Manager Ed Hare, W1RFI, who is leading the technical side of the fight against Broadband over Power Lines, or BPL.

"He and I studied the same license manual—the ARRL License manual for 1958," Wiley explained. "It was about four pages overall. 'If you want to see "dumbed down," ' (Hare wrote), 'look at that.' "

On the other hand, Wiley said, Hare told him that "if he looked at the size and complexity of today's *Now You're Talking* (the ARRL's Technician Class license manual), he would have said 'forget it' and gone on to something else. Don't you think it was worthwhile to get Ed Hare into amateur radio?"

Wiley added that many people misinterpret the function of the license exams. "The purpose of the test is not to teach people electronic engineering," he said. "We want to see if people know how to run their radio and not interfere with other people. If people want to learn how to build a radio ... there are hundreds of books out there on how to do that."

Wiley believes that neither the number of questions on the test nor the complexity of those questions has a major effect on the number of people coming into ham radio. "What's having a significant effect is that we seem to be having trouble showing people how much fun (ham radio) is," he said. "We need to get some fun into amateur radio. We have to show kids what's cool and what's fun."

"If we can't show them how cool it is," he continued, "we won't get kids (coming into ham radio)."

QPC Changes?

Wiley said the only change he wants to see in the activities of the QPC is more VEC participation. He said he wants "as many VECs as possible" involved and invites "all the VECs to appoint a person to be a point of contact between their VEC and the Question Pool Committee." He would also like the NCVEC to get more participation from individual volunteer examiners nationwide, "rather than have decisions made for them by a small number of people."

"If they decide that they'd rather have a small number of people go on making the decisions, then OK," Wiley continued, "but they should have the opportunity to participate if they want to."

There have been complaints that the QPC has not really been open to suggestions of new test questions or topics from the amateur community. According to Wiley, the committee has sent out announcements requesting ham input and has gotten no feedback. However, "people will still have to jump through some hoops" to submit questions to the committee, he said. "We need to stick to a standardized format of a question of no more than 'X' characters, four possible answers, one right, one seriously wrong, two distracters. We need to make sure they're on topic and don't get political or anything like that."

"The best way to submit something," he said, "is via the VEC organizations... but the new NCVEC website—ncvec.org—will have a place to ask questions of the QPC and a form for submitting proposed questions and keeping them in the standardized format." Wiley expected that form to be online by September or October.

Timetable for a New License

The first job the new QPC faces, said Wiley, is preparing a question pool for the new entry-level license that he expects the FCC to formally propose before the end of this year. According to Wiley, "the FCC personnel at the (NCVEC) conference thought there was a possibility of releasing a Notice of Proposed Rule Making by this December, followed by a Report and Order by next summer and having a new license in effect by next fall."

Wiley added that the group is already working on a question pool for a possible new license and plans to have it ready to release—plus or minus some tweaking—as soon as possible after the FCC makes its final decision.

"The job of the QPC," Wiley concluded, "is to get the pools ready, have them accurate, have them readable, and have them pertinent ... and have them out on time." ■

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While utilities trip over their own feet trying to implement broadband over power lines, or BPL—with many of them abandoning their experiments—some are saying that a wireless alternative with none of BPL's interference problems may be the answer everyone's looking for. KA3JIJ says don't be too sure, but pay attention anyway.

WiMax: (Not?) The BPL Alternative

BY RON OLEXA,* KA3JIJ

Faster than a speedy DSL line! More powerful than a microwave link! Able to bypass tall buildings with a multipath bounce! Look up in the sky . . . it's a bird, it's a plane, no it's WiMax! Otherwise known as 802.16, WiMax is the latest IEEE (Institute of Electrical and Electronics Engineers) standard for Metropolitan Area Data Networks (MANs). This new technology was introduced commercially in limited quantity in late 2003, and has slowly been becoming more generally available this year. Major industry players such as Intel are supporting the development of chipsets and promoting the development of commercial hardware, while wireless pioneers such as Craig McCaw (through ClearWire Communications) are beginning to build companies intent on using this new standard to deploy systems.

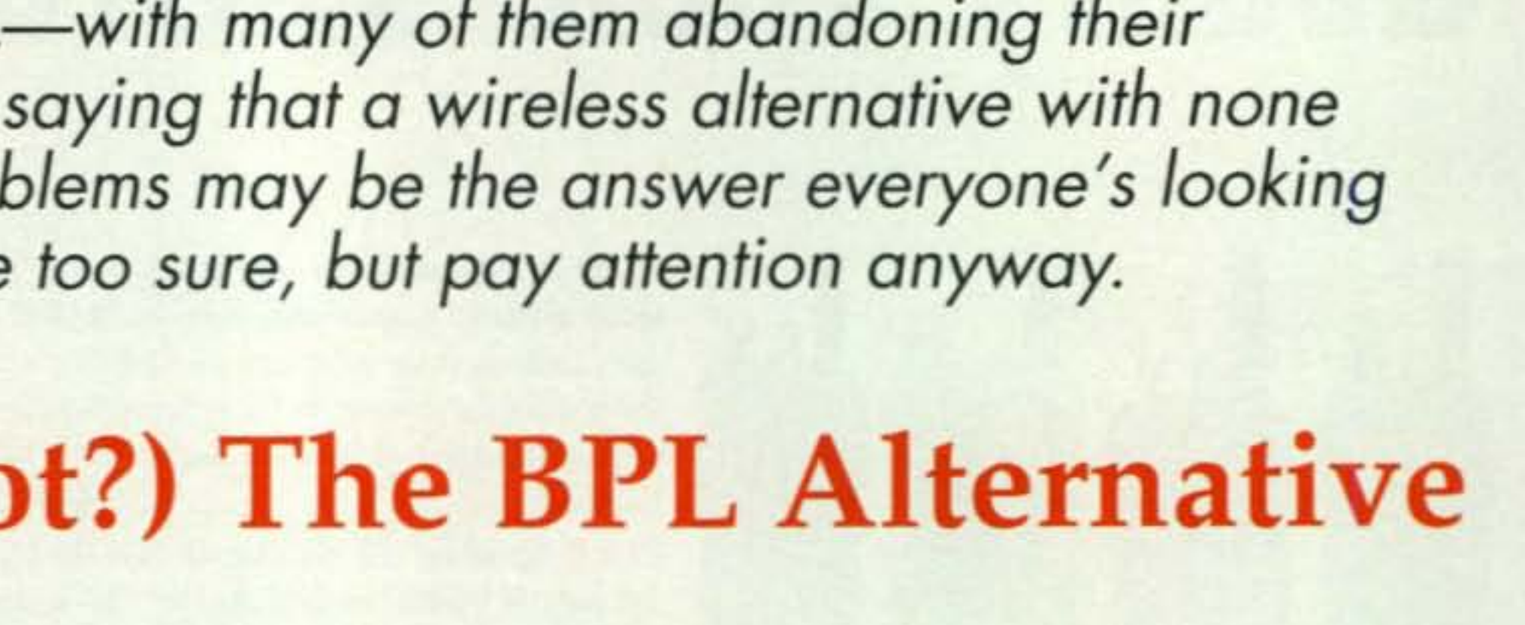

Fig. 1– An OFDM carrier is composed of many individual carriers, or "tones," that are precisely spaced so as to place the peak of each carrier at the upper and lower edge of adjacent carriers. This allows each carrier to be independently demodulated with no interference from the adjacent carriers.

802.16 and WiMax

In much the same way as the WiFi forum became the group that guaranteed interoperation of various manufacturers implementation of 802.11, 802.16 interoperability is being tested and certified by the WiMax forum. Now that the technology is coming close to commercial availability, the marketing hype is starting. Public press articles are touting 802.16 as an amazing new technology that will strip away the limits previously associated with wireless systems. Claims are being made of ubiquitous 30-mile range, along with huge capacity. While there is a grain of truth in the hype, as we shall see in this article, a real-world implementation will not be able to meet the expectations set by the hype.

That's not to say that this isn't a great advance in the state of the art. It most certainly is. In addition, this technology may have an effect on the amateur community in a number of ways. It certainly could be adopted and modified for use under Part 97 rules. Also, there are those who have high hopes that this technology will offer cost-effective wireless broadband service to consumers and could be used as a possible alternative to BPL. Personally, I have doubts about this, the reasons for which you'll see later in the article.

Differences Between 802.11 and 802.16

But, you may well ask, isn't 802.11 currently available, inexpensive, and able to provide service to the same users? The truth of the matter is, while 802.11 excels at certain things, the very fact that it has become ubiquitous and inexpensive has resulted in its being pressed into use to provide services for which it is not entirely suitable. 802.11 was developed to provide a wireless alternative to wired Ethernet connections. Thus, its focus is providing LAN (Local Area Network) connectivity in an office-type area. Its specifications and operating parameters were tailored for this type of operating space. Because the LAN environment was well characterized (connecting computers on the floor of a building), certain expectations could underlie the selection of the Media Access Control (MAC) layer and radio protocols. Chief among these expectations are that 802.11 will operate in unlicensed spectrum and that the implementation will cover a small interior area in which all user equipment can

*4929 Gair Loch Lane, Gainesville, GA 30506
e-mail: <ka3jij@callsign.net>

"hear" all other radio transmissions in the network.

These expectations led to the selection of Direct Sequence Spread Spectrum (DSSS) as the original modulation used for 802.11, and the selection of Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) as the MAC layer used to allow multiple users to share the bandwidth. As the 802.11 standard evolved, the FCC modified the rules regarding modulation in order to allow greater capacity at the expense of reduced interfence tolerance. This led to the inclusion of Complimentary Code Keying (CCK) and Orthogonal Frequency Division Multiplexing (OFDM) as modulation types and the attendant rise in capacity from 2 Megabits per Second (MBPS) to 11 and then 54 MBPS. Throughout these modifications, the CSMA/CA MAC remained constant. In a CSMA/CA system, each user listens for activity prior to transmitting. If a carrier is sensed (i.e., another person is using the LAN), the device will "back off" for a random interval, and then listen again. If the channel is clear, the transmission proceeds; if it is still in use, the device backs off for an interval twice as long as the first interval. This backoff interval continues to double until the LAN is clear of traffic and the message can be transmitted.

This works well in an office LAN environment, but falls apart when 802.11 is deployed to cover a large outdoor area. This implementation is no longer considered a LAN; it's evolved into a MAN. There is no way for CSMA/CA to effectively manage the allocation of the channel to multiple users, because users can be spread around the area in such a way that while all can communicate with the Access Point (AP), they cannot all hear one another. This leads to multiple units attempting to access the AP simultaneously, since each thinks the channel is clear. This simultaneous access results in interference, and the possibility that no station will get its message through.

Clearly, from the standpoint of both manageable spectrum and the need for a grant request MAC layer, a better technology than 802.11 is required for implementing a MAN. The IEEE formed the 802.16 working group to devise a standard that could be used in this emerging MAN marketplace.

802.16—Designed for Licensed and Unlicensed Band Use

Unlike 802.11, which was designed specifically to be used by consumers in the unlicensed bands, the original scope of the 802.16 committee was to design a standard for worldwide use in the 10-GHz to 66-GHz licensed bands, with the ability to work in unlicensed microwave bands if available. The standard will enable an operator to implement point-to-multipoint communications over a 1-to-3 mile path length instead of the point-to-point links traditionally deployed in these bands. By the nature of propagation at these microwave frequencies, these bands generally support only line-of-sight (LOS) communications. Any blockage of the path will render the link useless.

In the U.S., the available commercial licensed spectrum falls under FCC Part 101 rules. Worldwide, these bands have standard channel allocations of 20 MHz, 25 MHz, and 28 MHz. These channel allotments were originally devised for supporting digital telephony transmission using T1 multiples (1.544 MBPS, which equals 24 individual 64-kbps digitized telephony voice timeslots), such as T3 (45 MBPS) or OC3 (155 MBPS). The unlicensed spectrum falls in the 24- and 60-GHz Industrial, Scientific, and Medical (ISM) bands that are also allocated for Part 15 use. The 60-GHz frequencies were allocated as ISM bands due to the fact that they fall on the atmospheric-oxygen absorption peak. Atmospheric oxygen resonates at 60 GHz, causing absorption and scattering of any radio signal passing through the atmosphere. This extra attenuation can exceed 15 dB per kilometer, severely limiting the distance a radio link operating on these frequencies can cover.

Ham Bands Included

Radio amateurs may also find uses for WiMax technology. Part 97 allocations at 10 GHz, 24 GHz, 47 GHz, and beyond all are capable of supporting an 802.16 system. Such a system could be used to provide backbone communications between local data nodes. These local nodes could use either 802.11 or the next phase of 802.16—802.16a, discussed below.

The 10–66 GHz standard uses Quadrature Amplitude Modulation (QAM) as the basic modulation. QAM provides the lowest bit rate and the longest link lengths. Variations such as 16QAM and 64QAM modulation increase the complexity of the waveform by adding more phase/amplitude states. This increases the bits per Hertz with an attendant reduction in range. The 802.16 standard will handle from 32 to 143 MBPS

of traffic in a 28-MHz channel, depending on the frequency of operation, the modulation in use, and the range of the link. Using QAM modulation provides the longest range and conversely the lowest capacity. Increasing to 64 QAM yields significantly shortened coverage distance but a proportionate rise in capacity. Due to the selected frequency range and the selected modulations, these links are LOS only, and their utility is limited to those locations where a LOS path can be obtained between the base station and the end user.

802.16a— The Standard for 2–10 GHz

Because of the LOS limitation, there arose a need to expand the standard to support operation in lower bands where Non LOS (NLOS) systems could be implemented. The 802.16a Committee was formed to focus on an enhanced standard to include operation in the 2-GHz to 10-GHz bands as well. Adding this new range of frequencies caused the need for significant changes to the standard. First, the commercial frequency allocations in these bands differ from the Part 101 channels in that the channel allocations are much smaller, so more channel bandwidth flexibility was required. In addition, the traditional wideband microwave modulation modes (QAM, 16QAM, and 64QAM) used by the 11–66 GHz 802.16 standard were unsuitable for NLOS links because they do not tolerate the time and phase shifts caused by the multipath environment present in NLOS links.

These needs were accommodated by a change in the modulation. The modulation selected to support 802.16a is Orthogonal Frequency Division Multiplexing (OFDM). OFDM is a variation of Frequency Division Multiplexing (FDM). FDM is familiar as the traditional method by which a band is broken up into individual channels. In FDM each channel is assigned an amount of spectrum appropriate to the communication to be carried. There is then a bit of unused spectrum called *guardband,* which separates adjacent channels. Guardband is used to help control adjacent channel interference by assuring that out-of-channel energy is minimized in neighboring channels.

In OFDM, instead of using a single carrier within the channel, many small overlapping channels (as seen in fig. 1) are used to transmit the data. Each of these sub-channels, for all intents and purposes, has its own independent modem and appears to be an independent carrier. These carriers overlap, but are spaced apart at precise frequencies so as to provide "orthogonality," which is accomplished by placing the center of the modulated carrier on the edge of the adjacent carriers. This technique prevents the independent demodulators from seeing frequencies other than their own. The benefits of OFDM are high spectral efficiency due to the overlap of individual carriers, great flexibility to conform to available channel bandwidth due to the ability to implement only enough carriers to occupy the available channel, and lower susceptibility to multi-path distortion due to the ability to break up the broadband data into a large number of parallel streams, each having a much lower bandwidth and each feeding an individual carrier.

Because of the various channel assignments in the target bands, 802.16a can support channel bandwidths from as low as 1.25 MHz to a full 20 MHz. The maximum capacity of a 20-MHz channel is 75 MBPS. Smaller channels will have proportionally lower capacity. If LOS conditions exist, 802.16a can support link lengths of up to 30 miles. In NLOS conditions, environment plays a significant role in the actual range and coverage of any radio system working at frequencies over 1 GHz. This remains true for 802.16. There are no magic bullets here. This system must obey the same laws of physics as any other radio system. The achievable range of an 802.16 base station will depend on the frequency of operation, the power available both at the user's station and the base station, the antenna gains, and the environmental variables.

802.16 and Mobility

So far, the 802.16 standards have addressed only fixed operation. In July of 2003 the IEEE formed yet another 802.16 working group. This one, the 802.16e committee, is focused on the modifications necessary to make 802.16 support mobile operation at vehicle speeds of up to 90 MPH. With the addition of 802.16e, the 802.16 standard will have a variant to support most any data communication requirement.

802.16 and the Amateur

How does this new technology affect amateur radio? It's certainly a technology that bears watching. With the power of the likes of Intel behind this technology, it should become available in high volume in a short period of time. Much like 802.11 gear, as equipment sales volume ramps up, the cost will decline. Furthermore, because of the flexibility in operating frequencies, there may be hardware that can easily be converted from operation in the world's licensed commercial bands to operation in the Part 97 amateur bands. For example, the licensed (commercial) 3.4- to 3.6-GHz bands in Europe partially overlap the Part 97 allocation of 3.3.to 3.5 GHz. This band in particular could provide a useful alternative to using 802.11 equipment operating under Part 97 rules.

Not only does 802.16 have a far better bandwidth management and allocation algorithm than 802.11, but the 3.3- to 3.5-GHz band is not shared with Part 15 users, so interference and rising noise-floor issues can be minimized. In addition, this band would support NLOS communications and could be effectively used to provide wide-area communications. The coverage limits of such a system will be related to how high the base station and receive stations can be located, and what obstacles to LOS exist in the path.

Predicated on the expectation that equipment will be inexpensive and easily modified to operate in the Part 97 bands, 802.16 in its many forms may be able to provide the amateur community with true high-speed wireless data network capabilities. This system could use 802.16 or 802.16e (depending on whether mobility was required) in the 3.3-GHz Part 97 bands for data communications in much the same way as VHF and UHF repeaters are used today for voice communications, albeit on a much smaller scale due to the differences in propagation between 144 MHz and 3.3 GHz. 802.16 or 802.16a links could be used to interconnect these local nodes into an area-wide or regional network. Connections to the internet or point-to-point amateur microwave links could be used to connect several of these networks into a wide-area system. The limits of a network such as this will be set by the interest of the amateur community and the availability of suitable towers or other high locations necessary to implement the necessary base stations.

802.16 and BPL

As to the question of whether this technology could eliminate BPL, the answer is probably not. As you have seen, while the 802.16 standard *can* support links of up to 30 miles (depending on the operating frequency), it is quite dependent on having LOS paths to achieve

links of this length. In most urban and suburban areas, it will be difficult to find many homes that all have a line-of-sight path to a single point 30 miles away. That means it will rarely be possible to serve a community with a single site.

A significantly denser deployment, much like a cellular network, will be required so that the distance to be traversed between the base station and the home is much shorter than 30 miles. This density means that multiple channels will be necessary so that a frequency reuse plan can be developed that will give appropriate separation between co-channel usage locations (think about the frequency reuse planning associated with 2-meter repeaters, only with this technology, tens or hundreds of sites could be included in the area covered by a single 2-meter repeater!).

Potentially, *lots* of spectrum will be needed to support such a system, so economics and the realities of the marketplace will have to be considered. Where will this spectrum come from, and who will provide the services based on 802.16 technology? The power companies don't have the spectrum, yet they seem interested in getting into the broadband-service delivery game. Without available spectrum, they probably will continue down the BPL path.

What about other entities that might have spectrum and are interested in delivering a competitive service, thus putting economic pressure on the power companies by driving down service prices? The Cellular and PCS companies are already using the majority of their spectrum for voice, and have embarked on a digital path that is more focused on low-bandwidth mobility rather than high-bandwidth fixed service. The available millimeter microwave frequencies, because of the need for LOS, are more suited to connecting buildings in an urban center or buildings in a suburban office park rather than connecting to the home user, who ultimately seems destined to be the big consumer of broadband data services provided by BPL, DSL, and cable.

One possible source of spectrum for deploying 802.16 systems might be the MMDS (Multipoint Microwave Distribution System) channels. These channels, once used for distribution of "wireless cable" TV signals, were aggregated by the likes of MCI in the late 1990s for the purpose of providing wireless data networks. Unfortunately, two factors led to lack of deployment: First, the equipment to support this service was rare and expensive, and second, with the bursting of the "Internet Bubble," investors' appetite for deploying new wireless data networks dwindled. On the bright side, this spectrum is still available, and 802.16 now may fulfill the need for inexpensive hardware. In fact, this is the spectrum currently being used by Clearwire Communications in its early systems.

Thus, although 802.16 may not be the "fix-all" it's being promoted to be, it is certainly a useful standard that will provide some level of broadband connectivity to a certain segment of potential customers. Like 802.11, it will find its niche and effectively serve it.

The amateur community may find that commercial equipment easily transfers to the Part 97 bands and provides the basis for metropolitan area data networks that can support hobby traffic on a daily basis, as well as emergency and disaster communications when needed. I see it quite possibly becoming the "2-meter Repeater" of the 21st century.

Wireless communications without radiated power. Hard to believe, yes, but simple examples already exist. Now new findings in physics may make it a practical reality, but prepare to meet some new technologies as we examine the potential benefits of potentials.

Wireless Signaling Without Radiated Power – The Future?

BY WALTER F. BAIN,* W4LTU

We at CQ are blessed with a healthy sense of skepticism and that guided our initial response to this article, which was, "I don't know about this. ..." But that was also a problem. ... We didn't know if the author's suggestions made scientific sense. So we asked a couple of experts in the field to review the manuscript and their conclusion was, essentially, "Could be ... could be." So, with our skepticism satisfied and considering the amateur tradition of thinking outside the box, we present the following for your consideration and comment. —W2VU

It was in 1887 that Heinrich Hertz, following the theoretical predictions of James Clerk Maxwell, first demonstrated the existence of radio waves by transmitting over the length of his lab. Extrapolating his modest results to the variety of applications we know today would have, at that time, been difficult to say the least.

Once again however, new theoretical predictions have had confirmation in scientific labs and patents are being issued. This article will present a simplified outline of the theory and will attempt to extrapolate its possible application to signaling and communication. Some of the implications could be startling. Consider, for example, the "Big Silence" in SETI, the search for extraterrestrial intelligence. No extraterrestrial radio signals of intelligent origin have ever been confirmed. Perhaps we have been listening for the wrong thing; perhaps radio signaling as we know it is already obsolete! However, this and other possible applications will be discussed later.

*39462 Rickard Road, Lovettsville, VA 20180
e-mail: <wfbain@erols.com>

ELECTRIC SOURCE → ELECTRIC POTENTIAL → ELECTRIC FIELD
MAGNETIC SOURCE → VECTOR MAGNETIC POTENTIAL* → MAGNETIC FIELD

*A scalar magnetic potential also exists but does not have application here and will not be considered in this article.

Fig. 1– Genesis of fields.

Signaling Without Radiated Power?

The idea that radiated power is necessary to support wireless signaling is deeply ingrained in all of us, just as was the idea that a carrier was necessary. After over 100 years of radiating power, signaling without it seems unnatural, like getting something for nothing. However, the concept is not unknown. In order to lead up to simple though impractical examples, let's consider the independent electric field and the independent magnetic field that together make up an electromagnetic field, and whether power is radiated with either of them. We may have been using the electromagnetic field (radio) for so long we might have forgotten that the electric field and the magnetic field can exist independently.

Let's consider the units that are used to measure and define each of them. Electric intensity is given in terms of volts/meter, while magnetic intensity can be given in terms of amperes/meter. Note that power, which is volts times amps, is not present in either! (In a radio wave, however, both are present, where we have: [volts/meter] times [amps/meter], giving [watts/square-meter], or power density!) If you prefer a more experimental approach, consider a charged air-capacitor. If well insulated, it will maintain the electric field between its plates almost indefinitely, and no power is being supplied. Similarly, the magnetic field of a modern permanent magnet will last even longer and obviously there is no power input.

The above should establish that no power is radiated in the fields, so let's picture some primitive signaling methods as examples. Consider first an electric-field signaling scheme using two widely separated metal plates as antennas. The transmit plate needs to be driven by a source providing an AC *voltage*. Ideally, only an electric field is generated and no power is radiated. This field induces a signal voltage in the distant receiving plate that is then coupled to a high-impedance receiver. (Think of the two plates as forming a capacitor with widely separated plates!)

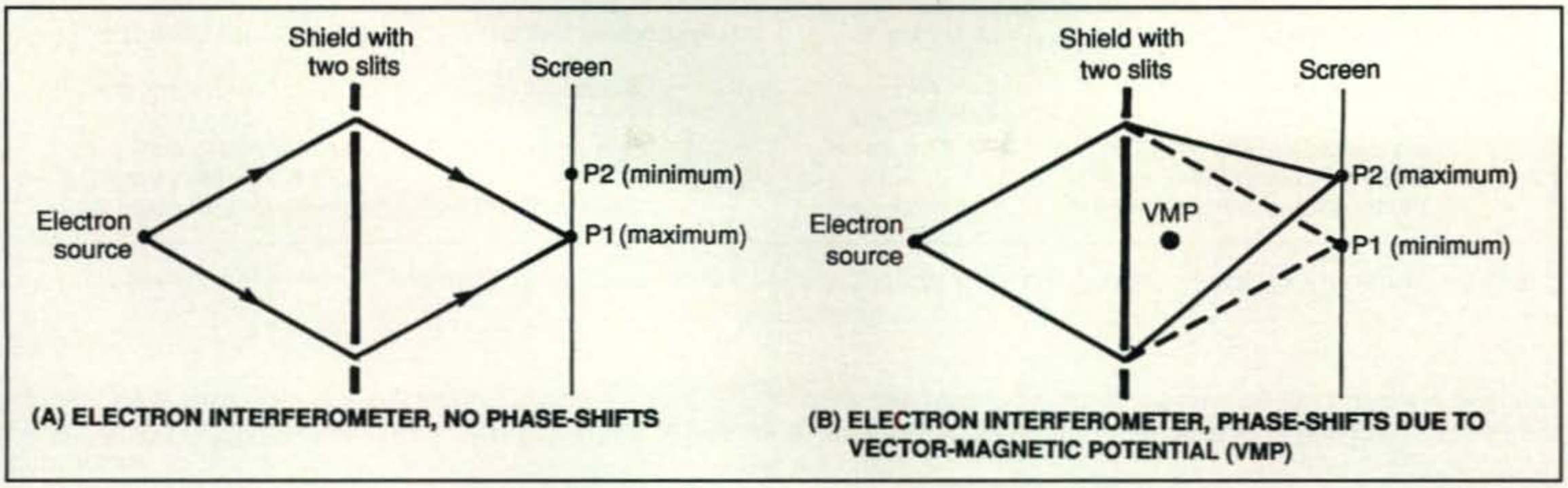

Fig. 2– Interferometer, electron beams in vacuum.

Any power consumed at the transmit end is incidental, due to losses such as dielectric leakage current and corona discharge. No power is radiated as in a radio wave. (*This is similar to the successful experiments in wireless telegraphy carried out by Mahlon Loomis in 1868!—ed.*)

A similar scheme, but using magnetic fields, might use two widely separated air-core coils (a transformer with widely separated primary and secondary!). The transmit coil requires only signal *current* to generate the magnetic field. Any power consumed would be due to ohmic loss in the coil winding at the transmit end. This can be reduced arbitrarily by using a heavier conductor. Perhaps these negligible losses are akin to friction losses in a mechanical system. They are not what makes the system work; they exist only because it is not worth the cost of reducing them any further.

These two simple examples serve only to demonstrate that the concept of wireless signaling without radiated power is a real possibility. It does not appear to violate any physical laws. Perhaps it violates only our intuition and tradition.

Unfortunately, the two methods described above are unlikely to ever be practical. Both electric field and magnetic field show a rapid drop-off with distance. This makes them unable to compete with our beloved radio waves which have a more modest drop-off with distance, but do radiate power. Therefore, let us now turn to the subject of this article, an entity that theoretically does not radiate power in its transmission, but whose drop-off rate is more modest than the two simple examples discussed above.

From the Mathematical To the Physical

We routinely assume that an electric source generates an electric field, and that a magnetic source generates a magnetic field. However, in doing so we have omitted something quite important. We have left out a significant step that previously was of interest largely to the mathematically inclined, as it provides them with a convenient means of deriving the equations for the fields. This step is the *potential* generated by the source, which in turn yields the fields (see fig. 1).

The source generates the potential, and the potential in turn generates the field. The simple arrows in the figure are in place of vector math operations given in electromagnetics texts. The texts used by the author are given in references 1, 2, 3, and 4, but any other good text on electromagnetics will give essentially the same results. This part is nothing new.

It is important, however, to understand that the potentials exist at a distance from the source, as do the fields. This may require some change in our thinking, as in the past we frequently have used the term *potential* to mean the source voltage at a terminal.

Why have the potentials seen so little consideration in day-to-day practical work? This is because previously they were considered to be only a convenient mathematical step having *no* physical significance. *This has now changed.*

In 1959, two theoretical physicists, Aharonov and Bohm[5], showed mathematically that potentials should be directly detectable, independent of the fields, by the use of wave mechanics (matter waves). This is now known as the Aharonov-Bohm effect and was described non-mathematically in 1989 in *Scientific American*.[6] Experimental work in a number of scientific labs has confirmed the reality of the basic effect and application patents have been granted. This article describes the potentials and their possible application to

Relevant Patents

Between 1984 and 1998, seven patents were issued by the United States Patent and Trademark Office dealing with the detection of potentials, using the techniques that won Brian Josephson a Nobel Prize in physics. They are:

4,429,280 Jan. 31, 1984 Apparatus and method for demodulation of a modulated curl-free magnetic vector potential field.

4,429,288 Jan. 31, 1984 Apparatus and method for modulation of a curl-free magnetic vector potential field.

4,432,098 Feb. 14, 1984 Apparatus and method for transfer of information by means of a curl-free magnetic vector potential field.

4,447,779 May 8, 1984 Apparatus and method for determination of a receiving device relative to a transmitting device utilizing a curl-free magnetic vector potential field.

4,491,795 Jan. 1, 1985 Josephson junction interferometer device for detection of curl-free magnetic vector potential fields.

4,605,897 Aug. 12, 1986 Apparatus and method for distance determination between a receiving device and a transmitting device utilizing a curl-free magnetic vector potential field.

5,845,220 Dec. 1, 1998 Communication method and apparatus with signals comprising scalar and vector potentials without electromagnetic fields.

Patents may be called up in full by patent number at the patent office website: <http://www.uspto.gov>. Be aware, however, that patents are written to provide rigorous legal protection. Technical clarity, regrettably, is frequently secondary.

Signaling Entity	Units	Generated Using:	Dropoff with Distance
1. Electromagnetic (Radio)	Watts/m^2	Power	Modest (inverse square)
2. Electric Field (E)	Volts/m	Voltage	Rapid (inverse cube)
3. Magnetic Field (B)	Webers/m^2	Current	Rapid (inverse cube)
4. Electric Potential (V)	Volts	Voltage	Modest (inverse square)
5. Vector Magnetic Potential (VMP)	Webers/m	Current	Modest (inverse square)

Table I– Summary of results of equations in appendix in terms of calculating intensity vs. distance for electric and magnetic potentials.

wireless signaling, along with some of the perhaps startling implications.

The Behavior of the Potentials

Quantitatively, what are the characteristics of the potentials that might make them suitable for signaling and possibly advantageous over electromagnetic signaling (radio)? Do they consume power, and is their drop-off rate indeed more favorable than that of the simple signaling schemes described earlier, using either an electric field or a magnetic field?

Most electromagnetic texts, such as those referenced earlier, rigorously describe the behavior of the potentials and the fields using generalized equations given in copious vector math. To obtain a more usable form, these were reduced to less generalized algebraic equations. These give the behavior of the intensity versus distance, but only in the direction of maximum intensity. They also were simplified so as to apply only to distances large compared to the source size, and to use a specific source rather than generalized. For the interested reader these four equations are given in the Appendix, but the results are summarized in Table I, along with radio waves as a point of reference. These results summarize what is theoretically required to generate each, and what is the comparative drop-off rate with distance.

First, for comparison, in line 1, is our beloved radio signaling (electromagnetic). It is generated using power (and power is radiated). It shows a modest drop-off, the familiar inverse square of the distance.

In line 2, electric field, generation requires only voltage. However, it has a more rapid drop-off with distance, decreasing by the inverse cube.

In line 3, magnetic field, generation requires only current, but it also drops off rapidly, as the inverse cube. This rapid drop-off with distance makes both electric field and magnetic field impractical for long-distance use.

Line 4, electric potential, shows that for generation only voltage is required, but now the drop-off is more modest, only by the inverse square of distance, similar to radio waves!

Line 5, vector magnetic potential, shows that only current is required to generate it. Its drop-off is also modest, again by the inverse square of distance!

Based, then, on the theoretical equations, the potentials should allow us the best of both worlds: zero power radiated together with an acceptable drop-off with distance. The only power consumption involved is, again, incidental to real-world losses in the generation process. *No power goes into radiation.*

Generation of Potentials

This will be the easy part, compared to detecting them. Anything that sets up an electric or magnetic field must also be setting up a corresponding potential. For a signaling circuit using electric potential, a pair of metal spheres or plates might be driven against one another by a balanced high-voltage RF source. If you choose to use vector magnetic potential, a large low-resistance loop should be driven by an RFcurrent source. Either potential may be used independently, thus providing two available spectra, theoretically extending down in frequency to DC!

For the magnetic case, it is tempting to add turns to the loop to increase the potential. However, for the same conductor size this simply increases the ohmic resistance, making it more difficult to maintain the desired current. A single turn on a larger diameter is likely a better approach. For either case, though, electric or magnetic, if the structure becomes large enough to be a sizeable fraction of a wavelength, and is configured correctly (or incorrectly in our case), power can begin to be wasted as radiation!

Detection of Potentials

Detection of the potentials is, regrettably, a bit more complicated. Prior to Aharonov and Bohm's theoretical work in 1959, potentials were assumed to be only mathematical things, having no physical reality. However, their theoretical work showed that the presence of a potential (either electric or vector magnetic) would shift the phase of matter waves. This phase shift could then be detected by interferometer techniques.

What, however, are matter waves (also called deBroglie waves after the physicist who first proposed them)? Basically, any moving particle such as an electron can also show wave properties having a wavelength that depends on the particle mass and velocity. (This is the counterpart of quantum effects, where any wave might also show particle properties.) If moving particles are in an environment that can react to their wave character, they will do so. It gets complicated, but in any case, matter waves exist, they are what are affected by potentials, and we are stuck with it!

The setup to demonstrate the detection of potentials using an interferometer is shown in fig. 2, starting with an interferometer using electrons in a vacuum in fig. 2(A). The electron gun emits electrons toward the screen, but only those passing through the slits can ever reach it. The resulting interference pattern on the screen (like antenna lobes) depends on the relative path lengths through the two slits. This interference pattern is formed by the matter waves of the electrons. The point P1 is a maximum in intensity, as the path lengths are equal and the waves add in phase. P2 is a minimum where the difference in path lengths puts them completely out of phase. (The bizarre part is that if only a single electron is fired toward the screen, that electron's wave characteristic goes through both slits to interfere with itself! Irrational as it seems, that is what happens. Welcome to modern physics.) The final pattern defining the maximum and minimum is, of course, determined by many electrons and their many individual waves.

Next consider this same interferometer, but let's place a magnetic source between the two paths that go through the slits, as shown in fig. 2(B). The presence of the vector magnetic potential

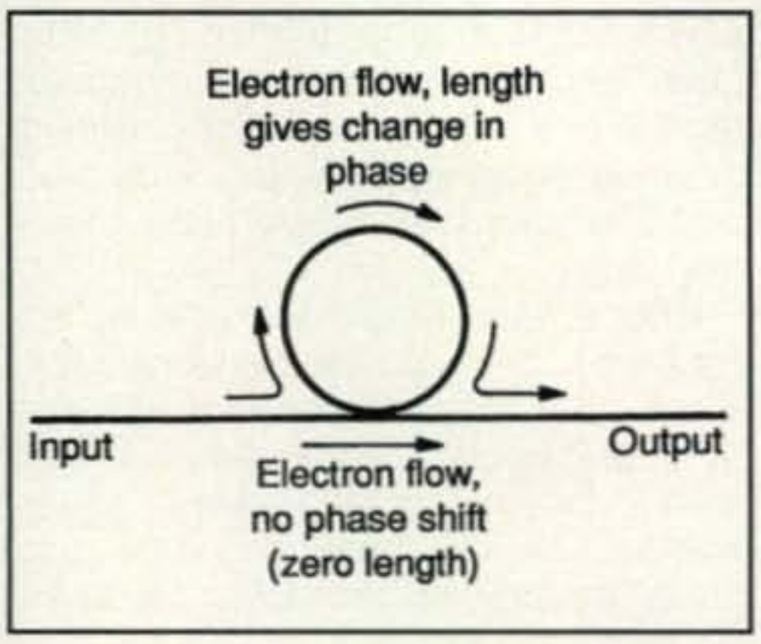

Fig. 3– Interferometer, one leg now zero length.

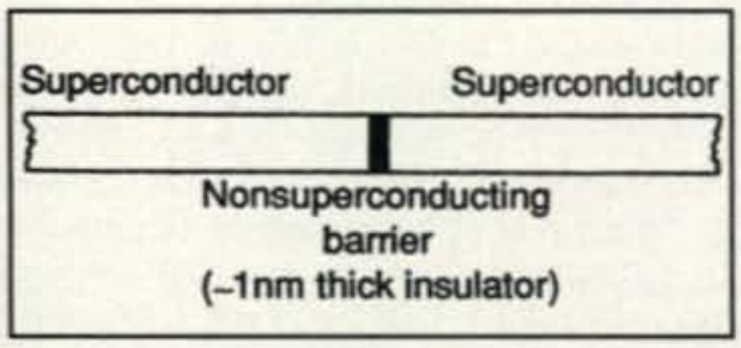

Fig. 4– Josephson junction.

causes one path to advance in phase and the other path to retard in phase. (Think of this as similar to a 2-element phased antenna when you change the length of the phasing lines—the pattern shifts.) For phase shifts of +90 and –90 degrees in the two paths of the interferometer, the matter waves will now *cancel* at the point P1, giving a null due to the total of 180-degree difference. (A maximum will still exist but will be moved to P2.) Thus, the observed electron intensity at a given point on the screen will vary due to the presence of the potential. *We have achieved detection—the presence of potential caused a shift in position of electron flow onto the screen.*

This is the basic configuration that has been used by scientists to demonstrate the Aharonov-Bohm effect in the lab. As was shown in fig. 2(B), it will detect a potential source that originates within the detector itself, but for signaling we are hoping for somewhat longer ranges than that!

To detect an external potential source, let us take our basic interferometer configuration and reduce to zero the path length of one side. This is shown in generalized form in fig. 3. The phase shift in the remaining (circular) leg is now being compared with zero phase shift of the zero length section, and can detect a potential source located at a distance.

How do we implement something like fig. 3 using electron beams in a vacu-

um? Perhaps we don't. Can we construct something like fig. 3 using electron flow in wires? Yes, but now we face a new problem. Electrons flowing in a wire rather than in a vacuum are subject to collisions with the atoms of the wire. The matter waves of the electrons then lose their phase coherence and become noise-like. Without phase coherence they cannot provide the wave interference effect necessary to yield detection.

Superconducting wires offer one solution. In superconduction, certain materials develop zero electrical resistance when cooled sufficiently. Their zero resistance means that collisions have been eliminated and the matter waves can then survive the trip with their phase intact. Rapid progress in cooled superconductors makes this approach most promising. Superconduction using readily available liquid nitrogen for cooling is now possible, and the march toward room-temperature superconductivity continues.

In addition to cooling the conductors, another approach to superconductivity is the use of microscopic conductor sizes. This eliminates the collisions, but does it without the cooling that is necessary to attain superconduction in ordinary-size conductors. However, don't start reaching for your roll of #40 wire. By microscopic we mean on the order of 10 nanometers diameter, a fraction of the wavelength of visible light. Nanotechnology has made great strides, and this approach is also very promising.

Perhaps the most intriguing approach to the detection of potentials (as of this writing) is the Josephson junction.[7] Predicted theoretically in 1962 by Brian Josephson, it won him a Nobel Prize in physics. As shown in fig. 4, its appearance is deceptively simple, although its operation is quite otherwise. It consists of two superconductors separated by an extremely thin non-superconductor (usually an insulator).

Josephson predicted, correctly, that the Cooper pairs (pairs of coupled electrons) in the superconductor could tunnel through the insulator. This means a current could still flow with no applied voltage, as it does in a superconductor alone. He further predicted that the magnitude of the current flowing would depend on the phase difference of the matter waves on each side of the junction. (Cooper pairs of electrons can behave as a wave just as do the single electrons discussed earlier.)

This phase difference is what is of key interest here. Remember that Aharonov and Bohm showed theoretically, and later experimenters confirmed, that an incident potential will shift the phase of a matter wave. Therefore, a properly incident potential will shift the phase difference across a Josephson junction, thereby changing the current flowing through the junction. Again, we have achieved detection!

This configuration uses the DC Josephson effect, which involves a direct flow of current through the junction. It is this current that is then modulated by the presence of the potential, at the same frequency as the potential.

Another, newer, configuration uses the AC Josephson effect[8] and it too can be expected to respond to potentials, although much about it remains to be resolved. It comes about when we apply sufficient DC bias to the junction. When a critical current is reached (where the superconductivity begins to disappear) the junction oscillates! The frequency of oscillation is directly proportional to the applied bias voltage. A DC bias of 1 microvolt yields an oscillation frequency of 483.6 MHz, well within amateur receiving capabilities. Of course, a highly stable, noise-free voltage regulator/divider will be required for that bias source!

These new technologies may seem daunting at this time, but it is likely that when vacuum-tube technology was new, and then later semiconductor technology, their technical details seemed equally perplexing. However, we have been able to cope nicely, to say the least.

Prior to departing from receiver approaches, it should be mentioned that seven patents have been located which address detection of potentials. They all utilize Josephson techniques. These patents, issued between 1984 and 1998, are listed in the sidebar "Relevant Patents."

Possible Amateur Applications

The most obvious advantage of potentials would be the ability to put out a strong signal without consuming large amounts of line power. A less obvious advantage is the reduction in the number of heavy power components required. If using electric potential, the high-voltage source might use a Tesla coil-type device, or even something like a TV horizontal oscillator to obtain the high-voltage drive from a modest source. If vector magnetic potential is to be used, semiconductor switching devices are well advanced and could provide a high RF current at a very low voltage.

Portable and mobile operation could be simplified due to reduced power drain, as would repeater operation. Effective emergency transmitters might be powered by a single D-cell, with most of the power drain due to the receiver and control circuitry. This could greatly enhance amateur readiness and capability under emergency and disaster conditions, as it eliminates dependence on substantial power sources of any kind.

The location of radiators might be greatly simplified when using potential. In theory, the potentials are not shielded by obstructions, either conducting or non-conducting! This might permit complete installation within a vehicle or a home! No antenna covenant problems there!

Other Possible Applications

Other uses also become evident. A signaling method promising to provide a substantial signal with minimal power drain has obvious application for ocean beacons, lifeboats, and life vests. Use by downed aircraft and pilots must also be considered. Satellites and deep-space probes might have new dimensions in data rate and in range for the solar power available to them. Telephone repeaters might be feasible in remote areas lacking power lines, such as polar, desert, and jungle regions.

Subsurface signaling would be greatly enhanced for location and rescue in mines and tunnels. Beacons might become practical as applied to automatic highway guidance. Law-enforcement and military applications undoubtedly would abound.

Aside from signaling applications as we usually think of them, there could also be some interesting biological implications. Implanted biological telemetry packages might be made functional with greater data rates, greater ranges, and greater battery life. Also, we are familiar with the wide range of conflicting and inconclusive results obtained in attempting to determine the effect on human health of electric and magnetic fields such as those from power lines, cell phones, etc. However, it has been speculated that the functioning of the human brain may well be quantum mechanical in nature. If this is so, perhaps the brain and the nervous system are responding not to external *fields*, but to external *potentials* that follow different laws than do the fields. This would then yield conflicting results if testing and data evaluations concerning electromagnetic effects assumed that only the electric and magnetic fields are acting.

In addition to what has been mentioned above, other implications come to mind on perhaps a grander scale:

"The Big Silence"

Those who follow SETI (the Search for Extraterrestrial Intelligence) are aware that over the years increasingly sophisticated scanning of the skies is being carried out searching for electromagnetic (radio) signals of intelligent origin. With one brief, possible exception, never repeated, nothing has ever been found. With over 100 billion stars in our galaxy alone, estimates using the Drake equation[9] suggest that the galaxy could well be teeming with intelligent life, and consequently with communications. Why, then, the "Big Silence" as it has been called?

Electromagnetic signaling (radio) has been known to us for just over a century, a mere instant on a galactic time scale. It is highly inefficient, as it requires a lot of power! Kraus (W8JK)[10] calculates that to signal over a distance of 1000 light-years (just one-hundredth the width of the galaxy!) using 100-meter-diameter dish antennas and a bandwidth of only 0.1 Hz would require one million watts radiated. Higher signaling rates would increase the required power proportionately. A bandwidth of

100 Hz would require 1000 megawatts. Radio signaling may be just an interim step in the evolution of more sophisticated techniques. It may be absent from the rest of the galaxy for the same reason that smoke-signals are absent from the Earth. They were replaced by something more advanced.

Where Do We Go from Here?

What has been described may seem far-fetched. However, what has resulted from Hertz's limited demonstration of radio waves in 1887 is also far-fetched!

1. We must begin to acquaint ourselves with the individual technologies that relate to signaling using the potentials. The world wide web provides a broad cross-section of information on potentials, superconductivity, nanotechnology, Josephson junctions, matter waves (wave mechanics), etc., most of which is presented at understandable levels.

2. Any among us who already have specialized know-how in the technical areas involved should author articles to pass along their knowledge to the rest of us.

3. All of us should explore the new concept and attempt to generate ideas for simplified implementation. If detection can be achieved using readily available components, we are on our way.

Perhaps a genuinely new approach to wireless signaling will invigorate ham radio. It provides the challenge to again, of necessity, build our own equipment and perhaps take the lead as we did in the early years of radio. The time is now.

References

1. Dale R. Corson and Paul Lorrain, *Introduction to Electromagnetic Fields and Waves*, W.H. Freeman and Co., 1962.

2. I. S. Grant and W. R. Phillips, *Electromagnetism*, John Wiley and Sons Ltd., 1975.

3. Alan M. Portis, *Electromagnetic Fields: Sources and Media*, John Wiley and Sons, 1978.

4. Wm. H. Hayt, *Engineering Electromagnetics*, 5th edition, McGraw-Hill, 1989.

5. Y. Aharonov and D. Bohm, "Significance of Electromagnetic Potentials in the Quantum Theory," *The Physical Review*, Second Series, Vol. 115, No.3, August I, 1959, pp. 485–491.

6. Yosef Imry and Richard A. Webb, "Quantum Interference and the Aharonov-Bohm Effect," *Scientific American*, April 1989, pp. 56–62.

7. B. D. Josephson, "Coupled Superconductors," *Review of Modern Physics*, 1/1964, pp. 216–220.

8. D. N. Langenberger, et. al., "Investigation of Microwave Radiation Emitted by Josephson Junctions," *Physical Review Letters*, Vol. 15, No.7, 16 August 1965, pp. 294–297.

9. J. M. Pasachoff, *Contemporary Astronomy*, Ch. 21: Life in the Universe, Saunders College Publishing, 1981

10. J. D. Kraus, *Radio Astronomy*, Ch.12: SETI, Cygnus-Quasar Books, 1986. ■

Appendix

These are the formulas used to calculate intensities of field and potentials, both electric and magnetic, at a distance much greater than the size of the source. See key below for any symbols that may be unfamiliar to you.

1a. Electric Field – E – (Volts/m)

At a distance γ from a pair of charge centers carrying charge of +q and –q at spacing ℓ, charge provided by a drive voltage V_o:

$$E = \frac{1}{2\pi\epsilon_o} \times \frac{q\ell}{\gamma^3}$$

1b. Magnetic Field – B – (Weber/m^2)

At a distance γ from a single-turn loop of radius R, carrying a current I:

$$B = \frac{\mu_o}{2} \times I \times \frac{R^2}{\gamma^3}$$

1c. Electric Potential – V – (Volts)

At a distance γ from a pair of charge centers carrying charge of +q and –q at spacing ℓ, charge provided by a drive voltage V_o:

$$V = \frac{1}{4\pi\epsilon_o} \times \frac{q\ell}{\gamma^2}$$

1d. Vector Magnetic Potential – A – (Weber/m)

At a distance γ from a single-turn loop of radius R, carrying a current I:

$$A = \frac{\mu_o}{4} \times I \times \frac{R^2}{\gamma^2}$$

Key:

γ = distance in meters
R = loop radius in meters
ℓ = charge center spacing in meters
q = charge in Coulombs
ϵ_o = permittivity of space, 8.85×10^{-12} F/M
μ_o = permeability of space, $4p \times 10^{-7}$ H/M

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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*".

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As amateur radio came back to life after World War II, some of the earliest activity was from—of all places—Germany. First on the air were Allied soldiers posted to the British, American, and French occupation zones. The author has organized a group to record and keep alive the memories of those times.

Forward into the Past
The Ex D Association

BY JOHN HAWKINS,* VK6HQ

John Padgett, DJ2JA, serving with US Forces TRIFT 7I in Celle, Germany was my first QSO (as DL2XH) when I first operated as a ham —50 years ago—from HQ 2nd Tactical Air Force (RAF) in Bad Eilsen, then in the British Zone of Germany. We worked on October 16, 1954 on 3.625 kilocycles, as they were known then, and on AM (amplitude modulation, or *ancient modulation,* as the youngsters call it!). John was running 60 watts to a Johnson Viking Ranger TX and read me 5 by 6 on his Hallicrafters SX71 double superhet RX. John's QSL card, enlarged and framed and on the wall of my shack here in Western Australia, will be lit up with a spotlight on Saturday, October 16, 2004, when at age 70, I celebrate 50 years as a Radio Ham!

That QSL card, which I look at every day, was probably more instrumental than anything else in the conception of the Ex D Association in February 2000. From the moment the idea was first floated, an ever-growing group of us began to march resolutely—but, all too often, sadly—*forward into the past.* Sadly because too many of the D2s and D4s were by then Silent Keys.

What exactly is the Ex D Association and what is its aim? The XDA, now in its fourth year and still free of fees, seeks to bring together British and other Allied service personnel who served in Germany post-WW II and who were, or were qualified to be, radio amateurs. The group's name comes from the call-sign prefixes we were issued – originally D2 and D4, later DL2, DL4, and DJ. The XDA has achieved its objective very satisfactorily. Let's look back.

The very first edition of the association's journal, *As You Were!!*, dated September 2000 reminisced: "Those were the days, my friend! We thought they'd never end!" (words from a very big hit song sung by Mary Hopkins in the '60s). Even then, in 2000, memories of the autobahns, those cobbled high-speed motorways, delicious German food, convivial harvest festivals, similar lively celebrations, and the DL2XH radio shack were beginning to fade. It would be a shame, I thought, if those memories were to be lost forever. As the computer keyboard began to send words up to the screen, for a moment nearly 50 years dissolved away and I was a young man again. From the mail that I was to receive, many Ex Ds experienced the same sensation.

Beginning at the End

When hostilities came to an end in 1945, impounded amateur radio equipment in the UK began to filter back to its owners. Amateur radio was being reborn. It was not long before British service personnel in Germany began to receive "Certificates of Authority For Wireless Experiments in the British Zone." The same was happening in the US and French Zones. Only a privileged few knew what was happening in the Russian Zone! The benefits of the speedy return to the airwaves of German nationals were not ignored and followed in time.

Transmissions by British service personnel were permitted as outlined in Table I. There *was* this strict prohibition:

Photo 1– The DL2ZN Rheindahlen Club. Seated: Brig. Johnny Clinch, CBE, DL2ER/G3MJK; standing: Nev Cooper, G3LMO; and far right, an unidentified club member. (Photo courtesy of G3MJK)

"The use of *spark* sending apparatus is specifically forbidden…" Not a problem. The availability of quality war-surplus equipment meant that spark-gap transmitters could stay where they were—in obsolescence. The first British stations on the air from Germany used callsigns in the D2+2 series. The first US stations were D4+2.

My Own History

It was April 1953 and I was 18. One door had just closed; the end of the war in Korea was near, and like many of my fellow RAF cadet pilots and navigators, my flight training was no longer needed. After I had been retrained as a teleprinter operator, a new door opened and I was sent to HQ 2nd Tactical Air Force, NATO Comms Centre, Bad Eilsen, in Germany.

In Bad Eilsen, I first had the opportunity to try out grammar school German

**17 Shasta Road, Lesmurdie, WA 6076, Australia*
e-mail: <bushcarp@iinet.net.au>

Photo 2– The author, Bandsman LAC Hawkins, DL2XH.

on real Germans. It had instant benefits and started opening doors within the local German community. In the billet, I translated vital German for the adventurers. Outdoors, I decoded the bargains in local shops, read posters, and soon made friends with a German lad a year or two my junior. His family, the Lehmanns, living in Railway Road, took a shine to me and in return I cooked them a British "delicacy"—fried egg on fried bread, spread with hydrolyzed meat extract from the UK and garnished with baked beans. The sweet German black bread was not good for frying, so some English white bread, bought from the NAAFI (Navy, Army & Air Force Institute), added an authentic final touch.

I was an invited guest at many local festivities, under canvas, with oompah bands and steins of beer, and I'd hear Herr Lehmann whisper to locals, "He's okay!" Frau Lehmann became something of a second mother to me.

In the majestic Bade Hotel, above the teleprinter room where I worked, was the wireless room. Pilot training had included Morse code, and this helped raise my speed to 15 wpm. Wireless telegraphy was far more akin to amateur radio than teleprinting, and I began wandering upstairs during night-watch quiet spells. Several of the wireless operators had been pressed into the trade and were more than ready to stand aside and allow me to sit in. The receivers were quieter than my R1155 at home and had a broad, aesthetic tuning scale.

It was not long before the Signals Officer, a Flight Lieutenant in the Royal Dutch Air Force, noticed my absences from the teleprinter room and called me into his office. I felt sure I was in trouble, certain to be disciplined and put on a *Form 252* (otherwise known in the RAF as a *fizzer* or *jankers*). Instead, I walked

out with assurances that my qualifications permitted me to hold a DL2 callsign, plus I'd be loaned an AR88 receiver, a T1154 transmitter, some test gear, and a room in the Bade Hotel for a shack. The only condition was that I form and oversee a club station. My call, DL2XH, soon arrived. All systems were go!

Just before I had the station on air, Corporal John Jones, a teleprinter technician hailing from Wales, introduced himself to me as we changed shifts. He held the call DL2SW, he said, and had operated his station from married quarters. He was leaving at the weekend for the UK, but had seen mention of the new radio club in the *Station Magazine*. He wished me well, and I often wondered what became of him and if he went on to take out a G or GW call.

I had a most rewarding time in Germany in the ensuing 18 months and once even played piano in the RAF dance band at old Pop's *Jägerhof*. This was the local pub and watering hole, where we enjoyed a Dortmunder Pils beer or two, pork cutlet, two eggs, and chips, and spiriting away the ashtrays. All good things had to end, though. Laden with dutiable goods in two brand-new suitcases, I wistfully bade farewell to Bad Eilsen in October of 1954, destined for England and demobilization. It was not until 1957, the International Geophysical Year as it happened, that I passed the Radio Amateurs' Examination and Post Office Morse Test and became G3LXD. By the time Connie and our two kids and I had emigrated to Australia in March 1973, I'd traded and upgraded my equipment from a KW Electronics Vanguard AM transmitter, a Geloso VFO, and an HRO receiver to an SSB KW2000A transceiver, one of a few important items we were permitted to take with us on our flight to a new life in Western Australia. I was on the air a few days later as VK6HQ.

Power in watts	Frequencies in kilocycles per second	Types of emission
10	1800–2000	A1 A2 A3
25	3500–3635	A1 A2 A3
25	3685–3800	A1 A2 A3
25	7000–7300	A1 A2 A3
25	14000–14400	A1 A2 A3
25	28000–30000	A1 A2 A3
25	58500–60000	A1 A2 A3

Table I– Power, frequencies, and modes initially authorized to British service personnel in occupied Germany soon after the end of World War II.

Fast Forward to 2000

In the year 2000, when many super New Year's resolutions were made, curiosity got the better of me and I decided to see how many ex-DL2s I could track down to possibly start an association. The year 2000 was also, of course, the year when computers worldwide were expected to fall over like daffodils in a storm. As it happened, Y2K glitches turned out to be minimal. My computer was unscathed and I was glad of that. There was no way whatsoever I could have gotten the Ex D Association up and running without a computer, internet access, and e-mail. With no idea as to what lay ahead, I decided to start by checking my QSL collection for cards showing DL2 or DJ2 prefixes as previously held callsigns. That worked well. But wait a moment! What were those occasional D2 and D4 calls I was finding? It became clear that in the immediate post-war period these prefixes plus two-letter suffixes were the ones being issued.

A page or so of ex-D2s, D4s, DL2s, and DJs was soon garnered. Those names were then compared with the RSGB CallSeeker CD ROM to see if any were still licensed and to look for current addresses. Some were no longer listed, most likely Silent Keys. The information on those whose calls were current was then compared with data on <www.qrz.com> for possible biographies and e-mail addresses. Those with

Photo 3– The author (left) with his "second parents" in Germany, Herr and Frau Lehmann.


OFFICE OF THE THEATER CHIEF SIGNAL OFFICER EUROPEAN THEATER
APO 757 US ARMY

AMATEUR RADIO STATION AND OPERATOR'S LICENSE

Under the provisions of the current edition of Signal Standing Operating Procedure No. 20 HQS U.S. Forces European Theater, and upon evidence of conformity with the licensing provisions contained therein, this combined Amateur Operator's and Amateur Radio Station License is issued to:

Harry W. Richardson, 1st Lt. O-871836
133rd AACS Sq.Det.303, APO 206 US Army
50 Gronsdorf, St.Gronsdorf b.Munich
Germany

for a period of one (1) year from the date of issuance, unless sooner terminated or suspended by the Theater Chief Signal Officer.

Date of issuance: 30 April 1946

Lt.Col.Chief Radio Br.

CALL SIGN D4 AMK

Photo 4– A US-issued license from early 1946, callsign D4AMK, granted to Harry Richardson, W2CKD. Harry is XDA member #119, well into his 80s, and retired in New York State.

e-mail received an introductory letter straightaway. For those with no e-mail, aerogrammes, the cheapest form of international air mail, were employed. As the first batch went out, answers to e-mails began to arrive. Many mentioned other D2s, D4s, DL2s, and DL4s. The XDA snowball was rolling.

Next, radio/electronics magazines and clubs were contacted and asked to run the XDA promo. The advertisement in the "RSGB Bulletin" reached the most ex-Ds first. Biographies, photos, and memorabilia flowed in. Rowley Shears, G8KW—or Major Shears, D2KW, as he was known in those immediate postwar days—authorized callsigns for so many expatriate British service personnel in Germany that he was offered, and persuaded to accept, XDA membership #001.

The Early Days

Shears had obtained permission from Military HQ and the Director of Post and Communications of the British Zone of Germany, Control Commission, to organize and issue transmitting licenses to members of the Forces and civilians (British, Belgian, Dutch, Danish, Norwegian, and Polish) who held licenses pre-war or had the necessary qualifications or trade ratings based upon conditions for "G" licenses. Shears issued his own D2KW call, but later had to change all prefixes to DL2 (DL4 was used by the US and DL5 by the French), because ITU countries that, pre-war, had held the D prefix wished to keep their original identities. On June 19, 1947 Major Shears authorized the formation of the Deutscher Amateur Radio Club (Britische [sic] Zone) initially for shortwave listening only. Approvals in the US Zone and later the French Zone followed. Early in 1998 DARC, the German amateur radio body, celebrated its 50th anniversary and presented Honorary Membership Certificate number one, signed by Rudi Rapcke, DL1WA, the DARC President at the time the club came back into existence, to G8KW (see photo 6). Each year G8KW and his XYL Ruth are invited to DARC's annual dinner. On leaving the British Army, G8KW started a fledgling company which went on to become the very successful KW Electronics Ltd.

Floyd Rhine, W3IRB, another old timer and former Voice of America engineer, now lives in Switzerland. In a letter he wrote: "...In the fall of 1946, then a Captain in the Office of the Theater Chief Signal Officer...I got the job of writing regulations for the licensing and operation of amateur radio stations in the American Occupation Zone of Germany...Some of us had pressed the Theater Chief Signal Officer, General Lanahan, for such authorization. Callsigns of D4 plus three letters, starting with AAA, were assigned by Lt. Colonel RV Fite...He took the call D4AAA, D4AAB was assigned to Captain Harold W Toedmeier, and I got D4AAC (I was out of the office when the authority came through—Hi!) issued 27 November 1945."

Another early respondent was Graham, GM3JQJ (ex-DL2WM), who then became UK XDA representative. He was posted to RAF Butzweilerhof, a "receive only" outfit with acres of rhombics and Vee beams on top of 80- or 100-foot masts. There was a radio club in the camp, and he lost no time in applying for his own license. The club call was

Photo 5– Major Rowley Shears, G8KW/D2KW, was responsible for issuing callsigns to British forces in postwar Germany.

Photo 6– Rowley Shears, in a more recent photo, displays his honorary membership certificate from DARC, the Deutscher Amateur-Radio-Club, Germany's national ham radio association. (Photo courtesy G8KW)

DL2WA, but had previously been DL2SS. Twice a year I e-mail the XDA journal to Graham, who prints it and posts paper copies to UK members without internet access. Graham got his full ticket in 1954 at RAF Wythall.

The evolution of the XDA has essentially been biographical. As a result, many anecdotes stemming from the period immediately after hostilities ceased were not just lost in the vortex of time. They are recorded permanently in the pages of *As You Were!!*, or *AYW* as it is now known, in many instances accompanied by photos and graphics. Those who have served in the armed forces know the significance of the barked correcting command *As You Were!!*

Photo 7– Graham, GM3JQJ, operating club station DL2WA as DL2WM. Graham is now the XDA's representative in the UK.

XDA membership has grown steadily and consequently has been manageable. Since inception, the XDA has allocated 141 memberships worldwide: UK (77), USA (31), Australia (8), Canada (6), France (6), Germany (3), Gibraltar (2), Norway (1), Belgium (1), Ireland (1), and Cyprus (1). There has been one resignation and several lapsed memberships, but the saddest losses of all have been the 12 Silent Keys. One was DL2SW, Cpl J. Jones (later G3JUT), the technician I'd met at Bad Eilsen. When I finally traced his G call in 2001, I found he had died in 1995. The next holder of DL2SW, Stan (later G3LQI), retired in Ireland as EI5IY, but died in 2001. D4AKW, Tony (later WØZO), whom I met for coffee in W2HTI and Eileen KO4DI's uniform shop in Franklin, NC in 2002, died in 2003 at the grand old age of 90. There have been many more, lost to the passage of time, but all were young men back in 1945.

For one coordinator working alone, advertising in the USA for potential members was daunting. Pacing would be essential. Thus, when I learned that an ARRL member who collected memorabilia relating to amateur radio had died and bequeathed a collection of *International Callbooks* to the ARRL, I contacted them and they very kindly photocopied pages for me. These in turn were cross-matched and generated several hundred possible new XDA members in the US, the UK, and France. Even with five US XDA members assisting in the contact process, we were still losing possible members to the Silent Key syndrome, in some cases by months or even days. Overall, however, the results were good.

Who was first on the air in Germany when the war ended? That's a very contentious issue! Certainly, from what several Ex Ds have said, there were some illegal transmissions from within the national population, primarily related to eagerness, the black market, and liaisons behind the Iron Curtain. However, George, WØAV, gave an interesting report on his enthusiastic approach to getting "on-air" as self-styled D4USA before he was closed down and reappeared legitimately as D4ACD. George's biography appears on <www.qrz.com>, where he tells that he was first licensed in 1935 as W9UXQ in St. Louis, MO at age 14. His oft read D4USA article describes how, when WW II ended in 1945, he gathered and constructed enough equipment to get on the air:

"There was the matter of obtaining a license to operate...the German government was hardly functional and the US authorities had not addressed the problem...I decided to jump the gun...I assigned myself the prestigious call D4USA and ham radio in Germany resumed with a bang. I was the first of a dozen or so GI hams in Germany, all using calls up to D4USJ, as I recall...I had made WAC on phone and CW several times over when the inevitable happened. The US Army authorities monitored my operations...and I was ordered off the air...Shortly after the demise of D4USA (and all the other bogus D4 stations), the Signal Corps began issuing D4 calls to GI hams who could prove they held valid FCC tickets...and I was back on the air legally."

Photo 8– Guy, F6HKK, the XDA representative in France, as he was in the Forces Français Allemagne (FFA).

Conclusion

If you served in Germany between 1945 and 1955 and want to know more about the XDA and what it does, please visit our website, which is provided and maintained by Bill, VE7DGM, DA1MH/DA2HK, (XDA #075) at <www.members.shaw.ca/mil-hams>, or contact VK6HQ, 17 Shasta Road, Lesmurdie, WA 6076, Australia, or by e-mail to <bushcarp@iinet.net.au>. ■

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Noise-canceling stereo headsets are the latest consumer electronics hit, with models introduced recently by Maxell, JVC, Sony, RCA, Sennheiser, and others. Heil Sound brings the trend to amateur radio—along with a boom mic containing a Heil mic element—with its "Quiet Phone" headset.

CQ Reviews:

The Heil Sound "Quiet Phone" Headset

BY GORDON WEST,* WB6NOA

Bob Heil, K9EID, stopped by the shack last spring, right at the height of the CQ World-Wide WPX SSB Contest. He came by with a new product called the Pro Set Quiet Phone, and he said it was good timing. The landscaper was using a roto-til just outside the window, and the neighbor next door was having his entire house sandblasted.

The double earmuff phones went on, and I plugged them into the same patch cable that I normally use to run the Heil Gold Line base mic and a foot switch. The only change was a plug-in to the HF radio's headphone jack.

The well-padded earmuffs felt comfortable, and they helped provide some degree of relief from all the background racket. The boom mic is the full-fidelity element, and since WPX is a rather casual weekend affair for me, I didn't need the more pinched DX capabilities of Bob's other mic element.

"Watch this. You are soon going into the Land of Oz," said Bob as he leaned over and flipped a little switch on the headset cord. Within one second, the roar of the sandblaster and the rumble of the roto-til machine had all but vanished. Electronic noise cancellation at its best! I immediately thought of the benefits that could be had when trying to listen to incoming signals over the external roar of the upcoming Field Day gas generator!

Bob's new Pro Set Quiet Phone electronically phases out any background rumble below 400 Hz to –20 dB. Two AA batteries run the active noise-canceling circuit for up to 50 hours.

"You're listening to the same headset that ran continuously at W1AW," added Heil, speaking of his recent visit to ARRL Headquarters with his rock star friend Joe Walsh, WB6ACU.

"I wish I had a video of the expression on everyone's face when they put the headset on and I secretly click-in the active 20-dB noise-cancellation circuit," smiled Bob, speaking of his W1AW operation where he switched over to AM on 75 meters and logged over 100 AM contacts with the headset.

Ham Radio sound man Bob Heil, K9EID, drops by WB6NOA's QTH with a new headset—the noise-canceling "Quiet Phone." Also seen here is a protective carrying case designed by Bob's wife, Sarah Heil. (Photos by the author)

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

The "Quiet Phone" operates on two AA batteries and includes a boom mic with a famous Heil element (your choice of three elements).

The secret behind the headphones is that each earpiece is fitted with noise-canceling mic pickups, but you can still hear your XYL calling!

Imbedded in each foam-cushioned earpiece are microphone pick-ups, 180 degrees out of phase and custom-designed to roll off low-frequency rumble—such as a Field Day generator, a noisy air conditioner, or aeronautical mobile noise. The padded earpieces *alone* helped muffle outside sounds, so much so that some operators will partially remove one earphone to hear their own voice on transmit. Unfortunately, this will undo much of the great electronic noise-cancellation feature.

"Most base stations may offer a transmit MONITOR function that allows the operator to feed back transmit audio into their headset," added Heil. This would allow you to set a comfortable level of your own voice coming back into the noise-canceling headphones on transmit.

Many states throughout the country prohibit the operation of a motor vehicle with double-ear headphones, but as a "passenger" working some DX from your mobile rig, having both ears covered is just fine.

"And best of all, he can still hear me when I talk in his direction," added Sarah Heil, speaking about the capabilities of those embedded external-sound pick-up mics to easily hear the voice sounds—especially the higher frequency ladies' voices! Sarah also designed an accessory padded protection bag to securely hold the headset in a suitcase or car seat when traveling. The headset plugs into the $17 accessory cable kits which are designed to match the Heil equipment to *any* ham radio equipment.

You have three choices for transmit boom mic elements: the DX mic, which may sound flat to the locals; the full-fidelity mic element which sounds terrific to almost everyone; and a special high-output element specifically for ICOM equipment users.

The Pro Set Quiet Phone sells for $199, plus $17 for the equipment adaptor cable unless you are already running Heil gear. The "Sarah Bag" sells for $25. All of Bob's equipment is sold by leading amateur radio distributors and dealers.

For more information on the new Pro Set Quiet Phone, log onto the Heil website at <www.heilsound.com>. ■

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DJ-S40TD 440 MHz HT

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

DJ-596T Mark II Dual-Band HT

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

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

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

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Amateur Radio Direction Finding, or ARDF, has been growing in popularity. WA6NGH jumped in with both feet, competing in the 2004 U.S. ARDF Championship after just a year of "foxhunting" experience.

The US 2004 ARDF Championship: A Beginner's Adventures

BY SAM VIGIL,* WA6NGH

United States hams have long been involved with mobile transmitter hunting, or foxhunting, but have only been participating in European-style on-foot ARDF, or Amateur Radio Direction Finding, since the late 1990s. European-style ARDF is an international competitive sport, sanctioned and regulated by the International Amateur Radio Union (IARU).

Joe Moell, KØOV, Marvin Johnston, KE6HTS, and Dale Hunt, WB6BYU, were key pioneers in starting ARDF competition in the U.S. and forming Team USA to compete in the 1998 IARU ARDF World Championship in Hungary. Joe Moell is now the ARDF Coordinator for the USA. He is the author of the long running "Homing In" column that began in *73* magazine and continues today in *CQ VHF*. Joe is also webmaster for <www.homingin.com>, the best place on the web to find out about ARDF, and is co-author of the authoritative book, *Transmitter Hunting —Radio Direction Finding Simplified*, now in its 12th printing.

What is an ARDF Meet?

Most ARDF events are held as organized meets following the ARDF Rules of the IARU. Foxhunters are issued orienteering maps of the area where the "foxes," or hidden transmitters, are hidden, with the start and finish areas marked. Only the map and a compass may be used; GPS (Global Positioning System) is not allowed. Orienteering maps are similar to standard USGS topographical maps but are typically larger scale (1:10000 or 1:15000) and use a different color-coding scheme to indicate degree of difficulty in running or hiking the course. Most ARDF meets are held in cooperation with local orienteering clubs so that existing orienteering maps and courses can be used. More information on orienteering can be found at <www.us.orienteering.org>.

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

ARDF meets are timed events in which foxhunters try to find five foxes on a common frequency. Separate competitions are held on 2 meters and 80 meters. The transmitters and antennas are hidden but are plainly marked with standard orange and white orienteering flags (see photo 1). The transmitters send a MCW (modulated CW) signal on a 5-minute cycle as follows:

Minute 1: Transmitter 1 sends "MOE" (-- --- .) several times and the callsign of the control operator.

Minute 2: Transmitter 2 sends "MOI" (-- --- ..) several times and the callsign of the control operator.

Minute 3: Transmitter 3 sends "MOS" (-- --- ...)several times and the callsign of the control operator.

Photo 1– Typical "fox" with orienteering flag and e-punch control unit. See text for details. (Photos by the author except as noted.)

Minute 4: Transmitter 4 sends "MOH" (-- --- ....) several times and the callsign of the control operator.

Minute 5: Transmitter 5 sends "MO5" (-- --- .....) several times and the callsign of the control operator.

There is also a sixth transmitter on a different frequency, continuously sending "MO" (-- ---), to act as a homing beacon at the finish area.

Foxhunters must either punch their map at each station or use an e-card (or "finger stick") which is inserted into a control unit. The e-punch technology, developed by the German company SPORTident, is used throughout the world for ARDF, orienteering, and other athletic events. At the finish, the foxhunter either punches a card at the finish station or inserts the e-card in a reader. The results are then downloaded into a computer.

Long Beach, September 2003

My personal adventures in ARDF began only recently. I have

Photo 2– The VK3YNG Sniffer is a favorite among competitive foxhunters for close-in "sniffing" out of a hidden transmitter.

Photo 3– Rugged terrain was the order of the day at the Vasquez Rocks 2-meter ARDF course during the U.S. championships. The similar photo at the beginning of the article shows Mike Cegelski, K8EHP, at the start of the course.

M19: Males ages 19 and younger, find 4 foxes
M21: Males of any age, 5 foxes
M40: Males ages 40 and older, 4 foxes
M50: Males ages 50 and older, 4 foxes
M60: Males ages 60 and older, 3 foxes
D19: Females ages 19 and younger, find 4 foxes
D21: Females of any age, 4 foxes
D35: Females ages 35 and older, 4 foxes
D50: Females ages 50 and older, 3 foxes

Table 1– ARDF age classes.

been a ham on and off for over 44 years, but my first experience with foxhunting was at the 2003 ARRL Southwestern Division Convention in Long Beach, California. There I met Joe Moell, KØOV, and Marvin Johnston, KE6HTS. Joe gave a one-hour talk on the basics of ARDF and discussed Team USA. Later, Marvin ran a two-hour hands-on workshop in which we all built 3-element tape-measure Yagis for 2 meters from kits that he had put together. The Yagis are cheap and virtually indestructible. The kits, based on the popular design by Joe Leggio, WB2HOL, consisted of precut lengths of steel tape measure and PVC pipe. Also provided in the class were pre-built circuit boards based on Joe Moell's offset attenuator design. An attenuator pulls down the strength of an incoming radio signal, and an offset attenuator shifts the frequency slightly to prevent problems from signals leaking through the case of the unit. See Joe's website (www.homingin.com) for construction details of both the antenna and attenuator.

On Sunday afternoon after the convention, a 16-transmitter foxhunt was held at Angel's Gate Park in nearby San Pedro. My wife Eve, KF6NEV, and I entered as a team. Alas, although my Yagi was finished, I didn't have time to finish the attenuator, as it required a few extra parts (control knob and switch) that I didn't have, so I arrived at the foxhunt with just an HT and a Yagi. It proved to be a frustrating day, as I could get bearings to the more distant transmitters but couldn't home in on them because my HT was overloading! A good attenuator is an absolute must for foxhunting!

Griffith Park, April 2004

I wasn't able to practice again until the Griffith Park foxhunt in Los Angeles on April 17, 2004. At that point, I had installed the 2-meter offset attenuator and tested it with my HT. This time I found all of the low-powered foxes on the novice 2-meter course and even the "real" 80-meter fox using a borrowed

Photo 4– Finish-line station on at the Mt. Pinos ARDF course, staffed by the Los Angeles Orienteering Club.

80-meter ferrite-rod DF set. My time wasn't stellar—24:30 for the 80-meter fox—but it was in the middle of the pack. I could finally see the light at the end of the tunnel. A crazy dream started to grow in my mind: Could I actually compete in the upcoming 2004 US ARDF Championship? The timing was right, as my college teaching job would be winding down for the summer, and the location was in southern California! Still, with the championship only 2 months away and virtually no experience or success so far, what was I thinking? However, Marvin was very encouraging, so I decided to go for it.

At that point, my XYL surprised me. She told me I was never going to be competitive with my HT and attenuator setup, and asked why I didn't just bite the bullet and get one of those "blue boxes" that so many of the foxhunters were using! I couldn't believe it . . . my XYL encouraging me to buy some new ham gear! She said to consider it an early combined Father's Day and birthday present. The "blue box" to which Eve was referring is the VK3YNG "Sniffer 4" ARDF receiver (photo 2), which is available from VK3YNG on his website, <http://www.users.bigpond.net.au/vk3yng/foxhunt/foxhunt.html>.

The VK3YNG receiver incorporates an automatic attenuator with a digital readout so that you can estimate the relative distance to the fox. It also has an audio S-meter so that it is easy to identify the peak signal and bearing to the fox. It can be operated hands-free to allow foxhunters to concentrate on where they are running (or walking, in my case).

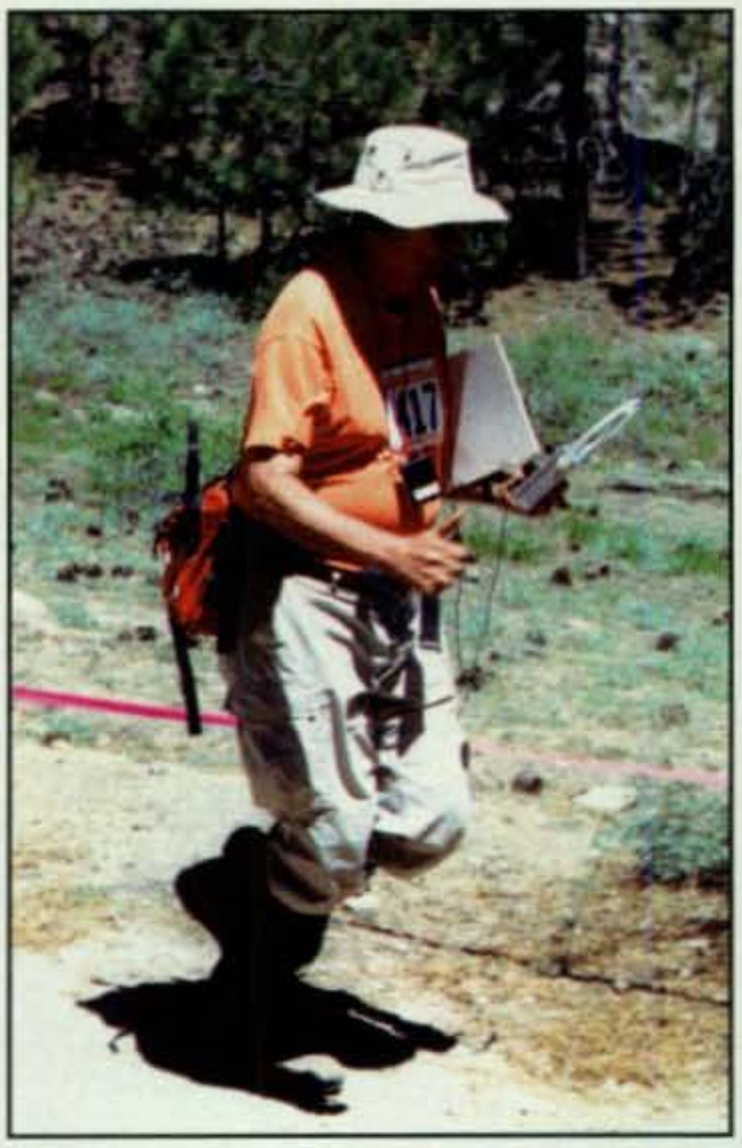

Photo 5– The author jogging to the finish area . . . about two minutes too late for his score to count. (Photo courtesy Joe Moell, KØOV)

I was on a roll, so I also ordered a 50-mW 2-meter foxhunt transmitter from Marvin Johnston for practice. I had Marvin set up the rig as an "MOS" transmitter using the standard ARDF timing (one minute on, four minutes off). This way, I could practice at home with a realistic signal.

ARDF Training Camp, June 2004

The next two months proved to be hectic as the school year closed out and I had little time for practice. In fact, I barely got the VK3YNG Sniffer tested and mounted on my tape-measure Yagi before I had to leave for the ARDF Training Camp in Los Angeles. The camp, organized by Marvin, was held at two different venues in Griffith Park, a huge, mountainous, and largely undeveloped area in the center of Los Angeles.

I arrived at the Vermont Canyon venue late in the afternoon on Tuesday, June 15th. The 2-meter course was winding down and the 80-meter foxes were being set up. I borrowed an 80-meter sniffer and was off.

The terrain at Vermont Canyon is challenging, with steep, dusty hillsides. I made my first mistake by going cross country as a "shortcut" to one of the foxes. I violated the first rule of foxhunting: Read the map! The most direct path may not be the fastest. I ended the day with no luck.

Photo 6– Here is some typical 2-meter ARDF gear (left to right): 3-element Yagi with attenuator and HT; 3-element tape-measure Yagi (elements folded) with VK3YNG Sniffer; 2-element Rod Graham Electronics HB9CV-style beam; and RX-1 2M ARDF receiver.

The next day I was more successful, finding two of the 2-meter foxes at the Travel Town venue on the other side of Griffith Park. Again the terrain was challenging, with the additional complication of a busy park road crossing through the center of the venue. I was starting to gain confidence in my new VK3YNG Sniffer, so the day's experience was valuable. The training camp

broke up early so that we could all drive up Interstate 5 to the Championship Headquarters in Gorman, California.

Calibration Day

The first day of the championship—Thursday, June 17th—was a calibration and practice day at Hungry Valley State Vehicle Recreation Area. Located a few miles from Gorman, the Hungry Valley area is a desert plain with rolling hills covered with scrub oaks. The area is criss-crossed by motorcycle and all-terrain vehicle trails. Fortunately, very few vehicles were around on the day of our practice session. Both 2- and 80-meter foxes were set out at known distances. This enabled us to learn what the transmitters would sound like at 500- and 1000-meter distances. I borrowed an 80-meter receiver built by Dale Hunt, WB6BYU. (I liked the unit so much that I bought one of his kits to build over the summer.) I found all of the 80- and 2-meter foxes, so my confidence level was increasing.

Vasquez Rocks

The 2-meter competition was held on Friday, June 18th, at Vasquez Rocks County Park. From the starting point, the park features an amazing vista of fantastic rock formations, desert plains, and complex canyons (photo 3). The orienteering map provided for the competition was one of the most complex contour maps I have ever seen, with hundreds of rock formations, hills, and canyons. How would I ever find anything out there?

When my number was called, I ran onto the course with apprehension, all of my confidence of the previous day evaporating in the rising midday heat. I was out on the course with national champions. Would I find even *one* of the foxes?

My practice of the last few days paid off, and I found two foxes easily, although not quickly. It should be explained that I am not a runner or a jogger and was hiking the course. I then discovered that I had made a tactical error. I had first found Fox 1, which was closest to the start. Then I found Fox 5, after a long, hot hike across the park. This was a mistake, because Fox 5 was a relatively short distance from the finish and should have been found last. Now I had to backtrack to find Foxes 3 and 4. (Note: I was competing in the M50 class and only had to find four of the five foxes. See Table I for an explanation of the age classes.)

Next I started tracking Fox 4, which seemed to closest to me. After 20 minutes of hiking, I decided that it was too far away for me to find it and make it back on time ($2^1/2$ hours maximum), so I reluctantly turned around and headed toward the homing beacon. My time of 1:55 with two foxes bagged was good enough for 4th place in the M50 Division. Although I was much slower than Dick Arnett's Gold Medal time of 1:07 (with four foxes), I had survived and found two foxes. It was a great day!

Mt. Pinos

The 80-meter competition was held the next day at Mt. Pinos. This mountain venue, at 8000 feet elevation, was completely different from Vasquez Rocks. The air was clean-smelling and cool, and I got to compete in a beautiful alpine setting. As an experienced Sierra Nevada backpacker and hiker, this was more my turf. I had camped in the Mt. Pinos area before, but was not familiar with the ARDF venue area.

We had a delayed start due to problems with the transmitters and some 80-meter QRM very close to the fox frequency. The delay allowed all of us some extra rest and a chance to socialize with our fellow competitors. This time I was determined to get at least three foxes. I bagged my first two, 1 and 5, fairly easily, but I overshot Fox 4 by a considerable distance so I headed for Fox 3, which at least was in the direction of the finish (photo 4). When I had 40 minutes left, I decided to head for the finish, as getting in on time was more important than the long-shot chance at a third fox. However, as I slogged toward the homing beacon, I started to feel that I wasn't going to make it on time. The signal strength wasn't increasing as quickly as I would have liked. When I intersected the junction of the paved access road and the trail to the finish, I knew exactly where I was and that I probably wouldn't make it on time. At this point I started jogging (photo 5). Still, my time was 2:31:46, one minute and 46 seconds over the limit! My two foxes didn't count.

Lessons Learned

The most important lesson I learned is that ARDF competition is one of the biggest thrills in ham radio. It takes three sets of skills to be a good ARDFer: First, you need to be in good condition. This has been a great incentive for me to lose a few pounds and get back into jogging. Second, you need good equipment (photo 6) and good DFing skills. While it is possible to find foxes with an HT and attenuator, a good receiver such as the VK3VNG Sniffer will make a big difference. Finally, good map and compass skills are an absolute requirement. Although I have backpacked and hiked for years and consider myself a good navigator, over the past few years I have tended to rely too heavily on GPS. In ARDF competition you have to be able to read the land with only a map and compass. ARDFers who know where they are at all times have a big advantage.

Orienteering competition is a good way to pick up these skills. Nancy Pistole, KF6PAV, like me a relative newcomer to ARDF, won gold in both the 2-meter and 80-meter competitions this year. Her secrets: good physical conditioning and years of orienteering experience.

I will continue with more ARDF competitions. My goal is to make the Team USA for the 2006 World Championship in the M60 class. I have a lot of training and conditioning ahead of me, but I'm looking forward to the challenge.

Acknowledgements

Many thanks to Marvin Johnston, KE6HTS, and Joe Moell, KØOV, for their encouragement and help. Also thanks to Jay Hennigan, WB6RDV, for his tips on advanced ARDF techniques.

References

<http://www.homingin.com>: The best place on the web to find out about ARDF and mobile transmitter hunting. Many links to equipment suppliers, ARDF clubs, and upcoming events.

<http://www.us.orienteering.org>: Orienteering information, links, and sample orienteering maps.

<http://www.users.bigpond.net.au/vk3yng/foxhunt/foxhunt.html>: Information website for the VK3YNG Sniffer.

<http://www.sbarc.org/ardf/>: Homepage for the 2004 US ARDF Championship. Course maps and complete results.

<http://members.aol.com/homingin/nancy04.html>: First-person account of 2004 US ARDF Championship by Nancy Pistole, KF6PAV.

<http://members.aol.com/homingin/nccapix1.html>: KØOV's photo album of the 2004 US ARDF Championship.

TRANSMITTER HUNTING – Radio Direction Finding Simplified, by Joseph D. Moell, KØOV, and Thomas N. Curlee, WB6UZZ. Publication #2701 from TAB Books, division of McGraw-Hill, First edition, 12th printing (available on the <www.homingin.com> website).

Do you depend on foreign hams to speak English if you're going to have more than a "59, 73" QSO? How about learning a little bit of their language? KD5HTB offers a tool for learning some basic ham radio phrases in four major languages.

Worldwide Conversations
Breaking the Language Barrier

BY FRANCIS GRADIJAN,* KD5HTB

Have you ever wanted to speak another language on the airwaves? Converse with a German or maybe a Frenchman in his native tongue? In the past, your options for doing so were limited: attend a course, use a dictionary, or resort to a published list of handy phrases. Well, nowadays with the advent of fast home computers, you are limited no more. Several simple operating aids can get you involved in a foreign language QSO, even if you only have limited skills speaking the foreign language. You can access myriad translation tools via the internet (such as *Google* or the *Babel Fish*), or use the off-line Amateur Radio Language Translation program described below to help with your foreign-language translations and on-the-air conversations.

Internet Translation Solutions

If you have internet access at your operating position, you might prefer a comprehensive web-based translator such as Google's Language Translation tool or Altavista's Babel Fish. Google's Language Translation tool can be accessed by clicking to the right of the search toolbar on the button for Language Tools from the main Google search-engine web page, or by following the direct link provided in the sidebar, "Internet Based Translation Tools." Both Google and Altavista provide fairly good translations in numerous languages and work very well in conjunction with digital communication applications where you can cut and paste text from one program to another. However, to make use of them, you have to be connected to the internet. *(Be aware, though, that grammar and syntax in the translations are not always correct.—ed.)*

Google's tool is easy to use. Go to the Language Tool page from the website, select the languages you wish to translate to or from; and finally, type in the translatable text or paste it in from your digital-mode communications program (see fig. 1). You get a remarkably good, if only slightly imperfect, translation!

Altavista's Babel Fish is accessible from the Babel Fish page (see fig. 2). It works just like Google's Language Tool.

In addition, there is a third site, Babblefish (not to be confused with Babel Fish), which contains an extensive links directory to sites specializing in translations from or to less common languages, featuring everything from Kurdish to Russian to Algerian to Yiddish to Thai.

Fig. 1– Google's Internet Language Translation tool.

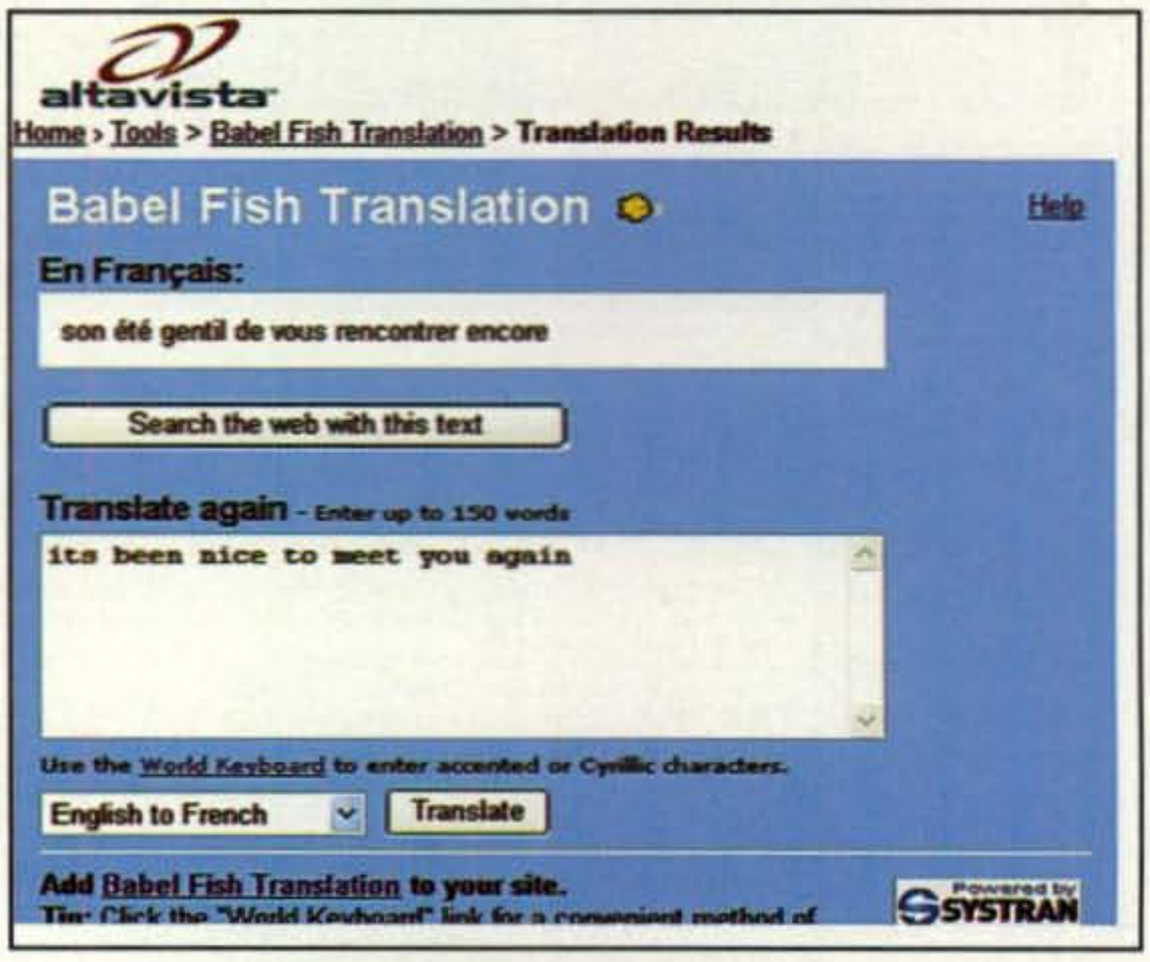

Fig. 2– Altavista's Babel Fish is another popular internet translation operating aid.

The Off-Line Alternative

The Amateur Radio Language Translation program translates words or phrases between English and up to three different languages (French, German, and Spanish). The program, as shown in fig. 3, may be downloaded from <http://www.qsl.net/wb5kia/arlt. htm>. It's free! You can use it so that you will no

**1902 Middle Glen Dr., Carrollton, TX 75007*
e-mail: <kd5htb@arrl.net>

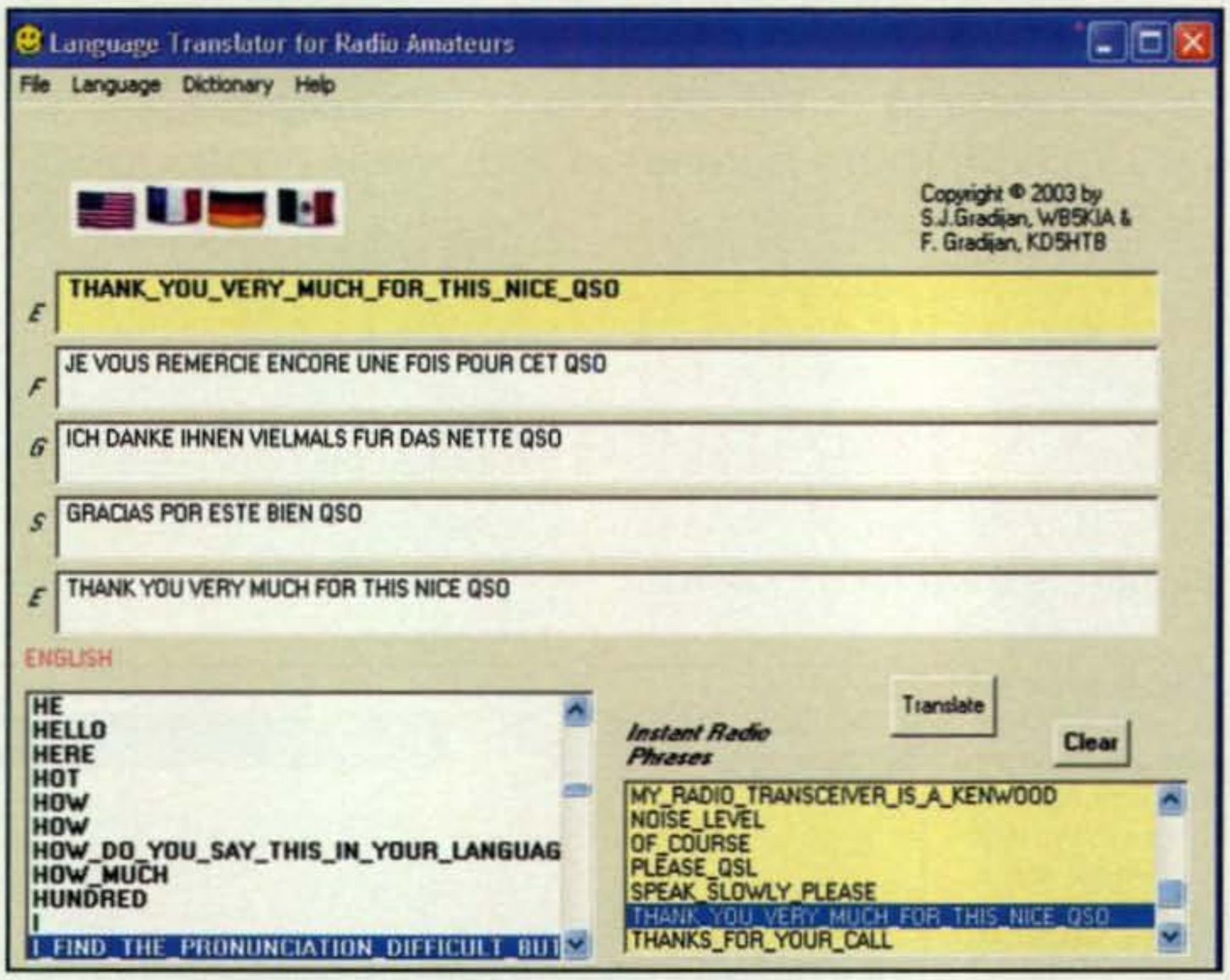

Fig. 3– The simple translation program itself can run in screens as small as 800×600.

longer have to spend time during conversations flipping through loose pages or paging through dictionaries to find the appropriate words.

The program can best be used to translate CW, PSK, RTTY, or other digital-mode QSOs where you don't have to worry about pronunciation. It is much more useful than an ordinary traveler's dictionary or computer translation program, because first of all, it can be modified, and second, it knows the technical terms and phrases used by radio amateurs!

This program is just for fun. It does a fair job of English to another language translation, but not as well in the other direction, since verbs in other languages change their spellings based upon the tense and number of people being mentioned. In addition, many nouns change, based upon the gender and number of the person(s) being talked about. It also has trouble with verb tenses and suffixes, especially when a language has more than one word that means the same thing. For example, the program can either recognize the articles "un" or "una" in Spanish to mean "a" in English, but not both.

For any serious language communications, you probably should use a commercial translation program, an internet-based language translator, or better yet, take a language course. However, you can improve this application's usefulness by creative choice of additional vocabulary words. Unfortunately, because word positions and spelling change depending on whom or what you are referring to in other languages and because of different sentence structures, the grammar will not always be 100% correct. However, you probably will still be able to get your point across regardless of this, even though you might sound a bit strange to a native speaker.

For example, you need to be aware that in some languages noun modifiers (adjectives) are placed behind the noun or elsewhere, instead of their usual English placement before the noun being modified. If you restrict yourself to simple sentences in your QSOs and stay within the present or past tense (is, was), avoiding all other tenses, you probably will make grammatical sense.

What the Program Can Do

The program has three options:

- a simple English-French-German-Spanish one-word dictionary that can be disabled.
- a grammatically-correct, instant phrase translator containing commonly used QSO words.
- a moderately smart "translation" program for everything else.

More sophisticated translation programs are available for use on the internet, as noted above. However, this program is great for those amateur radio operators who have slow internet connections or no internet access from their operating positions, because it can be used as an off-line translator for ham radio.

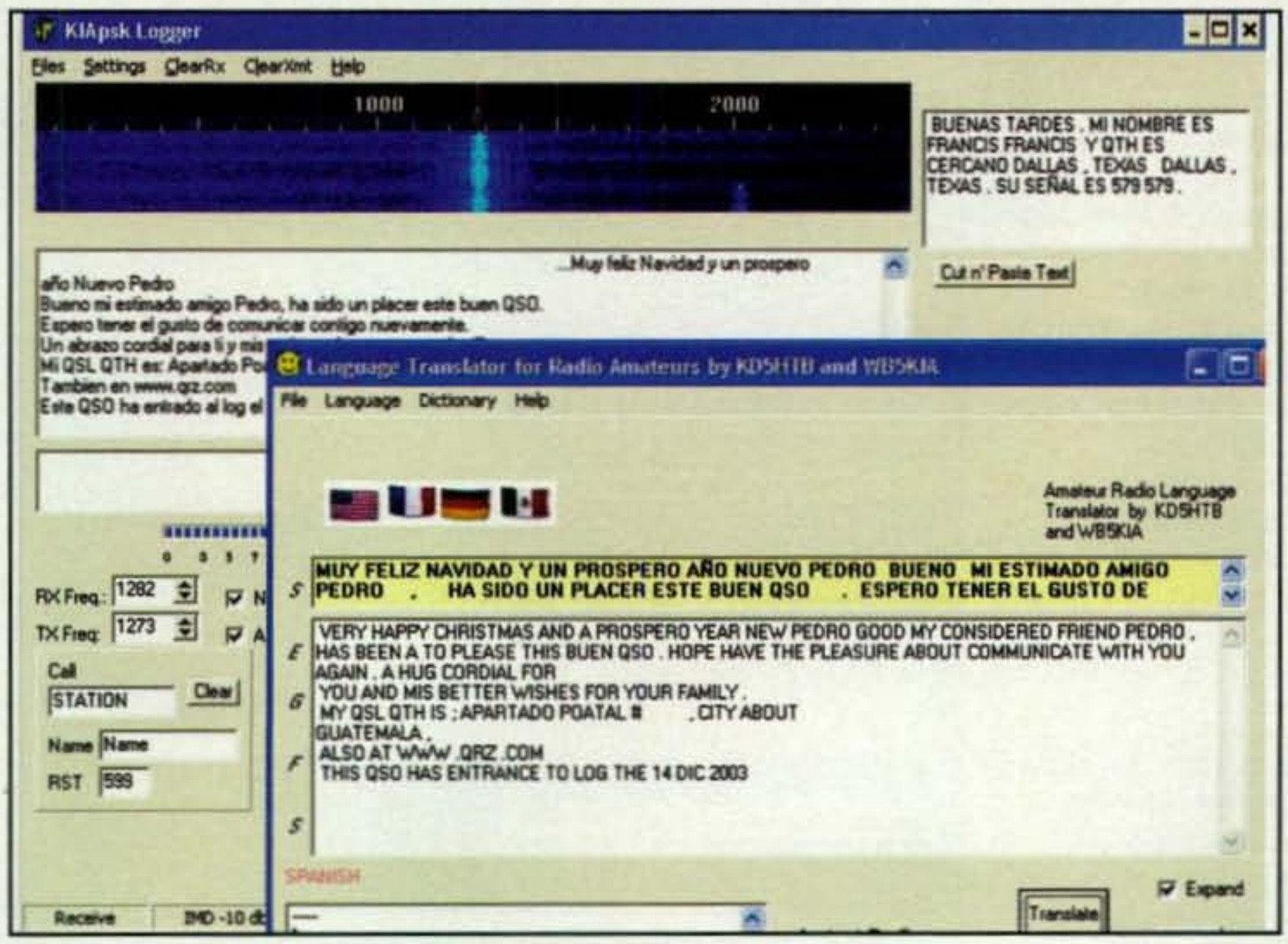

Fig. 4– The text of a foreign-language PSK-QSO's text can be dragged into the translation program using cut and paste.

How to Use It

If you're planning to use the program in conjunction with voice QSOs instead of digital contacts, it will be helpful to familiarize yourself with how different words are pronounced in different languages. The program comes with a simple "pronunciation" dictionary example and a standard amateur radio operator's vocabulary, which can be supplemented with additional words. If you are not comfortable with the pronunciation of a foreign language, you will be glad to know that with editing you can include a phonetic representation of the words or phrases

Internet-Based Translation Tools

Several language aids are available on the internet. Here are three of the most popular:

Google's Language Translation Tool:
<http://www.google.com/language_tools?hl=en>
Babblefish.com:
<http://www.babblefish.com/babblefish/bfish_lang.htm>
Altavista's Babel Fish: <http://babelfish.altavista.com/>

within the vocabulary file. In fact, a dummy phonetics file is included with the program to start you on your way. However, if you wish to add additional words or phrases to the program itself, you can do so using Notepad, the simple text editor that comes with all versions of Windows® (see sidebar, "Editing the Translator Program Language Files").

If you use the translator with a RTTY or PSK program, you can copy the text from your decoding program by either highlighting the foreign words and "drag-and-dropping" it into the translator or highlighting the text in your RTTY/PSK program, hitting CTRL+C, and then opening the translator program, clicking on the translator box and pressing CTRL+V in the translating window. Once the text is in the translator, you can either move your mouse to the lower right-hand corner and click TRANSLATE, or hit the enter key (see fig. 4).

The program does have some limitations. For example, it knows only present and past verb tenses, and although the translator can recognize foreign characters (such as ñ,í, etc.) when used with an ASCII-based PSK program, it needs to use an alternate language dictionary for RTTY conversations, because RTTY does not recognize foreign characters by default.

Two main language files are provided in the program, one which recognizes foreign characters (for use with voice and PSK) and another which ignores the foreign characters by substituting the closest English alphabet character (for RTTY and CW conversations).

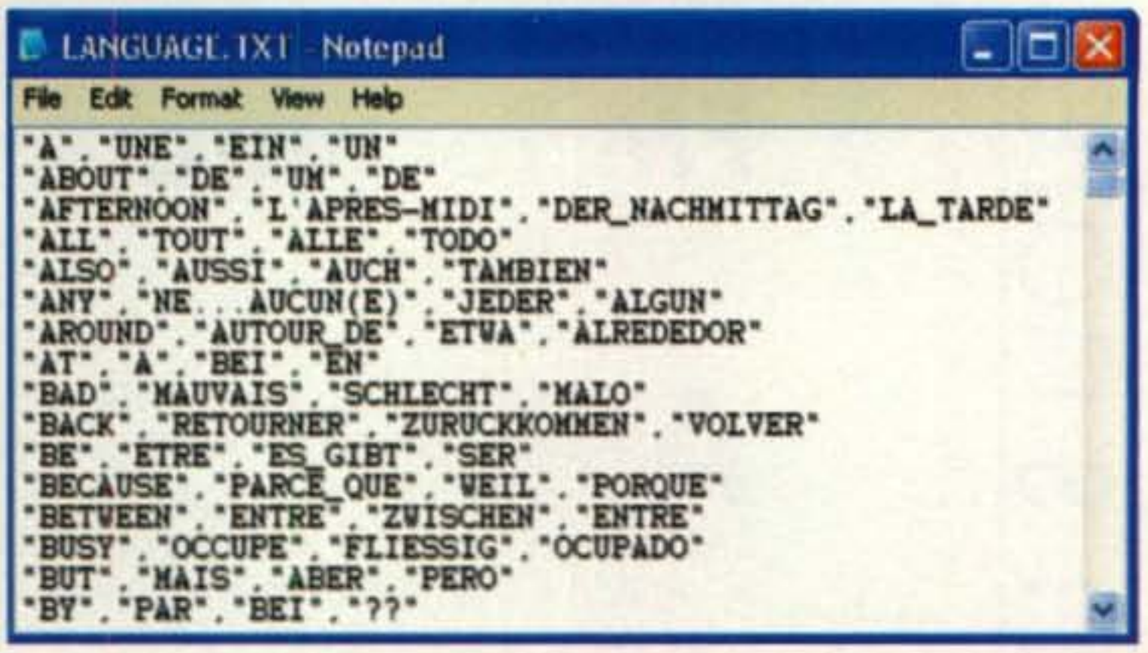

Fig. 5– The language text file can be edited or one can add languages/words to the program with a text editor.

When translating with the program, hit the CLEAR button or double-click in the yellowed region after every phrase translated to reset the program's vocabulary (see fig. 3).

Conclusion

Hopefully, you are now well on your way to using a quick, free, and easy-to-use foreign phrases translator, and hopefully your DXing will greatly improve because of it. Just think of how happy foreign amateur radio stations will be when they hear an American speaking their language!

Seventy Three and Good DX . . .
Sesenta y tres y bien DX . . .
Mes meilleurs amities et bonne chance pour le DX . . .
and, die besten grusse und gut DX.

Editing the Translator Program Language Files

The translator includes a vocabulary of over 250 words in English, French, German, and Spanish. If you are satisfied with the existing "translator" vocabulary, you are ready to "converse" in another language immediately. However, you can also expand the vocabulary, substitute a language for one of those provided, or create another vocabulary translation file using appropriate words and phrases.

Notepad, Wordpad, Superpad, or any other simple text editor can be used to create another vocabulary translation file (fig. 4). To create a translation file you have to open the master translation file called *language.txt*. Then you should save the file under a different name in the same file folder so that you don't accidentally delete the translations that come with the program.

When you view the language vocabulary file in your text editor, you will notice that the vocabulary words are in quotation marks and are jammed together. If you are going to change any words, you will have to separate the new words using commas, and without any spaces between them. When more than two words are needed in one language to express one word in another, you should use an underscore bar between the two words (example in bold type in the insert below).

The original translation file contains words in English, French, German, and Spanish (see fig. 4). Part of the file looks like this:

"A","UNE","EIN","UN"
"ABOUT","DE","UM","DE"
"AFTERNOON","L'APRES-MIDI","**DER_NACHMITTAG**","LA_TARDE"
"ALL","TOUT","ALLE","TODO"

If you choose to eliminate the French vocabulary, and substitute the Norwegian words for A, ABOUT, AFTERNOON, and ALL, the revised file will look like:

"A","**EN**","EIN","UN"
"ABOUT","**OM**","UM","DE"
"AFTERNOON","**ETTERMIDDAG**","DER_NACHMITTAG","LA_TARDE"
"ALL","**ALL**","ALLE","TODO"

Don't add any floating spaces to the file after the words, as that will cause the program to crash. Each line must end with a carriage return (enter) and nothing else. Also, type everything in capital letters for it to work correctly.

When you finish modifying the text file, open the translator, go to the FILE menu, load your saved file, and *viola*! You have a new language on the translator (at the expense of one of the existing language choices)! You no longer have to look up words in a dictionary and can add all the words you want!

You can add words to an existing file by pressing ENTER after the last line in the file and adding a new English vocabulary word with its three foreign equivalents. If you do not know the correct words for a translation, then you should put a question mark between the quotation marks, because if you do not, then you will mess up the translation program.

math's notes

BY IRWIN MATH,* WA2NDM

FM Techniques

A number of years ago, we described a method of modifying an AM receiver using the now obsolete RCA CA3089 integrated circuit so that the receiver would be capable of receiving FM signals. Many experimenters built this circuit (which worked quite well) to update AM/SSB receivers for FM reception, and the article became quite popular.

Recently (in our work) the need to detect FM again arose, and since the CA3089 and its various clones are no longer manufactured or readily available, we looked for a present-day substitute. The chip we finally came up with is the SA604A from Philips. This device performs the same function as the older RCA chip and even has a few additional features that are of interest. It also is in full production, cost is less than a few dollars, and most Philips distributors stock it.

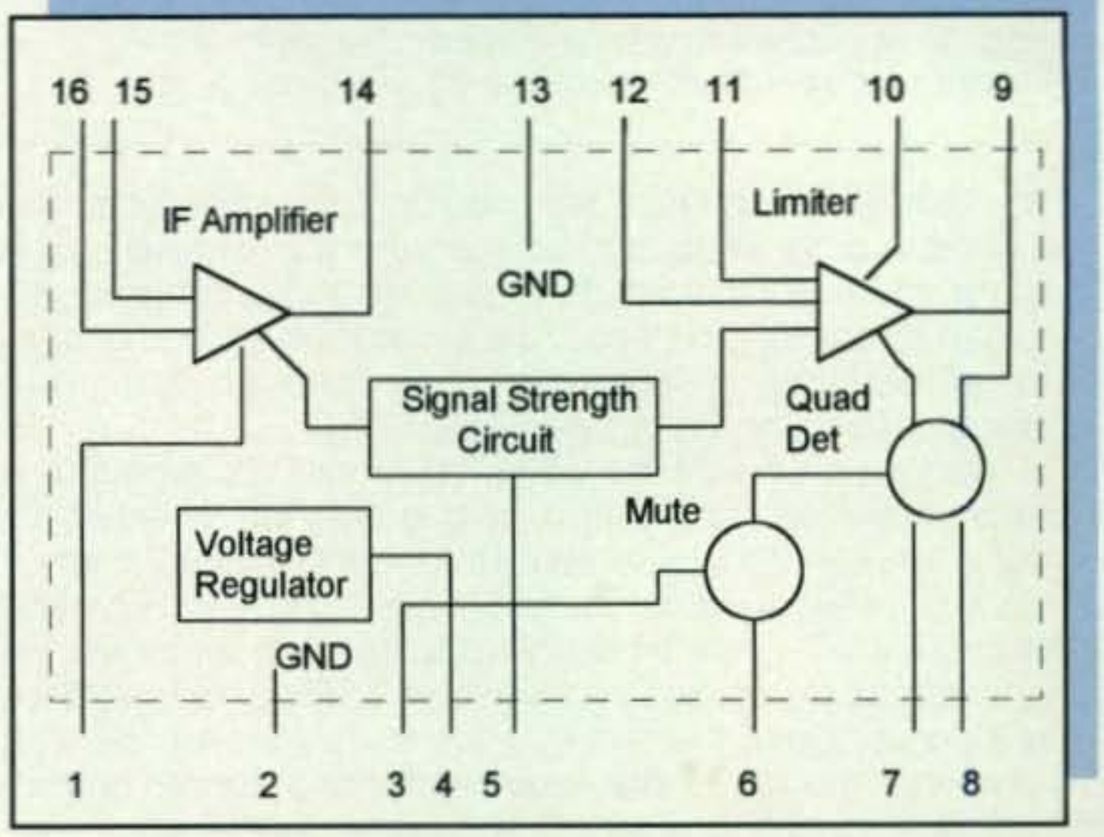

Fig. 1– Basic internal structure of the SA604.

The basic internal structure of the SA604A is shown in fig. 1. It consists of a high-gain IF (intermediate frequency) amplifier with a bandwidth of 25 MHz, an AM limiter, and an FM quadrature detector. Some additional circuitry, such as a signal-strength indicator and internal muting scheme, is also included and we will discuss it later. The basic function of the SA604A is to configure a complete FM IF strip. As a result, the bandwidth of the chip is adequate for all common lower IF ranges—including 455 kHz, 10.7 MHz, and 21.4 MHz (as well as everything in between)—and only the tuned

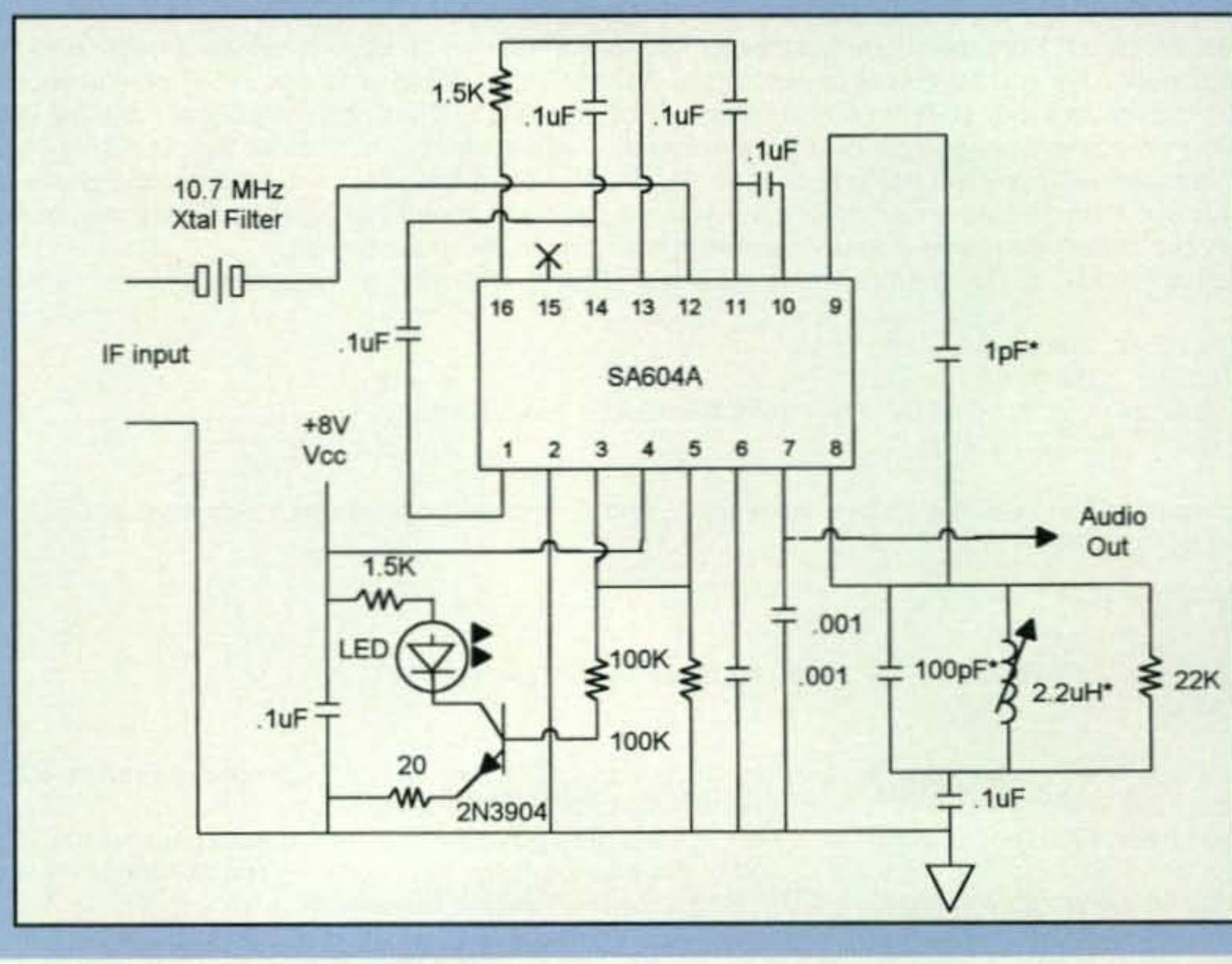

Fig. 2– FM detector circuit using the SA604A.

*c/o CQ magazine

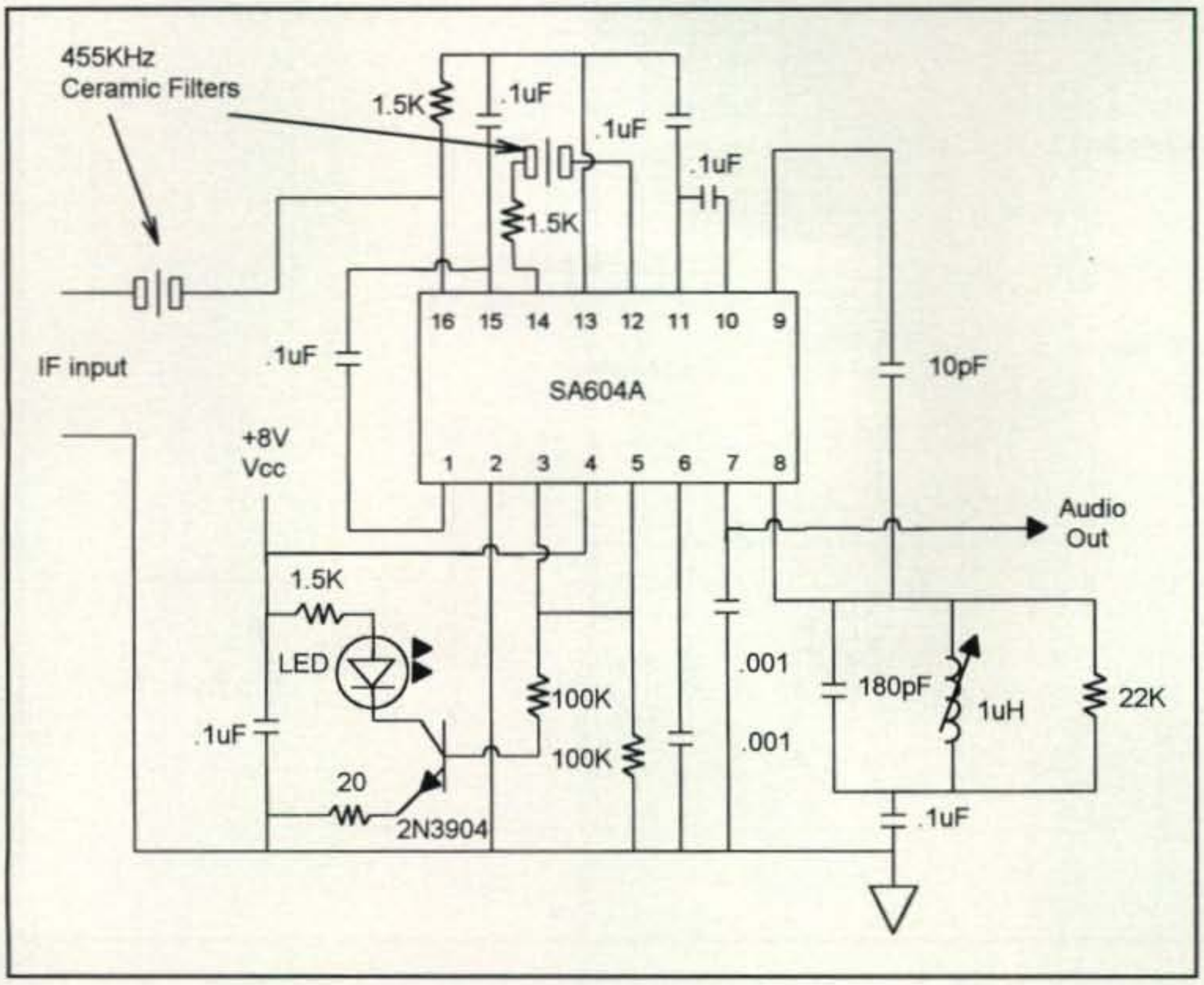

Fig. 3– High-sensitivity 455-kHz FM detector circuit.

circuits need be changed to accommodate any of them. Sensitivity is quite high, and when connected directly to an antenna through a suitable tuned circuit, the SA604 can even be used as a complete receiver (below 25 MHz).

For FM detector (only) applications use the circuit of fig. 2. Here the IF amplifier section is not used and the input is applied directly to the limiter. The sensitivity of the limiter is such, however, that even a millivolt (or less) of input can easily be handled. Although the application shown is for 10.7 MHz, if you wish

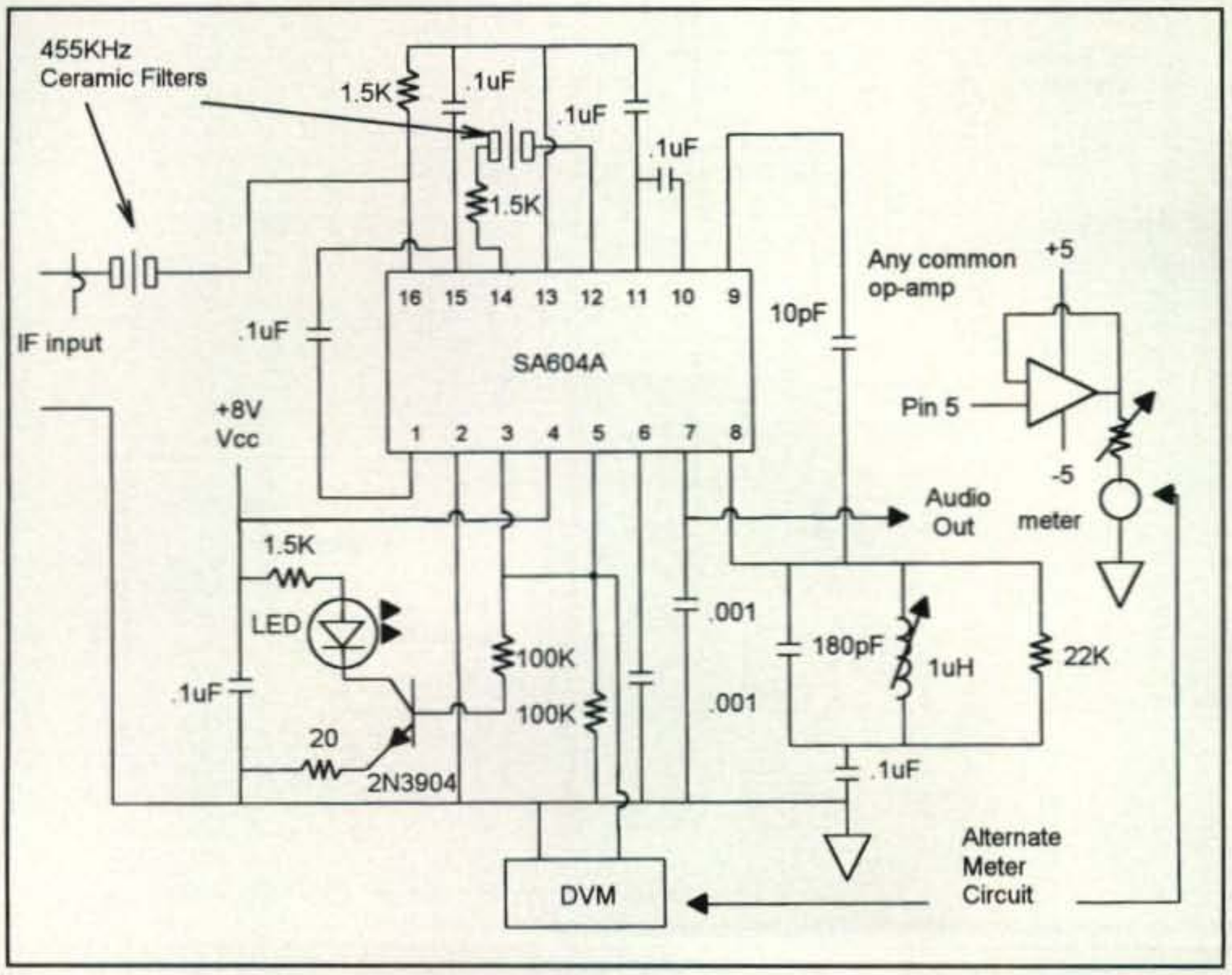

Fig. 4– Adding an S-meter to the FM detector circuit.

Our Readers Say

Ferrite to the Core

The following letter was sent to Antennas Editor Kent Britain, WA5VJB:

Hi Kent,

I read your FB article in the May issue of *CQ*. I am interested in articles on antennas and transmisson lines. Since I am far from being an engineer, I welcome clear and easy to understand pieces such as yours. I hope to see more articles like this.

Please tell me the number of beads that are needed at the feedpoint of an HF antenna in order to form a good balun. Should such a balun be made of 43 mix ferrites? What number mix are used in beads that are used on computers?

Jim Esposito, WA2LYZ

WA5VJB responds:

Hi Jim,

Good question, but the answer may not be all that simple. To pass FCC Conducted testing, they have to suppress 450 kHz to 30 MHz emissions from those switching power supplies. So while I don't know the typical ferrite mix, I do know it is pretty optimized over the HF ham bands.

The reactance also varies with frequency. If we take a typical bead, and this depends on a tight fit between the bead and the coax, at 160 meters a big bead has about 20–30 ohms of reactance. You'd like the coax to be a lot higher impedance than a dipole element, so you'd need 10 to 20 of the things. But even a few might help keep you from tingling your lips when you talk too close to the mic. Yet that same bead would have nearly 1000 ohms of reactance on 10 meters. So two or three would pretty much isolate the coax at that frequency. I hope this helps.

Phoenix Phans

Editor, *CQ:*

What a great article, "The Phoenix QRP Transceiver" (June and July issues). This is the kind of thing that will keep ham radio alive. Hope to see more material like this.

John Somerville, VE7CFG

(Continued on page 114)

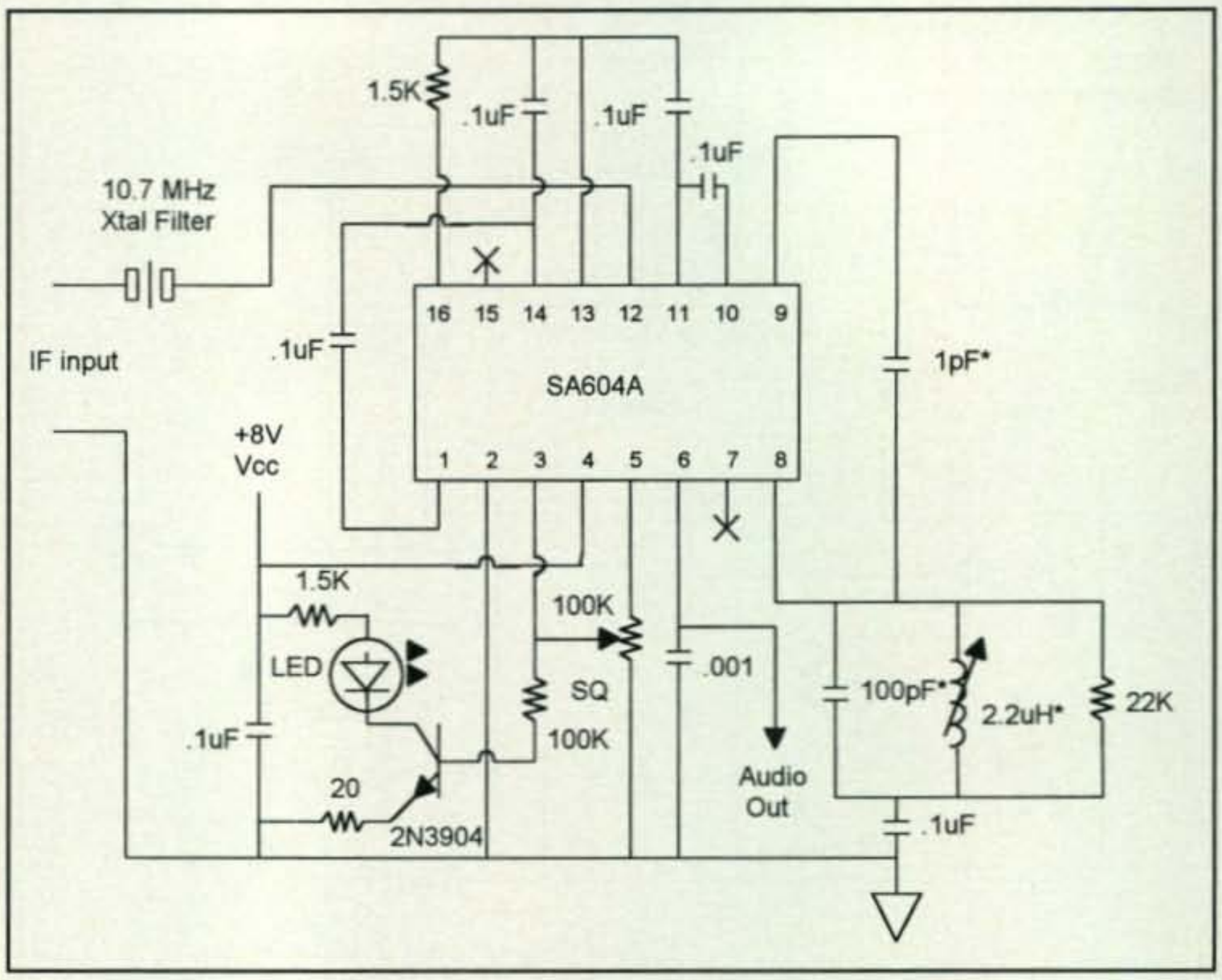

Fig. 5– Using the RSSI output as a squelch control.

to operate at 21.4 MHz, another common IF frequency, simply replace the 100-pF capacitor in the tuned circuit with a 27-pF ceramic and use a 21.4-MHz IF filter of some sort at the input. If 455 kHz is your need, replace the tuned circuit components with an adjustable 1-µH coil and a 180-pF

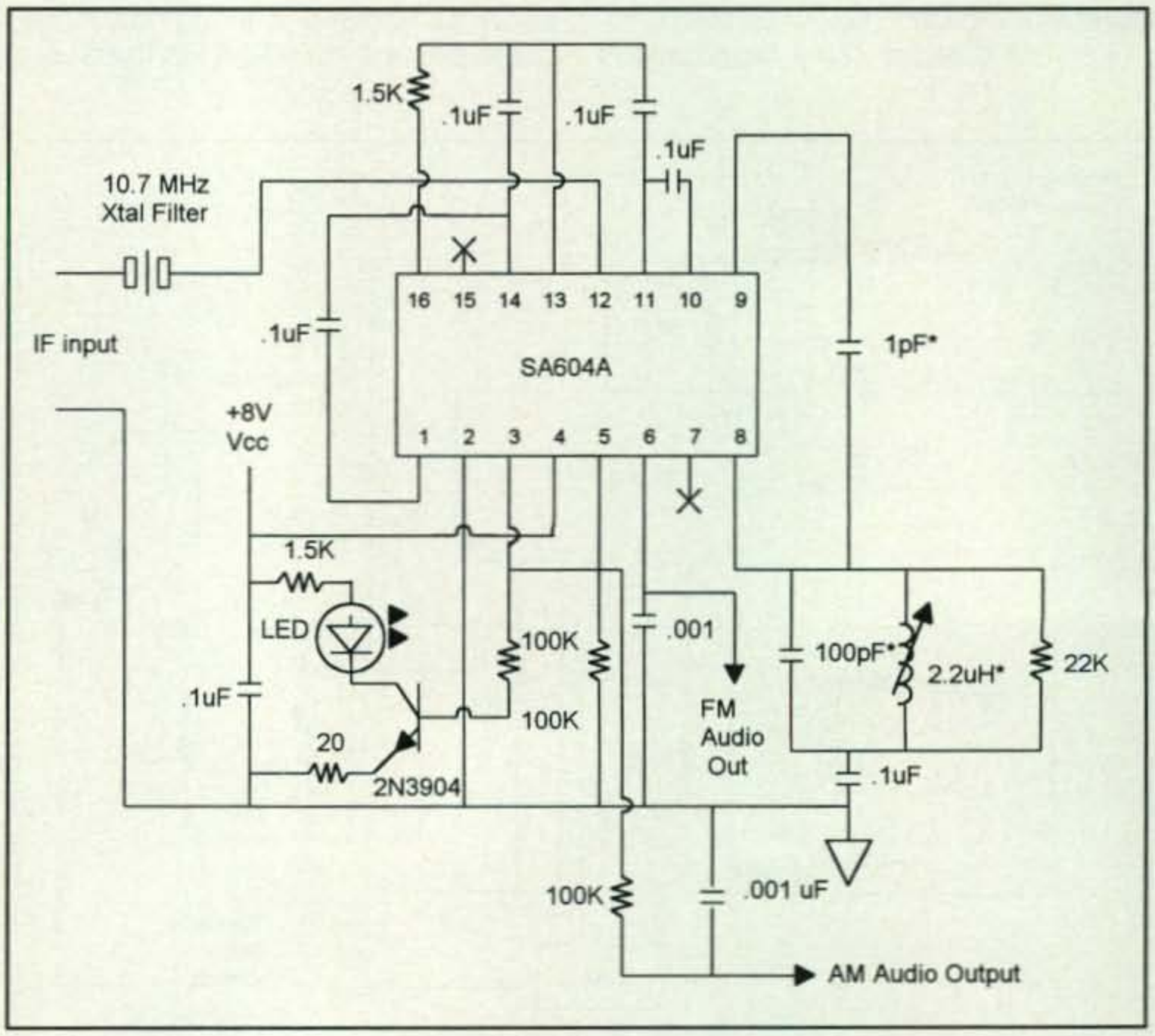

Fig. 6– Obtaining an AM output from the SA604A.

capacitor, and also replace the 1-pF capacitor with a 10-pF ceramic. The Vcc range is not critical, but since we had 8 volts available, we used it. The LED, by the way, is a carrier indicator. When a signal of sufficient strength is received, it will light.

To test the circuit, simply apply an FM modulated signal (at the proper IF frequency) and tune the coil for maximum recovered audio. You should be able to get a couple of hundred millivolts of audio from a NB (noise blanker) FM signal and as much as a half to one volt of audio from a wide-band signal. If you need even more sensitivity, using the first IF amplifier will increase the sensitivity of the circuit by a factor of about 10 (bringing it down to a few microvolts).

Fig. 3 shows the circuit modifications needed for this change, with 455-kHz ceramic IF filters. The filters are available from various sources, such as DigiKey (part numbers TK2304 through TK2311, depending on the bandwidth required), or you probably can even salvage some from old transistorized FM radios. The RSSI (received signal strength indicator) output from pin 5 is a DC voltage that varies logarithmically with the level of received signal, and it has several uses. As shown in figs. 2 and 3, it lights an LED when the voltage is high enough to turn on the transistor. It can be used for a tuning meter or S-meter, as well.

Fig. 4 shows where to connect a DVM (digital voltmeter) to implement a digital S-meter. If you want to drive an analog meter, you will have to use an op-amp voltage follower to avoid loading the output. This is also shown in fig. 4.

As we mentioned before, since this signal varies in accordance with signal strength, it can be used to cut off the audio output when a carrier is not received. This feature can be converted to a variable squelch control as shown in fig. 5. Note that the audio output is now taken from pin 6 instead of pin 7, as this output is controlled by the input to pin 3.

Finally, since the RSSI output is a function of signal amplitude, it can even be used to provide an AM output if you wish. This is shown in fig. 6. Note that the output from pin 6 (through the 100K series resistor) must be fed to a high-input impedance audio amplifier.

If FM conversion is what you require, be sure to investigate the use of this unique chip. A full data sheet as well as an application note or two are available from Philips at <www.philips.com>.

73, Irwin, WA2NDM

how it works

BY DAVE INGRAM,* K4TWJ

Investigating FM Toning

As you will recall, our previous "How It Works" column discussed the basic operating concepts of FM and VHF/UHF repeaters. It also concluded with a brief mention of CTCSS encoding and decoding techniques for accessing or working through restricted repeaters, usually in areas of overlapping repeater coverage. We continue along that path this month with a more detailed look at tone control systems, namely DTMF, CTCSS, and DCS. This is a plain-language discussion new amateurs should find quite useful for understanding the why and how of toning, and a mild-mannered study we trust everyone will find useful for many years to come.

As a logical point of introduction, let's start with a simple definition of encoders and decoders. A device or circuit that generates or produces control tones or control signals for transmission is called an *encoder,* and a device or circuit that detects those tones or control signals when received is called a *decoder.* Two familiar examples of encoders are the DTMF, or Touchtone®-type keypad, and CTCSS, or subaudible tone generator, included in most recent VHF and UHF FM transceivers. A mating DTMF decoder at a repeater is then used for remote switching and autopatching, and a CTCSS decoder (also at a repeater) limits access by requiring all users to include a specific subaudible tone on their transmissions. These concepts will become clearer as we continue, beginning with a closer look at DTMF concepts.

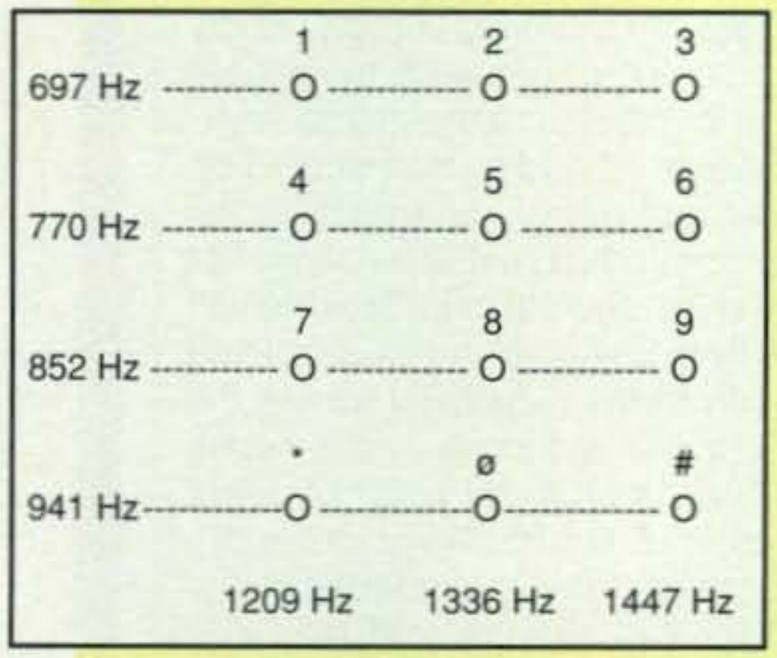

Fig. 1– Overview of the 7-tone matrixing concept used to produce Touchtones® and DTMF tones employed worldwide. (Discussion in text.)

DTMF Toning

Surely the best known form of FM toning is the classic Touchtone® arrangement used by commercial telephone companies (fig. 1). Here seven specific-frequency tones are matrixed in various combinations to produce control and/or dialing codes employed in telephone systems worldwide. As an example, notice a tone of 697 Hz is produced when the 1, 2, or 3 button is pressed and an accompanying (second) tone of 1209 Hz, 1336 Hz, or 1447 Hz indicates whether the pressed button/digit is 1, 2, or 3. Likewise, a tone of 1336 Hz corresponds with a 2, 5, 8, or Ø digit, and an accompanying (second) tone of 941 Hz narrows the selection down to a Ø digit.

The most familiar use of Touchtones, or *DTMF (Dual Tone Multi Function) Toning,* in amateur radio applications involve activating, deactivating, and dialing numbers on a repeater connected to a telephone line—or autopatching. In fact, radio amateurs installed DTMF pads and encoders on basic FM handhelds and used them for telephoning many years before cell phones came into existence (original communications pioneers, we are indeed!). A number of creative-minded amateurs also use DTMF toning for remotely controlling around-home items such as driveway and patio lights. The typical arrangement here involves using an inexpensive kit receiver for monitoring a particular frequency and a homebrewed circuit consisting of one or two NE567 tone decoders with NANDed outputs and a power transistor driving a latching relay to switch the light(s). If unauthorized access is not a problem, only one NE567 can be used. When set to recognize or decode 697 Hz, for example, pressing DTMF digit 1, 2, or 3 can toggle lights on and off.

CTCSS Toning

As FM repeaters grew in popularity and nationally coordinated input/output frequency pairs or repeater channels filled to capacity, entanglements of undesired "falsing" by stations in different areas arose. Hearing both local and distant stations on a repeater made monitoring specific stations difficult, especially when the repeater continuously "timed out" from long transmit time. Naturally, the situation was most dominant when the repeater was most needed—during times of inclement weather. Further, operators in each area usually were unaware that their (propagated) signals were "falsing" distant repeaters, because they were being overshadowed, or "covered up," by signals from their own local repeaters. *Subaudible tone encoding and decoding,* or inclusion of a *Continuous Tone Control Squelch System,* was thus adopted to solve (or at least minimize) the problem (fig. 2). We should also mention that some repeaters require club or group financing for operation and limit access with CTCSS. A simple inquiry usually brings answers.

*4941 Scenic View Drive, Birmingham, AL 35210
e-mail: <k4twj@cq-amateur-radio.com>

Simply explained, a CTCSS-equipped repeater requires that all users include a continuously transmitted low-frequency and low-level tone superimposed on their transmitted signal. A CTCSS decoder at the repeater detects the tone and activates the repeater so it can relay the incoming signal. If the specific CTCSS tone is not received or detected, the repeater's Carrier Operated Relay (COR) is not activated and the repeater ignores the incoming signal. A typical example of CTCSS in use is shown in fig. 3. Here, two repeaters in separate areas operate on the same frequencies, but "A" requires a CTCSS or subaudible tone of 88.5 Hz for access, while "B" requires a subaudible tone of 179.9 Hz for access. Mobile station M3 is traveling in a fringe area and must use a subaudible tone of 179.9 Hz to operate through repeater B, or a tone of 88.5 Hz to operate through repeater A. If signal ducting or a "band opening" occurs so stations M1 and P2 can copy repeater B when repeater A is not transmitting, they can switch from using an 88.5-Hz tone to a 179.9-Hz tone and access/operate via repeater B. There is a caveat here, however. Although they are using a 179.9-Hz tone, their signals are still being received at repeater A and thus can interfere with other stations (transmitting an 88.5-Hz tone) attempting to use repeater A. In other words, CTCSS encoding and decoding minimizes falsing of repeaters (kerchunking), but it does not prevent the repeater from receiving any on-frequency signal if a properly encoded signal activates its receiver.

67.0	91.5	118.8	156.7	210.7
71.9	94.8	123.0	162.2	218.1
74.4	97.4	127.3	167.9	225.7
77.0	100.0	131.8	173.8	233.6
79.7	103.5	136.5	179.9	241.8
82.5	107.2	141.3	186.2	250.3
85.4	110.9	146.2	192.8	254.1
88.5	114.8	151.4	203.5	

Fig. 2– The 39 popular CTCSS or subaudible tones employed in controlled access FM repeaters and basic tone paging systems. All listed frequencies in Hz.

Interestingly, FM mobile transceivers and FM handhelds equipped with both CTCSS encoders and decoders can also be used for *personal paging*. How? The amateur desiring personal paging sets his/her rig's *decoder* to a discreetly chosen CTCSS frequency and tells selected friends the "secret paging frequency" so they can set their rig's encoders accordingly, and then the amateur sets his/her rig for decoding. The rig's S-meter will indicate on-frequency

Cell-phone Pioneers

During the mid-to-late 1970s and prior to the evolution of cell phones, radio amateurs installed small Touchtone-type DTMF keypads with encoders on their handheld 2-meter FM transceivers for autopatching. This early form of tone signaling or controlling typically utilized a keypad's "*" and "#" buttons for connecting and disconnecting an FM repeater to/from a telephone line and its Ø through 9 digits for dialing numbers. The arrangement gained immediate popularity, especially during emergencies, and autopatching became an overnight sensation. Although much of the original "gee whiz" glamour of autopatching has now quelled, it continues to prove popular on many FM repeaters. DTMF toning is also popular for switching driveway and/or patio lights on/off; functions cell 'phones have yet to match. Yes, radio amateurs are still modern-day communications pioneers and we will surely continue dinking, experimenting, and setting the pace for many years hence!

An early-model Pipo tonepad with encoder mounted on a 1978 model FDK "Palm II" 2-meter FM handheld. Rigs such as this and the radio amateurs who used them truly paved the way for modern-day cell phones, and we continue to set the pace by directly communicating via satellite with dualband FM handhelds.

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.500"	$.80/ft	1.375"	$1.75/ft
.625"	$.90/ft	1.500"	$1.95/ft
.750"	$1.00/ft	1.625"	$2.25/ft
.875"	$1.10/ft	1.750"	$2.50/ft
1.000"	$1.20/ft	1.875"	$2.75/ft
1.125"	$1.35/ft	2.000"	$3.00/ft
		2.125"	$3.50/ft

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A6270-13S	$199
AR2/ARX2B	$55/69
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C3E	10/12/15/17/20m, 8 el	$699
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C3SS	10/12/15/17/20m, 6 el	$599
C4	10/12/15/17/20/40m, 8 el	$799
C4S	10/12/15/17/20/40m, 7 el	$719
C4SXL	10/12/15/17/20/40m, 8 el	$1019
C4XL	10/12/15/17/20/40m, 9 el	$1189
C19XR	10/15/20m, 11 el	$999
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T200-80	80', 15 square feet	$1649
T200-88	88', 15 square feet	$1949
T200-96	96', 15 square feet	$2249
T300-88	88', 22 square feet	$2189
T400-80	80', 34 square feet	$2089
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T600-64	64', 60 square feet	$1869

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HF9VX, 9 Band Vertical	$369
A1712, 12/17m Kit	$54
CPK, Counterpoise Kit	$129
RMKII, Roof Mount Kit	$159
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2M4/2M7/2M9	$95/109/129
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2M5-440XP, 2m/70cm	$179

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440-470-5W/420-450-11	$139/95
432-9WL/432-13WLA	$179/239
440-18/440-21ATV	$129/149

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2MCP14/2MCP22	$169/239
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BPL25G/45G/55G	$99/129/149
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MA770/MA850	$2799/4349
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TMM541SS	$1939
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TX472/TX489MDPL	$3139/8239
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SB14, 6m/2m/70cm Mobile	$59
SBB224NMO,2m/220/70cm	$69
SBB2NMO, 2m/70cm Mobile	$39
SBB5NMO, 2m/70cm Mobile	$55
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17M3DX, 3 Element 17m	$399
20M4DX, 4 Element 20m	$529

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NR770HBNMO/NR770RA	$55/49
X200A, 2m/70cm Vertical	$129
X500HNA/X700HNA	$229/369
X510MA/510NA	$189/189
X50A/V2000A	$99/149
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269, Antenna Analyzer	$299
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945E, Antenna Tuner	$99
949E, Antenna Tuner	$139
969, Antenna Tuner	$169
986, Antenna Tuner	$289
989C, Antenna Tuner	$309
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1796, 40/20/15/10/6/2m Vert	$199

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LMR600 Ultraflex	$1.95/ft

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1/2"x9"EE / EJ Turnbuckle	$18/19
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Titan DX	$329
Titan Guy Kit	$29
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Voyager Counterpoise	$49
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Yaesu G-1000DXA	$499
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Yaesu G-550/G-5500	$299/599

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R81/82	$.25/ft./.39/ft.
R84	$.85/ft

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HPTG2100I	$.59/ft
PLP2738 Big Grip (2100)	$6.00
HPTG4000I	$.89/ft
PLP2739 Big Grip (4000)	$8.50
HPTG6700I	$1.29/ft
PLP2755 Big Grip (6700)	$12.00
HPTG11200	$1.89/ft
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• MDP & MDPL models include motor drive

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

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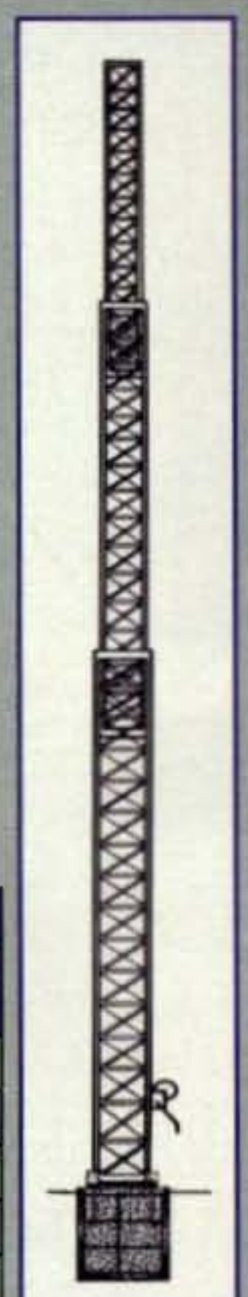
TX SERIES HEAVY DUTY CRANK-UP TOWERS					
TOWER MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	LIST PRICE	SALE PRICE
TX-438	38'	21'6"	355	$1,523	$1,379
TX-455	55'	22'	670	$2,107	$1,899
TX-472	72'	22'8"	1040	$3,462	$3,139
TX-472MDP	72'	22'8"	1210	$5,571	$5,049
TX-489MDPL	89'	23'4"	1800	$9,034	$8,239



HDX SERIES CRANK-UP TOWERS

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

• All models supllied with hinged T-base, anchor bolts, hand winch (except motor drive models), top plate, and rotor plate.

• MDPL models include motor drive

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

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

MA SERIES CRANK-UP MASTS

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

• MDP models include motor drive.

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

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

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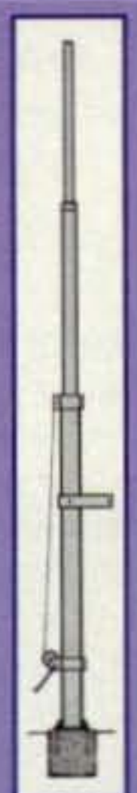
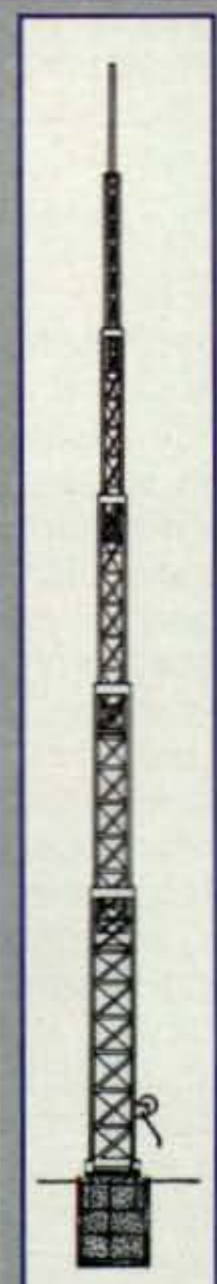


MA SERIES CRANK-UP MASTS							
MAST MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	50 MPH (sq. ft.)	70 MPH (sq. ft.)	LIST PRICE	SALE PRICE
MA-40	40'	21'6"	242	16.5	6.8	$1,209	$1,099
MA-550	55'	22'1"	435	22	9	$1,875	$1,699
MA-550MDP	55'	22'1"	620	22	9	$3,584	$3,249
MA-770	71'	22'10"	645	15.5	5.5	$3,091	$2,799
MA-770MDP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



TMM SERIES COMPACT CRANK-UP TOWERS

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

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

• All models supllied with hinged T-base, anchor bolts, load-actuated hand winch, 8' steel mast, top plate, and rotor plate.

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

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

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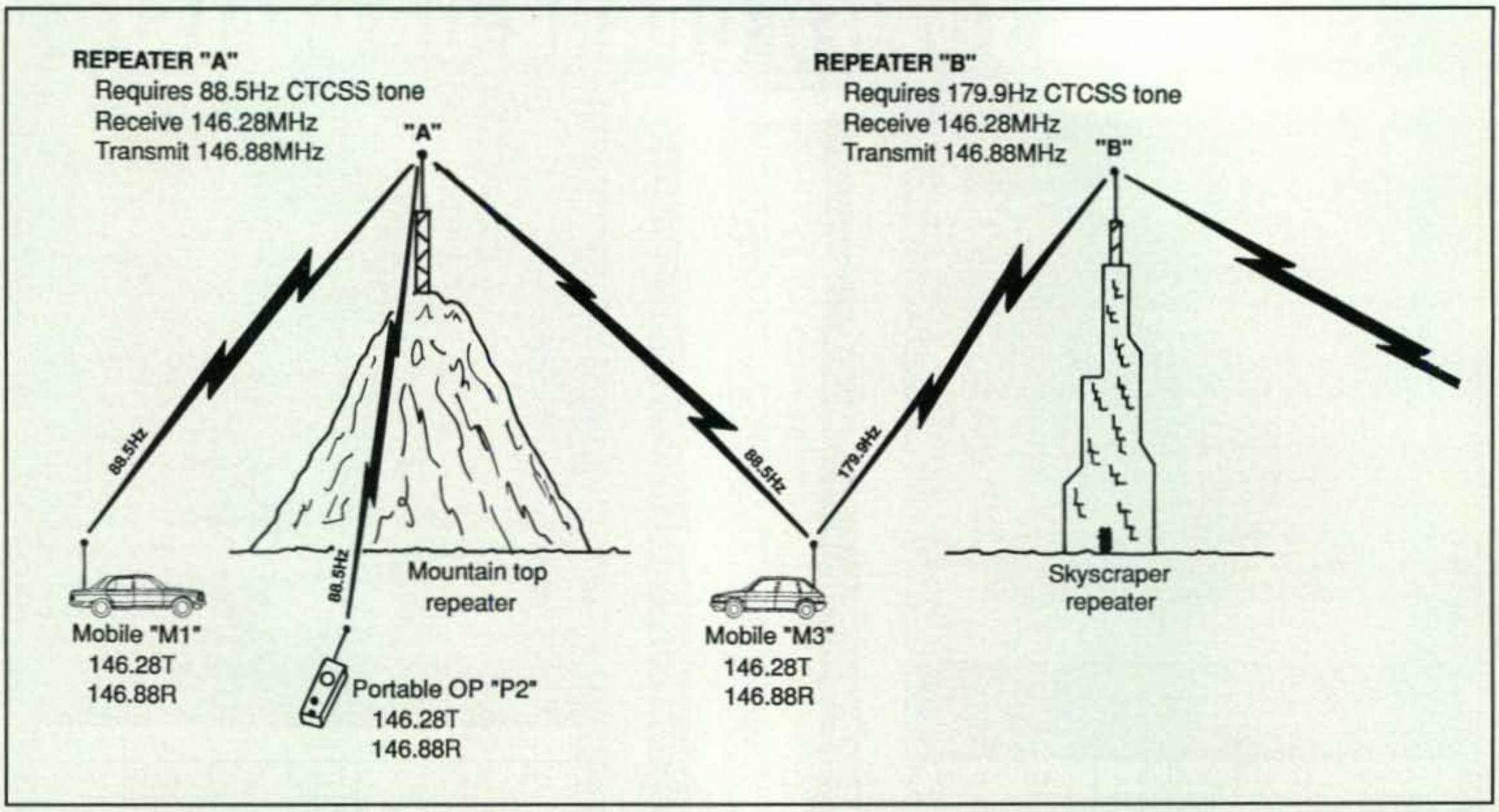

Fig. 3– Example of how CTCSS minimizes interference on same-frequency FM repeaters located in separate cities close enough for cross-access during signal ducting or "skip" conditions. Repeater A requires all users transmit a subaudible tone of 88.5 Hz for access, and repeater B requires all users transmit a subaudible tone of 179.9 Hz for access. (Discussion in text.)

signals (and on-frequency activity can be checked any time desired by opening the squelch), yet the transceiver remains silently until paged by a specific CTCSS tone.

CTCSS paging is quite attractive for silent monitoring in a variety of situations and locations, and it is also compatible with transceivers of all models and manufacturers. *Even if another station only has a CTCSS encoder, he or she can page a station with a CTCSS decoder* (although a station without a decoder cannot enjoy silent monitoring

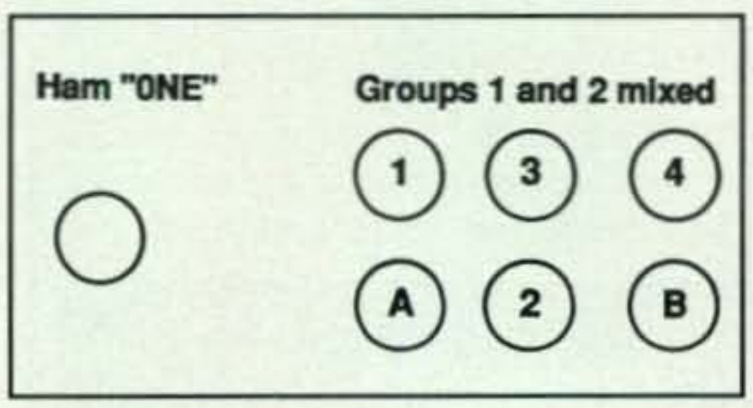

Fig. 4– Simplified example of a DCS paging concept. Operator "Ham One" may page only operators 1, 2, 3, and 4 (group 1), only operators A & B (group 2), both group 1 and 2 (all operators), or only operator 2. Each operator's transceiver will display a caller's code when paged and attach the paged operator's code to return replies. (Discussion in text.)

or personal paging capabilities). Some repeaters also filter out CTCSS tones, so paging capabilities may be limited in some areas. Try it and see.

DCS Paging

Expanding on the use of CTCSS for selective calling, amateur radio equipment manufacturers developed their own form of *digital coded squelch* systems for both personal and group paging. The manufacturers did not coordinate plans for universal compatibility before starting development, however, so each system differs in its exact name, format, and on-the-air sound. One system sounds like high-speed Touch-tones, one sounds like packet radio, one sounds like computer data, etc. As a result, a Kenwood paging system (presently) works only between Kenwood transceivers, an ICOM paging system (presently) works only between ICOM transceivers, etc. However, this situation may change as new rigs are introduced. Check with manufacturers for the latest facts.

Although Japanese amateurs are quite attuned to personal paging and digital calling systems, these systems have been slow to gain popularity in the U.S.—possibly because they seem complex to set up and use. Typically, a system can be set to transmit or receive pages from one, two, or more pre-planned groups, all groups or a specific individual within a group (fig. 4). When paged, a transceiver may also store (and display) the caller's digital ID and automatically attach it to subsequent transmissions as a "from/to" header when the rig's PTT switch is pressed—until cancelled by the operator.

DCS is probably one of today's most unique assets, and I encourage all amateurs to give it a try. How? Study your particular rig's instruction manual and set up in-home experiments between two rigs where you can hear and see them work in real time. Invite a friend (or two!) to join in the experiments so you both "learn while doing." Make notes, too, as it is easy to forget exact keystrokes for digital paging if they are not used on a regular basis (and no, I do not remember keystrokes of all the different systems either. I just read and follow the manual's guidance).

Conclusion

Once again we have overfilled available space, but we covered a creditable amount of always-useful ground. More horizon-expanding topics are planned for 2005, so continue to read this column and also drop us a note on topics you would like to see discussed.

73, Dave, K4TWJ

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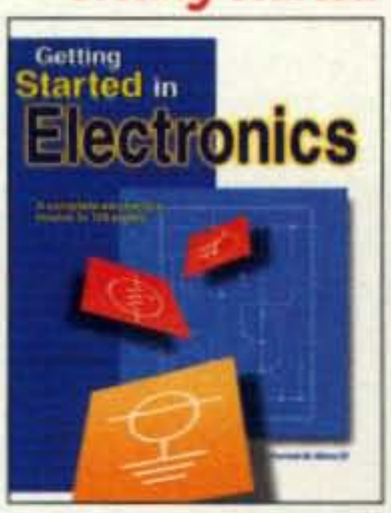

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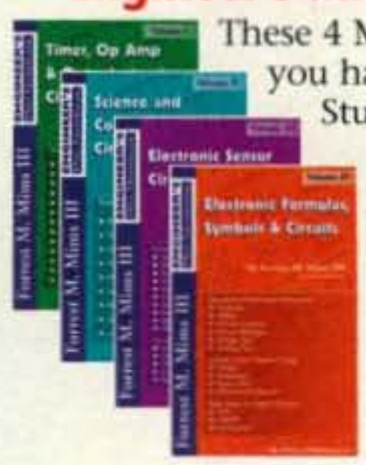

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washington readout

BY FREDERICK O. MAIA,* W5YI

How do I . . . ? When can I . . .? What is (or) are . . .? Where can I . . .?

We get tons of questions asking how to perform routine license filing functions or requesting information about amateur radio. This month let's quickly answer some of the most-often-asked queries.

Q: How do I find out where to take an amateur radio examination?

A: Most amateur radio examinations are coordinated by the American Radio Relay League (ARRL-VEC) or the W5YI-VEC. Together they account for about 85 percent of all examinees tested. Both list examination information on their websites at: <http://www.arrl.org/arrlvec/examsearch.phtml> and <http://www.w5yi.org/exam_locations_ama.php>. Just insert your zip code to find the nearest exam site. Some other VECs also list their upcoming exams on their websites. Go to: <http://wireless.fcc.gov/services/amateur/licensing/vecs.html> to find their internet addresses.

Q: What is "examination credit" and how do I get it?

A: This is the credit you receive for having already passed a license examination or having held a specific license as of a certain date. You will find a list of the instances whereby you receive credit in the Part 97 Rules in Section 97.505.

Q: Where can I find a copy of the FCC Part 97 Rules?

A: An up-to-date copy of the U.S. Amateur Service regulations can be found online at: <http://www.arrl.org/FandES/field/regulations/news/part97> or <http://www.w5yi.org/page.php?id=57>. The FCC also has the Part 97 Rules online but it is less accurate since their version is only updated once a year in October.

Q: Where can I find copies of the various examination question pools?

A: The ARRL has the Technician, General, and Extra Class question pools (complete with the correct answer identified) on its website at: <http://www.arrl.org/arrlvec/pools.html>. You can even take practice amateur radio exams (for free) at: <http://www.aa9pw.com/radio/> and <http://www.qrz.com/testing.html>.

Q: Where may I operate my amateur radio station?

A: As a general rule, FCC-licensed amateur radio operators may operate from any location where the FCC has jurisdiction. This generally includes all of the United States and its territories and possessions. Certain restrictions may apply, however. For example, you need the permission of the ship's master or aircraft pilot when operating from a vessel or plane, and you may not transmit from any place where the operation of the station could cause excessive levels of RF exposure. You may also operate in Canada under a bilateral arrangement whereby each country recognizes the license of the other. Certain European and Latin American countries also permit visiting American hams to operate without getting special permission. See <http://www.arrl.org/FandES/field/regulations/io/#us> for details.

Q: What is the Universal Licensing System?

A: Developed within the past five years, ULS is a common licensing arrangement for all of the U.S. wireless radio services, including the Amateur Radio Service. It supports electronic filing of applications and online access to licensing information. You can find out more about ULS at: <http://wireless.fcc.gov/uls/faq.html>.

Q: How do I check the status of my amateur radio license?

A: The best way is to access the FCC's Amateur Service license database located at: <http://wireless.fcc.gov/uls> and mouse click on the "Licenses" button. Then enter your station callsign in the "License Search" box. If you are checking to see if your new license (and callsign) has been issued, access the drop-down menu and enter your name. (Format: Last name first, followed by a comma and your first name and middle initial.) Some other good Amateur Radio Service licensee databases are located at: <http://www.qrz.com>, <http://www.arrl.org/fcc/fcclook.php3>, and <http://hamcall.net/call>.

Q: What are one-way, two-way, and third-party communications?

A: A one-way transmission is when another human operator is not involved, such as during a brief transmission to adjust station equipment, commanding an object by radio, radio telemetry from a remote radio station, information bulletins, Morse code training, or a beacon station to aid in radio-wave propagation. Two-way communications are transmissions between two or more amateur stations. A third-party communication is a message from the control operator (first party) of an amateur station to another amateur station (second party) on behalf of another person (third party). A third party may not operate your amateur station. Only the control operator may "operate" the station. However, a third party may speak over the microphone or type on a keyboard as long as you, as control operator, are in control of the transmitter.

*Chairman, NCVEC Rules Committee
1020 Byron Lane, Arlington, TX 76012
e-mail: <w5yi@cq-amateur-radio.com>

Q: What can I do to avoid disrupting other amateur radio communications in progress?

A: Remember that all frequencies are shared and none are assigned for the exclusive use of any amateur station. Here are some suggestions to consider:

- Use a non-radiating dummy antenna system when testing your system.
- Use an uncongested frequency band.
- Select a frequency band having only short-range propagation characteristics (if you are making a short-range contact).
- Transmit only during periods when the channel is unlikely to be in use by other amateur stations.
- Listen before you transmit and confirm that the channel is clear before transmitting.
- Do not use any channels designated by the Amateur Service community for repeaters, space stations, networks, and so forth.
- Use the lowest possible transmitter power.
- Use an antenna that focuses antenna power in one direction.
- Follow the suggested frequency band plan.

Q: When will Morse code be discontinued for U.S. amateur operators?

A: A very common question! First of all, we have to separate Morse code the operating mode from Morse code the license requirement. Many amateurs enjoy operating Morse code and *none* of the proposals now before the FCC suggest eliminating Morse operating or the frequencies set aside for code and other digital modes. There are several petitions before the FCC to eliminate the Morse code *test requirement,* all filed after the International Telecommunications Union (ITU) made code testing optional at last year's World Radiocommunication Conference (WRC-2003). The best guess for FCC action is sometime in 2006.

The American Radio Relay League wants a demonstration of Morse code knowledge continued for Extra Class operators. This probably won't happen, since no other country in the world that has changed its rules since the ITU relaxed the telegraphy requirement has opted to retain Morse proficiency for any level of license.

Q: When will the FCC again be restructuring the Amateur Radio Service?

A: There have been a multitude of Petitions for Rulemaking filed suggesting a complete revamping of the existing license classes, privileges, and frequencies. The FCC has said that it will be lumping all of the post-WRC-2003 petitions together and shortly issuing a single Notice of Proposed Rulemaking. These petitions, from various amateur radio organizations and individuals, make a variety of suggestions regarding realigning the license classes, ending Morse code testing, designating emissions by maximum occupied bandwidth, realigning frequency subbands, and establishing a new beginning license class with HF privileges. It will likely be at least two years before the new restructuring proposals can make their way though the FCC rulemaking process. One thing seems certain, however. The U.S. Amateur Radio Service of tomorrow will be vastly different from what it is today.

Q: How do I learn the Morse code?

A: The best way is by learning the code characters through a training class or recorded course—and then lots of practice. The American Radio Relay League transmits slow code

practice from W1AW on several amateur radio HF/VHF frequencies and posts downloadable MP3 files which can be played on your PC using the Windows Media Player, RealPlayer, or your favorite MP3 player. Check out: <http://www.arrl.org/w1aw.html>. There are also several Morse Code translators on the web that can convert text to telegraphy. Find them by inserting "Morse code translator" into a web search engine. You simply type in the text and your PC will play it back in Morse code.

Q: What are the types of communications I may transmit over ham radio?

A: You determine for yourself whether your communications should be transmitted on Amateur Service frequencies. As a general rule, any amateur-to-amateur communication is permitted, unless it is specifically prohibited or transmitted for compensation. Although there are some exceptions, transmitting music or "secret" messages, using ham radio while engaging in a criminal act, broadcasting to the general public, retransmitting signals from other types of radio stations, or using obscene or indecent language over the air is prohibited. In an emergency situation it is legal to transmit outside your license privileges.

Q: How do I renew my license, or notify the FCC of an address change?

A: Amateurs are required to keep their license information up to date. Licensees may renew for another ten-year term during a "window" that opens 90 days before expiration to two years after expiration (if you wait until after your license expires, though, you *may not transmit* until your license has been renewed). You can change your address at any time. There is no charge if you handle this yourself on the FCC's website. To renew, go to <http://wireless.fcc.gov/uls>, select "Online Filing," and log in to the ULS License Manager with your FCC Registration Number (FRN) and password. Many radio amateurs have a VEC handle their renewals for them (for example, go to <http://www.w5yi.org> and click on the "Renew your license" link in the middle of the page). There is a small charge if a VEC handles your filing. You also may manually file a Form 605, but very few amateurs use this method, since PCs are so prevalent.

Q: How do I replace a lost amateur radio license?

A: It is no longer necessary to have a copy of your license in your possession when operating on the ham bands. Your listing in the FCC's ULS database is considered proof of being licensed. You may replace a license document, however, if you wish to do so, by accessing the ULS License Manager (see above). You do not even have to wait until you receive a hard-copy license document from the FCC to begin operating for the first time. As noted above, once your license information appears in the FCC's database, you are considered fully licensed.

Q: Where can I get a paper form to notify the FCC of my new mailing address?

A: Be aware that there are two versions of the Form 605. The multi-page FCC Form 605 must be mailed to the FCC and is much harder to use since it is intended for several radio services. It is available by calling 800-418-FORM (3676), downloading from <http://www.fcc.gov/formpage.html>, or by fax by calling 202-418-0177.

The VEC version is less complicated and looks similar to the old Form 610. You can download the NCVEC Form 605 from <http://www.w5yi.org/documents/ncvec605.pdf> or

<http://www.arrl.org/arrlvec/605ins.html>. However, this form may only be filed with a VEC, which will then process the change for you. A small fee may apply.

Q: What are "grandfathered" amateur radio classes?

A: A "grandfather clause" is a legal provision that exempts people from complying with a new regulation, requirement, or law due to a pre-existing condition. It also allows "continuance" based on the situation in effect prior to implementation of a new rule or policy.

On April 15, 2000, the FCC stopped issuing new Novice, Tech Plus, and Advanced Class licenses. Instead, the Novice and Advanced Class were "grandfathered"—that is, people already holding these licenses could renew or modify them indefinitely, but no new Novice and Advanced Class licenses would be issued. Licensees holding a Tech Plus license have their licenses renewed as Technician but retain their 5 wpm code credit.

Q: How do I form a ham radio club?

A: Any group of four or more licensed amateurs may form an amateur radio club. A club station license is granted only to the person who is the license trustee designated by an officer of the club. (A Novice operator may not be a club trustee.) The club must have a name, a document of organization, management, and a primary purpose devoted to Amateur Service activities. Your NCVEC application Form 605 must be submitted to an FCC-designated Club Call Sign Administrator (CCSA). Both the W5YI-VEC and ARRL-VEC are CCSAs. For more information, call (toll free) 1-800-669-9594 or 1-800-927-7583. The club's first station callsign will be a sequentially issued 2-by-3 format call. Once issued, the club trustee may change it to one of his/her choosing (providing the call is available) under the FCC's vanity callsign program. Many clubs affiliate with the American Radio Relay League. A list of affiliated clubs can be found at: <http://www.arrl.org> (click on the "Clubs" link near the top of the home page).

Q: When may I allow someone else to operate my ham station?

A: Anyone may operate your station with your permission provided the person holds an amateur operator license of the appropriate class. This person then becomes the control operator of your station. Section 97.3 defines the term *control operator* as an amateur operator designated by the licensee of

the station to be responsible for the transmissions from that station to ensure compliance with the Rules.

An unlicensed "third party" may speak over your station provided a licensed control operator is present and operates the controls of the transmitting equipment. You are prohibited from allowing any third party to communicate over your station if the person's license was previously revoked, suspended, or surrendered for cancellation following enforcement action.

Q: How do I change my callsign?

A: All callsigns fall within four format "groups." The Novice Class qualifies for a (Group D) 2-by-3 format—that is, two prefix letters, a district numeral, and three suffix letters. Technician and General Class operators additionally qualify for (Group C) 1-by-3 callsigns; Advanced Class (Group B) 2-by-2; and Extra Class (Group A) 1-by-2, 2-by-1, and 2-by-2 format callsigns beginning with the letter "A." When all callsigns in a particular group within a district have been issued, calls are assigned from the next group "down."

You may change your callsign "sequentially" at any time simply by filing an application to do so. There is no charge. You will receive the next available callsign from an alphabetized block authorized for your license class. To receive a specific callsign, you must make a request under the Vanity callsign program.

Q: How do I obtain a Vanity callsign?

A: The rules surrounding Vanity callsigns are very complex! In a nutshell, you submit a list of callsigns in which you are interested to the FCC and the first available one is issued to you or your club. RACES and military recreation stations are not eligible for Vanity callsigns.

Unlike all other station callsigns, Vanity callsigns are not free. There is an FCC fee that must be paid —currently $20.80 for a ten-year term. You may request a Vanity callsign online using the Universal Licensing System or by submitting a paper application Form 605 and Form 159 Remittance Advice to the FCC.

There are all sorts of rules concerning obtaining a callsign you formerly held, or one of a deceased relative or club member. Generally, no callsign is available for reassignment unless it has been inactive for at least two years. Also, you may only request a callsign from the specific "group" which coincides with your license class.

Carefully read the FAQ (Frequently Asked Questions) on the W5YI Group's website (http://www.w5yi.org/page.php?id=254) if you are interested in getting a specific callsign.

Q: How do I get a 1-by-1 format station callsign?

A: 1-by-1 format station callsigns are available for temporary use by any radio amateur to commemorate some sort of "special event," and you determine what the short-term "event" is. Examples include a wide variety of celebrations such as conventions, festivals, dedications, and anniversaries; even local events qualify.

A 1-by-1 callsign consists of a single prefix letter (K, N, or W), the region number (Ø to 9), and a single suffix letter (A to Z, except the letter X). There are 750 such callsigns. Amateurs of any license class may reserve a 1-by-1 callsign for up to 15 days. Once you reserve the callsign, you simply substitute the self-selected 1-by-1 callsign for your FCC-assigned callsign. Be sure to read the 1-by-1 callsign Frequently Asked Questions located at <http://www.ncvec.org/page.php?id=159>.

A 1-by-1 database has been established at: <http://ncvec.spindle.net> so that you can determine which 1-by-1 callsigns are available during specific dates. Coordinators have also been selected by the FCC to approve and post 1-by-1 callsign reservations to the database.

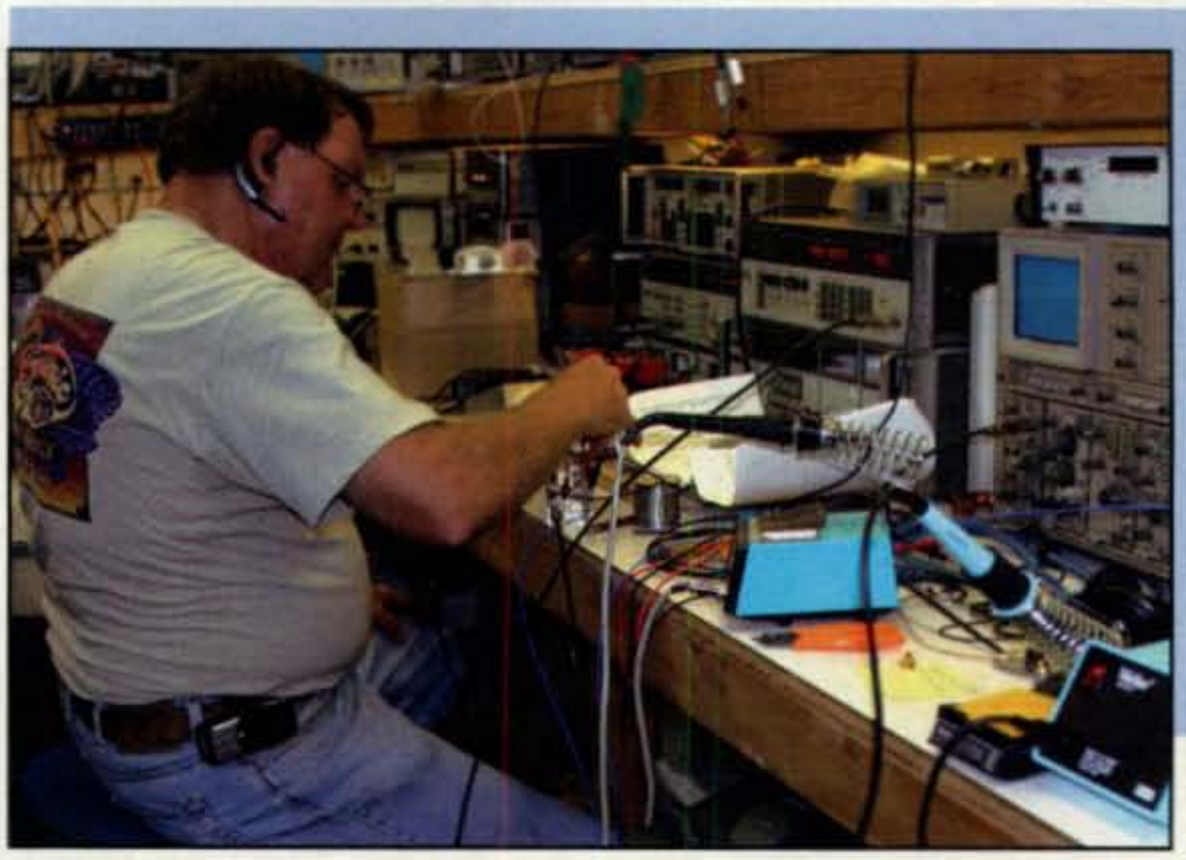
We hope we've answered some of your questions and cleared up any confusion you may have about these matters. If we've missed *anything* that you're not sure about, drop us a line and we'll try to answer your question, either directly or in print. 73, Fred, W5YI

BY WAYNE YOSHIDA,* KH6WZ

The Gift of Knowledge, Friendship, and Ham Radio

Each year as we move into the holiday season, I think about how much I have learned, how many people and friends have helped me out of jams, and how grateful I am for the friends I have, both radio- and non-radio-related alike. As I reflect on this, it is amazing how many of these helpful people happen to be ham radio operators.

I was just thinking about how much I've learned about my newest ham radio pursuit, microwave-radio building and microwave contesting. This is an area that is so different from anything else I have done in nearly 30 years as a ham. I decided early on that I needed to "latch onto" some people who know what they are doing, so I joined a microwave radio club (San Bernardino Microwave Society). I am amazed at the amount of knowledge and experience that the SBMS members have.



Dave Glawson, WA6CGR, troubleshooting and tuning up another rig for a fellow microwave contest club member in his well-equipped laboratory.

Dave Glawson, WA6CGR, and others in the SBMS, are my microwave radio mentors. Each time I go to Dave's laboratory with a problem, he always seems to be able to figure out what I did, and then he helps me fix the problem. If I need a strange or specialized part, Dave will search his inventory, and he usually comes up with something that works. Someday I would like to be like Dave, with the knowledge and equipment to help out others.

Just like what happens to a country doctor, sometimes I cannot pay Dave for his time and trouble. However, I always try to return the favor with a gift (no, not a dozen eggs) or a little something in return. Always be thankful for the favors and the help your mentors offer you, since they are your most valuable resources. Cherish those friendships and return their generosity.

One of the things I decided to do was to keep a "microwave notebook" of tips, tricks, techniques, and facts on my new adventure. I began the series of notebooks so that I could retain the knowledge passed on to me from all sources, including books, internet websites, and hands-on building. This is a good practice, since I always feel guilty about going back to Dave's lab with the same problems over and over. I thought that if Dave took the time to teach me how to do something, I should be able to learn the techniques so that I can do it by myself. I even created a searchable index (well, okay, it is just a text document) on the topics in the notebooks so that I can easily find the information by a keyword search.

The series of notebooks is now a hands-on reference source filled with practical solutions to everyday radio problems. Of course, since I am not creating anything new, the problems and solutions can be very helpful for others, since other people are likely to have similar difficulties.

Actions of a True Friend

Have you ever been stuck someplace and called a friend to get some help? Sometimes you just have to reach out and ask, and your true friends will come to your rescue.

I still recall one spring Saturday morning that started out to be a fun adventure, turned into a disaster, and then ended up a little bit better. Of course, ham radio is involved in this story.

A good friend and I decided to clean out our basements of unused radio gear and accessories and drive to a far-away hamfest to sell the junk and maybe buy something new. We loaded my old orange pickup truck with several hundred pounds of gear, including some sort of low-band, VHF, tube-type Motorola base station in a giant rack. The hamfest was over 200 miles away.

We left early in the morning and took our time, since we had all this breakable gear in the back of the truck. We enjoyed the view as we drove to the hamfest. Somewhere along the interstate highway, and about halfway to the hamfest, the truck made this thumping noise and the accelerator had no effect. It was as if the truck was stuck

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

in neutral. I knew what it was, but for some reason I tried to think it was something else.

I pulled the truck over to the shoulder, looked underneath the vehicle, and saw the driveshaft hanging on the road. We were "dead in the water."

Having a 2-meter rig in the car, we called several times on the local repeater, but apparently no one was listening. Several hours went by, and we finally got someone to call the state troopers to come get us. We found out later that the troopers' beat ended a few miles from where we were stuck, so if we hadn't had a way to call someone, the troopers would never have found us. A great big thanks to the W1-station who answered our call for help.

We got towed into a service station, where the mechanic said he couldn't help us, since he didn't have a driveshaft in stock, and this being the weekend, nothing could be done until the following Monday. There we were, stuck with no transportation, a truck full of radio gear, and nowhere to go. We had some cash, but it wasn't enough to take a cab to the next town over, much less pay for a motel. Digging for some coins, I dialed information to get another friend's telephone number back home. Oddly, neither of us needed to call our friend Ed Raso, WA2FTC, on the telephone, since he was always reachable on the repeater back home.

I dialed Ed on that Saturday afternoon and said, "Hey, Ed, are you doing anything today? How would you like to come over and pick us up? We're stuck out here in the middle of nowhere!"

Ed said, "Sure." Now remember that this was a Saturday afternoon and we were just a bit past the 100-mile mark from home. This is a true friend.

Making New Friends

I was having lunch alone at a local restaurant the other day, minding my own business and thinking about my deadlines and meeting schedule. I thought I was hallucinating, but every now and then I heard certain buzz words that just grabbed my attention. They were ham radio technical terms such as *spectrum analyzer, local oscillator,* and *grid square.*

These are terms microwave radio operators throw around. After I finished my meal, I went over to the couple behind me and introduced myself. I mentioned the upcoming microwave contest. As it turned out, David Kunkee, KØDI, was new in town, and we work only a few blocks from one another. Dave was having lunch with his wife Liz, also a ham. We talked about contest plans and equipment and solutions to rig problems. I advised Dave to join the SBMS for more networking opportunities on the microwave bands. Microwave hams are always on the lookout for newcomers, since more stations on the air means more points to add to a contest score!

It's a Small World

These everyday and sometimes fantastic events are not limited to just our neighborhood. Many years ago, I wanted to "do" a DXpedition (a trip to a foreign place to operate ham radio) "someplace," but did not know where to go or how to prepare for the expedition. I found a small blurb in the "How's DX?" column in *QST* magazine about ham radio contesting by a small group of hams in Barbados (8P). I wrote a short note to the operator mentioned in the article and received a very helpful and friendly reply.

Think about this: Here was a letter from a complete stranger in another country that basically said, "Hi. You don't know me and I don't know you, but I need a place to stay and a place to operate a radio contest. Can you help?"

Dean St. Hill, 8P6SH, and I have been great friends ever since, and we even had a reunion of sorts a number of years ago, operating the CQ WW DX SSB Contest together once again. A lot of changes had taken place in our personal lives, and the equipment had changed dramatically, but we still had the common bond of ham radio and radio contesting.

I have many other stories like this, and I am sure that as you spend more time in the wonderful world of ham radio, you will have some stories like this as well (if you don't already). As we end this month's column, I want to remind everyone to cherish the most precious gifts of all – our families, our friends, and ham radio.

73, Wayne, KH6WZ

BY JEFF REINHARDT,* AA6JR

The Voltswagen Redux

Photo A– From Los Angeles, the "strange vehicle" capital of the world, comes the "real" Volts-Wagon (WA6AYJ photo)

Last time, we talked about some of the changes and innovations in the auto industry. You might remember my repeating the old bad joke about new electric German car, the "Volts-wagen." Well, if there's a moral to be learned here, it's never to challenge the ingenuity of *CQ* readers!

Just after the magazine hit subscribers, I received a nice note from Bob Hill, WA6AYJ, who sent along the picture of, what else, a Volts-Wagon. Bob wrote: "I thought you might find it interesting that the Los Angeles Department of Water and Power has just that—a Volts-Wagon, that is. I have attached a picture of the unit (photo A), with my XYL, Lindsay. This vehicle was built over 30 years ago to show the possibilities of electric transportation. In the last few years, the vehicle was rebuilt." I can't top Bob's note, except to ask, "Watt's next?" I'd love to follow Bob as he drives the electric vehicle into one of California's exhaust-emission testing stations!

Ask for Help—It Really Works!

I received another note, this one from Paul Gates, KD3JF, whose wife wanted assurance that her new car would not encounter problems or difficulties with its warranty if a radio was installed. This was complicated by the dealership salesperson saying that she should never put a radio in the car! Well, that didn't quite sound right, so I passed Paul's note along to a GM engineer (who wishes to remain anonymous). In return, Paul received assurance that putting a radio in the car was okay.

You may also recall the last column had a reference to the ARRL's website, where mobile assistance is available (http://www.arrl.org/tis/info/ rficar.html). GM pointed Paul to the site, and it showed diagrams of how to route the antenna and power cables. Help doesn't get any better than that. Happy mobiling, Paul!

Antenna Antics

Ah, for the "good old days" when every car had a pair of massive chrome bumpers. Not only did they actually function as bumpers, but they also made for nifty and strong antenna mounts. Alas, except for some truck models, the "real" bumper seems to be a thing of the past. Now it seems every car has its own unique challenges in getting an antenna in place, particularly for HF operations.

Bill Dews, K6AWO, wrote to share some tips on mounts, and it would seem he has had plenty of experience. His first photo (photo B) shows yet another approach to mounting an antenna onto the external spare tire of a Honda CRV. Bill reports a "60-mph lean" to the antenna, but says it seems to work just fine.

The second photo from Bill (photo C) shows a slick use of the towing bracket on his Saturn, which Bill tows behind his RV (recreational vehicle). With a little ingenuity and an inexpensive "L" bracket, a sturdy HF antenna mount was created. Just be sure that when drilling into any towing apparatus you're not compromising the structural integrity of the unit. If in doubt, check with the manufacturer.

Is Portable a Stretch?

Has your boss ever told you "you need to stretch your talents"? Our intrepid editor, Rich Moseson, W2VU, has not *quite* said those words to me, but

Photo B– This simple bracket can attach to the spare tire mount of a Honda CRV. (K6AWO photo)

*5904 Lake Lindero Drive, Agoura Hills, CA 91301
e-mail: <aa6jr@cq-amateur-radio.com>*

Photo C– Again, a simple design works in mating an antenna mount to the towbar of a small SUV that rides behind an RV. (W6AYJ photo)

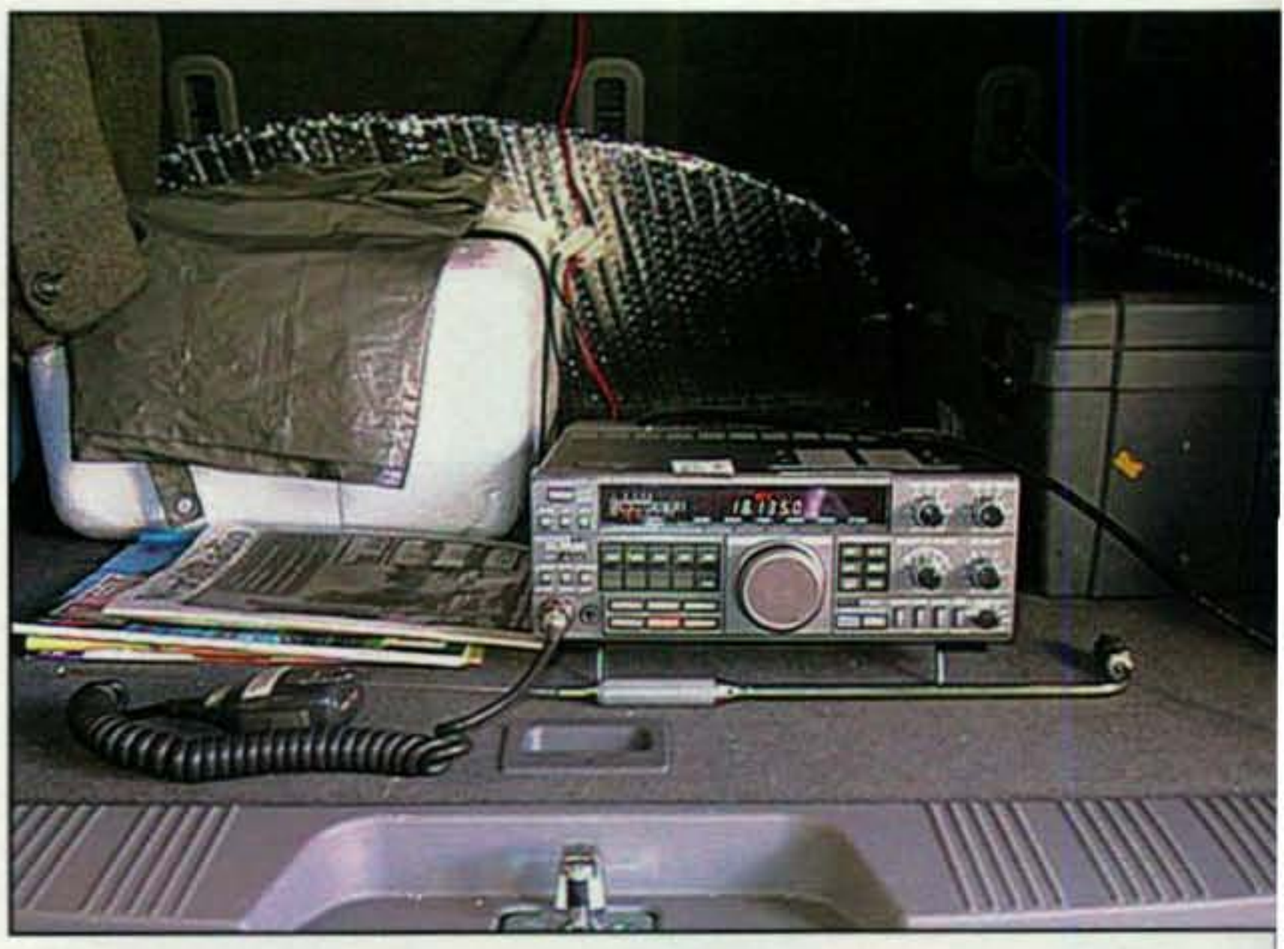


Photo D– "Tailgate portable" operation is one way avoid the hassles of finding a way to permanently mount a rig in your vehicle. (W6AYJ photo)

I'll try to convince him he implied it! The point of this "stretch" is going just a bit beyond mobile operations to the joys of *portable* setups. The connection, of course, is that you can drive your rig to the location of choice and set up a station just about anywhere you want (see photo D).

This can be very useful if:

A. You live in an antenna-restricted housing tract.

B. You can't find a place to mount a radio in your car

C. You'd like to go to a really nice location to operate.

D. All of the above.

VHF/UHF weak-signal "hilltoppers" have known about portable operations for many years, especially for contests, but you don't need to be a contester to enjoy a blend of mobile and portable modes. I know of one ham who occasionally drives to an abandoned broadcasting tower site, where he parks his car and connects his antenna line to one of the (now dormant) towers. He says it's the only chance he gets to work 160 meters. If nothing else, he deserves credit for making the most of an opportunity. Just be sure that tower is *really* unused before glomming onto it! *(Permission from the owner might be nice, too!—pesky editor)*

You can put the rig, a good-size gel-cell battery, and an antenna in the car, drive to a nice location, and get on the air. A few years ago I did just that in Hawaii and enjoyed being DX with a minimum of effort (and my XYL thought we were going there to celebrate an anniversary!). The antenna can be a dipole hung between a few trees or a vertical. Use your imagination!

Mobile/Portable Discoveries

At the recent ARRL Southwestern Division Convention, I had a chance to see a very well-packaged portable antenna system from W3FF Antennas, the Buddipole™ and Buddistick™ antennas. Information is available at <www.buddipole.com>. This package folds down to "suitcase" size and can be assembled quickly.

Also, Bill Dews shared another discovery he made, a high-current cigarette-lighter power plug from RadioShack that powers his rig from an outlet in the back of his SUV (photo E). Bill did his homework, checking to see that the power-access socket and wiring in the car were rated for 20 amps prior to using that power source. ***Failing to do so could damage the car or even cause a fire. Check before you proceed!*** Of course, you can buy yourself some reserve "overhead" by reducing the output power of your rig, or even going QRP.

Photo E– This hefty power tap provides enough current to operate "tailgate portable." Play it safe and check all current ratings prior to using a similar arrangement; specifications vary widely among vehicles.

One advantage of fixed portable operations is that you can operate with the engine off (assuming you have sufficient battery power to operate, then restart the engine), which eliminates the gremlins associated with ignition, fuel-pump, and on-board processor noise.

Portable operations are yet another way you can blend opportunities and technologies to maximize your opportunities to enjoy ham radio. In the process, you'll also become a pretty adept emergency or Field Day communicator.

Emergency Operations

Perhaps the greatest benefit to having a mobile rig in the car is the ability to conduct emergency operations from any location. This is being written in the aftermath of the hurricanes that struck Florida in quick succession. It's been good to hear occasional references to ham radio in the newscasts. (See WA3PZO's "Public Service" column in this issue for details on ham activities.) If you're aware of any mobile operators who assisted in the recovery efforts, please pass along the info; we'd love to have pictures of these hard-working volunteers and their hard-working mobile rigs.

Thanks for the many contributions to this column. Readers like you are what makes it work! 73, Jeff, AA6JR

Holiday gift ideas

CQ is your one-stop source for all your Ham holiday gift-giving needs!

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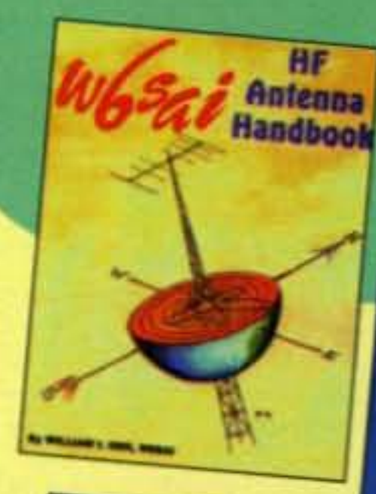

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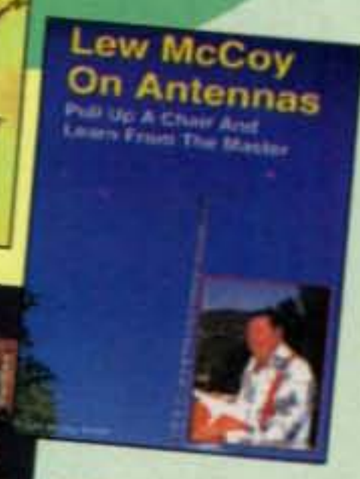

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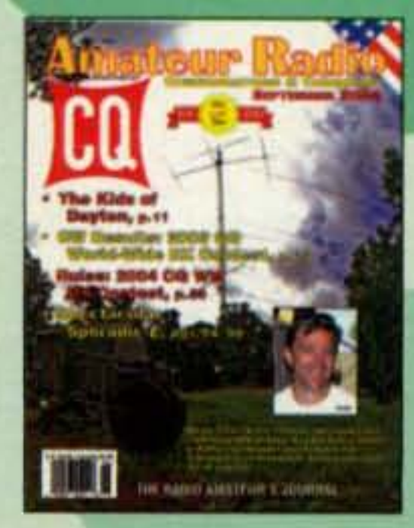

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BY DAVE INGRAM,* K4TWJ

More Old-Time Radio Fun!

Last month's resurrection of the famous 1950s wood-framed 6L6 transmitter simply would not be complete without equal recognition of comparable barebones receivers from the same era. This month we thus highlight some of the "low-end" receivers that have also become so memorable in old-time radio circles: the Hallicrafters S-38, National SW-54, Knight Kits such as the Span Master, and those dear "one tubers" we homebrewed for fun. In many ways, this represents the "other side of the coin" in vintage rigs—the gear many of us used as budding Novices (underdogs!) while the big boys worked AM with their Johnson Rangers, SX-100s, and other fancy gear. The pursuit was challenging for sure, but we stuck with it and ultimately emerged as dedicated amateurs and extra-sharp operators, so maybe it was worth the struggle!

Photo A– The Hallicrafters S-38 receiver, a gem from the days of yesteryear. The S-38B, shown above, sported five tubes, four bands, and a black-wrinkle finish. Ah . . . the glow of the green dial. (Owned and photographed by Gail, K2RED)

Low Tech in the '50s

Amateur radio life in the 1950s will always be remembered for its full-size vacuum-tube gear, keys flashing with high voltage, and a special room filled with big-time radio excitement. A typical station of the day consisted of a separate receiver and transmitter, an SWR meter, and a simple dipole or longwire antenna. The transmitter was often crystal controlled (even as General licensees, many of us had only three or four crystals), and tuning for answers to CQs rather than just listening on our transmit frequency was commonplace. By comparison, many CW operators answering CQs today find shifting their transmit frequency only 400 or 500 Hz is all that's necessary to fall within the receiving station's narrow passband. What a change!

A popular philosophy among budget-conscious amateurs of the 1950s was building your own transmitter and purchasing your receiver. This build/buy logic drove many of us to consider starting out with a little Hallicrafters S-38 (photo A) or National SW-54 (photo B) until we could move up in the world, so to speak. The receivers left much to be desired for sure, but they were fun all the way—especially when you mastered the technique of mentally filtering signals and actually worked other stations with them. What's mental filtering? You tune in a desired signal so it is the lowest pitch CW tone being received, and then concentrate on only that tone and ignore all the others blaring in your ears. Does it work? It does for me, and it lets me stay aware of other near-frequency activities at the same time. Even today with the abundance of narrow filters and DSP, I still use an SSB bandwidth for most CW work. Maybe the '50s were good training after all.

Looking back at 1955-advertised specs on "entry level" receivers, we see the Hallicrafters S-38 exhibited a sensitivity of 15 microvolts, while the National SW-54 offered up a more impressive 11 microvolts. As a point of reference today, ICOM's popular IC-706, IC-718, and IC-703 transceivers exhibit 0.16-microvolt sensitivity. The ICOM rigs can hear a weak fifth-of-a-microvolt station, while the golden oldies are going to hear a 10-microvolt signal. Selectivity comparisons are

Photo B– Oh the warmth and beauty of those sweet "low-end" receivers of the 1950s! This National SW-54 is a good example. It was not high tech, but it sure was fun to use. It also supports our philosophy that the operator rather than the rig makes the difference in successful operating on the bands. (Owned and photographed by Mike Zane, N6ZW)

*4941 Scenic View Drive, Birmingham, AL 35210
e-mail: <k4twj@cq-amateur-radio.com>

Photo C– This beautifully preserved Knight Kit Span Master receiver also belongs to Mike Zane, N6ZW, and we understand he is preparing to put it, plus a little wood-frame 6L6 transmitter back on the air today. Look out, big guns! (Photo courtesy N6ZW)

even wilder. First consider the reference. ICOM's little IC-706 (stock, without any extra filters) exhibits an SSB/CW bandwidth of 2.4 kHz at –6 dB (a semi-weak signal) and 4.8 kHz at –60 dB (a strong signal). That equates to a shaping factor of 2:1, which means the filter's skirts can be flared to double width by a strong signal. By comparison (and the following specs were copied directly from advertised specs), an S-38 exhibited a 5-kHz bandwidth at –6 dB and a whopping 70 kHz at –60 dB. The SW-54 checked in with a 7-kHz bandwidth at -6 dB and extended to 65 kHz at –60 dB. Hello—are you still with me folks? That is a shaping factor of over 9:1. The whole 30-meter band is only 50 kHz wide! Now if using a receiver like that isn't the ultimate compliment to its operator, nothing is!

Would you like to experience this kind of real radio fun in your own shack right now? Check hamfest flea markets and strike a deal on a little '50s model receiver. Then restore your prize with a new round of tubes, new filter capacitors, and new bypass capacitors, and you are set for classic-style hamming supreme. At least one dealer of vacuum tubes attends most hamfests, and a new set of "bottles" perks up old receivers quite admirably. If your receiver needs further attention, such as trouble-shooting or realigning, check with W7FG manuals at 1-800-807-6146 or <www.vintagemanuals. com> for a reproduction manual and give home repair a go. Refurbishing tube-type gear is usually a smooth process.

The Span Master

Another well-known name in "low end" receivers during those romantic days of yesteryear was Knight Kit, producer of the Ocean Hopper, DXer, and Space Spanner highlighted in our previous vintage-rig columns. Although slightly less well known, the clean-looking Span Master shown in photo C joined Knight Kit's line during the 1950s. To the best of my knowledge and investigation, this was the last regenerative receiver sold as a Knight Kit. It was followed by the R-55 and R-100 during the 1960s and the Star Roamer during the early 1970s—superheterodyne units even youngsters could build if they were diligent and patient.

The Span Master sported a two-tube circuit similar to its famed predecessors, but it used four separately wound and switch-selected coils to cover the HF range of 540 kHz to 30 MHz. It also used a small transformer and new-for-the-'50s selenium rectifier to supply filament and plate voltage to the 6BZ6 and 6AW8 tubes rather than continuing the AC/DC con-

On the Cover

NOAA satellite image of Hurricane Frances covering virtually the entire state of Florida. It was one of several major tropical storms to ravage the eastern United States and islands of the Caribbean Sea during the 2004 hurricane season, which doesn't end until November 30th. The storms caused significant flooding as far north as Pennsylvania and New Jersey. Hams throughout the affected areas repeatedly showed the value of amateur radio in disasters, as they maintained communications even as electric power, standard and cellular telephone systems failed.

One of the key information-gathering points for the ham network was the permanent amateur radio station at the National Hurricane Center in Miami, Florida (see inset). There, hams monitored HF networks as well as local VHF emergency nets patched in over the internet via Echolink and IRLP. Forecasters consider the "on the ground" reporting of conditions by amateurs in affected areas to be vital in making predictions and issuing appropriate warnings. Details are in this month's "Public Service" column on page 11. (Hurricane photo courtesy NOAA; NHC photo courtesy Julio Ripoll, WD4R.)

Photo D– The Bordon Radio Company One Tuber radio kit as received and unpacked prior to assembly, although I was overly impatient to start winding the coil before shooting this photo! Note pre-drilled holes to ensure quick success. Bordon also has some neat crystal set kits. Check them out at <www.xtalman.com>.

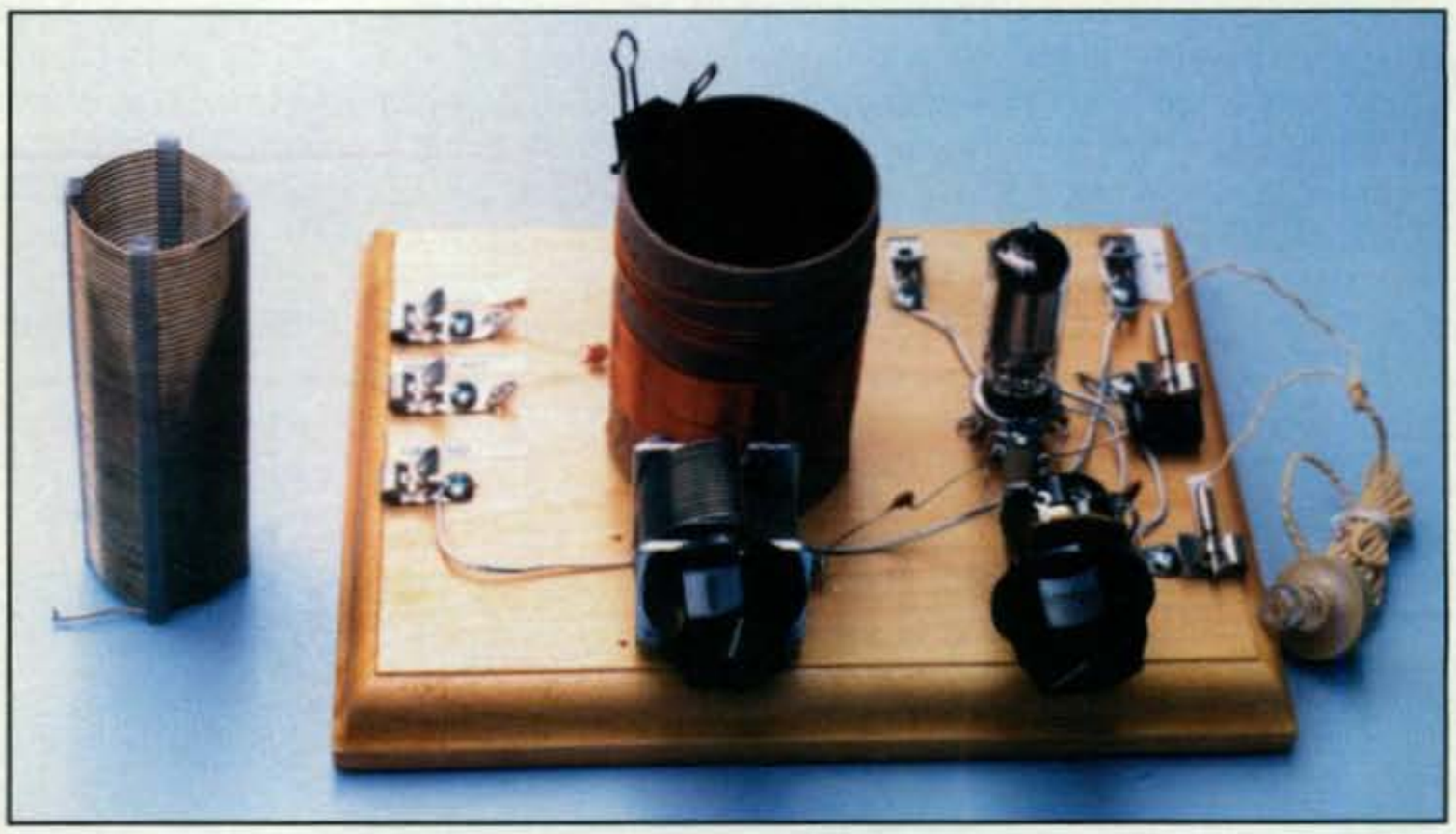

Photo E– The completed Bordon Radio Company One Tuber—well, almost. I was still dinking with coil turns for shortwave reception when shooting this photo. Note the cool decoupage plaque-type base! (Details in text.)

cept employed in the Ocean Hopper and Space Spanner. The only specs we could find on the Span Master, incidentally, were frequency coverage, tube lineup, and physical size. It was described simply as "a fine low cost and highly sensitive four band regenerative receiver covering the standard broadcast and shortwave bands and copying amateur phone and code transmissions alike." Impressive? You bet! That was heavy talk for Novices of the '50s!

One Tubers

In reviewing radio books and magazines of the 1950s, including back issues of *CQ*, we rediscovered another very special receiver we are sure you will find interesting to study—the little 354/3A4 One Tuber shown in fig. 1. This remarkable regenerative receiver was described (with minor circuit variations) in *Boy's Life* magazine and the ARRL's "How To Become A Radio Amateur" booklet during the 1950s, and we also included homebrewing tips (compliments of Arnold Sayre, W8WVM) in the September 1995 issue of *CQ*. Not only are receivers like this enjoyable to build, they are also a neat way to discover (or rediscover) the sheer pleasures of experimenting with simple electronics and hand-wound coils.

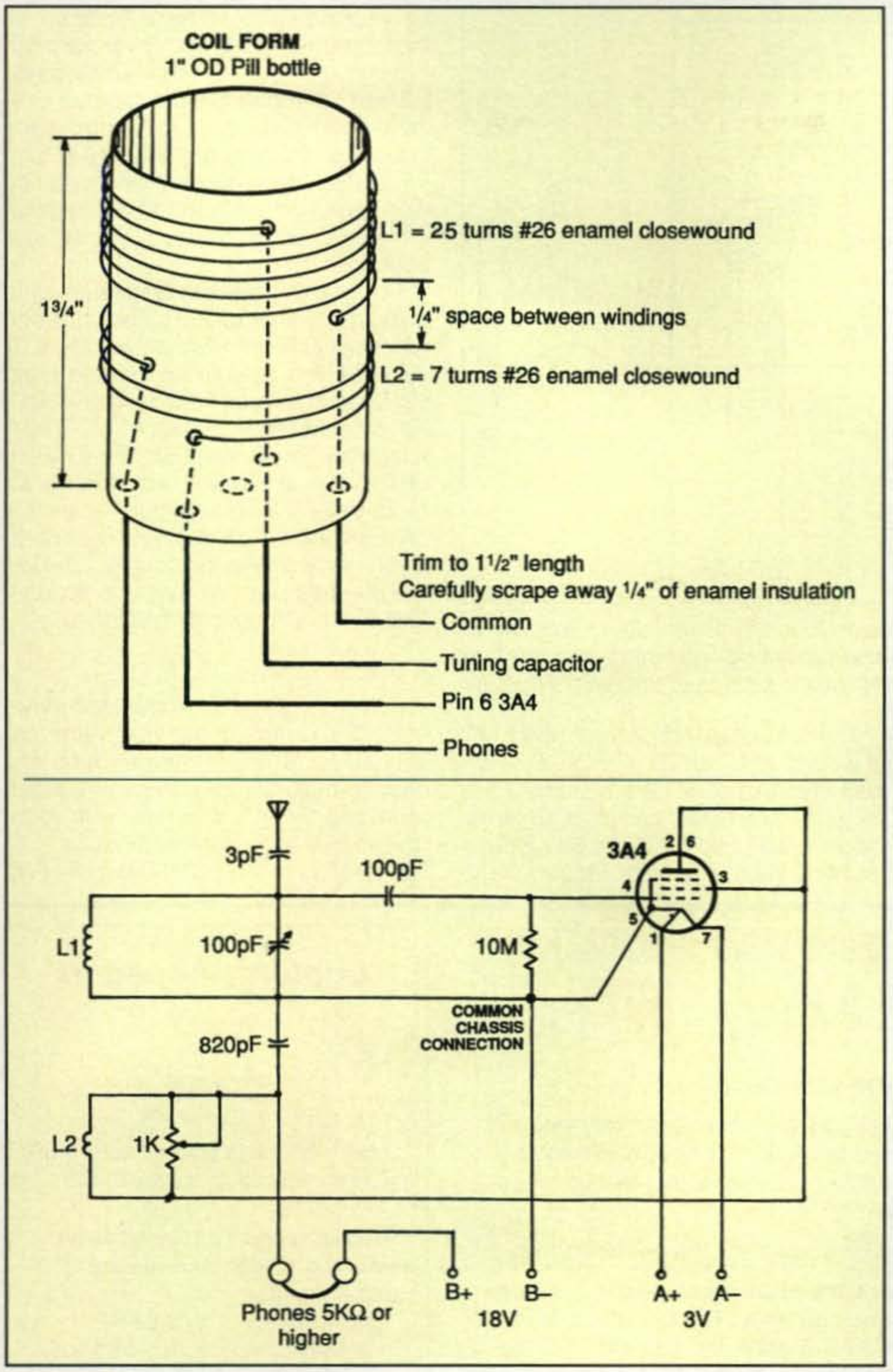

Fig. 1– Circuit diagram and coil-winding details for the 1950s-era One Tuber regenerative receiver. The little delight is battery powered and can be built for 40 or 30 meters. (Discussion in text.)

Here a 1-inch pill bottle serves as a coil form. Input coil L1 consists of approximately 25 turns for 40 meters or 20 turns for 30 meters. Tickler coil L2 is 7 turns for either band. It is spaced 1/4 inch above or below L1, and both coils use No. 24 or 26 wire. After assembly, set the regeneration control for a howl in the earphone (reverse L2 wires if no howl is heard). Then listen for the weakly radiated regen signal on a nearby receiver (an old 200-kHz per knob revolution receiver is handy here). Plot the observed tuning range, and then increase or decrease turns count as necessary to cover a desired frequency range. Experiment and enjoy!

A classy "breadboard" version of the 3S4 receiver is presently available in kit form from Lance Bordon, WB5REX, and the Bordon Radio Company (photos D and E and fig. 2). This kit radio tunes the

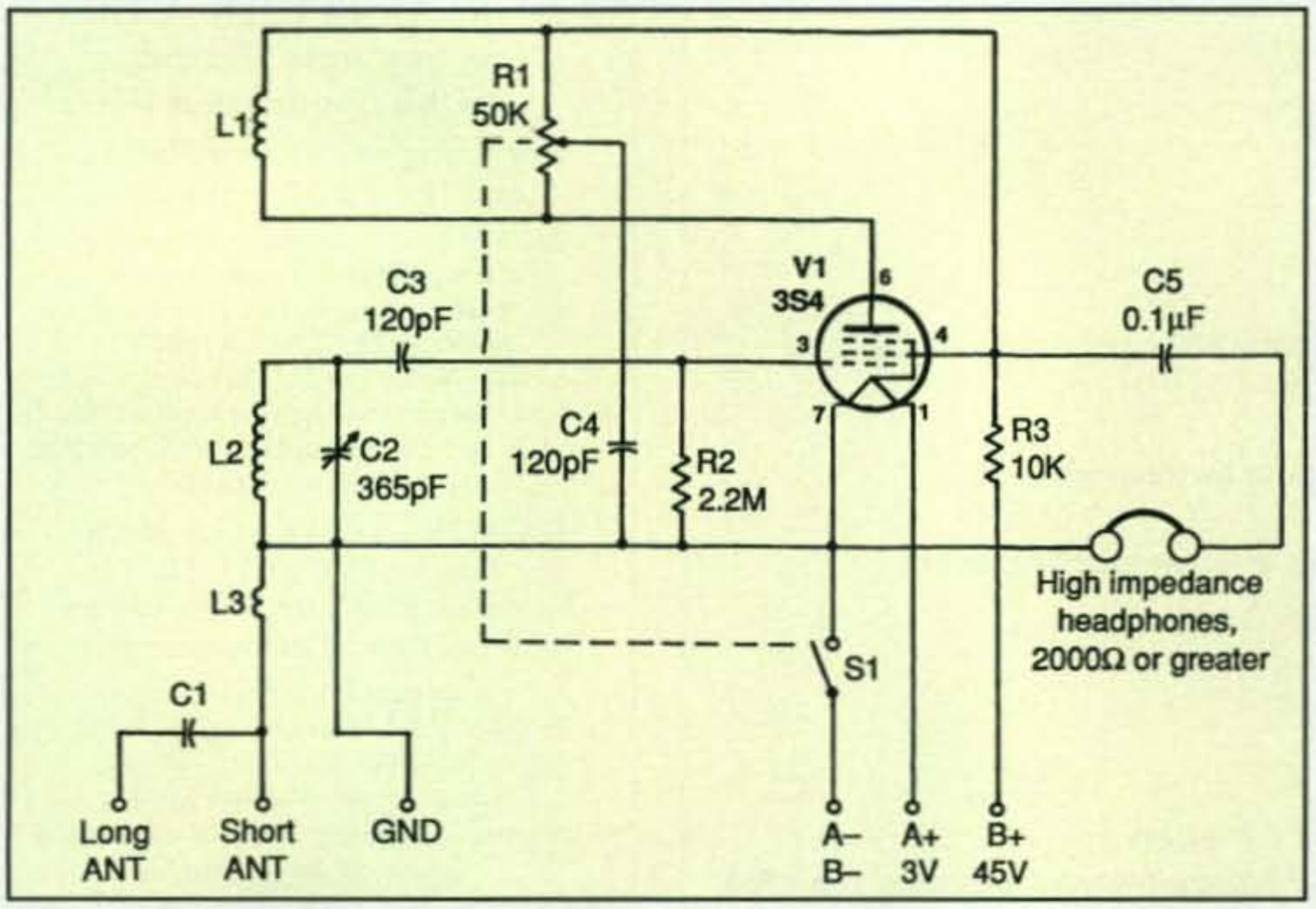

Fig. 2– Circuit diagram of the Bordon Radio Company One Tuber. Receiver is presently available in kit form. Included instructions for assembly are easy to understand, and they also feature an interesting discussion of the radio's history.

standard 550- to 1700-kHz AM band, but modifying it for shortwave reception is fairly easy with some patience and coil experimenting. Lance and I pursued the idea, compared notes, and arrived at the following figures.

The original (AM broadcast band) coil is wound with No. 26 wire on a 2-inch diameter form. Coil L2 is 55 turns, L3 is 20 turns, and tickler coil L1 is 15 turns. Decreasing L2 to 5 turns, L3 to 5 turns (spread over 1/2-inch length), and decreasing L1 to 15 turns (spaced 1/8 inch from L2/L3) gives coverage from around 4.8 to 7.05 MHz. Decreasing L2 and L3 to only 3 turns (spread over 1/2-inch length) and L1 to 10 turns gives coverage from approximately 6.5 to 11.0 MHz. As mentioned earlier, adding or subtracting one turn further "tweaks" coverage to fit various needs and situations.

Bordon is now developing plug-in coils for various ranges. The coils and full receiver kits should be available by the time this column appears in print. Check with Bordon Radio Co. at 13911 Kensington Place, Houston, TX 77034; telephone (evenings) 281-481-0149, or on the web at <www.xtalman.com> for more details. Why "xtalman"? Lance is quite involved in producing breadboard-style crystal sets, and a couple of the kits are real beauties. We will take a closer look at them in upcoming columns.

Conclusion

That winds down our notes and views of Golden Oldies for this year, gang, but stay tuned for even more exciting and easy-to-build romantic retros in 2005. It promises to be a fun time with more unique one-tube transmitters.

73, Dave, K4TWJ

Looking Ahead in CQ

Here's a look at articles we're working on for upcoming issues of *CQ:*

Details on the "CQ Gang" Award and WW2CQ 60th Anniversary Special Event

"Noisy Meteors," by W6BNB

"HF Meteor Scatter," by VE3ACK

"Still Chasing the Invisible Wave," by RV3IZ

"My Father, Ham Radio and Me," by K2MMT

Do you have a ham radio story to tell? See our writers' guidelines on the CQ website at <http://www.cq-amateur-radio.com/guide.html>.

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SS-12	10	12	1⅝ x 6 x 9	3.4
SS-18	15	18	1⅝ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅝	4.2
SS-30	25	30	3¾ x 7 x 9⅝	5.0

MODEL SS-25M

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

MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

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

WITH SEPARATE VOLT & AMP METERS

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

MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

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

WITH SEPARATE VOLT & AMP METERS

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

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

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

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

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antennas

BY KENT BRITAIN,* WA5VJB

Mounting Yagis

Scenario: The antenna designer—whether working with advanced NEC simulation software, a Larson-based program, hours of trimming and tweaking on the antenna range, or just a calibrated eyeball with a spit and a guess—has come up with an antenna design. All dimensions have been carefully calculated to .0001 inch and manufactured to 1/16th of an inch. *Now you're going to stick a 10-foot-long, 2-inch-diameter mast through the middle of that??* (See fig. 1.)

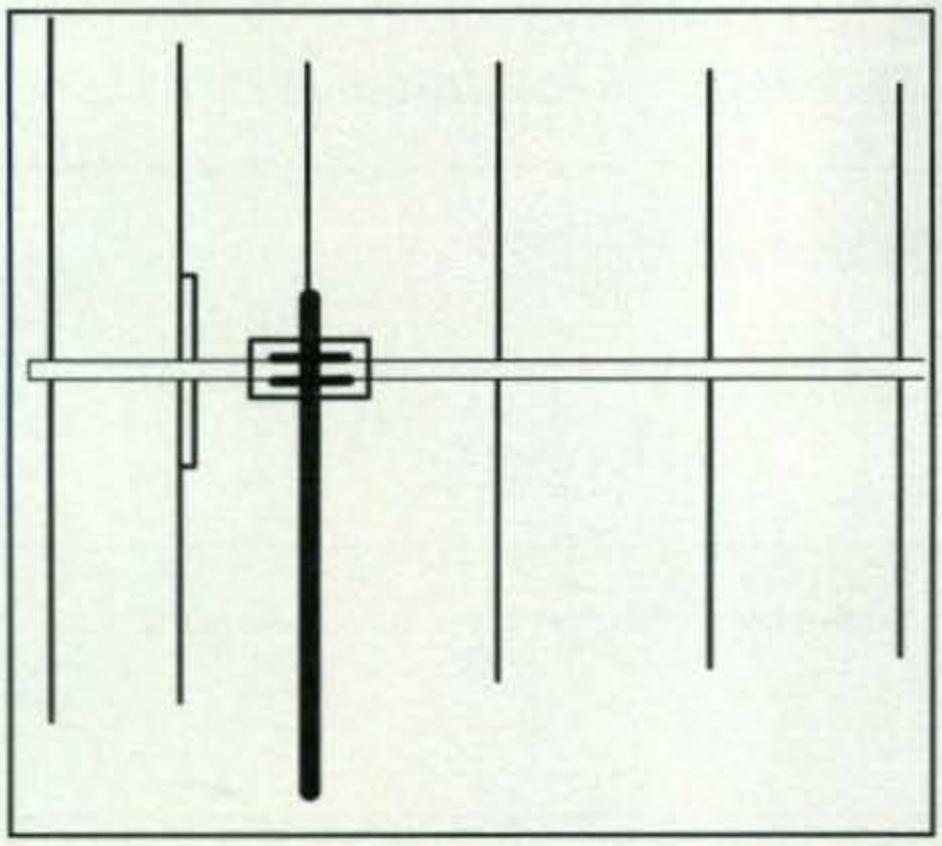

Fig. 1– Just about the worst way to mount your antenna, with the mast parallel to the elements and stopping halfway through.

That mounting mast is going to *drastically* change the pattern of your new antenna (see photo A). Saying, "Well, that's where they put the mounting clamps" is a poor excuse. The clamps are usually at the antenna's center of gravity, with few electrical considerations.

The issue of how best to mount a Yagi antenna has been hotly debated in the AMSAT community for years. Some incredibly elaborate mounting techniques had been developed to avoid degrading the gain and circular polarization of satellite antennas. At one point, WB5IPM asked me to test some antennas and find out just how much the mounting mast *did* change the antenna gain. I set up an 11-element, 432-MHz Yagi on the antenna range, stuck a mast through it, and started taking measurements.

With the mast coming in at a 90-degree angle to the element, as you'd find in a horizontally polarized antenna (see fig. 2), gain variation was less than .1 dB, and that .1 dB was when the mast was very close to an element. Gain variation was virtually undetectable when the mounting mast was placed between elements.

What about vertically polarized antennas? End mounting (fig. 3) also showed little variation. When

*1626 Vineyard, Grand Prairie, TX 75052
e-mail: <wa5vjb@cq-amateur-radio.com>

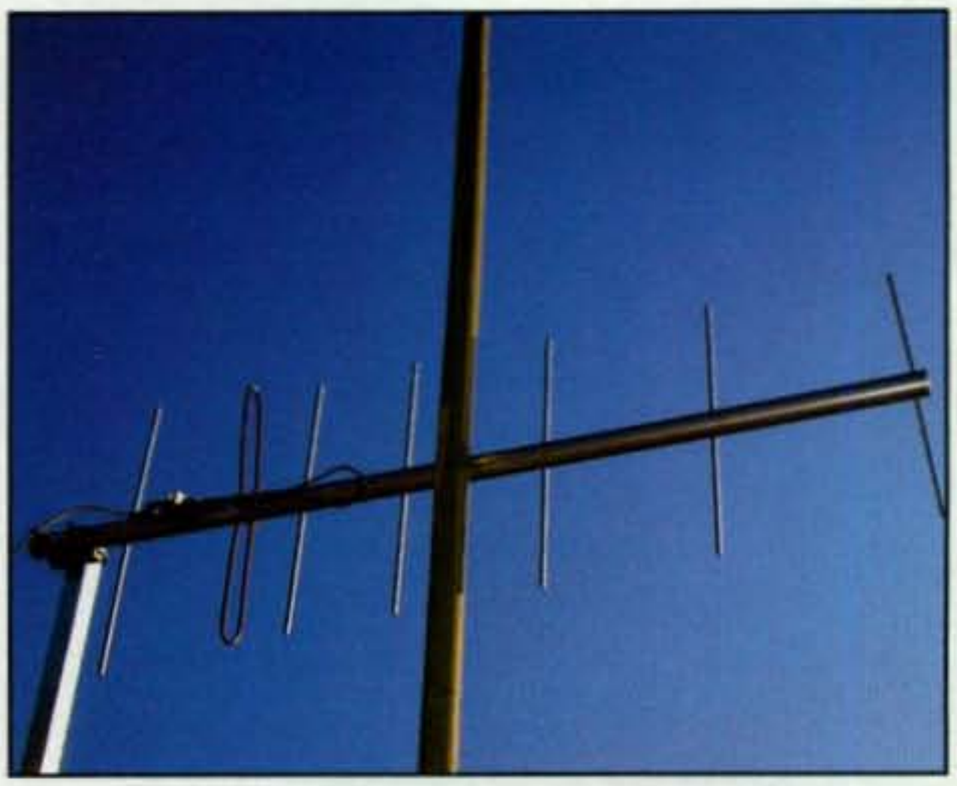

Photo A– Testing antenna-mast interaction.

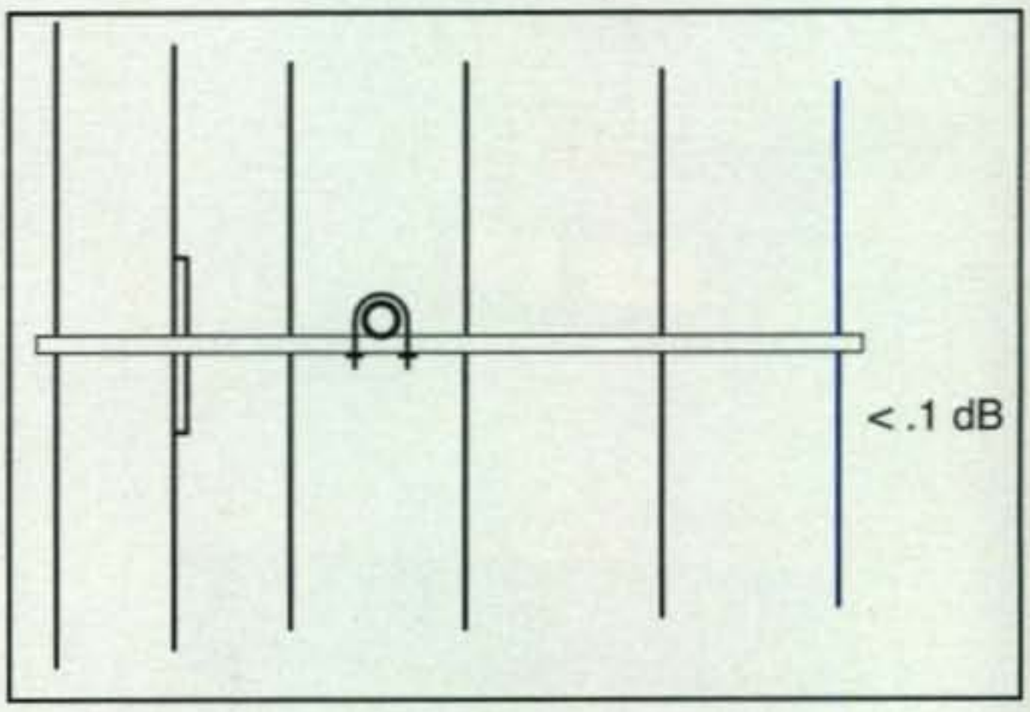

Fig. 2– Horizontally mounting a Yagi.

the mast was very close to the reflector, it would retune the reflector element and I could see some gain variation. There were also points at which the reflector and mast were 1/4 and 1/2 wavelength apart, which showed some interaction, but variation was rarely even .2 dB.

Mounting the mast through the antenna, but stopping at the boom (fig. 4), greatly detuned the antenna. As I tested different points along the mast, the gain varied from –3 dB to –11 dB. The greatest dips were when the mast was close to an element. If you absolutely have to mount a Yagi this way, put the mast equidistant between two of the director elements, and as far as practical from the driven element. Leave just enough mast above the boom for the clamp to attach firmly, but no higher. You want as little mast above the boom as is practical.

Mounting the mast completely through the antenna (fig. 5) really messed it up, and again, having the mast close to an element showed the greatest loss in forward gain. I have often seen 2-meter antennas mounted under a tribander this way, but the pattern is closer to omnidirectional than the expected beam pattern. Mount a Yagi this way only when you have no choice (anything in the air is

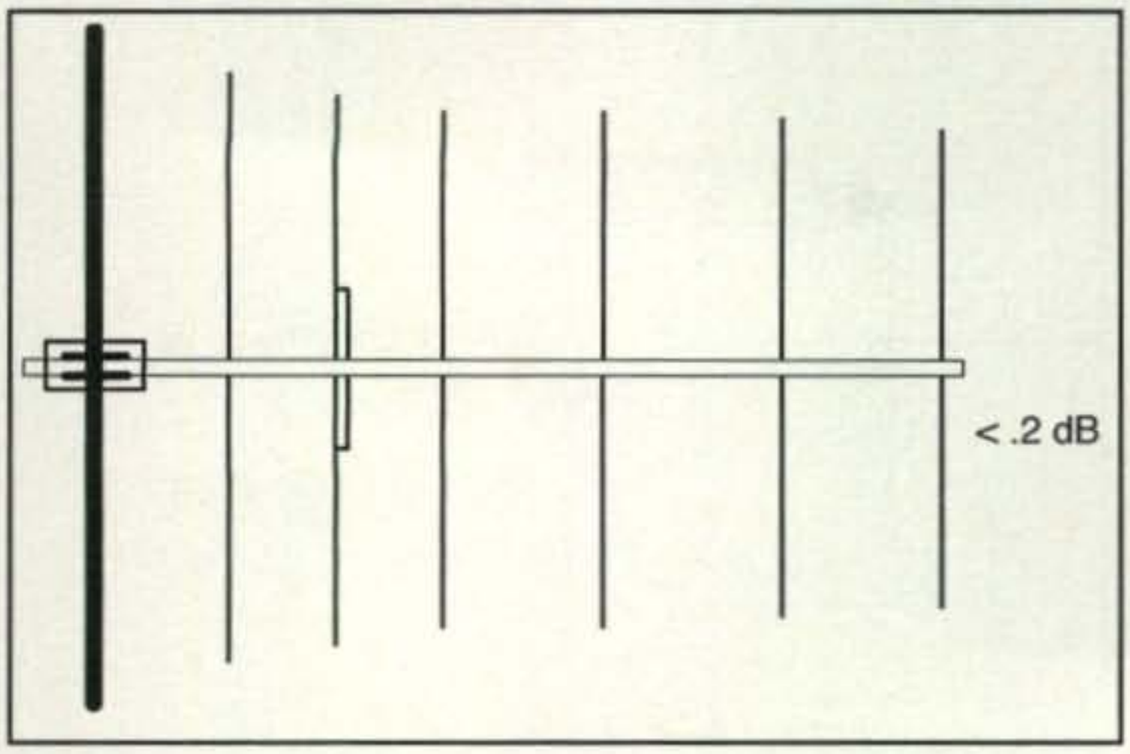

Fig. 3– End mounting a Yagi.

Fig. 4– Mid mounting a Yagi.

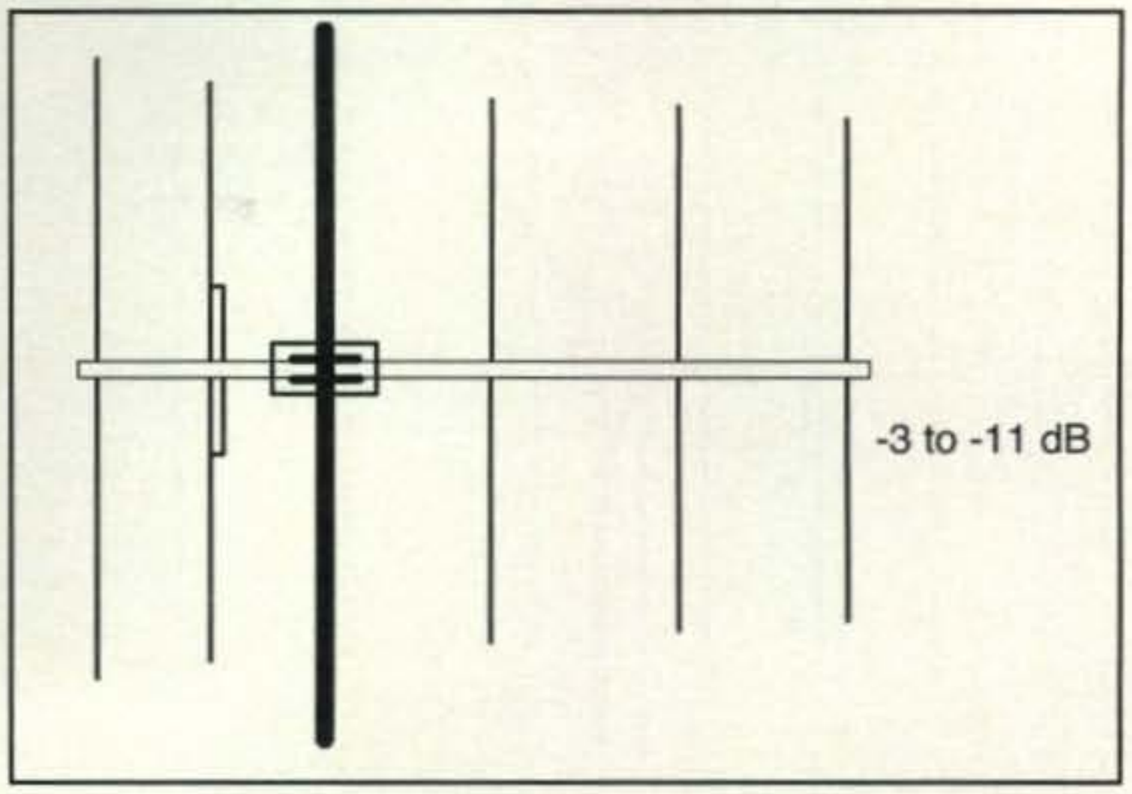

Fig. 5– Mid mounting a Yagi on a short mast.

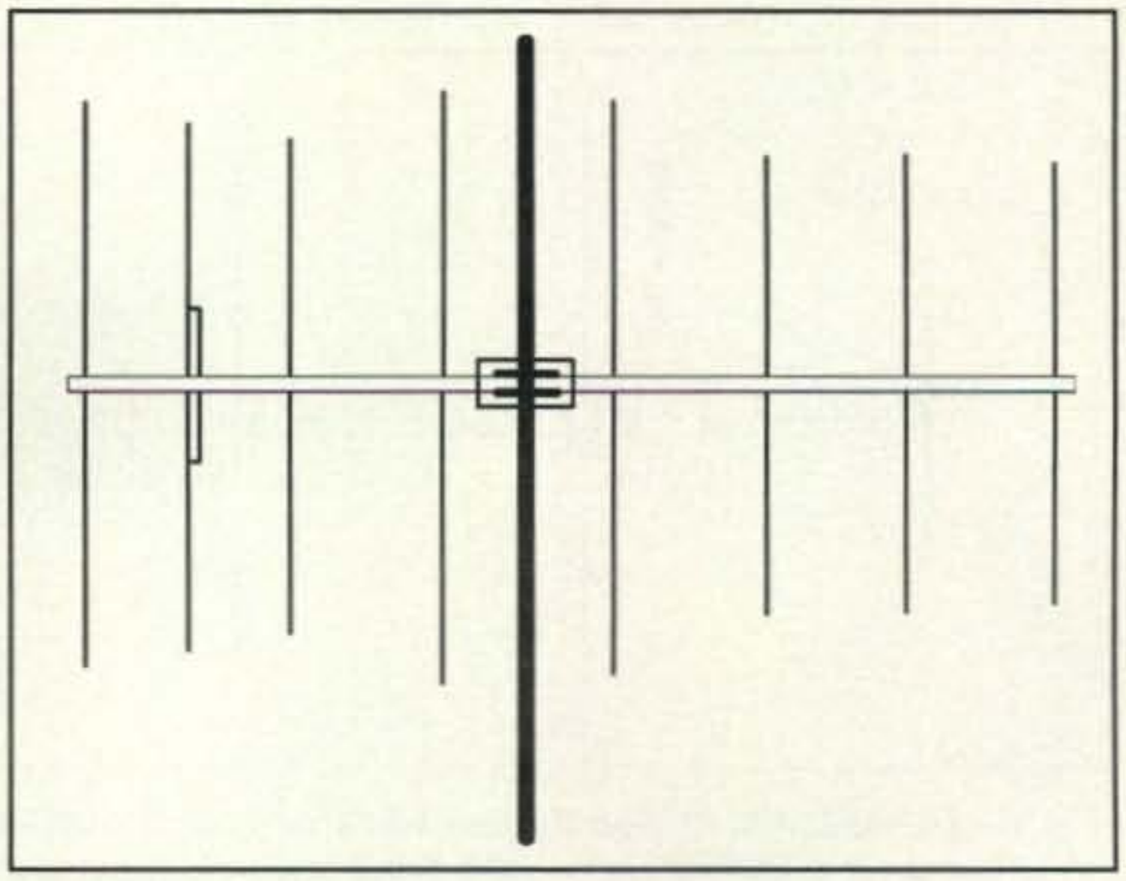

Fig. 6– Electrical effects of a mast through a Yagi.

better than the perfect antenna still in its box), but don't expect good performance.

It's not the mast itself, but its coupling effect to the Yagi elements, that's the culprit. A long non-resonant conductor passing near an antenna has surprisingly little effect on the antenna pattern. However, in a highly tuned Yagi, the element lengths are quite critical. The Yagi elements closest to the mast couple to the mast and are now much longer electrically, resulting in a Yagi that acts like the one in fig 6. It would be possible to come up with a cut chart for a Yagi, "Trim Elements 4 and 5 xx inches if vertically mounted through a mast," but I have never seen this done. Maybe I'll get some antenna engineers thinking...

What About Plastic?

So you're going to be clever and use a non-conductive mast. A light antenna with a plastic mast or some expensive fiberglas rod can be used successfully. However, if you route your coax along the boom and back down your non-conductive mast (fig. 7), you have accomplished *nothing*! To the antenna, your coax looks just like a metal tube. Many satellite stations have had their coax routed out the back of the antenna and back to the mast in a big loop. Electrically this was fine, even if it did have a lot of extra coax loss.

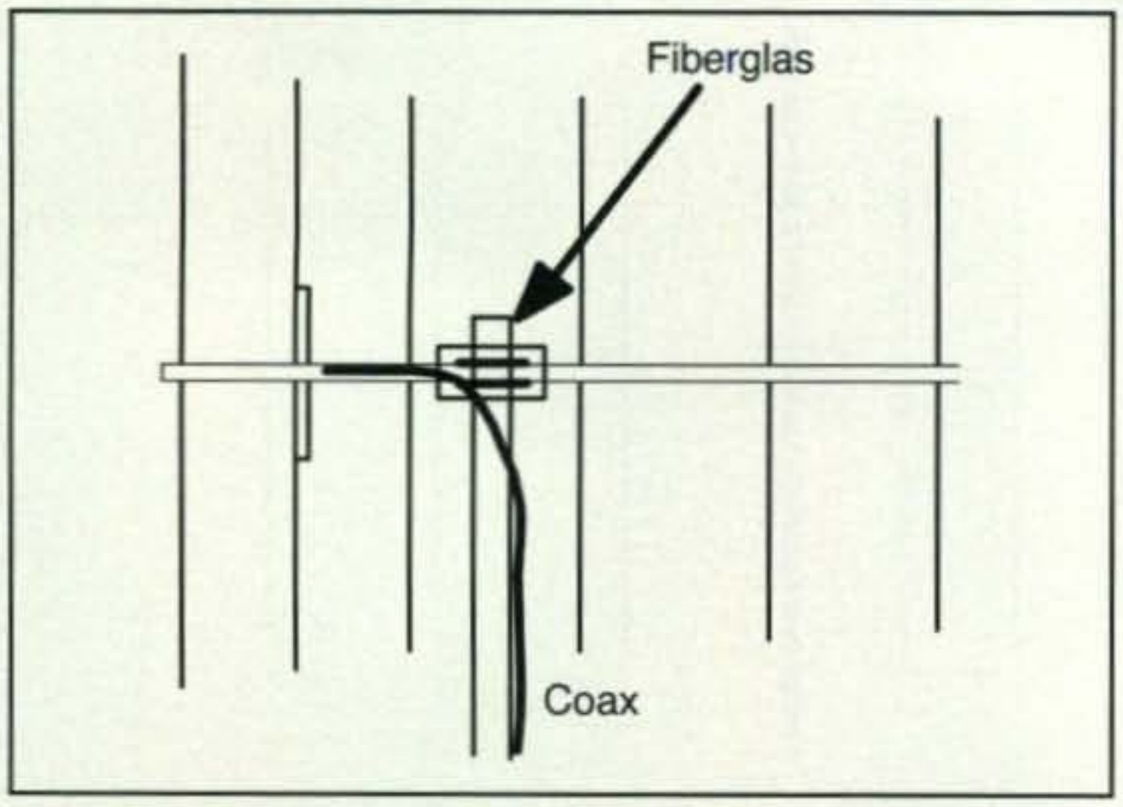

Fig. 7– Using a nonconductive mast won't help if you run the coax along it..

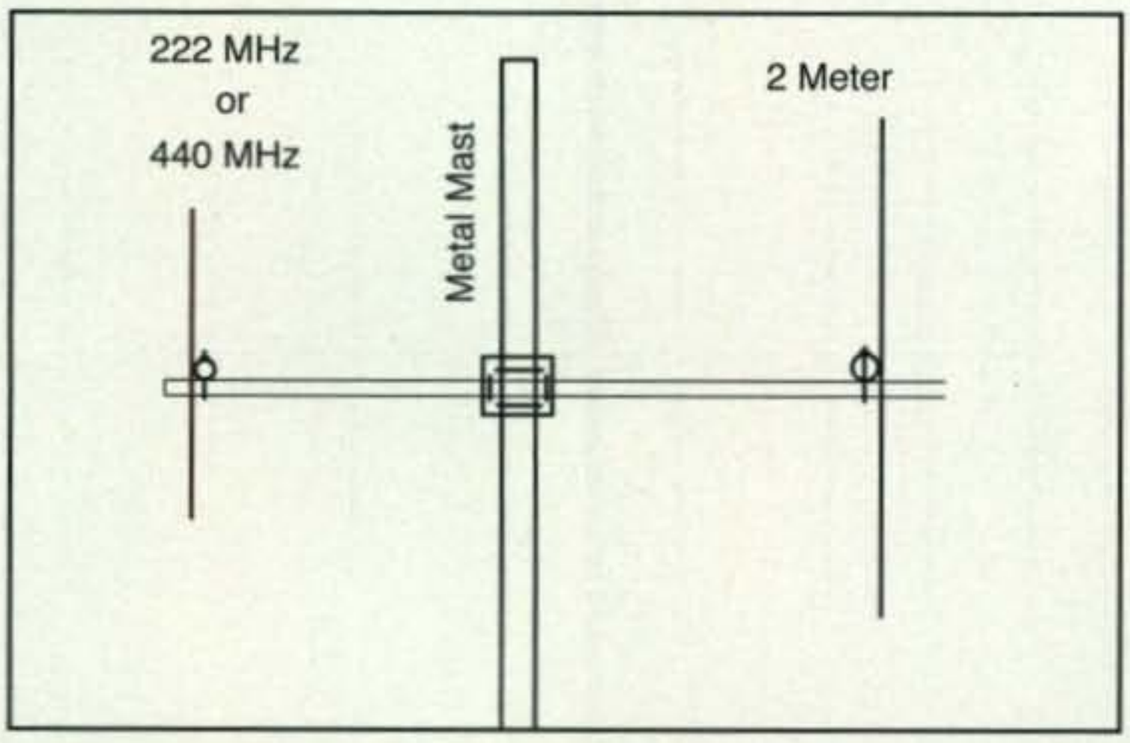

Fig. 8– The best way to mount your vertical polarized Yagi(s) is by using an additional horizontal cross boom to separate the antenna(s) from the mast.

Mechanically, though, it was a poor solution; tail heavy and with a weak mast, they flopped around a lot and often broke during storms.

How *Should* I Mount Them?

End mounting is best but is limited to small antennas. For bigger antennas, using an additional horizontal cross-boom to move the antenna away from the mast and feedline (fig. 8) will give the best results. If you can get the Yagi even a quarter of a wavelength away from the mast, it does wonders for the pattern. A half wave or more is even better if you can wrangle it. For 2 meters, this would be about 2 feet. Just get it away from that metal mast!

Circular Polarization

On 145 and 435 MHz, many AMSAT stations generate circular polarization (CP) by feeding a vertical and a horizontal Yagi 90 degrees out of phase. A good circularly polarized signal depends on the two antennas having the same gain. When mounted as shown in fig. 9A, the boom messes up the pattern of one of the antennas and the signal is no longer CP. If you probe a piece of metal near a Yagi element and watch the gain of the Yagi, it's the tips of the elements that are most sensitive. Therefore, it's just the tips of the Yagi elements we need to keep away from the extra metal. Rotating the antenna 45 degrees, as shown in fig. 9B, will eliminate the problem.

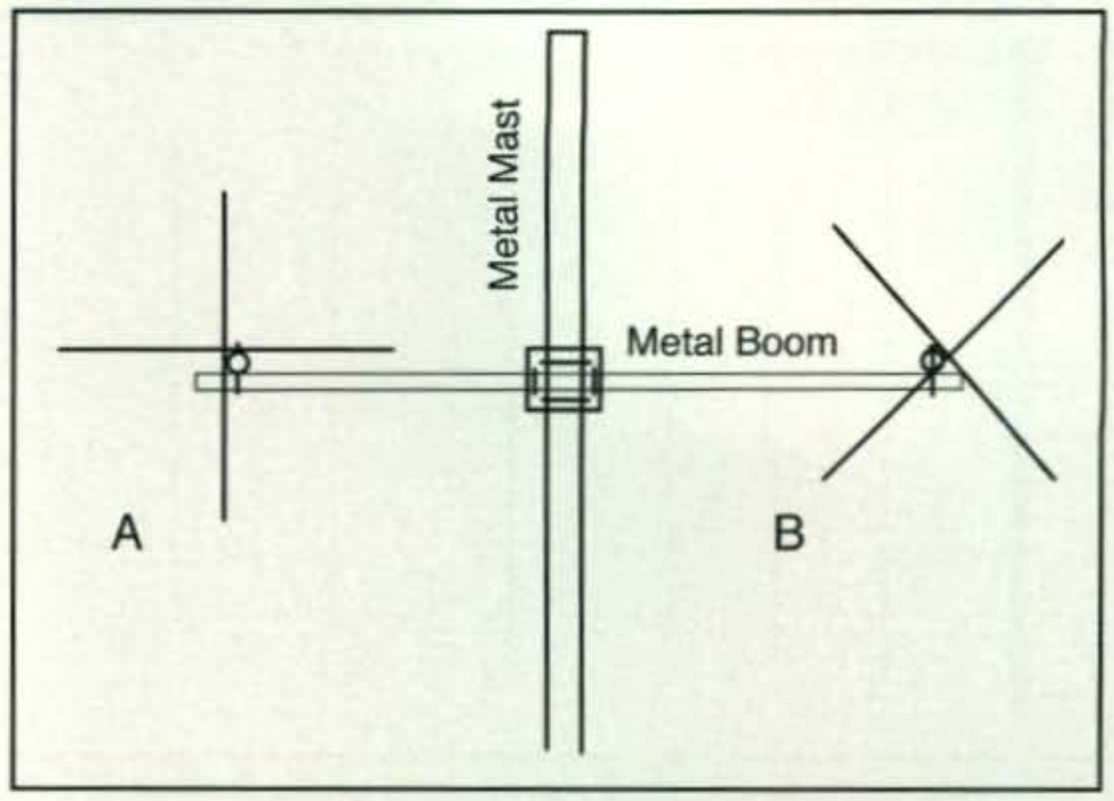

Fig. 9– Mounting circularly polarized satellite antennas without affecting polarization. (See text for details.)

A Solid Mount for Your Circularly Polarized Satellite Antenna

1. Mount the mast clamp exactly between two elements, as far from the driven element as mechanically practical.
2. Have your mast extend only an inch or so beyond the Yagi boom. Leave enough space for the U-bolt to get a good grip, but no more.
3. Rotate the mast until the elements are X fashion, as in fig. 9B.
4. Now you can run the coax back along the antenna boom and along the cross boom.

This is mechanically stronger, you can use a metal cross boom, and there is a lot less coax loss.

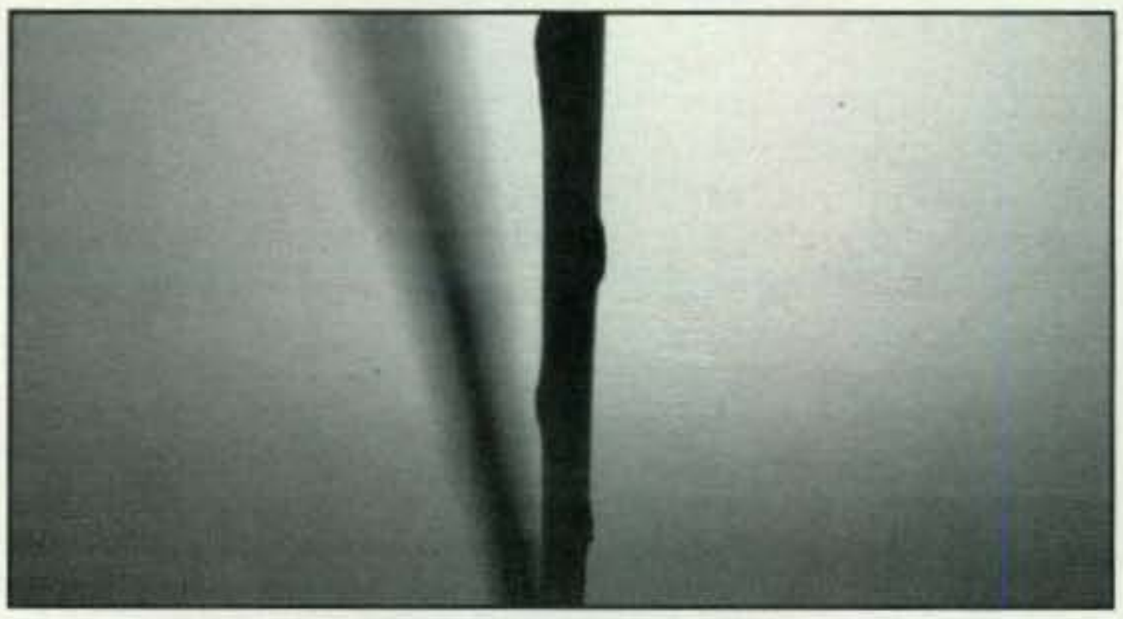

Photo B– Flutes on car-radio antennas.

FYI

I've heard some rather crazy speculation recently about those flutes or ridges you see spiraling down automotive AM-FM antennas these days (see photo B). No, the spirals are not a new form of antenna loading coil. A taut wire in a strong wind will vibrate or even sing. The flutes break up the wind and pretty much kill any resonances. This just makes the car a fraction of a dB quieter, with no effect on radio reception.

What do we talk about next time? You're always my best source of ideas, so let me know. 73, Kent, WA5VJB

Digital-to-Analog Converter, Antenna Stack Switch, Phantom Antenna . . .

BY KARL T. THURBER, JR.,* W8FX

This month in your "What's New" column we'll present some noteworthy hamshack accessories, antennas and antenna accessories, software, books, and more. Let's dig right in.

Accessories for the Radio Shack

New Goodies from MFJ. The innovative folks at MFJ have come up with several interesting new hamshack accessories we would like to bring to your attention this month.

First up is the new MFJ-134RC In/Out Temperature/Calendar Atomic Clock (see photo A). The new high-tech clock, with its indoor and outdoor temperature sensors and very large time digits, receives very accurate time from the National Institute of Standards and Technology (NIST) station WWVB in Ft. Collins, Colorado. This means saying goodbye to manual clock resetting because of Daylight-Savings Time (DST) adjustments. The clock can be set to UTC, since it has a DST on/off option and different time-zone settings. The $39.95 clock features various alarm settings, calendar display, weekday display, and choice of English, French, or Spanish languages. The clock may be wall- or desk-mounted, and its outdoor sensor is wireless.

Next up is the MFJ-6404 Transceiver/Accessories Travel Case (photo B), designed for on-the-go applications—including portable operation, DXpedition use, and the like. The heavy-duty hard case can take a beating but still keep your delicate electronic gear safe with its universal foam insert. The

*289 Poplar Drive, Millbrook, AL 35054-1674
e-mail: <w8fx@cq-amateur-radio.com>

Photo A– The MFJ-134RC In/Out Temperature/Calendar Atomic Clock, with its indoor and outdoor temperature sensors and very large time digits, automatically receives precision time data from station WWVB in Ft. Collins, Colorado. The clock features a choice of English, French, or Spanish languages. (Photo courtesy MFJ Enterprises)

Photo B– The MFJ-6404 Transceiver/Accessories Travel Case is designed for the on-the-go ham. The heavy-duty hard case can take a beating but still keep your delicate electronic gear safe with its universal foam insert, which can be shaped to custom-fit a wide variety of equipment. (Photo courtesy MFJ Enterprises)

Photo C– The MFJ-5429 RS-232 to USB Adapter is a dB-9 male RS-232 serial port to USB 1.1 port adapter cable. You can use this handy gadget to connect serial port devices to a computer with no serial ports. (Photo courtesy MFJ Enterprises)

Photo D– AOR has created the ARD25 Multimode Data Receiver, an APCO25 Digital to Analog Conversion Unit, for use with receivers that have a 10.7-MHz IF output. The adapter processes the 10.7-MHz signal, converts the digital transmission, and sends it to the internal speaker or your station speaker. (Photo from the AOR USA website)

Photo E– One of Comtek's newest products is the STACK-2 2-High Stack Switch for tribanders, log periodics, or monobanders from 40 to 10 meters. You simply run two equal lengths of 50-ohm coax from the STACK-2 to each antenna and a three-conductor control line to enjoy increased performance in contests or chasing DX. (Photo from the Comtek website)

insert can be shaped to custom-fit your electronic equipment, radio gear, computer laptop, camera gear, and the like.

The $39.95 case comes with a black handle, a long red-and-blue carrying strap, and two sets of keys. Corners are riveted with extra metal pieces to guard against wear and tear. A major plus is that you can purchase inexpensive extra foam inserts for the MFJ-6404, which will allow you to customize foam shapes for different types of equipment.

Also new from MFJ for your computer gear is an RS-232 to USB Adapter. The MFJ-5429 (photo C) is a dB-9 male RS-232 serial port to USB 1.1 port adapter cable. It comes with a driver for Windows® 98/ME/2000/XP on a 3.5-inch floppy disk. You can use this handy device, priced at $24.95, to connect serial-port devices to a computer with no serial ports. Also in the same family of adapters is the MFJ-5427 USB-to-Parallel Port Cable/Adapter (not pictured), which lets you use a computer USB port to print to a parallel printer, using USB and DB-25 female connectors. The MFJ5428 (also not shown), is essentially the same as the MFJ-5427, but it has USB and Centronics 36-pin male connectors. Drivers also are included for the MFJ-5427 and MFJ-5428 adapters.

For additional information or a free catalog, contact MFJ Enterprises, Inc., 300 Industrial Park Rd., Starkville, MS 39759 (1-800-647-1800; e-mail: <mfj@mfjenterprises.com>; on the web: <http://www.mfjenterprises.com>).

AOR ARD25 Digital to Analog Conversion Unit. Many high-quality receivers were "left behind" when some public agencies began to use APCO Project 25 digital modulation. To fill this gap, AOR has created an APCO25 digital decoder for use with receivers that have a 10.7-MHz IF output. Now you can receive standard (unencrypted) APCO Project 25 digital signals using an ordinary analog receiver that has a 10.7-MHz IF output.

The ARD25 Digital to Analog Conversion Unit, also known as the ARD25 Multimode Data Receiver (photo D), processes the 10.7-MHz signal, converts the digital transmission, and sends it to the internal speaker or to your station speaker. Thus, if your receiver has a 10.7-MHz output port, the ARD25 can translate these digital signals to intelligible audio. In addition, you can also channel your receiver's analog output through the ARD25. It will automatically recognize analog signals and pass them to the ARD25 internal speaker or to an external station speaker.

The ARD25 features ease of connection and operation, compact size, no need for receiver modifications, the ability to let analog signals pass through, and data output through an RS-232C serial port. Receivers that can use the ARD25 include the AOR ARONE, the AR8600 series and AR5000 series, as well as other receivers and monitors that have a 10.7-MHz IF output port.

There are limitations: The ARD25 is not effective on systems that use encryption or digital modulation other than APCO Project 25. It can't translate signals from receivers that do not have a 10.7-MHz IF output, as the full channel band-

Photo F– The LDG Electronics AT-100Pro Memory Automatic Antenna Tuner is a full-featured, frequency-sensing, memory autotuner designed for today's HF radios. It features dual antenna connectors with over 2000 memories for each antenna. Details are in the column. (Photo from the LDG Electronics website)

width is needed to convert the signal from digital to analog. Also, the ARD25 does not add trunking capabilities to your receiver, and some jurisdictions may limit the use of devices such as the ARD25.

For more information and pricing, contact AOR U.S.A., Inc., 20655 S. Western Ave., Suite 112, Torrance, CA 90501 (310-7878615; e-mail: <info@aorusa.com>; on the web: <http://www.aorusa.com>).

Antennas and Antenna Accessories

STACK-2 2-High Stack Switch from Comtek Systems. Comtek Systems is now in its 15th year of manufacturing its Four-Square Hybrid Phased Array Systems. The company manufactures several antenna solutions for the amateur radio enthusiast.

One of the firm's newest antenna solutions is the affordable STACK-2 2-High Stack Switch for tribanders, log periodics, or monobanders from 40 to 10 meters (photo E). The STACK-2 features Amphenol silver-tip connectors, MOVs (a Comtek standard since 1994), Potter & Brumfield relays, and a 2.4-inch OD UNUN (unbalanced to unbalanced transformer) that provides reliability at 3-kW maximum power levels. You simply run two equal lengths of 50-ohm coax from the STACK-2 to each antenna and a three-conductor control line to enjoy increased performance in contests or chasing DX. The unit is $194.95 plus s/h.

Antenna aficionados should note that other popular products offered by Comtek include the ACB-4 Hybrid Phasing Coupler, RCAS8 Remote Antenna System, RR-1 61-Hole Radial Ring, SYS-3 Stack Yagi System, and the VFA-4 Vertical Feedpoint Assembly. Details on these products are found on the company's website.

For more information, contact Comtek Systems, P.O. Box 470565, Charlotte, NC 28247 (phone 704-542-4808; e-mail: <comtek4@juno.com>; web: <http://www.comteksystems. com>).

The Comtek website features a convenient, secure ordering system.

AT-100Pro Memory Automatic Antenna Tuner from LDG. For several years we have noted many excellent products from Dwayne Kincaid, WD8OYG, of LDG Electronics. We think you will be impressed with this one.

The new LDG AT-100Pro Memory Automatic Antenna Tuner (photo F) is said to be the next step in the evolution of the automatic tuner. This desktop tuner covers all frequencies from 1.8–54 MHz, automatically and quickly matching your antenna. It features a two-position antenna switch, allowing you to switch instantly between two antennas. The AT-100Pro requires just 0.1 watts to operate, but will handle up to 125 watts, making it suitable for everything from QRP up to a typical 100-watt transceiver.

The AT-100Pro includes over 2000 memories for each antenna, automatically storing tuning configurations for each frequency and band as you use them. Frequency-sensing circuitry lets the AT-100Pro "know" your operating band and frequency. Whenever you transmit on or near a frequency you've used before, the AT-100Pro can retune from memory almost instantly.

Rugged, easy-to-read LED bar graphs show power and SWR, and a function key on the front panel lets you access data such as mode and status. The AT-100Pro uses latching relays which retain the tuned configuration indefinitely even when powered down.

The AT-100Pro uses LDG's state-of-the-art processor-controlled Switched-L tuning network. It will match dipoles, verticals, inverted-Vees, or virtually any coax-fed antenna. With an optional LDG balun, you can also use longwires or antennas fed with ladderline. Control from the front panel is simple and straightforward, and optional interfaces are available for most ICOM, Kenwood, Yaesu, and Alinco transceivers.

Contact LDG Electronics, 1445 Parran Rd., St. Leonard, MD 20685 (1-877-890-3003; e-mail: <ldg@ldgelectronics.com>; on the web: <http://www.ldgelectronics.com>).

Antenex Cellular/PCS Dual Band Phantom Antenna. It's interesting to note what spectrum users other than radio amateurs are using in the antenna department. Here's an intriguing one.

Photo G– The new Antenex Cellular/PCS Dual Band Phantom® Antenna is now available from Antenex in a dual-band cellular/PCS configuration. It operates simultaneously on the cellular (821–896 MHz) and PCS (1850–1970 MHz) bands. (Photo courtesy Antenex)

We're referring to the new Phantom® antenna, now available from Antenex in a dual-band cellular/PCS configuration (photo G). The new, patent-pending design operates simultaneously on the cellular (821–896 MHz) and the PCS (1850–1970 MHz) bands. With dual-band capability, the antenna can be installed without concern for whether the user has roamed from a digital to an analog system or vice-versa. In a permanent-installation project, the antenna eliminates the need to predict what system is available at any given location.

The antenna features a patented field design that compensates for signal fading in highly reflective or mobile environments. This technology is said to be beneficial when high performance is desired and ruggedness and low profile are required. The new antenna is available with a standard NMO mounting socket for mobile applications, or with a permanent stud mount for fixed-station operation. It's also available in an attractive molded white on bright chrome finish, or in molded black on black chrome for covert operations.

For more information and pricing, contact Antenex, 2000-205 Bloomingdale Road, Glendale Heights, IL 60139 (1-800-323-3757; e-mail: <sales@antenex.com>; on the web: <http://www.antenex.com>).

Software and Computers

Topo USA 5.0 Mapping and Navigation Software from Delorme. When is a map not just a map? Delorme suggests it's when you create it with Topo USA 5.0, which joins the firm's many high-quality mapping and navigation software packages. The new software (see fig. 1) features automatic routing on trails and roads, advanced map customization and printing, nationwide campground information, and GPS compatibility. It also includes $50 of free aerial and satellite imagery downloads with purchase.

Topo USA 5.0 provides up-to-date map detail and the routing, GPS, editing, and printing capabilities to create exactly the maps needed for any outdoor adventure—including some of those favored by radio amateurs. Not simply the product of outdated scanned maps, Topo USA 5.0 maps are built from the ground up with USGS digital map data plus the latest DeLorme street network.

With Topo USA 5.0 you can view imagery in the split-screen window to better preview the terrain. Also included is the ability to link photos and web addresses to maps, 360-degree 3-D map views, downloadable campground locations, and new GPS tools. You actually get five maps in one: a topographic map, a shaded relief map, a 3-D shaded relief map, a trail map, and a road map. Topo USA 5.0 lets you route automatically for all of them.

The new product is conveniently available on a single DVD or on multiple CDs. For more information, including disc media options and product pricing, contact DeLorme, Two DeLorme Drive, P.O. Box 298, Yarmouth, ME 04096 (1-800-561-5105; on the web: <http://www.delorme.com>).

From the Bookshelf

New Quick Reference Mini-Manuals from Nifty! Ham Accessories. Bernie Lafreniere, N6FN, let us know of another addition to his growing series of quick reference guides for various ICOM, Kenwood, and Yaesu radios.

We're referring to the new IC-756PRO and IC-756PROII Mini-Manuals™, which provide coverage for ICOM's popular IC-756 PRO and PROII models (photo H). These short-form manuals are organized for quick access to simplified, step-by-step instructions for programming and operating the radios' many features. All controls and setup menus are fully described. Also included are convenient memory joggers for instantly recalling how to set up and operate your radio.

Printed in color and laminated for durability, the compact, 4.5" × 8" Mini-

Fig. 1– Topo USA 5.0 Mapping and Navigation Software from DeLorme features automatic routing on trails and roads, advanced map customization and printing, nationwide campground information, GPS compatibility, and much more. A sample Topo USA 5.0 interface screen is shown here. Details are in the text of the column. (Image courtesy Delorme)

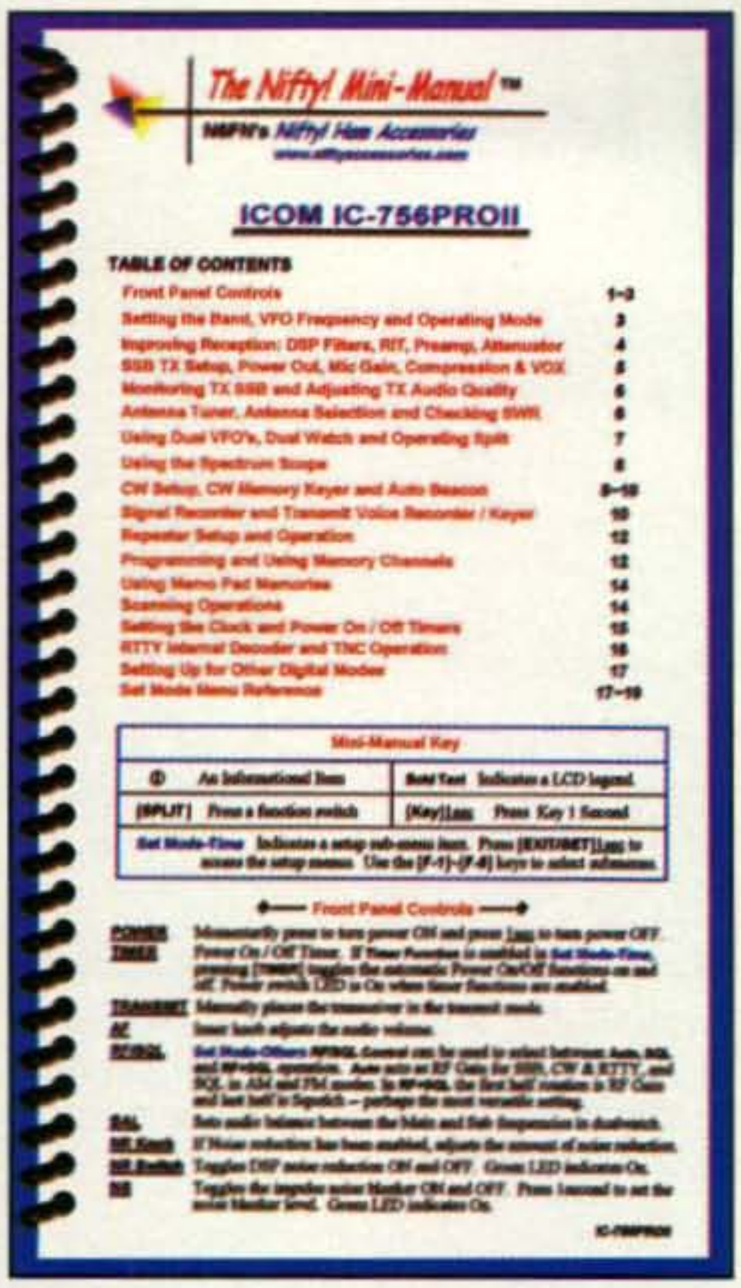

Photo H– The IC-756PRO and IC-756PROII Mini-Manuals, which provide coverage for ICOM's popular IC-756 PRO and PROII models, are organized for quick access to simplified, step-by-step instructions for programming and operating the radios' many features. The IC-756PROII Mini-Manual is shown here. (Photo courtesy Nifty! Ham Accessories)

Manuals are designed as ready references to be kept with the radios they support—so they are there when you need them. The new Mini-Manuals are $20.85 each, plus s/h. Contact Nifty! Ham Accessories, 1601 Donalor Drive, Escondido, CA 92027; (760-781-5522; e-mail: <berniel@niftyaccessories.com>; and on the web: <http://www.niftyaccessories. com>).

New Cebik Antenna Book. We mainly think of MFJ as a manufacturer of hamshack gear, accessories, and antennas, but MFJ also is very much into publishing. Hot off the press is the new *Antennas from the Ground Up*, Vol. 2, Numbers 22 to 42, by respected antenna authority L. B. Cebik, W4RNL.

The new W4RNL volume (MFJ-3307, $19.95), with the MFJ Publishing Company's imprint, takes up where Volume 1 left off, providing the relative newcomer to amateur radio antennas with enough information—in small doses—to develop reasonable expectations of his or her antennas, feedlines, and antenna tuners. Written in non-mathematical terms, the book continues the compendiums of antenna patterns, adding horizontal loops, inverted-Vees, and quadrant antennas to those in Volume 1.

The 205-page book—a collection of some 21 W4RNL papers, or "episodes," plus a foreword and an afterword—also includes information on verticals, loops, and terminated antennas. Grounding, installing, and maintaining antenna systems also are discussed. The book ultimately aims to prepare you not only for building your own practical wire antenna system, but also for digging further into the art and science of antennas.

For more information, contact MFJ Enterprises, Inc., 300 Industrial Park Rd., Starkville, MS 39759 (1-800-647-1800; e-mail: <mfj@mfjenterprises.com>; and on the web: <http://www.mfjenterprises.com>).

New Universal Radio Communications Catalog. Universal Radio has been offering quality amateur and shortwave equipment from its Ohio location for over 62 years, being founded in 1942. The company carries all major lines of amateur and shortwave radio equipment, antennas, and accessories.

Universal Radio has issued its periodic update to its always well-illustrated, large-format catalog—seemingly one of the few firms left that don't require you to visit their website to view their wares. The 104-page 2004 Universal Radio Communications Catalog is both an excellent ordering and reference resource that covers equipment for the amateur radio, shortwave, and scanner buff alike. A large selection of accessories also is featured.

The new catalog is available free upon request. For your copy, send an e-mail to <dx@universal-radio.com> with your name and address, stating that you would like to receive the catalog in the mail. For more information, contact Universal Radio, Inc., 6830 Americana Parkway, Reynoldsburg, OH 43068-4113 (1-800-4313939; e-mail: <dx@universal-radio.com>; on the web: <http://www.universal-radio.com> or <http://www.rffun.com>). Also available is an online catalog that includes much more than the print catalog can cover.

Note: We should also note that Universal Radio's affiliate, Universal Radio Research, offers the popular <DXing.com> website, billed as "The Web Resource for Radio Hobbyists." Universal Radio Research sponsors this informative website, originally created by noted author Harry Helms, for radio enthusiasts. The site is oriented toward a broad spectrum of radio interests, including shortwave radio listening, radio basics, receivers, scanner monitoring, ham radio, AM band and longwave DXing, clandestine and pirate radio, TV/FM DXing, and more. A number of useful radio links are provided. Check out the site at <http://www.DXing.com>.

Wrap-Up

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

Overheard: One thing I've learned the hard way is that the person who agrees with everything you say probably isn't paying attention to anything you say.

73, Karl, W8FX

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

dx

BY CARL SMITH,* N4AA

Activity on 17 and 30 Meters

Ah, cooler weather for us in the southeastern U.S., and by the time you read this, we are out of the hurricane season. With two already having created havoc for us as I write this and yet another one (Ivan) coming slowly toward the Gulf coast, we've had enough. I'll take this opportunity to express my best wishes to those who were more affected by these storms than we were here in North Carolina. Many of our DX friends live in Florida and other areas that recently felt the wrath of Mother Nature, and we can only hope that they are getting their lives back together by now.

In 1994, Ralph Fedor, KØIR, took this picture of the team's transportation to Peter I from the helicopter. The ship sits in pack ice as it approaches the island. (Photos courtesy of KØIR)

On the Bands

In spite of the decline of the current solar cycle, there is a lot of DX to be worked on many bands. No, you won't find much, if anything, on 10 meters these days, but 12 meters is still showing signs of life.

I work at home and have the advantage of being able to walk into the ham shack at odd times of the day. I happened to walk in there recently and saw a 4X4 spotted on packet on 12 meters SSB. I thought "Yeah, right!" but I turned the receiver to the reported frequency and sure enough there he was. The signal was amazingly strong, swinging from S5 to S9. As he finished a QSO, I picked up the microphone and gave my call a few times and he came back with "the station Alpha?" I repeated my call, and sure enough he was talking to *me*.

Now understand that I only run 100 watts and have been using my two-element 40-meter beam to work 17 meters, and that's what I was using at the time. I was somewhat dumbfounded when the 4X4 gave me a good signal report, and we carried on a conversation for a good five minutes. As we signed off, other stations in the U.S. called him and he worked some of them as well. A short time later his signal was gone, but it just proves a point: If no one says anything on a "dead" band, it appears just that—*dead*. If we make some effort at making contacts on these dead bands, we just might be surprised and work some pretty fair DX along the way. When is the last time you called CQ on one of those "dead" bands? I recall Charles, S9SS, telling me that he tries this many times on 10 meters and ends up working a lot of stations that were "just listening."

Speaking of 17 meters, I continue to be impressed with this band. All these years on the air and I had made no effort to work the band—my mistake. I see spots for and hear a lot of good DX on this band when there is little to be seen/heard on 15 meters. It's interesting to observe the difference just a few megahertz makes in propagation.

Thirty meters is another band that I really had not pursued until this year. It's fun to work these bands with just 100 watts and less than ideal antennas. It reminds me of the "old days" when I had only 25 watts and a piece of wire hanging from a tree in Kansas City. Each of these current contacts is special, and I remember many of them just as I remember a lot of those from 50 years ago. Gee, has it really been 50 years since I started hamming? Indeed it has, and as I recall, there wasn't a lot of activity on 10 meters back then either. I remember my one and only *legal* contact on 27 MHz with a station in California when it was still a ham band. I wonder how many of you Old Timers have any memory of contacts on 11 meters?

DXpeditions

The number of DXpeditions picked up somewhat as this year progressed. Our friends with the United Nations have been moving around and operating from various locations in Africa for short

The 1994 Peter I team members dressed in their Arctic gear struggle to assemble the antennas.

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

The shelters for the '94 Peter I operation failed to keep the snow from blowing in and covering up the Alpha amp.

periods of time. Thanks to them for the effort to get on the air from these rare/semi-rare locations for our benefit.

I'll also wish you well in working the DXpeditions scheduled for October—Lord Howe (VK9L), Chesterfield (TX/C), Cameroon (TJ), Kiribati (T30) Cambodia (XU), Tuvalu (T20), Miquelon (FP), and Bhutan (A5)—as well as the "biggie," 3YØX in January/February next year.

DXCC Notes

The DXCC Annual List cutoff date has been eliminated. Beginning in September 2004, there will be no deadline. Bill Moore, DXCC Manager at the ARRL, released the following announcement in mid-September:

In previous years, September 30 was the cutoff point for compiling the entity totals for the DXCC Annual List, published in the DXCC Yearbook. Over the years, DXCC participants tended to collect cards and submit them once a year, in September, to ensure the highest possible total for the listing. A major downside of the deadline is that we receive over 25% of our annual credit submissions during the month of the deadline. This in turn creates a huge increase in workload and a lengthy processing time.

5 Band WAZ

As of September 1, 2004, 661 stations have attained the 200 zone level and 1406 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:

KF2O ES5RW

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

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
VE7AHA, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
NN7X, 199 (34)
IK1AOD, 199 (1)
DF3CB, 199 (1)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W6SR, 199 (37)
W3NO, 199 (26)
K4UTE, 199 (18)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
HB9BGV, 199 (31)
N3UN, 199 (18)
OH2VZ, 199 (31)
K5MC, 199 (22)
W1JZ, 199 (24)
K2UU, 199 (26)
W1WAI, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
PY5EG, 199 (23)
SP5DVP, 199 (31 on 40)
W8AEF, 199 (40)
K8RR, 199 (26)
UU5JR, 199 (4)
W8GF, 199 (22)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N4PQX, 199 (26)
DL2KQ, 199 (31)
JA5IU, 199 (2)
CT3DL, 199 (26)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
KG9N, 198 (18, 22)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K5PC, 198 (18, 23)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
N4XR, 198 (22, 27)
RU3DX, 198 (1, 6)
N6HR/7, 198 (34, 37)
OE2LCM, 198 (1, 31)
W7SX, 198 (18, 23)
HA1RW, 198 (1, 31)
WK3N, 198 (23, 24)
HA9RT, 198 (1, 31)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)

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

UA6YW (167 zones)
KØGY (170 zones)
ES5RW (200 zones)
EU4AA (170 zones)
UR7CA (170 zones)

Endorsements:

KZ2I (198 zones)
K8PT (191 zones)

****Please note: Cost of the 5 Band WAZ Plaque is $80 ($100 if airmail shipping is requested).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

The WAZ Program

15 Meter SSB

615 ..... JJ2VLY

20 Meter SSB

1131 ..... JA1BON

80 Meter SSB

82 ..... ES5RW 83 ..... EW4MM

160 Meters

201 ..... DL9KR

All Band WAZ SSB

4931 ..... KWØH 4933 ..... I1PLX/QRP
4932 ..... HB9DKZ 4934 ..... JH1VUO

Mixed

8321 ..... JL2LPX 8323 ..... EU4AA
8322 ..... HA1ZH

All CW

435 ..... UA6YW 436 ..... CN2PM

RTTY

148 ..... JH1EEB 149 ..... JA1EUL

Satellite

22 ..... 9V1XE

SSTV

3 ..... PT2TF

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 335 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is $1.00 each plus SASE. Please make checks payable to the awards manager, Billy F. Williams. All updates should be mailed to P.O. Box 9673, Jacksonville, FL 32208.

CW

K2TQC 334	K4MQG 334	N5FG 333	K6LEB 331	YU1TR 330	K4JLD 327	YV5ANT 324	PY4WS 319	KØHQW 299
K2FL 334	EA2IA 334	N7RO 333	VE3XN 331	W4UW 330	W6OUL 327	9A2AJ 323	G3KMQ 317	WG7A 295
K9BWQ 334	PA5PQ 334	K4CN 333	W1WAI 331	G3KMQ 329	IT9TQH 326	W6SR 323	YT1AT 317	KE3A 295
K9MM 334	K3UA 334	W4MPY 333	K2JF 331	KZ4V 329	I2EOW 326	N5ZM 323	K8JJC 315	K4IE 291
W7OM 334	DL3DXX 334	PY2YP 333	K3JGJ 331	N5HB 329	W7IIT 326	KUØS 322	CT1YH 313	KD8IW 288
K2JLA 334	K2ENT 334	W8XD 333	PT2TF 331	W9IL 329	SM5HV/HK7 326	KE5PO 322	N1HN 313	WA4DOU 286
N7FU 334	OK1MP 334	W2VJN 333	N4CH 331	K1HDO 329	W4LI 325	HA5DA 321	W6YQ 313	EA3BHK 282
K2OWE 334	NC9T 334	KA7T 332	WA8DXA 331	K7JS 328	I5XIM 325	IKØTUG 321	K9DDO 312	YC2OK 282
N4MM 334	WB5MTV 333	WØJLC 332	K9IW 331	K9OW 328	K5UO 325	VE7DX 320	W3II 312	DJ1YH 281
F3TH 334	W7CNL 333	K8LJG 332	WB4UBD 331	K8PV 327	IK2ILH 325	IKØADY 320	UA9SG 309	XE1MD 278
F3AT 334	YU1HA 333	YU1AB 332	W2UE 330	W4QB 327	N5FW 325	WG5G/QRPp 320	KF8UN 308	EA2CIN 278
DJ2PJ 334	IT9QDS 333	K5RT 332	I4LCK 330	I1JQJ 327	9A2AA 325	N7WO 320	YU7FW 306	I3ZSX 276
WA4IUM 334	G4BWP 333	YU1AB 332	VE7CNE 330	I4EAT 327	N4OT 325	F5OIU 320	LU3DSI 302	G3DPX 275
W4OEL 334	K4CEB 333	NØFW 332	4N7ZZ 330	DL8CM 327	K6CU 325	HA5NK 319	N1KC 302	
W2FXA 334	K4IQJ 333	N4AH 332	W6DN 330	SM6CST 327	LA7JO 324	F6HMJ 319	KH6CF 301	
N4JF 334	WØHZ 333	HB9DDZ 332	K7LAY 330	N4KG 327	K1FK 324	OZ5UR 319	VE7KDU 300	

SSB

K6YRA 335	4Z4DX 335	W5RUK 334	KSØZ 332	K2JF 329	IT9TQH 327	WA4ZZ 322	YV5NWG 311	K7ZM 292
K2TQC 335	N7RO 335	K4CN 334	LU4DXU 332	ZL1AGO 329	DK5WQ 327	WN9NBT 322	LU3HBO 310	OA4EI 292
W6EUF 335	IØZV 335	EA3KB 334	VE4ROY 332	W9OKL 329	UY5XE 327	WW1N 322	HA6NF 310	K7ZM 292
K2JLA 335	EA2IA 335	N4CH 334	W7FP 332	I2EOW 329	KE5K 327	W6OUL 322	WA5MLT 310	K1RB 292
K4MQG 335	IN3DEI 335	K3UA 334	K9HQM 332	VE7DX 329	I1JQJ 327	N3RX 321	XE2LV 310	KØOZ 291
IK1GPG 335	EA4DO 335	K4JLD 334	CT1EEB 332	W2FGY 329	CP2DL 327	XE1CI 321	XE2NLD 310	W9ACE 291
K5OVC 335	PA5PQ 335	N5ZM 334	W2FKF 332	CT1CFH 329	NI5D 327	CT1ESO 321	EA3BHK 307	I3ZSX 290
NØFW 335	K9OW 335	PY2YP 334	CT3BM 332	EA1JG 329	W6SR 326	EA8TE 321	RW9SG 307	WØROB 287
K9MM 335	W6DPD 335	AA4S 334	CT1EEN 332	KE4VU 328	N4KG 326	W6MFC 321	W9IL 306	KKØDX 285
W6BCQ 335	XE1VIC 335	CT3DL 334	DL9OH 331	K5UO 328	K7TCL 326	KD5ZD 321	XE1MDX 305	VE7HAM 285
XE1AE 335	K2ENT 335	NC9T 334	N2VW 331	KF8UN 328	W9HRQ 326	N4CSF 320	EA5OL 305	F5RRS 284
W7OM 335	OK1MP 335	W9SS 334	YV1JV 331	WØULU 328	W4QB 326	N4HK 320	WB2AQC 305	N8LIQ 284
KZ2P 335	IZ6GPZ 335	VE7WJ 334	WA4WTG 331	K1EY 328	K8PV 326	KØFP 320	VE7SMP 305	WØIKD 283
IK8CNT 335	K1UO 335	VE2PJ 334	W8KS 331	KZ4V 328	DL6KG 326	EA7TV 320	KC4FW 304	KBØRNC 282
VK4LC 335	I8KCI 335	W3AZD 334	YV5IVB 331	XE1D 328	W4LI 326	SV1RK 320	K3BYV 303	WN6J 281
OE7SEL 335	I8LEL 335	YZ7AA 334	KX5V 331	KD8IW 328	N1ALR 326	N1KC 320	YC2OK 303	IK8TMI 281
VE3MR 335	DU9RG 335	4N7ZZ 333	K3JGJ 331	KE3A 328	HB9DDZ 326	W5GZI 320	WB2NQT 303	F5JSK 281
VE3MRS 335	DU1KT 335	KE5PO 333	N5ORT 331	W9IL 328	WR5Y 325	SV3AQR 320	VK3IR 303	KA5OER 280
K4MZU 335	WDØBNC 334	VE1YX 333	PT2TF 331	K3LC 328	WA4JTI 325	WA4DAN 319	KK4TR 303	KK5UY 280
OZ5EV 335	K2FL 334	I4LCK 333	CT1AHU 331	K8DXA 328	KC4MJ 325	CE1YI 318	JR4NUN 303	F5INJ 279
N7BK 335	WØYDB 334	W2JZK 333	EA3JL 331	LU5DV 328	PY2DBU 325	W5OXA 317	VE7KDU 302	K7SAM 279
K7LAY 335	W4UW 334	K8LJG 333	K9IW 331	I1EEW 327	IKØIOL 325	YV4VN 317	W2GZI 302	EA3CWT 278
ZL3NS 335	K9BWQ 334	VE4ACY 333	K1HDO 331	SV1ADG 327	YT1AT 325	EA5GMB 317	N5QDE 302	VE2DRN 277
N4MM 335	W4NKI 334	KØKG 333	W6DN 330	DL8CM 327	K7HG 324	KE4SCY 317	KD4YT 302	9A9R 277
OZ3SK 335	WB4UBD 334	W4WX 333	K8CSG 330	F9RM 327	AC7DX 324	K6RO 316	SV2CWY 300	W6UPI 276
K7JS 335	W4UNP 334	VE2WY 333	YV1CLM 330	XE1MD 327	KØHQW 324	N5HSF 316	4X6DK 300	Z31JA 275
XE1L 335	W8AXI 334	WB3DNA 333	LA7JO 330	I4EAT 327	EA3BKI 323	N8SHZ 316	YT7TY 300	G4URW 275
YU1AB 335	VE2GHZ 334	K9PP 333	AB4IQ 330	W3GG 327	K4JDJ 323	WZ3E 314	K4IE 300	VE2AJT 275
OE3WWB 335	OE2EGL 334	W2CC 333	AE5DX 330	AA6BB 327	W6WI 323	IZ6CST 314	W4PGC 300	4Z5FL/M 275
K5TVC 335	WA4IUM 334	DL3DXX 333	KB2MY 330	SM6CST 327	EA3CYM 323	K9YY 313	K6GFJ 299	KU4BP 275
N5FG 335	K5RT 334	EA3BMT 333	K3PT 330	WD8MGQ 327	F6BFI 322	NØMI 313	AC6WO 297	
DJ9ZB 335	W2FXA 334	EA3EQT 333	ZL1BOQ 330	CX4HS 327	K6CF 322	W7GAX 312	WA1ECF 295	
PY4OY 335	N4JF 334	YV1KZ 332	KW7J 330	IØSGF 327	LU7HJM 322	VE3CKP 311	KW1DX 295	
VE3XN 335	W6SHY 334	YV1AJ 332	WS9V 329	IT9TGO 327	K5NP 322	CT1YH 311	N5WYR 293	

RTTY

K2ENT	333	K3UA	327	EA5FKI	320	W2JGR	316	OK1MP	312	KE5PO	297	I2EOW	291	W4QB	280	YC2OK	280
WB4UBD	330	NI4H	325	N5FG	318	G4BWP	312	PA5PQ	311	W4EEU	297	I1JQJ	289				

Ralph, KØIR, holds one of the snow anchors used to secure antennas and shelters from the heavy winds.

Going forward, the lists of DXCC standings previously published in the DXCC Yearbook will be replaced by complete lists on the ARRL website. The new web-based lists should be ready and online early in the first quarter of 2005, when the listings in the DXCC Yearbook would normally have been published. After initial publication, the new lists published on the web will be updated regularly, perhaps weekly or even daily. They will also include the standings of all DXCC members, not just those who made a submission in the previous year (as has been the practice with the printed yearbook due to space limitations).

A smaller version of the yearbook will be published, containing highlights of the standings, along with other features, as in the past.

This month I've included a few photos from the 1994 DXpedition to Peter I Island. There will be a major DXpedition to Peter I in January/February of 2005. Visit the web page at <http://www.peterone.com>.

The Peter I team roster is complete. The 3YØX operators will be F2JD, HB9AHL, HB9BHW, KØIR, K4UEE, K3NA, K4SV, K5AB, K9SG, LA6VM, N2WB, N4GRN, N6OX, NK7C, NP4IW, OH2BH, OH2PM, PA5M, UA3AB, VK4GL, and WØRUN. Alternates are in place for any unexpected cancellations.

This expedition is over 70% funded by the team members and that percentage is growing larger. They need your help, no matter how large or small the donation. Checks should be made out to: "DX Expeditions, LLC" and please send your contributions to one of the following:

Bob Allphin, K4UEE
4235 Blackland Drive
Marietta, GA 30067

Gerard F. Jacot, F2JD
Le Grand Revard
Boucle de l'Observatorie
73100 Pugny-Chatenod
France

Toshikazu Kusano, JA1ELY
P.O. Box 8
Kamata, Tokyo 144-869
Japan

Lee Jennings, ZL2AL
203 Beresford Street
Hastings 4201
New Zealand

In Closing . . .

As I write this, I'm looking forward to seeing many DXers at the W9-DXCC Convention in Chicago the weekend of September 18th. This is always a well-attended event with a great program. If all goes well, I should have a few pictures of the convention for next month.

Also, as some of you will note, there is no WPX Award Program box this month. No activity was reported for the month of August.

73, Carl, N4AA

CQ DX Awards Program

SSB

2441 .....CE1VLY 2442.....JA6KTY

SSB Endorsements

320.....WR5Y/325 300 .....CE1VLY/208

CW Endorsements

320 .....WB4UBD/331 275.....WA4DOU/286
320 .....K6CU/325

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 335 active countries. Please make all checks payable to the award manager.

QSL Information

IØ/N6CY via N6CY
IA5/IK5PWQ via IK5PWQ
IA5/IK5WOB via IK5WOB
IA5/IK5XCT via IK5XCT
IC8M via IZ8EDJ
IF9/IQ8B via IZ8CLM
IG9/IV3NVN via N1IBM
IG9B via N1IBM
IH9/IT9MRM via IT9MRM
IH9B via N1IBM
II0P via IZ1EPM
II5LDV via I5NZR
II5MD via IK5DND
II6CC via IZ6FUQ
II6IM via IK6OFE
II7ANT via IZ7AUH
IO1PDT via IZ1CCE
IO3AJZ via IV3AJZ
IO3BKO via IV3BKO
IO3CJT via IV3CJT
IO3CMW via IV3CMW
IO3DDM via IV3DDM
IO3DYS via IV3DYS
IO3EAD via IV3EAD
IO3GTO via IV3GTO
IO3HLS via IV3HLS
IO3IBZ via IV3IBZ
IO3IIM via IV3IIM
IO3KAS via IV3KAS
IO3KSE via IV3KSE
IO3LNQ via IV3LNQ
IO3MIE via IV3MIE
IO3MPW via IV3MPW
IO3OQR via IV3OQR
IO3TPW via IV3TPW
IO3TRK via IV3TRK
IO3YAO via IV3YAO
IQ8CS via IZ8BGY
IR1CL via IK1AWV
IR1PL via IW1RHG
IR7A via I7ALE
IR7MD via IK7XNF
IU7I/P via IK7JWX
IY6GM via I6GFX
J79JRC via W4IX
J79XBI via SMØXBI
J87AB via ZL3AX
JA6WFM/H via JA6VU
JD1BLK via JM1LJS
JM1LJS/J via JM1LJS
JO2JDJ/J via JO2JDJ
JW1CCA via LA1CCA
JW7FJA via LA7FJA
K1D via W1DAD
K4T via KC4PX
KG4KK via N6AWD
KG8RP/KHØ via 7K4QOK
KHØ/JM1MAC via JM1MAC
KHØ/JQ2GYU via JQ2GYU
KHØY/TG9 via JA1WSX
KHØY/YS via JA1WSX
KH2/DK2ZF via DK2ZF
KL7/K6ST via N6AWD
KL7/W6IXP via N6AWD
KL7AK via N6AWD
KNØWCW/2 via KB1DSB
KP2AA via K7JA
LA/DL5ME via DL5ME
LA/PAØJSE via PAØJSE
LPØH via EA7FTR
LS7D via LU7DW
LU4DRH/D via LU7DSY
LU4ETN/D via LU7DSY
LU5DRV/D via LU7DSY
LU7DSY/D via LU7DSY
LU8DWR/D via LU7DSY
LU8EBJ/D via LU7DSY
LU9ESD/D via LU7DSY
LW9EAG/D via LU7DSY
LW9EC via EA7JX
LW9EVA/D via LU7DSY
LXØSAR via DJ8VH
LZ/GØSGB/P via GØSGB
LZ2TU via WB2RAJ
LZ7H via LZ2ITU
MØ/IZ5FKK via IZ5FKK
MØO via GXØOOO
MD3VPE/P via M3VPE
MI6X via GNØXYZ
MJØDLQ/P via ON4ON
MMØBNN/P via MØBNN
MMØMWW via MMØEAX
NØMLW/KH via JK3NSD
N6AWD/P via N6AWD
N9L via W5AZN
NA8O/KHØ via JK1FNL
NC2N/V44 via W3HNK
NJ2BB via KB2BRR

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," 106 Dogwood Dr., Paris, TN 38242; phone 731-641-4354; e-mail: <golist@golist.net>.)

contesting

BY JOHN DORR,* K1AR

Approaching the Sunspot Minimum—Remembering the 1995 CQ WW

November's Contest Tip

In keeping with this month's theme of operating near a solar minimum, it's important to remember that when conditions are poor, they are bad for everyone, not just you. Sometimes we're inclined to forget the fact that we should still operate as intensely as possible, regardless of conditions. Remember, the idea in contesting is not necessarily to set a record score; it is to have a score that's higher than the next guy's. If your drive and motivation stay high, you'll always do better than your competitors—guaranteed!

Calendar of Events

Oct. 23–24	W/VE Islands QSO Party
Oct. 30–31	**CQ WW DX SSB Contest**
Nov. 6–7	Ukrainian DX Contest
Nov. 6–8	ARRL CW Sweepstakes
Nov. 13–14	WAEDC RTTY Contest
Nov. 13–14	JIDX Phone Contest
Nov. 13–14	OK/OM CW DX Contest
Nov. 20–21	LZ DX Contest
Nov. 20–22	ARRL SSB Sweepstakes
Nov. 27–28	**CQ WW DX CW Contest**
Dec. 3–5	ARRL 160M Contest
Dec. 5	CIS DX Contest
Dec. 11–12	ARRL 10M Contest

If you've been around for a while like me, you can easily remember the impact of sunspot minimums. In fact, over the next year or so, we're entering one as I write this. Naturally, it brings back memories of horrible high-band conditions, 20 meters being packed like a sardine can and hams predicting the end of contesting as we know it.

Fortunately, all is not lost. In fact, I thought it would be fun to share with you the experience I had in the 1995 CQ WW DX Contest, which was at the very bottom of the last solar cycle. While we certainly can't count on conditions mirroring that contest weekend, I thought it might show you that all is far from lost in this current contest season.

Operating in a Solar Minimum, 1995 Style

Like most people, I had fairly low expectations for the '95 contest. Without too much analysis, one can quickly assume that solar minimums usually result in boring DX contest weekends. In listening to the bands the week before the contest, it was clear that we had a better than even shot of having tolerable conditions. Fifteen meters was opening daily to Europe with 59+ signals, and even a few weak EAs were popping through on 10.

Thus, with station and operator ready to go, I fired up on 20 meters at 2330Z to check things out. One quick CQ immediately yielded a pile-up of JAs. As the adrenaline continued to build, so did the pile-up. At 2340Z I make the requisite pit stop at the "other side of the house" and then sat down for the start of the race. For reasons that I still don't understand, the U.S. handed me 14150.4 kHz, which I used right at the beginning. My normal pre-contest operating approach is to tune the bands right up to the beginning rather than camp on a run frequency. However, with the band edge available and a pile-up calling me, how could I turn down the opportunity?

It seemed that nearly every station that called me in the 15 minutes preceding the contest waited on my frequency for 0000Z. One quick CQ as the clock turned over resulted in my working 37 JAs in 11 minutes! Now that's the way to start a contest! As one might expect, the band quickly died towards Asia. By 0030Z I was relegated to a night of low-band operating—not a terrible form of suffering, if you are fortunate enough to have some good antennas.

Forty meters also started with a bang with 55 QSOs in the log (101 total) by 0100Z. It was a thrilling first hour, as 9X/ON4WW and JW8GV called in, among many others. As is the case for most East Coast stations, nighttime operating is a slugfest of CQing and tuning for Europeans. Sometimes it can result in some quality runs, but for most it's just a "holding pattern" warm-up period for the real fun in the morning. That year, 40 meters died very early to Europe, making 80 meters the money band. With a 4-square 80-meter vertical array at my fingertips, the evening hours yielded slow but steady rates of 40–60 QSOs/hour. This style of operating really doesn't require much creative strategy. In fact, the real difficulty is maintaining your enthusiasm and momentum and being aware that your competitors are experiencing the same doldrums.

During the late night hours, I made my usual side trips to the high bands hoping to find a few interesting multipliers coming through via odd propagation paths. That year was no exception, as I snagged KHØ, FO, A35, and a few others on 20 meters. As it turns out, the night time hours are an operating period when a second radio really becomes useful. I'm much more inclined to call CQ continuously on 80 meters if I know that I can tune the other bands with a second transceiver.

Although we certainly don't experience the 06–08Z European opening on 20 meters during this part of the sunspot cycle, it was encouraging to hear EA8AH and scores of audible (but unworkable) Europeans coming through at 0830Z. Frankly, I didn't put much faith in a quality 15-meter opening for the weekend, but my hopes increased dramatically, as 20 seemed to be awakening earlier than expected. During the 0900Z hour I was able, in search-and-pounce mode, to work many European stations. By 1020Z the flood gates

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

opened up! The unfortunate thing about a relatively early 20-meter opening is that you cannot effectively work any more low-band QSOs, even with a second radio. The QSO rate and action are just too fast and furious. Having said that, I just couldn't resist the temptation when hearing S9 JAs on 40 meters, so I made a brief pit stop on 40 and snagged a few quick "double multipliers" and then jumped back on 20. If you analyze the strategy, it probably didn't make sense, but sometimes you can use a little burst of motivation to your advantage.

One of the most valuable applications of the second radio came into play at around 1150Z on Saturday. Even though I was running stations extremely well on 20 meters, I knew that 15 was going to be the place to hang out if it opened at all. As I checked it over and over, I was able to land on a wonderful run frequency (21205) right as the band was peaking without even skipping a beat. It was as if I had just moved up to the high (very high!) end of 20 meters.

Fifteen meters turned out to be an amazing band for the entire weekend. After only 20 minutes of operating, I had already worked 81 stations! Not only were the Italians and other southern Europeans booming in, but so was northern Europe. I vividly recall one SM station asking me what my antenna was, because I was pinning his S-meter! The first hour (1200Z) ended up being the best I've ever experienced from the states—231 QSOs and a constant roaring pile-up! The excitement on 15 meters continued for several more hours. During that period it was virtually impossible to do anything else (i.e., tune other bands on the other transceiver).

Except for a few QSOs on 10 meters, this was temporarily a single-band 15-meter contest. With 15 meters being so wide open, I knew that either the maximum usable frequency (MUF) was at 21451 or 10 meters had some possibilities. What little listening time I could afford proved that the band was at least open to Africa. It turned out to be very productive to spin down to 10 meters and easily work four or five fast double multipliers as well as two Europeans (9A1A and IK4GRO)! Of course, I was thinking, "What is this contest going to be like in a few years when conditions pick back up?"

From years of previous experience, you learn to accept that after the fast runs of Saturday morning subside, you're generally relegated to slower rates for the rest of the contest. This was the next surprise of the contest. Not only did I work 48 stations in 16 minutes on 15 meters at 1630Z (after 4 1/2 hours of running), but 20 meters was a big surprise. Usually, with a fantastic 15-meter opening such as the one experienced in 1995, 20 meters is a bit of a "downer." Therefore, at 1730Z, with 15 meters still wide open, I decided I'd better hit 20 and slug it out. A quick listen to the band found 14178 relatively clear, and off I went. After one CQ, it seemed like the 15 meter pile-up followed me to this new run frequency. The noises I was hearing in my headphones were beyond belief. Perhaps the usual Sunday afternoon hallucinations were already happening? In the first ten minutes of operating on 20 I worked 33 stations. These were 15-meter rates, not 20! In the first hour of 20-meter running I worked 206 stations, yet another unexpected result.

With constant CQing going on for the first seven sunlight hours, you might expect a low multiplier was going to be one of the by-products. Feeling relatively guilty about that, I decided to take a brief break from the "runs" and tune 10 and 15 meters. This turned out to be very worthwhile, with 18 new multipliers logged in 20 minutes. Getting that out of my system, I returned to 20-meter CQing for several more hours. It just seemed that every time I hit the "F1" key to call CQ, another station was there answering me.

By 2030Z, JAs started to mix in with the European callers on 20 (another surprise, at the earliness of the opening). This kept the run rate relatively high, while allowing for extremely effective use of the second radio. Again, a scenario had developed where I could call CQ more aggressively on 20 meters without my multiplier totals suffering on the other bands. This period around 21–23Z is a fun part of the contest. It's also one which requires a carefully considered operating strategy. It is one of the only times in the entire contest when all six bands are open at the same time. Deciding how to maximize your efforts is a real challenge. Unfortunately, I frequently fall into the trap of DXing during this time, because it's more fun to work the DU, 9M2, VK6, KHØ, stations calling in during a JA run than it is to slug it out on in an early 40/80-meter opening. Someday I'll do the analysis and learn more about the trade-offs in this area.

As the first day wound down, operating had become a constant switch between bands. I'd be running stations on 20 meters and calling multipliers on 80. Then within a few seconds I'd be running stations on 40 meters and calling others on 20.

The first day ended with a bang on 20 meters. Although the North Pole opening wasn't setting new signal-strength records, it was open and I was lucky to work an amazing string of three double multipliers in a row—JT1Z, BV2FI, and HS1BV. Then there's the story of hearing a large pile-up building off my run frequency, only to discover that it was 5Z4SS, yet another double multiplier! I'll never forget the clock turning over to 0000Z and sitting back thinking that it just doesn't get better than this!

Saturday night presented its usual slow pace. There really wasn't a good place to consistently run stations, so by 0100Z I headed for my first sleep break. Unlike many other breaks I've taken in the past, I was able to "crash" immediately, having set two alarm clocks for 0300Z. I guess I'd expected more action at 0300Z, but to my disappointment, there just wasn't much going on. Forty meters was not runnable, and I had already worked most of the stations calling CQ. The rates on 80 were relatively slow, and without a Beverage on 160 meters, I had a tough time copying the Europeans on that band. Therefore, after four hours of relative boredom, I headed for my second and final sleep break, waking up at 0900Z.

Unlike Saturday morning, 20 meters opened slightly later, making my wake-up time somewhat early. In retrospect, I think I could have benefited more from an extra 45 minutes of slumber. Although 20 meters was filled with European stations, the ability to run stations was delayed by nearly 45 minutes when compared to the first day. Twenty meters was absolutely packed on Sunday morning. You'd think that with a big station finding a good run frequency is easy, but not this time. By 1115Z I finally got going up higher in the band, and within 30 minutes stations started coming through on 15 meters again. Unlike the previous day, 20 and 15 meters opened almost at the same time—a real dilemma for a single op.

The 12Z hour turned out to be the most critical time in the contest for me. As I was tuning 15 meters with the other radio, I heard loud and workable European stations. It appeared that even though the bands opened later that morning, 15 was still going to be good and I had better get up there right away! At this decision point, I could not believe my ears. Although K1KI was running stations on 21202.5, there was absolutely no one on the band edge. Where were all the multi-multi and single-band guys? I couldn't get there fast enough. For a few minutes I kept waiting for W3LPL or someone to tell me that they were there, but it just didn't happen. Instead, I began running Europeans at QSO rates paralleling Saturday's pace. It was absolutely phenomenal!

One of the things I do to keep me awake during this period of the contest is drink fairly large amounts of coffee. Usually that is a good strategy,—except when you land on the best frequency on the band and cannot/should not leave the operating chair. Well, this reason prevailed over all other biological considerations, and I sat there in pain for nearly four hours running stations at exhilarating rates. The band was totally wide open, with Asiatic Russians, VUs, and others calling in. By this point, my soapbox for the weekend was easy to write: "Great contest—can't wait for the next sunspot minimum."

The remainder of the contest mirrored Saturday, for the most part. Twenty meters opened up in style to Europe, and lots of multipliers were available on the second station. Unlike the first day, however, 10 meters was a little more alive. I'll never get over the vast number of LU stations that participate in the CQ WW contest. You can actually obtain a reasonable rate by searching and pouncing on 10 meters with these guys —it's great!

The last few hours of the contest were spent intensely tuning for multipliers. Although my totals were reasonable, I couldn't help thinking that they had suffered some due to all the CQing over the weekend. When you enter that "multiplier chasing" operating mode, some very funny "on-the-air" stories inevitably emerge. My favorite was when I worked a 6Y5 on 15 meters. He had the usual Sunday afternoon pile-up calling him, and I was lucky to get through on the first call. Unfortunately, he came back to K2AR, which I quickly corrected for him. His response, however, was a first in my contesting experience. Rather than just correcting my call outright, he told me to stand by while he used some "white-out" correcting fluid to fix his log. "Stand by, K2AR, while my log dries and I'll call you in two QSOs to get your correct call." Can you imagine what was going through my mind at that point? Well, true to this word, he did call me two QSOs later to inform me that his log had dutifully dried and that he was now ready to enter the correction. Maybe we have a new contest "tip of the month"!

Well, 48 hours had passed like a blur and somehow 3600+ QSOs were in my log. It was one of those weekends that just could have kept going. I'm still trying to fathom how this could have happened at the bottom of the sunspot cycle. More important, it's a reminder that this year's contest season may not be as bad as we think, either. Keep that in mind as you prepare for whatever conditions are dealt to us!

Final Comments

I'll be compiling the 2004 CQ Contest Survey results over the next weeks with the goal of reporting a summary of your responses next month. It should be really interesting!

Good luck in this year's CQ WW contests. If conditions are the same as in 1995, we'll all have a great ride!

73, John, K1AR

One of the highlights of CQ's 50th anniversary celebrations a decade ago was the "CQ Gang Award," in which hams could earn certificates for contacting people connected with CQ over its first half century. Next January is our 60th anniversary, and we're going to do it again, this time with stations signing "/60"—plus a special bonus!

Announcing:

The "CQ/60" Operating Activity and the Return of the "CQ Gang Award"

January 1 – March 1, 2005

CQ magazine will be 60 years old in January 2005, and to celebrate, we're bringing back the "CQ Gang Award" and operating activity that premiered ten years ago during our golden anniversary. The goal is to provide recognition for, and encourage you to work, everyone who's contributed to *CQ*'s success over the past six decades.

For the first 60 days of 2005 (January 1 – March 1), all current and former CQ staff members and associates, along with current subscribers, will be authorized to sign "/60" after their callsigns. Any ham (or SWL) will be able to earn a nice piece of wallpaper for contacting enough members of "The CQ Gang."

The "CQ Gang Award" is easy to earn. Just contact stations signing "/60," tell them your name, where you're operating from and their signal report, and then write down (or type) each person's callsign, name, signal report, and CQ position held. (Please don't feel shy about continuing the QSO and actually having a conversation with one another!) You get 6 points for each contact with a "/60" station, plus bonus points for working top *CQ* staffers. If you qualify to sign "/60" yourself, then you also get one point for every QSO with a non-/60 station. When your point total is 60 or higher, you qualify! It's as simple as that! There are even endorsements for higher scores, up to 600 total points. The only catch is that you have to make all of your "/60" contacts in the first 60 days of 2005 (January 1 – March 1).

Listen for WW2CQ

In addition, various members of the CQ "family" will be activating the CQ club callsign—WW2CQ—from different parts of the U.S. during January and February. Listen for WW2CQ/61 (1st call area), WW2CQ/62 (2nd call area), etc. We will have a separate certificate for working WW2CQ in all ten U.S. call areas.

Complete rules for the "CQ Gang Award" and details on the WW2CQ/6x operation will appear next month and will be posted on our website as soon as they're finalized. Have fun and see you on the air in 2005!

awards

BY TED MELINOSKY,* K1BV

County Hunting on 30 meters

In recent months several CW county hunters have begun to experiment using the 30-meter band. They decided to use the frequency of 10.114 MHz. Active county hunter mobiles rapidly bought into this idea, and Bob Voss, N4CD, reports working over 500 different counties since June. Thirty meters combines the favorable propagation attributes of 20 and 40 meters, both long in use by the county hunting fraternity. Operators are limited to lower power and only the CW mode on this band, which helps to keep everyone at about the same level and removes some of the disadvantages of mobile operation. Therefore, for a little additional fun, set 10.114 MHz into the memory of your favorite transceiver and check it out from time to time. As far as I know, there's no special award for working counties either all 30 meters or on the WARC bands.

Brian Bird, NXØX
USA-CA All Counties #1096

Brian, NXØX, USA-CA All Counties #1096, making contact with his dad Cliff, ACØB, who was in Carter County, Montana, for Brian's last county for "the whole ball of wax."

Brian, NXØX, was granted USA-CA All Counties #1096, All SSB, on July 4, 2004. Here is his story:

I grew up with my dad as an amateur radio operator during the '70s and was always fascinated by the different countries he would work with his Drake station and by seeing all the QSL cards come in from all over the world. For some reason, though, I did not get involved in amateur radio until 1993, when a co-worker was talking about ham radio and another one was talking about selling his Yaesu FT-757 station. I think the difference for me was seeing people of my generation operating and having fun, which brought me into the hobby. I ended up studying for my Tech Plus ticket and bought that FT-757 station as my first radio. A short time later I was granted NØYTZ.

My dad was generally a CW operator (other than for the SSB DX contests), so I followed in his footsteps and pretty much operated 40-meter CW my first year. After entering the Novice Round-Up contest in 1994 and finishing first in Minnesota, I decided it was time to upgrade, as my code speed had improved. I upgraded that summer and was granted AAØSY, and then the bands really opened up for me.

I was enjoying myself on the radio and wanted a newer radio and a better antenna system soon thereafter. I thought it would be easier to buy some "new toys" if I got my wife Shari interested in ham radio, as then the new toys would be for the both of us. It worked, and Shari is now KBØMHH! With a little hinting, she took the 13-wpm code test and General written exam and passed them both, so the bands really opened up for her also. CW is

Cliff, ACØB, giving his son Brian, NXØX, his last county for USA-CA All Counties.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>

USA-CA Special Honor Roll

Alan R. Young, K6KLL
USA-CA All Counties #1102 (Mixed B/M)
August 4, 2004

USA-CA Honor Roll

500
PA5O.....3312
KE4HBE ...3313
K4LQ 3314
K6KLL.....3315
9A2HF 3316
G3UAS 3317

1000
K6KLL.....1669
9A2HF 1670
G3UAS 1671

1500
K6KLL.....1395
G3UAS 1396

2000
K6KLL.....1292
G3UAS 1293

2500
K6KLL.....1213
G3UAS 1214

3000
K6KLL.....1123

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

not her thing and that was it for CW, but I got her on the HF bands.

Shari and I started operating together on SSB collecting the states, 10-10 numbers, countries, etc. It wasn't long before Shari stumbled across the county hunters net on 14.336, and we found that enjoyable. The nice thing about the county hunters net is that there generally is always something going on seven days a week, so you can turn on the radio at any given time and make contacts. My first contact on the net was with AA6MR in Stillwater County, Montana on May 29, 1996, and it all took off from there. Shari and I were not only enjoying ourselves collecting counties, but we also started putting them on the air for other county hunters. My dad, ACØB, even came along on one of the trips and became very interested in the fun of being the "DX" in the pile-up of putting out a county. He started collecting counties soon after that trip, which got him active again after being off the radio for the past few years.

After collecting counties for almost eight years, things started to come together for me and working all 3077 counties was becoming a reality. I had four counties remaining (three in Georgia and one in Montana) when Randy, AA8R, asked if he could help out, and he made a special trip from the Tampa, Florida area to put out my last three Georgia counties. One thing about county hunters, they're a great bunch of guys and gals willing to help you reach your goals.

After making the contacts with Randy, I was now down to my last, Carter County, Montana. My dad packed the van and with my mom headed out the next day to Carter, and on June 14, 2004 I made contact with ACØB for all 3077 counties! It was interesting, as my first county contact was with Montana and my last for All Counties was as well.

Along with my many thanks to Randy and my dad for helping me finish, I would like to also thank a couple of other mobiles who really went out of their way to help me: Dan, KM9X, and Jeffrey, AF3X. Thank you for all you did for me, and thanks to all the other mobile out there who put out the counties for us all.

I worked all the counties on SSB and now have started collecting them on CW as well. I have just under 1000 worked, and it feels good to get back on CW, where I started out some 11 years ago. My daughter Ashley, KØUMD, is getting interested now, as she saw how much fun I had doing it all. This might be the little push she needs to get her General ticket. Oh, and as per my wife Shari, she is now down to about 175 left to finish them all. Good Luck, Honey!

—73, Brian, NXØX

The Rag Chewers Club Award

An old friend returns after a short pause. For many operators, the first award we were able to earn didn't require any QSLs or payment. The ARRL sponsored the Rag Chewers Club award for many years and made it available for just a brief statement that you had made a contact with another station for at least 30 minutes. The idea was to emphasize longer contacts and to get to know the other person just a little better.

The Rag Chewers' Club award has been adopted by the Society for the Preservation of Amateur Radio. It may be claimed by going to the SPAR website and completing simple information on the online form.

The ARRL discontinued its sponsorship of this venerable award in early 2004 due to a low volume of requests. W5ALT reports that the RCC has been adopted by the Society for the Preservation of Amateur Radio (SPAR). It may be claimed by going to the SPAR website and completing simple information on the online form. The award certificate is personalized according to the data given and is sent in the form of an Adobe PDF file that can be printed out on a color printer. (For the Spanish speaking, the certificate is available in Spanish [Club de Radioaficionados Charlatanes].)

This is the second award I'm aware of that follows the "free" and "PDF file" procedure, and I hope more clubs and sponsoring organizations will follow this path. Yes, you will need an internet connection (not free), the PDF reader software (free), and a color printer (not free). I suspect that many operators have the necessary equipment, though.

The rules are simple and follow in the spirit of the original RCC award: Present evidence of having "rag chewed" on the air with another station for at least 30 minutes on or after 1 September 2004. This must be an actual QSO, not a net or roundtable. This award can be endorsed CW, Phone (including FM), or Digital. The QSO can be on any legal amateur frequency.

To apply for the RCC award, go to <http://www.spar-hams.org>, navigate to the SPAR RCC Application, and fill in the online form with contact information, including callsign of station contacted; date, time, and length of the QSO; and the frequency and mode. Your award will be e-mailed back to you shortly.

Radioclub Arktica Awards

Back in May, I followed up on word received that the Siberian Radioclub Arktika awards program had ceased to exist. The club was founded in 1989 with the following goals: to support all amateurs in polar regions and members of arctic expeditions, to sponsor awards to provide interest in this region, and in general to support greater general knowledge of the arctic regions.

I was happy to learn that not only had the club not disappeared, it revised its awards program to include some very interesting certificates and even a cloth pennant and a gold medal. Now that winter is almost upon us, may I suggest that we turn our antennas toward the frozen north of the Russian arctic region and get started on these awards. If you have

Sponsored by Siberian Radioclub Arktica, the Arktica Award is earned by confirming contacts with Arctic areas and club members.

cards from the area of Siberia, look at them and you may see that some list their affiliation with this club. You may already have enough cards to qualify. My QSL card collection includes a card from a Vorkuta station that shows a "freshly frozen" ham operator, just emerging from his shack, peering at a thermometer recording –68°C (doesn't nitrogen fall out of the air as a kind of snow at that temperature?).

General requirements. Several of the awards require contacting club members. If you are interested in becoming a member, an amateur from *any* country must meet one of the following criteria (no time limits):

1. Live in and operate an amateur station from any QTH north of the polar circle.
2. Take part in any Arctic or Antarctic DXpedition.
3. Win first to third place in the Arctic Cup contest.
4. Earn all three awards offered by the club (certificate, pennant, and medal).

Life membership fee is $US20 or 20 Euros, which should be sent to: Dmytro Ostrenko, KY2T, 14 Pavillion Rd., Apt. 5, Suffern, NY 10901 USA. Supply your Arctic area callsign, QTH, and time period when the callsign was active. The club sponsors an activity week every year from 21–24 September to make it easier for you to earn any of the awards. During this week, the certificate can be earned with just ten member contacts, the Arktika-V with 20 member contacts, and the RAA Gold Medal with 30. Award correspondence should be sent to Award Manager Alexander MakSurov, UA6LTO/Ø, P.O. Box 606, Vorkuta 169912, Russia; e-mail: <ua6lto@mail.ru>. A list of the club members can be found at: <http://www.arktika.komi.com/internationalnorthradioclub.htm>.

Radioclub Arktika Award. Confirm contacts on any bands or modes with arctic areas and Radioclub Arktika members on or after 24 September 1989. Cards are not needed. Earn 67 points from the following schedule: (a) Arktika members (a minimum of five different members) = 3 points each; (b) any station residing in the arctic (within the polar circle) = 1 point each. The award is available for CW, SSB, Mixed, QRP, RTTY, SSTV, Digital, or SWL endorsement. Fee is $US5, 5 Euros, or 7 IRCs. Send the fee to KY2T at the address shown above and a GCR list to UA6LTO/Ø at his address also listed above.

The Arktika-V Pennant is a continuation of the Arktika Award, and 100 points are needed to earn one.

Another step in Radioclub Arktika's award series is the Gold Medal, and 167 points are needed.

To participate in the Diplom of Arctic Travel program, write to UA6LTO/Ø telling him the latitude/longitude of your station. You will receive an application and participant number for the program.

Arktika-V Pennant. This is a continuation of the Arktika Award, and 100 points are needed. It is a colorful cloth pennant. Fee is $US5 or 5 Euros.

Gold Medal. This is a continuation of the Arktika Award and pennant described above, and 167 points are needed. Fee is $US5 or 5 Euros.

Diplom of Arctic Travel (DAT). To participate in this program, write to UA6LTO/Ø telling him the latitude and longitude of your station. Enclose 1 IRC. Be as accurate as possible. You will receive a special application and participant number for the DAT program. UA6LTO/Ø will calculate the number of points you need—basically the distance between your QTH and the nearest pole, in kilometers. You will need to earn the points per the following:

1. QSO with any Arctic DAT QTH = 50 points.
2. QSO with an Arctic Island = 100 points.
3. QSO with DXpedition to the North Pole = 200 points.
4. QSO with any Radioclub Arktika member = 50 points.
5. QSO with any Radioclub Arktika HQ member = 60 points.

When you have made all the needed contacts, send the completed form/application to UA6LTO/Ø with the fee of 7 Euros, or $US7 to KY2T.

Does your club or special-interest group sponsor an award? Send me samples or a link to the information, and we'll see about getting you the publicity that will encourage award hunters to apply.

73, Ted, K1BV

Announcing:

The 2005 CQ World-Wide 160 Meter DX Contest

CW: 0000Z January 29 to 2359Z January 30
SSB: 0000Z February 26 to 2359Z February 27

The objective of these contests is for amateurs around the world to contact other amateurs in as many U.S. states, Canadian provinces, and countries as possible on the 160 meter band. *Note:* Each contest is 48 hours long and starts at 0000Z. Single operator stations may only operate 30 out of the 48 hours.

Classes: Single and Multi-Operator only. Use of packet, a spotting net, or logging assistance makes an entry Multi-Operator. Multi-Operators must show all operators, even helpers. Under Single Operator there will be a designation of power level: H = power over 150 watts, L = power under 150 watts, and Q = 5 watts or less. Single operators must show the actual call of the operator as a guest operator if it is different from the call used in the contest. Score listings will be per state or country, but if there is sufficient category activity or if a high enough score is made, then a certificate will be issued. Minimum score for a certificate is 5000 points for Low Power and 1000 points for QRP. Multi-Operators will all be considered high power.

Exchange: RS(T) and state for U.S., province for Canada, and either prefix or country abbreviation for DX. Contacts without some location indicator will be ruled invalid.

Scoring: Contacts with stations in own country, 2 points. Contacts with other countries on same continent, 5 points. Contacts with other continents, 10 points. Maritime mobile contacts count 5 points. There is no multiplier value for a maritime mobile contact.

Multiplier: Each continental U.S. state (48), U.S. District of Columbia (DC), Canadian area (14), and DX country. KL7 and KH6 are considered DX and not states for this contest. DX countries are DXCC plus WAE (IT, GM Shetland Islands, et. al). Canadian areas include VO1, VO2, NB, NS, PEI, VE2, VE3, VE4, VE5, VE6, VE7, NWT, VYØ, and Yukon. Do not count the United States and Canada as separate countries.

Final Score: Total QSO points times the sum of all multipliers (states, VE, DX countries).

Penalties: Three additional contacts may be deleted for each unverified contact removed from the log.

Disqualification: A log may be disqualified for violation of amateur radio regulations, unsportsmanlike conduct, or claiming excessive unverified contacts.

Awards: Certificates will be awarded to the top scorers in each class (see provisions under classes) by state, Canadian area, and DX country. Runners-up with high scores over 100,000 may also receive certificates. The following plaques, with donating sponsors as indicated, will be awarded for exceptional efforts.

2004 PLAQUES

SINGLE OPERATOR

	CW	SSB
World	W4ZV	N4NX
USA	K4TEA	K4JRB
Canada	K8FC	WØETC
Zone 3 USA	N5IA	N4TMW
Zone 4 USA	K4WA	N4XMX
Zone 5 USA	N4PN	K1PX
Europe	K9DX	WS9V
Africa	WS9V	WB4ZNH
Oceania	K9DX	D4B/4L5A
Asia	K4SX	NT4TT
Japan*	W4ZV	—
Russia	RZ3AA	—
S. America	W4NU	D4B/4L5A
N. America**	CQ	CQ
	N4IN Memorial	K2EEK Memorial

MULTI-OPERATOR

World	N4RJ	SE DX Club
USA	W8UVZ, WØCD, K8GG	WB9Z
Zone 3	4X4NJ	4X4NJ

TBA = to be announced.
**There is no SSB operation allowed in Japan at present on 160 meters.*
***North America outside U.S. and Canada.*

The plaque procedure is the top scorer in the indicated area wins the plaque. However, a station can only win one plaque per contest section. The plaque is then awarded to the next highest scoring station. For example, WX8ZZZ wins top World Multi-Operator. Then the next station in the U.S. wins the U.S. plaque.

Please observe the DX window from 1830 to 1835 kHz during the hours of darkness. The DX window is for intercontinental contacts. All stations will operate under the rules and regulations of their licensing agency regarding frequencies allowed and power levels. This is a gentleman's contest and band, so let's help make intercontinental contacts happen.

Computer Logging: Please submit your log via e-mail in the Cabrillo format. The Cabrillo format is created by all the major logging programs. Be sure to put your call and mode in the "Subject" line of each e-mail. The log must be an attachment and not in the body of the text. Large logs may be zipped using WINZIP only. The correct name of the contest is either CQ-160-CW or CQ-160-SSB. Put in a claimed score in the Cabrillo summary if you want to be listed in claimed scores. Use your call .log (k4jrb.log for example) as the log name. Your e-mail log will automatically be acknowledged by the server and checked for proper Cabrillo format. You may mail a diskette; if you do so you must attach a printed summary sheet. The diskette must be clearly labeled with the call of the entrant, the mode (CW or SSB), and the category. If you print out a computer log, you must also send a diskette. Do not send .bin files, database files, or other non-conforming files. Do not remove duplicates from your log, as there is no penalty for duplicate contacts.

Manual Logs: Sample log and summary sheets may be obtained from *CQ* by sending a large SASE with sufficient postage to cover your request. You can also download paper log forms from the CQ website <http://www.cq-amateur-radio.com>, or make your own with 40 contacts per page with columns for GMT, exchanges, multiplier, and points. Paper logs with over 200 QSOs must include a dupe/check sheet with all calls in alpha-sort order. Show the multiplier only the first time it is worked. Each page must have sub-totals for multipliers, contacts, and points. A running total below the sub-total on each page is recommended. Include a summary sheet with your entry showing the scoring and other essential information. A printed name/mailing address is recommended and a signed declaration that all rules have been observed. Clearly mark all duplicate contacts and remember they have no point value. Please put the summary sheet at the front of the log. Manual logs should clearly indicate total multiplier, W/VE multiplier, and DX multiplier.

Club Competition: Any club that submits at least three logs may enter the Club Competition. The name of the club must be clearly identified under club competition on the summary sheet, or summary portion of the Cabrillo log. Club Competition is "for fun" to foster more activity. There is a separate listing for club scores.

Log Submissions: Mailing deadline for CW entries is February 28, 2005; for SSB entries March 31, 2005. *Exception:* You may send both logs at once as long as the logs are received by March 31, 2005. For manual and diskettes logs send them early to assure receipt by the deadlines. For a return receipt enclose an SASE or SAE with postage or 1 IRC. Unreadable paper logs will be put in as check logs.

Send CW e-mail logs to: <160cw@kkn.net>; send SSB e-mail logs to: <160ssb@kkn.net>.

All other logs go to CQ 160 Meter Contest, 25 Newbridge Road, Hicksville, NY 11801 USA. Indicate CW or SSB on the envelope.

vhf plus

BY JOE LYNCH,* N6CL

Spectacular Sporadic-E Openings (cont.)

In my September and October columns I covered the majority of the reports that I received pertaining to the July 6–7 sporadic-*E* opening. The following are the reports that I was unable to include due to space limitations.

Isaac, 4Z4TL, KM72: "Please note that in 4X (Haifa and Tel-Aviv – KM72) many reports have been posted yesterday and today for 2-meter FM contacts with 5B, SV1, SV8, TA, 9H, and 9A."

Bill, KØAWU, EN37ed: "This wasn't July 1982, but it sure was a good *Es* opening into EN37 July 6–7, 2004. I had 61 contacts on 144 MHz and two on 222 MHz. The 144-MHz contacts included the following grids: EL79, 89, 98, EM72, 73, 74, 75, 76, 80, 81, 82, 83, 84, 85, 86, 90, 93, 94, 95, 96, FM04, 05, 06, 07, 14, 15, 16, and 17. They also included the following states: AL, VA, NC, SC, GA, FL, and TN. The best DX was Gary Vest, NW5E, EL98kq, at 1440 miles (2318 km). Most northern contact was KO4YC, FM17. The first station was NG4C, FM16, at 21:42 UTC, and the last station was KK4NO, EM84, at 02:10 UTC. There was nothing heard between 0044 and 0131 UTC. Most signals early on were very strong, and toward the end there was a mix of strong and weak signals often at the same time.

"The 222 MHz included W4VC, EM81tg, Georgia at 23:15 UTC, for a distance of 1248 miles (2008 km) and AF4HX, EM85xp, North Carolina, at 23:24 UTC, for a distance of 996 miles (1599 km). These are the only 222 *Es* I have worked, having only been on the band for about 18 months. Signals on 222 were never over S5 and were brief. Nothing else heard even though I called quite often and monitored the entire period even when I was on 144 MHz."

Jon, NØJK, EM17: "I didn't make any 2-meter sporadic-*E* QSOs despite listening several times. Maybe I was at edge of the opening. I spent most of my time on 6 meters looking for EU DX and worked EH7RM at 2355 UTC!"

Terry, VE3TMG, EN82: "Here is a report of the 2-meter sporadic-*E* opening. I'm in EN82lh, and my station on 2 meters is a Kenwood TS-790, with a 150-watt brick, and antennas are stacked 13b2s at 55 feet.

"My first contact was at 21:24 UTC and my last contact was at 23:55 UTC. Here are the grids I worked: FM15 (new), EM41 (new), EM31, EM30 (new), EM55, el98 (new), EM54, EM81 (new), EM73 (new), FM04 (new), and EM27. I've been on 2-meter SSB for about 11 years and never heard a sporadic-*E* opening this good before. I hope I don't have to wait another 11 years for another one."

Tom, N9QQB, EN53: "Here in EN53 (SE Wisconsin) I heard a lot of activity on 2 meters, but by the time I got home, I wasn't able to work much of it. I don't have a very impressive station for 2 meters SSB (or anything else for that matter), but I was able to pick up some new grids on 6 meters.

"As I worked the opening from 0030 to 0330 UTC the grids I worked flowed from FM07, FM06, FM05 to FM04, then EM95, EM90, EM80, EM72, EM84, EM71. The last one was EM17. It was a nice, long opening. Great fun."

Peter, VE3AX, FN02: "An unbelievable sporadic-*E* opening indeed! Congratulations to Ev, W2EV, and Tony, WA8RJF, for making the grade on 222 MHz, sporadic-*E*. Indeed, while Mark, K2AXX, and I were alternating CQs on 222.100 MHz, Ev snuck in there and worked Bill Duvall, K5UGM, while all I could hear was a whisper. Then Bill turned on his amp and he was copyable immediately. I then worked Bill for my second 222-MHz sporadic-*E* contact (the first was July 8, 2001 with K5LLL in EM10). I stood by to let Mark work him and they exchanged info, but do not believe it was completed. I got out the tape recorder and have about 10 minutes of further exchanges between Bill, who reached 20 over S-9, myself, and Tony. It was very frustrating that nobody else could be heard—and here I thought we were so special!

"If QRZ.com 6-digit squares are right, Ev's contact with K5UGM was 2012.7 km/1250.7 miles almost exactly the same distance as KØAWU/EM37 and W4VC/EM81 at 2316 UTC. The record is 2195 km (W5UWB–W6QIW). It will be interesting to see some plots of the 222 *Es* times/paths to see what happened!

"I worked 56 stations on 2 meters, working all states in W4-land except VA, all W5-land except NM (which I was desperately looking for, as it is one of the two states still needed for WAS-144), KS, MO, and IL. Shortest QSOs were with W9RVG in EM57 and a NC station in FM04. The longest ones weren't anywhere near my 2-meter sporadic-*E* best of W5UWB in EL17 on July 8th 2001. What's next?"

Bob, N3LL, EN90: "On July 6, while operating

VHF Plus Calendar

Oct. 30–31	Second weekend of the ARRL EME Contest (see text for details)
Oct. 31	Poor EME conditions
Nov. 2	Moon Apogee
Nov. 5	Last Quarter Moon
Nov. 7	Good EME conditions
Nov. 12	New Moon
Nov. 14	Moon Perigee; Poor EME conditions
Nov. 18	*Leonids* Meteor Shower Peak
Nov. 19	First Quarter Moon
Nov. 21	Good EME conditions
Nov. 26	Full Moon
Nov. 28	Very Poor EME conditions
Nov. 30	Moon Apogee

—EME conditions courtesy W5LUU

*e-mail: <n6cl@sbcglobal.net>

W3KWH, I worked WØJRP, which was 800 miles in distance (EN90 to EM27), the first 222-MHz sporadic-*E* QSO for us! It was a great day!"

Pat, WA5IYX, EL09: "This is more of a "non-report" just to show how steep the sporadic-*E* MUF *(maximum usable frequency—ed.)* gradient and footprints for the 144–222 MHz stuff was yesterday, as at the peak of it down here I was only seeing spotty Ch. 3 (65.75 MHz) signals. Usually in such a major event, even if we don't get it per se, I normally would have plenty of 88–108+ MHz things coming through. The Dallas area is but 250 miles north of here. I won't bother to lament this part of the EL field not getting any of the Euro-Africa stuff on 50 MHz the past several days as well."

Ed, K1TR, FN42: "Here is a view of what I snagged from FN42. Got home from work at 2215 UTC with W4HP, EM75 as the first QSO. The fun ended 41 QSOs later. Grids worked include: EL79, EM25, 27, EM31, 35, 36, 37, 48, 52, 54, 55, 57, 59, 60, 64, 68, 69, 70, 72, 74, 75, 77, 79, 81, 85, and EN50. The last QSO was at 0106 UTC, with the total operating time about one hour. The setup includes 700 watts to a 16LBX at 96 feet. Let's do it again!"

Stan, WA1ECF, FN41sr: "My report from FN41sr, Cape Cod, MA, for the sporadic-*E* opening on 2 meters started with my first SSB QSO with KE8FD in EM84, at 2106 UTC, and followed with 26 new grids from Florida through Kansas. CW was not used. Grids included: EL59, 79, 97, EM15, 16, 29, 35, 38, 41, 42, 45, 46, 48, 51, 52, 54, 56, 58, 59, 60, 63, 64, 68, 72, 74, and 76. I worked five new states, which included Louisiana, Mississippi, Kansas, Indiana, and Arkansas.

"As I plot the new grid squares, activity was centered in northern Mississippi. There were multiple QSOs in the 1000 to 1500 mile range. Activity waned with my last log entry at 0026 UTC with W5MRB in EM35.

"Signals were up and down and often of short duration, not allowing multiple QSOs from neighboring stations. At its peak, the band was occupied from 144.160 through 144.250 MHz; it was hard to find a place to CQ. The 222-MHz band was also monitored, but I did not hear beyond the local 150-mile range. On 2 meters my station includes: 17B2 at 78 feet (313 feet, ASL); am running about 1200W with the Lunar Link PA and the trusty FT-847 transceiver. This opening was certainly a highlight of my ham radio career. Last time I worked as many new grids was during the *Leonid* meteor shower of November 1998."

Sam, K5SW, EM25: "Here is report of the 144-MHz contacts that I made between 2200 UTC on July 6 and 0150 UTC on July 7, encompassing 3 hours 50 minutes of opening time. I got all of W1s except RI; got both 2s; among the 3s, I missed DE; I got VA in 4s: I got all 8s; and got VE3. My best DX was K1WHS, FN43, in ME, for a distance of 1398 miles. My station consists of a TS-820, MMT/144, Gonset 903, 240 watts, 16-element KLM at 80 feet, fed by 7/8-inch heliax.

"Stations worked included: N1DPM, FN32, MA; W1ZC, FN42, NH; W1FKF, FN32, MA; K1BQT, FN43, NH; WW1Z, FN42, NH; W1COT, FN31, CT; KU2A, FN42, NH; K1TR, FN42, NH; WZ1V, FN31, CT; AA1TT, FN33, NH; WA2BPE, FN12, NY; KW1AM, FN41, CT; KC2JZK, FN12, NY; W2MTK, FN23, NY; WB2JIL, FN10, NY; N8RAT, FM19, WV; W3KWH, EN90, PA; N2NT, FN20, NJ; K8GUN, FM09, WV; K1PXE, FN31, CT; WB2EZG, FN20, NJ; W2KV, FN20, NJ; W1LP, FN41, MA; WA1ECF, FN41, MA; VA3HGO, FN14, ONT; VE3AX, FN02, ONT; K2TXB, FM29, NJ; W1AIM, FN34, VT; K8WW, EN81, OH; NE8I, EN82, MI; W2FBB, FN32, NY; K3XI, FN20, VA; AA2DR, FN30, NY; WB2SIH, FN31, NY; N2FKF, FN30, NY; AK3E, FM19, MD; K2SMN, FN20, NJ; W3EP, FN31, CT; K1VYU, FN31, CT; K1JT, FN20, NJ; W3STU, FM19, MD; K1DG, FN42, NH; K1CMF, FN42, MA; W3TEF, FN00, PA; W1RIL, FN42, MA; N3DL, FN20, PA; W2WGL, FN23, NY; WA2BPE, FN12, NY; K1WHS, FN43, ME; K8ZES, FN02, NY; WA1VTA, FN42, MA; and K2CBA, FN32, NY, for a total of 52 QSOs in 13 states plus VE3.

"The propagation for 222 MHz took place between 2302 and 2318 UTC. My setup includes a TS-820, MMT/222, S.S. brick, running 70 watts, into a 14-element KLM at 75 feet, fed by 1/2-inch heliax. Stations worked include: WZ1V, FN31, CT (for my first 222-MHz sporadic-*E* QSO, a distance of 2048 km); K1TEO, FN31, CT; N3LL, EN90, PA (heard only); WA8RJF, EN91, OH; W2EV, FN03, NY; NQ2O, FN13, NY (new grid number 131); VE3AX, FN02, ONT (heard both ways but no QSO); and K2AXX, FN12, NY (heard only)."

Shelby, W8WN, EM77: "I saw several notes about extreme DX posted to

the VHF reflector. Several gave exact distances, but most were approximate. It appears that there must have been a bunch of 144-MHz contacts greater than 1200–1300 miles, with several beyond 1400 miles (including the 1604 mile contact).

"One hour into the opening stations in FN were working into Florida and Texas. Except for one brief signal from a pair of MN stations, I heard *nothing* in those directions. I listened quite a bit, for there are grids I need in those quadrants. Because of the distances involved and the huge areas, it appeared at that time that there was either one *huge* cloud or a bunch of small ones (probably one and the same). I expected to get some weak signals from Texas, etc., which are good sporadic-*E* distances for me. Nil. Not a peep all night.

"So what was the mechanism? My lack of signals would imply no double-hop. At least no 'normal' double hop, although I couldn't rule it out, for the signals from the NE were the strongest I've ever heard on 144. There was no tropo here, but then I wasn't at the extreme NE end of the path. I didn't see many reports of tropo in the northeastern states, but with all of the sporadic-*E*, I wouldn't expect to see tropo reports. I believe there may have been some reports earlier in the day, but didn't pay any attention to them for I was busy cleaning up the limbs from Monday's severe thunderstorm, and then the sporadic-*E* started. Therefore, I'm wondering if there was actually double-hop, if there was that much tropo in the northeast, or if it could have been some tilted *E* clouds causing chordal hops. To me, this is one of the most interesting questions to come out of the big opening. Hope you can sift out enough details to come up with more on it.

"Four *Es* openings in three days! Not bad for North America! And this one on July 6–7 appears to be about as big as we've ever experienced.

"Things looked good; started CW CQ to NE at 2116 UTC. At 2120, K1PXE answered, and it sounded like everybody and his brother was under him! Went from nil to huge batch of S9++ signals in only about 30 seconds. Some of the strongest signals I've ever heard on 144 MHz.

"I had propagation only to NE, working only 11 grids. Others apparently did much better. Had to disconnect antenna for about 15 minutes as a severe thunderstorm went across the southern end of the county.

"About 2200 UTC, band was about dead, with much QRN and precipitation static. About 2230, signals were very strong again, but not as many. About 2300, reported that 222 was open. A number of 222 reports were seen.

"I heard FN10 briefly on 144 MHz (that's getting rather short); heard NØUK and WØVB, EN34, briefly. Did not work anybody except to northeast. At 2400, band was dead here. Even so, sporadic-*E* was still being reported at 0200 UTC. This makes a ~4 1/2 hour *Es* opening, from Maine to Minnesota to Florida to Texas. Almost like they do it over in Europe!"

Samuel, KD4ESV, EL87: "Hello VHFers. Got home yesterday afternoon from work to a message on phone that the 2-meter band was open to the northeast U.S.! The day before was also open but not at this location, and then it opened twice, so turned on the radio and hope it would open again. About 21:00 UTC band opened up and for the next 4 hours worked the northeast U.S. and Canada. Grids worked include: FN 07, 10, 20, 21, 22, 23, 25, 30, 31, 32, 34, 35, 41, 42, 45, 54, EN93, and FM19, with a total of 81 contacts made. Thank you everyone for best sporadic-*E* opening in years."

David, K3KEL, FN11uf: "Now wasn't that just special! It probably was the strongest, most enduring sporadic-*E* I've heard in 44 years on 2 meters. I didn't have many QSOs, as I spent most of the time searching for new ones. Got four new grids but missed a new state due to QRM. Hope I don't have to wait another 44 years."

Steve, N4JQQ, EM55: "Incredible opening to EM55 from the NE. I worked at least 20 new grids on 2 meters. Tried CQ on 222 a few times with no luck. I was afraid to turn on the 6-meter rig."

Chris, NØUK, EN34: "I was a little late to the fray and unfortunately missed the enhancement on 222 MHz. Nevertheless, the following stations were worked on 144 MHz from my home in Minneapolis (EN34jv) using 350 watts SSB and a single K1FO-12. stations worked include: W4WA EM84, KE8FD EM84, N4HN EM95, W4BCU EM86, N1GMV FM05, N1GC EM95, KD4JRX FM19, N4XD FM05, K8OY EM88, NE4C FM06, and WA1ZMS/4 FM07.

"This was undoubtedly the biggest 144-MHz *Es* opening that I have operated in since moving stateside in '86! Except for W4WA and K8OY, who were around S5, all signals were at or above S9. Indeed, I worked W4WA before my amplifier had warmed up and I was only running about 5 watts!"

Gary, NW5E, EL98: "I worked over 200 QSOs and 42 grids today alone. The grids worked include: FM09, 19, 29; FN00, 02, 03, 07, 12, 13, 14, 20, 21, 22, 23, 25, 30, 31, 32, 33, 34, 35, 41, 42, 43, 44, 45 & 54; EN36, 37, 53, 54, 65, 66, 72, 74, 81, 82, 84, 85, 91, 93, and 94. I first became aware of the opening on 2 meters at 1510 UTC and the last station was worked at 0054 UTC. I was out from 1534 to 2141 UTC to make an appointment. I tried 222 MHz but nothing but MS *(meteor scatter—ed.)* pings from VE3AX and K2AXX when we tried.

"While all this was going on, the 6-meter band was open to Europe quite nicely. Additionally, on the 7th the following was worked on what seemed to be a very narrow path to the Mediterranean area: IH9/I2ADN, ISØGQX, and EH6VQ. Later F5LNU came through with a loud signal, and then the band died quickly.

"The station consists of a IC746 Pro with ARR Gasfet preamp driving a Henry 2002A. The antenna is a 19-element CC (modified) at 105 feet fed with LDF4-50."

Jim, AA3ID, FM25: "Here is my report from Hatteras Island, NC. Six-meter contacts: 92 QSOs in 45 grids. Farthest was WB9MVQ in DN87 (ND). It seemed odd to me that I was able to work SC (EM94) at the same time as working EN63 in Wisconsin with 5-9 signals. Equipment on this band includes a 3-element beam and 25 watts. Two-meter contacts: 57 Qs in 21 grids, farthest being EN13. Grids worked on 2 meters include: EN13, 22, 31, 32, 34, 35, 41, 43, 51, 52, 53, 54, 61, 62, 64, 72, 74, 81, 82, 83, and EM 39. The 57 QSOs were worked in 70 minutes. Couldn't decide whether to stay on 6 or go to 2! Hi, Hi!"

Larry, AF4HX, EM85: "Yesterday's big *E* opening lasted here on 2 meters for me for a couple of hours. My location is in western NC in EM 85. My best string on 2 meters started at 2252 UTC and ended 2322 UTC. It included 47 QSOs in 17 grids in 30 minutes. Some of the RSTs were 20 over. It was so strong that I worked two stations running only one loop each. When I first started calling CQ it sounded like a pile-up on 20 meters. Everyone was so strong. I worked the stations fast, and I know there were other stations on the edge that I didn't get to work before it started to die down. Before this strongest opening I worked several stations that would come up and be there for a few minuets and then go away, and then a couple more would come up and I would work them, but this was the best time of the event for me.

"At 2322 UTC I went to 222 MHz to

give it a try. I know this move took 2-meter QSOs away from my total, but if it was going to happen on 222 MHz, it had to be when the signals were the strongest on 2 meters. I called on CW for a few minutes hoping to get someone to hear me and then went to SSB. At 2328 UTC KMØT answered my SSB call and I worked him in EN13 with a 55 RST. Then at 2329 UTC KØAWU answered my call at 57 in EN37. I could hear some other weak stations but could not pull them out enough to make the QSO. I'll give up some 2-meter QSOs to work 222 MHz on sporadic-*E* anytime.

"I almost went out of my chair when we completed the two QSOs on 222 MHz. What a time yesterday was!! This event was the best sporadic-*E* that I've ever experienced.

"I worked Europe the day before and the day before that on 6 meters. When they died out, I ran nearly 500 QSOs stateside from the west coast to the far northeast in Canada. What an event!

"Some grids worked in 30 minutes on 2 meters include: EN34, EN93, EN36, EN35, EN37, EN54, EN53, EN31, EN52, EN43, EN66, EN65, EN84, EN12, EN13, EN37, EN26, and EN10."

Clint, W1LP, FN41: "Here is what I got from Cape Cod/FN41sr. The band was open here for about 30 minutes from 1600–1630 UTC to EM55, 56, and 66. Then it opened again for a solid 4 hours starting at 2130 UTC. Totals were 72 QSOs, 40 grids (31 of them new), and three new states! At one point I had to run out and pick someone up. In my car I heard stations in Florida and Oklahoma City on 146.52 MHz simplex. It was pretty amazing to hear a 4 working a Ø and hear both sides of the QSO. I sure needed a good opening in that direction, and this was just what the doctor ordered. Wow!

"Grids worked include: EL 59, 79, EM15, 16, 19, 25, 26, 27, 29, 35, 36, 37, 38, 39, 41, 42, 45, 46, 48, 52, 55, 56, 57, 58, 59, 62, 63, 64, 66, 68, 72, 73, 74, 75, 76, 77, 79, 81, 84, and 85."

Hal, W4HP, EM75: "I started working the 2-meter opening at 2124 UTC with WA1RKS in FN32. During the opening I worked 74 different stations in 24 different grids. Most distant contacts were EN36 across the U.S. to FN64. I had to shut down at 2330 UTC because of a local thunderstorm. Even so, strong signals were still coming into EM75. This opening was one of the best I've seen since I got on 2 meters SSB from here in EM75 in 1980."

Neil, N4ION, EM62: "There was a tremendous 2-meter opening, even here in central Alabama EM-62. I worked 98 contacts in grids as follows: FN02, 03, 04, 07, 12, 13, 14, 20, 21, 22, 23, 25, 30, 31, 32, 33, 34, 35, 41, 42, 43, 45, 54; EN52, 53, 56, 62, 74, 81, 91, 92, and 93. Total 21 new grids and 5–6 new states from here.

Howard, WB4WXE, EM74: "Good opening on 6 meters on 5 July from here in EM74 Alabama with the following going into the log: EH7ZM, EH7RM, CT1FOH, EH5RM, EH9AI, CT1FJC, CU3EQ, CT3BM, CT3BD, and ZB3B for country number 112. On 6 July there was more of the same propagation as on the 5th, but not as strong. FP/KB9LIE was S9 on 50 MHz, giving many a new one.

"Then a very good 2-meter opening graced us with contacts into FN23, FN33, FN35, FN34, FN14, FN30, FN12, FN45, EN74, FN03, EN92, EN91, EN37, FN41, FN33, for new states of RI, MN, MI, and MA. I did not catch the beginning of the opening, but managed 30 contacts from 2313Z to 2354Z. These included WA1ECF, WB8WIV, WA2RQC, AA2DR, WB2CUT, KC2MHU, W2MPK, N2OEQ, NY2Z, W8ANS, KA3FZN, W8MIL, KBØLBS, N1XZW, K2OVS, WV2C, AA1TT, WA3LTB, as well as, VE2DCP, VA3HGO, VE2AWN, VE3AJY, VA2LC, VE3NPB, VE3UIN, VE2AMN, VE2JMK, VE2CUA, and VE3HJK/mobile, with VE3DSS the last contact.

"States included NY, NJ, MA, RI, MN, MI, OH and Canada."

John, VA3QRM (yes, that's his suffix), EN82: "I have been a ham here in Windsor, Ontario (EN82) since 1992 and just purchased a Yaesu FT-817 and put up a Comet GP-15 (vertical) at about 4 meters. I had been having a blast on 6 July on 6 meters and had a ham mention to me that short hops heard on 10 meters told him that 2-meter sporadic-*E* would be open. I had previously struggled at best to check into N8EDV's local 2-meter net, but I went up and started to tune around. At 2223 UTC I worked KC4PX Merritt Island, Florida, EL98, with my puny 5 watts QRP and vertical antenna. Ivars heard me through the pile-up, and when asked, the multitudes calling stood by. His report was 60 over; mine, 59? Of course, Ivars shelving in the ham shack is worth more than my entire station, but it did not dull my excitement at an estimated 973 miles, or 195 miles per watt, confirmed contact on 2 meters QRP, and vertically polarized. A local ham who records openings sent me some audio of KC4PX and my exchange. Therefore, I have the card and some audio because sometimes I think it to be bordering on the impossible!"

Current Contest

The second weekend of the **ARRL EME** contest will be October 30–31 *(this issue of CQ should reach most readers by that time—ed.)*. As was the case last month, the contest will be for the full weekend, a 48-hour period (0000 UTC Saturday through 2359 UTC Sunday). This weekend's contest is for the 2304-MHz and up bands. For more information on the ARRL EME contest, see page 98 in the September 2004 issue of *QST* or go to: <http://www.arrl.org/contests/rules/2004/eme.html>.

Meteor Shower

While another peak in activity is a year away, it is still important to pay attention to the *Leonids* meteor shower, as it may produce a ZHR (zenith hourly rate) in excess of 100 at its peak. It is predicted to peak at around 0825 UTC on November 18. For more information, visit the International Meteor Organization's URL: <http://www.imo.net>.

And Finally . . .

Now we have covered all of the reports sent to me regarding the July 6–7, 2004 sporadic-*E* opening. Ironically, the last one from VA3QRM came in as I was finishing editing WB4WXE's report. While it was more than two months after the fact, it was just in time to meet the deadline for this column.

Until next month

. . .73, de Joe, N6CL

propagation

BY TOMAS HOOD,* NW7US

CQ WW DX CW Contest Conditions

A Quick Look at Current Cycle 23 Conditions
(Data is rounded to nearest whole number)

Sunspots
Observed Monthly, August 2004: 41
Twelve-month smoothed, February 2004: 49

10.7 cm Flux
Observed Monthly, August 2004: 110
Twelve-month smoothed, February 2004: 116

***Ap* Index**
Observed Monthly, August 2004: 10
Twelve-month smoothed, February 2004: 18

The 2004 CQ WW DX CW Contest will start at 0000 UTC, Saturday, November 27 and continue until 2400 UTC, Sunday, November 28. Expect High Normal conditions for the first contest day, and Low Normal for the second. The Planetary *A* (*Ap*) index should remain at about 15 for both days.

The best tool available to predict HF propagation conditions in advance is the 27-day recurrence tendencies of geomagnetic, solar, and ionospheric conditions. It is not an absolute method, but it does give a very good indication of what can be expected. Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational periods. Be sure to carefully check conditions on October 31 and November 1, since this would be one rotational period before the CW contest weekend. There is better than a 90-percent chance that conditions observed on those days will recur during the November CW contest weekend.

See the "Last-Minute Forecast" for additional information concerning expected day-to-day conditions for the entire month of November. An updated day-to-day forecast for the CW contest weekend will appear as a bulletin at the beginning of next month's column. December's issue should reach most subscribers before the CW contest begins. You can also see an up-to-the-day "Last-Minute Forecast" on my propagation resource center, at <http://prop.hfradio.org/>.

Table I tabulates the observed sunspot count during previous WW DX Contest periods since 1993, and what's predicted for the 2004 contests *(we printed it last month, too, as it's for both the SSB and CW contests—ed.)*. Contest conditions could be somewhat like those of 1994. Low- to middle-latitude propagation paths should be fairly good, with openings even on 15 meters. With the low probability of geomagnetic disturbance during the contest weekend, the bands should be stable, and the lower frequency bands will be much quieter than the past few years.

*P.O. Box 213, Brinnon, WA 98320-0213
e-mail: <cq-prop-man@hfradio.org>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for November 2004

	Expected Signal Quality			
Propagation Index.....	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 3-6, 13-16, 24-26, 30	**A**	**A**	**B**	**C**
High Normal: 2, 7, 9-10, 12, 17-19, 22-23, 27, 29	**A**	**B**	**C**	**C-D**
Low Normal: 1, 11, 28	**B**	**C-B**	**C-D**	**D-E**
Below Normal: 8, 21	**C**	**C-D**	**D-E**	**E**
Disturbed: 20	**C-D**	**D**	**E**	**E**

Where expected signal quality is:
A—Excellent opening, exceptionally strong, steady signals greater than S9.
B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing on the following pages.
2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 3 will be fair to poor (C-D) on Nov. 1st, good (B) on the 2nd, excellent (A) on the 3rd through the 6th, etc.

November Propagation

Last month's column contained a detailed review of conditions expected during October. Let's look at what we can expect this month.

160 Meters: Expect an increase in DX openings on this band during the hours of darkness and into the sunrise period. Since we are far along on the downward slope of Cycle 23's decline, this season will be quite a bit more favorable for stable conditions on this and the other bands. With the cycle predicted to reach its end by the beginning of 2007, we're only two years away from the least amount of geomagnetic disturbance conditions since the start of Cycle 23. This winter season will be rea-

	1993	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04
Oct.	45	27	12	9	32	71	108	115	114	91	58	29*
Nov.	41	26	11	10	35	73	111	113	116	85	57	27*

** Predicted values expected during the 2004 contest*

Table I– Smoothed sunspot numbers recorded during CQ World-Wide DX Contests since 1993 (October SSB, November CW).

FLASH!

CQ WW SSB DX Contest Forecast Looks Good!

Good to Excellent Conditions Expected

Since this issue of *CQ* should reach most subscribers prior to the start of the CQ World-Wide DX SSB Contest weekend of October 30–31, here is an updated forecast made at press time for the general propagation conditions expected. Based on the 27-day recurrence tendencies of solar and geomagnetic conditions, it looks like conditions will be excellent on October 30 and good on October 31. Expect Above to High Normal HF conditions for the both days.

Daily 10.7-cm solar flux levels are expected to be around 105 during the contest weekend. The geomagnetic planetary *A*-index is expected to be about 10 to 12 during the SSB contest.

There are no major storms expected for the weekend, so propagation conditions during this year's contest should be good. To maximize scores, be sure to plan your operation based upon the details covered in last month's column.

sonably quiet. The combined effect of the decreased static levels and longer hours of darkness in the northern latitudes will make 160 a pleasurable band all winter. During this month's CQ WW CW contest, participants should experience fair to good scores on this band. Look for openings toward Europe and toward the south from the eastern half of the U.S., and toward the south, the Far East, Australasia, and the South Pacific from the western half of the country. These openings should be strong during the contest period. Remember, the best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path.

80 Meters: This should be a great band for DX openings to many areas of the world during the hours of darkness and into the sunrise period. Eighty meters becomes a reliable long-distance band throughout the entire period of darkness. The band should peak toward Europe and in a generally easterly direction around midnight. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open toward the south throughout most of the night. Noise levels will be considerably down from October, and the period for band openings in a particular direction will be a bit longer. Some contest operators may take the challenge of operating exclusively on 80, an adventure in skill and patience. The conditions are expected to be favorable for high scores on this band.

40 Meters: Competing with 80 meters, this should be a hot DX band during the dark hours, as the seasonal static levels are lower than they were during the summer. Nighttime MUFs (maximum usable frequencies) could fall below 7 MHz this month for many paths, so it might lose some steam until morning hours. The band should be open first for DX toward Europe and the east during the late afternoon. Signals should increase in intensity as darkness approaches. Signals should peak from an easterly direction closer to midnight, and from a westerly direction just after sunrise. Remember, just as with 80 meters, signals tend to peak as the sun rises on the eastern end of a propagation path. Working against the CW operator is the interference that increases when the propagation is excellent.

20 Meters: DX openings should be possible on this band mostly during the day, and somewhat during the night. However, because of the shorter daylight hours in the Northern Hemisphere, nighttime path openings will be open for a shorter period this month compared to October, with signal peaks from about an hour or two after sunrise and again during the late afternoon and early evening hours. Don't forget to look for long-path openings for about an hour or so after sunrise and again for an hour or so before local sunset. On days with quiet geomagnetic conditions look for transpolar DX.

15 Meters: DX propagation conditions should be fair to good on this band, especially at low latitudes. A daytime band, reasonable conditions are expected from shortly after sunrise through the early evening hours. The band could remain open into the evening toward southern and tropical areas. While 15 meters might be the best daytime band for the contest weekend, it will be close a bit earlier and open a bit later than it did in October.

10 Meters: With an expected flux no higher than about 110 on the best days of the month, 10 meters will be a poor band. Those in low- and middle-latitude locations can expect some daytime contacts during the contest weekend, mainly on north/south paths. If open, the band will peak right after sunrise, and just a bit before sunset, local time. Openings toward Europe and in a generally easterly direction will be sparse, if at all, and should peak an hour or two before noon, while those toward South

America and Africa are expected to peak during the early afternoon hours. Optimum conditions toward the Far East, Australia, southern Asia, and the South Pacific are forecast for the late afternoon and early evening hours, especially from stations in lower latitudes. This band will require a lot of skill and better-than-average antennas.

CW Contest Tips

Overall, expect fair to good conditions on 15 meters, and good to excellent conditions on 20 meters during most of the daylight hours. For stations in the lower latitudes, 20 meters will be usable for most of the contest period, well into the hours of darkness.

From sundown to midnight, 40 meters should be the best band for openings toward the east, north, and south. Twenty meters will close in many locations before midnight, while 80 meters will be a hot band with openings into the same areas as for 40.

Between midnight and sunrise, the best DX band should be 80 meters, with 40 a close second. Openings on both bands should be possible to most areas of the world, with conditions peaking towards the south and west. Some good 20-meter openings are also expected during this period, mainly towards the south and west. The 160-meter band should wake up, offering some good DX openings, similar to 80 meters but with somewhat weaker signals.

It is unlikely that there will be any major solar or geomagnetic storm during the November contest weekend. However, if a storm should develop, work the higher bands and look for openings on a north/south propagation path.

During the contest, be sure to check my propagation page (http://prop.hfradio.org/) for up-to-the-minute conditions. If you have a WAP/WML device, you can gather the latest propagation information, warnings, alerts, and a look at conditions by pointing your WAP device to <http://wap.hfradio.org/>. This is a special URL for wireless access to this free resource. There are more resources listed in the October column.

VHF Conditions

The *Leonids* meteor shower is the big event for November. It is expected to peak on November 17 at 0825 UTC, with a rate of 10 to 50 visuals per hour. The *Leonids* start around November 14 and continue through November 21.

The strongest activity for the *Leonids* was between 1998 and 2002. It was in 1998 that the 55P/Tempel-Tuttle

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An * indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in ( ) after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 AM; 13 is 1 PM, etc. In the Short-Skip Chart appropriate *standard* time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EST, on a circuit between New York and Texas, the time at the midpoint would be CST, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones add 2 hours in the PST zone; 3 hours in the MST zone; 4 hours in the CST zone; and 5 hours in the EST zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 PM in Los Angeles; 17 or 5 PM in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *standard* time in other areas of the USA subtract 8 hours in the PST zone; 7 hours in the MST zone; 6 hours in the CST zone; and 5 hours in the EST zone. For example, at 20 GMT it is 15 or 3 PM in New York City.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

5. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado 80302.

CQ Short-Skip Propagation Chart
November & December 2004
Band Openings Given In Local Standard Time At Path Mid-Point (24-Hour Time System)

Band (Meters)	*Distance From Transmitter (Miles)*			
	50-250	*250-750*	*750-1300*	*1300-230*
10	Nil	Nil	08-11 (0-1) 11-17 (0-2) 15-17 (0-1)	08-09 (1) 09-11 (1-2) 11-15 (2) 15-17 (1) 17-19 (0-1)
15	Nil	09-11 (0-1) 11-15 (0-2) 15-18 (0-1)	07-08 (0-1) 08-09 (0-2) 09-11 (1-3) 11-15 (2-4) 15-16 (1-3) 16-18 (1-2) 18-19 (0-1)	07-08 (1) 08-09 (2) 09-11 (3) 11-15 (4) 15-16 (3) 16-18 (2-3) 18-19 (1-2) 19-21 (0-1)
20	10-12 (0-1) 12-14 (0-2) 14-16 (0-1)	06-07 (0-1) 07-10 (0-2) 10-12 (1-3) 12-14 (2-4) 14-16 (1-4) 16-17 (0-3) 17-19 (0-2) 19-22 (0-1)	06-07 (1) 07-09 (2-3) 09-10 (2-4) 10-12 (3-4) 12-16 (4) 16-17 (3-4) 17-19 (2-3) 19-22 (1-2) 22-00 (0-1)	06-07 (1-2) 07-09 (3) 09-15 (4-3) 15-17 (4) 17-19 (3-4) 19-21 (2-3) 21-22 (2) 22-23 (1-2) 23-00 (1) 00-06 (0-1)
40	07-08 (0-2) 08-09 (1-3) 09-17 (3-4) 17-19 (2-3) 19-21 (1) 21-00 (0-1)	06-07 (0-2) 07-08 (2-3) 08-09 (3) 09-15 (4-3) 15-17 (4) 17-19 (3-4) 19-21 (1-3) 21-00 (1-2) 00-03 (0-2) 03-06 (0-1)	06-07 (2-3) 07-08 (3) 08-09 (3-2) 09-15 (3-1) 15-17 (4-2) 17-19 (4) 19-21 (3-4) 21-03 (2-4) 03-06 (1-3)	06-08 (3-2) 08-09 (2-1) 09-15 (1-0) 15-17 (2-0) 17-19 (4-3) 19-03 (4) 03-06 (3)
80	08-21 (4) 21-01 (3-4) 01-04 (2-3) 04-07 (1-2) 07-08 (3)	08-09 (4-2) 09-16 (4-1) 16-18 (3-1) 18-01 (4) 01-04 (3-4) 04-07 (2-3) 07-08 (3)	08-09 (2-1) 09-16 (1-0) 16-18 (3-1) 18-20 (4-3) 20-04 (4) 04-06 (3-4) 06-07 (3) 07-08 (3-1)	08-09 (1-0) 09-16 (0) 16-18 (1-0) 18-20 (3-2) 20-04 (4) 04-06 (4-2) 06-07 (3-1) 07-08 (1)
160	07-09 (3-2) 09-11 (2-0) 11-17 (1-0) 17-19 (3-2) 19-07 (4)	07-09 (2-1) 09-17 (0) 17-19 (2-1) 19-04 (4) 04-07 (4-2)	07-09 (1-0) 09-17 (0) 17-19 (1-0) 19-21 (4-2) 21-04 (4) 04-06 (2) 06-07 (2-1)	07-19 (0) 19-21 (2-1) 21-04 (4-2) 04-06 (2-1) 06-07 (1-0)

HAWAII
November & December 2004
Openings Given in GMT

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Eastern USA	08-10 (1) 10-12 (2) 12-14 (1)	07-08 (1) 08-12 (2) 12-14 (3) 14-15 (2) 15-17 (1)	06-08 (2) 08-13 (1) 13-14 (2) 14-17 (3) 17-20 (2) 20-00 (1)	16-18 (1) 18-02 (3) 02-04 (1) 18-20 (1)* 20-01 (2) 01-03 (1)*
Central USA	08-10 (1) 10-14 (2) 14-16 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (2) 07-08 (3) 08-13 (2) 13-14 (3) 14-16 (4) 16-18 (3) 18-20 (2) 20-00 (1)	17-19 (1) 19-20 (2) 20-02 (3) 02-03 (2) 03-04 (1) 19-21 (1)* 21-02 (2)* 02-04 (1)*
Western USA	08-10 (1) 10-14 (2) 14-17 (1)	06-07 (1) 07-08 (2) 08-12 (3) 12-14 (4) 14-16 (3) 16-17 (2) 17-19 (1)	06-07 (2) 07-09 (4) 09-14 (3) 14-16 (4) 16-18 (3) 18-22 (2) 22-02 (1)	17-18 (1) 18-20 (2) 20-01 (4) 01-04 (3) 04-06 (2) 06-07 (1) 18-19 (1)* 19-21 (2)* 21-04 (3)* 04-05 (2)* 05-06 (1)*

ALASKA
November & December 2004
Openings Given in GMT

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Eastern USA	19-22 (1)	16-18 (1) 18-21 (2) 21-23 (3) 23-00 (2) 00-01 (1)	18-21 (1) 21-23 (2) 23-01 (3) 01-02 (2) 02-04 (1)	06-12 (1) 07-11 (1)*
Central USA	19-23 (1)	17-18 (1) 18-21 (2) 21-00 (3) 00-01 (2) 01-02 (1)	17-20 (1) 20-23 (2) 23-02 (3) 02-03 (2) 03-05 (1)	06-14 (1) 07-12 (1)*
Western USA	19-21 (1) 21-23 (2) 23-00 (1)	17-20 (1) 20-21 (2) 21-22 (3) 22-00 (4) 00-01 (3) 01-02 (2) 02-03 (1)	14-17 (1) 17-20 (2) 20-22 (3) 22-00 (4) 00-02 (3) 02-04 (2) 04-06 (1)	02-03 (1) 03-05 (2) 05-14 (3) 14-15 (2) 15-16 (1)

**Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.*
For 12 meter openings interpolate between 10 and 15 meter openings.
For 17 meter openings interpolate between 15 and 20 meter openings.
For 30 meter openings interpolate between 40 and 20 meter openings.

Propagation charts prepared by George Jacobs, W3ASK.

comet, the source of the *Leonids*, returned to its perihelion. Since then, we have been seeing a continuing decline in activity. No one is predicting any enhanced activity for this year's shower. However, it is possible that we could be surprised.

Remember that the *Leonid* radiant is best around local midnight in the Northern Hemisphere. Working VHF propagation off meteor tails (the highly ionized plasma trails left by the meteor) requires some reasonable power and gain, and good operating skill. With the latest high-speed burst-mode CW software, you can possibly work even the smaller meteors.

Go to <http://www.imo.net/calendar/cal04.html> for a complete calendar of meteor showers in 2004.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for August 2004 is 41, down 10 points from July. The lowest daily sunspot value during August was recorded on August 31, with a count of 9. The highest daily sunspot count was 76 on August 13. The 12-month running smoothed sunspot number centered on February 2004 is 49, three points down from January. A smoothed sunspot count of 28 is expected for November 2004, give or take about 12 points.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 110 for August 2004, down 9 points from July 2004. The 12-month smoothed 10.7-cm flux centered on February 2004 is 115.5, continuing a downward trend. The predicted smoothed 10.7-cm solar flux for November 2004 is about 88, give or take about 15 points.

The observed monthly mean planetary *A*-index (*Ap*) for August 2004 is 10, down from July's (revised since last month's report) 23. The 12-month smoothed *Ap*-index centered on February 2004 is 17.7, less than one point down from January's 18.1. Expect the overall geomagnetic activity to be quiet during most days in November. Refer to the Last-Minute Forecast for the outlook on what days that this might occur.

Correction for the October column

In October's column, the "Quick Look at Current Cycle 23 Conditions" contained June/December data, rather than the July/January data. Here is the correct information:

A Quick Look at Current Cycle 23 Conditions
(Data is rounded to nearest whole number)

Sunspots
Observed Monthly, July 2004: 51
Twelve-month smoothed, January 2004: 52

10.7 cm Flux
Observed Monthly, July 2004: 119
Twelve-month smoothed, January 2004: 116

***Ap* Index**
Observed Monthly, July 2004: 23
Twelve-month smoothed, January 2004: 18

I hope to hear your station on the air, especially during the WW CW contest weekend. I am not the fastest CW operator, but I expect to be in the mix somewhere on the bands, increasing my skill little by little. Please come and participate in my online propagation discussion forum at <http://hfradio.org/ forums/>. Good luck in the 2004 CQ WW DX CW Contest!

73, Tomas, NW7US/AAAØWA

Zero Bias *(from page 6)*

problem with semi-automatic stations is the nature of HF propagation—the person activating the remote transmitter has no way of hearing what the band sounds like at the remote location, so there is the distinct possibility of unintentionally causing interference with a QSO in progress that the human control operator cannot hear. This also sets up the potential—as these modes become more popular and more numerous—for significant interference problems between incompatible modes.

It is therefore essential that any change such as the one proposed be accompanied by a strong voluntary band plan, establishing separate areas for incompatible modes. All "major players" must agree to these in advance—and then abide by them.

In an e-mail to *CQ*, ARRL Chief Executive Officer Dave Sumner, K1ZZ, agrees in principle, saying that "within the regulatory framework (present or future) there has to be an additional framework of voluntary 'good practices'—(such as) band plans." On the other hand, Dave points out that "the regulatory framework—since it doesn't change very often or very quickly—has to be sufficiently loose to accommodate things we haven't even thought of yet." Dave is 100% correct on both counts, and voluntary band plans have always been an important part of amateur radio's self-regulatory tradition. However, we would strongly encourage the League to add into its proposed rules a statement that "All amateurs are strongly encouraged to cooperatively develop and abide by voluntary band plans to minimize interference between incompatible modes."

And Furthermore . . .

There are a few other points that need attention but which we don't have space to examine here in detail. For example, the unexplained and inexplicable provision to permit "continuous test transmissions" on all VHF and UHF bands, except for 50–51 MHz and 144.0–144.1 MHz (a recipe for incredible QRM); and the elimination of all bandwidth restrictions (beyond staying in the band) for all bands above 222 MHz, which has the potential for disastrous consequences to EME, satellite and other weak signal communications on the UHF and microwave bands. The VHF/UHF weak-signal and satellite communities need to weigh in with alternatives that will accomplish the worthy goals of encouraging experimentation with new modes while still protecting current activities. Finally, the issue that has bogged down this concept in the past—how the typical ham measures the bandwidth of his/her transmitted signal—is dealt with by not being dealt with, except for a comment in an ARRL news release that measurement would not be necessary because the proposed limits "are more than sufficient for 'clean' signals using the traditional HF modes." There needs to be discussion of whether there is general agreement on this point.

Several critics have suggested that because the ARRL's draft is flawed and complex, it should be scrapped and started over. We disagree. Throwing out the baby with the bathwater is not the right approach. The purpose of putting the draft out for public comment was to identify the flaws and get suggestions for improvements. We encourage everyone to carefully read the ARRL's draft (the whole thing, not just the synopsis—both are at <http://www.arrl.org/announce/bandwidth.html>), compare it with the current rules and send comments and suggestions to <bandwidth@arrl.org>.

Happy Thanksgiving!

73, W2VU

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our readers say

"Zero Bias" Fan

Hey there:

Just re-reading some issues from earlier this year, and wanted to thank you for the excellent editorial by Rich Moseson (W2VU). The April '04 issue editorial entitled "They Just Want to Make More Money" was a wonderful piece, from the point about CB radio to the manufacturers' point of view; simply excellent! I've been a ham since '77 when in high school, and really enjoyed his frame-of-reference.

Also top notch was the January'04 "Magic in the Sky" by AA6JR! That article brought a tear to my eye, having been a ham these many years, then having that experience put so eloquently into print! Great work!

QST may have the flashier photos and construction articles, but you guys have the best writing!

Many thanks, best 73,

Steve Summitt, WA4LZB
Nashville, TN

Contesting Question

Editor, *CQ:*

In years past I enjoyed contests very much, and now after ten years of little activity I have begun to enjoy ham radio again. I am sure that I am not the only operator out here with questions and would like to learn more about electronic logging.

It would be nice to have an article on the essentials of electronic logs and how to do "Cabrillo." I have found little information. The ARRL has a rather vague two-page article but it is of little help when looking at commercial log programs. What is the difference between Cabrillo and ADIF?

Just and idea for thought.

Stephen Bissler, KB9RW
via e-mail

W2VU responds:

Stephen—We're glad you're getting active again and enjoying contesting. We've passed on your suggestion for a review of the basics of computer contest logging to our contesting folks. Meanwhile, to answer your direct question, ADIF stands for Amateur Data Interchange Format and is a standard format for transferring information between various pieces of amateur radio software. For example, if you have one program for contest logging and one for general logging, as I do, if both support ADIF then you can easily transfer your contest log into your general log when you're ready. Likewise, if you switch from one logging program to another, ADIF will let you transfer your old files to your new program. Technical details are on the main ADIF website at <http://www.hosenose.com/adif/>.

Cabrillo is a standardized method of organizing contest logs for electronic submission. It is much more contest-specific than ADIF. You can find more information on Cabrillo at <http://www.storm.ca/~ve3iay/ cabrillo. html> or on the CQ World-Wide DX Contest website at <http://www.cqww.com/cbr_info.htm>.

More "Phoenix" Mail

Editor, *CQ:*

What a great article "The Phoenix QRP Transceiver" (June/July issues). This is the kind of thing that will keep ham radio alive. Hope to see more material like this.

John Somerville, VE7CFG
via e-mail

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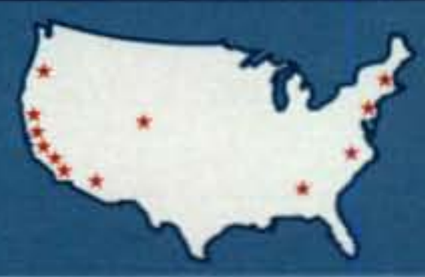

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